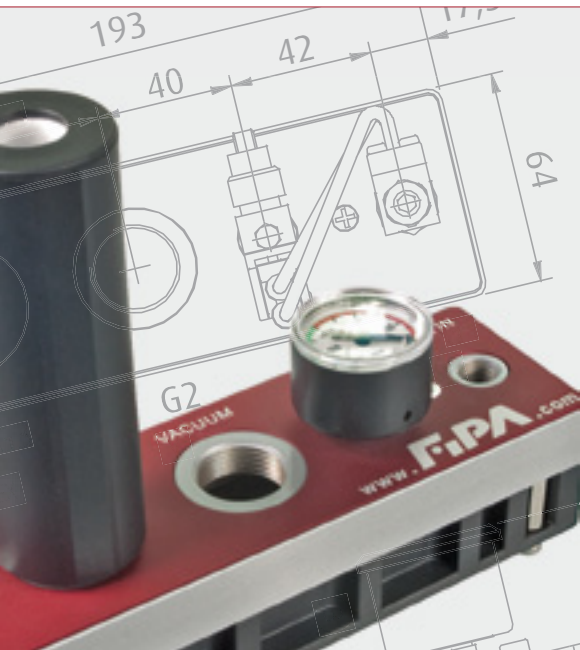


# FIPA Vacuum Technology



[www.fipa.com](http://www.fipa.com)

**FIPA**

*Material in Motion*

„Only those who think ahead stay ahead.“



## Vacuum Technology Expertise

With the headquarter in Ismaning / Germany, just outside of Munich, FIPA specialises in developing and marketing innovative vacuum technology for handling a wide variety of products.

In doing so we cover the entire process chain, from vacuum generation to system peripherals, through to vacuum cups and gripper systems at the interface with your product.

Our aim is to offer the right solution for every customer and every requirement. Either by selecting a suitable product from our extensive standard range or by developing a customised solution that is tailored to your exact requirements.

Our modular product and component construction kit forms the basis for this. The construction kit is being continually expanded and developed, allowing us to respond promptly to shifting market requirements.

Our innovative product solutions, combined with a competent workforce, a practiced service culture, an international sales network and reliable partners make FIPA a pioneering company in the field of vacuum technology.

This catalogue represents our extensive range of vacuum cups and vacuum components. Please contact us if you need a customised solution. We would be pleased to develop it for you.

FIPA: vacuum technology for streamlining your material flow!



Best regards, Rainer Mehrer  
CEO of FIPA GmbH

---

### Order information

---

- > Please add the part number with the respective material code to your order.
- > Please turn the page for available materials and material selection!



## Overview of vacuum cup materials

Short designation	Material code	Hardness [Shore A ± 5°]	Commercial designation	Commercial name (example)	Short-term working temperature [°C]	Abrasion resistance	Flexibility	Oil-resistance	Fuel resistance	Ozone and weathering resistance	Acid resistance	Leaching resistance
BR-AS	10-AS	60	Butadiene rubber, anti-static		-50 / +100	++	+	0	0	0	+	++
CR	9	50 - 60	Chloroprene	Neoprene®	-40 / +110	+	+	++	0	++	+	+
EPDM	15	50		Vistalon®	-40 / +130	+	++	0	0	++++	+++	+++
FKM	7	65	Fluor rubber (FPM)	Viton®	-10 / +230	0	0	++++	++++	++++	+++	+++
Foam rubber	12						++++					
HNBR	14	55	Hydrogenated acrylonitrile-butadiene rubber	Therban®	-30 / +160	++	+	++++	++	+++	+	+
NBR	1	50 - 60	Nitrile rubber	Perbunan®	-30 / +90	+	+	+++	+	0	0	0
NBR-AS	1-AS	50 - 70	Nitrile rubber, anti-static		-30 / +90	+	+	+++	++	0	0	+
NR	4	35 - 45	Natural rubber	SMR	-40 / +80	++	++++	0	0	0	+	++
NR	3	50 - 65	Natural rubber	SMR	-40 / +80	++	+++	0	0	0	+	++
PU	5	50 - 65	Polyurethane (EU/AU)	Urepan®	-20 / +80	++	+	+++	++	+	0	0
SBR	13	50 - 60	Styrene-butadiene-rubber (SBR)	Buna®	-30 / +80	+++	++	0	0	+	+	+
SI	8	35 - 45	Silicone rubber	Elastosil®	-40 / +200	0	++++	0	0	+++	0	0
SI	2	50 - 65	Silicone rubber	Elastosil®	-40 / +200	0	+++	0	0	+++	0	0
SI-AS	2-AS	50 - 60	Silicone rubber, anti-static		-40 / +200	0	+++	0	0	+++	0	0
SI-FS	2-FS	40	Fluorosilicone		-50 / +190	0	+++	+	+	+++	++	+++
Tepuflex®	17	50	Thermoplastic elastomer		0 / +60	+++	++	0	0	+++	0	0
Thermalon®	19	60			0 / +160	++	+	+++	++	0	+	+
TPU	18	60	Thermoplastic elastomer	Elastollan®	0 / +65	+++	0	+++	++	+++	0	+
Varioflex®	16	30 / 60	Polyurethane (2 Shore Hardnesses)		+10 / +50	+++	++++	+++	+++	++	0	+++
Vinyl	V	50 - 55	PVC (soft)		0 / +60	+++	++	+	+	++	++	++
Vulkollan®	11	75		Vulkollan®	-40 / +80	++++	+	+++	++	+++	+	+

++++ = Excellent    +++ = Very good    ++ = Good    + = Fair    0 = Low to satisfactory

### Ordering example: Flat vacuum cup made of silicone 50° Shore A

Item No.

102.030.222.\* > Add material code > 102.030.222.2

### Note!

- > Depending on the application, vacuum cups are subject to mechanical and chemical stresses. The data serve therefore only as guidelines.
- > Special vacuum cups fitted with felt linings are extremely low-marking and can be deployed at temperatures up to a max. of 500 °C.
- > Material colors may change, but the quality remains unaffected.  
Material colors: bg = beige, bl = blue, br = brown, g = green, ge = yellow, gr = gray, or = orange, r = red, sw = black, tr = transparent, w = white

# Sachgerechte Lagerung von Elastomeren

Some elastomer parts are stored for long periods. This can affect product quality. Changes are the result of individual or combined influences of special factors, such as deformation, oxygen, ozone, light, heat, moisture, oils and solvents. For this reason, precautions must be taken to ensure that the service life will not be considerably shortened by incorrect storage. Storage and the recording of time in storage is governed by ISO 2230 and DIN 7716.



## Heat

- > Storage temperature of elastomers should preferably be between +5 °C and +25 °C.
- > Direct contact with heat sources (such as radiators) or direct sunlight should be avoided.
- > Storage at low temperatures can cause elastomers to harden. In this temperature range, therefore, moulded parts must be handled with great care to avoid deformations.

## Moisture

- > Relative humidity in storage areas should be below 70 %. Avoid extremely wet or dry conditions. No condensation should be present.

## Light, ozone

- > Elastomer parts should be stored away from light sources and ozone. In particular, direct sunlight or strong artificial light containing an ultraviolet band should be avoided. The use of individual containers, especially plastic bags, is preferred, provided they are UV-protected.

## Deformation

- > Elastomer components should be stored free of compressions or deformations and in an unbent state. Items delivered in an unbent state should be kept in their original packaging.

## Contact with liquids or grease

- > Moulded elastomer parts should not come into contact during storage with solvents, oils or grease, if not already so packed by the manufacturer.

## Contact with metal and non-ferrous metals

- > Direct contact with certain metals such as manganese, iron, copper and its alloys, e.g. brass, damages some elastomers and should be avoided during storage.
- > Due to the potential for plasticiser migration or migration of other components, elastomers should not be stored in contact with PVCs.

## Length of storage and inspection (empirical values)

The useful life of elastomeric products depends to a considerable degree on the type of elastomer. If the above-mentioned recommendations for storage are observed, the various elastomers can be stored for the times given below:

AU, EU, BR, SBR, NR, thermoplastics	4 years
NBR, HNBR, CR	6 years
EPDM	8 years
FKM, SI, SI-FS	10 years

After the specified time, moulded elastomer parts should be inspected. An extension of shelf life is then possible. Elastomer parts and components less than 1.5 mm thick are more susceptible to attack by oxidation, even when stored under ideal conditions as recommended. The inspection interval should therefore be shorter than indicated above.

The full FIPA product line		2
General explanation		4
Vacuum cups - Industries		5
Vacuum cups - Series		27
Vacuum cups by size		173
Fastening elements vacuum cups		407
Vacuum cups accessories		473
Vacuum gripping systems		477
Special grippers		495
Vacuum generation		511
Vacuum filters		621
Control technology		633
Valve technology		643
System monitoring		683
Connectors		701
General technical information   Technical tables   Questionnaires   Fax form		756
Item number index		771

# The full FIPA product line

Criteria that affect quality, such as choice of materials or robustness can be taken for granted nowadays. At FIPA, we focus more on offering the right solution for every requirement.

## Competence in vacuum cups and vacuum components

As a system provider, FIPA covers the entire process chain from vacuum generation, through system peripherals, to the optimal vacuum cups for your product.

A wide range of highly-efficient vacuum pumps and ejectors are available for optimum vacuum generation. This allows very short cycle times and compressed air savings up to 97 % to be achieved.

FIPA offers the widest range of vacuum cups in the world - perfectly tailored to the needs and application areas found in various industries.

Whatever the industry, FIPA produces complete gripper and vacuum systems that are individually tailored to customer requirements.

The high level of compatibility also allows third-party systems to be quickly and easily optimised with quality FIPA products.

## Efficient and reliable

It is crucial that all components work together perfectly in order to ensure the proper functioning of vacuum cups and gripper systems.

FIPA components are designed on the basis of quality, efficiency, space-saving and market requirements, in collaboration with our clients. On the basis of extensive testing and always with an eye on market requirements.

## The full FIPA product line:

### Vacuum Technology



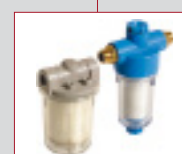
Generate



Generate



Regulate



Filter



Control



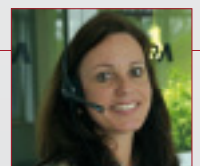
Check / Monitor



Suction

### Service

> It's part of the package at FIPA.



## End-of-Arm-Tooling

> Request a catalogue now  
at [www.fipa.com](http://www.fipa.com)

Fix



Connect



Grab



Change



Grip



Grip



Cut



## Expertise in End-of-Arm-Tooling (EOAT)

In addition to vacuum components and vacuum cups, FIPA is also your point of contact when it comes to End-of-Arm-Tooling, e.g. for industrial robot applications. Here, we continue to operate on the modular design principle and offer a comprehensive range of grippers, pneumatic air nippers and accessories. In addition, we provide complete gripper systems that are individually tailored to your requirements.

As a result of system compatibility, we ensure that existing systems from other providers can be quickly and easily expanded and optimised using FIPA products.

From base plates and extrusion systems to gripper parts and air nippers - all components are completely compatible with one another.

FIPA products are successfully utilised across all in various industries, such as the plastics, automotive, packaging and electronic industries.

## Service as a company principle

FIPA is characterised by a strong service culture in combination with professional project management.

Our technical sales department will provide you with expert practical advice in all questions relating to product range, application options, system integration and system project management.

## FIPA - your partner for material flow

FIPA listens to its clients carefully and finds the right product or tailor-made system solution for their application.



## Structure of order number:

Using the example of a flat vacuum cup with a diameter of 30 mm made of silicone material

**Item No.**

**102.030.222.2**

Vacuum cup diameter

Material code

(derived from the material overview in the foldover)

## Structure of the drawings

**Drawing of the cup**

---

**Product feature**

---

**Item No. of the vacuum cup**

---

(\* Please always add the material code - to be derived from the material overview in the foldover)

Recommended connection parts for the vacuum cup shown (fitting)

Item No.	Connection	see page
270.317	M5-AG	35
270.103	M6-AG	78
270.205	G1/8-AG	213
270.109	G1/8-AG	147
270.194	G1/4-AG	381

Recommended spring levels for direct snap-in

Item No.	Stroke	see page
50.020	8,5 mm	84

**Stroke vacuum cup**

---

**Stroke spring levels**

---

**Available material (colour)**

---

**Item No.:** 102.030.222.2 \*

**Material:** NBR (Sw), SI (Tr)

**Cross reference:** Additional sizes available are found on p. 283.

**Stroke vacuum cup**

---

**Stroke spring levels**

---

**Available material (colour)**

---

All dimensions in this catalogue are given in mm. Changes in any form are reserved.

Sheet metal handling .....	7
Wood & Glas .....	10
Plastics .....	12
Foods industry .....	15
Packaging .....	16
Printing industry, Films & Paper .....	19







## FIPA vacuum cups for sheet metal handling

> Oil-resistant materials, such as NBR, are primarily used in the handling of sheet metal.



### Flat vacuum cups for dynamic sheet handling - SM-F

- > Reliable, non-slip handling of oily sheets thanks to “anti-slip” supporting ribs.
- Good absorption of lateral forces
- > Supports help to prevent deep-drawing or deformation of thin sheets
- > Vulcanised connection thread ensures a secure fit
- > Diameter: 30 - 125 mm

> See page 64



### Bellows vacuum cups with 1.5 folds for dynamic sheet handling - SM-B

- > Reliable, non-slip handling of oily sheets thanks to “anti-slip” supporting ribs.
- Good absorption of lateral forces
- > Internal supports help to prevent deep-drawing or deformation of thin sheets
- > Leak-free suction even with curved surfaces due to flexible sealing lip
- > Secure fit due to vulcanised connection thread
- > Diameter: 30 - 125 mm

> See page 133



### Non-slip flat vacuum cups - SM-P

- > Distinct, radially encircling supporting ribs increase holding force
- > The firmly bolted fittings (from a diameter of 20 mm) ensure good process security
- > Diameter: 10 - 50 mm

> See page 62



### Flat vacuum cups with safety sealing lips - SFU-S

- > High process reliability through multiple sealing lip
- > Good stability due to vulcanised retainer plate, as well as support surfaces for the product
- > Diameter: 30 - 225 mm

> See page 68

Continued on the next page →



## FIPA Vacuum cups for sheet metal handling



### Heavy-duty flat vacuum suction plates - SFPL-D

- > Vulcanised steel carrier plate allows lifting of very heavy loads
- > Secure gripping of uneven surfaces thanks to additional inner sealing lip
- > Diameter: 160 - 300 mm

> See page 73



### Vacuum suction plate with foamed sealing lip - SP-PLM

- > Good sealing of heavily textured surfaces
- > Cost-effective replacement of worn seals
- > Diameter: 35 - 300 mm

> See page 72



### Flat XXL suction rings - SFR

- > Large, flat suction seals vulcanised on steel ring for handling very large loads
- > Connection through circular, circumferentially placed thread holes
- > Diameter: 450 - 920 mm

> See page 74



### Oval vacuum suction plates - SOPL-S

- > High suction force on a small footprint
- > Rubberised support surfaces help prevent warping of the product
- > Individual machine connection
- > Dimensions: 110x40 - 580x180 mm

> See page 160



### Varioflex® bellows cups, 1.5 and 2.5 folds for dry sheets - SP-BX

- > Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
- > Soft lip for optimal sealing
- > Long service life and low wear
- > Short cycle times and high process reliability
- > Low marking

#### 1.5 folds - SP-BX1

- > Good adaptation to uneven product surfaces
- > Supports (∅ 20 - 75 mm) stabilise the product
- > Diameter: 15 - 75 mm

> See page 107



#### 2.5 folds - SP-BX2

- > Good adaptation to uneven product surfaces
- > Large range of height and angle adjustment
- > Diameter: 15 - 75 mm

> See page 110



## FIPA Vacuum cups for sheet metal handling



### **Bellows vacuum suction plates - SBPL-E**

- > Gentle handling of heavy, sensitive products
- > Good adaptation to concave or convex surfaces
- > Rubberised support surfaces prevent deformation of workpieces
- > Diameter: 150 - 350 mm

> See page 137



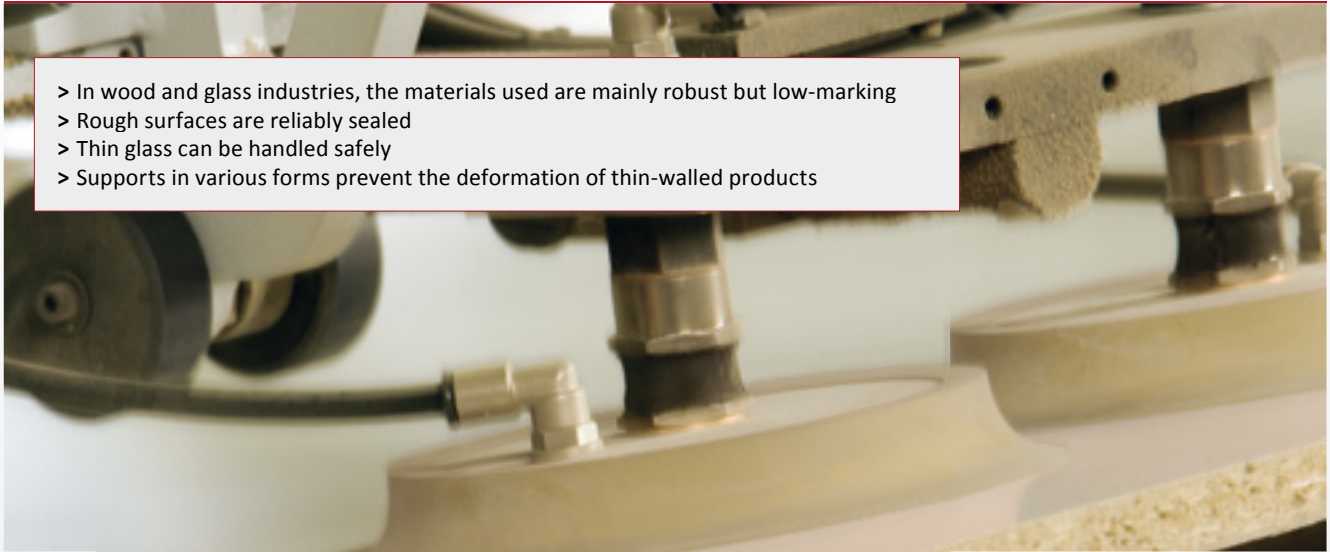
### **Suction plates with leakage reduction - SPLT**

- > Reliable suction with variable product shapes in systems with multiple vacuum cups
- > Combination of 4x4 or 6x6 bellows vacuum cups with 2.5 folds
- > Flow restrictions prevent the collapse of the vacuum when individual vacuum cups are not in use

> See page 487



## FIPA Vacuum cups for the wood and glass industries



- > In wood and glass industries, the materials used are mainly robust but low-marking
- > Rough surfaces are reliably sealed
- > Thin glass can be handled safely
- > Supports in various forms prevent the deformation of thin-walled products



### Flat vacuum cups for textured surfaces - SFU-R

- > Optimal sealing of rough and uneven surfaces thanks to very fine sealing lips
- > Enhanced safety thanks to two-fold, internal safety sealing lip
- > Interlocking, clip-in retaining plate for quick and inexpensive replacement of the sealing lip
- > Diameter: 40 - 200 mm

> See page 66



### Flat vacuum cups for porous products - SFU-RT

- > Separation of porous plate materials through simultaneous suction and punctual blow-off of the product
- > Enhanced safety thanks to two-fold, internal safety sealing lip
- > Diameter: 160 mm

> See page 67



### Oval vacuum suction plates for textured surfaces - SOPL-R

- > Leak-free gripping of many problematic product surfaces thanks to very flexible, thinly tapered sealing lip
- > Increased security due to vulcanised carrier plate
- > Dimensions: 90x50 - 190x90 mm

> See page 158



### Oval vacuum suction plates - SOPL-S and SOPL-A

- > High suction power with minimal space requirement
- > Rubberised support surfaces help prevent warping of the product
- > Available in the following materials: NBR (low-marking) and NR (wear-resistant)
- > Dimensions: 110x40 - 580x180 mm

> See page 160



## FIPA Vacuum cups for the wood and glass industries



### Varioflex® bellows cups, 1.5 and 2.5 folds - SP-BX

- > Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
- > Soft lip for optimal sealing
- > Long service life and low wear
- > Short cycle times and high process reliability
- > Low-marking

#### 1.5 folds - SP-BX1

- > Good adaptation to uneven product surfaces
- > Supports (Ø 20 - 75 mm) stabilise the product
- > Diameter: 15 - 75 mm

> See page 107



#### 2.5 folds - SP-BX2

- > Good adaptation to uneven product surfaces
- > Large range of height and angle adjustment
- > Diameter: 15 - 75 mm

> See page 110



### Bellows vacuum suction plates Softgrip - SBPL-SG

- > Very gentle handling of sensitive products thanks to highly flexible fold walls
- > Combines the flexibility of bellows cups with the stability of flat vacuum suction plates
- > Central support block with safety sealing lip ensures a firm grip
- > Diameter: 150 - 210 mm

> See page 136



### Short lift vacuum cups SFK

- > Minimal lift for flat, sensitive surfaces
- > Supports prevent deformation of the product and increase stability
- > Available in the following materials: NBR and SI
- > Particularly suited for use in clamping systems
- > Diameter: 65 - 150 mm

> See page 70



### High temperature vacuum cups with felt pad - SX-F

- > Outstanding low-marking properties thanks to special felt coating
- > Highest temperature resistance (FKM briefly up to 300 °C; special silicone with an evaporated silicone lock made of aluminium briefly up to 500 °C)
- > Diameter: 25 - 160 mm

> See page 164

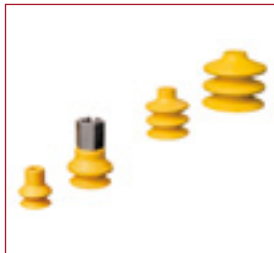




## FIPA Vacuum cups for the plastics industry

- > The most common application in the plastics industry is the removal of plastic parts from the injection molding machine
- > Models which are able to take optimal advantage of the available space thanks to their design are primarily used for this purpose
- > Temperature-resistant vacuum cup materials which enable the subsequent painting of the parts are preferable for use

The industry recommendations listed here represent a selection of special materials. Vacuum cups made from standard materials (NBR, NR, silicone) can be found in the SF and SB series chapters.



### HNBR vacuum cups

- > Standard material for removing hot plastic parts from an injection molding machine
- > Heat-resistant up to 160 °C
- > No silicones or other adhesive-repelling substances, enabling later painting of the products
- > Low-marking
- > Wear-resistant material

### Bellows vacuum cups, 1.5 folds - SKH-B1

- > Good adaptation to uneven product surfaces
- > Bellows compensates for height differences
- > Diameter: 5 - 43 mm

> See page 86

### Bellows vacuum cups, 2.5 folds - SKH-B2

- > Very good adaptation to uneven product surfaces
- > Large range of height and angle adjustment
- > Particularly gentle handling thanks to good cushioning
- > Diameter: 5 - 60 mm

> See page 94



### Flat vacuum cups with a short lift - SFK

- > Flat vacuum cups with a short lift for flat surfaces
- > Minimal space requirement thanks to virtually vertical suction lip
- > Great suction power thanks to the largest active vacuum suction surface possible
- > Diameter: 20 - 45 mm

> See page 70

### Oval vacuum cups - SKH-O

- > Flat vacuum cups in an oval design for the handling of narrow products
- > Narrow width enables the gripping of ribbed surfaces
- > Significantly greater suction power than round vacuum cups of equal width
- > Dimensions: 4x2 - 45x15 mm

> See page 146





## FIPA Vacuum cups for the plastics industry



### Thermalon® vacuum cups

- > Optimised material for less to marking
- > Heat-resistant up to 160 °C
- > No silicones or other adhesive-repelling substances, enabling later painting of the products

### Bellows vacuum cups, 1.5 folds - SKT-B1

- > Good adaptation to uneven product surfaces
- > Diameter: 11 - 63 mm

> See page 84

### Bellows vacuum cups, 2.5 folds - SKT-B2

- > Very good adaptation to uneven product surfaces
- > Large range of height and angle adjustment
- > Particularly gentle placement on product surfaces
- > Diameter: 5 - 62 mm

> See page 92



### Oval vacuum cups - SKH-O

- > Oval-shaped flat vacuum cups for the handling of narrow products
- > Narrow width enables the gripping of ribbed surfaces
- > Significantly greater suction power than round vacuum cups of equal width
- > Dimensions: 4x2 - 45x15 mm

> See page 144

### Flat vacuum cups - SKT-F

- > Flat vacuum cups with a flexible single sealing lip
- > Low internal volume saves energy
- > Diameter: 5 - 60 mm

> See page 36



### Varioflex® bellows cups, 1.5 and 2.5 folds - SP-BX

- > Excellent service life and superior retention force
- > Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
- > Soft lip for optimal sealing
- > Short cycle times and high process reliability
- > Operating temperature: 10 - 50 °C
- > Low-marking

#### 1.5 folds - SP-BX1

- > Good adaptation to uneven product surfaces
- > Supports (∅ 20 - 75 mm) stabilise the product
- > Diameter: 15 - 75 mm

> See page 107



#### 2.5 folds - SP-BX2

- > Good adaptation to uneven product surfaces
- > Large range of height and angle adjustment
- > Diameter: 15 - 75 mm

> See page 110





## FIPA Vacuum cups for the food industry



- > The requirements for vacuum cups in the food industry range from the handling of pre-packaged food up to the direct handling of unpackaged foodstuffs
- > The special shape and consistency of the products usually requires marked adjustments to the design of the cup
- > All FIPA vacuum cups for the food industry are manufactured from FDA-approved materials



### Vacuum cups for chocolates - SL-P

- > Extremely flexible and adaptable suction lip for leak-free sealing of three-dimensional product surfaces
- > Low-marking and FDA-approved

### Flat vacuum cups - SL-PF

- > Diameter: 16 - 22 mm

> See page 58

### Bellows vacuum cups - SL-PB

- > Diameter: 12 - 16 mm

> See page 125



### Vacuum cups for baked goods - SL-B

- > Multiple folds ensure a high degree of height adjustment and gentle product handling
- > FDA-approved
- > Diameter: 34 - 60 mm

> See page 126



### Detectable vacuum cups for baked goods - SL-BD

- > Detectable, providing optimum assurance that the product is not contaminated by vacuum components
- > Multiple folds ensure a high degree of height adjustment and gentle product handling
- > FDA-approved
- > Diameter: 35 - 40 mm

> See page 128



### Vacuum cups for eggs - SL-E

- > Bellows vacuum cups in a design specially optimised for handling eggs
- > Gentle attachment to the product and a high lifting motion thanks to a long vacuum cup lift
- > FDA-approved
- > Diameter: 33 - 34 mm

> See page 129



## FIPA Vacuum cups for the packaging industry

> The packaging industry uses primarily wear-resistant vacuum cup materials which are resilient and flexible enough for complex applications (e.g. erection of boxes, handling of flexible goods, goods packaged in foil, palletising, etc.)



### Vinyl bellows cups, 1.5 and 2.5 folds - SBV

- > Wear-resistant material - long service life
- > Good adaptation to curved or flexible product surfaces

#### 1.5 folds - SBV 1

- > Diameter: 5 - 70 mm

> See page 113



#### 2.5 folds - SBV 2

- > Diameter: 4 - 50 mm

> See page 116



### Vinyl oval bellows cups - SO-BV

- > Compensates for height differences and enables gentle set down on the workpiece
- > Good adaptation to curved or flexible product surfaces
- > Wear-resistant material - long service life
- > Dimensions: 35x28 - 100x55 mm

> See page 149



### Bellows vacuum cups 1.5 and 2.5 folds with special connection for standard packaging machines - SV-SB

- > Smooth suspension for gentle product handling
- > Available in NR and silicone (FDA-approved)
- > Diameter: 16 - 40 mm

> See page 130

Vacuum cups specially optimised for handling foils and foil-packaged goods can be found on p. 20



## FIPA Vacuum cups for the packaging industry



### Varioflex® bellows cups, 1.5 and 2.5 folds - SP-BX

- > Excellent service life and superior retention force
- > Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
- > Soft lip for optimal sealing
- > Long service life and low wear
- > Short cycle times and high process reliability
- > Low marking

#### 1.5 folds - SP-BX1

- > Good adaptation to uneven product surfaces
- > Supports (Ø 20 - 75 mm) stabilise the product
- > Diameter: 15 - 75 mm

> See page 107



#### 2.5 folds - SP-BX2

- > Good adaptation to uneven product surfaces
- > Large range of height and angle adjustment
- > Diameter: 15 - 75 mm

> See page 110



### Silicone flat cups (FDA-approved) for use with tubes - SV-T

- > With straight or conical opening
- > Direct machine connection through pipe mounting
- > Handling of cans or tubes
- > Diameter: 11 - 46 mm

> See page 60



### Silicone rectangular bellows cups, 2.5 and 3.5 folds - SV-RB

- > Handling of flexible parts and workpieces with uneven surfaces or products with flexible outer packaging
- > FDA-approved vacuum cup material
- > Dimensions: 52x25 - 80x50 mm

> See page 150

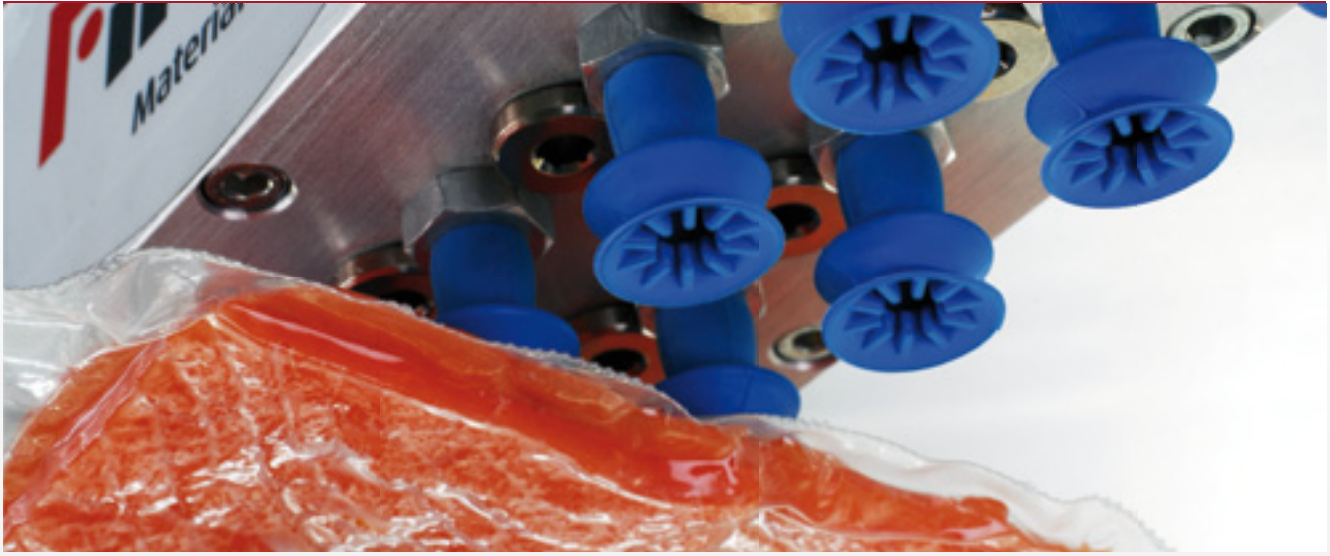
Vacuum cups specially optimised for handling foils and foil-packaged goods can be found on p. 20







FIPA Vacuum cups for the handling of foils and paper



**Flat vacuum cups for foils and paper with and without supports - SD-F**

- > Available in the materials NR, Vinyl, SI and NBR
- > Soft and flexible sealing lip for the optimum sealing of flexible substrates
- > Supports prevent the aspiration and wrinkling of foils and paper
- > Handling of foil-packaged goods

> See page 22



**Bellows vacuum cups for foils and paper - SD-B**

- > Available in the materials NR, NBR, CR and SI
- > Bellows allow for good compensation of height and angle differences
- > Soft and flexible sealing lip for the optimum sealing of flexible substrates
- > Supports prevent the aspiration and wrinkling of foils and paper
- > Handling of foil-packaged goods

> See page 23



**Vacuum cups with connection, compatible to Mueller-Martini machines - SD-MM**

- > Available in the materials NR, SI, Vinyl and Vulkollan®
- > High cycle times possible
- > Wear-resistant materials

> See page 24



**Suction discs - SD-S**

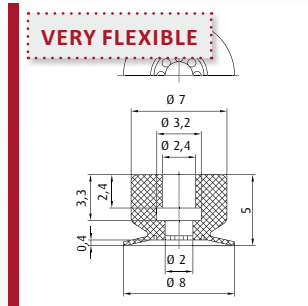
- > Available in the materials NR and polyurethane
- > Suitable for universal use

> See page 26





## Flat vacuum cups with cleats for Films & Paper - SD-FA

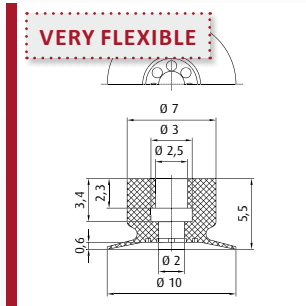


**VERY FLEXIBLE**

**Item no. 104.008.070. \***

**Material**  
NBR (sw), SI-FS (r) 0.5 mm

**Details see page 181**

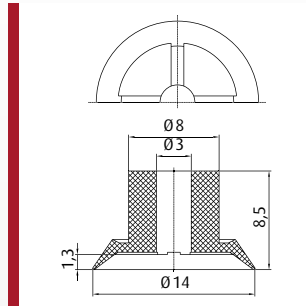


**VERY FLEXIBLE**

**Item no. 104.010.071. \***

**Material**  
NBR (sw), SI-FS (r) 0.7 mm

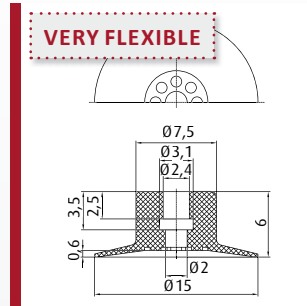
**Details see page 184**



**Item no. 102.014.089. \***

**Material**  
NBR (sw) 1.5 mm

**Details see page 188**

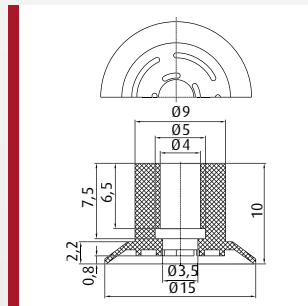


**VERY FLEXIBLE**

**Item no. 104.015.072. \***

**Material**  
NBR (sw), SI-FS (r) 1.1 mm

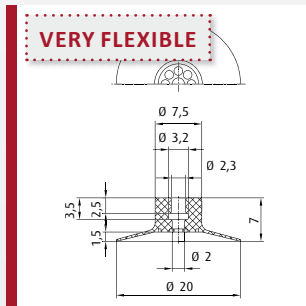
**Details see page 190**



**Item no. 102.015.431. \***

**Material**  
SI (tr), NR (bg) 0.5 mm

**Details see page 190**

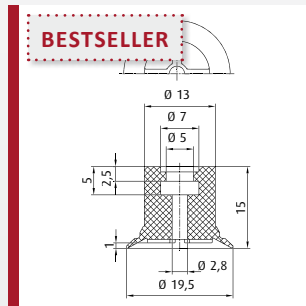


**VERY FLEXIBLE**

**Item no. 104.020.073. \***

**Material**  
NBR (sw), SI-FS (r) 1.6 mm

**Details see page 201**

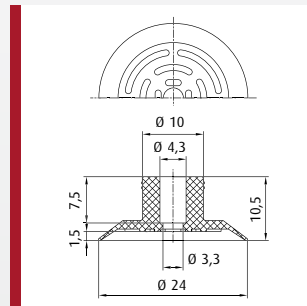


**BESTSELLER**

**Item no. 102.020.083. \***

**Material**  
NBR (sw), SI (tr), SI (r) 1 mm

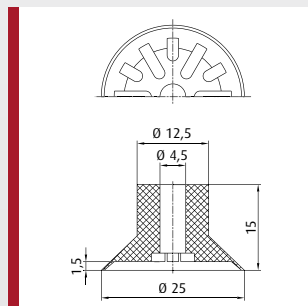
**Details see page 198**



**Item no. 102.024.457. \***

**Material**  
SI (tr), NR (bg) 1.8 mm

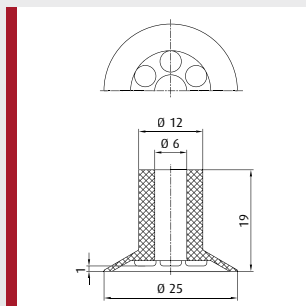
**Details see page 207**



**Item no. 104.025.043. \***

**Material**  
Vinyl (bl) 1.5 mm

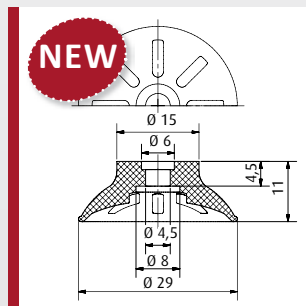
**Details see page 211**



**Item no. 104.025.094. \***

**Material**  
NR (br) 1 mm

**Details see page 211**



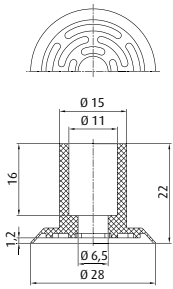
**NEW**

**Item no. 102.029.509. \***

**Material**  
NR (br) 4 mm

**Details see page 217**

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760

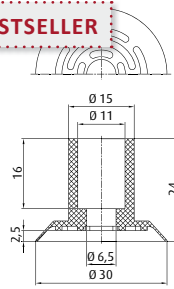


Item no. 104.029.093.\*

Material NR (sw) 1 mm

Details see page 216

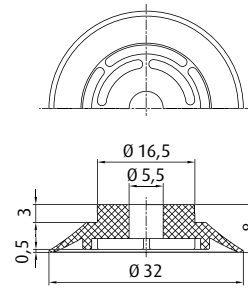
**BESTSELLER**



Item no. 104.030.009.\*

Material NBR (sw), SI (w), SI (tr), NR (sw) 3 mm

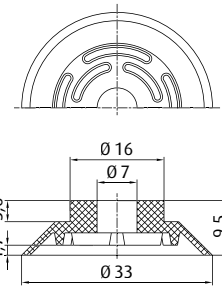
Details see page 221



Item no. 102.032.104.\*

Material NR (bg) 1.8 mm

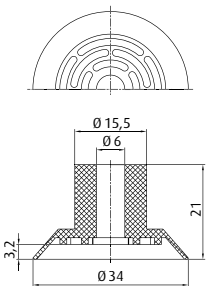
Details see page 224



Item no. 102.033.398.\*

Material Vinyl (bl) 2 mm

Details see page 224

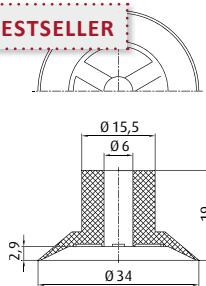


Item no. 104.034.036.\*

Material NR (bg) 3 mm

Details see page 225

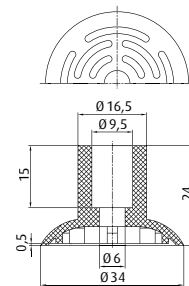
**BESTSELLER**



Item no. 104.034.054.\*

Material Vinyl (bl) 3 mm

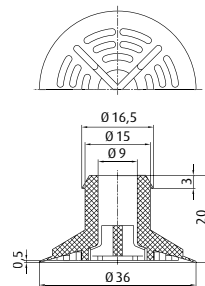
Details see page 226



Item no. 116.034.001.\*

Material NR (sw), NR (bg) 0.5 mm

Details see page 226

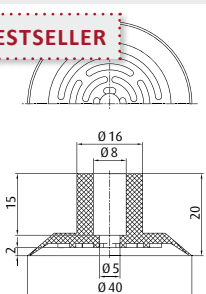


Item no. 102.036.342.\*

Material SI (tr) 0.5 mm

Details see page 229

**BESTSELLER**



Item no. 104.040.018.\*

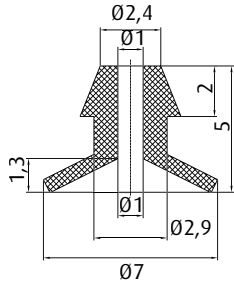
Material SI (tr), NR (sw), NR (br) 2 mm

Details see page 233

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



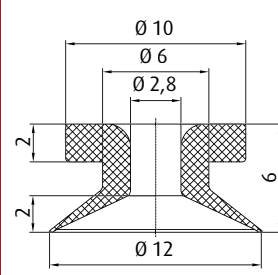
## Flat vacuum cups for Film & Paper - SD-F



Item no. 102.007.266.\_\*

Material SI (tr) 1.5 mm

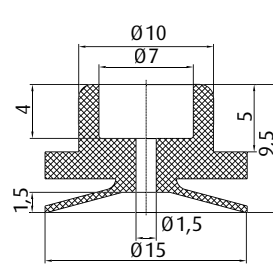
Details see page 179



Item no. 102.012.267.\_\*

Material NR (bg) 2.5 mm

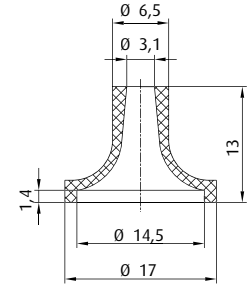
Details see page 186



Item no. 102.015.339.\_\*

Material Vinyl (bl) 1.5 mm

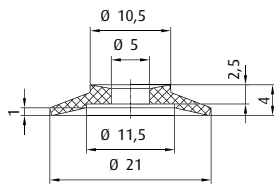
Details see page 189



Item no. 102.017.276.\_\*

Material NR (br) 3 mm

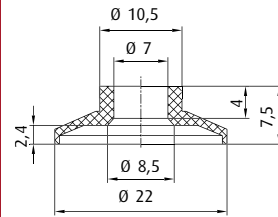
Details see page 195



Item no. 102.021.063.\_\*

Material NR (sw) 1 mm

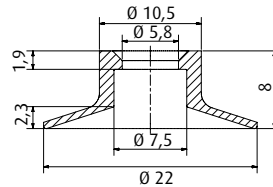
Details see page 204



Item no. 102.022.185.\_\*

Material NR (gr) 0.5 mm

Details see page 204



Item no. 102.022.526.\_\*

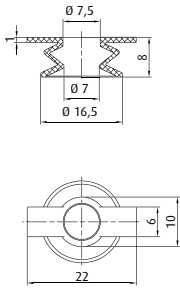
Material NR (bl) 2 mm

Details see page 204

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



## Bellows vacuum cups for Films & Paper - SD-B

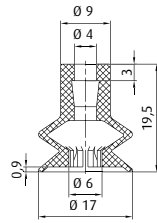


**Item no. 23.017.102.\_\***

**Material**  
NR (sw) 5.5 mm

**Details** see page 300

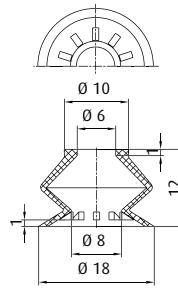
**BESTSELLER**



**Item no. 23.018.175.\_\***

**Material**  
SI (tr), NR (bl) 5.5 mm

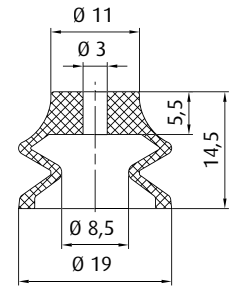
**Details** see page 300



**Item no. 23.018.082.\_\***

**Material**  
SI (tr), NR (bl),  
CR (sw) 5.5 mm

**Details** see page 301

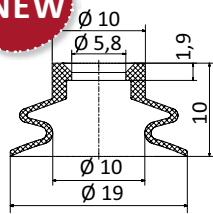


**Item no. 23.019.168.\_\***

**Material**  
NR (bl), NR (br) 5.5 mm

**Details** see page 304

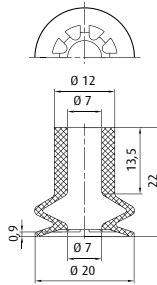
**NEW**



**Item no. 23.019.254.\_\***

**Material**  
SI (tr) 3.5 mm

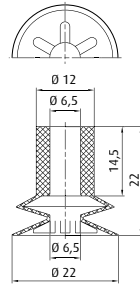
**Details** see page 304



**Item no. 23.020.133.\_\***

**Material**  
NBR (sw), SI (tr) 4 mm

**Details** see page 305

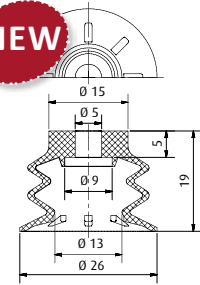


**Item no. 23.023.099.\_\***

**Material**  
NR (br) 5 mm

**Details** see page 310

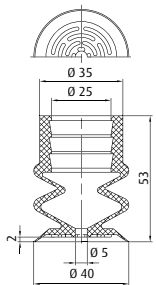
**NEW**



**Item no. 21.026.162.\_\***

**Material**  
NR (br) 9 mm

**Details** see page 314



**Item no. 21.040.141.\_\***

**Material**  
NR (bg) 18 mm

**Details** see page 328

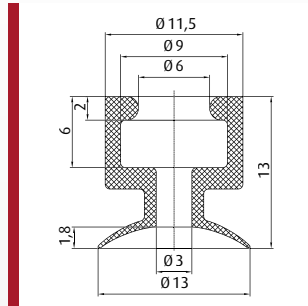
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Vacuum cups - Industries | Printing industry, Films & Paper

Ø 13 - 25 mm

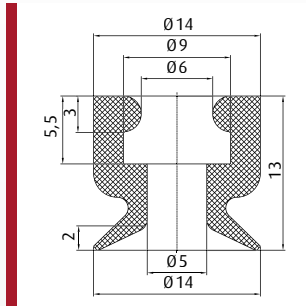
Vacuum cups compatible to machines manufactured by Mueller-Martini - SD-MM



Item no. 102.012.332.\_\*

Material NR (or) 1.5 mm

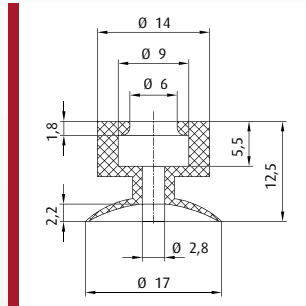
Details see page 187



Item no. 102.014.333.\_\*

Material NR (or) 2 mm

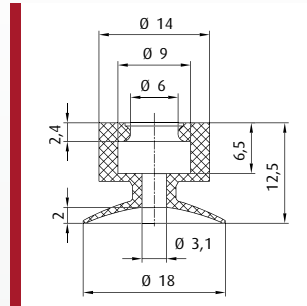
Details see page 187



Item no. 102.016.255.\_\*

Material SI (r) 3 mm

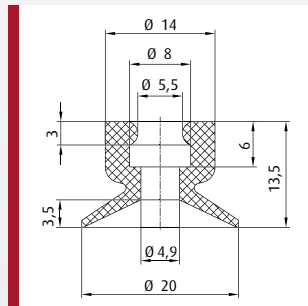
Details see page 193



Item no. 102.018.442.\_\*

Material NR (or) 2 mm

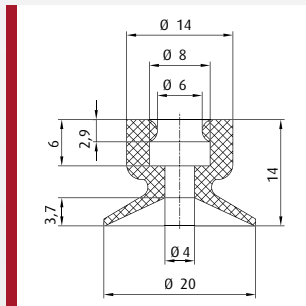
Details see page 196



Item no. 102.020.140.\_\*

Material NR (sw), NR (or) 3 mm

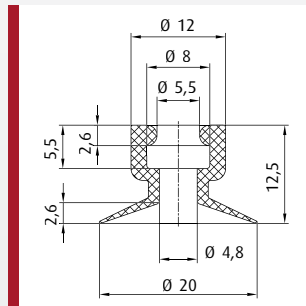
Details see page 198



Item no. 126.020.004.\_\*

Material NR (or) 3.5 mm

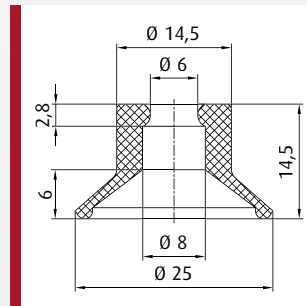
Details see page 198



Item no. 126.020.005.\_\*

Material SI (tr) 1 mm

Details see page 199

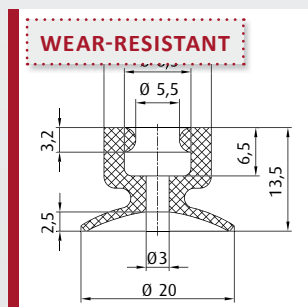


Item no. 102.025.102.\_\*

Material NR (g) 4 mm

Details see page 209

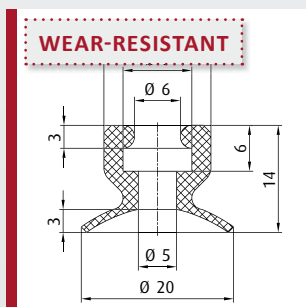
## Vulkollan® flat vacuum cups - SD-MM-VU



Item no. 102.020.299.\_\*

Material Vulkollan® (br) 3.5 mm

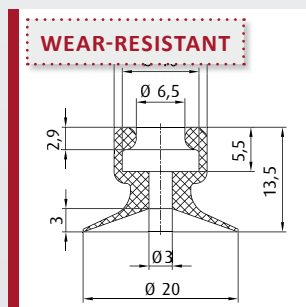
Details see page 199



Item no. 102.020.300.\_\*

Material Vulkollan® (br) 3 mm

Details see page 199



Item no. 102.020.308.\_\*

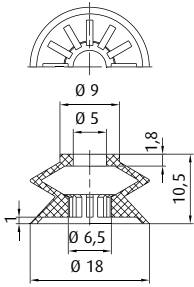
Material Vulkollan® (br) 1 mm

Details see page 199

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



Bellows vacuum cups - SD-MM



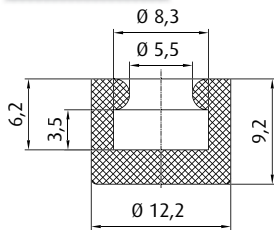
Item no. 23.018.183.\_\*

Material NR (or)  5.5 mm

Details see page 300

Accessories - SD-MM

RUBBER CAP



Item no. 77.101

Material NR (r)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Suction discs - SD-S



Ordering notes

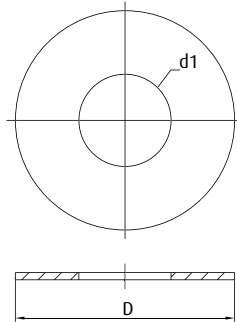
- > Packing unit = 100 pieces
- > When ordering, supplement the item no. with the material code according to ordering logic.

Ordering logic

Material code	Material	Thickness	Colour
01	NR	0.5	green
02	NR	0.8	pink
03	NR	1.0	beige

Material code	Material	Thickness	Colour
04	NR	1.6	white
05	NR	2.0	green
06	PU	0.8	transparent

Dimensions



Technical Data

Item no.	Material	Ø D [mm]	Ø d1 [mm]
3.13.001._XX	NR, PU	12.7	1.6
3.16.003._XX	NR, PU	15.9	1.6
3.16.007._XX	NR, PU	15.9	3.2
3.17.002._XX	NR, PU	17.5	3.2
3.19.004._XX	NR, PU	19.1	6.4
3.19.005._XX	NR, PU	19.1	1.6
3.19.011._XX	NR, PU	19.1	4.8
3.21.006._XX	NR, PU	20.6	4.8
3.22.008._XX	NR, PU	22.2	4.8
3.22.012._XX	NR, PU	22.2	6.4
3.24.010._XX	NR, PU	23.8	9.5
3.25.013._XX	NR, PU	25.4	4.8
3.25.014._XX	NR, PU	25.4	6.4
3.25.015._XX	NR, PU	25.4	9.5
3.27.016._XX	NR, PU	27.0	3.2
3.27.017._XX	NR, PU	27.0	6.4

Technical Data

Item no.	Material	Ø D [mm]	Ø d1 [mm]
3.27.018._XX	NR, PU	27.0	9.5
3.29.019._XX	NR, PU	28.6	6.4
3.29.020._XX	NR, PU	28.6	12.7
3.29.021._XX	NR, PU	28.6	14.3
3.30.022._XX	NR, PU	30.2	9.5
3.30.023._XX	NR, PU	30.2	12.7
3.30.024._XX	NR, PU	30.2	14.3
3.32.025._XX	NR, PU	31.8	4.8
3.32.026._XX	NR, PU	31.8	9.5
3.32.027._XX	NR, PU	31.8	12.7
3.32.028._XX	NR, PU	31.8	14.3
3.32.046._XX	NR, PU	31.8	6.4
3.32.047._XX	NR, PU	31.8	11.1
3.35.029._XX	NR, PU	34.9	9.5
3.35.030._XX	NR, PU	34.9	12.7
3.35.031._XX	NR, PU	34.9	14.3

Technical Data

Item no.	Material	Ø D [mm]	Ø d1 [mm]
3.38.032._XX	NR, PU	38.1	9.5
3.38.033._XX	NR, PU	38.1	12.7
3.38.034._XX	NR, PU	38.1	14.3
3.38.035._XX	NR, PU	38.1	15.9
3.38.045._XX	NR, PU	38.1	11.1
3.41.036._XX	NR, PU	41.3	9.5
3.41.037._XX	NR, PU	41.3	12.7
3.41.038._XX	NR, PU	41.3	14.3
3.41.039._XX	NR, PU	41.3	15.9
3.44.040._XX	NR, PU	44.5	7.9
3.44.041._XX	NR, PU	44.5	12.7
3.44.042._XX	NR, PU	44.5	14.3
3.44.043._XX	NR, PU	44.5	15.9
3.50.044._XX	NR, PU	50.8	12.7



Flat vacuum cups SF .....	28
Bellows vacuum cups SB .....	75
Oval vacuum cups SO .....	138
Special vacuum cups SX .....	162



## FIPA Flat vacuum cups SF

- > Handling of flat products with smooth surfaces
- > Low cup volume enables short cycle times
- > Good stability allows the products to pivot



### Universal flat vacuum cups - SFU-A

- > Very shallow cup with single sealing lip for handling smooth or slightly rough surfaces
- > Great stability allows high acceleration
- > Connection by means of plug-in nipple (up to a diameter of 50 mm), or vulcanised carrier plate (from a diameter of 60 mm)
- > Diameter: 1 - 200 mm

> See page 32



### High temperature Thermalon® cups - SKT-F

- > Optimised special material for improved resistance to marking
- > Heat-resistant up to 160 °C
- > No silicones or paint-wetting-impairment substances (PWIS), enabling later painting of the products
- > Diameter: 5 - 60 mm

> See page 36



### Universal flat vacuum cups - SFU-B

- > Very shallow cup with single sealing lip for handling smooth or slightly rough surfaces
- > Great stability allows high acceleration
- > Connection via firmly bolted nipple (from a diameter of 20 mm), thereby increasing process security
- > Diameter: 0.7 - 60 mm

> See page 38



### Flat vacuum cups, modular - SP-F

- > Universal flat vacuum cups in even, supported or deep design
- > Design: Replacement sealing lip for attachment to fitting
- > Diameter: 5 - 150 mm

> See page 42



## FIPA Flat vacuum cups SF



### Flat vacuum cups with fixed mounted fittings - SP-F

- > Universal flat vacuum cups in even or supported design
- > Series with sensing valve prevents dropping of the product if individual vacuum cups in a system are not in contact with the product
- > Design: Complete with vacuum cup fitting and filter screen
- > Diameter: 20 - 150 mm

> See page 47



### Flat vacuum cups with a flexible lip - SFU-F

- > Soft, very flexible single sealing lip for handling sensitive products
- > Good sealing to slightly rough surfaces
- > Diameter: 4 - 40 mm

> See page 50



### Flat vacuum cups with curved lip - SFU-D

- > Universal flat vacuum cups with tapering curved sealing lip
- > Pre-tension of the sealing lip enables gripping of uneven, slightly curved products
- > Diameter: 4 - 85 mm

> See page 52



### Flat vacuum cups with long shaft - SFU-L

- > Gentle handling of particularly sensitive, uneven and slightly curved products
- > Long, slim design enables pipe mounting and low gimbal leveling for uneven product surfaces
- > Diameter: 6 - 60 mm

> See page 56



### Vacuum cups for chocolates - SL-PF

- > Extremely flexible and adaptable suction lip for leak-free sealing of three-dimensional product surfaces
- > Low-marking and FDA-approved
- > Diameter: 16 - 22 mm

> See page 58



### Silicone cups (FDA-approved) for use with tubes - SV-T

- > With straight or conical opening
- > Direct machine connection through pipe mounting
- > Handling of cans or tubes

> See page 60

Continued on the next page →



FIPA Flat vacuum cups SF	
	<p><b>Non-slip vacuum cups - SM-P</b></p> <ul style="list-style-type: none"><li>&gt; Flat vacuum cups for the handling of sheet metal</li><li>&gt; Distinct, radially encircling supporting ribs increase holding force</li><li>&gt; Diameter: 10 - 50 mm</li></ul> <p>&gt; See page 62</p>
	<p><b>Flat vacuum cups for dynamic sheet handling - SM-F</b></p> <ul style="list-style-type: none"><li>&gt; Reliable, non-slip handling of oily sheets thanks to "anti-slip" supporting ribs. Good absorption of lateral forces</li><li>&gt; Supports help to prevent deep-drawing or deformation of thin sheets</li><li>&gt; Vulcanised connection thread ensures a secure fit</li><li>&gt; Diameter: 30 - 125 mm</li></ul> <p>&gt; See page 64</p>
	<p><b>Flat vacuum cups for textured surfaces - SFU-R</b></p> <ul style="list-style-type: none"><li>&gt; Optimal seal with rough and uneven surfaces thanks to very fine sealing lips</li><li>&gt; Enhanced safety due to two-fold, internal safety sealing lip</li><li>&gt; Interlocking, clip-in retaining plate for quick and inexpensive replacement of the sealing lip</li><li>&gt; Diameter: 40 - 200 mm</li></ul> <p>&gt; See page 66</p>
	<p><b>Flat vacuum cups for porous products - SFU-RT</b></p> <ul style="list-style-type: none"><li>&gt; Separation of porous plate materials by simultaneous suction and punctual blow-off of the product</li><li>&gt; Enhanced safety due to two-fold, internal safety sealing lip</li><li>&gt; Diameter: 160 mm</li></ul> <p>&gt; See page 67</p>
	<p><b>Flat vacuum cups with safety sealing lips - SFU-S</b></p> <ul style="list-style-type: none"><li>&gt; High process reliability through multiple sealing lip</li><li>&gt; Good stability due to vulcanised retainer plate, as well as support surfaces for the product</li><li>&gt; Diameter: 30 - 225 mm</li></ul> <p>&gt; See page 68</p>
	<p><b>Short lift vacuum cups SFK</b></p> <ul style="list-style-type: none"><li>&gt; Minimum lift for flat, sensitive surfaces</li><li>&gt; Supports prevent deformation of the product and increase stability</li><li>&gt; Particularly suited for use in clamping systems</li><li>&gt; Diameter: 20 - 150 mm</li></ul> <p>&gt; See page 70</p>



FIPA Flat vacuum cups SF



**Vacuum suction plate with foamed sealing lip - SP-PLM**

- > Good sealing of heavily textured surfaces
- > Cost-effective replacement of worn seals
- > Diameter: 35 - 300 mm

> See page 72



**Heavy-duty flat vacuum suction plates - SFPL-D**

- > Vulcanised steel carrier plate allows lifting of very heavy loads
- > Secure gripping of uneven surfaces thanks to additional inner sealing lip
- > Diameter: 160 - 300 mm

> See page 73



**Flat XXL suction rings - SFR**

- > Large, flat suction seals vulcanised on steel ring for handling very large loads
- > Connection through circular, circumferentially placed thread holes
- > Diameter: 450 - 920 mm

> See page 74



## Series | Flat vacuum cups SF

Universal flat vacuum cups - SFU-A

### Universal flat vacuum cups - SFU-A



#### Product Description

Very shallow cup with single-lip seal for handling various products with smooth or rough surfaces.  
Connection up to  $\varnothing$  50 mm by means of plug-in nipple, from  $\varnothing$  60 mm with vulcanised carrier plate (bolttable)


#### Advantage

- > Great stability allows high acceleration
- > Fast cycle times are possible, due to the cup's low volume
- > Cost-effective replacement of worn seals

#### Ordering notes:

$\varnothing$  1 mm to  $\varnothing$  3 mm: PU = 10 pieces

#### Technical data

Item no.	Model / Lip dimensions		Material / Colour	Connection thread
102.001.002.*	SFU-A -1.5	0.3	NBR (sw), SI (tr)	--
102.002.004.*	SFU-A-2	0.4	NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl)	--
102.003.005.*	SFU-A -3	0.5	NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)	--
102.005.009.*	SFU-A -5	0.9	NBR (sw), SI (tr), SI-AS (sw), FKM (sw)	--
102.006.013.*	SFU-A -6	1	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)	--
102.008.017.*	SFU-A -8	1.4	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)	--
102.010.024.*	SFU-A -10	1.2	NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl)	--
102.015.030.*	SFU-A-15	2	NBR (sw), SI (tr), PU (bl)	--
102.015.309.*	SFU-A-15A	1.9	NBR (sw), SI (tr), PU (bl)	--
102.020.041.*	SFU-A -20	2	NBR (sw), SI (tr), PU (bl)	--
102.025.047.*	SFU-A -25	2.5	NBR (sw), SI (tr), PU (bl)	--
102.030.053.*	SFU-A -30	2	NBR (sw), SI (tr), PU (bl)	--
102.035.056.*	SFU-A -35	3	NBR (sw), SI (tr)	--
102.040.061.*	SFU-A -40	3.5	NBR (sw), SI (tr), PU (bl)	--
102.050.065.*	SFU-A -50	4	NBR (sw), SI (tr), PU (bl)	--
102.060.303.*	SFU-A -60	5	NBR (sw), SI (tr), PU (bl)	G1/4-female
102.080.304.*	SFU-A -80	6	NBR (sw), SI (tr), PU (bl)	G1/4-female
102.095.305.*	SFU-A -95	6	NBR (sw), SI (tr), PU (bl)	G1/4-female
154.120.018.*	SFU-A -120	7	NBR (sw), SI (tr)	--
154.150.020.*	SFU-A -150	9	NBR (sw), SI (tr)	--
154.191.025.*	SFU-A -200	13	NBR (sw), SI (tr), PU (bl)	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Accessories

Item no.	Suitable fittings										Suitable spring levelers (Snap-In)	
	M3-male	M5-male	M5-female	M6-male	M10x1.25-female	G1/8-male	G1/8-female	G1/4-male	G1/4-female	G1/2-female	Spring leveler	
102.001.002.*	270.011 (p.408)	--	--	--	--	--	--	--	--	--	--	--
102.002.004.*	270.014 (p.408)	270.300 (p.411)	--	--	--	--	--	--	--	--	--	--
102.003.005.*	270.014 (p.408)	270.300 (p.411)	--	--	--	--	--	--	--	--	--	--
102.005.009.*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.006.013.*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.008.017.*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.010.024.*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.015.030.*	--	270.200 (p.411)	--	--	--	270.064 (p.418)	270.065 (p.422)	--	--	--	--	--
102.015.309.*	--	270.010 (p.411)	270.005 (p.412)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	--	50.330 (p.454)	10
102.020.041.*	--	270.311 (p.411)	--	--	--	270.063 (p.419)	270.061 (p.422)	--	--	--	--	--
102.025.047.*	--	--	--	270.312/19 (p.414)	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--	--
102.030.053.*	--	--	--	270.312/19 (p.414)	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--	--
102.035.056.*	--	--	--	270.312/19 (p.414)	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--	--
102.040.061.*	--	--	--	270.312/19 (p.414)	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--	--
102.050.065.*	--	--	--	--	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)	--	--	--
102.060.303.*	--	--	--	--	270.090 (p.752)	--	--	270.120 (p.750)	--	--	--	--
102.080.304.*	--	--	--	--	270.090 (p.752)	--	--	270.120 (p.750)	--	--	--	--
102.095.305.*	--	--	--	--	270.090 (p.752)	--	--	270.120 (p.750)	--	--	--	--
154.120.018.*	--	--	--	--	--	--	--	--	--	270.056 (p.437)	--	--
154.150.020.*	--	--	--	--	--	--	--	--	--	270.056 (p.437)	--	--
154.191.025.*	--	--	--	--	--	--	--	--	--	270.056 (p.437)	--	--

Continued on the next page →

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760

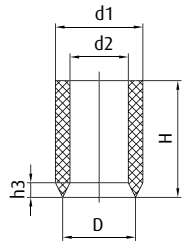




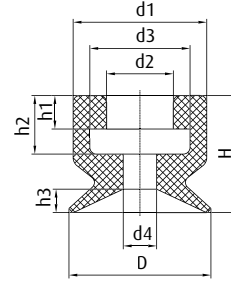
# Series | Flat vacuum cups SF

Universal flat vacuum cups - SFU-A

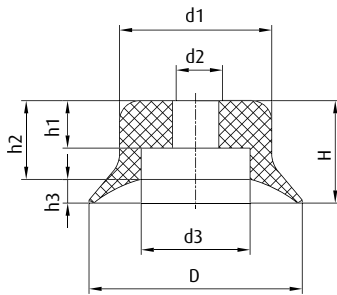
## Dimensions



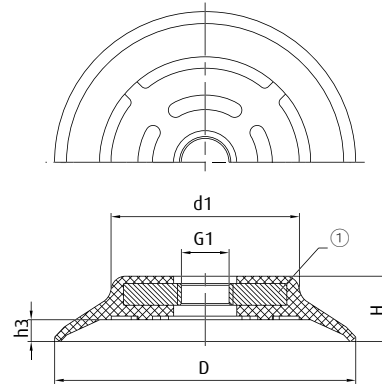
Drawing A



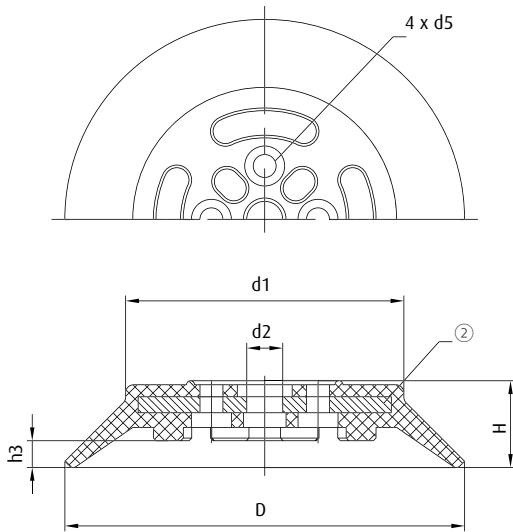
Drawing B



Drawing C



Drawing D



Drawing E

① = Aluminium ② = Steel

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	G1	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
102.001.002.*	A	1.5	1.8	1.2	--	--	--	--	2.5	--	--	0.3
102.002.004.*	B	2.5	4	2	3	1.2	--	--	4	1.5	2.5	0.5
102.003.005.*	B	4	4	2	3	1.2	--	--	4	1.5	2.5	0.5
102.005.009.*	B	5	7.5	3.8	6	1.3	--	--	6.5	1.8	3.9	0.8
102.006.013.*	B	6.5	7.5	4	6	2	--	--	7	2	4	1
102.008.017.*	B	8.5	8	4	6	2	--	--	7	2	3.5	1.4
102.010.024.*	B	11	8.5	4	6	2	--	--	7.5	1.8	3.8	1.4
102.015.030.*	C	15	12	4.5	7.5	--	--	--	8	2.6	2.1	2.1
102.015.309.*	B	15.5	9	3.8	6	2	--	--	8	2.2	4.4	2
102.020.041.*	C	21	15	4.6	11	--	--	--	10	4.5	8	2.4
102.025.047.*	C	25	16	6	11	--	--	--	14	7	11	3
102.030.053.*	C	30	14	6	11	--	--	--	12	7	10	2
102.035.056.*	C	36	21	6	11	--	--	--	14	7	11.2	2.8
102.040.061.*	C	42	24	6	11	--	--	--	14	7	11.2	2.8
102.050.065.*	C	50	27	8	20	--	--	--	15	7.4	11.5	3.5
102.060.303.*	D	62	38	--	--	--	--	G1/4	16	--	--	4.8
102.080.304.*	D	83	52	--	--	--	--	G1/4	18	--	--	6
102.095.305.*	D	95	66	--	--	--	--	G1/4	18	--	--	5.5
154.120.018.*	E	117	90	14	--	--	8.5	--	26	--	--	9
154.150.020.*	E	150	104	13.5	--	--	8.5	--	33	--	--	10
154.191.025.*	E	193	142	13	--	--	8.5	--	40	--	--	15.5

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Flat vacuum cups SF

High temperature Thermalon® cups - SKT-F

### High temperature Thermalon® cups - SKT-F

UP TO 160 °C & MINIMUM MARKING




#### Product Description

Flat vacuum cups for smooth surfaces especially suitable for removing hot plastic parts to be painted from an injection moulding machine. Thermalon® is a material mixture optimised for the plastics industry with a hardness of 60° Shore A. Connection up to Ø 50 mm by means of plug-in nipple, from Ø 60 mm with vulcanised carrier plate (boltable).




#### Advantage

- > Extremely low-marking
- > Free of silicone and other paint-wetting-impairment substances (PWIS)
- > Great stability allows high acceleration

#### Technical data

Item no.	Model / Lip dimensions		Material / Colour	Usage temperature [°C]
102.005.496.*	SKT-F-5	0.9	Thermalon® (bl)	0 - 160
102.008.497.*	SKT-F-8	1.3	Thermalon® (bl)	0 - 160
102.010.498.*	SKT-F-10	1.5	Thermalon® (bl)	0 - 160
102.015.499.*	SKT-F-15	1.9	Thermalon® (bl)	0 - 160
102.020.500.*	SKT-F-20	2.3	Thermalon® (bl)	0 - 160
102.025.501.*	SKT-F-25	3	Thermalon® (bl)	0 - 160
102.030.502.*	SKT-F-30	2	Thermalon® (bl)	0 - 160
102.040.503.*	SKT-F-40	3.9	Thermalon® (bl)	0 - 160
102.050.504.*	SKT-F-50	4	Thermalon® (bl)	0 - 160
102.060.505.*	SKT-F-60	4.9	Thermalon® (bl)	0 - 160

#### Accessories

Item no.	 Suitable fittings							 Suitable spring levelers (Snap-In)	
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler	
102.005.496.*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--	50.330 (p.454)	10
102.008.497.*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--	50.330 (p.454)	10
102.010.498.*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--	50.330 (p.454)	10
102.015.499.*	270.200 (p.411)	--	--	270.064 (p.418)	270.065 (p.422)	--	--	50.330 (p.454)	10
102.020.500.*	270.311 (p.411)	--	--	270.063 (p.419)	270.061 (p.422)	--	--	--	--
102.025.501.*	--	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--
102.030.502.*	--	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--

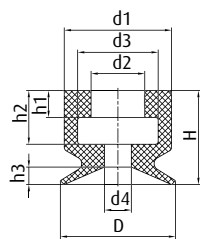
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



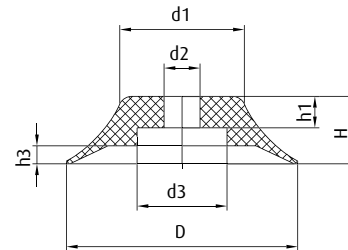
Accessories

Item no.	Suitable fittings						Suitable spring levelers (Snap-In)		
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler	
102.040.503.*	--	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)	--	--
102.050.504.*	--	--	--	270.012 (p.421)	270.020 (p.423)	270.491 (p.429)	270.492 (p.434)	--	--
102.060.505.*	--	--	--	--	--	--	--	--	--

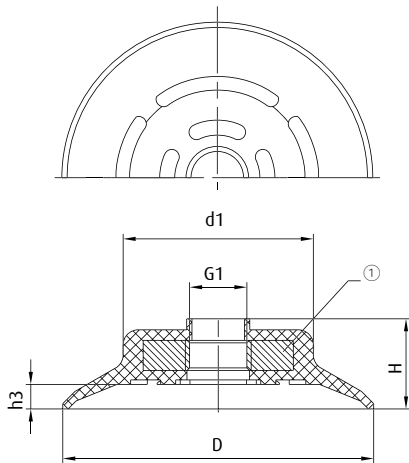
Dimensions



Drawing A



Drawing B



Drawing C

① = Aluminium

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	G1	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
102.005.496.*	A	5.5	7.5	4	6	1.5	--	6.5	2	4	0.9
102.008.497.*	A	8.5	8	4	6	2	--	7	2	4	1.3
102.010.498.*	A	11	8.5	4	6	2	--	7.5	2	4	1.4
102.015.499.*	B	15.5	12	4.5	8	--	--	8	2.7	--	1.8
102.020.500.*	B	21	15	4.5	11	--	--	10	4.5	--	2.2
102.025.501.*	B	26	16	6	11	--	--	14	7	--	2.8
102.030.502.*	B	31	14.5	6	11	--	--	12	7	--	2
102.040.503.*	B	41	24	6	11	--	--	14	7	--	3.9
102.050.504.*	B	51	27.5	8	20	--	--	15	7	--	4
102.060.505.*	C	62	38	--	30	--	G1/4	18	--	--	5

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Flat vacuum cups SF

Universal flat vacuum cups - SFU-B

### Universal flat vacuum cups - SFU-B




#### Product Description

Very shallow cup with single-lip seal for handling various products with smooth or slightly rough surfaces.  
Connection up to  $\varnothing$  15 mm by means of plug-in nipple, from  $\varnothing$  20 mm with firmly screwed-in nipple.  
Compatible "snap-in" spring levelers available.

#### Advantage

- > Great lateral stability allows high acceleration
- > Supported by support faces from  $\varnothing$  30 mm
- > Fastest cycle times are possible due to the cup's low volume
- > Cost-effective replacement of worn seals
- > High process reliability due to fixed, non-rotating seat of the screw nipple

#### Technical data

Item no.	Model / Lip dimensions	Material / Colour	
102.001.425.*	SFU-B-0.7	NBR (sw), SI-AS (sw)	0
102.001.463.*	SFU-B-1	NBR (sw), SI-AS (sw)	0
102.002.464.*	SFU-B-1.5	NBR (sw), SI-AS (sw)	0
102.002.279.*	SFU-B-2	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.2
102.003.280.*	SFU-B-3	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.3
102.004.281.*	SFU-B-4	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.3
102.006.282.*	SFU-B-6	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.5
102.008.283.*	SFU-B-8	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	1
102.010.284.*	SFU-B-10	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	1
102.015.285.*	SFU-B-15	NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	1.5
102.020.286.*	SFU-B-20	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.025.287.*	SFU-B-25	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.030.288.*	SFU-B-30	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.040.289.*	SFU-B-40	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.050.290.*	SFU-B-50	NBR (sw), SI (tr), PU (bl), FKM (gr)	2
102.060.291.*	SFU-B-60	NBR (sw), SI (tr), PU (bl), FKM (gr)	2.5

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Accessories

Item no.	Suitable fittings								Suitable spring levelers (Snap-In)							
	M3-male	M5-male	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler	Spring leveler	Spring leveler	Spring leveler	Spring leveler	Spring leveler		
102.001.425.*	270.524 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
102.001.463.*	270.524 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
102.002.464.*	270.524 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
102.002.279.*	270.427 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
102.003.280.*	270.427 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
102.004.281.*	270.427 (p.408)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
102.006.282.*	--	270.283 (p.409)	--	--	--	--	--	--	--	--	--	--	--	--	--	
102.008.283.*	--	270.283 (p.409)	--	--	--	--	--	--	--	--	--	--	--	--	--	
102.010.284.*	--	270.010 (p.411)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	50.103 (p.454)	6	50.125 (p.454)	10	50.126 (p.454)	15	50.127 (p.454)	20
102.015.285.*	--	270.010 (p.411)	--	--	270.009 (p.417)	270.007 (p.422)	--	--	50.103 (p.454)	6	50.125 (p.454)	10	50.126 (p.454)	15	50.127 (p.454)	20
102.020.286.*	--	270.311 (p.411)	270.459 (p.414)	--	270.480 (p.420)	270.479 (p.423)	--	--	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50
102.025.287.*	--	270.311 (p.411)	270.459 (p.414)	--	270.480 (p.420)	270.479 (p.423)	--	--	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50
102.030.288.*	--	--	270.460 (p.414)	--	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50
102.040.289.*	--	--	270.498 (p.414)	--	270.486 (p.420)	270.485 (p.423)	270.487 (p.429)	270.488 (p.434)	50.170 (p.456)	20	50.171 (p.456)	30	50.172 (p.456)	40	50.173 (p.456)	50
102.050.290.*	--	--	270.499 (p.414)	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)	50.174 (p.456)	20	50.175 (p.456)	30	50.176 (p.456)	40	50.177 (p.456)	50
102.060.291.*	--	--	--	270.512 (p.416)	--	--	--	--	--	--	--	--	--	--	--	--

Continued on the next page

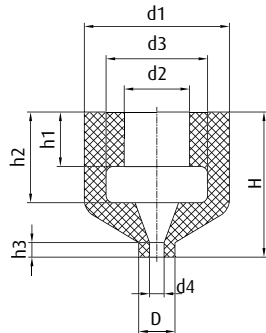
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



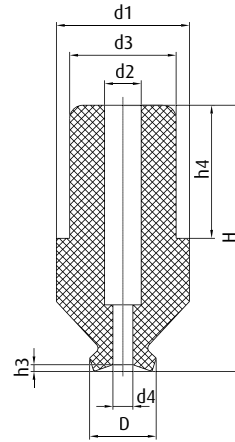
# Series | Flat vacuum cups SF

Universal flat vacuum cups - SFU-B

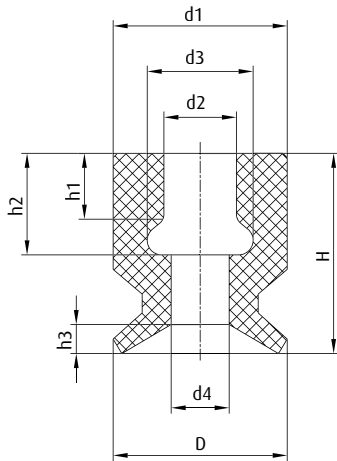
## Dimensions



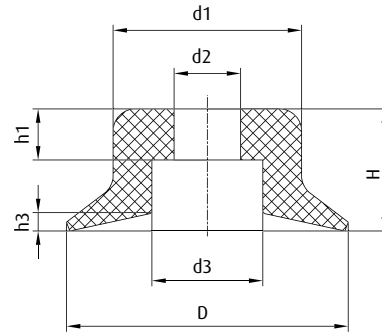
Drawing A



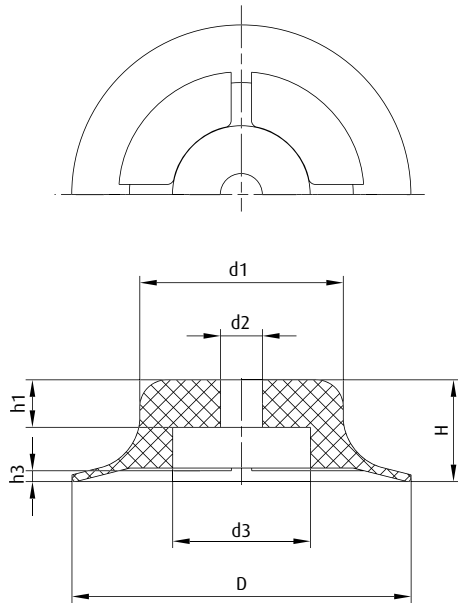
Drawing B



Drawing C



Drawing D



Drawing E

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760





Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	h4 [mm]
102.001.425_*	A	0.7	4	1.8	2.9	0.2	4	1.5	2.4	0.4	--
102.001.463_*	A	1	4	1.8	2.8	0.4	4	1.5	2.5	0.4	--
102.002.464_*	A	1.5	4	1.8	2.8	0.7	4	1.5	2.5	0.4	--
102.002.279_*	B	2	4	1.1	3.2	0.6	8	--	--	0.2	4
102.003.280_*	B	3	4	1.2	3.3	0.8	8	--	--	0.3	4
102.004.281_*	B	4	4	1.2	3.3	1.2	8	--	--	0.5	4
102.006.282_*	C	6	6	2.5	3.6	2	7	2.3	3.5	1	--
102.008.283_*	D	8	6	2.6	3.6	--	5.5	2.6	--	1	--
102.010.284_*	D	10	10	4	6	--	8	3	--	1	--
102.015.285_*	D	15	11	3.9	6	--	9	3.1	--	2.4	--
102.020.286_*	D	20	15	6	10	--	10	4.1	--	1.7	--
102.025.287_*	D	25	17	6	10	--	11	4.6	--	1.7	--
102.030.288_*	E	30	17	6	12	--	11	5	--	1.9	--
102.040.289_*	E	40	25	6	15	--	14	7	--	1.6	--
102.050.290_*	E	50	30	6	20	--	15	7	--	1.6	--
102.060.291_*	E	60	40	10.5	28	--	22	11	--	2.3	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Flat vacuum cups SF

Flat vacuum cups, modular - SP-F

## Flat vacuum cups, modular - SP-F



### Product Description

Universal flat vacuum cup in even, supported or deep design.  
Design: Replacement sealing lip for attachment to fitting.





### Advantage

- > High suction force
- > Fast cycle times possible
- > Very resistant to wear (Tepuflex®)
- > Compatible with established products from other vendors

### Ordering notes:

Explanation of the ending of the accessory fitting:  
> S: with screen

### Technical data

Item no.	Model / Lip dimensions		Material / Colour	Accessories
				Retaining ring
				
<b>Smooth design</b>				
102.005.090.*	SP-F-5	0.5	SI (tr), CR (sw)	--
102.007.091.*	SP-F-7	1	SI (tr), CR (sw)	--
102.009.092.*	SP-F-9	1.5	SI (tr), CR (sw)	--
102.011.093.*	SP-F-10	1	SI (tr), CR (sw)	--
102.016.098.*	SP-F-15	2	SI (tr), CR (sw)	--
102.020.095.*	SP-F-20	2.5	SI (tr), CR (sw)	78.011 (p.475)
102.030.096.*	SP-F-30	3.5	SI (tr), CR (sw)	78.011 (p.475)
102.040.094.*	SP-F-40	4	SI (tr), CR (sw)	78.012 (p.475)
102.050.097.*	SP-F-50	6.5	SI (tr), CR (sw)	78.013 (p.475)
				
<b>With cleats</b>				
104.016.003.*	SP-FA-16	0.5	SI (tr), CR (sw)	--
125.020.004.*	SP-FA-20	1	Tepuflex® (or), SI (tr), CR (sw)	78.011 (p.475)
125.025.007.*	SP-FA-25	1	Tepuflex® (or), SI (tr), CR (sw)	78.011 (p.475)
125.030.010.*	SP-FA-30	2	Tepuflex® (or), SI (tr), CR (sw)	78.011 (p.475)
125.040.013.*	SP-FA-40	2	Tepuflex® (or), SI (tr), CR (sw)	78.012 (p.475)
125.050.017.*	SP-FA-50	2.5	Tepuflex® (or), SI (tr), CR (sw)	78.013 (p.475)
154.078.027.*	SP-FA-75	3	Tepuflex® (or), SI (tr), CR (sw)	--
154.113.028.*	SP-FA-110	5	Tepuflex® (or), SI (tr), CR (sw)	--
154.155.026.*	SP-FA-150	5	Tepuflex® (or), SI (tr), CR (sw)	--
				
<b>Deep design</b>				
122.016.012.*	SP-FD-16	1.5	SI (tr), CR (sw)	--
122.022.022.*	SP-FD-20	2.5	SI (tr), CR (sw)	78.011 (p.475)
122.032.036.*	SP-FD-30	5	SI (tr), CR (sw)	78.011 (p.475)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Accessories

Item no.	Suitable fittings									
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G3/8-male	G3/8-female	G1/2-female	G3/4-female
<b>Smooth design</b>										
102.005.090.*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
102.007.091.*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
102.009.092.*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
102.011.093.*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
102.016.098.*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
102.020.095.*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
102.030.096.*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
102.040.094.*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
102.050.097.*	--	--	--	--	270.252, 270.502-S (p.424)	270.504-S (p.429)	270.507-S (p.435)	--	--	--
<b>With cleats</b>										
104.016.003.*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
125.020.004.*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
125.025.007.*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
125.030.010.*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
125.040.013.*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
125.050.017.*	--	--	--	--	270.252, 270.502-S (p.424)	270.504-S (p.429)	270.507-S (p.435)	--	--	--
154.078.027.*	--	--	--	--	270.527-S (p.424)	--	--	270.528-S (p.436)	270.529-S (p.436)	--
154.113.028.*	--	--	--	--	--	--	--	270.530-S (p.437)	270.531-S (p.437)	--
154.155.026.*	--	--	--	--	--	--	--	--	270.532-S (p.437)	270.533-S (p.437)
<b>Deep design</b>										
122.016.012.*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
122.022.022.*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
122.032.036.*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--

Continued on the next page →

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Flat vacuum cups SF

Flat vacuum cups, modular - SP-F

## Flat vacuum cups, modular

Example:



+



=



Assembly example



+



=

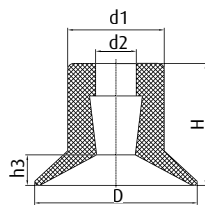


Assembly example

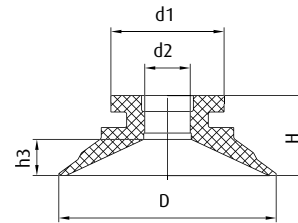
- \* Fittings are optionally available with and without filter screen
- \*\* Fittings come fitted with filter screen as standard

- > The modular series allows you to assemble your own vacuum cups
- > Worn sealing lips can be replaced quickly, cost-effective and easily
- > High flexibility thanks to a large selection of fitting threads

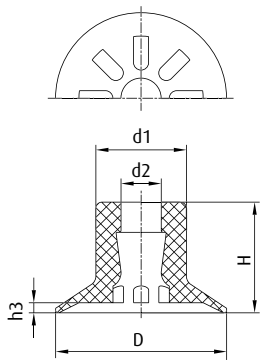
## Dimensions



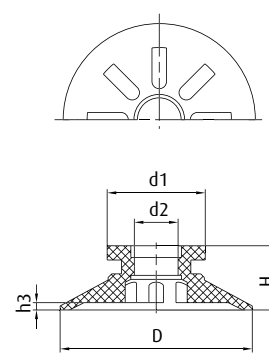
Drawing A



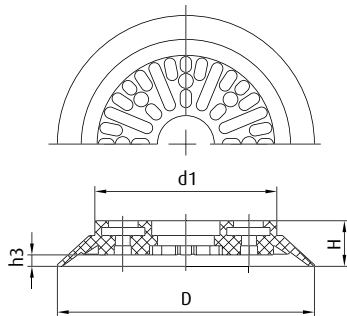
Drawing B



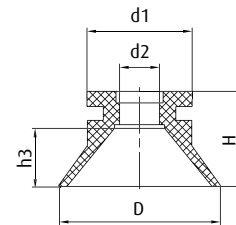
Drawing C



Drawing D



Drawing E



Drawing F

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Item no.	Drawing	∅ D [mm]	∅ d1 [mm]	∅ d2 [mm]	H [mm]	h3 [mm]
<b>Smooth design</b>						
102.005.090.*	A	5	4.5	2	6	0.5
102.007.091.*	A	7	5	2	7	0.9
102.009.092.*	A	9.5	5	2	7	1.1
102.011.093.*	A	11	9	3.8	10.5	0.8
102.016.098.*	A	16	9.5	4	12	3
102.020.095.*	B	22	14.5	5.5	8	3
102.030.096.*	B	32	14.5	6.5	10.5	4.7
102.040.094.*	B	42	20	7	13.5	6
102.050.097.*	B	52	27	11	19	8.5
<b>With cleats</b>						
104.016.003.*	C	17	9	4	11	1
125.020.004.*	D	22	14.5	5.5	8	0.9
125.025.007.*	D	28	14	5.5	9	1
125.030.010.*	D	32	14.5	6.5	10.5	1.2
125.040.013.*	D	42	20	7	13.5	2.1
125.050.017.*	D	53	27	12	17.5	2
154.078.027.*	E	78	55	--	13	3
154.113.028.*	E	113	80	--	20	5
154.155.026.*	E	155	109	--	24	5
<b>Deep design</b>						
122.016.012.*	F	17.5	9	4	17	8
122.022.022.*	F	22	14.5	5.5	13	8
122.032.036.*	F	32	14.5	5.5	19.5	14.4

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760










### Flat vacuum cups with fully assembled fitting - SP-F



Product Description	Advantage
<p>Universal flat vacuum cups in even or supported design. Series with sensing valve prevents dropping of the product if individual vacuum cups in a system are not in contact with the product.</p> <p>Version: Complete with vacuum cup fitting and filter screen.</p>	<ul style="list-style-type: none"> <li>&gt; High suction force</li> <li>&gt; Fast cycle times possible</li> <li>&gt; Very resistant to wear (Tepuflex®)</li> <li>&gt; Compatible with established products from other vendors</li> </ul>

Technical data						Accessories
Item no.	Model / Lip dimensions	Connection thread		Material / Colour		Spare cup
						
<b>Smooth design with fitting &amp; filter screen</b>						
<b>120.020.006._*</b>	SP-F-20	G1/8-male, M5-female	2.5	SI (tr), CR (sw)		102.020.095._* (p.205)
<b>120.030.013._*</b>	SP-F-30	G1/8-male, M5-female	3.5	SI (tr), CR (sw)		102.030.096._* (p.223)
<b>120.040.076._*</b>	SP-F-40	G1/8-female	4	SI (tr), CR (sw)		102.040.094._* (p.234)
<b>120.050.078._*</b>	SP-F-50	G1/8-female	6.5	SI (tr), CR (sw)		102.050.097._* (p.242)
						
<b>Smooth design with fitting, filter screen &amp; touch valve</b>						
<b>121.030.006._*</b>	SP-F-30	G1/8-male, M5-female	2.5	SI (tr), CR (sw)		102.030.096._* (p.223)
<b>121.040.007._*</b>	SP-F-40	G1/8-female	4	SI (tr), CR (sw)		102.040.094._* (p.234)
<b>121.050.008._*</b>	SP-F-50	G1/8-female	2.5	SI (tr), CR (sw)		102.050.097._* (p.242)
						
<b>With cleats, fitting &amp; filter screen</b>						
<b>123.020.003._*</b>	SP-FA-20	G1/8-male, M5-female	1	Tepuflex® (or), SI (tr), CR (sw)		125.020.004._* (p.205)
<b>123.025.010._*</b>	SP-FA-25	G1/8-male, M5-female	1	Tepuflex® (or), SI (tr), CR (sw)		125.025.007._* (p.216)
<b>123.030.019._*</b>	SP-FA-30	G1/8-male, M5-female	2	Tepuflex® (or), SI (tr), CR (sw)		125.030.010._* (p.223)
<b>123.040.028._*</b>	SP-FA-40	G1/8-female	2	Tepuflex® (or), SI (tr), CR (sw)		125.040.013._* (p.235)
<b>123.050.034._*</b>	SP-FA-50	G1/8-female	2.5	Tepuflex® (or), SI (tr), CR (sw)		125.050.017._* (p.242)
<b>152.078.133._*</b>	SP-FA-75	G1/8-female	3	Tepuflex® (or), SI (tr), CR (sw)		154.078.027._* (p.252)
<b>152.078.136._*</b>	SP-FA-75	G3/8-female	3	Tepuflex® (or), SI (tr), CR (sw)		154.078.027._* (p.252)
<b>152.078.139._*</b>	SP-FA-75	G1/2-female	3	Tepuflex® (or), SI (tr), CR (sw)		154.078.027._* (p.252)
<b>152.113.134._*</b>	SP-FA-110	G3/8-female	5	Tepuflex® (or), SI (tr), CR (sw)		154.113.028._* (p.262)
<b>152.113.137._*</b>	SP-FA-110	G1/2-female	5	Tepuflex® (or), SI (tr), CR (sw)		154.113.028._* (p.262)
<b>152.155.135._*</b>	SP-FA-150	G1/2-female	5	Tepuflex® (or), SI (tr), CR (sw)		154.155.026._* (p.269)
<b>152.155.138._*</b>	SP-FA-150	G3/4-female	5	Tepuflex® (or), SI (tr), CR (sw)		154.155.026._* (p.269)
						
<b>With cleats, fitting, filter screen &amp; touch valve</b>						
<b>124.030.002._*</b>	SP-FA-30	G1/8-male, M5-female	2	SI (tr), CR (sw)		125.030.010._* (p.223)
<b>124.040.006._*</b>	SP-FA-40	G1/8-female	2	SI (tr), CR (sw)		125.040.013._* (p.235)
<b>124.050.009._*</b>	SP-FA-50	G1/8-female	2.5	SI (tr), CR (sw)		125.050.017._* (p.242)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



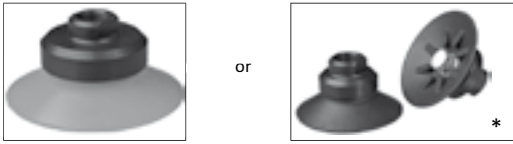


# Series | Flat vacuum cups SF

Flat vacuum cups with fully assembled fitting - SP-F

## Flat vacuum cups with fully mounted fitting

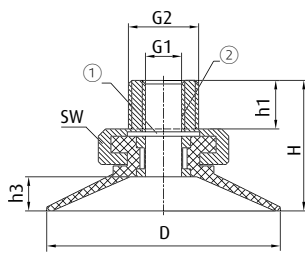
Example:



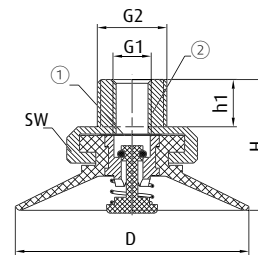
\* Version with touch valve available only for flat vacuum cups in smooth design and flat vacuum cups with cleats

- > High process reliability thanks to permanently installed fitting
- > Worn sealing lips can be replaced if necessary

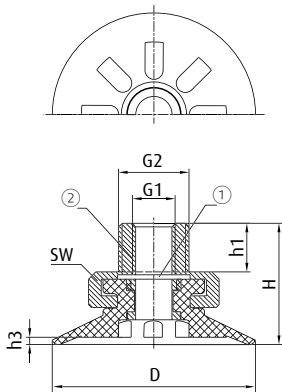
## Dimensions



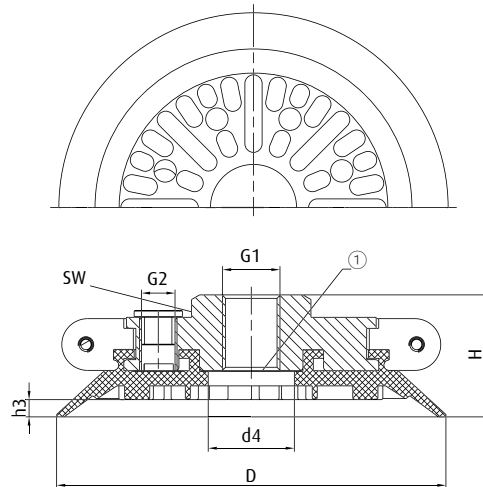
Drawing A



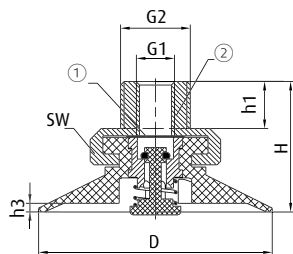
Drawing B



Drawing C



Drawing D



Drawing E

① = Filter screen ② = Aluminium

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Item no.	Drawing	Ø D [mm]	Ø d4 [mm]	G1	G2	H [mm]	h1 [mm]	h3 [mm]	SW
<b>Smooth design with fitting &amp; filter screen</b>									
120.020.006.*	A	22	--	M5	G1/8	15.5	6.5	3	17
120.030.013.*	A	32	--	M5	G1/8	18	6.5	4.5	17
120.040.076.*	A	42	--	G1/8	--	22	--	6	12
120.050.078.*	A	52	--	G1/8	--	27	--	8.5	12
<b>Smooth design with fitting, filter screen &amp; touch valve</b>									
121.030.006.*	B	32	--	M5	G1/8	18	6.5	--	17
121.040.007.*	B	42	--	G1/8	--	22	--	--	12
121.050.008.*	B	52	--	G1/8	--	27	--	--	12
<b>With cleats, fitting &amp; filter screen</b>									
123.020.003.*	C	22	--	M5	G1/8	15.5	6.5	0.9	17
123.025.010.*	C	28	--	M5	G1/8	16.5	6.5	1	17
123.030.019.*	C	32	--	M5	G1/8	18	6.5	1.2	17
123.040.028.*	C	42	--	G1/8	--	22	--	2.1	12
123.050.034.*	C	53	--	G1/8	--	26	--	2	12
152.078.133.*	D	78	10	G1/8	--	26	--	3	28
152.078.136.*	D	78	10	G3/8	--	26	--	3	28
152.078.139.*	D	78	10	G1/2	--	26	--	3	28
152.113.134.*	D	113	25	G3/8	G1/8	35	--	5	30
152.113.137.*	D	113	25	G1/2	G1/8	35	--	5	30
152.155.135.*	D	155	25	G1/2	G1/8	38	--	5	38
152.155.138.*	D	155	25	G3/4	G1/8	38	--	5	38
<b>With cleats, fitting, filter screen &amp; touch valve</b>									
124.030.002.*	E	32	--	M5	G1/8	18	--	1.2	17
124.040.006.*	E	42	--	G1/8	--	22	--	2.1	12
124.050.009.*	E	53	--	G1/8	--	26	--	2	12

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Flat vacuum cups SF

Flat vacuum cups with a flexible lip - SFU-F

### Flat vacuum cups with a flexible lip - SFU-F




#### Product Description

Flat vacuum cups with a soft, very flexible single-lip seal for handling highly sensitive products.  
Connection via plug-in nipple.  
Compatible "snap-in" spring levelers available.


















#### Advantage

- > Gentle product handling
- > Very good fit to the product surface
- > Good seal over a slightly rough surface
- > Low volume of the cup enables fast cycle times
- > Cost-effective replacement of worn seals

#### Technical data

Item no.	Model / Lip dimensions		Material / Colour
<b>102.004.216._*</b>	SFU-F-4	1	NBR (sw), SI (tr)
<b>102.006.217._*</b>	SFU-F-6	1	NBR (sw), SI (tr)
<b>102.008.218._*</b>	SFU-F-8	1	NBR (sw), SI (tr)
<b>102.010.219._*</b>	SFU-F-10	1	NBR (sw), SI (tr)
<b>102.015.220._*</b>	SFU-F-15	2	NBR (sw), SI (tr)
<b>102.020.221._*</b>	SFU-F-20	2	NBR (sw), SI (tr)
<b>102.030.222._*</b>	SFU-F-30	2	NBR (sw), SI (tr)
<b>102.040.223._*</b>	SFU-F-40	2	NBR (sw), SI (tr)

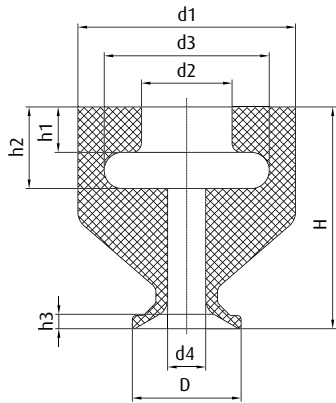
#### Accessories

Item no.	 Suitable fittings					 Suitable spring levelers (Snap-In)							
	M5-male	M6-male	G1/8-male	G1/8-female	G1/4-male	Spring leveler		Hose outside Ø	Spring leveler		Hose outside Ø		
<b>102.004.216._*</b>	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)		8.5	4	50.019 (p.454)		8.5	6
<b>102.006.217._*</b>	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)		8.5	4	50.019 (p.454)		8.5	6
<b>102.008.218._*</b>	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)		8.5	4	50.019 (p.454)		8.5	6
<b>102.010.219._*</b>	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)		8.5	4	50.019 (p.454)		8.5	6
<b>102.015.220._*</b>	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)		8.5	4	50.019 (p.454)		8.5	6
<b>102.020.221._*</b>	270.317 (p.410)	270.103 (p.413)	270.205 (p.416)	270.109 (p.421)	270.194 (p.425)	--	--	--	--	50.020 (p.454)		8.5	6
<b>102.030.222._*</b>	270.317 (p.410)	270.103 (p.413)	270.205 (p.416)	270.109 (p.421)	270.194 (p.425)	--	--	--	--	50.020 (p.454)		8.5	6
<b>102.040.223._*</b>	270.317 (p.410)	270.103 (p.413)	270.205 (p.416)	270.109 (p.421)	270.194 (p.425)	--	--	--	--	50.020 (p.454)		8.5	6

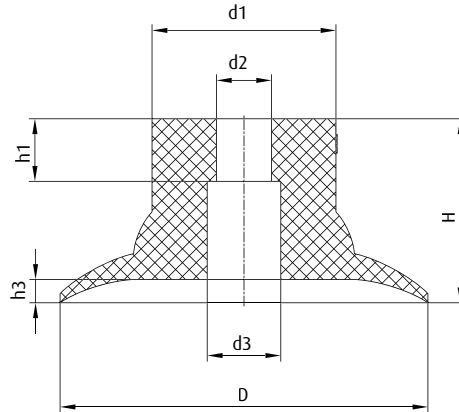
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
102.004.216.*	A	3.8	12	5	9	1.1	12	2.5	4.5	0.7
102.006.217.*	A	6	12	5	9	2.1	12.5	2.5	4.5	0.8
102.008.218.*	A	8	12	5	9	2	12.5	2.5	4.5	1.7
102.010.219.*	A	10.5	12	5	9	3	14.5	2.5	4.5	4.2
102.015.220.*	A	16	12	5	9.5	3.3	14	2.4	4.7	2.3
102.020.221.*	B	20	12	4.5	6	--	15	4.7	--	2.1
102.030.222.*	B	30	15	4.5	6	--	15	5	--	1.9
102.040.223.*	B	40	19.5	4.7	6.5	--	15	5	--	2

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Flat vacuum cups SF

Flat vacuum cups with curved lip - SFU-D

### Flat vacuum cups with curved lip - SFU-D




#### Product Description

Universal flat vacuum cups with tapering curved sealing lip. Connection via plug-in nipple.

#### Advantage

- > Pre-tension of the sealing lip enables gripping of uneven, slightly curved products
- > Large lift

#### Technical data

Item no.	Model / Lip dimensions		Material / Colour
112.004.001.*	SFU-D-4	0.5	NBR (sw), SI (r)
112.005.002.*	SFU-D-5	0.7	NBR (sw), SI (r)
112.006.003.*	SFU-D-6	1	NBR (sw), SI (r)
112.008.007.*	SFU-D-8	1.5	NBR (sw), SI (w), NR (sw)
112.010.011.*	SFU-D-10	2	NBR (sw), SI (w)
112.012.015.*	SFU-D-12	2	NBR (sw), SI (w), NR (sw)
112.015.022.*	SFU-D-15	2	NBR (sw), SI (w), NR (sw)
112.018.024.*	SFU-D-18	2.3	NBR (sw), SI (w), NR (sw)
112.020.031.*	SFU-D-20	2.3	NBR (sw), SI (w), NR (sw)
112.022.037.*	SFU-D-22	2.5	NBR (sw), SI (w)
112.025.042.*	SFU-D-25	4.5	NBR (sw), SI (w), NR (sw)
112.030.052.*	SFU-D-30	4.5	NBR (sw), SI (w)
112.035.060.*	SFU-D-35	5	NBR (sw), SI (w), NR (sw)
112.040.071.*	SFU-D-40	4	NBR (sw), SI (tr)
112.045.077.*	SFU-D-45	7	NBR (sw), SI (w), NR (sw)
112.060.091.*	SFU-D-60	9	NBR (sw), SI (tr)
112.085.102.*	SFU-D-85	12	NBR (sw), SI (tr), NR (sw)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



### Accessories

Item no.	Suitable fittings							
	M3-male	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
112.004.001.*	270.025 (p.408)	--	--	--	--	--	--	--
112.005.002.*	270.025 (p.408)	--	--	--	--	--	--	--
112.006.003.*	270.025 (p.408)	--	--	--	--	--	--	--
112.008.007.*	--	270.536 (p.409)	--	--	--	--	--	--
112.010.011.*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.012.015.*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.015.022.*	--	270.134 (p.409)	--	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.018.024.*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.020.031.*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.022.037.*	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
112.025.042.*	--	270.443 (p.410)	--	--	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
112.030.052.*	--	270.443 (p.410)	--	--	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
112.035.060.*	--	--	--	--	--	--	270.451 (p.426)	270.452 (p.431)
112.040.071.*	--	--	--	--	--	--	270.451 (p.426)	270.452 (p.431)
112.045.077.*	--	--	--	--	--	--	270.451 (p.426)	270.452 (p.431)
112.060.091.*	--	--	--	--	--	--	270.042 (p.431)	--
112.085.102.*	--	--	--	--	--	--	270.216 (p.431)	--

Continued on the next page →

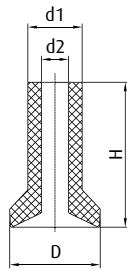
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



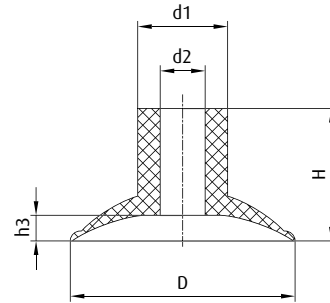
# Series | Flat vacuum cups SF

Flat vacuum cups with curved lip - SFU-D

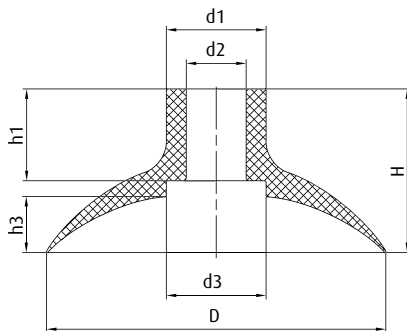
## Dimensions



Drawing A



Drawing B



Drawing C

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	H [mm]	h1 [mm]	h3 [mm]
112.004.001._*	A	4	3	1.5	--	7.5	--	--
112.005.002._*	A	5	3	1.5	--	8	--	--
112.006.003._*	A	6	3	1.5	--	8	--	--
112.008.007._*	B	8	5	2.8	--	8	--	1.6
112.010.011._*	B	10	6.5	3.8	--	10.5	--	1.9
112.012.015._*	B	12	8	4	--	11	--	1.7
112.015.022._*	B	15	8	4	--	12	--	2.5
112.018.024._*	B	18	8	3.9	--	11.5	--	2.3
112.020.031._*	B	20	8	4	--	12	--	2.3
112.022.037._*	B	22	8	4	--	13	--	2.5
112.025.042._*	B	25	12	6	--	16	--	4.3
112.030.052._*	B	30	12	6	--	17	--	4.4
112.035.060._*	B	35	15	10	--	16.5	--	5.2
112.040.071._*	B	40	15	10	--	16	--	4
112.045.077._*	B	45	15.5	10	--	17	--	7.5
112.060.091._*	C	60	15	10	25	23	10	9
112.085.102._*	C	85	25	15	25	41	23	14

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760





Notes:

A vertical red line is positioned on the left side of the page. The main body of the page is filled with horizontal lines, providing a space for handwritten notes.



## Series | Flat vacuum cups SF

Flat vacuum cups with long shaft - SFU-L

### Flat vacuum cups with long shaft - SFU-L



#### Product Description

Flat vacuum cups for handling sensitive or uneven and slightly curved products. Long, slim design enables pipe mounting and low gimbal leveling for uneven product surfaces.

#### Advantage

- > Gentle handling of particularly sensitive products
- > Cost-effective replacement of worn seals

#### Technical data

Item no.	Model / Lip dimensions	↓	Material / Colour
122.006.002.*	SFU-L-6	1.5	NBR (sw), SI (tr)
122.010.005.*	SFU-L-10	1.5	NBR (sw), SI (tr)
122.016.009.*	SFU-L-16	5	NBR (sw), SI (tr), NR (sw)
122.025.025.*	SFU-L-25	5	NBR (sw), SI (tr), NR (sw)
122.040.043.*	SFU-L-40	4	SI (tr), NR (sw)
122.060.059.*	SFU-L-60	10	NBR (sw), SI (tr), NR (sw)

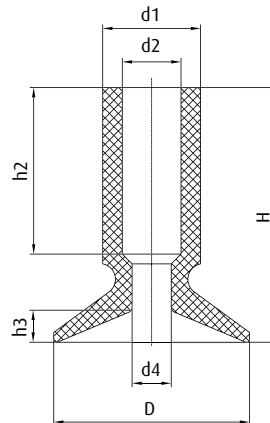
#### Accessories

Item no.	Suitable fittings				
	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
122.006.002.*	270.001 (p.409)	--	--	--	--
122.010.005.*	270.022 (p.409)	--	--	--	--
122.016.009.*	270.013 (p.410)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
122.025.025.*	--	270.132 (p.417)	270.114 (p.422)	270.043 (p.425)	270.178 (p.431)
122.040.043.*	--	--	--	270.049-1 (p.426)	--
122.060.059.*	--	--	--	270.049-1 (p.426)	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Dimensions



Item no.	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d4 [mm]	H [mm]	h2 [mm]	h3 [mm]
122.006.002.*	6	4	2	1	12	8	1.3
122.010.005.*	10	5	3	2	13	8.5	1.6
122.016.009.*	16	8	4.8	3	20	13	3.8
122.025.025.*	25	12	8	4	30	18	5.5
122.040.043.*	43	20	11	4.4	41	22	10.2
122.060.059.*	62	24	11	6	45	21	14.5

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Flat vacuum cups SF

Flat vacuum cups for chocolates - SL-PF

### Flat vacuum cups for chocolates - SL-PF



#### Product Description

Flat vacuum cups made of FDA-approved material for handling delicate products with heavily textured surfaces.

#### Advantage

- > Gentle handling of the most sensitive surfaces
- > Also suitable for three-dimensional products, e.g. chocolates

#### Technical data

Item no.	Model / Lip dimensions	Lip height	Material / Colour
107.016.008._*	SL-PF-16	2.4	SI (tr)
102.018.345._*	SL-PF-18	--	SI (tr)
107.018.004._*	SL-PF-18A	--	SI (tr)
102.022.043._*	SL-PF-22	5	SI (tr)

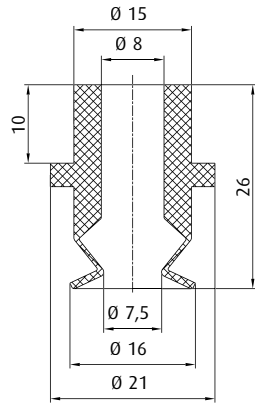
#### Accessories

Item no.	Suitable fittings				
	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
107.016.008._*	--	270.132 (p.417)	270.114 (p.422)	270.043 (p.425)	270.178 (p.431)
102.018.345._*	270.443 (p.410)	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
107.018.004._*	270.399 (p.410)	270.033 (p.416)	270.478 (p.421)	--	--
102.022.043._*	--	270.112 (p.419)	270.114 (p.422)	270.113 (p.425)	270.178 (p.431)

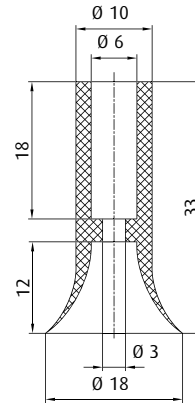
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



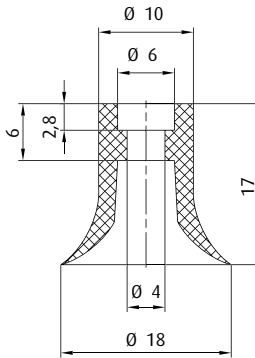
Dimensions



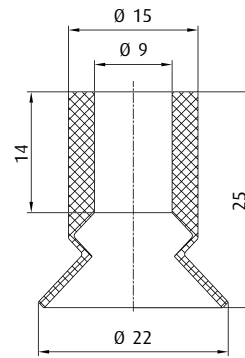
Drawing A



Drawing B



Drawing C



Drawing D

Item no.	Drawing
107.016.008.*	A
102.018.345.*	B
107.018.004.*	C
102.022.043.*	D

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Flat vacuum cups SF

Vacuum cups for handling tubes - SV-T

## Vacuum cups for handling tubes - SV-T



### Product Description

Special FDA-compliant seals for pipe mounting

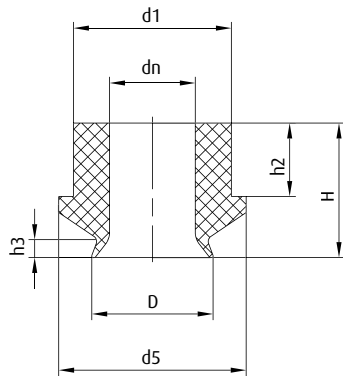
### Technical data

Item no.	Model / Lip dimensions	Material / Colour
<b>With straight passage - SV-TG</b>		
107.019.076._*	SV-TG-19	SI (tr)
107.019.112._*	SV-TG-20	SI (tr)
107.022.107._*	SV-TG-22	SI (tr)
107.025.109._*	SV-TG-25	SI (tr)
107.026.111._*	SV-TG-26	SI (tr)
107.028.108._*	SV-TG-28	SI (tr)
107.032.113._*	SV-TG-32	SI (tr)
107.037.114._*	SV-TG-37	SI (tr)
107.045.115._*	SV-TG-46	SI (tr)
<b>With conical passage - SV-TK</b>		
107.011.103._*	SV-TK-11	SI (tr)
107.012.106._*	SV-TK-12	SI (tr)
107.013.101._*	SV-TK-13	SI (tr)
107.013.105._*	SV-TK-13A	SI (tr)
107.015.102._*	SV-TK-15	SI (tr)
107.017.066._*	SV-TK-17	SI (tr)
107.018.104._*	SV-TK-18	SI (tr)

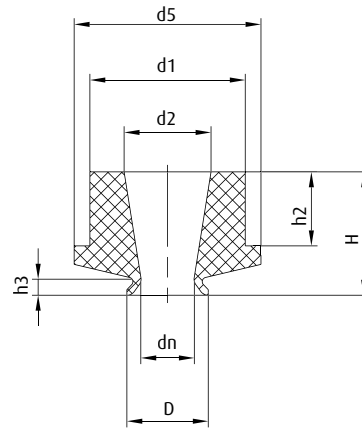
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



### Dimensions



**Drawing A**



**Drawing B**

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d5 [mm]	Ø dn [mm]	H [mm]	h2 [mm]	h3 [mm]
<b>With straight passage - SV-TG</b>									
107.019.076._*	A	18.5	25	--	30	14	21	12	2.2
107.019.112._*	A	19.5	25	--	30	14	22	12	2.9
107.022.107._*	A	22	25	--	30	17	21.5	12	2.5
107.025.109._*	A	25	25	--	31	17	22	12	2.6
107.026.111._*	A	26	25	--	30	17	23	12	5.5
107.028.108._*	A	28	25	--	30	19	24	12	5.5
107.032.113._*	A	32	32	--	40	25	25	13	2.3
107.037.114._*	A	37	45	--	53	29	31	17.5	2.7
107.045.115._*	A	46	45	--	54	37	32	17.5	--
<b>With conical passage - SV-TK</b>									
107.011.103._*	B	11	25	13.5	31	7.5	21	12	1.2
107.012.106._*	B	12.5	25	14	30	10.5	21	12	1.9
107.013.101._*	B	13	25	14	30	10.5	20	12	1.1
107.013.105._*	B	13	25	14	30	8.5	20	12	2.6
107.015.102._*	B	15	25	16	30	10.5	20	12	3
107.017.066._*	B	17.5	25	17	31	12.5	20	12	2.7
107.018.104._*	B	18	25	18	30	14	21	12	2.4

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Flat vacuum cups SF

Anti-slip flat vacuum cups - SM-P


### Anti-slip flat vacuum cups - SM-P



#### Product Description

Flat vacuum cups of oil-resistant NBR for handling metal sheets. Distinct radially extending cleats increase the holding force and prevent “deep drawing” of the product as well as any slipping of oily sheets. The firmly bolted holder (from Ø 20 mm) provides a secure seating.

#### Technical data

Item no.	Model / Lip dimensions	Connection thread		Material / Colour
<b>With female thread - SM-PI</b>				
100.010.100.*	SM-PI-10	G1/8-female	0.5	NBR (sw)
100.020.101.*	SM-PI-20	G1/8-female	1.1	NBR (sw)
100.030.102.*	SM-PI-30	G1/8-female	1.8	NBR (sw)
100.040.103.*	SM-PI-40	G1/8-female	2.5	NBR (sw)
100.050.104.*	SM-PI-50	G1/4-female	3.1	NBR (sw)
<b>With male thread - SM-PI</b>				
100.010.110.*	SM-PA-10	G1/8-male	0.5	NBR (sw)
100.020.111.*	SM-PA-20	G1/8-male	1.1	NBR (sw)
100.030.112.*	SM-PA-30	G1/8-male	1.8	NBR (sw)
100.040.113.*	SM-PA-40	G1/8-male	2.5	NBR (sw)
100.050.114.*	SM-PA-50	G1/4-male	3.1	NBR (sw)

#### Accessories

##### Spare cup

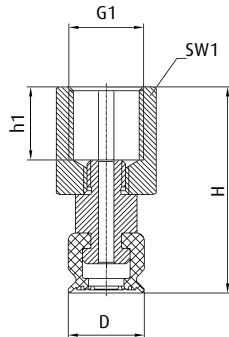
104.010.065.1 (p.183)
104.020.066.1 (p.201)
104.030.067.1 (p.219)
104.040.068.1 (p.231)
104.050.069.1 (p.239)
104.010.065.1 (p.183)
104.020.066.1 (p.201)
104.030.067.1 (p.219)
104.040.068.1 (p.231)
104.050.069.1 (p.239)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760

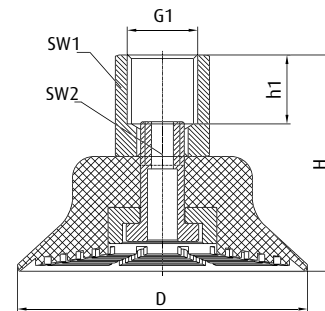
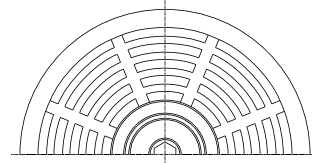




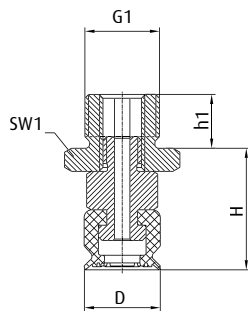
Dimensions



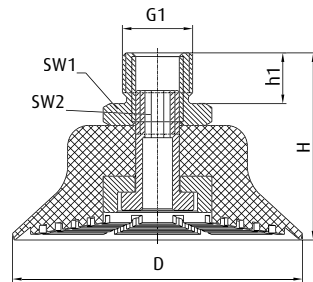
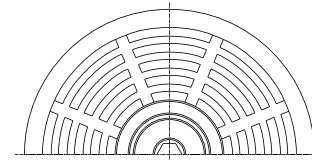
Drawing A



Drawing B



Drawing C



Drawing D

Item no.	Drawing	Ø D [mm]	G1	H [mm]	h1 [mm]	SW1	SW2
<b>With female thread - SM-PI</b>							
100.010.100.*	A	10	G1/8	27	9.5	13	--
100.020.101.*	B	20	G1/8	24	9.5	13	3
100.030.102.*	B	30	G1/8	26	9.5	13	3
100.040.103.*	B	40	G1/8	30	9.5	13	3
100.050.104.*	B	50	G1/4	35	11	17	3
<b>With male thread - SM-PI</b>							
100.010.110.*	C	10	G1/8	16	7	13	--
100.020.111.*	D	20	G1/8	23	8	13	3
100.030.112.*	D	30	G1/8	25	8	13	3
100.040.113.*	D	40	G1/8	29	8	13	3
100.050.114.*	D	50	G1/4	32	10	17	3

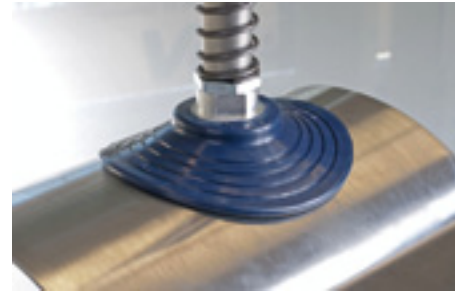
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Flat vacuum cups SF

Flat vacuum cups for dynamic sheet handling - SM-F

## Flat vacuum cups for dynamic sheet handling - SM-F



### Product Description

Robust, round NBR flat vacuum cups, 60° Shore A with vulcanised fitting made of aluminium and large area, multi-part "anti-slip" cleats. Various connection threads available. Silicone-free.

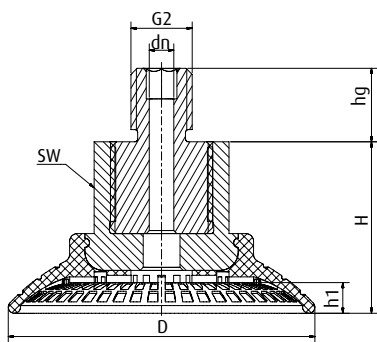
### Advantage

- > Reliable, non-slip handling of oily sheets due to "anti-slip" cleats. Good absorption of lateral forces
- > Supports help to prevent deep-drawing or deformation of thin sheets
- > Leak-free suction even with slightly curved surfaces due to flexible sealing lip
- > Vulcanised connection thread ensures a secure fit

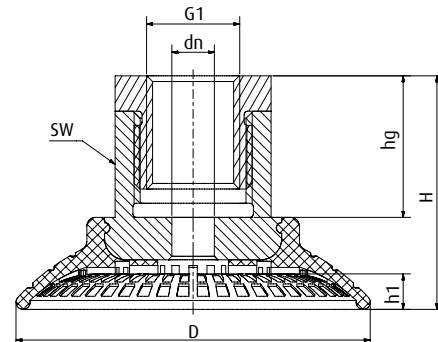
### Technical data

Model / Lip dimensions	Thread (Aluminium)						
	G1/4-male	G1/4-female	G3/8-female	M10-male	M14x1.5-male	Rectangular adapter	
SM-F-30	103.030.030.1	103.030.031.1	103.030.032.1	103.030.033.1	103.030.034.1	103.030.035.1	3
SM-F-40	103.040.036.1	103.040.037.1	103.040.038.1	103.040.039.1	103.040.040.1	103.040.041.1	4
SM-F-50	103.050.042.1	103.050.043.1	103.050.044.1	103.050.045.1	103.050.046.1	103.050.047.1	5
SM-F-60	103.060.048.1	103.060.049.1	103.060.050.1	103.060.051.1	103.060.052.1	103.060.053.1	6
SM-F-80	103.080.054.1	103.080.055.1	103.080.056.1	103.080.057.1	103.080.058.1	103.080.059.1	7.6
SM-F-100	103.100.060.1	103.100.061.1	103.100.062.1	103.100.063.1	103.100.064.1	103.100.065.1	9.5
SM-F-125	103.125.066.1	103.125.067.1	103.125.068.1	103.125.069.1	103.125.070.1	103.125.071.1	12.5

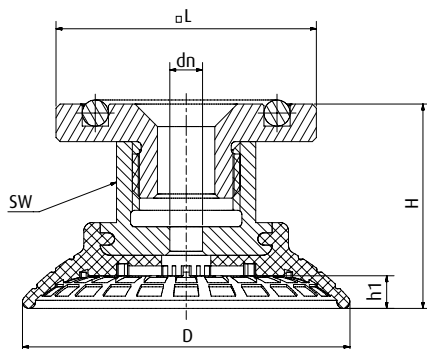
### Dimensions



Drawing A



Drawing B



Drawing C



„Anti-Slip“-Cleats (SM-F-100)



Item no.	Drawing	G1 (female)	G2 (male)	Ø D [mm]	Ø dn [mm]	□L [mm]	H [mm]	h1 [mm]	hg [mm]	SW
103.030.030.*	A	--	G1/4	30	4	--	20	3	10	17
103.030.031.*	B	G1/4	--	30	4	--	20	3	12	17
103.030.032.*	B	G3/8	--	30	4	--	36	3	10	17
103.030.033.*	A	--	M10	30	4	--	20	3	12	17
103.030.034.*	A	--	M14x1.5	30	4	--	20	3	12	17
103.030.035.*	C	--	--	30	4	32	23.2	3	--	17
103.040.036.*	A	--	G1/4	40	4	--	22	4	10	17
103.040.037.*	B	G1/4	--	40	4	--	22	4	12	17
103.040.038.*	B	G3/8	--	40	4	--	38	4	10	17
103.040.039.*	A	--	M10	40	4	--	22	4	12	17
103.040.040.*	A	--	M14x1.5	40	4	--	22	4	12	17
103.040.041.*	C	--	--	40	4	32	25	4	--	17
103.050.042.*	A	--	G1/4	50	6	--	28	5	10	22
103.050.043.*	B	G1/4	--	50	6	--	33	5	20	22
103.050.044.*	B	G3/8	--	50	6	--	28	5	15	22
103.050.045.*	A	--	M10	50	4	--	28	5	12	22
103.050.046.*	A	--	M14x1.5	50	6	--	28	5	12	22
103.050.047.*	C	--	--	50	6	32	27.5	5	--	22
103.060.048.*	A	--	G1/4	60	6	--	31	6	10	22
103.060.049.*	B	G1/4	--	60	8	--	36	6	20	22
103.060.050.*	B	G3/8	--	60	8	--	31	6	15	22
103.060.051.*	A	--	M10	60	4	--	31	6	12	22
103.060.052.*	A	--	M14x1.5	60	6	--	31	6	12	22
103.060.053.*	C	--	--	60	6	32	30.5	6	--	22
103.080.054.*	A	--	G1/4	80	6	--	35	7.6	10	22
103.080.055.*	B	G1/4	--	80	8	--	40	7.6	20	22
103.080.056.*	B	G3/8	--	80	8	--	35	7.6	15	22
103.080.057.*	A	--	M10	80	4	--	35	7.6	12	22
103.080.058.*	A	--	M14x1.5	80	6	--	35	7.6	12	22
103.080.059.*	C	--	--	80	8	32	34.5	7.6	--	22
103.100.060.*	A	--	G1/4	100	6	--	36	9.5	10	22
103.100.061.*	B	G1/4	--	100	8	--	41	9.5	20	22
103.100.062.*	B	G3/8	--	100	8	--	36	9.5	15	22
103.100.063.*	A	--	M10	100	4	--	36	9.5	12	22
103.100.064.*	A	--	M14x1.5	100	6	--	36	9.5	12	22
103.100.065.*	C	--	--	100	8	32	35.5	9.5	--	22
103.125.066.*	A	--	G1/4	125	6	--	43	12.5	10	22
103.125.067.*	B	G1/4	--	125	8	--	48	12.5	20	22
103.125.068.*	B	G3/8	--	125	8	--	43	12.5	15	22
103.125.069.*	A	--	M10	125	4	--	43	12.5	12	22
103.125.070.*	A	--	M14x1.5	125	6	--	43	12.5	12	22
103.125.071.*	C	--	--	125	8	32	42.5	12.5	--	22



# Series | Flat vacuum cups SF

Flat vacuum cups for textured surfaces - SFU-R

## Flat vacuum cups for textured surfaces - SFU-R



### Product Description

Flat vacuum cups with safety sealing lips to handle rough surfaces, as well as smooth but very uneven products. Connection via an interlocking, snap-in aluminium plate

### Advantage

- > Leak-free gripping of many difficult product surfaces thanks to extremely flexible, thinly tapered sealing lip
- > High stability under lateral forces
- > Optimum process reliability due to additional double lip seal
- > Cleats help prevent warping of the product
- > Cost-effective, tool-free changing of worn seals

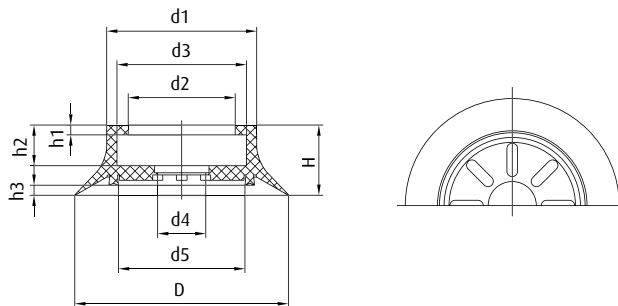
### Technical data

Item no.	Model / Lip dimensions	↓	Material / Colour
102.040.357.*	SFU-R-40	3	SI (tr), NR (br)
102.070.234.*	SFU-R-70	6	NBR (gr), SBR (br), SI (tr), NR (bg), NR (br)
102.100.269.*	SFU-R-100	5	SBR (br), NBR (gr), NR (br)
102.200.350.*	SFU-R-200	5	NR (w)

### Accessories

Item no.	Suitable fittings		
	G1/8-female	G1/4-female	G1/2-female
102.040.357.*	270.234 (p.438)	--	--
102.070.234.*	--	270.179 (p.438)	--
102.100.269.*	--	270.180 (p.438)	--
102.200.350.*	--	--	270.335 (p.438)

### Dimensions



Item no.	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
102.040.357.*	40	26	17.5	21	8	21	12.5	2.9	6	2.5
102.070.234.*	70	50	33	43	14	40	30	3.5	17	5.4
102.100.269.*	100	70	50	61	23	59	33	4.6	19	4.7
102.200.350.*	200	168	148	158	25	158	31	5	18.5	3.2



Flat vacuum cups for separating porous products - SFU-RT



**Product Description**

Patented flat vacuum cups for stacking of partially air-permeable plate material that air is drawn through. Separates uppermost plate layer from underlying plate layers. Soft sealing lip made of abrasion-resistant NR. Secure handling even of rough surfaces thanks to additional internal safety sealing lip. High stability under lateral forces. Cost-effective replacement of the wear part, as it comes in two parts.

**Ordering notes**

Elastomer seal and carrier plate 270.380 must be ordered separately

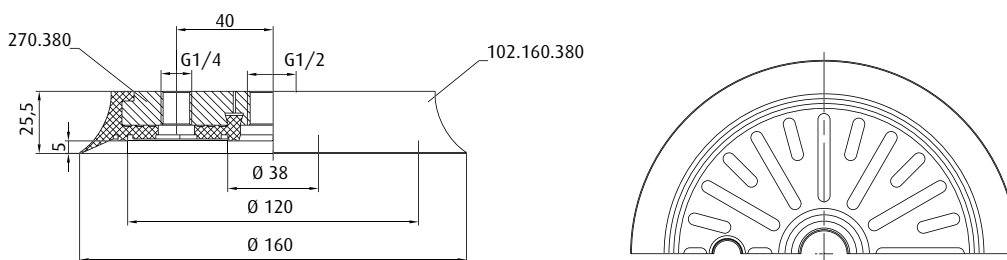
**Technical data**

Item no.	Model / Lip dimensions		Material / Colour	Suitable fittings
102.160.380.4	SFU-RT-160	6	NR (bg)	270.380

**Functional principle**

Task: Access the top layer of porous materials without carrying along the lower layers. Simultaneous intake (outer chamber) and selective blowing in a separate central chamber breaks adhesive forces between the layers. The unwanted take-up of lower layers is prevented. The air pressure level should be between 1 and 3 bar and is dependent on the nature of the product.

**Dimensions**



**Gripping force [N] at vacuum level [%]**

Item no.	20 % Vacuum	30 % Vacuum	40 % Vacuum	50 % Vacuum	60 % Vacuum	70 % Vacuum
102.160.380.4	83	137	186	230	280	324

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



## Series | Flat vacuum cups SF

Flat vacuum cups with double safety sealing lips - SFU-S

### Flat vacuum cups with double safety sealing lips - SFU-S




#### Product Description

Flat vacuum cups with dual internal safety sealing lip as well as vulcanised carrier plate made of aluminium.

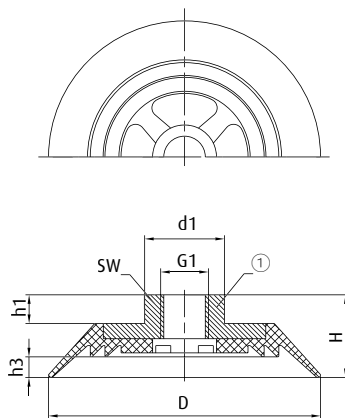
#### Advantage

- > High process reliability through multiple sealing lip
- > Excellent lateral stability due to vulcanised carrier plate, as well as rubberised support surfaces for the product

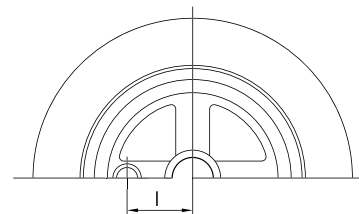
#### Technical data

Item no.	Model / Lip dimensions	Connection thread		Material / Colour
150.030.031._*	SFU-S-30	M5-female	3	SI (r), CR (sw)
150.050.032._*	SFU-S-50	G1/8-female	5.5	SI (r), FKM (sw), CR (sw)
150.075.033._*	SFU-S-75	G1/4-female	6	SI (r), FKM (sw), CR (sw)
150.100.034._*	SFU-S-100	G3/8-female	9	NBR (sw), SI (tr), NR (w)
150.150.010._*	SFU-S-150	G1/2-female	9	SI (gr), CR (gr)
150.225.018._*	SFU-S-225	G3/4-female	9.5	SI (gr), CR (gr)

#### Dimensions



Drawing A



Drawing B

① = Aluminium \*\* = Vacuum connection at the side possible

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



Item no.	Drawing	∅ D [mm]	l [mm]	∅ d1 [mm]	G1	G2	H [mm]	h1 [mm]	h3 [mm]	SW
150.030.031.*	A	29	--	10	M5	--	17.5	7	3	8
150.050.032.*	A	50	--	18	G1/8	--	18.5	7	5.5	14
150.075.033.*	A	75	--	22	G1/4	--	23	8	5.5	17
150.100.034.*	A	100	--	30	G 3/8	--	30	10	9	24
150.150.010.*	B	146	30	34	G1/2	G1/8	42	15.5	9	27
150.225.018.*	B	223	50	49	G3/4	G1/8	52	20	9.5	40

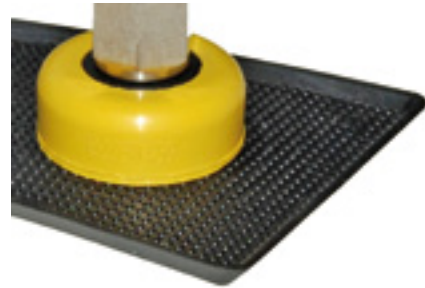
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Series | Flat vacuum cups SF

Flat vacuum cups with a short lift - SFK

## Flat vacuum cups with a short lift - SFK



### Product Description

Flat vacuum cups with a minimum lift for flat surfaces. HNBR version especially suited for removing hot plastic parts from an injection moulding machine, as they are silicone-free and temperature-resistant up to 160 °C. SFK-G series particularly suitable for clamping elements. Connection via a form-locking, snap-in aluminium plate.

### Advantage

- > Great suction power thanks to the largest active vacuum suction surface possible
- > Minimised wear, as the suction lip does not slide over the product during suction
- > Low space requirement
- > Cost-effective replacement of worn seals

### Technical data

Item no.	Model / Lip dimensions	Lift	Material / Colour
	<b>SFK-K</b>		
102.020.458.*	SFK-K-20	0.5	HNBR (ge), NR (br)
102.030.459.*	SFK-K-30	0.8	HNBR (ge), NR (br)
102.045.460.*	SFK-K-45	1.2	HNBR (ge), NR (br)
	<b>SFK-G</b>		
154.065.003.*	SFK-G-65	3	NBR (sw), SI (w), NR (sw)
154.110.014.*	SFK-G-110	1.5	NBR (sw), SI (w)
154.150.021.*	SFK-G-150	2	NBR (sw), SI (w)

### Accessories

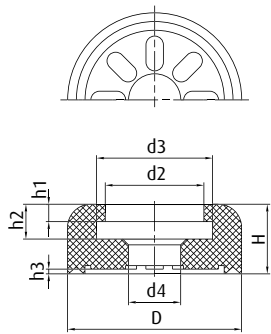
Item no.	Suitable fittings				
	M5-male	G1/8-female	G1/4-female	G3/8-female	G1/2-female
<b>SFK-K</b>					
102.020.458.*	270.521 (p.412)	--	--	--	--
102.030.459.*	--	270.234 (p.438)	--	--	--
102.045.460.*	--	270.235 (p.438)	--	--	--
<b>SFK-G</b>					
154.065.003.*	--	270.158 (p.438)	270.264 (p.438)	270.161 (p.438)	270.286 (p.438)
154.110.014.*	--	--	270.224 (p.438)	270.167 (p.438)	270.266 (p.438)
154.150.021.*	--	--	270.171 (p.438)	270.173 (p.438)	270.268 (p.438)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760

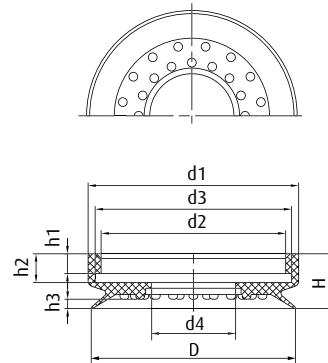




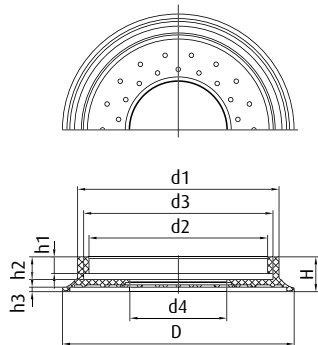
### Dimensions



**Drawing A**



**Drawing B**



**Drawing C**

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
<b>SFK-K</b>										
102.020.458._*	A	20	20	10	14	6.5	12	3	7	0.5
102.030.459._*	A	30	30	17	20	9	12	3	6	0.8
102.045.460._*	A	45	45	25	28	9	12	3.5	5.5	1.2
<b>SFK-G</b>										
154.065.003._*	B	65	67	59	63	27	17.5	6.3	9	3
154.110.014._*	C	114	96	88	91	53	17	8	11	1.2
154.150.021._*	C	153	133	118	125	64	23	11	15	3

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Flat vacuum cups SF

Vacuum suction plates with foam rubber sealing lip - SP-PLM

## Vacuum suction plates with foam rubber sealing lip - SP-PLM



### Product Description

Flat vacuum suction plate with a soft, foamed sealing lip made of EPDM. The sealing lip snaps (form-locking) into a support plate.

### Advantage

- > Good sealing of heavily textured surfaces
- > Cost-effective replacement of worn seals

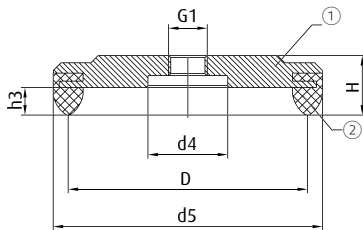
### Technical data

Item no.	Model / Lip dimensions	Connection thread		Weight [g]	Material / Colour
160.042.001._*	SP-PLM-35	G1/8-female	1	22	EPDM (sw)
160.067.003._*	SP-PLM-60	G1/8-female	1	63	EPDM (sw)
160.107.006._*	SP-PLM-100	G1/2-female	1	234	EPDM (sw)
160.145.014._*	SP-PLM-140	G1/2-female	1	588	EPDM (sw)
160.215.009._*	SP-PLM-200	G3/4-female	2.5	1,220	EPDM (sw)
160.315.012._*	SP-PLM-300	G3/4-female	2.5	2,482	EPDM (sw)

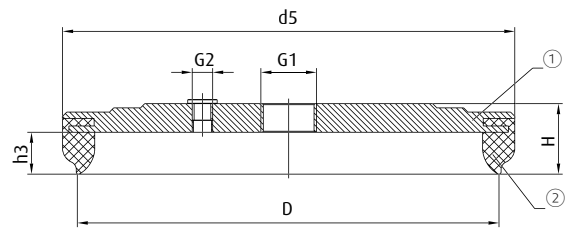
### Accessories

Spare cup	Touch valve
102.038.451.15 (p.227)	270.129 (p.670)
102.060.452.15 (p.244)	270.129 (p.670)
102.100.453.15 (p.259)	270.130 (p.670)
102.140.454.15 (p.266)	270.130 (p.670)
102.210.455.15 (p.273)	--
102.310.456.15 (p.279)	--

### Dimensions



Drawing A



Drawing B

① = Aluminium ② = EPDM foamed

Item no.	Drawing	Ø D [mm]	Ø d4 [mm]	Ø d5 [mm]	G1	G2	H [mm]	h3 [mm]
160.042.001._*	A	35	20	43	G1/8	--	15	7
160.067.003._*	A	60	20	68	G1/8	--	15	7
160.107.006._*	A	100	30	108	G1/2	--	19	7
160.145.014._*	A	138	30	145	G1/2	--	24	7
160.215.009._*	B	201	--	215	G3/4	G1/8	34	20
160.315.012._*	B	300	--	315	G3/4	G1/8	34	20

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



Heavy-duty flat vacuum suction plates - SFPL-D




**Product Description**

Heavy-duty vacuum suction plate for both smooth and rough surfaces such as metal sheets, cut marble, granite, precast concrete, metal plates or rough-sawn wood. Central mounting connection - lateral vacuum port.

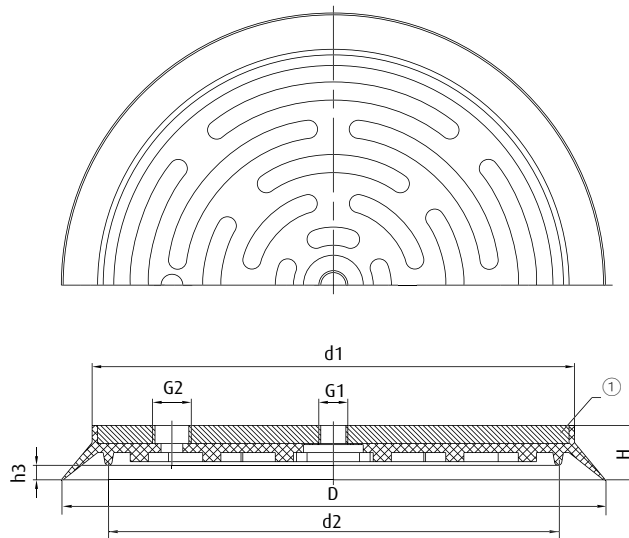
**Advantage**

- > Vulcanised steel carrier plate allows lifting of very heavy loads
- > Secure gripping of uneven surfaces thanks to additional inner sealing lip
- > Lateral vacuum connection

**Technical data**

Item no.	Model / Lip dimensions	Connection thread		Weight [g]	Material / Colour
152.160.127.*	SFPL-D-160	M12-female	9	970	CR (sw)
152.200.128.*	SFPL-D-200	M12-female	9	1,741	CR (sw)
152.250.129.*	SFPL-D-250	M12-female	9	2,990	CR (sw)
152.300.130.*	SFPL-D-300	M16-female	12	4,370	NBR (sw)
152.350.131.*	SFPL-D-350	M16-female	13	6,274	NBR (sw)

**Dimensions**



① = Steel

Item no.	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	G1	G2	H [mm]	h3 [mm]
152.160.127.*	160	124	109	M12	G3/8	28	9
152.200.128.*	200	166	146	M12	G3/8	27	7.5
152.250.129.*	250	212	194	M12	G3/8	27	7
152.300.130.*	300	266	248	M16	G1/2	30	8
152.350.131.*	350	316	298	M16	G1/2	30	8



# Series | Flat vacuum cups SF

Flat XXL suction rings - SFR


## Flat XXL suction rings - SFR



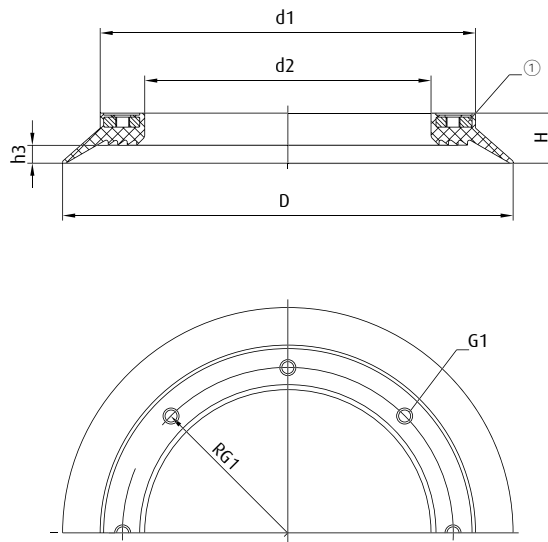
### Product Description

Large flat suction seals vulcanised on steel ring for handling very large loads. Mounting through circular, circumferentially placed thread holes.

### Technical data

Item no.	Material / Colour	
152.285.099.*	NBR (sw)	11
152.450.105.*	NBR (sw)	18
152.540.106.*	NBR (sw)	18
152.630.107.*	NBR (sw)	18
152.720.108.*	NBR (sw)	18
152.920.109.*	NBR (sw)	18

### Dimensions



① = Ring made of vulcanised ST37

Item no.	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	G1	R G1	H [mm]	h3 [mm]
152.285.099.*	285	250	160	4xM12	102.5	32	11
152.450.105.*	450	375	286	8xM12	165	50	18
152.540.106.*	540	465	375	8xM12	210	50	18
152.630.107.*	630	556	464	12xM12	255	50	18
152.720.108.*	720	646	554	12xM12	300	50	18
152.920.109.*	920	846	754	12xM12	400	50	18



FIPA Bellows vacuum cups SB

- > Gentle handling of delicate products
- > Bellows allow for height and angle compensation
- > Good adaptation to curved surfaces
- > Lifting of the product occurs via the lifting movement of the bellows



**Bellows vacuum cups, universal, 1.5 folds - SBU 1**

- > Universal bellows vacuum cups for handling sensitive or uneven products
- > Diameter: 5 - 88 mm

> See page 81



**High temperature Thermalon® bellows cups, 1.5 folds - SKT-B1**

- > Material blend especially suited for removing hot plastic parts to be painted from an injection molding machine
- > Very low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
- > Heat-resistant up to 160 °C
- > Diameter: 11 - 63 mm

> See page 84



**High temperature HNBR bellows cups, 1.5 folds - SKT-B1**

- > Universal vacuum cup for removing hot plastic parts to be painted from an injection molding machine
- > Low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
- > Heat-resistant up to 160 °C
- > Diameter: 5 - 43 mm

> See page 86



**Bellows vacuum cups, universal, 2.5 folds - SBU 2**

- > Universal vacuum cup with large stroke for handling sensitive or uneven products
- > Diameter: 4 - 88 mm

> See page 89

Continued on the next page →



## FIPA Bellows vacuum cups SB



### High temperature Thermalon® bellows cups, 2.5 folds - SKT-B2

- > Material blend especially suited for removing hot plastic parts to be painted from an injection molding machine
- > Very low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
- > Heat-resistant up to 160 °C
- > Diameter 5 - 62 mm

> See page 92



### High temperature HNBR bellows cups, 2.5 folds - SKH-B2

- > Universal vacuum cup with large stroke for removing hot plastic parts to be painted from an injection molding machine
- > Low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
- > Heat-resistant up to 160 °C
- > Diameter: 5 - 60 mm

> See page 94



### Bellows vacuum cups, universal, 3.5 folds - SBU 3

- > Gentle handling of sensitive products
- > Very large lifting movement
- > Diameter: 18 - 25 mm

> See page 96



### Vulkollan® bellows cups, universal, 1.5 to 2.5 folds - SBU-VU

- > Sturdy vacuum cup with minimal wear and a long service life - thereby offering long maintenance intervals
- > Short cycle times thanks to very good retraction
- > Diameter: 9 - 62 mm

> See page 97



### Bellows vacuum cups, 1.5 and 4.5 folds, modular - SP-B

- > Widely spread out bellows vacuum cups with a short or long stroke
- > Design: Replacement sealing lip for attachment to fitting
- > Diameter: 5 - 160 mm

> See page 100



### Bellows vacuum cups, 1.5 and 4.5 folds, with fixed mounted fittings - SP-B

- > Widely spread out bellows vacuum cups with a short or long stroke
- > Design: Complete with vacuum cup fitting and filter screen
- > Diameter: 20 - 160 mm

> See page 104



## FIPA Bellows vacuum cups SB



### Varioflex® bellows cups, 1.5 and 2.5 folds - SP-BX

- > Excellent service life and superior retention force
- > Special polyurethane in two degrees of hardness (60° Shore A black, 30° Shore A red)
- > Soft lip for optimal sealing
- > Long service life and low wear
- > Short cycle times and high process reliability
- > Low-marking

#### 1.5 folds - SP-BX1

- > Supports (Ø 20 - 75 mm) stabilise the product
- > Diameter: 15 - 75 mm

> See page 107

#### 2.5 folds - SP-BX2

- > Diameter: 15 - 75 mm

> See page 110



### Vinyl bellows cups, 1.5 and 2.5 folds - SBV

- > Wear-resistant material - long service life
- > Good adaptation to curved or flexible product surfaces

#### 1.5 folds - SBV 1

- > Diameter: 5 - 70 mm

> See page 113

#### 2.5 folds - SBV 2

- > Diameter: 4 - 50 mm

> See page 116



### Bellows vacuum cups, 1.5 folds - SBF-A

- > High degree of holding force thanks to supports at the sealing lip
- > Fine, flexible sealing lip suitable for uneven surfaces
- > Supporting ribs prevent the deformation of thin-walled products
- > High process reliability due to fixed, non-rotating seat of the screw fitting
- > Diameter: 10 - 80 mm

> See page 119



### Bellows vacuum cups, 1.5 folds - SBF-B

- > Soft sealing lip and soft bellows enable adaptation to curved or flexible product surfaces
- > Extremely gentle handling of sensitive products
- > Cost-effective replacement of worn seals thanks to plug-in fittings
- > Diameter: 6 - 20 mm

> See page 122

Continued on the next page →





## FIPA Bellows vacuum cups SB



### **Bellows vacuum cups, 4.5 folds - SBF-C**

- > Fine, flexible sealing lip fits in perfectly with irregularities of the product (e.g. bag-packaged goods)
- > Large stroke for the gentle handling of sensitive products
- > Connection via screwed fittings (hollow bolt + adapter)
- > Diameter: 10 - 50 mm

> See page 124



### **Bellows vacuum cups for chocolates - SL-PB**

- > Extremely flexible and adaptable suction lip for leak-free sealing of three-dimensional product surfaces
- > Low-marking and FDA-approved
- > Diameter: 12 - 16 mm

> See page 125



### **Vacuum cups for baked goods SL-B**

- > Multiple folds ensure a high degree of height adjustment and gentle product handling
- > FDA-approved
- > Diameter: 34 - 60 mm

> See page 126



### **Detectable vacuum cups for baked goods - SL-BD**

- > Detectable, providing optimum assurance that the product is not contaminated by vacuum components
- > Multiple folds ensure a high degree of height adjustment and gentle product handling
- > FDA-approved
- > Diameter: 35 - 40 mm

> See page 128



### **Vacuum cups for eggs - SL-E**

- > Bellows vacuum cups in a design specially optimised for handling eggs
- > Gentle attachment to the product and a high lifting motion thanks to a long vacuum cup stroke
- > FDA-approved
- > Diameter: 33 - 34 mm

> See page 129



### **Bellows vacuum cups 1.5 and 2.5 folds with special connection for standard packaging machines - SV-SB**

- > Smooth suspension for gentle product handling
- > Available in silicone (FDA-approved) and NR
- > Diameter: 16 - 40 mm

> See page 130





## FIPA Bellows vacuum cups SB



### **Bellows vacuum cups, 1.5 folds for dynamic sheet handling - SM-B**

- > Reliable, non-slip handling of oily sheets thanks to “anti-slip” supporting ribs.  
Good absorption of lateral forces
- > Internal supports help to prevent deep-drawing or deformation of thin sheets
- > Leak-free suction even with curved surfaces due to flexible sealing lip
- > Secure fit thanks to vulcanised connecting thread
- > Diameter: 30 - 125 mm

> See page 133



### **Bellows vacuum suction plates softgrip - SBPL-SG**

- > Very gentle handling of sensitive products thanks to highly flexible fold walls
- > Combines the flexibility of bellows cups with the stability of flat vacuum suction plates
- > Central support block with safety sealing lip ensures a firm grip
- > Diameter: 150 - 210 mm

> See page 136



### **Bellows vacuum suction plates - SBPL-E**

- > Gentle handling of heavy, sensitive products
- > Good adaptation to concave or convex surfaces
- > Rubberised support surfaces prevent deformation of workpieces
- > Diameter: 150 - 350 mm

> See page 137





## Bellows vacuum cups, universal, 1.5 folds - SBU 1




### Product Description

Universal bellows vacuum cups with 1.5 folds for handling sensitive or uneven products.  
Connection up to  $\varnothing$  75 mm by means of plug-in nipple, from  $\varnothing$  88 mm with vulcanised bracket.

### Advantage

- > Bellows compensates for differences in height and enables good adaptation to curved or uneven product surfaces
- > Soft attachment for sensitive products
- > Cost-effective replacement of worn seals

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Connection thread
23.005.181.*	SBU 1-5	2	1.5	NBR (sw), SI (tr)	--
23.011.008.*	SBU 1-11	4.5	1.5	NBR (sw), SI (tr)	--
23.013.120.*	SBU 1-13	4	1.5	NBR (sw), SI (tr), NR (gr)	--
23.016.016.*	SBU 1-16	6	1.5	NBR (sw), SI (tr)	--
23.019.119.*	SBU 1-19	4	1.5	NBR (sw), SI (tr)	--
23.022.028.*	SBU 1-22	8	1.5	NBR (sw), SI (tr)	--
23.025.137.*	SBU 1-25	9	1.5	NBR (sw), SI (tr), NR (gr)	--
23.033.039.*	SBU 1-33	12	1.5	NBR (sw), SI (tr), NR (gr)	--
23.043.096.*	SBU 1-43	12	1.5	NBR (sw), SI (tr), NR (gr)	--
23.053.033.*	SBU 1-53	11	1.5	NBR (sw), SI (tr), NR (gr)	--
23.075.151.*	SBU 1-75	20	1.5	NBR (sw), SI (tr)	--
22.088.158.*	SBU 1-88	23	1.5	NBR (sw), SI (tr)	G1/4-male
22.088.159.*	SBU 1-88	23	1.5	NBR (sw), SI (tr)	G1/4-female

Continued on the next page 

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



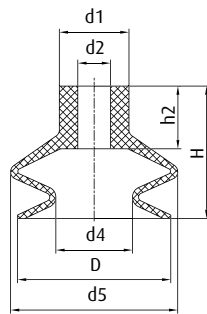
# Series | Bellows vacuum cups SB

Bellows vacuum cups, universal, 1.5 folds - SBU 1

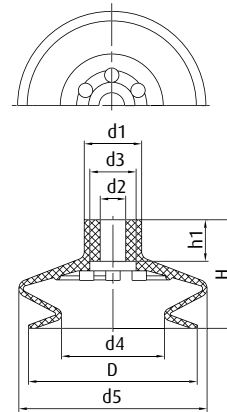
## Accessories

Item no.	Suitable fittings							
	M5-male	M5-female	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
23.005.181._*	270.195 (p.409)	--	--	--	--	--	--	--
23.011.008._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
23.013.120._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
23.016.016._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
23.019.119._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
23.022.028._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
23.025.137._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
23.033.039._*	--	--	270.315 (p.414)	--	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.043.096._*	--	--	270.315 (p.414)	--	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.053.033._*	--	--	270.315 (p.414)	--	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.075.151._*	--	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)
22.088.158._*	--	--	--	--	--	--	--	--
22.088.159._*	--	--	--	--	--	--	--	--

## Dimensions



Drawing A

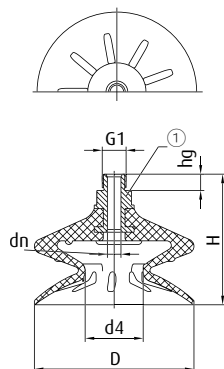


Drawing B

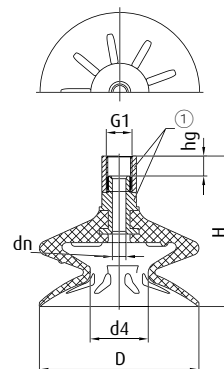
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Dimensions



Drawing C



Drawing D

① = Aluminium fitting, vulcanised

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	Ø dn [mm]	G1	H [mm]	h1 [mm]	h2 [mm]	hg [mm]
23.005.181.*	A	5	3	1.5	--	2	5	--	--	13	--	9.5	--
23.011.008.*	A	12	10	5	--	4.5	12	--	--	16	--	9	--
23.013.120.*	A	13.5	10	3.8	--	5	13.5	--	--	16	--	9	--
23.016.016.*	A	16	10	5	--	8	17	--	--	19	--	9	--
23.019.119.*	A	18.5	10	4.5	--	11	19.5	--	--	15	--	8.5	--
23.022.028.*	A	22	10	4.5	--	11	24	--	--	19	--	9	--
23.025.137.*	A	24	10	4	--	10	24	--	--	23	--	9	--
23.033.039.*	B	33.5	18	8	16.5	17	36	--	--	28	13	--	--
23.043.096.*	B	43	18	8	14.5	23	45	--	--	27	12	--	--
23.053.033.*	B	53	18	8	14.5	32	59	--	--	34	13	--	--
23.075.151.*	B	75	27	11	--	43	70.5	--	--	52	--	22	--
22.088.158.*	C	88	--	--	--	32	88	7.5	G1/4	72	--	--	9
22.088.159.*	D	88	--	--	--	32	88	7.5	G1/4	83	--	--	11

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

High temperature Thermalon® bellows cups, 1.5 folds - SKT-B1

## High temperature Thermalon® bellows cups, 1.5 folds - SKT-B1

UP TO 160 °C & MINIMUM MARKING




### Product Description

Bellows vacuum cups for uneven surfaces especially suited for removing hot plastic parts to be painted from an injection moulding machine. Thermalon® is a material mixture specially optimised for the plastics industry with a hardness of 60° Shore A. Connection via plug-in nipple.


### Advantage

- > Extremely low-marking
- > Free of silicone and other paint-wetting-impairment substances (PWIS)
- > Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Usage temperature [°C]
23.011.234.*	SKT-B1-11	5.5	1.5	Thermalon® (bl)	0 - 160
23.014.235.*	SKT-B1-14	5	1.5	Thermalon® (bl)	0 - 160
23.016.236.*	SKT-B1-16	8.5	1.5	Thermalon® (bl)	0 - 160
23.018.237.*	SKT-B1-18	5	1.5	Thermalon® (bl)	0 - 160
23.020.238.*	SKT-B1-20	5	1.5	Thermalon® (bl)	0 - 160
23.022.239.*	SKT-B1-22	8	1.5	Thermalon® (bl)	0 - 160
23.025.240.*	SKT-B1-25	12	1.5	Thermalon® (bl)	0 - 160
23.033.241.*	SKT-B1-33	11	1.5	Thermalon® (bl)	0 - 160
23.043.242.*	SKT-B1-43	12.5	1.5	Thermalon® (bl)	0 - 160
23.053.243.*	SKT-B1-53	15	1.5	Thermalon® (bl)	0 - 160
23.063.244.*	SKT-B1-63	15	1.5	Thermalon® (bl)	0 - 160

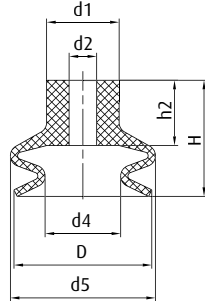
### Accessories

Item no.	 Suitable fittings						
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
23.011.234.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.014.235.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.016.236.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.018.237.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.020.238.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.022.239.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.025.240.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.033.241.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.043.242.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.053.243.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
23.063.244.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)

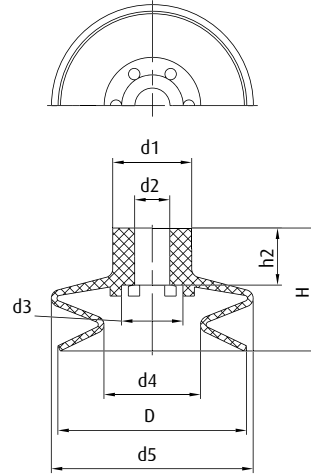
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	H [mm]	h2 [mm]
23.011.234.*	A	11	10	3.8	--	5	12	16	9
23.014.235.*	A	13	10	3.8	--	5	14	16	9
23.016.236.*	A	16	10	3.8	--	8	17.5	19	9
23.018.237.*	A	18	10	3.8	--	8	18	16.5	9
23.020.238.*	A	19	10	3.8	--	10.5	20	16	9
23.022.239.*	A	22	10	3.8	--	11	24	19	9
23.025.240.*	A	24	10	3.8	--	9.5	25	23	9
23.033.241.*	B	33	18	8	14	17	36	28	13
23.043.242.*	B	43	18	8	14	22	46	28	13
23.053.243.*	B	53	18	8	14	33	59	34	13
23.063.244.*	B	63	18	8	14	44	67	34	13

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

High temperature HNBR bellows cups, 1.5 folds - SKH-B1

## High temperature HNBR bellows cups, 1.5 folds - SKH-B1

UP TO 160 °C &  
MINIMUM MARKING



### Product Description

Bellows vacuum cups for uneven surfaces with suitability for removing hot plastic parts to be painted from an injection moulding machine. Connection via plug-in nipple.

### Advantage

- > Free of silicone and other paint-wetting-impairment substances (PWIS)
- > Minimum-marking
- > Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces

### Technical data

Item no.	Model / Lip dimensions	Number of folds	Number of folds	Material / Colour	Usage temperature [°C]
23.005.178._*	SKH-B1-5	2	1.5	HNBR (ge)	0 - 160
23.008.166._*	SKH-B1-8	3.5	1.5	HNBR (ge)	0 - 160
23.011.008._*	SKH-B1-11	4.5	1.5	HNBR (ge)	0 - 160
23.015.122._*	SKH-B1-15	5	1.5	HNBR (ge)	0 - 160
23.016.016._*	SKH-B1-16	6	1.5	HNBR (ge)	0 - 160
23.020.124._*	SKH-B1-20	8	1.5	HNBR (ge)	0 - 160
23.030.125._*	SKH-B1-30	9	1.5	HNBR (ge)	0 - 160
23.043.096._*	SKH-B1-43	12	1.5	HNBR (ge)	0 - 160

### Accessories

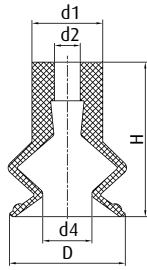
Item no.	Suitable fittings						
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
23.005.178._*	270.153 (p.409)	--	--	--	--	--	--
23.008.166._*	270.153 (p.409)	--	--	--	--	--	--
23.011.008._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
23.015.122._*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--
23.016.016._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
23.020.124._*	270.311 (p.411)	--	--	270.063 (p.419)	270.061 (p.422)	--	--
23.030.125._*	--	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)
23.043.096._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

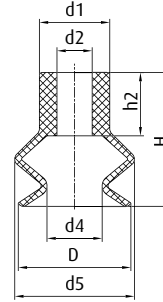




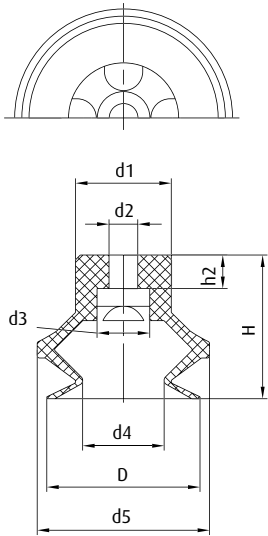
Dimensions



Drawing A



Drawing B



Drawing C

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	H [mm]	h2 [mm]
23.005.178.*	A	6	5	2	--	2.2	--	9	--
23.008.166.*	A	9	5.5	2	--	3.8	--	12	--
23.011.008.*	B	12	10	5	--	4.5	12	16	9
23.015.122.*	C	15	8.5	3.6	6	8	17	16	1.7
23.016.016.*	B	16	10	5	--	8	17	19	9
23.020.124.*	C	21.5	15	4.5	11	10	23.5	20	4.6
23.030.125.*	C	32	20	6	11	17	36	30	7
23.043.096.*	B	43	18	8	--	23	45	27	12

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760





## Bellows vacuum cups, universal, 2.5 folds - SBU 2




### Product Description

Universal bellows vacuum cups with 2.5 folds for handling sensitive or uneven products over large lift movements.  
Connection up to Ø 75 mm by means of plug-in nipple, from Ø 88 mm with vulcanised bracket.

### Advantage

- > Bellows compensate for differences in height and enable good adaptation to curved or uneven product surfaces
- > Soft attachment for sensitive products
- > Cost-effective replacement of worn seals

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Connection thread
21.004.083.*	SBU 2-4	3	2.5	SI (tr)	--
21.005.057.*	SBU 2-5	3	2.5	NBR (gr), SI (g), SI-AS (sw)	--
21.006.093.*	SBU 2-6A	3	2.5	NBR (sw), SI (tr)	--
21.006.087.*	SBU 2-6	3.5	2.5	NBR (sw), SI (tr)	--
21.008.094.*	SBU 2-8	4	2.5	NBR (sw), SI (tr)	--
21.009.002.*	SBU 2-9	2	2.5	NBR (sw), SI (tr), SI-AS (sw), NR (gr), PU (bl)	--
21.010.119.*	SBU 2-10	8	2.5	NBR (sw), SI (tr)	--
21.012.135.*	SBU 2-12	7	2.5	NBR (sw), SI (tr), NR (gr), PU (bl)	--
21.014.133.*	SBU 2-14A	11	2.5	NBR (sw), SI (tr), NR (gr)	--
21.014.007.*	SBU 2-14	12	2.5	NBR (sw), SI (tr), PU (bl)	--
21.018.010.*	SBU 2-18	8	2.5	NBR (sw), SI (tr), PU (bl)	--
21.020.016.*	SBU 2-20	9	2.5	NBR (sw), SI (tr)	--
21.025.060.*	SBU 2-25	19	2.5	NBR (sw), SI (tr)	--
21.032.075.*	SBU 2-32	13	2.5	NBR (sw), SI (tr), NR (gr), PU (bl)	--
21.043.049.*	SBU 2-43	19	2.5	NBR (sw), SI (tr), NR (gr)	--
21.062.055.*	SBU 2-62	25	2.5	NBR (sw), SI (tr)	--
20.088.123.*	SBU 2-88	36	2.5	NBR (sw), SI (tr)	G1/4-male
20.088.124.*	SBU 2-88	36	2.5	NBR (sw), SI (tr)	G1/4-female

Continued on the next page →

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



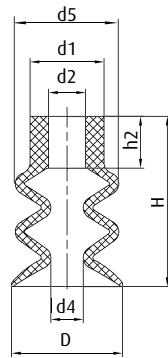
# Series | Bellows vacuum cups SB

Bellows vacuum cups, universal, 2.5 folds - SBU 2

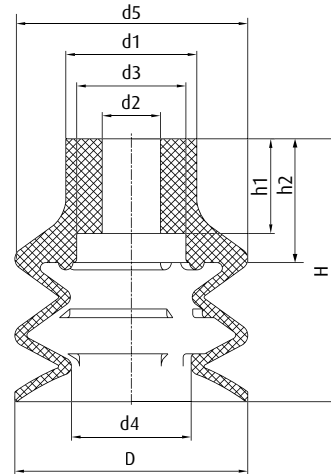
## Accessories

Item no.	Suitable fittings						
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.004.083._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.005.057._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.006.093._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.006.087._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.008.094._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.009.002._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.010.119._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.012.135._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.014.133._*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.014.007._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.018.010._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.020.016._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
21.025.060._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
21.032.075._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.043.049._*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.062.055._*	--	--	270.315 (p.414)	--	--	270.540 (p.429)	270.539 (p.434)
20.088.123._*	--	--	--	--	--	--	--
20.088.124._*	--	--	--	--	--	--	--

## Dimensions



Drawing A

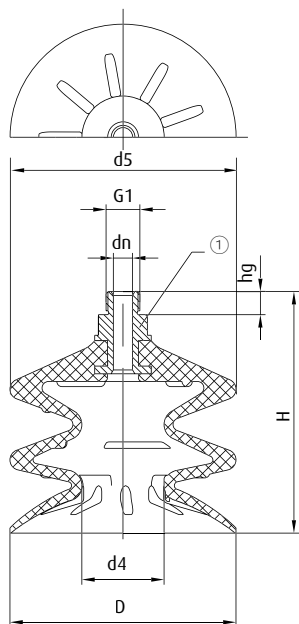


Drawing B

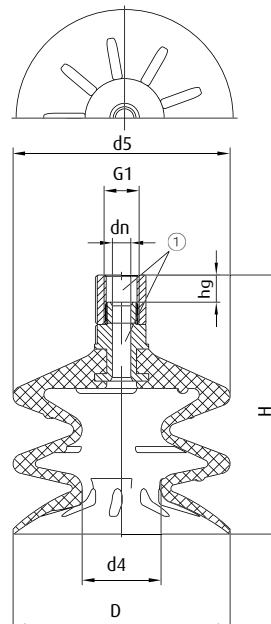
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Dimensions



Drawing C



Drawing D

① = Aluminium fitting, vulcanised

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	Ø dn [mm]	G1	H [mm]	h1 [mm]	h2 [mm]	hg [mm]
21.004.083._*	A	4.5	7	4	--	2	6.5	--	--	14	--	8	--
21.005.057._*	A	5.5	7	4	--	2.5	6.5	--	--	14	--	8.5	--
21.006.093._*	A	6	8	4	--	3	8	--	--	15	--	8	--
21.006.087._*	A	6.5	9	5	--	2.5	6.5	--	--	14.5	--	7.5	--
21.008.094._*	A	7.5	8	4	--	4	7.5	--	--	15	--	8.5	--
21.009.002._*	A	9	9	5	--	4	9	--	--	15	--	7	--
21.010.119._*	A	10	10	5	--	4.5	10	--	--	21	--	7	--
21.012.135._*	A	12	10	5	--	5	12	--	--	21	--	9	--
21.014.133._*	A	14	10	3.8	--	5.5	14	--	--	23	--	7.5	--
21.014.007._*	A	15	10	5	--	4.5	15	--	--	23	--	7	--
21.018.010._*	A	18	10	4.5	--	7	18	--	--	22	--	8.5	--
21.020.016._*	A	20	10	4.5	--	10	20	--	--	23	--	9	--
21.025.060._*	A	25	10	4.8	--	10	25	--	--	33	--	8	--
21.032.075._*	B	32	18	8	15	16.5	32	--	--	36	13	17	--
21.043.049._*	B	42	20	8	15	15.5	42	--	--	46	13	17	--
21.062.055._*	B	62	21	8.5	14.5	27.5	62	--	--	54	13	14.7	--
20.088.123._*	C	88	--	--	--	32	88	7.5	G1/4	94	--	--	9
20.088.124._*	D	88	--	--	--	32	88	7.5	G1/4	105	--	--	11

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

High temperature Thermalon® bellows cups, 2.5 folds - SKT-B2

## High temperature Thermalon® bellows cups, 2.5 folds - SKT-B2

UP TO 160 °C & MINIMUM MARKING



### Product Description

Bellows vacuum cups for uneven surfaces especially suited for removing hot plastic parts to be painted from an injection moulding machine. Thermalon® is a material mixture specially optimised for the plastics industry with a hardness of 60° Shore A. Connection via plug-in nipple.

### Advantage

- > Extremely low-marking
- > Free of silicone and other paint-wetting-impairment substances (PWIS)
- > Long vacuum cup lift and good adaptation to curved or uneven product surfaces

### Technical data

Item no.	Model / Lip dimensions	↓	Material / Colour	Number of folds	Usage temperature [°C]
21.005.146.*	SKT-B2-5	3	Thermalon® (bl)	2.5	0 - 160
21.007.147.*	SKT-B2-7	3	Thermalon® (bl)	2.5	0 - 160
21.009.148.*	SKT-B2-9	3	Thermalon® (bl)	2.5	0 - 160
21.012.149.*	SKT-B2-12	7	Thermalon® (bl)	2.5	0 - 160
21.014.150.*	SKT-B2-14	10	Thermalon® (bl)	2.5	0 - 160
21.018.151.*	SKT-B2-18	10	Thermalon® (bl)	2.5	0 - 160
21.020.152.*	SKT-B2-20	10	Thermalon® (bl)	2.5	0 - 160
21.025.153.*	SKT-B2-25	20	Thermalon® (bl)	2.5	0 - 160
21.032.154.*	SKT-B2-32	14.5	Thermalon® (bl)	2.5	0 - 160
21.042.155.*	SKT-B2-42	22	Thermalon® (bl)	2.5	0 - 160
21.052.156.*	SKT-B2-52	27	Thermalon® (bl)	2.5	0 - 160
21.062.157.*	SKT-B2-62	31	Thermalon® (bl)	2.5	0 - 160

### Accessories

Item no.	Suitable fittings						
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.005.146.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.007.147.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.009.148.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.012.149.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.014.150.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.018.151.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.020.152.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.025.153.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.032.154.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.042.155.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)

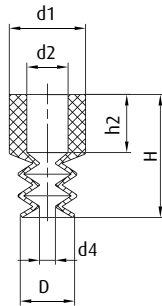
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



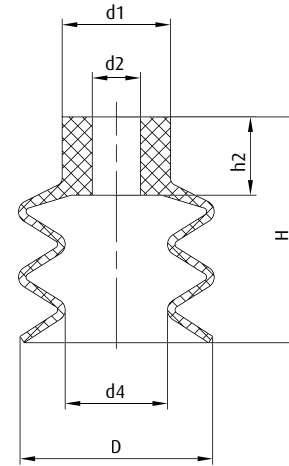
### Accessories

Item no.	Suitable fittings						
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.052.156.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.062.157.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)

### Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d4 [mm]	H [mm]	h2 [mm]
21.005.146.*	A	5.5	7	4	2.2	13.5	8
21.007.147.*	A	6	8.5	4.5	1.8	14	6.5
21.009.148.*	A	9.5	9	4.4	4	15	7.5
21.012.149.*	B	12	10	3.8	5	21	9
21.014.150.*	B	14	10	3.8	5	23	9
21.018.151.*	B	17.5	10	3.8	7.5	23	9
21.020.152.*	B	20	10	3.8	10	23	9
21.025.153.*	B	25	10	3.8	10	34	9
21.032.154.*	B	32	18	8	17	38	13
21.042.155.*	B	42	18	8	18.5	46	13
21.052.156.*	B	52	18	8	25	49	13
21.062.157.*	B	62	21	8	30	55	13

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

High temperature HNBR bellows cups, 2.5 folds - SKH-B2

## High temperature HNBR bellows cups, 2.5 folds - SKH-B2

UP TO 160 °C &  
MINIMUM MARKING




### Product Description

Bellows vacuum cups for uneven surfaces with suitability for removing hot plastic parts to be painted from an injection moulding machine. Connection via plug-in nipple.


### Advantage

- > Free of silicone and other paint-wetting-impairment substances (PWIS)
- > Minimum-marking
- > Long vacuum cup lift and good adaptation to curved or uneven product surfaces

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Usage temperature [°C]
21.005.057.*	SKH-B2-5	3	2.5	HNBR (ge)	0 - 160
21.007.089.*	SKH-B2-7	3	2.5	HNBR (ge)	0 - 160
21.009.002.*	SKH-B2-9	2	2.5	HNBR (ge)	0 - 160
21.012.135.*	SKH-B2-12	7	2.5	HNBR (ge)	0 - 160
21.014.053.*	SKH-B2-14	9	2.5	HNBR (ge)	0 - 160
21.018.010.*	SKH-B2-18	8	2.5	HNBR (ge)	0 - 160
21.020.016.*	SKH-B2-20	9	2.5	HNBR (ge)	0 - 160
21.032.075.*	SKH-B2-32	13	2.5	HNBR (ge)	0 - 160
21.043.049.*	SKH-B2-43	19	2.5	HNBR (ge)	0 - 160
21.060.051.*	SKH-B2-60	25	2.5	HNBR (ge)	0 - 160

### Accessories

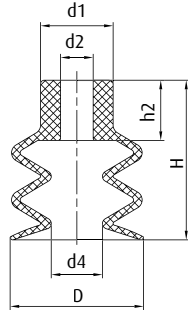
Item no.	 Suitable fittings						
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.005.057.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.007.089.*	270.010 (p.411)	270.005 (p.412)	--	270.009 (p.417)	270.007 (p.422)	--	--
21.009.002.*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.012.135.*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.014.053.*	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
21.018.010.*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
21.020.016.*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
21.032.075.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.043.049.*	--	--	270.315 (p.414)	270.196 (p.420)	270.114 (p.422)	270.190 (p.428)	270.192 (p.432)
21.060.051.*	--	--	270.315 (p.414)	--	--	270.540 (p.429)	270.539 (p.434)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

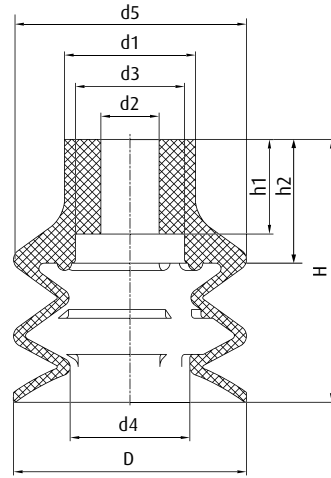




Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	H [mm]	h1 [mm]	h2 [mm]
21.005.057._*	A	5.5	7	4	--	2.5	--	14	--	8.5
21.007.089._*	B	7	7.5	4	5.5	3	7	10	2	3.5
21.009.002._*	A	9	9	5	--	4	--	15	--	7
21.012.135._*	A	12	10	5	--	5	--	21	--	9
21.014.053._*	A	14	8	4	--	5.5	--	18	--	5.5
21.018.010._*	A	18	10	4.5	--	7	--	22	--	8.5
21.020.016._*	A	20	10	4.5	--	10	--	23	--	9
21.032.075._*	B	32	18	8	15	16.5	32	36	13	17
21.043.049._*	B	42	20	8	15	15.5	42	46	13	17
21.060.051._*	B	61	22	8	14	28	61	57	14	18.5

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Bellows vacuum cups SB

Bellows vacuum cups, universal, 3.5 folds - SBU 3

### Bellows vacuum cups, universal, 3.5 folds - SBU 3



#### Product Description

Universal bellows vacuum cups with 3.5 folds for handling sensitive or uneven products over very large lift movements. Connection via plug-in nipple.


#### Advantage

- > Bellows compensate for differences in height and enable good adaptation to curved or uneven product surfaces
- > Soft attachment for sensitive products
- > Cost-effective replacement of worn seals

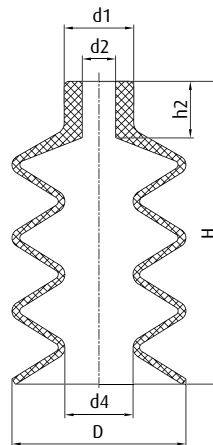
#### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
25.018.031._*	SBU 3-18	12	3.5	NBR (sw), SI (tr)
25.025.005._*	SBU 3-25	24	3.5	NBR (sw), SI (tr)

#### Accessories

Item no.	 Suitable fittings					
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male
25.018.031._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)
25.025.005._*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)

#### Dimensions



Item no.	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d4 [mm]	H [mm]	h2 [mm]
25.018.031._*	18	9.5	5	8	29	7
25.025.005._*	25	10	4.8	10	44	8

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760







## Vulkollan® bellows cups, universal, 1.5 to 2.5 folds - SBU-VU



Product Description	Advantage
Extremely robust universal bellows vacuum cups, material made from Vulkollan®	<ul style="list-style-type: none"> <li>&gt; Minimal abrasion</li> <li>&gt; Very long life cycle</li> <li>&gt; Very good resetting, enabling fast cycle times</li> <li>&gt; Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces</li> <li>&gt; Cost-effective replacement of worn seals</li> </ul>

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
	<b>Bellows vacuum cups, 1.5 folds - SBU1-VU</b>			
<b>23.020.169._*</b>	SBU1-VU-20	7	1.5	Vulkollan® (br)
<b>23.030.170._*</b>	SBU1-VU-30	8	1.5	Vulkollan® (br)
<b>23.050.171._*</b>	SBU1-VU-50	10	1.5	Vulkollan® (br)
	<b>Bellows vacuum cups, 2.5 folds - SBU2-VU</b>			
<b>21.009.106._*</b>	SBU2-VU-9	2	2.5	Vulkollan® (br)
<b>21.020.090._*</b>	SBU2-VU-20	8	2.5	Vulkollan® (br)
<b>21.032.091._*</b>	SBU2-VU-30	16	2.5	Vulkollan® (br)
<b>21.030.076._*</b>	SBU2-VU-31	14	2.5	Vulkollan® (br)
<b>21.051.097._*</b>	SBU2-VU-50	18	2.5	Vulkollan® (br)
<b>21.062.092._*</b>	SBU2-VU-60	25	2.5	Vulkollan® (br)

Continued on the next page 

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



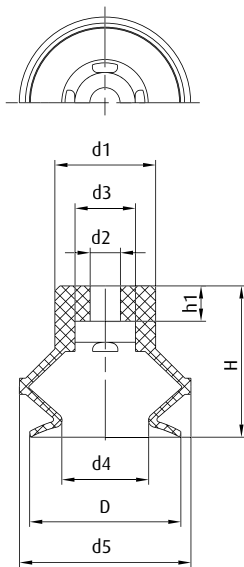
# Series | Bellows vacuum cups SB

Vulkollan® bellows cups, universal, 1.5 to 2.5 folds - SBU-VU

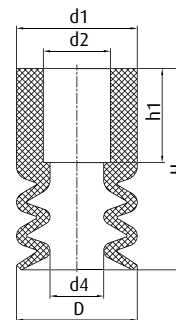
## Accessories

Item no.	Suitable fittings							
	M5-male	M5-female	M6-male	M8-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
<b>Bellows vacuum cups, 1.5 folds - SBU1-VU</b>								
23.020.169.*	--	--	270.312/19 (p.414)	--	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)
23.030.170.*	--	--	270.312/19 (p.414)	--	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)
23.050.171.*	--	--	270.314 (p.415)	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)
<b>Bellows vacuum cups, 2.5 folds - SBU2-VU</b>								
21.009.106.*	270.013 (p.410)	270.005 (p.412)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
21.020.090.*	270.024 (p.410)	--	270.104 (p.413)	--	270.033 (p.416)	270.478 (p.421)	--	--
21.032.091.*	--	--	270.315 (p.414)	--	270.132 (p.417)	270.114 (p.422)	270.190, 270.540 (p.428)	270.192, 270.539 (p.432)
21.030.076.*	--	--	--	270.255 (p.415)	270.486 (p.420)	270.485 (p.423)	270.487 (p.429)	270.488 (p.434)
21.051.097.*	--	--	--	--	270.132 (p.417)	270.114 (p.422)	270.204 (p.427)	270.324 (p.432)
21.062.092.*	--	--	270.315 (p.414)	--	--	--	270.540 (p.429)	270.539 (p.434)

## Dimensions



Drawing A

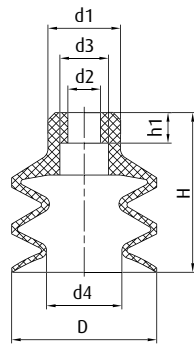


Drawing B

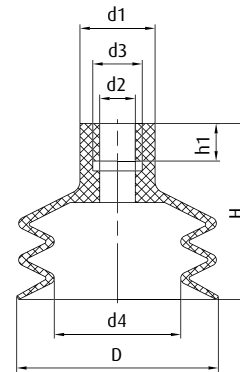
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



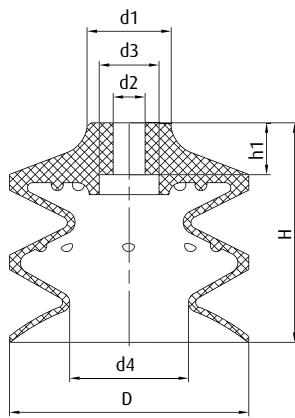
Dimensions



Drawing C



Drawing D



Drawing E

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	H [mm]	h1 [mm]
<b>Bellows vacuum cups, 1.5 folds - SBU1-VU</b>									
23.020.169._*	A	20	15	6	12	12.5	22	22	7
23.030.170._*	A	30	20	6	12	17	34	30	7
23.050.171._*	A	50	29	9	20	31	56	37	7
<b>Bellows vacuum cups, 2.5 folds - SBU2-VU</b>									
21.009.106._*	B	9	9	5	--	4	--	15	7
21.020.090._*	C	20	10	4.5	6.5	10.5	--	22	4.2
21.032.091._*	B	30	18	8	15	17	--	38	13
21.030.076._*	C	31	18.5	8	15	19.5	--	29	7
21.051.097._*	D	51	19	9	12.5	32	--	45	9.5
21.062.092._*	E	60	21	8	15	30	--	55	13

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
 Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Bellows vacuum cups with 1.5 and 4.5 folds, modular - SP-B

## Bellows vacuum cups with 1.5 and 4.5 folds, modular - SP-B





### Product Description


Bellows vacuum cups with a short or long lift.  
Version: Replacement sealing lip for attachment to fitting

### Advantage

- > High suction force
- > Fast cycle times possible
- > Very resistant to wear (Tepuflex®)
- > Compatible with established products from other vendors

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
 <b>Bellows vacuum cups, 1.5 folds</b>				
<b>23.005.178._*</b>	SP-B1-5	2	1.5	SI (r), SI-AS (sw), CR (sw)
<b>23.008.166._*</b>	SP-B1-8	3.5	1.5	SI (r), SI-AS (sw), CR (sw)
<b>23.011.007._*</b>	SP-B1-10	5	1.5	SI (tr), SI-AS (sw), CR (sw)
<b>23.016.015._*</b>	SP-B1-15	7	1.5	SI (tr), SI-AS (sw), CR (sw)
<b>23.020.026._*</b>	SP-B1-20	9	1.5	Tepuflex® (or), SI (tr), CR (sw)
<b>23.030.037._*</b>	SP-B1-30	9	1.5	Tepuflex® (or), SI (tr), CR (sw)
<b>23.040.045._*</b>	SP-B1-40	9	1.5	Tepuflex® (or), SI (tr), CR (sw)
<b>23.050.054._*</b>	SP-B1-50	12	1.5	Tepuflex® (or), SI (tr), CR (sw)
<b>23.078.065._*</b>	SP-B1-75	22	1.5	Tepuflex® (or), SI (tr), CR (sw)
<b>23.117.069._*</b>	SP-B1-110	29	1.5	Tepuflex® (or), SI (tr), CR (sw)
<b>23.160.072._*</b>	SP-B1-150	41	1.5	Tepuflex® (or), SI (tr), CR (sw)

 <b>Bellows vacuum cups, 4.5 folds</b>				
<b>25.020.025._*</b>	SP-B4-20	16	4.5	SI (tr), CR (sw)
<b>25.030.026._*</b>	SP-B4-30	21	4.5	SI (tr), CR (sw)
<b>25.040.027._*</b>	SP-B4-40	20	4.5	SI (tr), CR (sw)
<b>25.050.028._*</b>	SP-B4-50	25	4.5	SI (tr), CR (sw)

### Accessories

Filter disc	Retaining ring	Stiffening ring
--	--	--
--	--	--
--	--	--
--	--	--
78.200 (p.474)	78.011 (p.475)	--
78.201 (p.474)	78.011 (p.475)	--
78.202 (p.474)	78.012 (p.475)	--
78.203 (p.474)	78.013 (p.475)	--
--	--	--
--	--	--
--	--	--
--	--	--
--	78.011 (p.475)	78.000 (p.475)
--	78.012 (p.475)	78.001 (p.475)
--	78.012 (p.475)	78.002 (p.475)
--	78.013 (p.475)	78.003 (p.475)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Accessories

Item no.	Suitable fittings									
	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G3/8-male	G3/8-female	G1/2-female	G3/4-female
<b>Bellows vacuum cups, 1.5 folds</b>										
23.005.178._*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
23.008.166._*	270.153 (p.409)	--	--	--	--	--	--	--	--	--
23.011.007._*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
23.016.015._*	270.134 (p.409)	--	270.104 (p.413)	--	--	--	--	--	--	--
23.020.026._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
23.030.037._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
23.040.045._*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
23.050.054._*	--	--	--	--	270.252, 270.502-S (p.424)	270.504-S (p.429)	270.507-S (p.435)	--	--	--
23.078.065._*	--	--	--	--	270.527-S (p.424)	--	--	270.528-S (p.436)	270.529-S (p.436)	--
23.117.069._*	--	--	--	--	--	--	--	270.530-S (p.437)	270.531-S (p.437)	--
23.160.072._*	--	--	--	--	--	--	--	--	270.532-S (p.437)	270.533-S (p.437)
<b>Bellows vacuum cups, 4.5 folds</b>										
25.020.025._*	--	270.500-S (p.413)	--	270.250, 270.503-S (p.418)	--	--	--	--	--	--
25.030.026._*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
25.040.027._*	--	--	--	--	270.251, 270.501-S (p.423)	270.506-S (p.428)	270.505-S (p.434)	--	--	--
25.050.028._*	--	--	--	--	270.252, 270.502-S (p.424)	270.504-S (p.429)	270.507-S (p.435)	--	--	--

## Ordering notes:

Explanation of the ending of the accessory fitting:  
 > S with screen

Continued on the next page →

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
 Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Bellows vacuum cups with 1.5 and 4.5 folds, modular - SP-B

## Bellows vacuum cups - modular

### Example:



+



=



Assembly example



+



=

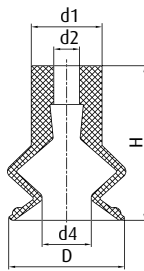


Assembly example

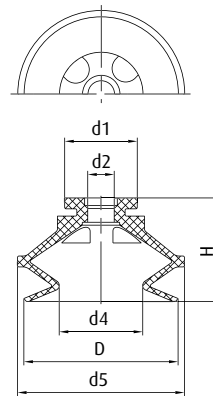
- \* Fittings are optionally available with and without filter screen
- \*\* Fittings come fitted with filter screen as standard

- > The modular series allows you to assemble your own vacuum cups
- > Worn sealing lips can be replaced quickly, cost-effective and easily
- > High flexibility thanks to a large selection of fitting threads

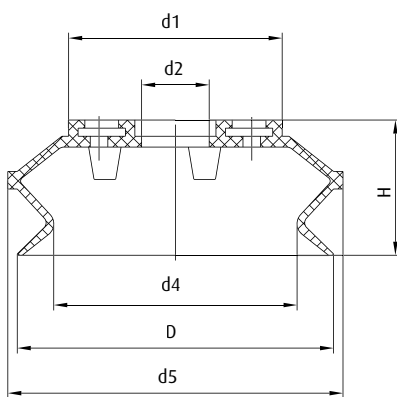
## Dimensions



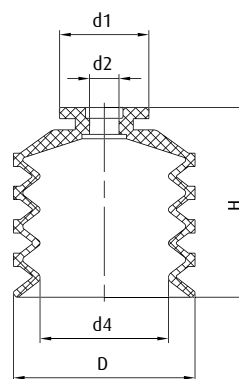
Drawing A



Drawing B



Drawing C



Drawing D

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760





Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d4 [mm]	Ø d5 [mm]	H [mm]
<b>Bellows vacuum cups, 1.5 folds</b>							
23.005.178._*	A	6	4.5	2	2.2	--	9
23.008.166._*	A	9	5.5	2	3.8	--	12
23.011.007._*	A	11	9	3.9	5.5	--	17
23.016.015._*	A	16	9	3.9	8	--	19
23.020.026._*	B	21	14.5	5.5	11	24	19.5
23.030.037._*	B	33	15	5.5	18.5	37	28
23.040.045._*	B	43	20	7.5	23	46	29
23.050.054._*	B	53	26	10.5	32	58	35
23.078.065._*	C	81	55	10	59	84	37
23.117.069._*	C	117	79	25	90	124	50
23.160.072._*	C	160	110	24	112	166	67
<b>Bellows vacuum cups, 4.5 folds</b>							
25.020.025._*	D	20	14.5	5	14	--	23
25.030.026._*	D	31	20	6.5	22	--	32
25.040.027._*	D	41	20	6.5	29	--	43
25.050.028._*	D	51	27	10.5	37	--	53

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760






## Series | Bellows vacuum cups SB

Bellows vacuum cups, 1.5 and 4.5 folds, with fully assembled fitting - SP-B

### Bellows vacuum cups, 1.5 and 4.5 folds, with fully assembled fitting - SP-B



Product Description	Advantage
Bellows vacuum cups with a short or long lift. Version: Complete with vacuum cup fitting and filter screen.	<ul style="list-style-type: none"> <li>&gt; High suction force</li> <li>&gt; Fast cycle times possible</li> <li>&gt; Very resistant to wear (Tepuflex®)</li> <li>&gt; Compatible with established products from other vendors</li> </ul>

Technical data						Accessories		
Item no.	Model / Lip dimensions	Connection thread	 Number of folds	Material / Colour	Spare cup	Filter disc	Stiffening ring	
								
<b>Complete vacuum cups, 1.5 folds with fitting &amp; filter screen</b>								
<b>22.020.020._*</b>	SP-B1-20	G1/8-male, M5-female	9	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.020.026._* (p.308)	78.200 (p.474)	--
<b>22.030.033._*</b>	SP-B1-30	G1/8-male, M5-female	9	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.030.037._* (p.321)	78.201 (p.474)	--
<b>22.040.045._*</b>	SP-B1-40	G1/8-female	9	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.040.045._* (p.332)	78.202 (p.474)	--
<b>22.050.056._*</b>	SP-B1-50	G1/8-female	12	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.050.054._* (p.338)	78.203 (p.474)	--
<b>22.078.163._*</b>	SP-B1-75	G1/8-female	22	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.078.065._* (p.349)	--	--
<b>22.078.166._*</b>	SP-B1-75	G3/8-female	22	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.078.065._* (p.349)	--	--
<b>22.078.169._*</b>	SP-B1-75	G1/2-female	22	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.078.065._* (p.349)	--	--
<b>22.117.164._*</b>	SP-B1-110	G3/8-female	29	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.117.069._* (p.355)	--	--
<b>22.117.167._*</b>	SP-B1-110	G1/2-female	29	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.117.069._* (p.355)	--	--
<b>22.160.165._*</b>	SP-B1-150	G1/2-female	41	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.160.072._* (p.358)	--	--
<b>22.160.168._*</b>	SP-B1-150	G3/4-female	41	1.5	Tepuflex® (or), SI (tr), CR (sw)	23.160.072._* (p.358)	--	--
								
<b>Complete vacuum cups, 4.5 folds with fitting &amp; filter screen</b>								
<b>24.020.033._*</b>	SP-B4-20	G1/8-male, M5-female	16	4.5	SI (tr), CR (sw)	25.020.025._* (p.308)	--	78.000 (p.475)
<b>24.030.039._*</b>	SP-B4-30	G1/8-female	21	4.5	SI (tr), CR (sw)	25.030.026._* (p.318)	--	78.001 (p.475)
<b>24.040.074._*</b>	SP-B4-40	G1/8-female	20	4.5	SI (tr), CR (sw)	25.040.027._* (p.330)	--	78.002 (p.475)
<b>24.050.087._*</b>	SP-B4-50	G1/8-female	30	4.5	SI (tr), CR (sw)	25.050.028._* (p.337)	--	78.003 (p.475)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



**Bellows vacuum cups with fully assembled fitting**

Example:

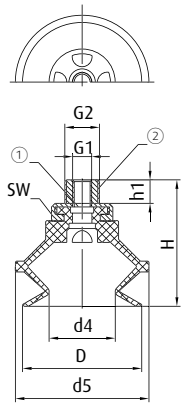


or

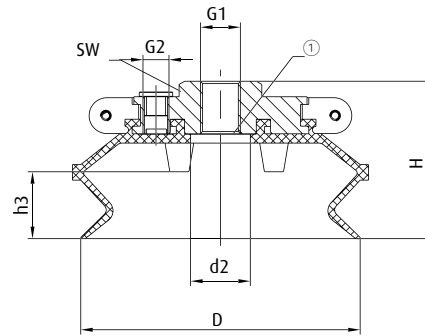


- > High process reliability thanks to permanently installed fitting
- > Worn sealing lips can be replaced if necessary

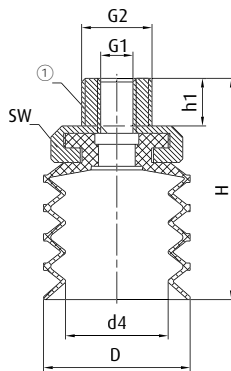
**Dimensions**



**Drawing A**



**Drawing B**



**Drawing C**

① = Filter screen ② = Aluminium

Continued on the next page →

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Bellows vacuum cups SB

Bellows vacuum cups, 1.5 and 4.5 folds, with fully assembled fitting - SP-B

Item no.	Drawing	∅ D [mm]	∅ d2 [mm]	∅ d4 [mm]	∅ d5 [mm]	G1	G2	H [mm]	h1 [mm]	h3 [mm]	SW
<b>Complete vacuum cups, 1.5 folds with fitting &amp; filter screen</b>											
22.020.020._*	A	21	--	11	24	M5	G1/8	27	6.5	--	17
22.030.033._*	A	33	--	18.5	37	M5	G1/8	35	6.5	--	17
22.040.045._*	A	43	--	23	46	G1/8	--	35	--	--	12
22.050.056._*	A	53	--	32	58	G1/8	--	42	--	--	12
22.078.163._*	B	81	10	--	--	G1/8	--	50	--	21.6	28
22.078.166._*	B	81	10	--	--	G3/8	--	50	--	21.6	28
22.078.169._*	B	81	10	--	--	G1/2	--	50	--	21.6	28
22.117.164._*	B	117	25	--	--	G3/8	G1/8	66	--	28	30
22.117.167._*	B	117	25	--	--	G1/2	G1/8	66	--	28	30
22.160.165._*	B	160	24	--	--	G1/2	G1/8	81.5	--	42	38
22.160.168._*	B	160	24	--	--	G3/4	G1/8	81.5	--	42	38
<b>Complete vacuum cups, 4.5 folds with fitting &amp; filter screen</b>											
24.020.033._*	C	20	--	14	--	M5	G1/8	30	6.5	--	17
24.030.039._*	C	31	--	22	--	G1/8	--	40	--	--	12
24.040.074._*	C	41	--	29	--	G1/8	--	51	--	--	12
24.050.087._*	C	51	--	37	--	G1/8	--	61	--	--	12

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



**NEW**



**COMPOSITE MATERIAL 60°/30°**

Varioflex® bellows cups, 1.5 folds - SP-BX1



### Product Description

Bellows vacuum cups with 1.5 folds made of an extremely wear-resistant polymer.  
Soft, flexible sealing lip in 30° Shore A (red).  
Stable body in 60° Shore A (black).  
Cleats stabilise the product.

### Advantage


- > Long life cycle reduces machine downtimes
- > Perfect sealing performance on rough or uneven surface
- > High stability and fast reset
- > Oil and Ozone resistant
- > Extremely low-marking
- > Bellows compensate for height differences
- > Cleats allow for fast acceleration

### Notes:

Explanation of the type description:

- > SP-BX1 = series name of the bellows vacuum cup with 1.5 folds
- > -xx = nominal diameter
- > Example: SP-BX1-15 = bellows vacuum cup with 1.5 folds and a nominal diameter of 15 mm

### Technical data

Model / Lip dimensions	Ø [mm]	Connection thread 1	Item no.	Connection thread 2	Item no.	Connection thread 3	Item no.	Usage temperature [°C]	Accessories	
									<b>Spare cup</b>	
<b>Bellows vacuum cups 1.5 folds - SP-BX1 fully assembled with fitting</b>										
SP-BX1-15	16	M5-male	22.016.253.16	M6-male	22.016.254.16	--	--	4.5	10 - 50	23.016.263.16
SP-BX1-20	21	G1/8-male	22.021.255.16	--	--	--	--	5	10 - 50	23.021.264.16
SP-BX1-25	26	G1/8-male	22.026.256.16	--	--	--	--	5	10 - 50	23.026.265.16
SP-BX1-35	37	G1/8-female	22.037.257.16	G1/4-male	22.037.258.16	--	--	9	10 - 50	23.037.266.16
SP-BX1-50	53	G1/8-female	22.053.259.16	G1/4-male	22.053.260.16	G3/8-male	22.053.261.16	10	10 - 50	23.053.267.16
SP-BX1-75	75	G3/8-male	22.075.262.16	G3/8-female	22.075.263.16	--	--	18	10 - 50	--

Continued on the next page →

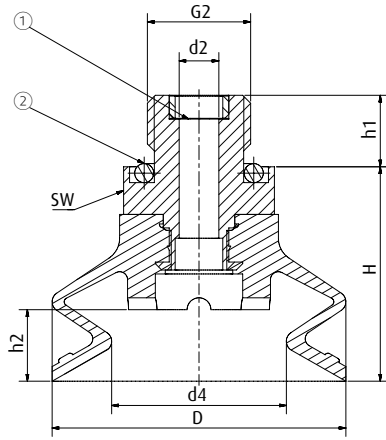
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



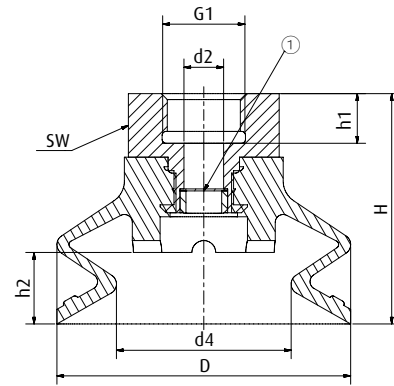
# Series | Bellows vacuum cups SB

Varioflex® bellows cups, 1.5 folds - SP-BX1

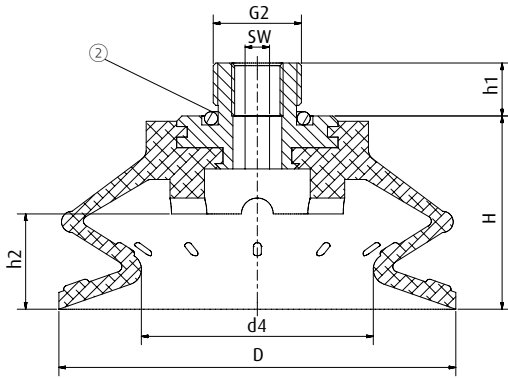
## Dimensions



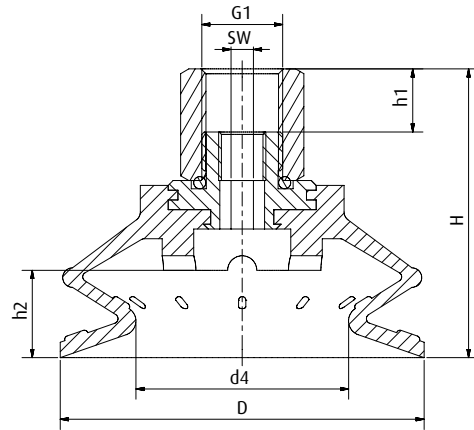
Drawing A



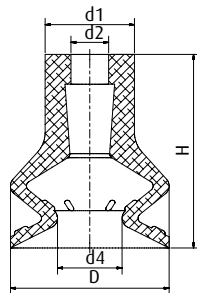
Drawing B



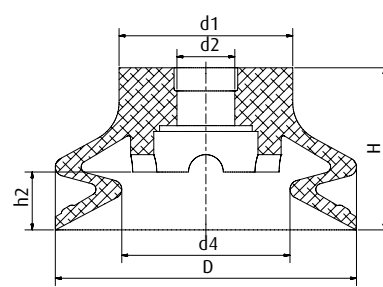
Drawing C



Drawing D



Drawing E



Drawing F

① = Filter screen ② = O-ring

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Item no.	Drawing	∅ D [mm]	∅ d1 [mm]	∅ d2 [mm]	∅ d4 [mm]	G1 (female)	G2 (male)	H	h1 [mm]	h2 [mm]	SW
<b>Bellows vacuum cups 1.5 folds - SP-BX1 fully assembled with fitting</b>											
22.016.253.*	A	16	--	2.5	6.5	--	M5	25	3.6	--	8
22.016.254.*	A	16	--	2.5	6.5	--	M6	24	6	--	13
22.021.255.*	A	21	--	4	12	--	G1/8	19	7	5	13
22.026.256.*	A	26	--	4	14.5	--	G1/8	19	7	5	13
22.037.257.*	B	37	--	5	22	G1/8	--	29	6.3	9	19
22.037.258.*	A	37	--	5	22	--	G1/4	27	9	9	19
22.053.259.*	B	53	--	8	32.5	G1/8	--	35	9	10	22
22.053.260.*	A	53	--	6	32.5	--	G1/4	32	9	10	22
22.053.261.*	A	53	--	6	32.5	--	G3/8	32	10	10	22
22.075.262.*	C	75	--	--	44	--	G3/8	36.5	10	18	8
22.075.263.*	D	75	--	--	44	G3/8	--	55	13	18	8
<b>Spare cups</b>											
23.016.263.*	E	16	9	4	6.5	--	--	19.5	--	--	--
23.021.264.*	F	21	11	5	12	--	--	14	--	5	--
23.026.265.*	F	26	15	5	14.5	--	--	14	--	5	--
23.037.266.*	F	37	20	7	22	--	--	21	--	9	--
23.053.267.*	F	53	26	10.5	32.5	--	--	26	--	10	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Varioflex® bellows cups, 2.5 folds - SP-BX2

## Varioflex® bellows cups, 2.5 folds - SP-BX2

**NEW**



COMPOSITE MATERIAL 60°/30°



### Product Description

Bellows vacuum cups with 2.5 folds made of an extremely wear-resistant polymer.  
Soft, flexible sealing lip in 30° Shore A (red).  
Stable body in 60° Shore A (black).

### Advantage

- > Long life cycle reduces machine downtimes
- > Perfect sealing performance on rough or uneven surface
- > High stability and fast reset
- > Oil and Ozone resistant
- > Extremely low-marking
- > Excellent height and angle compensation
- > Optional: Filter disc from Ø 26 mm installed between the bellows

### Notes:

Explanation of the type description:

- > SP-BX2 = series name of the bellows vacuum cup with 2.5 folds
- > -xx = nominal diameter
- > Example: SP-BX2-15 = bellows vacuum cup with 2.5 folds and a nominal diameter of 15 mm

### Technical data

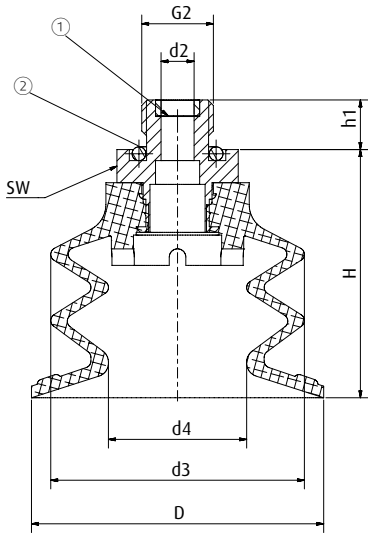
Model / Lip dimensions	Ø [mm]	Connection thread 1	Item no.	Connection thread 2	Item no.	Connection thread 3	Item no.	Usage temp. [°C]	Accessories	
<b>Bellows vacuum cups 2.5 folds - SP-BX2 fully assembled with fitting</b>									<b>Spare cup</b>	
SP-BX2-15	16	M5-male	20.016.145.16	M6-male	20.016.146.16	--	--	5,5	10 - 50	21.016.175.16
SP-BX2-20	21	G1/8-male	20.021.147.16	--	--	--	--	6,5	10 - 50	21.021.176.16
SP-BX2-25	26	G1/8-male	20.026.148.16	--	--	--	--	8	10 - 50	21.026.177.16
SP-BX2-35	37	G1/8-female	20.037.149.16	G1/4-male	20.037.150.16	--	--	14	10 - 50	21.037.177.16
SP-BX2-50	53	G1/8-female	20.053.151.16	G1/4-male	20.053.152.16	G3/8-male	20.053.153.16	19	10 - 50	21.053.178.16
SP-BX2-75	77	G3/8-male	20.077.154.16	G3/8-female	20.077.155.16	--	--	25	10 - 50	--
<b>Bellows vacuum cups 2.5 folds - SP-BX2 fully assembled with fitting and filter</b>										
SP-BX2-25	26	G1/8-male	20.026.148.16-FI	--	--	--	--	8	10 - 50	21.026.177.16-FI
SP-BX2-35	37	G1/8-female	20.037.149.16-FI	G1/4-male	20.037.150.16-FI	--	--	14	10 - 50	21.037.177.16-FI
SP-BX2-50	53	G1/8-female	20.053.151.16-FI	G1/4-male	20.053.152.16-FI	G3/8-male	20.053.153.16-FI	19	10 - 50	21.053.178.16-FI
SP-BX2-75	77	G3/8-male	20.077.154.16-FI	G3/8-female	20.077.155.16-FI	--	--	25	10 - 50	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

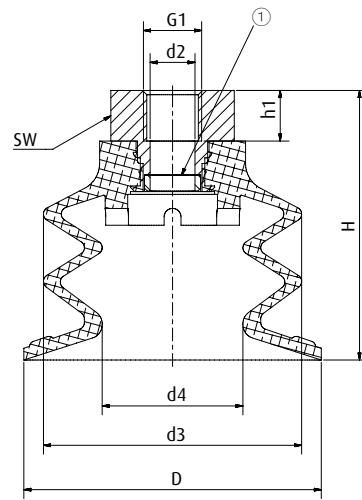




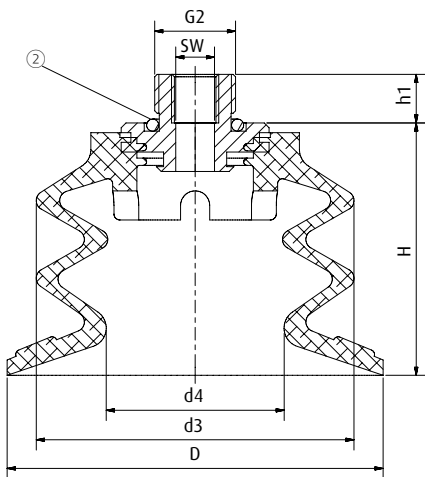
Dimensions



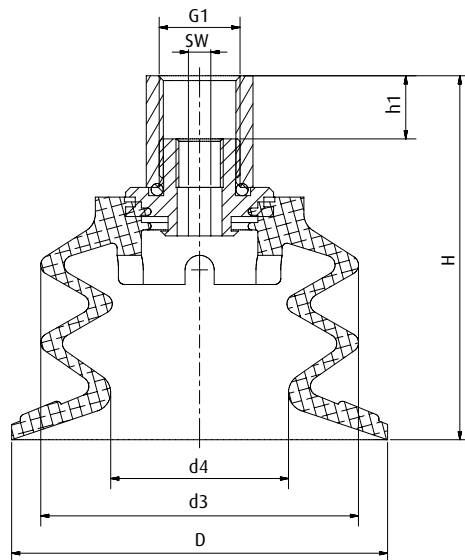
Drawing A



Drawing B



Drawing C



Drawing D

① = Filter screen ② = O-ring

Continued on the next page →

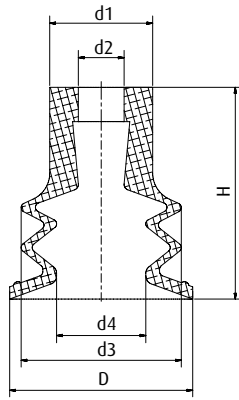
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



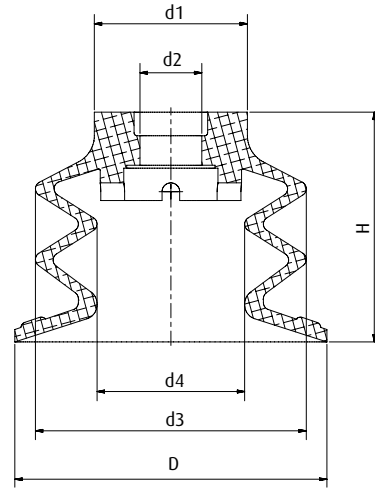
# Series | Bellows vacuum cups SB

Varioflex® bellows cups, 2.5 folds - SP-BX2

## Dimensions



Drawing E



Drawing F

① = Filter screen ② = O-ring

Item no.	Drawing	∅ D [mm]	∅ d1 [mm]	∅ d2 [mm]	∅ d3 [mm]	∅ d4 [mm]	G1 (female)	G2 (male)	H	h1 [mm]	SW
<b>Bellows vacuum cups 2.5 folds - SP-BX2 fully assembled with fitting</b>											
20.016.145.*	A	16	--	2.8	14	9	--	M5	24	4	8
20.016.146.*	A	16	--	2.5	14	9	--	M6	23	6	13
20.021.147.*	A	21	--	4	20	12	--	G1/8	20.2	7	13
20.026.148.*	A	26	--	4	23	12	--	G1/8	24	7	13
20.037.149.*	B	37	--	5	31	18	G1/8	--	34.8	6.3	19
20.037.150.*	A	37	--	5	31	18	--	G1/4	32.8	9	19
20.053.151.*	B	53	--	8	46	25	G1/8	--	48	9	22
20.053.152.*	A	53	--	6	46	25	--	G1/4	45	9	22
20.053.153.*	A	53	--	6	46	25	--	G3/8	45	10	22
20.077.154.*	C	77.5	--	--	65.5	37	--	G3/8	52	10	8
20.077.155.*	D	77.5	--	--	65.5	37	G3/8	--	75	13	8
<b>Spare cups</b>											
21.016.175.*	E	16	9	4	14	9	--	--	18.5	--	--
21.021.176.*	F	21	11	5	20	12	--	--	15.2	--	--
21.026.177.*	F	26	15	5	23	12	--	--	19	--	--
21.037.177.*	F	37	20	7	31	18	--	--	27	--	--
21.053.178.*	F	53	26	10.5	46	25	--	--	39	--	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



### Vinyl bellows cups, 1.5 folds - SBV 1




#### Product Description

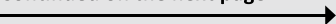
Durable bellows vacuum cups with 1.5 folds from snug-fitting, wear-resistant material. Very well suited for handling abrasive products such as cardboard. Flexible material enables low-leakage gripping of highly flexible products such as foil-packaged goods. Connection via plug-in nipple.

#### Advantage

- > Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces
- > Flexible, soft lips
- > Long life cycle
- > Cost-effective replacement of worn seals

#### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
23.005.095._*	SBV 1-5	2	1.5	Vinyl (bl)
23.007.112._*	SBV 1-7	2	1.5	Vinyl (bl)
23.013.097._*	SBV 1-13	5	1.5	Vinyl (bl)
23.015.098._*	SBV 1-15	5	1.5	Vinyl (bl)
23.019.109._*	SBV 1-19	8	1.5	Vinyl (bl)
23.020.114._*	SBV 1-20	6	1.5	Vinyl (bl)
23.022.028._*	SBV 1-22	8	1.5	Vinyl (bl)
23.028.113._*	SBV 1-28	9	1.5	Vinyl (bl)
23.030.107._*	SBV 1-30	10.5	1.5	Vinyl (bl)
23.031.192._*	SBV 1-31	6	1.5	Vinyl (bl)
23.035.111._*	SBV 1-35	12	1.5	Vinyl (bl)
23.052.116._*	SBV 1-52	6	1.5	Vinyl (bl)
23.070.060._*	SBV 1-70	20	1.5	Vinyl (bl)

Continued on the next page 

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



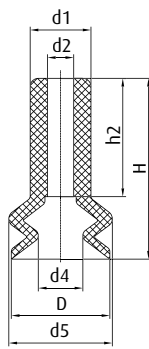
# Series | Bellows vacuum cups SB

Vinyl bellows cups, 1.5 folds - SBV 1

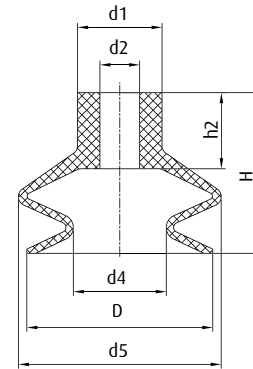
## Accessories

Item no.	Suitable fittings					
	M5-male	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
23.005.095._*	270.195 (p.409)	--	--	--	--	--
23.007.112._*	270.001 (p.409)	--	--	--	--	--
23.013.097._*	270.013 (p.410)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	--	--
23.015.098._*	270.134 (p.409)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.019.109._*	--	--	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)
23.020.114._*	270.134 (p.409)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.022.028._*	270.013 (p.410)	270.103 (p.413)	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
23.028.113._*	270.134 (p.409)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
23.030.107._*	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)
23.031.192._*	--	270.312/19 (p.414)	270.030 (p.419)	270.019 (p.423)	270.274 (p.427)	270.275 (p.432)
23.035.111._*	270.443 (p.410)	--	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
23.052.116._*	--	--	270.132 (p.417)	--	270.208 (p.425)	270.452 (p.431)
23.070.060._*	--	--	--	--	270.184 (p.431)	--

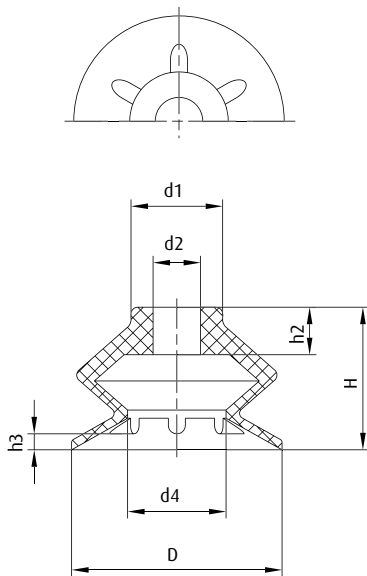
## Dimensions



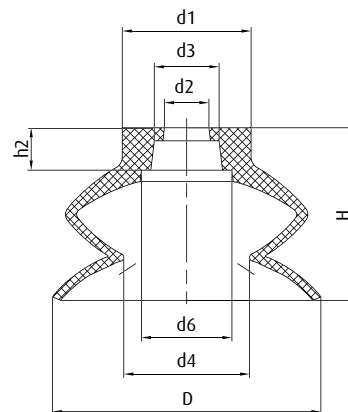
Drawing A



Drawing B



Drawing C



Drawing D

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	Ø d6 [mm]	H [mm]	h2 [mm]	h3 [mm]
23.005.095.*	A	4.5	3	1.5	--	2.5	4	--	12.5	10	--
23.007.112.*	A	6	3.7	1.6	--	2.5	6.5	--	11	7	--
23.013.097.*	B	13	7.5	3.5	--	7.5	12.5	--	14.5	6.5	--
23.015.098.*	B	15.5	9	3.4	--	8.5	17	--	20.5	11.5	--
23.019.109.*	B	19	13	7	--	12	19	--	18	7.5	--
23.020.114.*	B	20	9.5	3.5	--	11	19	--	20	9.5	--
23.022.028.*	A	22	10	4.5	--	11	24	--	19	9	--
23.028.113.*	B	28	12.5	3.5	--	13	26	--	21	9	--
23.030.107.*	B	30	13	7	--	15	29.5	--	22	7	--
23.031.192.*	C	31	13.5	7	--	14.5	--	--	21	7	2.4
23.035.111.*	B	35	17	6	--	20	33	--	30	16	--
23.052.116.*	B	51	18.5	9.5	--	30	50	--	41	21	--
23.070.060.*	D	70	34	11.5	17	33	--	24	45	11	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Vinyl bellows cups, 2.5 folds - SBV 2

## Vinyl bellows cups, 2.5 folds - SBV 2




### Product Description

Durable bellows vacuum cups with a long lift, made of snug-fitting, wear-resistant material. Very well suited for handling abrasive products such as cardboard. Flexible material enables low-leakage gripping of highly flexible products such as foil-packaged goods. Connection via plug-in nipple.


### Advantage

- > Long vacuum cup lift and good adaptation to curved or uneven product surfaces
- > Flexible, soft lips
- > Long life cycle
- > Cost-effective replacement of worn seals

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
21.004.142._*	SBV 2-4	1.3	2.5	Vinyl (bl)
21.006.001._*	SBV 2-6	3.5	2.5	Vinyl (bl)
21.010.070._*	SBV 2-10	5	2.5	Vinyl (bl)
21.018.068._*	SBV 2-18	11	2.5	Vinyl (bl)
21.023.066._*	SBV 2-23	9	2.5	Vinyl (bl)
21.029.069._*	SBV 2-29	10	2.5	Vinyl (bl)
21.032.082._*	SBV 2-32	14	2.5	Vinyl (bl)
21.040.027._*	SBV 2-40	16	2.5	Vinyl (bl)
21.050.084._*	SBV 2-50	20	2.5	Vinyl (bl)

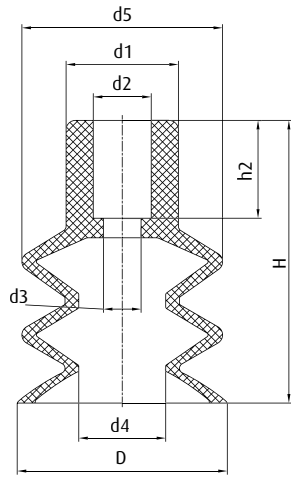
### Accessories

Item no.	 Suitable fittings						
	M5-male	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.004.142._*	270.195 (p.409)	--	--	--	--	--	--
21.006.001._*	270.013 (p.410)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
21.010.070._*	270.013 (p.410)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	--	--
21.018.068._*	270.013 (p.410)	270.103 (p.413)	--	270.003 (p.416)	270.015 (p.421)	270.194 (p.425)	--
21.023.066._*	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)
21.029.069._*	--	--	--	270.132 (p.417)	270.114 (p.422)	270.043 (p.425)	270.178 (p.431)
21.032.082._*	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)
21.040.027._*	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)
21.050.084._*	--	--	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)

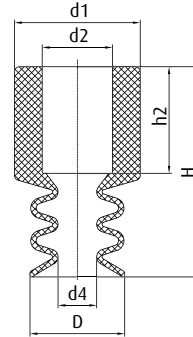
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø d5 [mm]	H [mm]	h2 [mm]
21.004.142._*	A	3.5	3	1.5	1.5	2	4.5	12.5	9
21.006.001._*	B	6.5	8.5	5	--	2.5	--	14	7
21.010.070._*	B	10	10	5	--	5	--	15.5	7.5
21.018.068._*	A	19	10	5	5	9	19	24	9
21.023.066._*	A	23	17	11	11	13.5	23	26	12
21.029.069._*	A	29	15.5	8	5	12	28	39	13.5
21.032.082._*	A	32	17	11	11	19.5	32	35	14
21.040.027._*	A	40	20	10.5	8	18.5	40	53	13.5
21.050.084._*	A	50	19.5	10.5	6.5	30	50	49	13.5

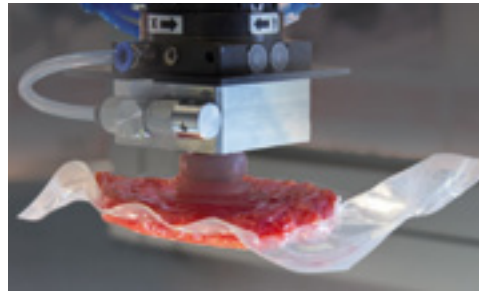
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760







### Bellows vacuum cups, 1.5 folds - SBF-A





#### Product Description

Bellows vacuum cup with soft, very flexible single sealing lip for handling highly sensitive products with high leveling adjustment. Connection with fixed screwed nipple or attachment frame (Ø 80 mm). Compatible "snap-in" spring levelers available.

#### Advantage


- > Large holding force
- > Fine, flexible sealing lip fits in perfectly with irregularities of the product
- > Cleats for the sealing lip prevent retraction of flexible products (e.g. films)
- > Cost-effective replacement of worn seals
- > High process reliability due to fixed, non-rotating seat of the screw nipple

#### Technical data



Item no.	Model / Lip dimensions		Number of folds	Material / Colour
	<b>Rubber sealing lip for attachment to fitting</b>			
<b>23.010.139._*</b>	SBF-A -10	4	1.5	NBR (sw), SI (tr)
<b>23.020.140._*</b>	SBF-A -20	6	1.5	NBR (sw), SI (tr)
<b>23.030.141._*</b>	SBF-A -30	8	1.5	NBR (sw), SI (tr)
<b>23.040.142._*</b>	SBF-A -40	9.5	1.5	NBR (sw), SI (tr)
<b>23.050.143._*</b>	SBF-A -50	11	1.5	NBR (sw), SI (tr)
<b>23.080.144._*</b>	SBF-A -80	10	1.5	NBR (sw), SI (tr)

#### Accessories

##### Spare cup

	<b>Full vacuum cups with receptacle</b>				
<b>22.080.161._*</b>	SBF-A -80	10	1.5	NBR (sw), SI (tr)	23.080.144._* (p.348)

#### Accessories

Item no.	 Suitable fittings								 Suitable spring levelers (Snap-In)							
	M4-male	M5-male	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler	Spring leveler	Spring leveler	Spring leveler	Spring leveler	Spring leveler		
<b>Rubber sealing lip for attachment to fitting</b>																
<b>23.010.139._*</b>	270.458 (p.408)	270.134 (p.409)	270.104 (p.413)	--	--	--	--	--	50.103 (p.454)	6	50.125 (p.454)	10	50.126 (p.454)	15	50.127 (p.454)	20
<b>23.020.140._*</b>	--	270.311 (p.411)	270.459 (p.414)	--	270.480 (p.420)	270.479 (p.423)	--	--	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50

Continued on the next page →

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



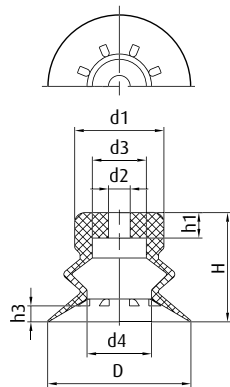
# Series | Bellows vacuum cups SB

Bellows vacuum cups, 1.5 folds - SBF-A

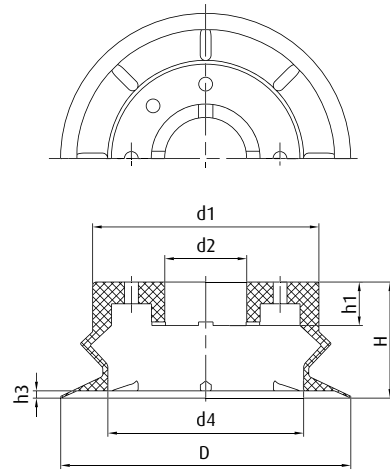
## Accessories

Item no.	Suitable fittings								Suitable spring levelers (Snap-In)							
	M4-male	M5-male	M6-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler	Spring leveler	Spring leveler	Spring leveler	Spring leveler	Spring leveler	Spring leveler	
23.030.141.*	--	--	270.460 (p.414)	--	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)	50.095 (p.456)	20	50.096 (p.456)	30	50.097 (p.456)	40	50.098 (p.456)	50
23.040.142.*	--	--	270.498 (p.414)	--	270.486 (p.420)	270.485 (p.423)	270.487 (p.429)	270.488 (p.434)	50.170 (p.456)	20	50.171 (p.456)	30	50.172 (p.456)	40	50.173 (p.456)	50
23.050.143.*	--	--	270.499 (p.414)	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)	50.174 (p.456)	20	50.175 (p.456)	30	50.176 (p.456)	40	50.177 (p.456)	50
23.080.144.*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>Full vacuum cups with receptacle</b>																
22.080.161.*	--	--	--	270.462 (p.416)	--	--	270.514 (p.429)	270.513 (p.434)	--	--	--	--	--	--	--	--

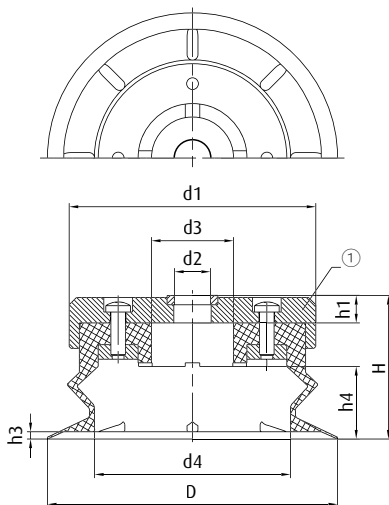
## Dimensions



Drawing A



Drawing B



Drawing C

① = Aluminium

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Item no.	Drawing	∅ D [mm]	∅ d1 [mm]	∅ d2 [mm]	∅ d3 [mm]	∅ d4 [mm]	H [mm]	h1 [mm]	h3 [mm]	h4 [mm]
<b>Rubber sealing lip for attachment to fitting</b>										
23.010.139._*	A	10	10	4	6	5	15.5	3	1	--
23.020.140._*	A	20	15	6	10	11	19	4	2	--
23.030.141._*	A	30	17	6	12	14	23	5	2.8	--
23.040.142._*	A	40	25	6	15	18	30	7	4.4	--
23.050.143._*	A	50	30	6	21	21	32	7	4	--
23.080.144._*	B	80	62	23	--	54	32	12	2	--
<b>Full vacuum cups with receptacle</b>										
22.080.161._*	C	80	68	10	23	54	40	7.5	2	20

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Bellows vacuum cups, 1.5 folds - SBF-B

## Bellows vacuum cups, 1.5 folds - SBF-B




### Product Description

Bellows vacuum cup, 1.5 folds with soft sealing lip and a soft bellows for handling curved or uneven product surfaces. Connection via plug-in nipple. Compatible "snap-in" spring levelers available.





### Advantage

- > Bellows compensate height differences
- > Good adaptation to curved or uneven product surfaces
- > Cost-effective replacement of worn seals

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
23.006.145.*	SBF-B-6	5	1.5	NBR (sw), SI (tr)
23.008.146.*	SBF-B-8	5	1.5	NBR (sw), SI (tr)
23.010.147.*	SBF-B-10	5	1.5	NBR (sw), SI (tr)
23.015.148.*	SBF-B-15	7	1.5	NBR (sw), SI (tr)
23.020.149.*	SBF-B-20	6	1.5	NBR (sw), SI (tr)

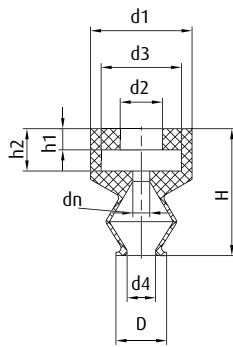
### Accessories

Item no.	 Suitable fittings					 Suitable spring levelers (Snap-In)						
	M5-male	M6-male	G1/8-male	G1/8-female	G1/4-male	Spring leveler		Hose outside Ø	Spring leveler		Hose outside Ø	
23.006.145.*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6	
23.008.146.*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6	
23.010.147.*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6	
23.015.148.*	270.200 (p.411)	--	270.064 (p.418)	270.065 (p.422)	--	50.018 (p.454)	8.5	4	50.019 (p.454)	8.5	6	
23.020.149.*	270.317 (p.410)	270.103 (p.413)	270.205 (p.416)	270.109 (p.421)	270.194 (p.425)	--	--	--	50.020 (p.454)	8.5	6	

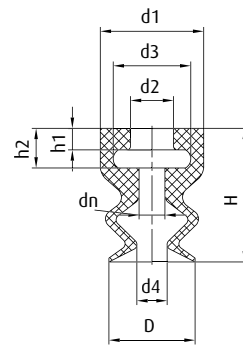
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



### Dimensions



Drawing A



Drawing B

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	Ø dn [mm]	H [mm]	h1 [mm]	h2 [mm]
23.006.145._*	A	6	12	5	9.5	3.4	2	15	2.5	5
23.008.146._*	B	8	12	5	9	4	2	14.5	2.5	4.5
23.010.147._*	B	10	12	5	9	3.5	3	15.5	2.5	4.5
23.015.148._*	B	15	12	5	9	5.5	3	17	2.5	4.5
23.020.149._*	B	20	12	4.5	6	6	6	20	5	9.5

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Bellows vacuum cups, 4.5 folds - SBF-C

## Bellows vacuum cups, 4.5 folds - SBF-C




### Product Description

Bellows vacuum cup, 4.5 folds, with a very thin, flexible sealing lip and a large lift. Fine, flexible sealing lip fits in perfectly with irregularities of the product (e.g. groceries packaged in bags).  
Connection via screw nipples (hollow bolt + adapter)


### Advantage

- > Optimal height and angle compensation
- > Very good fit to irregular products
- > Gentle handling of sensitive products
- > A very safe seat, bolted down with a bracket from the bottom
- > Cost-effective replacement of worn seals

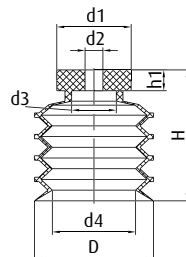
### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
25.010.044.*	SBF-C-10	4	4.5	NBR (sw), SI (tr)
25.020.045.*	SBF-C-20	10	4.5	NBR (sw), SI (tr)
25.030.046.*	SBF-C-30	14	4.5	NBR (sw), SI (tr)
25.040.047.*	SBF-C-40	19	4.5	NBR (sw), SI (tr)
25.050.048.*	SBF-C-50	26	4.5	NBR (sw), SI (tr)

### Accessories

Item no.	 Suitable fittings					
	M4-male	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
25.010.044.*	270.458 (p.408)	--	270.009 (p.417)	270.007 (p.422)	--	--
25.020.045.*	--	270.459 (p.414)	270.480 (p.420)	270.479 (p.423)	--	--
25.030.046.*	--	270.460 (p.414)	270.482 (p.420)	270.481 (p.423)	270.483 (p.429)	270.484 (p.433)
25.040.047.*	--	--	270.486 (p.420)	270.485 (p.423)	270.487 (p.429)	270.488 (p.434)
25.050.048.*	--	--	270.490 (p.420)	270.489 (p.423)	270.491 (p.429)	270.492 (p.434)

### Dimensions



Item no.	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]
25.010.044.*	10	10	4	--	6	14.5	3
25.020.045.*	20	15	6	10	14	25	4
25.030.046.*	30	18	6	12	19	38.5	5
25.040.047.*	40	25	6	15	28	44	7
25.050.048.*	50	30	6	19	32	54	7

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



### Bellows vacuum cups for chocolates - SL-PB



#### Product Description

Bellows vacuum cups made of FDA-approved material for handling delicate products with heavily textured surfaces.

#### Advantage

- > Gentle handling of the most sensitive surfaces
- > Also suitable for three-dimensional products, e.g. chocolates

#### Technical data

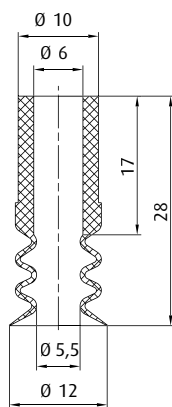
Item no.	Model / Lip dimensions		Material / Colour	Number of folds
21.012.079._*	SL-PB-12	7	SI (w)	2.5
27.016.001._*	SL-PB-16	6	SI (tr)	1.5

#### Accessories

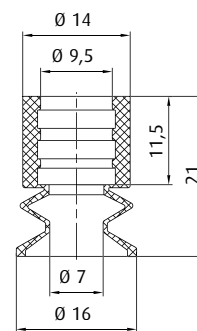
##### Suitable fittings

Item no.	M5-male	M10-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
21.012.079._*	270.443 (p.410)	--	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--
27.016.001._*	270.244 (p.410)	270.177 (p.416)	--	--	270.451 (p.426)	270.452 (p.431)

#### Dimensions



Drawing A



Drawing B

Item no.	Drawing
21.012.079._*	A
27.016.001._*	B

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Vacuum cups for baked goods - SL-B

## Vacuum cups for baked goods - SL-B



### Product Description

Bellows vacuum cups especially suitable for baked goods such as waffles, bread, rolls, pizzas and donut.

### Advantage

- > Large degree of leveling
- > Gentle attachment to the product
- > Good holding strength through optimised lip geometry
- > FDA-compliant

### Ordering notes:

Matching assembly aid for special fitting 270.419: Item No. 90.007

### Technical data

Item no.	Model / Lip dimensions	Number of folds	Number of folds	Material / Colour
21.034.179._*	SL-B-34	12	2.5	SI (tr)
25.038.016._*	SL-B-38	24	4.5	SI (tr)
27.039.017._*	SL-B-38A	20	5.5	SI (tr)
25.040.043._*	SL-B-40	24	4.5	SI (tr)
25.040.058._*	SL-B-40A	25	4.5	SI (bl)
21.060.074._*	SL-B-60	12	2.5	SI (tr)

### Accessories

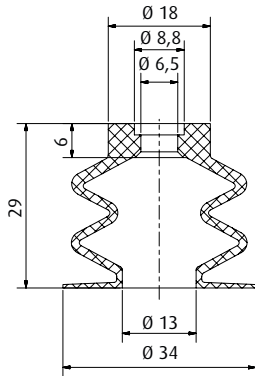
Item no.	Suitable fittings				
	Without Thread	M6-male	G1/4-male	G1/4-female	G1/2-male
21.034.179._*	--	270.039 (p.414)	--	--	--
25.038.016._*	270.419 (p.441)	--	270.183 (p.431)	270.182 (p.434)	--
27.039.017._*	270.419 (p.441)	--	270.183 (p.431)	270.182 (p.434)	--
25.040.043._*	270.419 (p.441)	--	270.183 (p.431)	270.182 (p.434)	--
25.040.058._*	270.419 (p.441)	--	270.183 (p.431)	270.182 (p.434)	--
21.060.074._*	--	--	--	--	270.372 (p.437)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

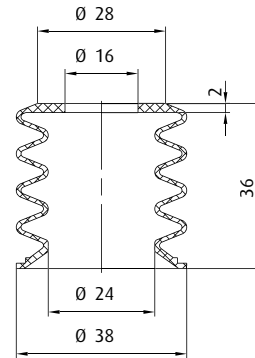




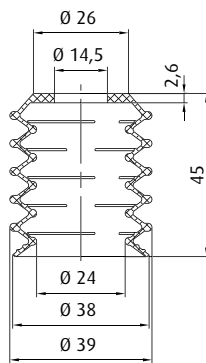
Dimensions



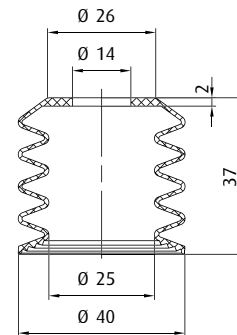
Drawing A



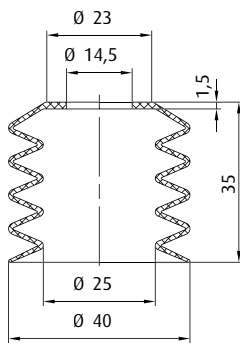
Drawing B



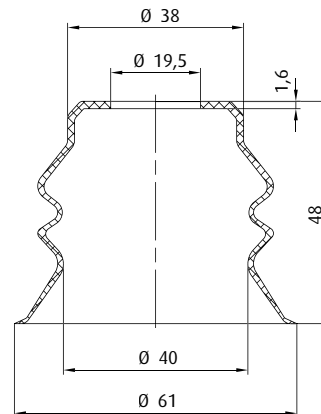
Drawing C



Drawing D



Drawing E



Drawing F

Item no.	Drawing
21.034.179._*	A
25.038.016._*	B
27.039.017._*	C
25.040.043._*	D
25.040.058._*	E
21.060.074._*	F

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Detectable vacuum cups for baked goods - SL-BD

## Detectable vacuum cups for baked goods - SL-BD

DETECTABLE



### Product Description

Bellows vacuum cups especially suitable for baked goods such as bread, rolls or pizza. The vacuum cup material used is a special mixture that can be detected, for example by metal detectors from SAFELINE, and then separated and discarded.


### Advantage

- > Detectable
- > FDA-compliant

### Ordering notes:

Matching assembly aid for special fittings 270.419: Item No. 90.007

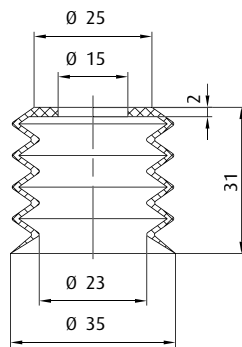
### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
25.035.069._*	SL-BD-35	25	4.5	SI (r)
25.040.066._*	SL-BD-40	28	4.5	SI (br), SI (bl)

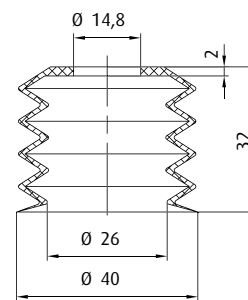
### Accessories

Item no.	Without Thread
25.035.069._*	270.419 (p.441)
25.040.066._*	270.419 (p.441)

### Dimensions



Drawing A



Drawing B

Item no.	Drawing
25.035.069._*	A
25.040.066._*	B

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



Vacuum cups for eggs - SL-E



**Product Description**

Bellows vacuum cups made of FDA-compliant silicone in a design specially optimised for handling eggs. Very long vacuum cup lift.

**Advantage**

- > Good absorption
- > Great stroke movement

**Technical data**

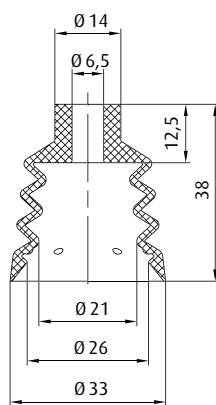
Item no.	Model / Lip dimensions	Number of folds	Material / Colour
27.033.008._*	SL-E-33	16	SI (tr)
27.034.023._*	SL-E-34	39	SI (r)

**Accessories**

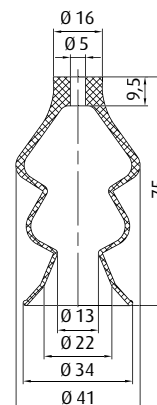
Suitable fittings

Item no.	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
27.033.008._*	--	270.132 (p.417)	270.114 (p.422)	270.208 (p.425)	270.178 (p.431)
27.034.023._*	270.443 (p.410)	270.238 (p.417)	270.110 (p.422)	270.534 (p.425)	--

**Dimensions**



Drawing A



Drawing B

Item no.	Drawing
27.033.008._*	A
27.034.023._*	B

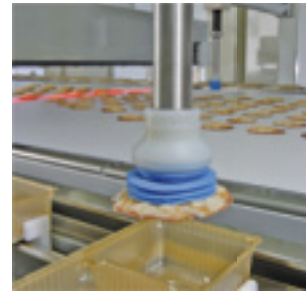
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Bellows vacuum cups, 1.5 and 2.5 folds - SV-SB

## Bellows vacuum cups, 1.5 and 2.5 folds - SV-SB




### Product Description

Bellows vacuum cups, 1.5 and 2.5 folds, for standard packaging machines. Soft, flexible sealing lip for smooth contact. FDA-compliant materials (SI).


### Advantage

> Gentle handling of sensitive products

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour
<b>Bellows vacuum cups 1.5 folds - SV-SB1</b>				
<b>23.016.232._*</b>	SV-SB1-16	6	1.5	SI (tr)
<b>23.030.230._*</b>	SV-SB1-30	7	1.5	NR (gr)
<b>Bellows vacuum cups 2.5 folds - SV-SB2</b>				
<b>21.030.030._*</b>	SV-SB2-30	13	2.5	SI (tr), NR (bl)
<b>21.040.132._*</b>	SV-SB2-40	11	2.5	SI (tr), SI (bl)

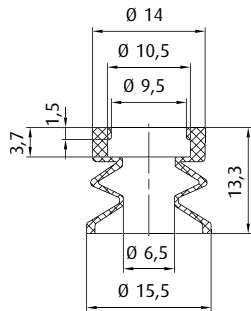
### Accessories

Item no.	 Suitable fittings				
	M5-male	M6-male	M10-male	G1/4-male	G1/4-female
<b>Bellows vacuum cups 1.5 folds - SV-SB1</b>					
<b>23.016.232._*</b>	270.311 (p.411)	270.312/19 (p.414)	--	--	--
<b>23.030.230._*</b>	--	--	270.177 (p.416)	270.451 (p.426)	270.452 (p.431)
<b>Bellows vacuum cups 2.5 folds - SV-SB2</b>					
<b>21.030.030._*</b>	--	--	270.177 (p.416)	270.451 (p.426)	270.452 (p.431)
<b>21.040.132._*</b>	--	--	--	--	--

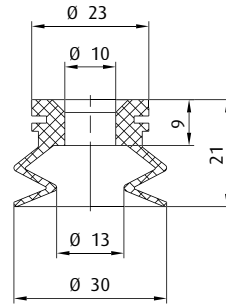
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



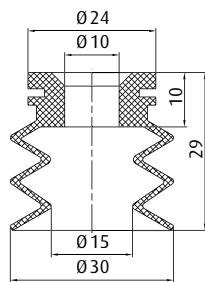
Dimensions



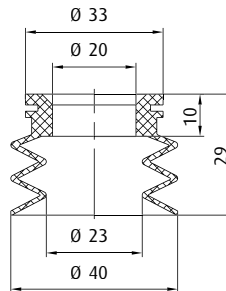
Drawing A



Drawing B



Drawing C



Drawing D

Item no.	Drawing
<b>Bellows vacuum cups 1.5 folds - SV-SB1</b>	
23.016.232.*	A
23.030.230.*	B
<b>Bellows vacuum cups 2.5 folds - SV-SB2</b>	
21.030.030.*	C
21.040.132.*	D

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Notes:

A large area for taking notes, featuring a vertical red line on the left side and horizontal lines for writing.



### Bellows vacuum cups with 1.5 folds for dynamic sheet handling - SM-B

**NEW**



#### Product Description

Robust, round NBR bellows vacuum cups, 60° Shore A with vulcanised fitting made of aluminium and large area, multi-part "anti-slip" cleats. Various connection threads available. Silicone-free.

#### Advantage

- > Internal supports help to prevent deep-drawing or deformation of thin sheets
- > Leak-free suction even with curved surfaces due to flexible sealing lip
- > Fold geometry allows handling of three dimensional shaped sheets
- > Secure fit due to vulcanised connection thread

#### Technical data

Model / Lip dimensions	Thread (Aluminium)						
	G1/4-male	G1/4-female	G3/8-female	M10-male	M14x1.5-male	Rectangular adapter	
SM-B-30	22.030.171.1	22.030.172.1	22.030.173.1	22.030.174.1	22.030.175.1	22.030.176.1	9
SM-B-40	22.040.177.1	22.040.178.1	22.040.179.1	22.040.180.1	22.040.181.1	22.040.182.1	10
SM-B-50	22.050.183.1	22.050.184.1	22.050.185.1	22.050.186.1	22.050.187.1	22.050.188.1	11.5
SM-B-60	22.060.189.1	22.060.190.1	22.060.191.1	22.060.192.1	22.060.193.1	22.060.194.1	14.5
SM-B-80	22.080.195.1	22.080.196.1	22.080.197.1	22.080.198.1	22.080.199.1	22.080.200.1	22
SM-B-100	22.100.201.1	22.100.202.1	22.100.203.1	22.100.204.1	22.100.205.1	22.100.206.1	26
SM-B-125	22.125.207.1	22.125.208.1	22.125.209.1	22.125.210.1	22.125.211.1	22.125.212.1	32

#### "Anti-Slip" Cleats (SM-B-80)



Continued on the next page

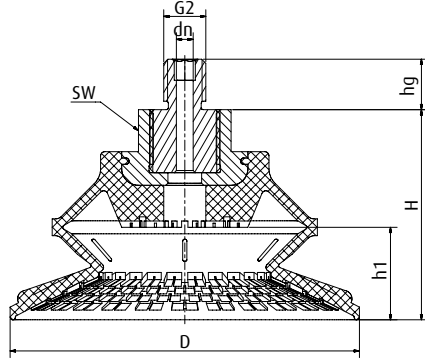
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



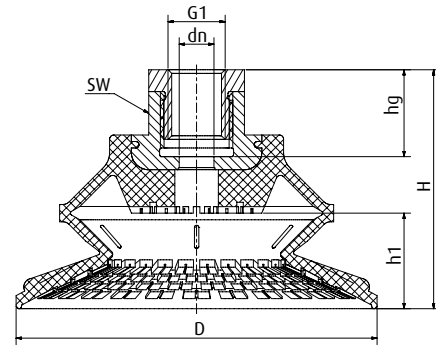
# Series | Bellows vacuum cups SB

Bellows vacuum cups with 1.5 folds for dynamic sheet handling - SM-B

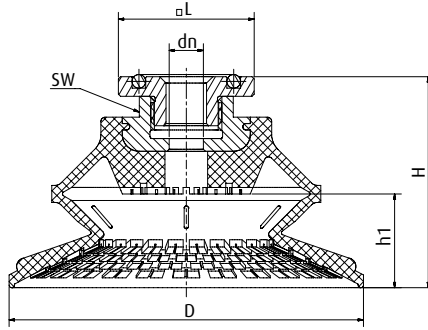
## Dimensions



Drawing A



Drawing B



Drawing C

Item no.	Drawing	Ø D [mm]	Ø dn [mm]	G1 (female)	G2 (male)	□L [mm]	H [mm]	h1 [mm]	hg [mm]	SW
22.030.171.*	A	32	4	--	G1/4	--	28	9	10	17
22.030.172.*	B	32	4	G1/4	--	--	28	9	12	17
22.030.173.*	B	32	4	G3/8	--	--	44	9	10	17
22.030.174.*	A	32	4	--	M10	--	28	9	12	17
22.030.175.*	A	32	4	--	M14x1.5	--	28	9	12	17
22.030.176.*	C	32	4	--	--	32	31.2	9	--	17
22.040.177.*	A	42	4	--	G1/4	--	29	10	10	17
22.040.178.*	B	42	4	G1/4	--	--	29	10	12	17
22.040.179.*	B	42	4	G3/8	--	--	45	10	10	17
22.040.180.*	A	42	4	--	M10	--	29	10	12	17
22.040.181.*	A	42	4	--	M14x1.5	--	29	10	12	17
22.040.182.*	C	42	4	--	--	32	31.2	10	--	17
22.050.183.*	A	52	6	--	G1/4	--	37	11.5	10	22
22.050.184.*	B	52	6	G1/4	--	--	42	11.5	20	22
22.050.185.*	B	52	6	G3/8	--	--	37	11.5	15	22
22.050.186.*	A	52	4	--	M10	--	37	11.5	12	22
22.050.187.*	A	52	6	--	M14x1.5	--	37	11.5	12	22
22.050.188.*	C	52	6	--	--	32	36.5	11.5	--	22
22.060.189.*	A	63	6	--	G1/4	--	41.5	14.5	10	22
22.060.190.*	B	63	8	G1/4	--	--	46.5	14.5	20	22
22.060.191.*	B	63	8	G3/8	--	--	41.5	14.5	15	22
22.060.192.*	A	63	4	--	M10	--	41.5	14.5	12	22
22.060.193.*	A	63	6	--	M14x1.5	--	41.5	14.5	12	22
22.060.194.*	C	63	8	--	--	32	41	14.5	--	22

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760





Item no.	Drawing	∅ D [mm]	∅ dn [mm]	G1 (female)	G2 (male)	□L [mm]	H [mm]	h1 [mm]	hg [mm]	SW
22.080.195.*	A	83	6	--	G1/4	--	50	22	10	22
22.080.196.*	B	83	8	G1/4	--	--	55	22	20	22
22.080.197.*	B	83	8	G3/8	--	--	50	22	15	22
22.080.198.*	A	83	4	--	M10	--	50	22	12	22
22.080.199.*	A	83	6	--	M14x1.5	--	50	22	12	22
22.080.200.*	C	83	8	--	--	32	49.5	22	--	22
22.100.201.*	A	103	6	--	G1/4	--	57	26	10	22
22.100.202.*	B	103	8	G1/4	--	--	62	26	20	22
22.100.203.*	B	103	8	G3/8	--	--	57	26	15	22
22.100.204.*	A	103	4	--	M10	--	57	26	12	22
22.100.205.*	A	103	6	--	M14x1.5	--	57	26	12	22
22.100.206.*	C	103	8	--	--	32	56.5	26	--	22
22.125.207.*	A	128	6	--	G1/4	--	68	32	10	22
22.125.208.*	B	128	8	G1/4	--	--	73	32	20	22
22.125.209.*	B	128	8	G3/8	--	--	68	32	15	22
22.125.210.*	A	128	4	--	M10	--	68	32	12	22
22.125.211.*	A	128	6	--	M14x1.5	--	68	32	12	22
22.125.212.*	C	128	8	--	--	32	67.5	32	--	22

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Bellows vacuum cups SB

Bellows vacuum suction plates softgrip - SBPL-SG

## Bellows vacuum suction plates softgrip - SBPL-SG




### Product Description

Vacuum suction plate with 1.5 folds for gentle handling of heavy but sensitive products (e.g. glass plates). Divided support surfaces prevent deformation of the product and provide a firm grip. Additional safety sealing lip on the support block positions the product orthogonally to the ground.  
Connection via an interlocking, snap-in aluminium plate.

### Advantage

- > Very careful handling due to soft sealing lip and lightly compressing bellows
- > Cleats provide product support
- > Cost-effective replacement of worn seals

### Technical data

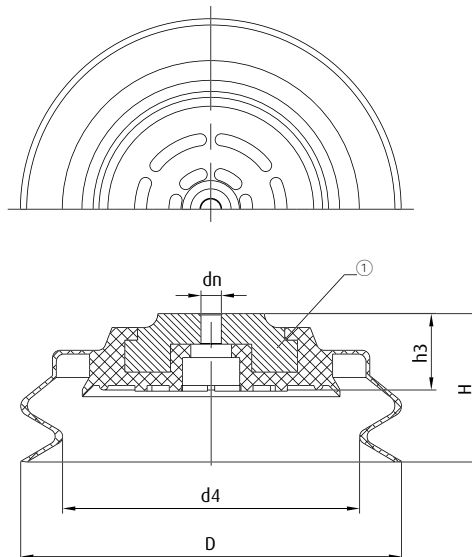
Item no.	Model / Lip dimensions		Weight [g]	Material / Colour	Number of folds
22.150.109._*	SBPL-SG-150	28	353	NBR (sw)	1.5
22.210.115._*	SBPL-SG-210	32	860	NBR (sw)	1.5

### Accessories

#### Spare cup

23.150.090.1 (p.357)
23.210.009.1 (p.360)

### Dimensions



① = Aluminium

Item no.	Ø D [mm]	Ø d4 [mm]	Ø dn [mm]	H [mm]	h3 [mm]
22.150.109._*	150	117	8	58	30
22.210.115._*	212	180	8	65	31

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



### Bellows vacuum suction plates - SBPL-E



#### Product Description

Vacuum suction plate, 1.5 folds, vulcanised carrier plate made of steel. Soft sealing lip from a low-marking NBR blend and lightly compressing bellows for gentle handling of heavy but sensitive products (e.g. glass plates). Divided support surfaces provide a firm grip for all loads.


#### Advantage

- > Gentle handling of heavy, sensitive products
- > Good adaptation to both concave and convex surfaces
- > Rubberised support surfaces prevent deformation of workpieces
- > Low-marking

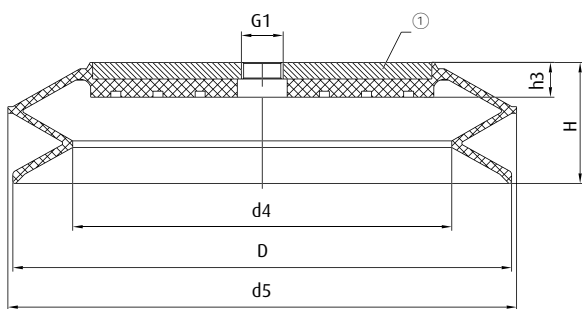
#### Ordering notes:

Customised drilling patterns on request

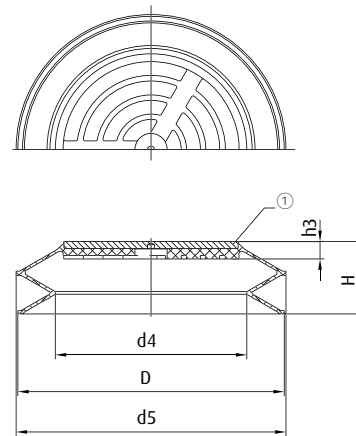
#### Technical data

Item no.	Model / Lip dimensions	Connection thread		Weight [g]	Number of folds	Material / Colour
22.150.084._*	SBPL-E-150	G1/2-female	32	460	1.5	NBR (gr)
22.200.087._*	SBPL-E-200	G1/2-female	30	860	1.5	NBR (gr)
22.250.088._*	SBPL-E-250	G1/2-female	38	1,900	1.5	NBR (gr)
22.300.091._*	SBPL-E-300	without	60	4,200	1.5	NBR (gr)
22.350.102._*	SBPL-E-350	without	55	4,200	1.5	NBR (gr)

#### Dimensions



Drawing A



Drawing B

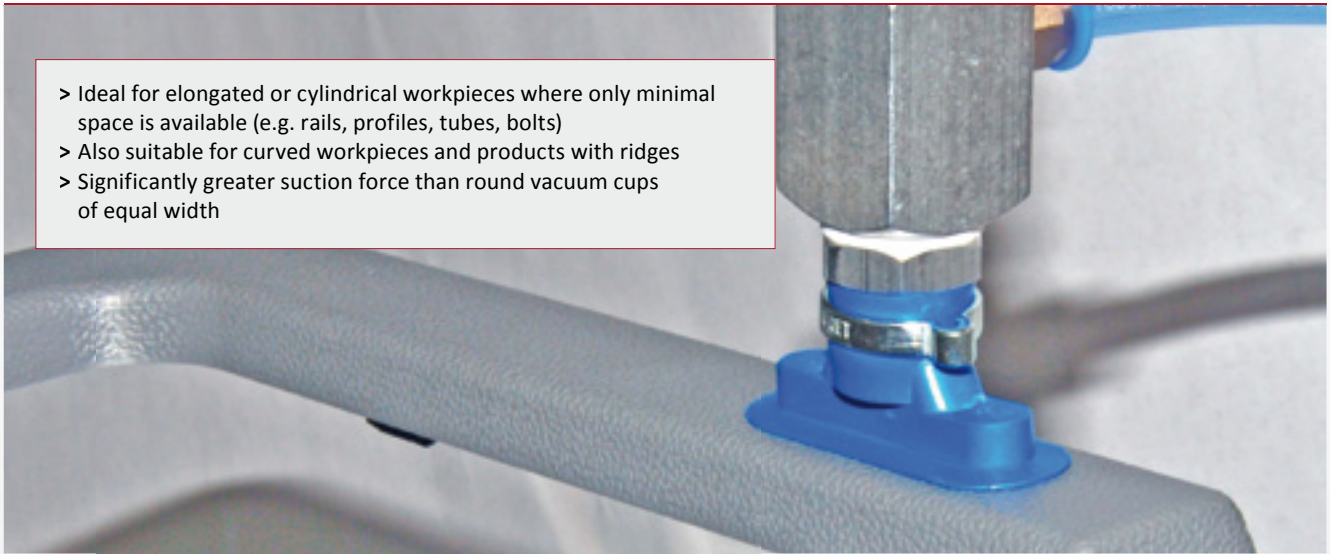
① = Steel

Item no.	Drawing	Ø D [mm]	Ø d4 [mm]	Ø d5 [mm]	G1	H [mm]	h3 [mm]
22.150.084._*	A	150	94	157	G1/2	54	15.5
22.200.087._*	A	200	140	206	G1/2	57	17
22.250.088._*	A	250	190	255	G1/2	61	17.5
22.300.091._*	B	306	220	310	--	83	20
22.350.102._*	B	350	262	350	--	84	21



## FIPA Oval vacuum cups SO

- > Ideal for elongated or cylindrical workpieces where only minimal space is available (e.g. rails, profiles, tubes, bolts)
- > Also suitable for curved workpieces and products with ridges
- > Significantly greater suction force than round vacuum cups of equal width



### Oval vacuum cups, flat, universal - SO-FU

- > Soft sealing lip also allows for the pick-up of curved products
- > Supports help to prevent warping of the product
- > Dimensions: 4x2 - 100x30 mm

> See page 141



### High temperature-resistant Thermalon® oval cups - SKT-O

- > Material blend especially suited for removing hot plastic parts to be painted from an injection molding machine
- > Very low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
- > Heat-resistant up to 160 °C
- > Dimensions: 4x2 - 75x25 mm

> See page 144



### High temperature-resistant HNBR oval cups - SKH-O

- > Universal vacuum cups for removing hot plastic parts to be painted from an injection molding machine
- > Low-marking and free of silicone and other paint-wetting-impairment substances (PWIS)
- > Heat-resistant up to 160 °C
- > Dimensions: 4x2 - 45x15 mm

> See page 146



### Oval vacuum cups, 2.5 folds, universal - SO-BU

- > Bellows compensate for level differences and enable gentle attachment to sensitive products
- > The reinforcement wires fitted into the folds help prevent collapse at excessive vacuum levels
- > Dimensions: 25x8 - 75x25 mm

> See page 148



## FIPA Oval vacuum cups SO

**Vinyl oval bellows cups - SO-BV**

- > Compensates for height differences and enables gentle set down on the workpiece
- > Good adaptation to curved or flexible product surfaces
- > Wear-resistant material - long service life
- > Dimensions: 35x28 - 100x55 mm

> See page 149

**Silicone rectangular bellows cups, 2.5 and 3.5 folds - SV-RB**

- > Handling of flexible parts, workpieces with uneven surfaces or products with flexible outer packaging
- > FDA-approved vacuum cup material
- > Dimensions: 52x25 - 80x50 mm

> See page 150

**Oval vacuum cups, flat - SO-E**

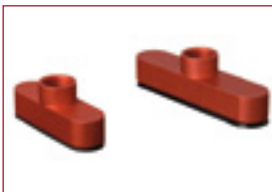
- > Very slim design in a number of graduations
- > Antistatic version also available
- > Interlocking clip-in fittings ensure torsional rigidity and security against rotation
- > Cost-effective replacement of worn seals
- > Dimensions: 10x4 - 30x8 mm

> See page 152

**Oval vacuum cups for cylindrical products - SO-Z**

- > Greater suction force over normal oval vacuum cups due to three-dimensional oval suction lip contour partially encompassing the workpiece
- > Suitable for cylindrical products with diameters of 2 - 18 mm

> See page 154

**Oval vacuum cups, flat - SO-C**

- > Vacuum cup housing of anodised aluminium enables torsion-resistant handling
- > Screwed rubber clamping plate fixes rubber sealing lip
- > Dimensions: 30x12 - 55x12 mm

> See page 157

**Oval vacuum suction plates for textured surfaces - SOPL-R**

- > Leak-free gripping of many problematic product surfaces thanks to extremely flexible, thinly tapered sealing lip
- > Increased security due to vulcanised carrier plate
- > Dimensions: 90x50 - 190x90 mm

> See page 158

**Oval vacuum suction plates - SOPL-S and SOPL-A**

- > Durable vacuum suction plates for handling heavy, narrow products
- > Rubberised support surfaces prevent the deformation of products
- > Available in the following materials: NBR (low-marking) and NR (wear-resistant)
- > Dimensions: 110x40 - 580x180 mm

> See page 160



Notes:

A large area for taking notes, featuring a vertical red line on the left side and horizontal lines for writing.



### Oval vacuum cups, flat, universal - SO-FU



#### Product Description

Flat vacuum cups in oval design for elongated workpieces where only minimal space is available (e.g., rails, profiles, tubes, bolts, etc.). Size 100x35 mm reinforced with metal inserts. Connection via plug-in nipple.


#### Advantage

- > Significantly increased suction force compared to round vacuum cups of the same width
- > Soft sealing lip also allows adhesion to curved products
- > Cleats help to prevent warping of the product
- > Cost-effective replacement of worn seals

#### Ordering notes:

From size 15x5 mm upward, a gripper clamp (available separately) is recommended to prevent inadvertent rotation.


#### Technical data

Item no.	Model / Lip dimensions		Material / Colour
132.4x2.001._*	SO-FU-4x2	0.5	NBR (sw), SI (tr), PU (bl)
132.4x2.031._*	SO-FU-4x2A	0.5	NBR (sw), SI (tr), PU (bl)
132.7x4.002._*	SO-FU-7x4	0.8	NBR (sw), SI (tr)
132.7x4.034._*	SO-FU-7x4A	0.8	NBR (sw), SI (tr)
132.12x4.004._*	SO-FU-12x4	0.5	NBR (gr), SI (tr)
132.15x5.008._*	SO-FU-15x5	1	NBR (gr), SI (tr), PU (bl)
132.18x6.012._*	SO-FU-18x6	1	NBR (gr), SI (tr), PU (bl)
132.24x8.016._*	SO-FU-24x8	1	NBR (gr), SI (tr), PU (bl)
132.30x10.018._*	SO-FU-30x10	2	NBR (gr), SI (tr), PU (bl)
132.36x12.019._*	SO-FU-36x12	2	NBR (gr), SI (tr), PU (bl)
132.45x15.020._*	SO-FU-45x15	3	NBR (gr), SI (tr), PU (bl)
132.60x20.022._*	SO-FU-60x20	3	NBR (gr), SI (tr), PU (bg)
132.75x25.023._*	SO-FU-75x25	3	NBR (gr), SI (tr)
132.100x35.26._*	SO-FU-100x35	3	NBR (sw)

#### Accessories

##### Clamp

--
--
--
--
--
78.030 (p.476)
78.030 (p.476)
78.032 (p.476)
78.032 (p.476)
78.032 (p.476)
78.032 (p.476)
78.032 (p.476)
78.033 (p.476)
78.033 (p.476)
78.034 (p.476)
78.034 (p.476)

Continued on the next page 

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



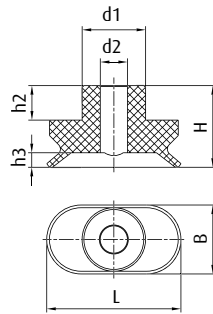
# Series | Oval vacuum cups SO

Oval vacuum cups, flat, universal - SO-FU

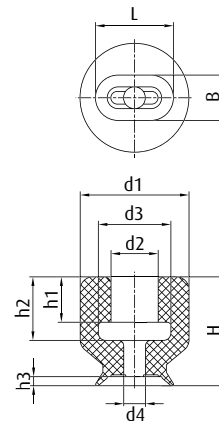
## Accessories

Item no.	Suitable fittings								
	M3-male	M4-male	M5-male	M5-female	M6-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
132.4x2.001.*	270.011 (p.408)	--	--	--	--	--	--	--	--
132.4x2.031.*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--	--	--	--
132.7x4.002.*	270.025 (p.408)	--	--	--	--	--	--	--	--
132.7x4.034.*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--	--	--	--
132.12x4.004.*	--	--	270.134 (p.409)	270.347 (p.412)	270.104 (p.413)	270.033 (p.416)	270.478 (p.421)	--	--
132.15x5.008.*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.18x6.012.*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.24x8.016.*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.30x10.018.*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.36x12.019.*	--	--	270.094 (p.411)	270.005 (p.412)	--	270.095 (p.418)	270.096 (p.422)	--	--
132.45x15.020.*	--	--	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.60x20.022.*	--	--	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.75x25.023.*	--	--	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.100x35.26.*	--	--	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)

## Dimensions



Drawing A



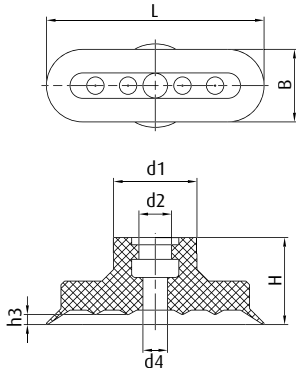
Drawing B

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

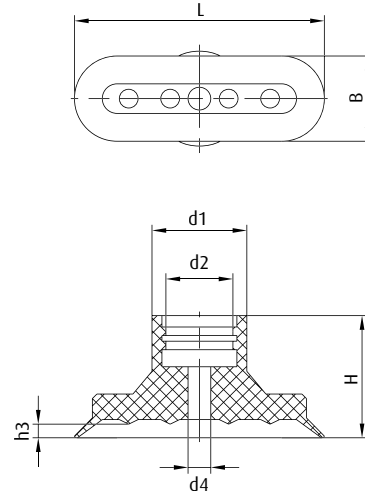




Dimensions



Drawing C



Drawing D

Item no.	Drawing	L [mm]	B [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
132.4x2.001.*	A	5	2.7	2	1	--	--	3	--	1.3	0.5
132.4x2.031.*	B	4.3	2.5	6	2.6	4	1.2	6	2.5	3.5	0.5
132.7x4.002.*	A	7.5	3.8	3.5	1.5	--	--	4.5	--	1.9	0.8
132.7x4.034.*	B	7.5	4	6	2.4	3	1.4	6	2.3	3	0.7
132.12x4.004.*	B	12	4	8	4	--	1.5	15	--	9.5	1
132.15x5.008.*	C	15	5	9	5	--	2	12	--	--	0.8
132.18x6.012.*	C	18	6	9	4.5	--	2	12	--	--	1.3
132.24x8.016.*	C	24	8	11.5	4.5	--	3	12	--	--	1.3
132.30x10.018.*	C	30	10	11.5	4.5	--	3.4	12	--	--	1.4
132.36x12.019.*	C	36	12	12	5	--	4	12	--	--	1.2
132.45x15.020.*	D	44	15	16.5	12	--	4	22	--	--	2.4
132.60x20.022.*	D	60	20	16.5	11.5	--	4	22	--	--	2.2
132.75x25.023.*	D	75	25	17.5	11	--	3.5	22	--	--	3
132.100x35.26.*	D	100	35	17.5	11.5	--	8	22	--	--	3.1

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Oval vacuum cups SO

High temperature-resistant Thermalon® oval cups - SKT-O

### High temperature-resistant Thermalon® oval cups - SKT-O

UP TO 160 °C & MINIMUM MARKING



#### Product Description

Oval vacuum cups for smooth surfaces suitable for removing hot plastic parts to be painted from an injection moulding machine. Thermalon® is a material mixture specially optimised for the plastics industry with a hardness of 60° Shore A. Connection via plug-in nipple.


#### Advantage

- > Extremely low-marking
- > Free of silicone and other paint-wetting-impairment substances (PWIS)
- > Significantly increased suction force compared to round vacuum cups of the same width
- > Soft sealing lip also allows adhesion to curved products

#### Ordering notes:

From size 24x8 mm upward, a gripper clamp (available separately) is recommended to prevent inadvertent rotation.

#### Technical data


Item no.	Model / Lip dimensions		Material / Colour	Usage temperature [°C]
132.4x2.079._*	SKT-O-4x2	0.4	Thermalon® (bl)	0 - 160
132.7x4.080._*	SKT-O-7x4	0.5	Thermalon® (bl)	0 - 160
132.15x5.081._*	SKT-O-15x5	0.6	Thermalon® (bl)	0 - 160
132.18x6.082._*	SKT-O-18x6	1	Thermalon® (bl)	0 - 160
132.24x8.083._*	SKT-O-24x8	1	Thermalon® (bl)	0 - 160
132.30x10.084._*	SKT-O-30x10	1	Thermalon® (bl)	0 - 160
132.45x15.085._*	SKT-O-45x15	2	Thermalon® (bl)	0 - 160
132.60x20.086._*	SKT-O-60x20	2.5	Thermalon® (bl)	0 - 160
132.75x25.087._*	SKT-O-75x25	2.5	Thermalon® (bl)	0 - 160

#### Accessories

##### Clamp

--
--
--
--
78.032 (p.476)
78.032 (p.476)
78.033 (p.476)
78.033 (p.476)
78.034 (p.476)

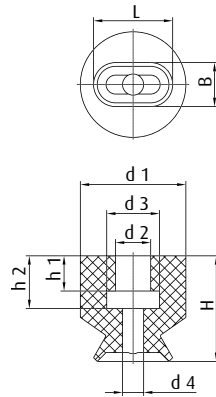
#### Accessories

Item no.	 Suitable fittings						
	M3-male	M4-male	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female
132.4x2.079._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--	--
132.7x4.080._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--	--
132.15x5.081._*	--	--	270.094 (p.411)	270.095 (p.418)	270.096 (p.422)	--	--
132.18x6.082._*	--	--	270.094 (p.411)	270.095 (p.418)	270.096 (p.422)	--	--
132.24x8.083._*	--	--	270.094 (p.411)	270.095 (p.418)	270.096 (p.422)	--	--
132.30x10.084._*	--	--	270.094 (p.411)	270.095 (p.418)	270.096 (p.422)	--	--
132.45x15.085._*	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.60x20.086._*	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)
132.75x25.087._*	--	--	--	--	--	270.097 (p.426)	270.098 (p.432)

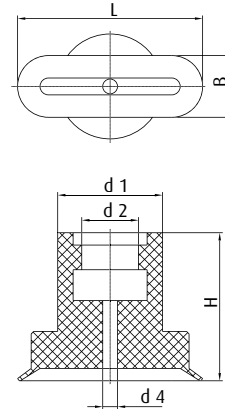
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



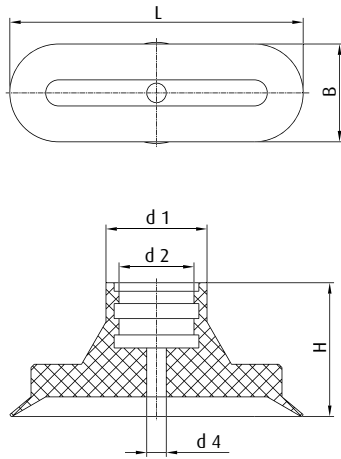
Dimensions



Drawing A



Drawing B



Drawing C

Item no.	Drawing	L [mm]	B [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]
132.4x2.079._*	A	4.5	2.5	6	2	3	1.2	6
132.7x4.080._*	A	7	3.5	6	2	3	1.4	6
132.15x5.081._*	B	15	5	8.5	4.6	--	1.2	12
132.18x6.082._*	B	18	6	8.5	4.6	--	1.5	12
132.24x8.083._*	B	24	8	11.5	5.5	--	1.5	12
132.30x10.084._*	B	30	10	11.5	5.5	--	2.5	12
132.45x15.085._*	C	45	15	15.5	11.5	--	3	21
132.60x20.086._*	C	60	20	15.5	11.5	--	4	21
132.75x25.087._*	C	75	25	17.5	11.5	--	4	21

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Oval vacuum cups SO

High temperature-resistant HNBR oval cups - SKH-O

## High temperature-resistant HNBR oval cups - SKH-O

UP TO 160 °C & MINIMUM MARKING



### Product Description

Oval vacuum cups for smooth surfaces suitable for removing hot plastic parts to be painted from an injection moulding machine. Connection via plug-in nipple.

### Advantage

- > Free of silicone and other paint-wetting-impairment substances (PWIS)
- > Minimum-marking
- > Significantly increased suction force compared to round vacuum cups of the same width
- > Soft sealing lip also allows adhesion to curved products

### Ordering notes:

From size 15x5 mm upward, a gripper clamp (available separately) is recommended to prevent inadvertent rotation

### Technical data

Item no.	Model / Lip dimensions	Lip height	Material / Colour	Usage temperature [°C]
132.4x2.031._*	SKH-O-4x2A	0.5	HNBR (ge)	0 - 160
132.7x4.034._*	SKH-O-7x4	0.8	HNBR (ge)	0 - 160
132.15x5.067._*	SKH-O-15x5	1	HNBR (ge)	0 - 160
132.24x8.066._*	SKH-O-24x8	1	HNBR (ge)	0 - 160
132.36x12.068._*	SKH-O-36x12	2	HNBR (ge)	0 - 160
132.45x15.064._*	SKH-O-45x15	3	HNBR (ge)	0 - 160

### Accessories

#### Clamp

--  
--  
78.030 (p.476)  
78.032 (p.476)  
78.032 (p.476)  
78.033 (p.476)

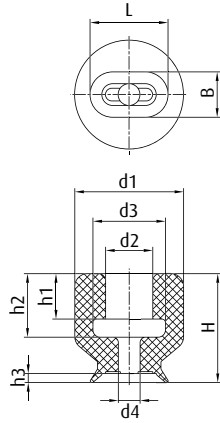
### Accessories

Item no.	Suitable fittings					
	M3-male	M4-male	M5-male	G1/8-male	G1/4-male	G1/4-female
132.4x2.031._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--
132.7x4.034._*	270.014 (p.408)	270.111 (p.408)	270.300 (p.411)	--	--	--
132.15x5.067._*	--	--	--	270.431 (p.418)	--	--
132.24x8.066._*	--	--	--	270.431 (p.418)	--	--
132.36x12.068._*	--	--	--	270.431 (p.418)	--	--
132.45x15.064._*	--	--	--	--	270.097 (p.426)	270.098 (p.432)

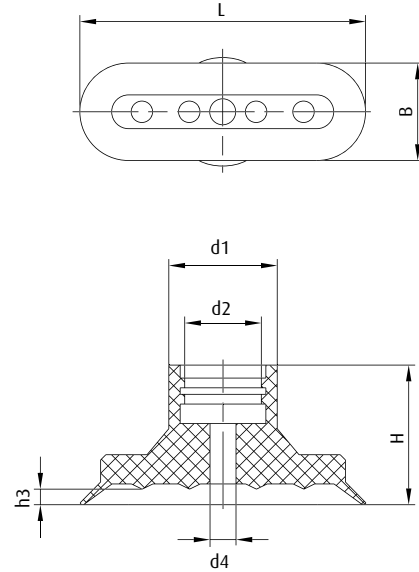
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



Dimensions



Drawing A



Drawing B

Item no.	Drawing	L [mm]	B [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]
132.4x2.031._*	A	4.3	2.5	6	2.6	4	1.2	6	2.5	3.5	0.5
132.7x4.034._*	A	7.5	4	6	2.4	3	1.4	6	2.3	3	0.7
132.15x5.067._*	B	15	5	9	5	--	2	12	--	--	0.8
132.24x8.066._*	B	24	8.5	12.5	5	--	3	13	--	--	1.5
132.36x12.068._*	B	36	12	12	5	--	4	12	--	--	1.6
132.45x15.064._*	B	44	15	16.5	12	--	4	22	--	--	2.4

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Oval vacuum cups SO

Universal oval vacuum cups, 2.5 folds - SO-BU

## Universal oval vacuum cups, 2.5 folds - SO-BU



### Product Description

Bellows vacuum cups in oval design for elongated workpieces where only minimal space is available (e.g., rails, profiles, tubes, bolts, etc.). The reinforcement wires fitted into the folds helps prevent collapse at excessive vacuum levels. Connection via plug-in nipple.

### Advantage

- > Significantly increased suction force compared to round vacuum cups of the same width
- > Bellows compensate for height differences
- > Soft sealing lip also allows adhesion to curved products

### Ordering notes:

> For fastening, the use of a gripper clamp (available separately) is recommended to prevent inadvertent rotation

### Technical data

Item no.	Model / Lip dimensions	Nipple	Number of folds	Material / Colour
138.25x8.002._*	SO-BU-25x8	6	2.5	NBR (gr), SI (tr)
138.45x15.003._*	SO-BU-45x15	8	2.5	NBR (gr), SI (tr)
138.75x25.004._*	SO-BU-75x25	11	2.5	NBR (gr), SI (tr)

### Accessories

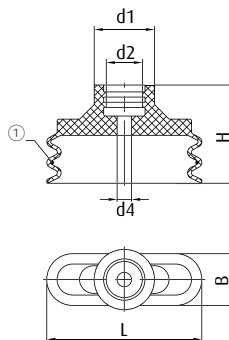
#### Clamp

78.031 (p.476)
78.033 (p.476)
78.034 (p.476)

### Accessories

Item no.	Suitable fittings					
	M5-male	M5-female	G1/8-male	G1/8-female	G1/4-male	G1/4-female
138.25x8.002._*	270.094 (p.411)	270.005 (p.412)	270.095 (p.418)	270.096 (p.422)	--	--
138.45x15.003._*	--	--	--	--	270.097 (p.426)	270.098 (p.432)
138.75x25.004._*	--	--	--	--	270.097 (p.426)	270.098 (p.432)

### Dimensions



① = Wire strap stiffening

Item no.	L [mm]	B [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d4 [mm]	H [mm]
138.25x8.002._*	25	8	10	4.5	2	18.5
138.45x15.003._*	45	15	17.5	10.5	4	29
138.75x25.004._*	75	25	17.5	10.5	6	35

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



### Vinyl oval bellows cups - SO-BV



#### Product Description

Durable oval vacuum cup with height adjustment made of snug-fitting, wear-resistant material. Very well suited for handling abrasive products such as cardboard. Flexible material enables low-leakage gripping of highly flexible products such as foil-packaged goods. Connection via plug-in nipple or vulcanised carrier plate.

#### Advantage

- > Significantly increased suction force compared to round vacuum cups of the same width
- > Bellows compensates for differences in height and enables good adaptation to curved or uneven product surfaces
- > Flexible, soft lips
- > Long life cycle

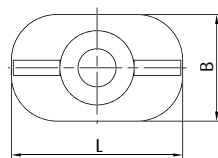
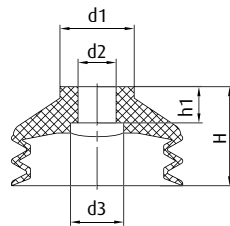
#### Technical data

Item no.	Model / Lip dimensions	Number of folds	Material / Colour
138.35x28.001.*	SO-BV-35x28	9	Vinyl (bl)
138.45x28.013.*	SO-BV-45x28	9	Vinyl (bl)
130.97x55.126.*	SO-BV-100x55	11	Vinyl (bl)

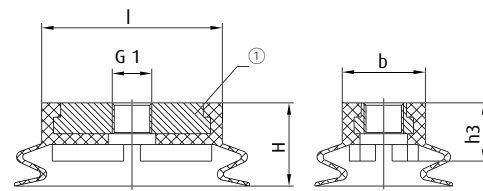
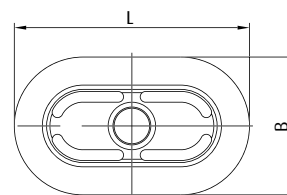
#### Accessories

Item no.	Suitable fittings		
	M10-male	G1/4-male	G1/4-female
138.35x28.001.*	270.177 (p.416)	270.451 (p.426)	270.452 (p.431)
138.45x28.013.*	270.177 (p.416)	270.451 (p.426)	270.452 (p.431)
130.97x55.126.*	--	--	--

#### Dimensions



Drawing A



Drawing B

① = Aluminium

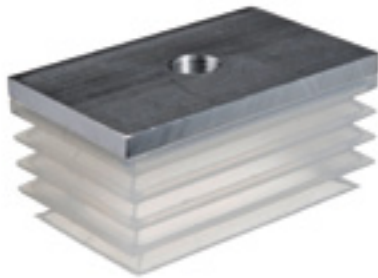
Item no.	Drawing	L [mm]	B [mm]	l [mm]	b [mm]	∅ d1 [mm]	∅ d2 [mm]	∅ d3 [mm]	G1	H [mm]	h1 [mm]	h3 [mm]
138.35x28.001.*	A	35	28	--	--	19.5	10	14	--	24	8.5	--
138.45x28.013.*	A	45	28	--	--	19.5	10	14	--	26	9.5	--
130.97x55.126.*	B	99	58	76	35	--	--	--	G3/8	35	--	25



# Series | Oval vacuum cups SO

Rectangular bellows vacuum cups - SV-RB

## Rectangular bellows vacuum cups - SV-RB



### Product Description

Bellows vacuum cups in rectangular design made of FDA-compliant material (SI). Particularly suitable for film-packaged products and filled pouches. Also available with wire stiffening. Connection via an interlocking snap-in carrier plate.


### Advantage

- > Large suction surface due to rectangular design
- > Bellows compensate differences in height and enable good adaptation to curved or uneven product surfaces
- > Gentle attachment to the product
- > Good fit for irregularities and folds thanks to soft sealing lip


### Ordering notes:

Optional: Wire strap reinforcement available.  
When ordering, please add "-VERS" to item number

### Technical data

Item no.	Model / Lip dimensions		Number of folds	Material / Colour	Accessories Wire strap reinforcement
<b>Bellows vacuum cups, 2.5 folds, for cylindrical products</b>					
201.79x29.002.*	SV-RB-79x29	16	2.5	SI (tr)	X 0020
<b>Bellows vacuum cups, 2.5 folds, with flat sealing lip</b>					
209.52x25.006.*	SV-RB-52x25	13	2.5	SI (tr)	X 0022
209.60x29.001.*	SV-RB-60x29	13	2.5	NBR (sw), SI (tr)	X 0024
<b>Bellows vacuum cups, 3.5 folds, with thinly tapering, flexible sealing lip</b>					
209.80x30.003.*	SV-RB-80x30	20	3.5	SI (tr)	X 0020
209.80x40.004.*	SV-RB-80x40	20	3.5	SI (tr)	X 0023
209.80x50.005.*	SV-RB-80x50	20	3.5	SI (tr)	X 0041

### Accessories

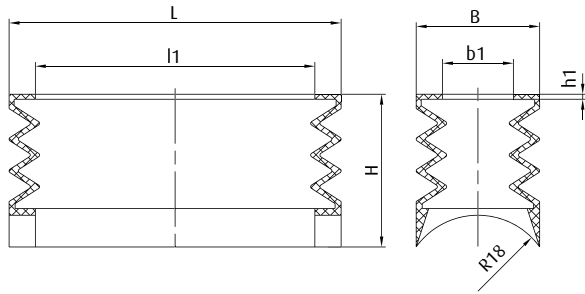
 Suitable fittings		
Item no.	G1/8-female	G1/4-female
<b>Bellows vacuum cups, 2.5 folds, for cylindrical products</b>		
201.79x29.002.*	--	270.392 (p.439)
<b>Bellows vacuum cups, 2.5 folds, with flat sealing lip</b>		
209.52x25.006.*	270.508 (p.439)	--
209.60x29.001.*	--	270.509 (p.439)
<b>Bellows vacuum cups, 3.5 folds, with thinly tapering, flexible sealing lip</b>		
209.80x30.003.*	--	270.392 (p.439)
209.80x40.004.*	--	270.510 (p.439)
209.80x50.005.*	--	270.511 (p.439)

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

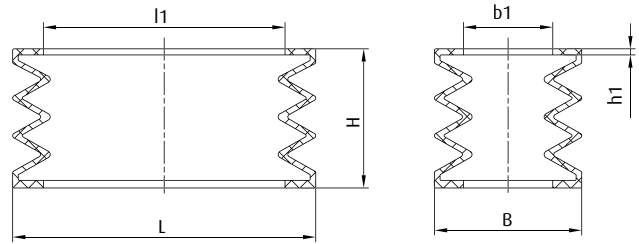




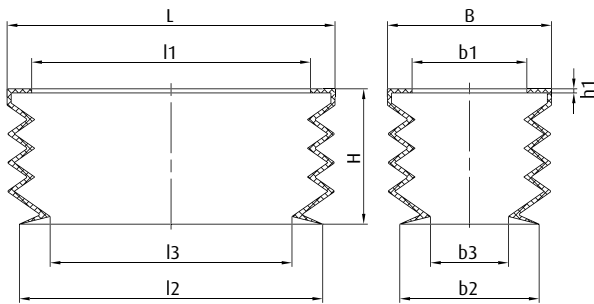
### Dimensions



Drawing A



Drawing B



Drawing C

Item no.	Drawing	L [mm]	B [mm]	l1 [mm]	l2 [mm]	l3 [mm]	b1 [mm]	b2 [mm]	b3 [mm]	H [mm]	h1 [mm]
<b>Bellows vacuum cups, 2.5 folds, for cylindrical products</b>											
201.79x29.002.*	A	80	30	67	--	--	17	--	--	37	1.2
<b>Bellows vacuum cups, 2.5 folds, with flat sealing lip</b>											
209.52x25.006.*	B	53	26	40	--	--	13	--	--	28	1.2
209.60x29.001.*	B	60	29	48	--	--	17.5	--	--	27	1.2
<b>Bellows vacuum cups, 3.5 folds, with thinly tapering, flexible sealing lip</b>											
209.80x30.003.*	C	81	31	69	75	60	18	25	9	34	--
209.80x40.004.*	C	80	40	68	74	59	28	34	19	33	--
209.80x50.005.*	C	80	50	67	74	57	37	44	27	33	--

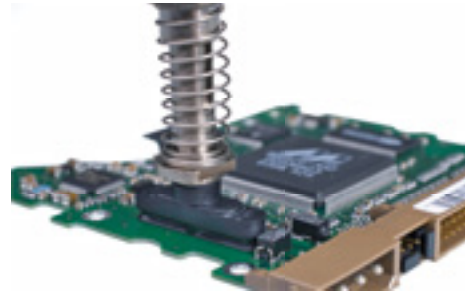
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Oval vacuum cups SO

Oval vacuum cups, flat - SO-E

## Oval vacuum cups, flat - SO-E



### Product Description

Small flat vacuum cups in oval design for elongated workpieces where only minimal space is available (e.g. semiconductors, carrier plates, etc.). Connection via an interlocking snap-in plug-in nipple.

### Advantage

- > Significantly increased suction force compared to round vacuum cups of the same width
- > Optimum bending strength due to elongated carrier plate in the plug-in nipple
- > Secured against rotation
- > Antistatic version available
- > Cost-effective replacement of worn seals

### Ordering notes:

The cups are delivered fully assembled with fitting.  
The listed fittings are spare parts.

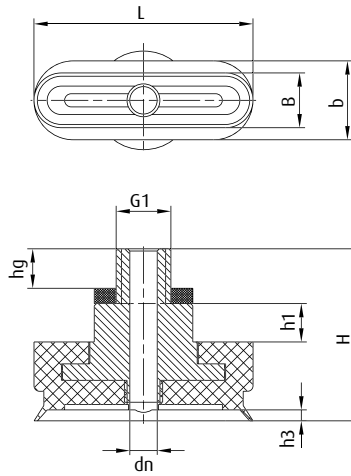
### Technical Data

Model / Lip dimensions	Item no.			Material / Colour	Spare cup	Spare fittings	
	M5-male	M6-male				M5-male	M6-male
SO-E-10x4	130.10x4.115._*	130.10x4.068._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.10x4.003._*	270.463	270.339
SO-E-10x5	130.10x5.116._*	130.10x5.071._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.10x5.007._*	270.463	270.339
SO-E-10x6	130.10x6.117._*	130.10x6.073._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.10x6.011._*	270.463	270.339
SO-E-20x4	130.20x4.118._*	130.20x4.069._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.20x4.005._*	270.464	270.340
SO-E-20x5	130.20x5.119._*	130.20x5.081._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.20x5.009._*	270.464	270.340
SO-E-20x6	130.20x6.120._*	130.20x6.074._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.20x6.013._*	270.464	270.340
SO-E-20x8	130.20x8.121._*	130.20x8.076._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.20x8.015._*	270.464	270.340
SO-E-30x5	130.30x5.123._*	130.30x5.072._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.30x5.010._*	270.464	270.340
SO-E-30x6	130.30x6.124._*	130.30x6.075._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.30x6.014._*	270.464	270.340
SO-E-30x8	130.30x8.125._*	130.30x8.077._*	0.9	NBR (sw), SI (tr), BR-AS (sw)	132.30x8.017._*	270.464	270.340

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Dimensions



Item no.	L [mm]	B [mm]	b [mm]	$\varnothing dn$ [mm]	G1	H [mm]	h1 [mm]	h3 [mm]	hg [mm]
130.10x4.115._*	10	4.6	7	2.5	M5	15.5	3.5	1	3.6
130.10x4.068._*	10	4.6	7	2	M6	15.5	3.5	1	4
130.10x5.116._*	10	5	7	2.5	M5	15.5	3.5	1	3.6
130.10x5.071._*	10	5	7	2	M6	15.5	3.5	1	4
130.10x6.117._*	10	6	7	2.5	M5	15.5	3.5	1	3.6
130.10x6.073._*	10	6	7	2	M6	15.5	3.5	1	4
130.20x4.118._*	20	4.3	7	2.5	M5	15.5	3.5	1	3.6
130.20x4.069._*	20	4.3	7	2	M6	15.5	3.5	1	4
130.20x5.119._*	20	5	7	2.5	M5	15.5	3.5	1	3.6
130.20x5.081._*	20	5	7	2	M6	15.5	3.5	1	4
130.20x6.120._*	20	6	7	2.5	M5	15.5	3.5	1	3.6
130.20x6.074._*	20	6	7	2	M6	15.5	3.5	1	4
130.20x8.121._*	20	8	8	2.5	M5	15.5	3.5	1	3.6
130.20x8.076._*	20	8	8	2	M6	15.5	3.5	1	4
130.30x5.123._*	30	5	7	2.5	M5	15.5	3.5	1	3.6
130.30x5.072._*	30	5	7	2	M6	15.5	3.5	1	4
130.30x6.124._*	30	6	7	2.5	M5	15.5	3.5	1	3.6
130.30x6.075._*	30	6	7	2	M6	15.5	3.5	1	4
130.30x8.125._*	30	8	8	2.5	M5	15.5	3.5	1	3.6
130.30x8.077._*	30	8	8	2	M6	15.5	3.5	1	4

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Oval vacuum cups SO

Oval vacuum cups for cylindrical products - SO-Z

### Oval vacuum cups for cylindrical products - SO-Z



#### Product Description

Oval vacuum cup for cylindrical products such as pins, needles, tubes, etc. Connection via plug-in nipple, hollow screw (SO-Z-10-18) or direct plug-in to the machine (SO-Z-4-10).

#### Advantage

- > Significantly greater suction force over normal oval vacuum cups due to three-dimensional oval suction lip contour partially encompassing the workpiece
- > Cost-effective replacement of worn seals

#### Technical data

Item no.	Model / Lip dimensions	Suitable for cylindrical products with $\varnothing$ [mm]	Material / Colour
201.10x3.005._*	SO-Z-2-4	2 - 4	NBR (sw), SI (tr)
201.10x6.006._*	SO-Z-3-7	3 - 7.5	NBR (sw), SI (tr)
132.15x7.073._*	SO-Z-4-10	4 - 10	SI (r)
201.12x9.007._*	SO-Z-6-13	6 - 13	NBR (sw), SI (tr)
9.23x11.036._*	SO-Z-10-18	10 - 18	SI (tr)

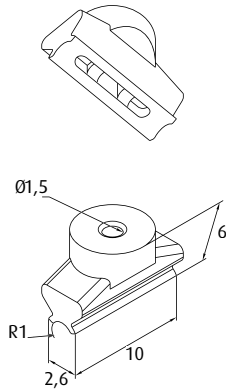
#### Accessories

Item no.	Suitable fittings		
	M5-male	G1/8-male	G1/8-female
201.10x3.005._*	270.300 (p.411)	--	--
201.10x6.006._*	270.300 (p.411)	--	--
132.15x7.073._*	--	--	--
201.12x9.007._*	270.300 (p.411)	--	--
9.23x11.036._*	270.310 (p.411)	270.493 (p.420)	270.494 (p.423)

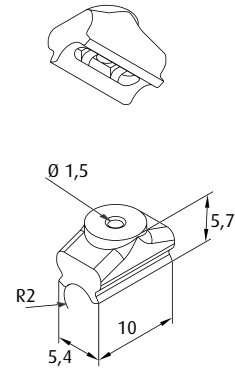
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



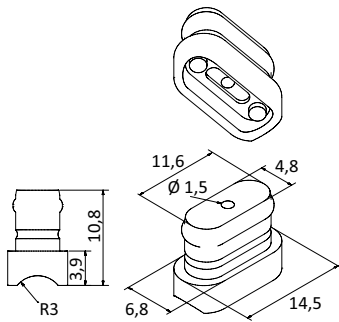
Dimensions



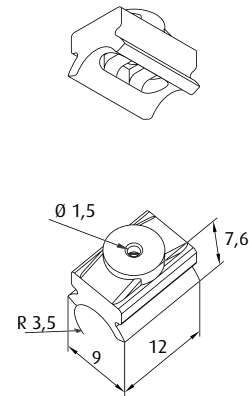
Drawing A



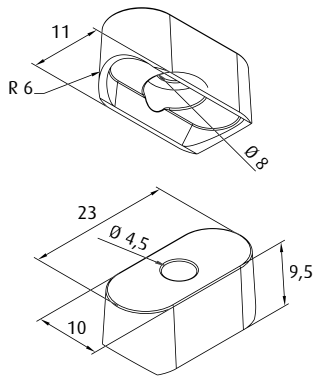
Drawing B



Drawing C



Drawing D



Drawing E

Item no.	Drawing
201.10x3.005._*	A
201.10x6.006._*	B
132.15x7.073._*	C
201.12x9.007._*	D
9.23x11.036._*	E

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Notes:

Lined area for taking notes, consisting of horizontal lines on a white background.



### Oval vacuum cups, flat - SO-C




#### Product Description

Flat vacuum cups in oval design for elongated workpieces where only minimal space is available (e.g. rails, profiles, tubes, bolts, etc.). Vacuum chamber housing of anodised aluminium. Rubber sealing lip is fixed by a screwed rubber clamping plate.

#### Advantage

- > Significantly increased suction force compared to round vacuum cups of the same width
- > Warp-resistant aluminium housing
- > Cost-effective replacement of worn seals

#### Technical data

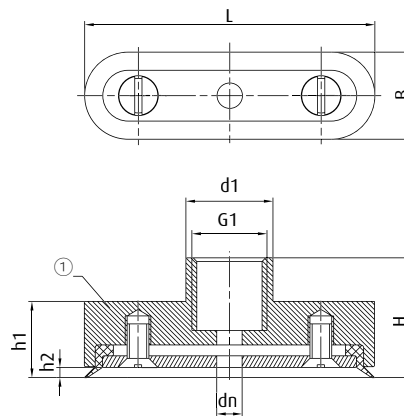
Item no.	Model / Lip dimensions	Connection thread		Material / Colour
<b>130.30x12.057.*</b>	SO-C-30x12	G1/8-female	1	SI (tr), NR (sw)
<b>130.40x12.058.*</b>	SO-C-40x12	G1/8-female	1	SI (tr), NR (sw)
<b>130.55x12.082.*</b>	SO-C-55x12	G1/8-female	1	NBR (sw), SI (tr), NR (sw)

#### Accessories

##### Spare cup

132.30x12.025.* (p.374)
132.40x12.027.* (p.375)
132.55x12.029.* (p.378)

#### Dimensions



① = Aluminium

Item no.	L [mm]	B [mm]	Ø d1 [mm]	Ø dn [mm]	G1	H [mm]	h1 [mm]	h2 [mm]
<b>130.30x12.057.*</b>	30	12	12	3.5	G1/8	16.5	10	1.3
<b>130.40x12.058.*</b>	40	12	12	3.5	G1/8	16.5	10	1.4
<b>130.55x12.082.*</b>	55	12	12	3.5	G1/8	16.5	10	1.5

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Oval vacuum cups SO

Oval vacuum suction plates for textured surfaces - SOPL-R

## Oval vacuum suction plates for textured surfaces - SOPL-R




### Product Description

Oval vacuum cups for handling both rough surfaces and smooth, markedly uneven products. Connection via vulcanised aluminium plate.

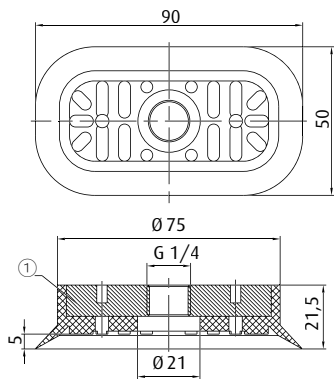
### Advantage

- > Leak-free gripping of difficult product surfaces thanks to extremely flexible, thinly tapered sealing lip
- > Cleats help prevent warping of the product
- > Optimum process reliability due to vulcanised backing plate, as well as additional internal safety sealing lip (190x90 mm and 120x65 mm)

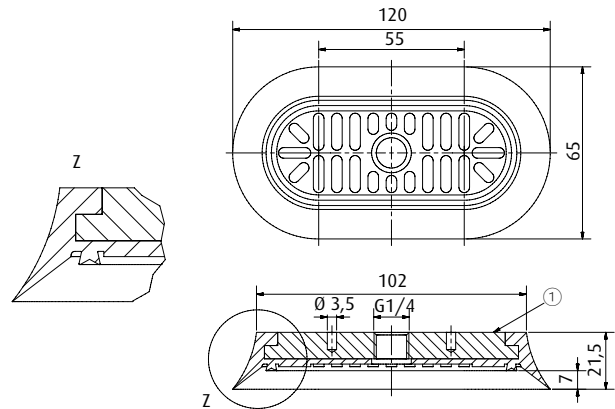
### Technical data

Item no.	Model / Lip dimensions	Connection thread	Material / Colour		Weight [g]
130.90x50.113.*	SOPL-R-90x50	G1/4-female	NR (bg)	5	72
9.120x65.088.*	SOPL-R-120x65	G1/4-female	NR (bg)	7	131
9.190x90.061.*	SOPL-R-190x90	G1/4-female	NR (bg)	5.5	295

### Dimensions



Drawing A



Drawing B

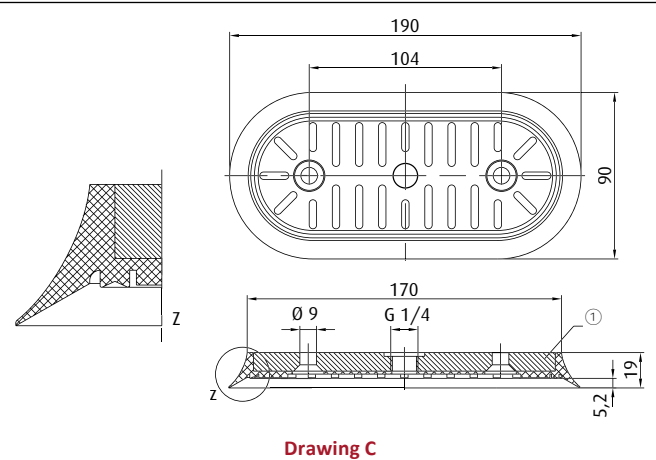
① = Aluminium

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760





Dimensions



Drawing C

① = Aluminium

Item no.	Drawing
130.90x50.113._*	A
9.120x65.088._*	B
9.190x90.061._*	C

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## Series | Oval vacuum cups SO

Oval vacuum suction plates - SOPL-S and SOPL-A

### Oval vacuum suction plates - SOPL-S and SOPL-A



#### Product Description

Oval vacuum cups, vulcanised, on a carrier plate of steel/aluminium for the handling of long, narrow products such as strips, profiles or frames. Rubberised support surfaces prevent deformation of the product and increase lateral stability.


#### Advantage

- > High suction force on a small footprint
- > Low-marking
- > High process reliability due to vulcanised carrier plate
- > Individual machine connection possible

#### Ordering notes:

Customised drilling patterns available on request for Series SOPL-S

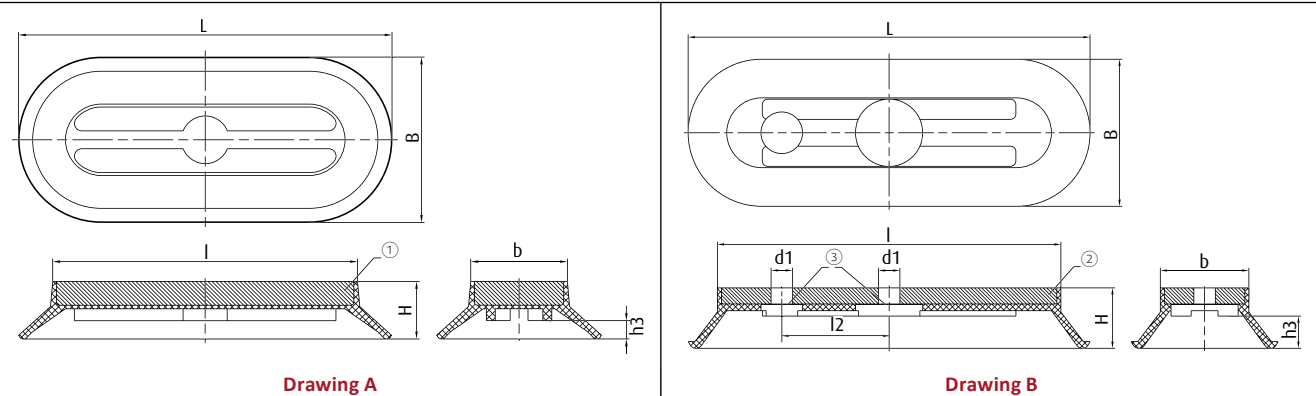
#### Technical data

Item no.	Model / Lip dimensions	Material / Colour		Weight [g]	Support surfaces
<b>SOPL-S: NBR material, grey, with steel carrier plate</b>					
9.200x40.010.*	SOPL-S-200x40	NBR (gr)	9	140	lengthwise
9.110x40.009.*	SOPL-S-110x40	NBR (gr)	9	122	lengthwise
9.125x55.012.*	SOPL-S-125x55	NBR (gr)	9	320	lengthwise
9.150x55.013.*	SOPL-S-150x55	NBR (gr)	7	255	lengthwise
9.200x55.014.*	SOPL-S-200x55	NBR (gr)	7	538	lengthwise
9.250x55.016.*	SOPL-S-250x55	NBR (gr)	8	770	lengthwise
9.300x55.019.*	SOPL-S-300x55	NBR (gr)	8	902	lengthwise
9.370x70.022.*	SOPL-S-370x70	NBR (gr)	10	1,895	lengthwise
9.200x100.015.*	SOPL-S-200x100	NBR (gr)	8	595	lengthwise
9.280x100.017.*	SOPL-S-280x100	NBR (gr)	10	1,880	lengthwise
9.450x130.025.*	SOPL-S-450x130	NBR (gr)	6	2,660	crosswise
9.430x180.024.*	SOPL-S-430x180	NBR (gr)	6	3,720	selective
9.580x180.029.*	SOPL-S-580x180	NBR (gr)	10	3,500	lengthwise
<b>SOPL-A: NR material, orange, with aluminium carrier plate</b>					
9.100x55.020.*	SOPL-A-100x55	NR (or)	8	65	lengthwise
9.150x55.083.*	SOPL-A-150x55	NR (or)	8	114	lengthwise
9.200x55.020.*	SOPL-A-200x55	NR (or)	8	159	lengthwise
9.300x55.046.*	SOPL-A-300x55	NR (or)	8	300	lengthwise

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



Dimensions



① = Steel ② = Aluminium ③ = Sealed with rubber

Item no.	Drawing	L [mm]	B [mm]	l [mm]	l2 [mm]	b [mm]	Ø d1 [mm]	H [mm]	h3 [mm]
<b>SOPL-S: NBR material, grey, with steel carrier plate</b>									
9.200x40.010.*	A	195	36	176	--	15	--	19	6
9.110x40.009.*	A	113	43	87	--	17	--	19	8.5
9.125x55.012.*	A	126	56	103	--	33	--	19	6
9.150x55.013.*	A	151	56	128	--	33	--	19	6
9.200x55.014.*	A	200	55	178	--	33	--	19	6.3
9.250x55.016.*	A	250	55	228	--	33	--	19	6
9.300x55.019.*	A	300	55	227	--	33	--	19	6
9.370x70.022.*	A	378	82	349	--	53	--	26	9
9.200x100.015.*	A	190	90	161	--	61	--	22	8.5
9.280x100.017.*	A	278	100	250	--	72	--	25	9
9.450x130.025.*	A	449	131	420	--	102	--	20	6.5
9.430x180.024.*	A	430	180	402	--	158	--	20	6
9.580x180.029.*	A	579	179	570	--	150	--	25	9
<b>SOPL-A: NR material, orange, with aluminium carrier plate</b>									
9.100x55.020.*	B	99	54	78	25	33	8	22.5	9
9.150x55.083.*	B	150	55	128	40	33	8	22.5	9
9.200x55.020.*	B	201	56	178	50	33	8	22.5	9
9.300x55.046.*	B	300	55	278	100	33	8	22.5	9

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



## FIPA Special vacuum cups SX



### Temperature-resistant, felt coated vacuum cups - SX-F

- > Virtually mark-free special vacuum cups for high temperature requirements, e.g. in the glass industry
- > Highest temperature resistance (FKM briefly up to 300 °C; special silicone with an evaporated silicone lock made of aluminium briefly up to 500 °C)
- > Special felt pad vulcanised inseparably to elastomer carrier
- > Diameter: 25 - 160 mm

> See page 164



### Vacuum cups with sponge pad - SX-SH

- > Flat vacuum cups with contact surface made from special silicone sponge
- > Very low-marking on polished surfaces
- > Flat sealing prevents leakage for rough, porous surfaces
- > Diameter: 8 - 40 mm

> See page 166



### Bernoulli vacuum cups - SX-B

- > Non-contact, deformation-resistant transport of thin and sensitive products
- > No ejector, requires compressed air only
- > High holding force: Bernoulli vacuum cups can move up to 1,200 g of mass
- > Perfectly suited for porous products thanks to high volume flow at low vacuum level
- > Series made of PEEK (approval according to FDA / EC 1935 / 2004) for direct contact with food and ease of cleaning

> See page 498



### Foam grippers

- > Handling of individual products or layers without the need to change the gripper and regardless of workpiece positioning
- > Integrated vacuum generation or external compressor for use with particularly air-permeable workpieces
- > Versions available with leakage reduction or flow valves

> See page 477



## FIPA Special vacuum cups SX



### Hand grippers - SX-G

- > Sturdy gripper for the manual handling of flat, smooth products
- > No vacuum source required
- > Simple handling - release of the product via a release button

> See page 168



### Sealing cords - SX-D

- > Long-length version for DIY production of individual vacuum suction plates
- > Ideal adaptation to special product shapes

> See page 169



## Series | Special vacuum cups SX

High temperature vacuum cups with felt pad - SX-F

### High temperature vacuum cups with felt pad - SX-F

**HEAT RESISTANT  
& LOW MARKING**



#### Product Description

Almost mark-free special vacuum cup for high temperature requirements, e.g. in the glass industry. Special felt pad vulcanised to elastomer carrier. Migration of silicone particles is prevented by vapour-deposited aluminium layer. Connection up to  $\varnothing$  70 mm by means of plug-in nipple, from  $\varnothing$  90 mm with bolted bracket plate.


#### Advantage

- > Temperature-resistant up to 500 °C (SI)
- > Almost mark-free
- > Cost-effective replacement of worn seals


#### Notes:

There is a small leak at first use resulting from the texture of the special felt, but after a brief period of use this will be significantly reduced by the thickening of the felt layer.

#### Technical data

Item no.	Model / Lip dimensions	 Number of bellows	Weight [g]	Max. operating temperature [°C]	Material / Colour	Number of bellows
26.025.009._*	SX-F-25	2	6	500	SI (tr/ge)	--
26.037.010._*	SX-F-40	3	10	500	SI (tr/ge)	--
26.070.011._*	SX-F-70	7	24	500	SI (tr/ge)	--
26.090.001._*	SX-F-90	17	80	500, 300	SI (tr/ge), FKM (sw/ge)	1.5
26.120.002._*	SX-F-120	18	140	300	FKM (sw/ge)	1.5
26.160.003._*	SX-F-160	18	205	300	FKM (sw/ge)	1.5

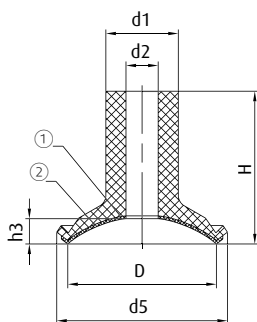
#### Accessories

Item no.	 Suitable fittings				
	G1/8-male	G1/8-female	G1/4-male	G1/4-female	G3/8-female
26.025.009._*	270.132 (p.417)	270.114 (p.422)	270.208 (p.425)	270.178 (p.431)	--
26.037.010._*	270.132 (p.417)	270.114 (p.422)	270.208 (p.425)	270.178 (p.431)	--
26.070.011._*	270.132 (p.417)	270.114 (p.422)	270.208 (p.425)	270.178 (p.431)	--
26.090.001._*	--	--	--	--	270.400 (p.436)
26.120.002._*	--	--	--	--	270.402 (p.436)
26.160.003._*	--	--	--	--	270.404 (p.436)

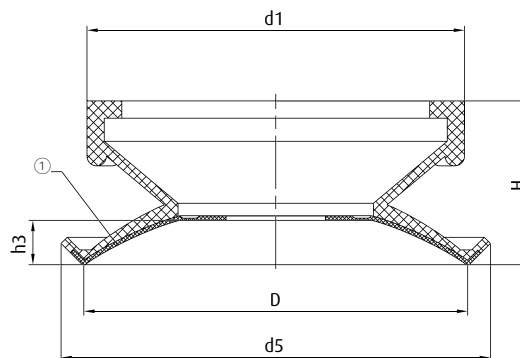
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for vacuum cups you will find on page 760



Dimensions



Drawing A



Drawing B

① = Felt pads ② = For silicone vacuum cups: Silicone membrane by evaporated aluminium layer

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d5 [mm]	H [mm]	h3 [mm]
26.025.009._*	A	24	16	8	29	36	3.3
26.037.010._*	A	37	18	8	42	38	6.5
26.070.011._*	A	67	21	8	71	36	8
26.090.001._*	B	89	87	--	99	38	10.5
26.120.002._*	B	120	108	--	129	45	17.5
26.160.003._*	B	150	130	--	161	48	16.5

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Special vacuum cups SX

Vacuum cups with sponge pad - SX-SH

## Vacuum cups with sponge pad - SX-SH




### Product Description

Low-marking flat vacuum cup with contact surface of special silicone sponge.  
Soft sponge coating compensates for unevenness.  
Connection via an interlocking snap-in plug-in nipple.







### Advantage

- > Very low-marking on polished surfaces
- > Flat sealing prevents leakage
- > Cost-effective replacement of worn seals

### Technical data

Item no.	Model / Lip dimensions		Max. operating temperature [°C]	Material / Colour
104.008.082.*	SX-SH-8	0.5	200	SI (bl/r)
104.009.083.*	SX-SH-9	0.5	200	SI (bl/r)
104.013.084.*	SX-SH-13	0.5	200	SI (bl/r)
104.015.085.*	SX-SH-15	1	200	SI (bl/r)
104.020.086.*	SX-SH-20	1.5	200	SI (bl/r)
104.030.087.*	SX-SH-30	1.5	200	SI (bl/r)
104.040.088.*	SX-SH-40	2.5	200	SI (bl/r)

### Accessories

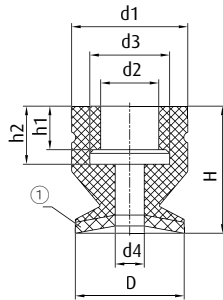
Item no.	 Suitable fittings					 Suitable spring levelers (Snap-In)					
	M5-male	G1/8-male	G1/8-female	G1/4-male	G1/4-female	Spring leveler	 Spring leveler	 Spring leveler	 Spring leveler	 Spring leveler	
104.008.082.*	270.200 (p.411)	270.064 (p.418)	270.065 (p.422)	--	--	50.018 (p.454)	8.5	50.141 (p.456)	10	--	--
104.009.083.*	270.200 (p.411)	270.064 (p.418)	270.065 (p.422)	--	--	50.018 (p.454)	8.5	50.141 (p.456)	10	--	--
104.013.084.*	270.200 (p.411)	270.064 (p.418)	270.065 (p.422)	--	--	50.018 (p.454)	8.5	50.141 (p.456)	10	--	--
104.015.085.*	--	270.012 (p.421)	270.020 (p.423)	270.034 (p.428)	270.038 (p.432)	50.005 (p.456)	5	50.145 (p.456)	10	50.146 (p.456)	30
104.020.086.*	--	270.012 (p.421)	270.020 (p.423)	270.034 (p.428)	270.038 (p.432)	50.005 (p.456)	5	50.145 (p.456)	10	50.146 (p.456)	30
104.030.087.*	--	270.012 (p.421)	270.020 (p.423)	270.034 (p.428)	270.038 (p.432)	50.005 (p.456)	5	50.145 (p.456)	10	50.146 (p.456)	30
104.040.088.*	--	270.012 (p.421)	270.020 (p.423)	270.034 (p.428)	270.038 (p.432)	50.005 (p.456)	5	50.145 (p.456)	10	50.146 (p.456)	30

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

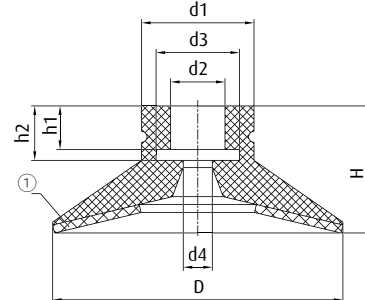




Dimensions



Drawing A



Drawing B

① = Silicone sponge

Item no.	Drawing	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	Ø d4 [mm]	H [mm]	h1 [mm]	h2 [mm]
104.008.082.*	A	8	10.5	5	7	3	14	3	5
104.009.083.*	A	9	10.5	5	7	3	14	3	5
104.013.084.*	A	13	10.5	5	7	3	14	3	5
104.015.085.*	A	15	15.5	7.5	11.5	4	17.5	6	8
104.020.086.*	A	20	15.5	7.5	11.5	4	17.5	6	8
104.030.087.*	B	30	15.5	7.5	11.5	4	17.5	6	8
104.040.088.*	B	40	15.5	7.5	11.5	4	17.5	6	8

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760



# Series | Special vacuum cups SX

## Hand grippers - SX-G

### Hand grippers - SX-G



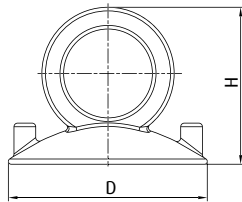
#### Product Description

Sturdy gripper for the manual handling of flat, smooth products.  
No vacuum source required. Simple handling.  
Release of the product via a release button.

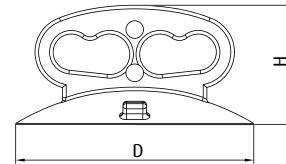
#### Technical data

Item no.	Model / Lip dimensions	Tearing force [kg]	Material / Colour
64.001.*	SX-G-55	14	Vinyl (sw)
64.002.*	SX-G-65	19	Vinyl (sw)
64.003.*	SX-G-75	22	Vinyl (sw)
64.004.*	SX-G-125	25	NBR (sw)
64.005.*	SX-G-130	28	Vinyl (sw)

#### Dimensions



Drawing A



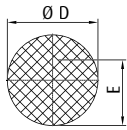
Drawing B

Item no.	Drawing	Ø D [mm]	H [mm]
64.001.*	A	54	42
64.002.*	A	66	48
64.003.*	B	82	42
64.004.*	B	115	63
64.005.*	B	121	65



### Sealing cord, round - SX-D

Long-length version for production of individual vacuum suction plates



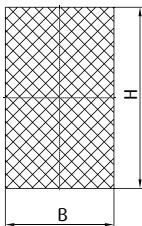
Technical data				Dimensions
Item no.	Model / Lip dimensions	Recommended installation depth E [mm]	Material / Colour	Ø D [mm]
<b>231.05.026.12</b>	SX-D-5	3.7	CR (sw)	5
<b>231.06.011.12</b>	SX-D-6	4.5	CR (sw)	6
<b>231.08.012.12</b>	SX-D-8	6	CR (sw)	8
<b>231.10.013.12</b>	SX-D-10	7	CR (sw)	10
<b>231.12.014.12</b>	SX-D-12	8.5	CR (sw)	12

#### Ordering notes:

Minimum standard length: 1,000 mm

### Sealing cord, rectangular - SX-D

Long-length version for production of individual vacuum suction plates



Technical data			Dimensions	
Item no.	Model / Lip dimensions	Material / Colour	B [mm]	H [mm]
<b>231.10x6.006.12</b>	SX-D-10x6	CR (gr)	6	10
<b>231.20x10.027.12</b>	SX-D-20x10	EPDM (sw)	10	20

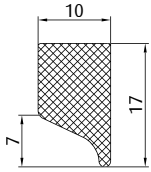
#### Ordering notes:

Minimum standard length: 1,000 mm



## Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



### Technical data

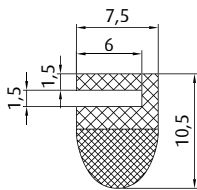
<b>Item no.</b>	<b>Material / Colour</b>
<b>231.17x10.025.12</b>	NR (gr)

### Ordering notes:

Minimum standard length: 1,000 mm

## Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



### Technical data

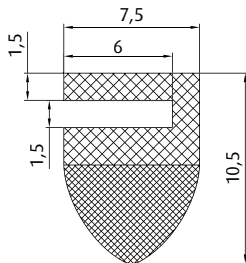
<b>Item no.</b>	<b>Material / Colour</b>
<b>231.10,5x7,5.001.12</b>	EPDM (sw) - 80°/30° Shore A

### Ordering notes:

Minimum standard length: 1,000 mm

## Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



### Technical data

<b>Item no.</b>	<b>Material / Colour</b>
<b>231.10,5x7,5.002.12</b>	EPDM (sw) - 80°/30° Shore A

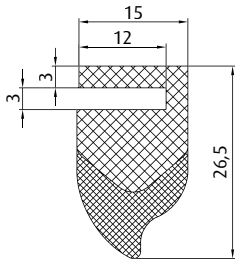
### Ordering notes:

Minimum standard length: 1,000 mm



### Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



#### Technical data

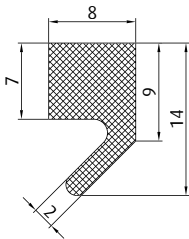
Item no.	Material / Colour
231.26,5x15.003.12	EPDM (sw) - 80°/30° Shore A

#### Ordering notes:

Minimum standard length: 1,000 mm

### Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



#### Technical data

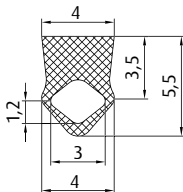
Item no.	Material / Colour
231.14x8x2.009.12	Sponge rubber (gr)

#### Ordering notes:

Minimum standard length: 1,000 mm

### Sealing cord, profiled - SX-D

Long-length version for production of individual vacuum suction plates



#### Technical data

Item no.	Material / Colour
231.5,5x4.015.2tr	SI (tr)

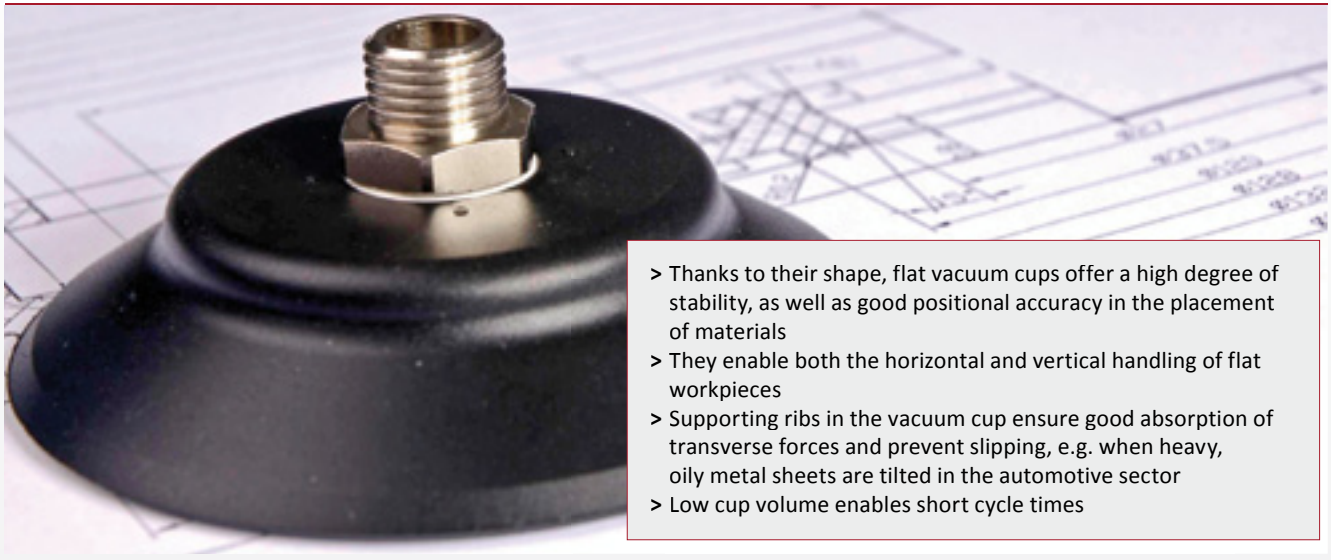
#### Ordering notes:

1 packaging unit = 25 m



Flat vacuum cups by $\varnothing$ .....	174
Bellows vacuum cups by $\varnothing$ .....	283
Oval vacuum cups by size .....	363
Ring and segment vacuum cups .....	404

## Application / Uses



- > Thanks to their shape, flat vacuum cups offer a high degree of stability, as well as good positional accuracy in the placement of materials
- > They enable both the horizontal and vertical handling of flat workpieces
- > Supporting ribs in the vacuum cup ensure good absorption of transverse forces and prevent slipping, e.g. when heavy, oily metal sheets are tilted in the automotive sector
- > Low cup volume enables short cycle times

## Designs



- > FIPA flat vacuum cups are available with or without supporting ribs
- > Support ribs in the vacuum cup ensure significantly better suction by enlarging the active suction surface
- > They prevent the sucking in and deformation of flexible workpieces
- > Support ribs are especially recommended for:
  - flexible products
  - rapid acceleration of the machine

## Methods of connection



### Vacuum cups for attaching to the fittings (plug-in)

- > Secure hold
- > Quick replacement
- > Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced



### Bolted fittings

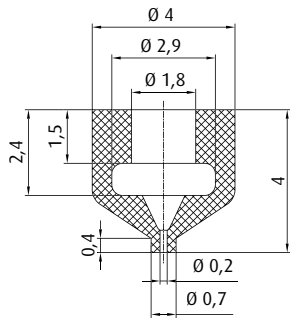
- > Vacuum cups are bolted from below into a threaded counterpart using a hollow bolt
- > Extremely secure hold
- > Eliminates twisting of the vacuum cups
- > Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced



### Vulcanised fittings / retainer plate

- > Very secure hold
- > Secured against rotation
- > High degree of dimensional stability





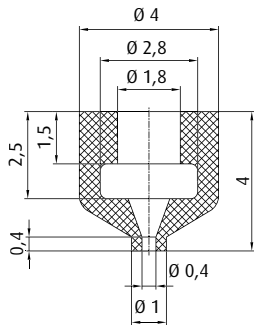
	Connection	see page
270.524	M3-male	408

**Item no.**  
102.001.425.\_\*

**Material**  
NBR (sw), SI-AS (sw)

0 mm

Additional sizes available are found on p. 38.



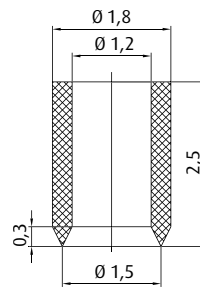
	Connection	see page
270.524	M3-male	408

**Item no.**  
102.001.463.\_\*

**Material**  
NBR (sw), SI-AS (sw)

0 mm

Additional sizes available are found on p. 38.



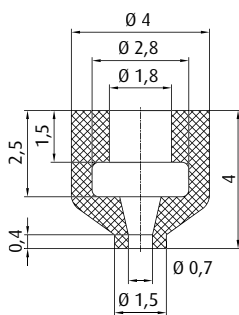
	Connection	see page
270.011	M3-male	408

**Item no.**  
102.001.002.\_\*

**Material**  
NBR (sw), SI (tr)

0.3 mm

Additional sizes available are found on p. 32.  
**Ordering notes:** Packing unit = 10 pieces



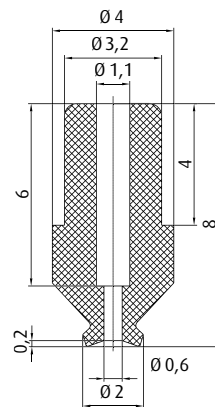
	Connection	see page
270.524	M3-male	408

**Item no.**  
102.002.464.\_\*

**Material**  
NBR (sw), SI-AS (sw)

0 mm

Additional sizes available are found on p. 38.



	Connection	see page
270.427	M3-male	408

**Item no.**  
102.002.279.\_\*

**Material**  
NBR (sw), SI (tr), SI-AS (sw),  
PU (bl), FKM (gr)

0.2 mm

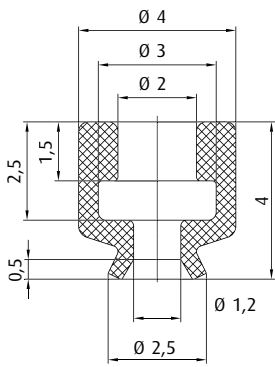
Additional sizes available are found on p. 38.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

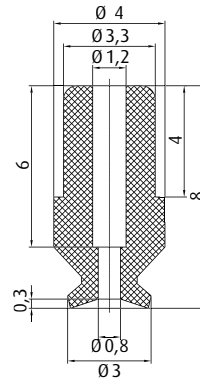
Ø 2 - 4 mm



	Connection	see page
270.014	M3-male	408
270.300	M5-male	411

<b>Item no.</b> 102.002.004._*	<b>Material</b> NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl)	0.4 mm
-----------------------------------	---	--------

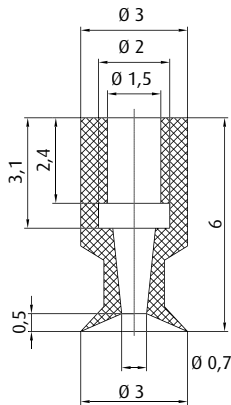
Additional sizes available are found on p. 32.  
Ordering notes: Packing unit = 10 pieces



	Connection	see page
270.427	M3-male	408

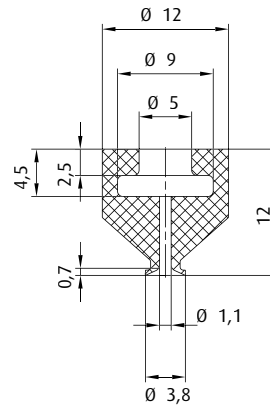
<b>Item no.</b> 102.003.280._*	<b>Material</b> NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.3 mm
-----------------------------------	--	--------

Additional sizes available are found on p. 38.



	Connection	see page
270.025	M3-male	408

<b>Item no.</b> 102.003.480._*	<b>Material</b> NBR (sw)	0.3 mm
-----------------------------------	-----------------------------	--------

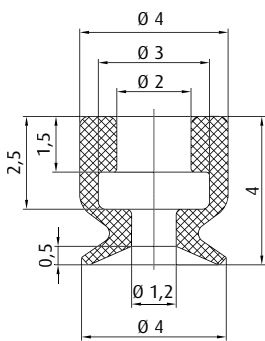


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

<b>Item no.</b> 102.004.216._*	<b>Material</b> NBR (sw), SI (tr)	1 mm
-----------------------------------	--------------------------------------	------

Additional sizes available are found on p. 50.

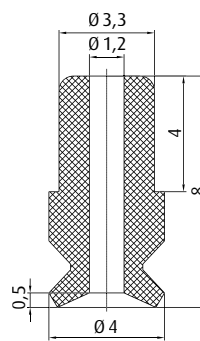


	Connection	see page
270.014	M3-male	408
270.300	M5-male	411

**BESTSELLER**

<b>Item no.</b> 102.003.005._*	<b>Material</b> NBR (sw), NBR-AS (sw), SI (tr), SI-AS (sw), PU (bl), FKM (sw)	0.5 mm
-----------------------------------	---	--------

Additional sizes available are found on p. 32.  
Ordering notes: Packing unit = 10 pieces

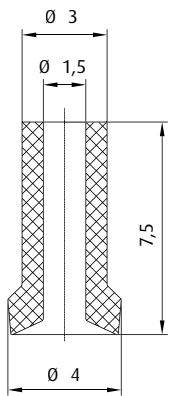


	Connection	see page
270.427	M3-male	408

<b>Item no.</b> 102.004.281._*	<b>Material</b> NBR (sw), SI (tr), SI-AS (sw), PU (bl), FKM (gr)	0.3 mm
-----------------------------------	--	--------

Additional sizes available are found on p. 38.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



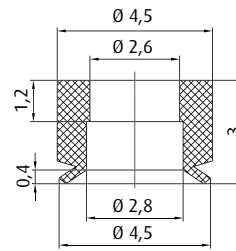
	<b>Connection</b>	<b>see page</b>
270.025	M3-male	408

**Item no.**  
112.004.001.\_\*

**Material**  
NBR (sw), SI (r)

0.5 mm

Additional sizes available are found on p. 52.

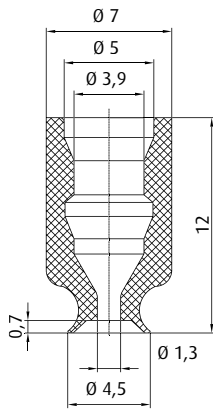


	<b>Connection</b>	<b>see page</b>
270.014	M3-male	408
270.111	M4-male	408

**Item no.**  
102.005.115.\_\*

**Material**  
NBR (sw), SI (tr)

0.5 mm

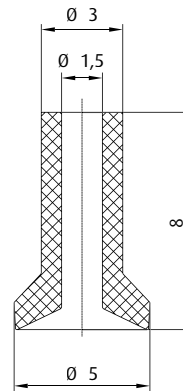


	<b>Connection</b>	<b>see page</b>
270.399	M5-male	410

**Item no.**  
102.005.391.\_\*

**Material**  
SI (tr)

0.5 mm



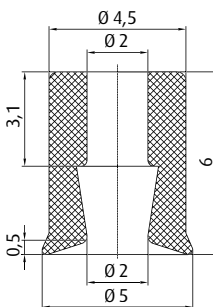
	<b>Connection</b>	<b>see page</b>
270.025	M3-male	408

**Item no.**  
112.005.002.\_\*

**Material**  
NBR (sw), SI (r)

0.7 mm

Additional sizes available are found on p. 52.



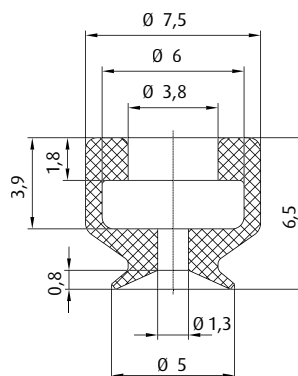
	<b>Connection</b>	<b>see page</b>
270.153	M5-male	409

**Item no.**  
102.005.090.\_\*

**Material**  
SI (tr), CR (sw)

0.5 mm

Additional sizes available are found on p. 42.



	<b>Connection</b>	<b>see page</b>
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422
	<b>see page</b>	
50.330	10 mm	454

**Item no.**  
102.005.009.\_\*

**Material**  
NBR (sw), SI (tr), SI-AS (sw),  
FKM (sw)

0.9 mm

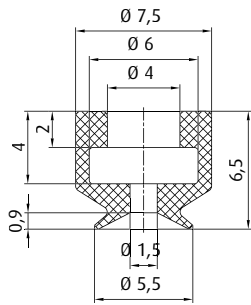
Additional sizes available are found on p. 32.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 5 - 6 mm



Icon	Connection	see page
	M5-male	411
	M5-female	412
	G1/8-male	417
	G1/8-female	422

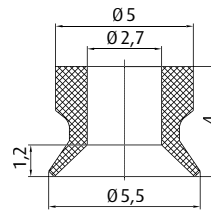
Icon	Icon	see page
	10 mm	454

**Item no.**  
102.005.496.\_\*

**Material**  
Thermalon® (bl)

0.9 mm

Additional sizes available are found on p. 36.

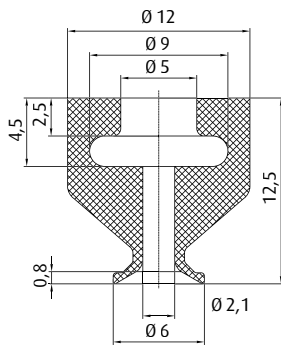


Icon	Connection	see page
	M3-male	408

**Item no.**  
102.005.081.\_\*

**Material**  
NBR (sw), SI (tr), SI-AS (sw)

0.9 mm



Icon	Connection	see page
	M5-male	411
	G1/8-male	418
	G1/8-female	422

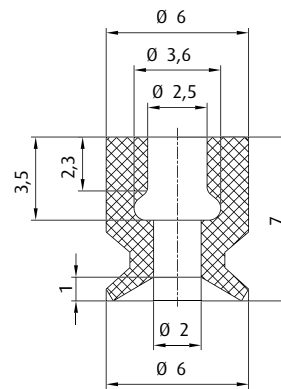
Icon	Icon	see page
	8.5 mm	454
	8.5 mm	454

**Item no.**  
102.006.217.\_\*

**Material**  
NBR (sw), SI (tr)

1 mm

Additional sizes available are found on p. 50.



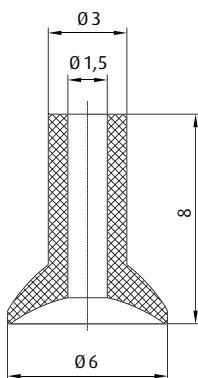
Icon	Connection	see page
	M5-male	409

**Item no.**  
102.006.282.\_\*

**Material**  
NBR (sw), SI (tr), SI-AS (sw),  
PU (bl), FKM (gr)

0.5 mm

Additional sizes available are found on p. 38.



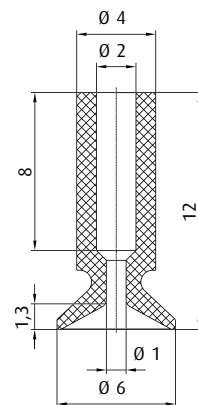
Icon	Connection	see page
	M3-male	408

**Item no.**  
112.006.003.\_\*

**Material**  
NBR (sw), SI (tr)

1 mm

Additional sizes available are found on p. 52.



Icon	Connection	see page
	M5-male	409

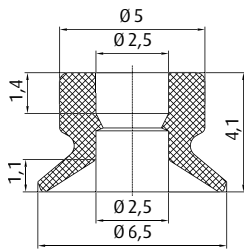
**Item no.**  
122.006.002.\_\*

**Material**  
NBR (sw), SI (tr), Vulkollan® (br)

1.5 mm

Additional sizes available are found on p. 56.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

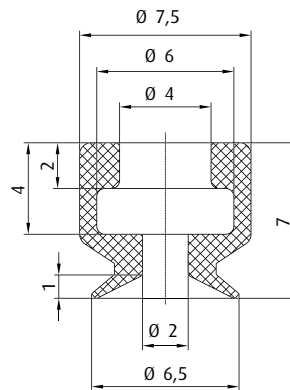


	Connection	see page
270.111	M4-male	408
270.300	M5-male	411

**Item no.**  
102.006.297.\_\*

**Material**  
NBR (sw)

0.8 mm



	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.330	10 mm	454

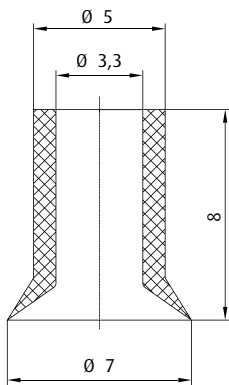
**BESTSELLER**

**Item no.**  
102.006.013.\_\*

**Material**  
NBR (sw), SI (tr), SI-AS (sw),  
PU (bl), FKM (sw)

1 mm

Additional sizes available are found on p. 32.

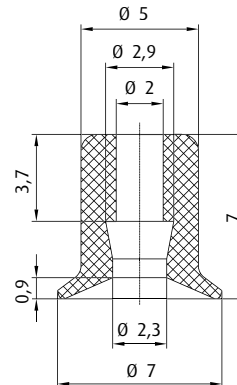


	Connection	see page
270.536	M5-male	409

**Item no.**  
112.006.004.\_\*

**Material**  
NBR (sw), SI (tr)

1 mm



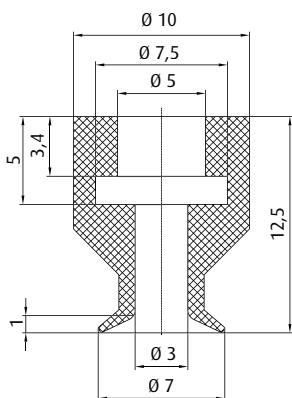
	Connection	see page
270.153	M5-male	409

**Item no.**  
102.007.091.\_\*

**Material**  
SI (tr), CR (sw)

1 mm

Additional sizes available are found on p. 42.

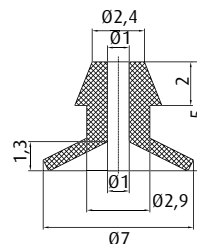


	Connection	see page
270.037	M5-male	411
270.085	G1/8-male	418
270.086	G1/8-female	422

**Item no.**  
102.007.109.\_\*

**Material**  
SI (r), SI-AS (sw)

1.6 mm



	Connection	see page
270.025	M3-male	408

**Item no.**  
102.007.266.\_\*

**Material**  
SI (tr)

1.5 mm

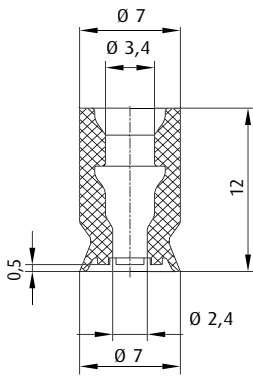
Additional sizes available are found on p. 22.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 7 - 8 mm

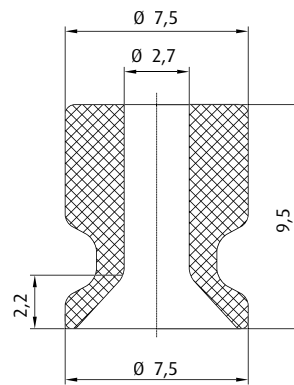


Icon	Connection	see page
	M5-male	410

**Item no.**  
102.007.484.\_\*

**Material**  
SI (tr)

0.8 mm

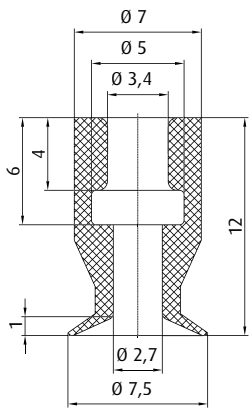


Icon	Connection	see page
	M5-male	409

**Item no.**  
102.008.187.\_\*

**Material**  
NR (sw)

1.5 mm

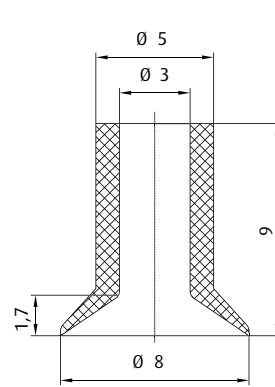


Icon	Connection	see page
	M5-male	411
	M5-female	412
	G1/8-male	417
	G1/8-female	422

**Item no.**  
102.008.392.\_\*

**Material**  
SI (tr)

0.5 mm

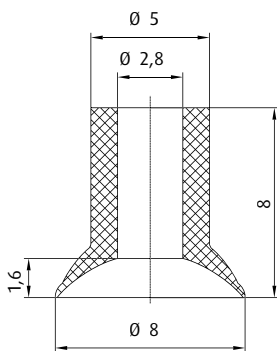


Icon	Connection	see page
	M5-male	409

**Item no.**  
102.008.395.\_\*

**Material**  
NBR (sw)

0.9 mm

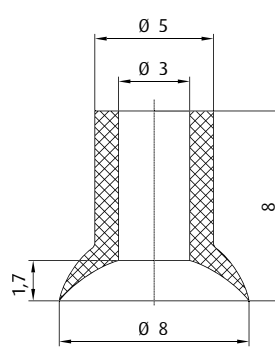


Icon	Connection	see page
	M5-male	409

**Item no.**  
112.008.007.\_\*

**Material**  
NBR (sw), SI (w), NR (sw)

1.5 mm



Icon	Connection	see page
	M5-male	409

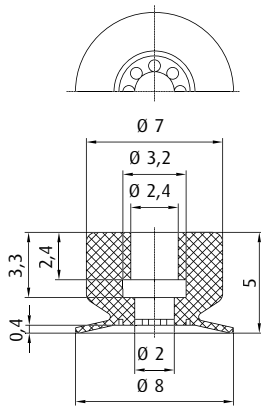
**Item no.**  
112.008.009.\_\*

**Material**  
SI (tr), NR (sw), NR (br)

1 mm

Additional sizes available are found on p. 52.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
	M5-male	409

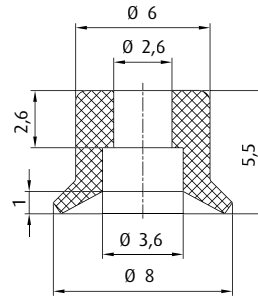
**VERY FLEXIBLE**

**Item no.**  
**104.008.070.\***

**Material**  
NBR (sw), SI-FS (r)

0.5 mm

Additional sizes available are found on p. 20.  
This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 20 mm



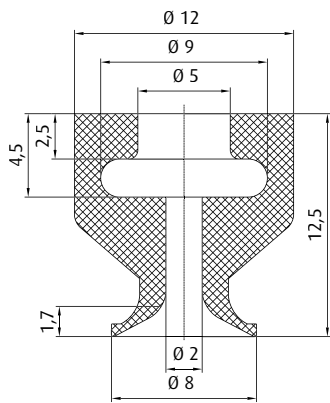
	Connection	see page
	M5-male	409

**Item no.**  
**102.008.283.\***

**Material**  
NBR (sw), SI (tr), SI-AS (sw),  
PU (bl), FKM (gr)

1 mm

Additional sizes available are found on p. 38.



	Connection	see page
	M5-male	411
	G1/8-male	418
	G1/8-female	422

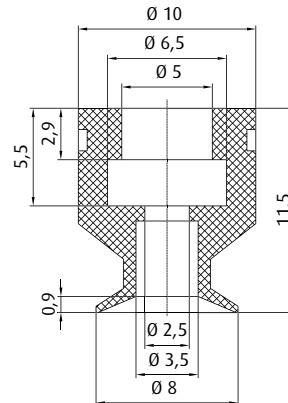
	see page
	454
	454

**Item no.**  
**102.008.218.\***

**Material**  
NBR (sw), SI (tr)

1 mm

Additional sizes available are found on p. 50.

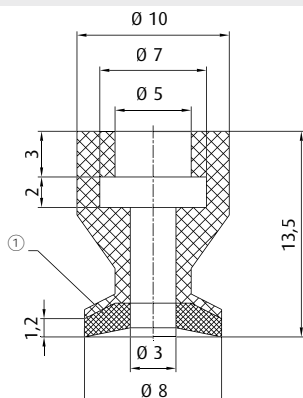


	Connection	see page
	M5-male	411
	M5-female	412
	G1/8-male	417
	G1/8-female	422

**Item no.**  
**102.008.227.\***

**Material**  
SI (tr)

0.5 mm



	Connection	see page
	M5-male	411
	M5-male	411
	G1/8-male	418
	G1/8-female	422

	see page
	454
	456

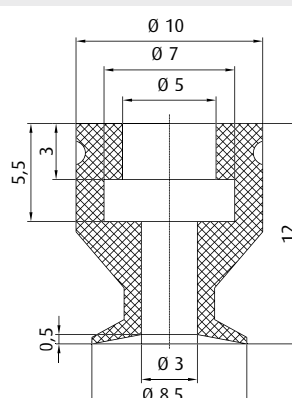
① = Silicone sponge

**Item no.**  
**104.008.082.\***

**Material**  
SI (bl/r)

0.5 mm

Additional sizes available are found on p. 166.



	Connection	see page
	M5-male	411
	G1/8-male	418
	G1/8-female	422

	see page
	454
	456

**Item no.**  
**102.008.362.\***

**Material**  
SI (bl)

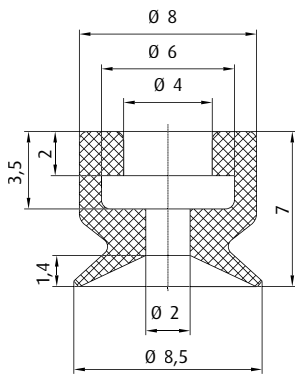
0.6 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 8 - 9 mm



Connection	see page
<b>270.010</b> M5-male	411
<b>270.005</b> M5-female	412
<b>270.009</b> G1/8-male	417
<b>270.007</b> G1/8-female	422

Connection	see page
<b>50.330</b> 10 mm	454

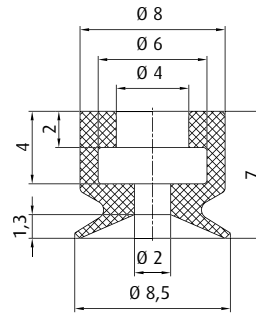
**BESTSELLER**

**Item no.**  
**102.008.017.\_\***

**Material**  
NBR (sw), SI (tr), SI-AS (sw),  
PU (bl), FKM (sw)

1.4 mm

Additional sizes available are found on p. 32.



Connection	see page
<b>270.010</b> M5-male	411
<b>270.005</b> M5-female	412
<b>270.009</b> G1/8-male	417
<b>270.007</b> G1/8-female	422

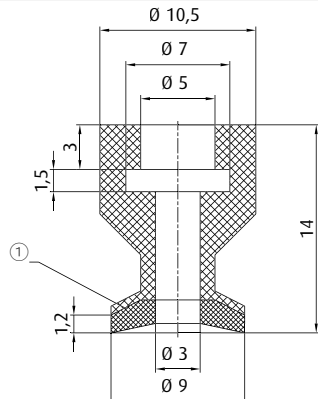
Connection	see page
<b>50.330</b> 10 mm	454

**Item no.**  
**102.008.497.\_\***

**Material**  
Thermalon® (bl)

1.3 mm

Additional sizes available are found on p. 32.



① = Silicone sponge

Connection	see page
<b>270.200</b> M5-male	411
<b>270.064</b> G1/8-male	418
<b>270.065</b> G1/8-female	422

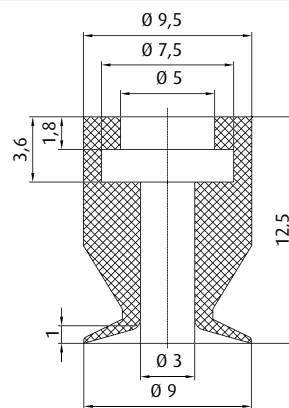
Connection	see page
<b>50.141</b> 10 mm	456
<b>50.018</b> 8.5 mm	454

**Item no.**  
**104.009.083.\_\***

**Material**  
SI (bl/r)

0.5 mm

Additional sizes available are found on p. 166.



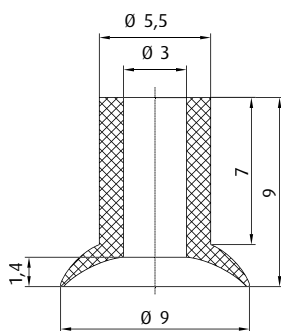
Connection	see page
<b>270.200</b> M5-male	411
<b>270.064</b> G1/8-male	418
<b>270.065</b> G1/8-female	422

Connection	see page
<b>50.018</b> 8.5 mm	454
<b>50.141</b> 10 mm	456

**Item no.**  
**102.009.111.\_\***

**Material**  
SI (tr)

1 mm

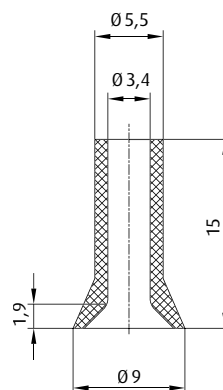


Connection	see page
<b>270.536</b> M5-male	409

**Item no.**  
**102.009.174.\_\***

**Material**  
Vinyl (bl)

1 mm



Connection	see page
<b>270.134</b> M5-male	409
<b>270.104</b> M6-male	413
<b>270.033</b> G1/8-male	416
<b>270.478</b> G1/8-female	421

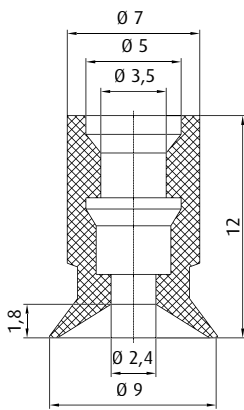
**Item no.**  
**107.009.001.\_\***

**Material**  
SI (tr), NR (br)

1.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



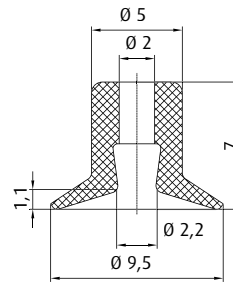


	Connection	see page
270.399	M5-male	410

**Item no.**  
102.008.228.\_\*

**Material**  
SI (tr)

0.8 mm



	Connection	see page
270.153	M5-male	409

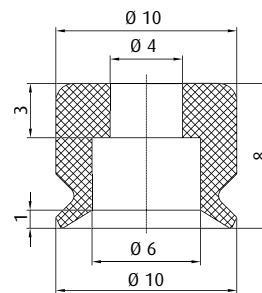
**BESTSELLER**

**Item no.**  
102.009.092.\_\*

**Material**  
SI (tr), CR (sw)

1.5 mm

Additional sizes available are found on p. 42.



	Connection	see page
270.010	M5-male	411
270.009	G1/8-male	417
270.007	G1/8-female	422

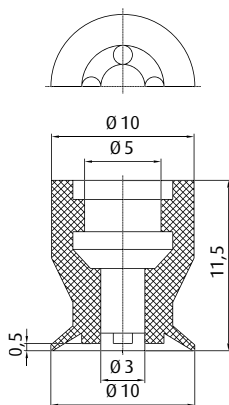
		see page
50.103	6 mm	454
50.104	6 mm	454
50.125	10 mm	454
50.126	15 mm	454
50.127	20 mm	454

**Item no.**  
102.010.284.\_\*

**Material**  
NBR (sw), SI (tr), SI-AS (sw),  
PU (bl), FKM (gr)

1 mm

Additional sizes available are found on p. 38.



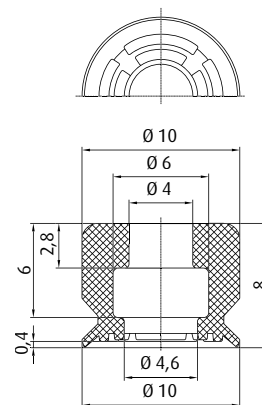
	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
104.010.001.\_\*

**Material**  
NBR (sw), SI (bl)

1.5 mm

This vacuum cup is also available in the following dimensions: 15 mm, 18 mm, 24 mm, 30 mm, 40 mm, 50 mm



	Connection	see page
270.010	M5-male	411
270.009	G1/8-male	417
270.007	G1/8-female	422

		see page
50.103	6 mm	454
50.104	6 mm	454
50.125	10 mm	454
50.126	15 mm	454
50.127	20 mm	454

**Item no.**  
104.010.065.\_\*

**Material**  
NBR (sw)

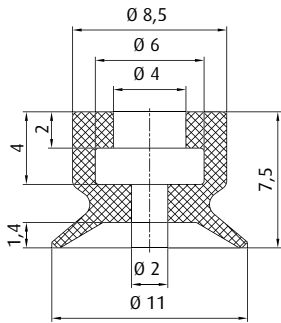
0.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 10 mm



Connection	see page
270.010 M5-male	411
270.005 M5-female	412
270.009 G1/8-male	417
270.007 G1/8-female	422

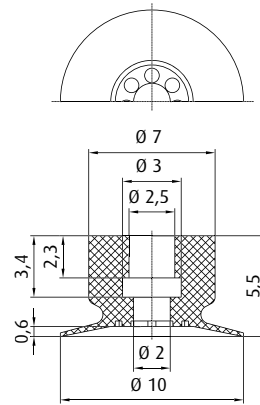
Connection	see page
50.330 10 mm	454

**Item no.**  
102.010.498.\_\*

**Material**  
Thermalon® (bl)

1.5 mm

Additional sizes available are found on p. 36.



Connection	see page
270.283 M5-male	409

**VERY FLEXIBLE**

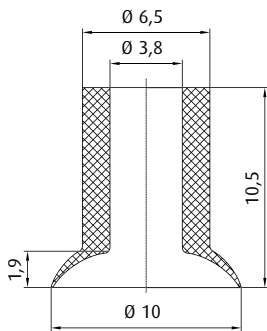
**Item no.**  
104.010.071.\_\*

**Material**  
NBR (sw), SI-FS (r)

0.7 mm

Additional sizes available are found on p. 20.

This vacuum cup is also available in the following dimensions: 8 mm, 15 mm, 20 mm



Connection	see page
270.134 M5-male	409
270.347 M5-female	412
270.104 M6-male	413
270.033 G1/8-male	416
270.478 G1/8-female	421

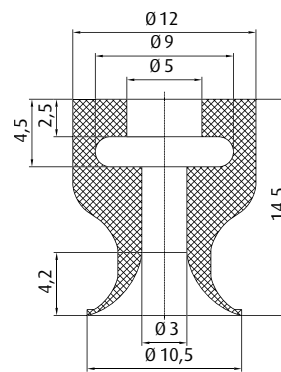
Connection	see page
50.037 25 mm	456

**Item no.**  
112.010.011.\_\*

**Material**  
NBR (sw), SI (w)

2 mm

Additional sizes available are found on p. 52.



Connection	see page
270.200 M5-male	411
270.064 G1/8-male	418
270.065 G1/8-female	422

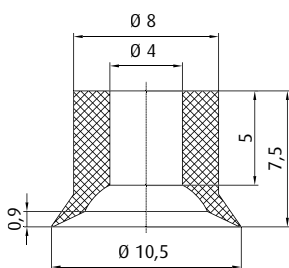
Connection	see page
50.018 8.5 mm	454
50.019 8.5 mm	454

**Item no.**  
102.010.219.\_\*

**Material**  
NBR (sw), SI (tr)

1 mm

Additional sizes available are found on p. 50.

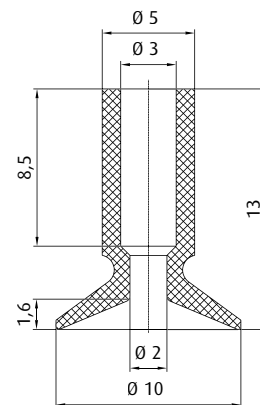


Connection	see page
270.010 M5-male	411
270.005 M5-female	412
270.009 G1/8-male	417
270.007 G1/8-female	422

**Item no.**  
112.010.027.\_\*

**Material**  
NBR (sw), SI (bl)

1.5 mm



Connection	see page
270.022 M5-male	409

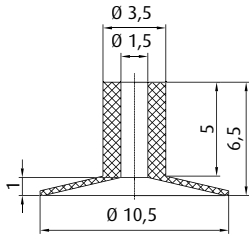
**Item no.**  
122.010.005.\_\*

**Material**  
NBR (sw), SI (tr), Vulkollan® (br)

1.5 mm

Additional sizes available are found on p. 56.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

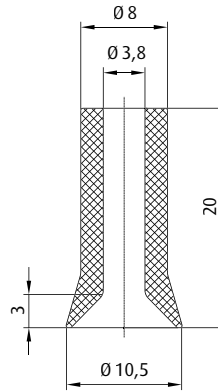


Icon	Connection	see page
	M3-male	408
	M5-male	409

**Item no.**  
102.011.172.\*

**Material**  
Vinyl (bl)

0.5 mm

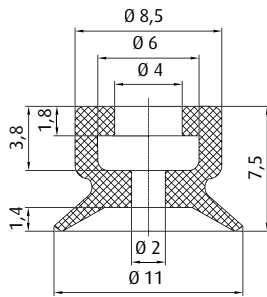


Icon	Connection	see page
	M5-male	409
	M5-female	412
	M6-male	413
	G1/8-male	416
	G1/8-female	421

**Item no.**  
102.011.173.\*

**Material**  
Vinyl (bl)

1.5 mm



Icon	Connection	see page
	M5-male	411
	M5-female	412
	G1/8-male	417
	G1/8-female	422

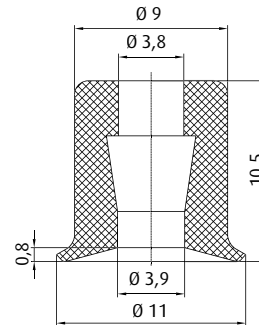
Icon	Connection	see page
	10 mm	454

**Item no.**  
102.010.024.\*

**Material**  
NBR (sw), NBR-AS (sw), SI (tr),  
SI-AS (sw), PU (bl)

1.2 mm

Additional sizes available are found on p. 32.



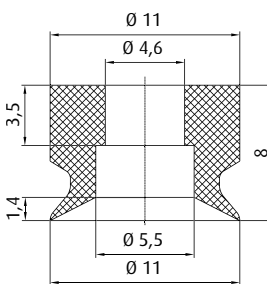
Icon	Connection	see page
	M5-male	409
	M6-male	413

**Item no.**  
102.011.093.\*

**Material**  
SI (tr), CR (sw)

1 mm

Additional sizes available are found on p. 42.

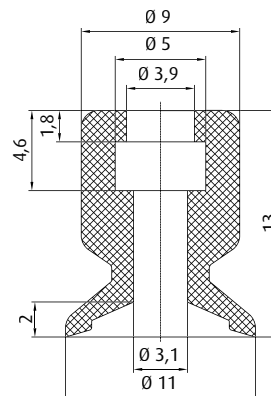


Icon	Connection	see page
	M5-male	411
	M5-female	412
	G1/8-male	417
	G1/8-female	422

**Item no.**  
102.011.181.\*

**Material**  
NBR (sw), SI (tr)

1 mm



Icon	Connection	see page
	M5-male	409
	M5-female	412
	M6-male	413
	G1/8-male	416
	G1/8-female	421

**Item no.**  
102.011.171.\*

**Material**  
Vinyl (bl)

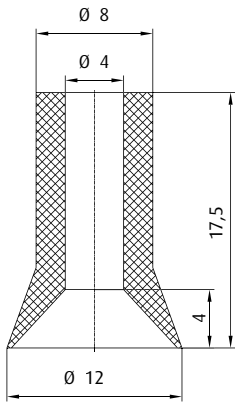
0.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 12 - 13 mm

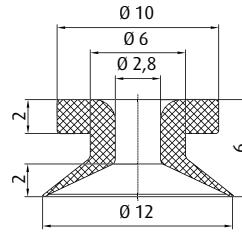


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.  
102.012.101.\*

Material  
NR (br)

2.5 mm



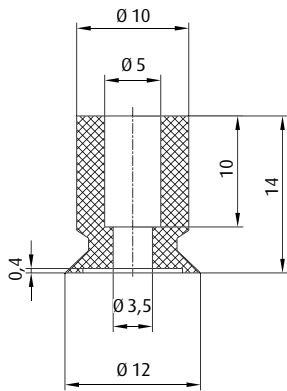
	Connection	see page
270.283	M5-male	409

Item no.  
102.012.267.\*

Material  
NR (bg)

2.5 mm

Additional sizes available are found on p. 22.

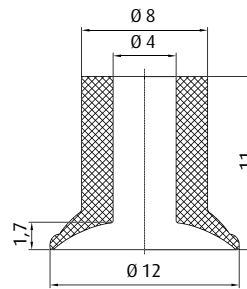


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no.  
107.012.002.\*

Material  
NBR (sw), SI (tr), NR (bg)

0.4 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

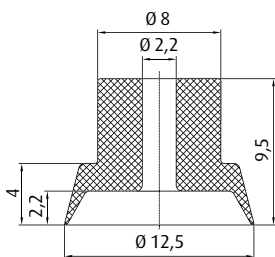
		see page
50.037	25 mm	456

Item no.  
112.012.015.\*

Material  
NBR (sw), SI (w), NR (sw)

2 mm

Additional sizes available are found on p. 52.

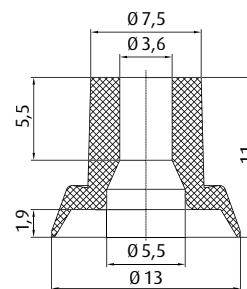


	Connection	see page
270.153	M5-male	409

Item no.  
102.013.070.\*

Material  
NR (bg)

2 mm



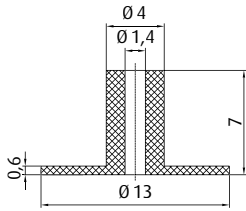
	Connection	see page
270.010	M5-male	411
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.  
102.013.077.\*

Material  
NR (bl)

2 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

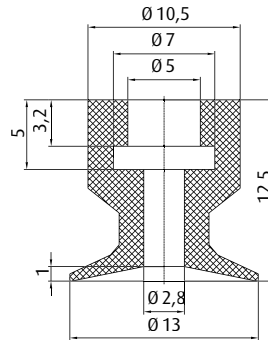


Icon	Connection	see page
	M3-male	408

**Item no.**  
102.013.012.\_\*

**Material**  
SI (tr)

0 mm



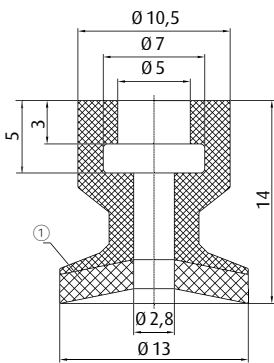
Icon	Connection	see page
	M5-male	411
	G1/8-male	418
	G1/8-female	422

Icon	Icon	see page
	8.5 mm	454
	10 mm	456

**Item no.**  
102.013.363.\_\*

**Material**  
SI (bl)

0.8 mm



Icon	Connection	see page
	M5-male	411
	M5-male	411
	G1/8-male	418
	G1/8-female	422

Icon	Icon	see page
	8.5 mm	454
	10 mm	456

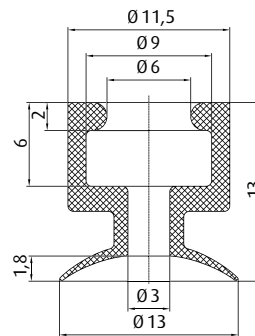
① = Silicone sponge

**Item no.**  
104.013.084.\_\*

**Material**  
SI (bl/r)

0.5 mm

Additional sizes available are found on p. 166.



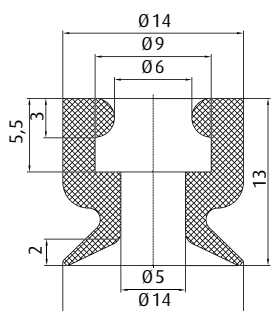
Icon	Connection	see page
	M5-male	411
	M6-male	413
	G1/8-male	418
	G1/8-female	422

**Item no.**  
102.012.332.\_\*

**Material**  
NR (or)

1.5 mm

Additional sizes available are found on p. 24.



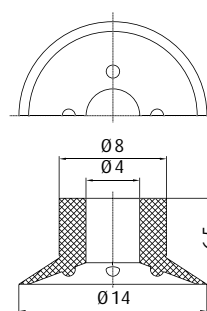
Icon	Connection	see page
	M5-male	411
	M6-male	413
	G1/8-male	418
	G1/8-female	422

**Item no.**  
102.014.333.\_\*

**Material**  
NR (or)

2 mm

Additional sizes available are found on p. 24.



Icon	Connection	see page
	M5-male	411
	G1/8-male	416
	G1/8-female	421

**Item no.**  
104.014.020.\_\*

**Material**  
NBR (sw)

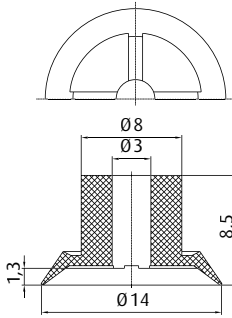
1.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 14 - 15 mm



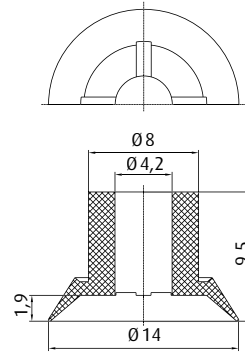
	Connection	see page
270.536	M5-male	409

Item no.  
102.014.089.\_\*

Material  
NBR (sw)

1.5 mm

Additional sizes available are found on p. 20.

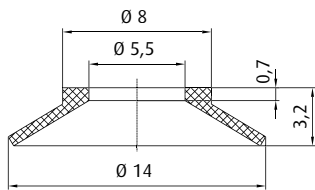


	Connection	see page
270.010	M5-male	411
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.  
104.014.025.\_\*

Material  
SI (tr), NR (sw)

2 mm

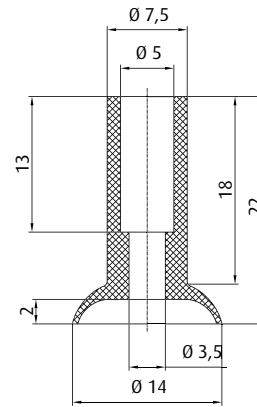


	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

Item no.  
107.014.005.\_\*

Material  
PU (tr)

1.5 mm

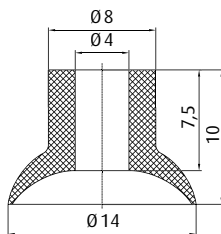


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no.  
115.015.002.\_\*

Material  
NR (bg)

3 mm

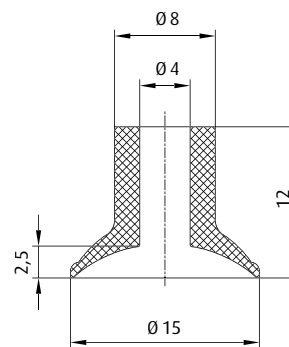


	Connection	see page
270.010	M5-male	411
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.  
112.015.021.\_\*

Material  
NBR (sw), SI (tr)

2 mm



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

		see page
50.037	25 mm	456

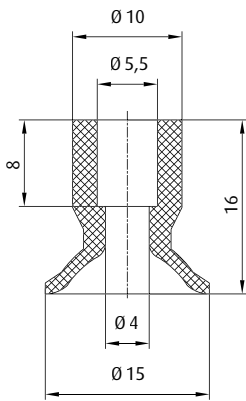
Item no.  
112.015.022.\_\*

Material  
NBR (sw), SI (w), NR (sw)

2 mm

Additional sizes available are found on p. 52.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

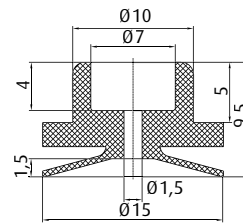


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
122.015.004.\*

**Material**  
CR (sw)

2 mm



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

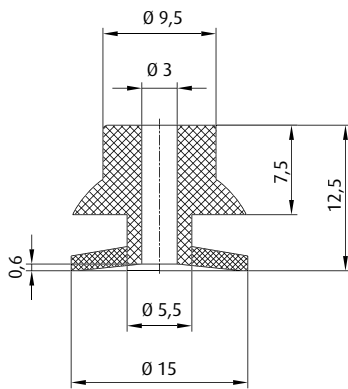
		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

**Item no.**  
102.015.339.\*

**Material**  
Vinyl (bl)

1.5 mm

Additional sizes available are found on p. 22.

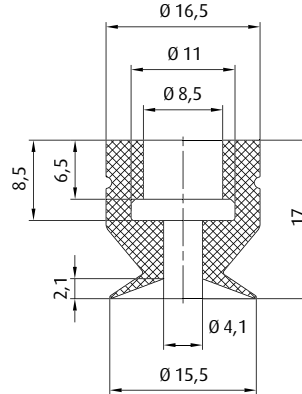


	Connection	see page
270.022	M5-male	409

**Item no.**  
107.015.062.\*

**Material**  
NR (sw)

1.5 mm



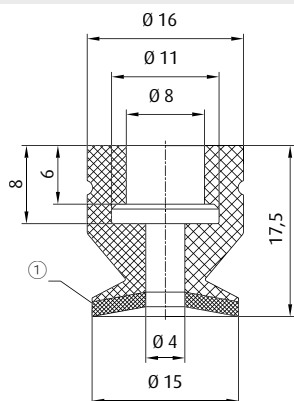
	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

**Item no.**  
102.015.414.\*

**Material**  
SI (bl)

2 mm



	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

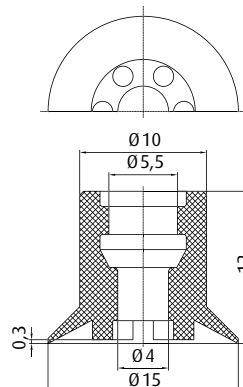
① = Silicone sponge

**Item no.**  
104.015.085.\*

**Material**  
SI (bl/r)

1 mm

Additional sizes available are found on p. 166.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
104.015.002.\*

**Material**  
NBR (sw), SI (bl)

1 mm

This vacuum cup is also available in the following dimensions: 10 mm, 18 mm, 24 mm, 30 mm, 40 mm, 50 mm

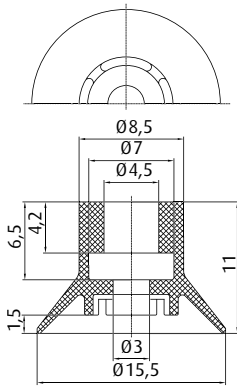
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





# Vacuum cups by size | Flat vacuum cups by Ø

Ø 15 mm

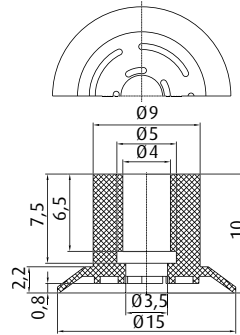


	Connection	see page
270.013	M5-male	410
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
102.015.367.\_\*

**Material**  
Vulkollan® (br)

2 mm



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

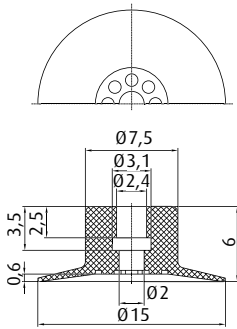
**Item no.**  
102.015.431.\_\*

**Material**  
SI (tr), NR (bg)

0.5 mm

Additional sizes available are found on p. 20.

This vacuum cup is also available in the following dimensions: 24 mm, 28 mm, 30 mm, 40 mm



	Connection	see page
270.283	M5-male	409

**VERY FLEXIBLE**

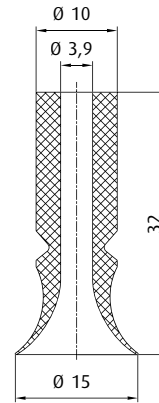
**Item no.**  
104.015.072.\_\*

**Material**  
NBR (sw), SI-FS (r)

1.1 mm

Additional sizes available are found on p. 20.

This vacuum cup is also available in the following dimensions: 8 mm, 10 mm, 20 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

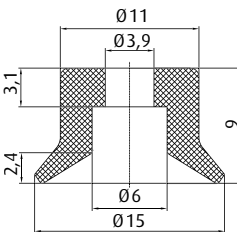
**FOR HIGHLY  
STRUCTURED  
SURFACES (3D)**

		see page
50.037	25 mm	456

**Item no.**  
126.015.002.\_\*

**Material**  
NR (sw), NR (bg)

6 mm



	Connection	see page
270.010	M5-male	411
270.009	G1/8-male	417
270.007	G1/8-female	422

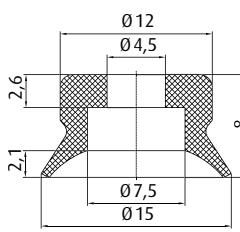
		see page
50.103	6 mm	454
50.104	6 mm	454
50.125	10 mm	454
50.126	15 mm	454
50.127	20 mm	454

**Item no.**  
102.015.285.\_\*

**Material**  
NBR (sw), SI (tr), SI-AS (sw),  
PU (bl), FKM (gr)

1.5 mm

Additional sizes available are found on p. 38.



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

**Item no.**  
102.015.030.\_\*

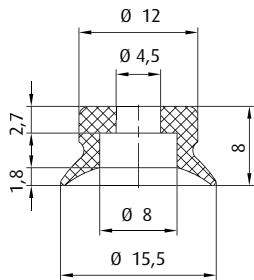
**Material**  
NBR (sw), SI (tr), PU (bl)

2 mm

Additional sizes available are found on p. 32.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





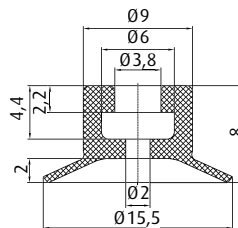
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422
		see page
50.330	10 mm	454

**Item no.**  
102.015.499.\*

**Material**  
Thermalon® (bl)

1.9 mm

Additional sizes available are found on p. 36.



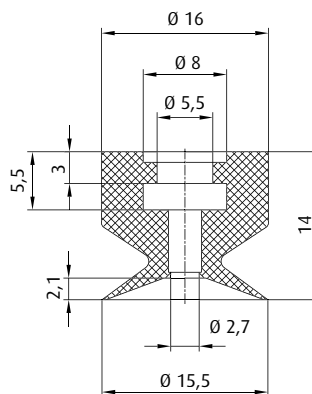
	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422
		see page
50.330	10 mm	454

**Item no.**  
102.015.309.\*

**Material**  
NBR (sw), SI (tr), PU (bl)

1.9 mm

Additional sizes available are found on p. 32.

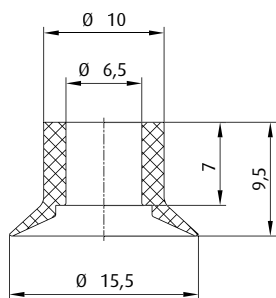


	Connection	see page
270.037	M5-male	411
270.085	G1/8-male	418
270.086	G1/8-female	422

**Item no.**  
102.016.319.\*

**Material**  
PU (bl)

2 mm

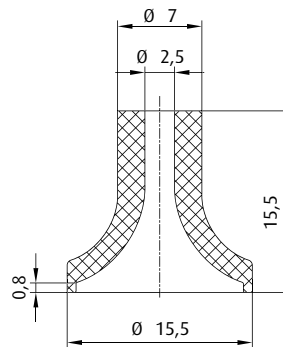


	Connection	see page
270.250	G1/8-male	418

**Item no.**  
102.016.146.\*

**Material**  
NR (gr)

2 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**Item no.**  
102.016.138.\*

**Material**  
NR (bg)

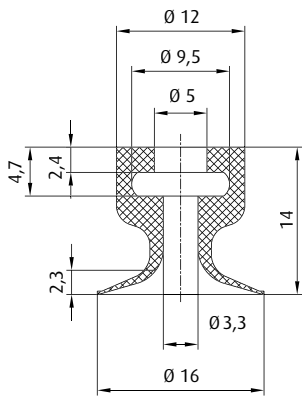
3.2 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

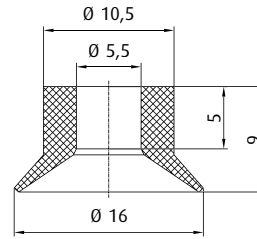
Ø 16 mm



Icon	Connection	see page
	M5-male	411
	G1/8-male	418
	G1/8-female	422
	8.5 mm	454
	8.5 mm	454

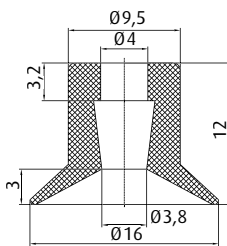
**Item no.** 102.015.220.\* **Material** NBR (sw), SI (tr) 2 mm

Additional sizes available are found on p. 50.



Icon	Connection	see page
	M5-male	411
	G1/8-male	418
	G1/8-female	422

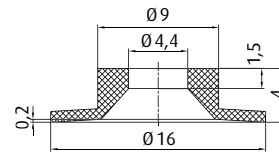
**Item no.** 126.016.003.\* **Material** NR (bg) 3 mm



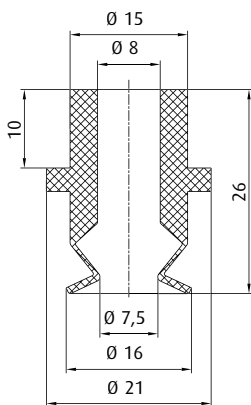
Icon	Connection	see page
	M5-male	409
	M6-male	413

**Item no.** 102.016.098.\* **Material** SI (tr), CR (sw) 2 mm

Additional sizes available are found on p. 42.



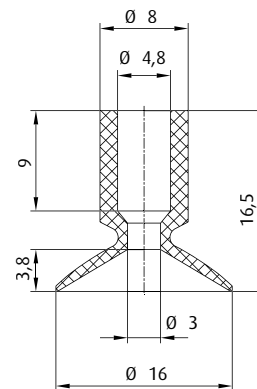
**Item no.** 102.016.145.\* **Material** NR (bg) 0.5 mm



Icon	Connection	see page
	G1/8-male	417
	G1/8-female	422
	G1/4-male	425
	G1/4-female	431

**Item no.** 107.016.008.\* **Material** SI (tr) 2.4 mm

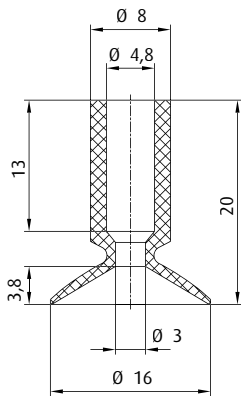
Additional sizes available are found on p. 58.



Icon	Connection	see page
	M5-male	410
	G1/8-male	416
	G1/8-female	421
	G1/4-male	425
	25 mm	456

**Item no.** 122.016.006.\* **Material** NBR (sw) 5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



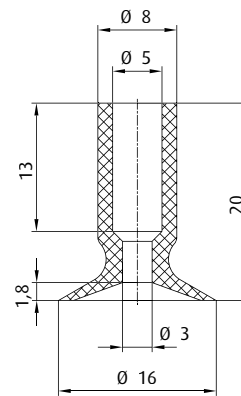
Icon	Connection	see page
	270.013 M5-male	410
	270.003 G1/8-male	416
	270.015 G1/8-female	421
	270.194 G1/4-male	425
	50.037 25 mm	see page 456

**Item no.**  
122.016.009.\*

**Material**  
NBR (sw), SI (tr), NR (sw)

5 mm

Additional sizes available are found on p. 56.

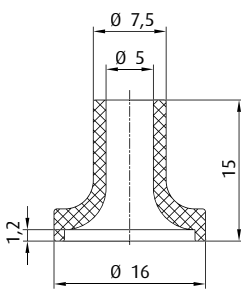


Icon	Connection	see page
	270.013 M5-male	410
	270.003 G1/8-male	416
	270.015 G1/8-female	421
	270.194 G1/4-male	425

**Item no.**  
122.016.076.\*

**Material**  
Vulkollan® (br)

2.5 mm

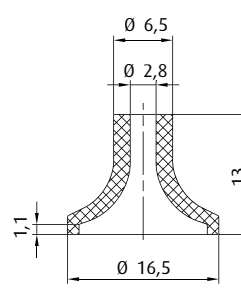


Icon	Connection	see page
	270.013 M5-male	410
	270.103 M6-male	413
	270.003 G1/8-male	416
	270.015 G1/8-female	421

**Item no.**  
102.016.122.\*

**Material**  
NR (bg)

3 mm

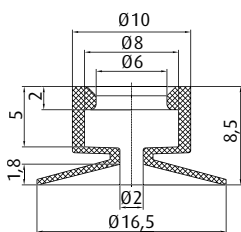


Icon	Connection	see page
	270.536 M5-male	409

**Item no.**  
102.017.420.\*

**Material**  
NR (br)

3.5 mm

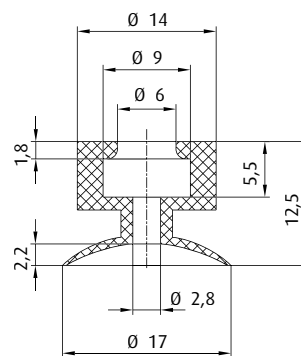


Icon	Connection	see page
	270.037 M5-male	411
	270.373 M6-male	413
	270.085 G1/8-male	418
	270.086 G1/8-female	422

**Item no.**  
102.016.151.\*

**Material**  
NR (gr)

0.5 mm



Icon	Connection	see page
	270.037 M5-male	411
	270.373 M6-male	413
	270.085 G1/8-male	418
	270.086 G1/8-female	422

**Item no.**  
102.016.255.\*

**Material**  
SI (r)

3 mm

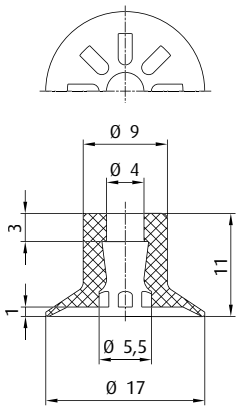
Additional sizes available are found on p. 24.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 17 - 18 mm



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

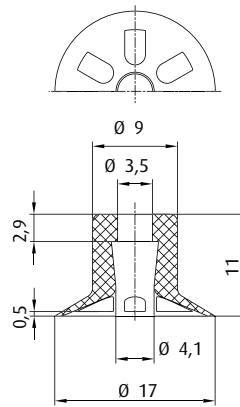
**BESTSELLER**

Item no.  
104.016.003.\*

Material  
SI (tr), CR (sw)

0.5 mm

Additional sizes available are found on p. 42.

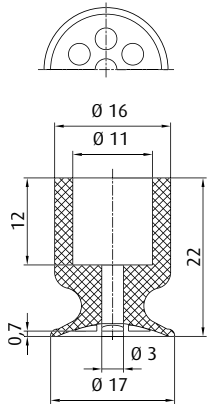


	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

Item no.  
104.017.026.\*

Material  
NR (sw)

1 mm

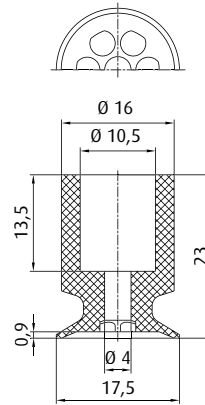


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.  
102.017.193.\*

Material  
Vulkollan® (br)

0.7 mm

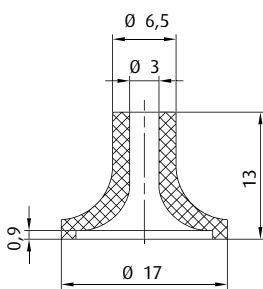


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.  
104.018.049.\*

Material  
Vinyl (bl)

2 mm

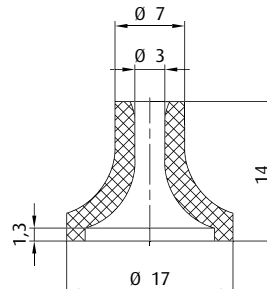


	Connection	see page
270.536	M5-male	409

Item no.  
102.017.132.\*

Material  
NR (bl)

3 mm



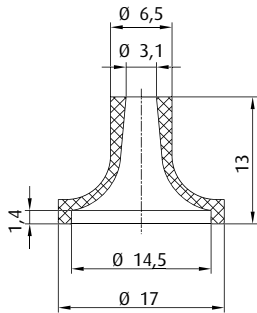
	Connection	see page
270.536	M5-male	409

Item no.  
102.017.133.\*

Material  
NR (g)

2.4 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



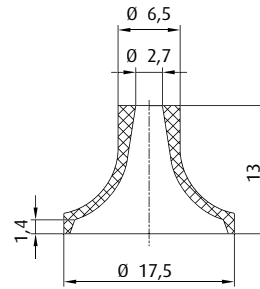
	Connection	see page
270.536	M5-male	409

**Item no.**  
102.017.276.\*

**Material**  
NR (br)

3 mm

Additional sizes available are found on p. 22.

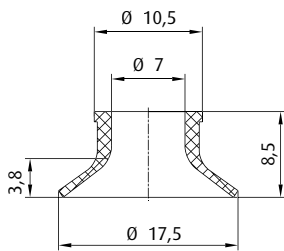


	Connection	see page
270.024	M5-male	410
270.347	M5-female	412
270.033	G1/8-male	416

**Item no.**  
102.018.277.\*

**Material**  
NR (bl)

0.6 mm

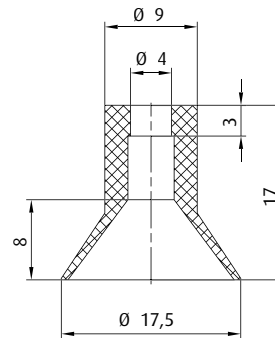


	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

**Item no.**  
102.019.139.\*

**Material**  
NR (bg)

1 mm



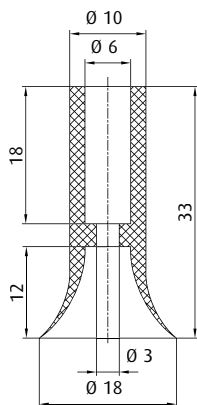
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

**Item no.**  
122.016.012.\*

**Material**  
SI (tr), CR (sw)

1.5 mm

Additional sizes available are found on p. 42.



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

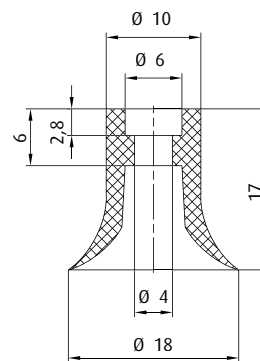
**FLEXIBLE LIP**

**Item no.**  
102.018.345.\*

**Material**  
SI (tr)

--

Additional sizes available are found on p. 58.



	Connection	see page
270.399	M5-male	410
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
107.018.004.\*

**Material**  
SI (tr)

--

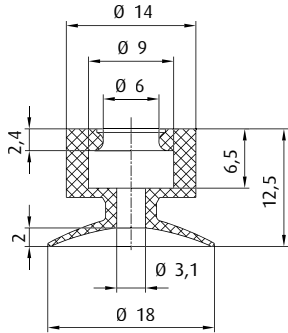
Additional sizes available are found on p. 58.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

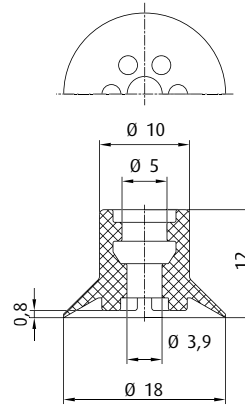
Ø 18 mm



Item no.	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

**Item no. 102.018.442.\*** Material NR (or) 2 mm

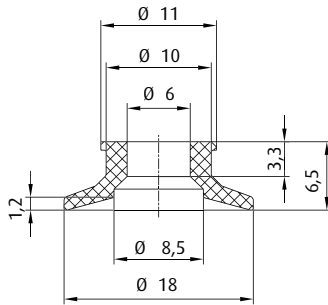
Additional sizes available are found on p. 24.



Item no.	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no. 104.018.005.\*** Material NBR (sw), SI (bl) 1 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 24 mm, 30 mm, 40 mm, 50 mm

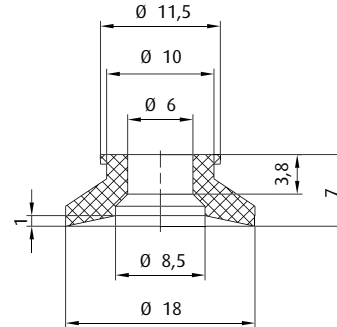


Item no.	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

Item no.	Material	see page
50.018	8.5 mm	454
50.019	8.5 mm	454

**Item no. 102.018.143.\*** Material NR (bg) 0.5 mm

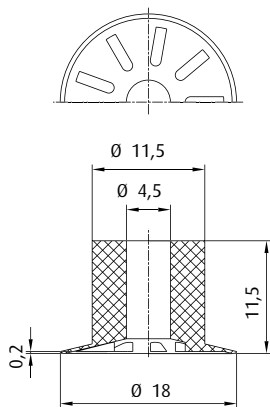


Item no.	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

Item no.	Material	see page
50.018	8.5 mm	454
50.019	8.5 mm	454

**Item no. 102.018.144.\*** Material NR (bg) 0.5 mm

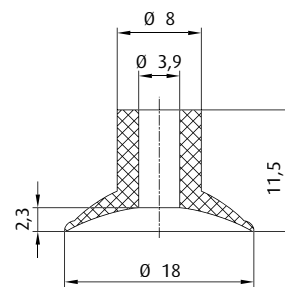


Item no.	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

Item no.	Material	see page
50.037	25 mm	456

**Item no. 104.018.051.\*** Material Vinyl (bl) 0.5 mm



Item no.	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

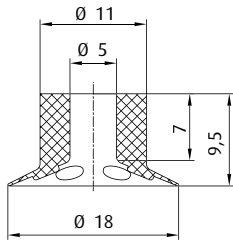
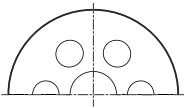
  

Item no.	Material	see page
50.037	25 mm	456

**Item no. 112.018.024.\*** Material NBR (sw), SI (w), NR (sw) 2.3 mm

Additional sizes available are found on p. 52.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760

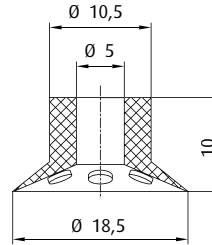
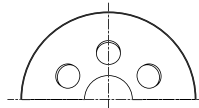


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
112.018.111.\_\*

**Material**  
SI (tr), NR (sw)

1 mm

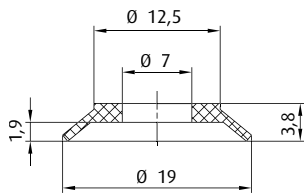


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
127.018.001.\_\*

**Material**  
NBR (sw), SI (tr), NR (bg)

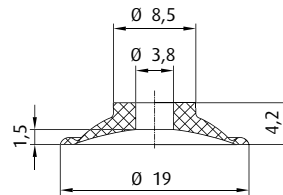
1.5 mm



**Item no.**  
107.019.054.\_\*

**Material**  
NR (bl)

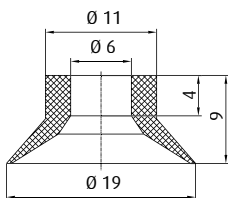
0.5 mm



**Item no.**  
112.019.073.\_\*

**Material**  
NR (sw)

2 mm

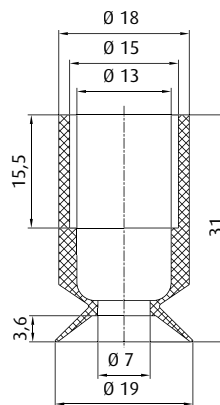


	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418
270.534	G1/4-male	425

**Item no.**  
122.019.014.\_\*

**Material**  
SI (tr), NR (bg)

3 mm



	Connection	see page
270.207	G1/4-male	426

**Item no.**  
102.019.036.\_\*

**Material**  
NR (sw)

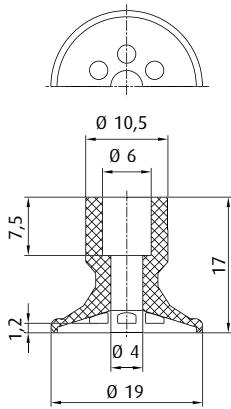
5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 19 - 20 mm

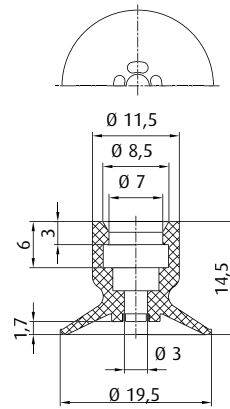


	Connection	see page
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no.  
104.020.042.\_\*

Material  
Vinyl (bl)

0.5 mm



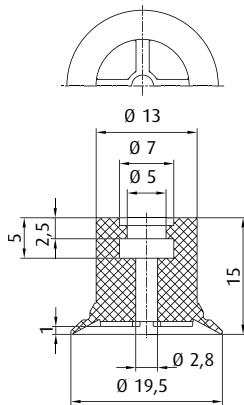
	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

Item no.  
102.020.355.\_\*

Material  
NBR (sw)

3 mm

This vacuum cup is also available in the following dimensions: 28 mm



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

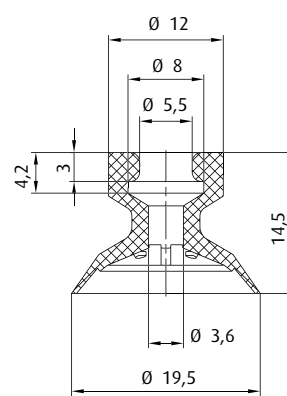
**BESTSELLER**

Item no.  
102.020.083.\_\*

Material  
NBR (sw), SI (tr), SI (r)

1 mm

Additional sizes available are found on p. 20.

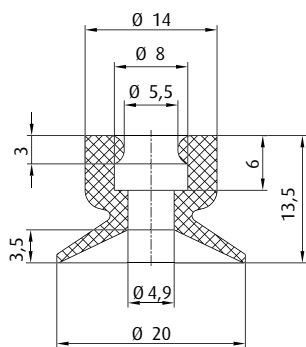


	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no.  
102.020.272.\_\*

Material  
NR (sw)

1 mm



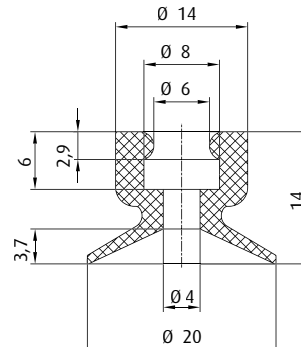
	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no.  
102.020.140.\_\*

Material  
NR (sw), NR (or)

3 mm

Additional sizes available are found on p. 24.



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

Item no.  
126.020.004.\_\*

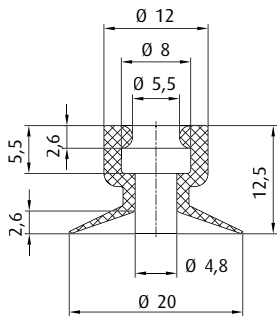
Material  
SI (tr), NR (or), NR (br)

3.5 mm

Additional sizes available are found on p. 24.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





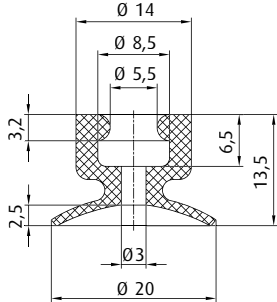
	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

**Item no.**  
126.020.005.\*

**Material**  
NBR (sw), SI (tr), NR (sw)

1 mm

Additional sizes available are found on p. 24.



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

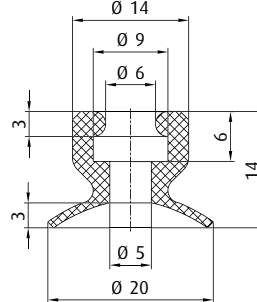
**WEAR-RESISTANT**

**Item no.**  
102.020.299.\*

**Material**  
Vulkollan® (br)

3.5 mm

Additional sizes available are found on p. 24.



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

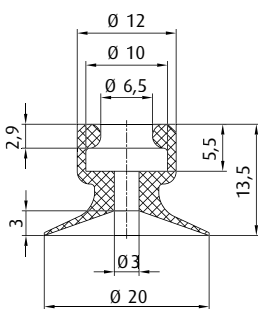
**WEAR-RESISTANT**

**Item no.**  
102.020.300.\*

**Material**  
Vulkollan® (br)

3 mm

Additional sizes available are found on p. 24.



	Connection	see page
270.037	M5-male	411
270.373	M6-male	413
270.085	G1/8-male	418
270.086	G1/8-female	422

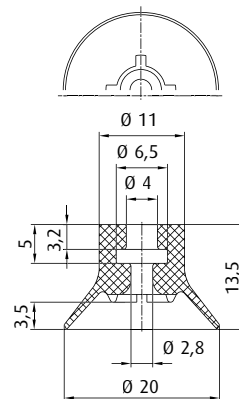
**WEAR-RESISTANT**

**Item no.**  
102.020.308.\*

**Material**  
Vulkollan® (br)

1 mm

Additional sizes available are found on p. 24.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
102.020.321.\*

**Material**  
Vulkollan® (br)

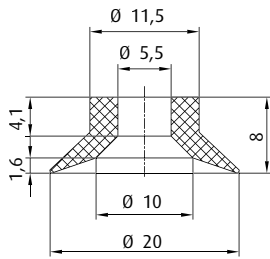
3.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 20 mm

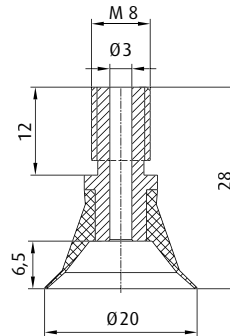


	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

Item no.  
102.019.110.\*

Material  
NR (bg)

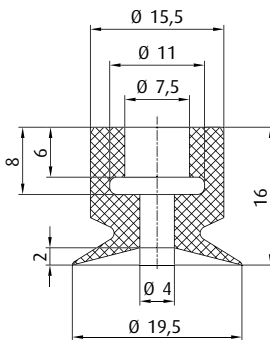
2 mm



Item no.  
120.019.003.\*

Material  
NBR (sw), SI (tr), NR (sw)

2 mm



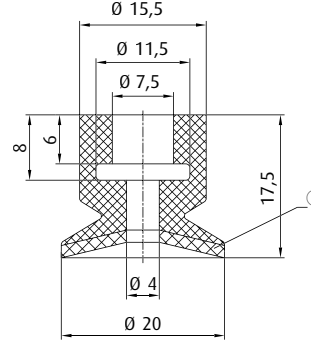
	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no.  
102.020.365.\*

Material  
SI (bl)

1.5 mm



	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

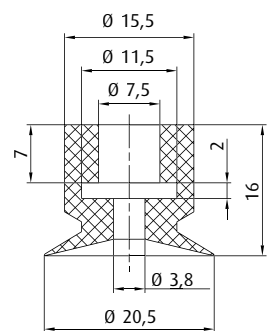
① = Silicone sponge

Item no.  
104.020.086.\*

Material  
SI (bl/r)

1.5 mm

Additional sizes available are found on p. 166.



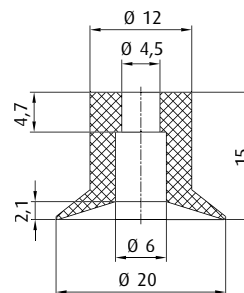
	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.034	G1/4-male	428
270.038	G1/4-female	432

		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

Item no.  
107.020.014.\*

Material  
SI (tr)

1 mm



	Connection	see page
270.317	M5-male	410
270.103	M6-male	413
270.205	G1/8-male	416
270.109	G1/8-female	421
270.194	G1/4-male	425

		see page
50.020	8.5 mm	454

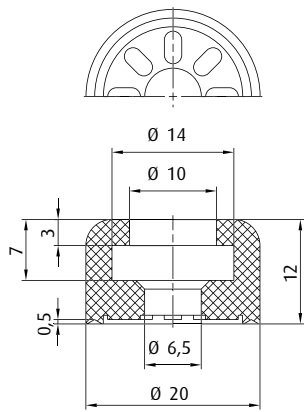
Item no.  
102.020.221.\*

Material  
NBR (sw), SI (tr)

2 mm

Additional sizes available are found on p. 50.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



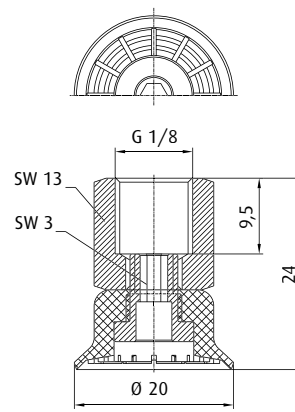
Item no.	Connection	see page
270.521	M5-male	412

**Item no.**  
102.020.458.\*

**Material**  
HNBR (ge), NR (br)

0.5 mm

Additional sizes available are found on p. 70.



**NON-SLIP**

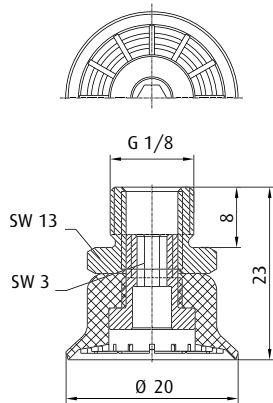
**Item no.**  
100.020.101.\*

**Material**  
NBR (sw)

1.1 mm

Additional sizes available are found on p. 62.

Spare cup



**NON-SLIP**

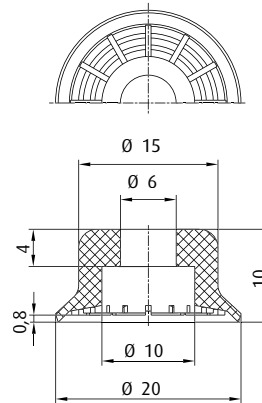
**Item no.**  
100.020.111.\*

**Material**  
NBR (sw)

1.1 mm

Additional sizes available are found on p. 62.

Spare cup



**Item no.**  
104.020.066.\*

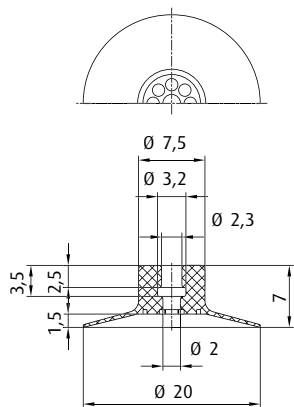
**Material**  
NBR (sw)

1.1 mm

Item no.	Connection	see page
270.311	M5-male	411
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

Item no.	Connection	see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.130	20 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456



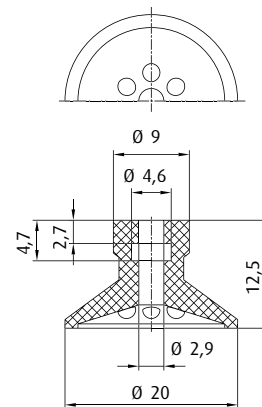
**VERY FLEXIBLE**

**Item no.**  
104.020.073.\*

**Material**  
NBR (sw), SI-FS (r)

1.6 mm

Additional sizes available are found on p. 20.  
This vacuum cup is also available in the following dimensions: 8 mm, 10 mm, 15 mm



**Item no.**  
104.020.075.\*

**Material**  
Vinyl (bl)

2 mm

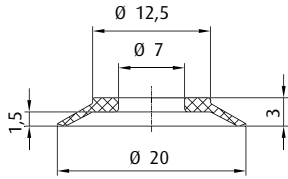
Item no.	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 20 mm

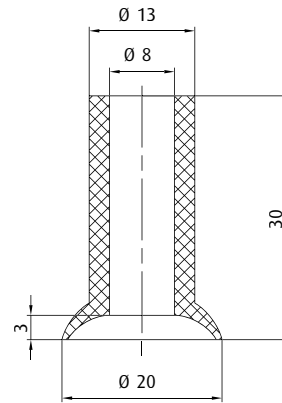


	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

Item no.  
102.020.271.\*

Material  
NR (sw)

1 mm

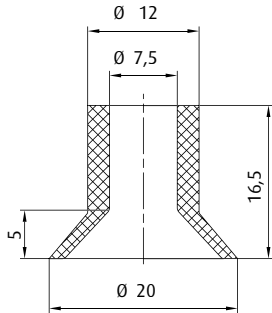


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no.  
107.020.013.\*

Material  
SI (tr), NR (br)

4 mm

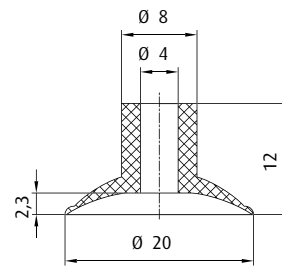


	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

Item no.  
107.020.015.\*

Material  
SI (tr), NR (sw), NR (br)

3 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

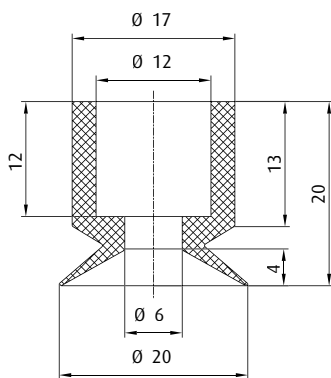
		see page
50.037	25 mm	456

Item no.  
112.020.031.\*

Material  
NBR (sw), SI (w), NR (sw)

2.3 mm

Additional sizes available are found on p. 52.

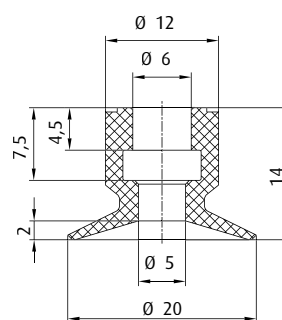


	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

Item no.  
122.020.017.\*

Material  
SI (tr), NR (bg)

3 mm



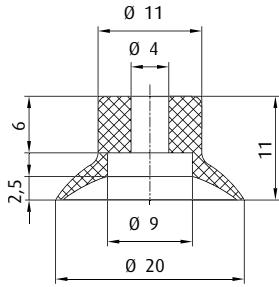
	Connection	see page
270.063	G1/8-male	419
270.061	G1/8-female	422

Item no.  
102.021.179.\*

Material  
Vinyl (bl)

0.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

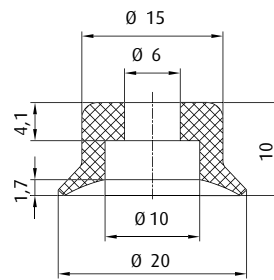


	Connection	see page
270.013	M5-male	410
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
102.020.312.\_\*

**Material**  
SI (tr)

2.5 mm



	Connection	see page
270.311	M5-male	411
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

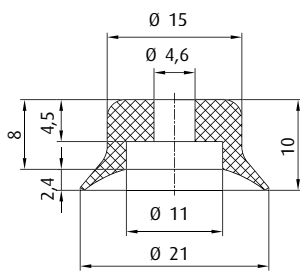
		see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.130	20 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

**Item no.**  
102.020.286.\_\*

**Material**  
NBR (sw), SI (tr), PU (bl),  
FKM (gr)

2 mm

Additional sizes available are found on p. 38.



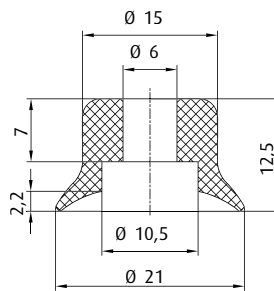
	Connection	see page
270.311	M5-male	411
270.063	G1/8-male	419
270.061	G1/8-female	422

**Item no.**  
102.020.041.\_\*

**Material**  
NBR (sw), SI (tr), PU (bl)

2 mm

Additional sizes available are found on p. 32.

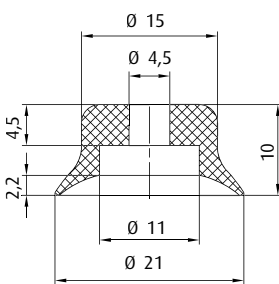


	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

**Item no.**  
102.020.330.\_\*

**Material**  
NBR (sw), SI (tr)

3 mm



	Connection	see page
270.311	M5-male	411
270.063	G1/8-male	419
270.061	G1/8-female	422

**Item no.**  
102.020.500.\_\*

**Material**  
Thermalon® (bl)

2.3 mm

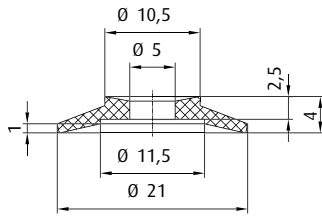
Additional sizes available are found on p. 36.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 21 - 22 mm

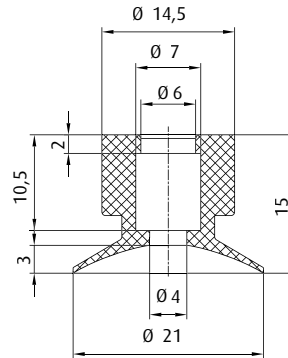


**Item no.**  
102.021.063.\_\*

**Material**  
NR (sw)

1 mm

Additional sizes available are found on p. 22.



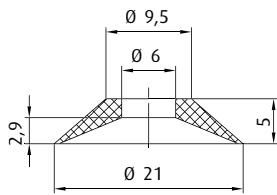
**Item no.**  
102.021.399.\_\*

**Material**  
Vinyl (bl)

2.5 mm

	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

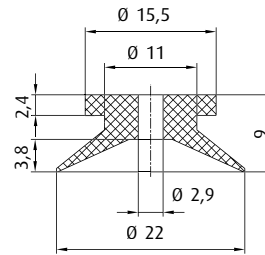
		see page
50.018	8.5 mm	454
50.019	8.5 mm	454



**Item no.**  
107.021.049.\_\*

**Material**  
NR (bg)

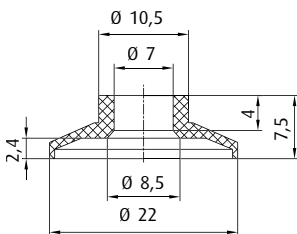
1.5 mm



**Item no.**  
102.022.150.\_\*

**Material**  
Vinyl (bl)

2.5 mm



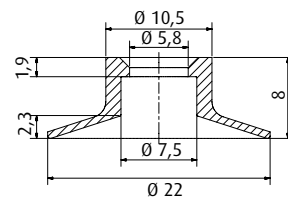
**Item no.**  
102.022.185.\_\*

**Material**  
NR (gr)

0.5 mm

Additional sizes available are found on p. 22.

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418



**Item no.**  
102.022.526.\_\*

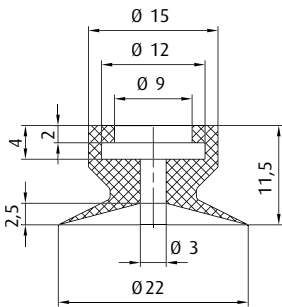
**Material**  
NR (bl)

2 mm

	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

Additional sizes available are found on p. 22.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

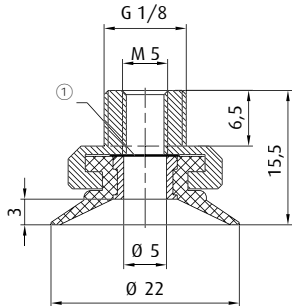


	Connection	see page
270.541	G1/8-male	421

**Item no.**  
102.022.406.\_\*

**Material**  
SI (r)

2 mm



① = Filter screen

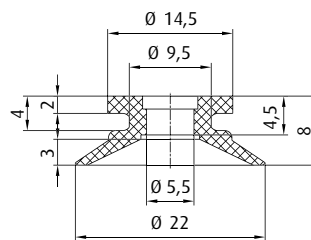
**Item no.**  
120.020.006.\_\*

**Material**  
SI (tr), CR (sw)

2.5 mm

Additional sizes available are found on p. 47.

Spare cup



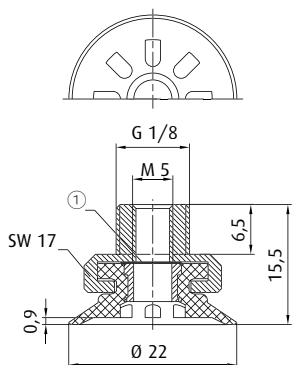
	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

**Item no.**  
102.020.095.\_\*

**Material**  
SI (tr), CR (sw)

2.5 mm

Additional sizes available are found on p. 42.



① = Filter screen

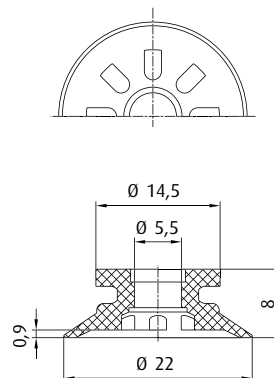
**Item no.**  
123.020.003.\_\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

1 mm

Additional sizes available are found on p. 47.

Spare cup



	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

**BESTSELLER**

**Item no.**  
125.020.004.\_\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

1 mm

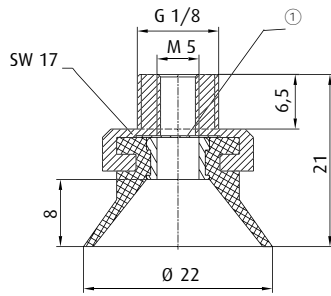
Additional sizes available are found on p. 42.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 22 mm



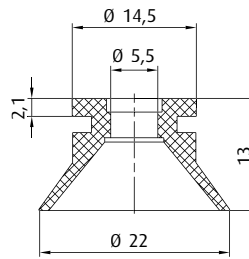
① = Filter screen

**Item no.**  
120.022.011.\*

**Material**  
SI (tr), CR (sw)

2.5 mm

Spare cup



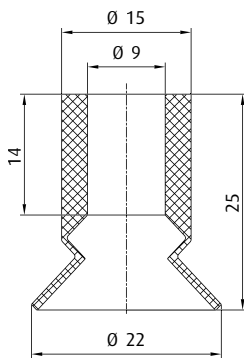
**Item no.**  
122.022.022.\*

**Material**  
SI (tr), CR (sw)

2.5 mm

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

Additional sizes available are found on p. 42.



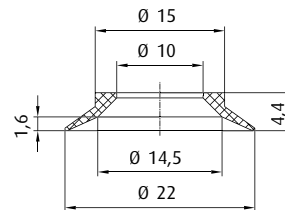
	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
102.022.043.\*

**Material**  
NBR (sw), SI (tr), NR (sw)

5 mm

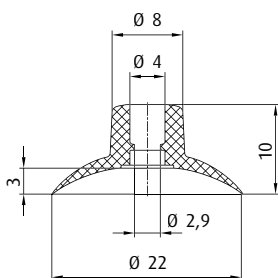
Additional sizes available are found on p. 58.



**Item no.**  
107.022.016.\*

**Material**  
NR (sw)

1 mm



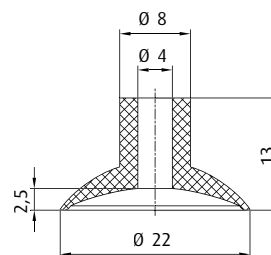
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
102.022.071.\*

**Material**  
PU (bl)

3 mm

This vacuum cup is also available in the following dimensions: 25 mm, 30 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

		see page
50.037	25 mm	456

**Item no.**  
112.022.037.\*

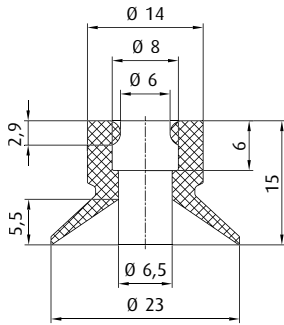
**Material**  
NBR (sw), SI (w)

2.5 mm

Additional sizes available are found on p. 52.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



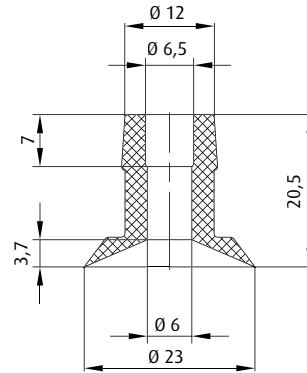


	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

**Item no.**  
102.023.356.\*

**Material**  
Vinyl (bl)

3.8 mm

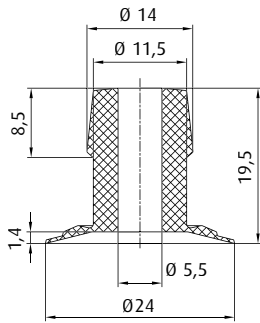


	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425
270.043	G1/4-male	425

**Item no.**  
102.023.331.\*

**Material**  
Vinyl (tr)

2.5 mm

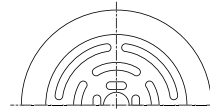


	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**Item no.**  
102.023.149.\*

**Material**  
Vinyl (tr)

0.5 mm



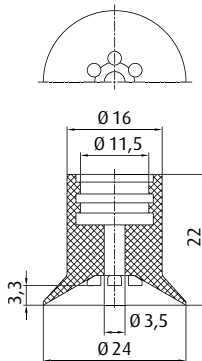
	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
102.024.457.\*

**Material**  
SI (tr), NR (bg)

1.8 mm

Additional sizes available are found on p. 20.  
This vacuum cup is also available in the following dimensions: 15 mm, 28 mm, 30 mm, 40 mm



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
104.024.006.\*

**Material**  
NBR (sw)

1 mm

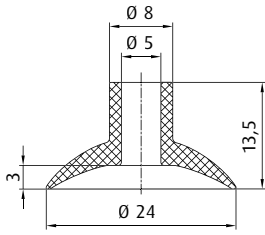
This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 30 mm, 40 mm, 50 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 24 - 25 mm

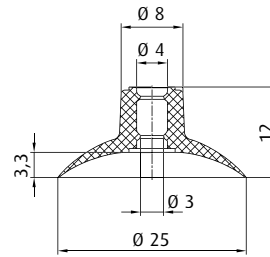


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.  
102.024.123.\*

Material  
NR (sw), NR (bg)

4 mm



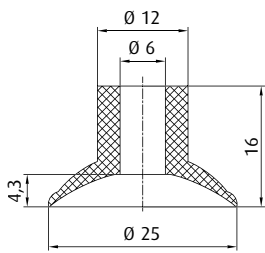
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.  
102.025.085.\*

Material  
PU (r)

4 mm

This vacuum cup is also available in the following dimensions: 22 mm, 30 mm



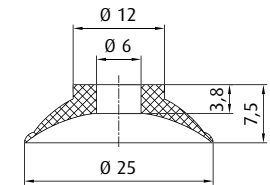
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no.  
112.025.042.\*

Material  
NBR (sw), SI (w), NR (sw)

4.5 mm

Additional sizes available are found on p. 52.

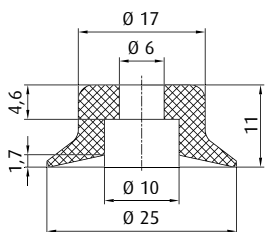


	Connection	see page
270.039	M6-male	414

Item no.  
112.025.043.\*

Material  
NBR (sw), SI (w), NR (sw)

2.5 mm



	Connection	see page
270.311	M5-male	411
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

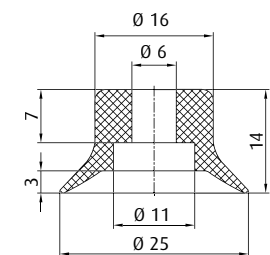
	see page
50.085	6 mm 454
50.128	10 mm 454
50.129	15 mm 454
50.130	20 mm 454
50.095	20 mm 456
50.096	30 mm 456
50.097	40 mm 456
50.098	50 mm 456

Item no.  
102.025.287.\*

Material  
NBR (sw), SI (tr), PU (bl),  
FKM (gr)

2 mm

Additional sizes available are found on p. 38.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

Item no.  
102.025.047.\*

Material  
NBR (sw), SI (tr), PU (bl)

2.5 mm

Additional sizes available are found on p. 32.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

<b>Item no.</b> 102.025.102._*	<b>Material</b> NR (g), NR (sw)	4 mm
-----------------------------------	------------------------------------	------

Additional sizes available are found on p. 24.

	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

<b>Item no.</b> 126.025.010._*	<b>Material</b> FKM (sw)	5 mm
-----------------------------------	-----------------------------	------

	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

<b>Item no.</b> 102.025.113._*	<b>Material</b> NBR (sw), SI (tr)	3.5 mm
-----------------------------------	--------------------------------------	--------

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

<b>Item no.</b> 102.025.103._*	<b>Material</b> NR (sw)	2.5 mm
-----------------------------------	----------------------------	--------

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

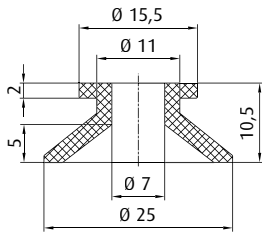
<b>Item no.</b> 102.025.119._*	<b>Material</b> NR (bg)	1.5 mm
-----------------------------------	----------------------------	--------

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

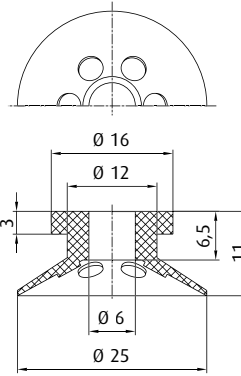
Ø 25 mm



Item no.  
102.026.128.\_\*

Material  
NR (bg)

1 mm 2.5 mm

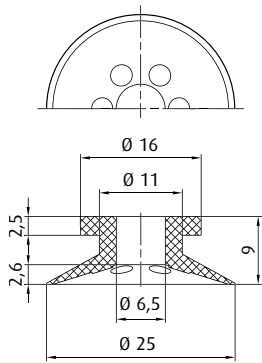


Item no.  
104.025.027.\_\*

Material  
NR (bg)

1 mm 3.5 mm

	Connection	see page
270.200	M5-male	411
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

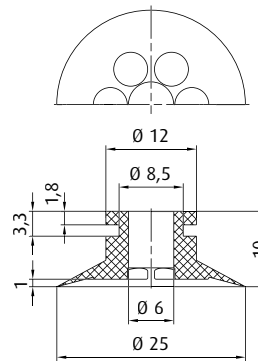


Item no.  
104.025.031.\_\*

Material  
NR (bg), PU (sw)

1 mm

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

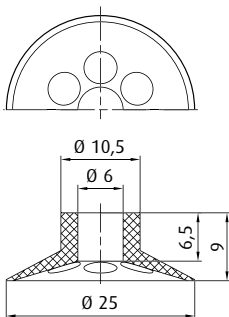


Item no.  
102.025.225.\_\*

Material  
NR (br)

1 mm 1.5 mm

	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

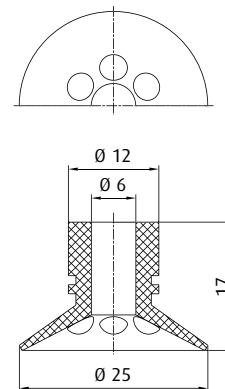


Item no.  
104.025.030.\_\*

Material  
NR (bg)

1 mm

	Connection	see page
270.200	M5-male	411
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425



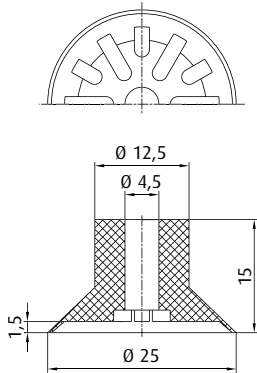
Item no.  
104.025.040.\_\*

Material  
Vinyl (bl)

1 mm 2.5 mm

	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



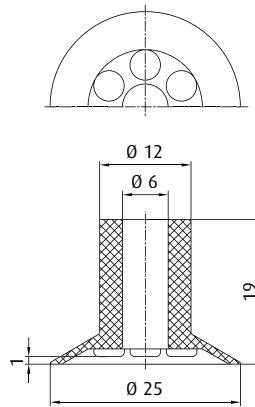
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

**Item no.**  
104.025.043.\_\*

**Material**  
Vinyl (bl)

1.5 mm

Additional sizes available are found on p. 20.



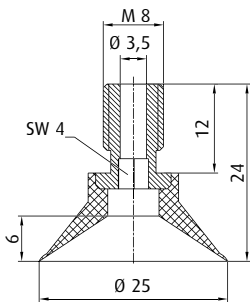
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**Item no.**  
104.025.094.\_\*

**Material**  
NR (br)

1 mm

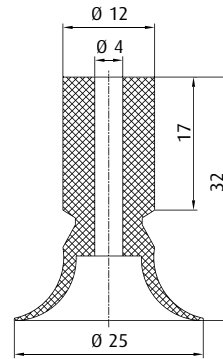
Additional sizes available are found on p. 20.



**Item no.**  
120.025.086.\_\*

**Material**  
SI (w), NR (sw)

3.5 mm

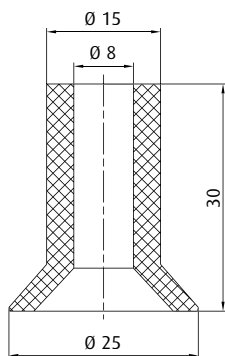


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
126.025.009.\_\*

**Material**  
NR (bg)

--

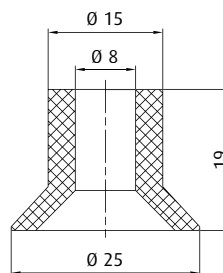


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
107.025.019.\_\*

**Material**  
NR (br)

2 mm



	Connection	see page
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
107.025.020.\_\*

**Material**  
NR (br)

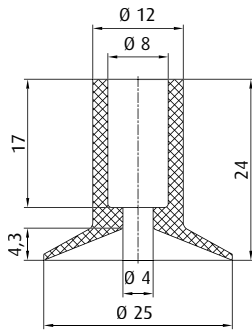
1 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 25 mm

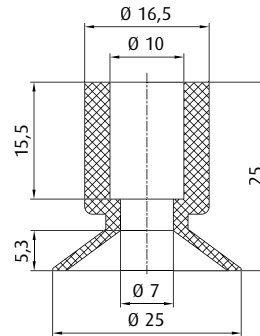


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no. 102.025.417.\*

Material SI (r)

3 mm

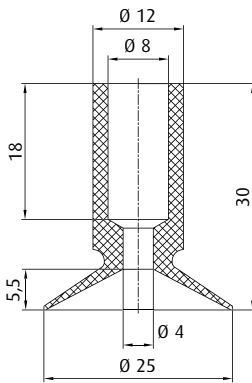


	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 102.025.126.\*

Material NR (bg)

4 mm



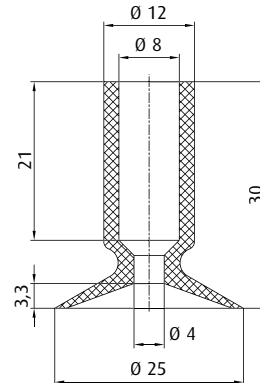
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

Item no. 122.025.025.\*

Material NBR (sw), SI (tr), NR (sw)

5 mm

Additional sizes available are found on p. 56.



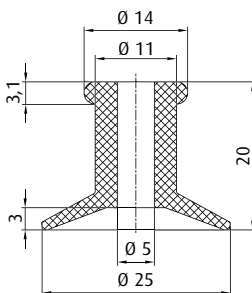
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**WEAR-RESISTANT**

Item no. 122.025.077.\*

Material Vulkollan® (br)

4 mm



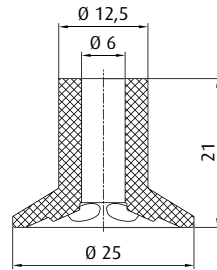
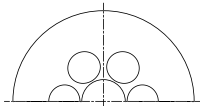
	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no. 102.027.124.\*

Material NR (bg)

4 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760

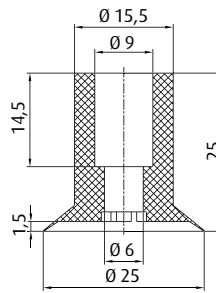
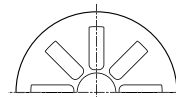


	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**Item no.**  
104.026.033.\*

**Material**  
NR (bg)

2 mm

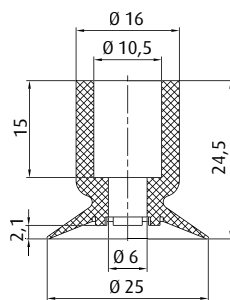
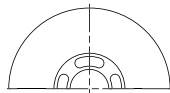


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
102.025.373.\*

**Material**  
Vinyl (bl)

1.5 mm

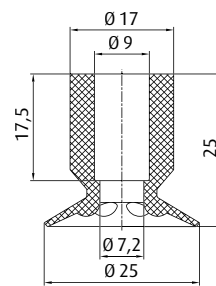
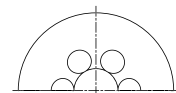


	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
104.025.037.\*

**Material**  
NR (bg)

2 mm

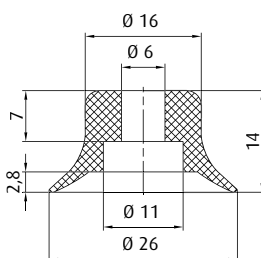


	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
104.025.056.\*

**Material**  
Vinyl (bl)

2.5 mm



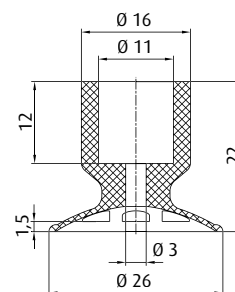
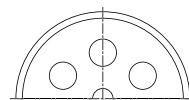
	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

**Item no.**  
102.025.501.\*

**Material**  
Thermalon® (bl)

3 mm

Additional sizes available are found on p. 36.



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**WEAR-RESISTANT**

**Item no.**  
102.025.192.\*

**Material**  
Vulkollan® (br)

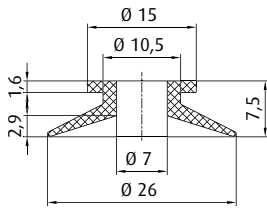
3 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

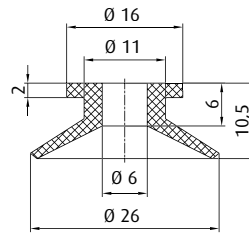
Ø 26 - 27 mm



**Item no.**  
102.026.121.\*

**Material**  
NR (bg)

3 mm

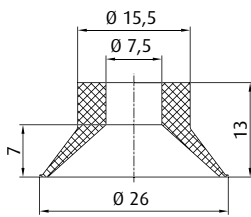


**Item no.**  
102.026.180.\*

**Material**  
Vinyl (bl)

4 mm

	Connection	see page
270.200	M5-male	411
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

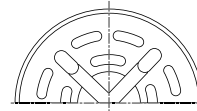


**Item no.**  
102.027.167.\*

**Material**  
Vinyl (bl)

5 mm

	Connection	see page
270.043	G1/4-male	425
270.038	G1/4-female	432



**Item no.**  
102.027.298.\*

**Material**  
SI (tr)

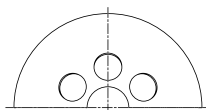
0.5 mm

	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

Additional sizes available are found on p. 20.

**Notes:** Especially well-suited for foils

This vacuum cup is also available in the following dimensions: 36 mm

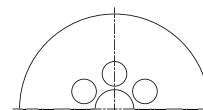


**Item no.**  
104.027.032.\*

**Material**  
NR (bg)

2 mm

	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425



**Item no.**  
104.027.055.\*

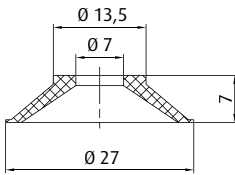
**Material**  
Vinyl (bl)

2.5 mm

	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



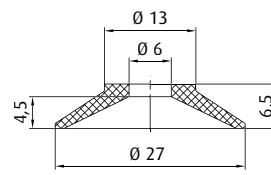


	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

**Item no.**  
107.027.022.\*

**Material**  
NBR (sw), SI (tr)

4 mm

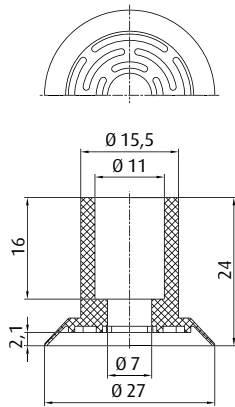


	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

**Item no.**  
107.027.052.\*

**Material**  
NR (gr)

3 mm

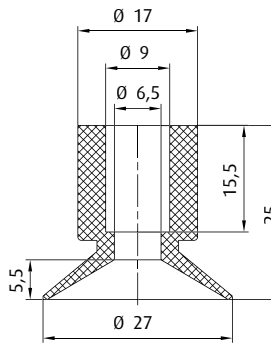


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
104.027.062.\*

**Material**  
NR (sw)

2 mm

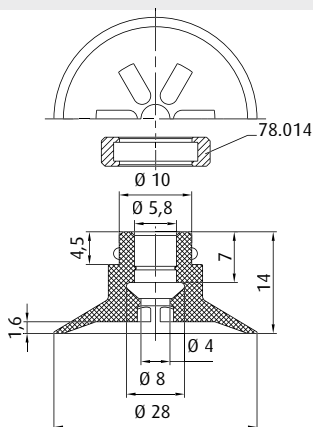


	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
102.028.164.\*

**Material**  
Vinyl (bl)

5 mm



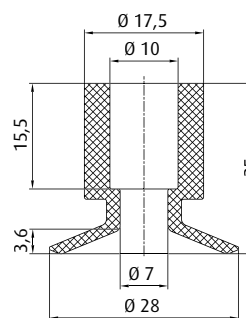
	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
102.028.461.\*

**Material**  
SI (tr)

2 mm

**Ordering notes:** The retaining ring Item. No. 78.014 (stainless steel) must be ordered separately



	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
102.028.163.\*

**Material**  
Vinyl (bl)

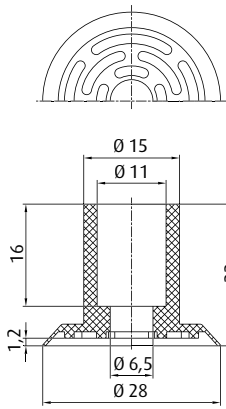
4 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 28 mm



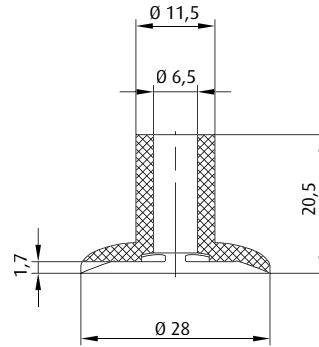
Connection	see page
270.451 G1/4-male	426
270.452 G1/4-female	431

**Item no.**  
104.029.093.\*

**Material**  
NR (sw)

1 mm

Additional sizes available are found on p. 21.  
This vacuum cup is also available in the following dimensions: 15 mm, 24 mm, 30 mm, 40 mm

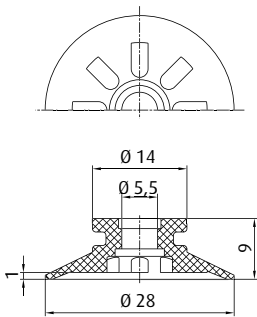


Connection	see page
270.112 G1/8-male	419
270.114 G1/8-female	422
270.113 G1/4-male	425
270.178 G1/4-female	431

**Item no.**  
102.027.246.\*

**Material**  
NR (br)

2 mm



Connection	see page
270.500-S M5-female	413
270.250 G1/8-male	418
270.503-S G1/8-male	418

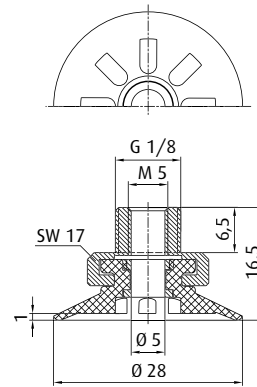
**Item no.**  
125.025.007.\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

1 mm

Additional sizes available are found on p. 42.

Spare cup

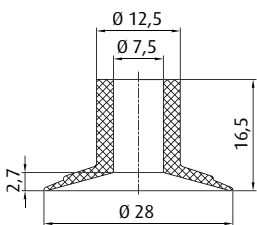


**Item no.**  
123.025.010.\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

1 mm

Additional sizes available are found on p. 47.

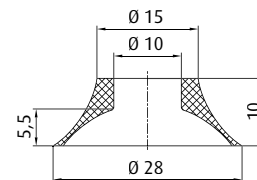


Connection	see page
270.112 G1/8-male	419
270.114 G1/8-female	422
270.113 G1/4-male	425
270.178 G1/4-female	431

**Item no.**  
102.028.175.\*

**Material**  
Vinyl (bl)

2 mm

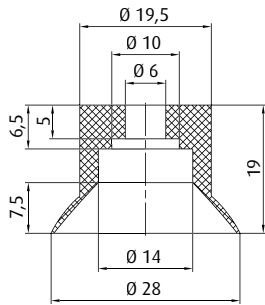


**Item no.**  
102.028.375.\*

**Material**  
SI (tr)

2 mm

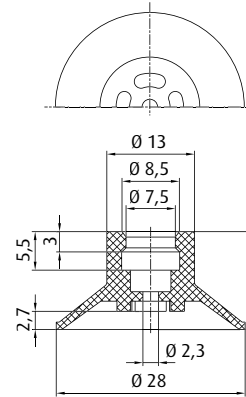
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

**Item no.**  
102.028.159\_\*

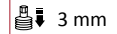
**Material**  
Vinyl (bl)



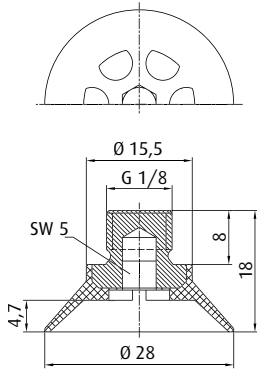
	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

**Item no.**  
102.028.194\_\*

**Material**  
NBR (sw)

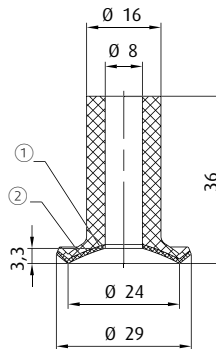
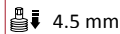


This vacuum cup is also available in the following dimensions: 20 mm



**Item no.**  
103.030.024\_\*

**Material**  
NBR (gr), NR (br)



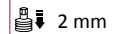
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

**NON-MARKING!**  
**TEMP. MAX. 500 °C**

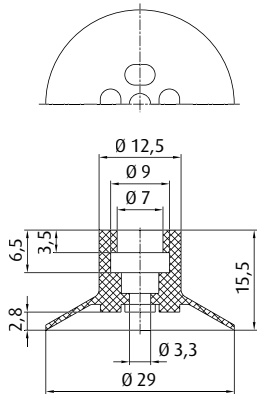
① = Felt pads ② = For silicone vacuum cups with silicone membranes: evaporated aluminium layer

**Item no.**  
26.025.009\_\*

**Material**  
SI (tr/ge)



Additional sizes available are found on p. 164.



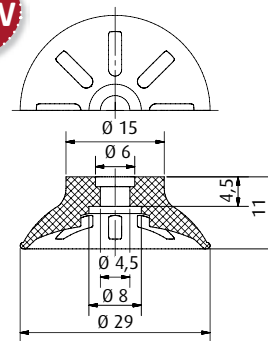
	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423

**Item no.**  
104.029.053\_\*

**Material**  
Vinyl (bl)



**NEW**



	Connection	see page
270.063	G1/8-male	419

**Item no.**  
102.029.509\_\*

**Material**  
NR (br)



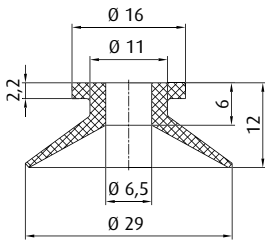
Additional sizes available are found on p. 20.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 29 - 30 mm

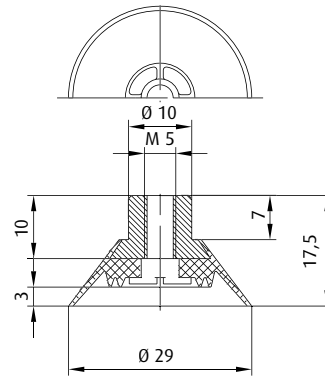


	Connection	see page
270.200	M5-male	411
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**Item no.**  
102.029.160.\_\*

**Material**  
Vinyl (bl)

4.5 mm

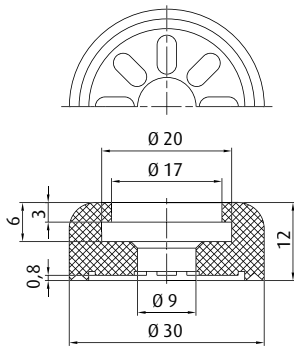


**Item no.**  
150.030.031.\_\*

**Material**  
SI (r), CR (sw)

3 mm

Additional sizes available are found on p. 68.



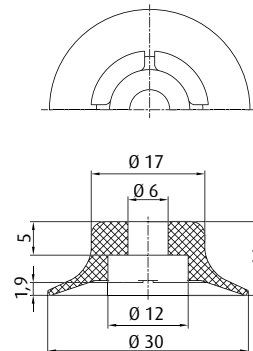
	Connection	see page
270.234	G1/8-female	438

**Item no.**  
102.030.459.\_\*

**Material**  
HNBR (ge), NR (br)

0.8 mm

Additional sizes available are found on p. 70.



	Connection	see page
270.460	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

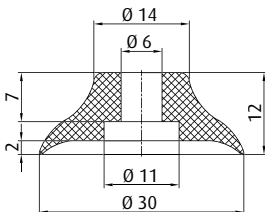
		see page
50.085	6 mm	454
50.128	10 mm	454
50.129	15 mm	454
50.130	20 mm	454
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

**Item no.**  
102.030.288.\_\*

**Material**  
NBR (sw), SI (tr), PU (bl), FKM (gr)

2 mm

Additional sizes available are found on p. 38.



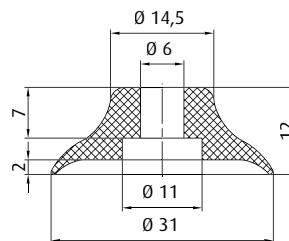
	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

**Item no.**  
102.030.053.\_\*

**Material**  
NBR (sw), SI (tr), PU (bl)

2 mm

Additional sizes available are found on p. 32.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

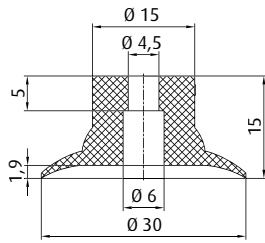
**Item no.**  
102.030.502.\_\*

**Material**  
Thermalon® (bl)

2 mm

Additional sizes available are found on p. 36.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



Connection	see page
270.317 M5-male	410
270.103 M6-male	413
270.205 G1/8-male	416
270.109 G1/8-female	421
270.194 G1/4-male	425

see page	Connection
50.020	8.5 mm

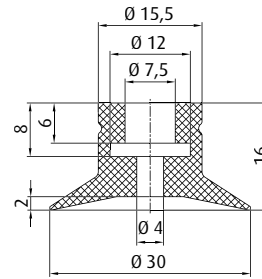
**BESTSELLER**

**Item no.**  
102.030.222.\*

**Material**  
NBR (sw), SI (tr)

1.5 mm

Additional sizes available are found on p. 50.



Connection	see page
270.012 G1/8-male	421
270.020 G1/8-female	423
270.034 G1/4-male	428
270.038 G1/4-female	432

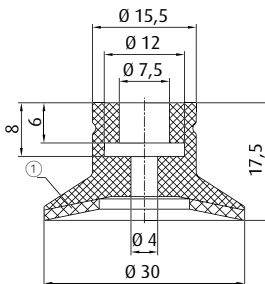
see page	Connection
50.005	5 mm
50.145	10 mm
50.146	30 mm

**Item no.**  
126.030.013.\*

**Material**  
SI (bl), SI (r)

1.5 mm

Additional sizes available are found on p. 50.



Connection	see page
270.012 G1/8-male	421
270.020 G1/8-female	423
270.034 G1/4-male	428
270.038 G1/4-female	432

see page	Connection
50.005	5 mm
50.145	10 mm
50.146	30 mm

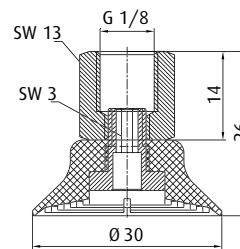
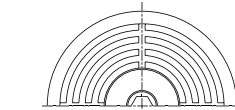
① = Silicone sponge

**Item no.**  
104.030.087.\*

**Material**  
SI (bl/r)

1.5 mm

Additional sizes available are found on p. 166.



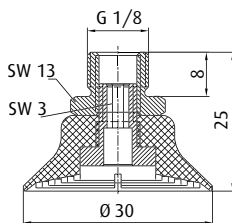
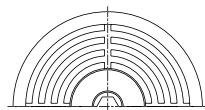
**NON-SLIP**

**Item no.**  
100.030.102.\*

**Material**  
NBR (sw)

1.8 mm

Additional sizes available are found on p. 62.



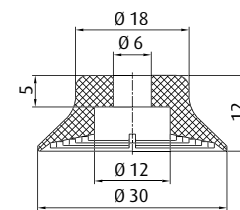
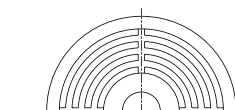
**NON-SLIP**

**Item no.**  
100.030.112.\*

**Material**  
NBR (sw)

1.8 mm

Additional sizes available are found on p. 62.



Spare cup

Connection	see page
270.460 M6-male	414
270.482 G1/8-male	420
270.481 G1/8-female	423
270.483 G1/4-male	429
270.484 G1/4-female	433

see page	Connection
50.085	6 mm
50.128	10 mm
50.129	15 mm
50.095	20 mm
50.096	30 mm
50.097	40 mm
50.098	50 mm

**Item no.**  
104.030.067.\*

**Material**  
NBR (sw)

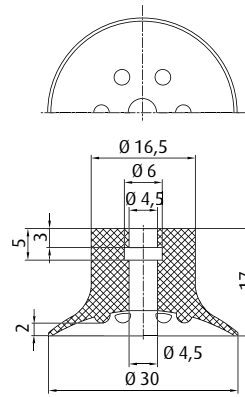
1.8 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 30 mm

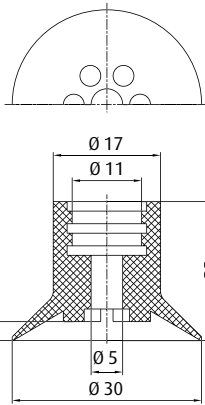


	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
102.030.322.\_\*

**Material**  
Vulkollan® (br)

⏴ 2 mm



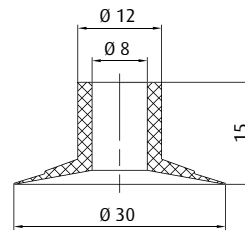
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
104.030.008.\_\*

**Material**  
NBR (sw), SI (bl)

⏴ 3 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 40 mm, 50 mm

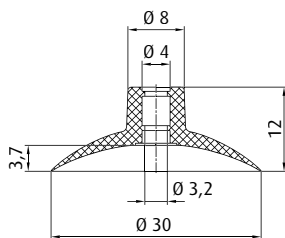


	Connection	see page
270.112	G1/8-male	419
270.113	G1/4-male	425
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
107.030.023.\_\*

**Material**  
NBR (sw), NR (bg)

⏴ 1 mm



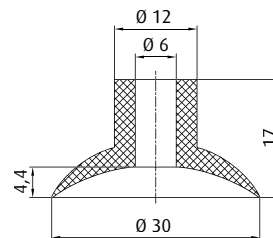
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
102.030.086.\_\*

**Material**  
PU (g)

⏴ 4.5 mm

This vacuum cup is also available in the following dimensions: 22 mm, 25 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

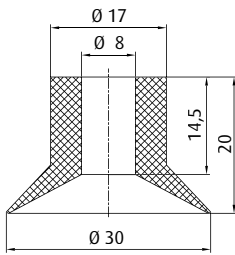
**Item no.**  
112.030.052.\_\*

**Material**  
NBR (sw), SI (w)

⏴ 4.5 mm

Additional sizes available are found on p. 52.

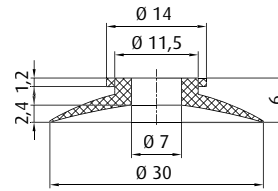
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

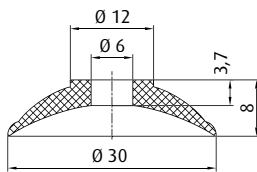
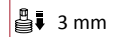
**Item no.**  
115.030.005.\*

**Material**  
NBR (sw), SI (tr), NR (sw),  
NR (bg)



**Item no.**  
102.030.178.\*

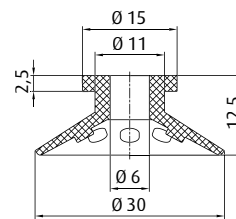
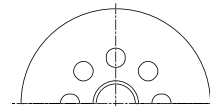
**Material**  
Vinyl (bl)



	Connection	see page
270.255	M8-male	415

**Item no.**  
112.030.051.\*

**Material**  
NBR (sw), SI (w)

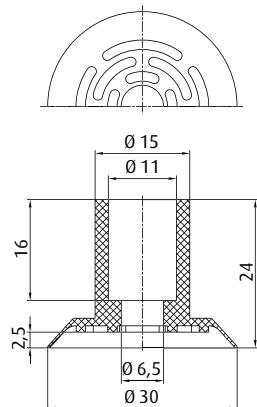


**Item no.**  
104.030.059.\*

**Material**  
Vinyl (bl)



	Connection	see page
270.039	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432



	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

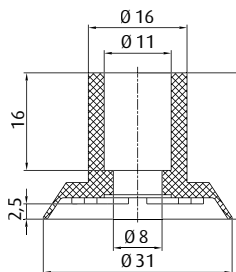
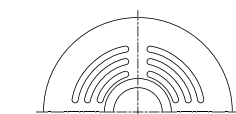
**BESTSELLER**

**Item no.**  
104.030.009.\*

**Material**  
NBR (sw), SI (w), SI (tr), NR (sw)

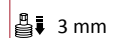


Additional sizes available are found on p. 21.  
This vacuum cup is also available in the following dimensions: 15 mm, 24 mm, 28 mm, 40 mm



**Item no.**  
104.030.007.\*

**Material**  
SI (tr), NR (sw)



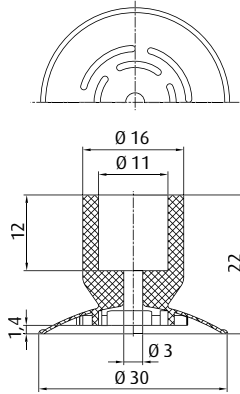
	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 30 - 31 mm

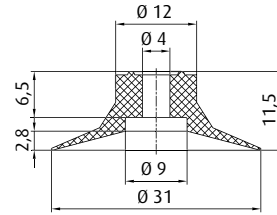


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.  
102.030.215.\*

Material  
Vulkollan® (br)

2 mm

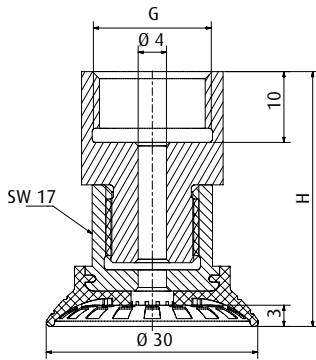


	Connection	see page
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

Item no.  
102.031.313.\*

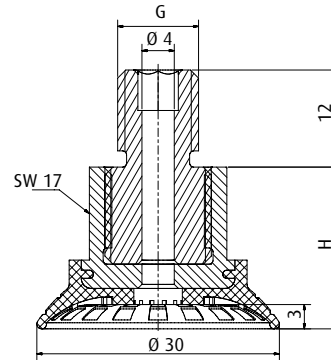
Material  
SI (tr)

3 mm



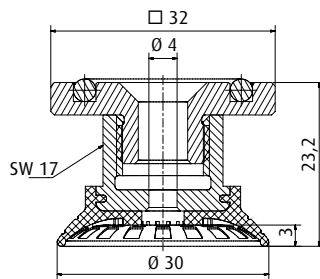
Item no.	Material	[mm]	Connection thread	H [mm]
103.030.031.*	NBR (bl)	3	G1/4-female	20
103.030.032.*	NBR (bl)	3	G3/8-female	36

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.030.030.*	NBR (bl)	3	G1/4-male	20
103.030.033.*	NBR (bl)	3	M10-male	20
103.030.034.*	NBR (bl)	3	M14x1.5-male	20

Additional sizes available are found on p. 64.



Item no.  
103.030.035.\*

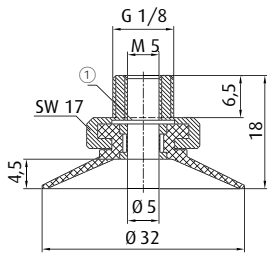
Material  
NBR (bl)

3 mm

Additional sizes available are found on p. 64.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

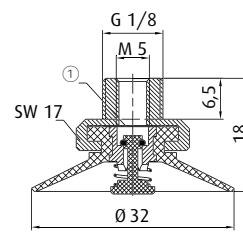




① = Filter screen

<b>Item no.</b> <b>120.030.013._*</b>	<b>Material</b> SI (tr), CR (sw)	3.5 mm
--	-------------------------------------	--------

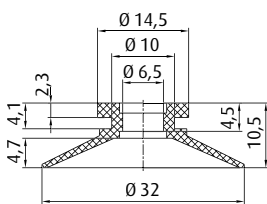
Additional sizes available are found on p. 47.



① = Filter screen

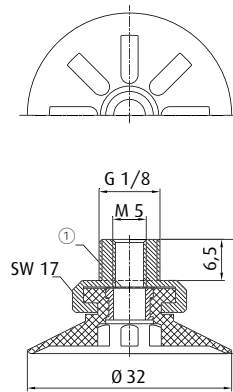
<b>Item no.</b> <b>121.030.006._*</b>	<b>Material</b> SI (tr), CR (sw)	2.5 mm
--	-------------------------------------	--------

Additional sizes available are found on p. 47.



<b>Item no.</b> <b>102.030.096._*</b>	<b>Material</b> SI (tr), CR (sw)	3.5 mm
--	-------------------------------------	--------

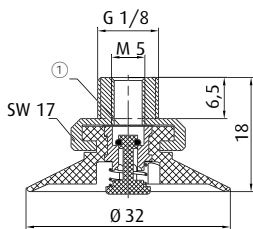
Additional sizes available are found on p. 42.



① = Filter screen

<b>Item no.</b> <b>123.030.019._*</b>	<b>Material</b> Tepuflex® (or), SI (tr), CR (sw)	2 mm
--	---	------

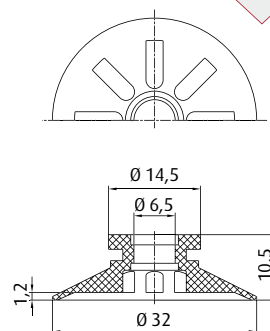
Additional sizes available are found on p. 47.



① = Filter screen

<b>Item no.</b> <b>124.030.002._*</b>	<b>Material</b> SI (tr), CR (sw)	2 mm
--	-------------------------------------	------

Additional sizes available are found on p. 47.



<b>Item no.</b> <b>125.030.010._*</b>	<b>Material</b> Tepuflex® (or), SI (tr), CR (sw)	2 mm
--	---	------

Additional sizes available are found on p. 42.

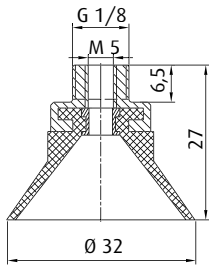
**BESTSELLER**

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 32 - 33 mm

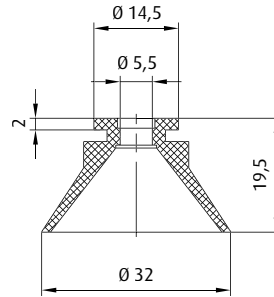


**Item no.**  
**120.032.025.\_\***

**Material**  
SI (tr), CR (sw)

5 mm

Spare cup



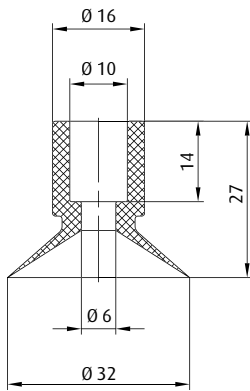
**Item no.**  
**122.032.036.\_\***

**Material**  
SI (tr), CR (sw)

5 mm

	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

Additional sizes available are found on p. 42.

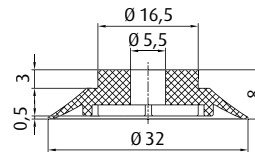
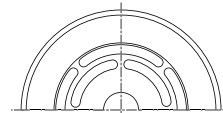


**Item no.**  
**122.030.034.\_\***

**Material**  
SI (tr), NR (sw)

6.5 mm

	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



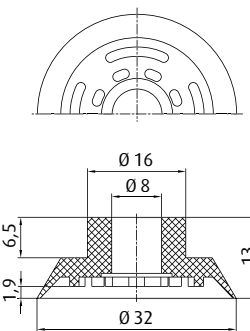
**Item no.**  
**102.032.104.\_\***

**Material**  
NR (bg)

1.8 mm

	Connection	see page
270.063	G1/8-male	419
270.061	G1/8-female	422

Additional sizes available are found on p. 21.

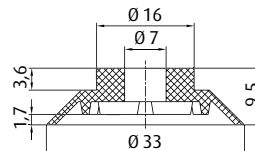
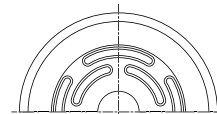


**Item no.**  
**108.032.002.\_\***

**Material**  
SI (tr), NR (bg)

2 mm

	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431



**Item no.**  
**102.033.398.\_\***

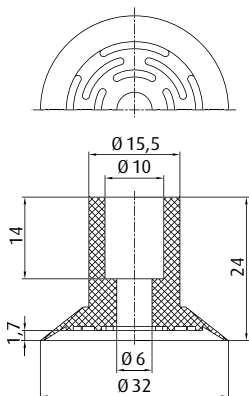
**Material**  
Vinyl (bl)

2 mm

	Connection	see page
270.039	M6-male	414

Additional sizes available are found on p. 21.

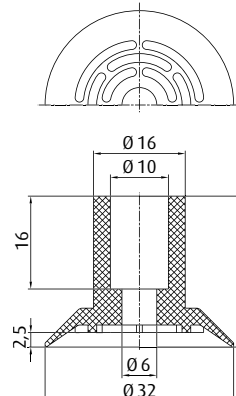
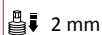
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
104.032.044.\_\*

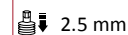
**Material**  
Vinyl (bl)



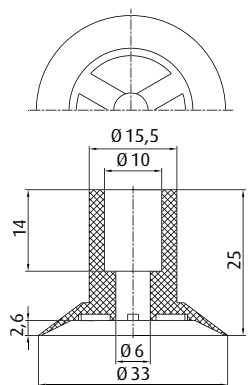
	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
104.033.034.\_\*

**Material**  
NR (bg), CR (r)



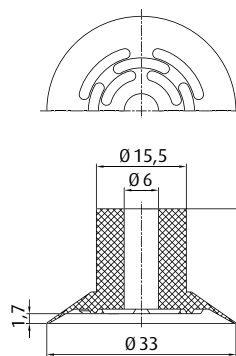
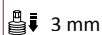
**Notes:** Especially well-suited for flexible products (foils, leather, veneer)



	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
102.033.226.\_\*

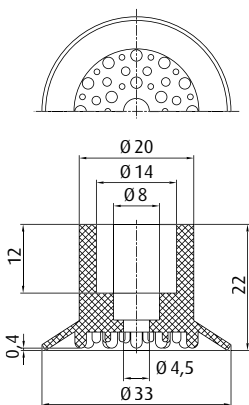
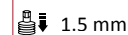
**Material**  
Vinyl (bl)



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

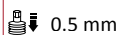
**Item no.**  
104.033.057.\_\*

**Material**  
Vinyl (bl)

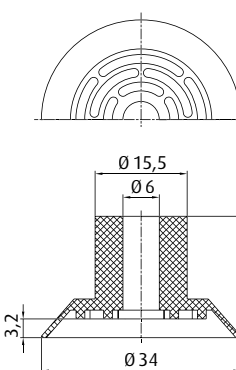


**Item no.**  
102.033.112.\_\*

**Material**  
NBR (sw), SI (tr)



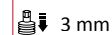
**Notes:** Especially well-suited for foils



	Connection	see page
270.030	G1/8-male	419
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
104.034.036.\_\*

**Material**  
NR (bg)



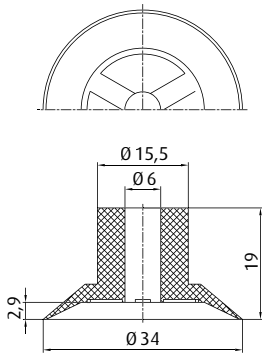
Additional sizes available are found on p. 21.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 34 - 35 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

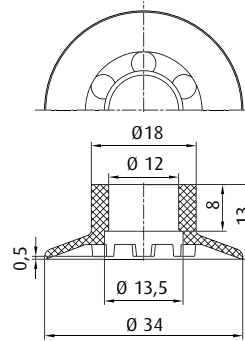
**BESTSELLER**

**Item no.**  
104.034.054.\_\*

**Material**  
Vinyl (bl)

3 mm

Additional sizes available are found on p. 21.

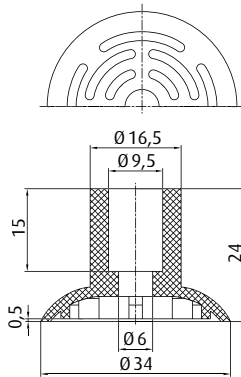


	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
108.034.003.\_\*

**Material**  
NR (bg)

1 mm



	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

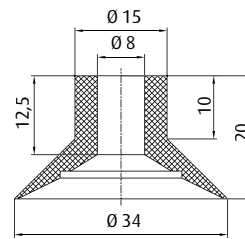
**Item no.**  
116.034.001.\_\*

**Material**  
NR (sw), NR (bg)

0.5 mm

Additional sizes available are found on p. 21.

**Notes:** Especially well-suited for flexible products (foils, leather, veneer)

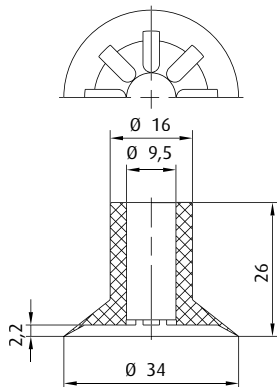


	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
122.034.038.\_\*

**Material**  
NR (sw), NR (br)

3 mm

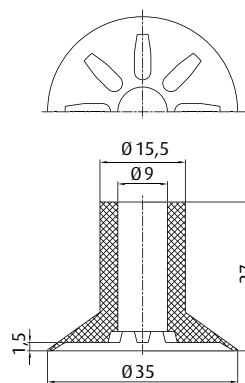


	Connection	see page
270.177	M10-male	416
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.452	G1/4-female	431

**Item no.**  
104.035.048.\_\*

**Material**  
Vinyl (bl)

2 mm



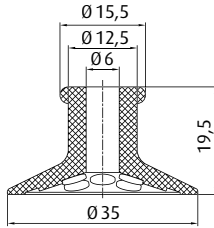
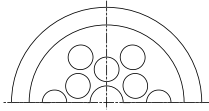
	Connection	see page
270.177	M10-male	416
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.452	G1/4-female	431

**Item no.**  
104.035.050.\_\*

**Material**  
Vinyl (bl)

2 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

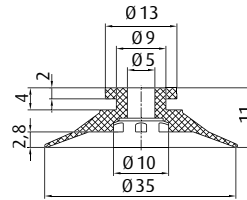
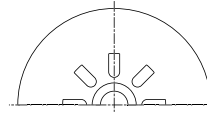


	Connection	see page
270.030	G1/8-male	419
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
104.035.038.\_\*

**Material**  
NR (bg)

1 mm

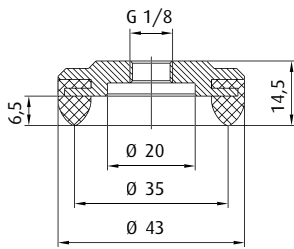


	Connection	see page
270.310	M5-male	411
270.250	G1/8-male	418

**Item no.**  
102.035.320.\_\*

**Material**  
NR (sw)

2.8 mm

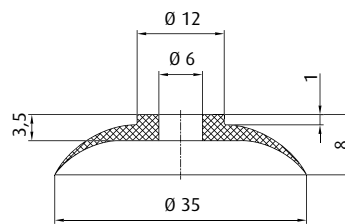


**Item no.**  
160.042.001.\_\*

**Material**  
EPDM (sw)

1 mm

Additional sizes available are found on p. 72.  
**Notes:** Foam sealing lip equalises product unevenness

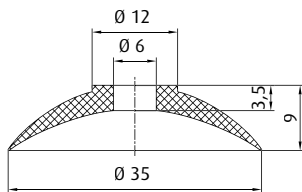


	Connection	see page
270.250	G1/8-male	418

**Item no.**  
112.035.059.\_\*

**Material**  
SI (tr), NR (sw)

3 mm



	Connection	see page
270.039	M6-male	414

**Item no.**  
112.035.065.\_\*

**Material**  
SI (tr)

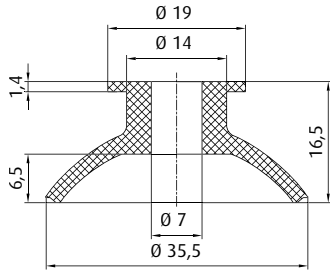
5.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 35 - 36 mm

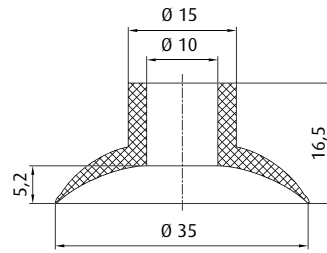


	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427

Item no. 102.035.176.\*

Material Vinyl (bl)

6 mm



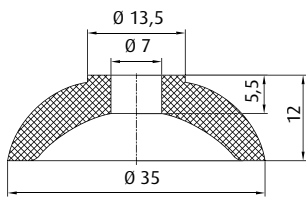
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no. 112.035.060.\*

Material NBR (sw), SI (w), NR (sw)

5 mm

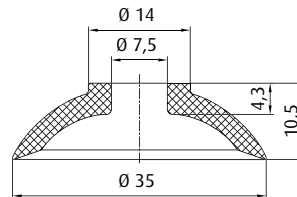
Additional sizes available are found on p. 52.



Item no. 112.035.064.\*

Material NR (sw), NR (bg)

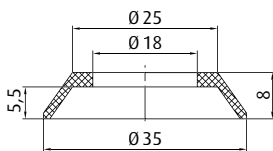
5 mm



Item no. 115.035.007.\*

Material NBR (sw), SI (tr), NR (sw)

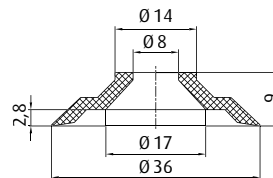
5 mm



Item no. 107.035.055.\*

Material NR (bg)

4 mm



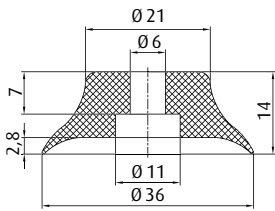
	Connection	see page
270.255	M8-male	415

Item no. 102.036.106.\*

Material SI (gr)

3 mm

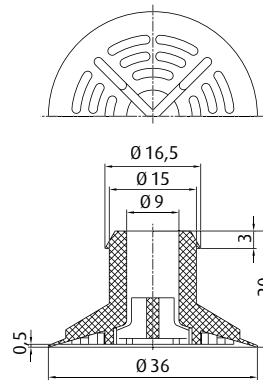
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

**Item no.**  
102.035.056.\* **Material**  
NBR (sw), SI (tr) 3 mm

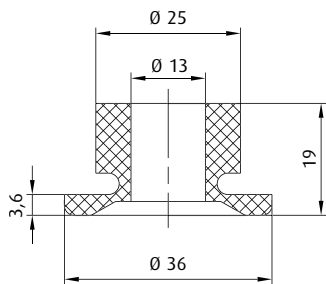
Additional sizes available are found on p. 32.



	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

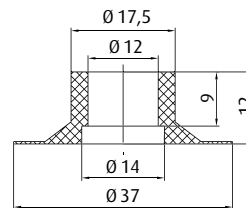
**Item no.**  
102.036.342.\* **Material**  
SI (tr) 0.5 mm

Additional sizes available are found on p. 21.  
**Notes:** Especially well-suited for foils  
This vacuum cup is also available in the following dimensions: 27 mm



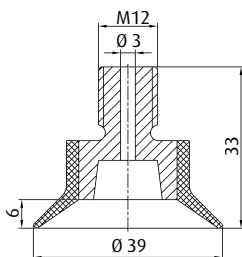
	Connection	see page
270.207	G1/4-male	426

**Item no.**  
107.036.037.\* **Material**  
NR (br) 1.5 mm

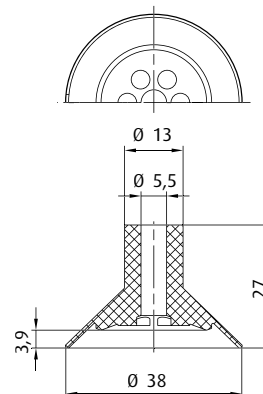


	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
107.037.027.\* **Material**  
NR (br) 0 mm



**Item no.**  
120.038.021.\* **Material**  
NR (sw) 3 mm



	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

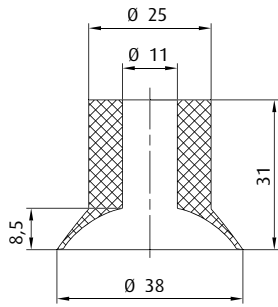
**Item no.**  
104.038.039.\* **Material**  
PU (br), Vinyl (bl) 3.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 38 - 40 mm

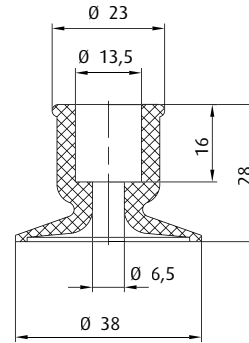


Icon	Connection	see page
	G1/4-male	426

**Item no.**  
102.038.157.\_\*

**Material**  
Vinyl (bl)

6 mm

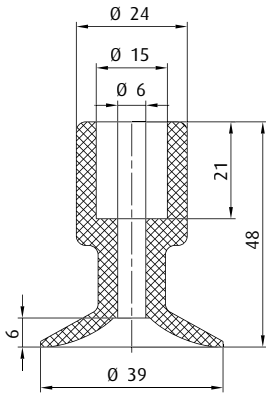


Icon	Connection	see page
	G1/4-male	426

**Item no.**  
102.038.136.\_\*

**Material**  
NR (bg)

2.5 mm

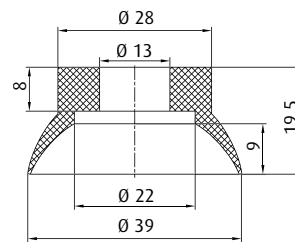


Icon	Connection	see page
	G1/4-female	432

**Item no.**  
102.039.154.\_\*

**Material**  
NR (bg)

2 mm

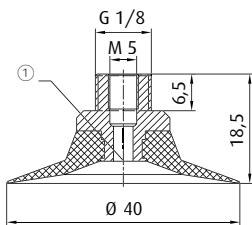


Icon	Connection	see page
	G1/4-male	430

**Item no.**  
112.039.069.\_\*

**Material**  
NR (bg)

5 mm



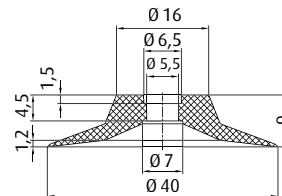
① = Filter screen

**Item no.**  
120.040.084.\_\*

**Material**  
CR (sw)

2.5 mm

Spare cup



Icon	Connection	see page
	M5-female	413
	G1/8-male	418
	G1/8-male	418

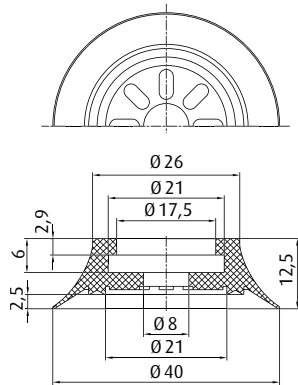
**Item no.**  
102.040.310.\_\*

**Material**  
CR (sw)

2 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





Item no.	Connection	see page
270.234	G1/8-female	438

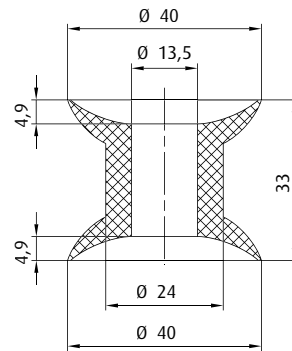
**FLEXIBLE LIP**

**Item no.**  
102.040.357.\*

**Material**  
SI (tr), NR (br)

3 mm

Additional sizes available are found on p. 66.

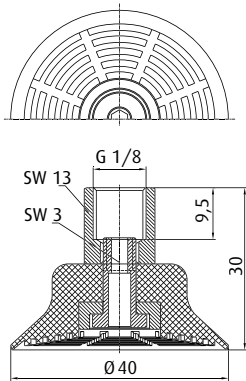


Item no.	Connection	see page
270.116	G1/4-female	432

**Item no.**  
102.039.235.\*

**Material**  
NR (br)

5 mm



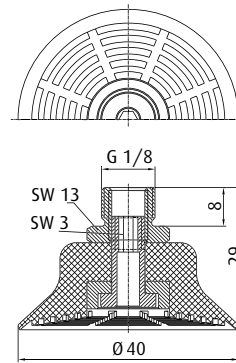
**NON-SLIP**

**Item no.**  
100.040.103.\*

**Material**  
NBR (sw)

2.5 mm

Additional sizes available are found on p. 62.



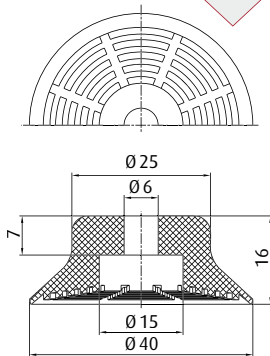
**NON-SLIP**

**Item no.**  
100.040.113.\*

**Material**  
NBR (sw)

2.5 mm

Additional sizes available are found on p. 62.



Item no.	Connection	see page
270.498	M6-male	414
270.486	G1/8-male	420
270.485	G1/8-female	423
270.487	G1/4-male	429
270.488	G1/4-female	434

Item no.	Connection	see page
50.170	20 mm	456
50.171	30 mm	456
50.172	40 mm	456
50.173	50 mm	456

**Item no.**  
104.040.068.\*

**Material**  
NBR (sw)

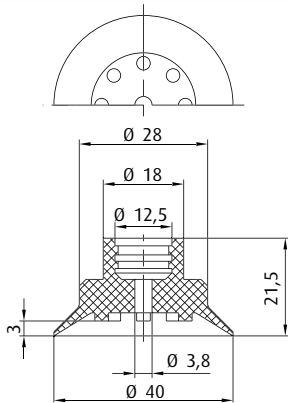
2.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

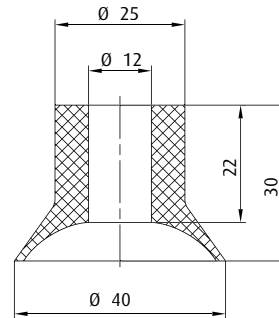
Ø 40 mm



Item no.	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

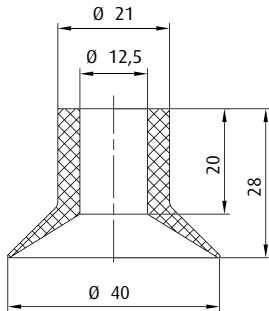
<b>Item no.</b> 104.040.014.*	<b>Material</b> NBR (sw)	2.5 mm
----------------------------------	-----------------------------	--------

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 30 mm, 50 mm



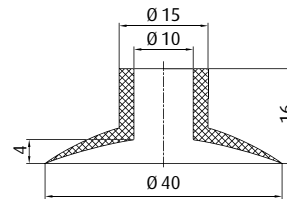
Item no.	Connection	see page
270.049-1	G1/4-male	426

<b>Item no.</b> 122.040.001.*	<b>Material</b> NBR (sw), SI (tr), NR (bg)	5 mm
----------------------------------	---	------



Item no.	Connection	see page
270.049-1	G1/4-male	426

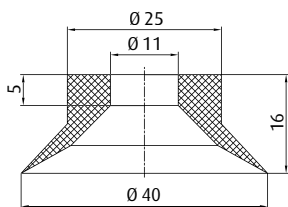
<b>Item no.</b> 122.040.044.*	<b>Material</b> SI (tr), NR (bg)	4.5 mm
----------------------------------	-------------------------------------	--------



Item no.	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

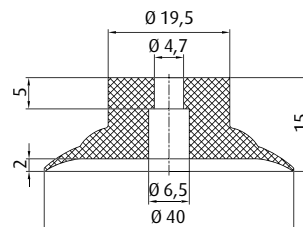
<b>Item no.</b> 112.040.071.*	<b>Material</b> NBR (sw), SI (tr)	4 mm
----------------------------------	--------------------------------------	------

Additional sizes available are found on p. 52.



Item no.	Connection	see page
270.256	M8-male	415
270.252	G1/8-female	424

<b>Item no.</b> 126.040.016.*	<b>Material</b> SI (tr), NR (bg), PU (bl)	5 mm
----------------------------------	--	------



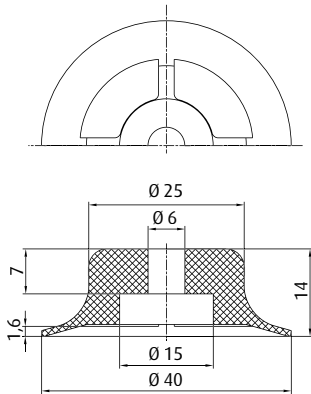
Item no.	Connection	see page
270.317	M5-male	410
270.103	M6-male	413
270.205	G1/8-male	416
270.109	G1/8-female	421
270.194	G1/4-male	425

Item no.	Connection	see page
50.020	8.5 mm	454

<b>Item no.</b> 102.040.223.*	<b>Material</b> NBR (sw), SI (tr)	2 mm
----------------------------------	--------------------------------------	------

Additional sizes available are found on p. 50.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
	M6-male	414
	G1/8-male	420
	G1/8-female	423
	G1/4-male	429
	G1/4-female	434

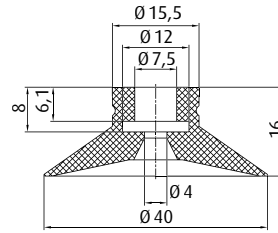
		see page
	20 mm	456
	30 mm	456
	40 mm	456
	50 mm	456

**Item no.**  
102.040.289.\*

**Material**  
NBR (sw), SI (tr), PU (bl),  
FKM (gr)

2 mm

Additional sizes available are found on p. 38.



	Connection	see page
	G1/8-male	421
	G1/8-female	423
	G1/4-male	428
	G1/4-female	432

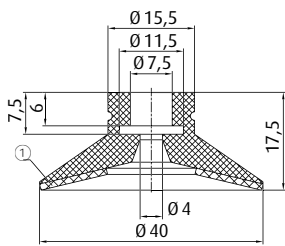
  

		see page
	5 mm	456
	10 mm	456
	30 mm	456

**Item no.**  
102.040.364.\*

**Material**  
SI (bl)

3 mm



	Connection	see page
	G1/8-male	421
	G1/8-female	423
	G1/4-male	428
	G1/4-female	432

		see page
	5 mm	456
	10 mm	456
	30 mm	456

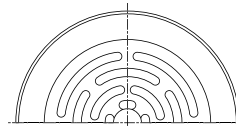
① = Silicone sponge

**Item no.**  
104.040.088.\*

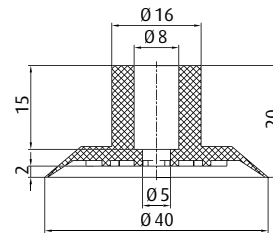
**Material**  
SI (bl/r)

2.5 mm

Additional sizes available are found on p. 166.



	Connection	see page
	G1/8-male	419
	G1/8-female	422
	G1/4-male	425
	G1/4-female	431



**BESTSELLER**

**Item no.**  
104.040.018.\*

**Material**  
SI (tr), NR (sw), NR (br)

2 mm

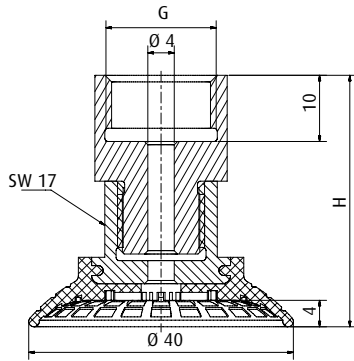
Additional sizes available are found on p. 21.  
This vacuum cup is also available in the following dimensions: 15 mm, 24 mm, 28 mm, 30 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



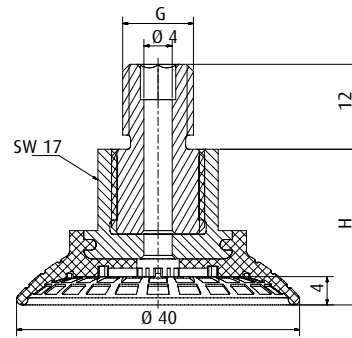
# Vacuum cups by size | Flat vacuum cups by Ø

Ø 42 mm



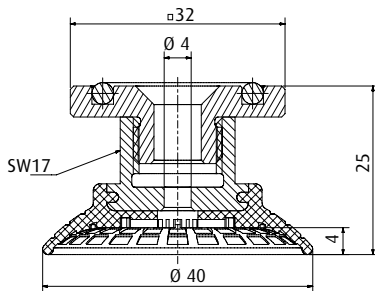
Item no.	Material	⌀ [mm]	Connection thread	H [mm]
103.040.037.*	NBR (bl)	4	G1/4-female	22
103.040.038.*	NBR (bl)	4	G3/8-female	38

Additional sizes available are found on p. 64.



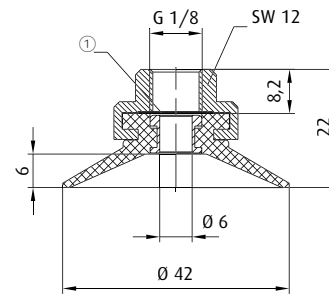
Item no.	Material	⌀ [mm]	Connection thread	H [mm]
103.040.036.*	NBR (bl)	4	G1/4-male	22
103.040.039.*	NBR (bl)	4	M10-male	22
103.040.040.*	NBR (bl)	4	M14x1.5-male	22

Additional sizes available are found on p. 64.



Item no.	Material	⌀ [mm]
103.040.041.*	NBR (bl)	4 mm

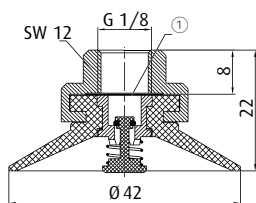
Additional sizes available are found on p. 64.



① = Filter screen

Item no.	Material	⌀ [mm]
120.040.076.*	SI (tr), CR (sw)	4 mm

Additional sizes available are found on p. 47.

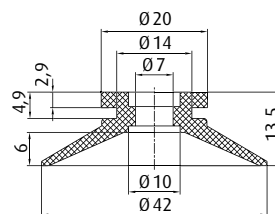


① = Filter screen

Item no.	Material	⌀ [mm]
121.040.007.*	SI (tr), CR (sw)	4 mm

Additional sizes available are found on p. 47.

Spare cup

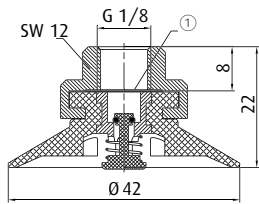


Item no.	Material	⌀ [mm]
102.040.094.*	SI (tr), CR (sw)	4 mm

Additional sizes available are found on p. 42.

	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

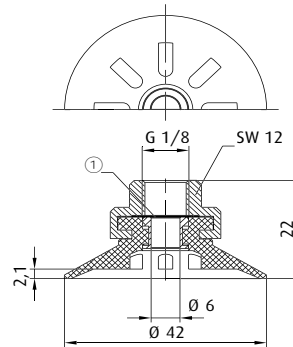
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



① = Filter screen

**Item no.**  
**124.040.006.\_\***      **Material**  
SI (tr), CR (sw)      2 mm

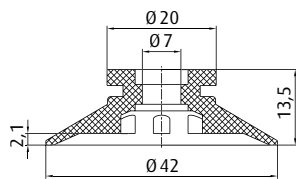
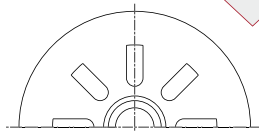
Additional sizes available are found on p. 47.



① = Filter screen

**Item no.**  
**123.040.028.\_\***      **Material**  
Tepuflex® (or), SI (tr), CR (sw)      2 mm

Additional sizes available are found on p. 47.

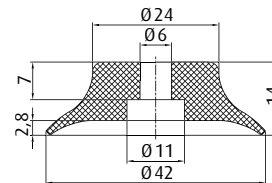


	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

**BESTSELLER**

**Item no.**  
**125.040.013.\_\***      **Material**  
Tepuflex® (or), SI (tr), CR (sw)      2 mm

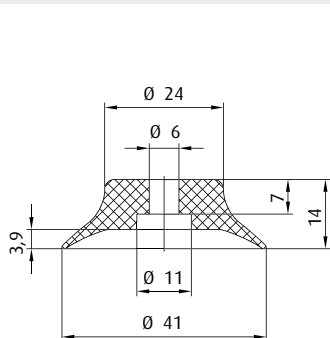
Additional sizes available are found on p. 42.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

**Item no.**  
**102.040.061.\_\***      **Material**  
NBR (sw), SI (tr), PU (bl)      3.5 mm

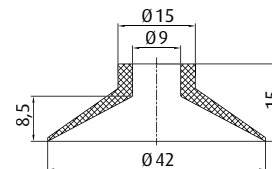
Additional sizes available are found on p. 32.



	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

**Item no.**  
**102.040.503.\_\***      **Material**  
Thermalon® (bl)      3.9 mm

Additional sizes available are found on p. 36.



	Connection	see page
270.034	G1/4-male	428
270.038	G1/4-female	432

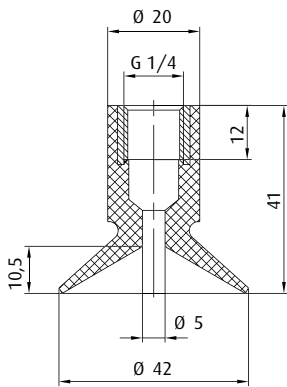
**Item no.**  
**102.042.232.\_\***      **Material**  
NR (sw)      7 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 42 - 43 mm

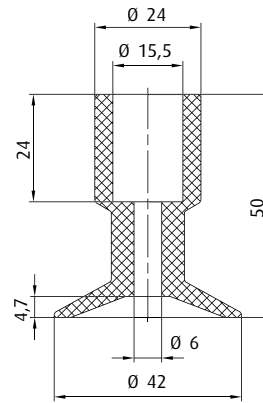


**Item no.**  
120.040.032.\*

**Material**  
SI (tr), NR (sw)

6 mm

This vacuum cup is also available in the following dimensions: 53 mm, 62 mm, 83 mm

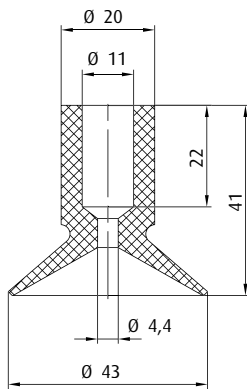


**Item no.**  
102.042.184.\*

**Material**  
Vinyl (bl)

4 mm

	Connection	see page
270.116	G1/4-female	432



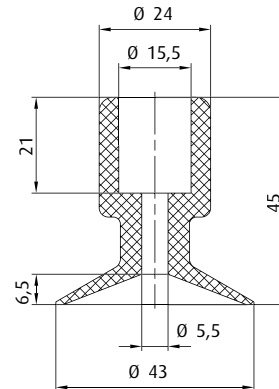
**Item no.**  
122.040.043.\*

**Material**  
SI (tr), NR (sw)

4 mm

Additional sizes available are found on p. 56.

	Connection	see page
270.049-1	G1/4-male	426

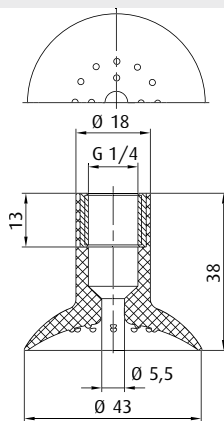


**Item no.**  
102.043.252.\*

**Material**  
NR (br)

7 mm

	Connection	see page
270.116	G1/4-female	432

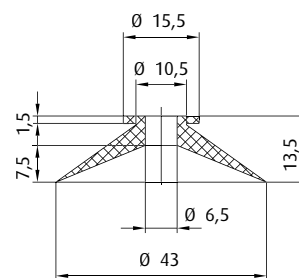


**Item no.**  
110.042.068.\*

**Material**  
SI (tr), NR (sw)

5 mm

This vacuum cup is also available in the following dimensions: 50 mm, 62 mm, 81 mm, 100 mm



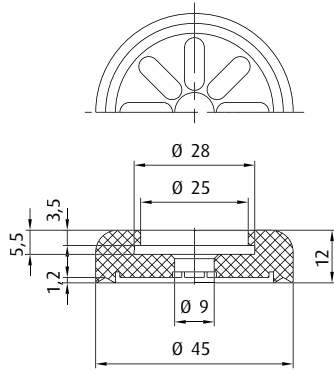
**Item no.**  
102.043.170.\*

**Material**  
Vinyl (bl)

5 mm

	Connection	see page
270.063	G1/8-male	419
270.061	G1/8-female	422

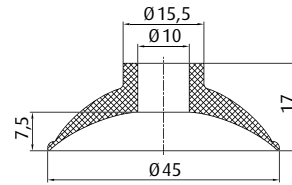
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



Item no.	Connection	see page
270.235	G1/8-female	438

Item no.	Material	Thickness
102.045.460.*	HNBR (ge), NR (br)	1.2 mm

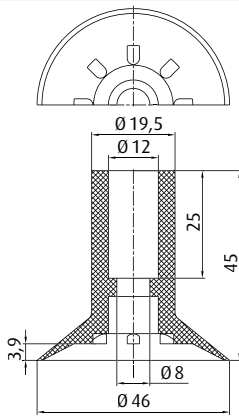
Additional sizes available are found on p. 70.



Item no.	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.	Material	Thickness
112.045.077.*	NBR (sw), SI (w), NR (sw)	7 mm

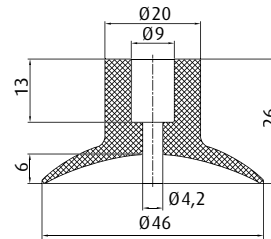
Additional sizes available are found on p. 52.



Item no.	Connection	see page
270.049-1	G1/4-male	426

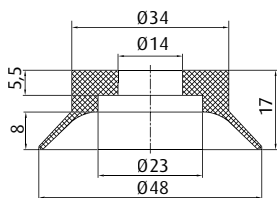
Item no.	Material	Thickness
127.045.002.*	NR (sw)	5 mm

This vacuum cup is also available in the following dimensions: 65 mm



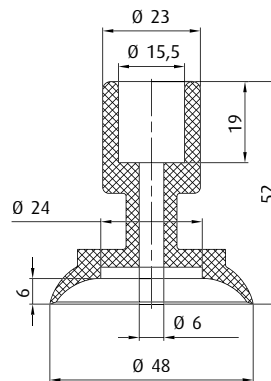
Item no.	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425

Item no.	Material	Thickness
102.046.046.*	NBR (sw)	6 mm



Item no.	Connection	see page
270.210	G1/4-male	430

Item no.	Material	Thickness
107.048.031.*	SI (tr), NR (gr)	5 mm



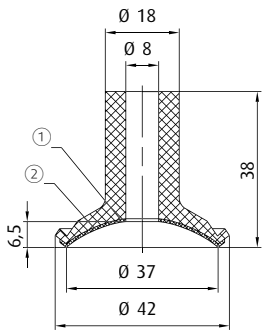
Item no.	Material	Thickness
115.048.008.*	NR (sw)	8 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 37 - 50 mm



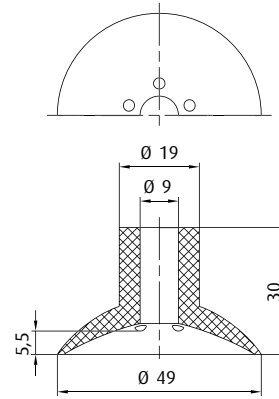
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

**NON-MARKING!**  
**TEMP. MAX. 500 °C**

① = Felt pads ② = For silicone vacuum cups with silicone membranes: evaporated aluminium layer

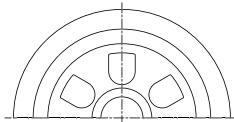
<b>Item no.</b> 26.037.010._*	<b>Material</b> SI (tr/ge)	3 mm
----------------------------------	-------------------------------	------

Additional sizes available are found on p. 164.



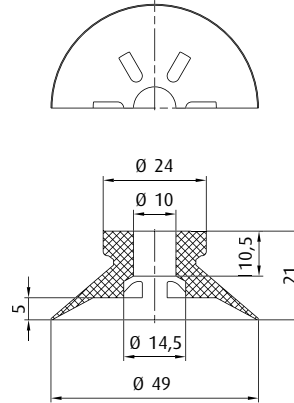
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

<b>Item no.</b> 102.048.274._*	<b>Material</b> NR (sw)	6 mm
-----------------------------------	----------------------------	------



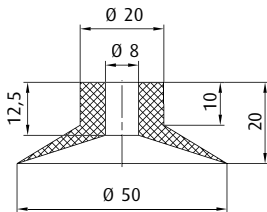
	Connection	see page
270.315	M6-male	414
270.177	M10-male	416
270.540	G1/4-male	429
270.539	G1/4-female	434

<b>Item no.</b> 104.050.022._*	<b>Material</b> NBR (gr), NR (bg)	4.5 mm
-----------------------------------	--------------------------------------	--------



	Connection	see page
270.249	G1/4-male	427
270.248	G1/4-female	433

<b>Item no.</b> 127.050.004._*	<b>Material</b> SI (tr), NR (sw), NR (bg)	4 mm
-----------------------------------	--	------

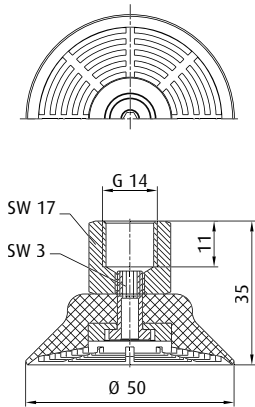


	Connection	see page
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

<b>Item no.</b> 126.050.017._*	<b>Material</b> SI (tr), NR (bg)	4 mm
-----------------------------------	-------------------------------------	------

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

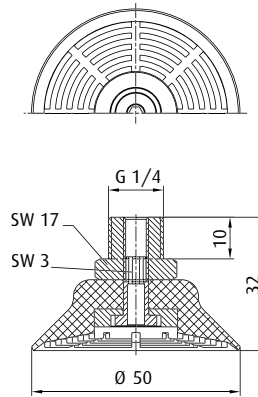




**NON-SLIP**

**Item no. 100.050.104.\*** Material NBR (sw) 3.1 mm

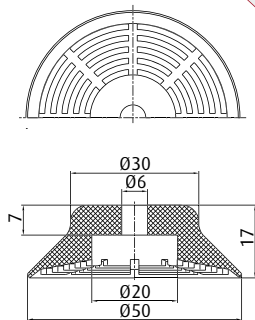
Additional sizes available are found on p. 62.



**NON-SLIP**

**Item no. 100.050.114.\*** Material NBR (sw) 3.1 mm

Additional sizes available are found on p. 62.

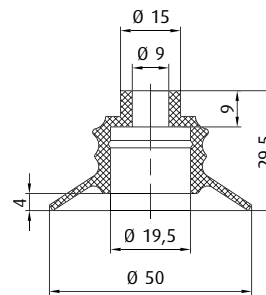


	Connection	see page
	M6-male	414
	G1/8-male	420
	G1/8-female	423
	G1/4-male	429
	G1/4-female	434

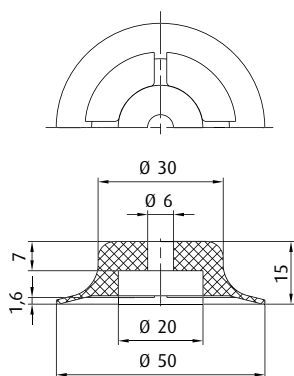
	Height	see page
	20 mm	456
	30 mm	456
	40 mm	456
	50 mm	456

**Item no. 104.050.069.\*** Material NBR (sw) 3.1 mm



	Connection	see page
	G1/8-male	421
	G1/8-female	423

**Item no. 107.050.042.\*** Material NR (sw), NR (br) 6 mm



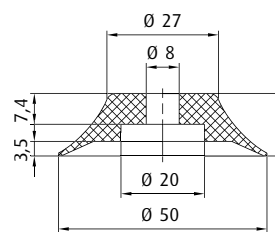
	Connection	see page
	M6-male	414
	G1/8-male	420
	G1/8-female	423
	G1/4-male	429
	G1/4-female	434

	Height	see page
	20 mm	456
	30 mm	456
	40 mm	456
	50 mm	456

**Item no. 102.050.290.\*** Material NBR (sw), SI (tr), PU (bl), FKM (gr) 2 mm

Additional sizes available are found on p. 38.



	Connection	see page
	G1/8-male	420
	G1/8-female	423
	G1/4-male	429
	G1/4-female	434

**Item no. 102.050.065.\*** Material NBR (sw), SI (tr), PU (bl) 4 mm

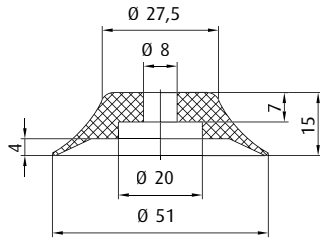
Additional sizes available are found on p. 32.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 50 mm



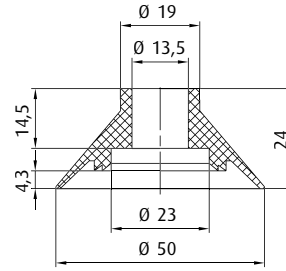
	Connection	see page
270.012	G1/8-male	421
270.020	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

**Item no.**  
102.050.504.\_\*

**Material**  
Thermalon® (bl)

4 mm

Additional sizes available are found on p. 36.



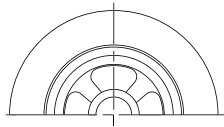
	Connection	see page
270.184	G1/4-male	431

**BESTSELLER**

**Item no.**  
127.050.003.\_\*

**Material**  
SI (r), CR (sw)

5 mm



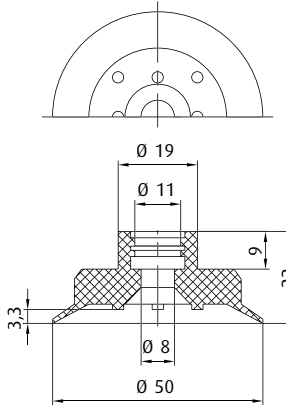
① = Aluminium

**Item no.**  
150.050.032.\_\*

**Material**  
SI (r), FKM (sw), CR (sw)

5.5 mm

Additional sizes available are found on p. 68.



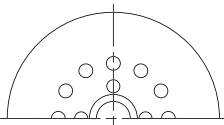
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
104.050.064.\_\*

**Material**  
NBR (sw), SI (tr)

5 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 30 mm, 40 mm

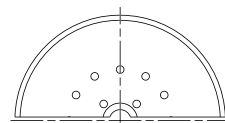


	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
102.050.433.\_\*

**Material**  
Vulkollan® (br)

3 mm

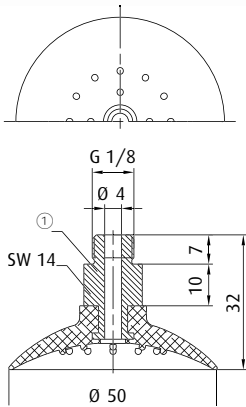


**Item no.**  
110.050.080.\_\*

**Material**  
NR (sw)

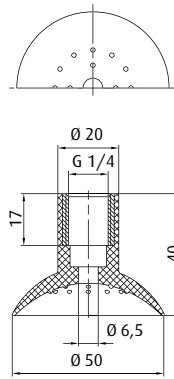
4 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



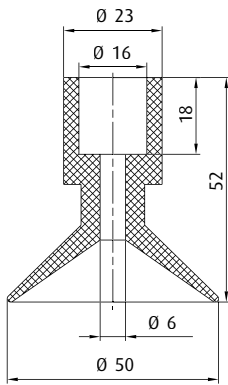
① = Aluminium

<b>Item no.</b> 113.050.014._*	<b>Material</b> NBR (sw)	5 mm
-----------------------------------	-----------------------------	------

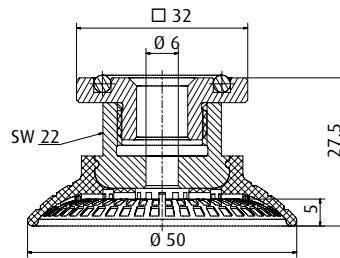


<b>Item no.</b> 110.050.078._*	<b>Material</b> SI (tr), NR (sw)	9 mm
-----------------------------------	-------------------------------------	------

This vacuum cup is also available in the following dimensions: 43 mm, 62 mm, 81 mm, 100 mm

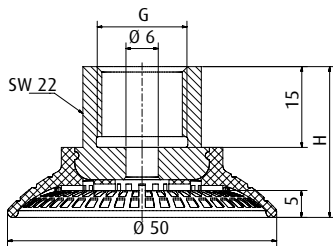


<b>Item no.</b> 126.050.018._*	<b>Material</b> NR (bg)	10 mm
-----------------------------------	----------------------------	-------



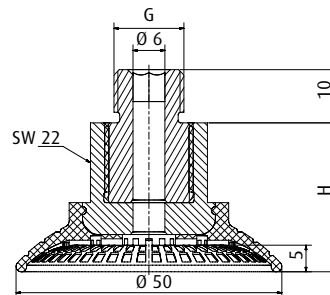
<b>Item no.</b> 103.050.047._*	<b>Material</b> NBR (bl)	5 mm
-----------------------------------	-----------------------------	------

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.050.043._*	NBR (bl)	5	G1/4-female	33
103.050.044._*	NBR (bl)	5	G3/8-female	28

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.050.042._*	NBR (bl)	5	G1/4-male	28
103.050.045._*	NBR (bl)	5	M10-male	28
103.050.046._*	NBR (bl)	5	M14x1.5-male	28

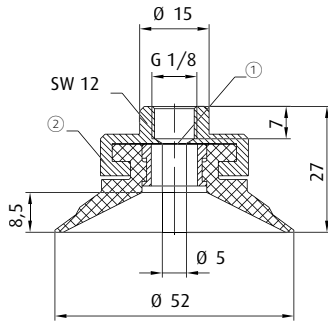
Additional sizes available are found on p. 64.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

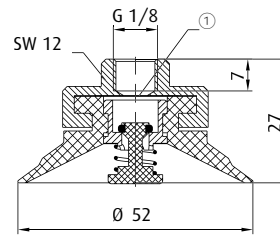
Ø 52 - 53 mm



① = Filter screen ② = Aluminium

**Item no.** 120.050.078.\* **Material** SI (tr), CR (sw) 6.5 mm

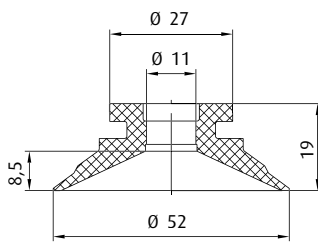
Additional sizes available are found on p. 47.



① = Filter screen

**Item no.** 121.050.008.\* **Material** SI (tr), CR (sw) 2.5 mm

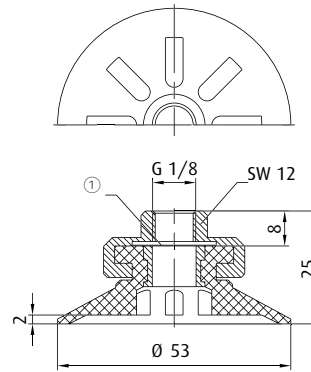
Additional sizes available are found on p. 47.



**Item no.** 102.050.097.\* **Material** SI (tr), CR (sw) 6.5 mm

Additional sizes available are found on p. 42.

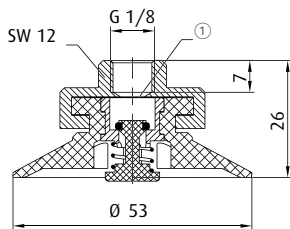
	Connection	see page
270.252	G1/8-female	424
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435



① = Filter screen

**Item no.** 123.050.034.\* **Material** Tepuflex® (or), SI (tr), CR (sw) 2.5 mm

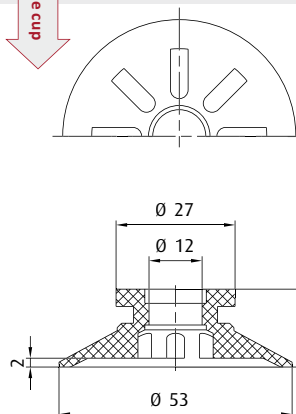
Additional sizes available are found on p. 47.



① = Filter screen

**Item no.** 124.050.009.\* **Material** SI (tr), CR (sw) 2.5 mm

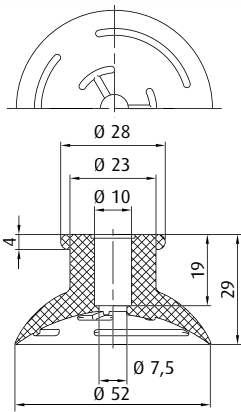
Additional sizes available are found on p. 47.



**Item no.** 125.050.017.\* **Material** Tepuflex® (or), SI (tr), CR (sw) 2.5 mm

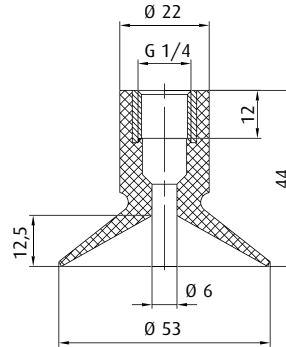
Additional sizes available are found on p. 42.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



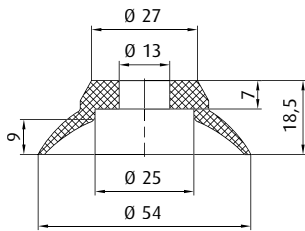
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
114.052.008.\* **Material**  
NR (bg) 6 mm



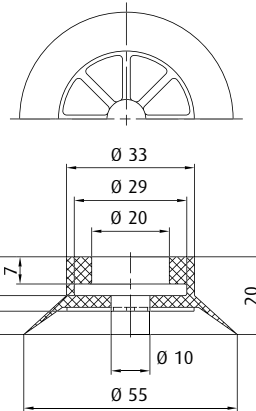
**Item no.**  
120.050.040.\* **Material**  
SI (tr), NR (sw) 11 mm

This vacuum cup is also available in the following dimensions: 42 mm, 62 mm, 83 mm



	Connection	see page
270.184	G1/4-male	431

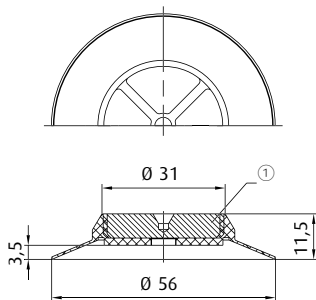
**Item no.**  
112.055.086.\* **Material**  
PU (bl) 6 mm



	Connection	see page
270.289	G1/8-female	438

**FLEXIBLE LIP**

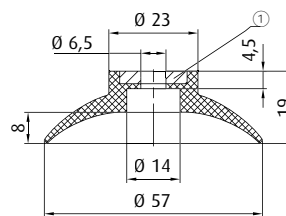
**Item no.**  
154.055.060.\* **Material**  
NBR (gr) 6 mm



① = Steel

**Item no.**  
152.055.092.\* **Material**  
NBR (gr) 4 mm

**Ordering notes:** Customised drilling patterns on request



① = Aluminium

**Item no.**  
112.057.087.\* **Material**  
NR (sw) 6 mm

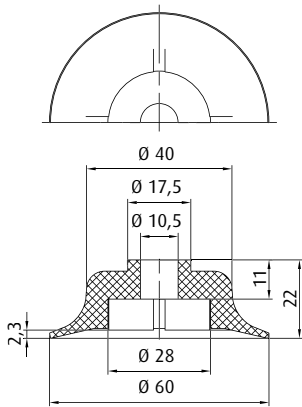
	Connection	see page
270.312/19	M6-male	414

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

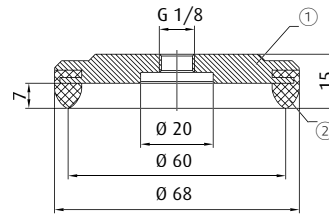
Ø 60 - 62 mm



Connection	see page
M10-male	416

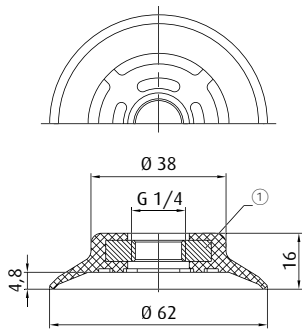
<b>Item no.</b> 102.060.291.*	<b>Material</b> NBR (sw), SI (tr), PU (bl), FKM (gr)	2.5 mm
----------------------------------	--	--------

Additional sizes available are found on p. 38.



<b>Item no.</b> 160.067.003.*	<b>Material</b> EPDM (sw)	1 mm
----------------------------------	------------------------------	------

Additional sizes available are found on p. 72.  
Notes: Foam sealing lip equalises product unevenness

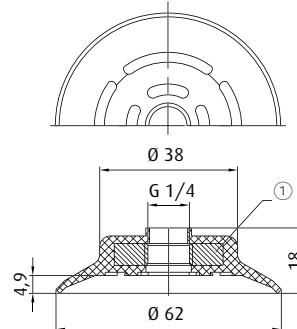


Connection	see page
M10x1.25-female	752
G1/4-male	750

**BESTSELLER**

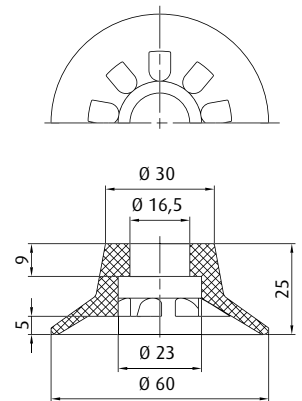
<b>Item no.</b> 102.060.303.*	<b>Material</b> NBR (sw), SI (tr), PU (bl)	5 mm
----------------------------------	---	------

Additional sizes available are found on p. 32.



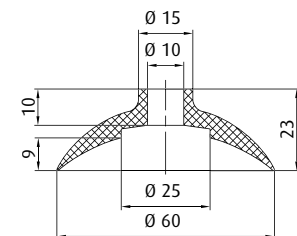
<b>Item no.</b> 102.060.505.*	<b>Material</b> Thermalon® (bl)	4.9 mm
----------------------------------	------------------------------------	--------

Additional sizes available are found on p. 36.



Connection	see page
G1/4-male	430

<b>Item no.</b> 104.060.024.*	<b>Material</b> NBR (gr), SBR (br), NR (bg)	4 mm
----------------------------------	--	------



Connection	see page
G1/4-male	431

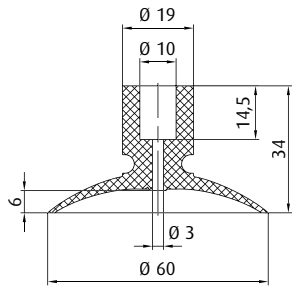
<b>Item no.</b> 112.060.091.*	<b>Material</b> NBR (sw), SI (tr)	9 mm
----------------------------------	--------------------------------------	------

Additional sizes available are found on p. 52.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

# Vacuum cups by size | Flat vacuum cups by Ø

Ø 60 - 62 mm

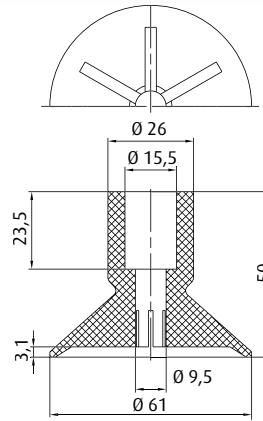


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.  
115.060.009.\*

Material  
NR (sw)

5 mm

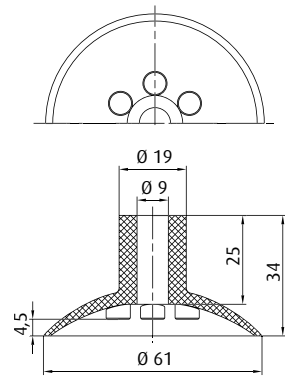


	Connection	see page
270.116	G1/4-female	432

Item no.  
104.061.060.\*

Material  
Vinyl (bl)

2.5 mm

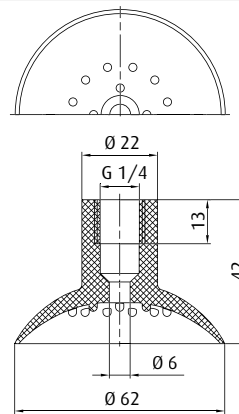


	Connection	see page
270.208	G1/4-male	425

Item no.  
114.061.010.\*

Material  
SI (tr), NR (sw)

5 mm

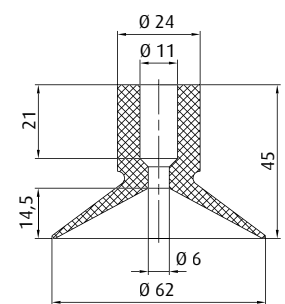


Item no.  
110.060.085.\*

Material  
SI (tr), NR (sw)

9.5 mm

This vacuum cup is also available in the following dimensions: 43 mm, 50 mm, 81 mm, 100 mm



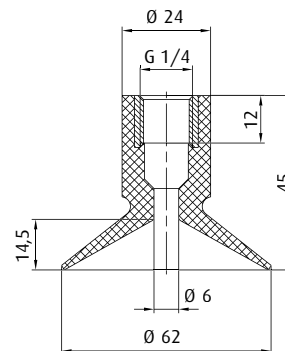
	Connection	see page
270.049-1	G1/4-male	426

Item no.  
122.060.059.\*

Material  
NBR (sw), SI (tr), NR (sw)

10 mm

Additional sizes available are found on p. 56.



Item no.  
120.060.045.\*

Material  
SI (tr), NR (sw)

10 mm

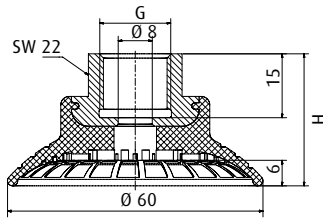
This vacuum cup is also available in the following dimensions: 42 mm, 53 mm, 83 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



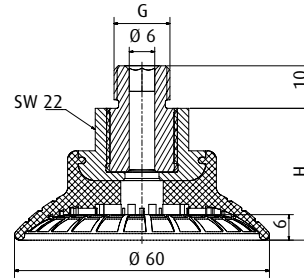
# Vacuum cups by size | Flat vacuum cups by Ø

Ø 63 - 64 mm



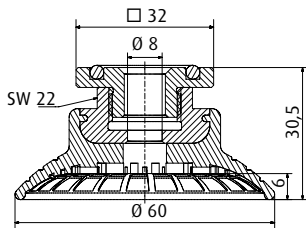
Item no.	Material	SW [mm]	Connection thread	H [mm]
103.060.049._*	NBR (bl)	6	G1/4-female	36
103.060.050._*	NBR (bl)	6	G3/8-female	31

Additional sizes available are found on p. 64.



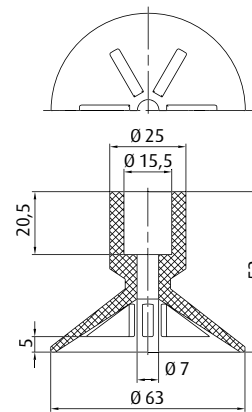
Item no.	Material	SW [mm]	Connection thread	H [mm]
103.060.048._*	NBR (bl)	6	G1/4-male	31
103.060.051._*	NBR (bl)	6	M10-male	31
103.060.052._*	NBR (bl)	6	M14x1.5-male	31

Additional sizes available are found on p. 64.



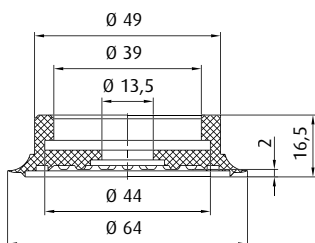
Item no.	Material	SW [mm]
103.060.053._*	NBR (bl)	6 mm

Additional sizes available are found on p. 64.



Item no.	Connection	see page
270.116	G1/4-female	432

Item no.	Material	SW [mm]
104.063.041._*	NR (bg), CR (r)	6.5 mm

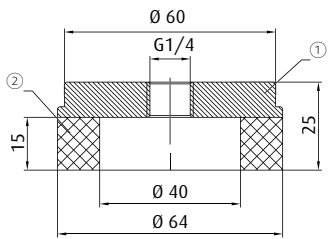


Item no.	Connection	see page
270.262	G1/8-female	438
270.284	G1/4-female	438

Item no.	Material	SW [mm]
154.065.002._*	SI (tr), NR (sw), NR (br), Vinyl (bl)	1.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



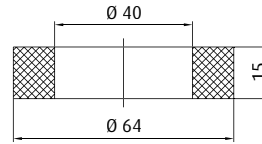


① = Aluminium ② = Sponge rubber NR

<b>Item no.</b> 206.064.006.*	<b>Material</b> Sponge rubber (or)	10 mm
----------------------------------	---------------------------------------	-------

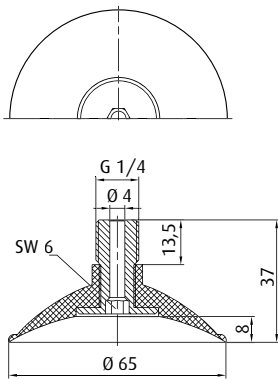
This vacuum cup is also available in the following dimensions: 91 mm

Spare cup

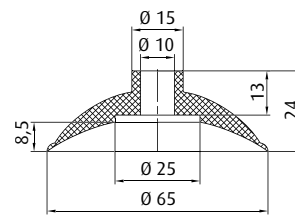


<b>Item no.</b> 208.064.001.*	<b>Material</b> Sponge rubber (or)	10 mm
----------------------------------	---------------------------------------	-------

This vacuum cup is also available in the following dimensions: 91 mm

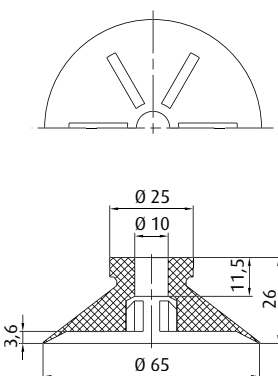


<b>Item no.</b> 110.065.091.*	<b>Material</b> NBR (sw), SI (tr), NR (sw), NR (bg), Vinyl (bl)	7 mm
----------------------------------	---	------



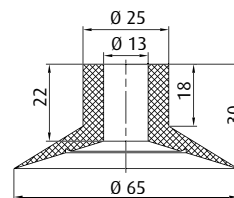
<b>Item no.</b> 112.065.093.*	<b>Material</b> NBR (sw), SI (tr), NR (sw), NR (bg), Vinyl (bl)	7 mm
----------------------------------	---	------

	<b>Connection</b>	<b>see page</b>
270.176	G1/4-male	430



<b>Item no.</b> 125.065.026.*	<b>Material</b> SI (tr), NR (sw), NR (bg)	5 mm
----------------------------------	--	------

	<b>Connection</b>	<b>see page</b>
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



<b>Item no.</b> 126.065.019.*	<b>Material</b> SI (tr), NR (sw)	5 mm
----------------------------------	-------------------------------------	------

	<b>Connection</b>	<b>see page</b>
270.207	G1/4-male	426

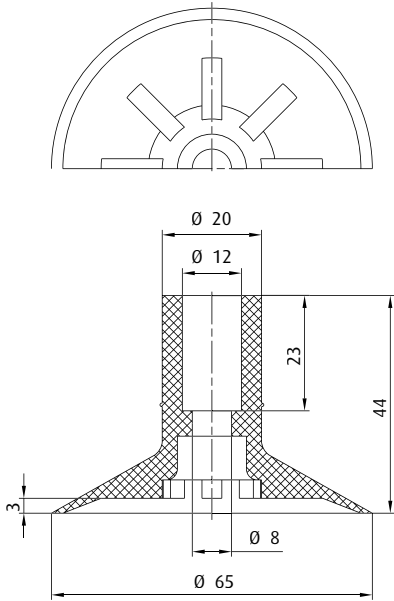
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 65 - 70 mm

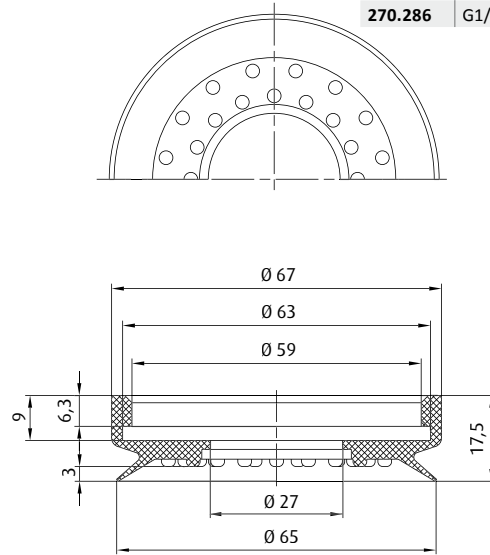
	Connection	see page
270.049-1	G1/4-male	426



**Item no.** 127.065.006.\* **Material** SI (tr), NR (sw) 3 mm

This vacuum cup is also available in the following dimensions: 46 mm

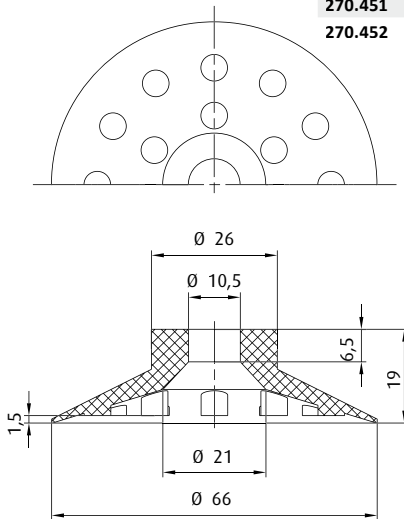
	Connection	see page
270.158	G1/8-female	438
270.264	G1/4-female	438
270.161	G3/8-female	438
270.286	G1/2-female	438



**Item no.** 154.065.003.\* **Material** NBR (sw), SI (w), NR (sw) 3 mm

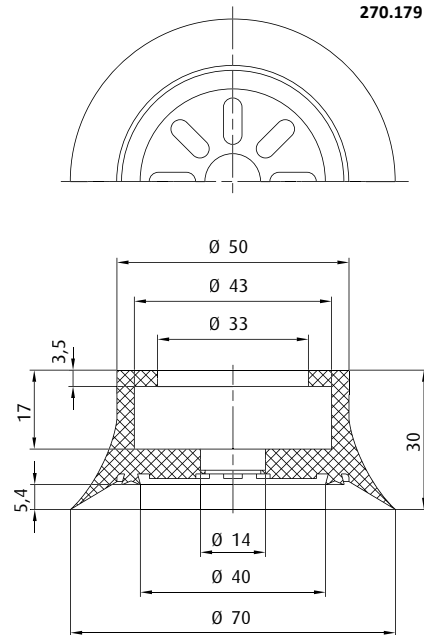
Additional sizes available are found on p. 70.

	Connection	see page
270.256	M8-male	415
270.012	G1/8-male	421
270.020	G1/8-female	423
270.451	G1/4-male	426
270.452	G1/4-female	431



**Item no.** 125.066.027.\* **Material** NBR (sw), SI (tr), NR (sw) 0.5 mm

	Connection	see page
270.179	G1/4-female	438



**BESTSELLER**

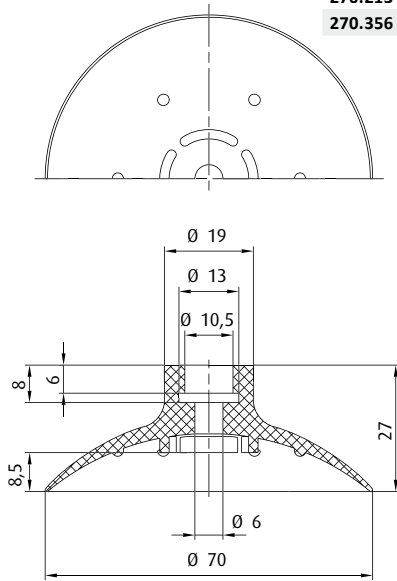
**Item no.** 102.070.234.\* **Material** NBR (gr), SBR (br), SI (tr), NR (bg), NR (br) 6 mm

Additional sizes available are found on p. 66.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



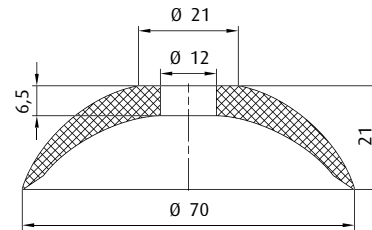
	Connection	see page
270.213	G1/4-male	428
270.356	G1/4-female	433



**Item no.**  
102.070.325.\_\*

**Material**  
Vulkollan® (br)

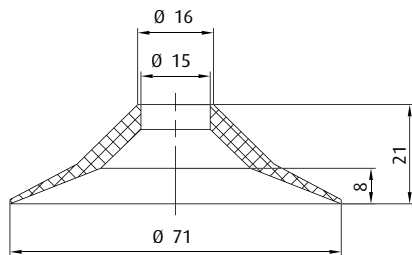
8.5 mm



**Item no.**  
112.070.096.\_\*

**Material**  
NR (bg)

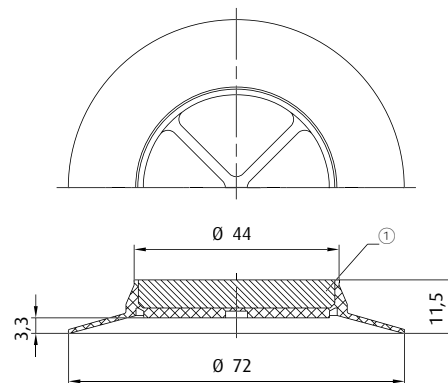
12 mm



**Item no.**  
107.070.029.\_\*

**Material**  
NR (br)

6 mm



① = Steel

**Item no.**  
152.070.093.\_\*

**Material**  
NBR (gr)

4 mm

**Ordering notes:** Customised drilling patterns on request

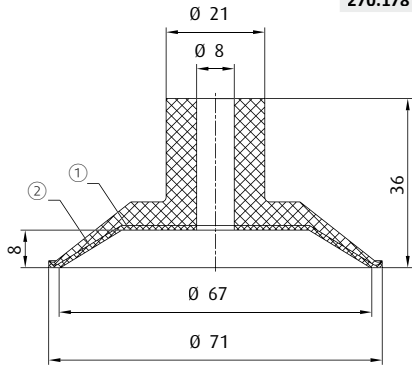
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 70 - 75 mm

	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431



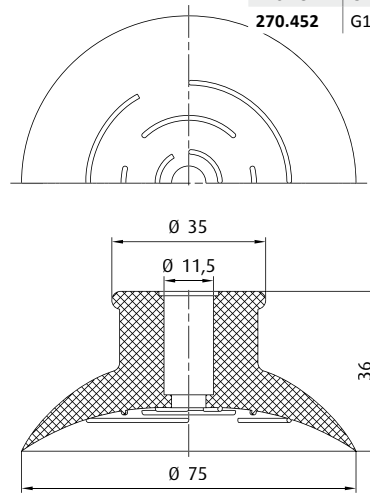
**NON-MARKING!**  
**TEMP. MAX. 500 °C**

① = Felt pads ② = For silicone vacuum cups with silicone membranes: evaporated aluminium layer

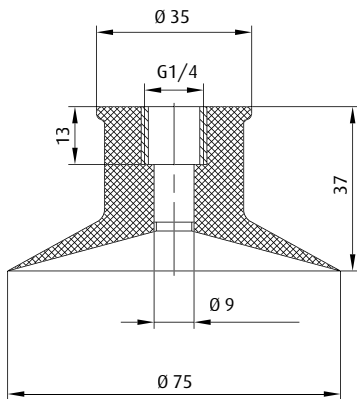
<b>Item no.</b> 26.070.011.*	<b>Material</b> SI (tr/ge)	7 mm
---------------------------------	-------------------------------	------

Additional sizes available are found on p. 164.

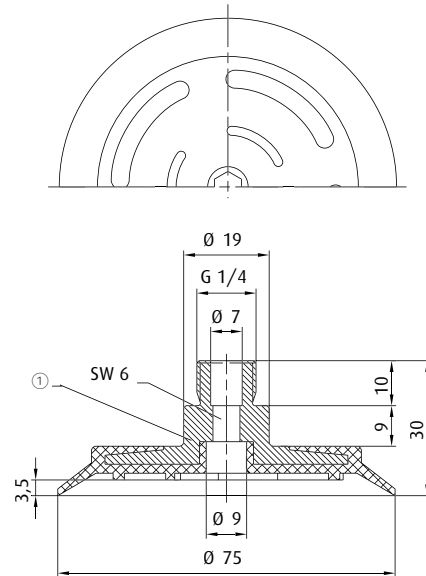
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



<b>Item no.</b> 114.075.012.*	<b>Material</b> NR (br)	3.5 mm
----------------------------------	----------------------------	--------



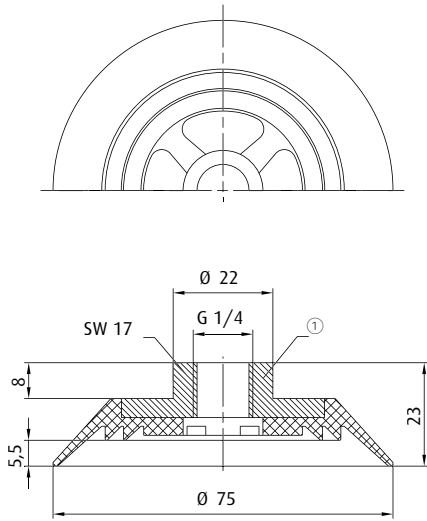
<b>Item no.</b> 120.075.075.*	<b>Material</b> NR (bg)	3 mm
----------------------------------	----------------------------	------



① = Aluminium

<b>Item no.</b> 103.075.025.*	<b>Material</b> Vulkollan® (br)	3.5 mm
----------------------------------	------------------------------------	--------

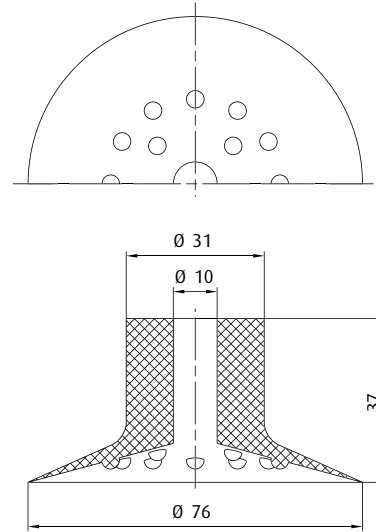
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



① = Aluminium

<b>Item no.</b> 150.075.033.*	<b>Material</b> SI (r), FKM (sw), CR (sw)	6 mm
----------------------------------	--	------

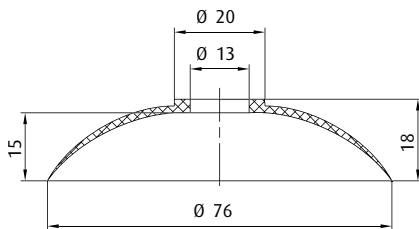
Additional sizes available are found on p. 68.



	<b>Connection</b>	<b>see page</b>
270.044	G1/4-male	426

<b>Item no.</b> 102.075.275.*	<b>Material</b> NR (br)	3 mm
----------------------------------	----------------------------	------

	<b>Connection</b>	<b>see page</b>
270.183	G1/4-male	431



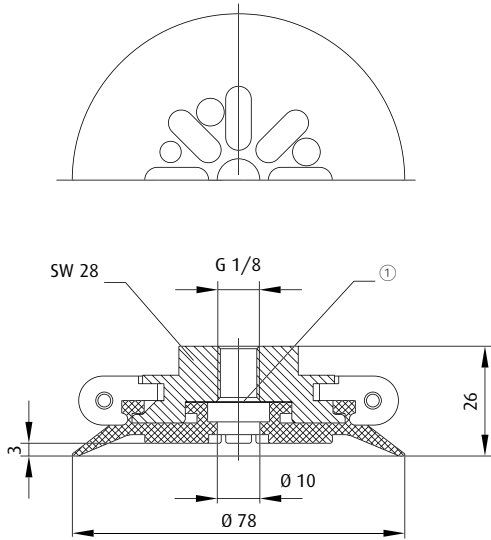
<b>Item no.</b> 102.076.263.*	<b>Material</b> Vinyl (bl)	9 mm
----------------------------------	-------------------------------	------

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 78 mm



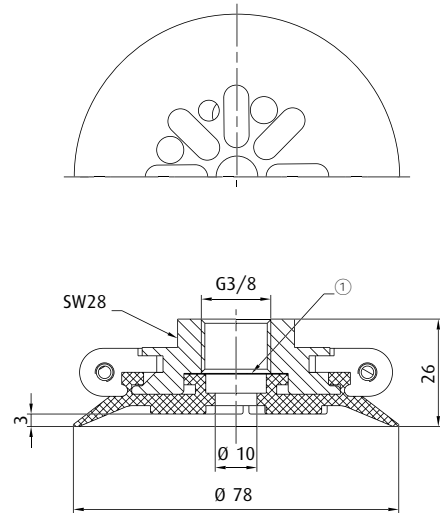
① = Filter screen

**Item no.**  
**152.078.133.\***

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

3 mm

Additional sizes available are found on p. 47.



① = Filter screen

**Item no.**  
**152.078.136.\***

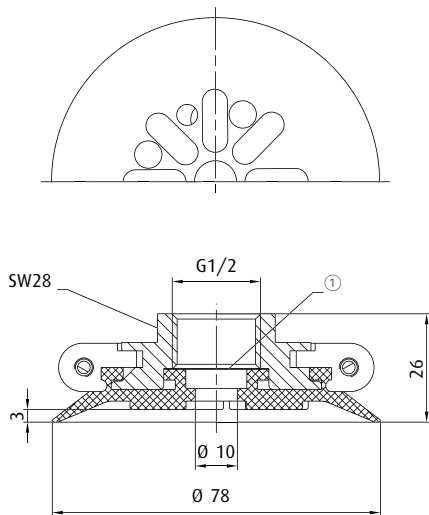
**Material**  
Tepuflex® (or), SI (tr), CR (sw)

3 mm

Additional sizes available are found on p. 47.

Spare cup

Spare cup



① = Filter screen

**Item no.**  
**152.078.139.\***

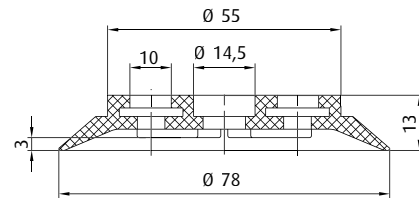
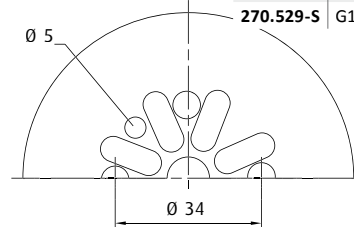
**Material**  
Tepuflex® (or), SI (tr), CR (sw)

3 mm

Additional sizes available are found on p. 47.

Spare cup

	Connection	see page
270.527-S	G1/8-female	424
270.528-S	G3/8-female	436
270.529-S	G1/2-female	436



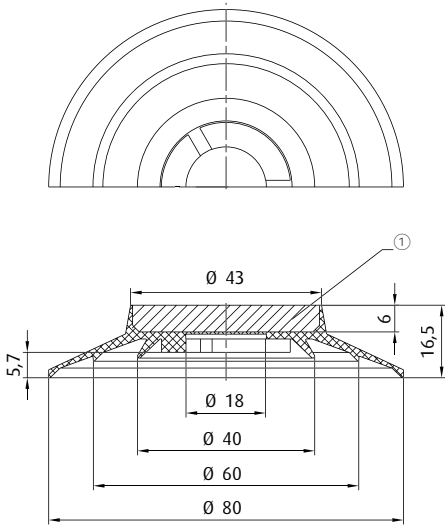
**Item no.**  
**154.078.027.\***

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

3 mm

Additional sizes available are found on p. 42.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



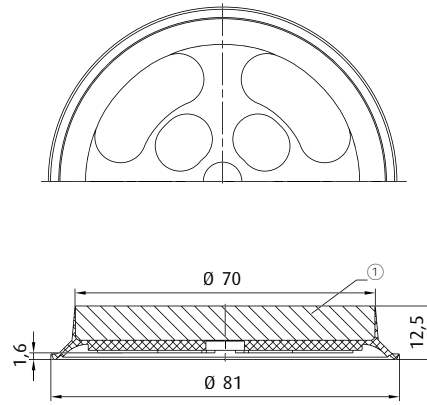
① = Steel

**Item no.**  
104.080.078.\_\*

**Material**  
SBR (br)

4.5 mm

**Notes:** Use: Picking up products of varying sizes

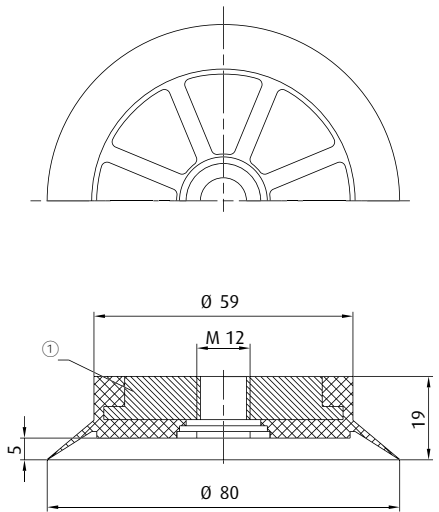


① = Steel

**Item no.**  
152.080.069.\_\*

**Material**  
SBR (sw)

1 mm



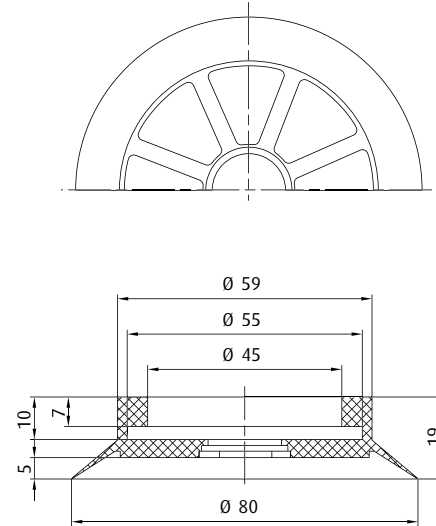
① = Aluminium

**Item no.**  
152.080.083.\_\*

**Material**  
NBR (sw), SI (tr), NR (sw)

6 mm

Spare cup



**Item no.**  
154.080.055.\_\*

**Material**  
NBR (sw), SI (tr), NR (sw)

6 mm


	Connection	see page
270.338	M12x1.75-female	438

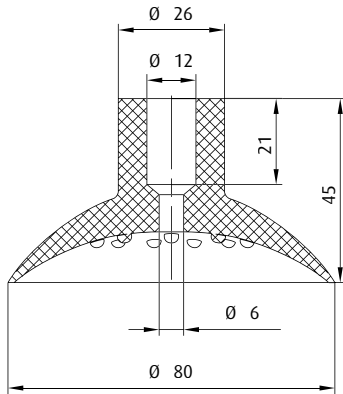
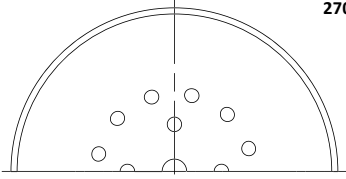
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 80 - 83 mm

	Connection	see page
	G1/4-male	426

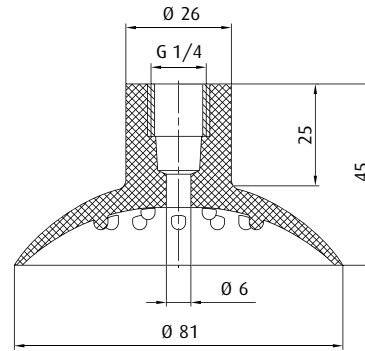
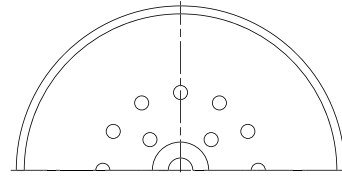


**Item no.**  
**114.080.020.\***

**Material**  
NR (sw)


 9 mm

This vacuum cup is also available in the following dimensions: 100 mm




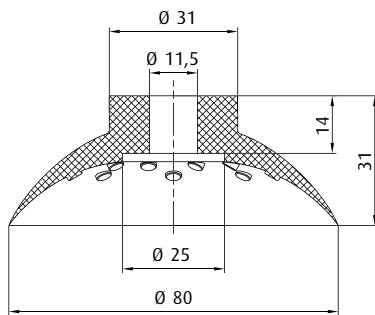
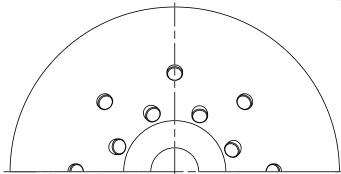
**Item no.**  
**110.080.095.\***

**Material**  
SI (tr), NR (sw)

 10 mm

This vacuum cup is also available in the following dimensions: 43 mm, 50 mm, 62 mm, 100 mm

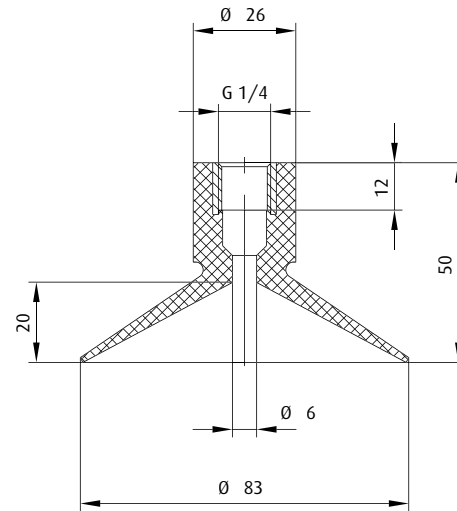
	Connection	see page
	G1/4-male	431



**Item no.**  
**114.080.021.\***


**Material**  
NR (br)

 9 mm



**Item no.**  
**120.080.052.\***

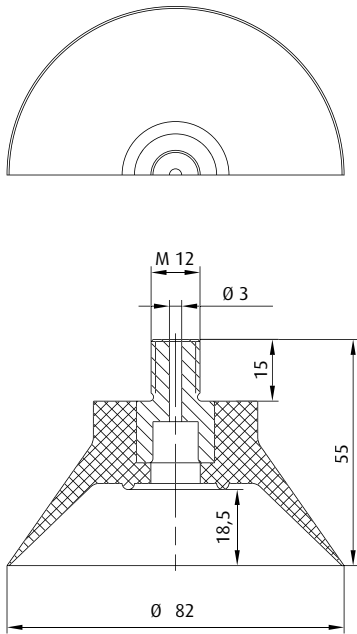
**Material**  
SI (tr), NR (sw)

 12 mm

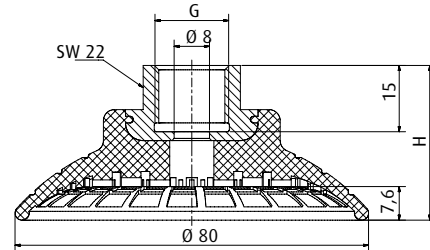
This vacuum cup is also available in the following dimensions: 42 mm, 53 mm, 62 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



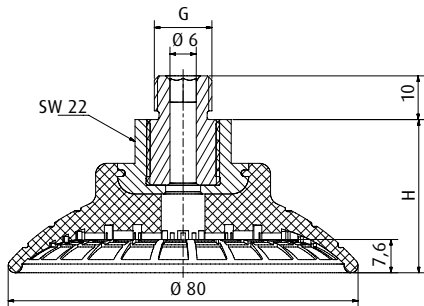


<b>Item no.</b> 120.082.063._*	<b>Material</b> NR (sw)	18.5 mm
-----------------------------------	----------------------------	---------



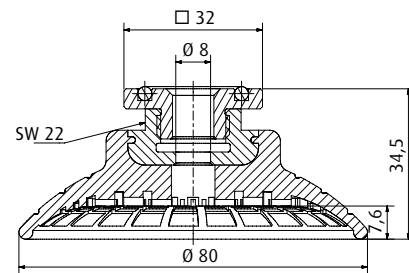
Item no.	Material	[mm]	Connection thread	H [mm]
103.080.055._*	NBR (bl)	7.6	G1/4-female	40
103.080.056._*	NBR (bl)	7.6	G3/8-female	35

Additional sizes available are found on p. 64.



Item no.	Material	[mm]	Connection thread	H [mm]
103.080.054._*	NBR (bl)	7.6	G1/4-male	35
103.080.057._*	NBR (bl)	7.6	M10-male	35
103.080.058._*	NBR (bl)	7.6	M14x1.5-male	35

Additional sizes available are found on p. 64.



<b>Item no.</b> 103.080.059._*	<b>Material</b> NBR (bl)	7.6 mm
-----------------------------------	-----------------------------	--------


Additional sizes available are found on p. 64.

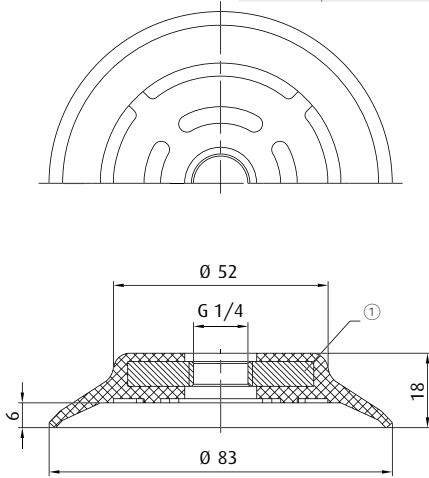
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760




# Vacuum cups by size | Flat vacuum cups by Ø

Ø 83 - 87 mm

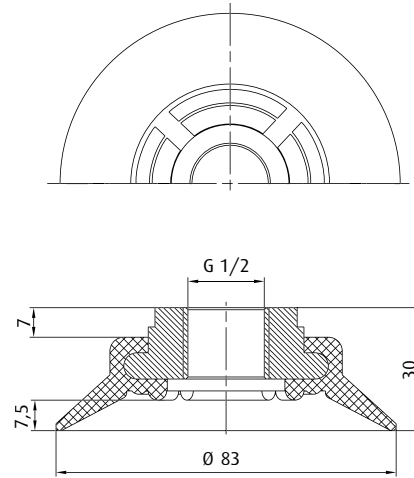
	Connection	see page
270.090	M10x1.25-female	752
270.120	G1/4-male	750





① = Aluminium

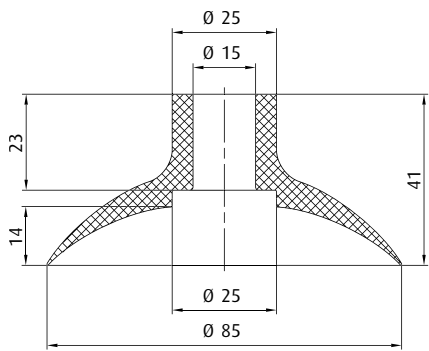
<b>Item no.</b> 102.080.304._*	<b>Material</b> NBR (sw), SI (tr), PU (bl)	 6 mm
-----------------------------------	---	--


Additional sizes available are found on p. 32.




<b>Item no.</b> 100.083.060._*	<b>Material</b> Vinyl (bl)	 7.5 mm
-----------------------------------	-------------------------------	--

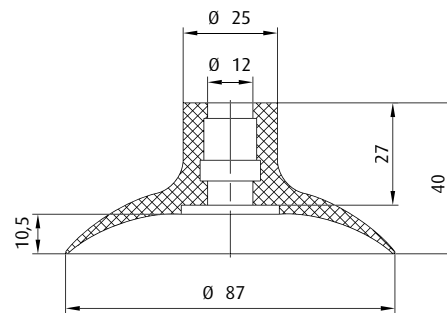
	Connection	see page
270.216	G1/4-male	431




<b>Item no.</b> 112.085.102._*	<b>Material</b> NBR (sw), SI (tr), NR (sw)	 12 mm
-----------------------------------	---	---

Additional sizes available are found on p. 52.


	Connection	see page
270.338	M12x1.75-female	438
270.207	G1/4-male	426

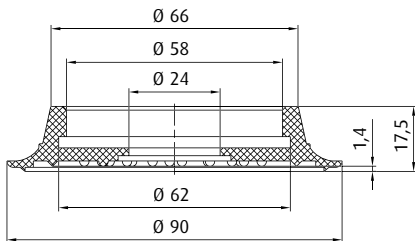


<b>Item no.</b> 112.087.089._*	<b>Material</b> NR (sw)	 9 mm
-----------------------------------	----------------------------	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760




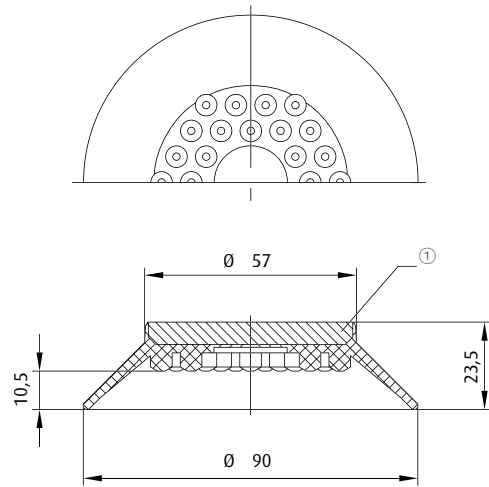
	Connection	see page
270.158	G1/8-female	438
270.264	G1/4-female	438
270.161	G3/8-female	438
270.286	G1/2-female	438



**Item no.**  
154.090.010.\*

**Material**  
SI (tr), NR (sw)


 1.5 mm

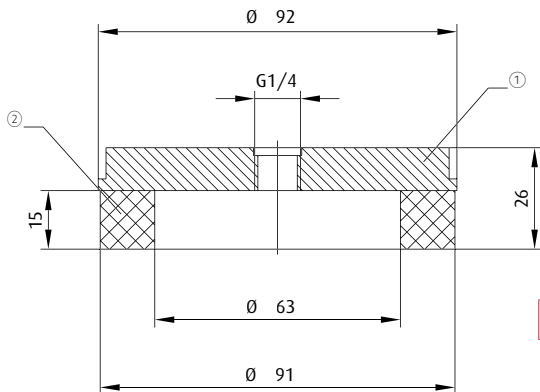


① = Steel

**Item no.**  
152.090.089.\*

**Material**  
SBR (br)


 11 mm



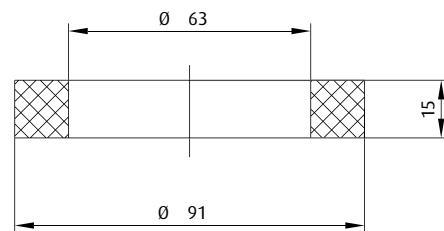
① = Aluminium ② = Sponge rubber NR

**Item no.**  
206.092.007.\*

**Material**  
Sponge rubber (or)


 10 mm

Spare cup



**Item no.**  
208.092.002.\*

**Material**  
Sponge rubber (or)

 10 mm

This vacuum cup is also available in the following dimensions: 64 mm

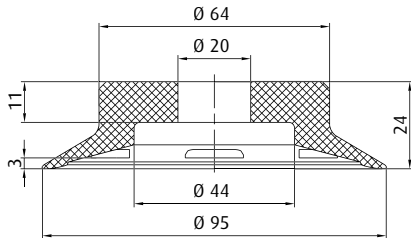
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

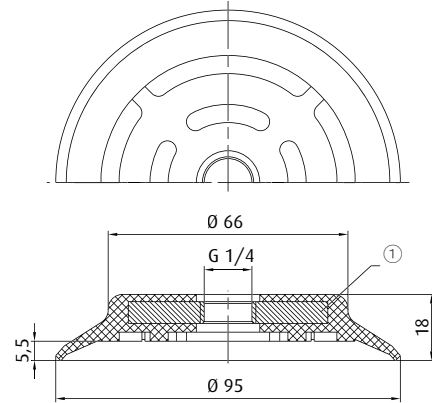
Ø 95 - 100 mm

	Connection	see page
270.100	G1/4-male	431



<b>Item no.</b> 102.095.182._*	<b>Material</b> NR (bg)	2.5 mm
-----------------------------------	----------------------------	--------

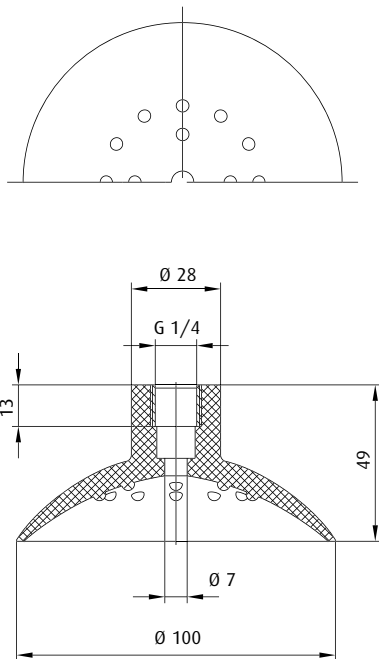
	Connection	see page
270.090	M10x1.25-female	752
270.120	G1/4-male	750



① = Aluminium

<b>Item no.</b> 102.095.305._*	<b>Material</b> NBR (sw), SI (tr), PU (bl)	6 mm
-----------------------------------	---	------

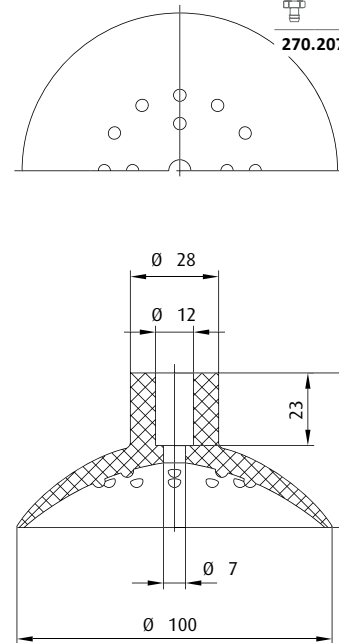
Additional sizes available are found on p. 32.



<b>Item no.</b> 110.100.103._*	<b>Material</b> NBR (sw)	13 mm
-----------------------------------	-----------------------------	-------

This vacuum cup is also available in the following dimensions: 43 mm, 50 mm, 62 mm, 81 mm

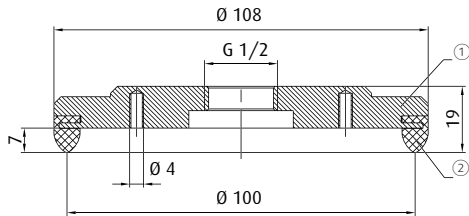
	Connection	see page
270.207	G1/4-male	426



<b>Item no.</b> 114.100.022._*	<b>Material</b> NR (sw)	13 mm
-----------------------------------	----------------------------	-------

This vacuum cup is also available in the following dimensions: 80 mm

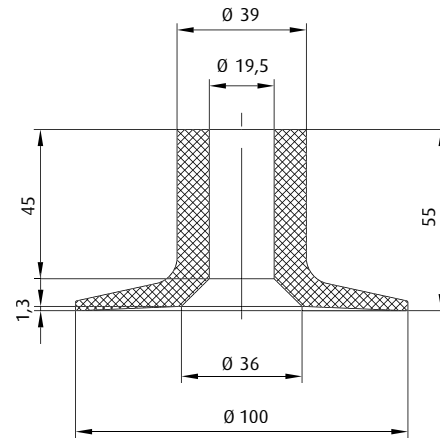
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



① = Aluminium ② = EPDM foamed

<b>Item no.</b> 160.107.006.*	<b>Material</b> EPDM (sw)	1 mm
----------------------------------	------------------------------	------

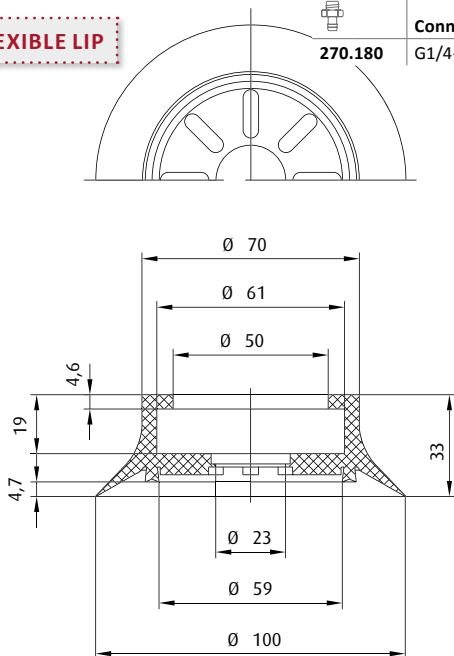
Additional sizes available are found on p. 72.  
**Notes:** Foam sealing lip equalises product unevenness



<b>Item no.</b> 102.100.100.*	<b>Material</b> NR (bg)	0.5 mm
----------------------------------	----------------------------	--------

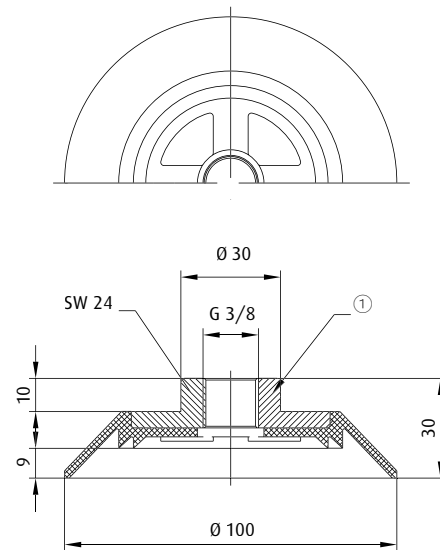
**FLEXIBLE LIP**

	<b>Connection</b> G1/4-female	<b>see page</b> 438
--	----------------------------------	------------------------



<b>Item no.</b> 102.100.269.*	<b>Material</b> SBR (br), NBR (gr), NR (br)	5 mm
----------------------------------	--	------

Additional sizes available are found on p. 66.



① = Aluminium

<b>Item no.</b> 150.100.034.*	<b>Material</b> NBR (sw), SI (tr), NR (w)	9 mm
----------------------------------	--	------

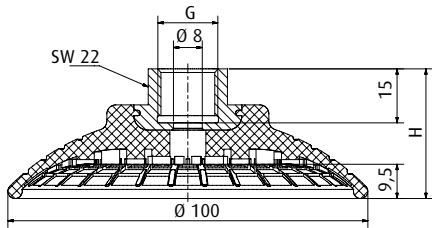
Additional sizes available are found on p. 68.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



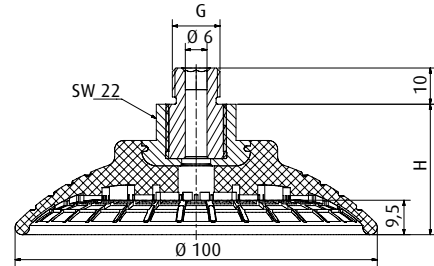
# Vacuum cups by size | Flat vacuum cups by Ø

Ø 100 mm



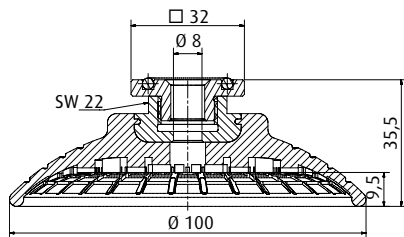
Item no.	Material	⌀ [mm]	Connection thread	H [mm]
103.100.061.*	NBR (bl)	9.5	G1/4-female	41
103.100.062.*	NBR (bl)	9.5	G3/8-female	36

Additional sizes available are found on p. 64.



Item no.	Material	⌀ [mm]	Connection thread	H [mm]
103.100.060.*	NBR (bl)	9.5	G1/4-male	36
103.100.063.*	NBR (bl)	9.5	M10-male	36
103.100.064.*	NBR (bl)	9.5	M14x1.5-male	36

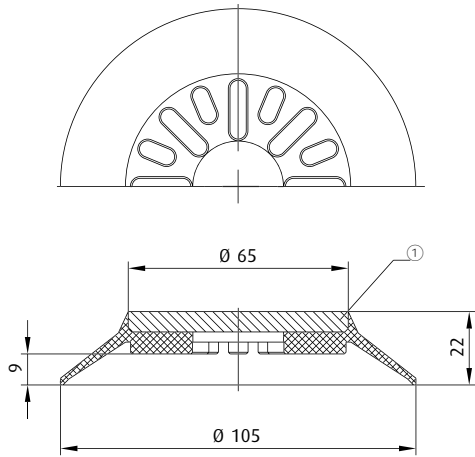
Additional sizes available are found on p. 64.



Item no.	Material	⌀ [mm]
103.100.065.*	NBR (bl)	9.5 mm

Additional sizes available are found on p. 64.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



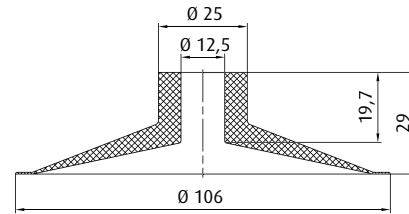
① = Steel

**Item no.**  
152.105.094.\*

**Material**  
NBR (gr)

9 mm

**Ordering notes:** Customised drilling patterns on request

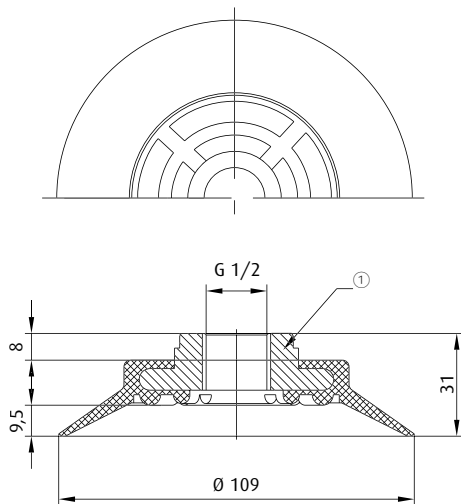


	Connection	see page
270.141	G1/4-male	430

**Item no.**  
107.105.035.\*

**Material**  
NR (br)

8.5 mm



① = Aluminium

**Item no.**  
100.109.059.\*

**Material**  
Vinyl (bl)

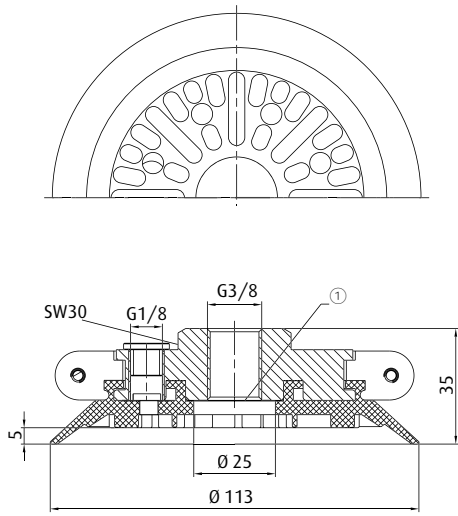
9.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 113 - 114 mm

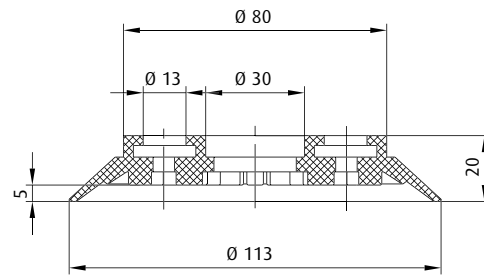
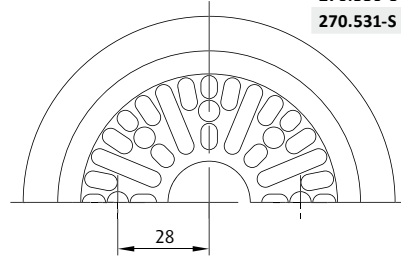


① = Filter screen

**Item no.**  
**152.113.134.\_\***      **Material**  
Tepuflex® (or), SI (tr), CR (sw)      5 mm

Additional sizes available are found on p. 47.

Spare cup

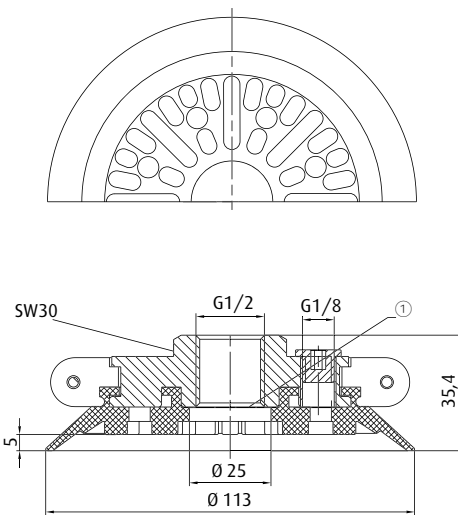


**Item no.**  
**154.113.028.\_\***      **Material**  
Tepuflex® (or), SI (tr), CR (sw)      5 mm

Additional sizes available are found on p. 42.

	Connection	see page
270.530-S	G3/8-female	437
270.531-S	G1/2-female	437

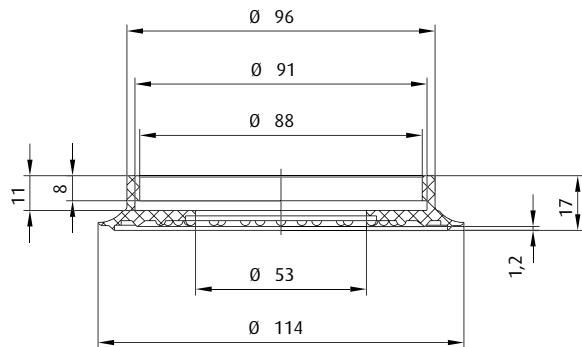
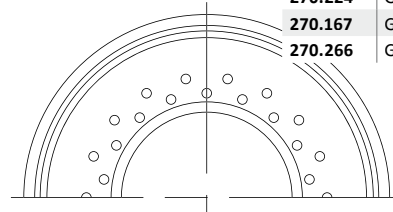
Spare cup



① = Filter screen

**Item no.**  
**152.113.137.\_\***      **Material**  
Tepuflex® (or), SI (tr), CR (sw)      5 mm

Additional sizes available are found on p. 47.



**Item no.**  
**154.110.014.\_\***      **Material**  
NBR (sw), SI (w)      1.5 mm

Additional sizes available are found on p. 70.


	Connection	see page
270.224	G1/4-female	438
270.167	G3/8-female	438
270.266	G1/2-female	438

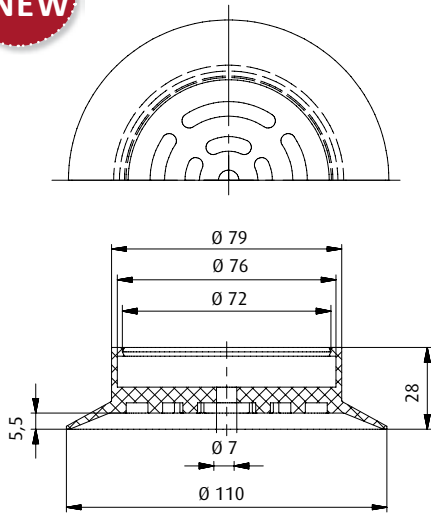
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



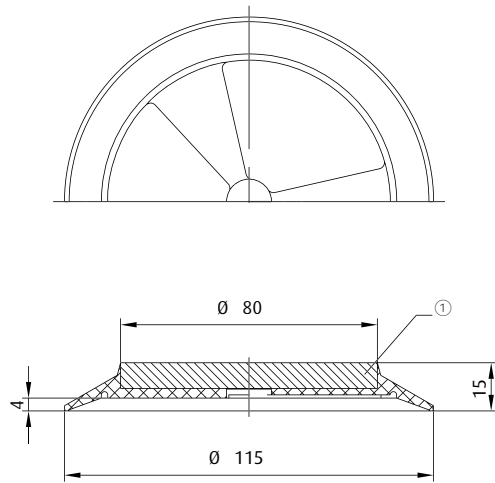


**NEW**


	Connection	see page
	G1/4-female	434



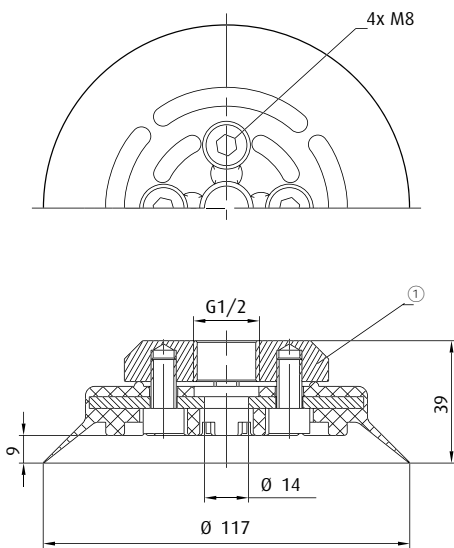
<b>Item no.</b> <b>102.110.483._*</b>	<b>Material</b> NBR (sw)	 5.5 mm
--	-----------------------------	--




① = Steel

<b>Item no.</b> <b>152.115.095._*</b>	<b>Material</b> NBR (gr)	 4 mm
--	-----------------------------	--

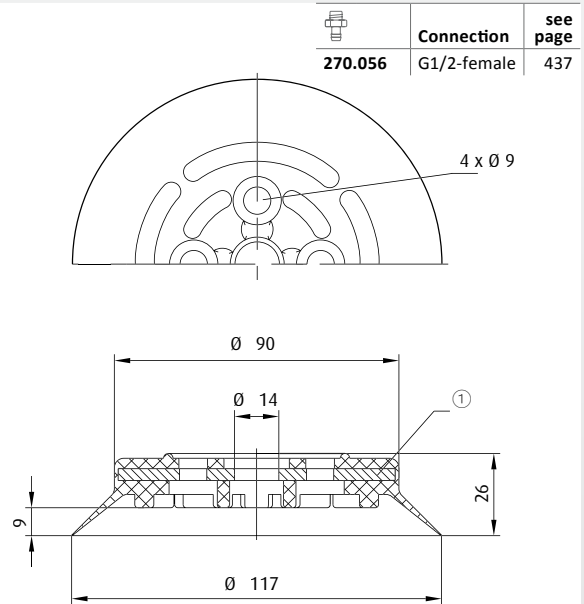
**Ordering notes:** Customised drilling patterns on request




① = Aluminium

<b>Item no.</b> <b>152.120.017._*</b>	<b>Material</b> NBR (sw), SI (tr)	 7 mm
--	--------------------------------------	--

Spare cup



① = Steel

<b>Item no.</b> <b>154.120.018._*</b>	<b>Material</b> NBR (sw), SI (tr)	 7 mm
--	--------------------------------------	--

Additional sizes available are found on p. 32.

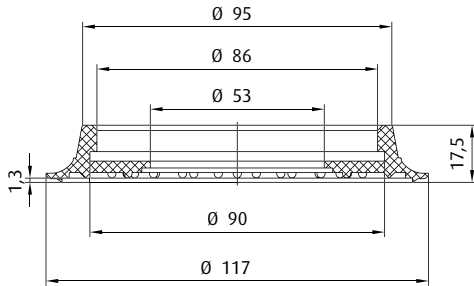
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 117 - 120 mm

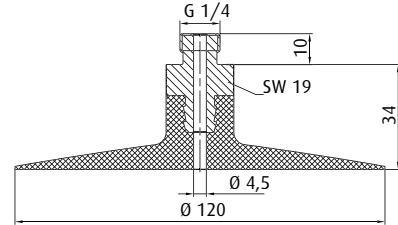
	Connection	see page
270.164	G1/8-female	438
270.224	G1/4-female	438
270.167	G3/8-female	438
270.266	G1/2-female	438



**Item no.**  
154.120.017.\*

**Material**  
SI (tr), NR (sw), Vinyl (bl)

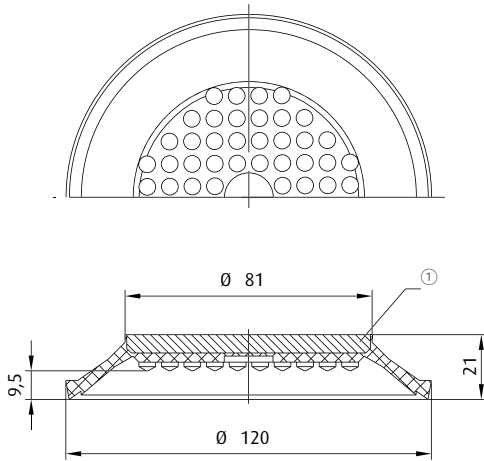
1.5 mm



**Item no.**  
100.120.036.\*

**Material**  
NBR (sw)

0.5 mm



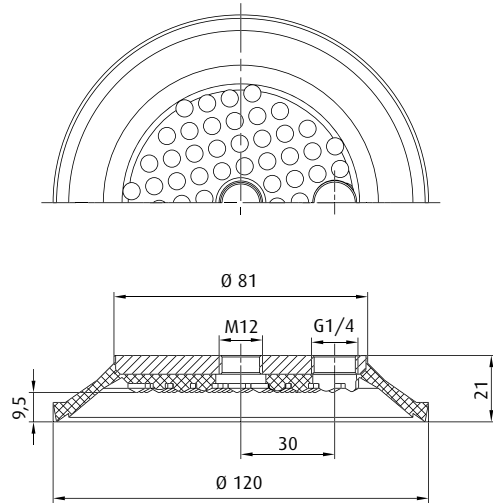
① = Steel

**Item no.**  
152.120.064.\*

**Material**  
NBR (gr), NR (br)

11 mm

**Ordering notes:** Customised drilling patterns on request

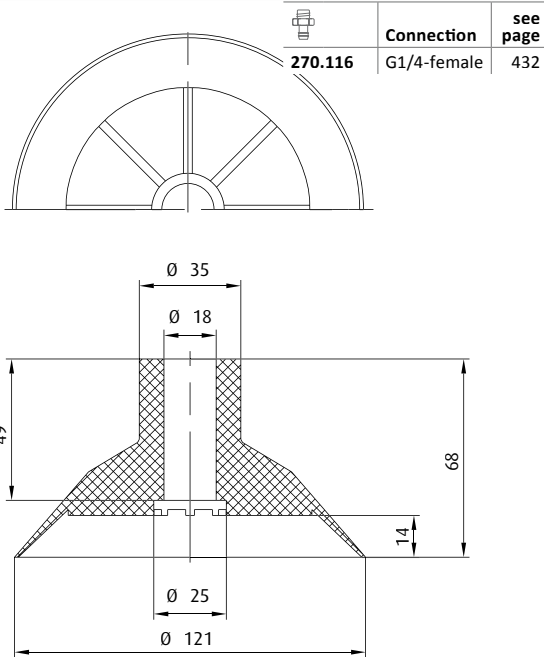


**Item no.**  
152.120.115.\*

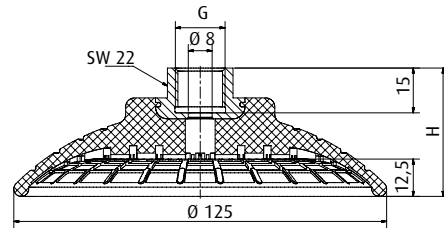
**Material**  
NBR (gr)

9.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

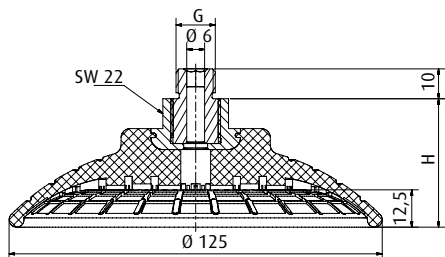


<b>Item no.</b> 108.120.006._*	<b>Material</b> NR (sw)	14 mm
-----------------------------------	----------------------------	-------



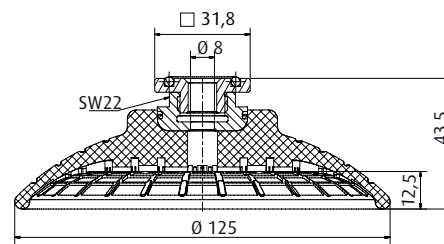
<b>Item no.</b>	<b>Material</b>	[mm]	<b>Connection thread</b>	<b>H [mm]</b>
103.125.067._*	NBR (bl)	12.5	G1/4-female	48
103.125.068._*	NBR (bl)	12.5	G3/8-female	43

Additional sizes available are found on p. 64.



<b>Item no.</b>	<b>Material</b>	[mm]	<b>Connection thread</b>	<b>H [mm]</b>
103.125.066._*	NBR (bl)	12.5	G1/4-male	43
103.125.069._*	NBR (bl)	12.5	M10-male	43
103.125.070._*	NBR (bl)	12.5	M14x1.5-male	43

Additional sizes available are found on p. 64.



<b>Item no.</b> 103.125.071._*	<b>Material</b> NBR (bl)	12.5 mm
-----------------------------------	-----------------------------	---------

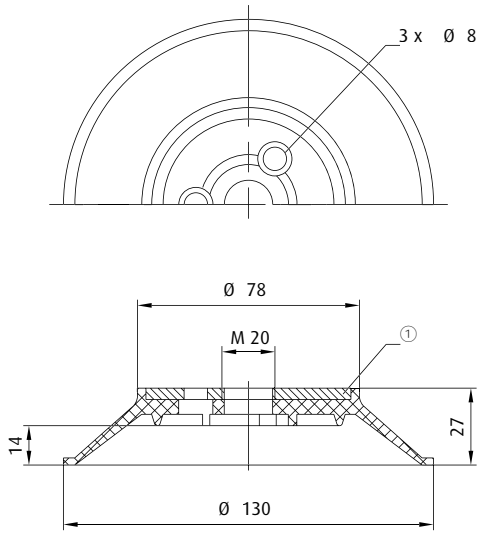
Additional sizes available are found on p. 64.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 130 - 137 mm



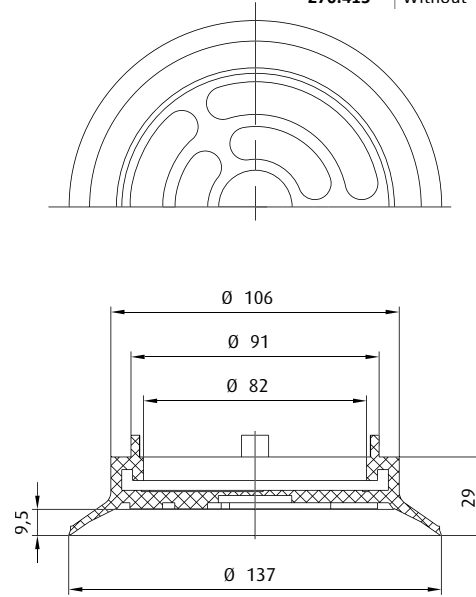
① = Steel

**Item no.**  
**100.130.058.\_\***

**Material**  
NR (sw)

14 mm

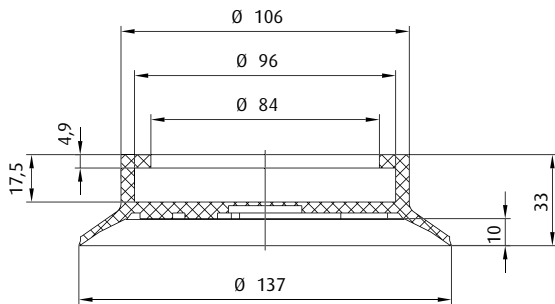
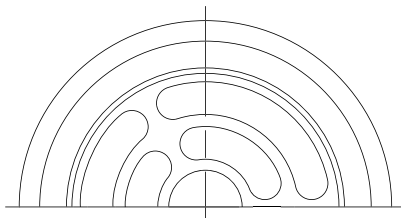
	<b>Connection</b>	<b>see page</b>
270.415	Without	440



**Item no.**  
**102.130.258.\_\***

**Material**  
SBR (sw)

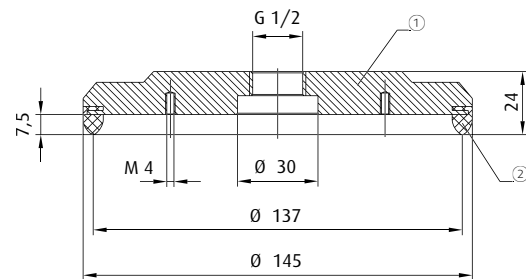
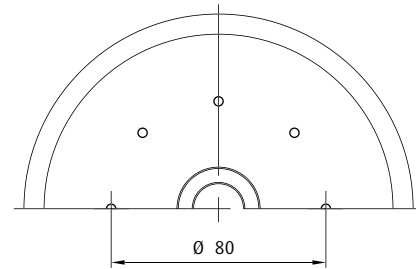
10 mm



**Item no.**  
**102.135.256.\_\***

**Material**  
NBR (gr), SBR (sw)

11 mm



① = Aluminium ② = EPDM foamed

**Item no.**  
**160.145.014.\_\***

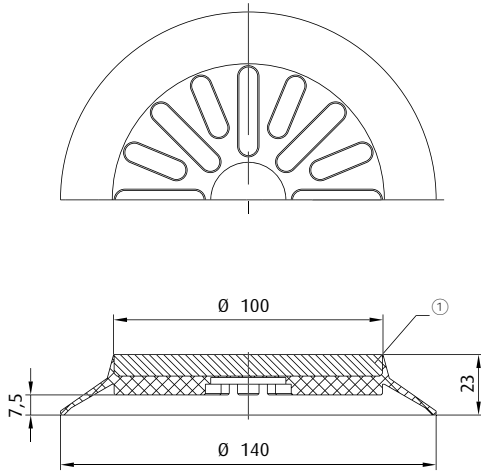
**Material**  
EPDM (sw)

1 mm

Additional sizes available are found on p. 72.

**Notes:** Foam sealing lip equalises product unevenness

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



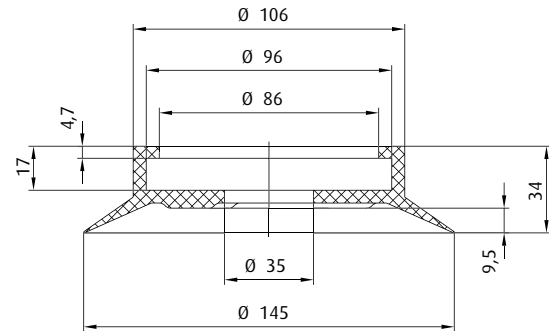
① = Steel

**Item no.**  
152.140.096.\*

**Material**  
NBR (gr)

8 mm

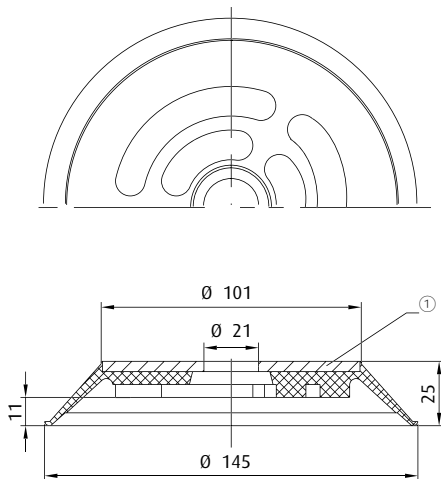
**Ordering notes:** Customised drilling patterns on request



**Item no.**  
102.145.257.\*

**Material**  
NBR (gr), SBR (sw)

9 mm

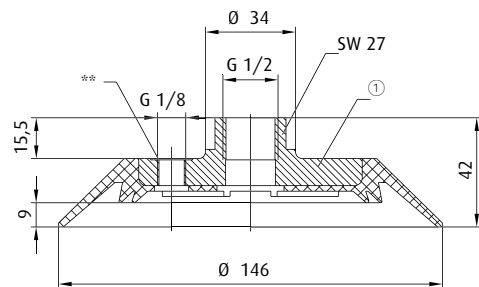
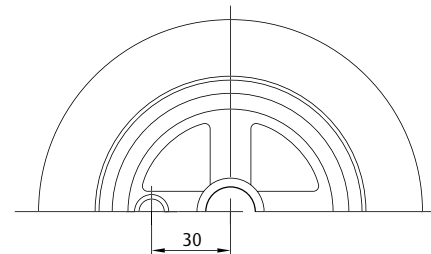


① = Aluminium

**Item no.**  
152.145.045.\*

**Material**  
NBR (sw), SI (tr)

11 mm



① = Aluminium \*\* = Vacuum connection at the side possible

**Item no.**  
150.150.010.\*

**Material**  
SI (gr), CR (gr)

9 mm

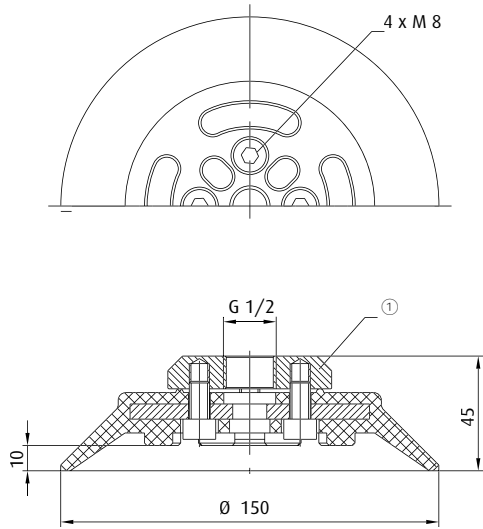
Additional sizes available are found on p. 68.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 150 - 153 mm

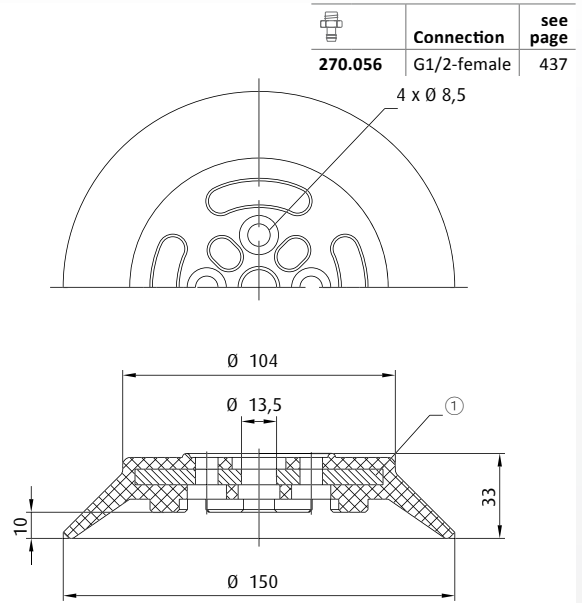


① = Aluminium

**Item no.**  
**152.150.019.\_\***

**Material**  
NBR (sw), SI (tr)

9 mm



① = Steel

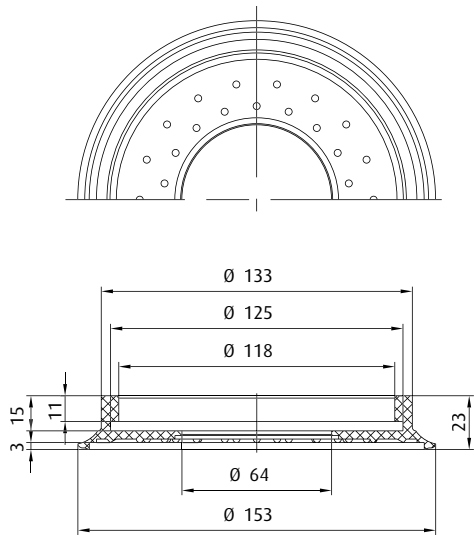
**Item no.**  
**154.150.020.\_\***

**Material**  
NBR (sw), SI (tr)

9 mm

Additional sizes available are found on p. 32.

	Connection	see page
270.171	G1/4-female	438
270.173	G3/8-female	438
270.268	G1/2-female	438



**Item no.**  
**154.150.021.\_\***


**Material**  
NBR (sw), SI (w)

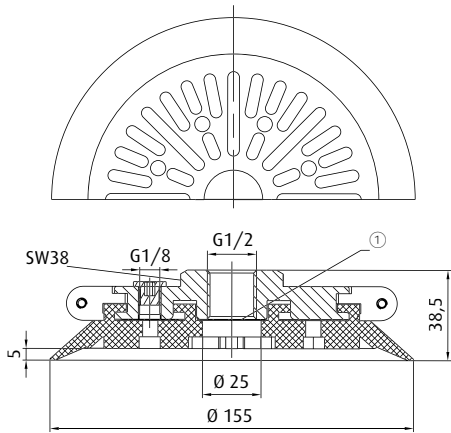
2 mm

Additional sizes available are found on p. 70.

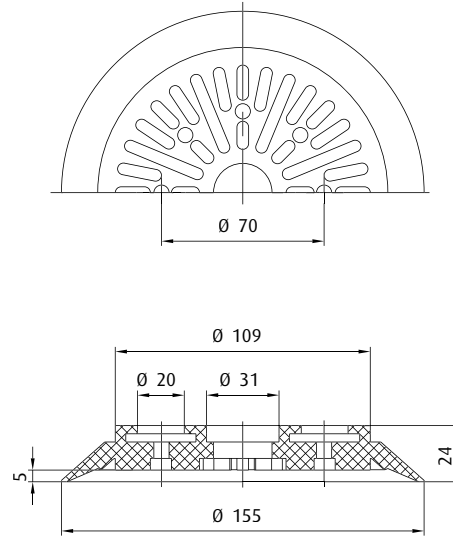
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.532-S	G1/2-female	437
270.533-S	G3/4-female	437




Spare cup



① = Filter screen

**Item no.**  
**152.155.135.\_\***


**Material**  
Tepuflex® (or), SI (tr), CR (sw)

 5 mm

Additional sizes available are found on p. 47.

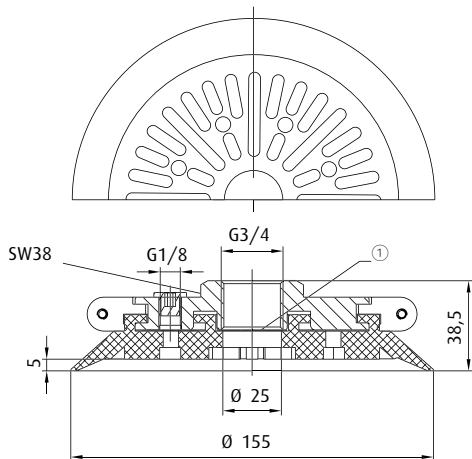
**Item no.**  
**154.155.026.\_\***

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

 5 mm

Additional sizes available are found on p. 42.


Spare cup



① = Filter screen

**Item no.**  
**152.155.138.\_\***

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

 5 mm

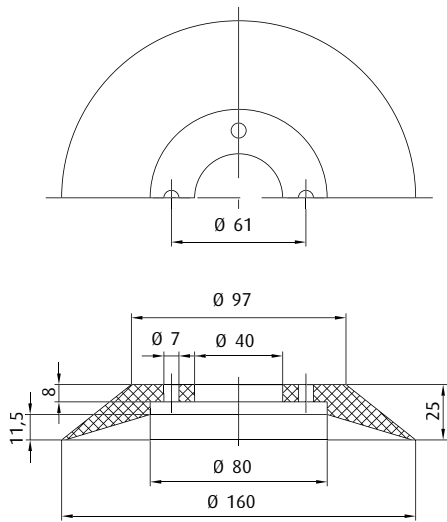
Additional sizes available are found on p. 47.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



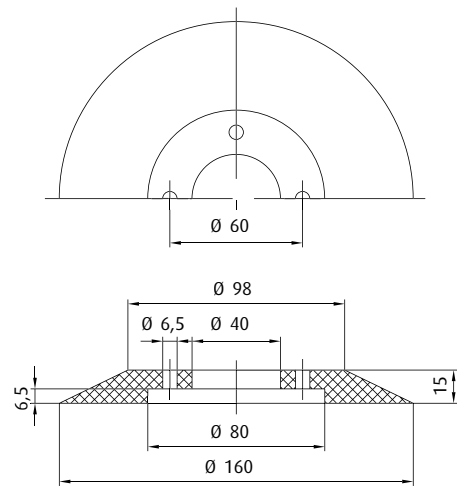
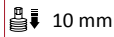
# Vacuum cups by size | Flat vacuum cups by Ø

Ø 160 mm



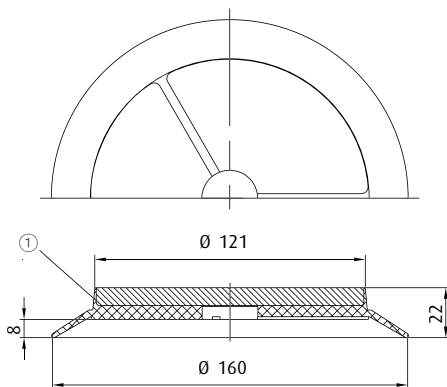
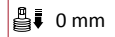
Item no.  
**102.160.031.\_\***

Material  
SI (r), NR (gr)



Item no.  
**102.160.195.\_\***

Material  
SI (gr)



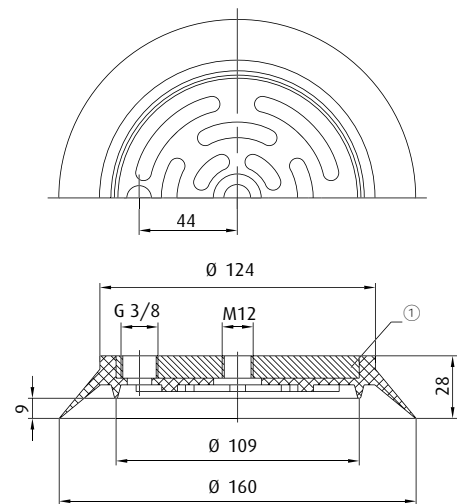
① = Steel

Item no.  
**152.160.097.\_\***

Material  
NBR (gr)



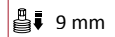
Ordering notes: Customised drilling patterns on request



① = Steel

Item no.  
**152.160.127.\_\***

Material  
CR (sw)



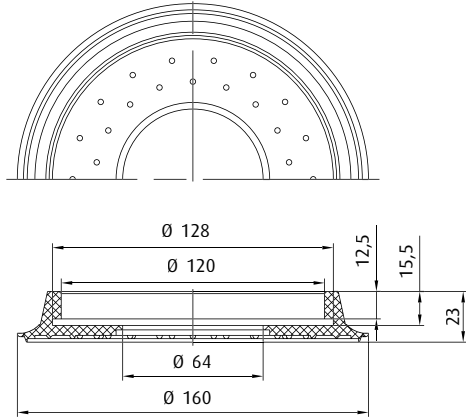
Additional sizes available are found on p. 73.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





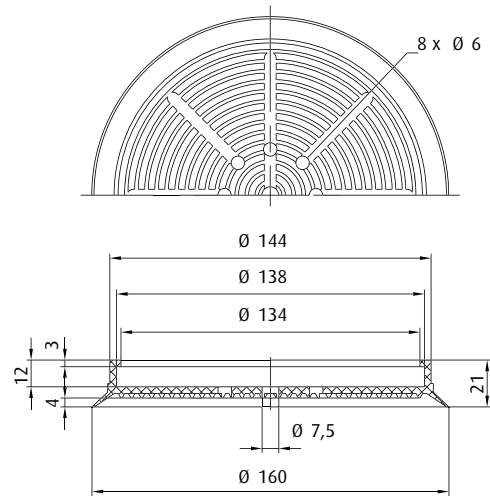
	Connection	see page
<b>270.171</b>	G1/4-female	438
<b>270.173</b>	G3/8-female	438
<b>270.268</b>	G1/2-female	438



**Item no.**  
**154.160.024.\_\***

**Material**  
SI (tr), NR (sw)

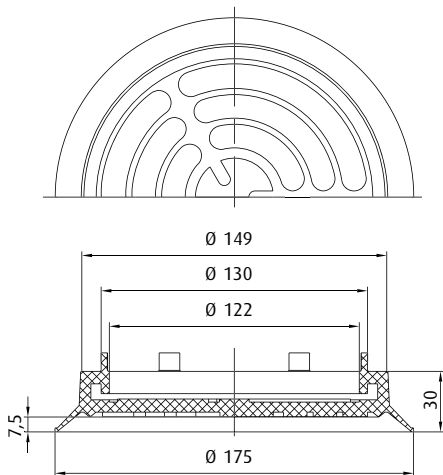
3 mm



**Item no.**  
**154.160.049.\_\***

**Material**  
NBR (gr), SI (tr)

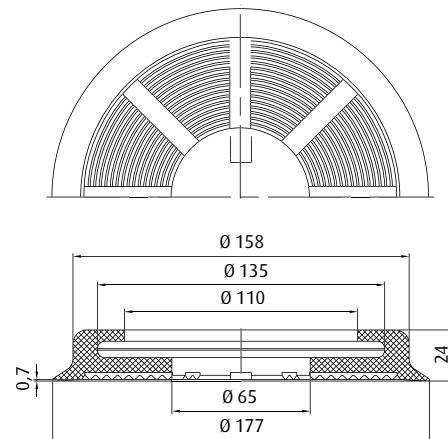
4.7 mm



**Item no.**  
**102.170.259.\_\***

**Material**  
SBR (sw), NR (bg)

7 mm



**Item no.**  
**154.177.053.\_\***

**Material**  
SI (tr)

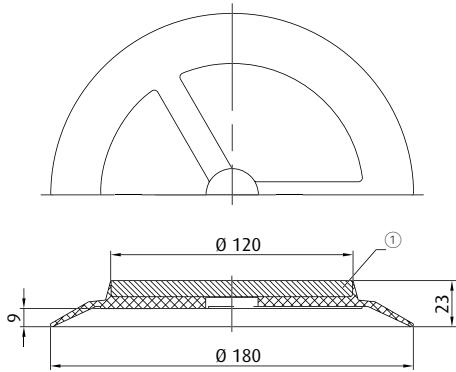
0.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 180 - 193 mm



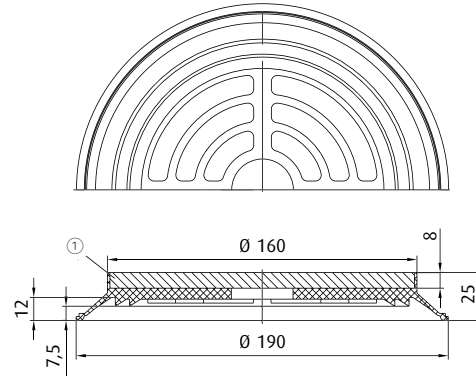
① = Steel

**Item no.**  
**152.180.067.\_\***

**Material**  
NBR (gr)

9 mm

**Ordering notes:** Customised drilling patterns on request



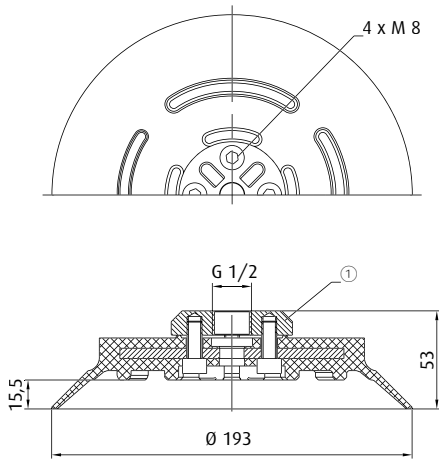
① = Steel

**Item no.**  
**152.190.080.\_\***

**Material**  
SBR (br), NBR (gr)

10 mm

**Ordering notes:** Customised drilling patterns on request



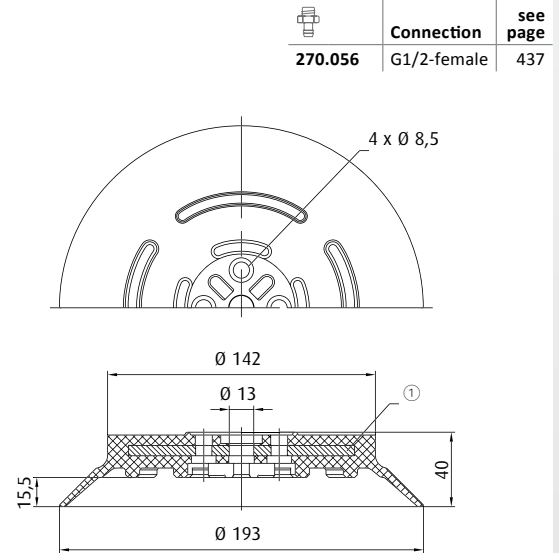
① = Aluminium

**Item no.**  
**152.191.025.\_\***

**Material**  
NBR (sw), SI (tr), PU (bl)

13 mm

Spare cup



① = Steel

**Item no.**  
**154.191.025.\_\***

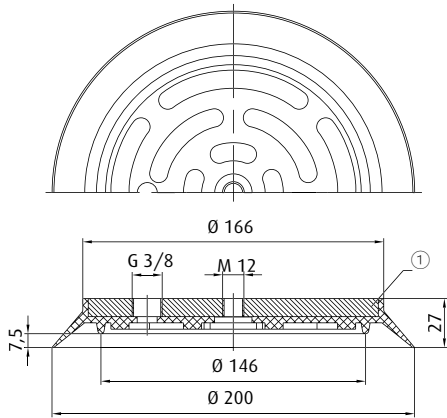
**Material**  
NBR (sw), SI (tr), PU (bl)

13 mm

Additional sizes available are found on p. 32.

	<b>Connection</b>	<b>see page</b>
270.056	G1/2-female	437

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760

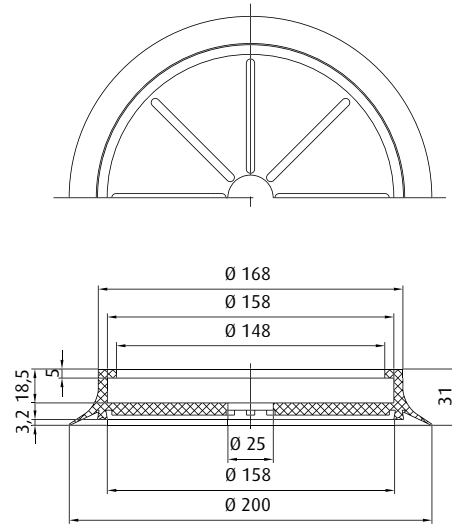


① = Steel

<b>Item no.</b> 152.200.128.*	<b>Material</b> CR (sw)	9 mm
----------------------------------	----------------------------	------

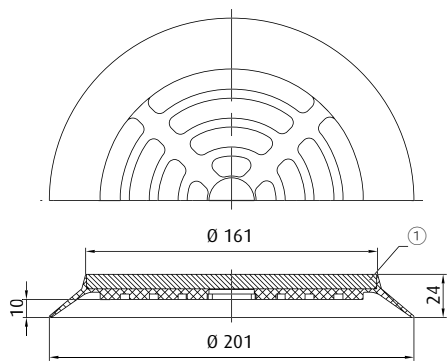
Additional sizes available are found on p. 73.

	<b>Connection</b>	<b>see page</b>
270.335	G1/2-female	438



<b>Item no.</b> 102.200.350.*	<b>Material</b> NR (w)	5 mm
----------------------------------	---------------------------	------

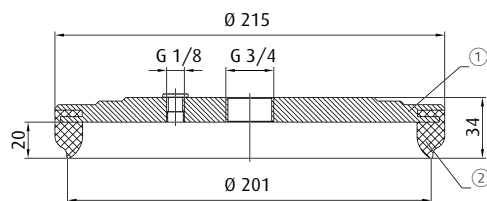
Additional sizes available are found on p. 66.



① = Steel

<b>Item no.</b> 150.190.015.*	<b>Material</b> NBR (gr)	11 mm
----------------------------------	-----------------------------	-------

**Ordering notes:** Customised drilling patterns on request



① = Aluminium ② = EPDM foamed

<b>Item no.</b> 160.215.009.*	<b>Material</b> EPDM (sw)	2.5 mm
----------------------------------	------------------------------	--------

Additional sizes available are found on p. 72.


**Notes:** Foam sealing lip equalises product unevenness

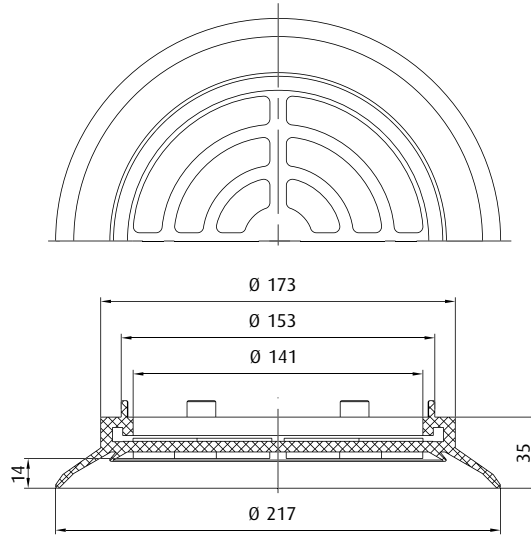
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø


Ø 217 - 223 mm

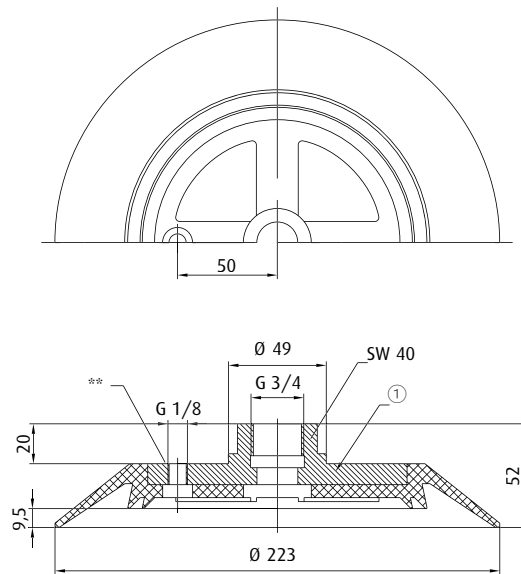
	Connection	see page
270.155	Without	440



**Item no.**  
**102.210.260.\_\***

**Material**  
SBR (sw)


 14 mm



① = Aluminium    \*\* = Vacuum connection at the side possible

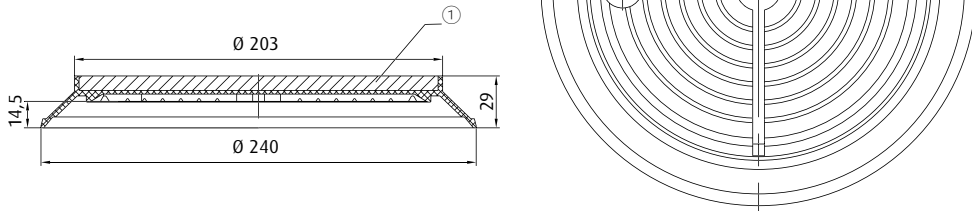
**Item no.**  
**150.225.018.\_\***

**Material**  
SI (gr), CR (gr)

 9.5 mm


Additional sizes available are found on p. 68.

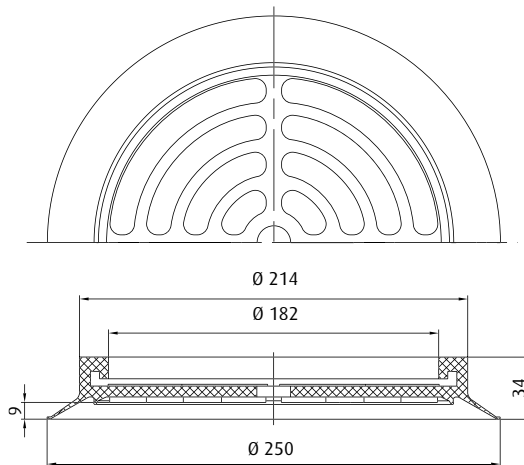
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



① = Steel

<b>Item no.</b> 152.240.046._*	<b>Material</b> NBR (gr), SBR (sw)	 14 mm	<b>Ordering notes:</b> Customised drilling patterns on request
-----------------------------------	---------------------------------------	---	--

	<b>Connection</b>	<b>see page</b>
270.236	G1/2-female	440



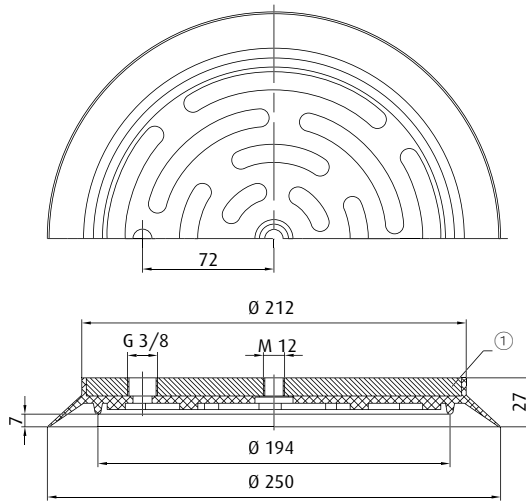
<b>Item no.</b> 102.250.261._*	<b>Material</b> SBR (sw)	 8.5 mm
-----------------------------------	-----------------------------	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 250 mm



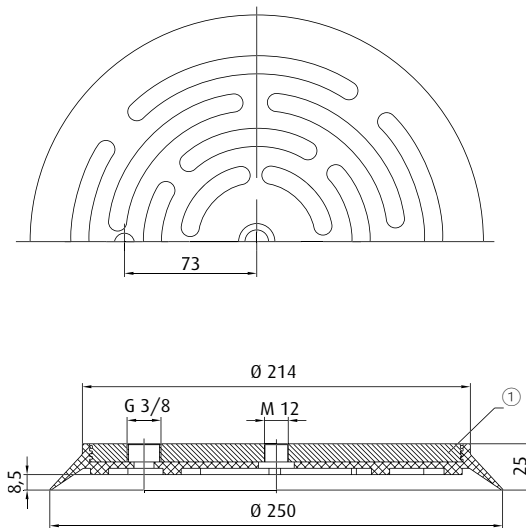
① = Steel

**Item no.**  
**152.250.129.\_\***

**Material**  
CR (sw)

9 mm

Additional sizes available are found on p. 73.



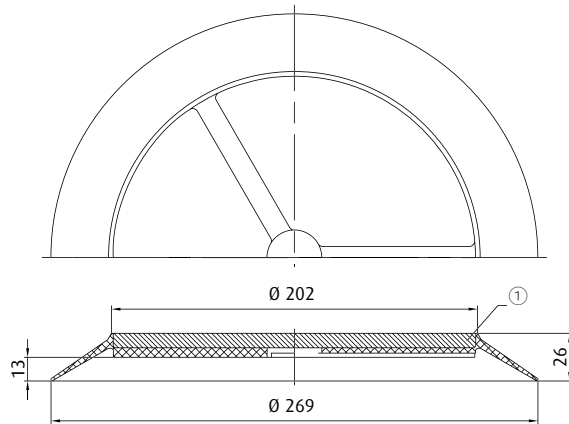
① = Steel

**Item no.**  
**152.250.031.\_\***

**Material**  
NBR (sw)

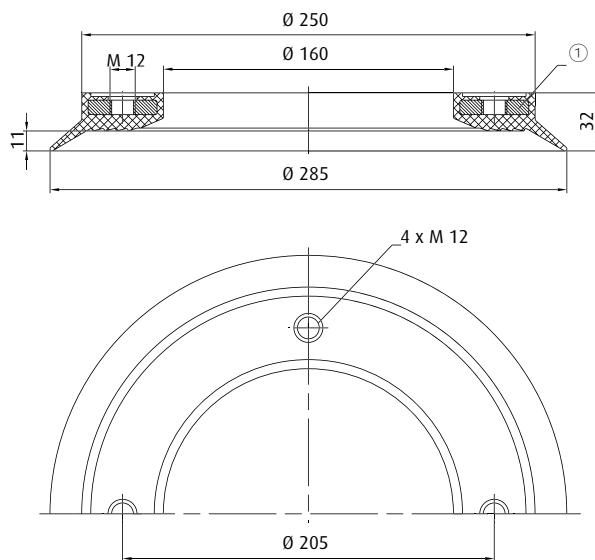
11 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



① = Steel

<b>Item no.</b> 152.260.068._*	<b>Material</b> NBR (gr)	13 mm	<b>Ordering notes:</b> Customised drilling patterns on request
-----------------------------------	-----------------------------	-------	--



① = Ring made of vulcanised ST37


<b>Item no.</b> 152.285.099._*	<b>Material</b> NBR (sw)	11 mm	Additional sizes available are found on p. 74.
-----------------------------------	-----------------------------	-------	--

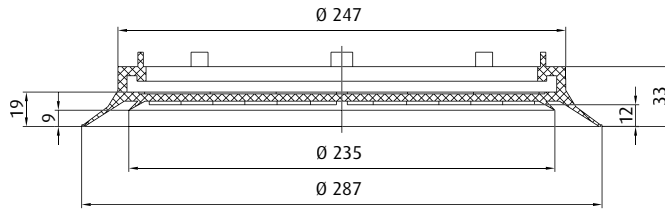
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
 Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø


Ø 287 - 300 mm

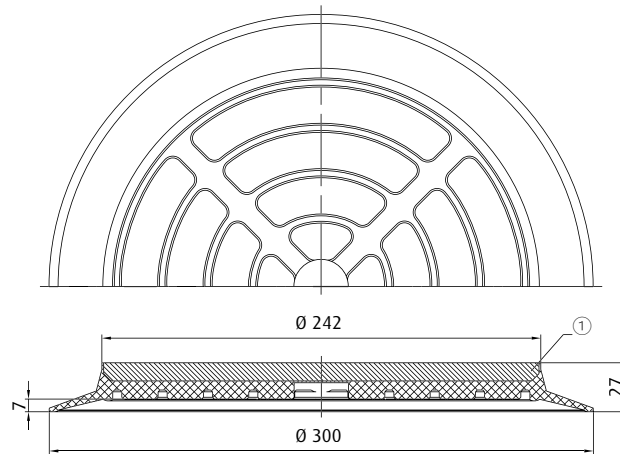
	Connection	see page
270.535	Without	440



Item no.  
102.290.262.\_\*

Material  
SBR (sw)


 15 mm



① = Steel

Item no.  
152.300.098.\_\*

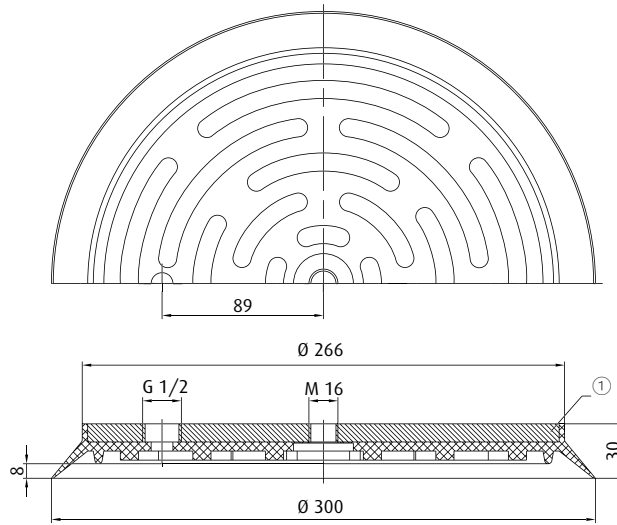
Material  
NBR (gr)

 7 mm

Ordering notes: Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





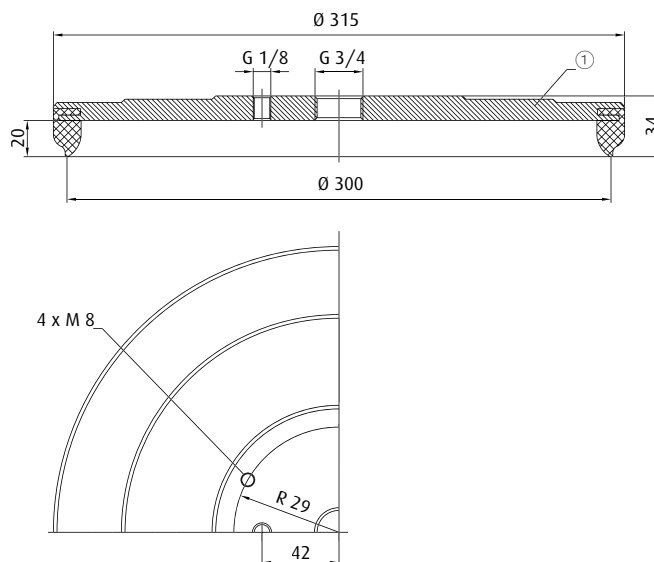
① = Steel

**Item no.**  
152.300.130.\*

**Material**  
NBR (sw)

12 mm

Additional sizes available are found on p. 73.



① = Aluminium

**Item no.**  
160.315.012.\*

**Material**  
EPDM (sw)

2.5 mm

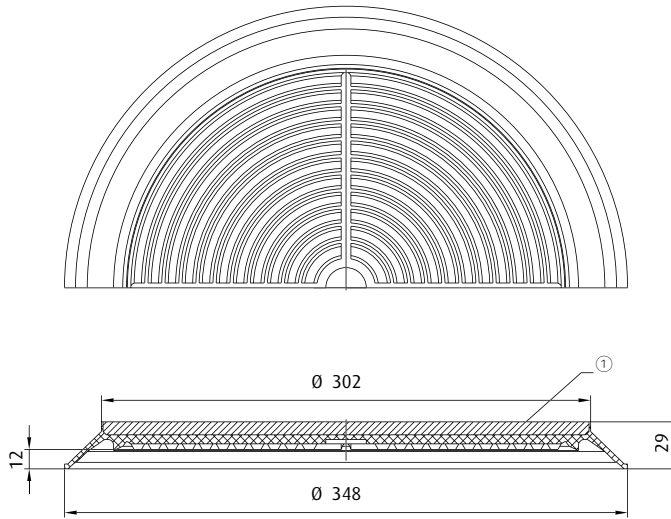
Additional sizes available are found on p. 72.  
**Notes:** Foam sealing lip equalises product unevenness

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 348 - 350 mm



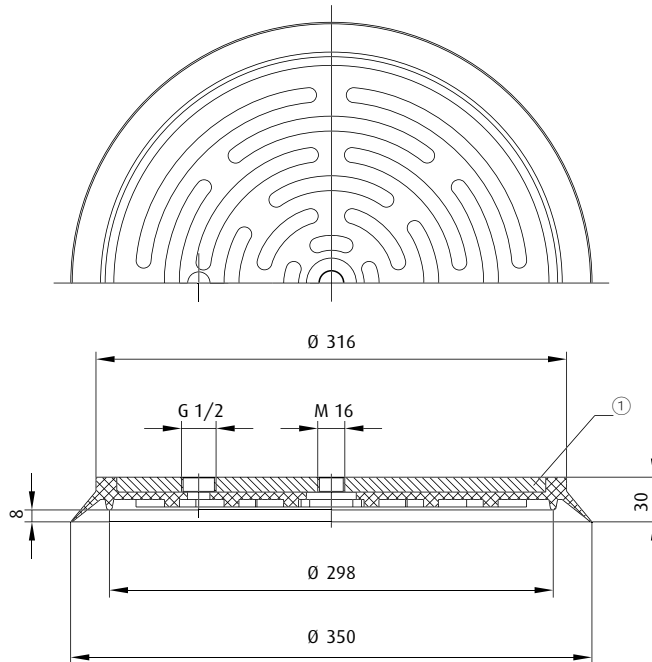
① = Steel

**Item no.**  
**150.340.030.\_\***

**Material**  
NBR (gr)

15 mm

**Ordering notes:** Customised drilling patterns on request



① = Steel

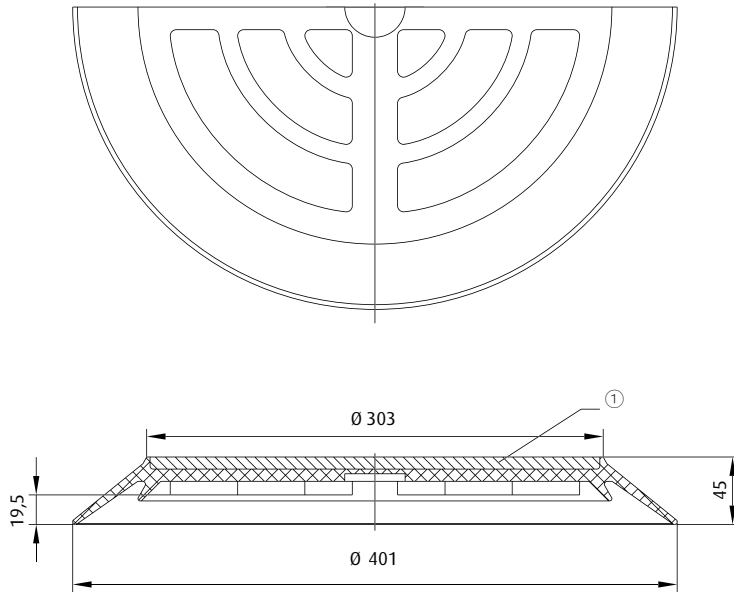
**Item no.**  
**152.350.131.\_\***

**Material**  
NBR (sw)

13 mm

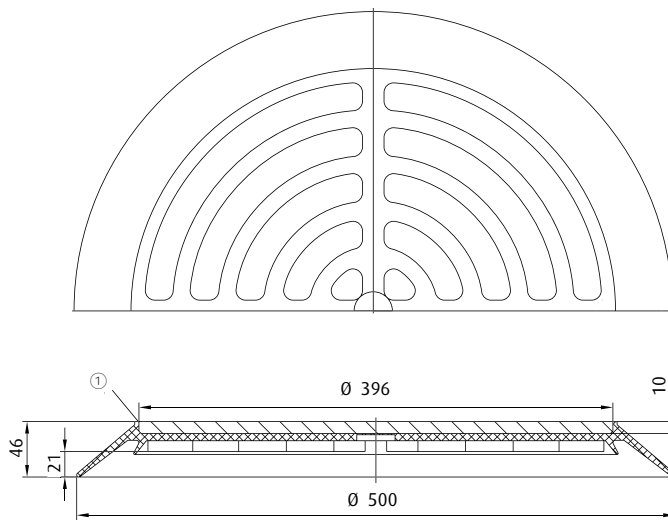
Additional sizes available are found on p. 73.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



① = Steel

<b>Item no.</b> <b>152.400.085._*</b>	<b>Material</b> NBR (gr), SBR (br), NR (sw)	25 mm	<b>Ordering notes:</b> Customised drilling patterns on request
--	--	-------	--



① = Steel

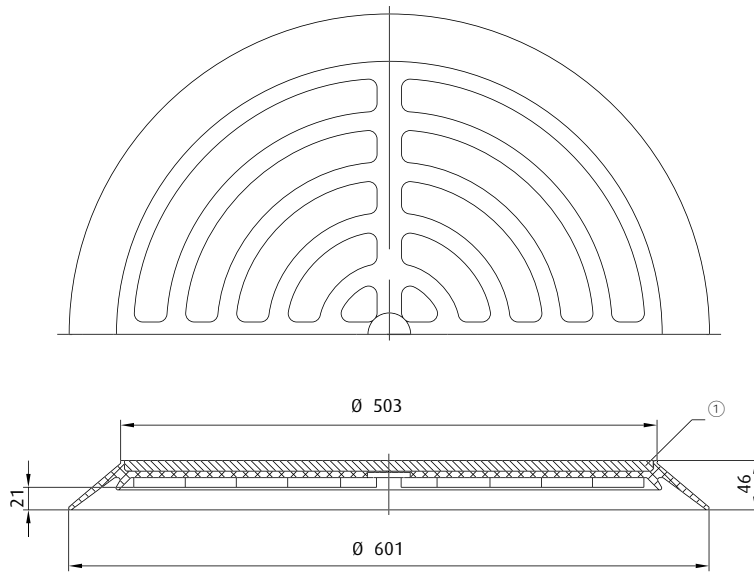
<b>Item no.</b> <b>152.500.086._*</b>	<b>Material</b> NBR (gr), SBR (br), NR (sw)	25 mm	<b>Ordering notes:</b> Customised drilling patterns on request
--	--	-------	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
 Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Flat vacuum cups by Ø

Ø 601 mm




① = Steel

**Item no.**

**152.600.087.\_\***

**Material**

NBR (gr), SBR (br), NR (sw)

 25 mm

**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

## Application / Uses

- > Bellows vacuum cups are especially suited to the gentle handling of sensitive products.
- > They allow for easy height and angle compensation for variable surfaces and lift the product up as soon as the vacuum is turned on.
- > The more folds the vacuum cup has, the greater the lifting movement and thus the height compensation. However, lateral stability is reduced by the number of folds. Bellows vacuum cups are therefore only recommended for vertical handling tasks.



## Designs



FIPA bellows vacuum cups are available in various different versions (generally 1.5 - 4.5 folds) They are available with supporting ribs towards the product, with supporting ribs between the folds and without supporting ribs.

**Supporting ribs towards the product (supporting ribs make contact with the object being handled):**

- > Increased stability and suction power
- > Prevent flexible product parts from being sucked in
- > Avoid slipping of the product while suction is being applied

**Supporting ribs between the folds:**

- > Improve lateral stability
- > Accelerate the depositing process, as the folds are prevented from sticking together

## Methods of connection



**Vacuum cups for attaching to the fittings (plug-in)**

- > Secure hold
- > Quick replacement
- > Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced



**Bolted fittings**

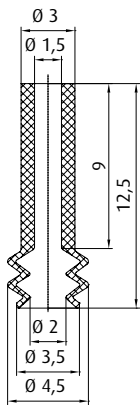
- > Vacuum cups are bolted from below into a threaded counterpart using a hollow bolt
- > Extremely secure hold
- > Eliminates twisting of the vacuum cups
- > Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced



**Vulcanised fittings / retainer plates**

- > Very secure hold
- > Secured against rotation
- > High degree of dimensional stability





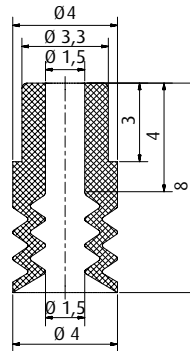
Icon	Connection	see page
	M5-male	409

**Item no.**  
**21.004.142.\_\***

**Material**  
Vinyl (bl)

1.3 mm

Additional sizes available are found on p. 116.

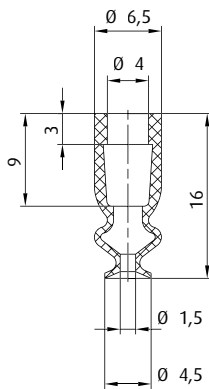


Icon	Connection	see page
	M3-male	408

**Item no.**  
**21.018.068.\_\***

**Material**  
NBR (bl)

1 mm

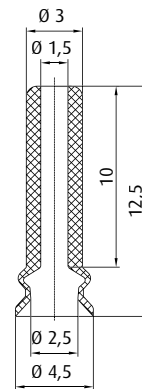


Icon	Connection	see page
	M5-male	409
	M6-male	413
	G1/8-male	416
	G1/8-female	421

**Item no.**  
**23.004.189.\_\***

**Material**  
NBR (sw), SI (tr)

4 mm



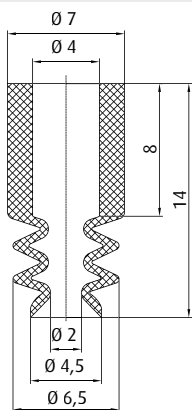
Icon	Connection	see page
	M5-male	409

**Item no.**  
**23.005.095.\_\***

**Material**  
Vinyl (bl)

2 mm

Additional sizes available are found on p. 113.



Icon	Connection	see page
	M5-male	409
	M5-female	412
	M6-male	413
	G1/8-male	416
	G1/8-female	421

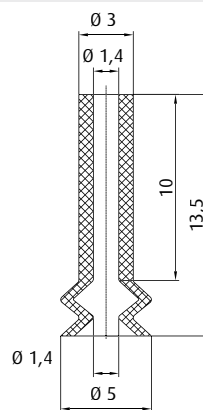
**BESTSELLER**

**Item no.**  
**21.004.083.\_\***

**Material**  
SI (tr)

3 mm

Additional sizes available are found on p. 89.



Icon	Connection	see page
	M5-male	409

**Item no.**  
**23.005.181.\_\***

**Material**  
NBR (sw), SI (tr)

2 mm

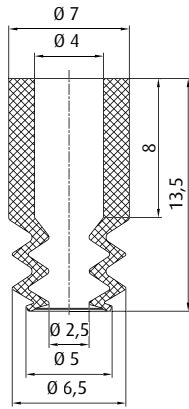
Additional sizes available are found on p. 81.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 5 - 6 mm

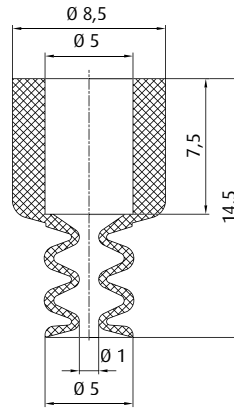


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
21.005.058.\_\*

**Material**  
NBR (sw), SI (tr)

3 mm

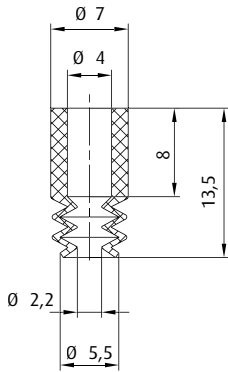


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
21.005.086.\_\*

**Material**  
SI (tr)

3.5 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

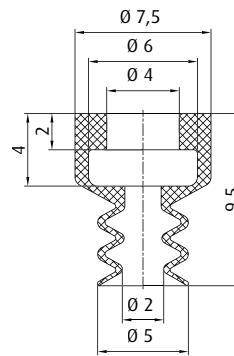
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
21.005.146.\_\*

**Material**  
Thermalon® (bl)

3 mm

Additional sizes available are found on p. 92.



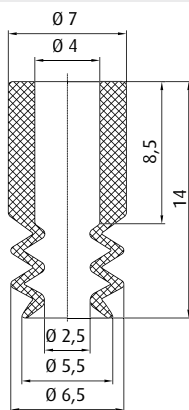
	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

**Item no.**  
21.005.088.\_\*

**Material**  
NBR (sw), SI (tr)

3 mm

This vacuum cup is also available in the following dimensions: 7 mm



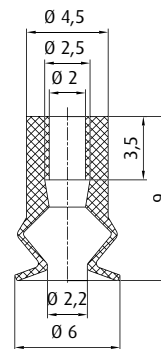
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
21.005.057.\_\*

**Material**  
NBR (g), HNBR (ge), EPDM (gr),  
SI (g), SI-AS (sw)

3 mm

Additional sizes available are found on p. 89.



	Connection	see page
270.153	M5-male	409

**BESTSELLER**

**Item no.**  
23.005.178.\_\*

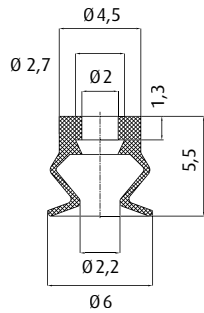
**Material**  
SI (r), SI-AS (sw), CR (sw),  
HNBR (ge)

2 mm

Additional sizes available are found on p. 100.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

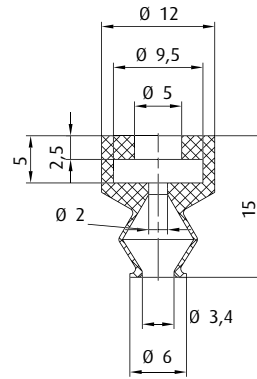




**Item no.**  
23.005.231.\_\*

**Material**  
SI (r)

2 mm



**Item no.**  
23.006.145.\_\*

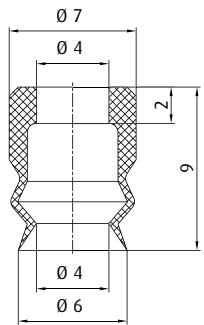
**Material**  
NBR (sw), SI (tr)

5 mm

	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

Additional sizes available are found on p. 122.



	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

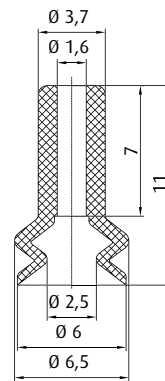
		see page
50.330	10 mm	454

**Item no.**  
23.006.161.\_\*

**Material**  
SI (tr)

2 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 20 mm, 30 mm



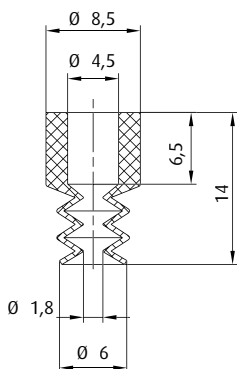
**Item no.**  
23.007.112.\_\*

**Material**  
Vinyl (bl)

2 mm

	Connection	see page
270.001	M5-male	409

Additional sizes available are found on p. 113.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

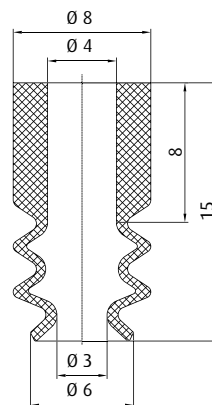
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
21.007.147.\_\*

**Material**  
Thermalon® (bl)

3 mm

Additional sizes available are found on p. 92.



**Item no.**  
21.006.093.\_\*

**Material**  
NBR (sw), SI (tr)

3 mm

Additional sizes available are found on p. 89.

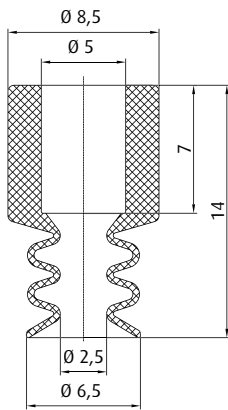
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

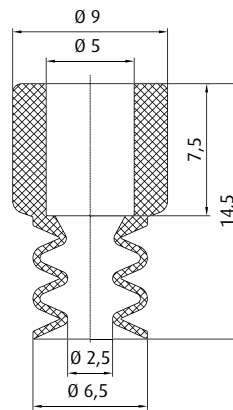
Ø 6 - 8 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

<b>Item no.</b> 21.006.001_*	<b>Material</b> NBR (sw), EPDM (gr), NBR-AS (sw), SI (tr), Vinyl (bl)	3.5 mm
---------------------------------	---	--------

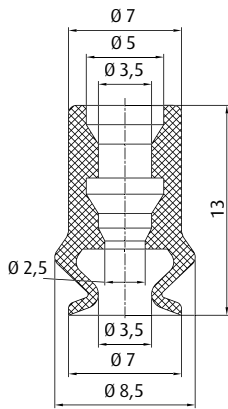
Additional sizes available are found on p. 116.



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

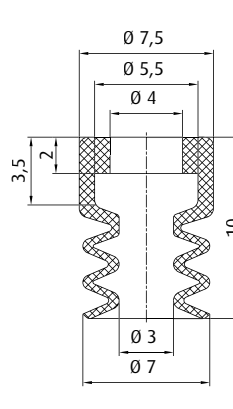
<b>Item no.</b> 21.006.087_*	<b>Material</b> NBR (sw), SI (tr)	3.5 mm
---------------------------------	--------------------------------------	--------

Additional sizes available are found on p. 89.



	Connection	see page
270.399	M5-male	410

<b>Item no.</b> 21.007.096_*	<b>Material</b> NBR (sw), SI (tr)	2 mm
---------------------------------	--------------------------------------	------

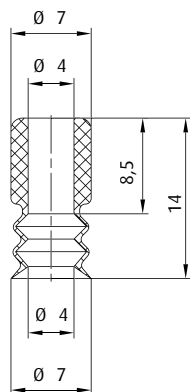


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

<b>Item no.</b> 21.007.089_*	<b>Material</b> NBR (sw), HNBR (ge), SI (tr), SI-AS (sw), PU (bl)	3 mm
---------------------------------	---	------

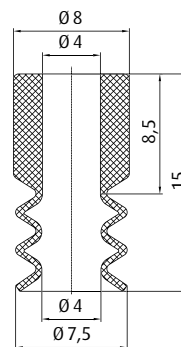
Additional sizes available are found on p. 94.

This vacuum cup is also available in the following dimensions: 5 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

<b>Item no.</b> 21.007.120_*	<b>Material</b> SI (tr)	4 mm
---------------------------------	----------------------------	------



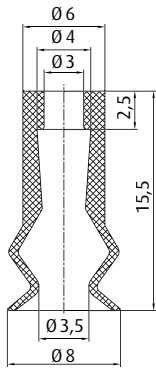
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

<b>Item no.</b> 21.008.094_*	<b>Material</b> NBR (sw), SI (tr)	4 mm
---------------------------------	--------------------------------------	------

Additional sizes available are found on p. 89.

**BESTSELLER**

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

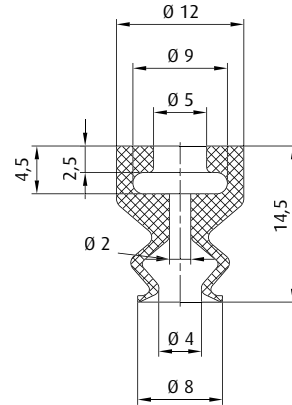


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413

**Item no.**  
23.008.057.\_\*

**Material**  
SI (tr), SI-AS (sw)

3.5 mm



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

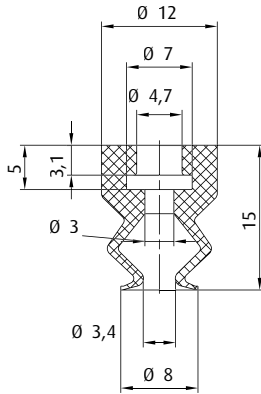
		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

**Item no.**  
23.008.146.\_\*

**Material**  
NBR (sw), SI (tr)

5 mm

Additional sizes available are found on p. 122.



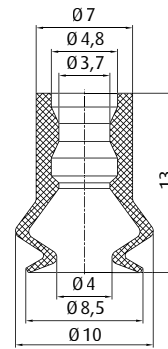
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.141	10 mm	456
50.018	8.5 mm	454

**Item no.**  
21.008.126.\_\*

**Material**  
SI (r)

8 mm

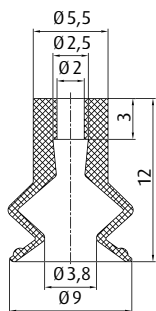


	Connection	see page
270.399	M5-male	410

**Item no.**  
23.008.225.\_\*

**Material**  
SI (tr)

3 mm



	Connection	see page
270.153	M5-male	409

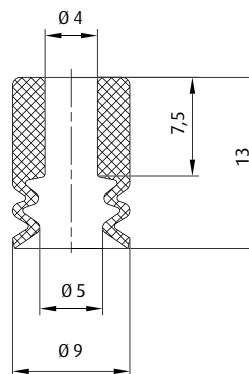
**BESTSELLER**

**Item no.**  
23.008.166.\_\*

**Material**  
SI (r), SI-AS (sw), CR (sw),  
HNBR (ge)

3.5 mm

Additional sizes available are found on p. 100.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
21.009.029.\_\*

**Material**  
PU (bl)

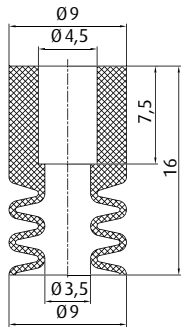
1.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 9 - 10 mm

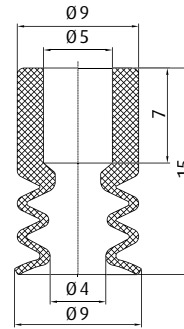


	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
21.009.100.\*

**Material**  
NBR (sw)

3.5 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

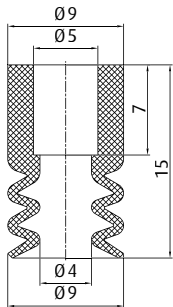
**BESTSELLER**

**Item no.**  
21.009.002.\*

**Material**  
NBR (sw), HNBR (ge), SI (tr),  
SI-AS (sw), NR (gr), PU (bl)

2 mm

Additional sizes available are found on p. 89.



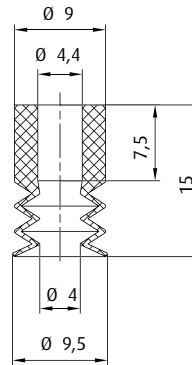
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
21.009.106.\*

**Material**  
Vulkollan® (br)

2 mm

Additional sizes available are found on p. 97.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

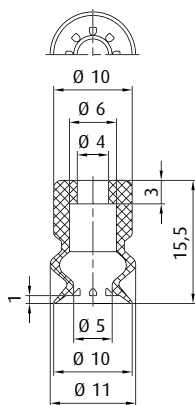
**UP TO 160 °C &  
MINIMUM MARKING**

**Item no.**  
21.009.148.\*

**Material**  
Thermalon® (bl)

3 mm

Additional sizes available are found on p. 92.



	Connection	see page
270.458	M4-male	408
270.134	M5-male	409
270.104	M6-male	413

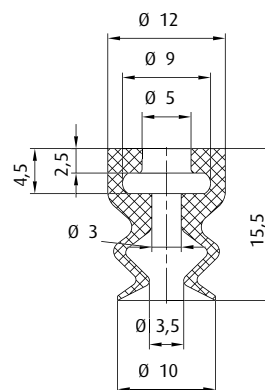
		see page
50.103	6 mm	454
50.104	6 mm	454
50.125	10 mm	454
50.126	15 mm	454
50.127	20 mm	454

**Item no.**  
23.010.139.\*

**Material**  
NBR (sw), SI (tr)

4 mm

Additional sizes available are found on p. 119.



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

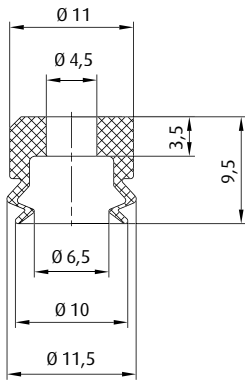
**Item no.**  
23.010.147.\*

**Material**  
NBR (sw), SI (tr)

5 mm

Additional sizes available are found on p. 122.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



Item no.	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

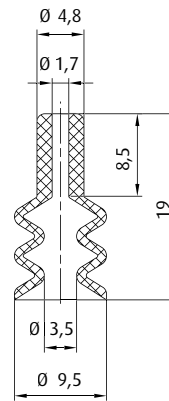
Item no.	Connection	see page
50.330	10 mm	454

**Item no.**  
**23.010.163.\_\***

**Material**  
SI (tr)

2.5 mm

This vacuum cup is also available in the following dimensions: 6 mm, 15 mm, 20 mm, 30 mm

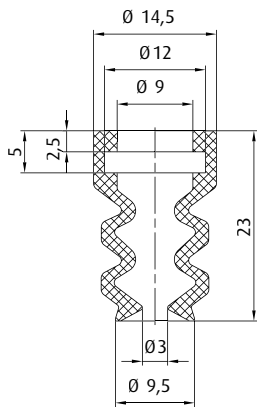


Item no.	Connection	see page
270.195	M5-male	409

**Item no.**  
**21.010.061.\_\***

**Material**  
Vinyl (bl)

8 mm

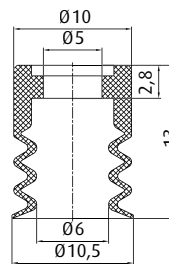


Item no.	Connection	see page
270.541	G1/8-male	421

**Item no.**  
**21.010.071.\_\***

**Material**  
Vinyl (bl)

8 mm



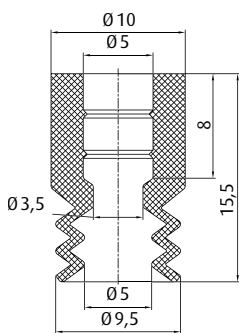
Item no.	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
**21.010.005.\_\***

**Material**  
NBR (sw), SI (bl)

4 mm

This vacuum cup is also available in the following dimensions: 15 mm, 18 mm, 24 mm, 30 mm, 40 mm

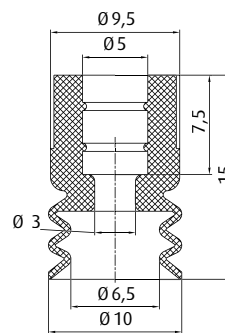


Item no.	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
**21.010.004.\_\***

**Material**  
NBR (sw), SI (r), PU (bg)

3 mm



Item no.	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
**21.010.056.\_\***

**Material**  
SI (bl), SI (r)

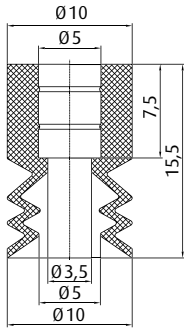
4 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 10 - 11 mm



Connection	see page
270.013 M5-male	410
270.103 M6-male	413
270.003 G1/8-male	416
270.015 G1/8-female	421

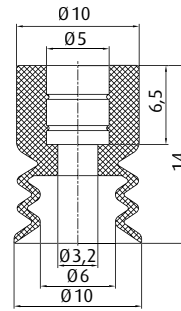
**BESTSELLER**

**Item no.**  
21.010.070.\*

**Material**  
Vinyl (bl)

5 mm

Additional sizes available are found on p. 116.

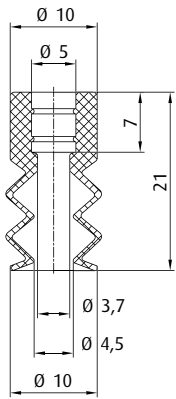


Connection	see page
270.013 M5-male	410
270.005 M5-female	412
270.103 M6-male	413
270.003 G1/8-male	416
270.015 G1/8-female	421

**Item no.**  
21.010.078.\*

**Material**  
SI (r), SI (tr), PU (bg)

4 mm



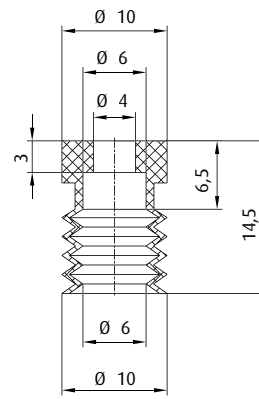
Connection	see page
270.013 M5-male	410
270.005 M5-female	412
270.103 M6-male	413
270.003 G1/8-male	416
270.015 G1/8-female	421

**Item no.**  
21.010.119.\*

**Material**  
NBR (sw), SI (tr)

8 mm

Additional sizes available are found on p. 89.



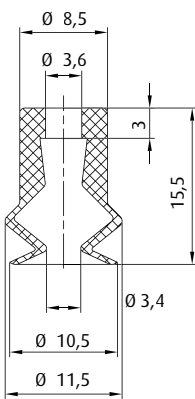
Connection	see page
270.458 M4-male	408
270.009 G1/8-male	417
270.007 G1/8-female	422

**Item no.**  
25.010.044.\*

**Material**  
NBR (sw), SI (tr)

4 mm

Additional sizes available are found on p. 124.

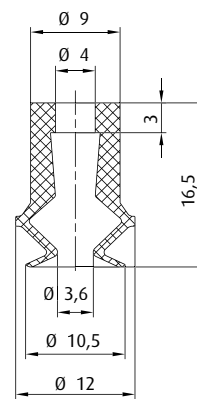


Connection	see page
270.134 M5-male	409
270.104 M6-male	413
270.033 G1/8-male	416
270.478 G1/8-female	421

**Item no.**  
23.011.138.\*

**Material**  
SI (r)

4 mm



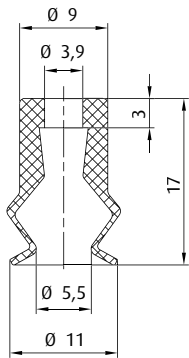
Connection	see page
270.134 M5-male	409
270.104 M6-male	413
270.033 G1/8-male	416
270.015 G1/8-female	421

**Item no.**  
23.011.173.\*

**Material**  
SI (tr)

3.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



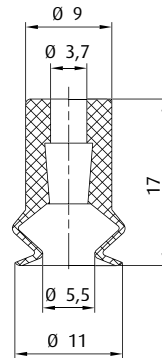
	Connection	see page
	M5-male	409
	M6-male	413

**Item no.**  
23.011.007.\*

**Material**  
SI (tr), SI-AS (sw), PU (bl),  
CR (sw)

5 mm

Additional sizes available are found on p. 100.

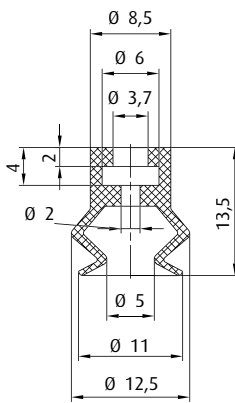


	Connection	see page
	M5-male	409
	M6-male	413
	G1/8-male	416
	G1/8-female	421

**Item no.**  
23.011.131.\*

**Material**  
NBR (sw), SI (r)

4 mm



	Connection	see page
	M5-male	411
	M5-female	412
	G1/8-male	417
	G1/8-female	422

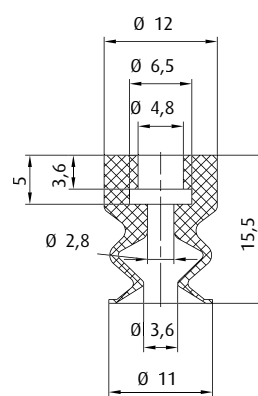
	Connection	see page
	10 mm	454

**Item no.**  
23.010.123.\*

**Material**  
NBR (sw), NBR-AS (sw), SI (tr),  
SI-AS (sw), PU (bl)

4 mm

This vacuum cup is also available in the following dimensions: 15 mm, 21 mm, 32 mm, 42 mm, 54 mm

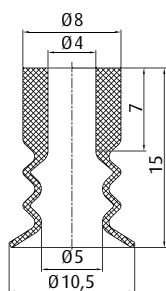


	Connection	see page
	M5-male	411
	G1/8-male	418
	G1/8-female	422

**Item no.**  
21.010.127.\*

**Material**  
SI (r)

6 mm

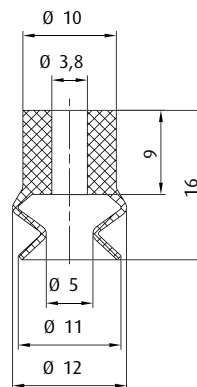


	Connection	see page
	M5-male	410
	G1/8-male	416
	G1/8-female	421

**Item no.**  
21.011.095.\*

**Material**  
NBR (sw), SI (tr)

5 mm



	Connection	see page
	M5-male	409
	M5-female	412
	M6-male	413
	G1/8-male	416
	G1/8-female	421

**UP TO 160 °C &  
MINIMUM MARKING**

**Item no.**  
23.011.234.\*

**Material**  
Thermalon® (bl)

5.5 mm

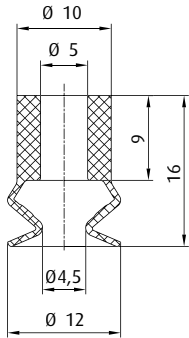
Additional sizes available are found on p. 84.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

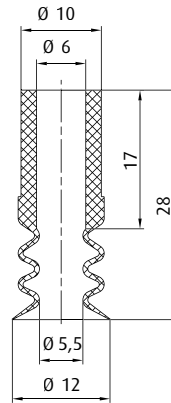
Ø 12 - 13 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
	see page	
50.037	25 mm	456

**Item no.** 23.011.008\_\* **Material** NBR (sw), HNBR (ge), SI (tr) 4.5 mm

Additional sizes available are found on p. 81.

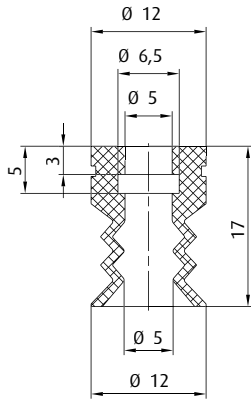


	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**FOR HIGHLY STRUCTURED SURFACES (3D)**

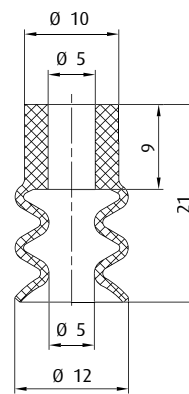
**Item no.** 21.012.079\_\* **Material** NBR (sw), SI (w), SI (tr) 7 mm

Additional sizes available are found on p. 125.



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422
	see page	
50.141	10 mm	456
50.018	8.5 mm	454

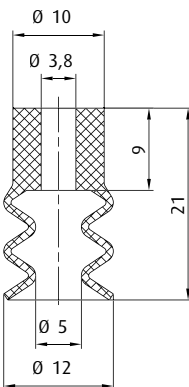
**Item no.** 21.012.108\_\* **Material** SI (r) 5 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.** 21.012.135\_\* **Material** NBR (sw), HNBR (ge), SI (tr), NR (gr), PU (bl) 7 mm

Additional sizes available are found on p. 89.

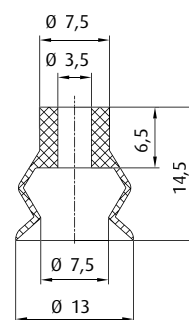


	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**UP TO 160 °C & MINIMUM MARKING**

**Item no.** 21.012.149\_\* **Material** Thermalon® (bl) 7 mm

Additional sizes available are found on p. 92.



	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

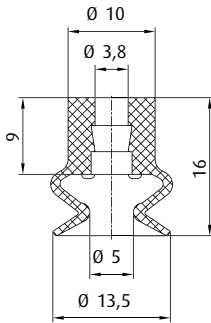
**BESTSELLER**

**Item no.** 23.013.097\_\* **Material** Vinyl (bl) 5 mm

Additional sizes available are found on p. 113.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760





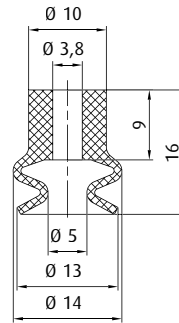
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
		see page
50.037	25 mm	456

**Item no.**  
23.013.120.\_\*

**Material**  
NBR (sw), SI (tr), NR (gr)

4 mm

Additional sizes available are found on p. 81.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

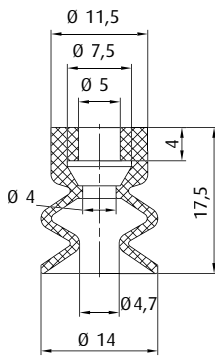
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
23.014.235.\_\*

**Material**  
Thermalon® (bl)

5 mm

Additional sizes available are found on p. 84.



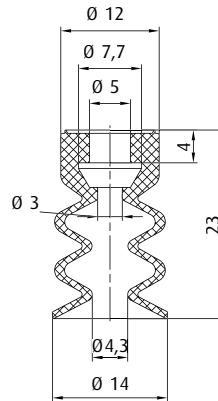
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
23.014.010.\_\*

**Material**  
NBR (sw), SI (r), NR (bg), PU (bl)

8 mm

This vacuum cup is also available in the following dimensions: 24 mm, 40 mm, 60 mm

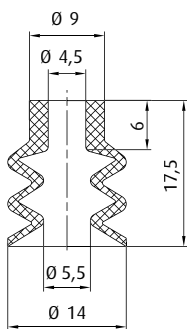


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
21.014.006.\_\*

**Material**  
NBR (sw), SI (r), NR (bg), PU (bl)

10 mm

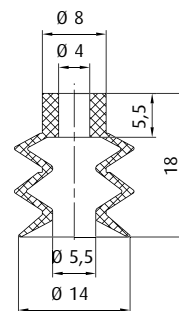


	Connection	see page
270.024	M5-male	410
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
21.014.046.\_\*

**Material**  
PU (r)

7 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**BESTSELLER**

**Item no.**  
21.014.053.\_\*

**Material**  
HNBR (ge), SI (tr), CR (sw)

9 mm

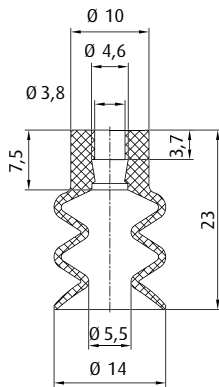
Additional sizes available are found on p. 94.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 14 - 15 mm



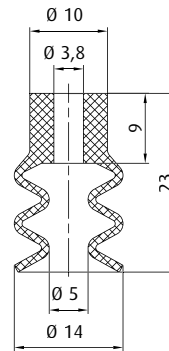
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
21.014.133.\_\*

**Material**  
NBR (sw), SI (tr), NR (gr)

11 mm

Additional sizes available are found on p. 89.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

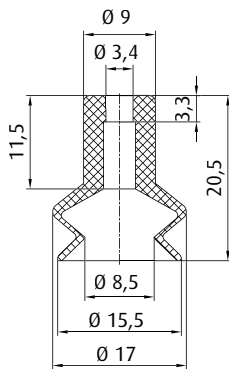
**Item no.**  
21.014.150.\_\*

**Material**  
Thermalon® (bl)

10 mm

Additional sizes available are found on p. 92.

**UP TO 160 °C & MINIMUM MARKING**



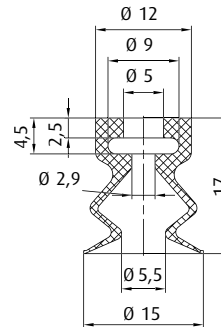
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
23.015.098.\_\*

**Material**  
Vinyl (bl)

5 mm

Additional sizes available are found on p. 113.



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

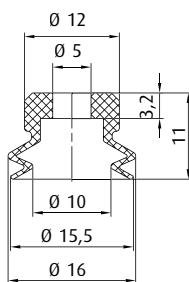
		see page
50.018	8.5 mm	454
50.019	8.5 mm	454

**Item no.**  
23.015.148.\_\*

**Material**  
NBR (sw), SI (tr)

7 mm

Additional sizes available are found on p. 122.



	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

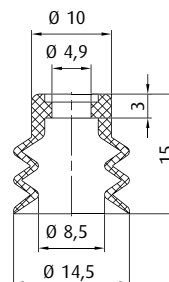
		see page
50.330	10 mm	454

**Item no.**  
23.015.164.\_\*

**Material**  
NBR (sw), SI (tr)

3.5 mm

This vacuum cup is also available in the following dimensions: 6 mm, 10 mm, 20 mm, 30 mm



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

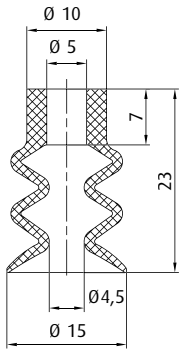
**Item no.**  
21.015.009.\_\*

**Material**  
NBR (sw), SI (tr)

5 mm

This vacuum cup is also available in the following dimensions: 10 mm, 18 mm, 24 mm, 30 mm, 40 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



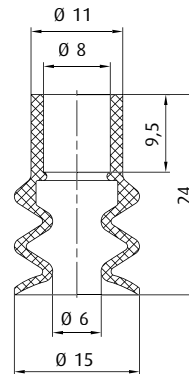
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
21.014.007.\*

**Material**  
NBR (sw), SI (tr), PU (bl)

12 mm

Additional sizes available are found on p. 89.



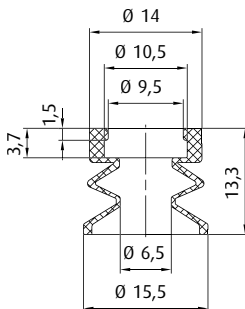
	Connection	see page
270.112	G1/8-male	419
270.113	G1/4-male	425

**Item no.**  
21.015.008.\*

**Material**  
NBR (sw), SI (r)

7 mm

This vacuum cup is also available in the following dimensions: 20 mm, 30 mm



	Connection	see page
270.311	M5-male	411
270.312/19	M6-male	414

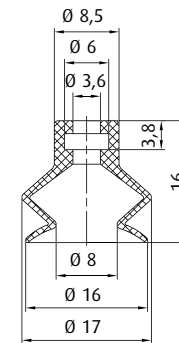
		see page
50.005	5 mm	456
50.145	10 mm	456
50.146	30 mm	456

**Item no.**  
23.016.232.\*

**Material**  
SI (tr)

6 mm

Additional sizes available are found on p. 130.



	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

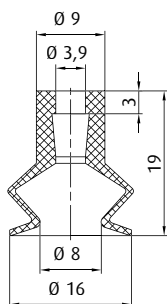
		see page
50.330	10 mm	454

**Item no.**  
23.015.122.\*

**Material**  
NBR (sw), SI (tr), PU (bl),  
HNBR (ge)

5 mm

Additional sizes available are found on p. 86.  
This vacuum cup is also available in the following dimensions: 11 mm, 21 mm, 32 mm, 42 mm, 54 mm



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

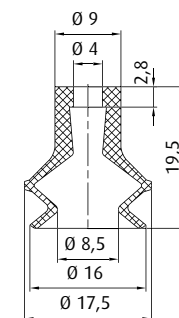
**BESTSELLER**

**Item no.**  
23.016.015.\*

**Material**  
SI (tr), SI-AS (sw), CR (sw)

7 mm

Additional sizes available are found on p. 100.



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
23.016.174.\*

**Material**  
SI (tr)

5 mm

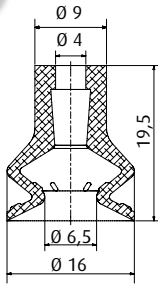
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 16 mm

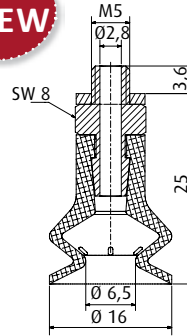
**NEW**



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413

Spare cup

**NEW**



**Item no.**  
23.016.263.\*

**Material**  
Varioflex® 60/30° (sw/r)

4.5 mm

Additional sizes available are found on p. 107.

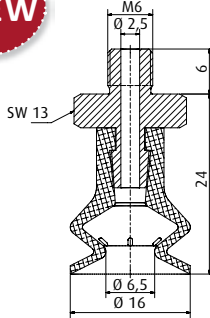
**Item no.**  
22.016.253.\*

**Material**  
Varioflex® 60/30° (sw/r)

4.5 mm

Additional sizes available are found on p. 107.

**NEW**



**Item no.**  
22.016.254.\*

**Material**  
Varioflex® 60/30° (sw/r)

4.5 mm

Additional sizes available are found on p. 107.

	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

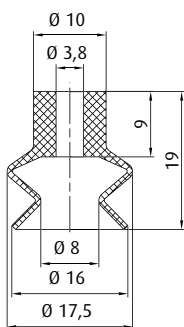
	see page
50.037	25 mm

**Item no.**  
23.016.016.\*

**Material**  
NBR (sw), HNBR (ge), SI (tr)

6 mm

Additional sizes available are found on p. 81.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

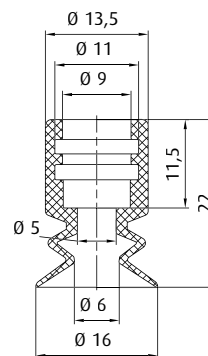
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
23.016.236.\*

**Material**  
Thermalon® (bl)

8.5 mm

Additional sizes available are found on p. 84.



	Connection	see page
270.244	M5-male	410

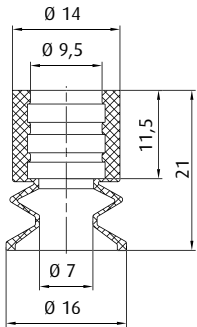
	see page
50.005	5 mm
50.145	10 mm
50.146	30 mm

**Item no.**  
23.016.104.\*

**Material**  
Vinyl (bl)

7 mm

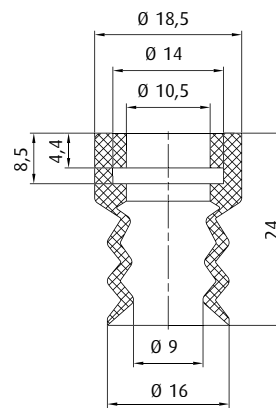
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



Icon	Connection	see page
	270.244 M5-male	410
	270.177 M10-male	416
	270.451 G1/4-male	426
	270.452 G1/4-female	431
Icon	Icon	see page
	50.005 5 mm	456
	50.145 10 mm	456
	50.146 30 mm	456

<b>Item no.</b> 27.016.001.*	<b>Material</b> SI (tr), NR (sw)	
---------------------------------	-------------------------------------	--

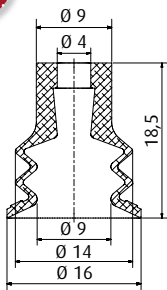
Additional sizes available are found on p. 125.



Icon	Connection	see page
	270.177 M10-male	416
	270.451 G1/4-male	426
	270.452 G1/4-female	431

<b>Item no.</b> 21.016.072.*	<b>Material</b> Vinyl (bl)	
---------------------------------	-------------------------------	--

**NEW**

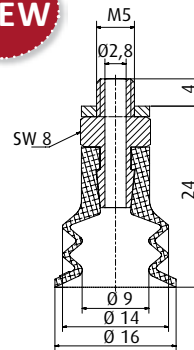


Icon	Connection	see page
	270.134 M5-male	409
	270.104 M6-male	413

<b>Item no.</b> 21.016.175.*	<b>Material</b> Varioflex® 60/30° (sw/r)	
---------------------------------	---	--

Additional sizes available are found on p. 110.

**NEW**

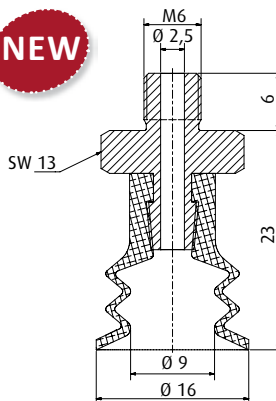


<b>Item no.</b> 20.016.145.*	<b>Material</b> Varioflex® 60/30° (sw/r)	
---------------------------------	---	--

Additional sizes available are found on p. 110.

Spare cup

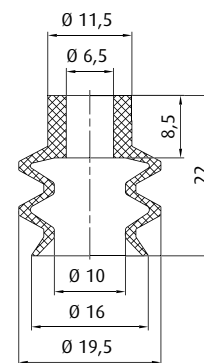
**NEW**



<b>Item no.</b> 20.016.146.*	<b>Material</b> Varioflex® 60/30° (sw/r)	
---------------------------------	---	--

Additional sizes available are found on p. 110.

Spare cup



Icon	Connection	see page
	270.274 G1/4-male	427
	270.275 G1/4-female	432

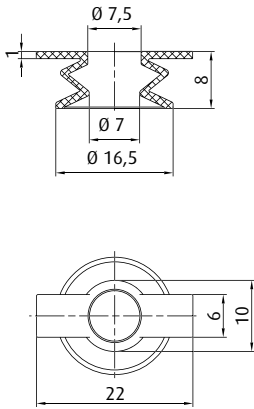
<b>Item no.</b> 21.015.050.*	<b>Material</b> SI (tr), NR (bg)	
---------------------------------	-------------------------------------	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 17 - 18 mm

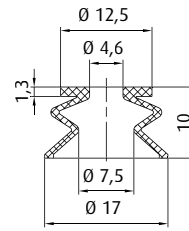


**Item no.**  
23.017.102.\*

**Material**  
NR (sw)

5.5 mm

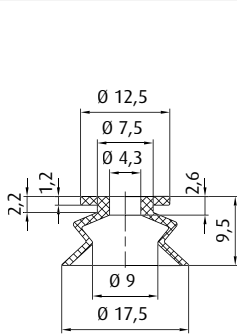
Additional sizes available are found on p. 23.



**Item no.**  
23.017.100.\*

**Material**  
NR (br)

6 mm

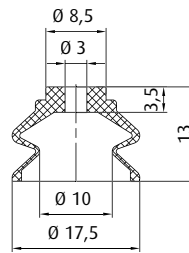


	Connection	see page
270.010	M5-male	411
270.005	M5-female	412
270.009	G1/8-male	417
270.007	G1/8-female	422

**Item no.**  
23.016.086.\*

**Material**  
SI (tr), PU (bg)

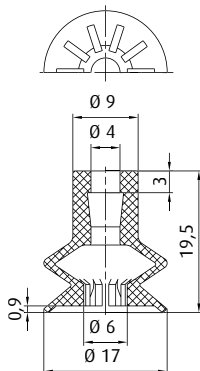
6 mm



**Item no.**  
23.017.105.\*

**Material**  
NR (sw)

7 mm



	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

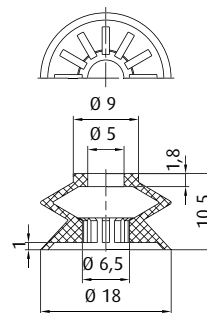
**BESTSELLER**

**Item no.**  
23.018.175.\*

**Material**  
SI (tr), NR (bl)

5.5 mm

Additional sizes available are found on p. 23.



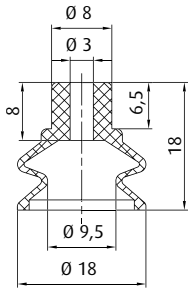
**Item no.**  
23.018.183.\*

**Material**  
NR (or)

5.5 mm

Additional sizes available are found on p. 25.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

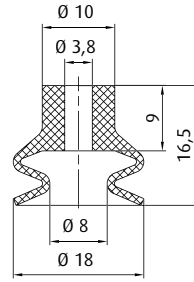


	Connection	see page
270.022	M5-male	409
270.347	M5-female	412

Item no.  
23.018.101.\*

Material  
NR (sw)

6 mm



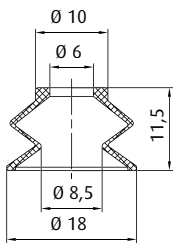
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

Item no.  
23.018.237.\*

Material  
Thermalon® (bl)

5 mm

Additional sizes available are found on p. 84.

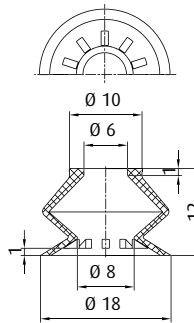


	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

Item no.  
23.018.019.\*

Material  
SI (tr), NR (sw), NR (bl)

8 mm



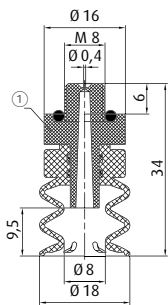
	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

Item no.  
23.018.082.\*

Material  
SI (tr), NR (bl), CR (sw)

5.5 mm

Additional sizes available are found on p. 23.



Spare cup

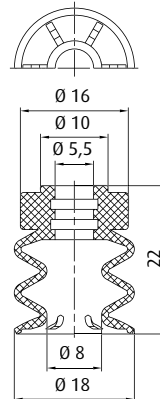
REDUCED LEAKAGE

① = Special fitting with installed orifice Ø 0.4 mm.  
Material: PA6/ O-ring NBR

Item no.  
20.018.125.\*

Material  
NBR (gr)

9.5 mm



	Connection	see page
270.443	M5-male	410
270.378	M8-male	415
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

Item no.  
21.018.118.\*

Material  
NBR (gr)

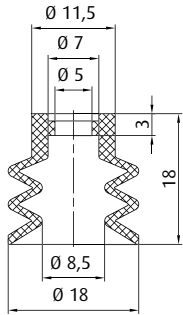
10 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 18 mm



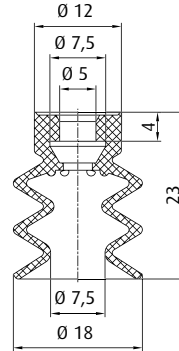
	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
21.018.012.\*

**Material**  
NBR (sw), SI (bl)

7 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 24 mm, 30 mm, 40 mm

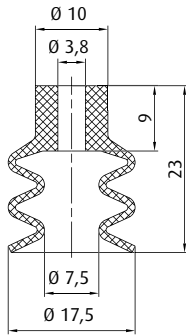


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
21.018.011.\*

**Material**  
NBR (sw), SI (r), NR (bg), PU (bl)

8 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

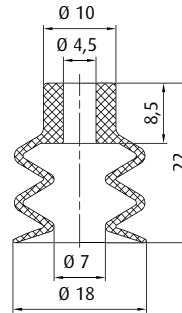
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
21.018.151.\*

**Material**  
Thermalon® (bl)

10 mm

Additional sizes available are found on p. 92.



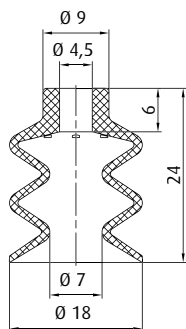
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
21.018.010.\*

**Material**  
NBR (sw), HNBR (ge), SI (tr), PU (bl)

8 mm

Additional sizes available are found on p. 89.

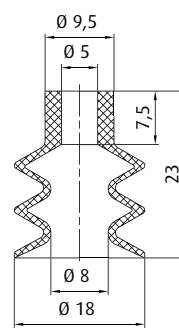


	Connection	see page
270.024	M5-male	410
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
21.018.047.\*

**Material**  
PU (g)

12 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

**BESTSELLER**

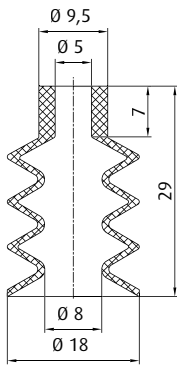
**Item no.**  
21.018.013.\*

**Material**  
NBR (sw), SI (tr), NR (sw)

9 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

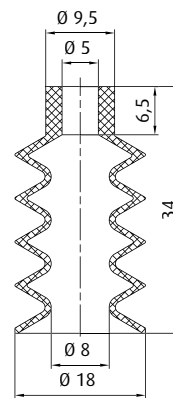
**BESTSELLER**

**Item no.**  
25.018.031\_\*

**Material**  
NBR (sw), SI (tr)

12 mm

Additional sizes available are found on p. 96.

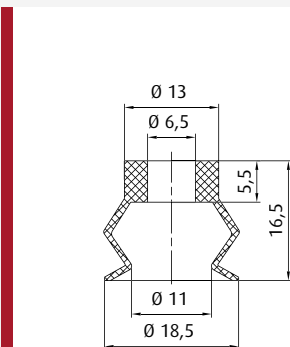


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

**Item no.**  
25.018.032\_\*

**Material**  
SI (tr)

14 mm

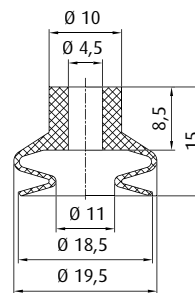


	Connection	see page
270.039	M6-male	414
270.063	G1/8-male	419
270.061	G1/8-female	422

**Item no.**  
23.019.021\_\*

**Material**  
NBR (sw), SI (tr)

8 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

		see page
50.037	25 mm	456

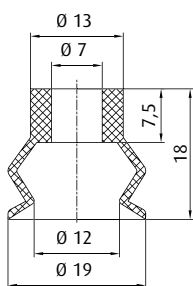
**BESTSELLER**

**Item no.**  
23.019.119\_\*

**Material**  
NBR (sw), SI (tr)

4 mm

Additional sizes available are found on p. 81.



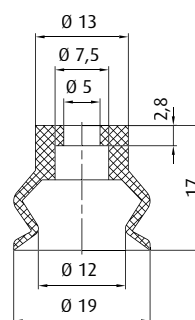
	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

**Item no.**  
23.019.109\_\*

**Material**  
Vinyl (bl)

8 mm

Additional sizes available are found on p. 113.



	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

**Item no.**  
23.019.179\_\*

**Material**  
Vinyl (bl)

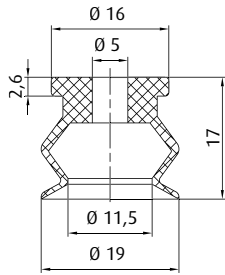
7 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 19 - 20 mm

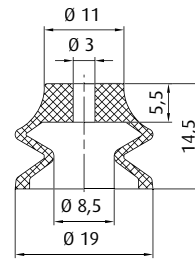


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
23.019.110.\*

**Material**  
Vinyl (bl)

8 mm

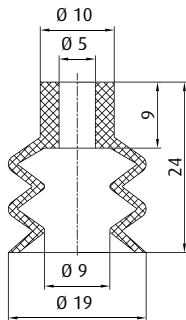


**Item no.**  
23.019.168.\*

**Material**  
NR (bl), NR (br)

5.5 mm

Additional sizes available are found on p. 23.



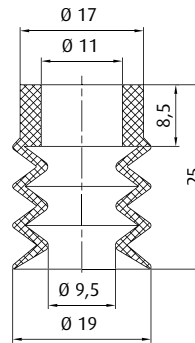
	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

**Item no.**  
21.018.068.\*

**Material**  
Vinyl (bl)

11 mm

Additional sizes available are found on p. 116.



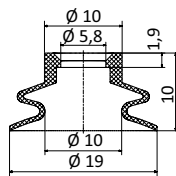
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
25.019.037.\*

**Material**  
Vinyl (bl)

10 mm

**NEW**



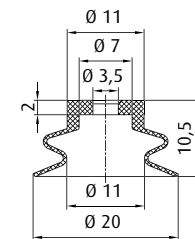
	Connection	see page
270.200	M5-male	411
270.064	G1/8-male	418
270.065	G1/8-female	422

**Item no.**  
23.019.254.\*

**Material**  
SI (tr)

3.5 mm

Additional sizes available are found on p. 23.



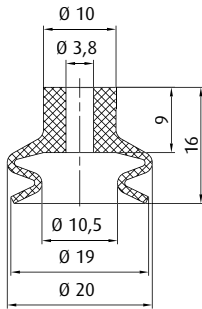
	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

**Item no.**  
23.020.103.\*

**Material**  
NR (bg)

2 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

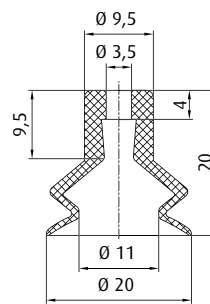
**UP TO 160 °C & MINIMUM MARKING**

**Item no. 23.020.238.\***

**Material**  
Thermalon® (bl)

5 mm

Additional sizes available are found on p. 84.



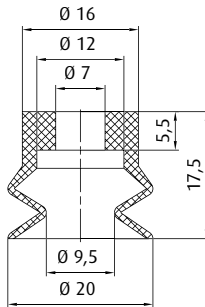
	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no. 23.020.114.\***

**Material**  
Vinyl (bl)

6 mm

Additional sizes available are found on p. 113.



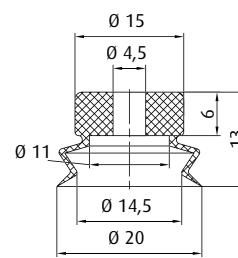
	Connection	see page
270.311	M5-male	411
270.312/19	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

**WEAR-RESISTANT**

**Item no. 23.020.121.\***

**Material**  
Tepuflex® (or), Vulkollan® (br)

5 mm



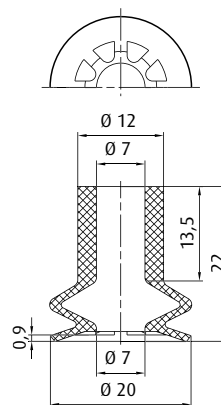
	Connection	see page
270.311	M5-male	411
270.063	G1/8-male	419
270.061	G1/8-female	422

**Item no. 23.020.154.\***

**Material**  
SI (tr)

4 mm

This vacuum cup is also available in the following dimensions: 6 mm, 10 mm, 15 mm, 30 mm



	Connection	see page
270.030	G1/8-male	419
270.019	G1/8-female	423
270.113	G1/4-male	425
270.275	G1/4-female	432

**Item no. 23.020.133.\***

**Material**  
NBR (sw), SI (tr)

4 mm

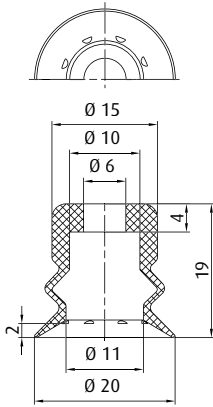
Additional sizes available are found on p. 23.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

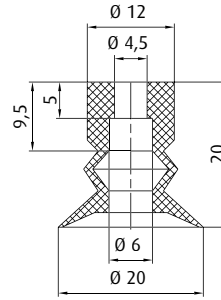
Ø 20 mm



	Connection	see page
	270.311 M5-male	411
	270.459 M6-male	414
	270.480 G1/8-male	420
	270.479 G1/8-female	423
		see page
	50.085 6 mm	454
	50.128 10 mm	454
	50.129 15 mm	454
	50.095 20 mm	456
	50.096 30 mm	456
	50.097 40 mm	456
	50.098 50 mm	456

**Item no.** 23.020.140.\* **Material** NBR (sw), SI (tr)

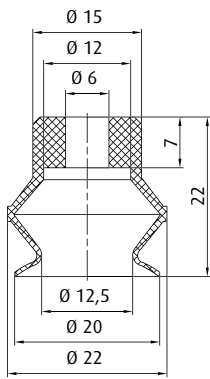
Additional sizes available are found on p. 119.



	Connection	see page
	270.317 M5-male	410
	270.103 M6-male	413
	270.205 G1/8-male	416
	270.109 G1/8-female	421
	270.194 G1/4-male	425
		see page
	50.020 8.5 mm	454

**Item no.** 23.020.149.\* **Material** NBR (sw), SI (tr)

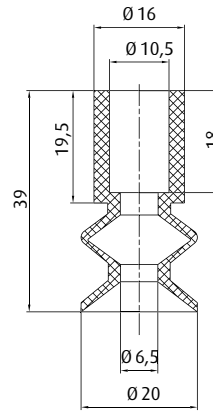
Additional sizes available are found on p. 122.



	Connection	see page
	270.312/19 M6-male	414
	270.482 G1/8-male	420
	270.481 G1/8-female	423
	270.483 G1/4-male	429
	270.484 G1/4-female	433
		see page
	50.095 20 mm	456
	50.096 30 mm	456
	50.097 40 mm	456
	50.098 50 mm	456

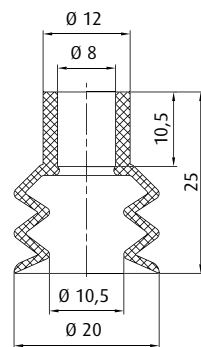
**Item no.** 23.020.169.\* **Material** Vulkollan® (br)

Additional sizes available are found on p. 97.



	Connection	see page
	270.177 M10-male	416
	270.451 G1/4-male	426
	270.452 G1/4-female	431

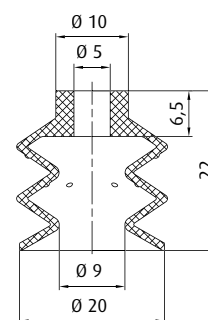
**Item no.** 23.020.027.\* **Material** SI (tr), NR (sw), NR (br)



	Connection	see page
	270.112 G1/8-male	419
	270.113 G1/4-male	425
	270.178 G1/4-female	431

**Item no.** 21.020.014.\* **Material** NBR (sw), SI (tr)

This vacuum cup is also available in the following dimensions: 15 mm, 30 mm

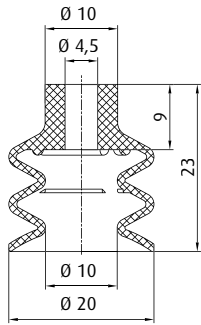


	Connection	see page
	270.443 M5-male	410
	270.238 G1/8-male	417
	270.110 G1/8-female	422
	270.534 G1/4-male	425

**Item no.** 21.020.015.\* **Material** NBR (sw), SI (tr), NR (sw)

**BESTSELLER**

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



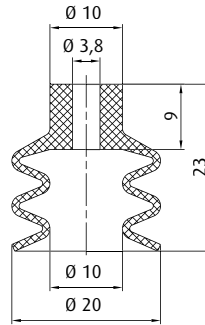
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

**Item no.**  
21.020.016\_\*

**Material**  
NBR (sw), HNBR (ge), SI (tr)

9 mm

Additional sizes available are found on p. 89.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

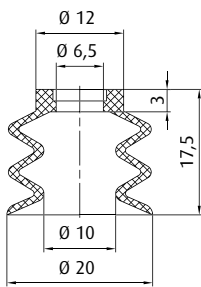
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
21.020.152\_\*

**Material**  
Thermalon® (bl)

10 mm

Additional sizes available are found on p. 92.



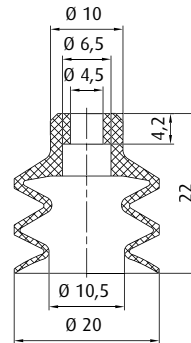
	Connection	see page
270.039	M6-male	414
270.247	M8-male	415
270.543	G1/8-male	419

**Item no.**  
21.020.073\_\*

**Material**  
SI (tr)

9 mm

Additional sizes available are found on p. 97.

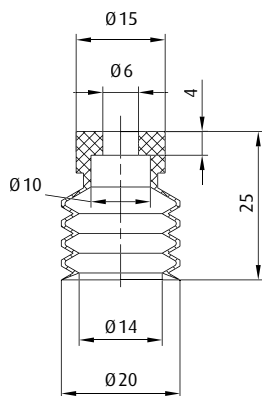


	Connection	see page
270.024	M5-male	410
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

**Item no.**  
21.020.090\_\*

**Material**  
Vulkollan® (br)

8 mm



	Connection	see page
270.459	M6-male	414
270.480	G1/8-male	420
270.479	G1/8-female	423

**Item no.**  
25.020.045\_\*

**Material**  
NBR (sw), SI (tr)

10 mm

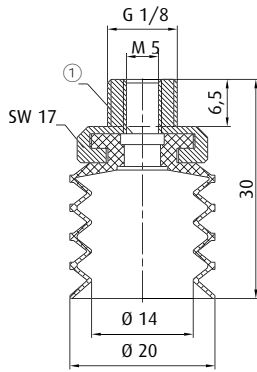
Additional sizes available are found on p. 124.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 20 - 21 mm

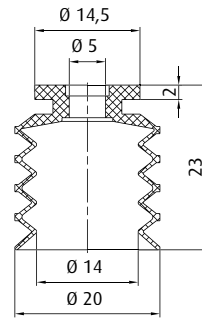


① = Filter screen

**Item no.** 24.020.033\_\* **Material** SI (tr), CR (sw) 16 mm

Additional sizes available are found on p. 104.

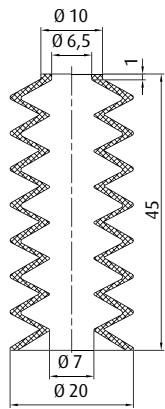
Spare cup



**Item no.** 25.020.025\_\* **Material** SI (tr), CR (sw) 16 mm

Additional sizes available are found on p. 100.

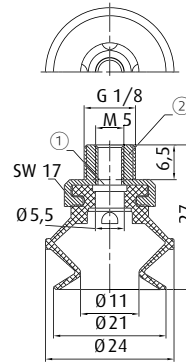
	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418



	Connection	see page
270.105	M6-male	414
270.040	M8-male	415
270.077	G1/8-male	419

**Item no.** 25.020.002\_\* **Material** SI (w) 26 mm

Additional sizes available are found on p. 104.

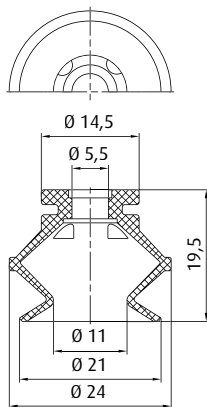


① = Filter screen ② = Aluminium

**Item no.** 22.020.020\_\* **Material** Tepuflex® (or), SI (tr), CR (sw) 9 mm

Additional sizes available are found on p. 104.

Spare cup



	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

**BESTSELLER**

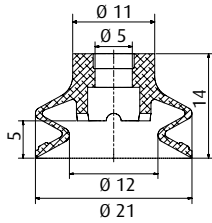
**Item no.** 23.020.026\_\* **Material** Tepuflex® (or), SI (tr), CR (sw) 9 mm

Additional sizes available are found on p. 100.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



**NEW**



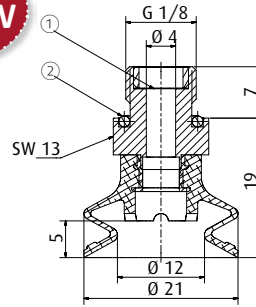
	Connection	see page
270.500-S	M5-female	413
270.503-S	G1/8-male	418

Spare cup

**Item no.** 23.021.264.\* **Material** Varioflex® 60/30° (sw/r) 5 mm

Additional sizes available are found on p. 107.

**NEW**

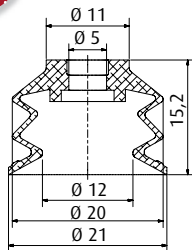


① = Filter screen ② = O-ring

**Item no.** 22.021.255.\* **Material** Varioflex® 60/30° (sw/r) 5 mm

Additional sizes available are found on p. 107.

**NEW**



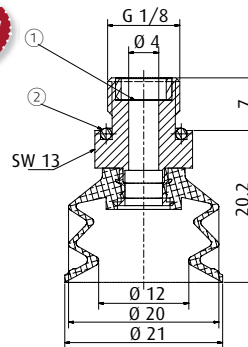
	Connection	see page
270.500-S	M5-female	413
270.503-S	G1/8-male	418

Spare cup

**Item no.** 21.021.176.\* **Material** Varioflex® 60/30° (sw/r) 6.5 mm

Additional sizes available are found on p. 110.

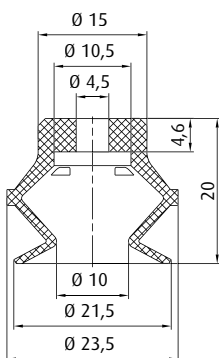
**NEW**



① = Filter screen ② = O-ring

**Item no.** 20.021.147.\* **Material** Varioflex® 60/30° (sw/r) 6.5 mm

Additional sizes available are found on p. 110.



	Connection	see page
270.311	M5-male	411
270.063	G1/8-male	419
270.061	G1/8-female	422

**Item no.** 23.020.124.\* **Material** NBR (sw), HNBR (ge), SI (tr), PU (bl) 8 mm

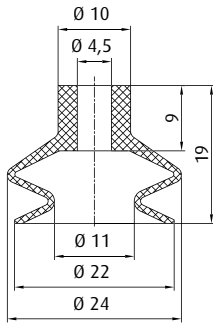
Additional sizes available are found on p. 86.  
This vacuum cup is also available in the following dimensions: 11 mm, 15 mm, 32 mm, 42 mm, 54 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 22 - 24 mm



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

		see page
50.037	25 mm	456

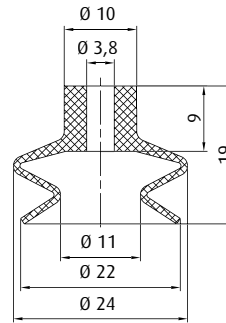
**BESTSELLER**

**Item no.**  
23.022.028.\*

**Material**  
NBR (sw), SI (tr), Vinyl (bl)

8 mm

Additional sizes available are found on p. 113.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

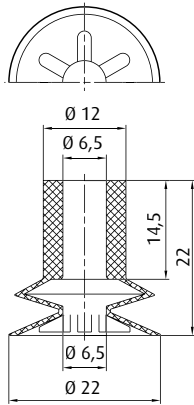
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
23.022.239.\*

**Material**  
Thermalon® (bl)

8 mm

Additional sizes available are found on p. 84.



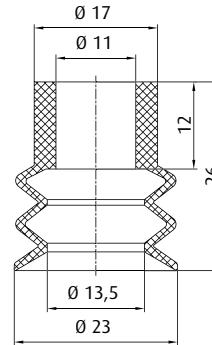
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**Item no.**  
23.023.099.\*

**Material**  
NR (br)

5 mm

Additional sizes available are found on p. 23.



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

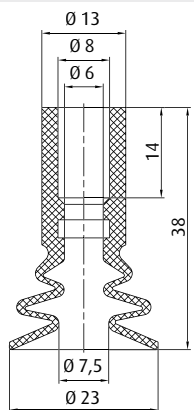
**BESTSELLER**

**Item no.**  
21.023.066.\*

**Material**  
Vinyl (bl)

9 mm

Additional sizes available are found on p. 116.



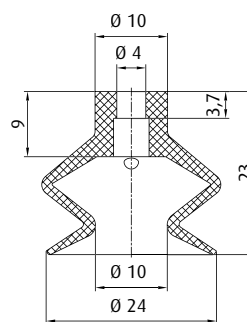
	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
21.023.102.\*

**Material**  
SI (g)

12 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

		see page
50.037	25 mm	456

**BESTSELLER**

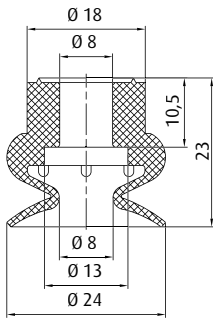
**Item no.**  
23.025.137.\*

**Material**  
NBR (sw), SI (tr), NR (gr)

9 mm

Additional sizes available are found on p. 81.





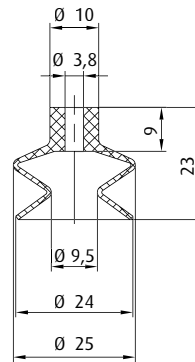
	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

**Item no.**  
23.025.030.\*

**Material**  
NBR (sw), SI (r), NR (bg)

5 mm

This vacuum cup is also available in the following dimensions: 14 mm, 40 mm, 60 mm



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

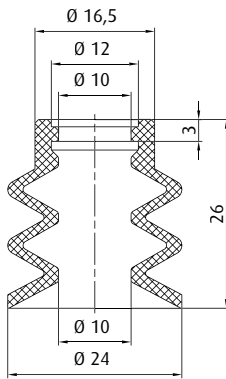
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
23.025.240.\*

**Material**  
Thermalon® (bl)

12 mm

Additional sizes available are found on p. 84.



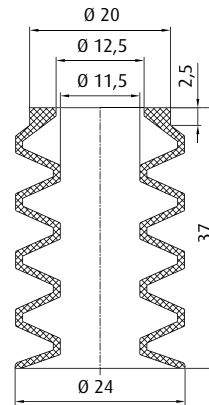
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
21.024.017.\*

**Material**  
NBR (sw), SI (tr)

10 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 30 mm, 40 mm

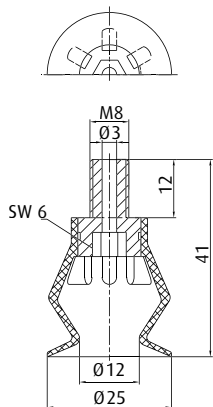


	Connection	see page
270.233	G1/8-female	438

**Item no.**  
25.024.057.\*

**Material**  
SI (tr)

20 mm

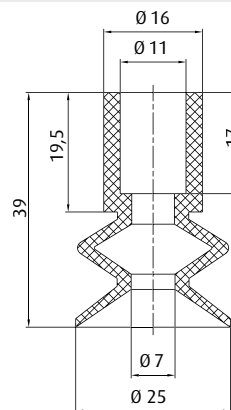


**Item no.**  
22.025.029.\*

**Material**  
NBR (sw), SI (tr), NR (sw)

11 mm

This vacuum cup is also available in the following dimensions: 31 mm, 44 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
23.025.032.\*

**Material**  
SI (tr), NR (sw), NR (br)

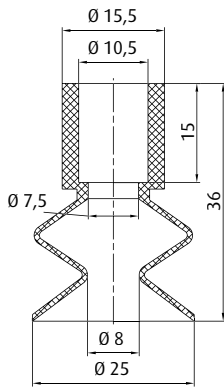
12 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 25 mm

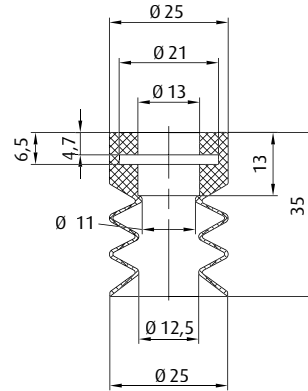


	Connection	see page
270.244	M5-male	410
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.  
23.025.200.\*

Material  
Vulkollan® (br)

13 mm

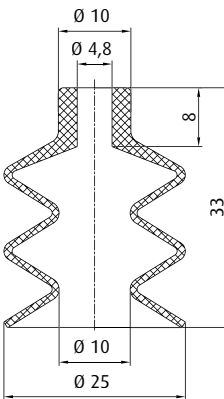


	Connection	see page
270.049-1	G1/4-male	426

Item no.  
21.025.059.\*

Material  
SI (tr)

16 mm



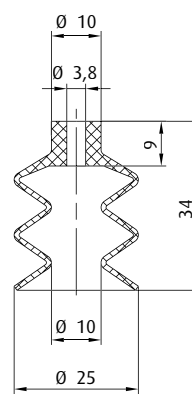
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no.  
21.025.060.\*

Material  
NBR (sw), SI (tr)

19 mm

Additional sizes available are found on p. 89.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

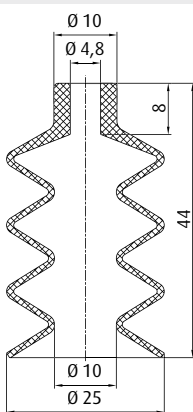
UP TO 160 °C &  
MINIMUM MARKING

Item no.  
21.025.153.\*

Material  
Thermalon® (bl)

20 mm

Additional sizes available are found on p. 92.



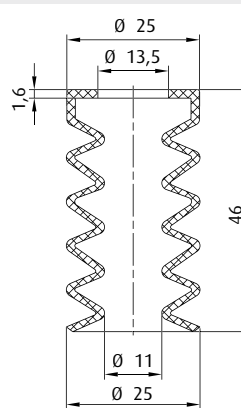
	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

Item no.  
25.025.005.\*

Material  
NBR (sw), SI (tr)

24 mm

Additional sizes available are found on p. 96.



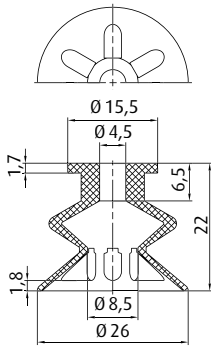
	Connection	see page
270.182.U	G1/4-male	431
270.182	G1/4-female	434

Item no.  
25.025.004.\*

Material  
SI (tr)

29 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

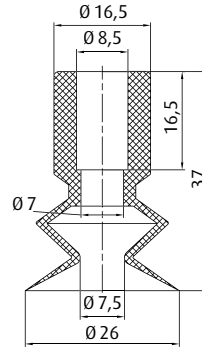


Connection	see page
270.013 M5-male	410
270.005 M5-female	412
270.103 M6-male	413
270.003 G1/8-male	416
270.015 G1/8-female	421
270.194 G1/4-male	425

Item no.  
23.026.115.\*

Material  
Vinyl (bl)

8 mm



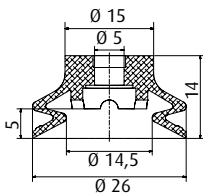
Connection	see page
270.244 M5-male	410
270.177 M10-male	416
270.451 G1/4-male	426
270.452 G1/4-female	431

Item no.  
23.026.118.\*

Material  
Vinyl (bl)

12.5 mm

**NEW**



Connection	see page
270.500-S M5-female	413
270.503-S G1/8-male	418

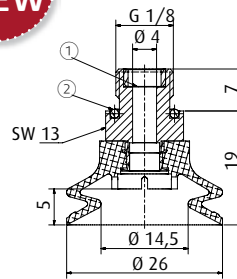
Item no.  
23.026.265.\*

Material  
Varioflex® 60/30° (sw/r)

5 mm

Additional sizes available are found on p. 107.

**NEW**



① = Filter screen ② = O-ring

Item no.  
22.026.256.\*

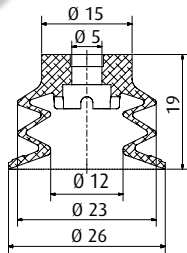
Material  
Varioflex® 60/30° (sw/r)

5 mm

Additional sizes available are found on p. 107.

Spare cup

**NEW**



Connection	see page
270.500-S M5-female	413
270.503-S G1/8-male	418

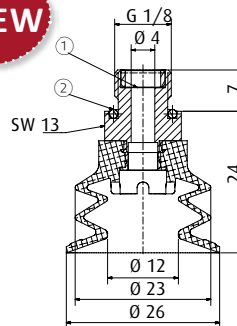
Item no.  
21.026.177.\*

Material  
Varioflex® 60/30° (sw/r)

8 mm

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code

**NEW**



① = Filter screen ② = O-ring

Item no.  
20.026.148.\*

Material  
Varioflex® 60/30° (sw/r)

8 mm

Additional sizes available are found on p. 110.

Spare cup

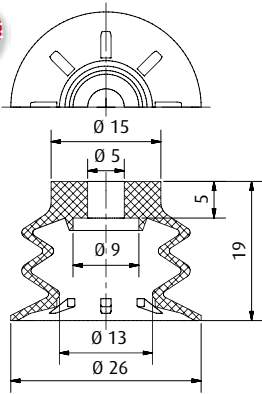
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 26 - 29 mm

**NEW**



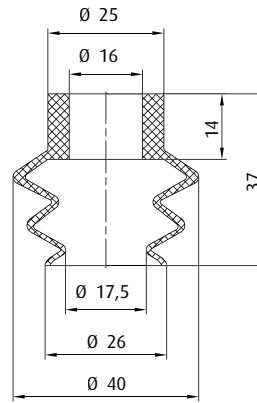
Connection	see page
270.063 G1/8-male	419
270.061 G1/8-female	422

**Item no.**  
21.026.162.\*

**Material**  
NR (br)

9 mm

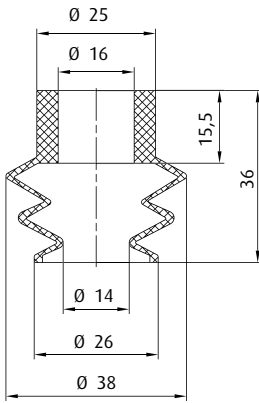
Additional sizes available are found on p. 23.



**Item no.**  
27.026.005.\*

**Material**  
SI (tr)

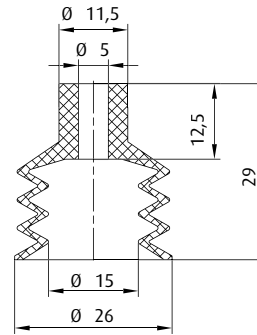
16 mm



**Item no.**  
27.026.015.\*

**Material**  
SI (tr)

16 mm

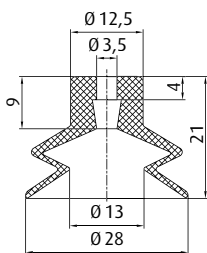


**Item no.**  
25.025.003.\*

**Material**  
SI (tr), NR (sw)

9 mm

Connection	see page
270.013 M5-male	410
270.103 M6-male	413
270.003 G1/8-male	416
270.015 G1/8-female	421
270.194 G1/4-male	425



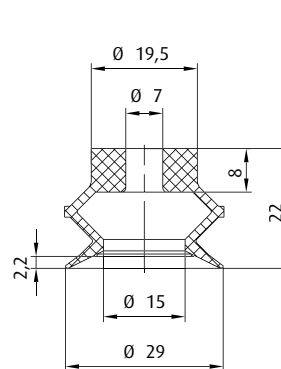
Connection	see page
270.134 M5-male	409
270.347 M5-female	412
270.104 M6-male	413
270.033 G1/8-male	416
270.478 G1/8-female	421

**Item no.**  
23.028.113.\*

**Material**  
Vinyl (bl)

9 mm

Additional sizes available are found on p. 113.



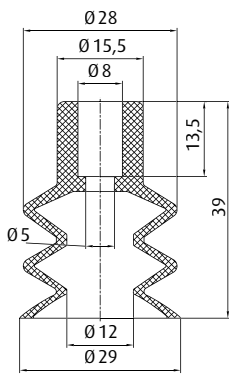
**Item no.**  
23.030.088.\*

**Material**  
NBR (gr), SI (tr), PU (bg)

10 mm

Connection	see page
270.030 G1/8-male	419
270.019 G1/8-female	423
270.274 G1/4-male	427
270.275 G1/4-female	432

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



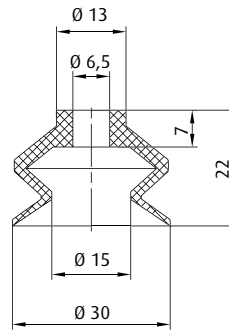
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
21.029.069.\_\*

**Material**  
Vinyl (bl)

10 mm

Additional sizes available are found on p. 116.



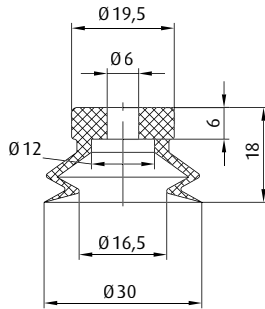
	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

**Item no.**  
23.030.107.\_\*

**Material**  
Vinyl (bl)

10.5 mm

Additional sizes available are found on p. 113.



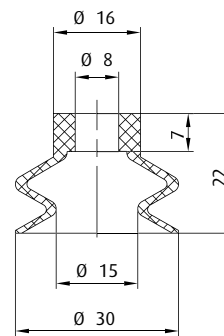
	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

**Item no.**  
23.030.155.\_\*

**Material**  
SI (tr)

4.5 mm

This vacuum cup is also available in the following dimensions: 6 mm, 10 mm, 15 mm, 20 mm

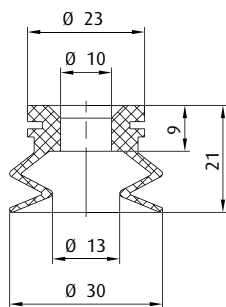


	Connection	see page
270.255	M8-male	415
270.486	G1/8-male	420
270.485	G1/8-female	423
270.487	G1/4-male	429
270.488	G1/4-female	434

**Item no.**  
23.030.193.\_\*

**Material**  
Vulkollan® (br)

8 mm



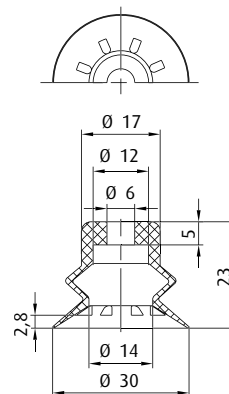
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
23.030.230.\_\*

**Material**  
NR (gr)

7 mm

Additional sizes available are found on p. 130.



	Connection	see page
270.460	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

	see page
50.085	6 mm 454
50.128	10 mm 454
50.129	15 mm 454
50.095	20 mm 456
50.096	30 mm 456
50.097	40 mm 456
50.098	50 mm 456

**Item no.**  
23.030.141.\_\*

**Material**  
NBR (sw), SI (tr)

8 mm

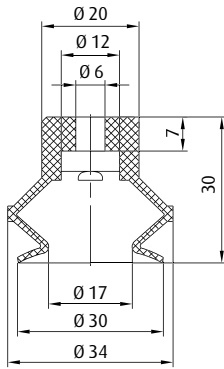
Additional sizes available are found on p. 119.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 30 mm



Item no.	Connection	see page
270.312/19	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

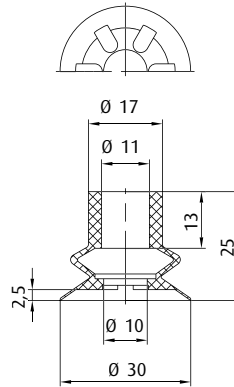
Item no.	Connection	see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

**Item no.**  
23.030.170.\*

**Material**  
Vulkollan® (br)

8 mm

Additional sizes available are found on p. 97.

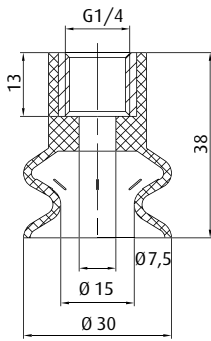


Item no.	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
23.033.134.\*

**Material**  
Vinyl (bl)

10 mm

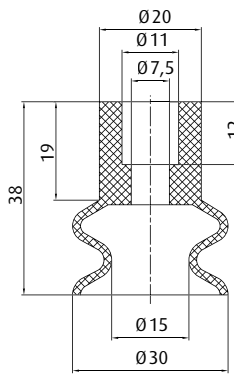


**Item no.**  
22.030.035.\*

**Material**  
SI (tr), NR (sw)

16 mm

This vacuum cup is also available in the following dimensions: 40 mm, 44 mm, 50 mm

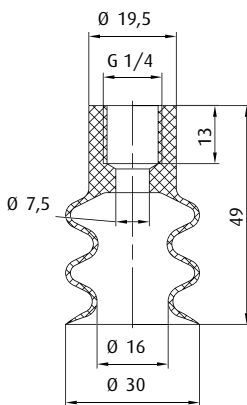


Item no.	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
23.030.038.\*

**Material**  
NBR (sw), SI (tr)

16 mm

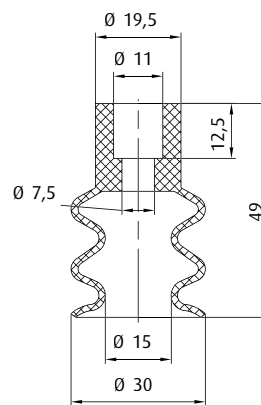


**Item no.**  
20.030.044.\*

**Material**  
SI (tr), NR (sw)

19 mm

This vacuum cup is also available in the following dimensions: 40 mm, 50 mm



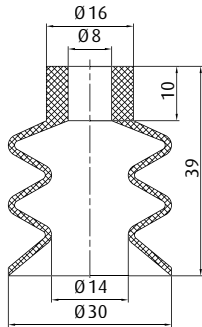
Item no.	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
21.030.021.\*

**Material**  
SI (tr), NR (sw), NR (bg)

18 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



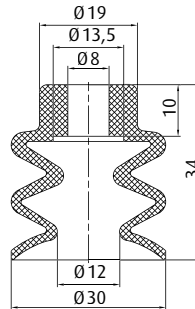
	Connection	see page
270.315	M6-male	414
270.132	G1/8-male	417
270.114	G1/8-female	422
270.540	G1/4-male	429
270.539	G1/4-female	434

**Item no.**  
21.030.018.\*

**Material**  
NBR (sw), SI (r)

18 mm

This vacuum cup is also available in the following dimensions: 15 mm, 20 mm

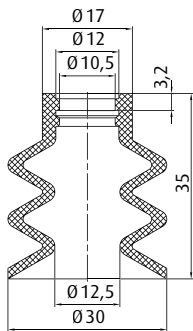


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
21.030.019.\*

**Material**  
NBR (sw), SI (r), NR (bg), PU (bl)

13 mm



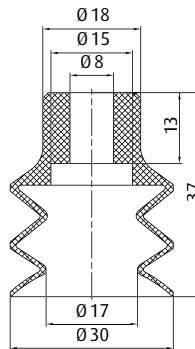
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
21.030.022.\*

**Material**  
NBR (sw), SI (bl)

14 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 40 mm



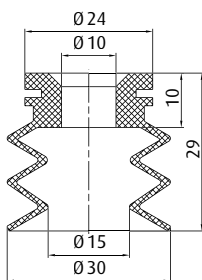
	Connection	see page
270.315	M6-male	414
270.132	G1/8-male	417
270.114	G1/8-female	422
270.190	G1/4-male	428
270.540	G1/4-male	429
270.192	G1/4-female	432
270.539	G1/4-female	434

**Item no.**  
21.032.091.\*

**Material**  
Vulkollan® (br)

16 mm

Additional sizes available are found on p. 97.



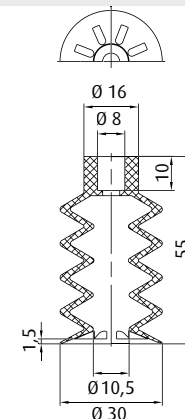
	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
21.030.030.\*

**Material**  
SI (tr), NR (bl)

13 mm

Additional sizes available are found on p. 130.



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
25.030.030.\*

**Material**  
NBR (sw), SI (tr)

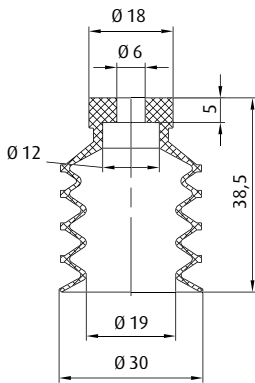
27 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 30 - 31 mm



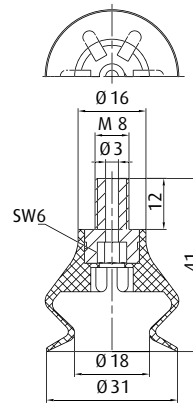
	Connection	see page
270.460	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

**Item no.**  
25.030.046.\*

**Material**  
NBR (sw), SI (tr)

14 mm

Additional sizes available are found on p. 124.

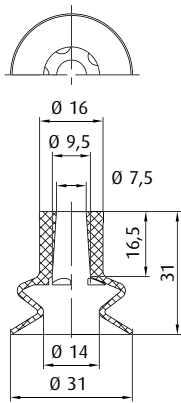


**Item no.**  
22.030.036.\*

**Material**  
NBR (sw), SI (tr), NR (sw)

9 mm

This vacuum cup is also available in the following dimensions: 25 mm, 44 mm



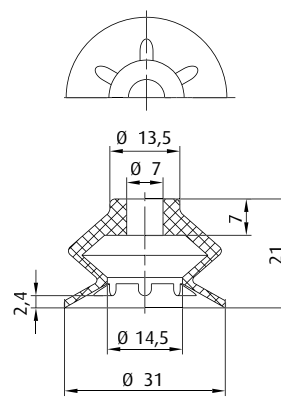
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
23.030.035.\*

**Material**  
NBR (sw), SI (r)

11 mm

This vacuum cup is also available in the following dimensions: 53 mm, 75 mm



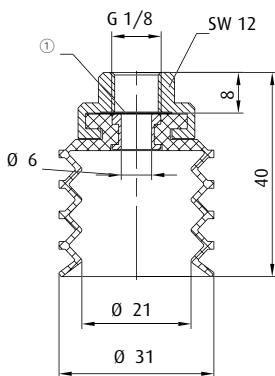
	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432

**Item no.**  
23.031.192.\*

**Material**  
Vinyl (bl)

6 mm

Additional sizes available are found on p. 113.



① = Filter screen

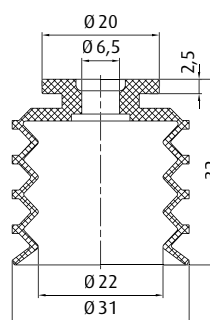
**Item no.**  
24.030.039.\*

**Material**  
SI (tr), CR (sw)

21 mm

Additional sizes available are found on p. 104.

Spare cup



	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

**Item no.**  
25.030.026.\*

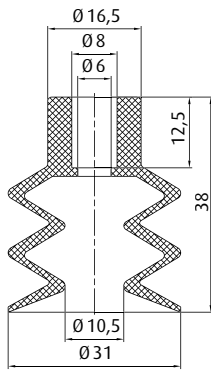
**Material**  
SI (tr), CR (sw)

21 mm

Additional sizes available are found on p. 100.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



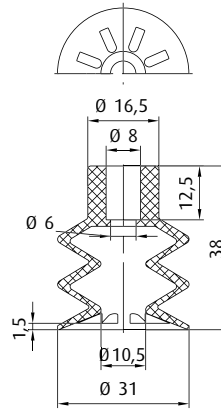


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
21.030.023.\_\*

**Material**  
NBR (sw), SI (tr), NR (sw)

15 mm

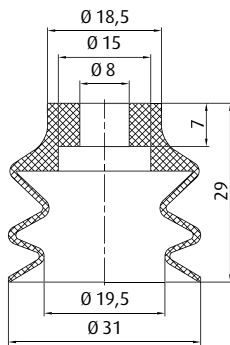


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.043	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
27.030.006.\_\*

**Material**  
NBR (sw), SI (tr), NR (sw)

15 mm



	Connection	see page
270.255	M8-male	415
270.486	G1/8-male	420
270.485	G1/8-female	423
270.487	G1/4-male	429
270.488	G1/4-female	434

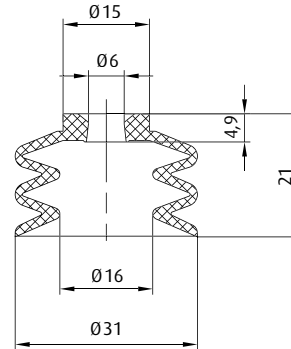
**WEAR-RESISTANT**

**Item no.**  
21.030.076.\_\*

**Material**  
Vulkollan® (br)

14 mm

Additional sizes available are found on p. 97.



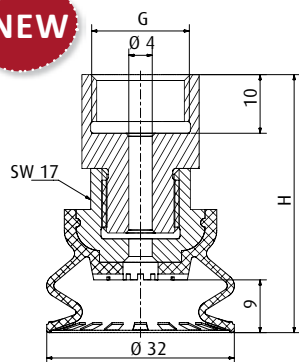
	Connection	see page
270.460	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

**Item no.**  
21.031.048.\_\*

**Material**  
SI (tr), NR (sw)

6 mm

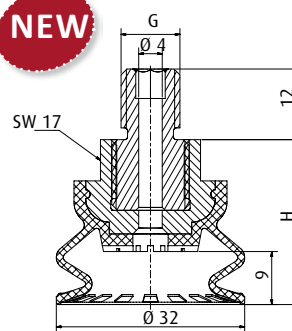
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.030.172._*	NBR (bl)	9	G1/4-female	28
22.030.173._*	NBR (bl)	9	G3/8-female	44

Additional sizes available are found on p. 133.

**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.030.171._*	NBR (bl)	9	G1/4-male	28
22.030.174._*	NBR (bl)	9	M10-male	28
22.030.175._*	NBR (bl)	9	M14x1.5-male	29

Additional sizes available are found on p. 133.

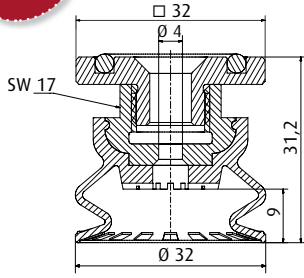
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 32 mm

**NEW**

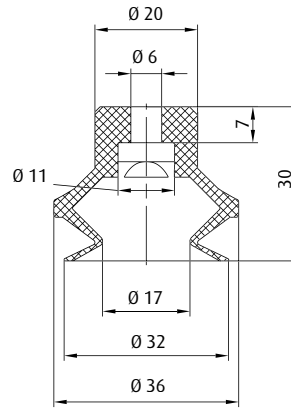


**Item no.**  
22.030.176.\_\*

**Material**  
NBR (bl)

9 mm

Additional sizes available are found on p. 133.



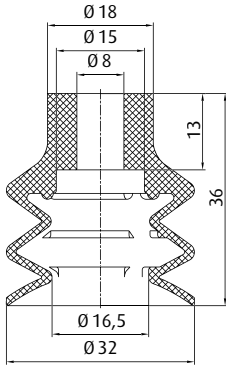
**Item no.**  
23.030.125.\_\*

**Material**  
NBR (sw), HNBR (ge), SI (tr), PU (bl)

9 mm

Additional sizes available are found on p. 86.  
This vacuum cup is also available in the following dimensions: 11 mm, 15 mm, 21 mm, 42 mm, 54 mm

	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

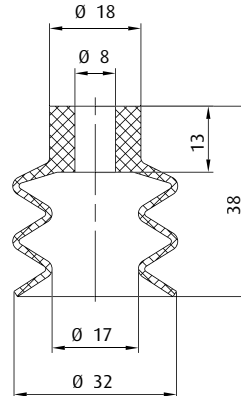
**BESTSELLER**

**Item no.**  
21.032.075.\_\*

**Material**  
NBR (sw), HNBR (ge), SI (tr), NR (gr), PU (bl)

13 mm

Additional sizes available are found on p. 89.



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

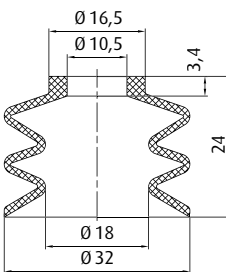
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
21.032.154.\_\*

**Material**  
Thermalon® (bl)

14.5 mm

Additional sizes available are found on p. 92.

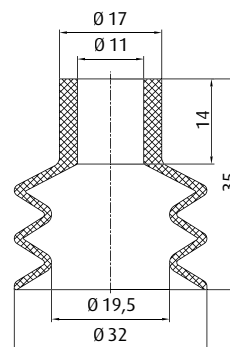


	Connection	see page
270.521	M5-male	412
270.254	M6-male	415
270.256	M8-male	415

**Item no.**  
21.032.067.\_\*

**Material**  
Vinyl (bl)

10 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

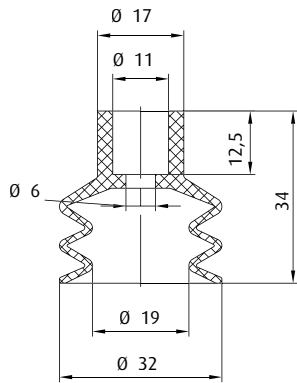
**Item no.**  
21.032.082.\_\*

**Material**  
Vinyl (bl)

14 mm

Additional sizes available are found on p. 116.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

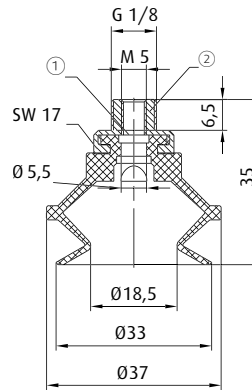


Item no.	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
21.032.081.\_\*

**Material**  
NR (sw)

13 mm



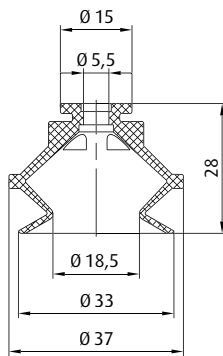
① = Filter screen ② = Aluminium

**Item no.**  
22.030.033.\_\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

9 mm

Additional sizes available are found on p. 104.



Item no.	Connection	see page
270.500-S	M5-female	413
270.250	G1/8-male	418
270.503-S	G1/8-male	418

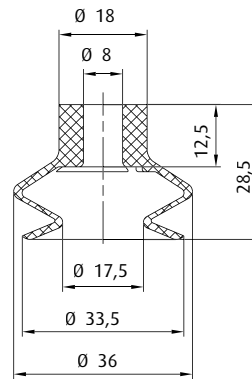
Spare cup

**Item no.**  
23.030.037.\_\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

9 mm

Additional sizes available are found on p. 100.



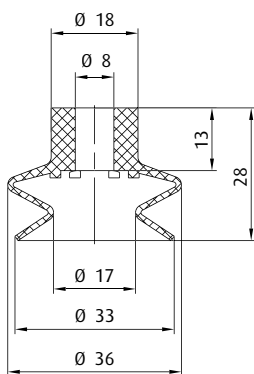
Item no.	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

**Item no.**  
23.033.039.\_\*

**Material**  
NBR (sw), SI (tr), NR (gr)

12 mm

Additional sizes available are found on p. 81.



Item no.	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

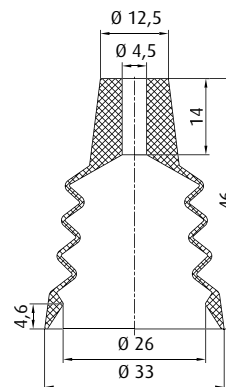
UP TO 160 °C &  
MINIMUM MARKING

**Item no.**  
23.033.241.\_\*

**Material**  
Thermalon® (bl)

11 mm

Additional sizes available are found on p. 84.



Item no.	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**Item no.**  
27.033.017.\_\*

**Material**  
SI (tr)

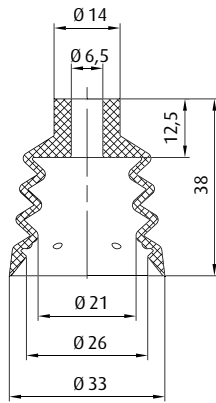
25 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

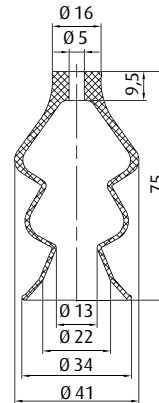
Ø 33 - 35 mm



	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

**Item no.** 27.033.008.\* **Material** SI (tr) 16 mm

Additional sizes available are found on p. 129.

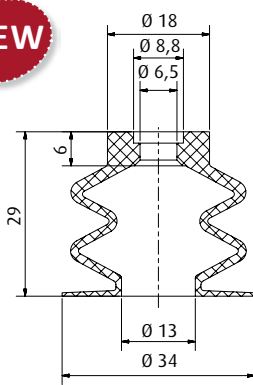


	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**Item no.** 27.034.023.\* **Material** SI (r) 39 mm

Additional sizes available are found on p. 129.

**NEW**

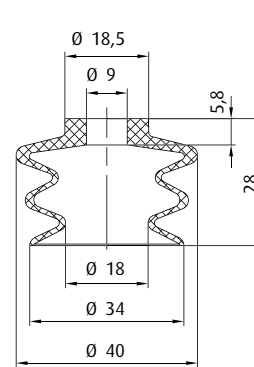


	Connection	see page
270.039	M6-male	414

**IDEAL FOR WAFERS**

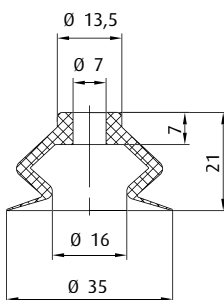
**Item no.** 21.034.179.\* **Material** SI (tr) 12 mm

Additional sizes available are found on p. 126.



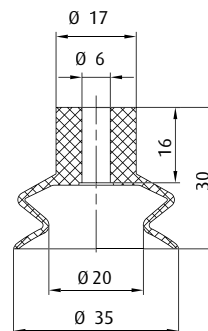
	Connection	see page
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

**Item no.** 27.034.003.\* **Material** Vulkollan® (br) 18 mm



	Connection	see page
270.312/19	M6-male	414
270.482	G1/8-male	420
270.481	G1/8-female	423
270.483	G1/4-male	429
270.484	G1/4-female	433

**Item no.** 23.035.106.\* **Material** Vinyl (bl) 14 mm



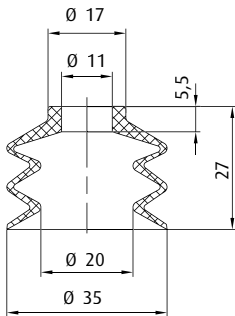
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**BESTSELLER**

**Item no.** 23.035.111.\* **Material** Vinyl (bl) 12 mm

Additional sizes available are found on p. 113.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760

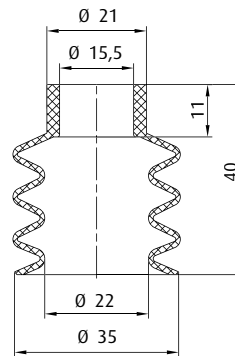


	Connection	see page
270.313	M8-male	415
270.177	M10-male	416
270.183	G1/4-male	431
270.182	G1/4-female	434

**Item no.**  
21.035.080.\_\*

**Material**  
Vinyl (bl)

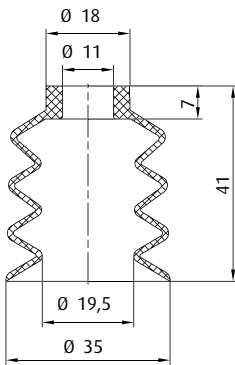
13 mm



**Item no.**  
25.035.011.\_\*

**Material**  
NR (sw), SI (tr)

20 mm

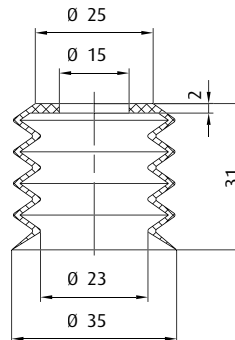


	Connection	see page
270.313	M8-male	415
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**Item no.**  
25.036.040.\_\*

**Material**  
Vinyl (bl)

20 mm



	Connection	see page
270.419	Without Thread	441

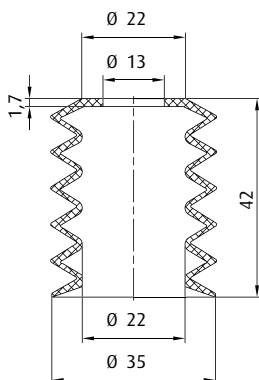
**DETECTABLE**

**Item no.**  
25.035.069.\_\*

**Material**  
SI (r)

25 mm

Additional sizes available are found on p. 128.

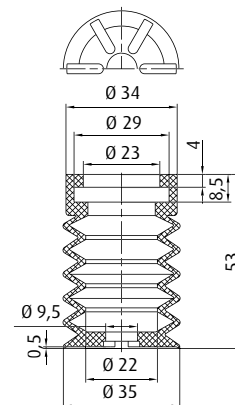


	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

**Item no.**  
25.035.010.\_\*

**Material**  
SI (tr), NR (sw)

26.5 mm



	Connection	see page
270.235	G1/8-female	438

**Item no.**  
25.036.041.\_\*

**Material**  
Vinyl (bl)

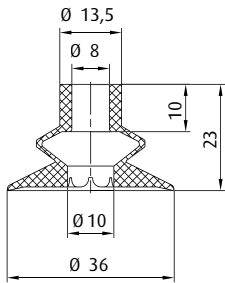
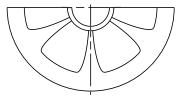
22 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 36 - 37 mm

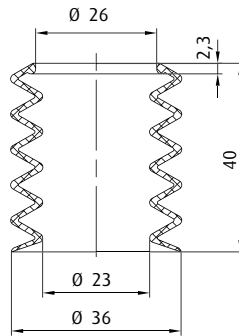


	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

Item no.  
**27.036.011.\_\***

Material  
SI (tr), NR (sw)

7 mm

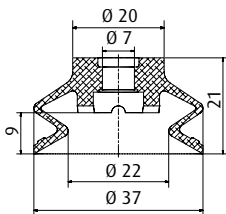


Item no.  
**25.036.072.\_\***

Material  
SI (tr)

24 mm

**NEW**



	Connection	see page
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

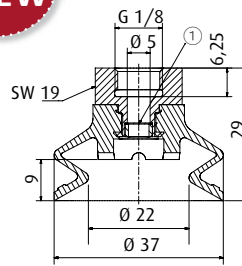
Item no.  
**23.037.266.\_\***

Material  
Varioflex® 60/30° (sw/r)

9 mm

Additional sizes available are found on p. 107.

**NEW**



① = Filter screen

Item no.  
**22.037.257.\_\***

Material  
Varioflex® 60/30° (sw/r)

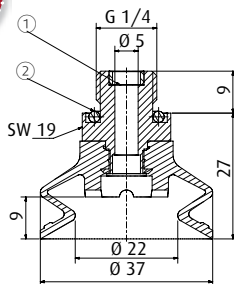
9 mm

Additional sizes available are found on p. 107.

Spare cup

Spare cup

**NEW**



① = Filter screen ② = O-ring

Item no.  
**22.037.258.\_\***

Material  
Varioflex® 60/30° (sw/r)

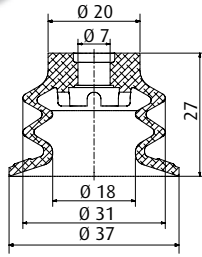
9 mm

Additional sizes available are found on p. 107.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



**NEW**



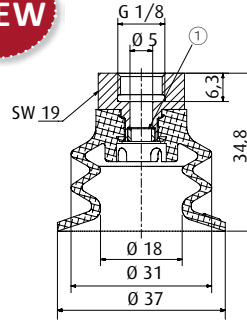
	Connection	see page
	270.501-S G1/8-female	424
	270.506-S G1/4-male	428
	270.505-S G3/8-male	434

Spare cup

**Item no.** 21.037.177.\* **Material** Varioflex® 60/30° (sw/r) 14 mm

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code

**NEW**

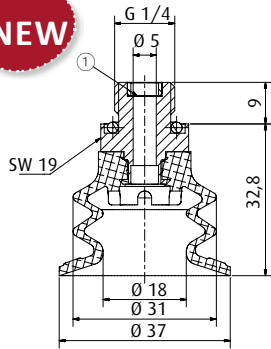


① = Filter screen

**Item no.** 20.037.149.\* **Material** Varioflex® 60/30° (sw/r) 14 mm

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code

**NEW**

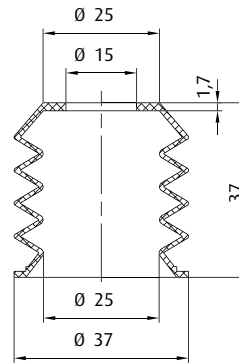


Spare cup

① = Filter screen

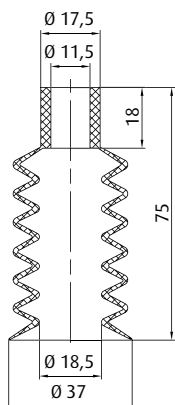
**Item no.** 20.037.150.\* **Material** Varioflex® 60/30° (sw/r) 14 mm

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code



	Connection	see page
	270.419 Without Thread	441
	270.183 G1/4-male	431
	270.182 G1/4-female	434

**Item no.** 25.037.012.\* **Material** SI (bl) 19 mm



	Connection	see page
	270.177 M10-male	416
	270.451 G1/4-male	426
	270.452 G1/4-female	431

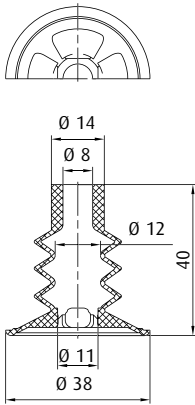
**Item no.** 25.038.039.\* **Material** Vinyl (bl) 35 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 38 - 39 mm

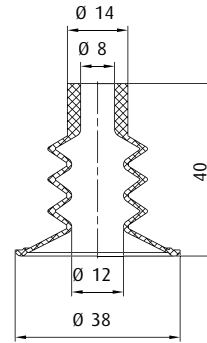


	Connection	see page
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
27.038.012.\*

**Material**  
SI (tr), NR (br)

16 mm

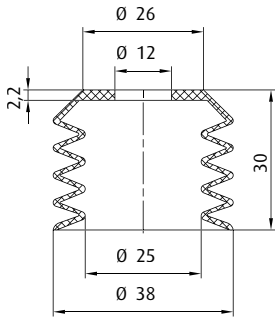


	Connection	see page
270.315	M6-male	414
270.112	G1/8-male	419
270.114	G1/8-female	422
270.113	G1/4-male	425
270.178	G1/4-female	431

**Item no.**  
27.038.020.\*

**Material**  
SI (tr)

16 mm

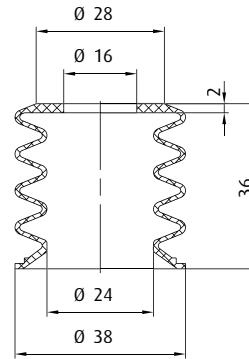


	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

**Item no.**  
25.038.014.\*

**Material**  
SI (tr)

18 mm



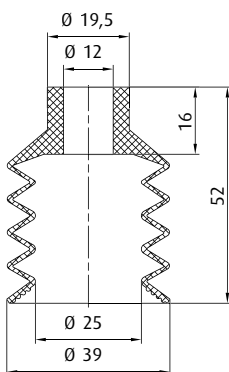
	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

**Item no.**  
25.038.016.\*

**Material**  
SI (tr)

24 mm

Additional sizes available are found on p. 126.

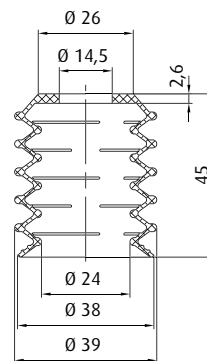


	Connection	see page
270.049-1	G1/4-male	426

**Item no.**  
25.038.015.\*

**Material**  
NBR (sw), SI (tr)

23 mm



	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

**Item no.**  
27.039.017.\*

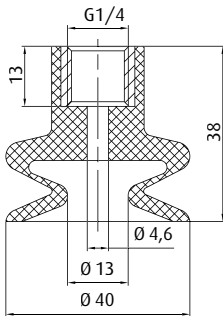
**Material**  
SI (tr)

20 mm

Additional sizes available are found on p. 126.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



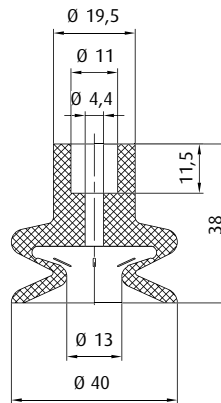


**Item no.**  
**22.040.046.\_\***

**Material**  
SI (tr), NR (sw)

7 mm

This vacuum cup is also available in the following dimensions: 30 mm, 44 mm, 50 mm

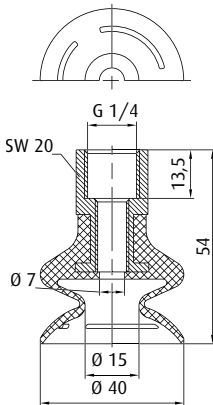


**Item no.**  
**23.040.044.\_\***

**Material**  
SI (tr), NR (sw)

7 mm

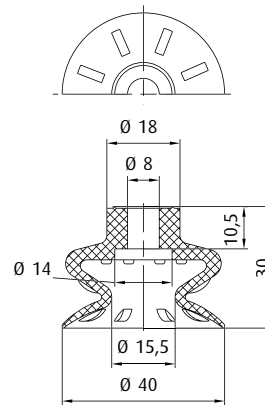
	Connection	see page
	M10-male	416
	G1/4-male	426
	G1/4-female	431



**Item no.**  
**22.040.048.\_\***

**Material**  
NBR (sw), SI (tr)

12 mm



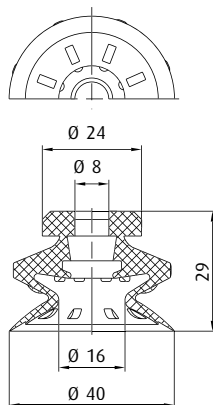
**Item no.**  
**23.040.042.\_\***

**Material**  
NBR (sw), SI (r), NR (bg)

13 mm

	Connection	see page
	G1/8-male	421
	G1/8-female	424
	G1/4-male	427
	G1/4-female	433

This vacuum cup is also available in the following dimensions: 14 mm, 24 mm, 60 mm

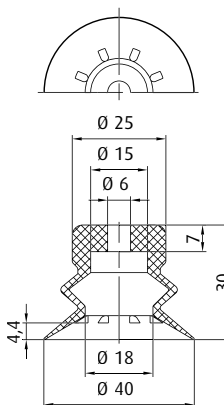


**Item no.**  
**23.040.223.\_\***

**Material**  
NR (br)

7 mm

	Connection	see page
	G1/4-male	425
	G1/4-female	431



**Item no.**  
**23.040.142.\_\***

**Material**  
NBR (sw), SI (tr)

9.5 mm

	Connection	see page
	M6-male	414
	G1/8-male	420
	G1/8-female	423
	G1/4-male	429
	G1/4-female	434

		see page
	20 mm	456
	30 mm	456
	40 mm	456
	50 mm	456

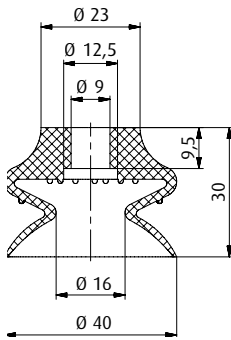
Additional sizes available are found on p. 119.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 40 mm

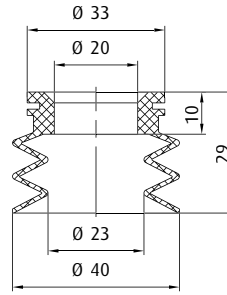


	Connection	see page
270.315	M6-male	414
270.540	G1/4-male	429
270.539	G1/4-female	434

**Item no.**  
23.040.176.\*

**Material**  
Vulkollan® (br)

12 mm

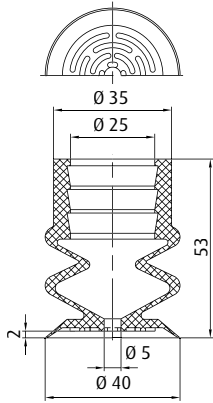


**Item no.**  
21.040.132.\*

**Material**  
SI (tr), SI (bl)

11 mm

Additional sizes available are found on p. 130.



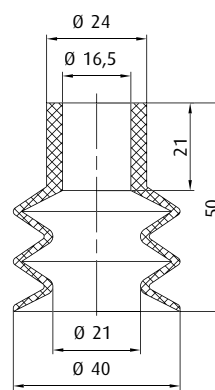
	Connection	see page
270.438	G1/4-male	427
270.442	G3/8-male	435

**Item no.**  
21.040.141.\*

**Material**  
NR (bg)

18 mm

Additional sizes available are found on p. 23.



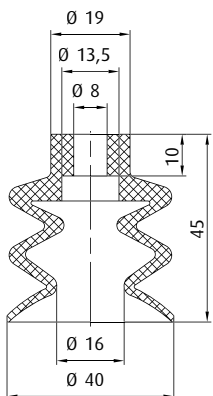
	Connection	see page
270.116	G1/4-female	432

**Item no.**  
21.040.024.\*

**Material**  
NBR (sw), SI (tr)

18 mm

This vacuum cup is also available in the following dimensions: 60 mm

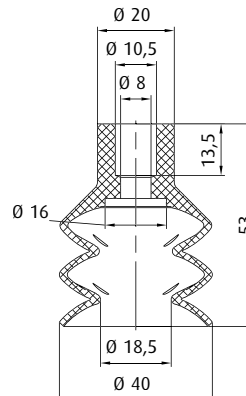


	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

**Item no.**  
21.040.025.\*

**Material**  
NBR (sw), SI (r), NR (bg), PU (bl)

20 mm



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

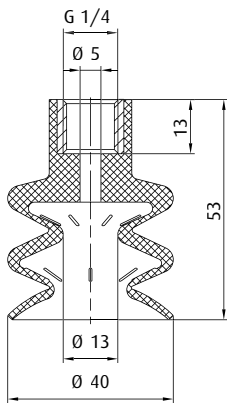
**Item no.**  
21.040.027.\*

**Material**  
NBR (sw), SI (tr), NR (br), Vinyl (bl)

16 mm

Additional sizes available are found on p. 116.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

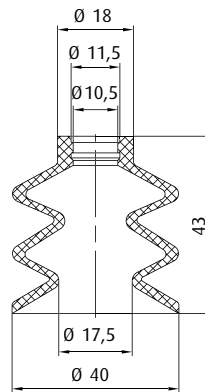


**Item no.**  
**20.040.054.\***

**Material**  
NBR (sw), SI (tr), NR (sw), NR (bg)

16 mm

This vacuum cup is also available in the following dimensions: 30 mm, 50 mm



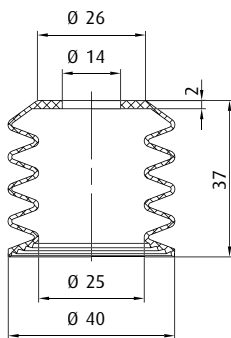
**Item no.**  
**21.040.028.\***

**Material**  
NBR (sw), SI (bl)

20 mm

This vacuum cup is also available in the following dimensions: 10 mm, 15 mm, 18 mm, 24 mm, 30 mm

	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432



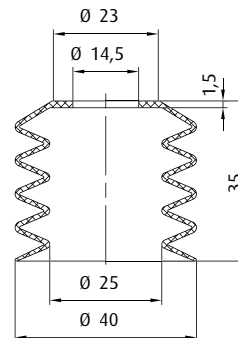
	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

**Item no.**  
**25.040.043.\***

**Material**  
SI (tr)

24 mm

Additional sizes available are found on p. 126.



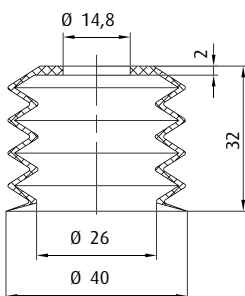
	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

**Item no.**  
**25.040.058.\***

**Material**  
SI (bl)

25 mm

Additional sizes available are found on p. 126.



	Connection	see page
270.419	Without Thread	441

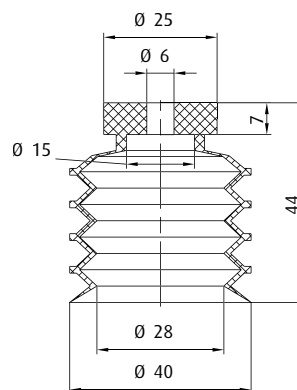
**DETECTABLE**

**Item no.**  
**25.040.066.\***

**Material**  
SI (br), SI (bl)

28 mm

Additional sizes available are found on p. 128.



	Connection	see page
270.486	G1/8-male	420
270.485	G1/8-female	423
270.487	G1/4-male	429
270.488	G1/4-female	434

**Item no.**  
**25.040.047.\***

**Material**  
NBR (sw), SI (tr)

19 mm

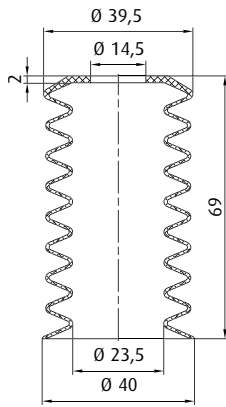
Additional sizes available are found on p. 124.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 40 - 42 mm

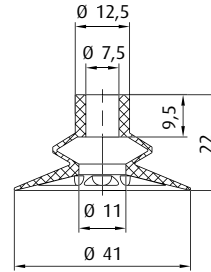
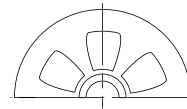


Item no.	Connection	see page
270.419	Without Thread	441
270.183	G1/4-male	431
270.182	G1/4-female	434

Item no. 25.040.019.\*

Material SI (tr)

Ø 40 mm

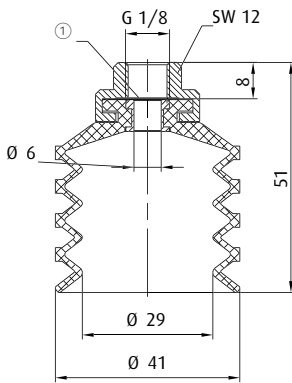


Item no.	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

Item no. 23.040.084.\*

Material NBR (sw), SI (tr)

Ø 9 mm



① = Filter screen

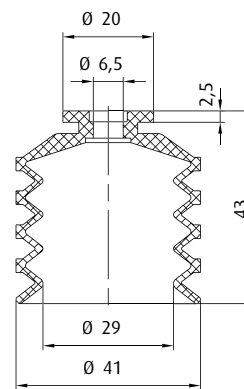
Item no. 24.040.074.\*

Material SI (tr), CR (sw)

Ø 20 mm

Additional sizes available are found on p. 104.

Spare cup



Item no.	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434

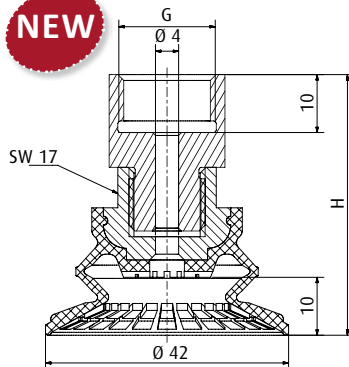
Item no. 25.040.027.\*

Material SI (tr), CR (sw)

Ø 20 mm

Additional sizes available are found on p. 100.

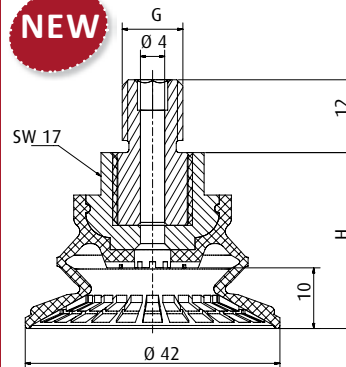
NEW



Item no.	Material	Ø [mm]	Connection thread	H [mm]
22.040.178.*	NBR (bl)	10	G1/4-female	29
22.040.179.*	NBR (bl)	10	G3/8-female	29

Additional sizes available are found on p. 133.

NEW



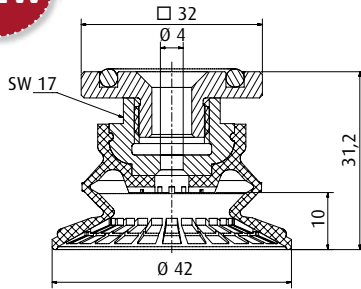
Item no.	Material	Ø [mm]	Connection thread	H [mm]
22.040.177.*	NBR (bl)	10	G1/4-male	29
22.040.180.*	NBR (bl)	10	M10-male	29
22.040.181.*	NBR (bl)	10	M14x1.5-male	29

Additional sizes available are found on p. 133.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760

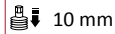


**NEW**

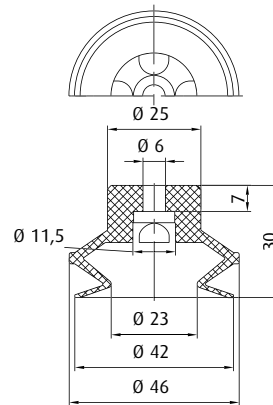


**Item no.**  
**22.040.182.\_\***

**Material**  
NBR (bl)

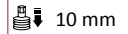


Additional sizes available are found on p. 133.



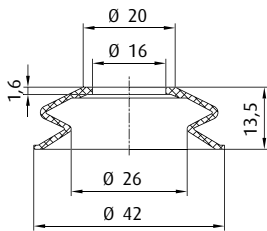
**Item no.**  
**23.040.126.\_\***

**Material**  
NBR (sw), SI (tr), PU (bl)



This vacuum cup is also available in the following dimensions: 11 mm, 15 mm, 21 mm, 32 mm, 54 mm

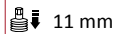
	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423
270.274	G1/4-male	427
270.275	G1/4-female	432



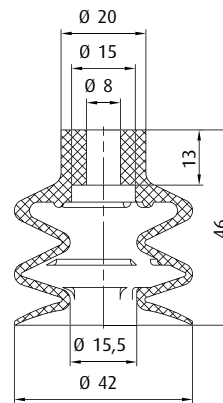
	Connection	see page
270.419	Without Thread	441
270.182.U	G1/4-male	431
270.182	G1/4-female	434

**Item no.**  
**23.042.048.\_\***

**Material**  
SI (tr), NR (sw), NR (br)



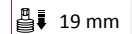
This vacuum cup is also available in the following dimensions: 47 mm



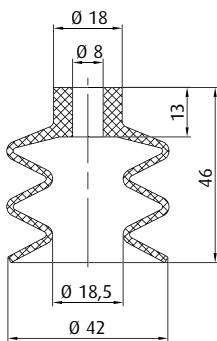
	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

**Item no.**  
**21.043.049.\_\***

**Material**  
NBR (sw), HNBR (ge), SI (tr), NR (gr)



Additional sizes available are found on p. 89.

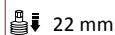


	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
**21.042.155.\_\***

**Material**  
Thermalon® (bl)



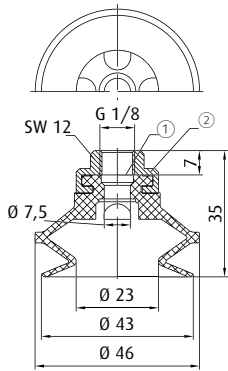
Additional sizes available are found on p. 92.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 43 - 44 mm

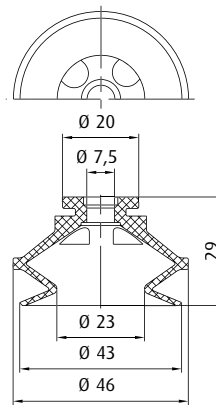


① = Filter screen ② = Aluminium

<b>Item no.</b> 22.040.045.*	<b>Material</b> Tepuflex® (or), SI (tr), CR (sw)	9 mm
---------------------------------	---	------

Additional sizes available are found on p. 104.

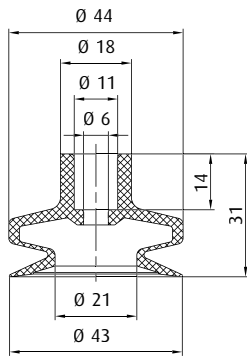
Spare cup



<b>Item no.</b> 23.040.045.*	<b>Material</b> Tepuflex® (or), SI (tr), CR (sw)	9 mm
---------------------------------	---	------

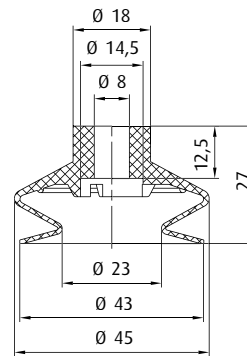
Additional sizes available are found on p. 100.

	Connection	see page
270.251	G1/8-female	423
270.501-S	G1/8-female	424
270.506-S	G1/4-male	428
270.505-S	G3/8-male	434



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

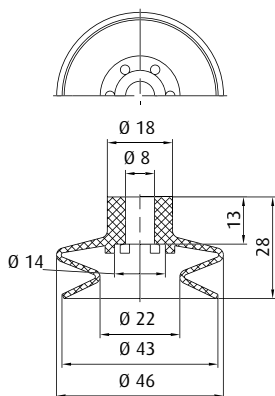
<b>Item no.</b> 23.042.049.*	<b>Material</b> SI (tr), NR (sw)	14 mm
---------------------------------	-------------------------------------	-------



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

<b>Item no.</b> 23.043.096.*	<b>Material</b> NBR (sw), HNBR (ge), SI (tr), NR (gr)	12 mm
---------------------------------	--	-------

Additional sizes available are found on p. 81.

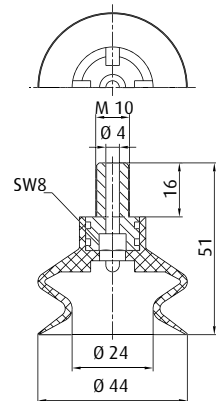


	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

UP TO 160 °C & MINIMUM MARKING

<b>Item no.</b> 23.043.242.*	<b>Material</b> Thermalon® (bl)	12.5 mm
---------------------------------	------------------------------------	---------

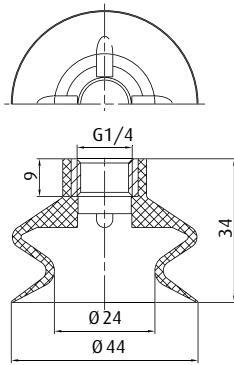
Additional sizes available are found on p. 84.



<b>Item no.</b> 22.044.054.*	<b>Material</b> SI (tr), NR (sw)	14 mm
---------------------------------	-------------------------------------	-------

This vacuum cup is also available in the following dimensions: 25 mm, 31 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760

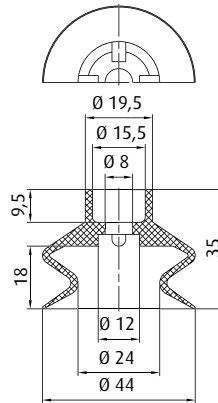


**Item no.**  
**22.044.034.\***

**Material**  
SI (tr), NR (sw)

15 mm

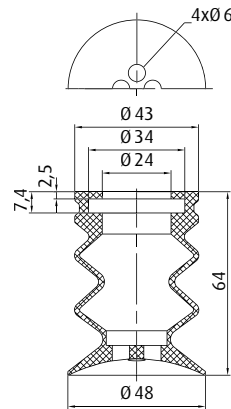
This vacuum cup is also available in the following dimensions: 30 mm, 40 mm, 50 mm



**Item no.**  
**23.044.091.\***

**Material**  
SI (tr)

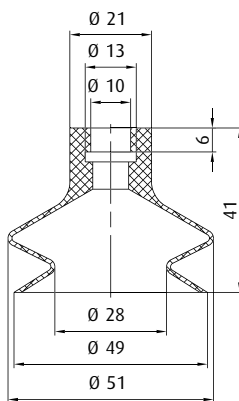
15 mm



**Item no.**  
**25.048.056.\***

**Material**  
SI (tr)

25 mm

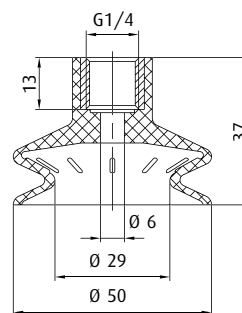


**Item no.**  
**23.049.199.\***

**Material**  
Vulkollan® (br)

20 mm

	Connection	see page
270.213	G1/4-male	428
270.356	G1/4-female	433



**Item no.**  
**22.050.058.\***

**Material**  
SI (tr), NR (br), NBR (sw)

12 mm

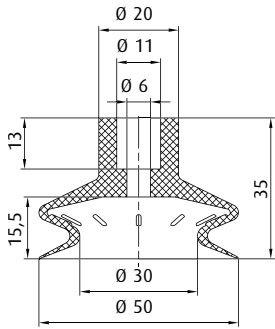
This vacuum cup is also available in the following dimensions: 30 mm, 40 mm, 44 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 50 mm

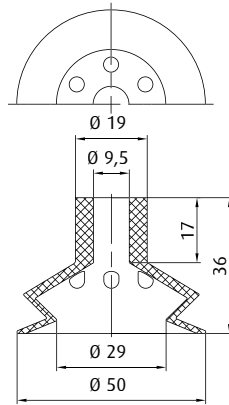


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.  
23.050.061.\*

Material  
SI (tr), NR (sw)

10 mm

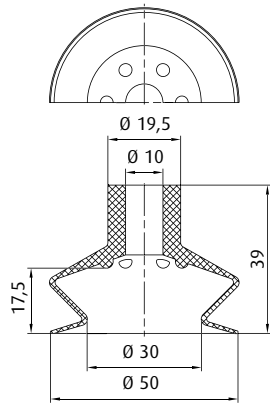


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.  
23.050.135.\*

Material  
NBR (sw)

10 mm

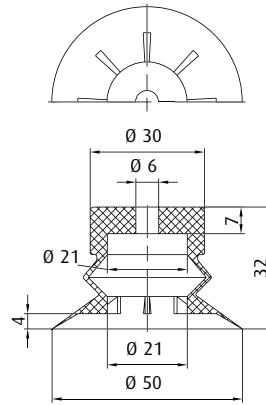


	Connection	see page
270.177	M10-male	416
270.044	G1/4-male	426
270.452	G1/4-female	431

Item no.  
23.050.188.\*

Material  
NR (sw)

20 mm



	Connection	see page
270.499	M6-male	414
270.490	G1/8-male	420
270.489	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

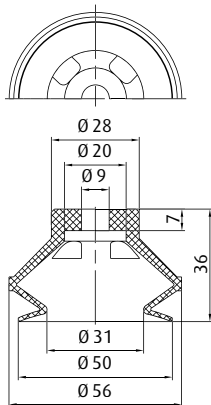
		see page
50.174	20 mm	456
50.175	30 mm	456
50.176	40 mm	456
50.177	50 mm	456

Item no.  
23.050.143.\*

Material  
NBR (sw), SI (tr)

11 mm

Additional sizes available are found on p. 119.



	Connection	see page
270.314	M6-male	415
270.490	G1/8-male	420
270.489	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434

		see page
50.174	20 mm	456
50.175	30 mm	456
50.176	40 mm	456
50.177	50 mm	456

Item no.  
23.050.171.\*

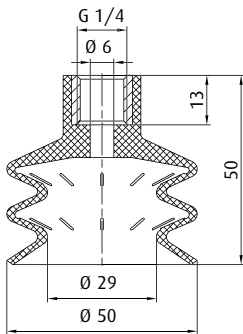
Material  
Vulkollan® (br)

10 mm

Additional sizes available are found on p. 97.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



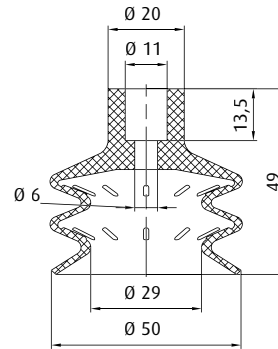


**Item no.**  
**20.050.064.\***

**Material**  
SI (tr), NR (sw), NR (bg)

18 mm

This vacuum cup is also available in the following dimensions: 30 mm, 40 mm

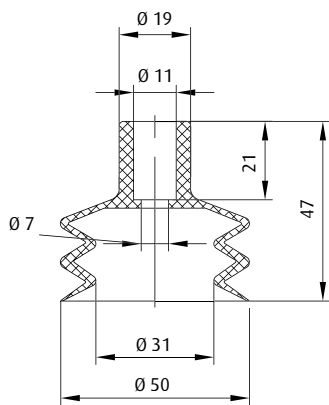


**Item no.**  
**21.050.031.\***

**Material**  
NBR (sw), SI (tr), NR (sw), NR (br), PU (tr)

18 mm

	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

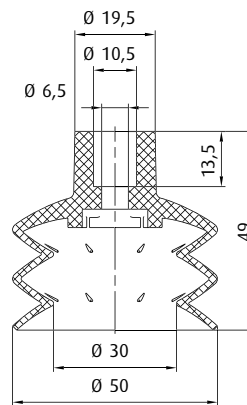


**Item no.**  
**21.050.065.\***

**Material**  
Vinyl (bl)

25 mm

	Connection	see page
270.451	G1/4-male	426
270.452	G1/4-female	431



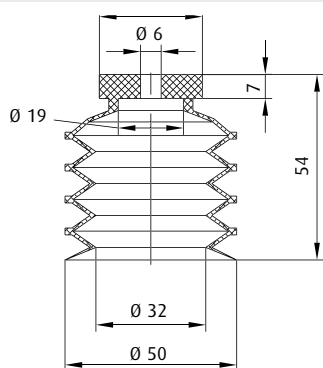
**Item no.**  
**21.050.084.\***

**Material**  
Vinyl (bl)

20 mm

	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Additional sizes available are found on p. 116.



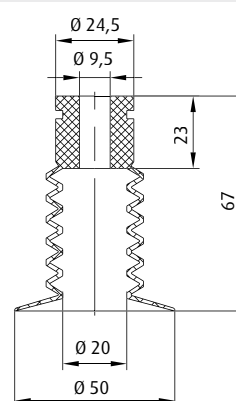
**Item no.**  
**25.050.048.\***

**Material**  
NBR (sw), SI (tr)

26 mm

Additional sizes available are found on p. 124.

	Connection	see page
270.490	G1/8-male	420
270.489	G1/8-female	423
270.491	G1/4-male	429
270.492	G1/4-female	434



**Item no.**  
**25.050.054.\***

**Material**  
NBR (sw), SI (tr)

29 mm

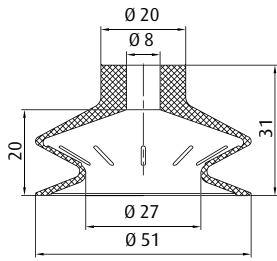
	Connection	see page
270.177	M10-male	416
270.132	G1/8-male	417
270.044	G1/4-male	426
270.452	G1/4-female	431

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 51 mm

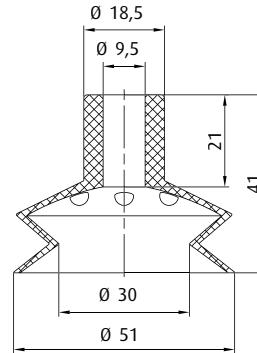


	Connection	see page
270.315	M6-male	414
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

Item no.  
23.050.029.\*

Material  
SI (tr), NR (sw)

10 mm



	Connection	see page
270.132	G1/8-male	417
270.208	G1/4-male	425
270.452	G1/4-female	431

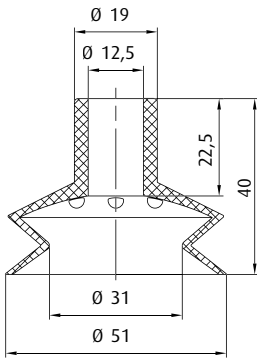
**BESTSELLER**

Item no.  
23.052.116.\*

Material  
Vinyl (bl)

6 mm

Additional sizes available are found on p. 113.

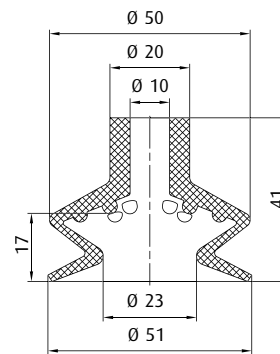


	Connection	see page
270.207	G1/4-male	426

Item no.  
23.052.117.\*

Material  
SI (tr), Vinyl (bl)

6 mm

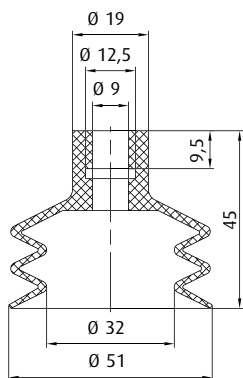


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

Item no.  
23.050.056.\*

Material  
NBR (sw), SI (tr), NR (sw)

11 mm



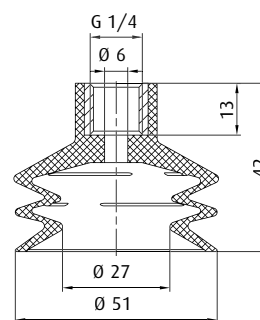
	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.204	G1/4-male	427
270.324	G1/4-female	432

Item no.  
21.051.097.\*

Material  
Vulkollan® (br)

18 mm

Additional sizes available are found on p. 97.

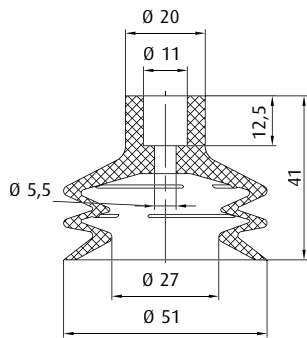


Item no.  
20.050.065.\*

Material  
SI (tr), NR (sw)

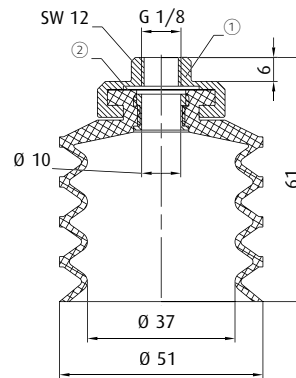
8 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

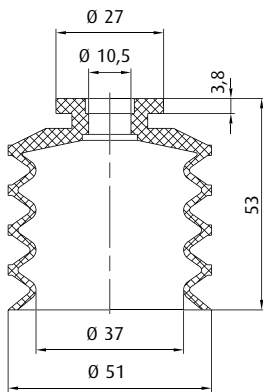
<b>Item no.</b> 21.050.032.*	<b>Material</b> NBR (sw), SI (tr), NR (sw), NR (br)	8 mm
---------------------------------	--	------



① = Filter screen ② = Aluminium

<b>Item no.</b> 24.050.087.*	<b>Material</b> SI (tr), CR (sw)	30 mm
---------------------------------	-------------------------------------	-------

Additional sizes available are found on p. 104.

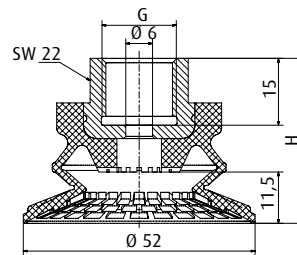


	Connection	see page
270.252	G1/8-female	424
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

<b>Item no.</b> 25.050.028.*	<b>Material</b> SI (tr), CR (sw)	25 mm
---------------------------------	-------------------------------------	-------

Additional sizes available are found on p. 100.

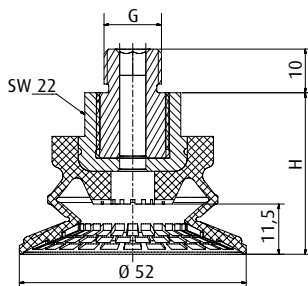
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.050.184.*	NBR (bl)	11.5	G1/4-female	42
22.050.185.*	NBR (bl)	11.5	G3/8-female	37

Additional sizes available are found on p. 133.

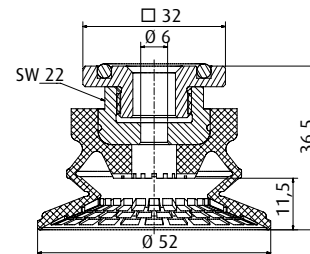
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.050.183.*	NBR (bl)	11.5	G1/4-male	37
22.050.186.*	NBR (bl)	11.5	M10-male	37
22.050.187.*	NBR (bl)	11.5	M14x1.5-male	37

Additional sizes available are found on p. 133.

**NEW**



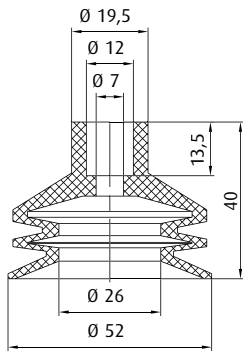
<b>Item no.</b> 22.050.188.*	<b>Material</b> NBR (bl)	11.5 mm
---------------------------------	-----------------------------	---------

Additional sizes available are found on p. 133.



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 52 - 53 mm

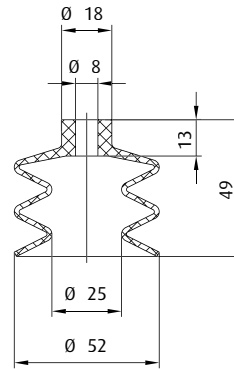


Item no.	Connection	see page
270.101	G1/4-male	426

**Item no.**  
21.052.033\_\*

**Material**  
NBR (sw)

12 mm



Item no.	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

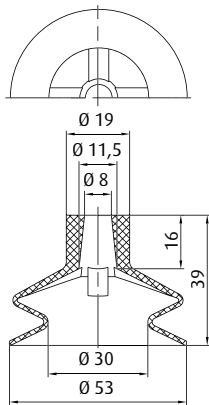
**UP TO 160 °C & MINIMUM MARKING**

**Item no.**  
21.052.156\_\*

**Material**  
Thermalon® (b)

27 mm

Additional sizes available are found on p. 92.



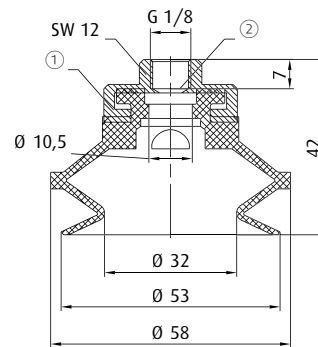
Item no.	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.192	G1/4-female	432

**Item no.**  
23.055.058\_\*

**Material**  
NBR (sw), SI (r)

11 mm

This vacuum cup is also available in the following dimensions: 31 mm, 75 mm



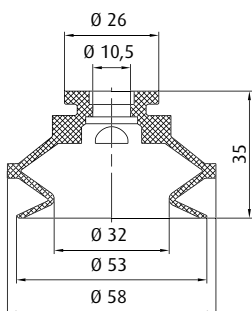
① = Filter screen ② = Aluminium

**Item no.**  
22.050.056\_\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

12 mm

Additional sizes available are found on p. 104.



Item no.	Connection	see page
270.252	G1/8-female	424
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

**Item no.**  
23.050.054\_\*

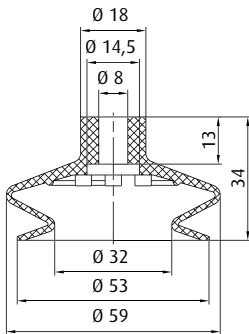
**Material**  
Tepuflex® (or), SI (tr), CR (sw)

12 mm

Additional sizes available are found on p. 100.

Spare cup

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



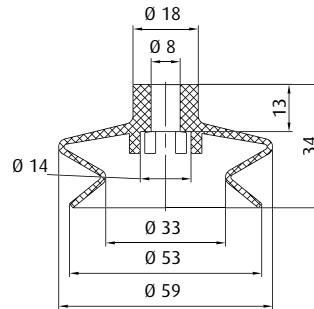
	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

**Item no.**  
23.053.033.\*

**Material**  
NBR (sw), SI (tr), NR (gr)

11 mm

Additional sizes available are found on p. 81.



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

**UP TO 160 °C &  
MINIMUM MARKING**

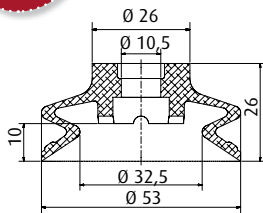
**Item no.**  
23.053.243.\*

**Material**  
Thermalon® (bl)

15 mm

Additional sizes available are found on p. 84.

**NEW**



	Connection	see page
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

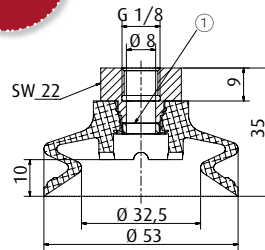
**Item no.**  
23.053.267.\*

**Material**  
Varioflex® 60/30° (sw/r)

10 mm

Additional sizes available are found on p. 107.

**NEW**



① = Filter screen

**Item no.**  
22.053.259.\*

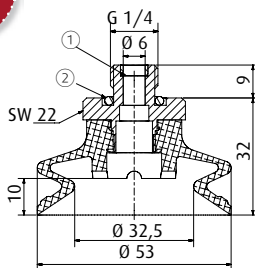
**Material**  
Varioflex® 60/30° (sw/r)

10 mm

Additional sizes available are found on p. 107.

Spare cup

**NEW**



① = Filter screen ② = O-ring

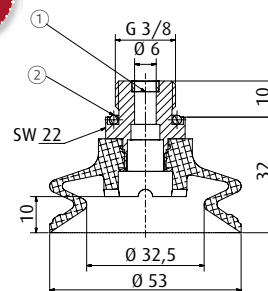
**Item no.**  
22.053.260.\*

**Material**  
Varioflex® 60/30° (sw/r)

10 mm

Additional sizes available are found on p. 107.

**NEW**



① = Filter screen ② = O-ring

**Item no.**  
22.053.261.\*

**Material**  
Varioflex® 60/30° (sw/r)

10 mm

Additional sizes available are found on p. 107.

Spare cup

Spare cup

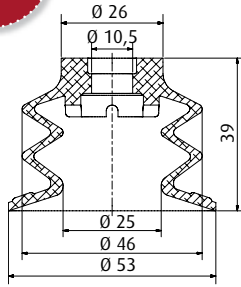
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 53 - 56 mm

**NEW**

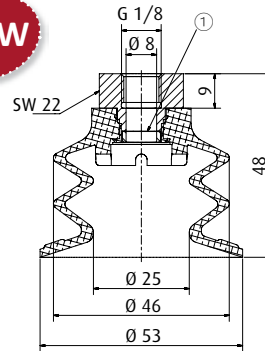


	Connection	see page
270.502-S	G1/8-female	424
270.504-S	G1/4-male	429
270.507-S	G3/8-male	435

**Item no.** 21.053.178\_\* **Material** Varioflex® 60/30° (sw/r) 19 mm

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code

**NEW**



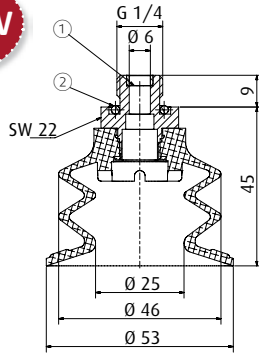
① = Filter screen

**Item no.** 20.053.151\_\* **Material** Varioflex® 60/30° (sw/r) 19 mm

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code

Spare cup

**NEW**

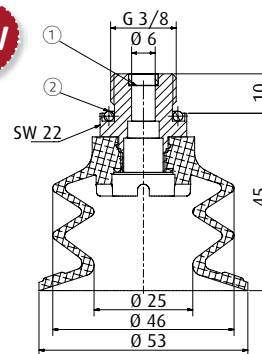


① = Filter screen ② = O-ring

**Item no.** 20.053.152\_\* **Material** Varioflex® 60/30° (sw/r) 19 mm

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code

**NEW**



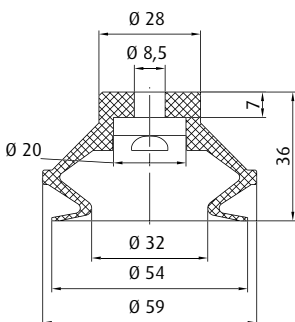
① = Filter screen ② = O-ring

**Item no.** 20.053.153\_\* **Material** Varioflex® 60/30° (sw/r) 19 mm

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code

Spare cup

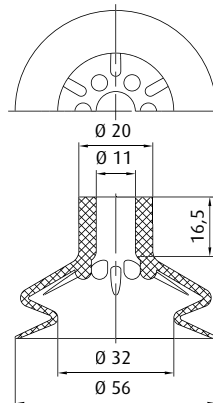
Spare cup



**Item no.** 23.050.127\_\* **Material** NBR (sw), SI (tr), PU (bl) 10 mm

This vacuum cup is also available in the following dimensions: 11 mm, 15 mm, 21 mm, 32 mm, 42 mm

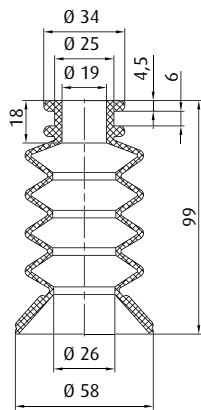
	Connection	see page
270.314	M6-male	415
270.499	M6-male	414
270.490	G1/8-male	420
270.489	G1/8-female	423
270.492	G1/4-female	434



**Item no.** 23.056.150\_\* **Material** SI (tr) 16 mm

	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

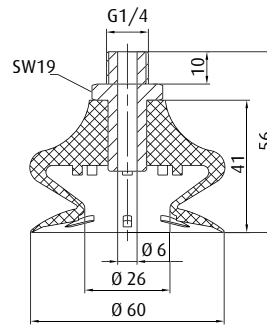
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
 Average holding forces for Vacuum cups you will find on page 760



**Item no.**  
25.058.049.\_\*

**Material**  
Vinyl (bl)

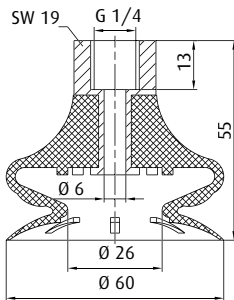
55 mm



**Item no.**  
22.060.142.\_\*

**Material**  
Vulkollan® (br)

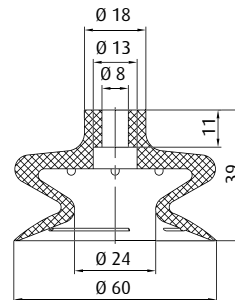
12 mm



**Item no.**  
22.060.143.\_\*

**Material**  
Vulkollan® (br)

12 mm



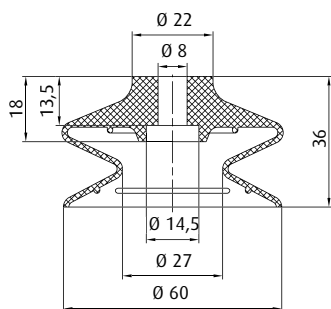
**Item no.**  
23.060.059.\_\*

**Material**  
NBR (sw), SI (r)

15 mm

	Connection	see page
270.093	G1/8-male	421
270.092	G1/8-female	424
270.249	G1/4-male	427
270.248	G1/4-female	433

This vacuum cup is also available in the following dimensions: 14 mm, 24 mm, 40 mm

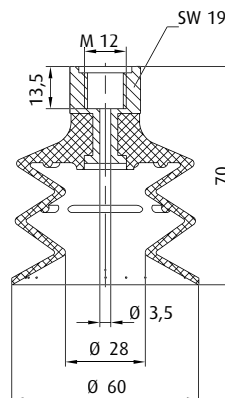


	Connection	see page
270.281	G1/4-male	428
270.282	G1/4-female	433

**Item no.**  
23.060.172.\_\*

**Material**  
SI (tr), NR (sw)

12 mm



**Item no.**  
20.060.101.\_\*

**Material**  
NR (sw)

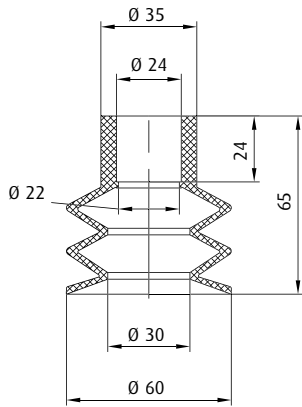
25 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 60 - 61 mm

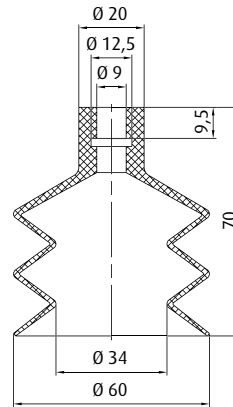


**Item no.**  
21.060.035.\*

**Material**  
EPDM (sw), SI (r)

27 mm

This vacuum cup is also available in the following dimensions: 40 mm

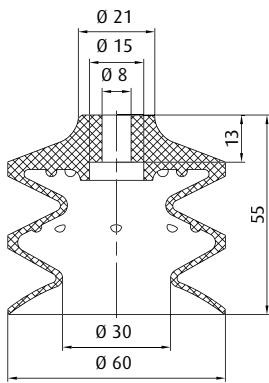


**Item no.**  
21.060.099.\*

**Material**  
Vulkollan® (br)

16 mm

	Connection	see page
270.352	G1/8-male	420
270.204	G1/4-male	427
270.324	G1/4-female	432



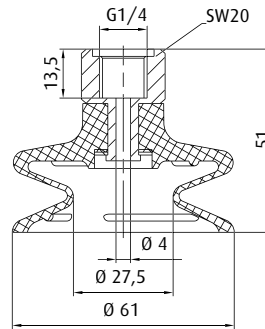
**Item no.**  
21.062.092.\*

**Material**  
Vulkollan® (br)

25 mm

Additional sizes available are found on p. 97.

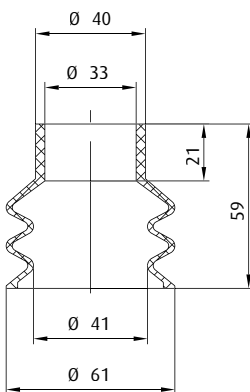
	Connection	see page
270.315	M6-male	414
270.540	G1/4-male	429
270.539	G1/4-female	434



**Item no.**  
22.060.107.\*

**Material**  
SI (tr), NR (sw)

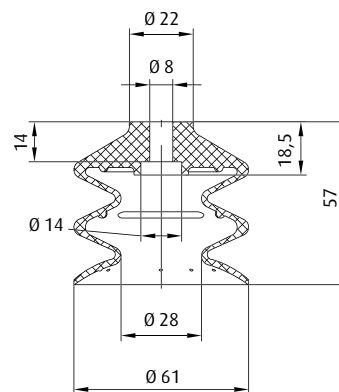
11 mm



**Item no.**  
21.060.038.\*

**Material**  
NBR (sw), SI (tr)

25 mm



**Item no.**  
21.060.051.\*

**Material**  
HNBR (ge), SI (tr), NR (sw)

25 mm



	Connection	see page
270.315	M6-male	414
270.540	G1/4-male	429
270.539	G1/4-female	434

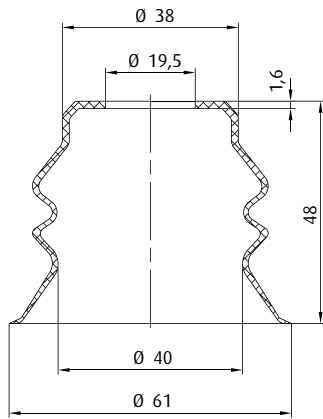
Additional sizes available are found on p. 94.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760








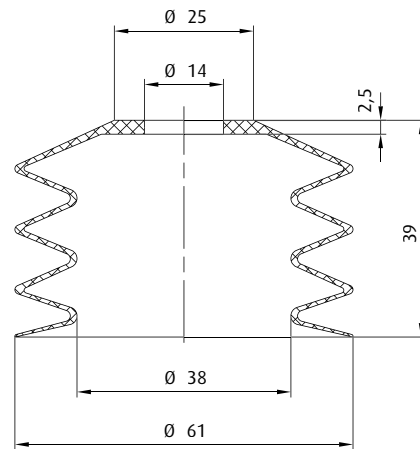
	Connection	see page
	G1/2-male	437








<b>Item no.</b> <b>21.060.074._*</b>	<b>Material</b> SI (tr)	 12 mm
---	----------------------------	---

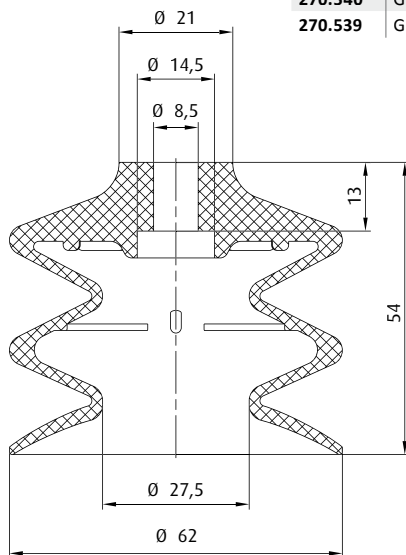
Additional sizes available are found on p. 126.


	Connection	see page
	G1/4-male	431
	G1/4-female	434









<b>Item no.</b> <b>25.060.033._*</b>	<b>Material</b> NBR (sw), SI (br)	 16 mm
---	--------------------------------------	---

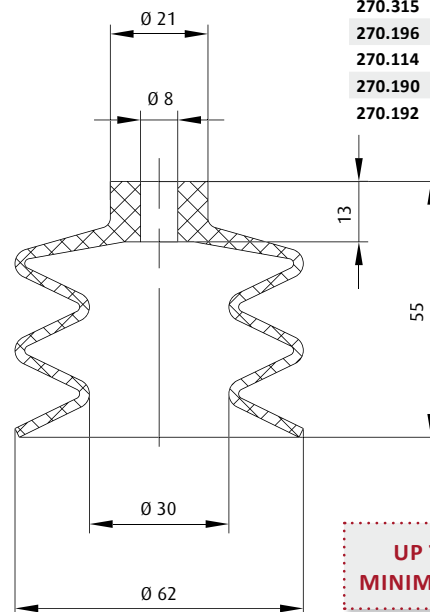
	Connection	see page
	M6-male	414
	G1/4-male	429
	G1/4-female	434



<b>Item no.</b> <b>21.062.055._*</b>	<b>Material</b> NBR (sw), SI (tr)	 25 mm
---	--------------------------------------	---

Additional sizes available are found on p. 89.

	Connection	see page
	M6-male	414
	G1/8-male	420
	G1/8-female	422
	G1/4-male	428
	G1/4-female	432



**UP TO 160 °C & MINIMUM MARKING**

<b>Item no.</b> <b>21.062.157._*</b>	<b>Material</b> Thermalon® (bl)	 31 mm
---	------------------------------------	---

Additional sizes available are found on p. 92.

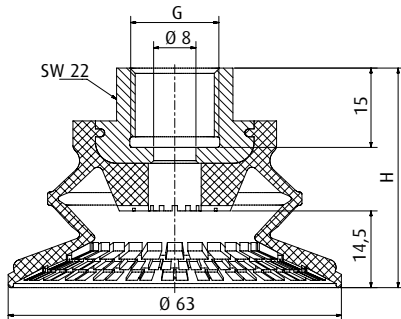
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by $\emptyset$

$\emptyset$  62 - 63 mm

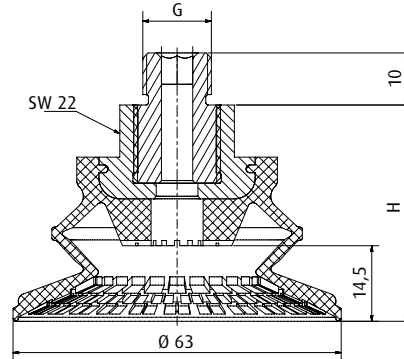
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.060.190.*	NBR (bl)	14.5	G1/4-female	46.5
22.060.191.*	NBR (bl)	14.5	G3/8-female	41.5

Additional sizes available are found on p. 133.

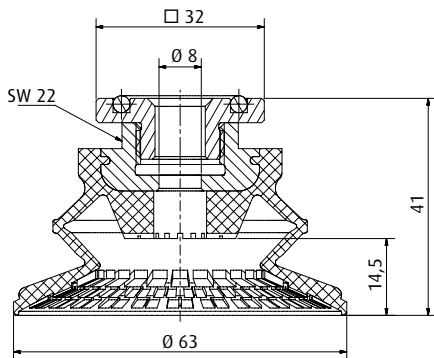
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.060.189.*	NBR (bl)	14.5	G1/4-male	41.5
22.060.192.*	NBR (bl)	14.5	M10-male	41.5
22.060.193.*	NBR (bl)	14.5	M14x1.5-male	41.5

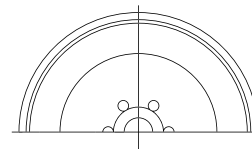
Additional sizes available are found on p. 133.

**NEW**

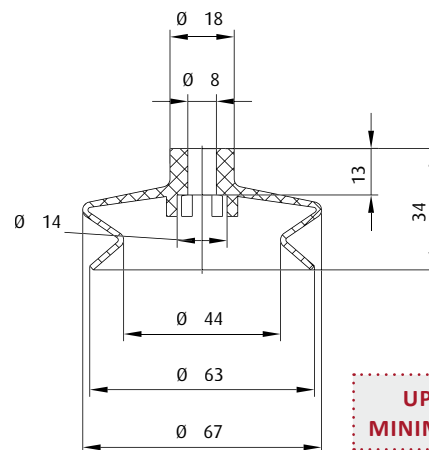


Item no.	Material	[mm]
22.060.194.*	NBR (bl)	14.5 mm

Additional sizes available are found on p. 133.



	Connection	see page
270.315	M6-male	414
270.196	G1/8-male	420
270.114	G1/8-female	422
270.190	G1/4-male	428
270.192	G1/4-female	432

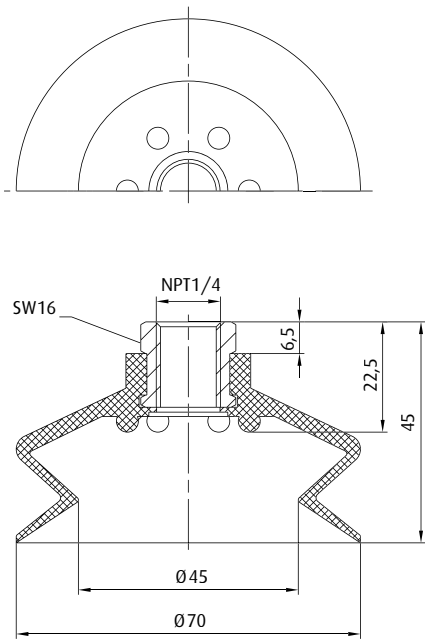


**UP TO 160 °C & MINIMUM MARKING**

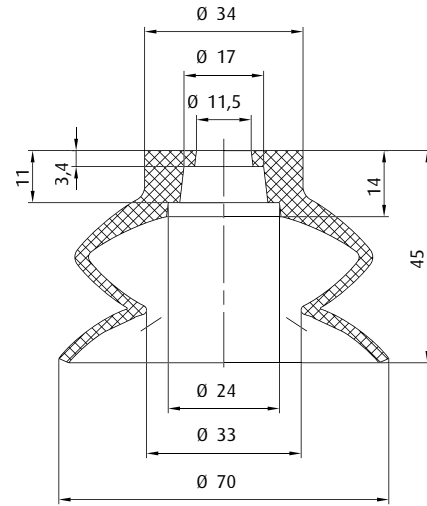
Item no.	Material	[mm]
23.063.244.*	Thermalon® (bl)	15 mm

Additional sizes available are found on p. 84.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760

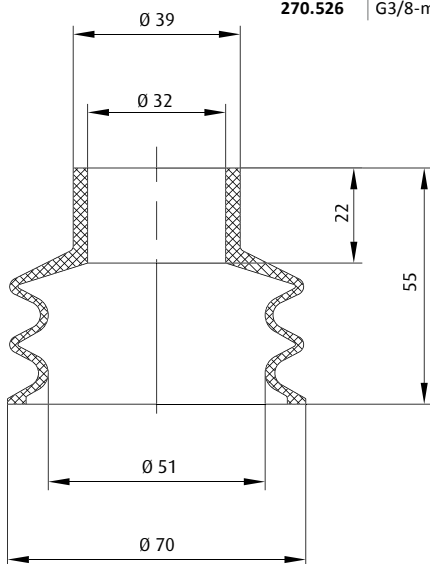


**Item no.** 22.070.127.\_\* **Material** Vinyl (bl) 13 mm



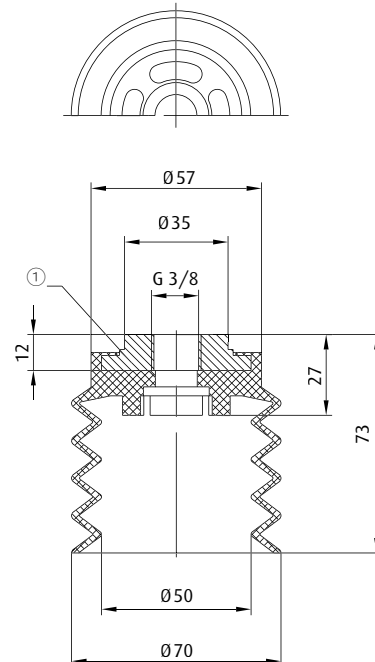
**Item no.** 23.070.060.\_\* **Material** NBR (sw), SI (tr), NR (sw), Vinyl (bl) 20 mm

Additional sizes available are found on p. 113.



**Item no.** 270.526 **Connection** G3/8-male **see page** 435

**Item no.** 21.070.041.\_\* **Material** NR (sw), SI (tr) 17 mm



① = Aluminium

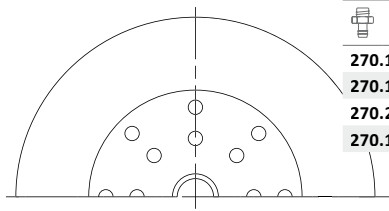
**Item no.** 25.069.050.\_\* **Material** Vinyl (bl) 32 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760

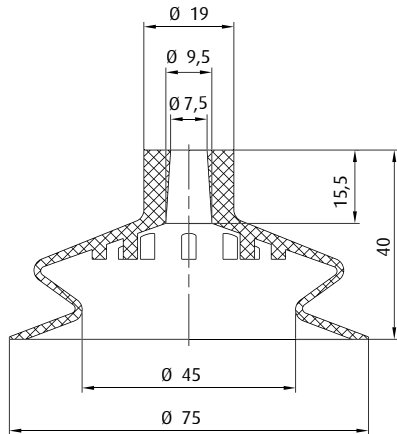


# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 75 mm

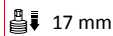


	Connection	see page
270.132	G1/8-male	417
270.114	G1/8-female	422
270.208	G1/4-male	425
270.178	G1/4-female	431

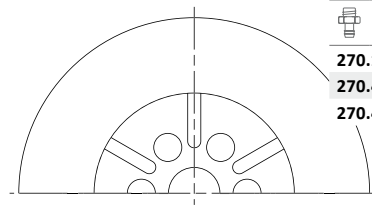


**Item no.**  
23.075.063.\*

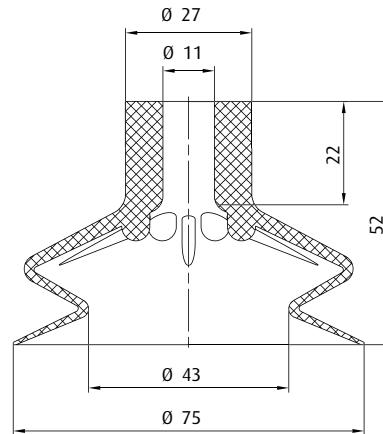
**Material**  
NBR (sw), SI (r)



This vacuum cup is also available in the following dimensions: 31 mm, 53 mm

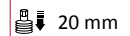


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431



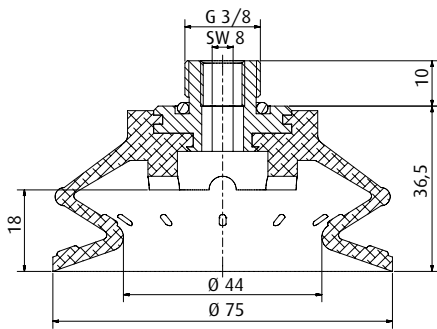
**Item no.**  
23.075.151.\*

**Material**  
NBR (sw), SI (tr)



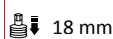
Additional sizes available are found on p. 81.

**NEW**



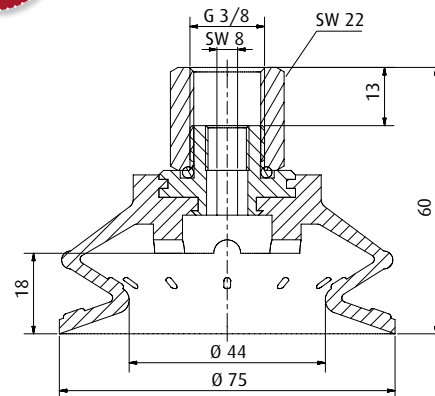
**Item no.**  
22.075.262.\*

**Material**  
Varioflex® 60/30° (sw/r)



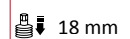
Additional sizes available are found on p. 107.

**NEW**



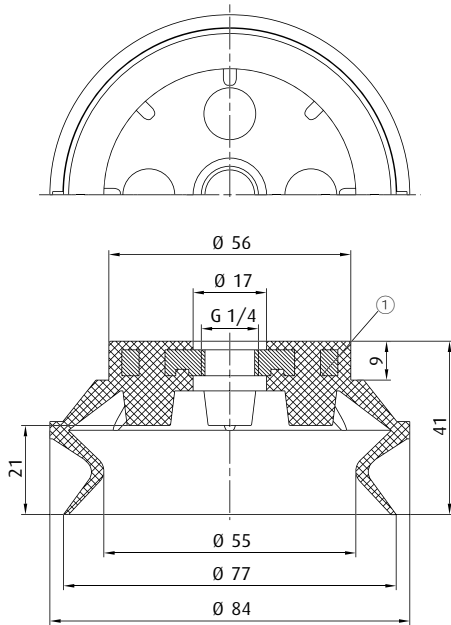
**Item no.**  
22.075.263.\*

**Material**  
Varioflex® 60/30° (sw/r)



Additional sizes available are found on p. 107.

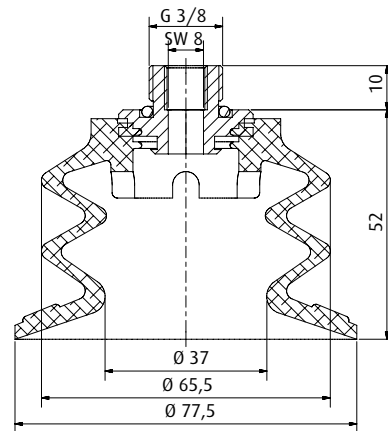
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



① = Aluminium

<b>Item no.</b> 23.075.130.*	<b>Material</b> NBR (sw), SI (tr), PU (bl)	21 mm
---------------------------------	---	-------

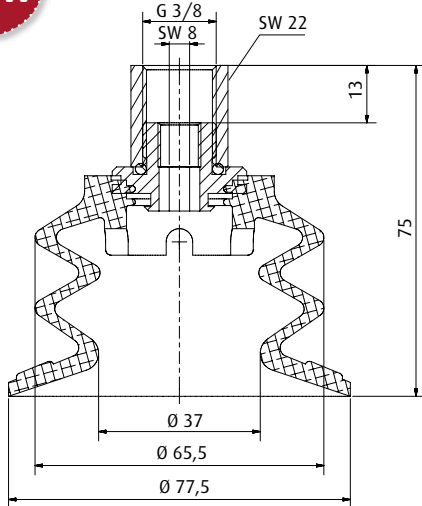
**NEW**



<b>Item no.</b> 20.077.154.*	<b>Material</b> Varioflex® 60/30° (sw/r)	25 mm
---------------------------------	---	-------

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code

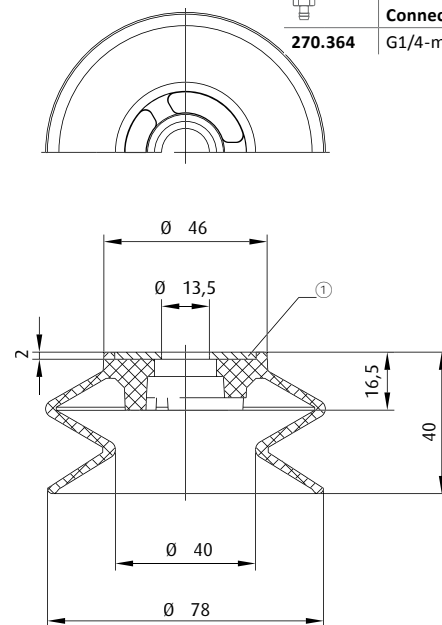
**NEW**



<b>Item no.</b> 20.077.155.*	<b>Material</b> Varioflex® 60/30° (sw/r)	25 mm
---------------------------------	---	-------

Additional sizes available are found on p. 110.  
**Ordering notes:** For version with in bellows inserted filter disc please add "-FI" to material code

	<b>Connection</b>	<b>see page</b>
270.364	G1/4-male	430



① = Aluminium

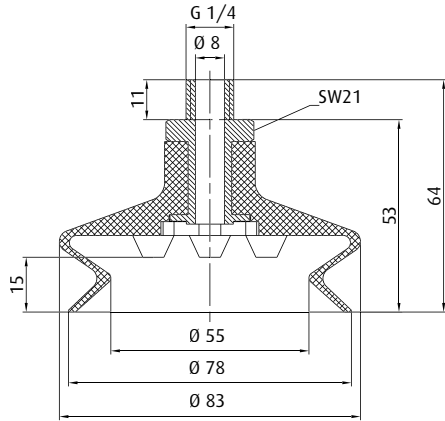
<b>Item no.</b> 22.080.144.*	<b>Material</b> SBR (br)	23 mm
---------------------------------	-----------------------------	-------

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

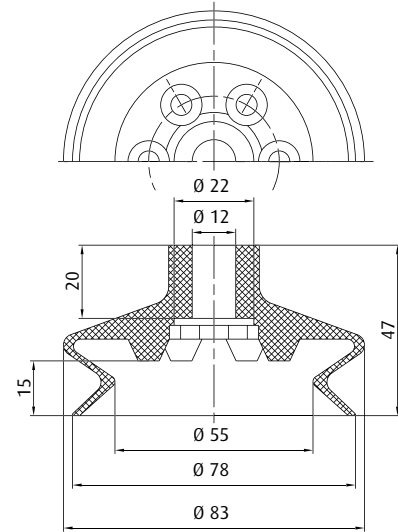


# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 78 - 80 mm



Spare cup



Connection	see page
270.184 G1/4-male	431

Item no. 22.078.071.\*

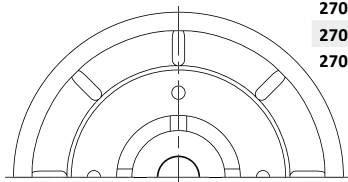
Material NBR (sw), SI (tr), NR (gr)

15 mm

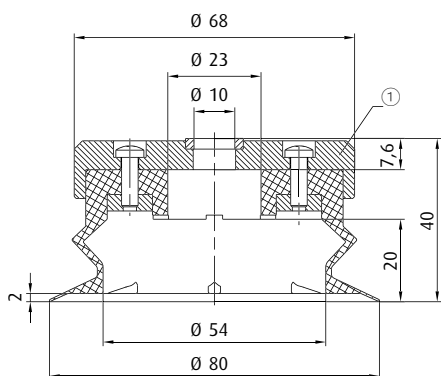
Item no. 23.078.067.\*

Material NBR (sw), SI (tr), NR (gr)

15 mm



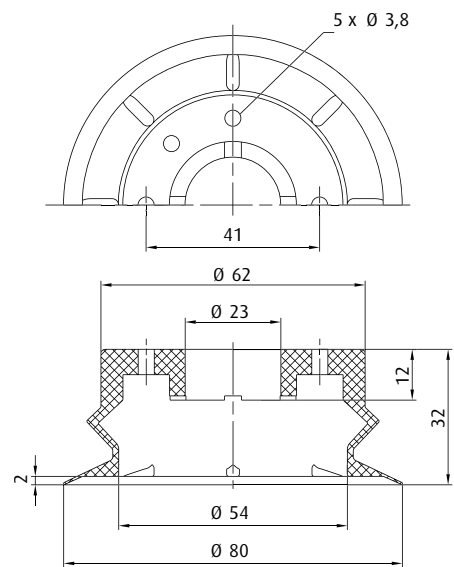
Connection	see page
270.462 M10-male	416
270.514 G1/4-male	429
270.513 G1/4-female	434



① = Aluminium

**FLEXIBLE & STABLE**

Spare cup



Item no. 22.080.161.\*

Material NBR (sw), SI (tr)

10 mm

Additional sizes available are found on p. 119.

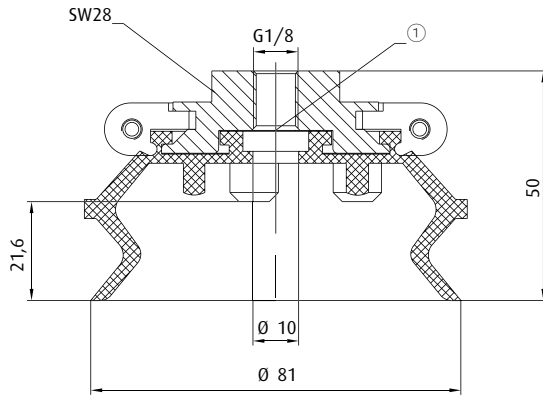
Item no. 23.080.144.\*

Material NBR (sw), SI (tr)

10 mm

Additional sizes available are found on p. 119.

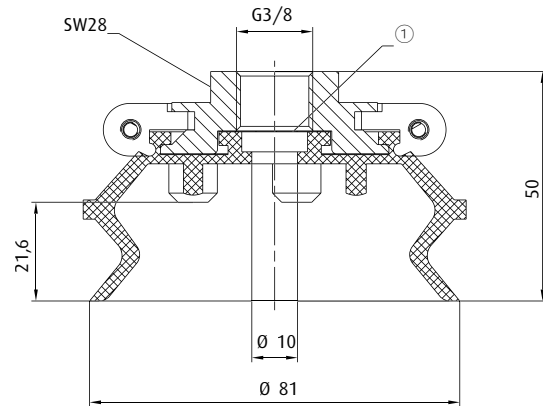
\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760



① = Filter screen

<b>Item no.</b> 22.078.163.*	<b>Material</b> Tepuflex® (or), SI (tr), CR (sw)	22 mm
---------------------------------	---	-------

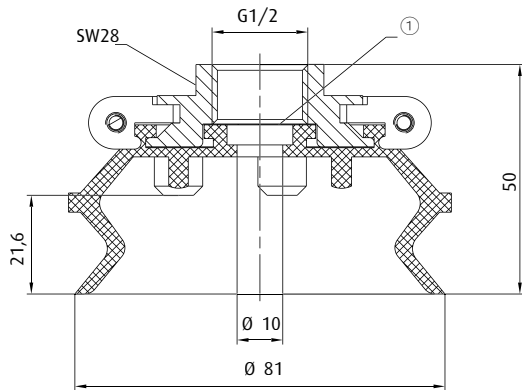
Additional sizes available are found on p. 104.



① = Filter screen

<b>Item no.</b> 22.078.166.*	<b>Material</b> Tepuflex® (or), SI (tr), CR (sw)	22 mm
---------------------------------	---	-------

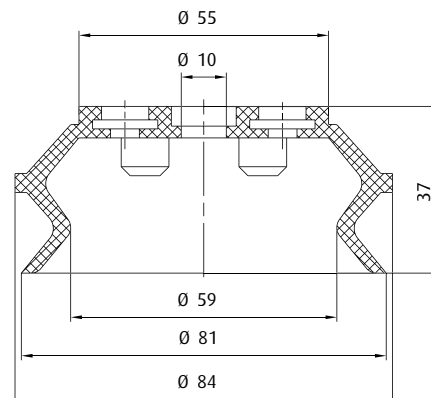
Additional sizes available are found on p. 104.



① = Filter screen

<b>Item no.</b> 22.078.169.*	<b>Material</b> Tepuflex® (or), SI (tr), CR (sw)	22 mm
---------------------------------	---	-------

Additional sizes available are found on p. 104.



<b>Item no.</b> 23.078.065.*	<b>Material</b> Tepuflex® (or), SI (tr), CR (sw)	22 mm
---------------------------------	---	-------

Additional sizes available are found on p. 100.

	Connection	see page
270.527-S	G1/8-female	424
270.528-S	G3/8-female	436
270.529-S	G1/2-female	436

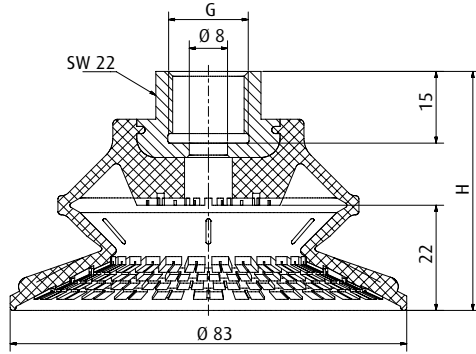
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by $\emptyset$

$\emptyset$  82 - 84 mm

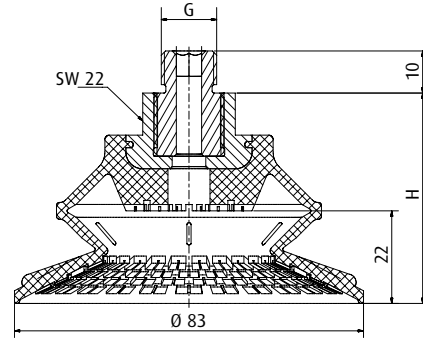
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.080.196.*	NBR (bl)	22	G1/4-female	55
22.080.197.*	NBR (bl)	22	G3/8-female	50

Additional sizes available are found on p. 133.

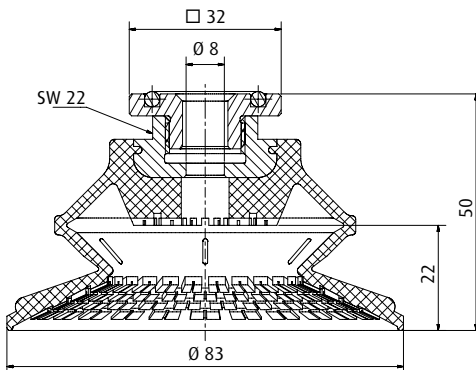
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.080.195.*	NBR (bl)	22	G1/4-male	50
22.080.198.*	NBR (bl)	22	M10-male	50
22.080.199.*	NBR (bl)	22	M14x1.5-male	50

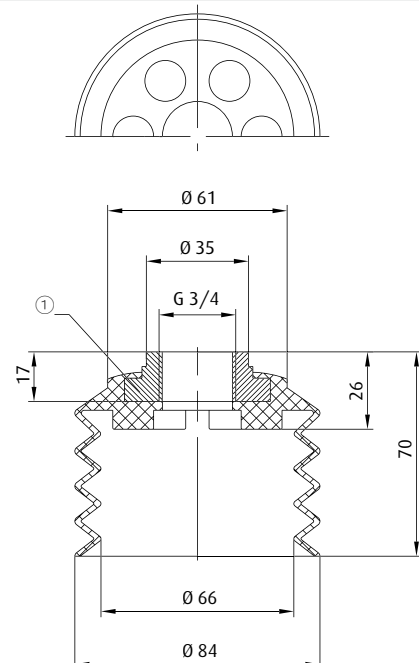
Additional sizes available are found on p. 133.

**NEW**



Item no.	Material	22 mm
22.080.200.*	NBR (bl)	

Additional sizes available are found on p. 133.

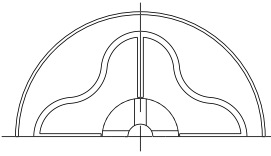


① = Aluminium

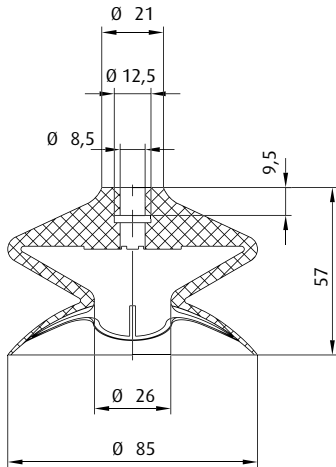
Item no.	Material	31 mm
25.084.051.*	Vinyl (bl)	

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





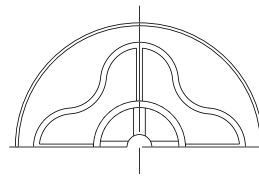
	Connection	see page
270.359	G1/4-male	427
270.361	G1/4-female	433



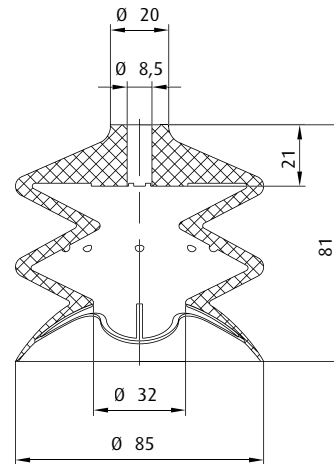
**Item no.**  
23.085.201.\*

**Material**  
Vulkollan® (br)

25 mm



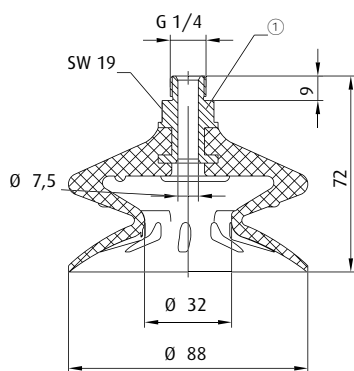
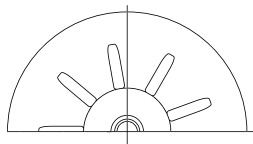
	Connection	see page
270.359	G1/4-male	427



**Item no.**  
21.085.107.\*

**Material**  
Vulkollan® (br)

38 mm



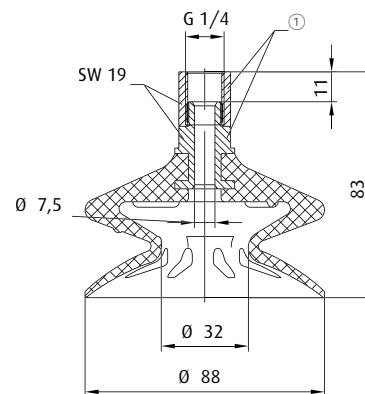
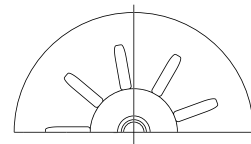
① = Aluminium fitting, vulcanised

**Item no.**  
22.088.158.\*

**Material**  
NBR (sw), SI (tr)

23 mm

Additional sizes available are found on p. 81.



① = Aluminium fitting, vulcanised

**Item no.**  
22.088.159.\*

**Material**  
NBR (sw), SI (tr)

23 mm

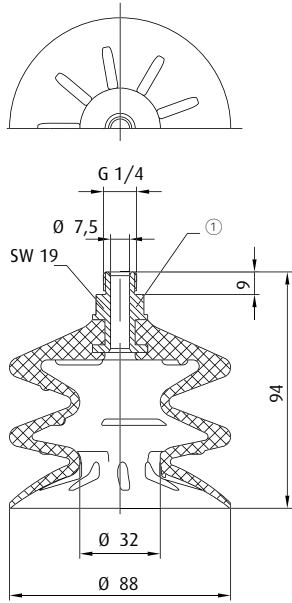
Additional sizes available are found on p. 81.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by $\emptyset$

$\emptyset$  88 - 92 mm



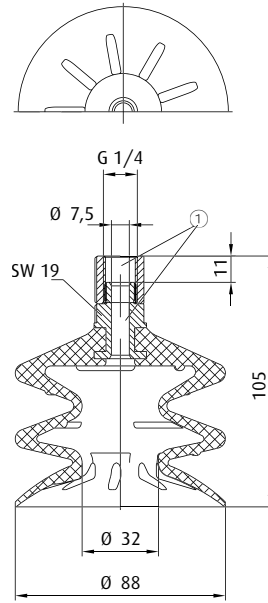
① = Aluminium fitting, vulcanised

**Item no.**  
**20.088.123.\_\***

**Material**  
NBR (sw), SI (tr)

36 mm

Additional sizes available are found on p. 89.



① = Aluminium fitting, vulcanised

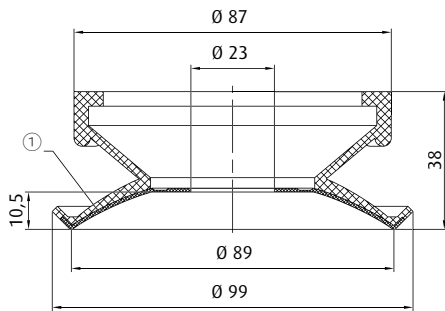
**Item no.**  
**20.088.124.\_\***

**Material**  
NBR (sw), SI (tr)

36 mm

Additional sizes available are found on p. 89.

	Connection	see page
270.400	G3/8-female	436



**HEAT RESISTANT & LOW MARKING**

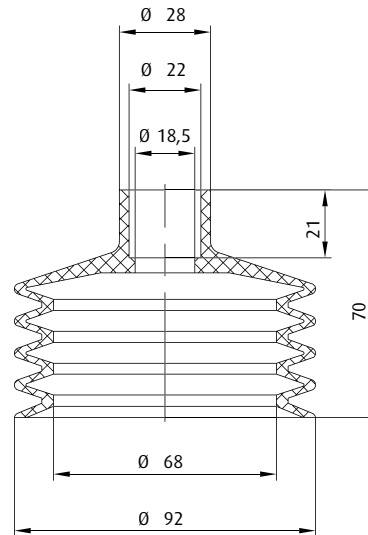
① = Felt pads

**Item no.**  
**26.090.001.\_\***

**Material**  
SI (tr/ge), FKM (sw/ge)

17 mm

Additional sizes available are found on p. 164.

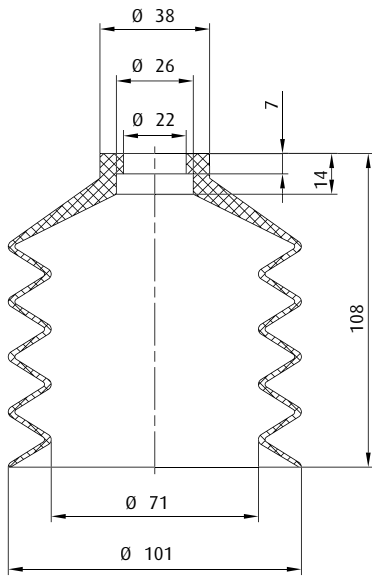


**Item no.**  
**25.091.052.\_\***

**Material**  
Vinyl (bl)

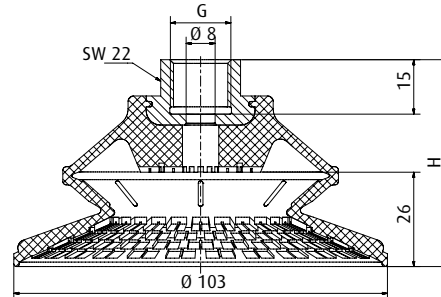
32 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



<b>Item no.</b> 25.102.053._*	<b>Material</b> Vinyl (bl)	55 mm
----------------------------------	-------------------------------	-------

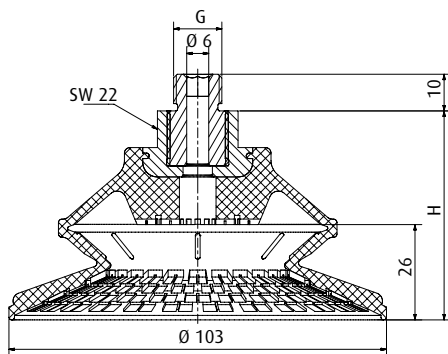
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.100.202._*	NBR (bl)	26	G1/4-female	62
22.100.203._*	NBR (bl)	26	G3/8-female	57

Additional sizes available are found on p. 133.

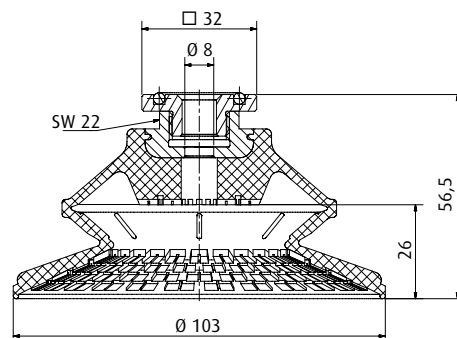
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.100.201._*	NBR (bl)	26	G1/4-male	57
22.100.204._*	NBR (bl)	26	M10-male	57
22.100.205._*	NBR (bl)	26	M14x1.5-male	57

Additional sizes available are found on p. 133.

**NEW**



<b>Item no.</b> 22.100.206._*	<b>Material</b> NBR (bl)	26 mm
----------------------------------	-----------------------------	-------

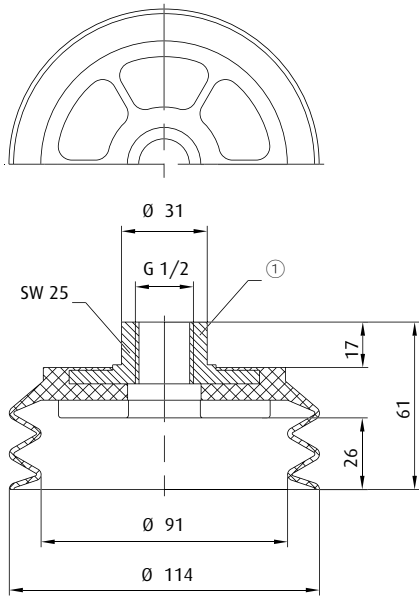
Additional sizes available are found on p. 133.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



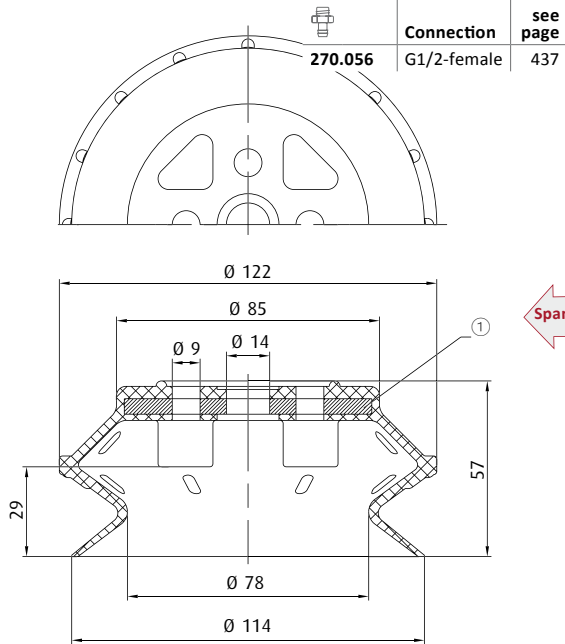
# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 114 mm



① = Aluminium

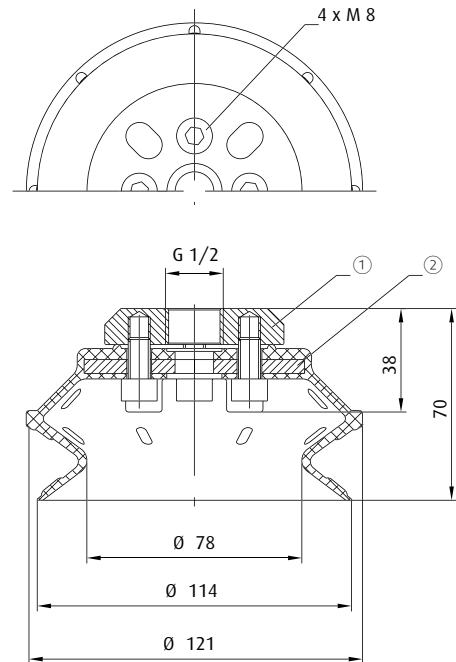
<b>Item no.</b> 20.115.114._*	<b>Material</b> Vinyl (bl)	27 mm
----------------------------------	-------------------------------	-------



① = Steel

<b>Item no.</b> 23.110.070._*	<b>Material</b> NBR (sw)	29 mm
----------------------------------	-----------------------------	-------

**Notes:** Hardness 70° Shore A




① = Aluminium ② = Steel

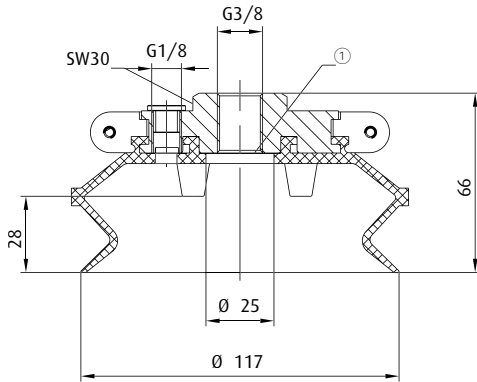
<b>Item no.</b> 22.110.080._*	<b>Material</b> NBR (sw)	29 mm
----------------------------------	-----------------------------	-------

**Notes:** Hardness 70° Shore A

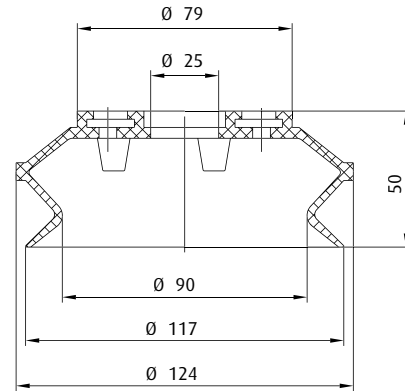
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760




	Connection	see page
270.530-S	G3/8-female	437
270.531-S	G1/2-female	437




Spare cup



① = Filter screen


**Item no.** 22.117.164.\*  
**Material** Tepuflex® (or), SI (tr), CR (sw)  
 29 mm

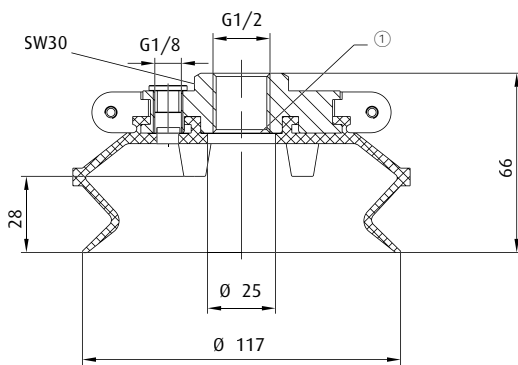
Additional sizes available are found on p. 104.

**Item no.** 23.117.069.\*  
**Material** Tepuflex® (or), SI (tr), CR (sw)  
 29 mm

Additional sizes available are found on p. 100.

Spare cup

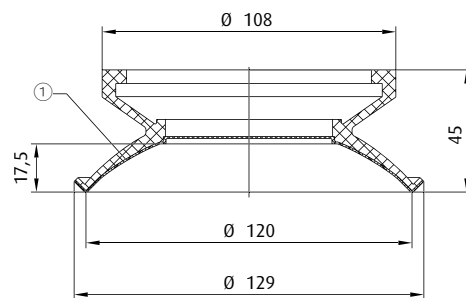
	Connection	see page
270.402	G3/8-female	436



① = Filter screen


**Item no.** 22.117.167.\*  
**Material** Tepuflex® (or), SI (tr), CR (sw)  
 29 mm

Additional sizes available are found on p. 104.



**HEAT RESISTANT & LOW MARKING**

① = Felt pads

**Item no.** 26.120.002.\*  
**Material** FKM (sw/ge)  
 18 mm

Additional sizes available are found on p. 164.

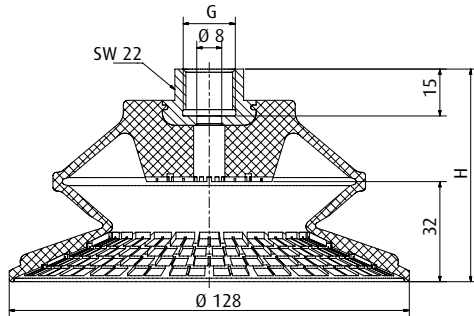
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
 Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by $\emptyset$

$\emptyset$  128 mm

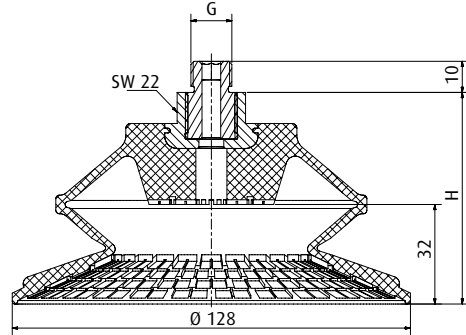
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.125.208.*	NBR (bl)	32	G1/4-female	73
22.125.209.*	NBR (bl)	32	G3/8-female	68

Additional sizes available are found on p. 133.

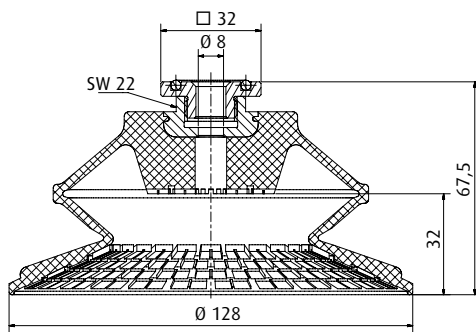
**NEW**



Item no.	Material	[mm]	Connection thread	H [mm]
22.125.207.*	NBR (bl)	32	G1/4-male	68
22.125.210.*	NBR (bl)	32	M10-male	68
22.125.211.*	NBR (bl)	32	M14x1.5-male	68

Additional sizes available are found on p. 133.

**NEW**



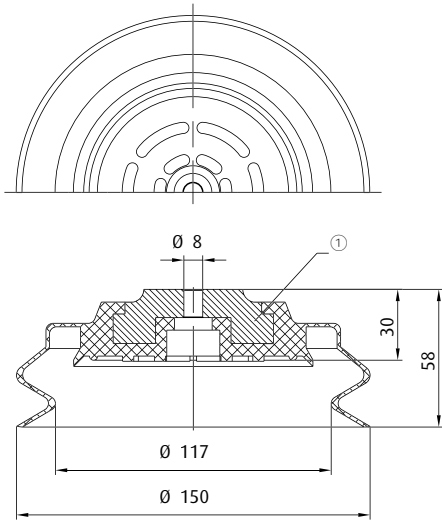
Item no. 22.125.212.*	Material NBR (bl)	32 mm
--------------------------	----------------------	-------

Additional sizes available are found on p. 133.

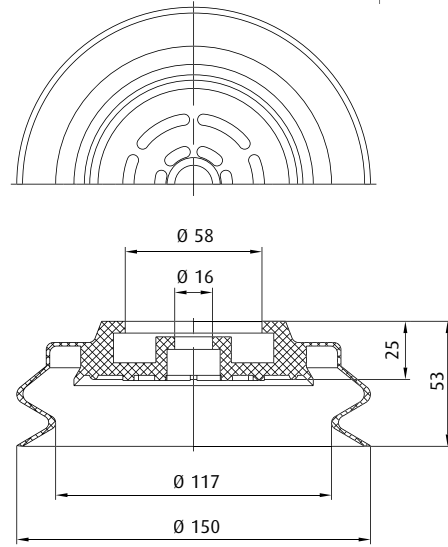
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.270	Without	440



Spare cup

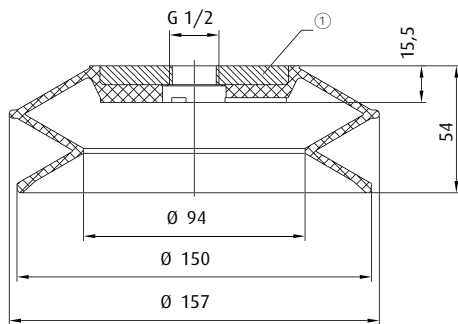


① = Aluminium

<b>Item no.</b> 22.150.109._*	<b>Material</b> NBR (sw)	28 mm
----------------------------------	-----------------------------	-------

Additional sizes available are found on p. 136.

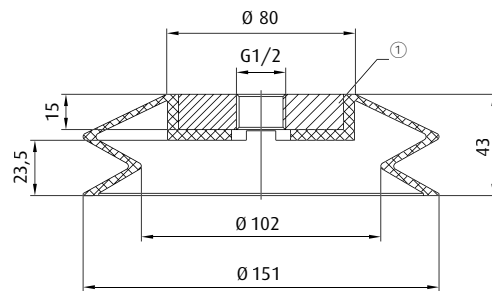
<b>Item no.</b> 23.150.090._*	<b>Material</b> NBR (sw)	28 mm
----------------------------------	-----------------------------	-------



① = Steel

<b>Item no.</b> 22.150.084._*	<b>Material</b> NBR (gr), NR (br)	32 mm
----------------------------------	--------------------------------------	-------

Additional sizes available are found on p. 137.



① = Aluminium

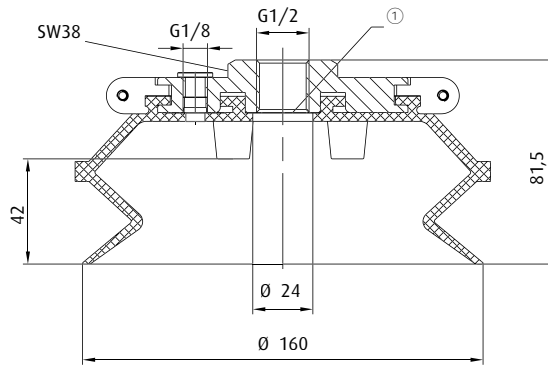
<b>Item no.</b> 23.150.020._*	<b>Material</b> NBR (sw), SI (tr)	20 mm
----------------------------------	--------------------------------------	-------

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø

Ø 160 mm



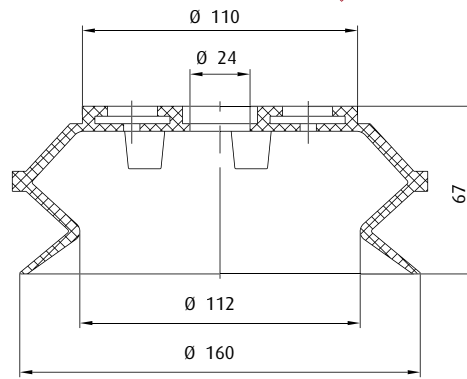
① = Filter screen

**Item no.**  
22.160.165.\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

41 mm

Additional sizes available are found on p. 104.  
This vacuum cup is also available in the following dimensions: 160 mm



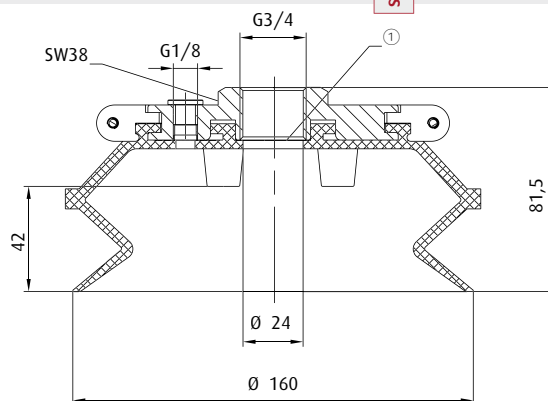
	Connection	see page
270.532-S	G1/2-female	437
270.533-S	G3/4-female	437

**Item no.**  
23.160.072.\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

41 mm

Additional sizes available are found on p. 100.



① = Filter screen

**Item no.**  
22.160.168.\*

**Material**  
Tepuflex® (or), SI (tr), CR (sw)

41 mm

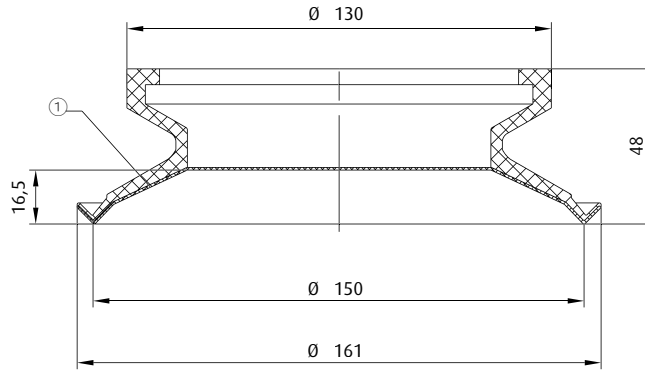
Additional sizes available are found on p. 104.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





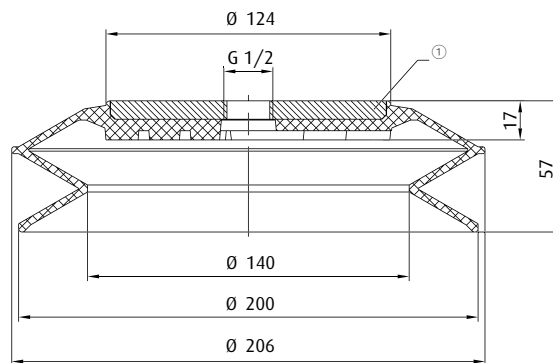
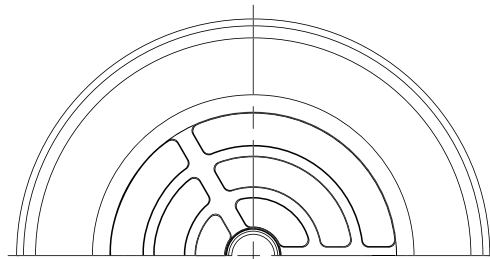
	Connection	see page
270.404	G3/8-female	436



**HEAT RESISTANT & LOW MARKING**

① = Felt pads

<b>Item no.</b> 26.160.003.*	<b>Material</b> FKM (sw/ge)	18 mm	Additional sizes available are found on p. 164.
---------------------------------	--------------------------------	-------	---



① = Steel

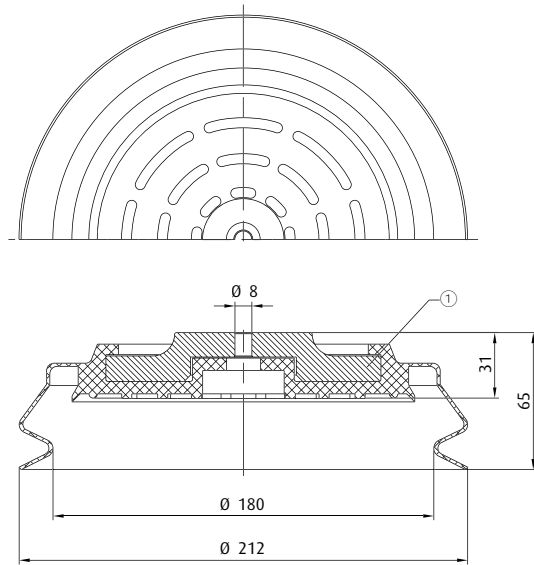
<b>Item no.</b> 22.200.087.*	<b>Material</b> NBR (gr), NR (br)	30 mm	Additional sizes available are found on p. 137.
---------------------------------	--------------------------------------	-------	---

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by Ø


Ø 212 mm



① = Aluminium

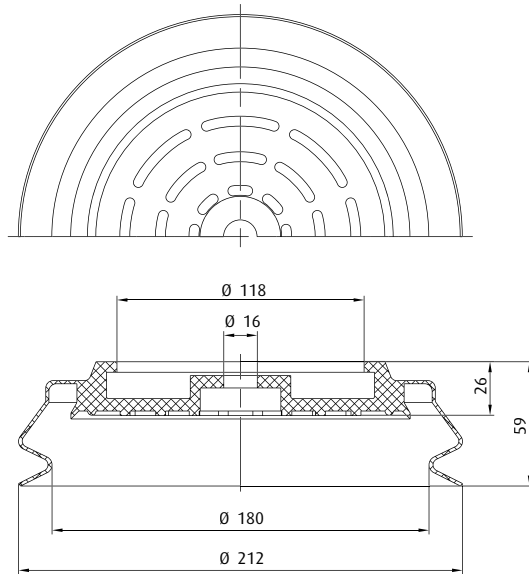
**Item no.**  
22.210.115.\_\*

**Material**  
NBR (sw)

 32 mm

Additional sizes available are found on p. 136.

Spare cup




270.269

**Connection**  
Without

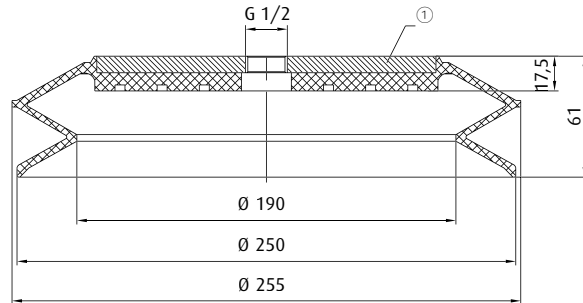
**see page**  
440

**Item no.**  
23.210.009.\_\*

**Material**  
NBR (sw)

 32 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



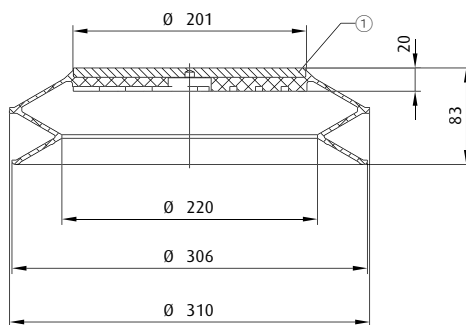
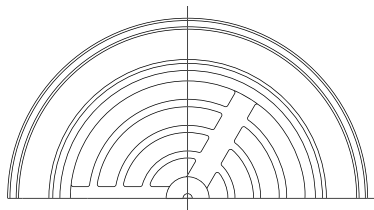
① = Steel

**Item no.**  
**22.250.088.\_\***

**Material**  
NBR (gr), SI (tr)

38 mm

Additional sizes available are found on p. 137.



① = Steel

**Item no.**  
**22.300.091.\_\***

**Material**  
NBR (gr)

60 mm

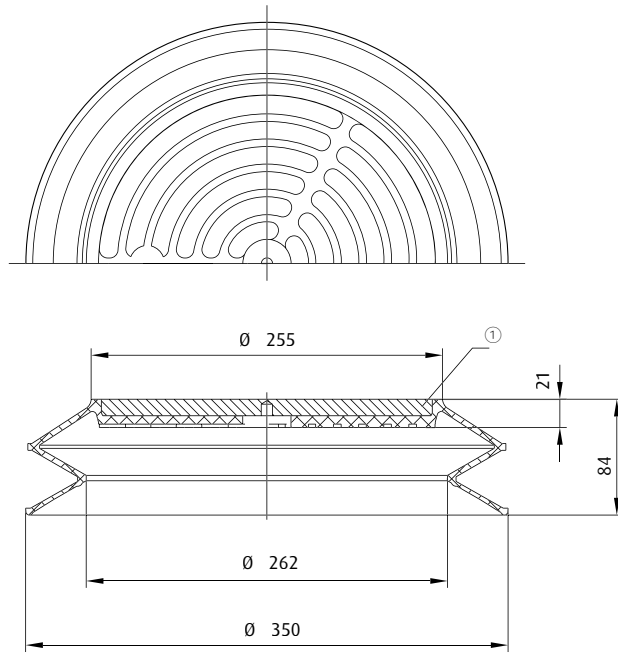
Additional sizes available are found on p. 137.  
**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Bellows vacuum cups by $\emptyset$


$\emptyset$  350 mm



① = Steel

**Item no.**  
22.350.102.\_\*

**Material**  
NBR (gr)

 55 mm

Additional sizes available are found on p. 137.  
**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

## Application / Uses

- > Oval vacuum cups are suited for elongated workpieces where only minimal space is available (e.g. rails, profiles, products with ridges)
- > Also suitable for curved workpieces
- > Significantly greater suction power than round vacuum cups of equal width



## Designs



- > FIPA oval vacuum cups are available as flat or bellows vacuum suction cups, with or without supporting ribs
- > Supporting ribs:
  - Improve stability and suction power
  - Prevent flexible product parts from being sucked in
  - Prevent slipping of the product while suction is being applied

## Methods of connection



### Vacuum cups for attaching to the fittings (plug-in)

- > Secure hold
- > Quick replacement
- > Cost-efficient and environmentally-friendly, as only the rubber part needs to be replaced



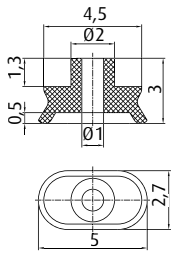
### Vulcanised fittings / retainer plates

- > Very secure hold
- > Secured against rotation during handling
- > High degree of dimensional stability



# Vacuum cups by size | Oval vacuum cups by size

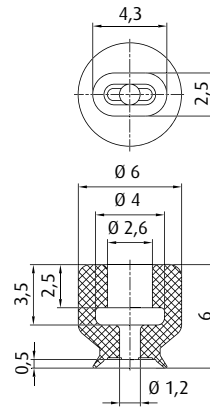
4x2 mm - 7x4 mm



Connection	see page
M3-male	408

<b>Item no.</b> 132.4x2.001.*	<b>Material</b> NBR (sw), SI (tr), PU (bl)	0.5 mm
----------------------------------	---	--------

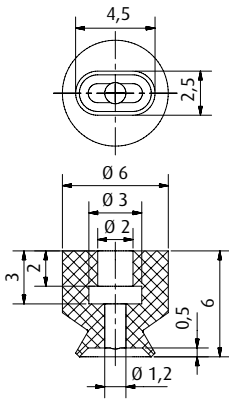
Additional sizes available are found on p. 141.



Connection	see page
M3-male	408
M4-male	408
M5-male	411

<b>Item no.</b> 132.4x2.031.*	<b>Material</b> NBR (sw), HNBR (ge), SI (tr), PU (bl)	0.5 mm
----------------------------------	--	--------

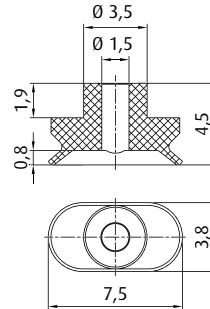
Additional sizes available are found on p. 141.



Connection	see page
M3-male	408
M4-male	408
M5-male	411

<b>Item no.</b> 132.4x2.079.*	<b>Material</b> Thermalon® (bl)	0.4 mm
----------------------------------	------------------------------------	--------

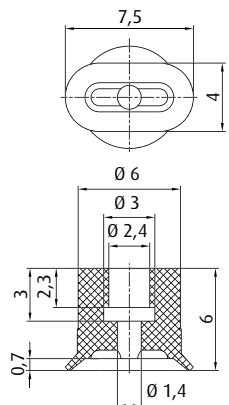
Additional sizes available are found on p. 144.



Connection	see page
M3-male	408

<b>Item no.</b> 132.7x4.002.*	<b>Material</b> NBR (sw), SI (tr), SI-AS (sw)	0.8 mm
----------------------------------	--	--------

Additional sizes available are found on p. 141.

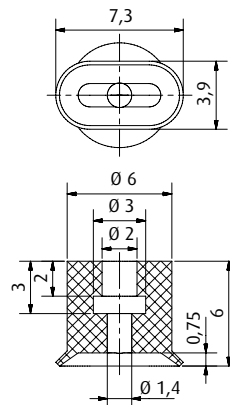


Connection	see page
M3-male	408
M4-male	408
M5-male	411

**BESTSELLER**

<b>Item no.</b> 132.7x4.034.*	<b>Material</b> NBR (sw), HNBR (ge), SI (tr)	0.8 mm
----------------------------------	---	--------

Additional sizes available are found on p. 141.

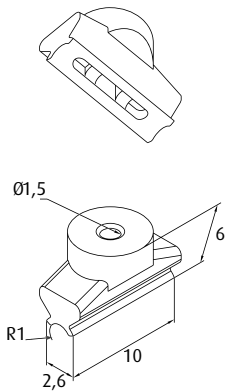



Connection	see page
M3-male	408
M4-male	408
M5-male	411

<b>Item no.</b> 132.7x4.080.*	<b>Material</b> Thermalon® (bl)	0.5 mm
----------------------------------	------------------------------------	--------

Additional sizes available are found on p. 144.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



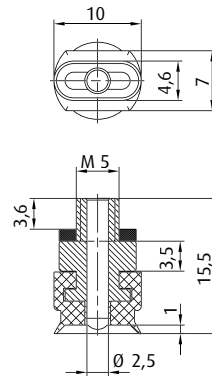
	Connection	see page
	M5-male	411



**Item no.**  
**201.10x3.005.\_\***

**Material**  
NBR (sw), SI (tr)

 0 mm


Additional sizes available are found on p. 154.  
**Notes:** Suitable for cylindrical products diam. 2-4 mm



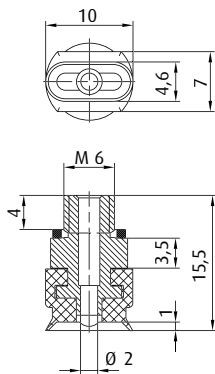
		see page
	10 mm	444
	20 mm	444





**Item no.**  
**130.10x4.115.\_\***

**Material**  
NBR (sw), SI (tr), BR-AS (sw)

 0.9 mm


Additional sizes available are found on p. 152.



		see page
	20 mm	456
	30 mm	456
	40 mm	456
	50 mm	456

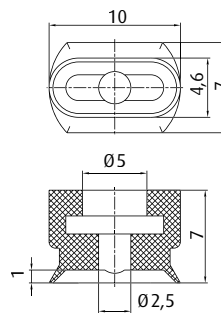
**Item no.**  
**130.10x4.068.\_\***

**Material**  
NBR (sw), BR-AS (sw), SI (tr)



 0.9 mm

Additional sizes available are found on p. 152.

Spare cup




Spare cup

	Connection	see page
	M5-male	412
	M6-male	413

**Item no.**  
**132.10x4.003.\_\***

**Material**  
NBR (sw), BR-AS (sw), SI (tr)

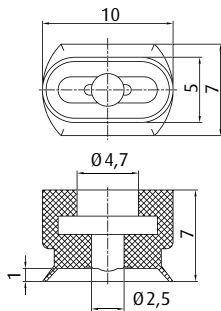
 0.9 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



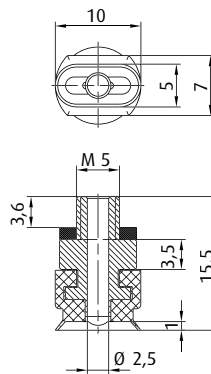
# Vacuum cups by size | Oval vacuum cups by size

10x5 mm - 10x6 mm



	Connection	see page
	M5-male	412
	M6-male	413

Spare cup



		see page
	10 mm	444
	20 mm	444

Item no.  
**132.10x5.007.\_\***

Material  
NBR (sw), BR-AS (sw), SI (tr)

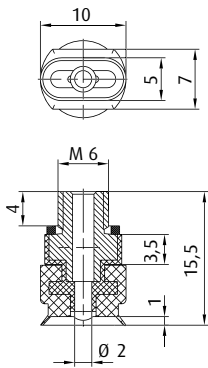
0.9 mm

Item no.  
**130.10x5.116.\_\***

Material  
NBR (sw), SI (tr), BR-AS (sw)

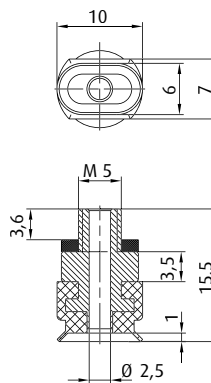
0.9 mm

Additional sizes available are found on p. 152.



		see page
	20 mm	456
	30 mm	456
	40 mm	456
	50 mm	456

Spare cup



		see page
	10 mm	444
	20 mm	444

Item no.  
**130.10x5.071.\_\***

Material  
NBR (sw), BR-AS (sw), SI (tr)

0.9 mm

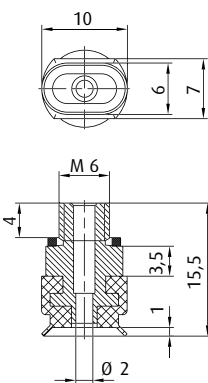
Item no.  
**130.10x6.117.\_\***

Material  
NBR (sw), SI (tr), BR-AS (sw)

0.9 mm

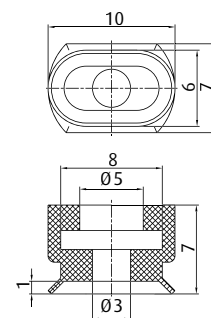
Additional sizes available are found on p. 152.

Additional sizes available are found on p. 152.



		see page
	20 mm	456
	30 mm	456
	40 mm	456
	50 mm	456

Spare cup



	Connection	see page
	M5-male	412
	M6-male	413

Item no.  
**130.10x6.073.\_\***

Material  
NBR (sw), BR-AS (sw), SI (tr)

0.9 mm

Item no.  
**132.10x6.011.\_\***

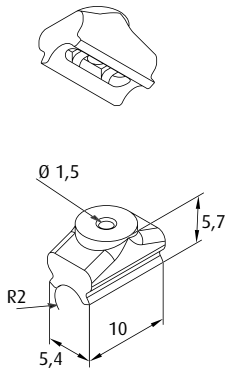
Material  
NBR (sw), BR-AS (sw), SI (tr)

0.9 mm

Additional sizes available are found on p. 152.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

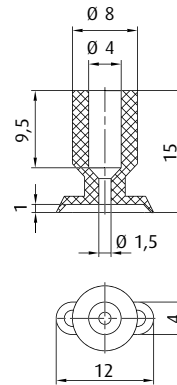




	Connection	see page
270.300	M5-male	411

<b>Item no.</b> 201.10x6.006._*	<b>Material</b> NBR (sw), SI (tr)	0 mm
------------------------------------	--------------------------------------	------

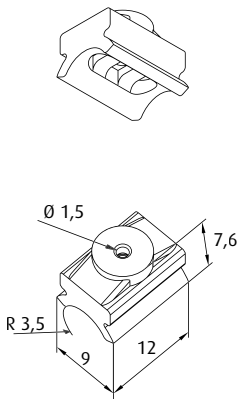
Additional sizes available are found on p. 154.



	Connection	see page
270.134	M5-male	409
270.347	M5-female	412
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

<b>Item no.</b> 132.12x4.004._*	<b>Material</b> NBR (gr), SI (tr)	0.5 mm
------------------------------------	--------------------------------------	--------

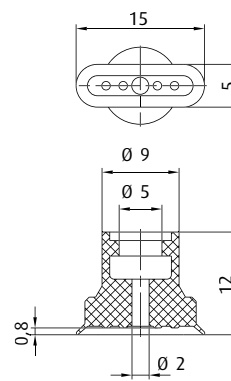
Additional sizes available are found on p. 141.



	Connection	see page
270.300	M5-male	411

<b>Item no.</b> 201.12x9.007._*	<b>Material</b> NBR (sw), SI (tr)	0 mm
------------------------------------	--------------------------------------	------

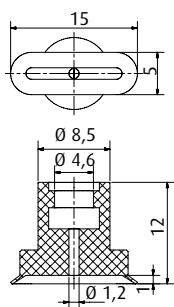
Additional sizes available are found on p. 154.  
**Notes:** Suitable for cylindrical products diam. 6-13 mm



	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

<b>Item no.</b> 132.15x5.008._*	<b>Material</b> NBR (gr), SI (tr), PU (bl)	1 mm
------------------------------------	---	------

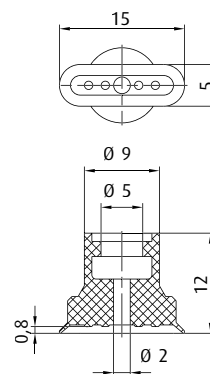
Additional sizes available are found on p. 141.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

<b>Item no.</b> 132.15x5.081._*	<b>Material</b> Thermalon® (bl)	0.6 mm
------------------------------------	------------------------------------	--------

Additional sizes available are found on p. 144.



	Connection	see page
270.431	G1/8-male	418

<b>Item no.</b> 132.15x5.067._*	<b>Material</b> HNBR (ge)	1 mm
------------------------------------	------------------------------	------

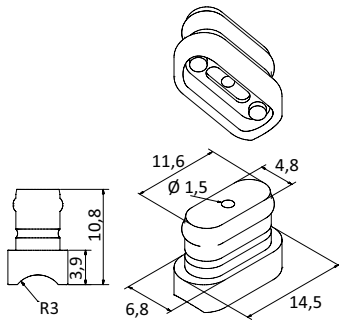
Additional sizes available are found on p. 146.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

15x8 mm - 19x5 mm



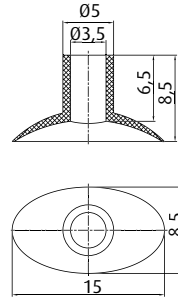
**Item no.**  
**132.15x7.073.\_\***

**Material**  
SI (r)

0 mm

Additional sizes available are found on p. 154.

**Notes:** Suitable for cylindrical products diam. 4-10 mm

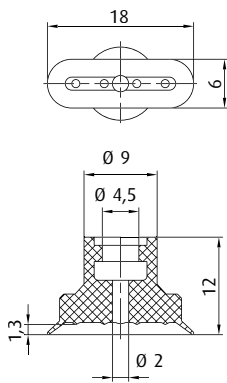


**Item no.**  
**132.15x8.5.33.\_\***

**Material**  
NR (sw)

2 mm

	Connection	see page
270.536	M5-male	409



	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

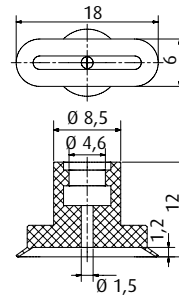
**Item no.**  
**132.18x6.012.\_\***

**Material**  
NBR (gr), SI (tr), PU (bl)

1 mm

Additional sizes available are found on p. 141.

**Ordering notes:** Use of a gripper clamp (available separately) recommended.



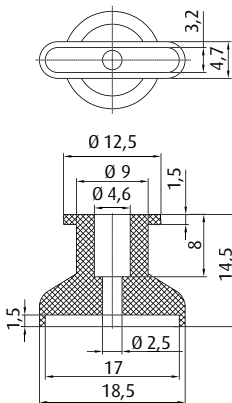
	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
**132.18x6.082.\_\***

**Material**  
Thermalon® (bl)

1 mm

Additional sizes available are found on p. 144.



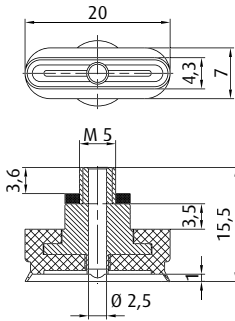
	Connection	see page
270.013	M5-male	410
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421

**Item no.**  
**132.19x5.044.\_\***

**Material**  
Vinyl (bl)

0 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



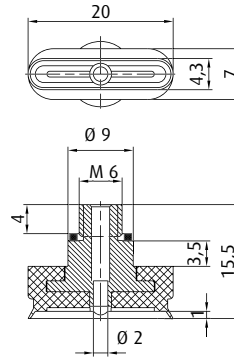
		see page
50.152	10 mm	444
50.153	20 mm	444

**Item no.**  
**130.20x4.118.\***

**Material**  
NBR (sw), SI (tr), BR-AS (sw)

0.9 mm

Additional sizes available are found on p. 152.



		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

**Item no.**  
**130.20x4.069.\***

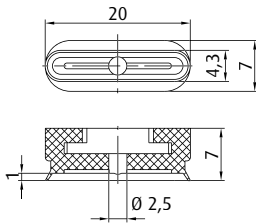
**Material**  
NBR (sw), BR-AS (sw), SI (tr)

0.9 mm

Additional sizes available are found on p. 152.

Spare cup

Spare cup

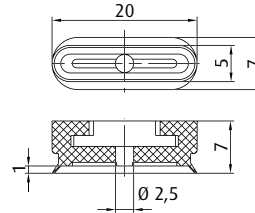


	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

**Item no.**  
**132.20x4.005.\***

**Material**  
NBR (sw), BR-AS (sw), SI (tr)

0.9 mm



	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

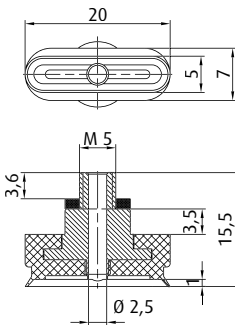
**Item no.**  
**132.20x5.009.\***

**Material**  
NBR (sw), BR-AS (sw), SI (tr)

0.9 mm

Spare cup

Spare cup



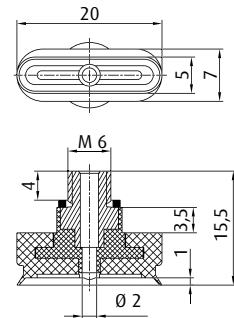
		see page
50.152	10 mm	444
50.153	20 mm	444

**Item no.**  
**130.20x5.119.\***

**Material**  
NBR (sw), SI (tr), BR-AS (sw)

0.9 mm

Additional sizes available are found on p. 152.



		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

**Item no.**  
**130.20x5.081.\***

**Material**  
NBR (sw), BR-AS (sw), SI (tr)

0.9 mm

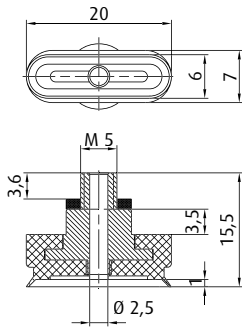
Additional sizes available are found on p. 152.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

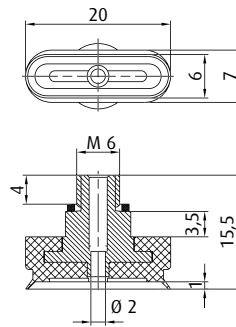
20x6 mm - 20x8 mm



		see page
	10 mm	444
	20 mm	444

**Item no. 130.20x6.120.\_\*** Material NBR (sw), SI (tr), BR-AS (sw) 0.9 mm

Additional sizes available are found on p. 152.



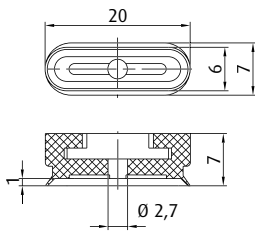
		see page
	20 mm	456
	30 mm	456
	40 mm	456
	50 mm	456

**Item no. 130.20x6.074.\_\*** Material NBR (sw), BR-AS (sw), SI (tr) 0.9 mm

Additional sizes available are found on p. 152.

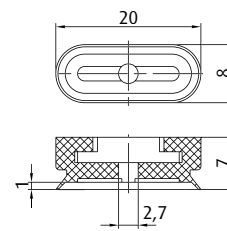
Spare cup

Spare cup



	Connection	see page
	M5-male	412
	M6-male	413

**Item no. 132.20x6.013.\_\*** Material NBR (sw), BR-AS (sw), SI (tr) 0.9 mm

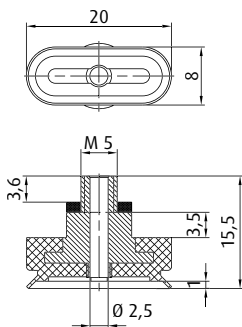


	Connection	see page
	M5-male	412
	M6-male	413

**Item no. 132.20x8.015.\_\*** Material NBR (sw), BR-AS (sw), SI (tr) 0.9 mm

Spare cup

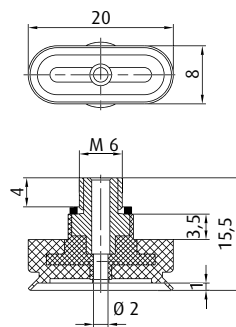
Spare cup



		see page
	10 mm	444
	20 mm	444

**Item no. 130.20x8.121.\_\*** Material NBR (sw), SI (tr), BR-AS (sw) 0.9 mm

Additional sizes available are found on p. 152.

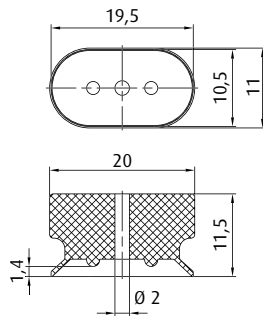


		see page
	20 mm	456
	30 mm	456
	40 mm	456
	50 mm	456

**Item no. 130.20x8.076.\_\*** Material NBR (sw), BR-AS (sw), SI (tr) 0.9 mm

Additional sizes available are found on p. 152.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout. Average holding forces for Vacuum cups you will find on page 760

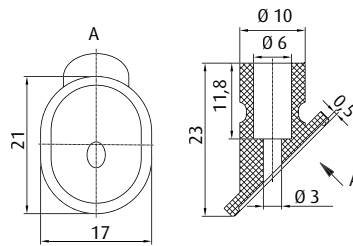


	Connection	see page
270.022	M5-male	409

**Item no.**  
132.20X11.077.\_\*

**Material**  
SI (tr)

1.5 mm

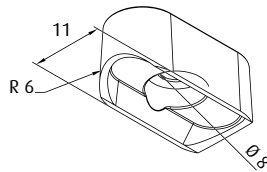


	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**Item no.**  
132.21x17.047.\_\*

**Material**  
NR (sw)

0 mm



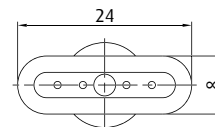
	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

**Item no.**  
9.23x11.036.\_\*

**Material**  
SI (tr)

0 mm

Additional sizes available are found on p. 154.  
**Notes:** Suitable for cylindrical products diam. 10-18 mm



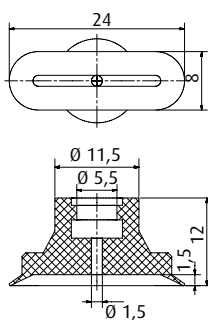
	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
132.24x8.016.\_\*

**Material**  
NBR (gr), SI (tr), NR (bg), PU (bl)

1 mm

Additional sizes available are found on p. 141.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



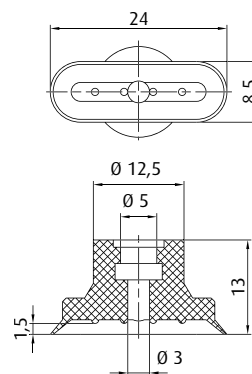
	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
132.24x8.083.\_\*

**Material**  
Thermalon® (bl)

1 mm

Additional sizes available are found on p. 144.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.431	G1/8-male	418

**Item no.**  
132.24x8.066.\_\*

**Material**  
HNBR (ge)

1 mm

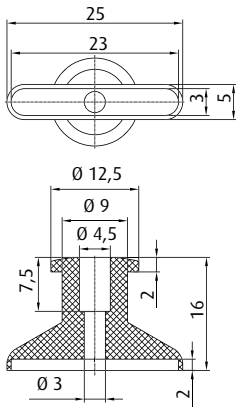
Additional sizes available are found on p. 146.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

25x5 mm - 30x5 mm

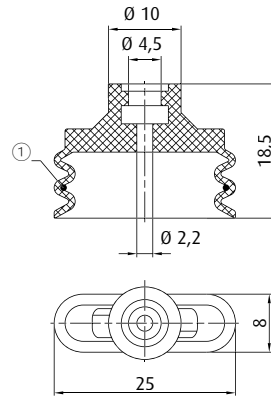


	Connection	see page
270.013	M5-male	410
270.005	M5-female	412
270.103	M6-male	413
270.003	G1/8-male	416
270.015	G1/8-female	421
270.194	G1/4-male	425

**Item no.**  
132.25x5.045.\_\*

**Material**  
Vinyl (bl)

0 mm



	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

① = Wire strap stiffening

**BESTSELLER**

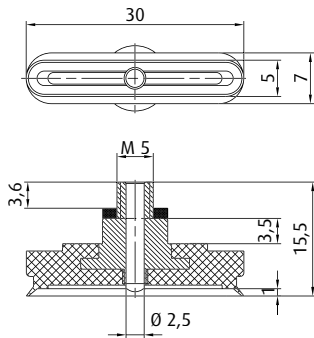
**Item no.**  
138.25x8.002.\_\*

**Material**  
NBR (gr), SI (tr)

6 mm

Additional sizes available are found on p. 148.

**Ordering notes:** Use of a gripper clamp (available separately) recommended.



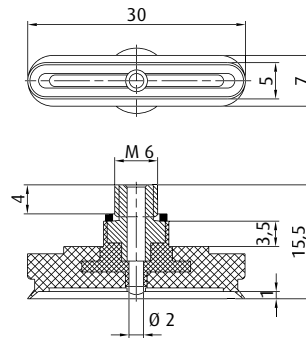
		see page
50.152	10 mm	444
50.153	20 mm	444

**Item no.**  
130.30x5.123.\_\*

**Material**  
NBR (sw), SI (tr), BR-AS (sw)

0.9 mm

Additional sizes available are found on p. 152.



		see page
50.095	20 mm	456
50.096	30 mm	456
50.097	40 mm	456
50.098	50 mm	456

**Item no.**  
130.30x5.072.\_\*

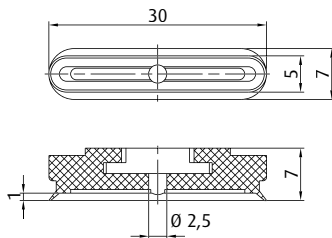
**Material**  
NBR (sw), BR-AS (sw), SI (tr)

0.9 mm

Additional sizes available are found on p. 152.

Spare cup

Spare cup



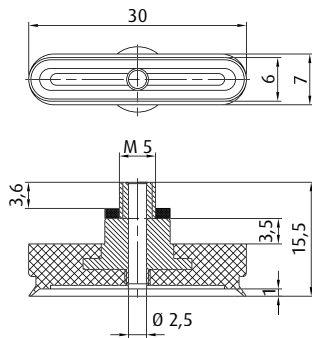
	Connection	see page
270.464	M5-male	412
270.340	M6-male	413

**Item no.**  
132.30x5.010.\_\*

**Material**  
NBR (sw), BR-AS (sw), SI (tr)

0.9 mm

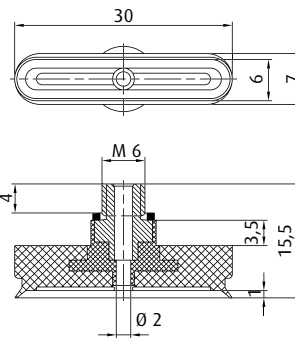
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



			see page
<b>50.152</b>	10 mm		444
<b>50.153</b>		20 mm	444

<b>Item no.</b> <b>130.30x6.124._*</b>	<b>Material</b> NBR (sw), SI (tr), BR-AS (sw)	0.9 mm
---	--	--------

Additional sizes available are found on p. 152.



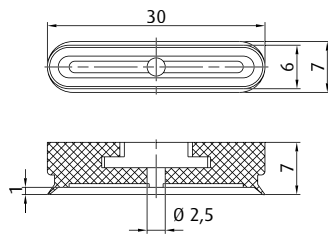
					see page
<b>50.095</b>	20 mm				456
<b>50.096</b>		30 mm			456
<b>50.097</b>			40 mm		456
<b>50.098</b>				50 mm	456

<b>Item no.</b> <b>130.30x6.075._*</b>	<b>Material</b> NBR (sw), BR-AS (sw), SI (tr)	0.9 mm
---	--	--------

Additional sizes available are found on p. 152.

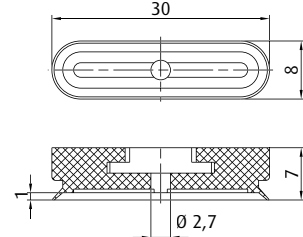
Spare cup

Spare cup



	Connection	see page
<b>270.464</b>	M5-male	412
<b>270.340</b>	M6-male	413

<b>Item no.</b> <b>132.30x6.014._*</b>	<b>Material</b> NBR (sw), BR-AS (sw), SI (tr)	0.9 mm
---	--	--------

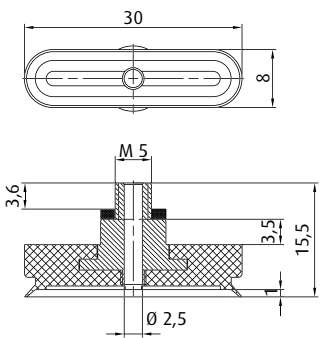


	Connection	see page
<b>270.464</b>	M5-male	412
<b>270.340</b>	M6-male	413

<b>Item no.</b> <b>132.30x8.017._*</b>	<b>Material</b> NBR (sw), BR-AS (sw), SI (tr)	0.9 mm
---	--	--------

Spare cup

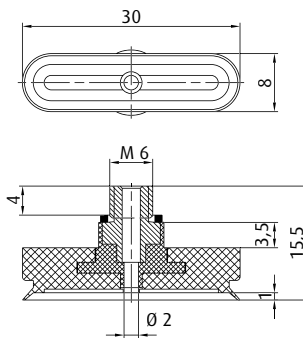
Spare cup



			see page
<b>50.152</b>	10 mm		444
<b>50.153</b>		20 mm	444

<b>Item no.</b> <b>130.30x8.125._*</b>	<b>Material</b> NBR (sw), SI (tr), BR-AS (sw)	0.9 mm
---	--	--------

Additional sizes available are found on p. 152.



					see page
<b>50.095</b>	20 mm				456
<b>50.096</b>		30 mm			456
<b>50.097</b>			40 mm		456
<b>50.098</b>				50 mm	456

<b>Item no.</b> <b>130.30x8.077._*</b>	<b>Material</b> NBR (sw), BR-AS (sw), SI (tr)	0.9 mm
---	--	--------

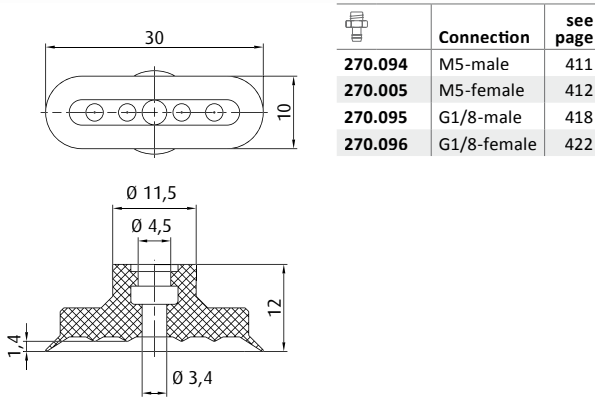
Additional sizes available are found on p. 152.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

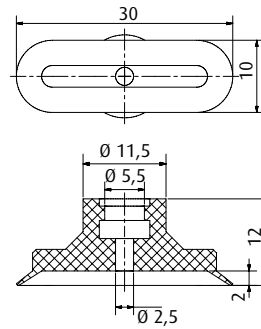
30x10 mm - 36x12 mm



	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
**132.30x10.018.\_\*** **Material**  
NBR (gr), SI (tr), PU (bl) 2 mm

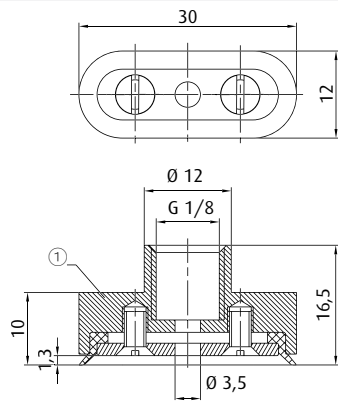
Additional sizes available are found on p. 141.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.094	M5-male	411
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
**132.30x10.084.\_\*** **Material**  
Thermalon® (bl) 1 mm

Additional sizes available are found on p. 144.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.

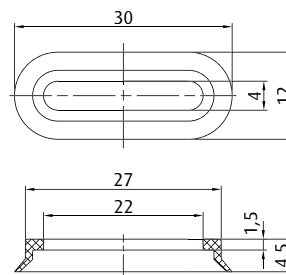


① = Aluminium

**Item no.**  
**130.30x12.057.\_\*** **Material**  
SI (tr), NR (sw) 1 mm

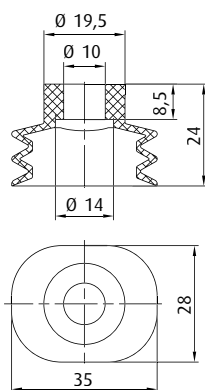
Additional sizes available are found on p. 157.

Spare cup



	Connection	see page
270.439	G1/8-female	424

**Item no.**  
**132.30x12.025.\_\*** **Material**  
SI (tr), NR (sw) 1 mm

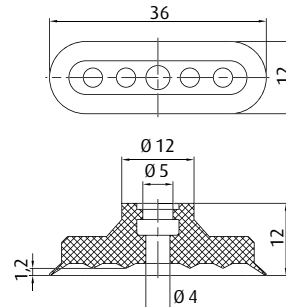


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

**BESTSELLER**

**Item no.**  
**138.35x28.001.\_\*** **Material**  
Vinyl (bl) 9 mm

Additional sizes available are found on p. 149.



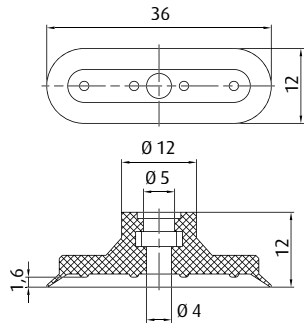
	Connection	see page
270.094	M5-male	411
270.005	M5-female	412
270.095	G1/8-male	418
270.096	G1/8-female	422

**Item no.**  
**132.36x12.019.\_\*** **Material**  
NBR (gr), SI (tr), PU (bl) 2 mm

Additional sizes available are found on p. 141.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





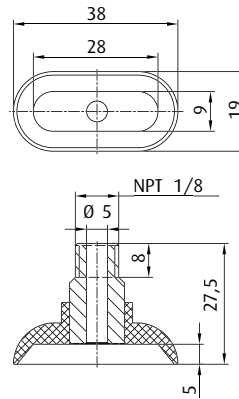
Connection	see page
G1/8-male	418

**Item no.**  
**132.36x12.068\_\***

**Material**  
HNBR (ge)

2 mm

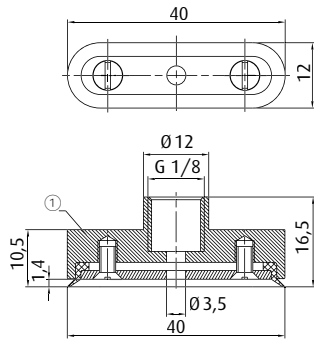
Additional sizes available are found on p. 146.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



**Item no.**  
**130.38x19.085\_\***

**Material**  
Vinyl (bl)

0 mm



① = Aluminium

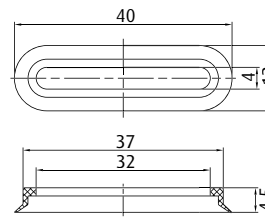
**Item no.**  
**130.40x12.058\_\***

**Material**  
SI (tr), NR (sw)

1 mm

Additional sizes available are found on p. 157.

Spare cup

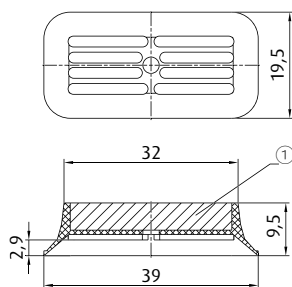


Connection	see page
G1/8-female	424

**Item no.**  
**132.40x12.027\_\***

**Material**  
SI (tr), NR (sw)

1 mm



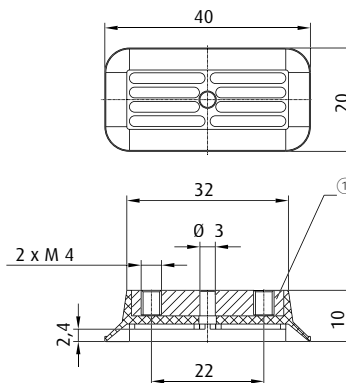
① = Steel

**Item no.**  
**9.40x20.041\_\***

**Material**  
NBR (gr), SI (tr), PU (bg)

2 mm

**Ordering notes:** Customised drilling patterns on request



① = Steel

**Item no.**  
**9.40x20.057\_\***

**Material**  
SI (tr)

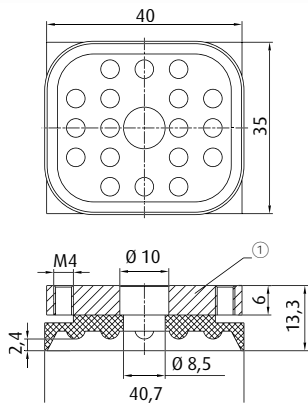
2 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

40x35 mm - 45x15 mm

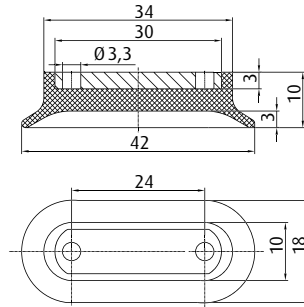


① = Steel

**Item no.**  
155.40x35.004.\_\*

**Material**  
NBR (gr)

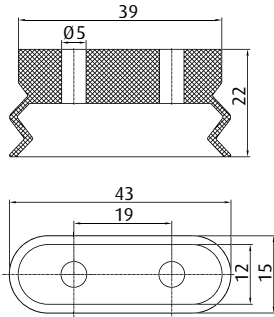
2.5 mm



**Item no.**  
130.42x18.037.\_\*

**Material**  
SI (tr)

2.5 mm

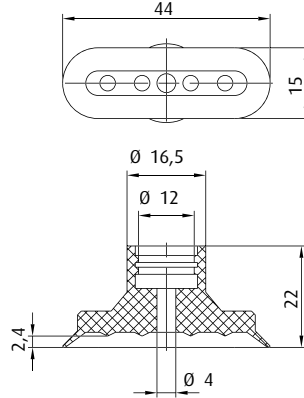


	Connection	see page
270.013	M5-male	410

**Item no.**  
138.43x15.001.\_\*

**Material**  
Vinyl (bl)

8 mm



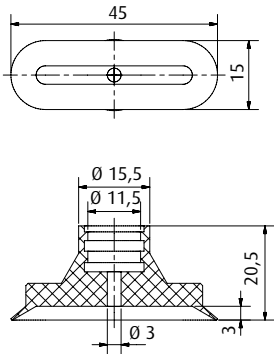
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
132.45x15.020.\_\*

**Material**  
NBR (gr), SI (tr), PU (bl)

3 mm

Additional sizes available are found on p. 141.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



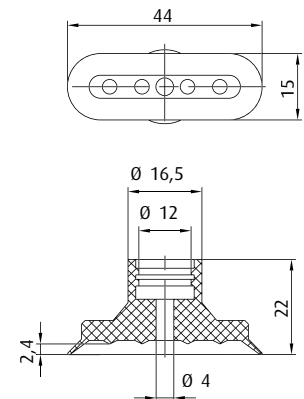
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
132.45x15.085.\_\*

**Material**  
Thermalon® (bl)

2 mm

Additional sizes available are found on p. 144.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

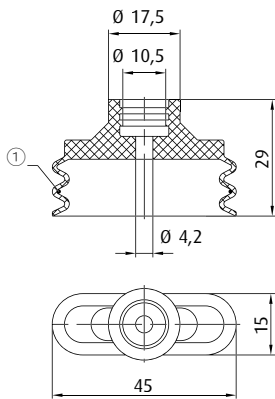
**Item no.**  
132.45x15.064.\_\*

**Material**  
HNBR (ge)

3 mm

Additional sizes available are found on p. 146.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

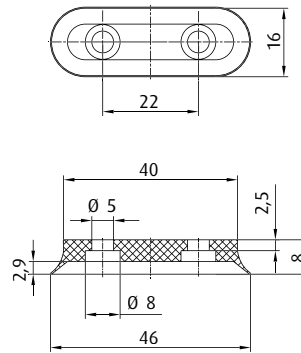


	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

① = Wire strap stiffening

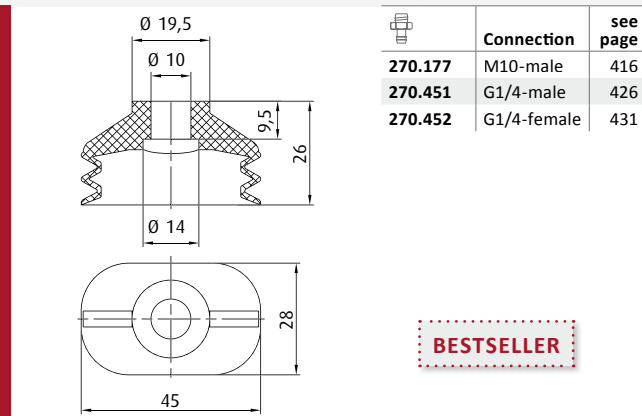
<b>Item no.</b> 138.45x15.003.*	<b>Material</b> NBR (gr), SI (tr)	8 mm
------------------------------------	--------------------------------------	------

Additional sizes available are found on p. 148.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



	Connection	see page
270.310	M5-male	411
270.493	G1/8-male	420
270.494	G1/8-female	423

<b>Item no.</b> 9.45x15.038.*	<b>Material</b> NBR (sw), SI (tr)	3 mm
----------------------------------	--------------------------------------	------

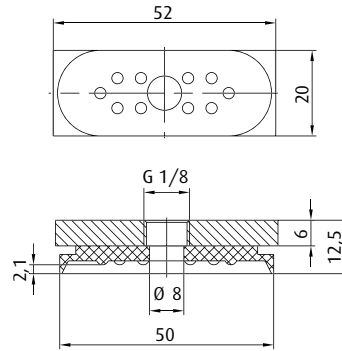


	Connection	see page
270.177	M10-male	416
270.451	G1/4-male	426
270.452	G1/4-female	431

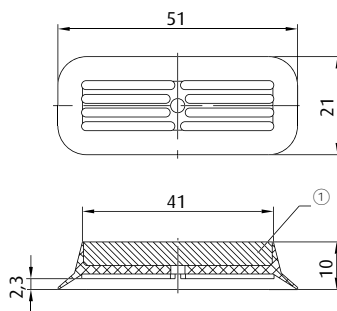
**BESTSELLER**

<b>Item no.</b> 138.45x28.013.*	<b>Material</b> Vinyl (bl)	9 mm
------------------------------------	-------------------------------	------

Additional sizes available are found on p. 149.



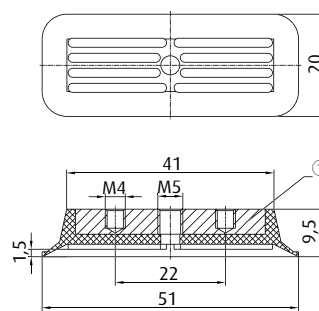
<b>Item no.</b> 130.50x20.102.*	<b>Material</b> NBR (gr)	3 mm
------------------------------------	-----------------------------	------



① = Steel

<b>Item no.</b> 9.50x20.001.*	<b>Material</b> NBR (gr), SI (tr)	2 mm
----------------------------------	--------------------------------------	------

**Ordering notes:** Customised drilling patterns on request



① = Aluminium

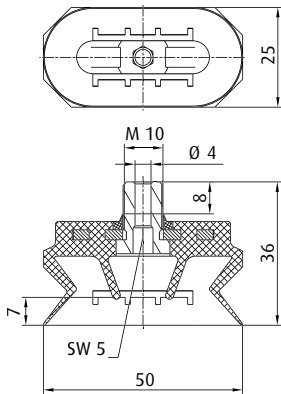
<b>Item no.</b> 9.50x20.034.*	<b>Material</b> NBR (gr), SI (tr)	2 mm
----------------------------------	--------------------------------------	------

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

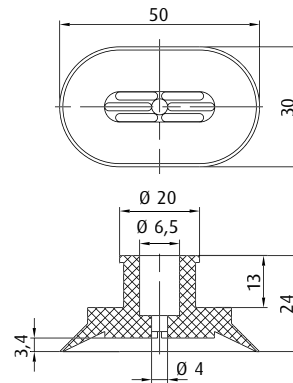
50x25 mm - 60x20 mm



**Item no.**  
130.50x25.094.\*

**Material**  
NBR (sw), SI (tr)

8 mm



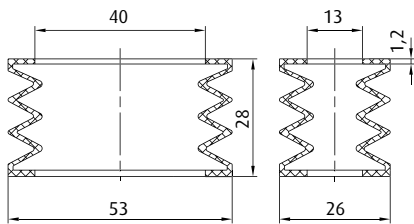
**Item no.**  
132.50x30.030.\*

**Material**  
NBR (gr), SBR (br)

5 mm

	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

	Connection	see page
270.508	G1/8-female	439

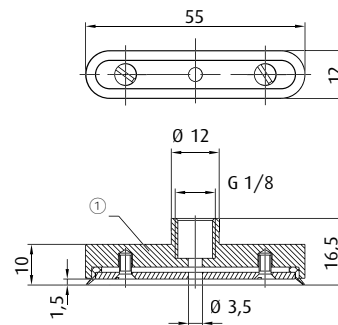


**Item no.**  
209.52x25.006.\*

**Material**  
SI (tr)

13 mm

Additional sizes available are found on p. 150.  
**Ordering notes:** On request, available with wire reinforcement



① = Aluminium

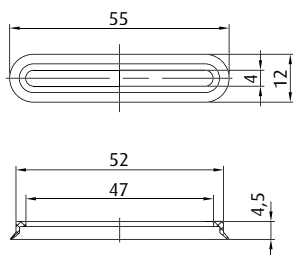
**Item no.**  
130.55x12.082.\*

**Material**  
NBR (sw), SI (tr), NR (sw)

1 mm

Additional sizes available are found on p. 157.

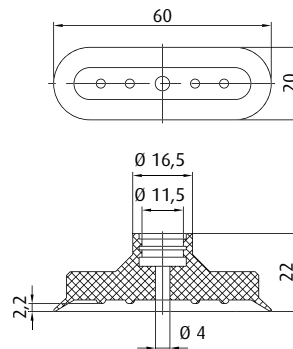
	Connection	see page
270.441	G1/8-female	424



**Item no.**  
132.55x12.029.\*

**Material**  
NBR (sw), SI (tr), NR (sw)

1 mm



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

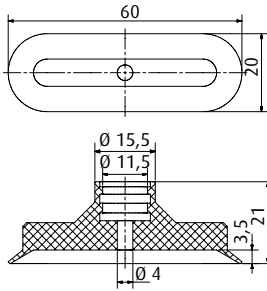
**Item no.**  
132.60x20.022.\*

**Material**  
NBR (gr), SI (tr), PU (bg)

3 mm

Additional sizes available are found on p. 141.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

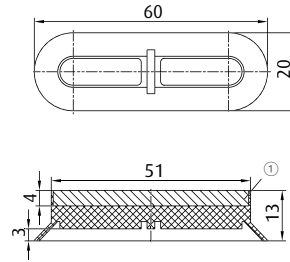
**Item no.**  
132.60x20.086.\*

**Material**  
Thermalon® (bl)

2.5 mm

Additional sizes available are found on p. 144.

**Ordering notes:** Use of a gripper clamp (available separately) recommended.



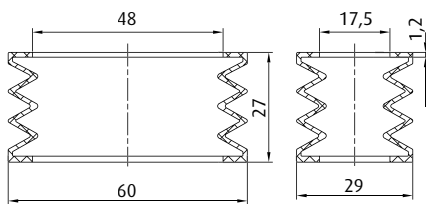
① = Steel

**Item no.**  
9.60x20.003.\*

**Material**  
SBR (sw), NR (bg)

4 mm

**Ordering notes:** Customised drilling patterns on request



	Connection	see page
270.509	G1/4-female	439

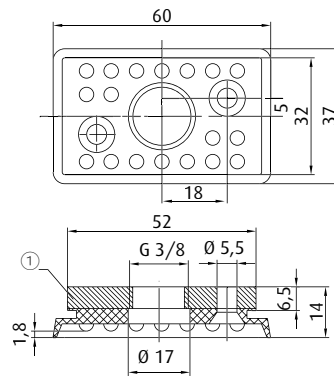
**Item no.**  
209.60x29.001.\*

**Material**  
NBR (sw), SI (tr)

13 mm

Additional sizes available are found on p. 150.

**Ordering notes:** On request, available with wire reinforcement

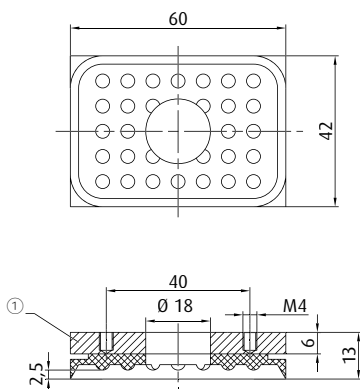


① = Aluminium

**Item no.**  
130.60x38.091.\*

**Material**  
NBR (gr)

2 mm

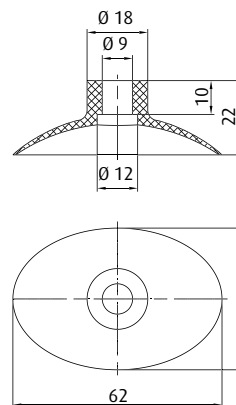


① = Steel

**Item no.**  
155.60x42.005.\*

**Material**  
NBR (gr)

2.5 mm



PERFECT FOR SOAPS

**Item no.**  
130.62x42.111.\*

**Material**  
Vulkollan® (br)

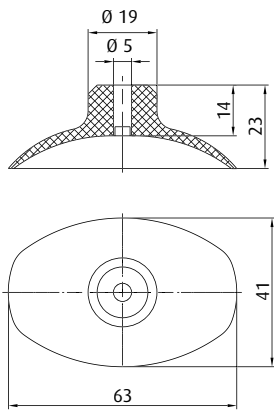
7 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

63x41 mm - 75x25 mm



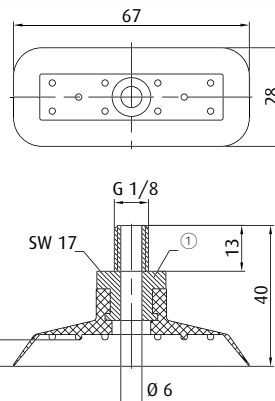
	Connection	see page
270.443	M5-male	410
270.238	G1/8-male	417
270.110	G1/8-female	422
270.534	G1/4-male	425

**PERFECT FOR SOAPS**

Item no.  
**132.60x42.052.\_\***

Material  
SI (g)

8 mm

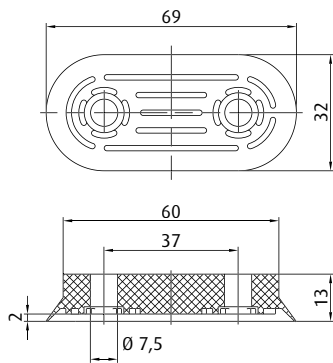


① = Aluminium

Item no.  
**130.67x28.104.\_\***

Material  
Vulkollan® (br)

7 mm

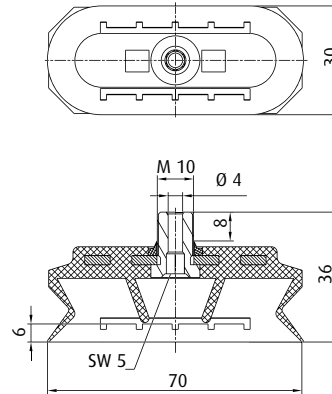


	Connection	see page
270.312/19	M6-male	414
270.030	G1/8-male	419
270.019	G1/8-female	423

Item no.  
**132.69x32.060.\_\***

Material  
NR (bg)

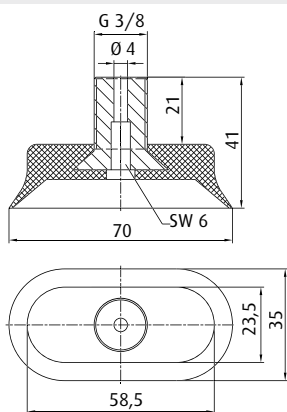
2 mm



Item no.  
**130.70x30.095.\_\***

Material  
NBR (sw)

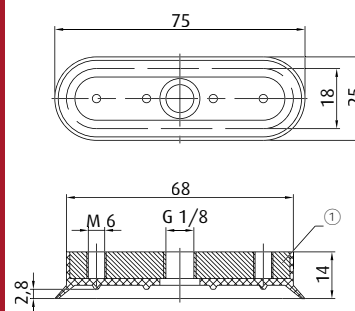
8 mm



Item no.  
**130.70x35.089.\_\***

Material  
NR (sw)

6 mm



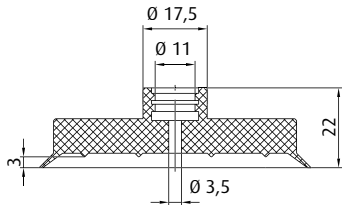
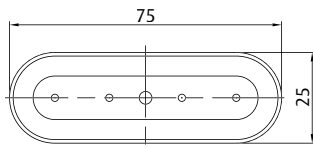
① = Aluminium

Item no.  
**130.75x25.080.\_\***

Material  
NBR (sw), SI (r)

3 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



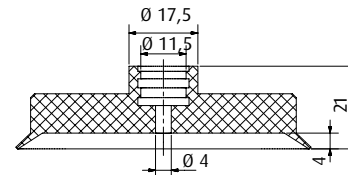
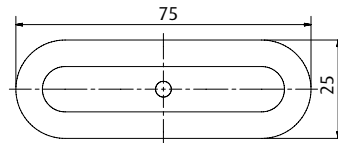
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
132.75x25.023.\*

**Material**  
NBR (gr), SI (tr)

3 mm

Additional sizes available are found on p. 141.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



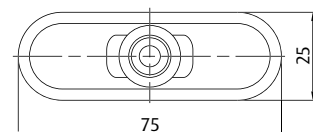
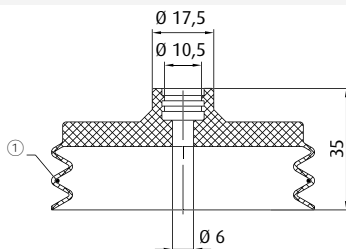
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
132.75x25.087.\*

**Material**  
Thermalon® (bl)

2.5 mm

Additional sizes available are found on p. 144.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



① = Wire strap stiffening

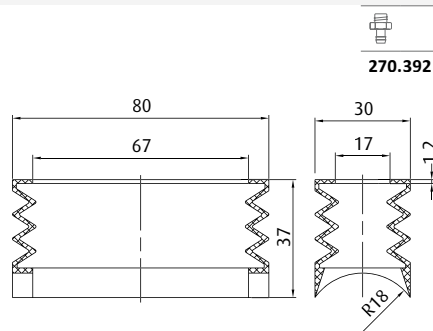
	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

**Item no.**  
138.75x25.004.\*

**Material**  
NBR (gr), SI (tr)

11 mm

Additional sizes available are found on p. 148.  
**Ordering notes:** Use of a gripper clamp (available separately) recommended.



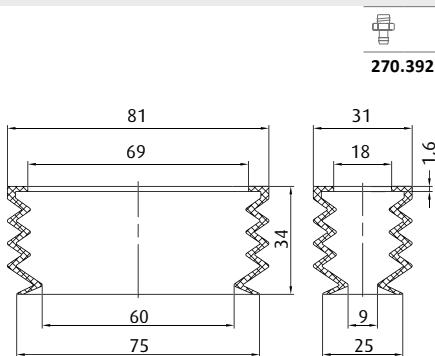
	Connection	see page
270.392	G1/4-female	439

**Item no.**  
201.79x29.002.\*

**Material**  
SI (tr)

16 mm

Additional sizes available are found on p. 150.  
**Ordering notes:** On request, available with wire reinforcement



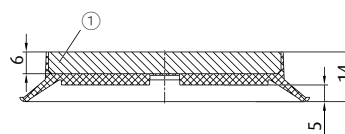
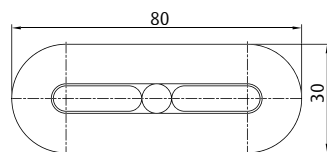
	Connection	see page
270.392	G1/4-female	439

**Item no.**  
209.80x30.003.\*

**Material**  
SI (tr)

20 mm

Additional sizes available are found on p. 150.  
**Ordering notes:** On request, available with wire reinforcement



① = Aluminium

**Item no.**  
9.80x30.004.\*

**Material**  
NR (br)

5 mm

**Ordering notes:** Customised drilling patterns on request

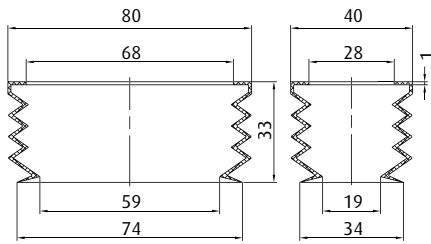
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

85x55 mm - 96x27 mm

	Connection	see page
270.510	G1/4-female	439



**Item no.**  
209.80x40.004.\*

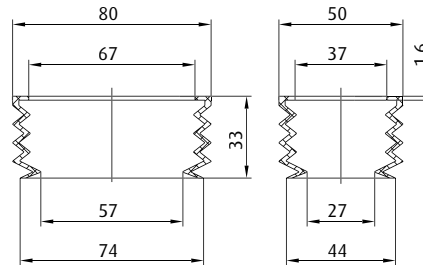
**Material**  
SI (tr)

20 mm

Additional sizes available are found on p. 150.

**Ordering notes:** On request, available with wire reinforcement

	Connection	see page
270.511	G1/4-female	439



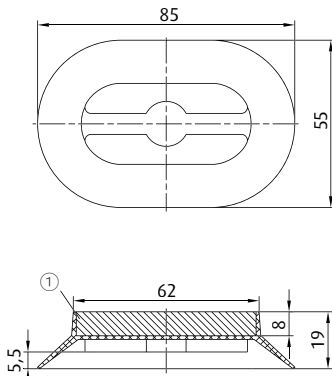
**Item no.**  
209.80x50.005.\*

**Material**  
SI (tr)

20 mm

Additional sizes available are found on p. 150.

**Ordering notes:** On request, available with wire reinforcement



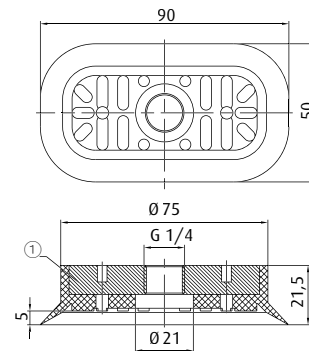
① = Aluminium

**Item no.**  
9.85x55.006.\*

**Material**  
NBR (gr), NR (bg)

7 mm

**Ordering notes:** Customised drilling patterns on request



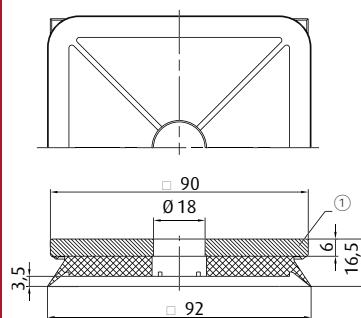
① = Aluminium

**Item no.**  
130.90x50.113.\*

**Material**  
NR (bg)

5 mm

Additional sizes available are found on p. 158.

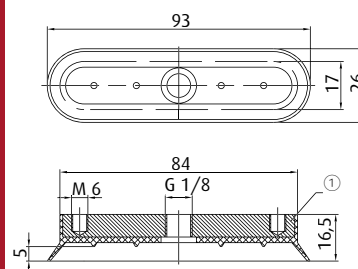


① = Steel

**Item no.**  
130.92x92.006.\*

**Material**  
NBR (gr)

3 mm



① = Aluminium

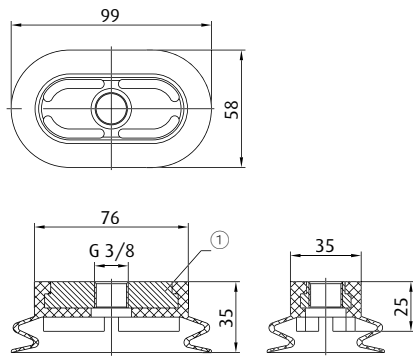
**Item no.**  
130.96x27.036.\*

**Material**  
SI (r)

6 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





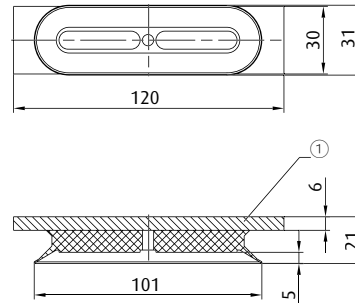
① = Aluminium

**Item no.**  
130.97x55.126.\_\*

**Material**  
Vinyl (bl)

11 mm

Additional sizes available are found on p. 149.



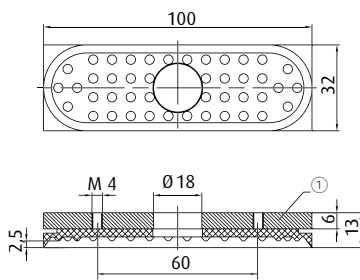
① = Steel

**Item no.**  
9.100x30.007.\_\*

**Material**  
NBR (gr), SBR (br)

5 mm

**Ordering notes:** Customised drilling patterns on request

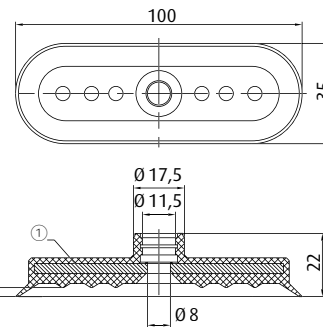


① = Aluminium

**Item no.**  
130.100x32.067.\_\*

**Material**  
NBR (gr)

2.5 mm



① = Aluminium

**Item no.**  
132.100x35.26.\_\*

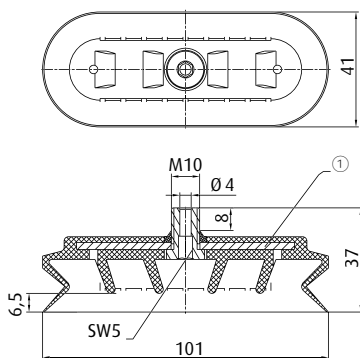
**Material**  
NBR (sw)

3 mm

Additional sizes available are found on p. 141.

**Ordering notes:** Use of a gripper clamp (available separately) recommended.

	Connection	see page
270.097	G1/4-male	426
270.098	G1/4-female	432

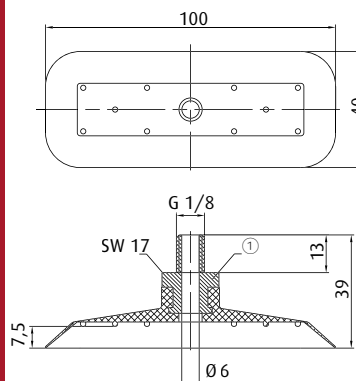


① = Steel

**Item no.**  
130.100x40.096.\_\*

**Material**  
NBR (sw), SI (tr)

8 mm



① = Aluminium

**Item no.**  
130.100x40.105.\_\*

**Material**  
Vulkollan® (br)

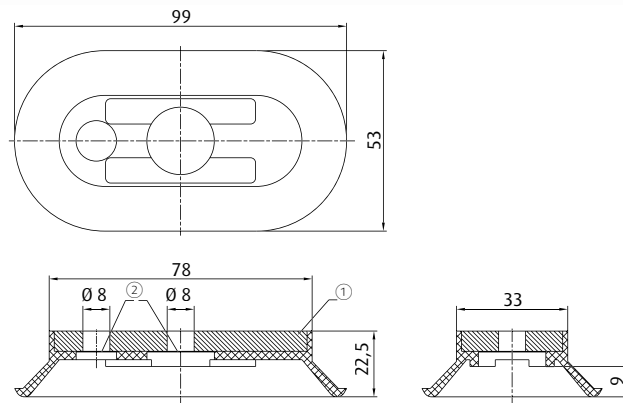
7 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

100x55 mm - 120x30 mm



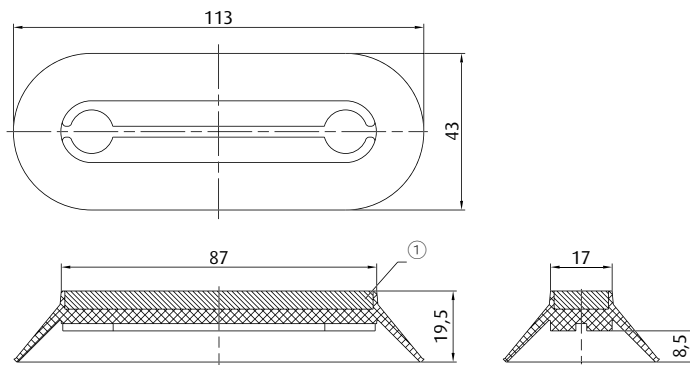
① = Aluminium ② = Sealed with rubber

**Item no.**  
9.100x55.020.\_\*

**Material**  
NR (or)

8 mm

Additional sizes available are found on p. 160.



① = Steel

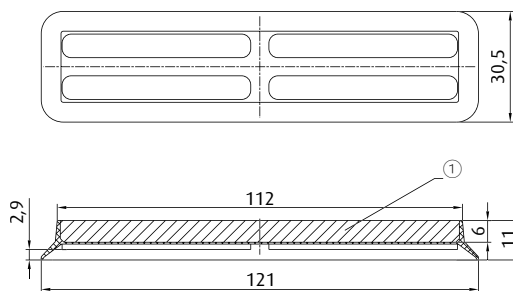
**Item no.**  
9.110x40.009.\_\*

**Material**  
NBR (gr), NR (br)

9 mm

Additional sizes available are found on p. 160.

**Ordering notes:** Version with aluminium carrier: 9.110x40.011.\_



① = Steel

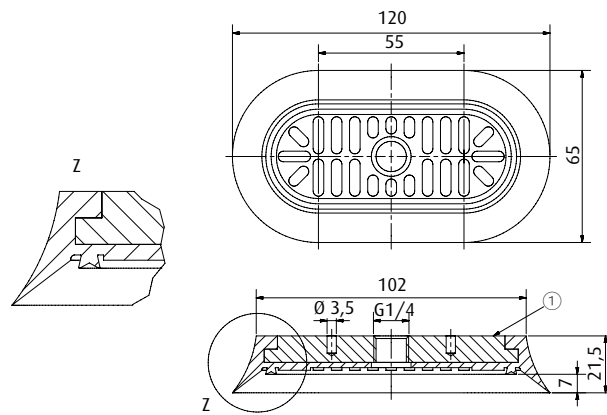
**Item no.**  
9.120x30.062.\_\*

**Material**  
NBR (gr)

3 mm

**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



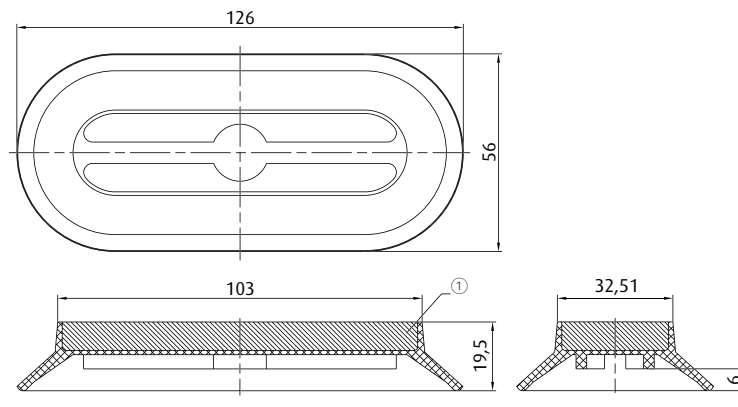
① = Aluminium

**Item no.**  
9.120x65.088.\_\*

**Material**  
NR (bg)

7 mm

Additional sizes available are found on p. 158.



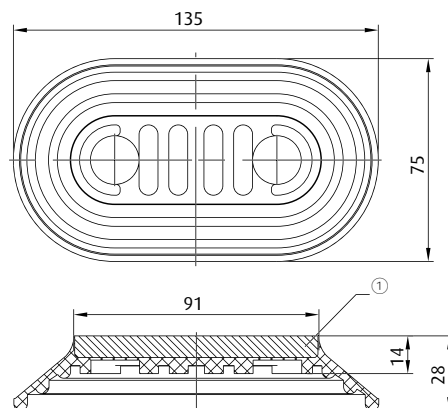
① = Steel

**Item no.**  
9.125x55.012.\_\*

**Material**  
NBR (gr), SBR (br), NR (br)

9 mm

Additional sizes available are found on p. 160.  
**Ordering notes:** Customised drilling patterns on request



① = Steel

**Item no.**  
9.135x75.066.\_\*

**Material**  
SBR (sw)

12 mm

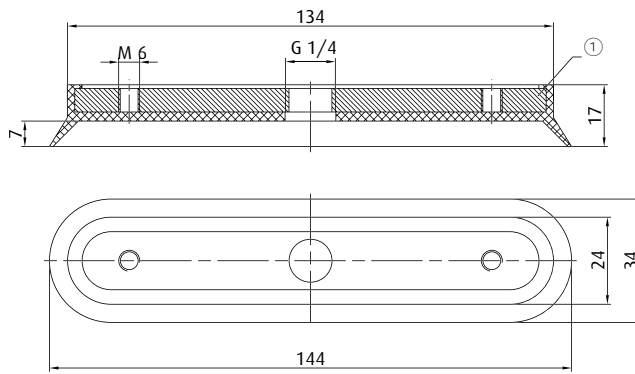
**Ordering notes:** Customised drilling patterns on request  
**Notes:** Especially well-suited for rough surfaces

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



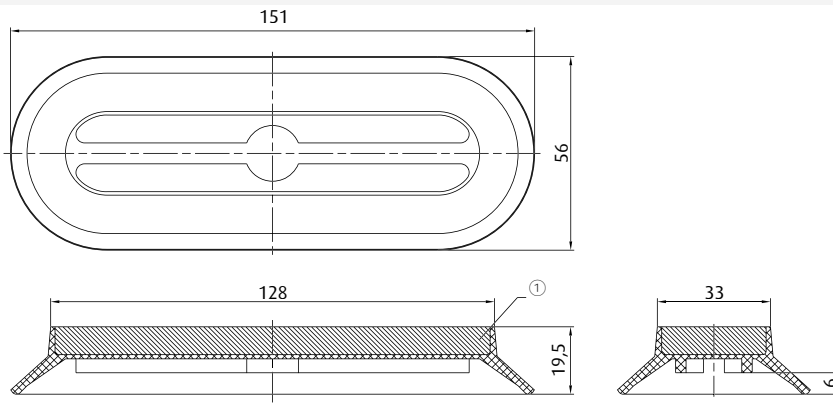
# Vacuum cups by size | Oval vacuum cups by size

145x34 mm - 150x55 mm



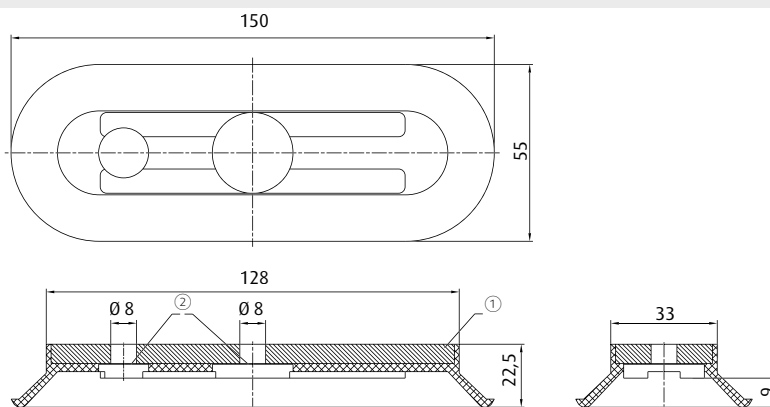
① = Aluminium

<b>Item no.</b> 130.145x34.55._*	<b>Material</b> NBR (sw), SI (r)	7 mm	
-------------------------------------	-------------------------------------	------	--



① = Steel

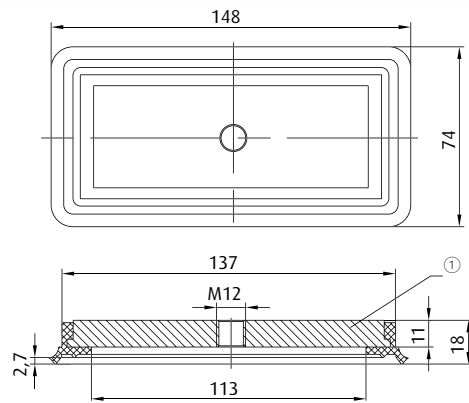
<b>Item no.</b> 9.150x55.013._*	<b>Material</b> NBR (gr)	7 mm	Additional sizes available are found on p. 160. <b>Ordering notes:</b> Customised drilling patterns on request
------------------------------------	-----------------------------	------	---



① = Aluminium ② = Sealed with rubber

<b>Item no.</b> 9.150x55.083._*	<b>Material</b> NR (or)	8 mm	Additional sizes available are found on p. 160.
------------------------------------	----------------------------	------	---

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

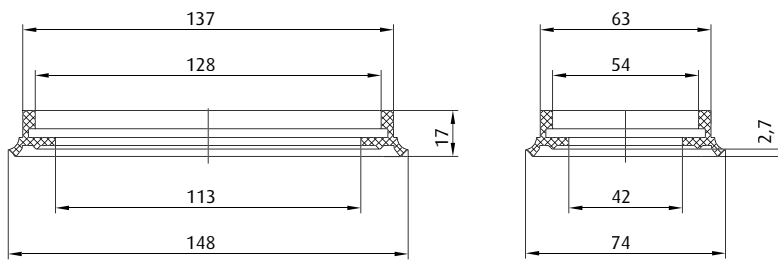


① = Aluminium

**Item no.**  
155.150x75.3.\*

**Material**  
NBR (sw)

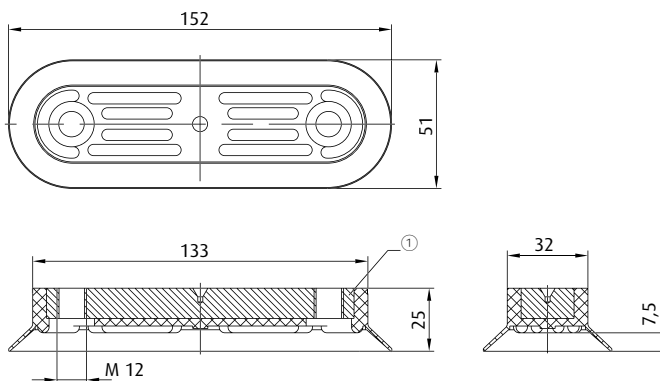
1.5 mm



**Item no.**  
216.150x75.3.\*

**Material**  
NBR (sw)

1.5 mm



① = Aluminium

**Item no.**  
130.152x51.092.\*

**Material**  
Vinyl (bl)

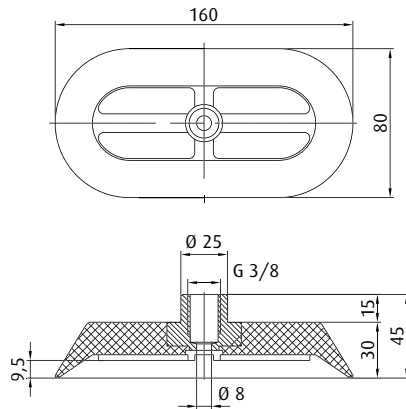
7 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

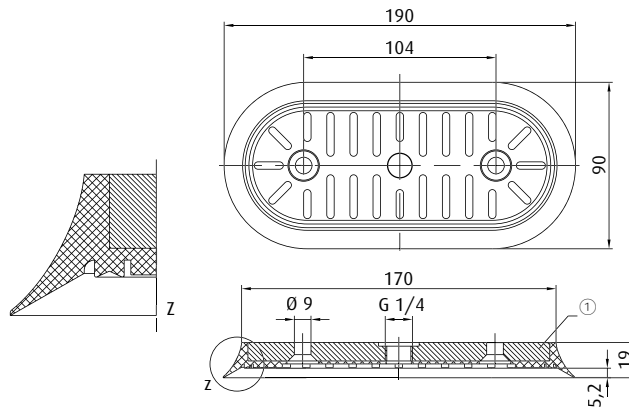
160x80 mm - 190x90 mm



**Item no.**  
9.160x80.075.\_\*

**Material**  
SBR (sw)

9 mm



**BESTSELLER**

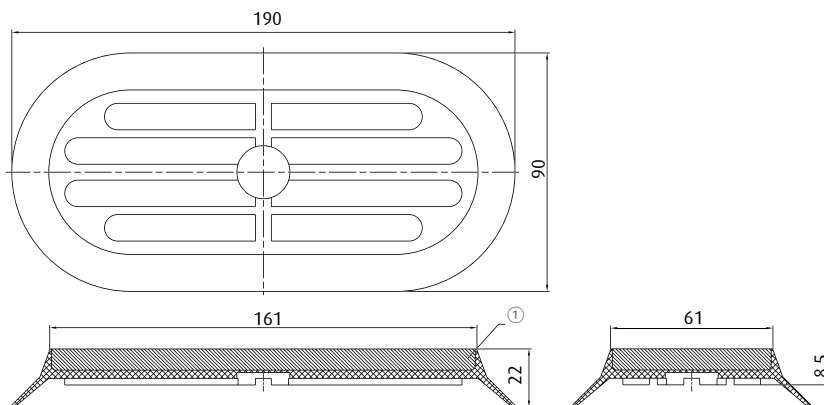
① = Aluminium

**Item no.**  
9.190x90.061.\_\*

**Material**  
NR (bg)

5.5 mm

Additional sizes available are found on p. 158.



① = Steel

**Item no.**  
9.200x100.015.\_\*

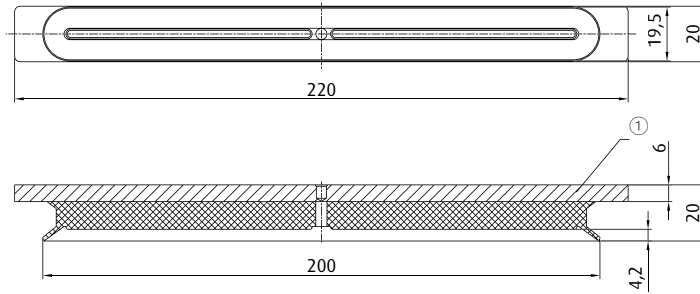
**Material**  
NBR (gr), SBR (sw), NR (br)

8 mm

Additional sizes available are found on p. 160.

**Ordering notes:** Version with aluminium carrier: 9.200x100.054.\_

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



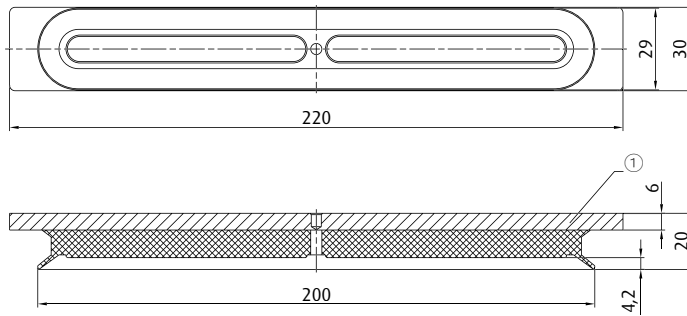
① = Steel

**Item no.**  
9.200x20.063.\_\*

**Material**  
NBR (gr)

5 mm

**Ordering notes:** Customised drilling patterns on request



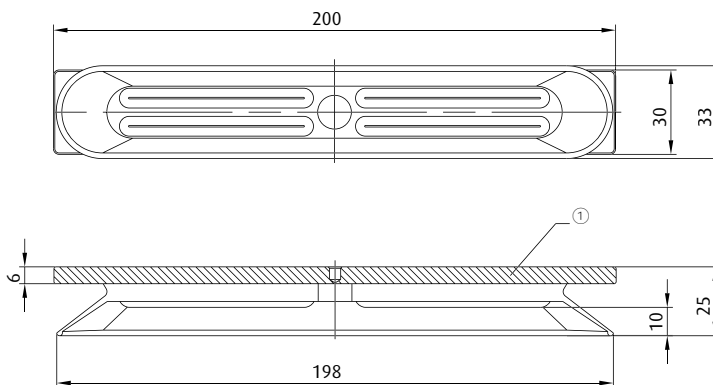
① = Steel

**Item no.**  
9.200x30.031.\_\*

**Material**  
SBR (br), NBR (gr)

4 mm

**Ordering notes:** Customised drilling patterns on request



① = Steel

**Item no.**  
9.200x35.065.\_\*

**Material**  
NBR (gr), PU (bg)

10 mm

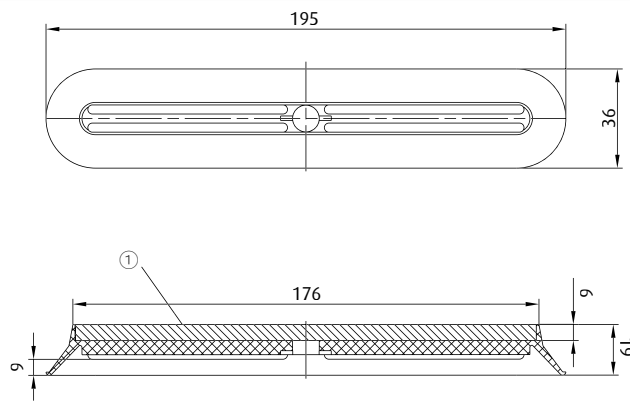
**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

200x40 mm - 200x55 mm



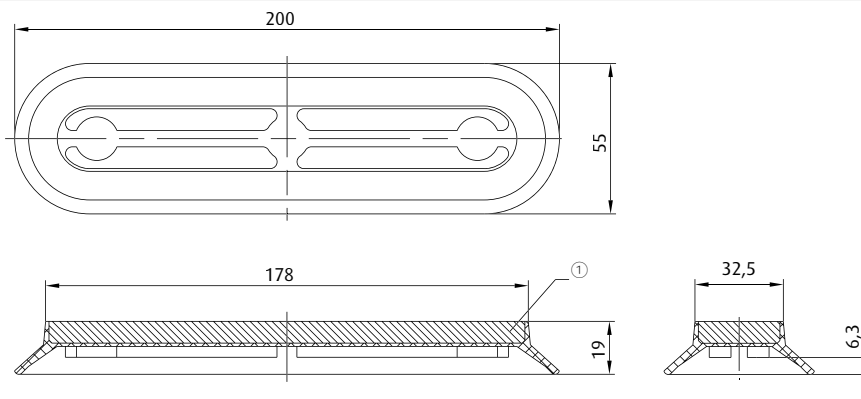
① = Steel

**Item no.**  
9.200x40.010.\_\*

**Material**  
SBR (br), NBR (gr)

9 mm

Additional sizes available are found on p. 160.  
**Ordering notes:** Version with aluminium carrier: 9.200x40.030.\_\* on request  
customised drilling patterns available



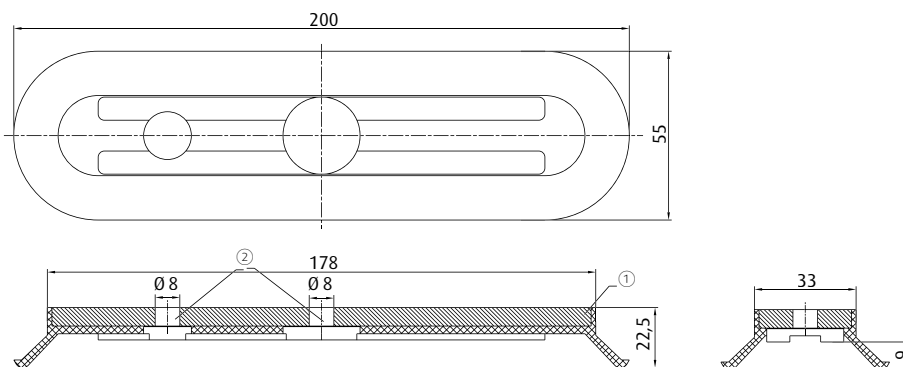
① = Steel

**Item no.**  
9.200x55.014.\_\*

**Material**  
NBR (gr)

7 mm

Additional sizes available are found on p. 160.  
**Ordering notes:** Customised drilling patterns on request



① = Aluminium ② = Sealed with rubber

**Item no.**  
9.200x55.020.\_\*

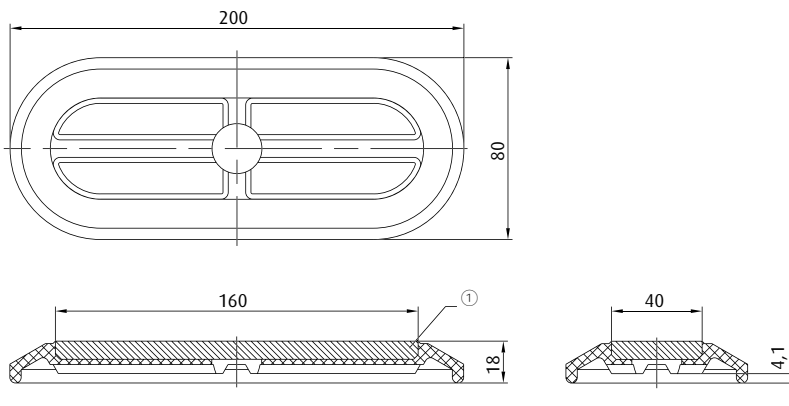
**Material**  
NR (or)

8 mm

Additional sizes available are found on p. 160.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





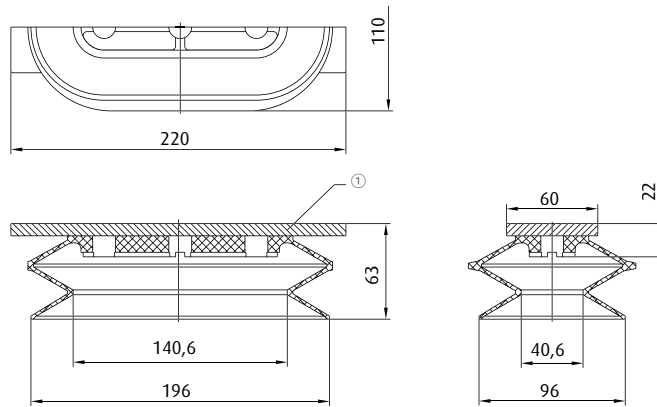
① = Steel

**Item no.**  
9.200x80.067.\_\*

**Material**  
SBR (sw)

4 mm

**Ordering notes:** Customised drilling patterns on request



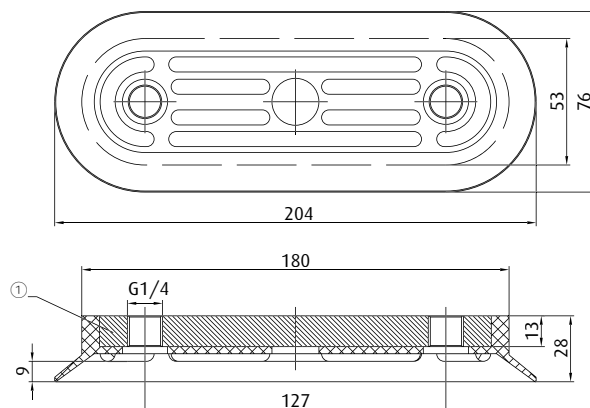
① = Aluminium

**Item no.**  
138.200x100.005.\_\*

**Material**  
SBR (br), NBR (gr)

41 mm

**Ordering notes:** With steel wire reinforcement in the fold:  
138.200x100.006.\_\* Customised drilling patterns on request



① = Aluminium

**Item no.**  
130.204x76.86.\_\*

**Material**  
Vinyl (bl)

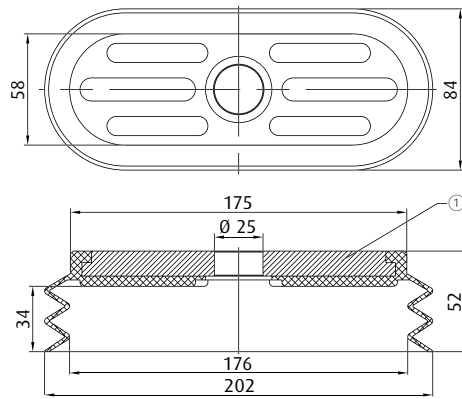
8 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



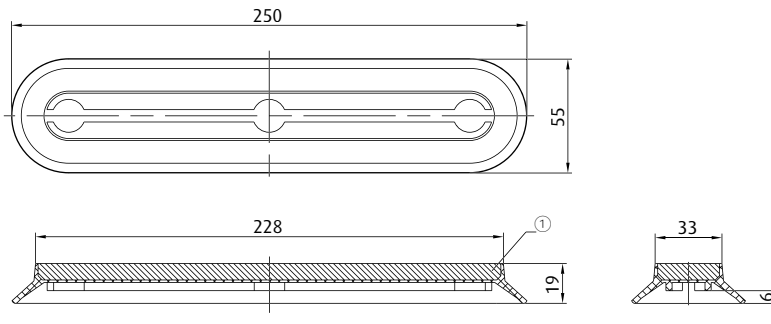
# Vacuum cups by size | Oval vacuum cups by size

205x82 mm - 250x80 mm



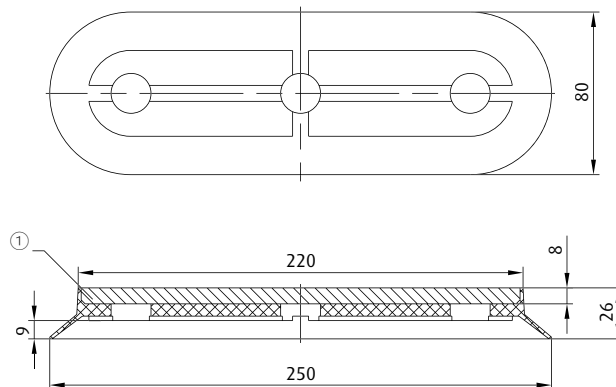
① = Aluminium

<b>Item no.</b> 137.205x82.1._*	<b>Material</b> Vinyl (bl)	25 mm	
------------------------------------	-------------------------------	-------	--



① = Steel

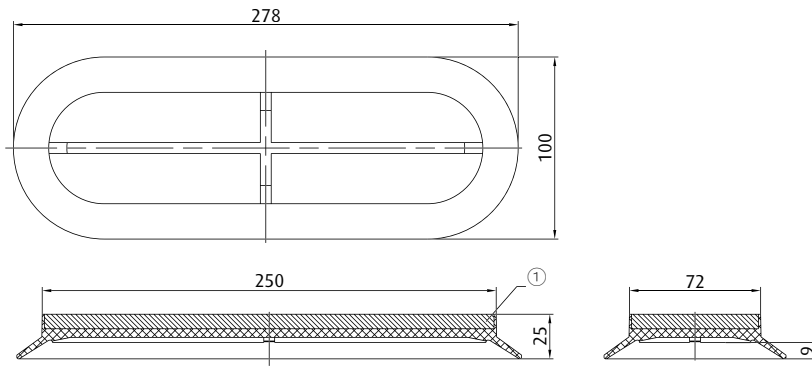
<b>Item no.</b> 9.250x55.016._*	<b>Material</b> NBR (gr), NR (br)	8 mm	Additional sizes available are found on p. 160. <b>Ordering notes:</b> Customised drilling patterns on request
------------------------------------	--------------------------------------	------	---



① = Steel

<b>Item no.</b> 9.250x80.033._*	<b>Material</b> NBR (gr), SBR (br), NR (br)	10 mm	<b>Ordering notes:</b> Customised drilling patterns on request
------------------------------------	--	-------	--

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



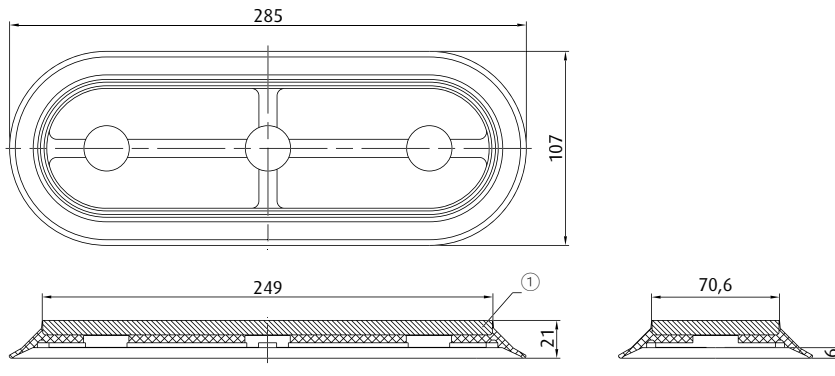
① = Steel

**Item no.**  
**9.280x100.017.\_\***

**Material**  
NBR (gr), SBR (br)

10 mm

Additional sizes available are found on p. 160.  
**Ordering notes:** Version with aluminium carrier: 9.280x100.018.\_\*



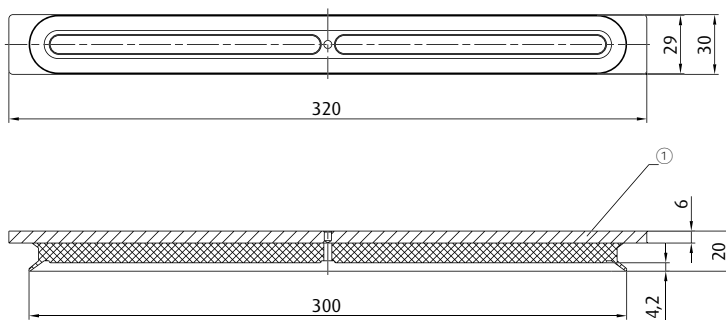
① = Steel

**Item no.**  
**9.280x107.070.\_\***

**Material**  
SBR (br)

6 mm

**Ordering notes:** Customised drilling patterns on request



① = Steel

**Item no.**  
**9.300x30.069.\_\***

**Material**  
NBR (gr)

5 mm

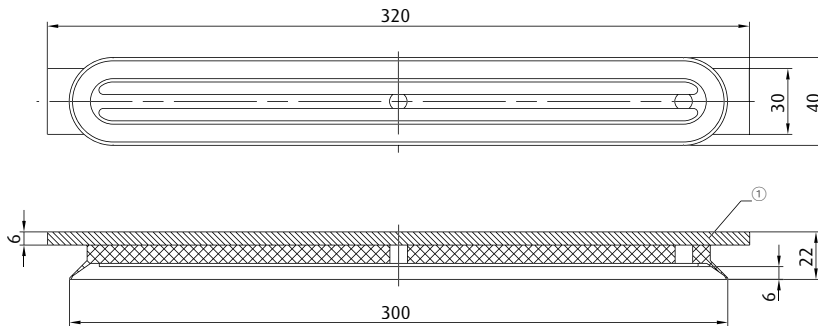
**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

300x40 mm - 300x55 mm



① = Steel

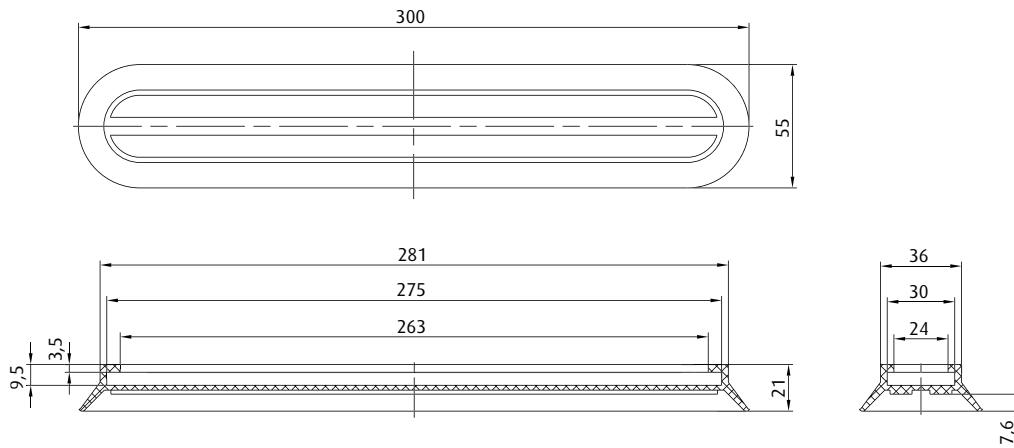
**Item no.**  
9.300x40.064.\_\*

**Material**  
NBR (gr)

7 mm

**Ordering notes:** Customised drilling patterns on request

	Connection	see page
270.332	Without	438

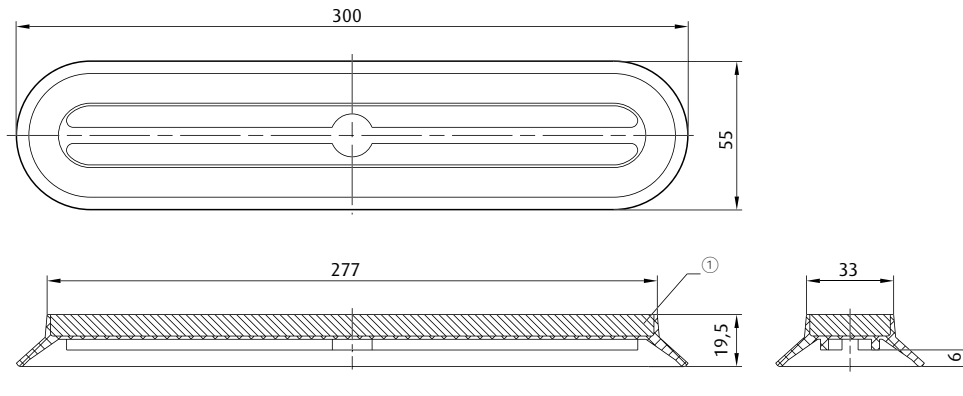


**Item no.**  
9.290x55.071.\_\*

**Material**  
NBR (gr)

7 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



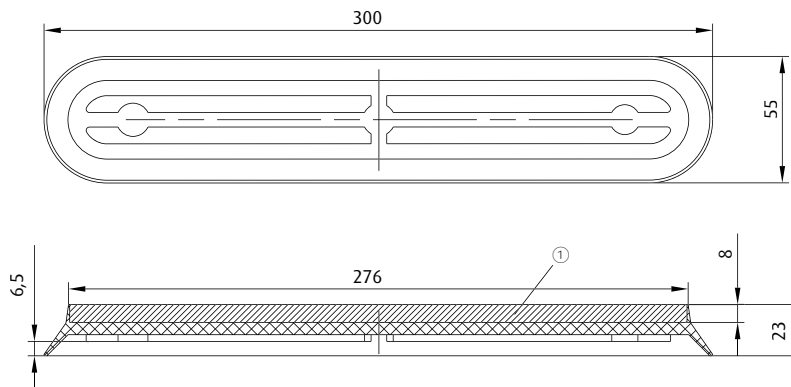
① = Steel

**Item no.**  
9.300x55.019.\_\*

**Material**  
NBR (gr)

8 mm

Additional sizes available are found on p. 160.  
**Ordering notes:** Customised drilling patterns on request



① = Aluminium

**Item no.**  
9.300x55.020.\_\*

**Material**  
NBR (gr)

8 mm

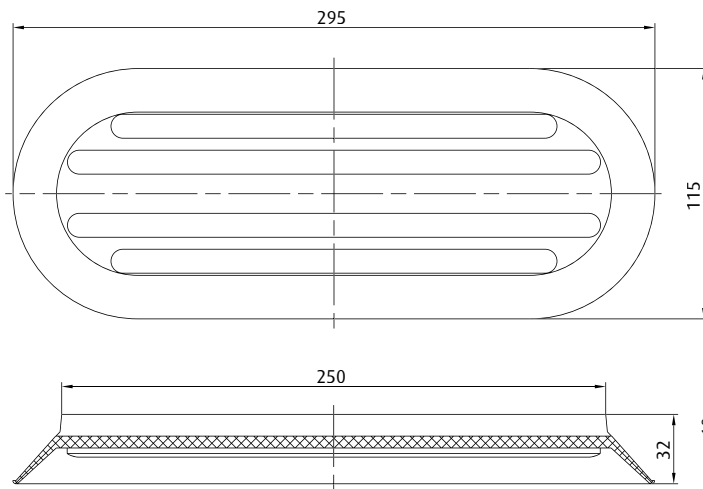
**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

300x55 mm - 300x115 mm



**DIVIDED CARRIER - SUITABLE FOR PIPES**

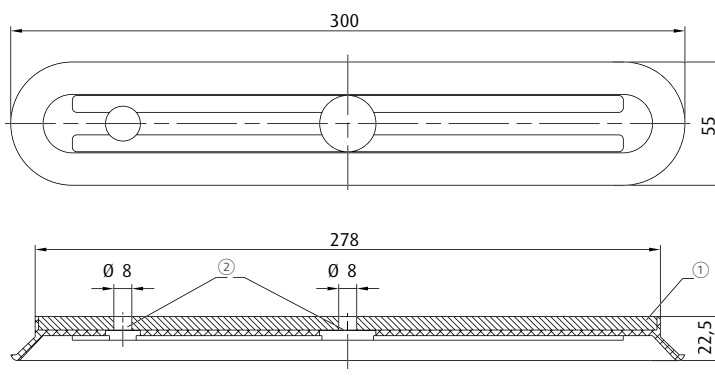
① = Steel beam divided (flexible)

**Item no.**  
**9.300x115.068.\_\***

**Material**  
NBR (gr)

14 mm

**Ordering notes:** Customised drilling patterns on request



① = Aluminium ② = Sealed with rubber

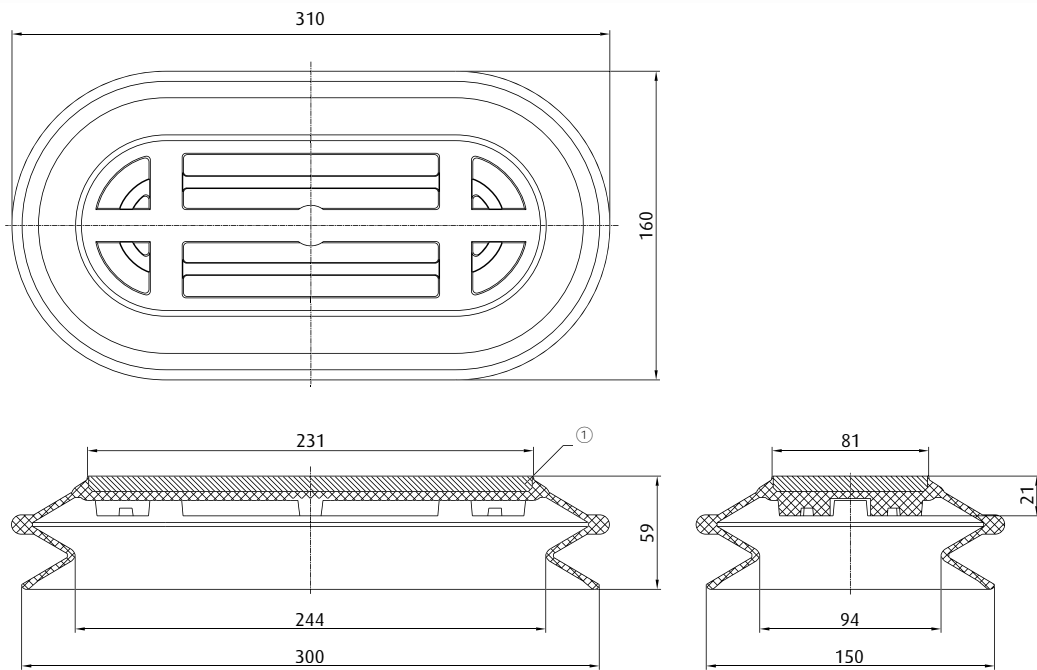
**Item no.**  
**9.300x55.046.\_\***

**Material**  
NR (or)

8 mm

Additional sizes available are found on p. 160.

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



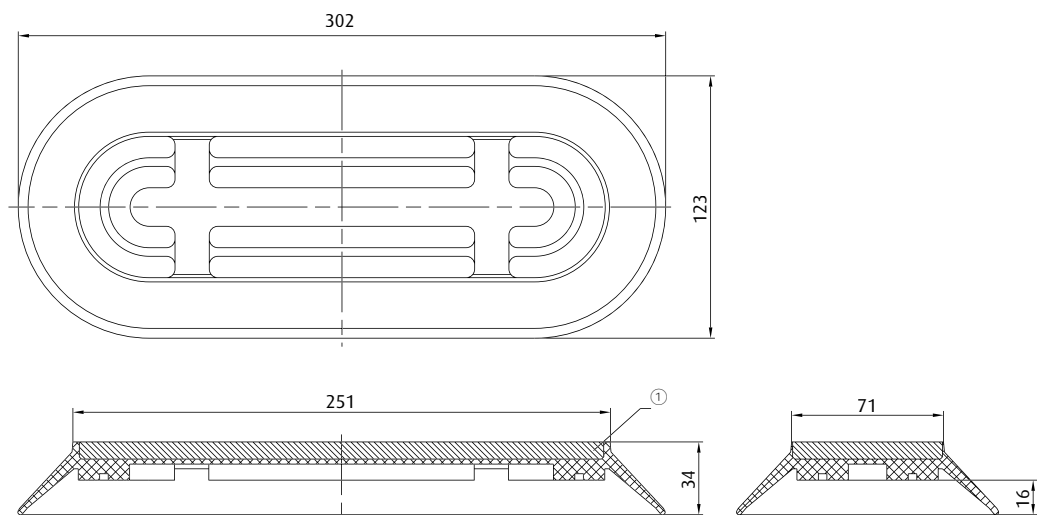
① = Steel

**Item no.**  
138.300x150.007.\_\*

**Material**  
SBR (br), NBR (gr)

39 mm

**Ordering notes:** With vulcanised metal reinforcement in the fold:  
138.300x150.008.\_\*



① = Steel

**Item no.**  
9.300x120.021.\_\*

**Material**  
NBR (gr), SBR (br)

17 mm

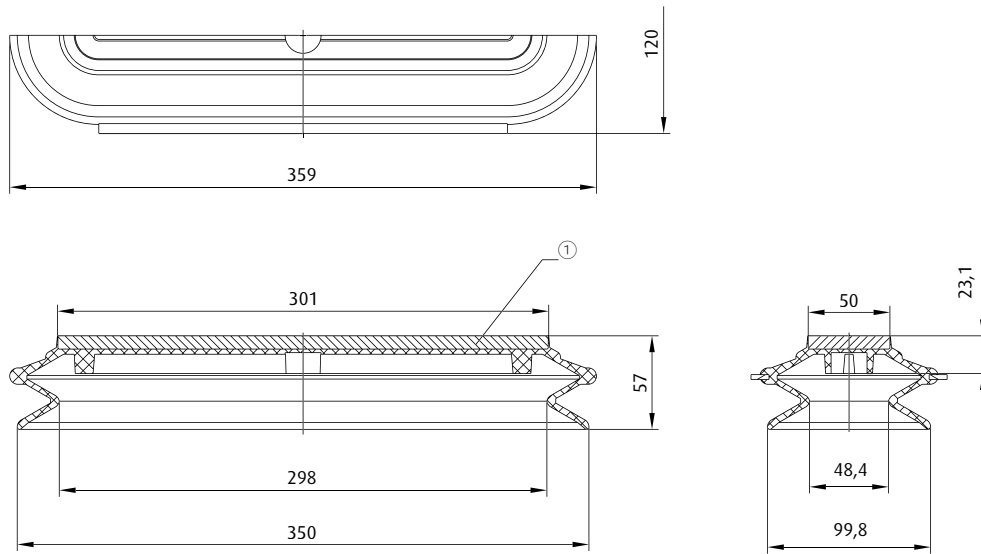
**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

350x100 mm - 370x70 mm



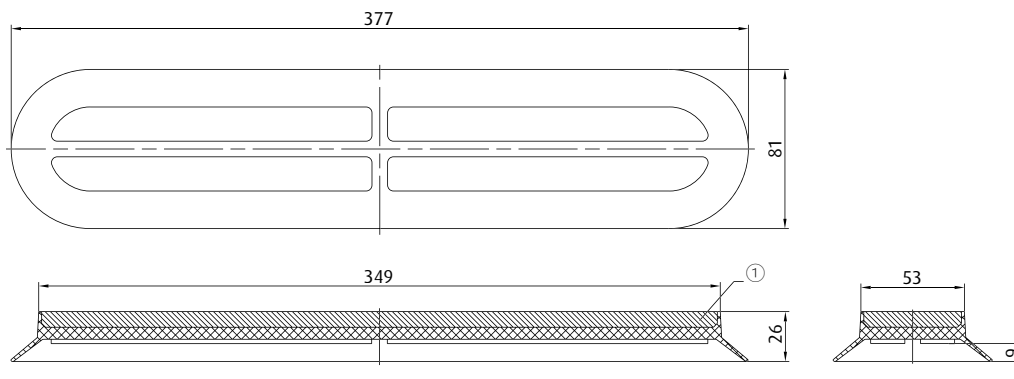
① = Steel

**Item no.**  
138.350x100.009.\*

**Material**  
SBR (br), NBR (gr)

39 mm

**Ordering notes:** With vulcanised metal reinforcement in the fold:  
138.350x100.010.\*



① = Steel

**Item no.**  
9.370x70.022.\*

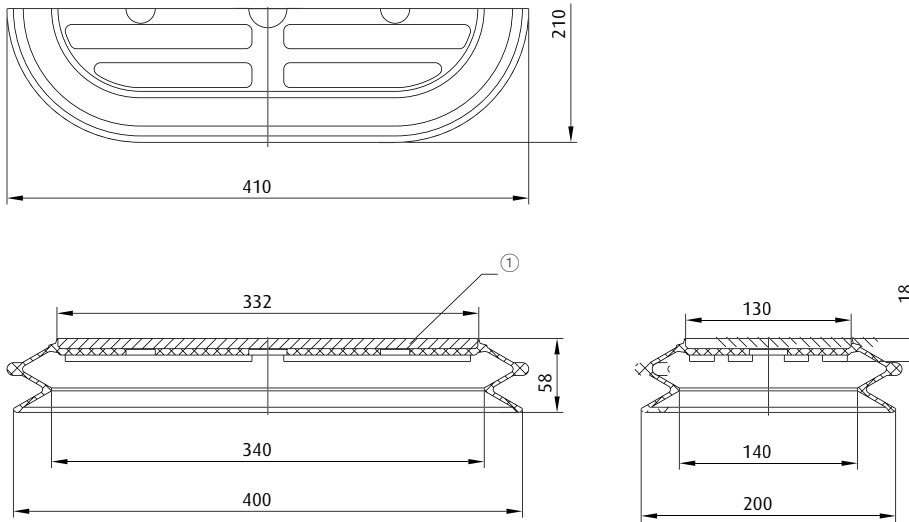
**Material**  
NBR (gr), SBR (br)

10 mm

Additional sizes available are found on p. 160.  
**Ordering notes:** Version with aluminium carrier: 9.370x70.023.\*

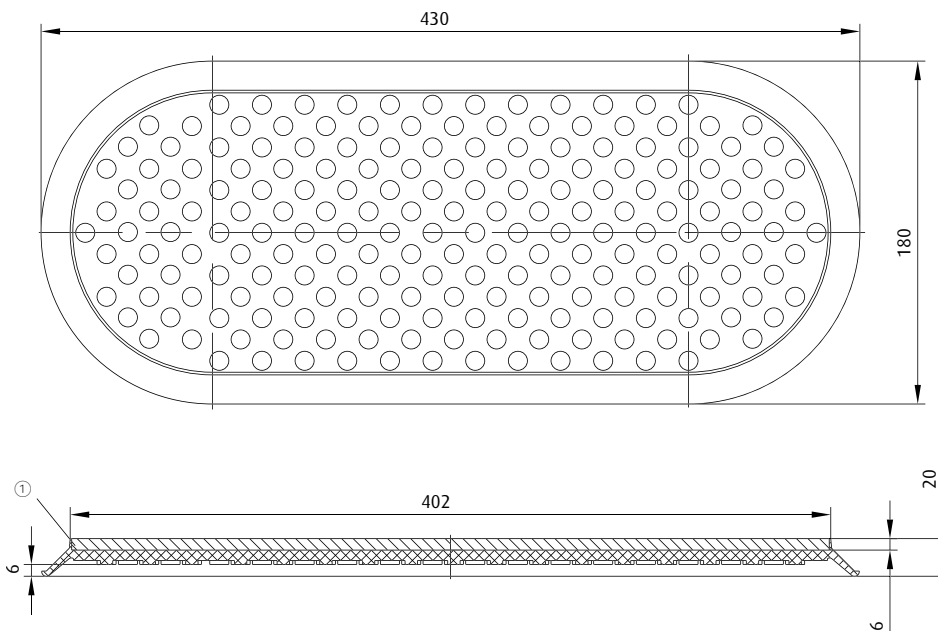
\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760





① = Steel

<b>Item no.</b> 138.400x200.011._*	<b>Material</b> SBR (br), NBR (gr)	39 mm	<b>Ordering notes:</b> With vulcanised metal reinforcement in the fold: 138.400x200.012._*
---------------------------------------	---------------------------------------	-------	---



① = Steel

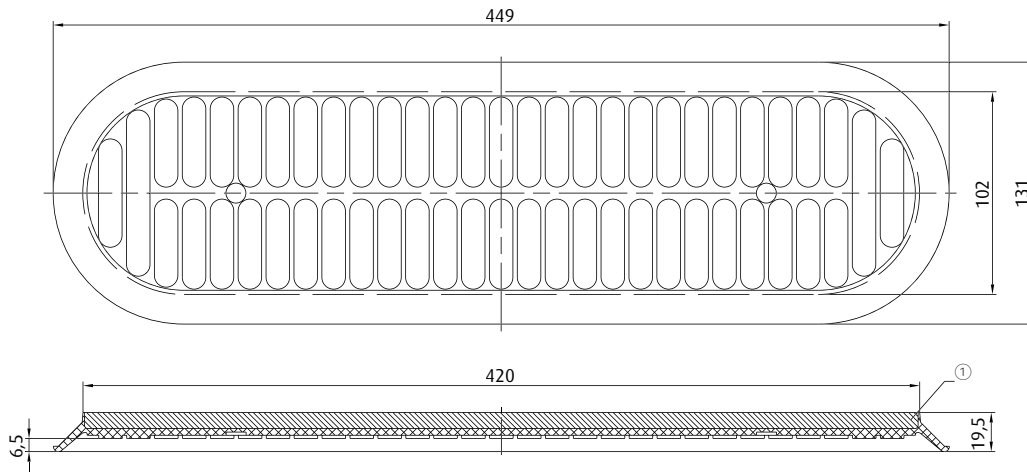
<b>Item no.</b> 9.430x180.024._*	<b>Material</b> SBR (sw), NBR (gr), PU (bg)	6 mm	Additional sizes available are found on p. 160. <b>Ordering notes:</b> Customised drilling patterns on request
-------------------------------------	--	------	---

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

450x130 mm - 450x150 mm



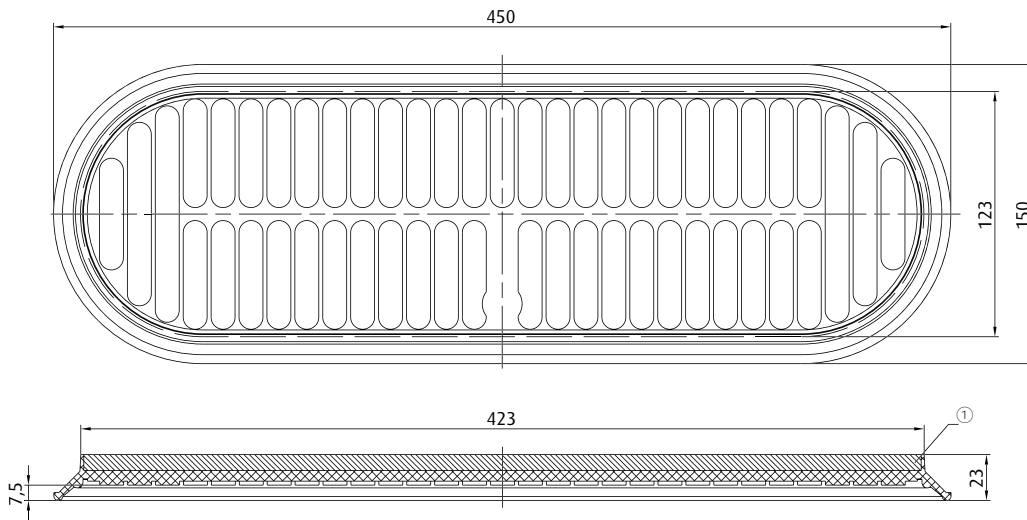
① = Steel

**Item no.**  
9.450x130.025.\_\*

**Material**  
NBR (gr), SBR (br)

6 mm

Additional sizes available are found on p. 160.  
**Ordering notes:** Customised drilling patterns on request



① = Steel

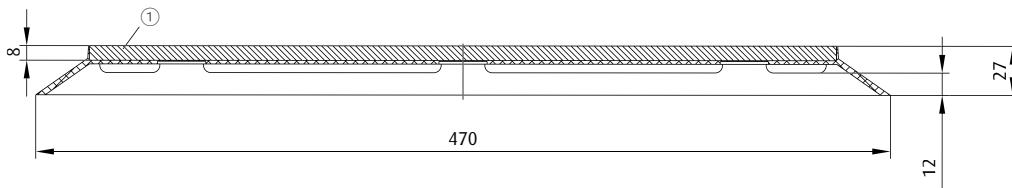
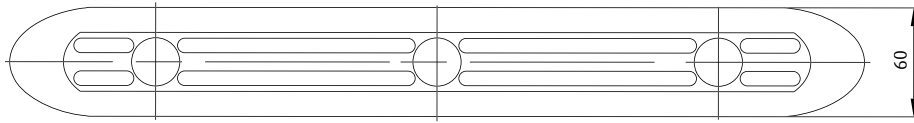
**Item no.**  
9.450x150.026.\_\*

**Material**  
NBR (gr), SBR (sw)

9 mm

**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



SUITABLE FOR ROUND SECTIONS AND PIPES

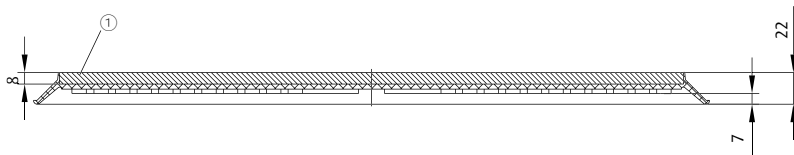
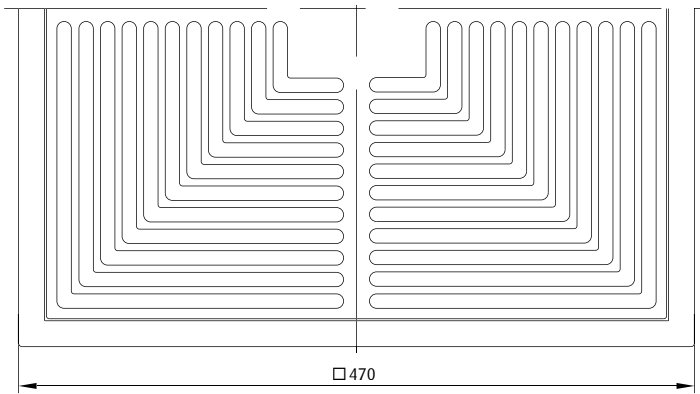
① = Steel

**Item no.**  
9.470x60.072.\*

**Material**  
NBR (gr), SBR (sw)

12 mm

**Ordering notes:** Customised drilling patterns on request



① = Steel

**Item no.**  
9.470x470.027.\*

**Material**  
SBR (sw)

6 mm

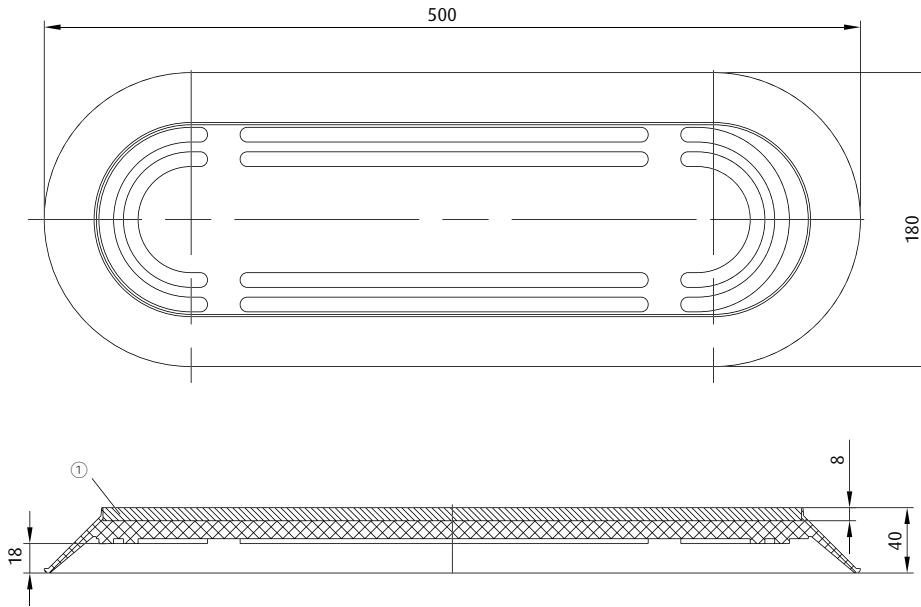
**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



# Vacuum cups by size | Oval vacuum cups by size

500x180 mm - 580x180 mm



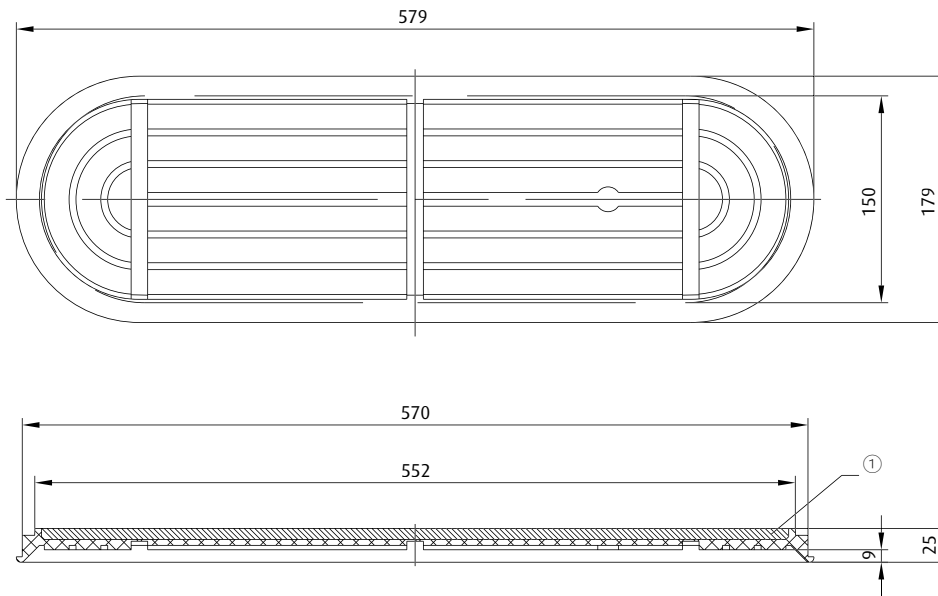
① = Steel

**Item no.**  
9.500x180.028.\_\*

**Material**  
NBR (gr), SBR (sw)

21 mm

**Ordering notes:** Customised drilling patterns on request



① = Steel

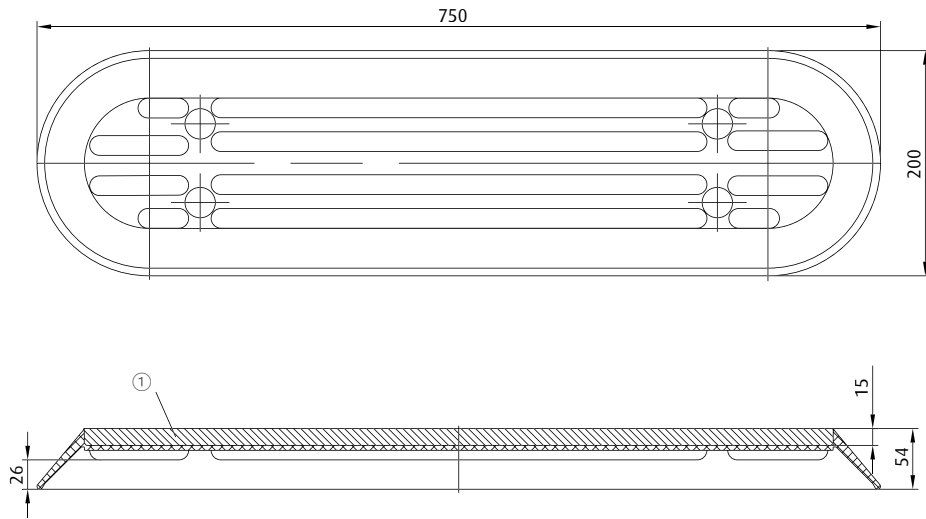
**Item no.**  
9.580x180.029.\_\*

**Material**  
NBR (gr), SBR (br)

10 mm

Additional sizes available are found on p. 160.  
**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760



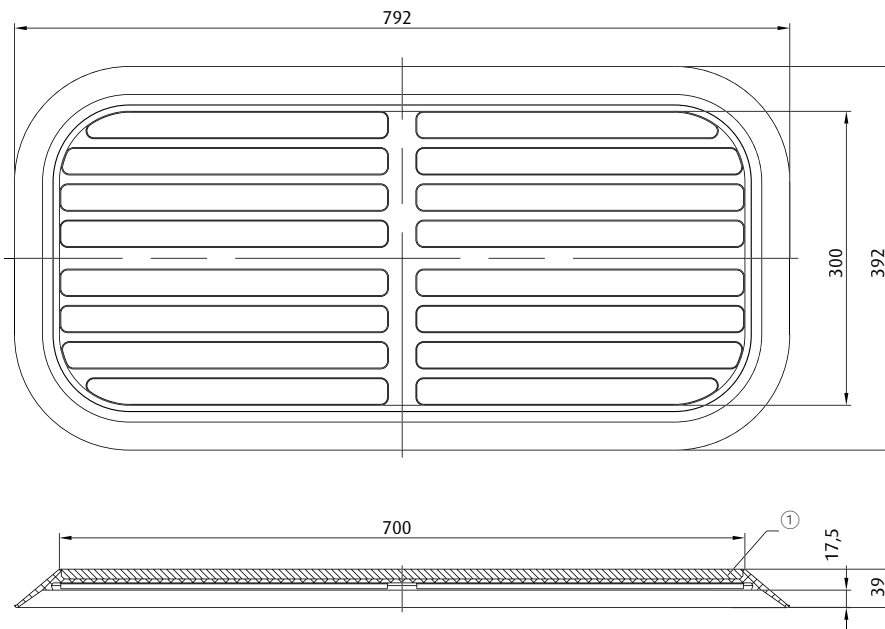
① = Steel

**Item no.**  
9.750x200.049.\_\*

**Material**  
SBR (br)

29 mm

**Ordering notes:** Customised drilling patterns on request



① = Steel

**Item no.**  
9.800x400.048.\_\*

**Material**  
SBR (br), NBR (gr)

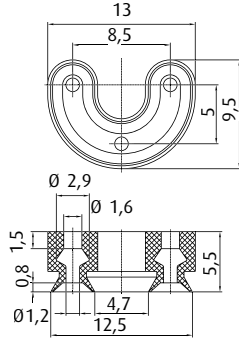
20 mm

**Ordering notes:** Customised drilling patterns on request

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for Vacuum cups you will find on page 760

# Vacuum cups by size | Ring and segment vacuum cups

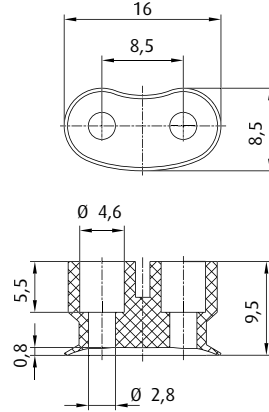
Ø 13 - 24 mm



Item no.  
107.013.095.\_\*

Material  
SI (tr)

0.7 mm

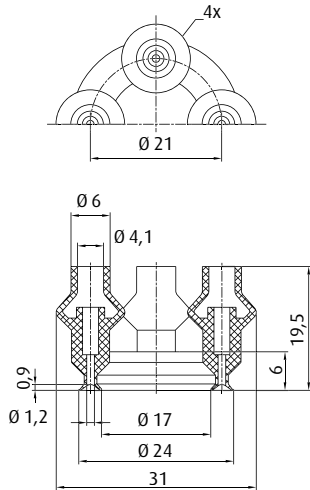


Item no.  
107.017.093.\_\*

Material  
SI (tr)

0.2 mm

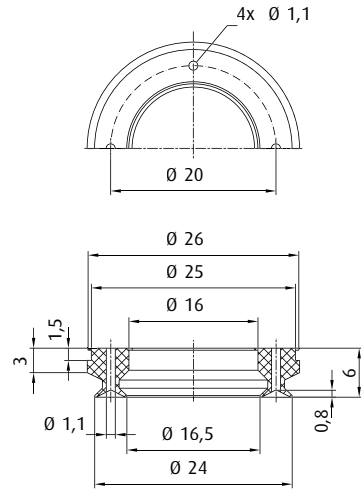
Connection	see page
270.010 M5-male	411



Item no.  
107.024.060.\_\*

Material  
SI (tr)

0.8 + 1.4 mm



Item no.  
107.024.061.\_\*

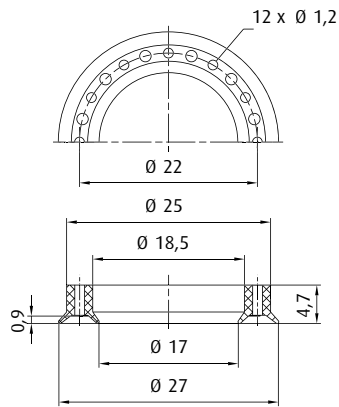
Material  
SI (tr)

0.8 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

# Vacuum cups by size | Ring and segment vacuum cups

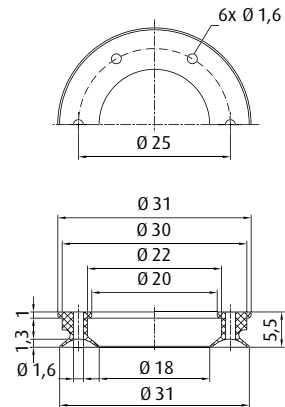
Ø 27 - 33 mm



Item no.  
107.027.121.\_\*

Material  
SI (tr)

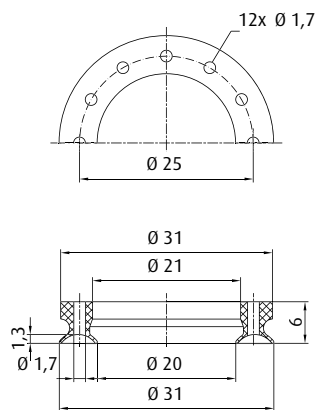
0.5 mm



Item no.  
107.031.079.\_\*

Material  
SI (bl)

1.3 mm

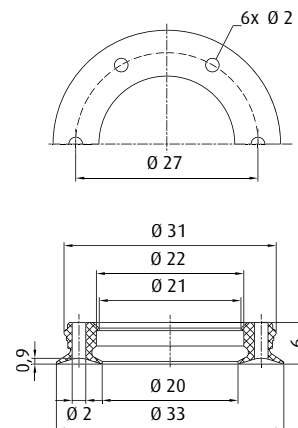


Item no.  
107.031.091.\_\*

Material  
SI (tr)

1.3 mm

**BESTSELLER**



Item no.  
107.033.046.\_\*


Material  
SI-AS (sw)

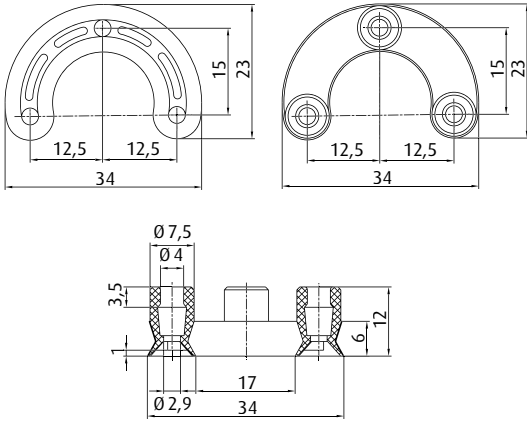
0.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

# Vacuum cups by size | Ring and segment vacuum cups


Ø 33 - 114 mm


	Connection	see page
270.134	M5-male	409
270.104	M6-male	413
270.033	G1/8-male	416
270.478	G1/8-female	421

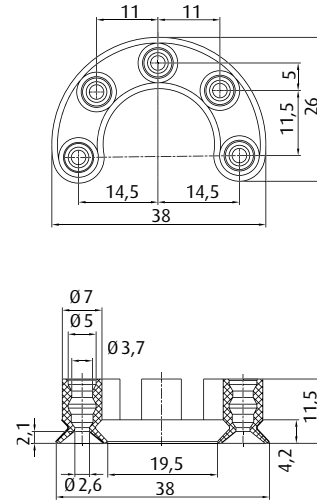


Item no.  
107.033.047.\*

Material  
SI (tr)


 1.2 mm

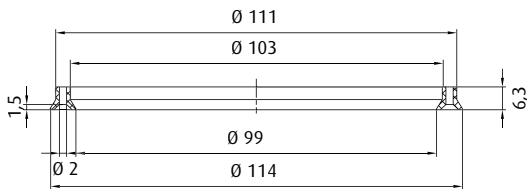
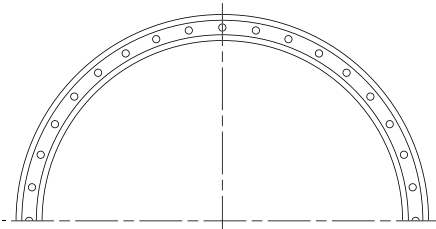
	Connection	see page
270.399	M5-male	410



Item no.  
107.038.119.\*

Material  
SI (tr)


 2 mm



**PTFE COATED**

Item no.  
107.114.118.\*

Material  
SI (tr)

 0.5 mm

\* When ordering please add the appropriate material code to item no. You will find it in the foldout.  
Average holding forces for vacuum cups you will find on page 760

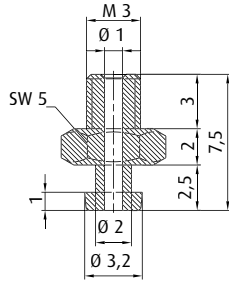


Standard fittings for vacuum cups .....	408
Carrier plates for vacuum cups .....	438
Fittings for suction discs .....	441
Spring levelers .....	442
Lifting cylinders .....	460
Joints .....	470



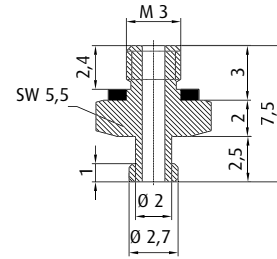
# Fastening elements vacuum cups | Fittings

M3-male | M4-male



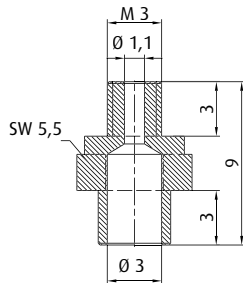
## Technical data

Item no.	Thread G1
270.014	M3-male



## Technical data

Item no.	Thread G1
270.524	M3-male

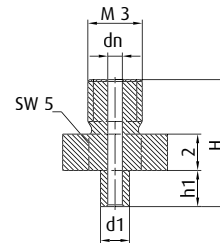


## Technical data

Item no.	Thread G1
270.427	M3-male

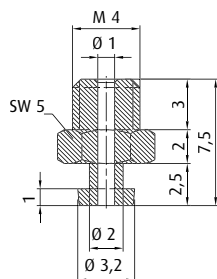
## Notes:

Vacuum cup is plugged into the borehole of the fitting



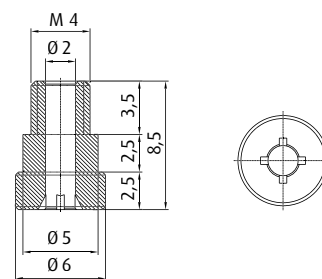
## Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	Ø d1 [mm]	Ø dn [mm]
270.026	M3-male	6	1	1.1	0.6
270.011	M3-male	7	2	1.6	0.8
270.025	M3-male	7.5	2	2	1



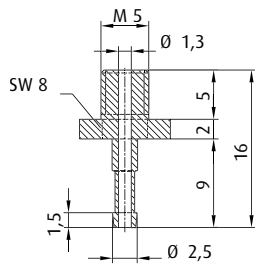
## Technical data

Item no.	Thread G1
270.111	M4-male



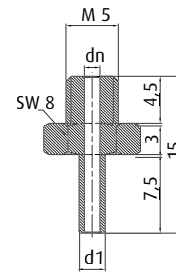
## Technical data

Item no.	Thread G1
270.458	M4-male



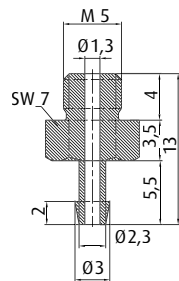
**Technical data**

Item no.	Thread G1
270.195	M5-male



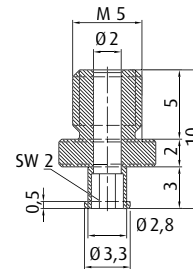
**Technical data**

Item no.	Thread G1	$\varnothing$ d1 [mm]	$\varnothing$ dn [mm]
270.001	M5-male	2.5	1.5
270.022	M5-male	3.4	2



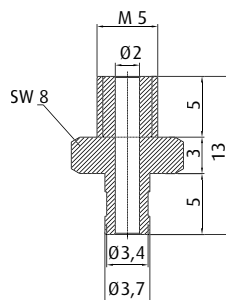
**Technical data**

Item no.	Thread G1
270.153	M5-male



**Technical data**

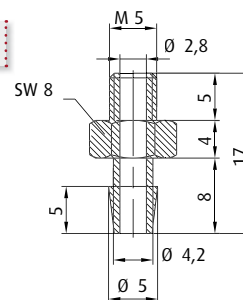
Item no.	Thread G1
270.283	M5-male



**Technical data**

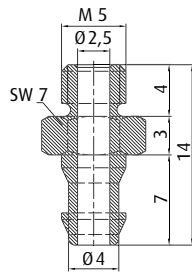
Item no.	Thread G1
270.536	M5-male

**BESTSELLER**



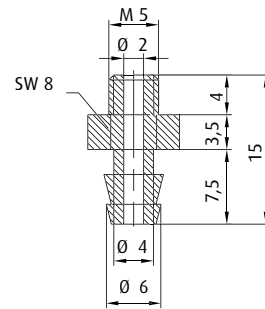
**Technical data**

Item no.	Thread G1
270.134	M5-male



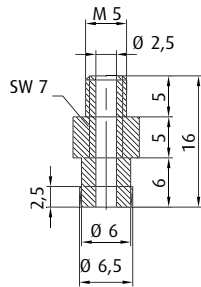
### Technical data

Item no.	Thread G1
270.399	M5-male



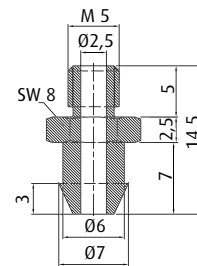
### Technical data

Item no.	Thread G1
270.024	M5-male



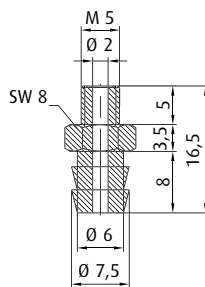
### Technical data

Item no.	Thread G1
270.013	M5-male



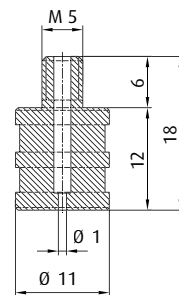
### Technical data

Item no.	Thread G1
270.317	M5-male



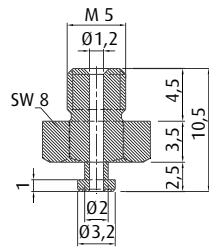
### Technical data

Item no.	Thread G1
270.443	M5-male



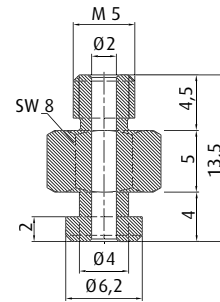
### Technical data

Item no.	Thread G1
270.244	M5-male



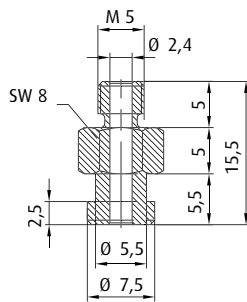
Technical data

Item no.	Thread G1
270.300	M5-male



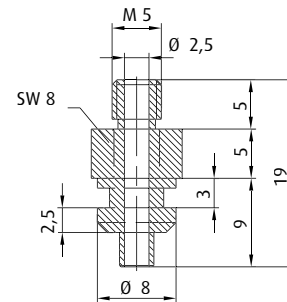
Technical data

Item no.	Thread G1
270.010	M5-male



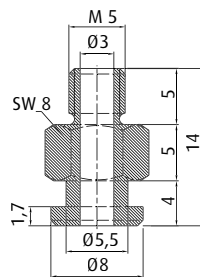
Technical data

Item no.	Thread G1
270.094	M5-male



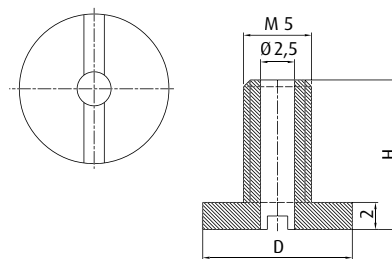
Technical data

Item no.	Thread G1
270.037	M5-male



Technical data

Item no.	Thread G1
270.200	M5-male



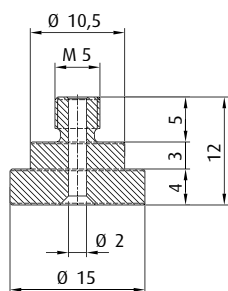
Technical data

Item no.	Thread G1	H [mm]	Ø D [mm]
270.310	M5-male	9	8
270.311	M5-male	11	11



# Fastening elements vacuum cups | Fittings

M5-male | M5-female



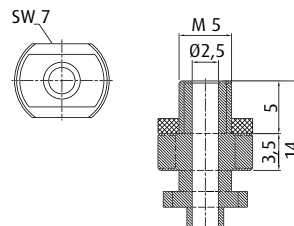
## Technical data

Thread G1

Item no.

270.521

M5-male



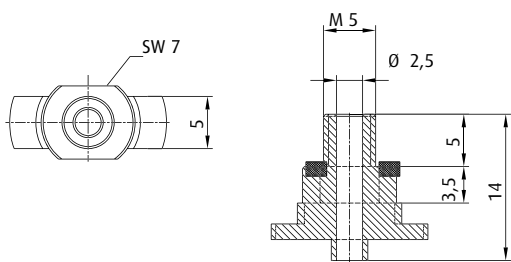
## Technical data

Thread G1

Item no.

270.463

M5-male



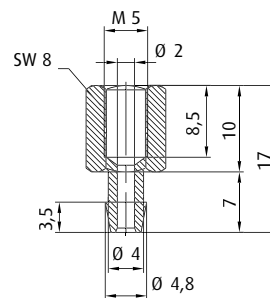
## Technical data

Thread G1

Item no.

270.464

M5-male



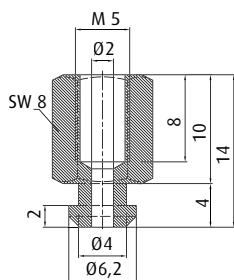
## Technical data

Thread G1

Item no.

270.347

M5-female



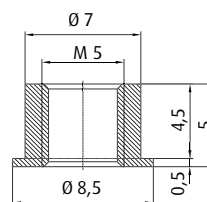
## Technical data

Thread G1

Item no.

270.005

M5-female



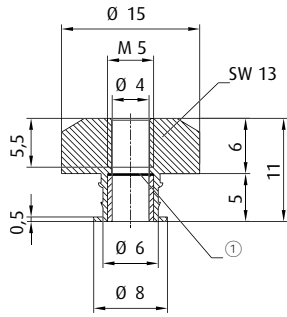
## Technical data

Thread G1

Item no.

270.382

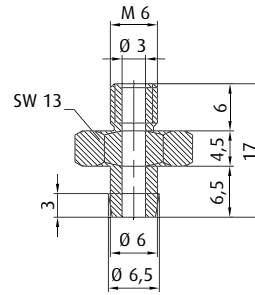
M5-female



① = Filter screen

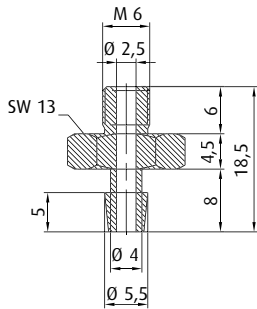
### Technical data

Item no.	Thread G1
<b>270.500-S</b>	M5-female



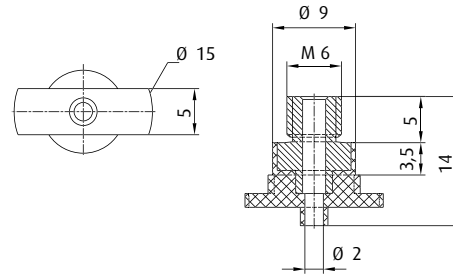
### Technical data

Item no.	Thread G1
<b>270.103</b>	M6-male



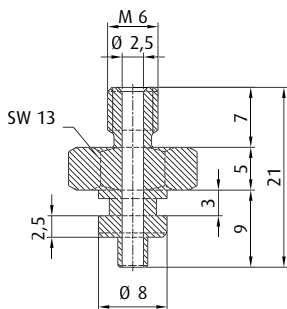
### Technical data

Item no.	Thread G1
<b>270.104</b>	M6-male



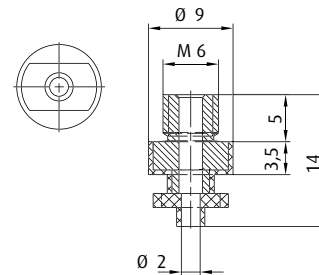
### Technical data

Item no.	Thread G1
<b>270.340</b>	M6-male



### Technical data

Item no.	Thread G1
<b>270.373</b>	M6-male



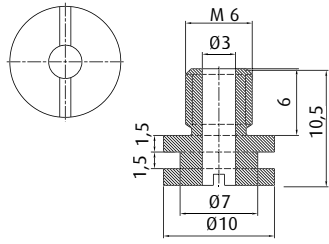
### Technical data

Item no.	Thread G1
<b>270.339</b>	M6-male



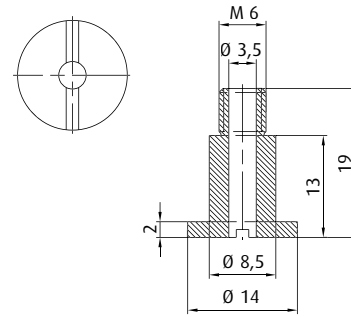
# Fastening elements vacuum cups | Fittings

M6-male



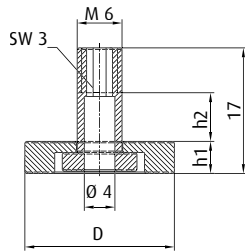
## Technical data

Item no.	Thread G1
270.105	M6-male



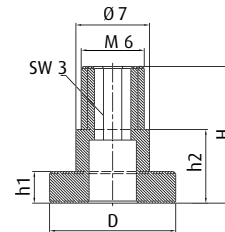
## Technical data

Item no.	Thread G1
270.315	M6-male



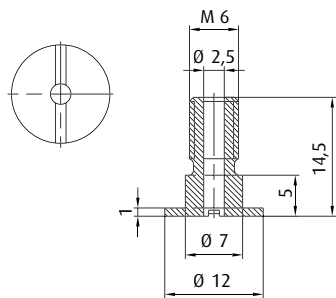
## Technical data

Item no.	Thread G1	h1 [mm]	h2 [mm]	Ø D [mm]
270.498	M6-male	5	6	15
270.499	M6-male	4.5	6.5	20



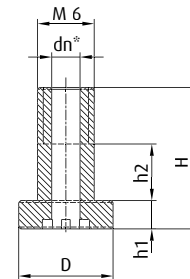
## Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.459	M6-male	11	2.5	6	10
270.460	M6-male	13	3	7	10



## Technical data

Item no.	Thread G1
270.039	M6-male

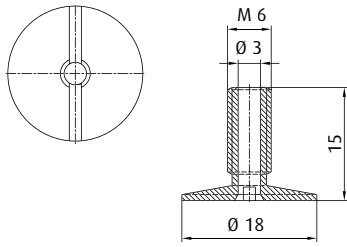


\* = 270.461: Wrench size SW 3

## Technical data

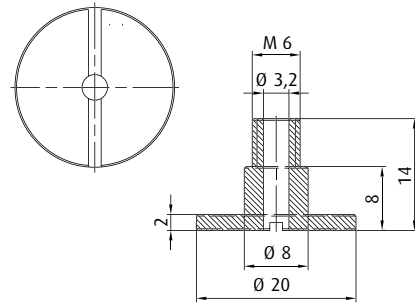
Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]	Ø dn [mm]
270.312/19	M6-male	14	2	5	11	3.5
270.457	M6-male	15	3	6	10	3
270.461	M6-male	16.5	2.5	8	10	--





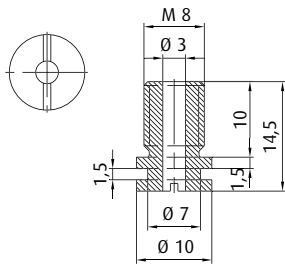
### Technical data

	Thread G1
<b>Item no.</b>	
<b>270.254</b>	M6-male



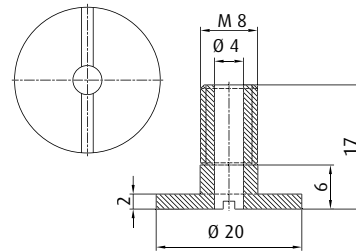
### Technical data

	Thread G1
<b>Item no.</b>	
<b>270.314</b>	M6-male



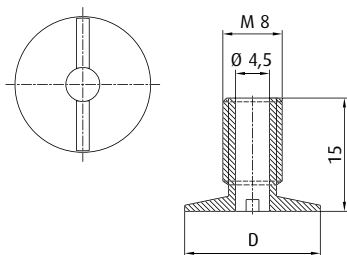
### Technical data

	Thread G1
<b>Item no.</b>	
<b>270.040</b>	M8-male



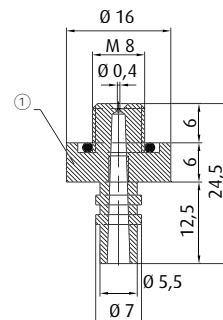
### Technical data

	Thread G1
<b>Item no.</b>	
<b>270.313</b>	M8-male



### Technical data

	Thread G1	Ø D [mm]
<b>Item no.</b>		
<b>270.247</b>	M8-male	12
<b>270.255</b>	M8-male	15
<b>270.256</b>	M8-male	18



① = Material: PA6

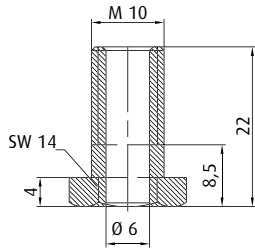
### Technical data

	Thread G1
<b>Item no.</b>	
<b>270.378</b>	M8-male



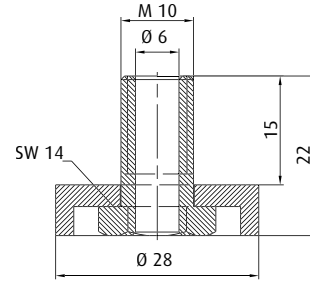
# Fastening elements vacuum cups | Fittings

M10-male | G1/8-male



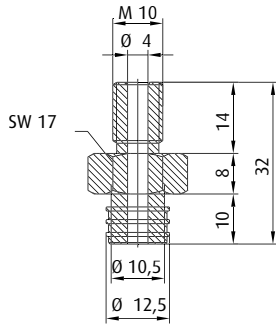
## Technical data

Item no.	Thread G1
270.462	M10-male



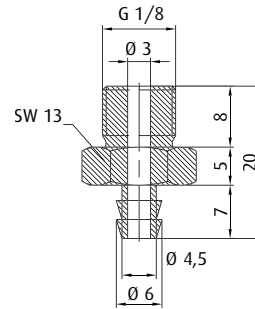
## Technical data

Item no.	Thread G1
270.512	M10-male



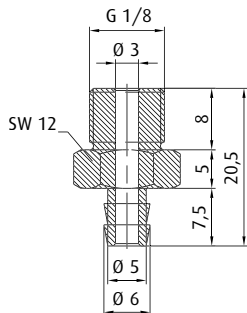
## Technical data

Item no.	Thread G1
270.177	M10-male



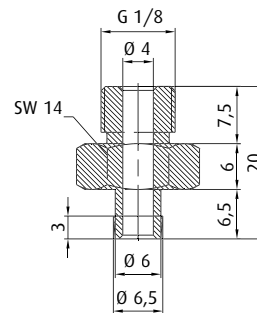
## Technical data

Item no.	Thread G1
270.033	G1/8-male



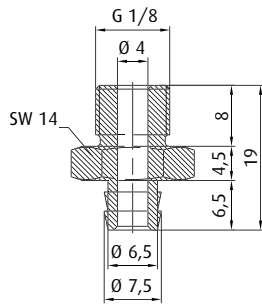
## Technical data

Item no.	Thread G1
270.205	G1/8-male



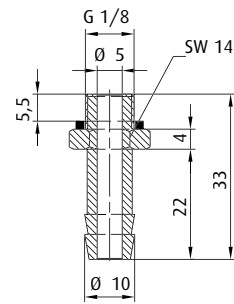
## Technical data

Item no.	Thread G1
270.003	G1/8-male



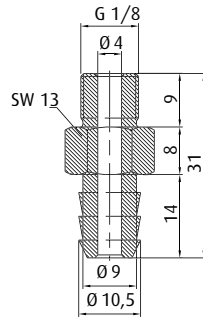
### Technical data

Item no.	Thread G1
270.238	G1/8-male



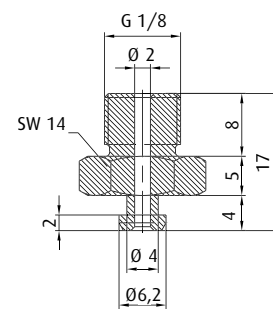
### Technical data

Item no.	Thread G1
270.060	G1/8-male



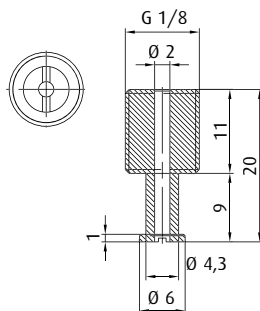
### Technical data

Item no.	Thread G1
270.132	G1/8-male



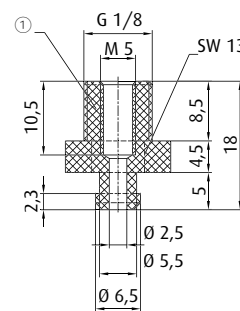
### Technical data

Item no.	Thread G1
270.009	G1/8-male



### Technical data

Item no.	Thread G1
270.242	G1/8-male



① = Material: POM

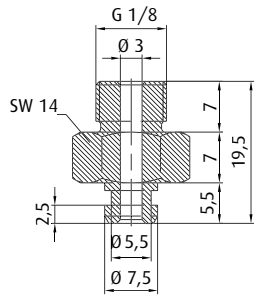
### Technical data

Item no.	Thread G1
270.188	G1/8-male



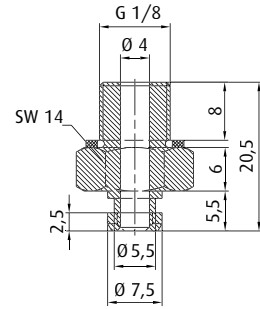
# Fastening elements vacuum cups | Fittings

G1/8-male



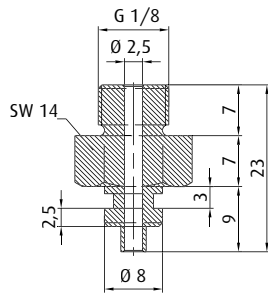
## Technical data

Item no.	Thread G1
270.095	G1/8-male



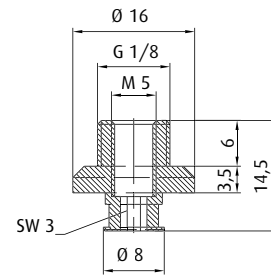
## Technical data

Item no.	Thread G1
270.431	G1/8-male



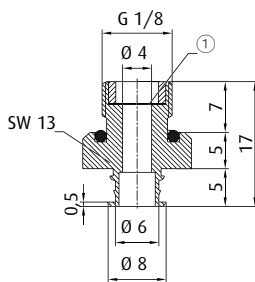
## Technical data

Item no.	Thread G1
270.085	G1/8-male



## Technical data

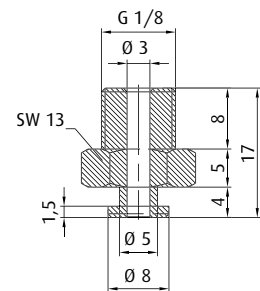
Item no.	Thread G1
270.250	G1/8-male



① = Filter screen

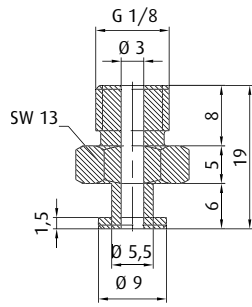
## Technical data

Item no.	Thread G1
270.503-S	G1/8-male



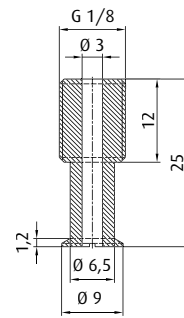
## Technical data

Item no.	Thread G1
270.064	G1/8-male



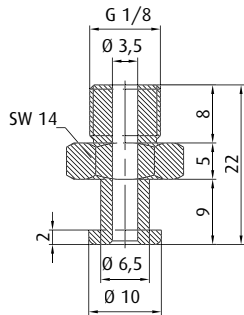
Technical data

Item no.	Thread G1
270.063	G1/8-male



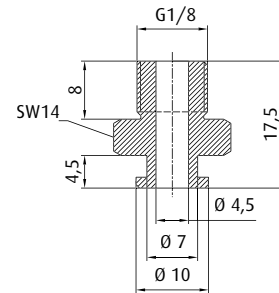
Technical data

Item no.	Thread G1
270.147	G1/8-male



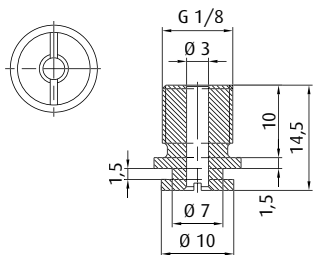
Technical data

Item no.	Thread G1
270.030	G1/8-male



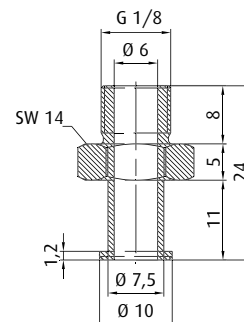
Technical data

Item no.	Thread G1
270.543	G1/8-male



Technical data

Item no.	Thread G1
270.077	G1/8-male



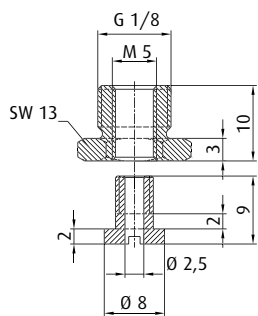
Technical data

Item no.	Thread G1
270.112	G1/8-male



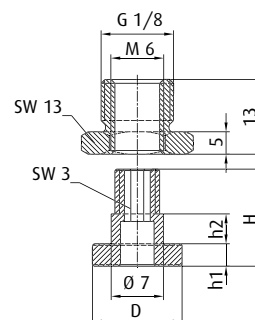
# Fastening elements vacuum cups | Fittings

G1/8-male



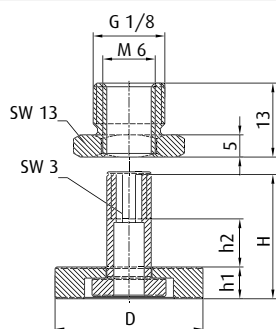
## Technical data

Item no.	Thread G1
270.493	G1/8-male



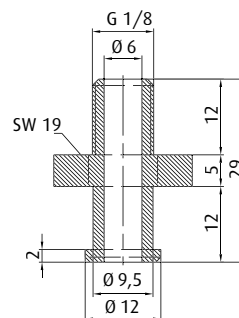
## Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.480	G1/8-male	11	2.5	3.5	10
270.482	G1/8-male	13	3	4	12



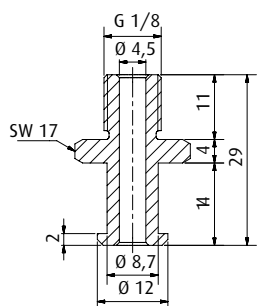
## Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.486	G1/8-male	17	5	6	15
270.490	G1/8-male	17	4.5	6.5	20



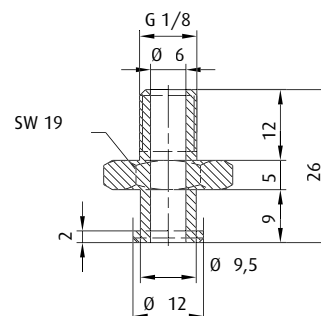
## Technical data

Item no.	Thread G1
270.352	G1/8-male



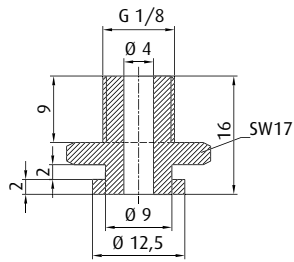
## Technical data

Item no.	Thread G1
270.196	G1/8-male



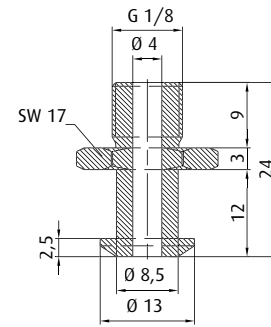
## Technical data

Item no.	Thread G1
270.354	G1/8-male



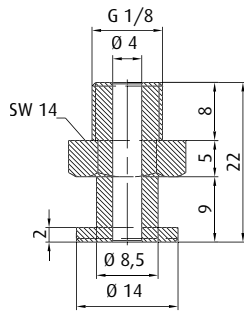
### Technical data

	Thread G1
Item no.	
270.541	G1/8-male



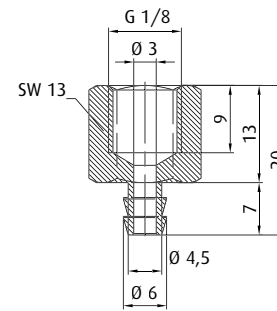
### Technical data

	Thread G1
Item no.	
270.093	G1/8-male



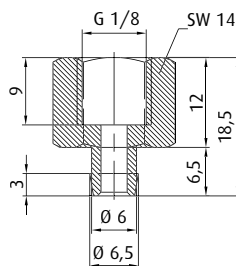
### Technical data

	Thread G1
Item no.	
270.012	G1/8-male



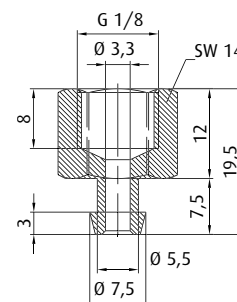
### Technical data

	Thread G1
Item no.	
270.478	G1/8-female



### Technical data

	Thread G1
Item no.	
270.015	G1/8-female



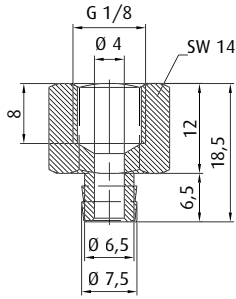
### Technical data

	Thread G1
Item no.	
270.109	G1/8-female



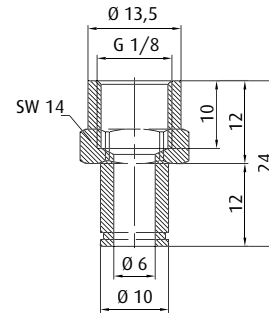
# Fastening elements vacuum cups | Fittings

G1/8-female



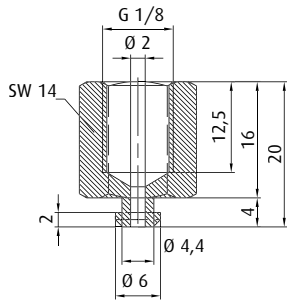
## Technical data

Item no.	Thread G1
<b>270.110</b>	G1/8-female



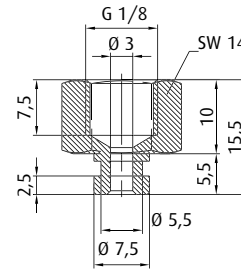
## Technical data

Item no.	Thread G1
<b>270.114</b>	G1/8-female



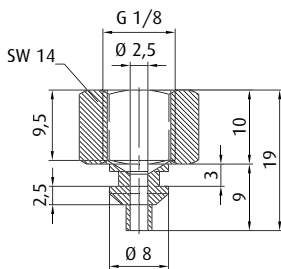
## Technical data

Item no.	Thread G1
<b>270.007</b>	G1/8-female



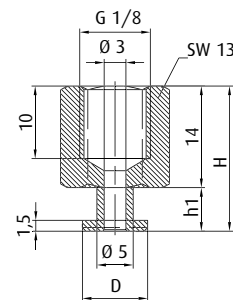
## Technical data

Item no.	Thread G1
<b>270.096</b>	G1/8-female



## Technical data

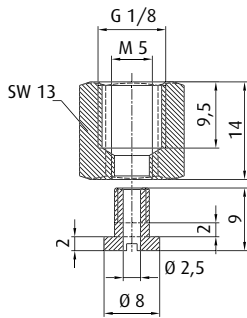
Item no.	Thread G1
<b>270.086</b>	G1/8-female



## Technical data

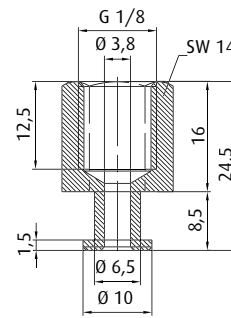
Item no.	Thread G1	H [mm]	h1 [mm]	Ø D [mm]
<b>270.065</b>	G1/8-female	18	4	8.5
<b>270.061</b>	G1/8-female	20	6	9





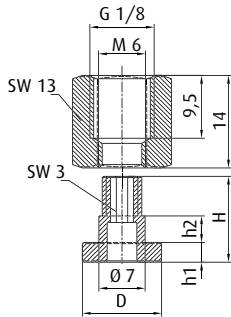
Technical data

Item no.	Thread G1
270.494	G1/8-female



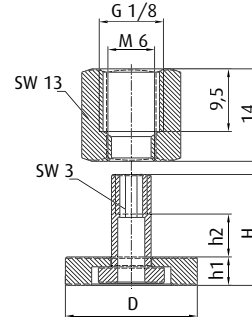
Technical data

Item no.	Thread G1
270.019	G1/8-female



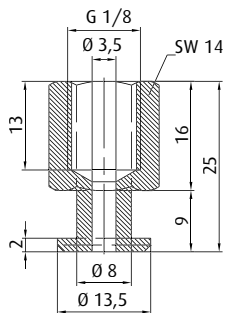
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.479	G1/8-female	11	2.5	3.5	10
270.481	G1/8-female	13	3	4	12



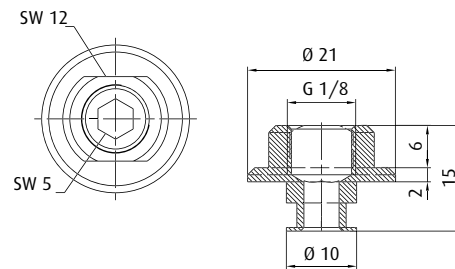
Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.485	G1/8-female	17	5	6	15
270.489	G1/8-female	17	4.5	6.5	20



Technical data

Item no.	Thread G1
270.020	G1/8-female



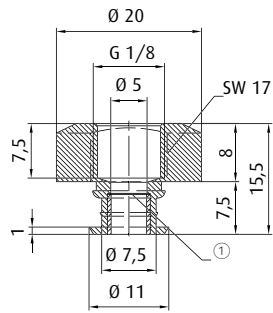
Technical data

Item no.	Thread G1
270.251	G1/8-female



# Fastening elements vacuum cups | Fittings

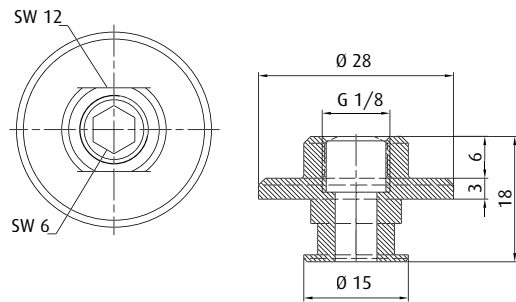
G1/8-female



① = Filter screen

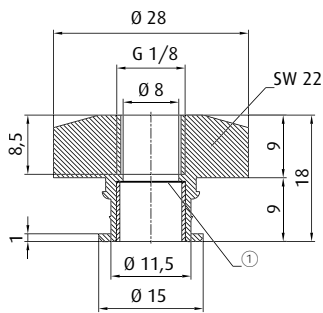
## Technical data

Item no.	Thread G1
270.501-S	G1/8-female



## Technical data

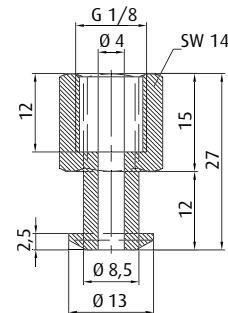
Item no.	Thread G1
270.252	G1/8-female



① = Filter screen

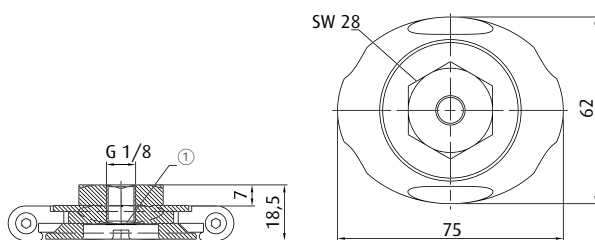
## Technical data

Item no.	Thread G1
270.502-S	G1/8-female



## Technical data

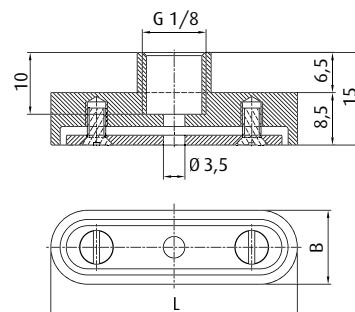
Item no.	Thread G1
270.092	G1/8-female



① = Filter screen

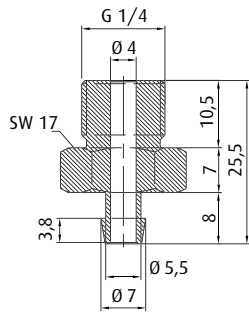
## Technical data

Item no.	Thread G1
270.527-S	G1/8-female



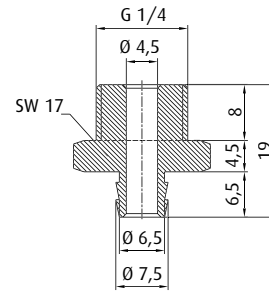
## Technical data

Item no.	Thread G1	Ø L [mm]	Ø B [mm]
270.439	G1/8-female	30	12
270.440	G1/8-female	40	12
270.441	G1/8-female	55	12



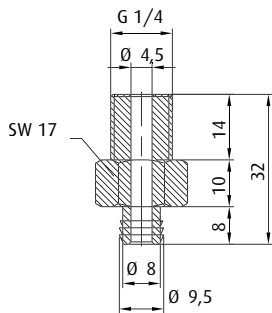
### Technical data

Item no.	Thread G1
270.194	G1/4-male



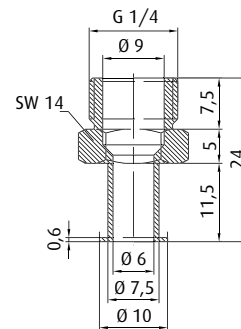
### Technical data

Item no.	Thread G1
270.534	G1/4-male



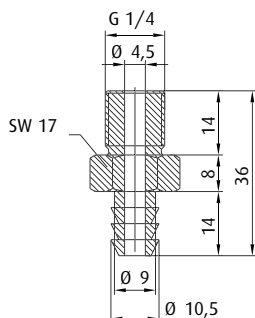
### Technical data

Item no.	Thread G1
270.043	G1/4-male



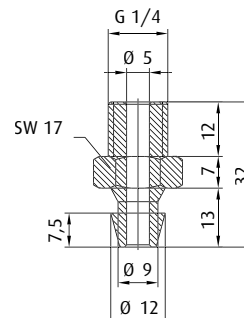
### Technical data

Item no.	Thread G1
270.113	G1/4-male



### Technical data

Item no.	Thread G1
270.208	G1/4-male



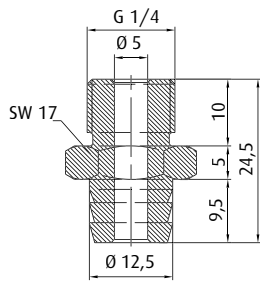
### Technical data

Item no.	Thread G1
270.515	G1/4-male



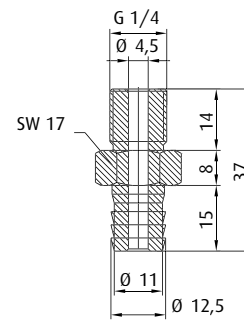
# Fastening elements vacuum cups | Fittings

G1/4-male



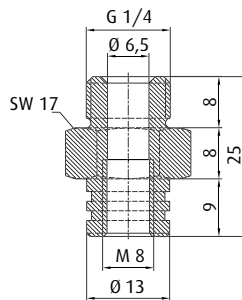
## Technical data

Item no.	Thread G1
270.451	G1/4-male



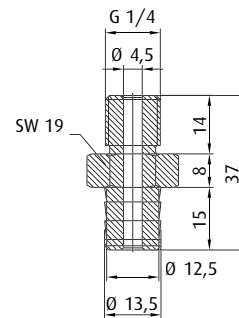
## Technical data

Item no.	Thread G1
270.044	G1/4-male



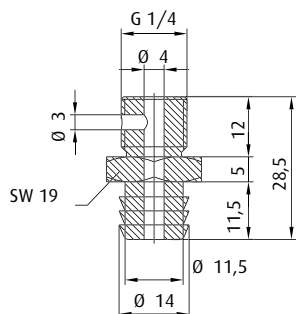
## Technical data

Item no.	Thread G1
270.097	G1/4-male



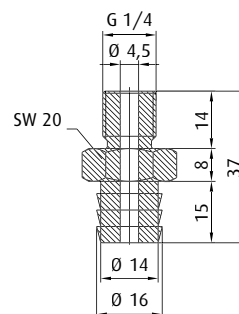
## Technical data

Item no.	Thread G1
270.049-1	G1/4-male



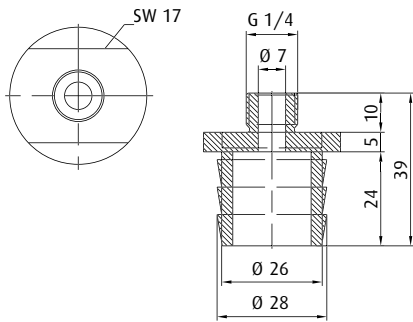
## Technical data

Item no.	Thread G1
270.101	G1/4-male



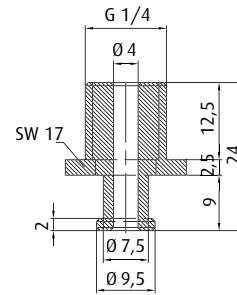
## Technical data

Item no.	Thread G1
270.207	G1/4-male



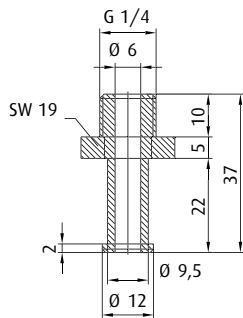
### Technical data

Item no.	Thread G1
270.438	G1/4-male



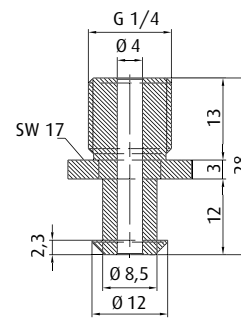
### Technical data

Item no.	Thread G1
270.274	G1/4-male



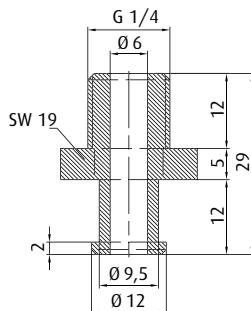
### Technical data

Item no.	Thread G1
270.359	G1/4-male



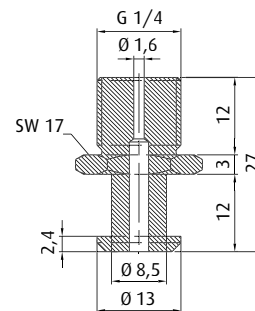
### Technical data

Item no.	Thread G1
270.249	G1/4-male



### Technical data

Item no.	Thread G1
270.204	G1/4-male



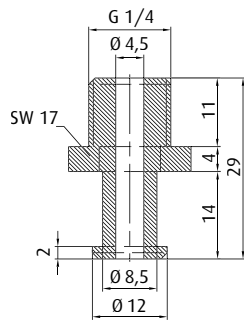
### Technical data

Item no.	Thread G1
270.099	G1/4-male



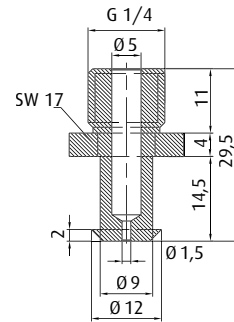
# Fastening elements vacuum cups | Fittings

G1/4-male



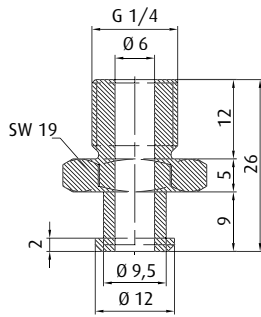
## Technical data

Item no.	Thread G1
270.190	G1/4-male



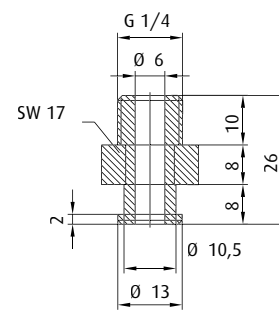
## Technical data

Item no.	Thread G1
270.002	G1/4-male



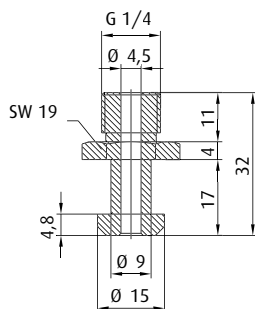
## Technical data

Item no.	Thread G1
270.034	G1/4-male



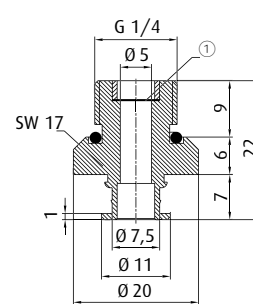
## Technical data

Item no.	Thread G1
270.213	G1/4-male



## Technical data

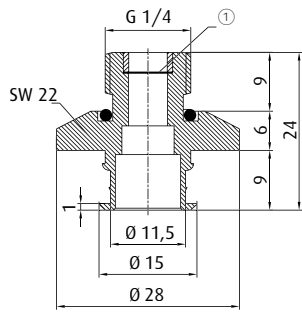
Item no.	Thread G1
270.281	G1/4-male



① = Filter screen

## Technical data

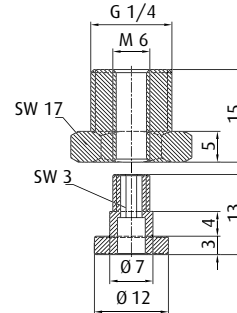
Item no.	Thread G1
270.506-S	G1/4-male



① = Filter screen

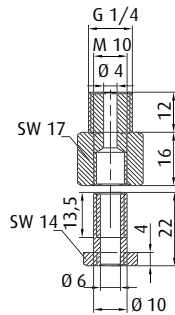
Technical data

Item no.	Thread G1
270.504-S	G1/4-male



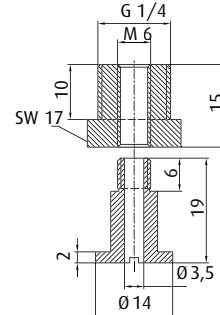
Technical data

Item no.	Thread G1
270.483	G1/4-male



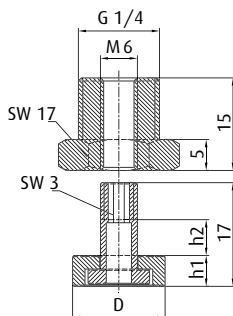
Technical data

Item no.	Thread G1
270.514	G1/4-male



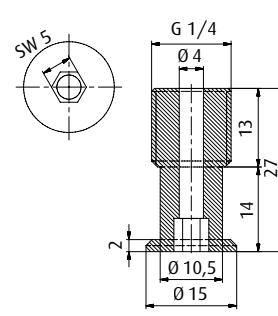
Technical data

Item no.	Thread G1
270.540	G1/4-male



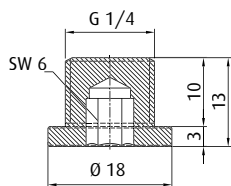
Technical data

Item no.	Thread G1	h1 [mm]	h2 [mm]	Ø D [mm]
270.487	G1/4-male	5	6	15
270.491	G1/4-male	4.5	6.5	20



Technical data

Item no.	Thread G1
270.175	G1/4-male

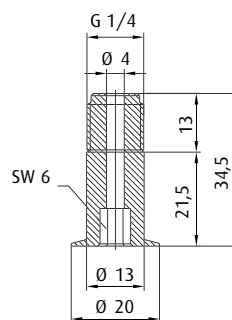


### Technical data

Item no.	Thread G1
270.364	G1/4-male

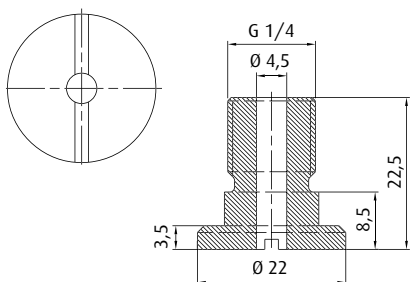
### Ordering notes:

Without drilling



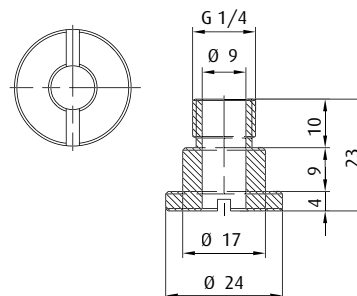
### Technical data

Item no.	Thread G1
270.141	G1/4-male



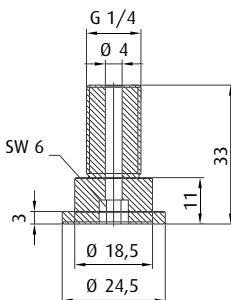
### Technical data

Item no.	Thread G1
270.210	G1/4-male



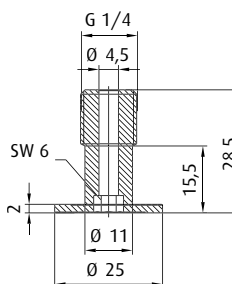
### Technical data

Item no.	Thread G1
270.237	G1/4-male



### Technical data

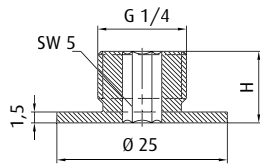
Item no.	Thread G1
270.145	G1/4-male



### Technical data

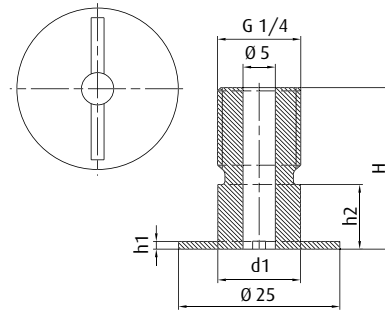
Item no.	Thread G1
270.176	G1/4-male





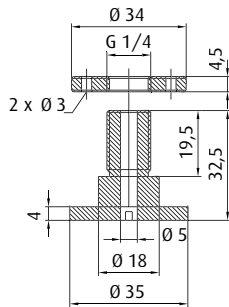
### Technical data

Item no.	Thread G1	H [mm]
270.182.U	G1/4-male	10.5
270.183	G1/4-male	15



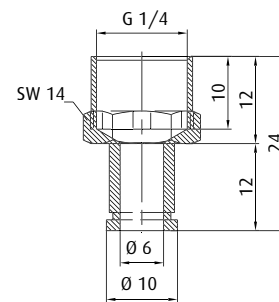
### Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø d1 [mm]
270.042	G1/4-male	25	1.2	10	13
270.184	G1/4-male	30	0.8	11	13
270.216	G1/4-male	37.5	1.3	23.5	15.5



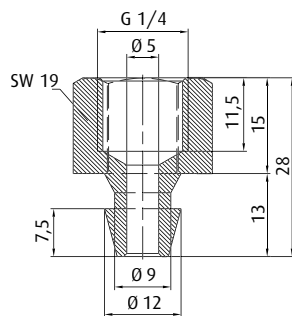
### Technical data

Item no.	Thread G1
270.100	G1/4-male



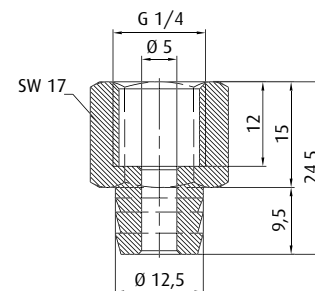
### Technical data

Item no.	Thread G1
270.178	G1/4-female



### Technical data

Item no.	Thread G1
270.434	G1/4-female



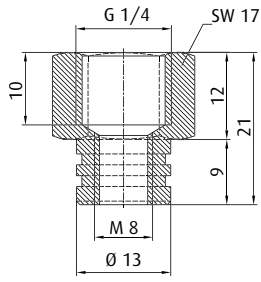
### Technical data

Item no.	Thread G1
270.452	G1/4-female



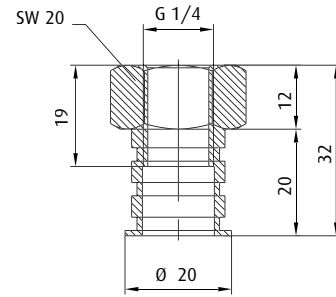
# Fastening elements vacuum cups | Fittings

G1/4-female



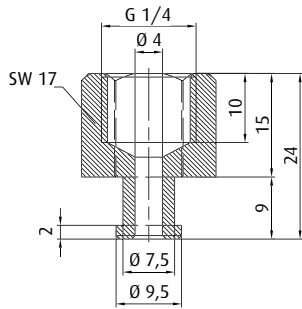
## Technical data

Thread G1	
Item no.	
<b>270.098</b>	G1/4-female



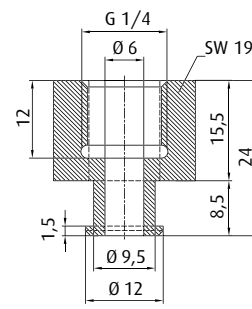
## Technical data

Thread G1	
Item no.	
<b>270.116</b>	G1/4-female



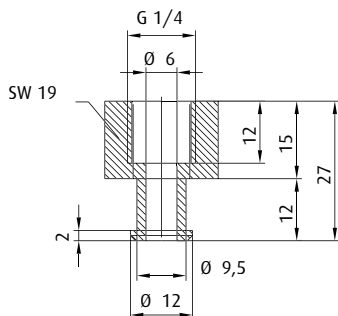
## Technical data

Thread G1	
Item no.	
<b>270.275</b>	G1/4-female



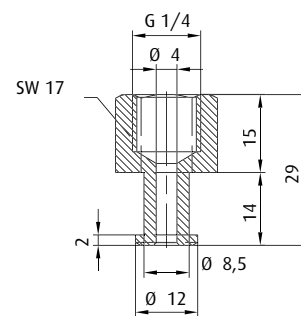
## Technical data

Thread G1	
Item no.	
<b>270.038</b>	G1/4-female



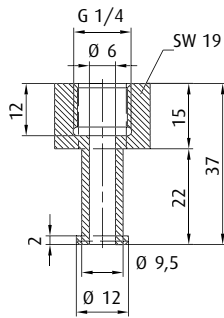
## Technical data

Thread G1	
Item no.	
<b>270.324</b>	G1/4-female



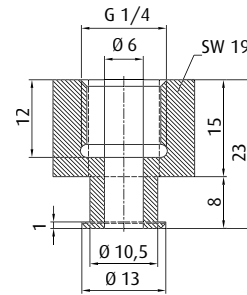
## Technical data

Thread G1	
Item no.	
<b>270.192</b>	G1/4-female



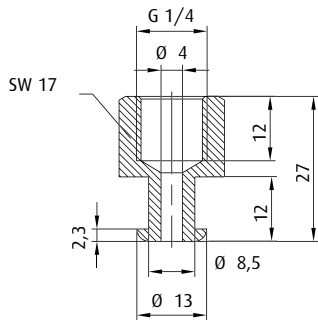
### Technical data

Item no.	Thread G1
270.361	G1/4-female



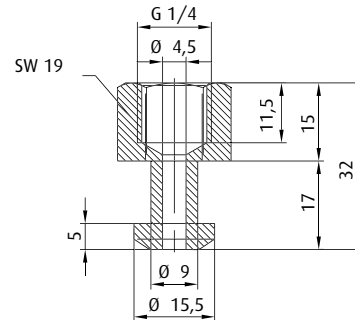
### Technical data

Item no.	Thread G1
270.356	G1/4-female



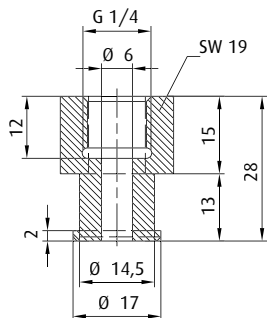
### Technical data

Item no.	Thread G1
270.248	G1/4-female



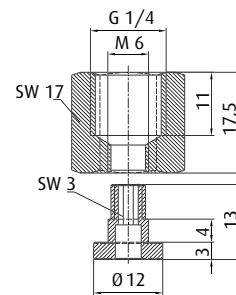
### Technical data

Item no.	Thread G1
270.282	G1/4-female



### Technical data

Item no.	Thread G1
270.358	G1/4-female



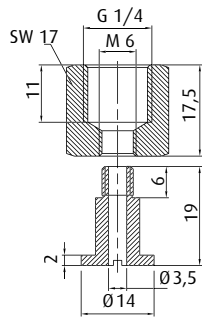
### Technical data

Item no.	Thread G1
270.484	G1/4-female



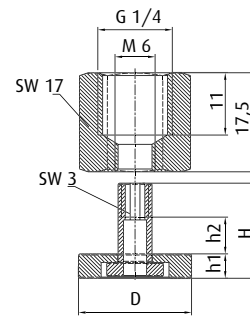
# Fastening elements vacuum cups | Fittings

G1/4-female | G3/8-male



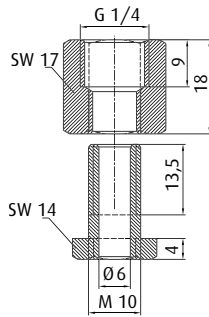
## Technical data

Item no.	Thread G1
270.539	G1/4-female



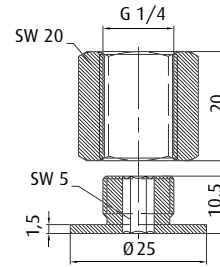
## Technical data

Item no.	Thread G1	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]
270.488	G1/4-female	17	5	6	15
270.492	G1/4-female	17	4.5	6.5	20



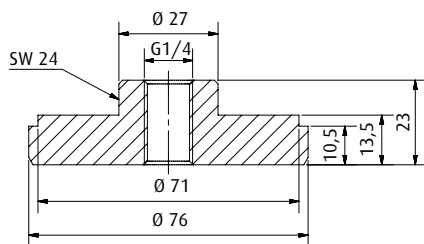
## Technical data

Item no.	Thread G1
270.513	G1/4-female



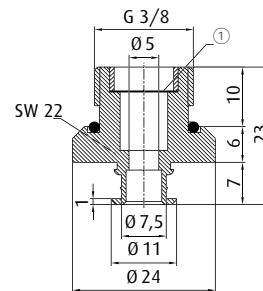
## Technical data

Item no.	Thread G1
270.182	G1/4-female



## Technical data

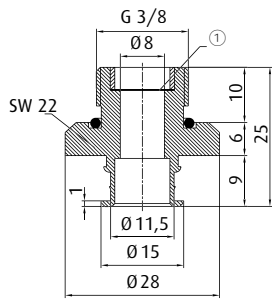
Item no.	Thread G1
270.554	G1/4-female



① = Filter screen

## Technical data

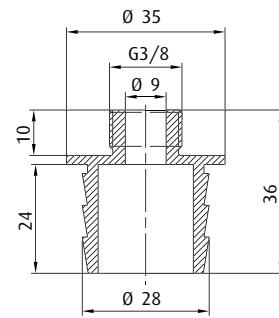
Item no.	Thread G1
270.505-S	G3/8-male



① = Filter screen

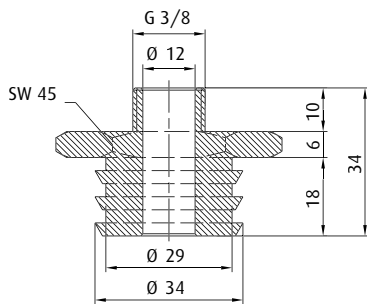
**Technical data**

Item no.	Thread G1
270.507-S	G3/8-male



**Technical data**

Item no.	Thread G1
270.442	G3/8-male



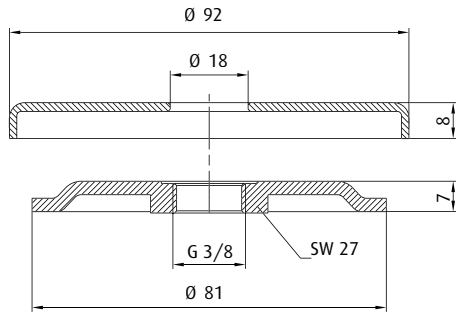
**Technical data**

Item no.	Thread G1
270.526	G3/8-male



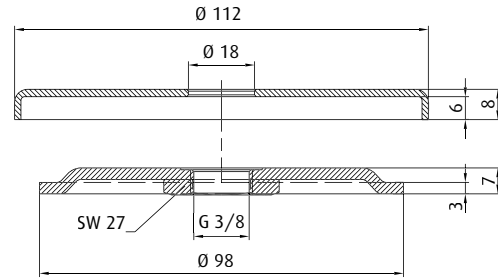
# Fastening elements vacuum cups | Fittings

G3/8-female | G1/2-female



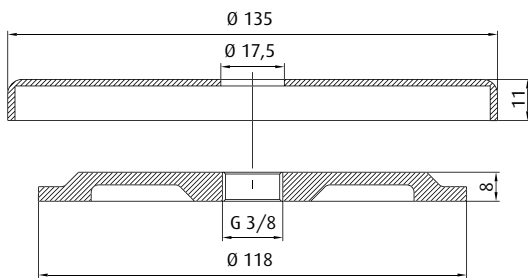
## Technical data

Item no.	Thread G1
270.400	G3/8-female



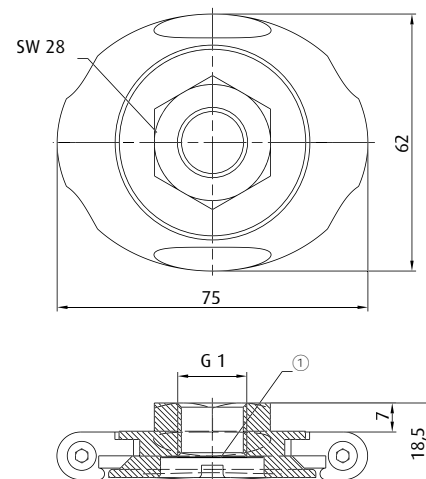
## Technical data

Item no.	Thread G1
270.402	G3/8-female



## Technical data

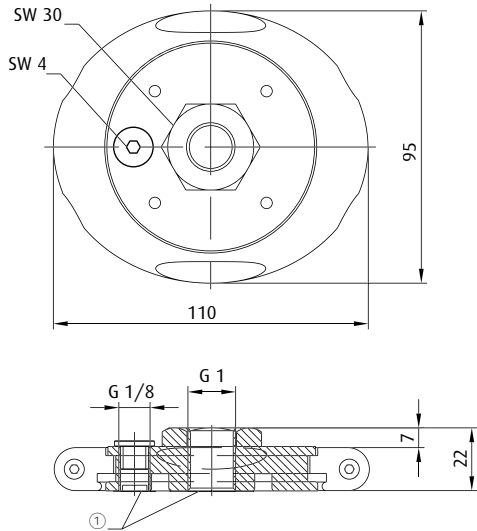
Item no.	Thread G1
270.404	G3/8-female



① = Filter screen

## Technical data

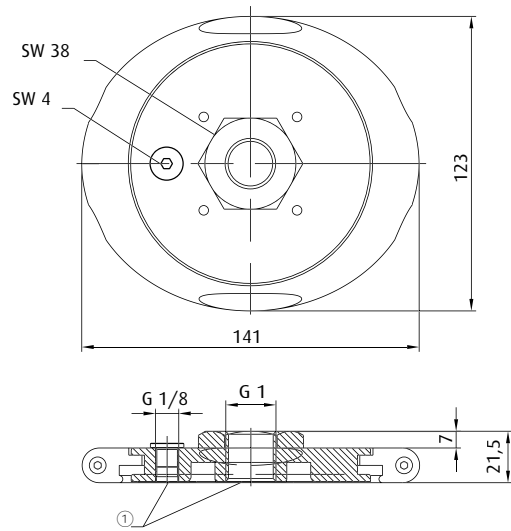
Item no.	Thread G1
270.528-S	G3/8-female
270.529-S	G1/2-female



① = Filter screen

### Technical data

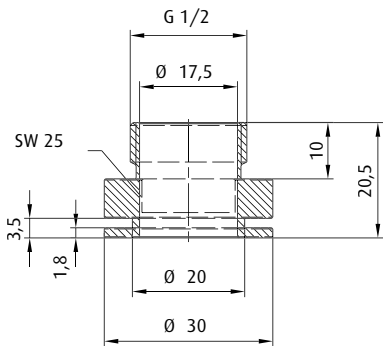
Item no.	Thread G1
270.530-S	G3/8-female
270.531-S	G1/2-female



① = Filter screen

### Technical data

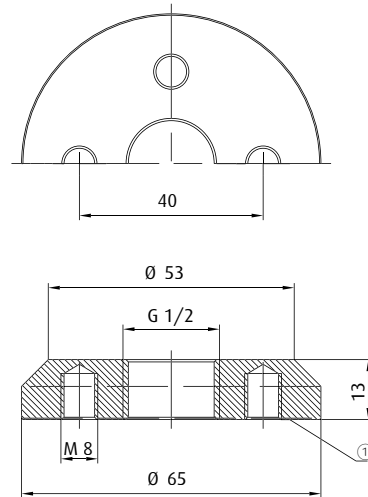
Item no.	Thread G1
270.532-S	G1/2-female
270.533-S	G3/4-female



① = Aluminium

### Technical data

Item no.	Thread G1
270.372	G1/2-male



### Technical data

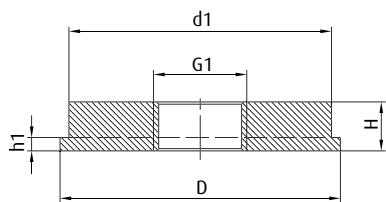
Item no.	Thread G1
270.056	G1/2-female

### Ordering notes:

4x screw M8x16 included in delivery



### Carrier plates SZ-NIP-T



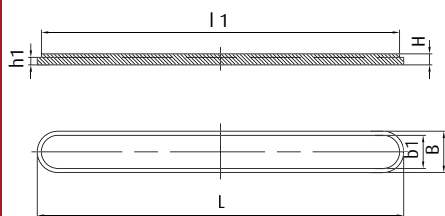
#### Technical data

Item no.	Thread G1
270.233	G1/8-female
270.234	G1/8-female
270.235	G1/8-female
270.289	G1/8-female
270.179	G1/4-female
270.262	G1/8-female
270.284	G1/4-female
270.338	M12x1.75-female
270.180	G1/4-female
270.158	G1/8-female
270.264	G1/4-female
270.161	G3/8-female
270.286	G1/2-female
270.224	G1/4-female
270.167	G3/8-female
270.266	G1/2-female
270.164	G1/8-female
270.171	G1/4-female
270.173	G3/8-female
270.268	G1/2-female
270.335	G1/2-female

#### Dimensions

G1	H [mm]	h1 [mm]	Ø D [mm]	Ø d1 [mm]
G1/8	6	3.1	17.5	14.9
G1/8	6	3	21	17.5
G1/8	5.5	2.1	28.5	25
G1/8	10	3	29	20
G1/4	20	14.5	43	32
G1/8	10	3	44	40
G1/4	10	3	44	40
M12x1.75	10	3	55	45
G1/4	20	14	60	50
G1/8	11	3	63	59
G1/4	11	3	63	59
G3/8	11	3	63	59
G1/2	11	3	63	59
G1/4	11	3	92	88
G3/8	11	3	92	88
G1/2	11	3	92	88
G1/8	11	3	95	88
G1/4	15	4	127	120
G3/8	15	4	127	120
G1/2	15	4	127	120
G1/2	20	14	160	150

### Carrier plates SZ-NIP-T



#### Technical data

Item no.	Thread G1
270.332	Without

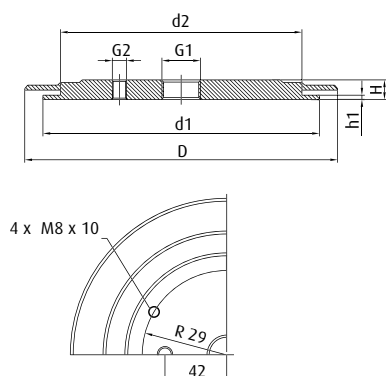
#### Dimensions

L [mm]	l1 [mm]	B [mm]	b1 [mm]	H [mm]	h1 [mm]
266	260	30	24	8	5.5





### Carrier plates SZ-NIP-T



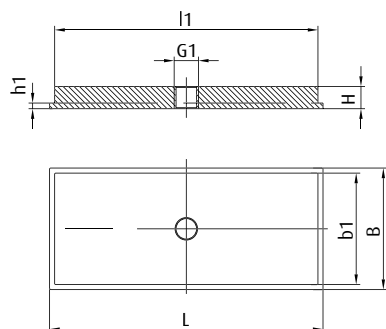
#### Technical data

Item no.	Thread G1
270.070	G3/4-female
270.076	G3/4-female

#### Dimensions

G1	G2	H [mm]	h1 [mm]	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]
G3/4	G1/8	13.5	3	215	190	166
G3/4	G1/8	13.5	3	315	309	285

### Carrier plates SZ-NIP-T



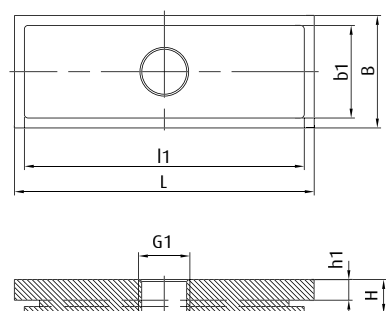
#### Technical data

Item no.	Thread G1
270.465	M12-female

#### Dimensions

L [mm]	l1 [mm]	B [mm]	b1 [mm]	H [mm]	h1 [mm]
135	130	60	55	11	2.8

### Carrier plates SZ-NIP-T



#### Technical data

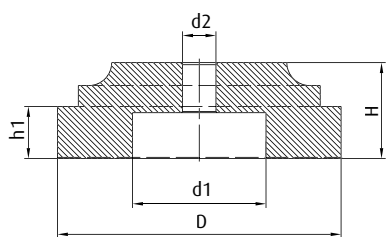
Item no.	Thread G1
270.508	G1/8-female
270.509	G1/4-female
270.392	G1/4-female
270.510	G1/4-female
270.511	G1/4-female

#### Dimensions

G1	L [mm]	l1 [mm]	B [mm]	b1 [mm]	H [mm]	h1 [mm]
G1/8	52	48	25	22	9	5.5
G1/4	60	56	29	25	9	5.5
G1/4	80	75	30	25	9	5.5
G1/4	80	75	40	35	9	5.5
G1/4	80	75	50	44	9	5.5



### Carrier plates SZ-NIP-T



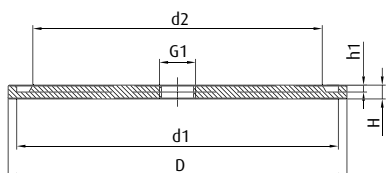
#### Technical data

Item no.	Thread G1
<b>270.270</b>	Without
<b>270.269</b>	Without

#### Dimensions

H [mm]	h1 [mm]	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]
23	12.5	68	32	8
23	12	130	50	8

### Carrier plates SZ-NIP-T

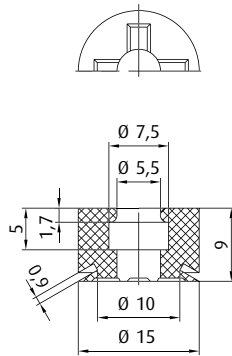


#### Technical data

Item no.	Thread G1
<b>270.415</b>	Without
<b>270.155</b>	Without
<b>270.236</b>	G1/2-female
<b>270.535</b>	Without

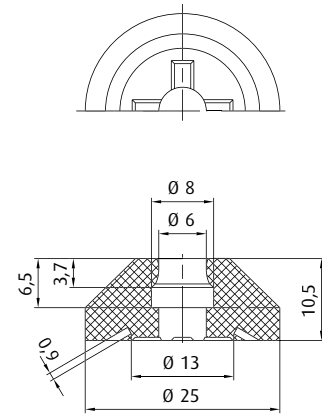
#### Dimensions

H [mm]	h1 [mm]	Ø D [mm]	Ø d1 [mm]	Ø d2 [mm]
8	4.8	95	86	62
8	4	158	148	123
8	4	196	186	167
10	5	237	227	198



### Technical data

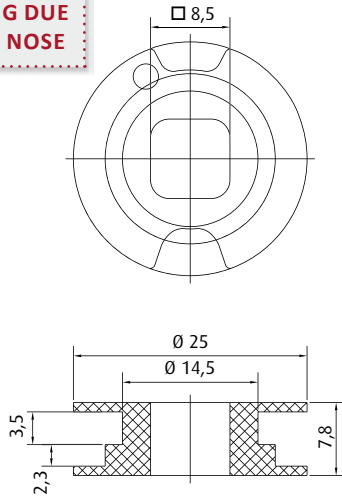
Item no.	Thread G1	Material / Colour
270.067	Without	NBR (sw) - 80° Shore A



### Technical data

Item no.	Thread G1	Material / Colour
270.068	Without	NBR (sw) - 80° Shore A

**EASY MOUNTING DUE TO ABRADABLE NOSE**



### Technical data

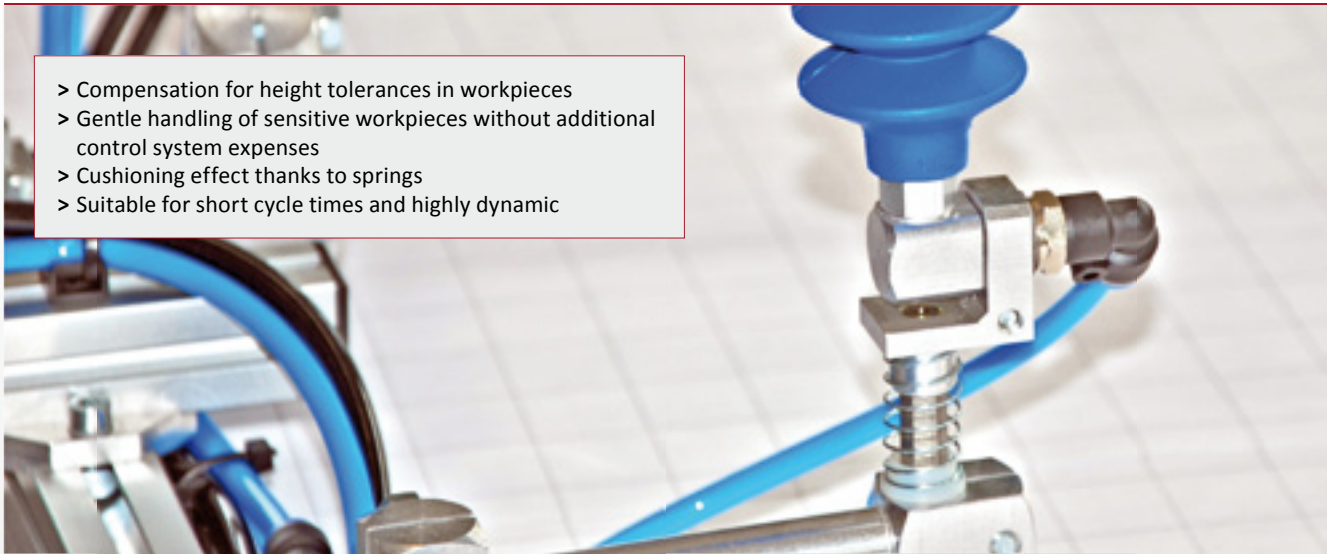
Item no.	Thread G1
270.419	Without

### Ordering notes:

Suitable mounting aid: Item No. 90.007



## FIPA Spring levelers



- > Compensation for height tolerances in workpieces
- > Gentle handling of sensitive workpieces without additional control system expenses
- > Cushioning effect thanks to springs
- > Suitable for short cycle times and highly dynamic



### Standard spring levelers - SZ-NIV-S

- > Suitable for universal use
- > Optional: M5-female also available in anti-twist design
- > Stroke: 5 - 75 mm
- > Vacuum connection: M5-female, G1/8-male, G1/4-male

> See page 444



### Spring levelers with internal spring - SZ-NIV-I

- > Spring protected against contamination and damage
- > Spring travel limitation for a longer service life
- > Stroke: 7 - 20 mm
- > Vacuum connection: M5-female, G1/8-male

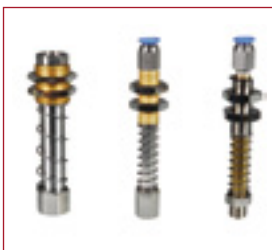
> See page 446



### Heavy-duty spring levelers - SZ-NIV-HD

- > High quality plain bearings for harsh operating conditions
- > Also available with rotation protection
- > Stroke: 15 - 75 mm
- > Vacuum connection:  
G1/8-male, G1/4-male, G3/8-male, G1/2-male and M12-male, M16-male

> See page 447



### Further spring levelers with thread connection

- > Suitable for universal use
- > Vacuum connection: M5-male, M8-male, G1/8-male, G1/8-female, G1/4-female

> See page 450



## FIPA Spring levelers



### Spring levelers for direct vacuum cup mounting

- > Direct mounting on the vacuum cup – no additional fitting required
- > Designs available both with and without anti-rotation device

#### Internal spring - SZ-NIV-DI

- > Stroke: 6 - 20 mm

> See page 454

#### Open spring - SZ-NIV-DA

- > Stroke: 5 - 50 mm

> See page 456



### Mounting brackets for spring levelers

- > Integration of spring levelers into gripper systems
- > Compatible with FIPA spring levelers SZ-NIV-S and SZ-NIV-HD

> See page 458



# Fastening elements vacuum cups | Spring levelers

Standard spring levelers with threaded connection - SZ-NIV-S

## Standard spring levelers with threaded connection - SZ-NIV-S



### Product Description

- > Compensate for height differences
- > Soft attachment for sensitive products
- > Leveling as standard version
- > Vacuum connection on top, vacuum channel via spring leveler
- > Also available non-rotating (M5-female)

### Notes

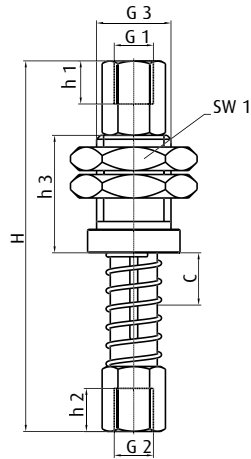
- > Recommendation: For the best possible service life do not exceed max. lift indicated

### Technical data

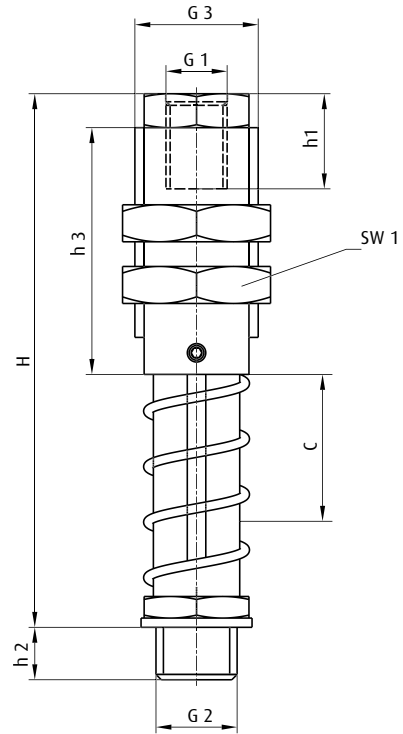
Item no.	Model	Thread suction side G2	Thread fixing bushes G3	Lift C [mm]	Non-rotating	Weight [g]	Suitable mounting bracket for gripper systems
50.158	SZ-NIV-S-M5-IG-5	M5-female	G1/8-male	5	--	17	GR02.230 (p.458)
50.149	SZ-NIV-S-M5-IG-10	M5-female	G1/8-male	10	--	18	GR02.230 (p.458)
50.152	SZ-NIV-S-M5-IG-10-VS	M5-female	G1/8-male	10	Yes	19	GR02.230 (p.458)
50.150	SZ-NIV-S-M5-IG-20	M5-female	G1/8-male	20	--	20	GR02.230 (p.458)
50.153	SZ-NIV-S-M5-IG-20-VS	M5-female	G1/8-male	20	Yes	21	GR02.230 (p.458)
50.230	SZ-NIV-S-G1/8-AG-15	G1/8-male	M16x1-male	15	--	94	GR02.231 (p.458)
50.160	SZ-NIV-S-G1/8-AG-25	G1/8-male	M16x1-male	25	--	94	GR02.231 (p.458)
50.162	SZ-NIV-S-G1/8-AG-50	G1/8-male	M16x1-male	50	--	110	GR02.231 (p.458)
50.164	SZ-NIV-S-G1/4-AG-25	G1/4-male	M20x1.5-male	25	--	136	GR02.232 (p.458)
50.166	SZ-NIV-S-G1/4-AG-75	G1/4-male	M20x1.5-male	75	--	195	GR02.232 (p.458)



### Dimensions



50.158 | 50.149 | 50.152 | 50.150 | 50.153



50.230 | 50.160 | 50.162 | 50.164 | 50.166

Item no.	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	SW1	G1 (female)	G2 (male)	G2 (female)	G3 (male)	C [mm]
50.158	43	5.5	6.2	15	14	M5	--	M5	G1/8	5
50.149	47	5.5	6.2	15	14	M5	--	M5	G1/8	10
50.152	47	5.5	6.2	15	14	M5	--	M5	G1/8	10
50.150	59	5.5	6.2	15	14	M5	--	M5	G1/8	20
50.153	59	5.5	6.2	15	14	M5	--	M5	G1/8	20
50.230	72	8	6.5	30	22	G1/8	G1/8	--	M16x1	15
50.160	85	8.5	6.5	30	22	G1/8	G1/8	--	M16x1	25
50.162	116	8.5	6.5	30	22	G1/8	G1/8	--	M16x1	50
50.164	86	13	9	40	24	G1/8	G1/4	--	M20x1.5	25
50.166	145	13	9	40	24	G1/8	G1/4	--	M20x1.5	75



# Fastening elements vacuum cups | Spring levelers

Spring levelers with internal spring and threaded connection - SZ-NIV-I

## Spring levelers with internal spring and threaded connection - SZ-NIV-I

**BESTSELLER**



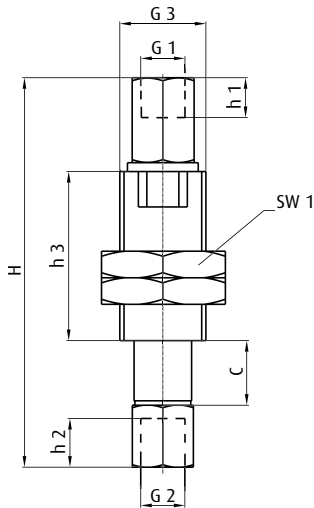
### Product Description

- > Compensate for height differences
- > Soft attachment for sensitive products
- > With internal spring protected from dirt and with spring deflection limiter
- > Vacuum connection on top, vacuum channel via spring leveler

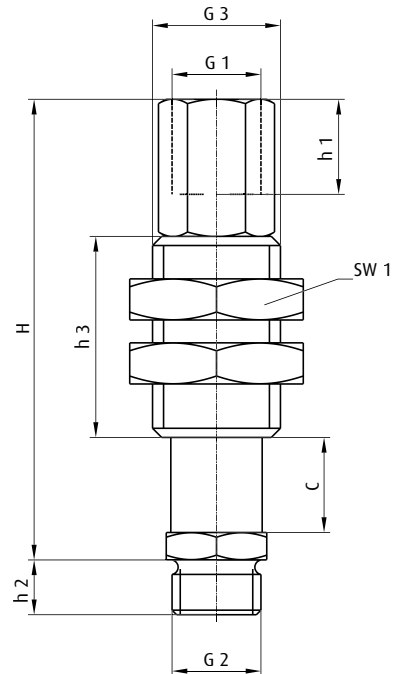
### Technical data

Item no.	Model	Thread suction side G2	Thread fixing bushes G3	Lift C [mm]	Weight [g]	Suitable mounting bracket for gripper systems
50.120	SZ-NIV-I-M5-IG-7	M5-female	G1/8-male	7	17	GR02.230 (p.458)
50.123	SZ-NIV-I-G1/8-AG-8	G1/8-male	M14x1.5-male	8	41	--
50.124	SZ-NIV-I-G1/8-AG-20	G1/8-male	M16x1-male	20	73	GR02.231 (p.458)

### Dimensions



50.120



50.123 | 50.124

Item no.	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	SW1	G1 (female)	G2 (female)	G2 (male)	G3 (male)	C [mm]
50.120	44	4.3	5	19	14	M5	M5	--	G1/8	7
50.123	50	10	6	22	19	G1/8	--	G1/8	M14x1.5	8
50.124	73	12	5.6	35	21	G1/8	--	G1/8	M16x1	20





## Heavy-duty spring levelers - SZ-NIV-HD

## HEAVY-DUTY DESIGN



## Product Description

- > Compensate for height differences
- > Soft attachment for sensitive products
- > Long life even under the toughest conditions
- > Leveling with stainless steel shaft and high-quality bearings
- > Vacuum connection on top, vacuum channel via spring leveler
- > Optionally also available non-rotating

## Notes

- > Recommendation: For the best possible service life do not exceed max. lift indicated

## Technical data

Item no.	Model	Thread suction side G2	Lift C [mm]	Non-rotating	Spring rate [N/mm]	Weight [g]	Suitable mounting bracket for gripper systems
50.315	SZ-NIV-HD-G1/8-AG-15	G1/8-male	15	--	0.221	83	GR02.231 (p.458)
50.310	SZ-NIV-HD-G1/8-AG-15-VS	G1/8-male	15	Yes	0.221	83	GR02.231 (p.458)
50.316	SZ-NIV-HD-G1/8-AG-25	G1/8-male	25	--	0.143	89	GR02.231 (p.458)
50.311	SZ-NIV-HD-G1/8-AG-25-VS	G1/8-male	25	Yes	0.143	89	GR02.231 (p.458)
50.317	SZ-NIV-HD-G1/8-AG-50	G1/8-male	50	--	0.097	104	GR02.231 (p.458)
50.312	SZ-NIV-HD-G1/8-AG-50-VS	G1/8-male	50	Yes	0.097	104	GR02.231 (p.458)
50.345	SZ-NIV-HD-G1/4-AG-25	G1/4-male	25	--	0.711	134	GR02.232 (p.458)
50.340	SZ-NIV-HD-G1/4-AG-25-VS	G1/4-male	25	Yes	0.711	134	GR02.232 (p.458)
50.346	SZ-NIV-HD-G1/4-AG-50	G1/4-male	50	--	0.452	160	GR02.232 (p.458)
50.341	SZ-NIV-HD-G1/4-AG-50-VS	G1/4-male	50	Yes	0.452	160	GR02.232 (p.458)
50.347	SZ-NIV-HD-G1/4-AG-75	G1/4-male	75	--	0.262	186	GR02.232 (p.458)
50.342	SZ-NIV-HD-G1/4-AG-75-VS	G1/4-male	75	Yes	0.262	186	GR02.232 (p.458)
50.350	SZ-NIV-HD-G3/8-AG-25	G3/8-male	25	--	3.828	410	--
50.353	SZ-NIV-HD-G3/8-AG-25-VS	G3/8-male	25	Yes	3.828	406	--
50.351	SZ-NIV-HD-G3/8-AG-75	G3/8-male	75	--	1.072	531	--
50.354	SZ-NIV-HD-G3/8-AG-75-VS	G3/8-male	75	Yes	1.072	525	--
50.360	SZ-NIV-HD-G1/2-AG-25	G1/2-male	25	--	3.828	419	--
50.363	SZ-NIV-HD-G1/2-AG-25-VS	G1/2-male	25	Yes	3.828	416	--
50.361	SZ-NIV-HD-G1/2-AG-75	G1/2-male	75	--	1.072	548	--
50.364	SZ-NIV-HD-G1/2-AG-75-VS	G1/2-male	75	Yes	1.072	540	--
50.366	SZ-NIV-HD-M12-AG-25	M12-male	25	--	0.711	150	GR02.232 (p.458)
50.367	SZ-NIV-HD-M12-AG-25-VS	M12-male	25	Yes	0.711	150	GR02.232 (p.458)

Continued on the next page



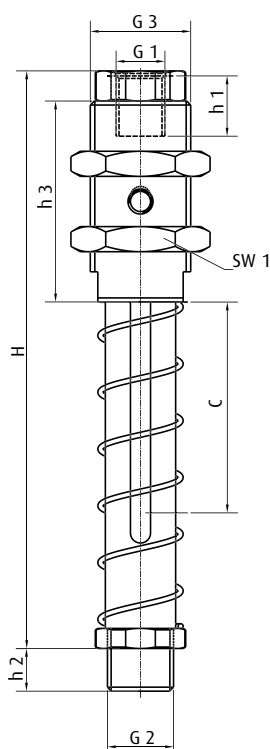
# Fastening elements vacuum cups | Spring levelers

Heavy-duty spring levelers - SZ-NIV-HD

## Technical data

Item no.	Model	Thread suction side G2	Lift C [mm]	Non-rotating	Spring rate [N/mm]	Weight [g]	Suitable mounting bracket for gripper systems
50.368	SZ-NIV-HD-M12-AG-50	M12-male	50	--	0.452	176	GR02.232 (p.458)
50.369	SZ-NIV-HD-M12-AG-50-VS	M12-male	50	Yes	0.452	176	GR02.232 (p.458)
50.370	SZ-NIV-HD-M12-AG-75	M12-male	75	--	0.262	202	GR02.232 (p.458)
50.371	SZ-NIV-HD-M12-AG-75-VS	M12-male	75	Yes	0.262	202	GR02.232 (p.458)
50.372	SZ-NIV-HD-M16-AG-25	M16-male	25	--	3.828	451	--
50.373	SZ-NIV-HD-M16-AG-25-VS	M16-male	25	Yes	3.828	447	--
50.374	SZ-NIV-HD-M16-AG-75	M16-male	75	--	1.072	572	--
50.375	SZ-NIV-HD-M16-AG-75-VS	M16-male	75	Yes	1.072	566	--

## Dimensions



Item no.	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	SW1	G1 (female)	G2 (male)	G3 (male)	C [mm]
50.315	72	8	8	30	22	G1/8	G1/8	M16x1	15
50.310	72	8	8	30	22	G1/8	G1/8	M16x1	15
50.316	85	8	8	30	22	G1/8	G1/8	M16x1	25
50.311	85	8	8	30	22	G1/8	G1/8	M16x1	25
50.317	116	8	8	30	22	G1/8	G1/8	M16x1	50
50.312	116	8	8	30	22	G1/8	G1/8	M16x1	50
50.345	85.5	12	8.5	40	24	G1/8	G1/4	M20x1.5	25
50.340	85.5	12	8.5	40	24	G1/8	G1/4	M20x1.5	25
50.346	115	12	8.5	40	24	G1/8	G1/4	M20x1.5	50
50.341	115	12	8.5	40	24	G1/8	G1/4	M20x1.5	50
50.347	144.5	12	8.5	40	24	G1/8	G1/4	M20x1.5	75
50.342	144.5	12	8.5	40	24	G1/8	G1/4	M20x1.5	75
50.350	104	14	12	53	36	G3/8	G3/8	M30x1.5	25

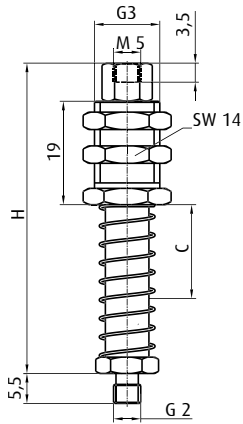


Item no.	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	SW1	G1 (female)	G2 (male)	G3 (male)	C [mm]
50.353	104	14	12	53	36	G3/8	G3/8	M30x1.5	25
50.351	175	14	12	53	36	G3/8	G3/8	M30x1.5	75
50.354	175	14	12	53	36	G3/8	G3/8	M30x1.5	75
50.360	104	14	12	53	36	G3/8	G1/2	M30x1.5	25
50.363	104	14	12	53	36	G3/8	G1/2	M30x1.5	25
50.361	175	14	12	53	36	G3/8	G1/2	M30x1.5	75
50.364	175	14	12	53	36	G3/8	G1/2	M30x1.5	75
50.366	97.5	12	10	40	24	G1/8	M12	M20x1.5	25
50.367	97.5	12	10	40	24	G1/8	M12	M20x1.5	25
50.368	127	12	10	40	24	G1/8	M10	M20x1.5	50
50.369	127	12	10	40	24	G1/8	M12	M20x1.5	50
50.370	156.5	12	10	40	24	G1/8	M12	M20x1.5	75
50.371	156.5	12	10	40	24	G1/8	M12	M20x1.5	75
50.372	119	14	10	53	36	G3/8	M16	M30x1.5	25
50.373	119	14	10	53	36	G3/8	M16	M30x1.5	25
50.374	190	14	10	53	36	G3/8	M16	M30x1.5	75
50.375	190	14	10	53	36	G3/8	M16	M30x1.5	75



# Fastening elements vacuum cups | Spring levelers

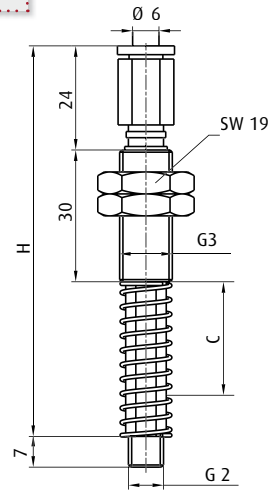
## Spring levelers with thread connection



### Technical data

Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.121	M5-male	10	28	M12x1-male	47
50.122	M5-male	20	31	M12x1-male	57

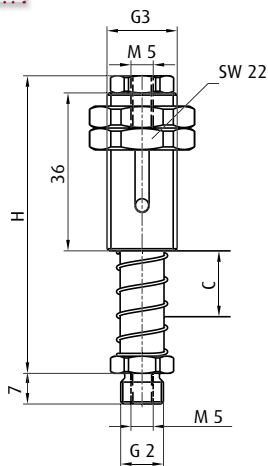
### NON-ROTATING



### Technical data

Item no.	Thread suction side G2	Lift C [mm]	Non-rotating	Weight [g]	Thread fixing bushes G3	H [mm]
50.054	M8-male	25	Yes	83	M12x1.25-male	89

### NON-ROTATING



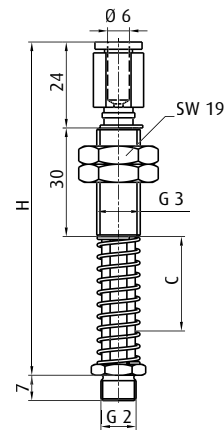
### Technical data

Item no.	Thread suction side G2	Lift C [mm]	Non-rotating	Weight [g]	Thread fixing bushes G3	H [mm]
50.066	G1/8-male	15	Yes	70	M16x1.5-male	68

### Notes:

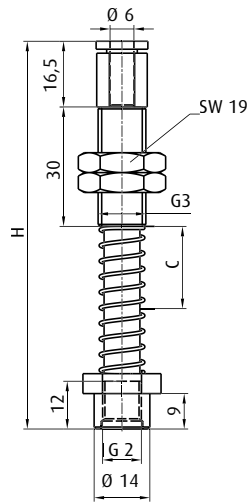
with plastic slide bearings

### NON-ROTATING



### Technical data

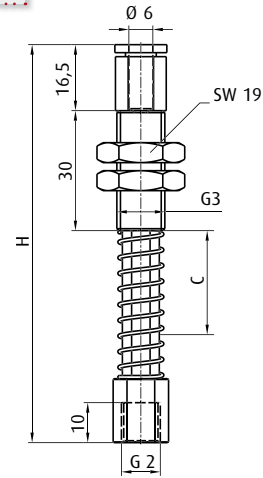
Item no.	Thread suction side G2	Lift C [mm]	Non-rotating	Weight [g]	Thread fixing bushes G3	H [mm]
50.055	G1/8-male	25	Yes	64	M12x1.25-male	92



### Technical data

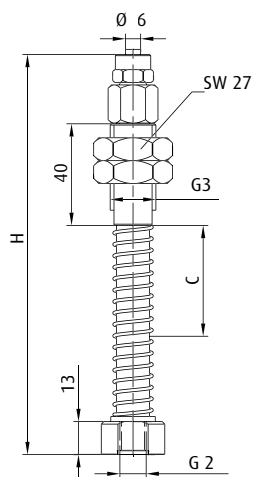
Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.021	G1/8-female	25	75	M12x1.5-male	98

### NON-ROTATING



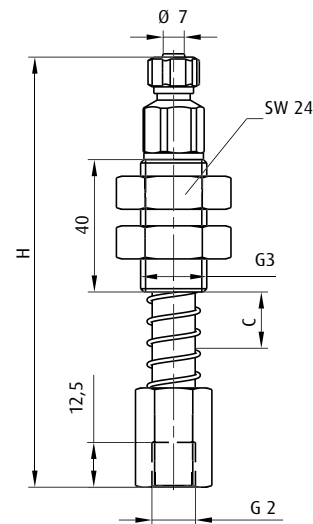
### Technical data

Item no.	Thread suction side G2	Lift C [mm]	Non-rotating	Weight [g]	Thread fixing bushes G3	H [mm]
50.056	G1/8-female	25	Yes	63	M12x1.5-male	100



### Technical data

Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.028	G1/8-female	25	240	M18x1.5-male	119
50.029	G1/8-female	50	280	M18x1.5-male	157
50.030	G1/8-female	75	310	M18x1.5-male	194



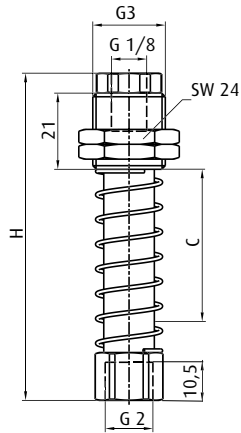
### Technical data

Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.106	G1/4-female	45	250	M20x1.5-male	167



# Fastening elements vacuum cups | Spring levelers

Spring levelers with thread connection



## Technical data

Item no.	Thread suction side G2	Lift C [mm]	Weight [g]	Thread fixing bushes G3	H [mm]
50.050	G1/4-female	42	122	M20x1.5-male	90



Notes:



Lined area for taking notes, consisting of multiple horizontal lines.

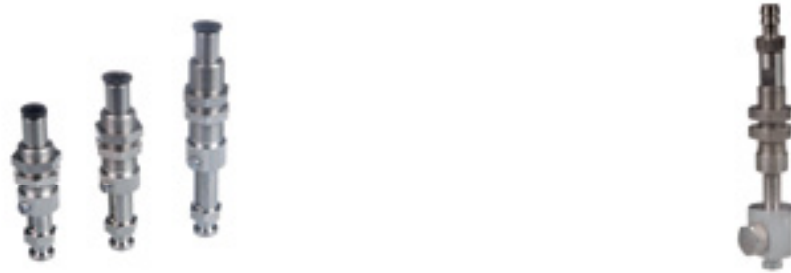




# Fastening elements vacuum cups | Spring levelers

Spring levelers for direct vacuum cup mounting - internal spring - SZ-NIV-DI

## Spring levelers for direct vacuum cup mounting - internal spring - SZ-NIV-DI



### Product Description

- > Soft attachment for sensitive products
- > With internal spring protected from dirt and with spring deflection limiter
- > Compensate for height differences
- > Direct mounting of the spring leveler on the vacuum cup, no additional fitting required
- > Vacuum connection on top, vacuum channel via spring leveler

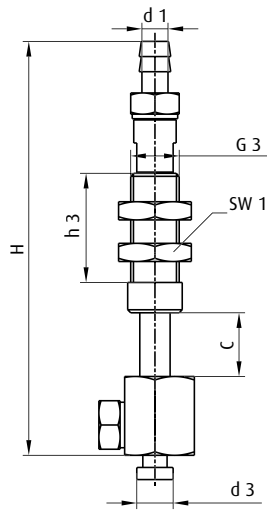
### Technical data

Item no.	Lift C [mm]	Non-rotating	Hose inner $\phi$ [mm]	Hose outer $\phi$ [mm]	Thread suction side G2	Thread fixing bushes G3	Weight [g]	Design	Suitable fittings for extrusion system
50.330	10	--	4	--	Without (Snap-in)	M8x0.75	19	--	--
50.103	6	Yes	--	6	Without (Snap-in)	M14x1-male	34	--	--
50.104	6	Yes	--	4	Without (Snap-in)	M14x1-male	33	--	--
50.125	10	Yes	--	6	Without (Snap-in)	M14x1-male	36	--	--
50.126	15	Yes	--	6	Without (Snap-in)	M14x1-male	41	--	--
50.127	20	Yes	--	6	Without (Snap-in)	M14x1-male	48	--	--
50.085	6	Yes	--	6	Without (Snap-in)	M14x1-male	36	--	--
50.086	6	Yes	--	4	Without (Snap-in)	M14x1-male	36	--	--
50.128	10	Yes	--	6	Without (Snap-in)	M14x1-male	36	--	--
50.129	15	Yes	--	6	Without (Snap-in)	M14x1-male	41	--	--
50.130	20	Yes	--	6	Without (Snap-in)	M14x1-male	48	--	--
50.018	8.5	--	--	4	Without (Snap-in)	M16x1-male	21	Plastic corpus	GR02.231 (p.458)
50.019	8.5	--	--	6	Without (Snap-in)	M16x1-male	22	Plastic corpus	GR02.231 (p.458)
50.020	8.5	--	--	6	Without (Snap-in)	M16x1-male	23	Plastic corpus	GR02.231 (p.458)

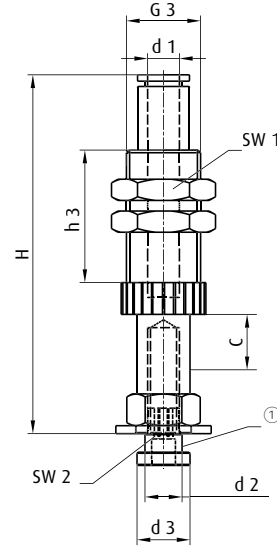




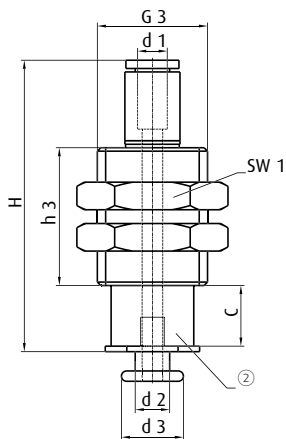
## Dimensions



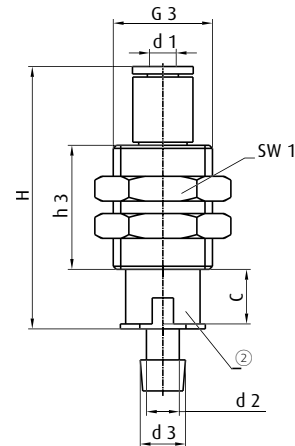
50.330



50.103 | 50.104 | 50.125 | 50.126 | 50.127 | 50.085 | 50.086 | 50.128 | 50.129 | 50.130



50.018 | 50.019



50.020

① = Mounting screw ② = Plastic body

Item no.	Ø d1 [mm]	Ø d2 [mm]	d2	Ø d3 [mm]	G3	H [mm]	h3 [mm]	SW1	SW2	C [mm]
50.330	4.3	--	--	6	M8x0.75	68	18	12	--	10
50.103	6	--	M4	6.3	M14x1	52	20	17	+	6
50.104	4	--	M4	6.3	M14x1	52	20	17	+	6
50.125	6	5	--	6	M14x1	56	20	17	3	10
50.126	6	5	--	6	M14x1	67	25	17	3	15
50.127	6	5	--	6	M14x1	83	34	17	3	20
50.085	6	7	--	10	M14x1	52	20	17	3	6
50.086	4	7	--	10	M14x1	52	20	17	3	6
50.128	6	7	--	10	M14x1	58	20	17	3	10
50.129	6	7	--	10	M14x1	68	25	17	3	15
50.130	6	7	--	10	M14x1	83	34	17	3	20
50.018	4	5	--	9	M16x1	45	20	19	--	8.5
50.019	6	5	--	9	M16x1	46.5	20	19	--	8.5
50.020	6	5	--	7.3	M16x1	42.5	20	19	--	8.5



# Fastening elements vacuum cups | Spring levelers

Spring levelers for direct vacuum cup mounting - spring open - SZ-NIV-DA

## Spring levelers for direct vacuum cup mounting - spring open - SZ-NIV-DA



Series 1

Series 2

### Product Description

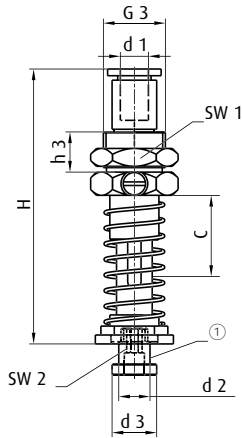
- > Direct mounting of the spring leveler on the vacuum cup, no additional fitting required
- > Compensate for height differences
- > Soft attachment for sensitive products
- > Leveling with an open spring

### Technical data

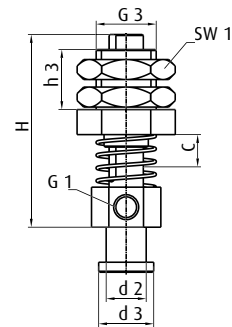
Item no.	Series	Lift C [mm]	Non-rotating	Hose outside $\varnothing$ [mm]	Hose inner $\varnothing$ [mm]	Thread suction side G2	Thread fixing bushes G3	Weight [g]
50.095	1	20	Yes	6	--	Without (Snap-in)	M14x1-male	51
50.096	1	30	Yes	6	--	Without (Snap-in)	M14x1-male	57
50.097	1	40	Yes	6	--	Without (Snap-in)	M14x1-male	62
50.098	1	50	Yes	6	--	Without (Snap-in)	M14x1-male	67
50.170	1	20	Yes	6	--	Without (Snap-in)	M14x1-male	51
50.171	1	30	Yes	6	--	Without (Snap-in)	M14x1-male	57
50.172	1	40	Yes	6	--	Without (Snap-in)	M14x1-male	62
50.173	1	50	Yes	6	--	Without (Snap-in)	M14x1-male	67
50.174	1	20	Yes	6	--	Without (Snap-in)	M14x1-male	51
50.175	1	30	Yes	6	--	Without (Snap-in)	M14x1-male	57
50.176	1	40	Yes	6	--	Without (Snap-in)	M14x1-male	62
50.177	1	50	Yes	6	--	Without (Snap-in)	M14x1-male	67
50.141	2	10	--	--	--	Without (Snap-in)	M10x1-male	12
50.005	2	5	--	--	--	Without (Snap-in)	M12-male	23
50.145	2	10	--	--	--	Without (Snap-in)	M12-male	39
50.146	2	30	--	--	--	Without (Snap-in)	M12-male	46
50.037	2	25	--	--	4	Without (Snap-in)	M12x1.5-male	69



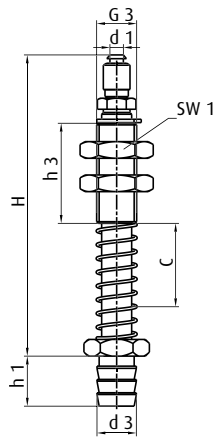
## Dimensions



50.095 | 50.096 | 50.097 | 50.098 | 50.170 | 50.171 | 50.172 |  
50.173 | 50.174 | 50.175 | 50.176 | 50.177



50.141 | 50.005 | 50.145 | 50.146



50.037

① = Mounting screw M6

Item no.	Ø d1 [mm]	Ø d2 [mm]	Ø d3 [mm]	G1	G3	H [mm]	h1 [mm]	h3 [mm]	SW1	SW2	C [mm]
50.095	6	7	10	--	M14x1	61	--	9	17	3	20
50.096	6	7	10	--	M14x1	75	--	9	17	3	30
50.097	6	7	10	--	M14x1	87	--	9	17	3	40
50.098	6	7	10	--	M14x1	100	--	9	17	3	50
50.170	6	6	15	--	M14x1	61	--	9	17	3	20
50.171	6	6	15	--	M14x1	75	--	9	17	3	30
50.172	6	6	15	--	M14x1	87	--	9	17	3	40
50.173	6	6	15	--	M14x1	100	--	9	17	3	50
50.174	6	6	20	--	M14x1	61	--	9	17	3	20
50.175	6	6	20	--	M14x1	75	--	9	17	3	30
50.176	6	6	20	--	M14x1	87	--	9	17	3	40
50.177	6	6	20	--	M14x1	100	--	9	17	3	50
50.141	--	5	7	M5	M10x1	40	--	12	14	--	8
50.005	--	8	11	M5	M12	43	--	16	19	--	5
50.145	--	8	11	M5	M12	44	--	15	17	--	10
50.146	--	8	11	M5	M12	65	--	15	17	--	30
50.037	4	--	5.5	--	M12x1.5	89	7	30	19	--	25



# Fastening elements vacuum cups | Spring levelers

SLine / MLine mounting brackets - for spring levelers

## SLine / MLine mounting brackets - for spring levelers

Connection of vacuum cups in gripper systems via spring levelers



Mounting example

### Product Description

- > Compatible with commercially available spring levelers
- > Particularly compatible with FIPA spring levelers SZ-NIV-S and SZ-NIV-HD

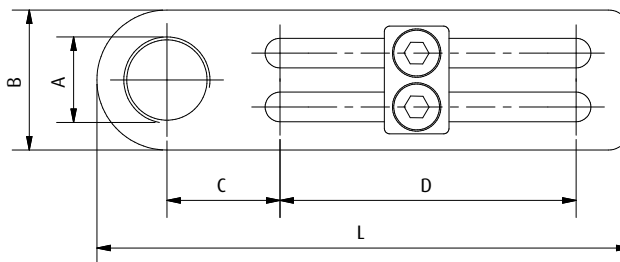
### Ordering notes

- > Channel nuts included in delivery

### Technical data

Item no.	Weight [g]
GR02.230	29
GR02.231	55
GR02.232	63

### Dimensions



Item no.	A	B [mm]	C [mm]	D [mm]	L [mm]
GR02.230	G1/8	20	17	45	82
GR02.231	M16x1	26	21	55	99
GR02.232	M20x1.5	28	21	65	110



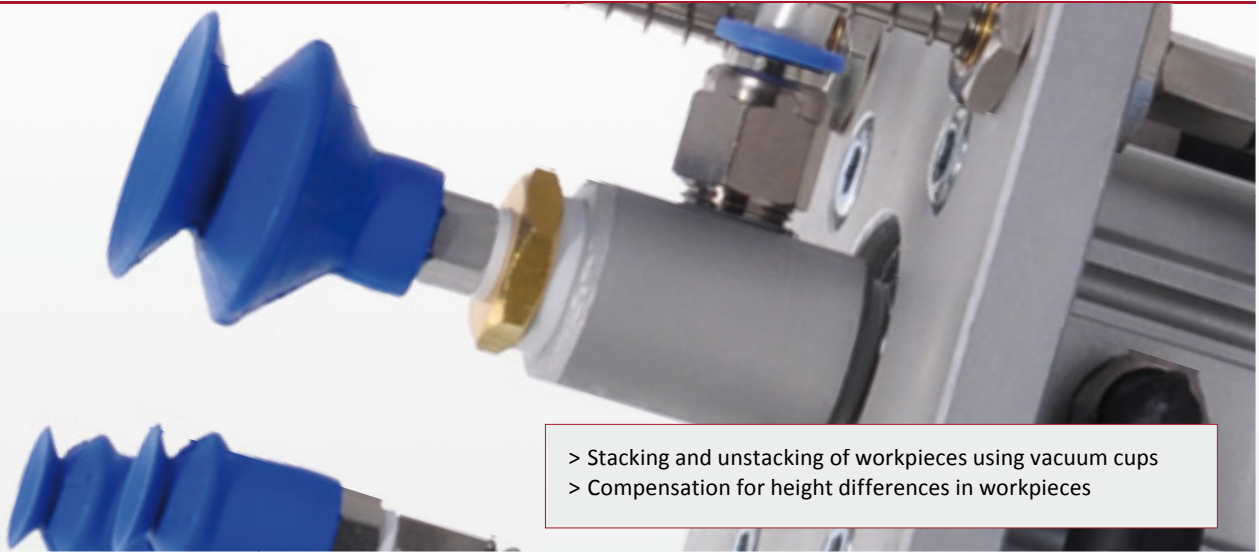
Notes:

A large area for taking notes, featuring a vertical red line on the left side and horizontal grey lines for writing.





## FIPA Lifting cylinders



- > Stacking and unstacking of workpieces using vacuum cups
- > Compensation for height differences in workpieces



### Compressed-air operated lifting cylinders for direct vacuum cup mounting (55.100 - 55.120)

- > Stacking and unstacking applications
- > Integrated vacuum generation
- > Specially suited for vacuum cups of SFU-F and SBF-B series

> See page 462



### Compressed-air operated lifting cylinders - with anti-twist (55.005)

- > Picking-up and stacking flat and sensitive objects such as signs, card, labels, veneer correct position using an anti-twist piston rod
- > Integrated vacuum generation
- > Very short cycle times thanks to integrated compressed air pulse during placement
- > Very compact design in robust aluminium housing
- > Long service life of around 25 million cycles thanks to Hardcoat® treated running surfaces
- > Optional part control by monitoring piston position

> See page 466



### Vacuum operated lifting cylinder - with anti-twist (55.000, 55.001, 55.004)

- > Suction and lifting of flat and sensitive objects such as signs, cards, labels, veneer
- > Part extraction from injection molds
- > Fixation of workpieces in cutting stations
- > Compensation of height differences between vacuum cup and workpiece
- > Short cycle times thanks to low moving masses
- > Robust aluminium housing
- > Long service life of around 25 million cycles thanks to Hardcoat® treated running surfaces
- > Particularly low-noise design

> See page 468



## FIPA Lifting cylinders



### Vacuum operated lifting cylinders - with anti-twist (55.002)

- > Stacking and lifting of metal sheets and heavy parts
- > Compensation of height differences between vacuum cup and workpiece
- > Robust aluminium housing
- > Long service life of around 25 million cycles thanks to Hardcoat® treated running surfaces

> See page 468

## Operation principles

### 55.100 to 55.120

In the initial position the piston rod is extended. As soon as compressed air supply is activated, vacuum is created by the integrated ejector. When the vacuum cup makes contact with the object to be handled, the piston rod is rapidly retracted. The handled object is held in position until compressed air supply is turned off.

### 55.005

In the initial position the piston rod is retracted. As soon as compressed air supply is activated, vacuum is created by the integrated ejector and the piston rod is extended.

When the vacuum cup makes contact with the object to be handled, the piston rod is rapidly retracted.

When compressed air is switched off, a pulse of compressed air from an integrated air chamber drives the piston rod back out and the object is released.

### 55.000 to 55.004

In the initial position the piston rod is retracted. Upon application of vacuum, the piston rod with the vacuum cup is extended.

When the vacuum cup makes contact with the object to be handled, the piston rod is rapidly retracted.

The gripped object remains on the vacuum cup until vacuum supply is switched off.



# Fastening elements vacuum cups | Lifting cylinders

Vacuum lifting cylinder - operated by compressed air

## Vacuum lifting cylinder - operated by compressed air

For flat suction picking, e.g. for suction cup series SFU-F Ø 4 - 15 mm



### Product Description

- > Stacking and destacking of workpieces
- > Vacuum generation by compressed air using an integrated ejector
- > Lifting cylinder extended during idle state
- > Cycle time independent of lift and weight

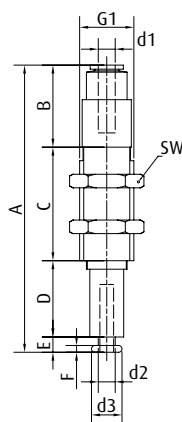
### Ordering notes

- > Suitable vacuum cups can be found in chapter vacuum cups series, flat vacuum cups SFU-F Ø 4 - 15 mm and bellows vacuum cups SBF-B Ø 6 - 15 mm

### Technical data

Item no.	Lift [mm]	Lifting force [N]	Operating pressure [bar]	Vacuum level [mbar]	Cycles [1/min]	Weight [g]	Suitable fittings for extrusion system
55.100	5	3.5 - 5	3.5 - 4.5	-700	50	33	GR02.231 (p.458)
55.102	10	3.5 - 5	3.5 - 4.5	-700	50	36	GR02.231 (p.458)
55.104	20	3.5 - 5	3.5 - 4.5	-700	50	41	GR02.231 (p.458)
55.106	30	3.5 - 5	3.5 - 4.5	-700	50	45	GR02.231 (p.458)
55.108	5	3.5 - 5	3.5 - 4.5	-700	50	32	GR02.231 (p.458)
55.110	10	3.5 - 5	3.5 - 4.5	-700	50	45	GR02.231 (p.458)
55.112	20	3.5 - 5	3.5 - 4.5	-700	50	52	GR02.231 (p.458)
55.114	30	3.5 - 5	3.5 - 4.5	-700	50	45	GR02.231 (p.458)

### Dimensions







Item no.	G1	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	d2 [mm]	d3 [mm]	E [mm]	F [mm]	SW
55.100	M16x1	55	23.5	22	5	4	5	9	4.5	2	19
55.102	M16x1	65	23.5	27	10	4	5	9	4.5	2	19
55.104	M16x1	85	23.5	37	20	4	5	9	4.5	2	19
55.106	M16x1	105	23.5	47	30	4	5	9	4.5	2	19
55.108	M16x1	56.5	25	22	5	6	5	9	4.5	2	19
55.110	M16x1	66.5	25	27	10	6	5	9	4.5	2	19
55.112	M16x1	86.5	25	37	20	6	5	9	4.5	2	19
55.114	M16x1	106.5	25	47	30	6	5	9	4.5	2	19



## Fastening elements vacuum cups | Lifting cylinders

Vacuum lifting cylinder - operated by compressed air

### Vacuum lifting cylinder - operated by compressed air

For high suction picking, e.g. for series SFU-F Ø 20 - 40 mm



#### Product Description

- > Stacking and destacking of workpieces
- > Vacuum generation by compressed air using an integrated ejector
- > Lifting cylinder extended during idle state
- > Cycle time independent of lift and weight

#### Ordering notes

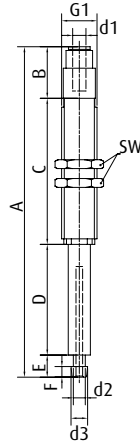
- > Suitable vacuum cups can be found in chapter vacuum cups series, flat vacuum cups SFU-F Ø 20 - 40 mm and bellows vacuum cups SBF-B Ø 20 mm

#### Technical data

Item no.	Lift [mm]	Lifting force [N]	Operating pressure [bar]	Vacuum level [mbar]	Cycles [1/min]	Weight [g]	Suitable fittings for extrusion system
55.101	5	3.5 - 5	3.5 - 4.5	-700	50	33	GR02.231 (p.458)
55.103	10	3.5 - 5	3.5 - 4.5	-700	50	36	GR02.231 (p.458)
55.105	20	3.5 - 5	3.5 - 4.5	-700	50	41	GR02.231 (p.458)
55.107	30	3.5 - 5	3.5 - 4.5	-700	50	46	GR02.231 (p.458)
55.109	5	3.5 - 5	3.5 - 4.5	-700	50	33	GR02.231 (p.458)
55.111	10	3.5 - 5	3.5 - 4.5	-700	50	36	GR02.231 (p.458)
55.113	20	3.5 - 5	3.5 - 4.5	-700	50	41	GR02.231 (p.458)
55.115	30	3.5 - 5	3.5 - 4.5	-700	50	46	GR02.231 (p.458)
55.120	50	3.5 - 5	3.5 - 4.5	-700	50	56	GR02.231 (p.458)



## Dimensions



Item no.	G1	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	d2 [mm]	d3 [mm]	E [mm]	F [mm]	SW
55.101	M16x1	60.5	23.5	22	5	4	5	7.5	10	5	19
55.103	M16x1	70.5	23.5	27	10	4	5	7.5	10	5	19
55.105	M16x1	90.5	23.5	37	20	4	5	7.5	10	5	19
55.107	M16x1	110.5	23.5	47	30	4	5	7.5	10	5	19
55.109	M16x1	62	25	22	5	6	5	7.5	10	5	19
55.111	M16x1	72	25	27	10	6	5	7.5	10	5	19
55.113	M16x1	92	25	37	20	6	5	7.5	10	5	19
55.115	M16x1	112	25	47	30	6	5	7.5	10	5	19
55.120	M16x1	151	25	67	50	6	5	7.5	10	5	19



### Lifting cylinder - operated by compressed air

With blow-off feature, torsionally rigid



#### Product Description

- > Stacking and destacking of thin and sensitive products, such as e.g. signboards, cards, paper, thin wood (veneers)
- > Very short cycle times thanks to compressed air pulse during placement
- > Suitable for fast transport movements
- > Torsionally rigid piston rods for correctly positioned placement
- > Robust aluminium housing with Hartcoat® coating in compact design with integrated ejector, valve technology and air chamber for blow-off air
- > Optional PNP magnetic field sensor to monitor lifting of workpiece

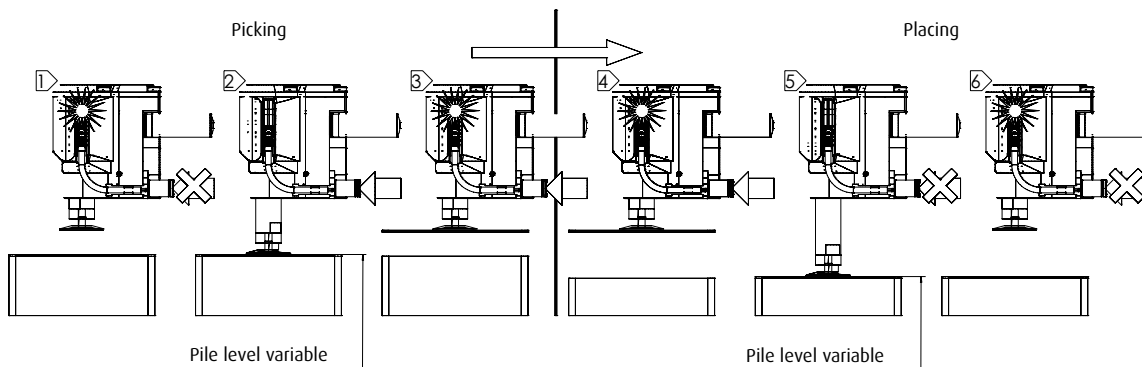
#### Notes

- > For release of workpiece (in defined position) compressed air line needs to be shut and ventilated by means of a 3/2 way valve. Otherwise the piston will not extend again for product release and the workpiece will just fall down.

#### Technical data

Item no.	Lift [mm]	Lifting force at 6 bar [N]	Operating pressure [bar]	Volume flow at 6 bar [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable accessories
55.005	25	8	5 - 8	48	5 - 80	220	Silencers 72.028 (p.577) Magnetic field sensor 55.099

#### Wiring diagram

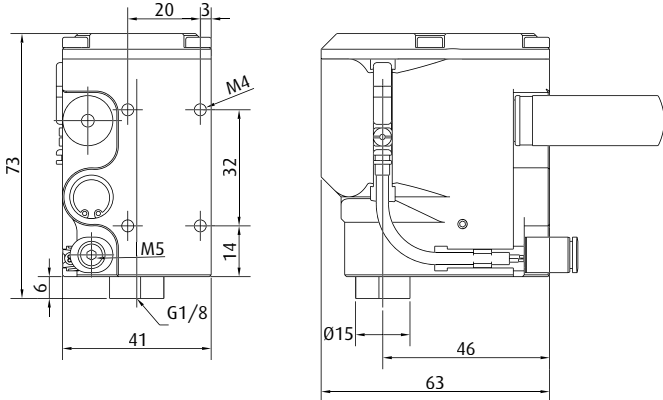


#### Process:

1. Initial position: Compressed air off, piston drawn in, magnetic sensor in operation
2. Compressed air switched on, piston moves out, workpiece is pulled in, piston retracts with the workpiece to the initial position
3. Workpiece sucked in and lifted, compressed air on, magnetic field sensor in operation
4. Transport movement
5. Switch off compressed air, piston moves out with the workpiece, places the workpiece and retracts to the initial position
6. Initial position: Compressed air off, piston drawn in, magnetic sensor in operation

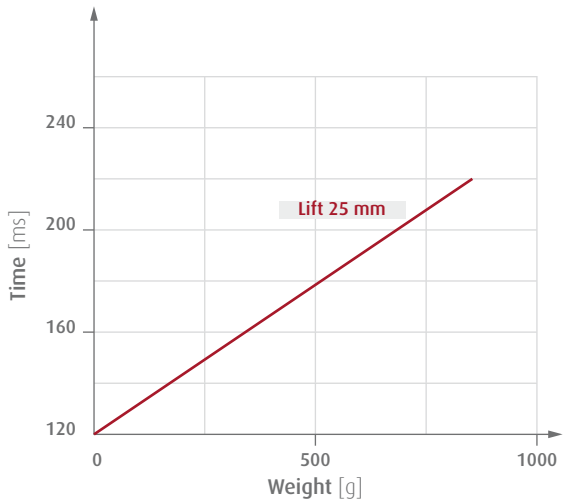


Dimensions

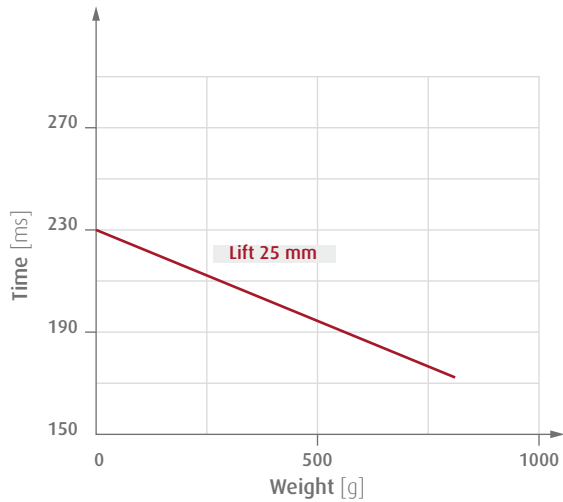


Diagrams

> Double lift lifting time against weight, pressure 6 bar



> Double lift lifting time against weight, pressure 6 bar





# Fastening elements vacuum cups | Lifting cylinders

Lifting cylinder - vacuum-operated

## Lifting cylinder - vacuum-operated

Torsionally rigid



55.000 | 55.001 | 55.004



55.002

### Product Description

- > Picking-up and stacking flat and sensitive objects such as e.g. signs, card, paper, veneers
- > Suitable for short cycle times
- > Application e.g. for workpiece fixation in cutting stations
- > Robust aluminium housing, Hartcoat® treated
- > Anti-twist piston rod
- > Particularly low-noise version

### Notes

- > 55.002: Stacking and lifting of metal sheet and heavy parts, not suitable for workpieces permeable to air

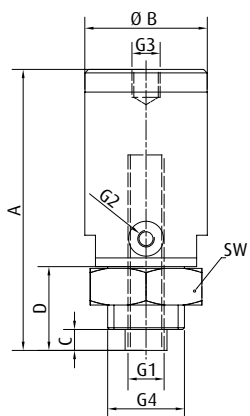
### Ordering notes

- > Customised sizes on request

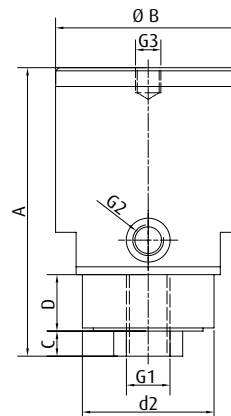
### Technical data

Item no.	Lift [mm]	Volume flow at 80 % vacuum [Nl/min]	Lifting force at 80 % vacuum [N]	Cycle time (extend-suction-lift) [s]	Operating temperature [°C]	Weight [g]
55.000	17	15	3	0.3	5 - 80	55
55.001	25	30	10	0.4	5 - 80	145
55.002	30	35	50	0.7	5 - 80	310
55.004	40	30	10	0.7	5 - 80	185

### Dimensions



55.000 | 55.001 | 55.004



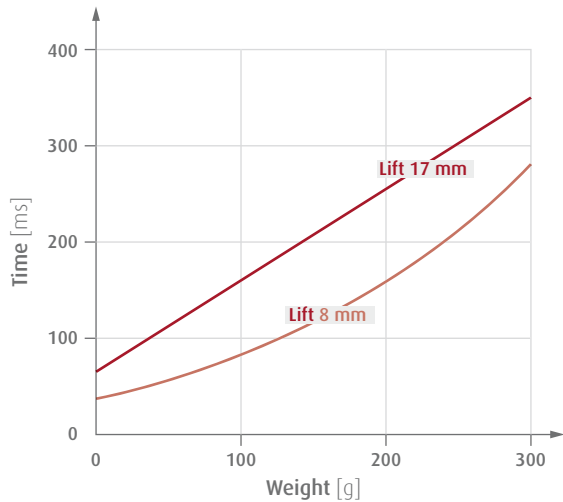
55.002



Item no.	G1	G2	G3	G4	A [mm]	Ø B [mm]	C [mm]	D [mm]	d2 [mm]	SW
55.000	M5	M5	M6	M16x1.5	55.5	24	4	16	--	24
55.001	G1/8	M5	M8	M22x1.5	78	35	6	22	--	32
55.002	G1/4	G1/8	M10	--	92	59	9	18	44	--
55.004	G1/8	G1/8	M8	M22x1.5	98	35	9	24	--	32

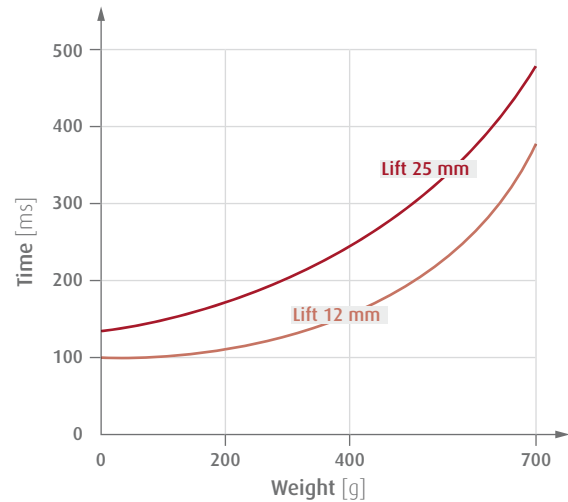
### Diagrams

> Double lift lifting time against weight



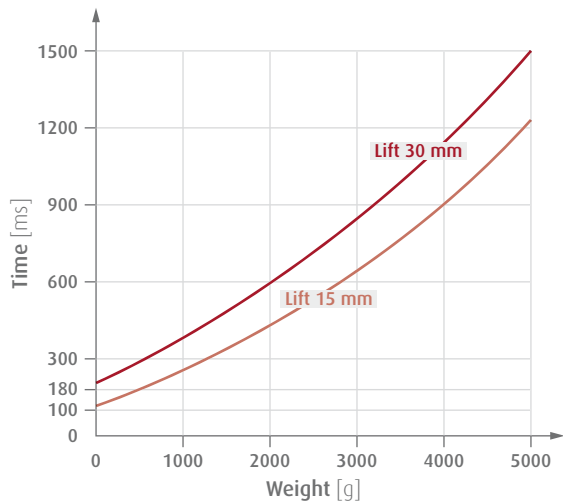
55.000

> Double lift lifting time against weight



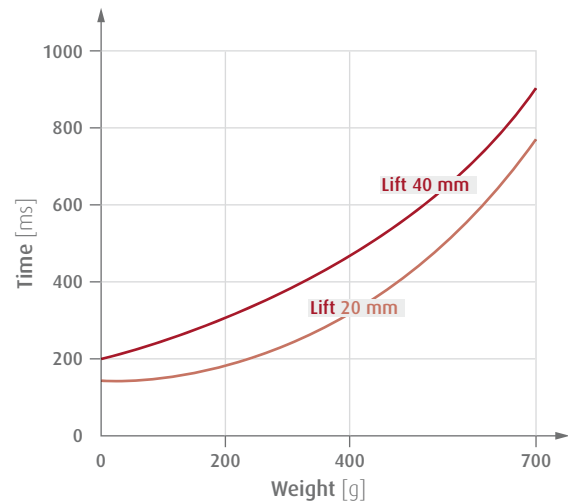
55.001

> Double lift lifting time against weight



55.002

> Double lift lifting time against weight



55.004



# Fastening elements vacuum cups | Joints

## G threaded ball joints - SZ-GKG

### G threaded ball joints - SZ-GKG



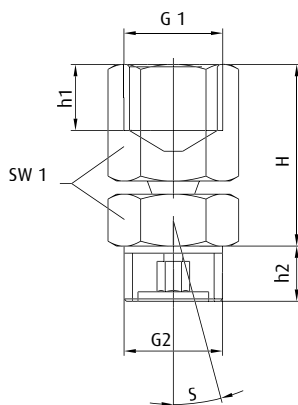
#### Product Description

- > Universal articulating mount for vacuum cups allows compensation for sloping product surfaces
- > Angle compensation for sagging products, such as sheet goods
- > Version: Ball and socket with O-ring seal

#### Technical data

Item no.	Thread suction side G2	Thread at the machine G1	Pivoting range S [°]	Lifting force [N]	Weight [g]
270.072	G1/8-male	G1/8-female	2x15	300	26
270.073/1	G1/4-male	G1/4-female	2x15	1,500	49
270.075	G1/2-male	G1/2-female	2x15	2,500	116

#### Dimensions



Item no.	Ø dn [mm]	G1	G2	H [mm]	h1 [mm]	h2 [mm]	SW1	S [°]
270.072	2	G1/8	G1/8	25	8.5	7	14	2 - 15
270.073/1	3.5	G1/4	G1/4	37	11	10	19	2 - 15
270.075	4	G1/2	G1/2	38.5	14	11.5	24	2 - 15





### Metric threaded ball joints - SZ-GKM



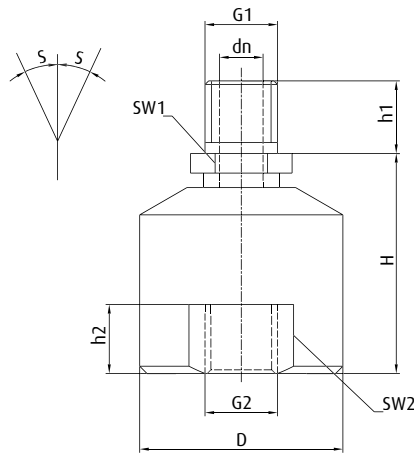
#### Product Description

- > Universal articulating mount for vacuum cups allows compensation for sloping product surfaces
- > Angle compensation for sagging products, such as sheet goods
- > Version: Ball and socket with O-ring seal

#### Technical data

Item no.	Thread suction side G2	Thread at the machine G1	Pivoting range S [°]	Weight [g]
270.185	M4-female	M4-male	2x15	9
270.186	M6-female	M6-male	2x15	20
270.187	M10-female	M10-male	2x15	58

#### Dimensions



Item no.	Ø D [mm]	Ø dn [mm]	G1	G2	H [mm]	h1 [mm]	h2 [mm]	SW1	SW2	S [°]
270.185	15	2	M4	M4	19	4	7	4	--	2 - 15
270.186	20	3	M6	M6	23	6	6.5	7	--	2 - 15
270.187	28	6	M10	M10	30	10	9.5	12	24	2 - 15



### Rubber joints - SZ-GG



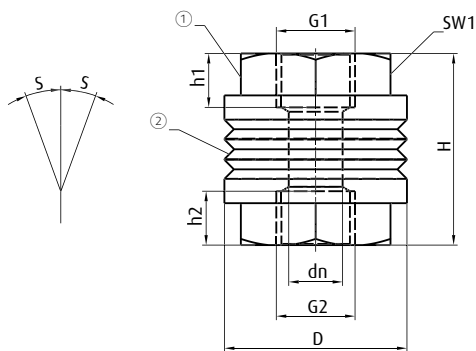
#### Product Description

- > Universal articulating mount for vacuum cups allows compensation for sloping product surfaces
- > Angle compensation for sagging products, such as sheet goods
- > Automatic reset of the vacuum cup to normal position
- > Version: Rubber-metal connection with vacuum channel

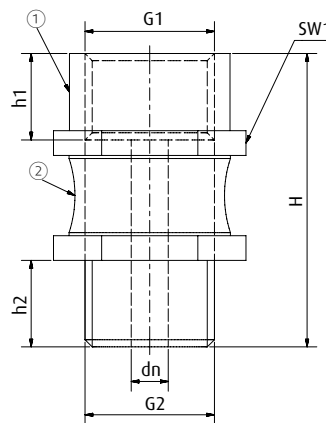
#### Technical data

Item no.	Thread suction side G2	Thread at the machine G1	Pivoting range S [°]	Lifting force [N]	Weight [g]
270.199	G1/4-female	G1/4-female	2x25	450	49
270.201	G1/4-female	G1/4-female	2x10	850	75
270.202	G3/8-female	G3/8-female	2x10	850	63
270.203	G1/2-male	G1/2-female	2x12	3,000	100

#### Dimensions



270.199 | 270.201 | 270.202



270.203

① = Brass/steel ② = Rubber

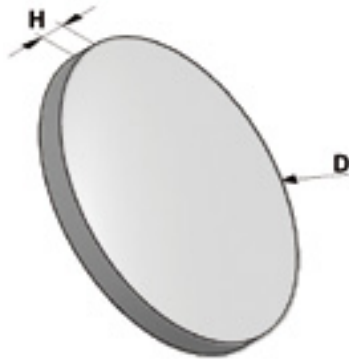
Item no.	Ø D [mm]	Ø dn [mm]	G1	G2	H [mm]	h1 [mm]	h2 [mm]	SW1	S [°]
270.199	30	5	G1/4	G1/4	46	8	8	17	2 - 25
270.201	30.5	9	G1/4	G1/4	32	9	9	25	2 - 10
270.202	30.5	11	G3/8	G3/8	32	9	9	25	2 - 10
270.203	--	6	G1/2	G1/2	33.5	14	14	27	2 - 12

Filter discs .....	474
Rings and clamps .....	475



## Filter discs - SZ-FI

For insertion into vacuum cup fold



Technical data			Dimensions	
Item no.	Material	Usage temperature [°C]	H [mm]	Ø D [mm]
78.200	HDPE white	-40 - 80	1.5	17.5
78.201	HDPE white	-40 - 80	1.5	28
78.202	HDPE white	-40 - 80	1.5	38.5
78.203	HDPE white	-40 - 80	1.5	48
78.204	HDPE white	-40 - 80	1.5	70.5
78.205	HDPE white	-40 - 80	1.5	113
78.206	HDPE white	-40 - 80	1.5	147

## Filter discs - SZ-FIN

For insertion into vacuum cup fold

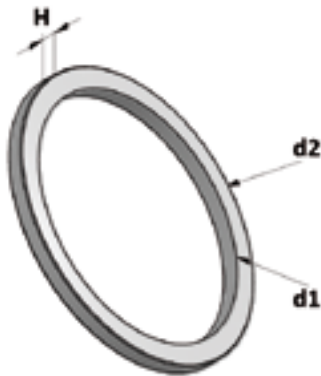


Technical data			Dimensions	
Item no.	Material	Usage temperature [°C]	H [mm]	Ø D [mm]
78.214	Nylon canvas / TPE	-40 - 50	1	20
78.215	Nylon canvas / TPE	-40 - 50	1.6	26
78.216	Nylon canvas / TPE	-40 - 50	3	40
78.217	Nylon canvas / TPE	-40 - 50	3	58



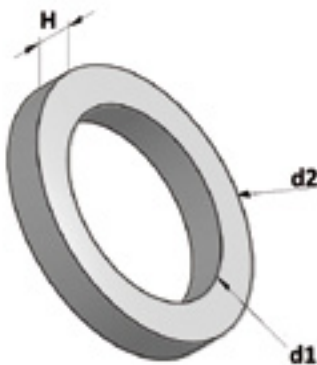
## Reinforcement rings - SZ-STAB

For stabilising bellows vacuum cups



Technical data		Dimensions		
Item no.	Material	H [mm]	∅ d1 [mm]	∅ d2 [mm]
78.000	PA6	1	13.5	17.5
78.001	PA6	1.1	22	26.5
78.002	PA6	1.2	30	35.5
78.003	PA6	1.5	36	45.5

## Retaining rings - SZ-HR



Technical data		Dimensions		
Item no.	Material	H [mm]	∅ d1 [mm]	∅ d2 [mm]
78.011	TPU	1.9	9.7	14
78.012	TPU	2.5	13	20
78.013	TPU	3.2	19	26

## Adapter plates - SZ-ASC



Technical data		Dimensions				
Item no.	Material	H [mm]	h1 [mm]	∅ D [mm]	∅ d1 [mm]	∅ d2 [mm]
78.080	Aluminium	5	2.8	15	11	6.2
78.081	Aluminium	4.3	2.8	20	12	6.2
78.082	Aluminium	7	4	28	23	10.2



## Gripper clamps - SZ-KS



Technical data			Dimensions	
Item no.	Ø range [mm]	Material	H [mm]	Ø d1 [mm]
<b>78.030</b>	7 - 9	Steel galvanised	4	9.3
<b>78.031</b>	9 - 11	Steel galvanised	3	11.3
<b>78.032</b>	11 - 13	Steel galvanised	4	13.2
<b>78.033</b>	15 - 18	Steel galvanised	4	18.2
<b>78.034</b>	17 - 20	Steel galvanised	4	20.2

Vacuum and bag grippers at a glance .....	478
Vacuum grippers .....	480
Suction plates .....	487
Bag grippers .....	488
Accessories .....	490



## FIPA Vacuum and bag grippers



- > Handling of individual products or sites without gripper changing and regardless of workpiece positioning
- > Integrated vacuum generation or external compressor for use with particularly air-permeable workpieces



### Vacuum grippers with closing valves - TC

- > Very large flow cross-sections for long service life and high process reliability, even if exposed to dust
- > Integrated valves, seal uncovered suction openings without loss of gripping force
- > No minimum coverage
- > Swivel and tilt movements up to < 90°

> See page 480



### Vacuum grippers with leakage reduction - TL

- > Economical gripper solution for low-dust handling processes
- > Recommended minimum coverage: 80 %
- > Swivel and tilt movements up to 360°

> See page 484



### Suction plates with leakage reduction - SPLT

- > Reliable suction with variable product shapes
- > Maintain an acceptable vacuum level by reducing leakage by means of integrated flow resistors in vacuum cups without product contact

> See page 487



### Bag grippers - TG

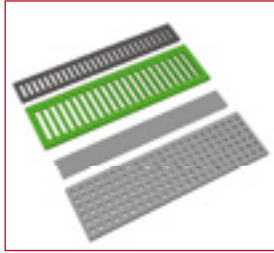
- > Handling of dimensionally unstable bags and shrink wrapping
- > Also suitable for other products, if vacuum cell is fully covered
- > Swivel and tilt movements possible up to 360°
- > External design similar to that of the TL variant

> See page 488





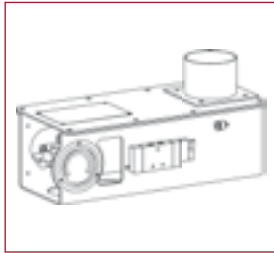
## FIPA Vacuum and bag grippers: Accessories



### Accessories

#### Sealing foam for vacuum grippers

- > Very good vacuum sealing and surface protection at the interface with the workpiece
  - > Easy mounting and quick replacement without residue
  - > Wide standard range
  - > Quick implementation of customised dimensions and hole patterns suitable for vacuum grippers of other brands
- > See page 490



#### Pick-up and release system

- > For TC vacuum grippers from 400 x 600 mm and external vacuum supply
  - > Minimises energy consumption and maximises service life
  - > Combination of gripper box and blower box
  - > Configuration depends on number of vacuum grippers used
- > See page 492



#### Gripper / robot connection elements

- > Example for vertical or 3-axis movements or the connection of multiple or longer gripper systems
  - > Layout depends on gripper system and robots
- > See page 494



### Vacuum grippers with closing valves

Strong holding force, independent of gripper coverage



**MAXIMUM LIFE, MINIMUM MAINTENANCE**

#### Product Description

- > Automated handling of individual products or product layers without gripper change
- > Suitable for rigid products with an even or uneven surface
- > Integrated valves seal unused suction openings without loss of gripping force
- > Large valve openings reduce sensitivity to dirt and ensure maximum suction power
- > Fast and uniform vacuum distribution ensures short cycle times and high acceleration rates
- > Separate compressed air connection for blow-off function for fast product release
- > Sealing foam for gentle product contact and optimum vacuum sealing - can be quickly replaced without tools and without leaving any residue

#### Notes

- > Suitable for use with < 90° swivel and tilt movements
- > No minimum coverage required
- > TC200x400:
  - Gripping area is divided into zones for flexible product pick-up and/or release
  - Available for all vacuum grippers on request
- > For vacuum grippers from TC 400x600 and up with external vacuum supply, the pick-up and place system (36.900/36.901) minimises power consumption and extends system service life (see the chapter on accessories)

#### Ordering notes

- > Ordering example vacuum generation
  - TC120x230-P20: integrated via ejectors
  - TC120x230-P20-OV: designed for external vacuum generation e.g. via side channel blower or pump
- > EPDM sealing foam, 24 mm thick and vacuum gauge included in scope of delivery
- > See the chapter on Accessories for further information on:
  - Sealing foam program for various applications
  - Gripper/robot connection elements

#### Technical data

Item no.	Air consumption at 6 bar [Nl/min]	Suction power against atmosphere [Nl/min]	Number of closing valves	Final vacuum [%]	Width [mm]	Recommended suction power at 35 % vacuum level [m <sup>3</sup> /h]	Weight [kg]	Suitable sealing foam
TC120x230-P20	105	360	50	85	--	--	2.3	PPF120.230-P20 (p.490)
TC120x230-P40	105	198	15	85	--	--	2.3	PPF120.230-P40 (p.490)
TC120x400-P20	210	396	95	85	--	--	3.55	PPF120.400-P20 (p.490)
TC120x400-P40	105	198	30	85	--	--	3.55	PPF120.400-P40 (p.490)
TC200x400-P20	420	1,440	171	85	--	--	6.15	PPF200.400-P20 (p.490)
TC200x400-P40	210	720	50	85	--	--	6.15	PPF200.400-P40 (p.490)
TC600x400-P20-OV*	--	--	551	--	35	90 - 140	12	PPF-600x400-20 (p.490)
TC600x400-P28-OV*	--	--	260	--	40	90 - 140	12	PPF-600x400-28 (p.490)
TC600x400-P40-OV*	--	--	126	--	55	50 - 90	12	PPF-600x400-40 (p.490)



### Technical data

Item no.	Air consumption at 6 bar [Nl/min]	Suction power against atmosphere [Nl/min]	Number of closing valves	Final vacuum [%]	Width [mm]	Recommended suction power at 35 % vacuum level [m <sup>3</sup> /h]	Weight [kg]	Suitable sealing foam
TC1300x260-P20-OV*	--	--	768	--	35	140 - 300	17	PPF-1300x260-20 (p.490)
TC1300x260-P28-OV*	--	--	360	--	40	90 - 140	17	PPF-1300x260-28 (p.490)
TC1300x260-P40-OV*	--	--	192	--	55	50 - 90	17	PPF-1300x260-40 (p.490)
TC1300x500-P20-OV*	--	--	1,536	--	35	140 - 300	32	PPF-1300x500-20 (p.490)
TC1300x500-P28-OV*	--	--	765	--	40	140 - 300	32	PPF-1300x500-28 (p.490)
TC1300x500-P40-OV*	--	--	384	--	55	140 - 300	32	PPF-1300x500-40 (p.490)

\* = Depending on external vacuum supply

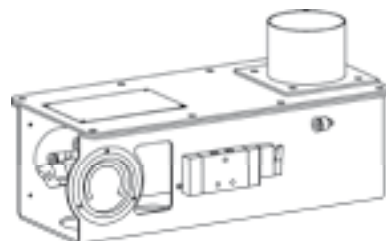
### Large valve openings reduce sensitivity to dirt and ensure maximum suction power



### Quick and non-destructive replacement of the sealing foam



### Optional gripper box 36.900 for short gripping times



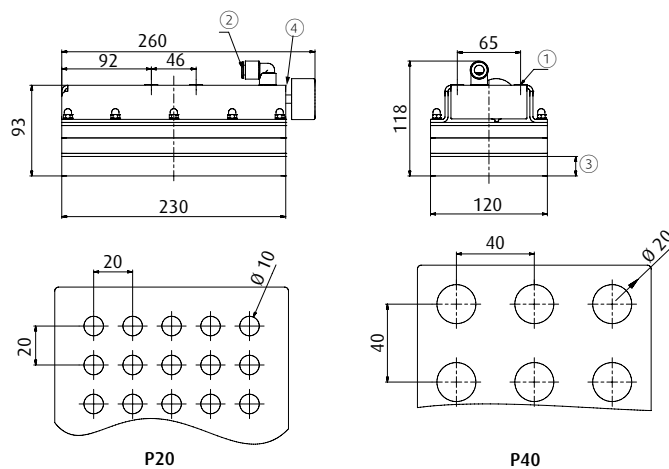
- > The vacuum inside the vacuum tubing starts to build up while the workpiece is approached, this reduces the gripping time
- > Special valves with excellent suction power for fast evacuation or venting
- > Extremely high dirt tolerance for maximum service life and high process reliability



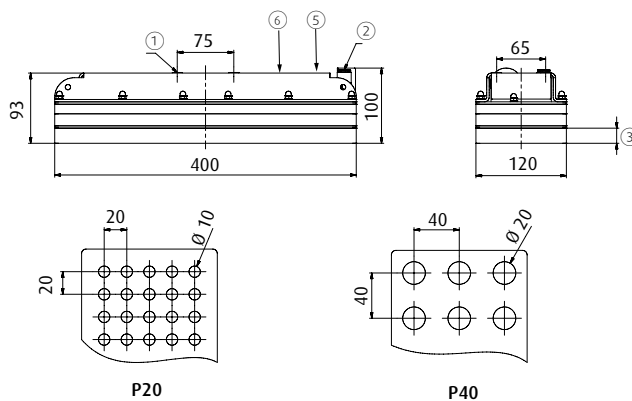
# Vacuum gripping systems | Vacuum grippers

Vacuum grippers with closing valves

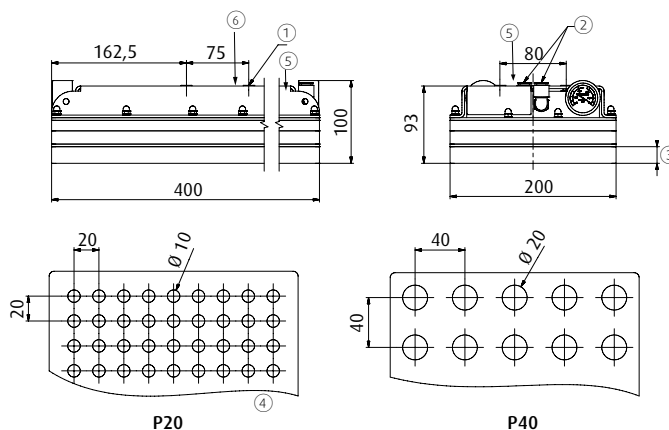
## Dimensions



TC120x230-P20 | TC120x230-P40



TC120x400-P20 | TC120x400-P40



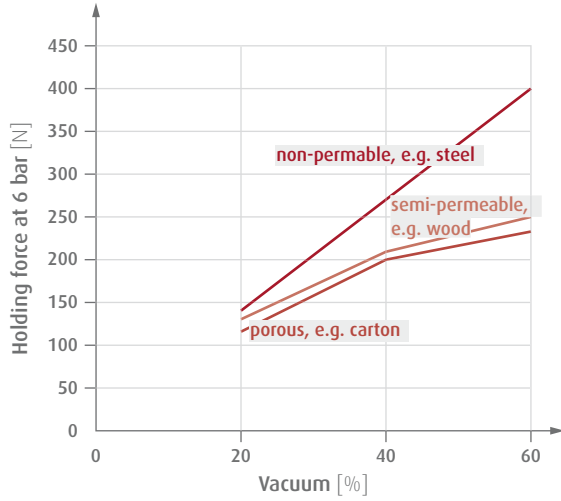
TC200x400-P20 | TC200x400-P40

- ① = Fixing with M6 screws
- ② = Compressed air connection G1/8-female with 10 mm quick-fitting
- ③ = 24 mm sealing foam
- ④ = Alternative compressed air connection G1/8-female (besides vacuum gauge)
- ⑤ = Alternative compressed air connection G1/8-female (at the top)
- ⑥ = Compressed air connection G1/8-female blow-off (at the top)



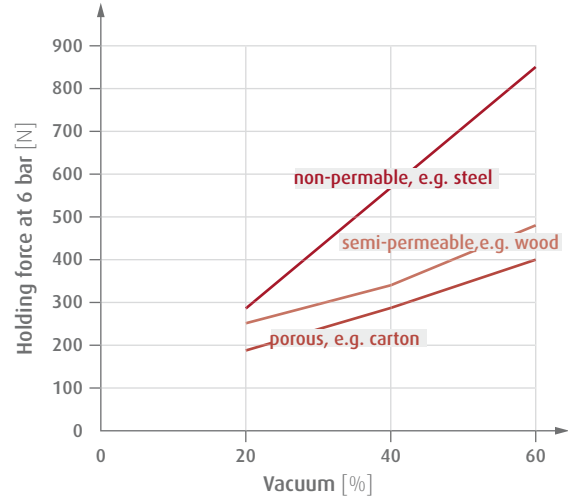
### Diagrams

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



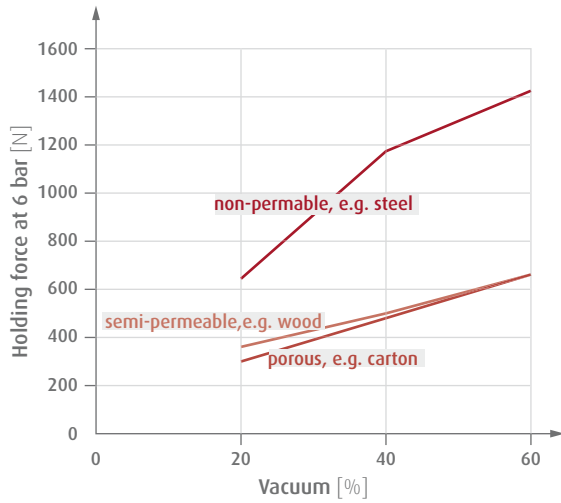
TC120x230-P20 | TC120x230-P40

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



TC120x400-P20 | TC120x400-P40

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



TC200x400-P20 | TC200x400-P40



# Vacuum gripping systems | Vacuum grippers

Vacuum grippers with reduced leakage

## Vacuum grippers with reduced leakage

Holding force increases with product coverage

**NEW**



**ECONOMIC GRIPPER SOLUTIONS FOR DUST-FREE HANDLING PROCESSES**

### Product Description

- > Automated handling of individual products or product layers without gripper change
- > Suitable for rigid products with an even or uneven surface
- > Fast and uniform vacuum distribution ensures short cycle times and high acceleration rates
- > Separate compressed air connection for blow-off function for fast product release
- > Sealing foam for gentle product contact and optimum vacuum sealing - can be quickly replaced without tools and without leaving any residue

### Notes

- > Minimum coverage of 80 % recommended
- > Suitable for use with > 90° swivel and tilt movements

### Ordering notes

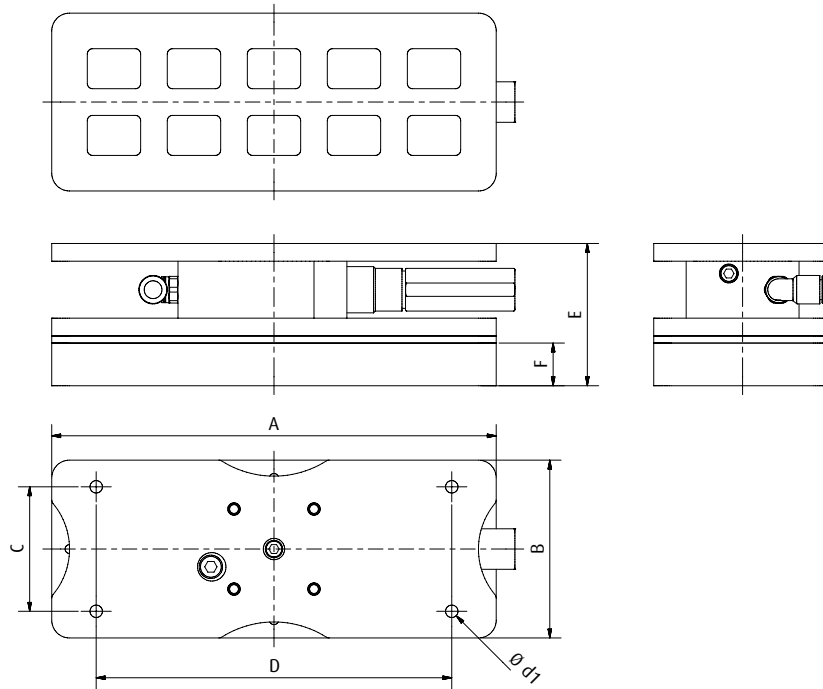
- > Wide range of standard grippers and quick manufacture of customised solutions
- > Ordering example vacuum generation
  - TL150x300: integrated via ejectors
  - TL150x300-OV: designed for external vacuum generation e.g. via side channel blower or pump
- > Universal EPDM sealing foam, 24 mm thick (Index x24) included in scope of delivery
- > Optional: EPDM sealing foam, 12 mm thick (Index x12)
- > The gripping area is divided into zones for flexible product pick-up and/or release
- > See chapter accessories for more information on:
  - Wide range of sealing foam for different applications
  - Gripper/robot connection elements

### Technical data

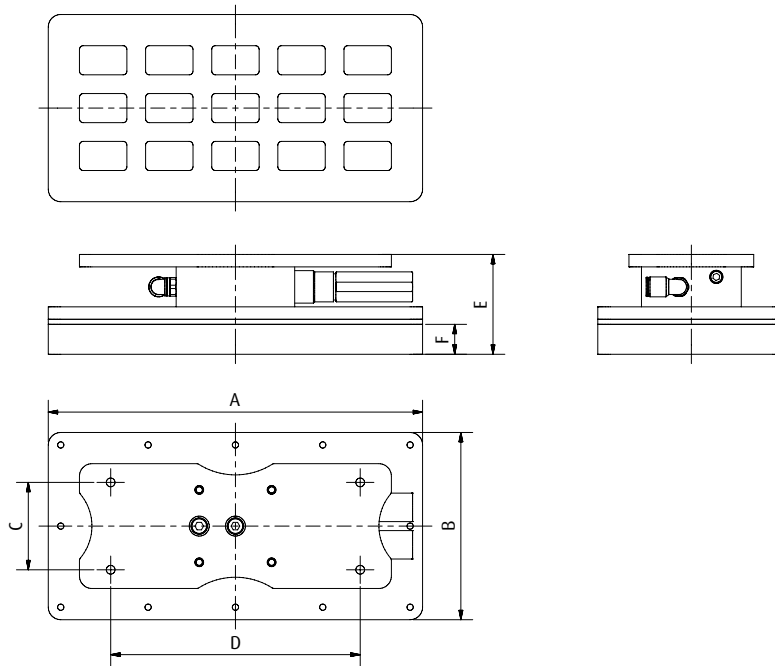
Item no.	Air consumption at 6 bar [Nl/min]	Suction power against atmosphere [Nl/min]	Final vacuum [%]	Weight [kg]	Suitable sealing foam
<b>TL100x250</b>	105	198	85	1.55	PPF-TL-100x250x12 (p.490) PPF-TL-100x250x24 (p.490)
<b>TL150x300</b>	210	396	85	3.2	PPF-TL-150x300x12 (p.490) PPF-TL-150x300x24 (p.490)
<b>TL200x350</b>	210	396	85	4.2	PPF-TL-200x350x12 (p.490) PPF-TL-200x350x24 (p.490)
<b>TL250x400</b>	210	396	85	4.65	PPF-TL-250x400x12 (p.490) PPF-TL-250x400x24 (p.490)



## Dimensions



**TL100x250**



**TL150x300 | TL200x350 | TL250x400**

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]
<b>TL100x250</b>	250	100	70	200	7	78	24
<b>TL150x300</b>	300	150	70	200	7	80	24
<b>TL200x350</b>	350	200	70	200	7	80	24
<b>TL250x400</b>	400	250	70	200	7	69	24

Continued on the next page →

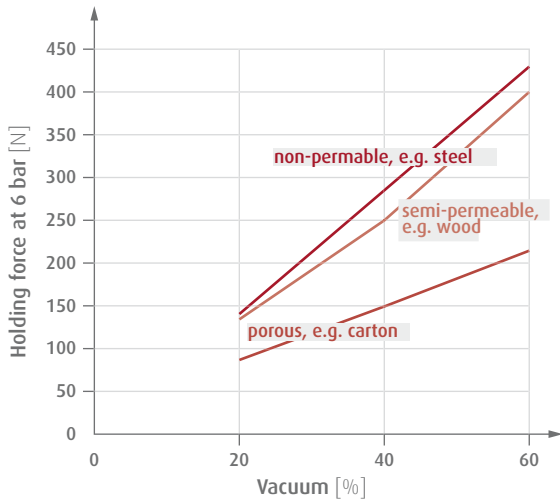


# Vacuum gripping systems | Vacuum grippers

Vacuum grippers with reduced leakage

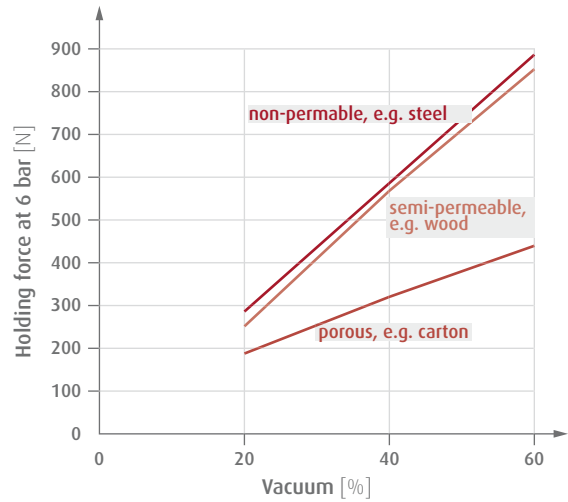
## Diagrams

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



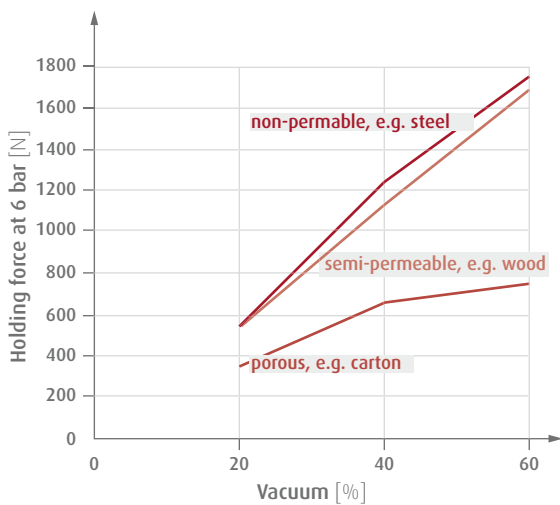
TL100x250

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



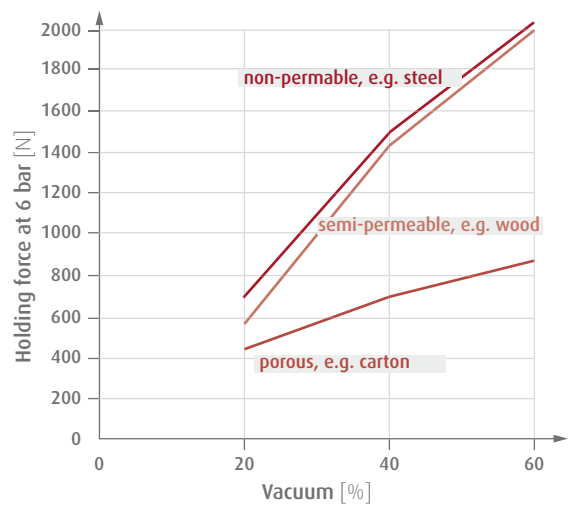
TL150x300

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



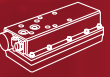
TL200x350

> Holding force against vacuum for different materials at 100 % coverage and safety factor 1.5



TL250x400





**NEW**



Suction plate 67.010



### Low-leak suction plates - SPLT

#### Product Description

- > Combination of 4x4 or 6x6 bellows vacuum cups with 2.5 bellows in oil resistant NBR
- > Suction plate suspended using a spring leveler with internal vacuum channel (25 mm stroke)
- > Off-center vacuum connection possible
- > Reliable suction with variable product geometries

#### Notes

- > Due to the flow cross-section of 0.4 mm per vacuum cup, these suction plates are not suitable for equipment with very short cycle times

#### Technical data

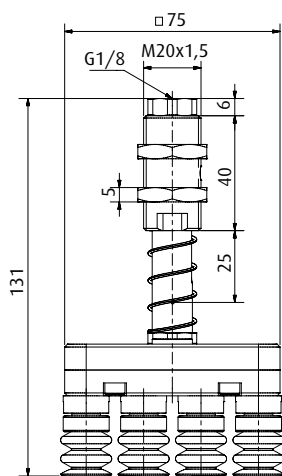
Item no.	Model	Number of Vacuum cups []	Lift Spring leveler [mm]	Cup lift [mm]	Gripping force * [N]	Max. leakage ** (Vacuum cups unassigned) [Nl/min]	Connection to the machine []	Vacuum connection	Suitable accessories
67.010	SPLT-4x4-25	16	25	9.5	190	24	M20x1,5-male	G1/8-female	Spare cup 20.018.125.1 (p.301) Wrench socket for cup assembly 90.008
67.011	SPLT-6x6-25	36	25	9.5	426	54	M30x1,5-male	G3/8-female	Spare cup 20.018.125.1 (p.301) Wrench socket for cup assembly 90.008

\* = theoretical value at 60 % vacuum and a dry, smooth product surface. Figure excludes safety factor    \*\* = at 60 % vacuum

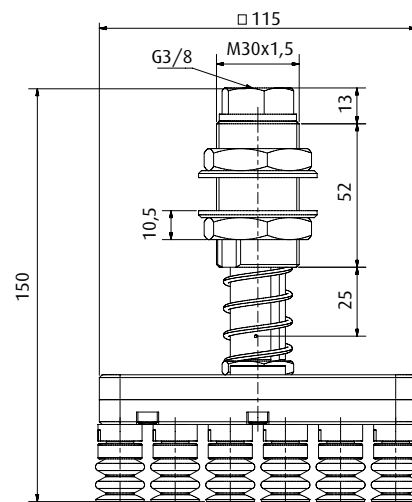
#### Application:

- > Handling of variable product geometries or products with recesses that prevent all vacuum cups from making contact with the product surface (e.g. metal sheet in laser cutting systems)
- > Integrated flow resistors reduce leakage and maintain an adequate vacuum level for the remaining vacuum cups covered by product, thus preventing products from being dropped

#### Dimensions



67.010



67.011



## Bag grippers

### Bag grippers

Handling of non-rigid goods



**MAXIMUM DURABILITY, MINIMUM MAINTENANCE**

View of the suction chamber

### Product Description

- > Handling of limp, non-rigid objects such as bags, shrink-wraps or any product that fully covers the suction chamber
- > On board vacuum generation via high performance ejectors for optimum suction power
- > Dust-resistant design
- > Sealing foam with optimum adjustment to product surface - easy to replace
- > Optional side channel blower for handling very porous goods

### Notes

On request:

- > Splitting of suction chamber for multi-zone picking and release or product adjustment
- > Depth of the suction chamber can be adjusted for optimum handling of specific products (standard 40 mm)

### Ordering notes

Ordering example vacuum generation

- > TG150x300: integrated via ejectors
- > TG150x300-OV: designed for external vacuum generation e.g. via side channel blower or pump

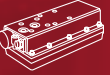
### Technical data

Item no.	Air consumption at 6 bar [NI/min]	Suction power against atmosphere [NI/min]	Max. gripping force at 60 % vacuum (-600 mbar) safety factor 1.5			Weight [kg]	Suitable sealing foam
			Dense products (e.g. steel) [N]	Semi-porous products (e.g. wood) [N]	Porous products (e.g. carton boxes) [N]		
TG100x250	105	198	280	170	70	1.5	PPF100x250
TG150x300	210	396	500	300	125	2.5	PPF150x300
TG200x350	210	396	770	470	190	3.5	PPF200x350
TG250x400	210	396	1,100	670	270	4.7	PPF250x400
TG300x500	210	396	1,670	1,000	400	6.7	PPF300x500
TG400x600	210	396	2,670	1,600	625	14.7	PPF400x600

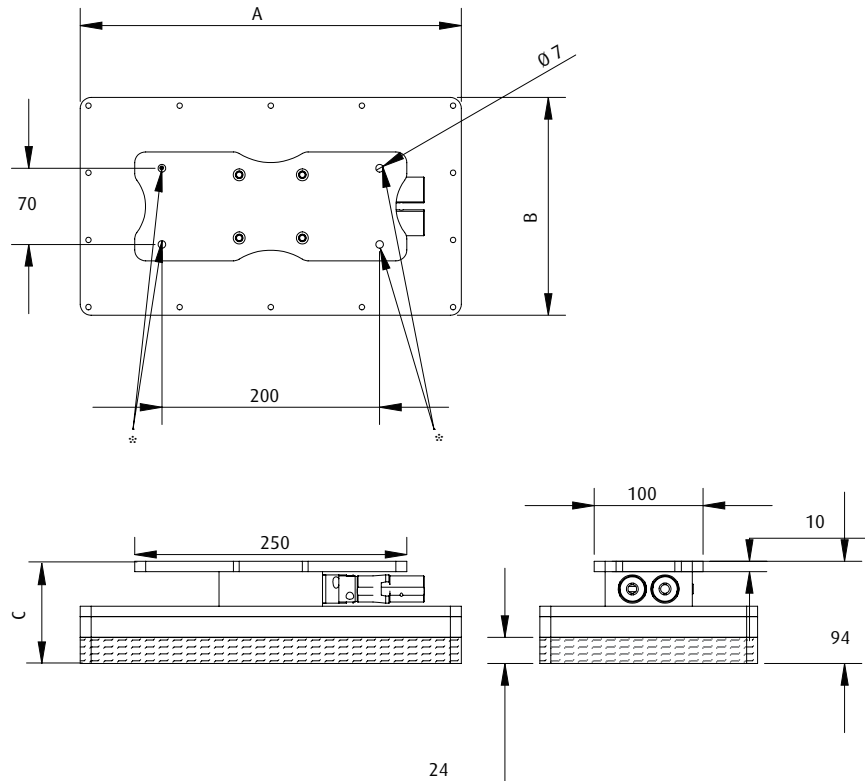
### Sealing foam



Easy replacement of sealing foam



Dimensions



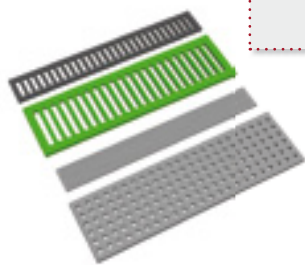
\* = Fixing holes for connection to gripper system

Item no.	A [mm]	B [mm]	C [mm]
TG100x250	100	250	62
TG150x300	150	300	62
TG200x350	200	350	62
TG250x400	250	400	93
TG300x500	300	500	93
TG400x600	400	600	93



### Sealing foam for vacuum grippers

Suitable for all vacuum grippers



**EASY INSTALLATION - FAST,  
RESIDUE-FREE REPLACEMENT!**



Easy replacement of the sealing foam without tools

#### Product Description

- > Firm grip on the gripper bottom
- > Quick, residue-free replacement without pre-handling or tools
- > Different foams for a broad range of applications

#### Notes

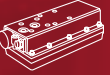
- > For information on the relevant hole patterns, see the chapter on vacuum grippers

#### Ordering notes

- > Custom sizes and hole patterns available, quick and easy to implement
- > The indicated item no. pertain to the universal sealing foam type

#### Technical data

Item no.	Suction area [mm]	Thickness [mm]	Material
PPF120.230-P20	120x230	24	EPDM
PPF120.230-P40	120x230	24	EPDM
PPF120.400-P20	120x400	24	EPDM
PPF120.400-P40	120x400	24	EPDM
PPF200.400-P20	200x400	24	EPDM
PPF200.400-P40	200x400	24	EPDM
PPF160.600-P20	160x600	24	EPDM
PPF160.600-P40	160x600	24	EPDM
PPF-TL-100x250x12	100x250	12	EPDM
PPF-TL-150x300x12	150x300	12	EPDM
PPF-TL-200x350x12	200x350	12	EPDM
PPF-TL-250x400x12	250x400	12	EPDM
PPF-TL-100x250x24	100x250	24	EPDM
PPF-TL-150x300x24	150x300	24	EPDM
PPF-TL-200x350x24	200x350	24	EPDM
PPF-TL-250x400x24	250x400	24	EPDM
PPF-600x400-20	600x400	24	EPDM
PPF-600x400-28	600x400	24	EPDM
PPF-600x400-40	600x400	24	EPDM
PPF-1300x260-20	1,300x260	24	EPDM
PPF-1300x260-28	1,300x260	24	EPDM
PPF-1300x260-40	1,300x260	24	EPDM
PPF-1300x500-20	1,300x500	24	EPDM
PPF-1300x500-28	1,300x500	24	EPDM
PPF-1300x500-40	1,300x500	24	EPDM



### Available sealing foam and their properties

Suction mat type	Material	Properties	Example applications
<b>Universal</b>	EPDM	<ul style="list-style-type: none"> <li>&gt; Very soft structure</li> <li>&gt; Very short reset time</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Porous workpieces such as cardboard boxes or untreated wooden palletes</li> <li>&gt; Dense workpieces such as coated wooden boards</li> <li>&gt; Suitable for short cycle times</li> </ul>
<b>Valve foam</b>	EPDM	<ul style="list-style-type: none"> <li>&gt; Very soft structure</li> <li>&gt; Very short reset time</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Handling of open glass jars (in combination with foam gripper TL)</li> <li>&gt; Suitable for short cycle times</li> </ul>
<b>NR green</b>	Natural rubber	<ul style="list-style-type: none"> <li>&gt; More rigid structure</li> <li>&gt; Cut-resistant</li> <li>&gt; Short reset time</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Building material, ceramics</li> <li>&gt; Untreated wooden palletes</li> <li>&gt; Wet palletes</li> <li>&gt; Sharp-edged or abrasive products</li> </ul>

On request, the preparation of composite sealing foams is possible to combine, for example, short reset times and cut-resistance.



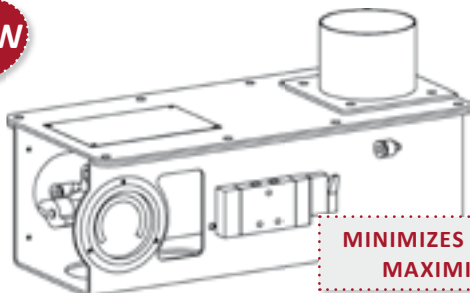
# Vacuum gripping systems | Accessories

## Pick-up and release system

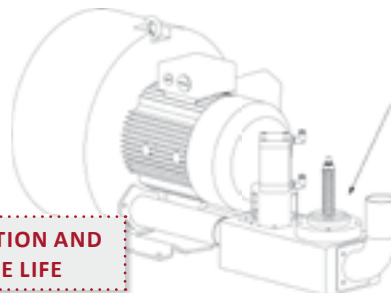
### Pick-up and release system

For vacuum grippers from size 400x600 and external vacuum supply with side channel blower

**NEW**



Pick-up Box 36.900



Blower box 36.901 (shown with side channel blower)

**MINIMIZES ENERGY CONSUMPTION AND  
MAXIMIZES SYSTEM SERVICE LIFE**

### Product Description

- > Combination of gripper box mounted on vacuum gripper and blower box
- > One pneumatically powered cylinder each ensures a high value for the rated flow and proactive vacuum control
- > This enables short gripping times and minimises blower power consumption
- > In addition to reducing power consumption, automatic venting after release also ensures long service life as blower is not continuously exposed to vacuum

### Notes

- > The number of pick-up boxes depends on the gripping system used

### Ordering notes

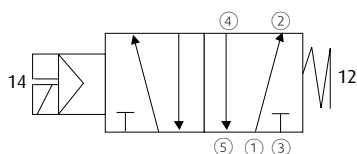
Included in scope of delivery:

- > 1 x aluminium housing, 5/2-way solenoid valve, pneumatically powered cylinder
- > Control cable with plug, 24 VDC, 1.28 W, IP65, 2-pin, 5m length, open end

### Technical data

Item no.	Feed pressure [bar]	Tubing diameter vacuum connection [mm]	Operating temperature [°C]
36.900	3 - 8	60	-5 - 50
36.901	3 - 8	60	-5 - 50

### Schematic of 5/2-way solenoid valve for pneumatic cylinder control



#### Assignment

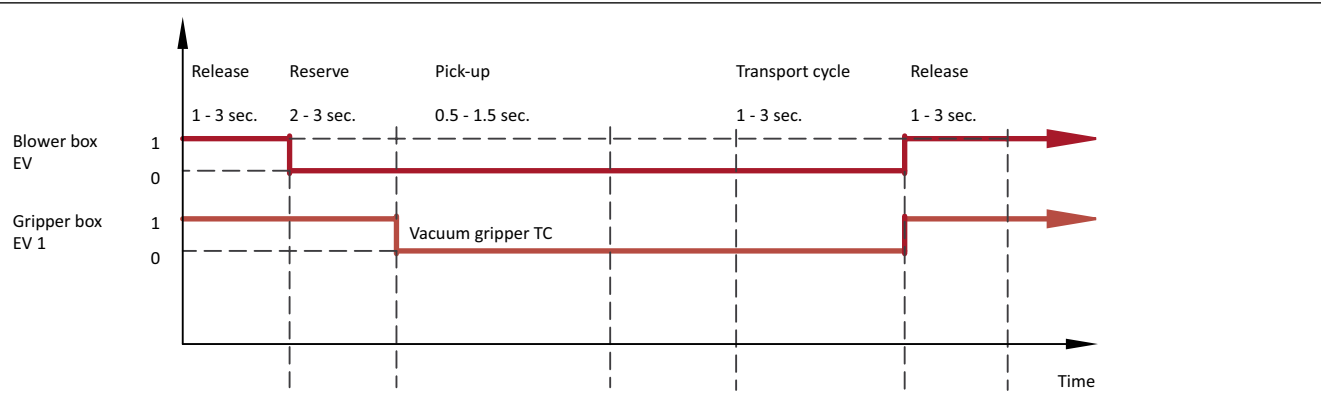
- ① Compressed air inlet
- ② Working connection (Cylinder open)
- ④ Working connection (Cylinder closed)
- ③, ⑤ Ventilation



### Diagram of pick-up and release system



### Example diagram of pick-up and release system for vacuum gripper with two TC gripper heads



### Process description

#### Vacuum build-up:

> The gripper/vacuum tubing connection is interrupted. The required vacuum is built up in the tubing during approach of gripper to workpiece.

#### Pick-up:

- > The gripper/vacuum tubing connection is made
- > The vacuum becomes operational on the gripper. This significantly reduces gripping time.

#### Transport cycle:

> The workpiece is securely moved by the gripper to its destination

#### Release:

- > The gripper is connected to atmospheric pressure, thus the workpiece is quickly released
- > The blower is vented with atmospheric air, which reduces power consumption and significantly increases service life as the blower is not continuously exposed to vacuum



### Connection elements gripper - robot

Application specific interface to the robot

**NEW**



#### Product Description

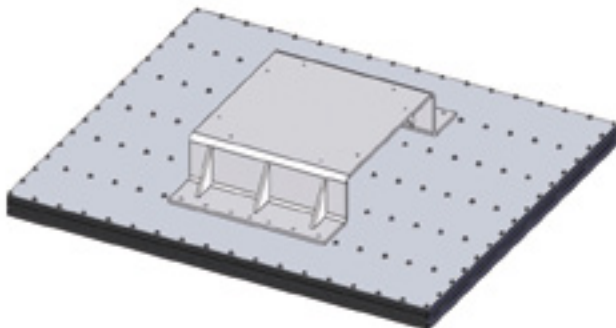
- > Example A: Installation of grippers on robots without removal of the plate
- > Example B: For vertical movements between robot and gripper
- > Example C: For 3-axis movements between robot and gripper
- > Example D: For connection of multiple or longer gripper systems, 3-axis movement

#### Ordering notes

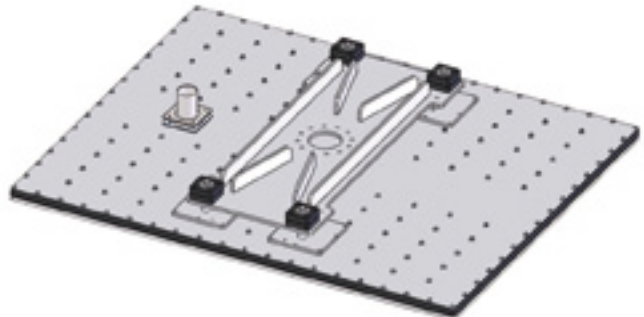
- > Layout dependent on gripper system and robots used
- > We will be happy to customize the interfaces for your application

#### Examples of application

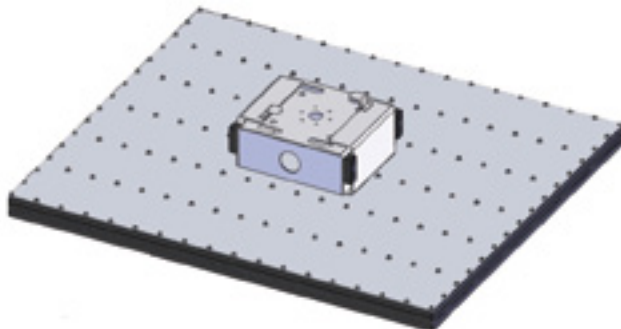
> Example A: Robot/gripper interface, raised



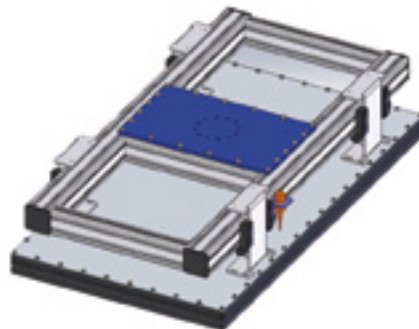
> Example B: Robot/gripper interface, type 1



> Example C: Robot/gripper interface, type 2



> Example D: Robot/gripper interface, type 3





Special grippers .....	496
Bernoulli vacuum cups .....	498
Vacuum tweezers .....	502
Magnetic grippers .....	503
Customised grippers .....	506
Gripper components .....	509



## FIPA Special grippers - Standard



### Bernoulli vacuum cups - SX-B and SX-B-PK

- > Non-contact, deformation-resistant transport of thin and sensitive products
- > No ejector, requires compressed air only
- > Suitable for porous products thanks to high volume flow
- > Series for direct contact with food (approval in accordance with FDA/EC1935/2004)

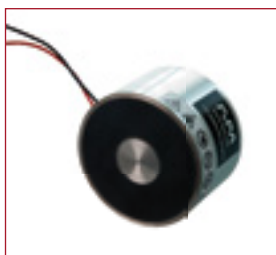
> See page 498



### Vacuum tweezers

- > Compressed air or vacuum operated pick-up tool for the assembly of small parts
- > Delivery includes set of miniature vacuum cups

> See page 502



### Magnetic grippers

- > Secure handling of sheet metal and ferromagnetic workpieces with and without recesses
- MG series**
- > Combination of electronic and permanent magnet
  - > High cycle times for thin and/or alloyed metal sheets thanks to negligible residual magnetism after switching off the magnetic force
  - > Holding force up to 700 N
  - > No piping required
  - > Very energy-efficient, as a short electrical pulse is only required for product release

> See page 503



### PMG series

- > Pneumatic dual-action with permanent magnet
- > Holding force up to 400 N
- > Extremely wear-resistant, quick-change friction rings made from low-marking NBR (hardness 70° Shore) prevent scratching as a result of contact between the workpiece and grippers
- > Part control by monitoring piston position

> See page 504



## FIPA Special grippers - Customised



### Insert grippers

- > Gripper tools for insert components such as threaded bushes
- > Gripper shape can be matched exactly to the component to be gripped
- > Flexible control systems available, e.g. with pneumatic dual-action or vacuum-operated
- > Simple integration into the overall system using gripper components such as spring levelers or clamping elements

> See page 506



### Modular gripper

- > Development of individual gripper tools according to customer demands
- > Constructed using a polyamide-based, high-performance plastic
- > Short cycle times thanks to a lightweight design and a gripper that can be adapted precisely to fit the component shape
- > Minimal set-up times thanks to integrated robot-gripper interface
- > Minimal cycle times thanks to integrated vacuum generation
- > Fewer tubing due to integrated media channels (pressure/vacuum)
- > Combi-grippers available, e.g. pneumatic finger gripper with vacuum cups or vacuum grippers
- > FDA-approved materials for direct contact with foodstuffs
- > Cost-effective production, starting with a batch size of one unit

> See page 508

**Modular grippers are individually customised according to customer demands:**  
Our technical sales department will be happy to advise you via e-mail ([info@fipa.com](mailto:info@fipa.com)) or phone on +49 (0) 89/96 24 89-0

## FIPA Components for gripper assembly



### FIPA gripper component range

- > Selection includes extrusion systems, clamping elements, vacuum and finger grippers, parallel, angular and needle grippers
- > FIPA supplies individual components as well as complete gripper systems
- > Typical applications include extraction of plastic parts from injection molding machines or handling of textiles

> See page 509





# Special grippers | Standard

## Bernoulli vacuum cups SX-B

### Bernoulli vacuum cups SX-B

Low-contact and gentle product transport



Housing made of anodised aluminium



#### Product Description

- > Integrated vacuum generation on the Bernoulli principle
- > Non-contact, deformation-resistant transport of thin and sensitive products
- > High holding force: Bernoulli vacuum cups can grip up to 600 g of mass
- > Suitable for porous products thanks to high volume flow at low vacuum level
- > Easy to install, system flexibly expandable through lateral compressed air inlets
- > Long life cycle due to maintenance-free operation

#### Notes

- > Only run with unoled, dry compressed air

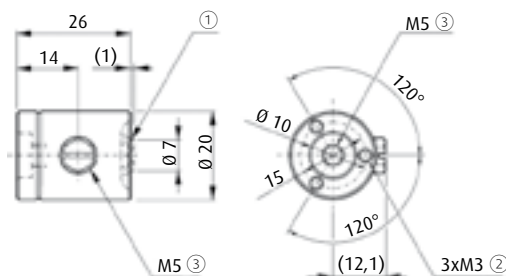
#### Ordering notes

- > With 65.530 and 65.540, the pads can be removed for contact-free applications
- > Silicone pads (pads SI) are included in scope of delivery

#### Technical data

Item no.	Model	Operating pressure [bar]	Holding force at 5 bar [N]	Air consumption at 5 bar [l/min]	Ambient air temperature [°C]	Weight [g]	Suitable accessories
65.510	SX-B-20	1 - 7	0.9	100	5 - 60	50	Pads NBR 78.509 Pads SI 78.510
65.520	SX-B-30	1 - 7	1.3	100	5 - 60	70	Pads NBR 78.509 Pads SI 78.510
65.530	SX-B-40	1 - 7	2	110	5 - 60	120	Pads NBR 78.511 Pads SI 78.512
65.540	SX-B-60	1 - 7	6	210	5 - 60	260	Pads NBR 78.511 Pads SI 78.512

#### Dimensions

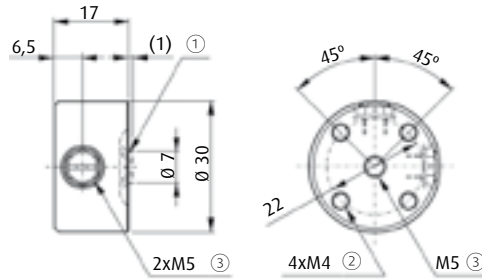


65.510

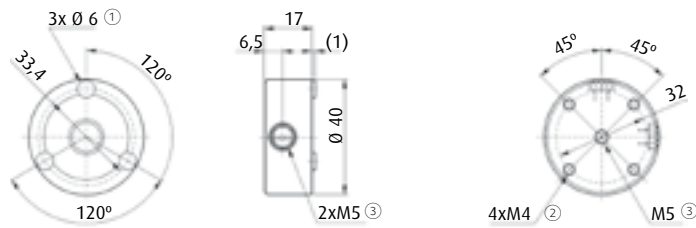
① = Pads ② = Depth 5 mm ③ = Compressed air connection



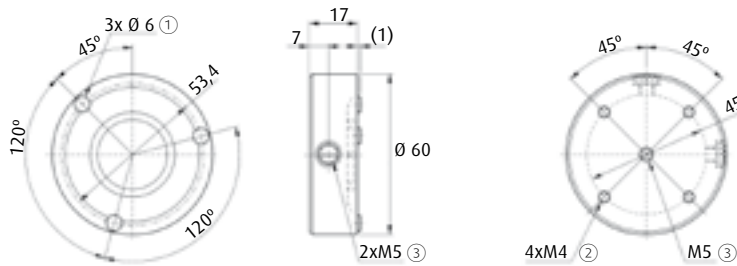
Dimensions



65.520



65.530

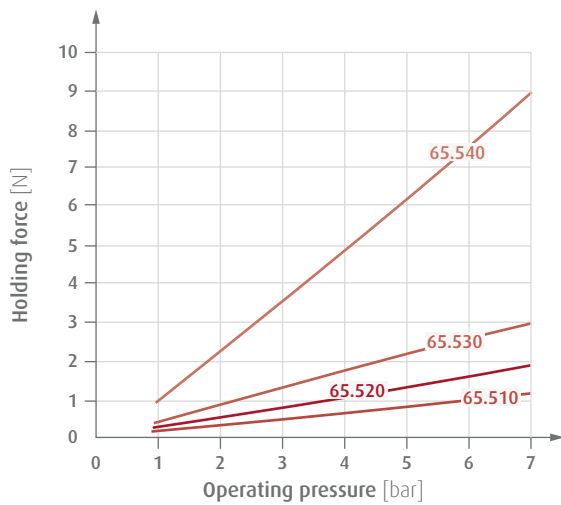


65.540

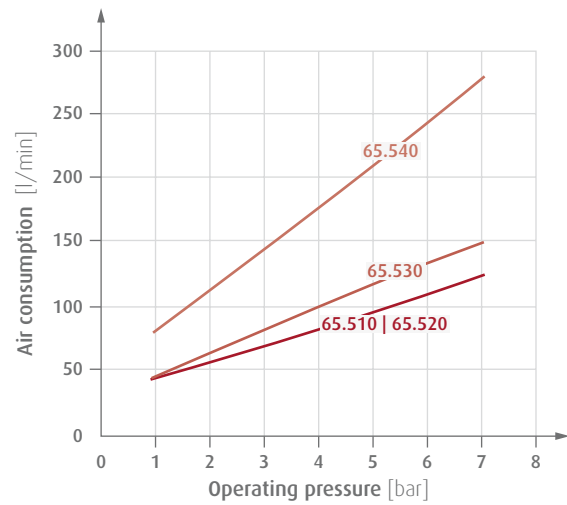
① = Pads ② = Depth 5 mm ③ = Compressed air connection

Diagrams

> Holding force as a function of operating pressure



> Air consumption as a function of operating pressure





# Special grippers | Standard

## Bernoulli vacuum cups SX-B-PK

### Bernoulli vacuum cups SX-B-PK

Non-contact vacuum suction grippers for direct food contact



SUITABLE FOR FOODSTUFFS

Housing made of FDA-approved plastic

### Product Description

- > Integrated vacuum generation on the Bernoulli principle
- > No ejector, requires compressed air only
- > Non-contact, deformation-resistant transport of thin and sensitive products
- > Suitable for direct contact with food products (Approval by FDA/EC1935/2004)
- > High holding force: Bernoulli vacuum cups can grip up to 1,200 g of mass
- > Suitable for porous products thanks to high volume flow at low vacuum level
- > Easy to install, system flexibly expandable through lateral compressed air inlets
- > Long life cycle due to maintenance-free operation

### Notes

- > Only be operated with oil-free, dry compressed air

### Technical data

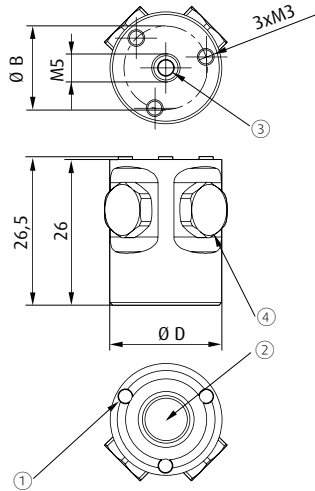
Item no.	Model	Operating pressure [bar]	Holding force at 5 bar [N]	Air consumption at 5 bar [Nl/min]	Max. Particle size [µm]	Medium	Ambient air temperature [°C]	Weight [g]	Suitable silicone pads
65.510-PK	SX-B-PK-20	1 - 7	2.5	150	40	Compressed air	5 - 60	10	78.510
65.520-PK	SX-B-PK-30	1 - 7	3	150	40	Compressed air	5 - 60	20	78.510
65.530-PK	SX-B-PK-40	1 - 7	5.5	150	40	Compressed air	5 - 60	30	78.512
65.540-PK	SX-B-PK-60	1 - 7	12	220	40	Compressed air	5 - 60	70	78.512

### Technical specifications

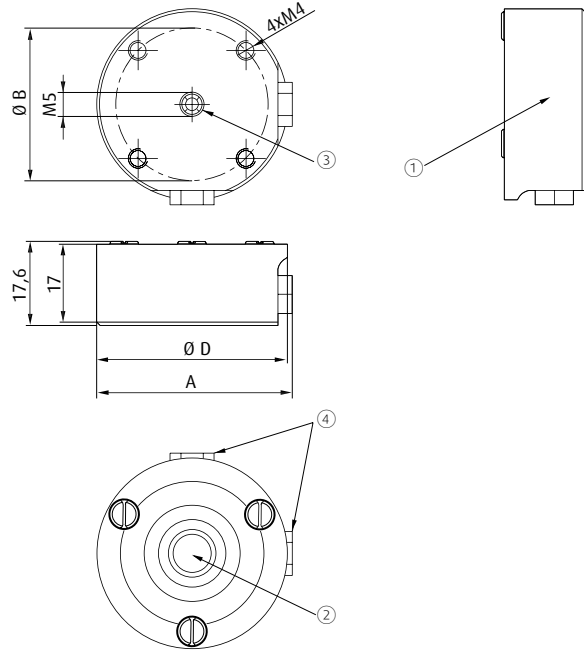
- > Highly resistant against diverse chemicals used in the food industry
- > Suitable for all conventional CIP (Cleaning-In-Place) and SIP (Sterilisation-In-Place) processes
- > Hygienic product design enables quick and easy cleaning
- > Materials:
  - Housing: Polyetheretherketone
  - Pad: Silicone caoutchouc
  - Nozzle: Stainless steel
  - Seals: Fluorocaoutchouc
  - Blanking screw: Polyetheretherketone



### Dimensions



65.510-PK



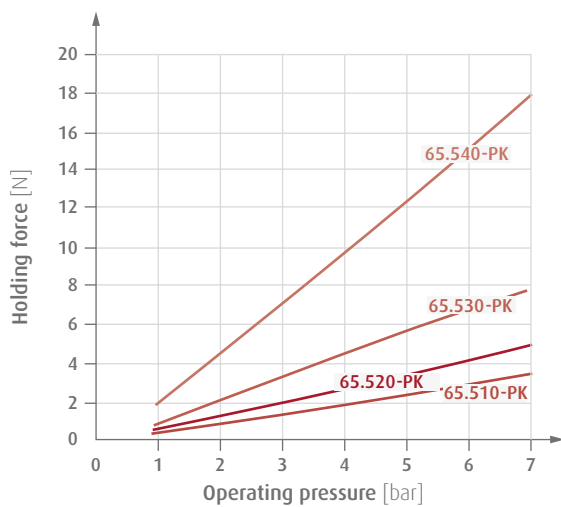
65.520-PK | 65.530-PK | 65.540-PK

① = Silicone rubber pads    ② = Nozzle    ③ = Compressed air connection    ④ = Alternative pneumatic connection

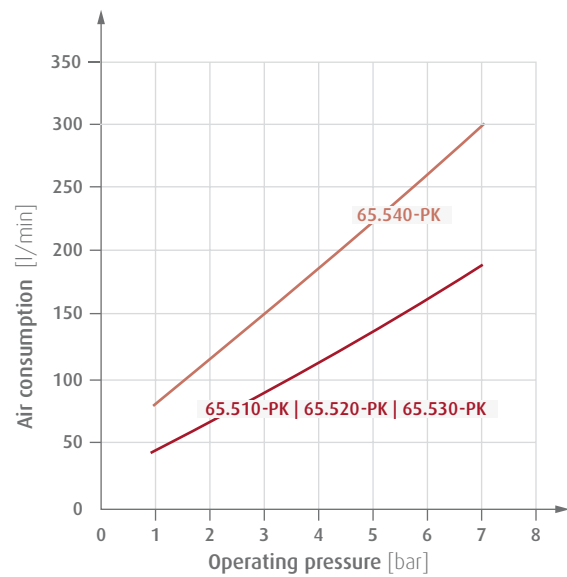
Item no.	A [mm]	Ø B [mm]	Ø D [mm]
65.510-PK	--	15	20
65.520-PK	31	22	30
65.530-PK	41	32	40
65.540-PK	61	45	60

### Diagrams

> Holding force as a function of operating pressure



> Air consumption as a function of operating pressure







# Special grippers | Standard

## Vacuum tweezers

### Vacuum tweezers

Assembly of small parts



### Product Description

- > **VTA-Set:**  
Vacuum tweezers with built-in ejector, without valve and with air vent. To pick up the object, close the air vent with the fingertip and release to place the object.
- > **VTB-Set:**  
Vacuum tweezers with built-in ejector, compressed air valve and built-in silencer - hence, very low-noise. The built-in compressed air valve is used to switch on the vacuum only when needed.
- > **VTA-Set-1:**  
Vacuum tweezers without ejector and with air vent. To pick up the object, close the air vent with the fingertip and release to place the object.

### Ordering notes

- The set contains:
- > Vacuum squeezers, spiral tubing, one each per vacuum cup (Silicone)  $\varnothing$  2, 4, 6 and 8 mm
  - > Adapter curved for vacuum cup  $\varnothing$  2 and 4 mm
  - > Adapter curved for vacuum cup  $\varnothing$  6 and 8 mm

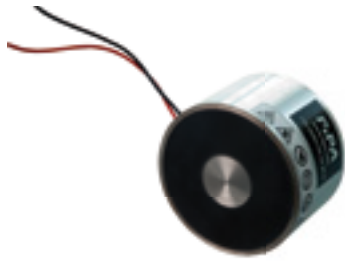
### Technical data

Item no.	Operating principle	Operating pressure [bar]	Nominal supply pressure [bar]	Final vacuum [%]	Operating temperature [°C]	Weight [g]	Suitable accessories
<b>VTA-Set</b>	Operated with compressed air	1.5 - 7	5	90	0 - 60	22	Adapter straight for vacuum cups $\varnothing$ 2, 4 mm VPZ-2-S Adapter straight for vacuum cups $\varnothing$ 6, 8 mm VPZ-6-S Spare cup NBR $\varnothing$ 2, 4, 6, 8 mm VT-NBR-Set Holder EIL.05-HO (p.524)
<b>VTB-Set</b>	Operated with compressed air	1.5 - 7	5	90	0 - 60	16	Adapter for vacuum cups - bended $\varnothing$ 2, 4 mm VPZ-2 Adapter for vacuum cups - bended $\varnothing$ 6, 8 mm VPZ-6 Spare cup NBR $\varnothing$ 2, 4, 6, 8 mm VT-NBR-Set Holder EIL.05-HO (p.524)
<b>VTA-Set-1</b>	Vacuum-operated	0 - 1	5	90	0 - 60	22	Adapter for vacuum cups - bended $\varnothing$ 2, 4 mm VPZ-2 Adapter for vacuum cups - bended $\varnothing$ 6, 8 mm VPZ-6 Spare cup NBR $\varnothing$ 2, 4, 6, 8 mm VT-NBR-Set Holder EIL.05-HO (p.524)





Magnetic grippers - electrical controlled  
Secure handling by permanent magnets



Product Description

- > Safe handling of sheet metal or ferromagnetic workpieces with or without recesses
- > Very high holding force thanks to high-performance electromagnet / permanent magnet
- > Short cycle times for thin and/or alloyed metal sheets thanks to negligible residual magnetism after switching off the magnetic force
- > No piping required
- > Very energy-efficient as a short electrical pulse is only required for product release
- > Robust design

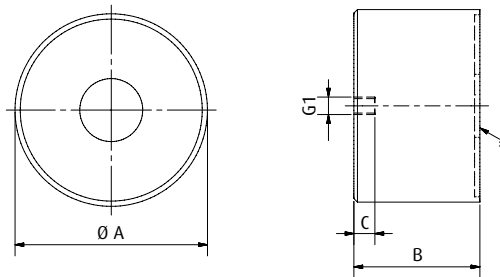
Notes

- > Indicated holding forces are valid direct placement, without air gap, on the flat holding surface

Technical data

Item no.	Principle of operation	Rated power [W]	Gripping force [N]	Residual gripping force [N]	Operating voltage of the switch-off coil [V]	Power-on time [ED]	Protection class	Max. operating temperature [°C]	Weight [g]	Suitable holder
MG35	Electrical	4.6	160	< 1	24	25 % ED at < 2 min.	IP65	0 - 70	200	270.448
MG55	Electrical	9	420	< 1	24	25 % ED at < 2 min.	IP65	0 - 70	500	270.449
MG70	Electrical	13.3	720	< 1	24	25 % ED at < 2 min.	IP65	0 - 70	900	270.450

Dimensions



\* = Holding surface

Item no.	G1	Ø A [mm]	B [mm]	C [mm]
MG35	M4	35	30	5
MG55	M5	55	36	6
MG70	M8	70	45	8



# Special grippers | Standard

Magnetic grippers - pneumatically controlled

## Magnetic grippers - pneumatically controlled

Safe handling by permanent magnets



Fast replacement NBR sealing rings (70° Shore A hardness)

### Product Description

- > Safe handling of sheet metal or ferromagnetic workpieces with or without recesses
- > Very high holding force thanks to powerful permanent magnets
- > Robust and compact aluminium body, anodised, red
- > Very wear-resistant and fast replacement NBR sealing rings (70° Shore A hardness) to avoid scratches due to contact between gripper and workpiece
- > Optional magnetic PNP and NPN sensors from model PMG40 for part control by monitoring the piston position

### Notes

- > The recommended working load includes safety factor of 3

### Ordering notes

- > Sealing ring included in scope of delivery

### Technical data

Item no.	Principle of operation	Pressure range [bar]	Gripping force [N]	Recommended workload [N]	Air consumption [l/stroke]	Min. recommended sheet thickness [mm]	Protection class	Operating temperature [°C]	Weight [g]	Suitable accessories
PMG24	Double	4 - 6	40	13	0.013	0.5	IP67	0 - 70	100	Sealing ring PMG24-NBR
PMG40	Double	4 - 6	170	57	0.04	0.5	IP67	0 - 70	200	Sensor GR04.199 Sensor GR04.199/NPN Sealing ring PMG40-NBR
PMG70	Double	4 - 6	400	135	0.142	0.5	IP67	0 - 70	800	Sensor GR04.199 Sensor GR04.199/NPN Sealing ring PMG70-NBR

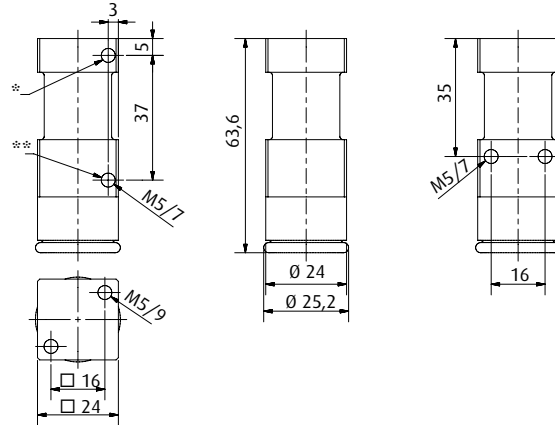
### Optional: with magnetic sensor



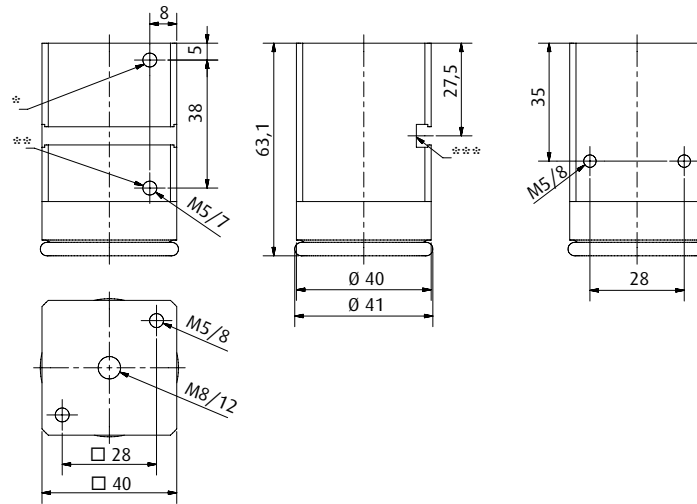
Magnetic gripper PMG70 with PNP sensor GR04.199



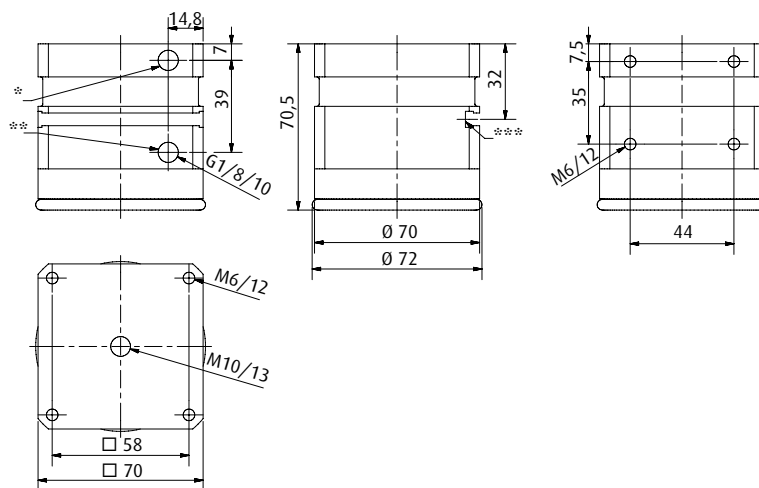
Dimensions



PMG24



PMG40



PMG70

\* = Magnetic force "on" \*\* = Magnetic force "off" \*\*\* = Sensor slot



## Special grippers | Customised

Insert gripper - compressed-air controlled

### Insert gripper - compressed-air controlled

Customised design example



Application example with insert part

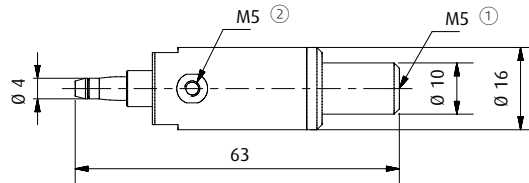
#### Product Description

- > Inserting (e.g. M5 nuts) threaded bushings thanks to "internal gripping"
- > Precisely tailored to the workpiece
- > Dual-action
- > Connection via  $\varnothing$  10 mm clamp
- > Housing material: brass, other materials on request
- > Weight: 115 g

#### Ordering notes

- > The product example displayed is based on customer specifications
- > We would be pleased to develop a solution optimally customised to your requirements

#### Dimensions



① = Compressed air connection for extending the piston    ② = Compressed air connection for pulling in the piston



Insert gripper - vacuum controlled

Customised design example



Application example with insert part

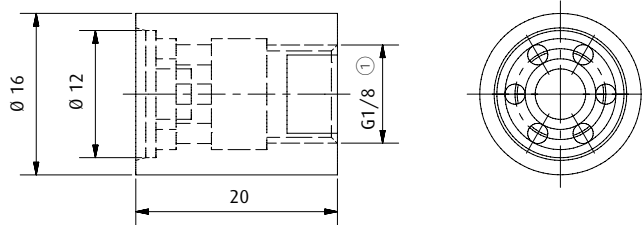
Product Description

- > Handling of customer-specific inserts on the face side
- > Alternative when internal or external gripping is not permitted
- > Gripper diameter precisely adjusted to the workpiece
- > Connection via spring leveler
- > Weight: 85 g
- > Housing material: brass, other materials on request
- > Suitable accessories: spring-loaded suction finger GR04.090A, angle clamp GR02.011A
- > Patent pending

Ordering notes

- > The product example displayed is based on customer specifications
- > We would be pleased to develop a solution optimally customised to your requirements

Dimensions



① = Vacuum connection



# Special grippers | Customised

## Modular gripper

### Modular gripper

Customised design example



SUITABLE FOR FOODSTUFFS



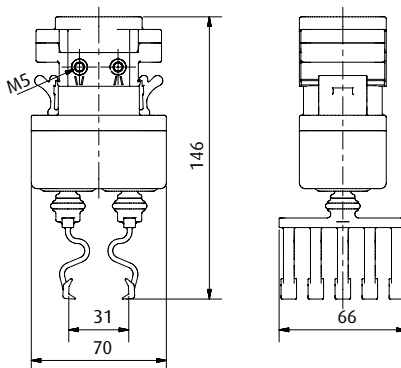
### Product Description

- > Handling of food - here: chocolate bars
- > Gripper is precisely tailored to the workpiece
- > Connection to a Delta Robot
- > Dual-action
- > All components with FDA-certification
- > Material: polyamide-based high-performance plastic

### Ordering notes

- > The product example displayed is based on customer specifications
- > We would be pleased to develop a solution optimally customised to your requirements

### Dimensions



### Examples of application

- > Modular gripper for cans - the gripper design follows the contours of the handling good, enables rapid acceleration to enable rapid acceleration



- > Modular gripper with integrated ejector EMM and Varioflex® bellows vacuum cups to compensate unevenness of the workpiece





FIPA components for gripper assembly



Suction fingers or spring levelers



Straight suction fingers



Pivoting suction fingers



Spring-loaded,  
non rotating  
suction finger



Adjustable spring levelers



Application example

Extrusions and screw connectors



Extrusion systems / framing  
S, M and XLine



Angle clamps



Angle connectors



Application example



Application example

Active gripping elements



Grippers



Finger grippers



Application example



Parallel grippers

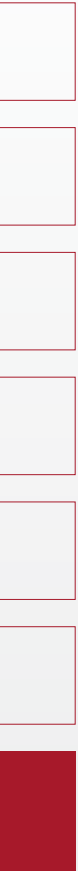


Needle grippers

Our End-of-Arm-Tooling (EOAT) catalogue  
can be found at:  
www.fipa.com | Info & Catalogues  
or requested by e-mail (info@fipa.com)  
or by calling +49 (0)89/96 24 89-0



Notes:



Lined area for notes, featuring a vertical red line on the left and horizontal lines for writing.

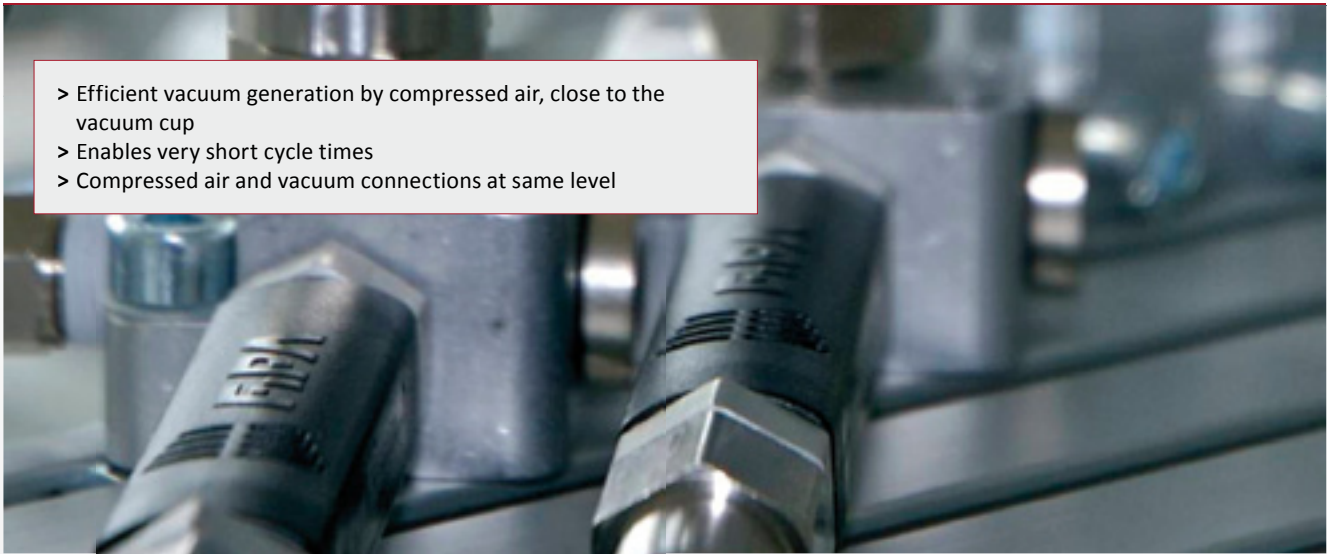


<b>Inline ejectors</b> .....	<b>513</b>
<b>Base and Heavy-duty ejectors</b> .....	<b>526</b>
<b>Multi-chamber ejectors</b> .....	<b>546</b>
<b>Compact ejectors</b> .....	<b>555</b>
<b>Feed ejectors</b> .....	<b>569</b>
<b>Silencers for vacuum ejectors</b> .....	<b>577</b>
<b>Rotary vane vacuum pumps</b> .....	<b>580</b>
<b>Vacuum units</b> .....	<b>606</b>
<b>Side channel blowers</b> .....	<b>614</b>
<b>Accessories</b> .....	<b>617</b>





## FIPA Inline ejectors



- > Efficient vacuum generation by compressed air, close to the vacuum cup
- > Enables very short cycle times
- > Compressed air and vacuum connections at same level



### Inline ejectors EIL

- > Handling of dense workpieces (max. vacuum level 85 % / 90 %): Index H
- > Handling of porous workpieces (higher suction power, max. vacuum level 60 % / 68 %): Index L
- > Compressed air-saving operation at only 3.5 bar (max. vacuum level 90 %) for the handling of dense workpieces: Index P

> See page 514



### Inline ejectors EIL expandable

- > Very high mechanical strength
- > Application e.g. directly with vacuum suction plates in the wood industry
- > Direct vacuum monitoring through simple connection of vacuum switches
- > Short cycle times thanks to easy connection with a blow-off unit

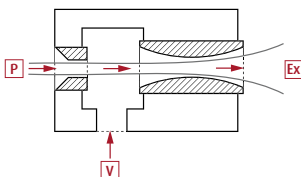
> See page 520

### Examples of use

- > Handling of lightweight parts
- > Pick & place applications
- > Separation systems in sheet metal or plastic manufacturing
- > Handling of electrical components

### Functional principle

Ejectors work according to the Venturi principle and generate vacuum  $\square V$  from compressed air  $\square P$ . Vacuum is created in the subsequent chamber as a result of the high flow speed after the primary nozzle. "Used" compressed air and suctioned air leave the ejector through the secondary nozzle. Either a silencer or an exhaust air duct can be connected to the outlet  $\square Ex$ .





### Inline ejectors EIL

Compressed air and vacuum connection via quick fittings, lateral exhaust



Series 1  
 Series 2  
 V = Vacuum connection P = Compressed air connection Ex = Exhaust outlet

### Product Description

- > Easy installation close to the vacuum cup
- > High suction power enables short gripping times

### Ordering notes

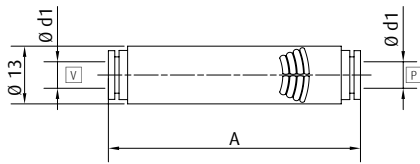
- > Index H: Ejectors for non air permeable products (max. vacuum degree 85 % / 90 %)
- > Index L: Ejectors for air permeable products, resp. in case of higher leakage (increased suction, max. vacuum degree 60 % / 68 %)
- > Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)

### Technical data

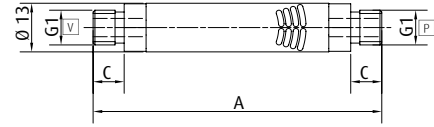
Item no.	Series	Nozzle diameter [mm]	Optimal feed pressure [bar]	Suction power at 5 bar [N/min]	Air consumption at 5 bar [N/min]	Final vacuum at 5 bar [%]	Evacuation time 0 to 70 % [s/l]	Evacuation time 0 to 45 % [s/l]	Weight [g]	Suitable accessories
EIL.05H.1	1	0.5	5	8	14	85	13	--	13	Plug-in filter 71.071 (p.628)
EIL.05H.2	1	0.5	5	8	14	85	13	--	15	--
EIL.05H.4	2	0.5	5	7	11.5	90	10	--	18.5	Plug-in filter 71.070 (p.628) Fitting EIL.05-HO (p.524)
EIL.05L.1	1	0.5	5	14	14	60	--	4	13	Plug-in filter 71.071 (p.628)
EIL.05L.2	1	0.5	5	14	14	60	--	4	15	--
EIL.05L.4	2	0.5	5	12	11.5	68	--	3.2	18.5	Plug-in filter 71.070 (p.628) Fitting EIL.05-HO (p.524)
EIL.07H.1	1	0.7	5	13	28	85	7.5	--	13	Plug-in filter 71.071 (p.628)
EIL.07H.2	1	0.7	5	13	28	85	7.5	--	15	--
EIL.07H.4	2	0.7	5	13	23	90	6	--	20	Plug-in filter 71.070 (p.628) Fitting EIL.07-HO (p.524)
EIL.07L.1	1	0.7	5	28	28	60	--	2	13	Plug-in filter 71.071 (p.628)
EIL.07L.2	1	0.7	5	28	28	60	--	2	15	--
EIL.07L.4	2	0.7	5	20	23	68	--	1.6	20	Plug-in filter 71.070 (p.628) Fitting EIL.07-HO (p.524)
EIL.07P.4	2	0.7	3.5	10	17	90	12	--	20.5	Plug-in filter 71.070 (p.628) Fitting EIL.07-HO (p.524)
EIL.07P.1	2	0.7	3.5	10	17	90	12	--	19	Plug-in filter 71.071 (p.628) Fitting EIL.07-HO (p.524)



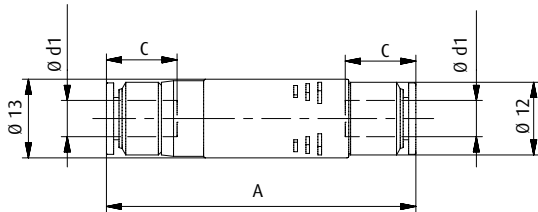
## Dimensions



EIL.05H.1 | EIL.05L.1 | EIL.07H.1 | EIL.07L.1



EIL.05H.2 | EIL.05L.2 | EIL.07H.2 | EIL.07L.2



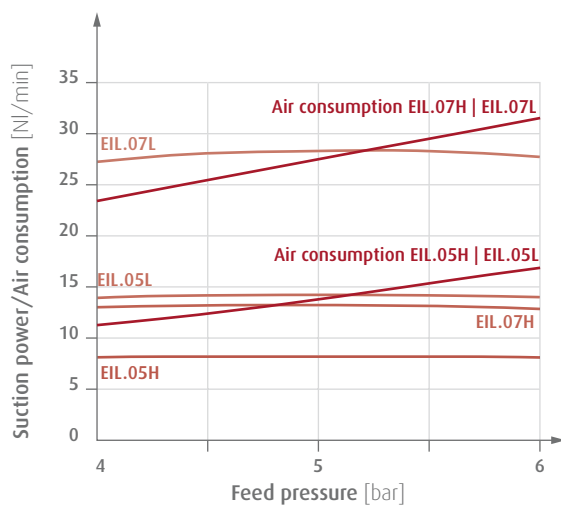
EIL.05H.4 | EIL.05L.4 | EIL.07H.4 | EIL.07L.4 | EIL.07P.4 | EIL.07P.1

V = Vacuum connection P = Compressed air connection

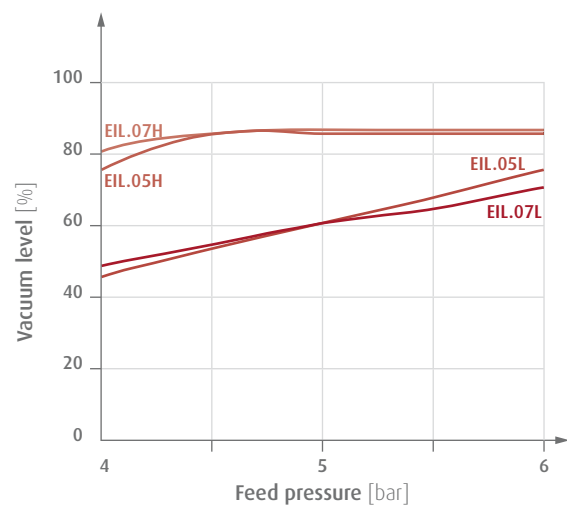
Item no.	G1	d1 [mm]	A [mm]	C [mm]
EIL.05H.1	--	6	61	--
EIL.05H.2	G1/8	--	78	8
EIL.05H.4	--	4	49	11
EIL.05L.1	--	6	61	--
EIL.05L.2	G1/8	--	78	8
EIL.05L.4	--	4	49	11
EIL.07H.1	--	6	61	--
EIL.07H.2	G1/8	--	78	8
EIL.07H.4	--	4	55.5	11
EIL.07L.1	--	6	61	--
EIL.07L.2	G1/8	--	78	8
EIL.07L.4	--	4	55.5	11
EIL.07P.4	--	4	55.5	11
EIL.07P.1	--	6	57	11.5

## Diagrams

> Series 1: Suction power and air consumption against feed pressure



> Series 1: Vacuum level against feed pressure

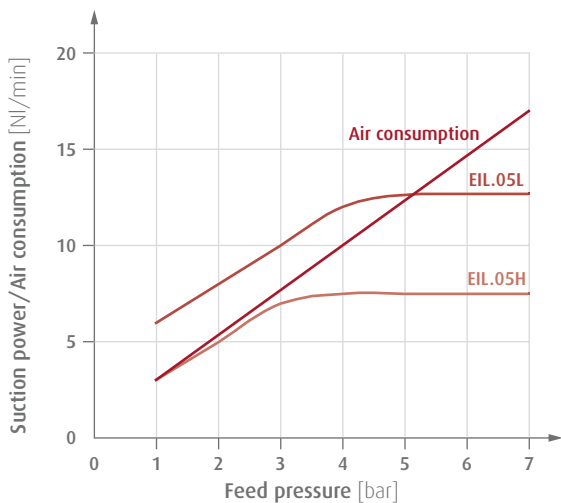


Continued on the next page

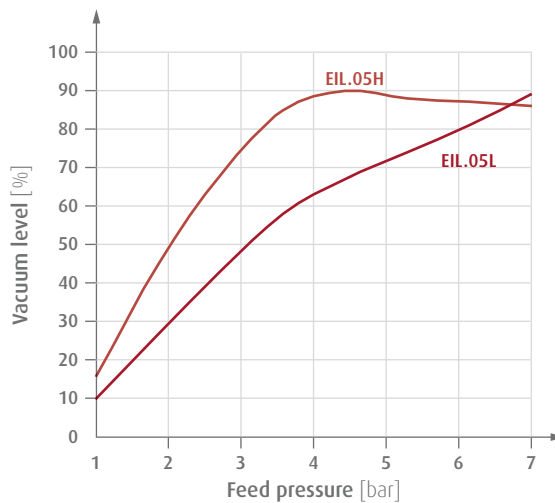


### Diagrams

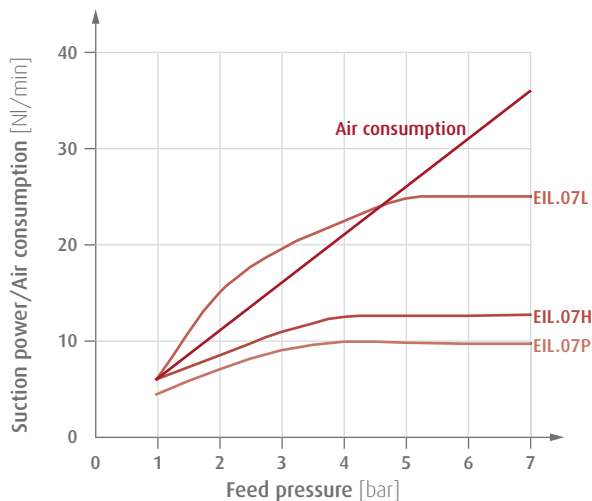
> Series 2: Suction power and air consumption against feed pressure



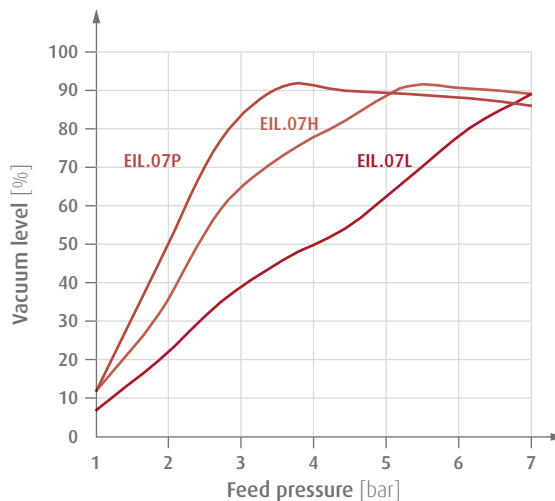
> Series 2: Vacuum level against feed pressure



> Series 2: Suction power and air consumption against feed pressure



> Series 2: Vacuum level against feed pressure



### Suction power [NI/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %
EIL.05H.1	8	5.3	4.2	3.9	3.3	2.5	1.3	0.4	0.1
EIL.05H.2	8	5.3	4.8	3.9	3.3	2.5	1.3	0.4	0.1
EIL.05H.4	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7
EIL.05L.1	14	11.9	9	6.8	4.3	2.2	0.1	--	--
EIL.05L.2	14	11.9	9	6.8	4.3	2.2	0.1	--	--
EIL.05L.4	12	10.2	8.3	6.5	4.7	2.9	1.1	--	--
EIL.07H.1	13	10.8	9.2	8.1	7	5.2	4.1	2.7	1.1
EIL.07H.2	13	10.8	9.2	8.1	7	5.2	4.1	2.7	1.1
EIL.07H.4	13	11.5	10.1	8.7	7.2	5.8	4.4	3	1.5
EIL.07L.1	28	26	22.1	17.6	10.8	5.4	1.9	--	--
EIL.07L.2	28	26	22.1	17.6	10.8	5.4	1.9	--	--
EIL.07L.4	22	18.7	15.3	12	8.6	5.3	2	--	--
EIL.07P.4	10	8.9	7.7	6.6	5.5	4.4	3.3	2.2	1.1
EIL.07P.1	10	8.9	7.7	6.6	5.5	4.4	3.3	2.2	1.1



### Inline ejectors EIL

Compressed air, vacuum and exhaust via quick fittings, two fixing holes



**V** = Vacuum connection   **P** = Compressed air connection   **Ex** = Exhaust outlet

#### Product Description

- > Easy installation close to the vacuum cup
- > High suction power for short gripping time

#### Ordering notes

- > Index H: Ejectors for dense products (max. vacuum degree 90 %)
- > Index L: Ejectors for air permeable products, resp. in case of higher leakage (increased suction, max. vacuum degree 68 %)
- > Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)

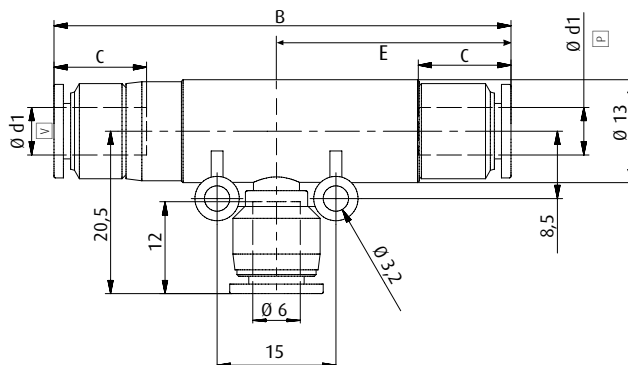
#### Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum at 5 bar [%]	Suction power at 5 bar [Nl/min]	Air consumption at 5 bar [Nl/min]	Evacuation time 0 to 70 % [s/l]	Evacuation time 0 to 45 % [s/l]	Weight [g]	Suitable accessories
<b>EIL.05H.1-B</b>	0.5	5	90	7	11.5	13	--	19.5	Fitting EIL.05-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
<b>EIL.05H.4-B</b>	0.5	5	90	7	11.5	13	--	21	Fitting EIL.05-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)
<b>EIL.07H.1-B</b>	0.7	5	90	13	23	7	--	20.5	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
<b>EIL.07H.4-B</b>	0.7	5	90	13	23	7	--	22.5	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)
<b>EIL.05L.1-B</b>	0.5	5	68	12	11.5	--	4	19.5	Fitting EIL.05-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
<b>EIL.05L.4-B</b>	0.5	5	68	12	11.5	--	4	21	Fitting EIL.05-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)
<b>EIL.07L.1-B</b>	0.7	5	68	22	23	--	1.6	20.5	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
<b>EIL.07L.4-B</b>	0.7	5	68	20	23	--	1.6	22	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)
<b>EIL.07P.1-B</b>	0.7	3.5	90	10	17	7.5	--	20.5	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.071 (p.628)
<b>EIL.07P.4-B</b>	0.7	3.5	90	10	17	7.5	--	22	Fitting EIL.07-HO (p.524) Filter element FEE8.2x2 Plug-in filter 71.070 (p.628)

Continued on the next page →



### Dimensions

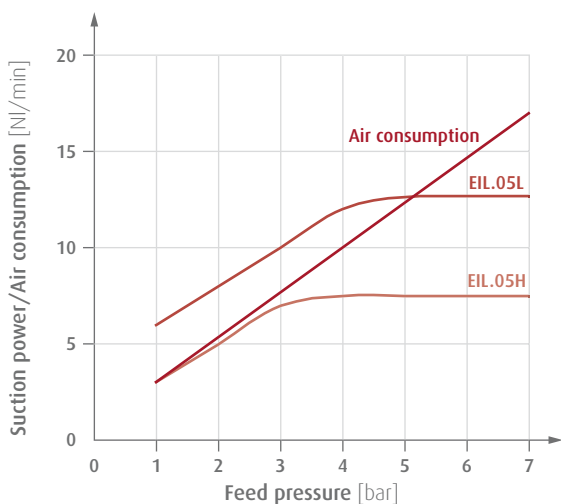


V = Vacuum connection   
 P = Compressed air connection

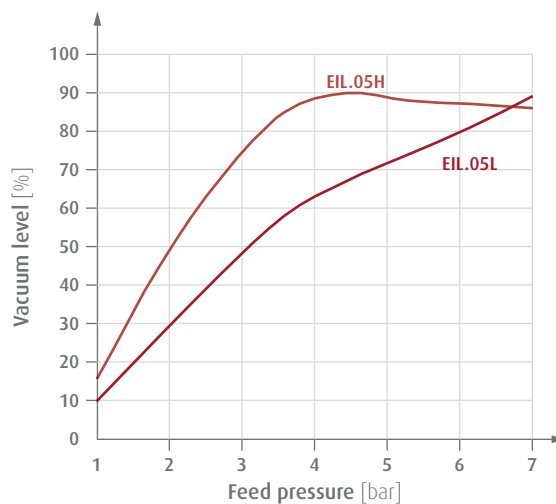
Item no.	Ø d1 [mm]	B [mm]	C [mm]	E [mm]
EIL.05H.1-B	6	50.5	11.5	22.5
EIL.05H.4-B	4	49	11	22
EIL.07H.1-B	6	57	11.5	26
EIL.07H.4-B	4	55.5	11	25.5
EIL.05L.1-B	6	50.5	11.5	22.5
EIL.05L.4-B	4	49	11	22
EIL.07L.1-B	6	57	11.5	26
EIL.07L.4-B	4	55.5	11	25.5
EIL.07P.1-B	6	57	11.5	26
EIL.07P.4-B	4	55.5	11	25.5

### Diagrams

> Suction power and air consumption against feed pressure



> Vacuum level against feed pressure

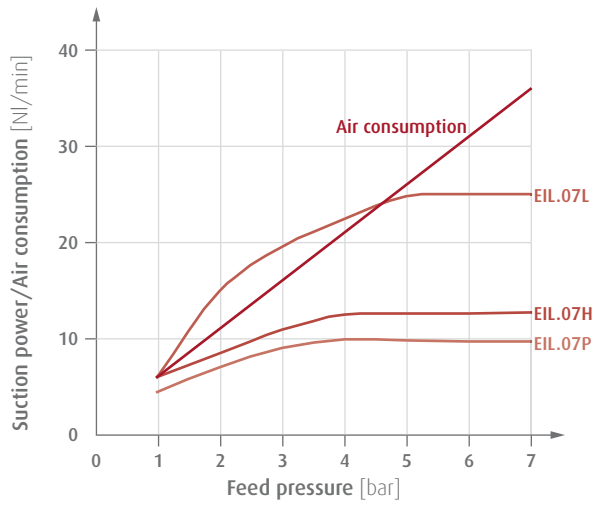




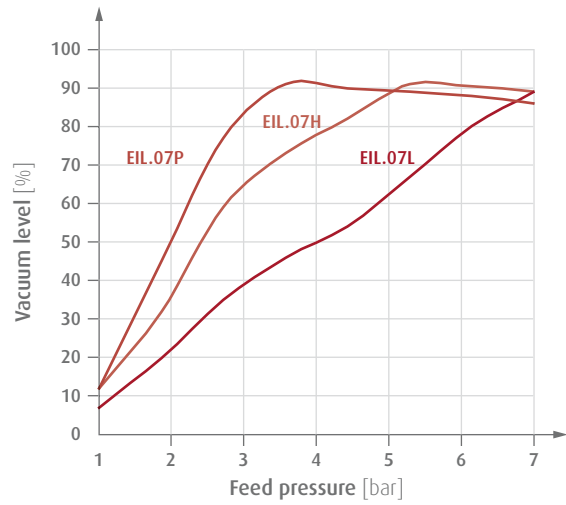


## Diagrams

> Suction power and air consumption against feed pressure



> Vacuum level against feed pressure



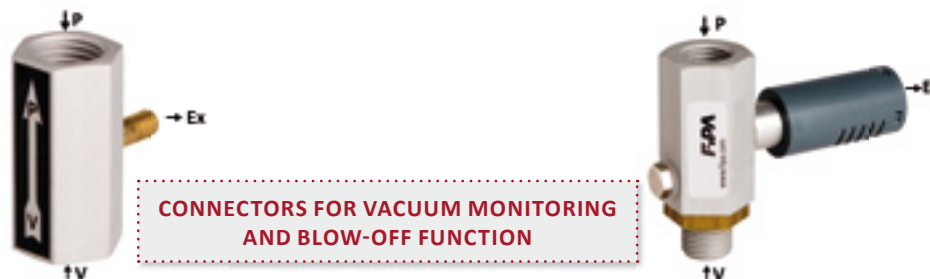
### Suction power [NI/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
EIL.05H.1-B	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7	--
EIL.05H.4-B	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7	--
EIL.07H.1-B	13	11.5	10.1	8.7	7.2	5.8	4.4	3	1.5	0.1
EIL.07H.4-B	13	11.5	10.1	8.7	7.2	5.8	4.4	3	1.5	0.1
EIL.05L.1-B	12	10.2	8.3	6.5	4.7	2.9	1.1	--	--	--
EIL.05L.4-B	12	10.2	8.3	6.5	4.7	2.9	1.1	--	--	--
EIL.07L.1-B	22	18.7	15.3	12	8.6	5.3	2	--	--	--
EIL.07L.4-B	22	18.7	15.3	12	8.6	5.3	2	--	--	--
EIL.07P.1-B	10	8.9	7.7	6.6	5.5	4.4	3.3	2.2	1.1	--
EIL.07P.4-B	10	8.9	7.7	6.6	5.5	4.4	3.3	2.2	1.1	--



### Inline ejectors EIL, expandable

Compressed air, vacuum connection and exhaust via G-threads



Series EIL.05 - EIL.09

Series EIL.10 - EIL.14 optionally with silencer

TV = Vacuum connection P = Compressed air connection Ex = Exhaust outlet

### Product Description

- > High suction power for short gripping time
- > Easy installation directly on the vacuum cup
- > Compact design for installation where space is limited
- > Robust aluminium body
- > Very short cycle time using optional blow-off function
- > Vacuum switch connection for high process reliability
- > Effective noise reduction through open and closed silencers

### Ordering notes

Connection blow-off device

- > Connection via M5-female
- > EIL.05-09: with I18 vacuum connection
- > EIL.10-14: always be connected

Connection of check valve with blow-off device 32.638

- > Connection to the vacuum outlet

Silencers

- > EIL.05-09: Closed diffuser silencer (72.045)
- > EIL.10-14: See item number specification

Vacuum monitoring: Connection to the ejector via M5-female

- > EIL.05-09: Vacuum switch connection possible with I18 vacuum connection
- > EIL.10-14: Vacuum switch can always be connected via M5-female

### Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power at 5 bar [N/min]	Air consumption at 5 bar [N/min]	Operating temperature [°C]	Weight [g]	Suitable accessories
<b>EIL.05</b>	0.5	5	87	7	12	-10 - 80	20	Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.045 (p.578)
<b>EIL.07</b>	0.7	5	90	14	21	-10 - 80	20	Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.045 (p.578)
<b>EIL.09</b>	0.9	5	90	21	36	-10 - 80	20	Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.045 (p.578)
<b>EIL.10</b>	1	5	90	27	44	-10 - 80	50	Check valve 32.638 (p.674), Blow-off device 32.660 (p.525), Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.000 (p.578), Silencer 72.028 (p.577)
<b>EIL.12</b>	1.2	5	90	45	66	-10 - 80	50	Check valve 32.638 (p.674), Blow-off device 32.660 (p.525), Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.000 (p.578), Silencer 72.028 (p.577)
<b>EIL.14</b>	1.4	5	90	64	108	-10 - 80	50	Check valve 32.638 (p.674), Blow-off device 32.660 (p.525), Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.000 (p.578), Silencer 72.028 (p.577)



## When ordering please specify

Type + Nozzle diameter + Vacuum output = Item number

Example: EIL.07-M6

(Mini ejector EIL., nozzle diameter 0.7 mm, with vacuum output M6-female)

1.: Type	2.: Nozzle diameter	3.: Vacuum output		
EIL.	05	Ø 0.5 mm	M6	M6
	07	Ø 0.7 mm	A18	G1/8-male
			A14	G1/4-male
	09	Ø 0.9 mm	I18	G1/8-female
			I14	G1/4-female

Type + Nozzle diameter + Vacuum output + Silencer = Item number

Example: EIL.12-M10G

(Inline ejector EIL, nozzle diameter: 1.2 mm, vacuum output M10x125 male thread with silencer 72.000)

1.: Type	2.: Nozzle diameter	3.: Vacuum output		4.: Silencer	
EIL.	10	Ø 1 mm	A14	G1/4-male	G 72.000 (closed diffusor silencer)
	12	Ø 1.2 mm	M10	M10x125-male	O 72.028 (open silencer)
	14	Ø 1.4 mm			

## Handling of wooden plates

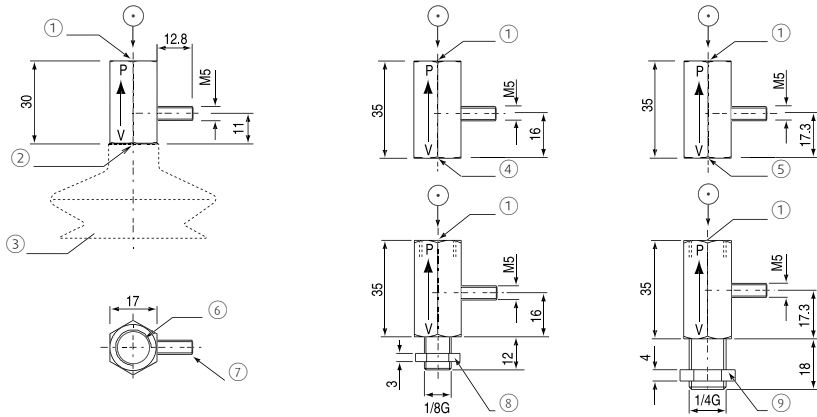


Illustration with check valve 32.638 with blow-off function and vacuum cup 102.070.234.9 for wood handling

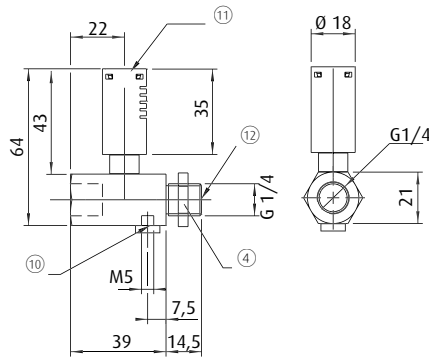
Continued on the next page →



## Dimensions



EIL.05 | EIL.07 | EIL.09

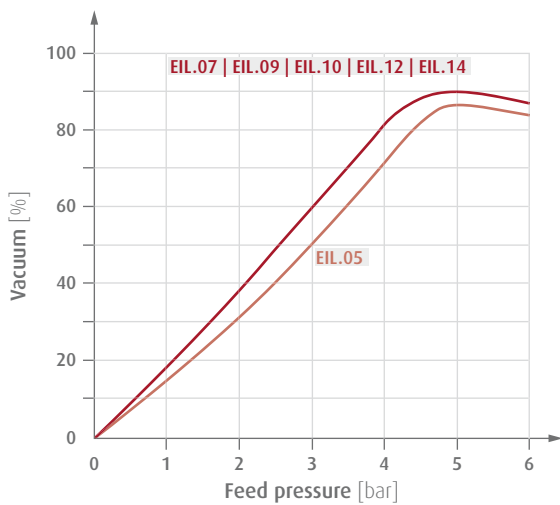


EIL.10 | EIL.12 | EIL.14

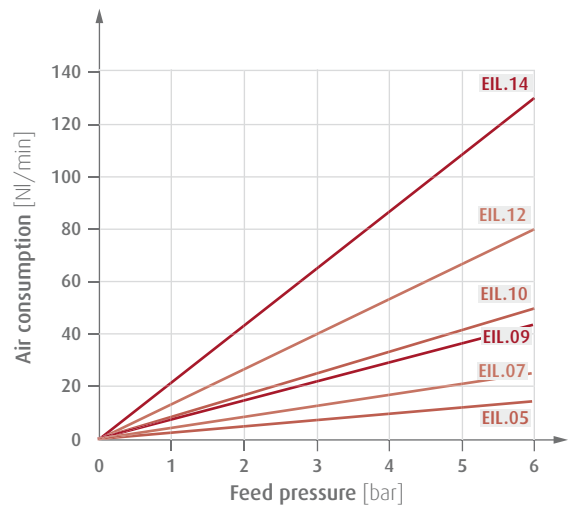
- ① = Compressed air input G1/4, depth 10 mm
- ② = Vacuum output M6, depth 6 mm
- ③ = Vacuum cup example
- ④ = Vacuum output G1/4-female, depth 7.5 mm
- ⑤ = Vacuum output G1/8-female, depth 10 mm
- ⑥ = Compressed air
- ⑦ = Exhaust
- ⑧ = Hex nut (SW14)
- ⑨ = Hex nut (SW19)
- ⑩ = Blow-off or vacuum switch connection
- ⑪ = Silencers
- ⑫ = Vacuum

## Diagrams

> Vacuum level against feed pressure



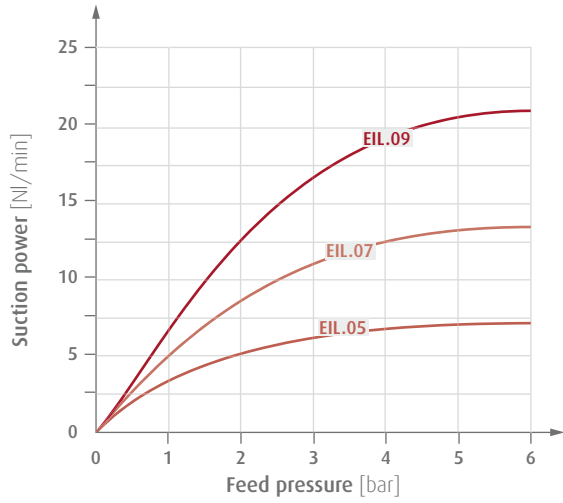
> Air consumption against feed pressure



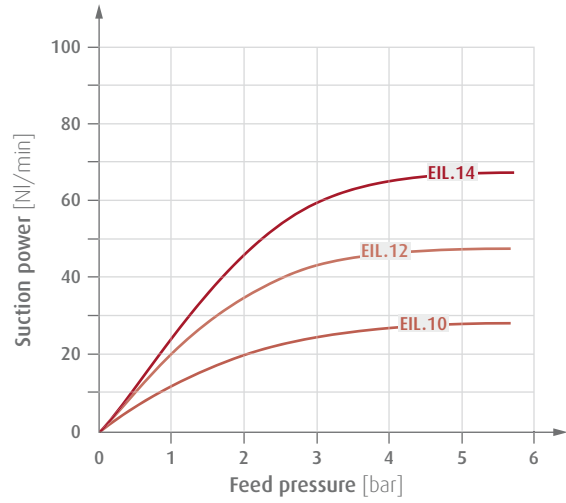


## Diagrams

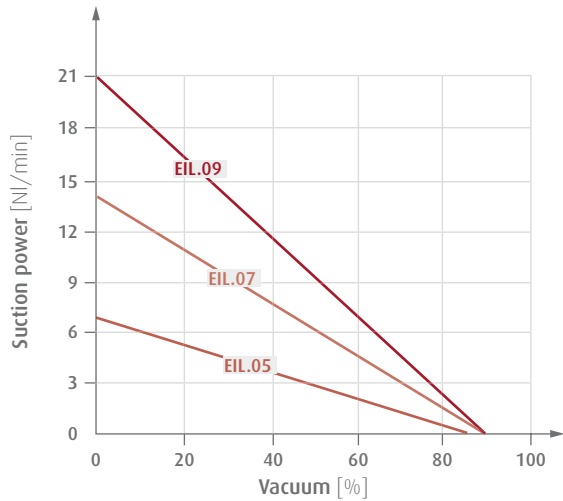
> Suction power against feed pressure



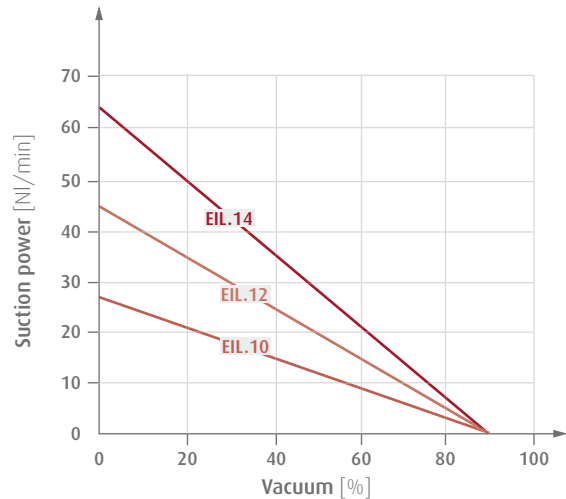
> Suction power against feed pressure



> Suction power against vacuum



> Suction power against vacuum



## Evacuation time [sec.] for 1 liter at vacuum level

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	85 %
EIL.05	0.92	1.96	3.18	4.63	6.38	8.79	12.17	18.96	27.39
EIL.07	0.46	0.98	1.58	2.28	3.13	4.27	5.8	8.55	11.01
EIL.09	0.31	0.65	1.05	1.52	2.09	2.85	3.87	5.7	7.34
EIL.10	0.24	0.51	0.82	1.18	1.62	2.21	3.01	4.43	5.71
EIL.12	0.14	0.3	0.49	0.71	0.97	1.33	1.81	2.66	3.42
EIL.14	0.1	0.21	0.34	0.5	0.68	0.93	1.27	1.85	2.44



### Inline ejectors EIL - accessories

#### Ejector bracket



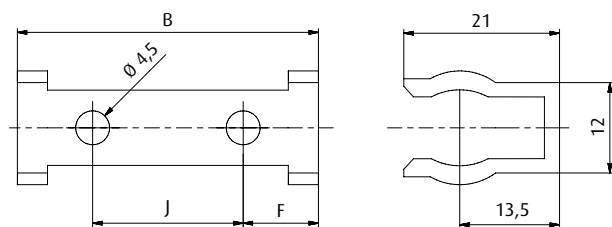
#### Technical data

Item no.	Weight [g]
EIL.05-HO	2
EIL.07-HO	2

#### Dimensions

B [mm]	F [mm]	J [mm]
33	9	15
39	10	20

#### Dimensions





Blow-off device for ejectors



32.660 enables blow-off with check valve 32.638

**Product Description**

- > Short cycle times thanks to direct connection to ejectors via M5 external thread
- > Suitable e.g. for inline ejectors EIL, expandable

**Notes**

- > Blow-off device is part of check valve 32.638 with blow-off function

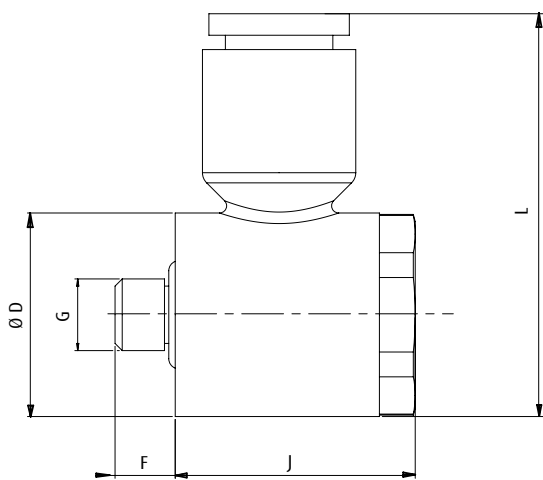
**Technical data**

Item no.	Plug connection [mm]	Blow-off capacity at 5 bar [NI/min]
32.660	6	100

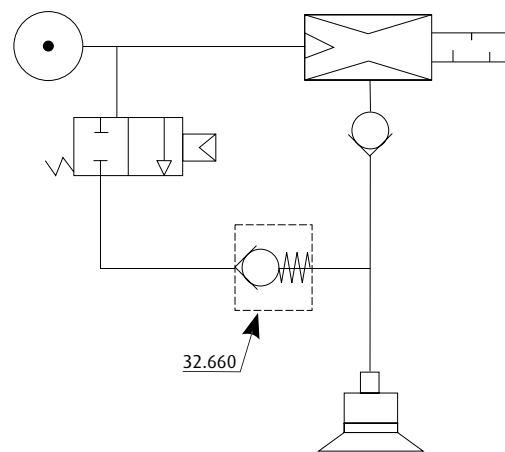
**Dimensions**

G	$\varnothing D$ [mm]	F [mm]	J [mm]	L [mm]
M5	14.2	4.2	16.75	28.1

**Dimensions**

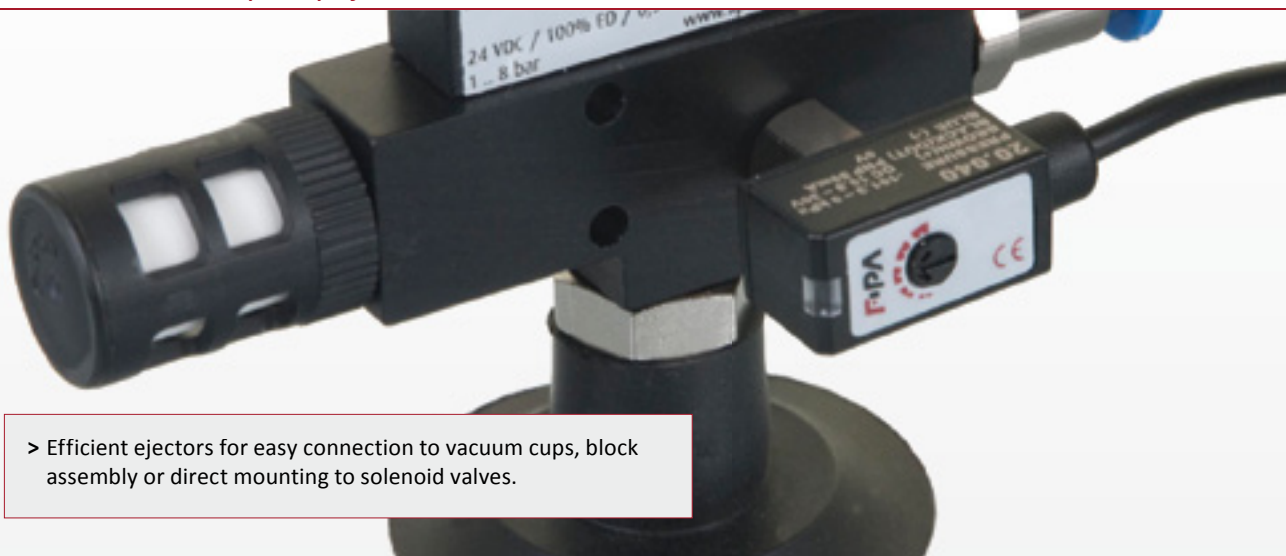


**Wiring diagram**





## FIPA Basic and Heavy-duty ejectors



> Efficient ejectors for easy connection to vacuum cups, block assembly or direct mounting to solenoid valves.



### Base ejectors with graded blow-off

- > Very short cycle times thanks to fast-reacting micro valve
- > Ideally suited for robotic applications, such as Delta robots (e.g. FlexPickers)

> See page 528



### Ejector boxes EBO

- > Rectangular design for space-saving parallel connection in centralised or decentralised vacuum systems
- > For handling dense workpieces (max. vacuum level 93 %): Index H
- > For handling porous workpieces (higher suction power, max. vacuum level 68 %): Index L
- > Special compressed air-saving operation for handling dense workpieces at only 3.5 bar (max. vacuum level 90 %): Index P

> See page 530



### Base ejectors EBA

- > For handling dense workpieces (max. vacuum level 93 %): Index H
- > For handling porous workpieces (higher suction power, max. vacuum level 68 %): Index L
- > Special compressed air-saving operation for handling dense workpieces at only 3.5 bar (max. vacuum level 90 %): Index P

> See page 533



### Base ejectors EBM

- > Easy installation directly on the vacuum cup
- > Small dimensions for installation where space is limited
- > Miniature silencer that can be dismantled for fast servicing and short downtimes

> See page 541





## FIPA Base and Heavy-duty ejectors



### Heavy-duty ejectors 65.102A - 65.130

- > Robust and compact aluminium housing
- > Compensation of compressed air fluctuations between 3 to 6 bar
- > Additional inlet for blow-off for short cycle times or vacuum switch connection for process monitoring (65.111, 65.130)
- > Rectangular design for space-saving parallel connection in centralised or decentralised vacuum systems

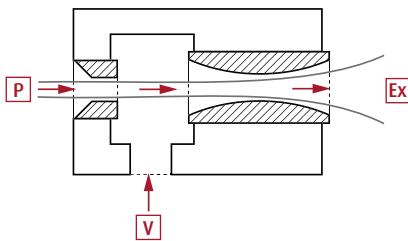
> See page 544

### Examples of use

- > Handling of lightweight parts
- > Pick & place applications
- > Separation systems in sheet metal handling or plastic manufacturing
- > Handling of electrical components

### Functional principle

Ejectors work according to the Venturi principle and generate vacuum **V** from compressed air **P**. Vacuum is created in the subsequent chamber as a result of the high flow speed to the primary nozzle. "Used" compressed air and suctioned air leave the ejector through the secondary nozzle **Ex**.





# Vacuum generation | Base ejectors

Base ejectors with graded blow-off

## Base ejectors with graded blow-off

**NEW**

**VERY SHORT RESPONSE TIME, SAFE AND GENTLE PRODUCT RELEASE**



Example: Ejector EBA.08H.2-A with digital mini vacuum switch 20.040, closed diffusor silencer 72.000 and flat vacuum cup  $\varnothing$  40 mm

### Product Description

- > Small and very light for installation directly on vacuum cups for fast vacuum build-up and short gripping times
- > Blow-off pulse from a fast-reacting micro valve enables very short cycle times
- > Graded blow-off boost effect: Initially the blow-off is supported by ambient air, for placement that is both quick and gentle
- > Robust design and long service life of > 100 million switching cycles
- > M5 connection for digital mini vacuum switch to ensure reliable process monitoring
- > Ideally suited for robotic applications with very short cycles such as Delta robots (e.g. FlexPickers)

### Ordering notes

- > Included in delivery: control cable 20.550, length 1,5 meter, 2-wire, free end

### Technical data

Item no.	EBA.08H.2-A
Nozzle diameter [mm]	0.8
Optimal feed pressure [bar]	5
Max. feed pressure [bar]	8
Final vacuum [%]	85
Suction power at 5 bar [NI/min]	25
Air consumption at 5 bar [NI/min]	30
Flow rate solenoid valve [NI/min]	15
Blow-off volumes of flow [NI/min]	110 - 45
Power-on time solenoid valve (ED) [%]	100
Power-on/ -off time solenoid valve [ms]	5
Power consumption solenoid valve [W]	0.9
Protection class	IP40
Operating temperature [°C]	-10 - 50
Weight [g]	35
Suitable accessories	Connector cable 20.550 (p.717), Vacuum switch 20.040 (p.689), Vacuum switch 20.041 (p.689), Silencer 72.000 (p.578), Silencer 72.028 (p.577)

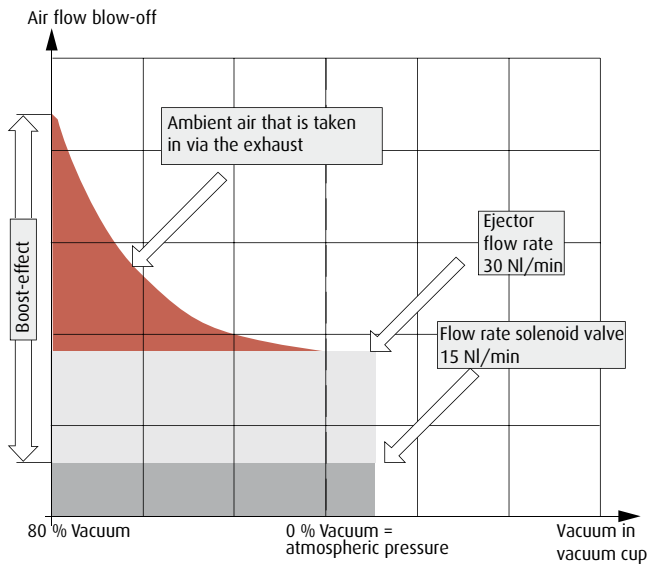
### Control cable 20.550



Cable assignment: red (+), black (-)



## Graded blow-off with boost-effect

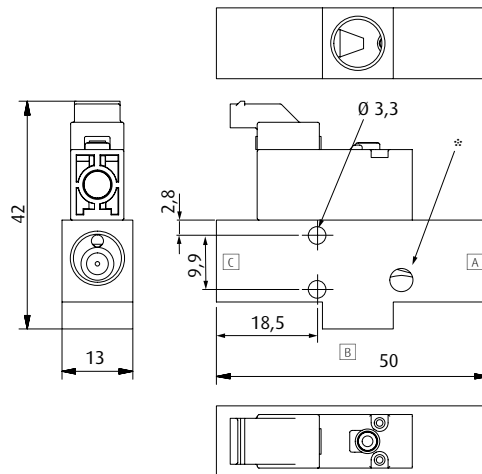


## Evacuation / Blow-off time

Evacuation / Blow-off time 1 liter volume up to % vacuum / atmospheric pressure [sec.]		
0 → 50 % / 50 % → 0	0 → 60 % / 60 % → 0	0 → 70 % / 70 % → 0
1.8 / 0.5	2.5 / 0.56	3.9 / 0.61

Evacuation / Blow-off time: example with Ø 30 mm flat suction cups, volume 1.7 cm <sup>3</sup> up to % vacuum / atmospheric pressure [ms]		
0 → 50 % / 50 % → 0	0 → 60 % / 60 % → 0	0 → 70 % / 70 % → 0
3 / < 1	4 / < 1	7 / 1

## Dimensions



A = Compressed air connection G1/8-female  
 B = Vacuum connection G1/8-female  
 C = Exhaust outlet G1/8-female  
 \* = M5 connection for vacuum switches



### Ejector boxes EBO

Compressed air and vacuum connection via quick fittings, exhaust via rectangular silencer



Series "-S" with mechanical vacuum switch

V = Vacuum connection  
 P = Compressed air connection  
 Ex = Exhaust outlet

### Product Description

- > High suction power for fast evacuation and short gripping time
- > Easy installation directly in the vacuum line
- > Rectangular design enables space-conserving parallel mounting of several ejector boxes
- > Replaceable silencer filter element
- > "-S" series with mechanical / electrical vacuum switch
  - Monitoring of vacuum circuits for high process reliability
  - NO / NC switching function

### Notes

"-S" series with mechanical / electrical vacuum switch:

- > Factory setting: -534 mbar
- > Contact capacity: 3 A at 250 V
- > Regulating range: -200 to -667 mbar
- > Repeat accuracy:  $\pm 50$  mbar
- > Hysteresis: -200 mbar

### Ordering notes

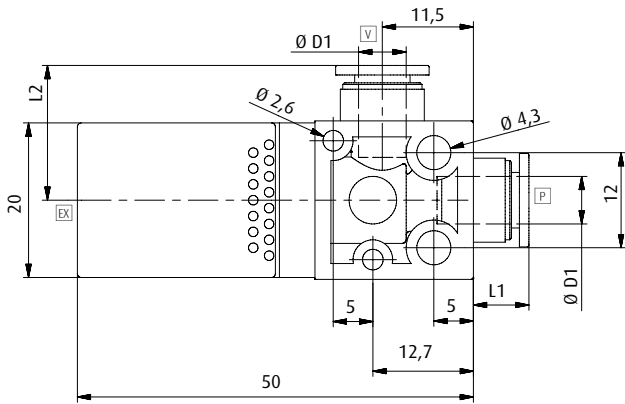
- > Index H: Ejectors for dense products (max. vacuum degree 90 %)
- > Index L: Ejectors for porous products, resp. in case of higher leakage (increased suction, max. vacuum degree 68 %)
- > Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)

### Technical data

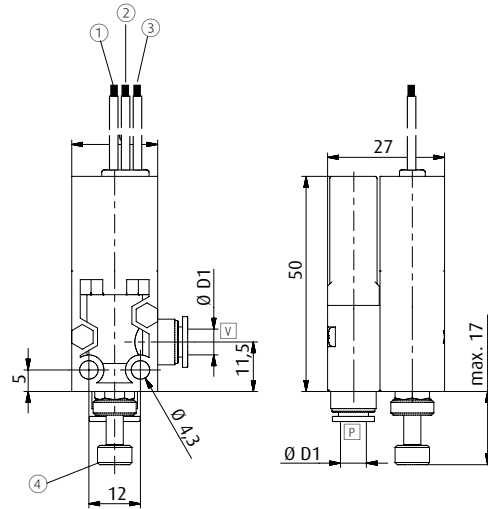
Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable filter and silencer set
<b>EBO.05H.4</b>	0.5	5	90	7	11.5	0 - 60	18	72.105
<b>EBO.07H.1</b>	0.7	5	93	13	23	0 - 60	18.5	72.105
<b>EBO.10H.1</b>	1	5	93	28	46	0 - 60	18.5	72.105
<b>EBO.12H.1</b>	1.2	5	93	38	70	0 - 60	18	72.105
<b>EBO.05L.4</b>	0.5	5	68	12	11.5	0 - 60	18	72.105
<b>EBO.07L.1</b>	0.7	5	68	26	23	0 - 60	18.5	72.105
<b>EBO.10L.1</b>	1	5	68	42	46	0 - 60	17.5	72.105
<b>EBO.07P.1</b>	0.7	3.5	90	10.5	17	0 - 60	18.5	72.105
<b>EBO.10P.1</b>	1	3.5	90	21	34	0 - 60	18.5	72.105
<b>EBO.12P.1</b>	1.2	3.5	90	27	47	0 - 60	18	72.105
<b>EBO.05H.4-S</b>	0.5	5	90	7	11.5	0 - 60	46.5	72.105
<b>EBO.07H.1-S</b>	0.7	5	93	13	23	0 - 60	46	72.105
<b>EBO.10H.1-S</b>	1	5	93	28	46	0 - 60	47	72.105
<b>EBO.12H.1-S</b>	1.2	5	93	38	70	0 - 60	47.5	72.105
<b>EBO.05L.4-S</b>	0.5	5	68	12	11.5	0 - 60	46.5	72.105
<b>EBO.07L.1-S</b>	0.7	5	68	26	23	0 - 60	48	72.105
<b>EBO.10L.1-S</b>	1	5	68	42	46	0 - 60	46.5	72.105
<b>EBO.07P.1-S</b>	0.7	3.5	90	10.5	17	0 - 60	48.5	72.105
<b>EBO.10P.1-S</b>	1	3.5	90	21	34	0 - 60	48.5	72.105
<b>EBO.12P.1-S</b>	1.2	3.5	90	27	47	0 - 60	47.5	72.105



Dimensions



EBO.05H.4 | EBO.07H.1 | EBO.10H.1 | EBO.12H.1 | EBO.05L.4 |  
EBO.07L.1 | EBO.10L.1 | EBO.07P.1 | EBO.10P.1 | EBO.12P.1



EBO.05H.4-S | EBO.07H.1-S | EBO.10H.1-S | EBO.12H.1-S |  
EBO.05L.4-S | EBO.07L.1-S | EBO.10L.1-S | EBO.07P.1-S |  
EBO.10P.1-S | EBO.12P.1-S

P = Compressed air side with tubing connection V = Vacuum side with tubing connection EX = Exhaust outlet ① = White ② = Red (NC)  
③ = Black (NO) ④ = knurled screw

Item no.	Ø D1 [mm]	L1 [mm]	L2 [mm]
EBO.05H.4	4	6.6	6.6
EBO.07H.1	6	7	7
EBO.10H.1	6	7	7
EBO.12H.1	6	7	7
EBO.05L.4	4	6.6	6.6
EBO.07L.1	6	7	7
EBO.10L.1	6	7	7
EBO.07P.1	6	7	7
EBO.10P.1	6	7	7
EBO.12P.1	6	7	7
EBO.05H.4-S	4	--	--
EBO.07H.1-S	6	--	--
EBO.10H.1-S	6	--	--
EBO.12H.1-S	6	--	--
EBO.05L.4-S	4	--	--
EBO.07L.1-S	6	--	--
EBO.10L.1-S	6	--	--
EBO.07P.1-S	6	--	--
EBO.10P.1-S	6	--	--
EBO.12P.1-S	6	--	--

Continued on the next page →



### Suction power [NI/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
<b>EBO.05H.4</b>	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
<b>EBO.07H.1</b>	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
<b>EBO.10H.1</b>	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
<b>EBO.12H.1</b>	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
<b>EBO.05L.4</b>	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
<b>EBO.07L.1</b>	26	22	18.2	14	10	6.3	2.4	--	--	--
<b>EBO.10L.1</b>	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
<b>EBO.07P.1</b>	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
<b>EBO.10P.1</b>	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
<b>EBO.12P.1</b>	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
<b>EBO.05H.4-S</b>	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
<b>EBO.07H.1-S</b>	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
<b>EBO.10H.1-S</b>	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
<b>EBO.12H.1-S</b>	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
<b>EBO.05L.4-S</b>	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
<b>EBO.07L.1-S</b>	26	22	18.2	14	10	6.3	2.4	--	--	--
<b>EBO.10L.1-S</b>	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
<b>EBO.07P.1-S</b>	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
<b>EBO.10P.1-S</b>	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
<b>EBO.12P.1-S</b>	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3

Diagrams see pages 542 - 543



### Base ejectors EBA for vacuum cups

Compressed air connection via quick fittings, vacuum connection via R-threads, exchangeable silencer



Series with fixed air connection



Series with rotatable, angular air connection

☐ = Vacuum connection    ☐ = Compressed air connection    ☐ = Exhaust outlet

### Product Description

- > High suction power for short gripping time
- > Easy installation directly on the vacuum cup
- > Robust aluminium body
- > Replaceable silencer filter element for short downtimes

### Ordering notes

- > Index H: Ejectors for dense products (max. vacuum degree 93 %)
- > Index L: Ejectors for porous products, resp. in case of higher leakage (increased suction power, max. vacuum degree 68 %)
- > Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)
- > Index -W: Order code for rotatable, angular air connection

### Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [N/min]	Air consumption [N/min]	Operating temperature [°C]	Weight [g]	Suitable Silencer elements
EBA.07H.1	0.7	5	93	13	23	5 - 50	31.5	72.102
EBA.07H.2	0.7	5	93	13	23	5 - 50	31.5	72.102
EBA.10H.1	1	5	93	28	46	5 - 50	31.5	72.102
EBA.10H.2	1	5	93	28	46	5 - 50	31.5	72.102
EBA.12H.1	1.2	5	93	38	70	5 - 50	31.5	72.102
EBA.12H.2	1.2	5	93	38	70	5 - 50	31.5	72.102
EBA.15H.1	1.5	5	93	63	100	5 - 50	87	72.103
EBA.15H.2	1.5	5	93	63	100	5 - 50	88	72.103
EBA.20H.1	2	5	93	110	200	5 - 50	92.5	72.104
EBA.15L.1	1.5	5	68	95	100	5 - 50	85	72.103
EBA.15L.2	1.5	5	68	95	100	5 - 50	86	72.103
EBA.20L.1	2	5	68	180	200	5 - 50	88	72.104
EBA.07P.1	0.7	5	90	10.5	17	5 - 50	31.5	72.102
EBA.07P.2	0.7	5	90	10.5	17	5 - 50	31.5	72.102
EBA.10P.1	1	5	90	21	34	5 - 50	31.5	72.102
EBA.10P.2	1	5	90	21	34	5 - 50	31.5	72.102
EBA.12P.1	1.2	5	90	27	47	5 - 50	31.5	72.102
EBA.12P.2	1.2	5	90	27	47	5 - 50	31.5	72.102
EBA.15P.1	1.5	5	90	42	70	5 - 50	87.5	72.103
EBA.15P.2	1.5	5	90	42	70	5 - 50	88.5	72.103

Continued on the next page →



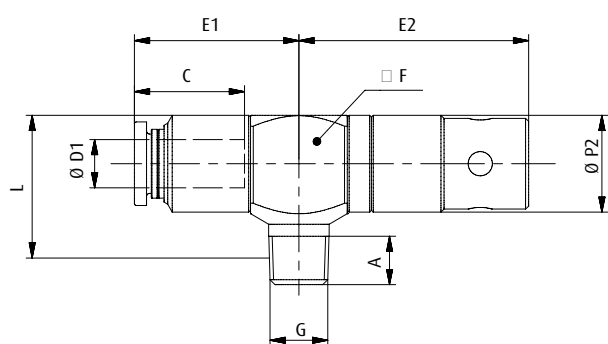
# Vacuum generation | Base ejectors

Base ejectors EBA for vacuum cups

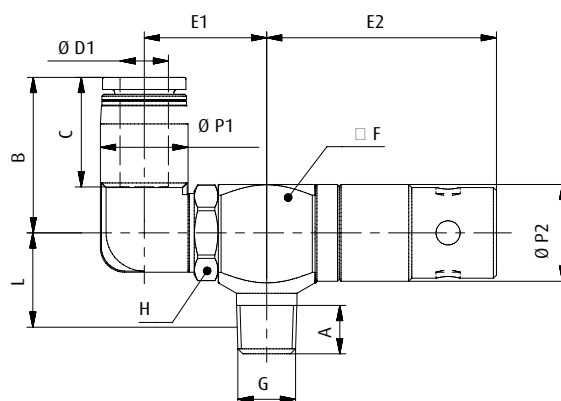
## Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable Silencer elements
EBA.20P.1	2	5	90	84	150	5 - 50	94	72.104
EBA.07H.1-W	0.7	5	93	13	23	5 - 50	31.5	72.102
EBA.07H.2-W	0.7	5	93	13	23	5 - 50	34	72.102
EBA.10H.1-W	1	5	93	28	46	5 - 50	31.5	72.102
EBA.10H.2-W	1	5	93	28	46	5 - 50	34	72.102
EBA.12H.1-W	1.2	5	93	38	70	5 - 50	31.5	72.102
EBA.12H.2-W	1.2	5	93	38	70	5 - 50	34	72.102
EBA.15H.1-W	1.5	5	93	63	100	5 - 50	85.5	72.103
EBA.15H.2-W	1.5	5	93	63	100	5 - 50	86.5	72.103
EBA.20H.1-W	2	5	93	110	200	5 - 50	95	72.104
EBA.15L.1-W	1.5	5	68	95	100	5 - 50	84	72.103
EBA.15L.2-W	1.5	5	68	95	100	5 - 50	85	72.103
EBA.20L.1-W	2	5	68	180	200	5 - 50	90.5	72.104
EBA.07P.1-W	0.7	5	90	10.5	17	5 - 50	31.5	72.102
EBA.07P.2-W	0.7	5	90	10.5	17	5 - 50	34	72.102
EBA.10P.1-W	1	5	90	21	34	5 - 50	31.5	72.102
EBA.10P.2-W	1	5	90	21	34	5 - 50	34	72.102
EBA.12P.1-W	1.2	5	90	27	47	5 - 50	31.5	72.102
EBA.12P.2-W	1.2	5	90	27	47	5 - 50	34	72.102
EBA.15P.1-W	1.5	5	90	42	70	5 - 50	86.5	72.103
EBA.15P.2-W	1.5	5	90	42	70	5 - 50	87.5	72.103
EBA.20P.1-W	2	5	90	84	150	5 - 50	96.5	72.104

## Dimensions



EBA.07H.1 - EBA20P.1



EBA.07H.1-W - EBA20P.1-W





Item no.	G	Ø D1 [mm]	A [mm]	B [mm]	C [mm]	E1 [mm]	E2 [mm]	□ F [mm]	H [mm]	L [mm]	Ø P1 [mm]	Ø P2 [mm]
EBA.07H.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.07H.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.10H.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.10H.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.12H.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.12H.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.15H.1	R1/4	8	11	--	18	29.5	75	22	--	21	--	24
EBA.15H.2	R3/8	8	12	--	18	29.5	75	22	--	20.5	--	24
EBA.20H.1	R1/4	10	11	--	20	31	75	22	--	21	--	24
EBA.15L.1	R1/4	8	11	--	18	29.5	75	22	--	21	--	24
EBA.15L.2	R3/8	8	12	--	18	29.5	75	22	--	20.5	--	24
EBA.20L.1	R1/4	10	11	--	20	31	75	22	--	21	--	24
EBA.07P.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.07P.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.10P.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.10P.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.12P.1	R1/8	6	8	--	17	24.5	38	16	--	16	--	16
EBA.12P.2	R1/8	8	8	--	18.5	28	38	16	--	16	--	16
EBA.15P.1	R1/4	8	11	--	18	29.5	75	22	--	21	--	24
EBA.15P.2	R3/8	8	12	--	18	29.5	75	22	--	20.5	--	24
EBA.20P.1	R1/4	10	11	--	20	31	75	22	--	21	--	24
EBA.07H.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.07H.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.10H.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.10H.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.12H.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.12H.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.15H.1-W	R1/4	8	11	26	18.5	23	75	22	19	21	14.5	24
EBA.15H.2-W	R3/8	8	12	26	18.5	23	75	22	19	20.5	14.5	24
EBA.20H.1-W	R1/4	10	11	30	21	25.5	75	22	19	21	17.5	24
EBA.15L.1-W	R1/4	8	11	26	18.5	23	75	22	19	21	14.5	24
EBA.15L.2-W	R3/8	8	12	26	18.5	23	75	22	19	20.5	14.5	24
EBA.20L.1-W	R1/4	10	11	30	21	25.5	75	22	19	21	17.5	24
EBA.07P.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.07P.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.10P.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.10P.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.12P.1-W	R1/8	6	8	23	17	19	38	16	14	16	12.5	16
EBA.12P.2-W	R1/8	8	8	24	18.5	20	38	16	14	16	14.5	16
EBA.15P.1-W	R1/4	8	11	26	18.5	23	75	22	19	21	14.5	24
EBA.15P.2-W	R3/8	8	12	26	18.5	23	75	22	19	20.5	14.5	24
EBA.20P.1-W	R1/4	10	11	30	21	25.5	75	22	19	21	17.5	24

Continued on the next page →



# Vacuum generation | Base ejectors

Base ejectors EBA for vacuum cups

## Suction power [NI/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
EBA.07H.1	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.07H.2	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.10H.1	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.10H.2	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.12H.1	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.12H.2	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.15H.1	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.15H.2	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.20H.1	110	98.1	86.3	74.5	62.7	50.8	39	27.2	15.3	3.5
EBA.15L.1	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.15L.2	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.20L.1	180	153.1	126.3	99.4	72.5	45.6	18.8	--	--	--
EBA.07P.1	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.07P.2	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.10P.1	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.10P.2	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.12P.1	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.12P.2	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.15P.1	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.15P.2	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.20P.1	84	74.7	65.5	56.3	47	37.8	28.6	19.4	10.1	0.9
EBA.07H.1-W	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.07H.2-W	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.10H.1-W	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.10H.2-W	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.12H.1-W	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.12H.2-W	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.15H.1-W	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.15H.2-W	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.20H.1-W	110	98.1	86.3	74.5	62.7	50.8	39	27.2	15.3	3.5
EBA.15L.1-W	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.15L.2-W	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.20L.1-W	180	153.1	126.3	99.4	72.5	45.6	18.8	--	--	--
EBA.07P.1-W	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.07P.2-W	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.10P.1-W	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.10P.2-W	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.12P.1-W	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.12P.2-W	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.15P.1-W	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.15P.2-W	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.20P.1-W	84	74.7	65.5	56.3	47	37.8	28.6	19.4	10.1	0.9

Diagrams see pages 542 - 543



### Base ejectors EBA for solenoid valves

Compressed air connection via R-threads, vacuum connection via quick fittings



Series with exhaust outlet via silencer



Series with exhaust outlet via quick fitting

☑ = Vacuum connection   ☐ = Compressed air connection   ☒ = Exhaust outlet

### Product Description

- > Suitable for direct fitting to solenoid valves
- > High suction power for short gripping times
- > Flexible installation thanks to rotatable, angled vacuum connection
- > Replaceable silencer for fast servicing and short downtimes
- > Avoidance of product contamination with exhaust outlet through quick fitting (index MV-I)

### Ordering notes

- > Index H: Ejectors for dense products (max. vacuum degree 93 %)
- > Index L: Ejectors for porous products, resp. in case of higher leakage (increased suction power, max. vacuum degree 68 %)
- > Index P: Ejectors designed for lower feed pressure (max. vacuum degree 90 %)
- > Index MV-I: Order code with exhaust outlet via quick fitting: Example: EBA.10H.1-MV-I

### Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable silencer elements
EBA.05H.1-MV	0.5	5	90	7	11.5	0 - 60	13	SEE0802
EBA.05H.2-MV	0.5	5	90	7	11.5	0 - 60	36.5	SE01
EBA.07H.1-MV	0.7	5	93	13	23	0 - 60	37	SE01
EBA.10H.1-MV	1	5	93	28	46	0 - 60	36.5	SE01
EBA.10H.2-MV	1	5	93	28	46	0 - 60	38	SE01
EBA.12H.1-MV	1.2	5	93	38	70	0 - 60	36.5	SE01
EBA.12H.2-MV	1.2	5	93	38	70	0 - 60	37.5	SE01
EBA.15H.1-MV	1.5	5	93	63	100	0 - 60	77	SE02
EBA.05L.1-MV	0.5	5	65	12	11.5	0 - 60	13	SEE0802
EBA.05L.2-MV	0.5	5	65	11	11.5	0 - 60	36.5	SE01
EBA.07L.1-MV	0.7	5	68	26	23	0 - 60	37	SE01
EBA.07L.2-MV	0.7	5	68	26	23	0 - 60	38.5	SE01
EBA.10L.1-MV	1	5	68	42	46	0 - 60	36	SE01
EBA.10L.2-MV	1	5	68	42	46	0 - 60	37.5	SE01
EBA.15L.1-MV	1.5	5	68	95	100	0 - 60	75	SE02
EBA.07P.1-MV	0.7	3.5	90	10.5	17	0 - 60	36.5	SE01
EBA.10P.1-MV	1	3.5	90	21	34	0 - 60	37	SE01
EBA.10P.2-MV	1	3.5	90	21	34	0 - 60	38.5	SE01

Continued on the next page →



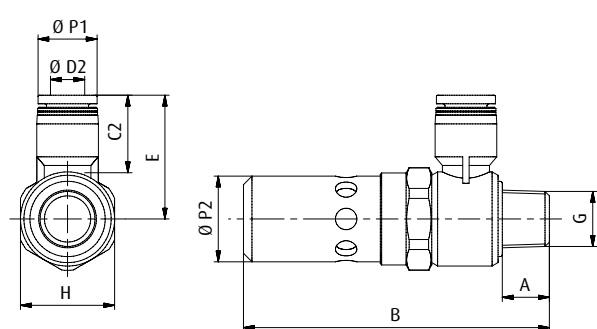
# Vacuum generation | Base ejectors

Base ejectors EBA for solenoid valves

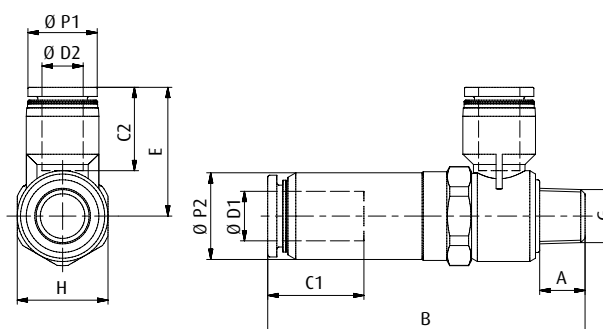
## Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Suitable Silencer elements
EBA.12P.1-MV	1.2	3.5	90	27	47	0 - 60	36.5	SE01
EBA.12P.2-MV	1.2	3.5	90	27	47	0 - 60	38	SE01
EBA.15P.1-MV	1.5	3.5	90	37	74	0 - 60	78	SE02
EBA.05H.1-MV-I	0.5	5	90	7	11.5	0 - 60	18	--
EBA.05H.2-MV-I	0.5	5	90	7	11.5	0 - 60	44.5	--
EBA.07H.1-MV-I	0.7	5	90	13	23	0 - 60	45.5	--
EBA.10H.1-MV-I	1	5	93	28	46	0 - 60	44.5	--
EBA.10H.2-MV-I	1	5	93	28	46	0 - 60	45.5	--
EBA.12H.1-MV-I	1.2	5	93	38	70	0 - 60	44	--
EBA.12H.2-MV-I	1.2	5	93	38	70	0 - 60	46	--
EBA.15H.1-MV-I	1.5	5	93	63	100	0 - 60	92	--
EBA.05L.1-MV-I	0.5	5	65	12	11.5	0 - 60	18	--
EBA.05L.2-MV-I	0.5	5	65	11	11.5	0 - 60	44.5	--
EBA.07L.1-MV-I	0.7	5	68	26	23	0 - 60	45	--
EBA.07L.2-MV-I	0.7	5	68	26	23	0 - 60	46	--
EBA.10L.1-MV-I	1	5	68	42	46	0 - 60	44	--
EBA.10L.2-MV-I	1	5	68	42	46	0 - 60	45	--
EBA.15L.1-MV-I	1.5	5	68	95	100	0 - 60	89.4	--
EBA.07P.1-MV-I	0.7	3.5	90	10.5	17	0 - 60	45	--
EBA.10P.1-MV-I	1	3.5	90	23	34	0 - 60	44.5	--
EBA.10P.2-MV-I	1	3.5	90	23	34	0 - 60	46.5	--
EBA.12P.1-MV-I	1.2	3.5	90	27	47	0 - 60	44.5	--
EBA.12P.2-MV-I	1.2	3.5	90	27	47	0 - 60	45.5	--
EBA.15P.1-MV-I	1.5	3.5	90	37	74	0 - 60	92	--

## Dimensions



EBA.05H.1-MV - EBA15P.1-MV



EBA.05H.1-MV-I - EBA15P.1-MV-I



Item no.	G	Ø D1 [mm]	Ø D2 [mm]	A [mm]	B [mm]	C2 [mm]	C1 [mm]	E [mm]	H [mm]	Ø P1 [mm]	Ø P2 [mm]
EBA.05H.1-MV	M5	--	4	4	35	15	--	21.5	8	10	9.5
EBA.05H.2-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.07H.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.10H.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.10H.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.12H.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.12H.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.15H.1-MV	R1/4	--	8	11	72	17.5	--	28	22	14.5	20
EBA.05L.1-MV	M5	--	4	4	35	15	--	21.5	8	10	9.5
EBA.05L.2-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.07L.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.07L.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.10L.1-MV	R1/8	--	--	8	48	--	--	25	17	12.5	16
EBA.10L.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.15L.1-MV	R1/4	--	8	11	72	17.5	--	28	22	14.5	20
EBA.07P.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.10P.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.10P.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.12P.1-MV	R1/8	--	6	8	48	16.5	--	25	17	12.5	16
EBA.12P.2-MV	R1/8	--	8	8	48	17.5	--	28	17	15	16
EBA.15P.1-MV	R1/4	--	8	11	72	17.5	--	28	22	14.5	20
EBA.05H.1-MV-I	M5	6	4	4	35	15	12.5	21.5	8	9.5	10
EBA.05H.2-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.07H.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10H.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10H.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28	17	16	15
EBA.12H.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.12H.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28.5	17	16	15
EBA.15H.1-MV-I	R1/4	12	8	11	77	17.5	21.5	28.5	22	20	14.5
EBA.05L.1-MV-I	M5	6	4	4	35	15	12.5	21.5	8	9.5	10
EBA.05L.2-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.07L.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.07L.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28	17	16	15
EBA.10L.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10L.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28.5	17	16	15
EBA.15L.1-MV-I	R1/4	12	8	11	77	17.5	21.5	28.5	22	20	14.5
EBA.07P.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10P.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.10P.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28	17	16	15
EBA.12P.1-MV-I	R1/8	8	6	8	58	16.5	17.5	25	17	16	12.5
EBA.12P.2-MV-I	R1/8	8	8	8	58	17.5	17.5	28.5	17	16	15
EBA.15P.1-MV-I	R1/4	12	8	11	77	17.5	21.5	28.5	22	20	14.5

Continued on the next page →



### Suction power [NI/min] at vacuum level

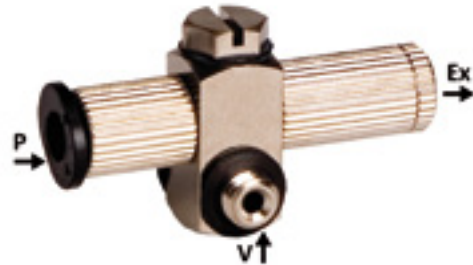
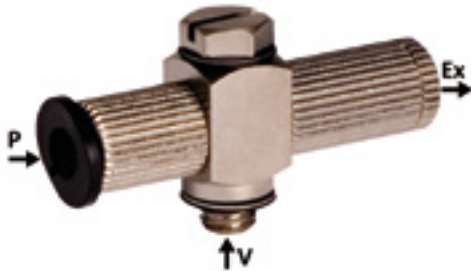
Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
EBA.05H.1-MV	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBA.05H.2-MV	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBA.07H.1-MV	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.10H.1-MV	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.10H.2-MV	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.12H.1-MV	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.12H.2-MV	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.15H.1-MV	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.05L.1-MV	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBA.05L.2-MV	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBA.07L.1-MV	26	22	18.2	14	10	6.3	2.4	--	--	--
EBA.07L.2-MV	26	22	18.2	14	10	6.3	2.4	--	--	--
EBA.10L.1-MV	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBA.10L.2-MV	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBA.15L.1-MV	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.07P.1-MV	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.10P.1-MV	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.10P.2-MV	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.12P.1-MV	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.12P.2-MV	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.15P.1-MV	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4
EBA.05H.1-MV-I	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBA.05H.2-MV-I	7	6.2	5.4	4.6	3.8	3	2.2	1.5	0.7	--
EBA.07H.1-MV-I	13	11.6	10.1	8.8	7.5	5.9	4.2	3	1.6	0.4
EBA.10H.1-MV-I	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.10H.2-MV-I	28	25	22	18.9	15.9	12.9	9.9	6.9	3.9	0.9
EBA.12H.1-MV-I	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.12H.2-MV-I	38	33.9	29.8	25.7	21.6	17.5	13.4	9.3	5.3	1.2
EBA.15H.1-MV-I	63	56.2	49.4	42.6	35.9	29.1	22.3	15.6	8.8	2
EBA.05L.1-MV-I	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBA.05L.2-MV-I	12	10.8	9	7.5	5.5	4	2.5	0.8	--	--
EBA.07L.1-MV-I	26	22	18.2	14	10	6.3	2.4	--	--	--
EBA.07L.2-MV-I	26	22	18.2	14	10	6.3	2.4	--	--	--
EBA.10L.1-MV-I	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBA.10L.2-MV-I	42	35.6	29.3	22.9	16.5	10.2	3.8	--	--	--
EBA.15L.1-MV-I	95	80.6	66.2	51.8	37.4	23	8.6	--	--	--
EBA.07P.1-MV-I	10.5	9.3	8.1	7	5.8	4.6	3.5	2.2	1.1	--
EBA.10P.1-MV-I	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.10P.2-MV-I	21	18.7	16.4	14	11.8	9.5	7.1	4.8	2.5	0.2
EBA.12P.1-MV-I	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.12P.2-MV-I	27	24	21	18.1	15.1	12	9.2	6.2	3.3	0.3
EBA.15P.1-MV-I	37	32.9	28.8	24.8	20.7	16.6	12.6	8.5	4.5	0.4

Diagrams see pages 542 - 543



## Base ejectors EBM - miniature size

Compressed air connection via quick fittings, vacuum connection via M-threads, exchangeable silencer element



Series with fixed tubing connection

$\nabla$  = Vacuum connection  $\text{P}$  = Compressed air connection  $\text{Ex}$  = Exhaust outlet

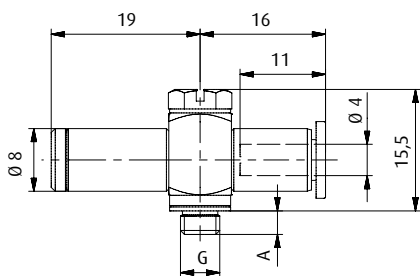
### Product Description

- > High suction power for fast evacuation and short gripping time
- > Easy installation directly on the vacuum cup
- > Small dimensions for installation where space is limited
- > Robust design with nickel-plated brass body
- > Miniature silencer that can be dismantled for fast servicing and short downtimes

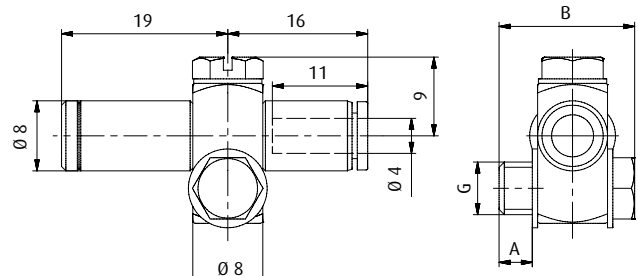
### Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Final vacuum [%]	Suction power [NI/min]	Air consumption at 5 bar [NI/min]	Operating temperature [°C]	Weight [g]	Suitable spare silencer element
<b>EBM.05H.5</b>	0.5	5	90	7	11.5	0 - 60	14.5	EBA.05-S
<b>EBM.05H.6</b>	0.5	5	90	7	11.5	0 - 60	14.5	EBA.05-S
<b>EBM.05H.5-W</b>	0.5	5	90	7	11.5	0 - 60	17	EBA.05-S
<b>EBM.05H.6-W</b>	0.5	5	90	7	11.5	0 - 60	17.5	EBA.05-S

### Dimensions



**EBM.05H.5 | EBM.05H.6**



**EBM.05H.5-W | EBM.05H.6-W**

Item no.	G	A [mm]	B [mm]
<b>EBM.05H.5</b>	M5	3.5	--
<b>EBM.05H.6</b>	M6	4	--
<b>EBM.05H.5-W</b>	M5	4	14.5
<b>EBM.05H.6-W</b>	M6	6	15.5

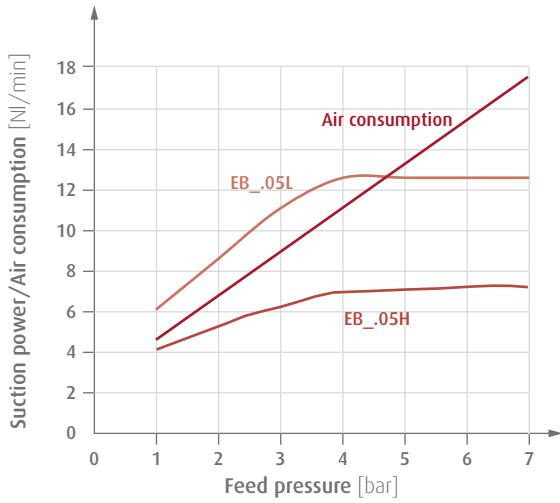
### Suction power [NI/min] at vacuum level

Item no.	0 %	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %
<b>EBM.05H.5</b>	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7
<b>EBM.05H.6</b>	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7
<b>EBM.05H.5-W</b>	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7
<b>EBM.05H.6-W</b>	7	6.2	5.4	4.6	3.8	3.1	2.3	1.5	0.7

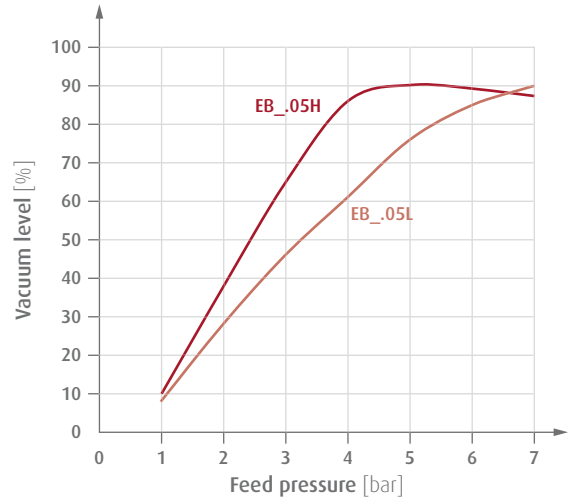
Diagrams see pages 542 - 543

**Diagrams**

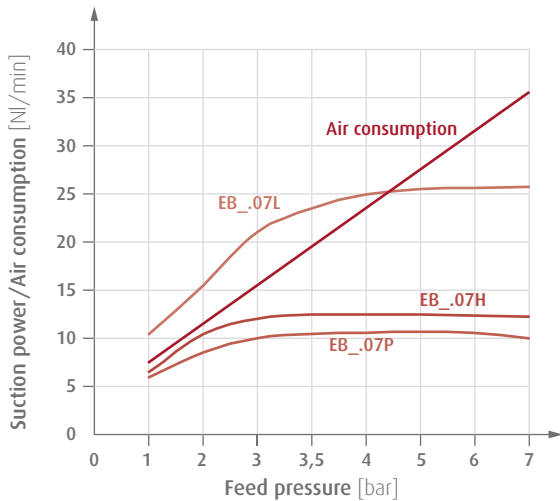
> Suction power and air consumption against feed pressure



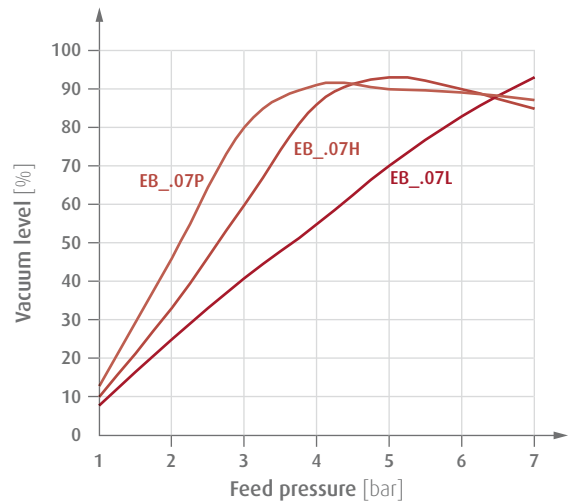
> Vacuum level against feed pressure



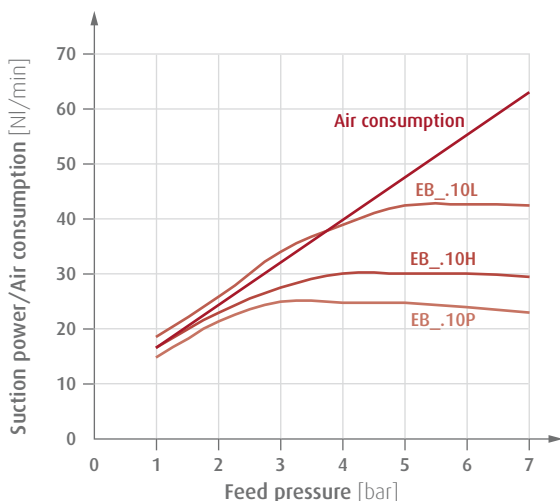
> Suction power and air consumption against feed pressure



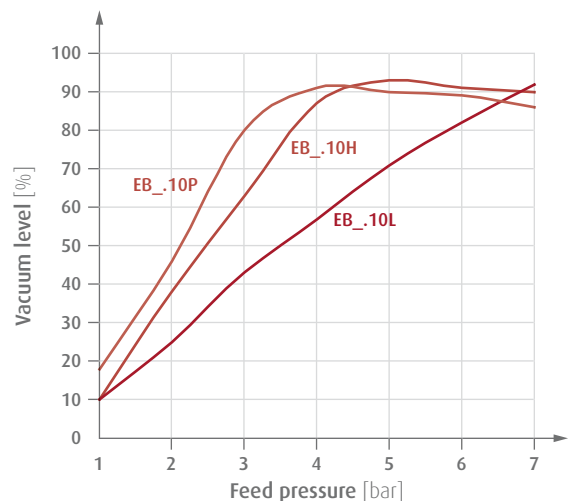
> Vacuum level against feed pressure



> Suction power and air consumption against feed pressure



> Vacuum level against feed pressure

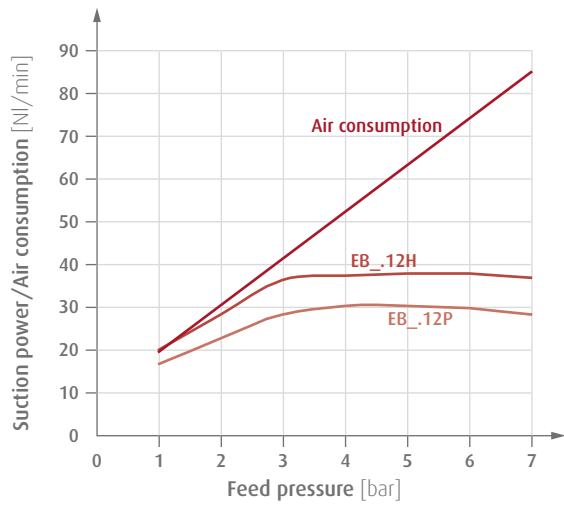




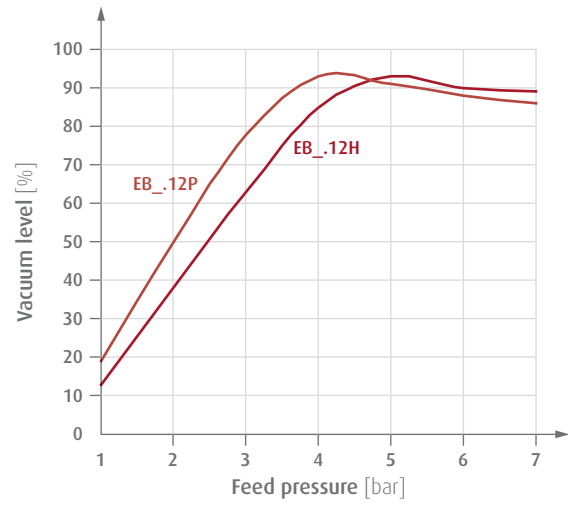


## Diagrams

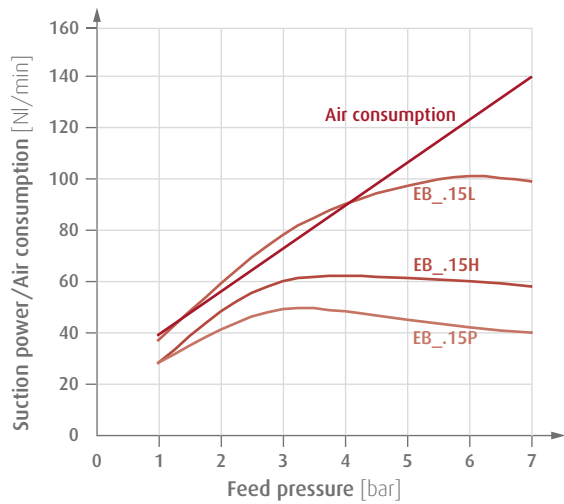
> Suction power and air consumption against feed pressure



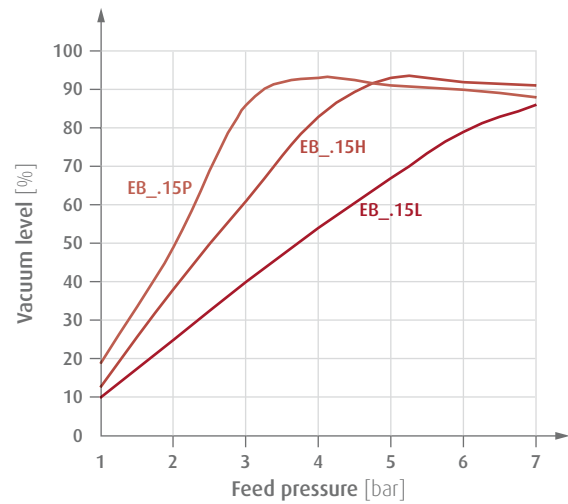
> Vacuum level against feed pressure



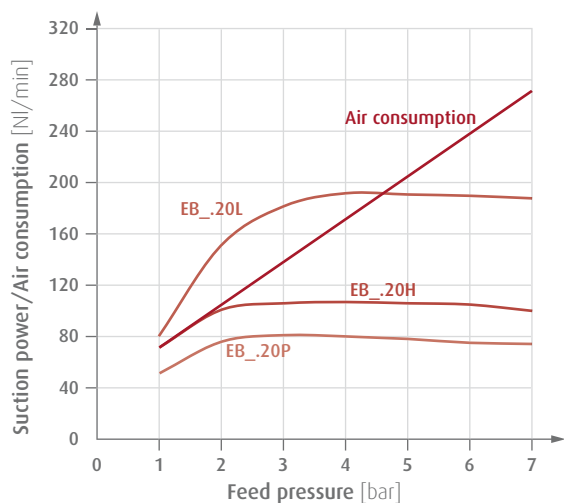
> Suction power and air consumption against feed pressure



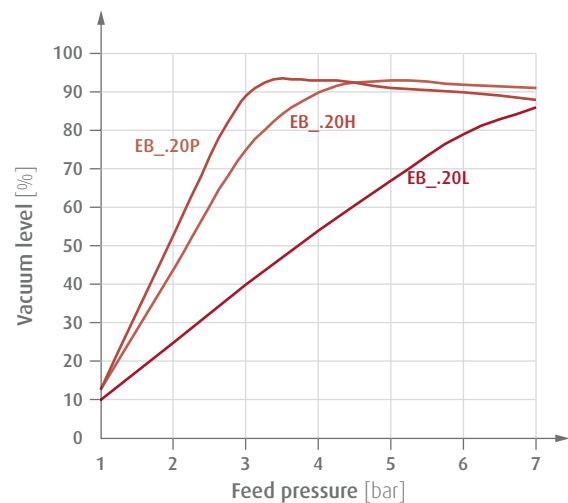
> Vacuum level against feed pressure



> Suction power and air consumption against feed pressure



> Vacuum level against feed pressure





### Heavy-duty ejectors

Vacuum generation under harsh conditions of use



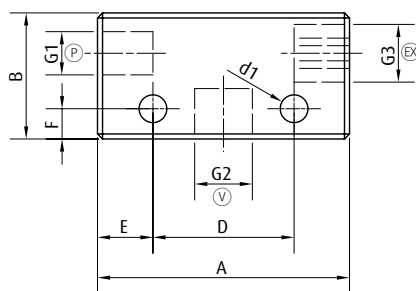
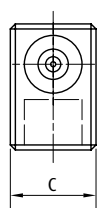
#### Product Description

- > Robust and compact aluminium housing
- > Compensation of compressed air fluctuations between 3 and 6 bar
- > Additional inlet for blow-off for fast product release or vacuum switch connection for process monitoring (65.111, 65.130)
- > Rectangular design enables block assembly in centralised or decentralised vacuum systems

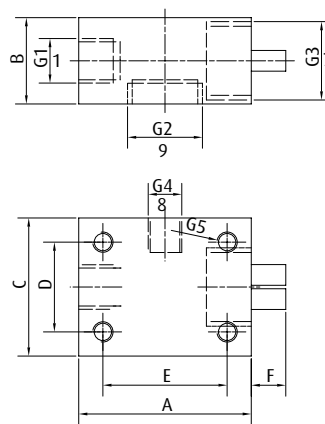
#### Technical data

Item no.	Optimal feed pressure [bar]	Max. feed pressure [bar]	Final vacuum [%]	Suction power [Nl/min]	Air consumption to 4 bar [Nl/min]	Evacuation time 0 to 70 % [s/l]	Weight [g]	Suitable accessories
65.102A	4	6	85	30	50	3.5	48	Silencer 72.001 (p.578) Silencer 72.029 (p.577)
65.111	4	6	85	33	60	3	120	Silencer 72.002 (p.578) Silencer 72.030 (p.577)
65.120	4	6	85	85	130	1.5	125	Silencer 72.031 (p.577)
65.130	4	6	85	130	240	0.7	225	--

#### Dimensions



65.102A



65.111 | 65.120 | 65.130

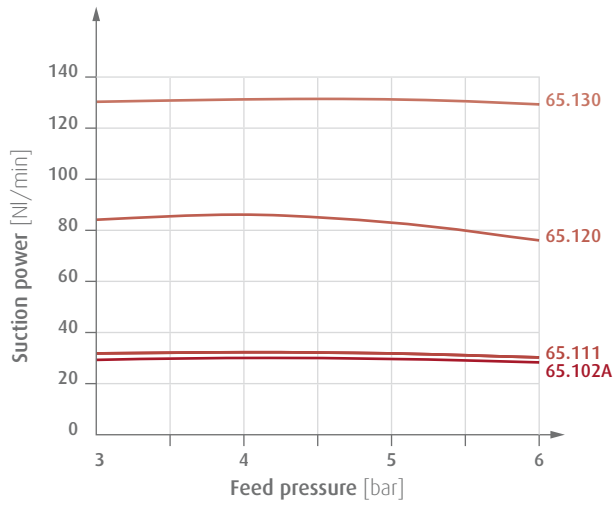
Ⓟ = Compressed air connection   Ⓥ = Vacuum connection   Ⓧ = Exhaust   Ⓞ = Blow-off (65.111 and 65.130)

Item no.	G1	G2	G3	G4	G5	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]
65.102A	G1/8	G1/4	G1/4	--	--	50	25	17	28	5.5	11	6
65.111	G1/4	G1/2	G3/8	G1/8	6.5	50	25	40	25	--	34	8
65.120	G1/4	G1/2	G1/2	G1/8	M6	50	25	40	25	--	34	10
65.130	G1/4	G1/2	G1	G1/8	M6	60	40	40	25	--	34	--

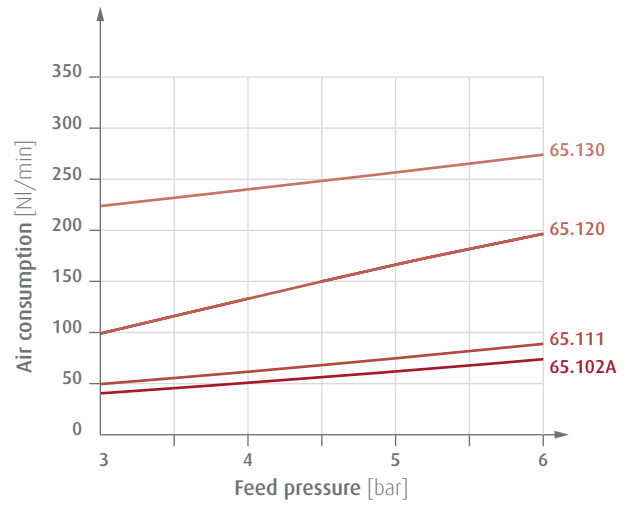


### Diagrams

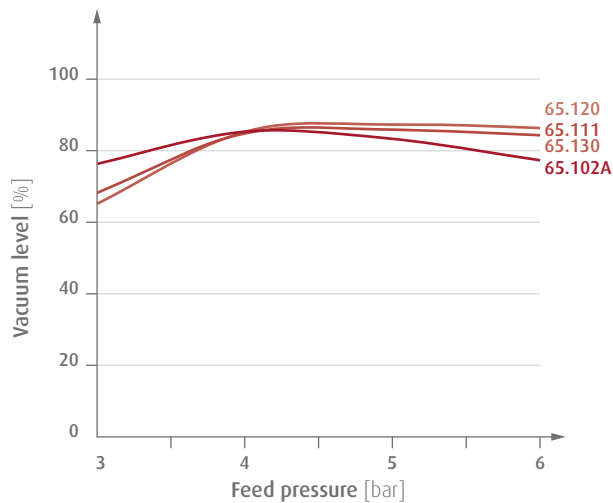
> Suction power against feed pressure



> Air consumption against feed pressure



> Vacuum level against feed pressure



Suction power [NI/min] at vacuum level

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %
65.102A	25	23	19	15	13	8	4	1
65.111	25	23	20	17	13	8	4	1
65.120	76	66	55	41	34	22	12	3
65.130	182	160	135	69	52	33	17	6



## FIPA Multi-chamber ejectors



- > High suction power with low air consumption for handling porous workpieces
- > Multi-stage nozzle system for short evacuation times in the lower vacuum range



### Multi-chamber ejectors 65.310 - 65.330

- > Robust aluminium construction
- > Very compact design for space-saving installation in handling systems
- > Low weight allows for high handling dynamics

> See page 548



### Multi-chamber ejectors 65.410

- > Robust aluminium construction
- > Particularly fast product release due to additional compressed air inlet for blow-off

> See page 548



### Multi-chamber ejectors 65.340 - 65.390

- > Robust aluminium construction
- > Compensation of fluctuations in compressed air supply
- > Compressed air inlet for blow-off enables fast release of the workpiece (65.410)
- > Optional air-saving function when handling dense products

> See page 550



## FIPA Multi-chamber ejectors

### Examples of use

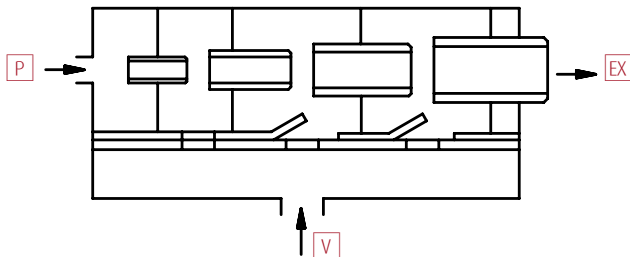
- > Handling porous materials (cardboard, wood fiber boards, insulation materials, etc.)
- > Handling dense workpieces at moderate cycle times (single-stage ejectors such as basic or compact ejectors are generally preferable for short cycle times in the handling of heavy products, as these more quickly achieve high vacuum levels)

### Multi-chamber ejectors with air-saving function (65.340-LSE - 65.390-LSE)

- > Handling of products with different air permeabilities (activation of the air-saving function for heavy products)
- > Switch-off of vacuum generation while assuming a “waiting position” in the event of a delay in downstream processes
- > Saving compressed air when using multi-chamber ejectors for the supply of vacuum tanks

### Functional principle

Prior to discharge into the atmosphere, the compressed air flows through a series of several connected nozzle chambers. In this way the kinetic energy of the supplied compressed air generates a partial vacuum in each of the chambers. These ejectors set themselves apart from single-stage ejectors such as basic or compact ejectors thanks to their lower consumption of compressed air despite the same suction power.





### Multi-chamber ejectors



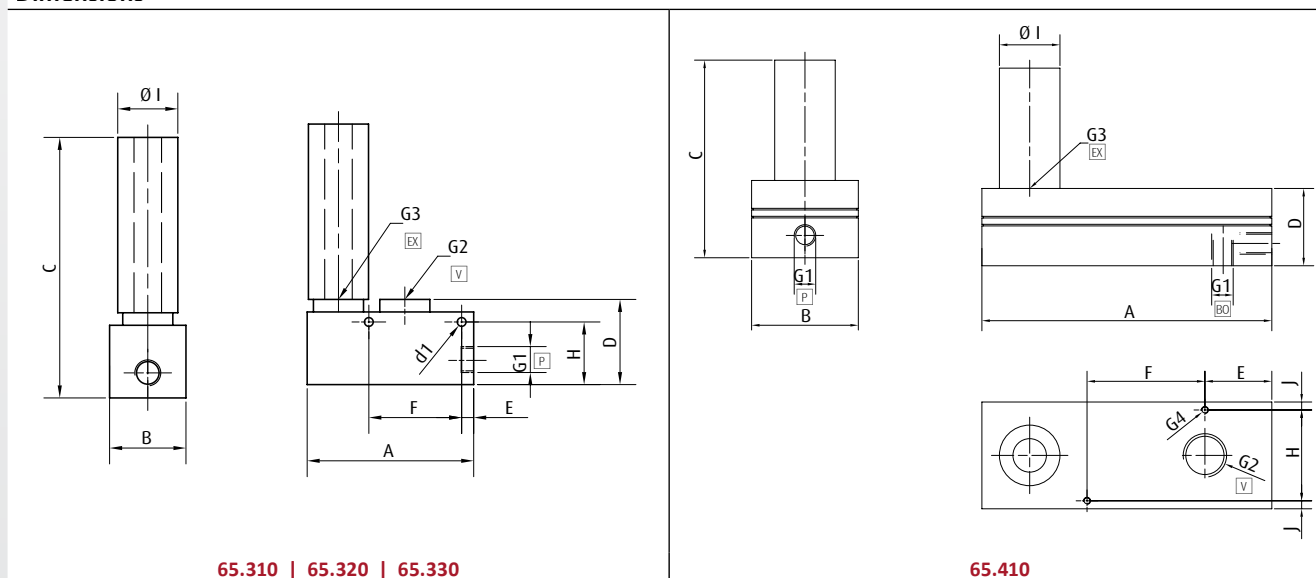
#### Product Description

- > Handling of air-permeable products, or for high leakages
- > High suction power for short evacuation times and fast vacuum build-up
- > Low space requirements due to small construction size (65.310 - 65.330)
- > Particularly fast product release due to additional compressed air inlet for blow-off (65.410)
- > Noise-optimised operation due to open silencer
- > Industry examples: packaging and printing

#### Technical data

Item no.	Optimal feed pressure [bar]	Max. feed pressure [bar]	Final vacuum [%]	Suction power [NI/min]	Air consumption at 6 bar [NI/min]	Evacuation time 0 to 70 % [s/l]	Weight [g]
65.310	6	7	85	120	56	1.95	111
65.320	6	7	85	180	108	1.07	111
65.330	6	7	85	250	144	0.5	169
65.410	6	7	85	320	95	1.15	1,006

#### Dimensions



65.310 | 65.320 | 65.330

65.410

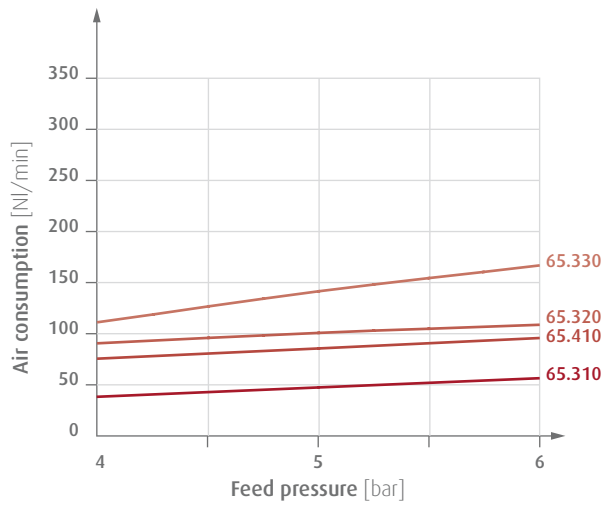
[P] = Compressed air connection [V] = Vacuum connection [EX] = Exhaust [BO] = Compressed air connection for blow-off

Item no.	G1	G2	G3	G4	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]	H [mm]	Ø I [mm]	J [mm]
65.310	G1/8	G3/8	G3/8	--	67	31	104	34	3.7	9.6	32.5	24	24	--
65.320	G1/8	G1/8	G3/8	--	67	31	104	34	3.7	9.6	32.5	24	24	--
65.330	G1/8	G1/2	G3/8	--	67	45	114	44	3.7	10.5	46.5	13.3	24	--
65.410	G1/4	G1/2	G1/2	M4	182	67	124.5	49	--	41.5	74	57	38	5

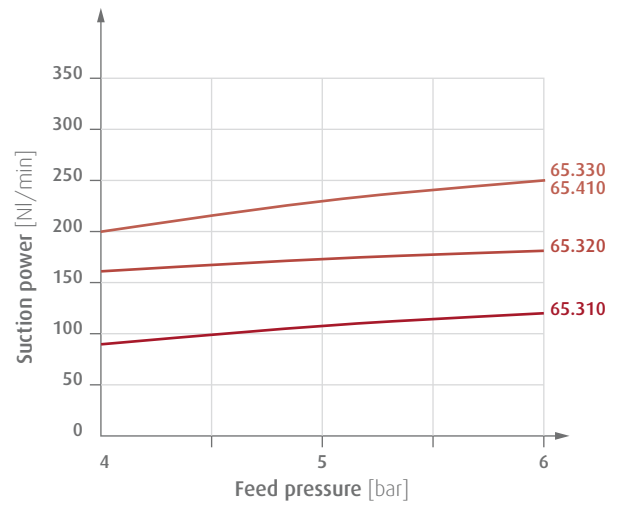


### Diagrams

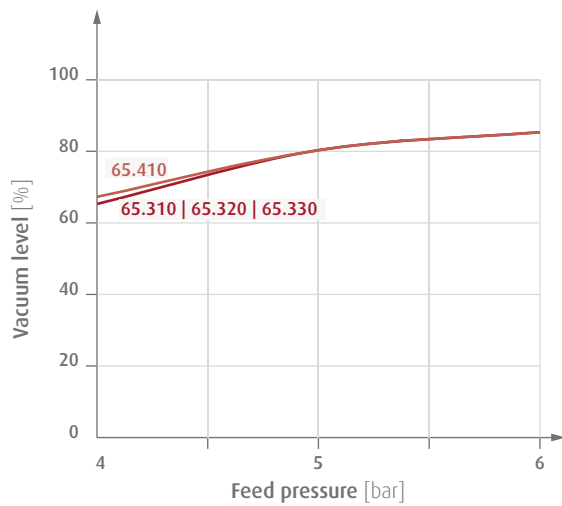
> Air consumption against feed pressure



> Suction power against feed pressure



> Vacuum level against feed pressure



### Suction power [NI/min] at vacuum level

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %
65.310	89	62	38	22	18	10	5	--
65.320	130	81	52	30	22	14	8	--
65.330	178	116	91	63	44	15	6	--
65.410	175	118	58	42	33	23	16	10



### Multi-chamber ejectors

High suction power for fast vacuum build up with porous workpieces



Application example: Multi-chamber ejector with vacuum gauge 91.001 (mounting on front or rear side)



Application example: Multi-chamber ejector 65.340-LSE with air saving function

### Product Description

- > High vacuum level at low feed pressures, and thus particularly efficient use of compressed air as well as suitability for fluctuating air pressure levels
- > Handling of porous products, or for high leakages
- > High suction power for short evacuation times in the lower vacuum range
- > Noise-optimised operation due to open silencer
- > Industry examples: packaging and printing

#### Air saving function (Index LSE)

- > Saving compressed air during handling of dense workpieces
- > Examples of use:  
Automatic switching off of vacuum generation during pick-and-place applications of dense workpieces if e.g. downstream processes are delayed. Saving compressed air when using the multi-chamber ejectors for feeding vacuum tanks.

### Notes

#### Construction / operation (Index -LSE):

- > Combination of pneumatic control valve with spring return and normally closed (NC) pneumatic vacuum switch
- > Setting target vacuum values by means of setting screw
- > Compressed air is conveyed through the valve to the compressed-air inlet of the injector; there is a partial airflow at input 1 of the vacuum switch
- > When set target vacuum is reached, vacuum switch opens, compressed air from input 1 is conducted to the control valve via output 2 and closes it - the vacuum generation is stopped
- > If the vacuum level has reached the hysteresis value (see table), the vacuum switch closes again and the spring opens the control valve - vacuum generation is activated again
- > Please note: The air saving function does not work with porous products, or in the case of high leakage

### Ordering notes

- > Seals optionally available in NBR as standard
- > Optionally available in EPDM or Viton upon request
- > Included in scope of delivery: two mounting brackets and G1/4"-AG - Ø 10 mm quick fitting for compressed air connection

### Technical data

Item no.	65.340	65.350	65.360	65.370	65.380	65.390
Optimal feed pressure [bar]	3.4	3.4	3.4	3.4	3.4	3.4
Max. feed pressure [bar]	7	7	7	7	7	7
Final vacuum at 3.4 bar [%]	92	92	92	92	92	92
Final vacuum at 6 bar [%]	89	89	89	89	89	89
Suction power at 3.4 bar [NI/min]	360	600	760	850	1,150	1,200
Suction power at 6 bar [NI/min]	420	700	950	1,010	1,400	1,500
Air consumption at 3.4 bar [NI/min]	116	230	365	445	545	655
Air consumption at 6 bar [NI/min]	185	370	610	720	780	810
Evacuation time 1 liter from 0 to 70 % at 3.4 bar [s]	0.95	0.5	0.46	0.27	0.2	0.23





### Technical data

Item no.	65.340	65.350	65.360	65.370	65.380	65.390
Evacuation time 0 to 70 % at 6 bar [s]	0.62	0.35	0.31	0.19	0.19	0.2
Vacuum switch hysteresis at LSE [mbar]	120	120	120	120	120	120
Noise level with silencer [dB]	60 - 65	60 - 65	60 - 65	60 - 65	60 - 65	60 - 65
Usage temperature [°C]	-20 - 80	-20 - 80	-20 - 80	-20 - 80	-20 - 80	-20 - 80
Weight incl. silencer [g]	690	690	880	880	1,160	1,160
Suitable accessories	Vacuum gauge 91.001 (p.696) Vacuum switch 20.021 (p.691) Double nipple 270.138 (p.751) Double nipple 270.148 (p.751)					

### When ordering please specify

#### Air saving function

Item no.	Design
65.340	without air saving function
65.340 -LSE	with air saving function

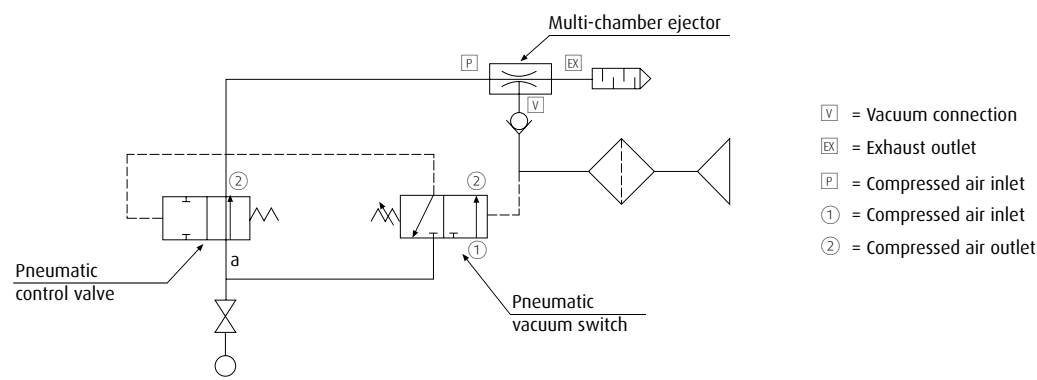
**Already built in for 65.340-LSE to 65.390-LSE.**

If the LSE is integrated in already delivered structurally identical ejectors without an air saving function, a non-return valve, item no. 32.662, is necessary at the compressed air input. For conversion of existing ejectors please consult the FIPA technical sales department.

**For 65-380-LSE and 65.390-LSE:**

It is recommended particular to consult FIPA technical sales department as to whether an air saving function is useful in the application.

### Wiring diagram air saving function LSE



Continued on the next page →



### Suction power [NI/min] at vacuum level (feed pressure 3.4 bar)

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
65.340	180	115	80	43	30	22.5	15.5	7.5	1.2
65.350	320	250	135	75	60	46	30	13	1.5
65.360	445	340	175	110	85	70	43	20	1.8
65.370	550	430	280	145	115	85	60	28	2.2
65.380	760	530	350	180	148	115	78	34.5	3.5
65.390	830	550	360	215	170	130	90	36	5

### Suction power [NI/min] at vacuum level (feed pressure 6 bar)

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
65.340	240	125	100	82	65	38	12.5	3.5	--
65.350	510	290	195	160	115	70	22	8	--
65.360	710	380	285	230	170	100	32	11	--
65.370	800	460	385	310	215	125	42	15.5	--
65.380	1120	560	490	355	260	150	50	25	--
65.390	1110	630	560	385	315	210	65	26	--

### Evacuation time [s/l] at vacuum level (operating pressure 3.4 bar)

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
65.340	0.022	0.06	0.11	0.21	0.4	0.65	0.95	1.6	4
65.350	0.014	0.031	0.06	0.1	0.2	0.34	0.5	0.8	2.5
65.360	0.012	0.029	0.058	0.095	0.18	0.31	0.46	0.89	1.5
65.370	0.01	0.025	0.043	0.075	0.11	0.19	0.27	0.45	1.2
65.380	0.006	0.015	0.029	0.052	0.085	0.145	0.202	0.33	1
65.390	0.005	0.013	0.027	0.045	0.07	0.105	0.23	0.46	0.9

### Evacuation time [s/l] at vacuum level (operating pressure 6 bar)

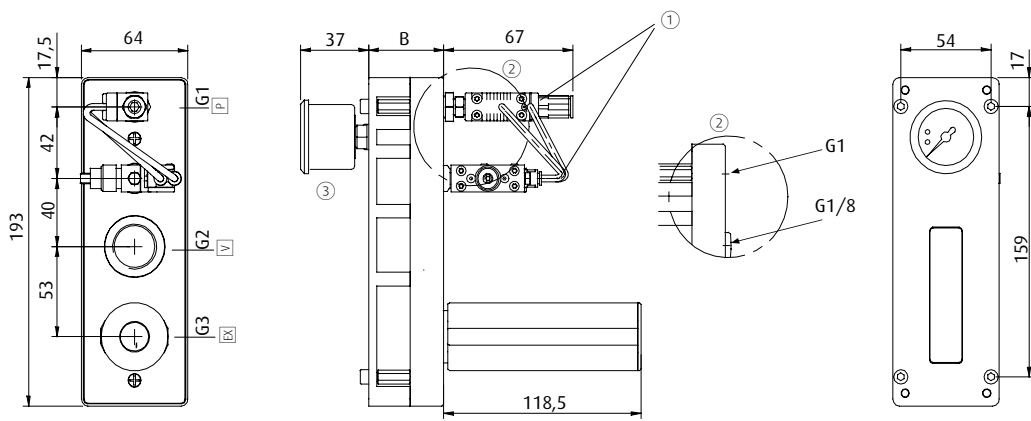
Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	90 %
65.340	0.018	0.05	0.08	0.18	0.25	0.4	0.62	1.55	--
65.350	0.01	0.022	0.048	0.08	0.11	0.2	0.35	0.78	--
65.360	0.009	0.019	0.045	0.075	0.13	0.18	0.31	0.7	--
65.370	0.007	0.018	0.038	0.055	0.08	0.12	0.19	0.47	--
65.380	0.005	0.013	0.026	0.045	0.062	0.115	0.194	0.56	--
65.390	0.003	0.009	0.014	0.030	0.060	0.095	0.2	0.8	--



### Recommended inner diameter [mm] for tubing up to length of 2 meter

Item no.		Air supply	Vacuum	Exhaust
65.340	65.340-LSE	> 4	> 12	> 12
65.350	65.350-LSE	> 6	> 15	> 15
65.360	65.360-LSE	> 8	> 19	> 22
65.370	65.370-LSE	> 8	> 19	> 22
65.380	65.380-LSE	> 10	> 25	> 32
65.390	65.390-LSE	> 10	> 25	> 32

### Dimensions



① = Air saving function (optional)    ② = Connection vacuum gauge and/or vacuum switch    ③ = Vacuum gauge (optional)  
 P = Compressed air connection    V = Vacuum connection    E = Exhaust outlet

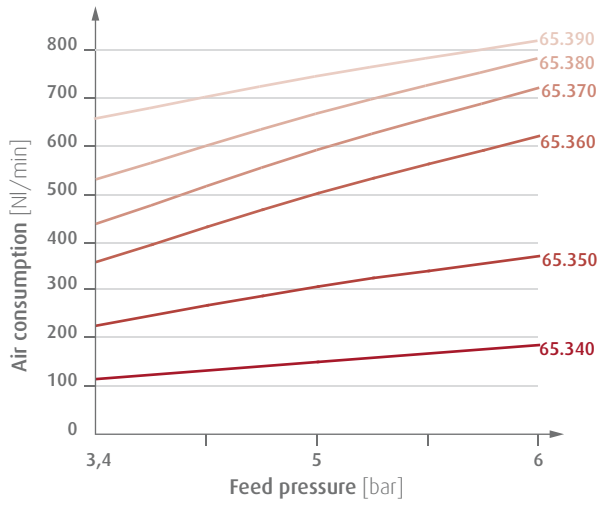
Item no.	65.340	65.350	65.360	65.370	65.380	65.390
G2	G3/4	G3/4	G3/4	G3/4	G1	G1
G3	G3/4	G3/4	G3/4	G3/4	G1	G1
A [mm]	163.5	163.5	183.5	183.5	203.5	203.5
B [mm]	45	45	65	65	85	85
G1	G1/4	G1/4	G1/4	G1/4	G1/4	G1/4

Continued on the next page →

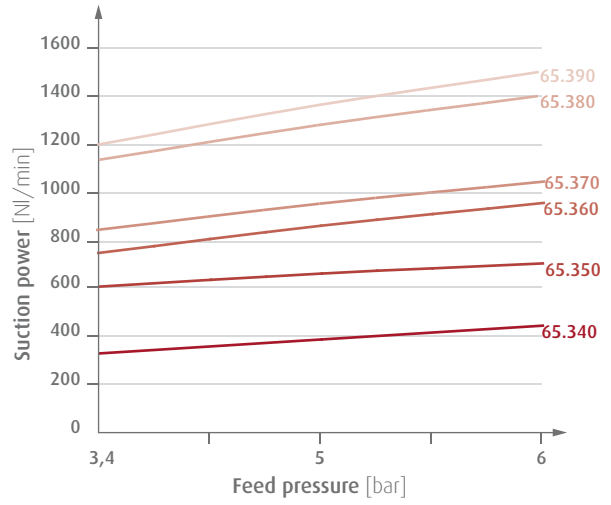


### Diagrams

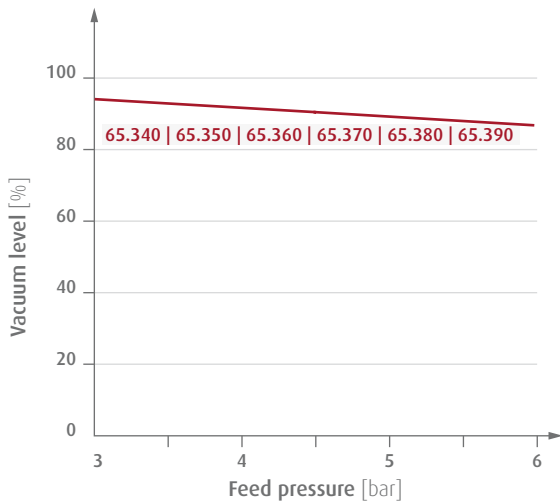
> Air consumption against feed pressure



> Suction power against feed pressure



> Vacuum level against feed pressure





## FIPA Compact ejectors



> Highly efficient vacuum supply, regardless of the air permeability of the workpiece



### Compact ejectors EMM / EMA

- > Handling of dense and porous workpieces
- > Very compact design for in-line installation directly onto the vacuum cup
- > Integrated vacuum monitoring
- > Integrated pressure-regulating air saving function reduces operating costs by up to 50 %

#### EMM

- > Pressure-regulating air saving function plus valves for electronic vacuum and blow-off control ensure short cycle times

> See page 556

#### EMA

- > Pressure-regulating air saving function and electronic air saving function reduce operating costs by up to 97 % for dense workpieces

> See page 559



### Compact ejectors EKPP / EKP

- > Handling of dense and porous workpieces
- > Integrated pressure-regulating air saving function reduces operating costs by up to 50 %
- > Process monitoring via optional vacuum switch

#### EKPP

- > Base version, with pressure-regulating air saving function, no valves
- > Performance data identical to that of EKP

#### EKP

- > Pressure-regulating air saving function plus electronic vacuum and blow-off control for short cycle times

> See page 563



# Vacuum generation | Compact ejectors

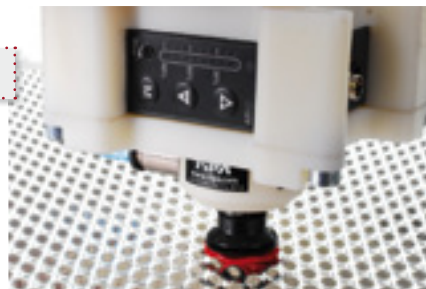
Ejectors with air saving function EMM

## Ejectors with air saving function EMM

Energy saving function by integrated pressure control



**SAVES UP TO 50 % OF ENERGY**



Ejector EMM integrated into gripper housing for Delta robots with Varioflex® bellows vacuum cups and workpiece

V = Vacuum connection P = Compressed air connection Ex = Exhaust outlet

### Product Description

- > Handling of dense and porous workpieces
- > Within the supply pressure of 4 - 8 bar, the ejector works at 3.5 bar with same high performance
- > Energy saving increases along with the difference between supply pressure and operating pressure
- > Electronic vacuum and blow-off control for short cycle times
- > Manual adjustment of the blow-off flow rate using a setscrew
- > Very compact design with integrated open silencer
- > Dust-resistant design, no additional filters required

### Ordering notes

- > Two model ranges available
  - EMM.90: for dense workpieces, max. vacuum level 90 %
  - EMM.60: Higher suction power for porous workpieces, max. vacuum level 60 %
- > Optionally available with integrated check valve to maintain vacuum in case of power failure

### Technical data

Item no.	EMM.60x10	EMM.60x12	EMM.60x14	EMM.90x10	EMM.90x12	EMM.90x14
Nozzle diameter [mm]	1	1.2	1.4	1	1.2	1.4
Feed pressure [bar]	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8
Internal working pressure [bar]	3.5	3.5	3.5	3.5	3.5	3.5
Final vacuum [%]	60	60	60	90	90	90
Suction power [NI/min]	38	72	92	29	45	70
Air consumption [NI/min]	44	65	90	44	65	90
Protection class	IP65	IP65	IP65	IP65	IP65	IP65
Operating principle	NC	NC	NC	NC	NC	NC
Control voltage	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %
Current consumption for vacuum and blow-off feature [mA]	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)
Operating temperature [°C]	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60
Weight [g]	120	120	120	120	120	120
Suitable connector cable	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)	20.501 (p.717) 20.502 (p.717)



### When ordering please specify

Type + Vacuum level x Nozzle diameter + Composition of module + Vacuum switch = Item number

Example: EMM.90x12-AVA

(Compact ejector EMM, vacuum level 90 %, nozzle diameter 1.2 mm, with controlled blow-off-function and with electric vacuum switch with display)

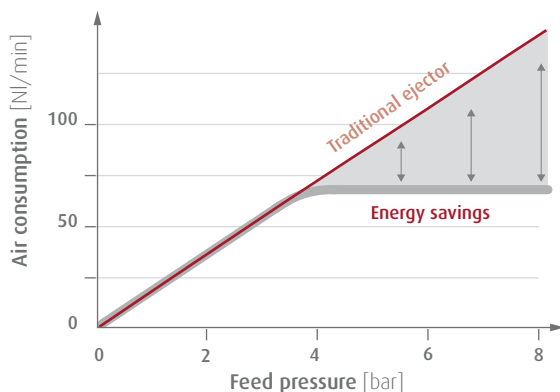
1.: Type	2.: Vacuum level		3.: Nozzle diameter		4.: Composition of module		5.: Vacuum switch		6.: Optional	
EMM.	60	max. 60 % vacuum (porous products)	X	10	∅ 1.0 mm	E	without blow-off-function	VA	digital with display	_CV (with check valve)
	90	max. 90 % vacuum (non-porous products)		12	∅ 1.2 mm	A	with controlled blow-off-function	VO	without vacuum switch	
				14	∅ 1.4 mm					

#### Suitable connector cables for vacuum switch:

20.501: M8 thread, female, 4-pin, straight plug, cable length 5 m

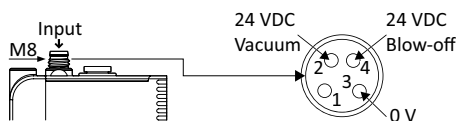
20.502: M8 thread, female, 4-pin, 90° elbow plug, cable length 5 m

### Display of the energy saving potential by integrated pressure control

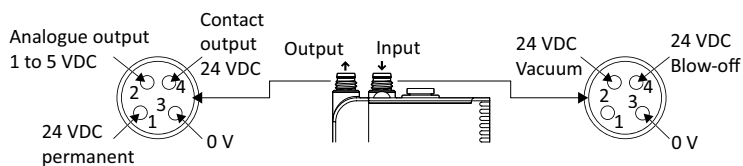


### Vacuum switches

#### Ejectors without vacuum switch



#### Ejectors with vacuum switch



Continued on the next page →

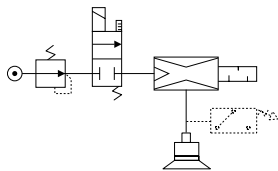


# Vacuum generation | Compact ejectors

Ejectors with air saving function EMM

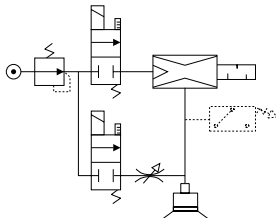
## Pneumatic Diagram

**Ejector with blow-off-function**  
EMM\_\_X\_\_EV\_\_



- > Basic product
- > Only one control signal
- > Display of vacuum level
- > Manual control option

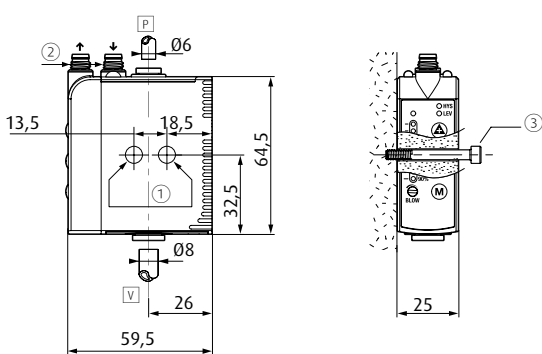
**Ejector with controlled blow-off-function**  
EMM\_\_X\_\_AV\_\_



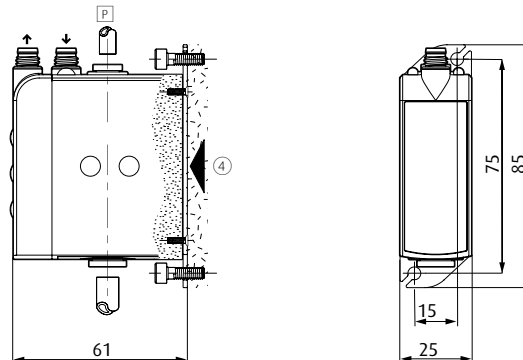
- > Automatic blow-off through external signal, with adjusting screw
- > Two control signals
- > Display of vacuum level and blow-off-function
- > Manual control option

## Dimensions and mounting options

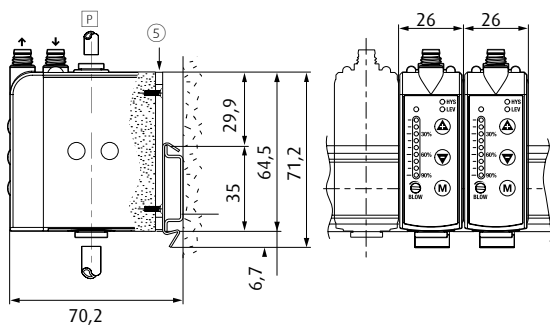
> Mounting sideways



> Mounting in the front



> Block mounting on a DIN rail



- P = Compressed air connection    V = Vacuum connection    ① = 2 Bore holes for 4 mm screws    ② = M8 plug    ③ = 2 Continuous screws  
 ④ = Mounting plate with 4 screws (Item no. EMM.FIX-V)  
 ⑤ = Mounting plate for DIN rail with 4 screws (Item no. EMM.FIX-D) - on plate per EMM-module

## Evacuation time [sec.] for 1 liter at vacuum level

Item no.	30 %	40 %	45 %	50 %	55 %	60 %	65 %	70 %	75 %	80 %
EMM.60x10	0.66	1.04	1.31	1.7	2.35	--	--	--	--	--
EMM.60x12	0.41	1.66	0.83	1.07	1.49	--	--	--	--	--
EMM.60x14	0.27	0.43	0.54	0.7	0.97	--	--	--	--	--
EMM.90x10	--	--	--	--	1.76	2.04	2.38	2.8	3.33	4.09
EMM.90x12	--	--	--	--	1.13	1.31	1.8	2.15	2.15	2.64
EMM.90x14	--	--	--	--	0.73	0.85	0.99	1.16	1.38	1.7



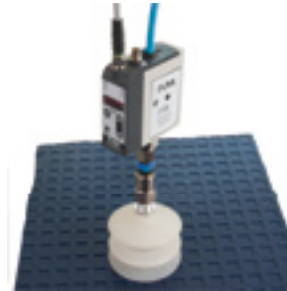


### Ejectors with air saving function EMA

Double energy efficient by integrated pressure control and electronic air saving function



**SAVES UP TO 97 % OF ENERGY**



Ejector EMA with bellows vacuum cup and workpiece

#### Product Description

- > Electronic air saving function reduces operating costs by up to 97 % with dense workpieces
- > Pressure regulation energy-saving function at constant 3.5 bar reduces operating costs by up to 50 % with porous workpieces
  - Energy saving increases along with the difference between supply pressure and operating pressure
- > Electronic vacuum and blow-off control for short cycle times
- > Manual adjustment of the blow-off flow rate using a setscrew
- > Very compact design with integrated open silencer
- > Dust-resistant design, no additional filters required

#### Notes

- > If the ejector experiences power failure, the workpiece is only held by the vacuum between non-return valve and product surface
- > Vacuum and blow-off are controlled using a single signal

#### Technical data

Item no.	EMA.90x14
Nozzle diameter [mm]	1.4
Feed pressure [bar]	4 - 8
Internal working pressure [bar]	3.5
Final vacuum [%]	90
Suction power [NI/min]	70
Air consumption [NI/min]	90
Protection class	IP65
Operating principle	NC
Control voltage	24 VDC (adjusted) ± 10 %
Current consumption for vacuum and blow-off feature [mA]	30 (0.7 W)
Operating temperature [°C]	10 - 60
Weight [g]	130
Suitable connector cable	20.502 (p.717) 20.501 (p.717)

Continued on the next page →

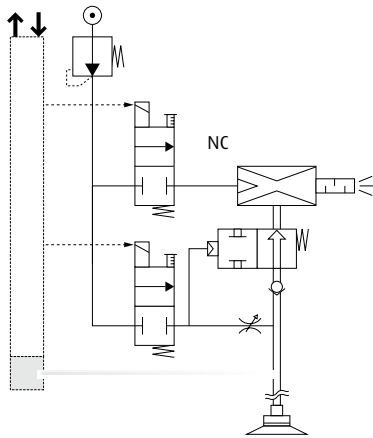


# Vacuum generation | Compact ejectors

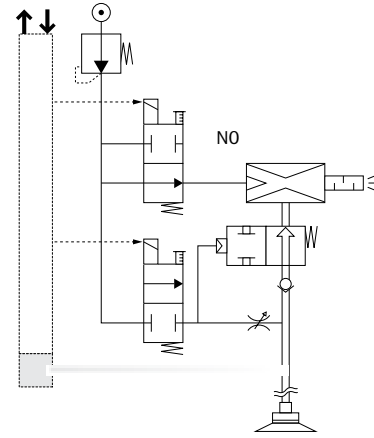
Ejectors with air saving function EMA

## Pneumatic diagram

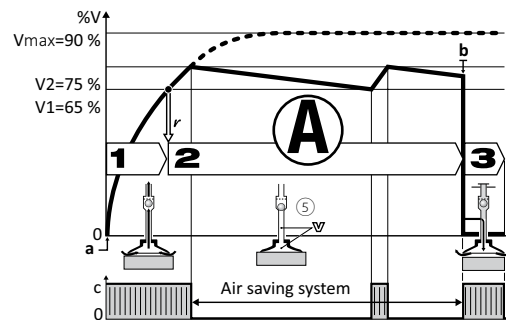
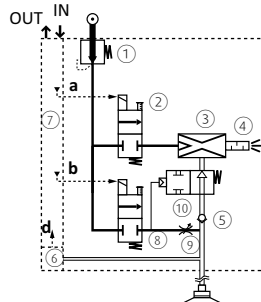
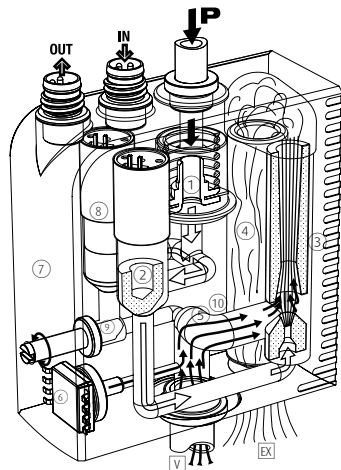
Solenoid valve NC



Solenoid valve NO



## Operating principle EMA series



### 1. Gripping the workpiece

The vacuum solenoid valve ② starts the cycle. Venturi nozzle ③ is supplied with compressed air and generates the vacuum to grip the item quickly with the vacuum cup → short-term energy consumption.

### 2. Operations on the suctioned item

The vacuum level is continually monitored by the vacuum switch ⑥. When the vacuum threshold limit V1 (65 %) is reached the signal "Item gripped" is triggered. This gives a green light for the scheduled operation (transfer, processing etc.). When the vacuum reaches the threshold limit V2 (75 %), the compressed air supply to the venturi nozzles via the solenoid valve ⑤ is interrupted. Energy consumption falls to zero. The item remains gripped because of the vacuum that remains because of the closed non-return valve. Tiny leakages often lead to a slow release of the vacuum. If the vacuum falls to the threshold limit of 65 %, new vacuum is briefly generated, i.e. until the threshold limit V2 (75 %) is reached.

### 3. Releasing the workpiece

At the end of the procedures blow-off is triggered. The blow-off valve ⑧ generates an air jet that closes the closing valve ⑩. This blows off the item using the air pressure regulator ⑨ so that it can be released more quickly.



### Nozzle diameter and energy saving potential

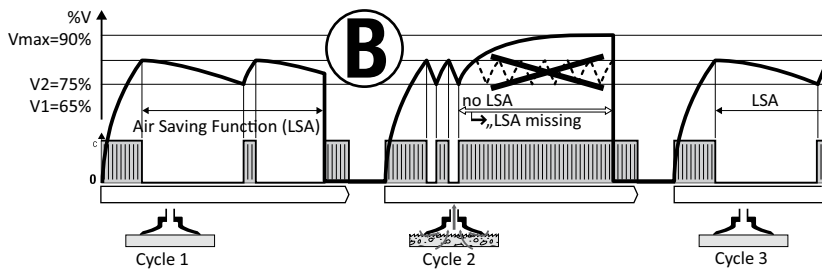
#### Air saving control cycle self-adaptation

**Cycle 1:**  
Deals with an air tight product under the influence of LSA, resulting in optimum energy savings.

**Cycle 2:**  
The porous product generates leaks that provoke repeated intermittent vacuum regeneration. The anomaly is automatically detected, and the cycle goes on but without LSA. An LSA missing signal is then emitted and displayed, and production goes on.

**Cycle 3:**  
Illustrates the automatic return to the LSA cycle as soon as leaks are eliminated due to air tight products. Vacuum level will be maintained.

The compact-ejector EMA thus provides maximum energy saving, without any limitations to the performance and functioning of the overall production system.



Without automatic air saving system			With automatic air saving system		
Nozzle diameter [mm]	Suction power [NI/min]	Air consumption [NI/min]	Suction duration (65 % vacuum) [sec]	Suction duration (75 % vacuum) [sec]	Air consumption [NI/min]
1	29	44	2.38	3.33	2.2
1.2	45	65	1.53	2.15	2.2
1.4	70	90	0.99	1.38	2.2

> Automatic air saving system activation allows a larger tube diameter to grip more quickly without increased consumption.

#### Example of the air saving potential

The examples show how the automatic air saving function reduces the energy demand:  
 > 75 % energy saved during product transfer  
 > 97 % energy saved during holding products while they are further processed or treated  
 The investment will often amortise itself within a couple of months.

Gripping + Transfer (Nozzle Ø 1.4 mm, Evacuation of 0.2 l)

Phase	Duration	Air consumption		air saving potential
		without "LSA"	with "LSA"	
Grip	0.28 s	0.4 NI	0.4 NI	75 %
Transfer	1.20 s	1.8 NI	0	
Placement	0.14 s	0.2 NI	0.2 NI	
		2.4 NI	0.6 NI	

Fixation + Operation process (Nozzle Ø 1.4 mm, Evacuation of 0.4 l)

Phase	Duration	Air consumption		air saving potential
		without "LSA"	with "LSA"	
Fixation	0.55 s	0.8 NI	0.8 NI	97 %
Operation process	60 s	90 NI	0	
Placement	0.14 s	0.2 NI	0.2 NI	
		91 NI	1.0 NI	

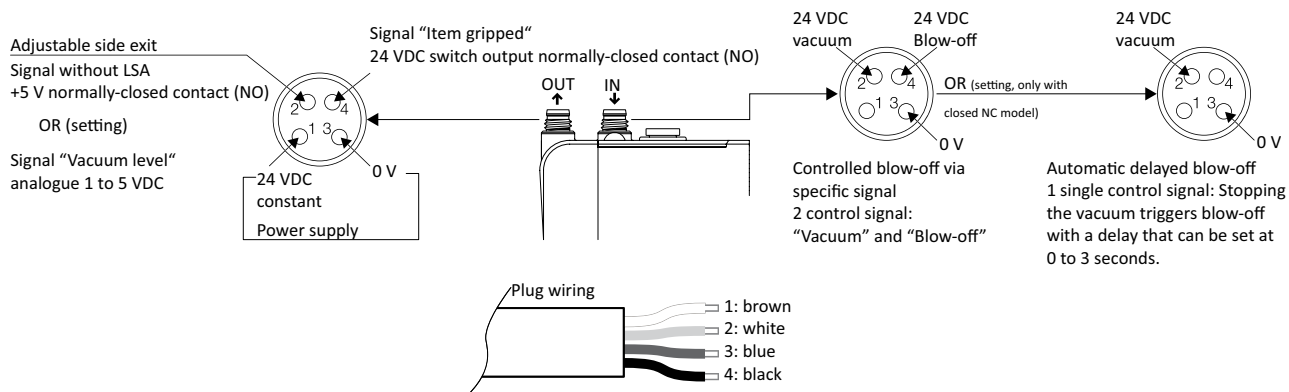
Continued on the next page →



# Vacuum generation | Compact ejectors

Ejectors with air saving function EMA

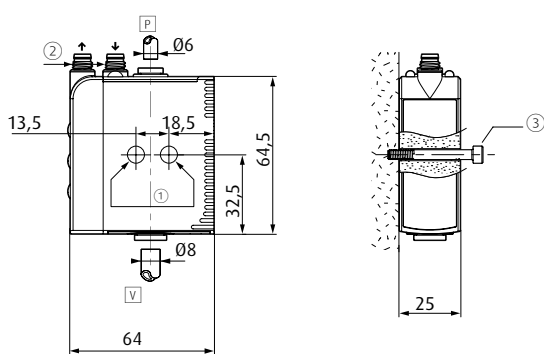
## Wiring diagram



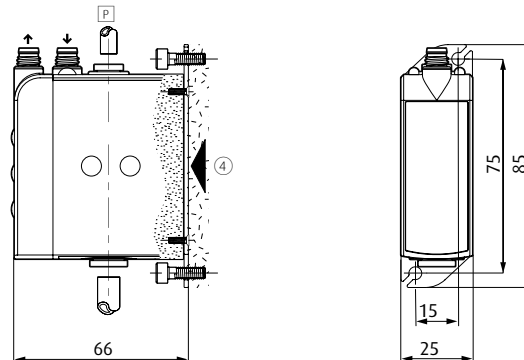
- > Output signal "object gripped", 24 VDC, switching output NO, switching current 125 mA, PNP
- > Adjustable side output:
  1. Signal without air saving function, +5 V switching output NO: eg. signal for failure indication
  2. Signal "vacuum level", analogue, 1-5 VDC of measuring range

## Dimensions and mounting options

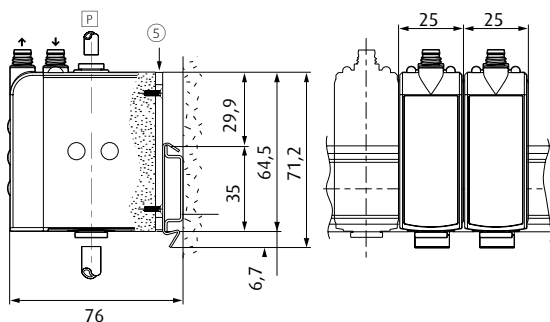
### > Mounting sideways



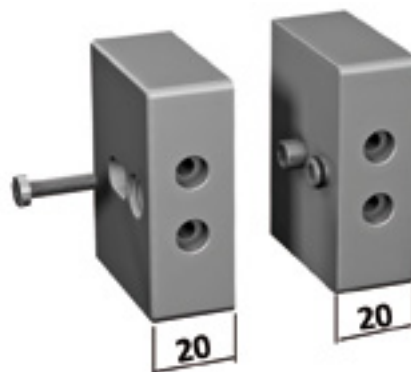
### > Mounting in the front



### > Block mounting on a DIN rail



### > EMA.FIX-B endpieces, with connecting screws and closing pins for collecting main



- P = Compressed air connection V = Vacuum connection ① = 2 Bore holes for 4 mm screws ② = M8 plug ③ = 2 Continuous screws
- ④ = Mounting plate with 4 screws (Item no. EMM.FIX-V)
- ⑤ = Mounting plate for DIN rail with 4 screws (Item no. EMM.FIX-D) - on plate per EMM-modul

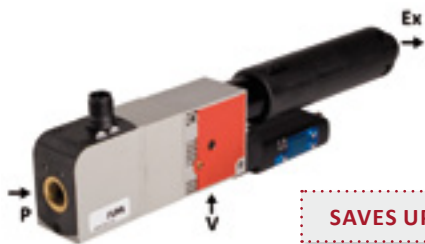
## Evacuation time [sec.] for 1 liter at vacuum level

Item no.	55 %	60 %	65 %	70 %	75 %	80 %
EMA.90x14	0.73	0.85	0.99	1.16	1.38	1.7



### Ejectors with air saving function EKP and EKPP

Energy saving function by integrated pressure control



Check valve with wire mesh to keep out impurities

□ = Vacuum connection   □ = Compressed air connection   □ = Exhaust outlet

#### Product Description

- > Handling of dense and porous workpieces
- > Within the supply pressure of 4 - 8 bar, the ejector works at 3.5 bar with same high performance
- > Electronic vacuum and blow-off control for short cycle times
- > Manual adjustment of the blow-off flow rate using a setscrew
- > Low noise emissions as, starting from 4 bar, outlet pressure is independent of inlet pressure
- > Open silencer further reduces the noise level and is completely maintenance-free

#### Notes

- > Ejector with digital vacuum switch 20.021 for process monitoring (Index „-VA“)
- > The vacuum switch can be freely adjusted after mounting the ejector

#### Ordering notes

- > Index EKP: with control valves
- > Index EKPP: without control valves
- > The performance data are identical for the two series
- > The optional check valve maintains the vacuum in cases of compressed air failure for a certain period of time to prevent sudden dropping of the workpiece
- > On request, ejectors are also available normally (current free) open (NO):  
In case of power failure, compressed air line remains open and workpiece is held by the gripper

#### Technical data

Item no.	EKP.60x12	EKP.60x15	EKP.60x20	EKP.60x25	EKP.60x30	EKP.90x12	EKP.90x15	EKP.90x20	EKP.90x25	EKP.90x30
Nozzle diameter [mm]	1.2	1.5	2	2.5	3	1.2	1.5	2	2.5	3
Feed pressure [bar]	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8	4 - 8
Internal working pressure [bar]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Final vacuum [%]	60	60	60	60	60	90	90	90	90	90
Suction power [Nl/min]	72	110	189	275	385	50	75	125	200	245
Air consumption [Nl/min]	65	97	179	200	385	65	97	179	260	385
Protection class	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Operating principle	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Control voltage	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %	24 VDC (adjusted) ± 10 %
Current consumption for vacuum and blow-off feature [mA]	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)	30 (0.7 W)

Continued on the next page →



# Vacuum generation | Compact ejectors

Ejectors with air saving function EKP and EKPP

## Technical data

Item no.	EKP.60x12	EKP.60x15	EKP.60x20	EKP.60x25	EKP.60x30	EKP.90x12	EKP.90x15	EKP.90x20	EKP.90x25	EKP.90x30
Operating temperature [°C]	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60
Weight [g]	250	250	250	250	250	250	250	250	250	250
Suitable accessories	Connector cable 20.518 (p.717) Connector cable 20.519 (p.717) Check valve 32.658									

## When ordering please specify

Type + Vacuum level + Nozzle diameter + Composition of module + Vacuum switch = Item number

Example: **EKP.90x12-AVA**

(Compact ejector EKP., vacuum level 90 %, nozzle diameter 1.2 mm, with controlled blow-off function and with electric vacuum switch with display)

1.: Type	2.: Vacuum level		3.: Nozzle diameter		4.: Composition of module		5.: Vacuum switch		6.: Optional
EKP	60	max. 60 % vacuum (porous products)	12	Ø 1.2 mm	-E	without blow-off-function	VA	digital with display	-NO  (normally open)
			15	Ø 1.5 mm	-A	with controlled blow-off-function			
			20	Ø 2 mm			-Z	with automatic blow-off-function with time release 0-3 sec.	
	90	max. 90 % vacuum (non-porous products)	25	Ø 2.5 mm	VO	without vacuum switch			
			30	Ø 3 mm					

Example: **EKPP.60x15-VA:**

(Compact ejector EKPP vacuum level 60 %, nozzle diameter 1.5 mm, without additional function)

1.: Model without vacuum- / blow-off control	2.: Vacuum level		3.: Nozzle diameter		4.: Vacuum switch	
EKPP.	60	max. 60 % vacuum (porous products)	12	Ø 1.2 mm	-VA	digital with display
			15	Ø 1.5 mm		
			90	max. 90 % vacuum (non-porous products)	20	Ø 2 mm
	25	Ø 2.5 mm				
	30	Ø 3 mm				

**Suitable connector cables for vacuum switch:**

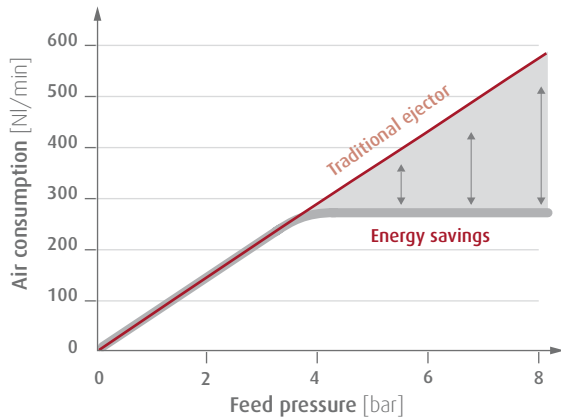
20.501: M8 thread, female, 4-pin, straight plug, cable length 5 m  
20.502: M8 thread, female, 4-pin, 90° elbow plug, cable length 5 m

**Suitable connector cables for EKP for vacuum valve and blow-off control:**

20.518: M12 thread, female, 4-pin, straight plug, cable length 2 m  
20.519: M12 thread, female, 4-pin, 90° elbow plug, cable length 2 m



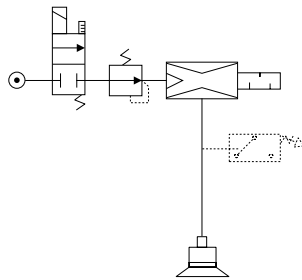
## Display of the energy saving potential by integrated pressure control



Example of EKP.90x25 resp. EKP.60x25

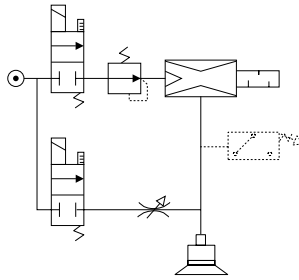
## Pneumatic Diagram

**Ejector without blow-off-function**  
EKP\_ \_X\_ \_EV\_ \_



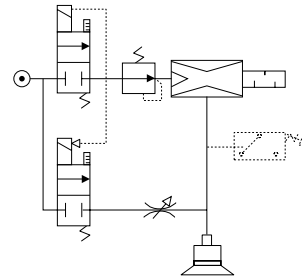
- > Basic product
- > Only one control signal

**Ejector with controlled blow-off-function**  
EKP\_ \_X\_ \_AV\_ \_



- > Control of blow-off-function through outer signal with screw to adjust blow-off-volume
- > Two control signals

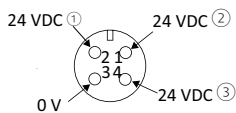
**Ejector with automatic blow-off-function with time release**  
EKP\_ \_X\_ \_ZV\_ \_



- > Automatic blow-off when ejector is switched off, delay of blow-off can be manually set between 0 and 3 s, with adjusting screw
- > Only one control signal

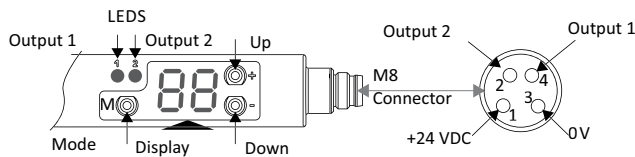
## Electric plug / Vacuum switch

Electric connection EKP



- ① = Control of vacuum
- ② = Permanent (version Z)
- ③ = Blow-off-control (version A)

Ejectors with electronic (digital) vacuum switch  
EKP-VA with display, 2 outputs



- > Ejectors without vacuum switch EKP-V0: This type needs to be complemented by an independent vacuum switch in the vacuum system or, during evacuation of a manually controlled volume, by a vacuum gauge.

Continued on the next page →

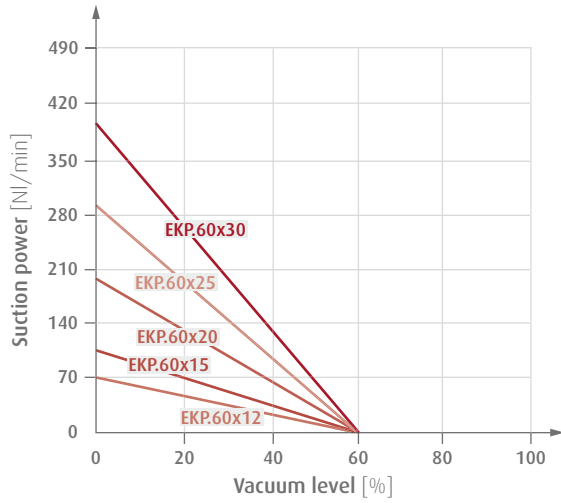




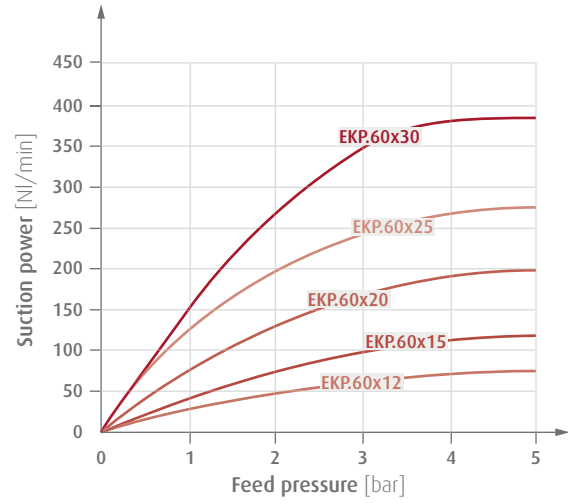


## Diagrams

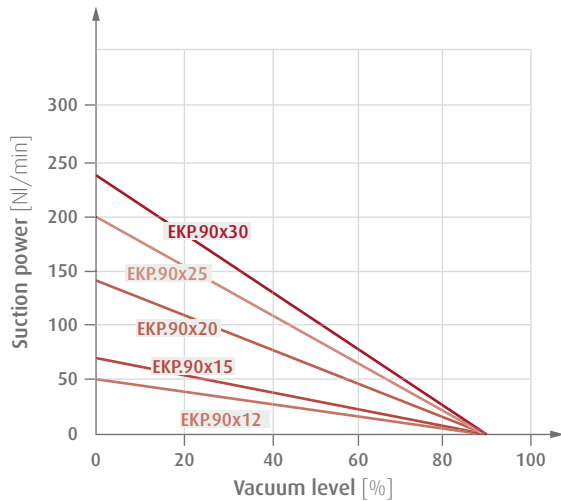
> Suction power against vacuum level



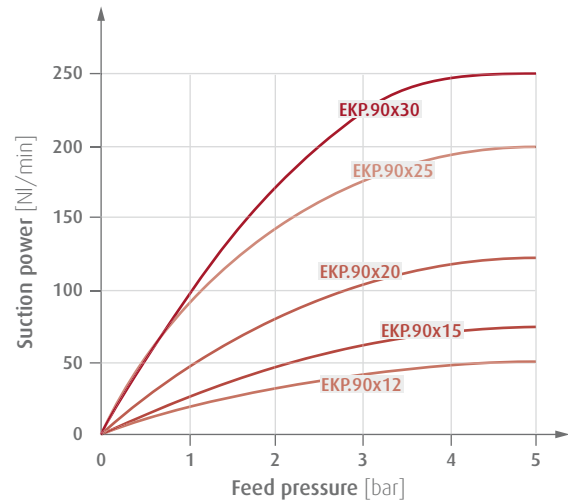
> Suction power against feed pressure



> Suction power against vacuum level



> Suction power against feed pressure



## Evacuation time [sec.] for 1 liter at vacuum level

Item no.	10 %	20 %	30 %	40 %	50 %	60 %	70 %	80 %	85 %
EKP.60x12	0.09	0.2	0.35	0.55	0.9	--	--	--	--
EKP.60x15	0.06	0.14	0.23	0.36	0.59	--	--	--	--
EKP.60x20	0.04	0.08	0.13	0.21	0.34	--	--	--	--
EKP.60x25	0.03	0.05	0.09	0.14	0.24	--	--	--	--
EKP.60x30	0.01	0.04	0.07	0.1	0.17	--	--	--	--
EKP.90x12	0.13	0.27	0.44	0.64	0.88	1.19	1.62	2.37	3.12
EKP.90x15	0.09	0.18	0.29	0.42	0.58	0.79	1.08	1.59	2.08
EKP.90x20	0.05	0.11	0.18	0.25	0.35	0.46	0.65	0.95	1.25
EKP.90x25	0.03	0.07	0.11	0.16	0.22	0.3	0.41	0.59	0.78
EKP.90x30	0.03	0.06	0.09	0.13	0.18	0.24	0.33	0.48	0.64





## FIPA Feed ejectors

- > Secure transport of bulk material
- > Extraction of non-aggressive gases or steams
- > Ideal source of vacuum in applications with high leakage



### Feed ejectors for large throughput

- > Contamination-resistant construction for reliable operation, even under harsh operating conditions

#### 65.701 - 65.731

- > High vacuum level
- > For overcoming larger height differences
- > Suction volume and vacuum level can be adapted to level of compressed air pressure



#### 65.742 - 85.802

- > Low vacuum level
- > For overcoming smaller height differences
- > Suction volume and vacuum level dependent on level of compressed air pressure

> See page 570



### Feed ejectors for small throughput EFO

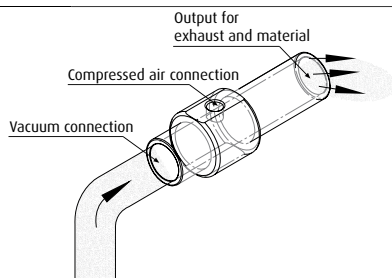
- > Low suction power due to medium vacuum levels
- > Various connections for inlets and outlets as well as for compressed air supply
- > Suitable filters or collection vessels available as accessories

> See page 574

## Examples of use

- > Gentle product feeding thanks to axial arrangement of inlet and outlet
- > Vacuum supply for vacuum cups used to handle porous workpieces, or for a high degree of leakage
- > Electricity-free alternative to motor-driven vacuum pumps or side channel blowers
- > Continual operation without heat development as there are no moving parts

## Functional principle





### Feed ejectors - rotatable

High suction power for handling with high leakage

ALSO AVAILABLE IN STAINLESS STEEL FOR FOOD INDUSTRY OR ABRASIVE MEDIA



#### Product Description

- > High suction power for safe handling of air-permeable products or generally in the presence of high leakage
- > Gentle transportation of powdery substances or small-size products such as granular material, coffee, flour
- > Extraction of non-aggressive vapors and gases
- > Volume of suction air and required vacuum level can be adjusted by turning the suction pipe, allowing for an energy efficient increase in performance without increasing air consumption
- > Can even be used in rough conditions thanks to the robust, maintenance-free construction without moving parts
- > No build-up of heat because of no moving parts and therefore no risk of ignition during transport
- > High maximum vacuum level for overcoming larger height differences
- > Stainless steel designs for easy cleaning when transporting foods and for handling abrasive media
- > Extremely flexible integration into gripper systems thanks to any mounting position

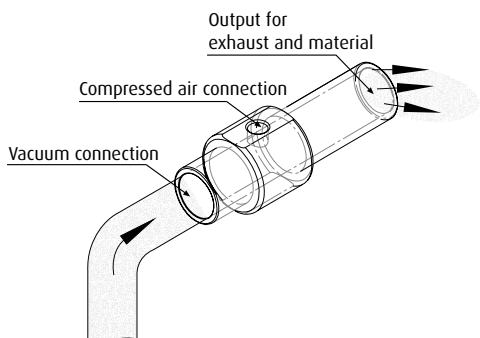
#### Notes

- > The transport length depends on the feed pressure, the transport volume and the transport goods
- > Rule of thumb:
  - Tubing length from suction point to ejector ~ 2/3 of the total tubing length
  - Tubing length from ejector to point of use ~ 1/3 of the total tubing length
- > Prior to installation a test at customer site is recommended
- > For longer distances, multiple ejectors can be serially connected

#### Technical data

Item no.	Nozzle diameter [mm]	Pressure range [bar]	Optimal feed pressure [bar]	Final vacuum [mbar]	Suction power [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Material	Suitable silencers
65.701	7	4 - 7	5	850	0 - 284	0 - 235	-20 - 80	105	Aluminium anodised	72.029 (p.577)
65.711	10	4 - 7	5	850	0 - 848	0 - 481	-20 - 80	275	Aluminium anodised	72.031 (p.577)
65.731	20	4 - 7	5	850	0 - 3,402	0 - 1,246	-20 - 80	550	Aluminium anodised	72.033 (p.577)
65.701-S	7	4 - 7	5	850	0 - 284	0 - 235	-20 - 80	300	Stainless steel	72.029 (p.577)
65.711-S	10	4 - 7	5	850	0 - 848	0 - 481	-20 - 80	700	Stainless steel	72.031 (p.577)
65.731-S	20	4 - 7	5	850	0 - 3,402	0 - 1,246	-20 - 80	1,500	Stainless steel	72.033 (p.577)

#### Functional principle





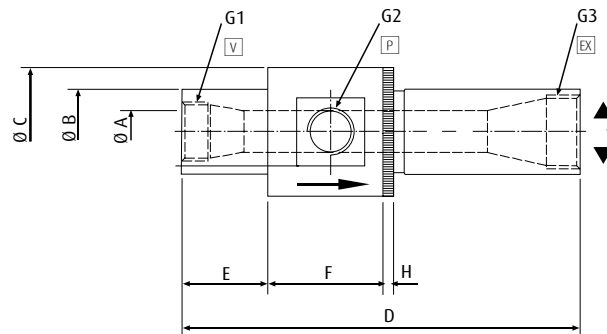
### Air consumption [NI/min] at vacuum level (feed pressure 5.5 bar)

Item no.	17 %	34 %	50 %	68 %	84 %
65.701	112	169	233	276	342
65.711	176	327	485	595	825
65.731	650	875	1250	1790	2550
65.701-S	112	169	233	276	342
65.711-S	176	327	485	595	825
65.731-S	650	875	1250	1790	2550

### Suction power [NI/min] at vacuum level (feed pressure 5.5 bar)

Item no.	17 %	34 %	50 %	68 %	84 %
65.701	280	240	200	162	125
65.711	846	735	620	520	395
65.731	3390	2460	1970	1440	1130
65.701-S	280	240	200	162	125
65.711-S	846	735	620	520	395
65.731-S	3390	2460	1970	1440	1130

### Dimensions



V = Vacuum connection  
 P = Compressed air connection  
 EX = Exhaust outlet  
 \* = rotatable

Item no.	G1	G2	G3	Ø A [mm]	Ø B [mm]	Ø C [mm]	D [mm]	E [mm]	F [mm]	H [mm]
65.701	G1/4	G1/8	G1/4	7	18.8	32	94 - 105	22	31.5	5
65.711	G1/2	G3/8	G1/2	10	25.1	51	155 - 165	38.1	44.2	5
65.731	G3/4	G1/2	G1	20	37.8	58	175 - 189	38.1	56.4	5
65.701-S	G1/4	G1/8	G1/4	7	18.8	32	94 - 105	22.1	31.5	5
65.711-S	G1/2	G3/8	G1/2	10	25.1	51	155 - 165	38.1	44.2	5
65.731-S	G3/4	G1/2	G1	20	37.8	58	175 - 189	38.1	56.4	5



### Feed ejectors - with a large passage

Very high suction power for high transportation throughput



#### Product Description

- > Very high suction power for high transportation throughput
- > Gentle transportation of powdery substances or small-size products such as granular material, pills, chippings
- > Extraction of non-aggressive vapors and gases
- > Can even be used in rough conditions thanks to the robust, maintenance-free construction
- > No build-up of heat because of no moving parts and therefore no risk of ignition during transport
- > Extremely flexible integration into gripper systems thanks to any mounting position

#### Notes

- > The transport length depends on the feed pressure, the transport volume and the transport goods
- > Rule of thumb:
  - Tubing length from suction point to ejector ~ 2/3 of the total tubing length
  - Tubing length from ejector to point of use ~ 1/3 of the total tubing length
- > Prior to installation a test at customer site is recommended
- > For longer distances, multiple ejectors can be serially connected

#### Ordering notes

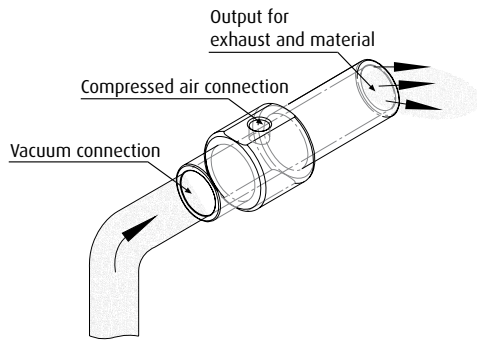
- > Mounting options:  
65.752: Connections for vacuum and outlet on both sides using G3/8 female thread (see drawing)

#### Technical data

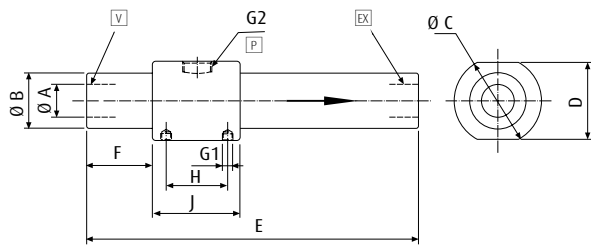
Item no.	Nozzle diameter [mm]	Pressure range [bar]	Max. feed pressure [bar]	Final vacuum [mbar]	Suction power at 5.5 bar [Nl/min]	Air consumption at 2.8 bar [Nl/min]	Air consumption at 5.5 bar [Nl/min]	Operating temperature [°C]	Weight [g]	Material	Suitable silencers
65.742	7	2.5 - 6	7	260	295	85	160	-10 - 80	92	Aluminium anodised	--
65.752	10	2.5 - 6	7	160	425	95	170	-10 - 80	81	Aluminium anodised	72.030 (p.577)
65.762	13	2.5 - 6	7	350	870	395	680	-10 - 80	177	Aluminium anodised	--
65.772	19	2.5 - 6	7	280	1,825	790	1,365	-10 - 80	380	Aluminium anodised	--
65.792	38	2.5 - 6	7	90	4,400	405	695	-10 - 80	607	Aluminium anodised	--
65.802	38	2.5 - 6	7	90	5,610	790	1,356	-10 - 80	777	Aluminium anodised	--



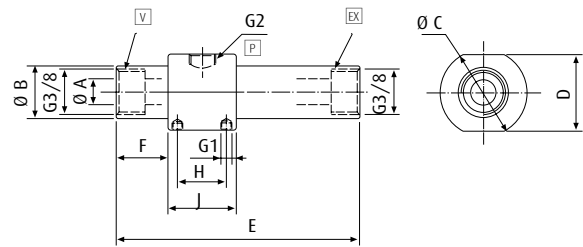
## Functional principle



## Dimensions



65.742 | 65.762 | 65.772 | 65.792 | 65.802



65.752

V = Vacuum connection P = Compressed air connection EX = Exhaust outlet

Item no.	G1	G2	Ø A [mm]	Ø B [mm]	Ø C [mm]	D [mm]	E [mm]	F [mm]	H [mm]	J [mm]
65.742	M4	G1/8	6.5	18.5	32	30	89	19	18	25
65.752	M4	G1/8	9.5	18.5	32	30	89	19	18	25
65.762	M4	G1/4	12.5	24	38	34	140	25.5	23	32
65.772	M6	G3/8	19	32	50	45	190	38	35	50
65.792	M6	G3/8	38	50	69	65	205	40	42	60
65.802	M6	G3/8	38	50	69	65	205	40	42	60



# Vacuum generation | Feed ejectors

Feed ejectors EFO - with a small passage

## Feed ejectors EFO - with a small passage

Compressed air connection via quick fittings, outlet via R-threads, exhaust via R-threads or quick fittings



Exhaust via R-threads



Exhaust via tubing connection

V = Vacuum connection P = Compressed air connection Ex = Output

### Product Description

- > Transport of powdery or granular materials
- > Extraction of non-aggressive vapors and gases
- > Medium vacuum level for overcoming larger height differences
- > No build-up of heat because of no moving parts and therefore no risk of ignition during transport
- > Maximum availability thanks to robust, maintenance-free design
- > Rotatable, angled compressed air connection and any mounting position for flexible system integration

### Notes

- > The transport length depends on the feed pressure, the transport volume and the transport goods
- > Rule of thumb:
  - Tubing length from suction point to ejector ~ 2/3 of the total tubing length
  - Tubing length from ejector to point of use ~ 1/3 of the total tubing length
- > Prior to installation a test at customer site is recommended
- > For longer distances, multiple ejectors can be serially connected

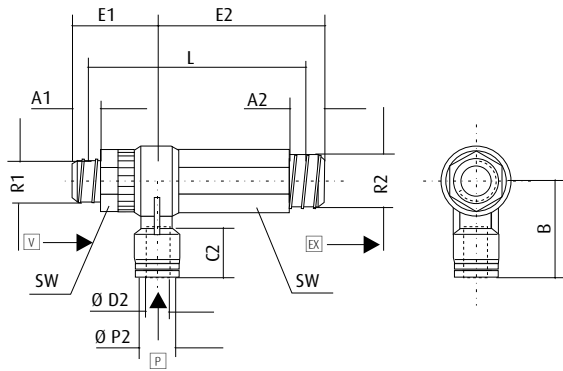
### Technical data

Item no.	Series	Nozzle diameter [mm]	Optimal feed pressure [bar]	Pressure range [bar]	∅ Free passage [mm]	Final vacuum [%]	Suction power at 5 bar [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]	Material
EFO.30L.1	With R-thread	3	5	0 - 10	2.3	52	50	50	0 - 60	41	Aluminium anodised
EFO.40L.1	With R-thread	4	5	0 - 10	3.6	52	100	100	0 - 60	81	Aluminium anodised
EFO.60L.1	With R-thread	6	5	0 - 10	5.5	52	200	200	0 - 60	190	Aluminium anodised
EFO.75L.1	With R-thread	7.5	5	0 - 10	7	52	300	300	0 - 60	193	Aluminium anodised
EFO.30L.2	With tubing connection	3	5	0 - 10	2.3	52	50	50	0 - 60	37.5	Aluminium anodised
EFO.40L.2	With tubing connection	4	5	0 - 10	3.6	52	100	100	0 - 60	77	Aluminium anodised
EFO.60L.2	With tubing connection	6	5	0 - 10	5.5	52	200	200	0 - 60	182	Aluminium anodised
EFO.75L.2	With tubing connection	7.5	5	0 - 10	7	52	300	300	0 - 60	183	Aluminium anodised

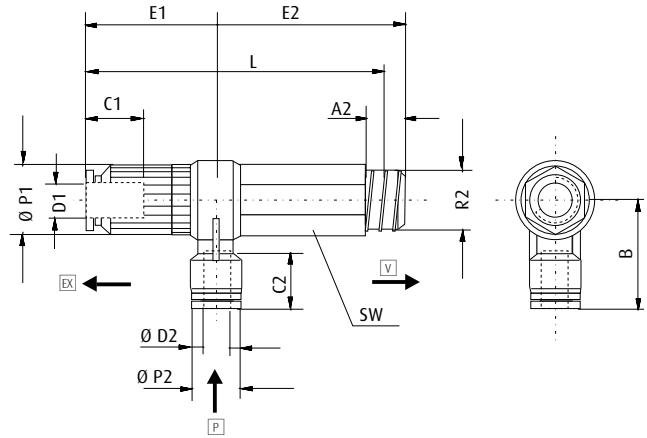




### Dimensions



EFO.30L.1 | EFO.40L.1 | EFO.60L.1 | EFO.75L.1



EFO.30L.2 | EFO.40L.2 | EFO.60L.2 | EFO.75L.2

V = Vacuum connection P = Compressed air connection EX = Output

Item no.	R1	R2	A1 [mm]	A2 [mm]	B [mm]	C1 [mm]	C2 [mm]	Ø D1 [mm]	Ø D2 [mm]	E1 [mm]	E2 [mm]	L [mm]	Ø P1 [mm]	Ø P2 [mm]	SW
EFO.30L.1	R1/8	R1/8	8	8	25	--	16.5	--	6	23	36	51	--	12.5	14
EFO.40L.1	R1/4	R1/4	11	11	29	--	17.5	--	8	29.5	53	70	--	14.5	17
EFO.60L.1	R3/8	R1/2	12	15	34	--	20	--	10	35	69.5	90	--	17.5	22
EFO.75L.1	R1/2	R1/2	15	15	34	--	20	--	10	38	69.5	91.5	--	17.5	24
EFO.30L.2	--	R1/8	--	8	25	17.5	16.5	8	6	30	36	62	16	12.5	14
EFO.40L.2	--	R1/4	--	11	29	20	17.5	10	8	35.5	53	82.5	20	14.5	17
EFO.60L.2	--	R1/2	--	15	34	23.5	20	12	10	43.5	69.5	105	25	17.5	24
EFO.75L.2	--	R1/2	--	15	34	25	20	16	10	45	69.5	106.5	25	17.5	24



# Vacuum generation | Feed ejectors

Feed ejectors EFO - with a small passage

## Feed ejectors EFO - with a small passage

Compressed air, vacuum and exhaust side with quick fittings



**V** = Vacuum connection **P** = Compressed air connection **Ex** = Output

### Product Description

- > Transport of powdery or granular materials
- > Extraction of non-aggressive vapors and gases
- > Medium vacuum level for overcoming larger height differences
- > No build-up of heat because of no moving parts and therefore no risk of ignition during transport
- > Maximum availability thanks to robust, maintenance-free design
- > Rotatable, angled compressed air connection and any mounting position for flexible system integration

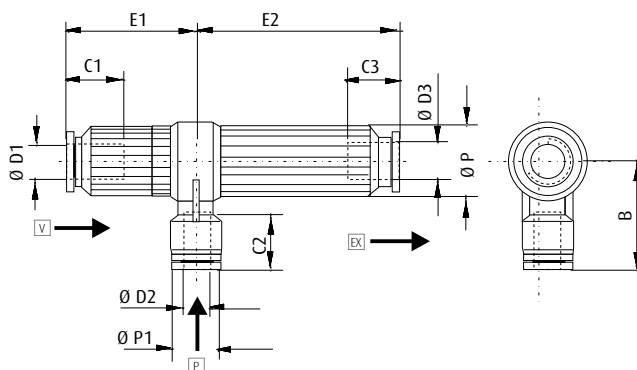
### Notes

- > The transport length depends on the feed pressure, the transport volume and the transport goods
- > Rule of thumb:
  - Tubing length from suction point to ejector ~ 2/3 of the total tubing length
  - Tubing length from ejector to point of use ~ 1/3 of the total tubing length
- > Prior to installation a test at customer site is recommended
- > For longer distances, multiple ejectors can be serially connected

### Technical data

Item no.	Nozzle diameter [mm]	Optimal feed pressure [bar]	Pressure range [bar]	Ø Free passage [mm]	Final vacuum [%]	Suction power at 5 bar [Nl/min]	Air consumption [Nl/min]	Operating temperature [°C]	Weight [g]
<b>EFO.30L.3</b>	3	5	0 - 10	2.3	52	50	50	0 - 60	49
<b>EFO.40L.3</b>	4	5	0 - 10	3.6	52	100	100	0 - 60	101.5
<b>EFO.60L.3</b>	6	5	0 - 10	5.5	52	200	200	0 - 60	186
<b>EFO.75L.3</b>	7.5	5	0 - 10	7	52	300	300	0 - 60	176.5

### Dimensions



**V** = Vacuum connection **P** = Compressed air connection **Ex** = Exhaust outlet

Item no.	Ø D1 [mm]	Ø D2 [mm]	Ø D3 [mm]	B [mm]	C1 [mm]	C2 [mm]	C3 [mm]	E1 [mm]	E2 [mm]	Ø P [mm]	Ø P1 [mm]
<b>EFO.30L.3</b>	8	6	8	25	17.5	16.5	17.5	30	55	16	12.5
<b>EFO.40L.3</b>	10	8	12	29	20	17.5	23.5	35.5	76.5	20	14.5
<b>EFO.60L.3</b>	12	10	16	34	23.5	20	25	43.5	74.5	25	17.5
<b>EFO.75L.3</b>	16	10	16	34	25	20	25	45	74.5	25	17.5



## Open silencers for ejectors



### Product Description

- > Suitable for Heavy-duty ejectors or inline ejectors EIL, expandable
- > Open design, specially suitable for dusty, high-particle environments (e.g. wood industry)

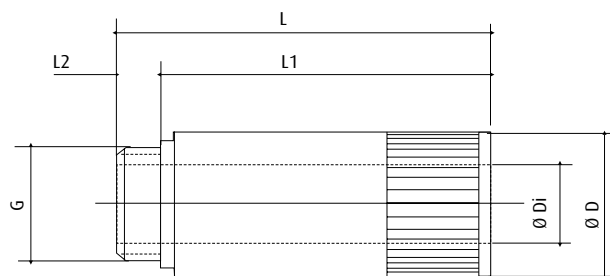
### Technical data

Item no.	Weight [g]
72.028	3
72.029	20
72.030	25
72.031	35
72.032	55
72.033	175

### Dimensions

G	$\varnothing D$ [mm]	$\varnothing Di$ [mm]	L [mm]	L1 [mm]	L2 [mm]
G1/8	14	7	46	41	5
G1/4	20	11	73	65	8
G3/8	24	11	72	64	8
G1/2	30	17	128	121	7
G3/4	40	17	126	119	7
G1	49	26	126	119	7

### Dimensions





### Closed silencers for ejectors



### Product Description

- > Closed diffusor / silencer specially designed for dust-free environments
- > Suitable for Heavy-duty ejectors or inline ejectors EIL, expandable

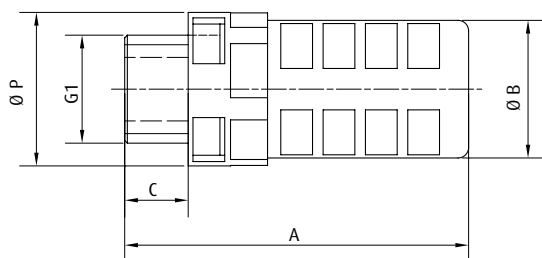
### Technical data

Item no.	Weight [g]
72.045	5
72.000	2
72.001	3.5
72.002	12
72.003	15
72.007	5.5
72.008	3
72.009	6.5

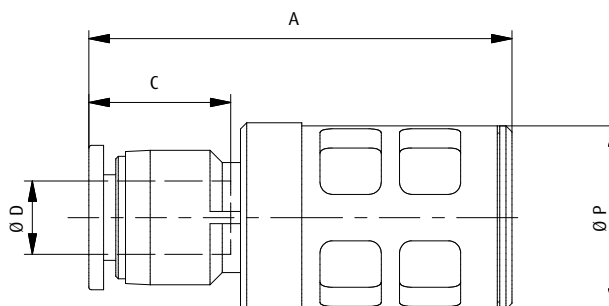
### Dimensions

G1	Ø D [mm]	A [mm]	Ø B [mm]	C [mm]	Ø P [mm]
M5	--	36	18	5.1	--
G1/8	--	28	15.5	6	15.5
G1/4	--	38	17.5	8	17.5
G3/8	--	58	26	10	26.5
G1/2	--	66	29	12	29
--	4	30	--	11	10.5
--	6	34.5	--	11.5	15.5
--	8	48.5	--	17.5	17.5

### Dimensions



72.045 | 72.000 | 72.001 | 72.002 | 72.003



72.007 | 72.008 | 72.009



### Silencers with filter function



Series 1: Brass construction with stainless steel wire fabric



Series 2: Brass construction with sintered material

### Product Description

- > Combination of silencer and air filter
- > 72.015 - 72.021: Also suitable as protective filter for 3/2-way valves at ventilation / blow-off inlet (under contaminated environmental conditions)
- > 72.022 - 72.027: Can be mounted directly into the vacuum cup or the fitting, temperature resistant up to 120 °C

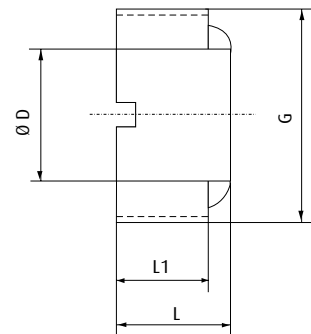
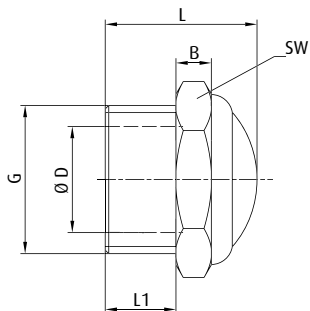
### Technical data

Item no.	Series	Weight [g]
72.015	1	2
72.016	1	6
72.017	1	10
72.018	1	15
72.019	1	25
72.020	1	38
72.021	1	56
72.022	2	1
72.022-1*	2	1
72.023	2	3
72.024	2	6
72.025	2	12
72.026	2	16
72.027	2	29

### Dimensions

G	B [mm]	Ø D [mm]	L [mm]	L1 [mm]	SW
M5	3.5	2.5	9.5	4	8
G1/8	4	6	14	6	13
G1/4	5	8.5	18.5	8	16
G3/8	6	11	19.5	8	19
G1/2	5	15	22.5	10	24
G3/4	6	20	25.5	10	30
G1	6.5	26	31	11.5	36
G1/8	--	5.5	4.5	3.5	--
G1/8	--	5.5	5	3.5	--
G1/4	--	7	6.8	4.5	--
G3/8	--	9.5	6.8	5	--
G1/2	--	12	9	7	--
G3/4	--	18	9	6.5	--
G1	--	23.5	10.5	7.5	--

### Dimensions



72.015 | 72.016 | 72.017 | 72.018 | 72.019 | 72.020 | 72.021

72.022 | 72.022-1\* | 72.023 | 72.024 | 72.025 | 72.026 | 72.027

\* = Special design: Coarse filter with mesh opening size 0.4 mm



## FIPA Rotary vane vacuum pumps



### Rotary vane vacuum pumps - oil-free

- > Handling of dense workpieces in dry areas
- > Suitable for load alternation and continuous operation
- > Available in single-phase and three-phase designs
- > Any installation position
- > Very low maintenance

> See page 582



### Piston pumps

- > Small output at compact design
- > Suitable for dry and wet areas
- > Long-life and low maintenance thanks to the permanently lubricated piston seals
- > Oil-free operation
- > Also suitable as compressors

> See page 592



### Rotary vane vacuum pumps - oil-lubricated

- > Handling dense and porous workpieces
- > Partially suitable for applications in wet areas
- > Suitable for continuous operation in product-dependent vacuum levels
- > Available in single-phase and three-phase designs
- > Horizontal installation position

> See page 594



### Centralised vacuum units

- > Supply of several modules via a central station
- > Made up of one to three oil-lubricated vacuum pumps
- > Incl. vacuum tank and electronic control

> See page 606



## FIPA rotary vane vacuum pumps



### Accessories

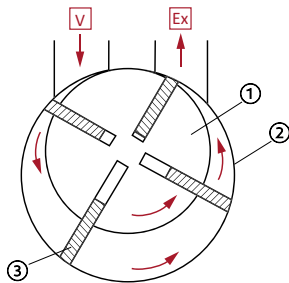
#### Vacuum tanks

- > As storage device for compressed air, vacuums and non-aggressive liquids
- > Efficient compressed air/vacuum usage (energy saving, protection of the unit)
- > For compressed air/vacuum systems with highly fluctuating consumption

> See page 617

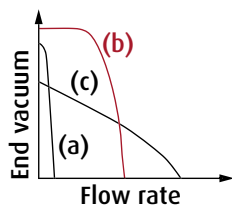
### Vacuum generation according to the displacement principle

- > A cylindrical rotor ① rotates eccentrically in a circular cavity ②.
- > The rotary vanes ③ are pushed against the outer walls of the cavity by centrifugal force, sealing the chambers that are created by this motion.
- > During rotation, the expanding chambers draw in air on the vacuum side  $\square V$ .
- > The suctioned aspirated air is then released via the exhaust  $\square Ex$ .



### Performance characteristics

- (a) Characteristic of ejectors
- (b) Rotary vane vacuum pumps achieve a very good ultimate vacuum along with a high flow volume
- (c) Characteristic of side channel blowers





### Rotary vane vacuum pumps - oil-free

Handling in dry areas



#### Product Description

- > High reliability and low maintenance costs owing to simple design
- > Universal application: Continuous operation at different vacuum levels
- > Compact design and low weight

#### Ordering notes

- > Available in single-phase and three-phase designs (Index -1 or -3)
- > Included in scope of delivery:
  - Silencer on suction side
  - DT.3C-1: Thermal protection 130 °C
  - DT.6, DT.10: Safety filter on suction side
- > Delivery without electric cables

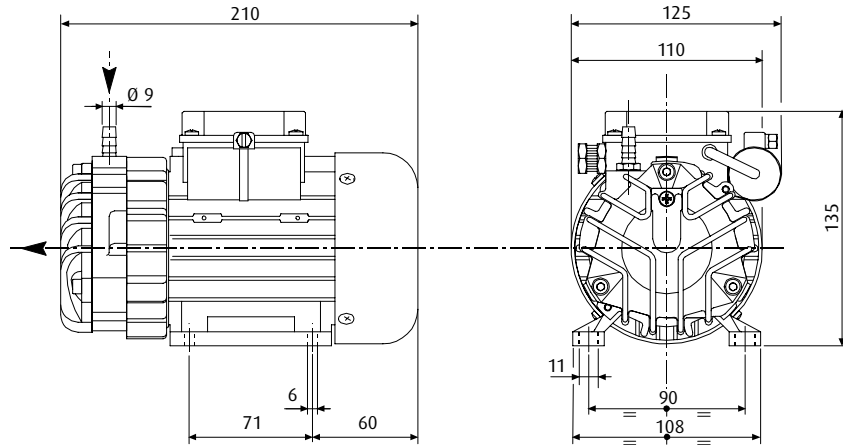
#### Technical data

Item no.	DT.3A-1	DT.3A-3	DT.6B-1	DT.6B-3	DT.10B-1	DT.10B-3
Suction power at 50 Hz [m <sup>3</sup> /h]	3	3	6	6	10	10
Suction power at 60 Hz [m <sup>3</sup> /h]	3.3	3.3	7	7	12	12
Final vacuum [%]	88	88	88	88	88	88
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)
Current consumption at 50 (60) Hz [A]	1 (1.1)	Delta: 0.7-0.8 (0.7) Star: 0.4-0.46 (0.38-0.42)	2.3 (2.5)	Delta: 1.4-1.5 (1.5-1.4) Star: 0.8-0.86 (0.86-0.8)	2.9 (2.7)	Delta: 1.8-2.3 (1.6-2.3) Star: 1-1.3 (0.9-1.3)
Rated power at 50 Hz [kW]	0.12	0.12	0.25	0.25	0.37	0.37
Rated power at 60 Hz [kW]	0.15	0.14	0.3	0.3	0.45	0.45
Noise level at 50 Hz [dB(A)]	62	62	60	60	64	64
Noise level at 60 Hz [dB(A)]	65	65	65	65	66	66
Operating temperature at 50 Hz [°C]	65 - 70	65 - 70	65 - 70	65 - 70	70 - 75	70 - 75
Operating temperature at 60 Hz [°C]	70 - 75	70 - 75	70 - 75	70 - 75	80 - 85	80 - 85
Weight [kg]	5	5	8.5	7.5	15.5	14
Suitable accessories	Spare part kit KIT-DT.3A* Vacuum regulator 73.002 (p.640) Pre-filter FC 10F (p.624) Pre-filter 71.032 (p.625)		Spare part kit KIT-DT.6B** Vacuum regulator 73.002 (p.640) Pre-filter FC 10F (p.624) Pre-filter 71.032 (p.625)		Spare part kit KIT-DT.10B*** Vacuum regulator 73.002 (p.640) Pre-filter FC 20F (p.624) Pre-filter 71.034 (p.625)	

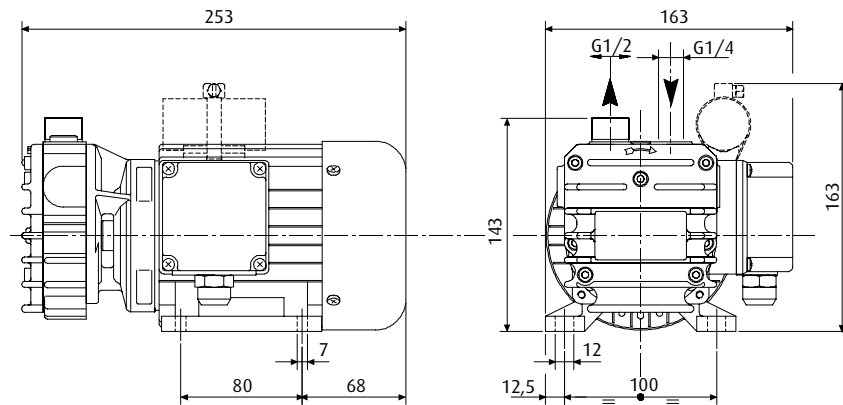




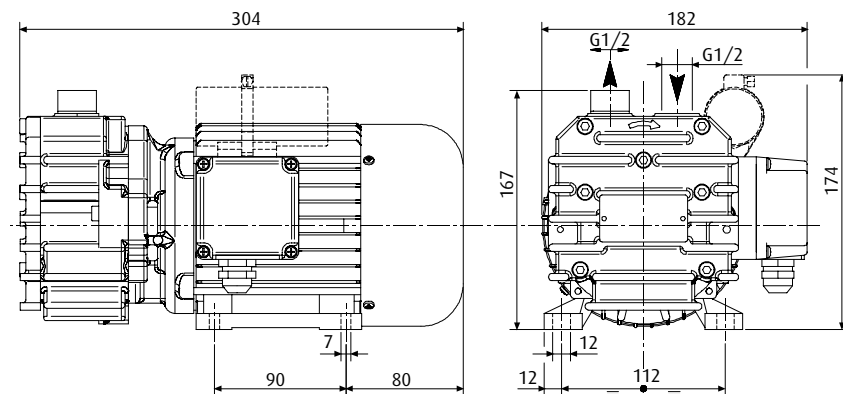
### Dimensions



DT.3A-1 | DT.3A-3



DT.6B-1 | DT.6B-3



DT.10B-1 | DT.10B-3

\* = 3 vanes, rotor    \*\* = 4 vanes, rotor    \*\*\* = 6 vanes, rotor

Continued on the next page →

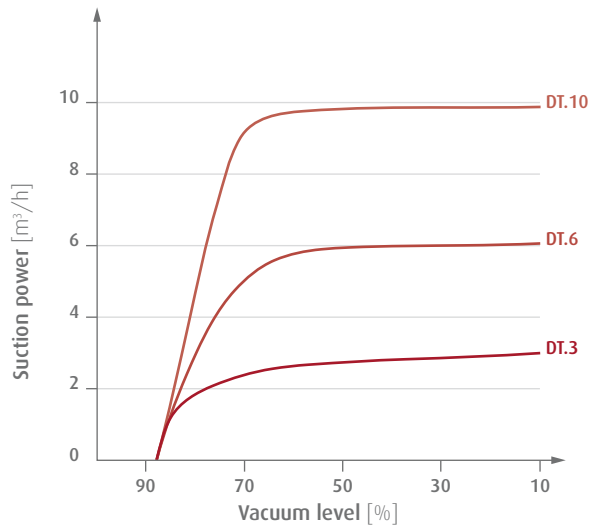


# Vacuum generation | Oil-free vacuum pumps

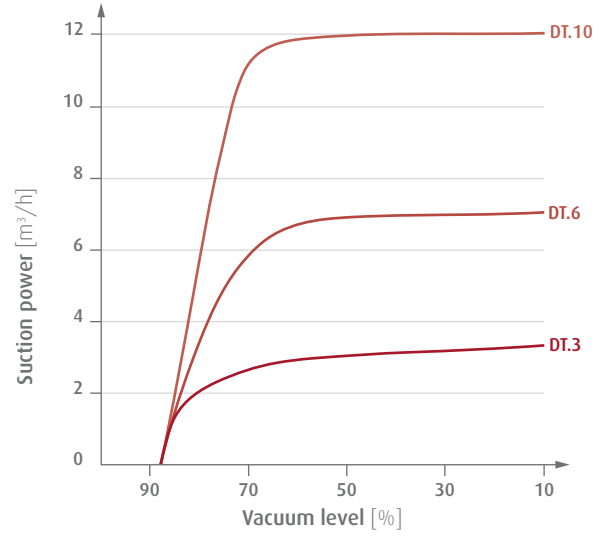
Rotary vane vacuum pumps - oil-free

## Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz





### Rotary vane vacuum pumps - oil-free

Handling in dry areas



#### Product Description

- > High reliability and low maintenance costs owing to simple design
- > Universal application: Continuous operation at different vacuum levels
- > Cooling with powerful fan at the rear of the motor
- > Compact design and low weight

#### Ordering notes

- > Available in single-phase and three-phase designs (Index -1 or -3)
- > Included in scope of delivery:
  - Safety filter on suction side
  - Silencer on pressure side
- > Electric cables not included

#### Technical data

Item no.	DT.16B-1	DT.16B-3	DT.25B-1	DT.25B-3	DT.40B-1	DT.40B-3
Suction power at 50 Hz [m <sup>3</sup> /h]	16	16	25	25	40	40
Suction power at 60 Hz [m <sup>3</sup> /h]	19	19	29	29	46	46
Final vacuum [%]	88	88	88	88	88	88
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 220-255 220-266 Star: 380-440 (380-460)	220 - 240	Delta: 220-255 220-266 Star: 380-440 (380-460)	220 - 240	Delta: 220-255 220-266 Star: 380-440 (380-460)
Current consumption at 50 (60) Hz [A]	5.6 (5)	Delta: 2,8-3 (3.8-3.2) Star: 1.6-1.7 (2.2-1.8)	5.8 (6.2)	Delta: 3.8-4.2 (4.4-4.2) Star: 2.2-2.4 (2.5-2.4)	9.8 (9)	Delta: 7 (7.1-7) Star: 4 (4.1-4.0)
Rated power at 50 Hz [kW]	0.66	0.55	0.75	0.75	1.5	1.5
Rated power at 60 Hz [kW]	0.72	0.66	0.9	0.9	1.8	1.8
Noise level at 50 Hz [dB(A)]	63	63	65	65	68	68
Noise level at 60 Hz [dB(A)]	65	65	67	67	70	70
Operating temperature at 50 Hz [°C]	55 - 60	55 - 60	65 - 70	65 - 70	75 - 80	75 - 80
Operating temperature at 60 Hz [°C]	60 - 65	60 - 65	70 - 75	70 - 75	80 - 85	80 - 85
Weight [kg]	29.5	27.5	29	28.5	40	37.5
Suitable accessories	Spare part kit KIT-DT.16B* Vacuum regulator 73.002 (p.640) Pre-filter FC 20F (p.624)		Spare part kit KIT-DT.25B* Vacuum regulator 73.003 (p.640) Pre-filter FC 25F (p.624)		Spare part kit KIT-DT.40B* Vacuum regulator 73.003 (p.640) Pre-filter FC 30F (p.624)	

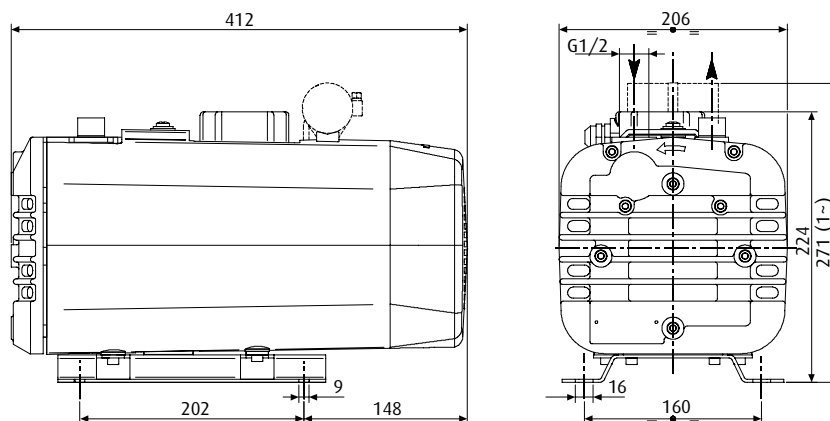
Continued on the next page →



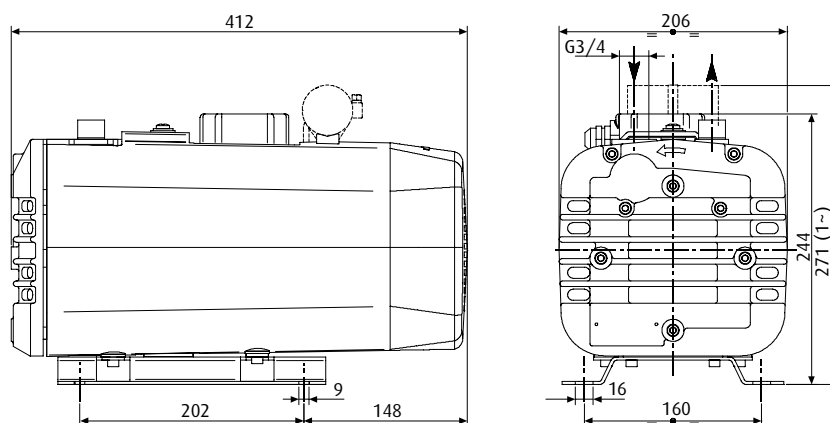
# Vacuum generation | Oil-free vacuum pumps

Rotary vane vacuum pumps - oil-free

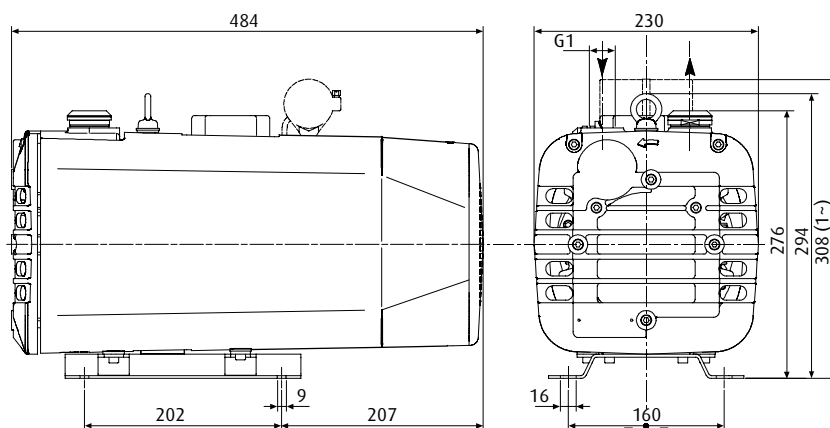
## Dimensions



DT.16B-1 | DT.16B-3



DT.25B-1 | DT.25B-3



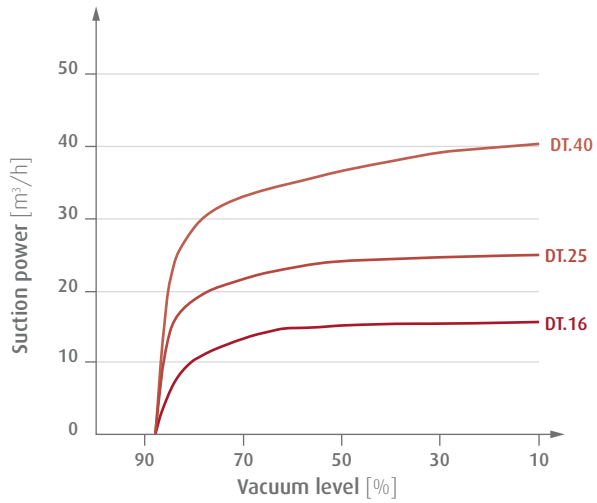
DT.40B-1 | DT.40B-3

\* = 4 vanes, filter cartridge

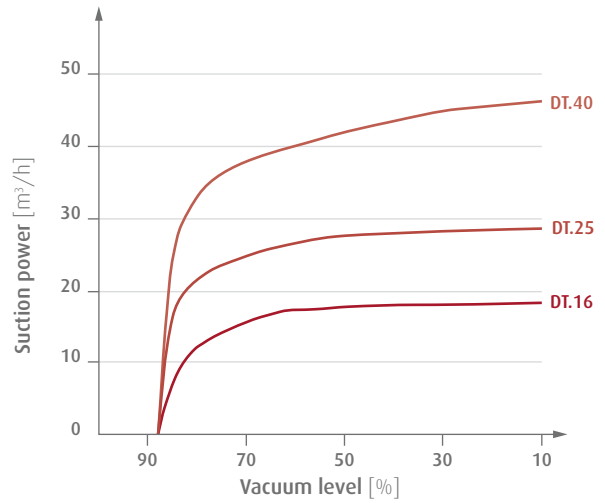


## Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz





### Rotary vane vacuum pumps - oil-free

Handling in dry areas



#### Product Description

- > High reliability and low maintenance costs owing to simple design
- > Universal application: Continuous operation at different vacuum levels
- > Compact design due to robust protective housing that also reduces the sound level
- > DT.60C-3: Universal motor according to IE class 2 with wide voltage spectrum for worldwide use

#### Ordering notes

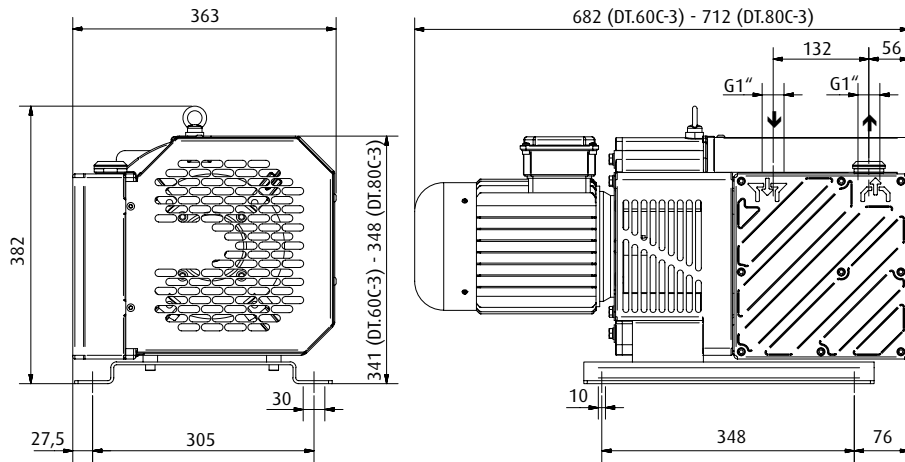
- > Included in scope of delivery:
  - Safety filter on suction side
  - Silencer on pressure side
- > Electric cables not included

#### Technical data

Item no.	DT.60C-3	DT.80C-3
Suction power at 50 Hz [m <sup>3</sup> /h]	60	80
Suction power at 60 Hz [m <sup>3</sup> /h]	70	90
Final vacuum [%]	88	88
Power supply at 50 (60) Hz [V]	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	Delta: 5.91 (5.6) Star: 3.4 (3.23)	Delta: 8.8 (9) Star: 5.1 (5.2)
Rated power at 50 Hz [kW]	1.5	2.2
Rated power at 60 Hz [kW]	1.8	2.7
Noise level at 50 Hz [dB(A)]	70	72
Noise level at 60 Hz [dB(A)]	72	74
Operating temperature at 50 Hz [°C]	70 - 73	72 - 78
Operating temperature at 60 Hz [°C]	72 - 75	75 - 80
Weight [kg]	66	71
Suitable accessories	Spare part kit KIT-DT.60C Silencer 72.003 (p.578) Pre-filter FC 30F (p.624)	Spare part kit KIT-DT.80C Silencer 72.003 (p.578) Pre-filter FC 35F (p.624)

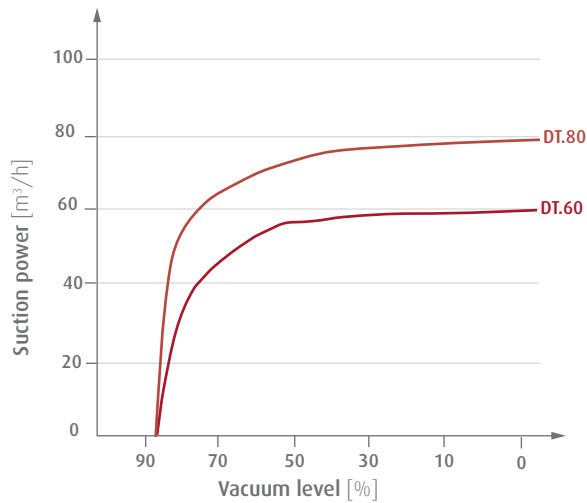


### Dimensions

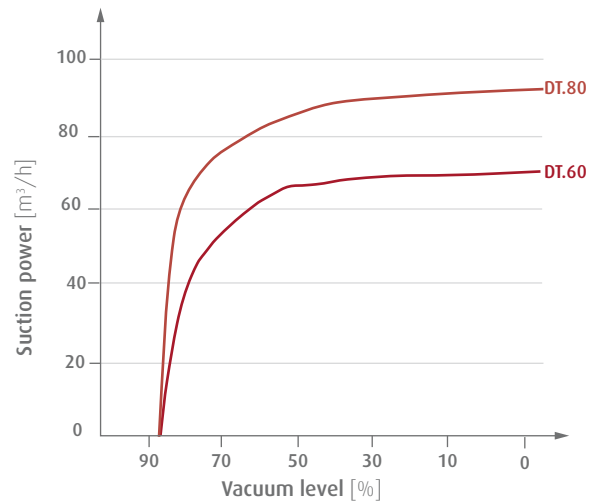


### Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz





### Rotary vane vacuum pumps - oil-free

Handling in dry areas



#### Product Description

- > High reliability and low maintenance costs owing to simple assembly
- > Universal application: Continuous operation at different vacuum levels
- > Compact design due to robust protective housing that also reduces the sound level
- > Universal motor according to IE class 2 with wide voltage spectrum for worldwide use

#### Ordering notes

- > Included in scope of delivery:
  - Safety filter on suction side
  - Silencer on pressure side
- > Electric cables not included

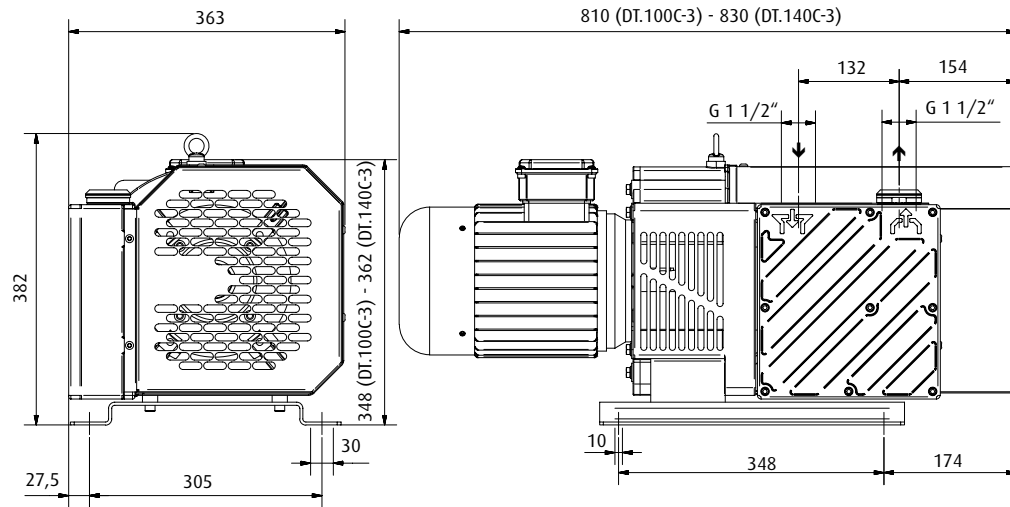
#### Technical data

Item no.	DT.100C-3	DT.140C-3
Suction power at 50 Hz [m <sup>3</sup> /h]	100	130
Suction power at 60 Hz [m <sup>3</sup> /h]	115	150
Final vacuum [%]	88	88
Power supply at 50 (60) Hz [V]	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	Delta: 11.8 (11.4) Star: 6.8 (6.6)	Delta: 14.7 (13.5) Star: 8.5 (7.8)
Rated power at 50 Hz [kW]	3	4
Rated power at 60 Hz [kW]	3.6	4.8
Noise level at 50 Hz [dB(A)]	75	76
Noise level at 60 Hz [dB(A)]	77	78
Operating temperature at 50 Hz [°C]	78 - 82	80 - 83
Operating temperature at 60 Hz [°C]	80 - 85	85 - 90
Weight [kg]	87	95
Suitable accessories	Spare part kit KIT-DT.100C Pre-filter FC 40F (p.624)	Spare part kit KIT-DT.140C Pre-filter FC 50F (p.624)



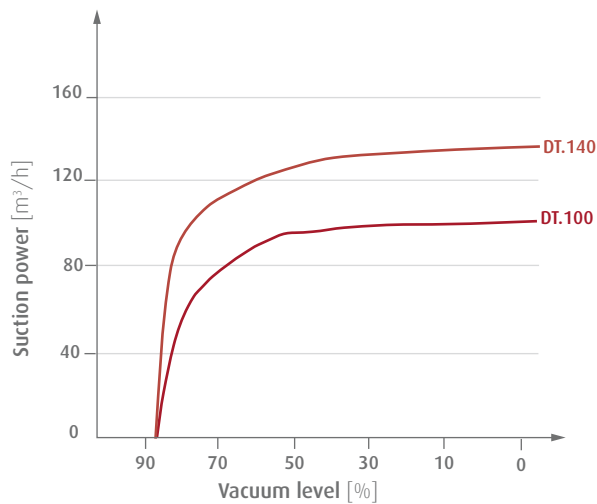


## Dimensions

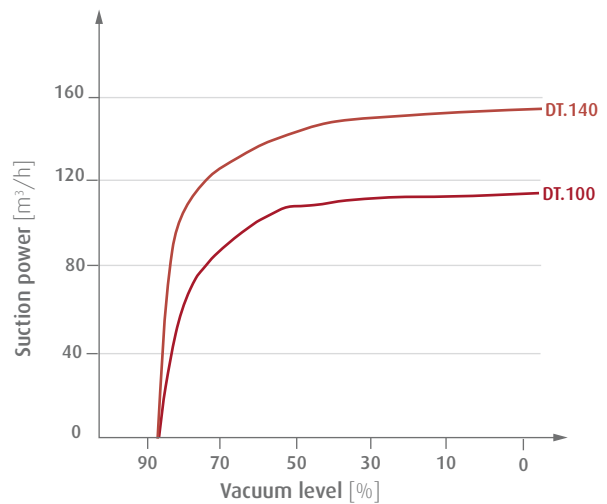


## Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz





### Piston pumps



#### Product Description

- > High volume flow and high vacuum level at low installation space
- > Can also be used as compressor
- > Low-vibration operation
- > Robust design
- > Long service life and maintenance-free operation due to permanently lubricated piston seals
- > Suitable for dry and moist air

#### Notes

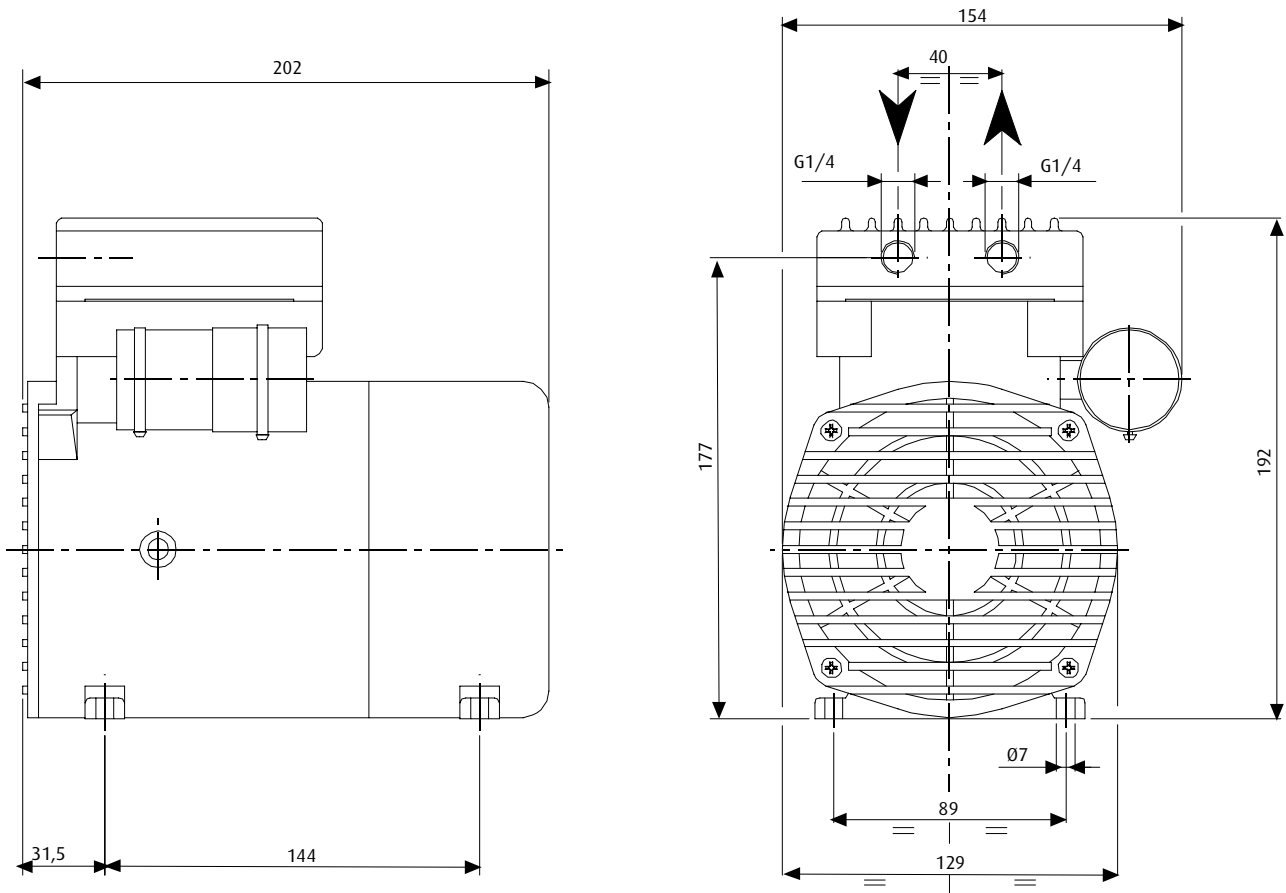
- > A 3/2-way valve must be installed at the inlet in case of pressure-vacuum alternating operation

#### Technical data

<b>Item no.</b>	<b>KE.1.9A-1</b>
Suction power at 50 Hz [m <sup>3</sup> /h]	1.9
Suction power at 60 Hz [m <sup>3</sup> /h]	2.2
Final vacuum [%]	89
Power supply [V]	220 - 240
Rated power at 50 Hz [kW]	0.2
Noise level at 50 Hz [dB(A)]	50
Noise level at 60 Hz [dB(A)]	52
Operating temperature [°C]	40 - 45
Weight [kg]	7.1
Suitable Pre-filters	FB 5 (p.626)

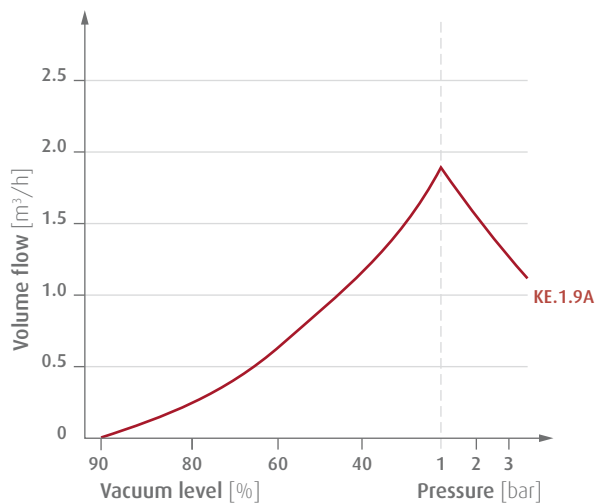


Dimensions



Diagrams

> Volume flow against pressure





### Rotary vane vacuum pumps - oil-lubricated



#### Product Description

- > Very high final vacuum level
- > Drives with multi-range voltages
- > Especially suited for the evacuation of small closed containers
- > Efficient damping and oil recovery system prevents oil mist and reduces sound level
- > Compact and lightweight design for low space requirements or installation on moving devices (sufficient ventilation needs to be ensured)
- > Pump is cooled via mounting fan
- > Horizontal mounting position

#### Notes

- > Continuous operation only under full load (min. 99.8 % vacuum), otherwise, risk of oil discharge, no gas ballast
- > For operation under moist conditions please consult FIPA

#### Ordering notes

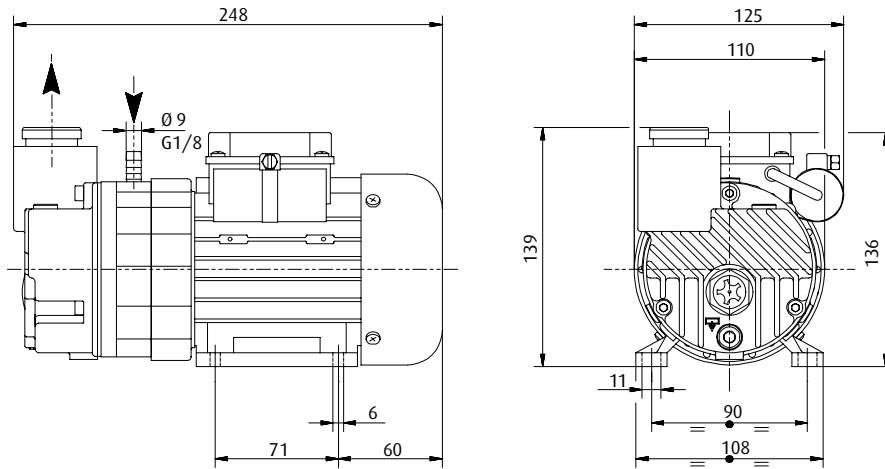
- > Available in single-phase and three-phase designs (Index -1 to -3)
- > Included in scope of delivery: Condensate exhaust filter oil SW 40, thermal protection 130 °C (with single-phase motor)

#### Technical data

Item no.	DO.3B-1	DO.3B-3	DO.4B-1	DO.4B-3
Suction power at 50 Hz [m <sup>3</sup> /h]	3	3	4	4
Suction power at 60 Hz [m <sup>3</sup> /h]	3.2	3.2	4.4	4.4
Final vacuum [%]	99.8	99.8	99.8	99.8
Power supply +/- 5 % at 50 Hz [V]	220 - 240	Delta: 220-255 Star: 380-440	220 - 240	Delta: 220-255 Star: 380-440
Power supply +/- 5 % at 60 Hz [V]	220 - 240	Delta: 220-266 Star: 380-460	220 - 240	Delta: 220-266 Star: 380-460
Current consumption at 50 Hz [A]	1	Delta: 0.7-0.8 Star: 0.4-0.46	1	Delta: 0.7-0.8 Star: 0.4-0.46
Current consumption at 60 Hz [A]	1.1	Delta: 0.7 Star: 0.38-0.42	1.1	Delta: 0.7 Star: 0.38-0.42
Rated power at 50 (60) Hz [kW]	0.12 (0.15)	0.12 (0.14)	0.12 (0.15)	0.12 (0.14)
Noise level at 50 Hz [dB(A)]	56	56	57	57
Noise level at 60 Hz [dB(A)]	58	58	59	59
Operating temperature at 50 Hz [°C]	60 - 65	60 - 65	60 - 65	60 - 65
Operating temperature at 60 Hz [°C]	65 - 70	65 - 70	65 - 70	65 - 70
Weight [kg]	5.4	5.4	5.4	5.4
Suitable accessories	Spare part kit KIT-DO.3B/K*** Spare part kit KIT-DO.3B/G* Pre-filter FB 5 (p.626)		Spare part kit KIT-DO.4B/K*** Spare part kit KIT-DO.4B/G** Pre-filter FB 5 (p.626)	



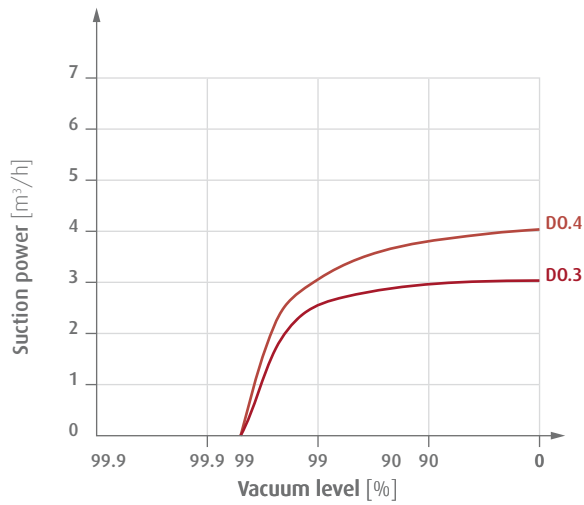
### Dimensions



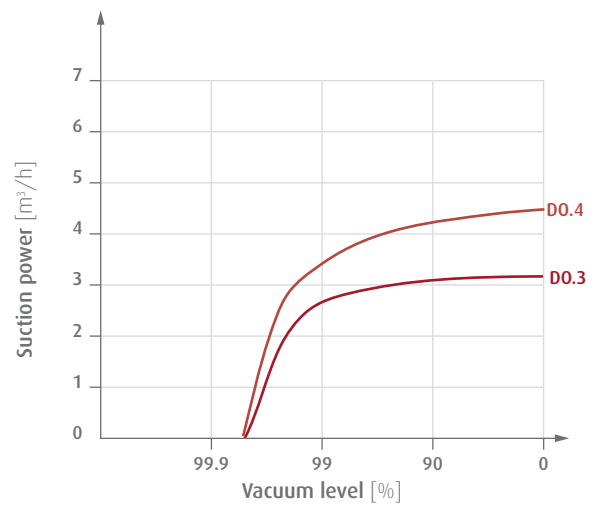
- \* = 6 x vanes, FKM O-Rings, oil recirculation valve, oil mist separator, filter
- \*\* = 6 x vanes, FKM O-Rings, seal, oil recirculation valve, oil mist separator, filter
- \*\*\* = Oil mist separator, rubber washer, follower, 1 x filter cartridge, 1 x O-ring FKM

### Diagrams

> Suction power against vacuum level at 50 Hz

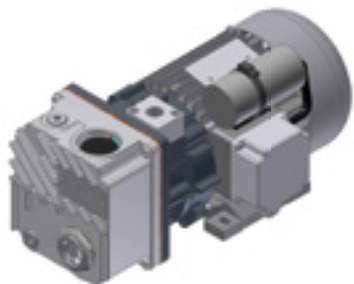


> Suction power against vacuum level at 60 Hz





### Rotary vane vacuum pumps - oil-lubricated



#### Product Description

- > Very high final vacuum level
- > Suitable for moist environments
- > Effective damping and recovery system prevents oil mist and reduces sound level
- > Innovative sealing system prevents oil recirculation at standstill under vacuum
- > Compact design and low weight
- > Horizontal mounting position

#### Notes

- > Designed for continuous operation under vacuum levels of 60 % to 99 %, integrated gas ballast, water vapor tolerance

#### Ordering notes

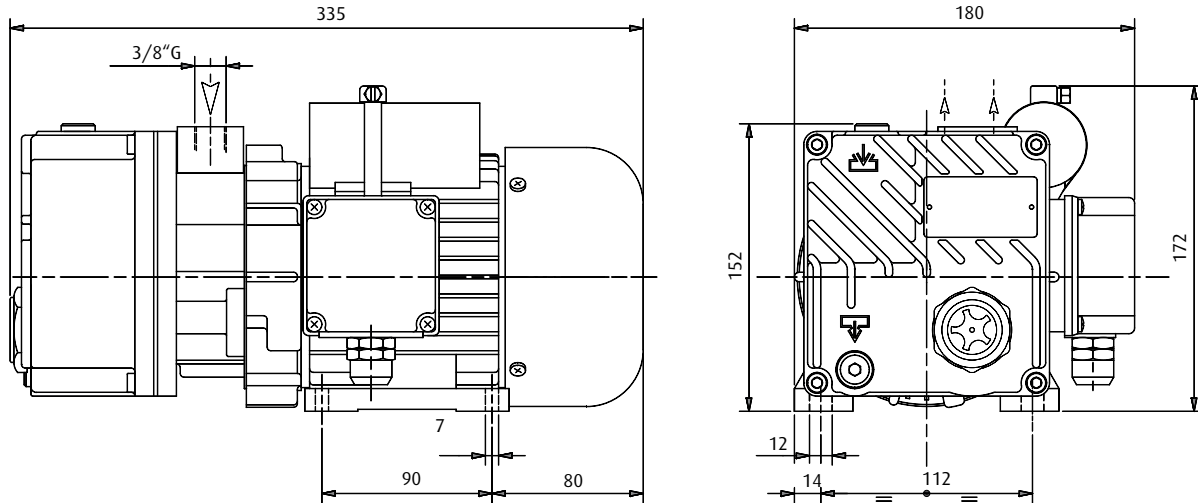
- > Available in single-phase and three-phase designs (Index -1 to -3)
- > Included in scope of delivery: Condensate exhaust filter, gas ballast, oil SW 60, oil non-return valve

#### Technical data

Item no.	DO.5B-1	DO.5B-3
Suction power at 50 Hz [m <sup>3</sup> /h]	5	5
Suction power at 60 Hz [m <sup>3</sup> /h]	6	6
Final vacuum [%]	99	99
Gas ballast	Yes	Yes
Max. inlet pressure for water vapour [mbar]	30	30
Steam capacity [l/h]	0.11	0.11
Check valve	Yes	Yes
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)
Current consumption at 50 (60) Hz [A]	1.7 - 2.1	Delta: 1.8-2.3 (1.6-2.3) Star: 1-1.3 (0.9-1.3)
Rated power at 50 (60) Hz [kW]	0.25 (0.25)	0.37 (0.45)
Noise level at 50 (60) Hz [dB(A)]	58 (60)	58 (60)
Operating temperature [°C]	65 - 75	65 - 75
Weight [kg]	13	11.5
Suitable Spare-part-kits	KIT-DO.5B/G** KIT-DO.5B/K*	KIT-DO.5B/G** KIT-DO.5B/K*



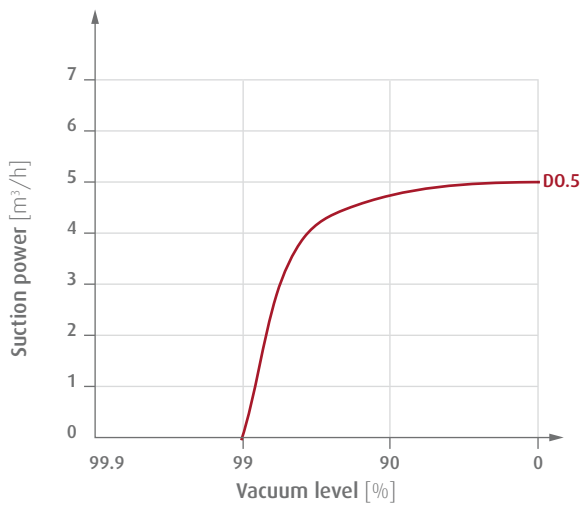
### Dimensions



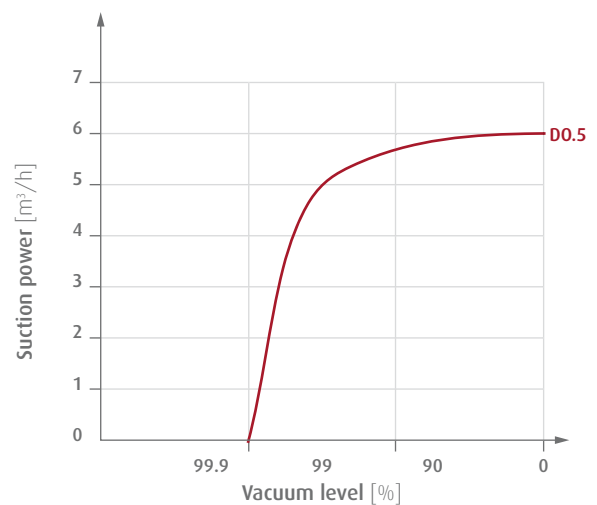
\* = O-Ring 121 FKM, filter element \*\* = Shaft seal, 2 x O-Ring 3300 NBR, 3 x vanes, 2 x ejector, inlet shield, inlet rubber NBR, filter disk, NBR rubber for exhaust valve, 3 x copper washer, O-Ring 121 FKM, filter element, gasket, sintered filter G1/8

### Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz





### Rotary vane vacuum pumps - oil-lubricated



#### Product Description

- > Very high final vacuum level
- > Effective damping and recovery system prevents oil mist and reduces sound level
- > Innovative sealing system prevents oil recirculation at standstill under vacuum
- > Compact design and low weight
- > Horizontal mounting position

#### Notes

- > DO.8: Continuous operation only under full load (min. 99.8 % vacuum), otherwise, risk of oil discharge, no gas ballast
- > DO.8: For operation under moist conditions please consult FIPA
- > DO.12: Designed for continuous operation for vacuum levels between 60 and 99.9 %, gas ballast available, can tolerate water vapor

#### Ordering notes

- > Available in single-phase and three-phase designs (Index -1 or -3)
- > Included in scope of delivery: Condensate exhaust filter, gas ballast (with DO.12C-3), oil SW 40, oil non-return valve

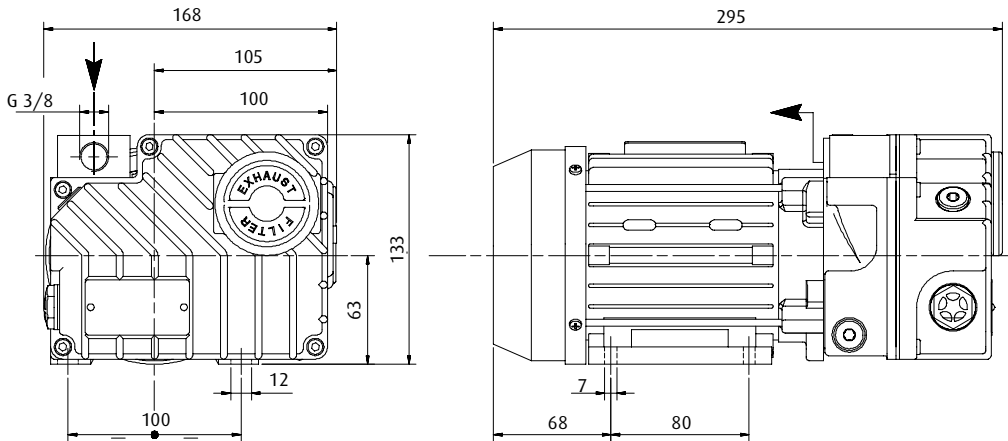
#### Technical data

Item no.	DO.8B-1	DO.8B-3	DO.12C-1	DO.12C-3
Suction power at 50 Hz [m <sup>3</sup> /h]	8	8	12	12
Suction power at 60 Hz [m <sup>3</sup> /h]	9	9	14	14
Final vacuum [%]	99.8	99.8	99.8	99.8
Gas ballast	--	--	Yes	Yes
Max. inlet pressure for water vapour [mbar]	--	--	40	40
Steam capacity [l/h]	--	--	0.3	0.3
Check valve	Yes	Yes	Yes	Yes
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)	220 - 240	Delta: 220-255 (220-266) Star: 380-440 (380-460)
Current consumption at 50 (60) Hz [A]	2.3 (2.5)	Delta: 1.4-1.5 (1.5-1.4) Star: 0.8-0.86 (0.86-0.8)	3-3.6 (3.3-3.1)	Delta: 1.4-1.5 (1.5-1.4) Star: 0.8-0.86 (0.86-0.8)
Rated power at 50 (60) Hz [kW]	0.37 (0.45)	0.25 (0.3)	0.45 (0.55)	0.37 (0.45)
Noise level at 50 (60) Hz [dB(A)]	58 (60)	58 (60)	60 (62)	60 (62)
Operating temperature [°C]	65 - 75	65 - 75	65 - 75	65 - 75
Weight [kg]	10	9	14	12.5
Suitable accessories	Spare part kit KIT-DO.8B/G** Spare part kit KIT-DO.8B/K* Pre-filter FB 10 (p.626)	Spare part kit KIT-DO.8B/G** Spare part kit KIT-DO.8B/K* Pre-filter FB 10 (p.626)	Spare part kit KIT-DO.12C/G**** Spare part kit KIT-DO.12C/K*** Pre-filter FB 20 (p.626)	Spare part kit KIT-DO.12C/G**** Spare part kit KIT-DO.12C/K*** Pre-filter FB 20 (p.626)

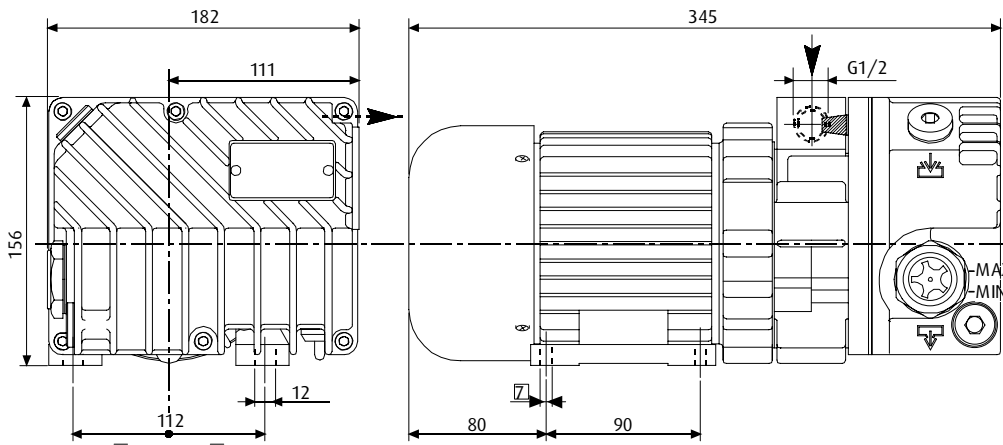




### Dimensions



DO.8B-1 | DO.8B-3

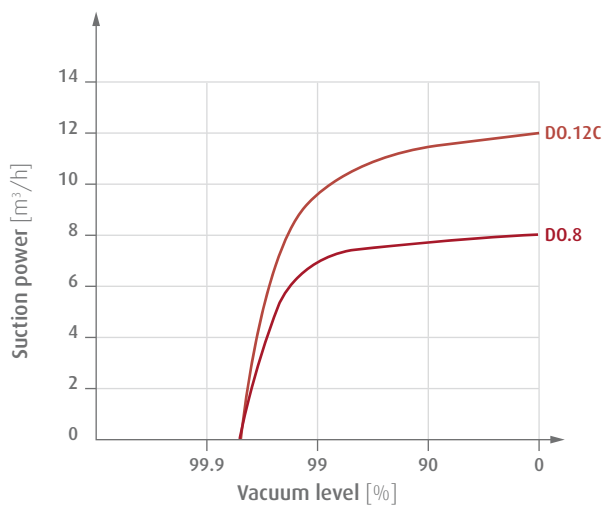


DO.12C-1 | DO.12C-3

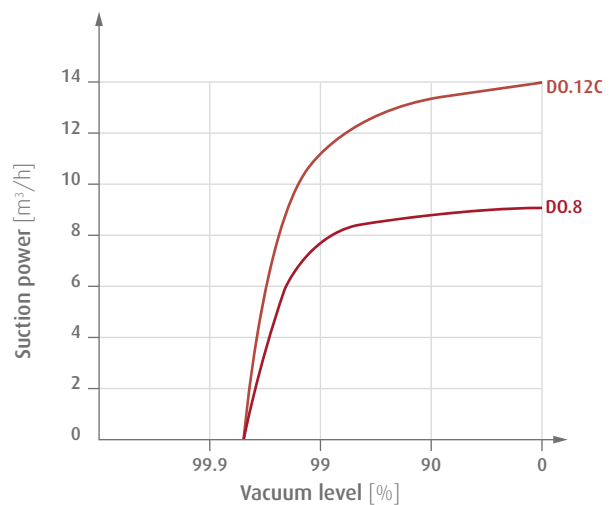
\* = FKM O-Rings, outlet filter    \*\* = 3 vanes, FKM-O rings, seal, valve, inlet and outlet filter, oil recirculation valve  
 \*\*\* = FKM O-rings, oil mist separator    \*\*\*\* = 3 vanes, FKM o-rings, seal, filter, oil mist separator, spring

### Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz





### Rotary vane vacuum pumps - oil-lubricated



#### Product Description

- > Very high level of final vacuum
- > Suitable for moist environments
- > Effective damping and recovery system prevents oil mist and reduces sound level
- > Innovative sealing system prevents oil recirculation at standstill under vacuum
- > DO.20C-3 und DO.25C-3: Universal motor according to IE class 2 with wide voltage spectrum for worldwide use
- > Horizontal mounting position

#### Notes

- > DO.20: Designed for continuous operation for vacuum level between 60 % and 99.8 %, gas ballast available, can tolerate water vapor
- > DO.25: Designed for continuous operation for vacuum level between 60 % and 99.95 %, gas ballast available, can tolerate water vapor

#### Ordering notes

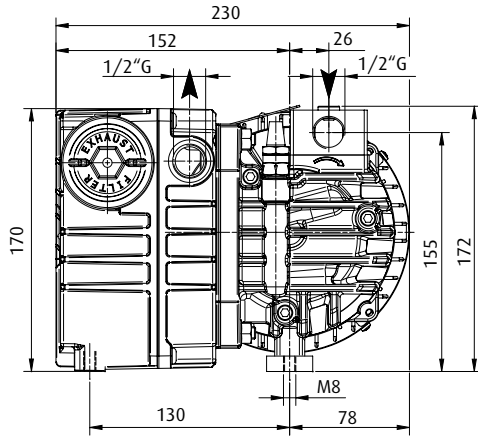
- > Available in single-phase and three-phase designs (Index -1 or -3)
- > Included in scope of delivery: Gas ballast, oil non-return valve, oil SW 40 (with DO.20), oil SW 60 (with DO.25)

#### Technical data

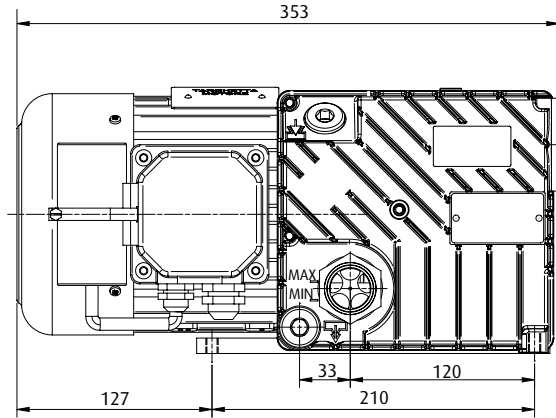
Item no.	DO.20C-1	DO.20C-3	DO.25C-1	DO.25C-3
Suction power at 50 Hz [m <sup>3</sup> /h]	20	20	25	25
Suction power at 60 Hz [m <sup>3</sup> /h]	24	24	29	29
Final vacuum [%]	99.8	99.8	99.95	99.95
Gas ballast	Yes	Yes	Yes	Yes
Max. inlet pressure for water vapour [mbar]	15	15	40	40
Steam capacity [l/h]	0.25	0.25	0.7	0.7
Check valve	Yes	Yes	Yes	Yes
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 175-260 (200-300) Star: 300-450 (346-520)	220 - 240	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	4-4.1 (5.7-5.6)	Delta: 3.4-3.3 (4.1-3.3) Star: 2.0-1.9 (2.4-1.9)	3 (3)	Delta: 3.0 (3.0) Star: 1.7 (1.7)
Rated power at 50 (60) Hz [kW]	0.75 (0.90)	0.75 (0.90)	0.75 (0.90)	0.75 (0.90)
Noise level at 50 (60) Hz [dB(A)]	64 (67)	64 (67)	62 (65)	62 (65)
Operating temperature [°C]	60 - 70	60 - 70	80 - 90	80 - 90
Weight [kg]	19	17	26	25
Suitable accessories	Spare part kit KIT-DO.20C/G** Spare part kit KIT-DO.20C/K* Pre-filter FB 20 (p.626)		Spare part kit KIT-DO.25C/G**** Spare part kit KIT-DO.25C/K*** Pre-filter FB 25 (p.626)	



### Dimensions



DO.20C-1 | DO.20C-3

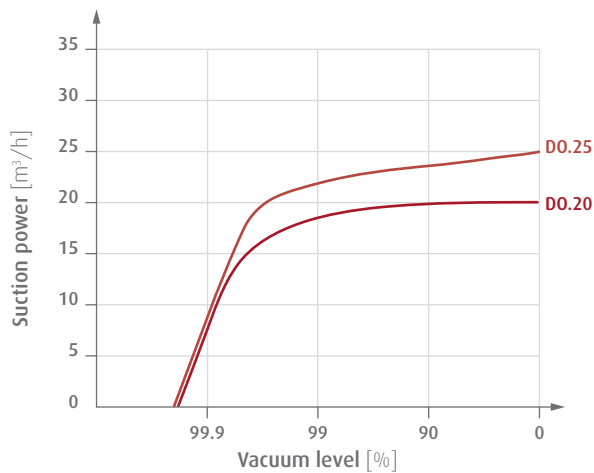


DO.25C-1 | DO.25C-3

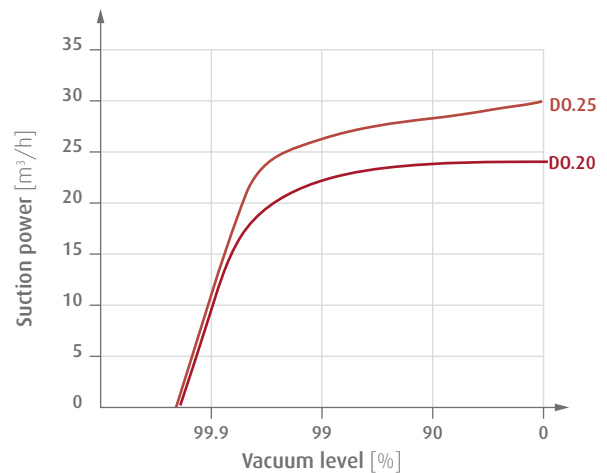
\* = FKM O-rings, oil mist separator    \*\* = 3 x vanes, FKM O-rings, valve, filter, copper washer G1/8"    \*\*\* = FKM and NBR O-rings, outlet filter  
 \*\*\*\* = 2x FKM shaft seals, FKM O-rings, filter, valve, 3 vanes

### Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz





### Rotary vane vacuum pumps - oil-lubricated



#### Product Description

- > Very high level of final vacuum
- > Suitable for moist environments
- > Effective damping and recovery system with by-pass and novel float valve guarantees oil-free exhaust air
- > Innovative sealing system prevents oil recirculation at standstill under vacuum
- > DO.40B-3 und DO.60B-3: Universal motor according to IE class 2 with wide voltage spectrum for worldwide use
- > Horizontal mounting position

#### Notes

- > Designed for continuous operation for vacuum level between 60 % to 99,95 %, gas ballast available, can tolerate water vapor

#### Ordering notes

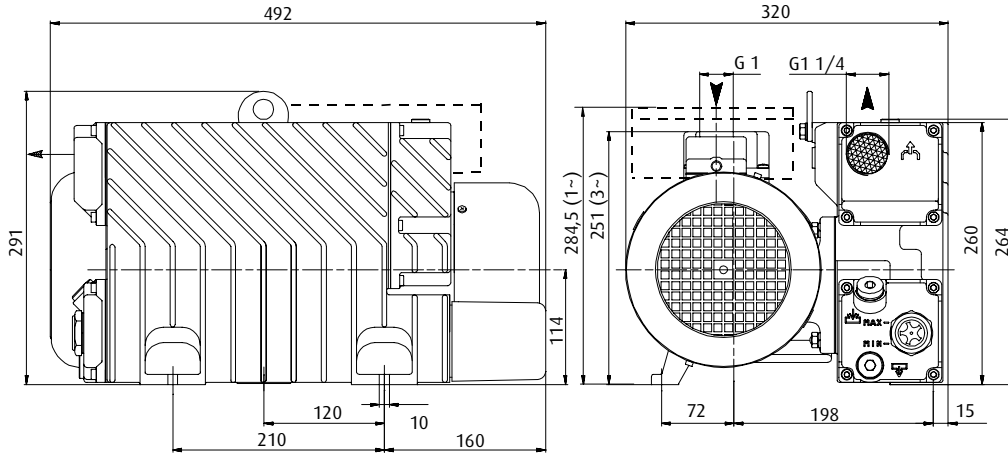
- > Available in single-phase and three-phase designs (Index -1 or -3)
- > Included in scope of delivery: Condensate exhaust filter, gas ballast, oil SW 60, oil non-return valve

#### Technical data

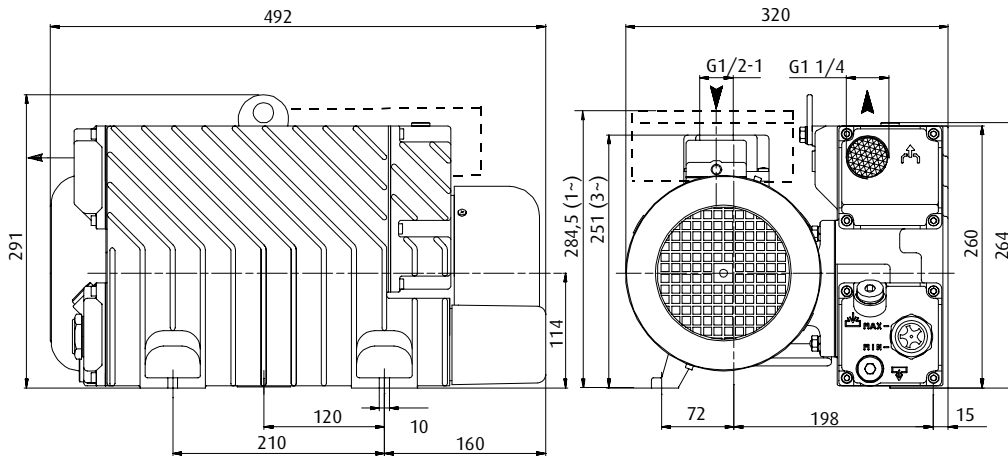
Item no.	DO.40B-1	DO.40B-3	DO.60B-1	DO.60B-3
Suction power at 50 Hz [m <sup>3</sup> /h]	40	40	60	60
Suction power at 60 Hz [m <sup>3</sup> /h]	48	48	72	72
Final vacuum [%]	99.95	99.95	99.95	99.95
Gas ballast	Yes	Yes	Yes	Yes
Max. inlet pressure for water vapour [mbar]	30	30	40	40
Steam capacity [l/h]	0.9	0.9	1.8	1.8
Check valve	Yes	Yes	Yes	Yes
Power supply at 50 (60) Hz [V]	220 - 240	Delta: 230 (265) Star: 400 (460)	220 - 240	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	4.1 (2.37)	Delta: 4.1 (4.3) Star: 2.37 (2,49)	5.76 (3.33)	Delta: 5.76 (5.72) Star: 3.33 (3.31)
Rated power at 50 (60) Hz [kW]	1.1 (1.35)	1.1 (1.35)	1.5 (1.8)	1.5 (1.8)
Noise level at 50 (60) Hz [dB(A)]	66 (68)	66 (68)	68 (70)	68 (70)
Operating temperature [°C]	70 - 80	70 - 80	75 - 85	75 - 85
Weight [kg]	49.5	43.5	50	44.5
Suitable accessories	Spare part kit KIT-DO.40B/G** Spare part kit KIT-DO.40B/k** Pre-filter FB 30 (p.626)		Spare part kit KIT-DO.60B/G** Spare part kit KIT-DO.60B/k** Pre-filter FB 30 (p.626)	



### Dimensions



DO.40B-1 | DO.40B-3

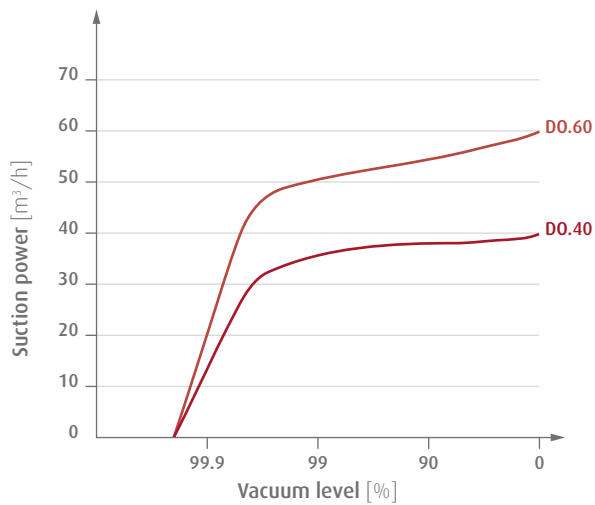


DO.60B-1 | DO.60B-3

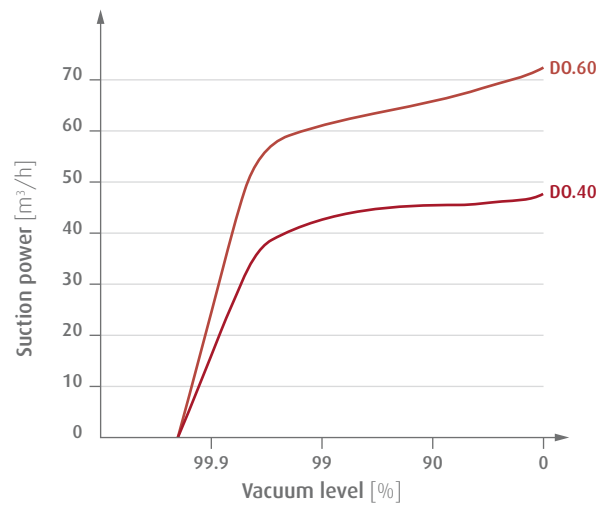
\* = Seal, Oil mist separator, Oil filter    \*\* = 2 x FKM shaft seals, FKM O-rings, seals, filter, 3 x vanes

### Diagrams

> Suction power against vacuum level at 50 Hz



> Suction power against vacuum level at 60 Hz





### Rotary vane vacuum pumps - oil-lubricated



#### Product Description

- > Very high final vacuum
- > Suitable for moist environments
- > Effective damping and recovery system with by-pass and novel float valve guarantees oil-free exhaust air
- > Innovative sealing system prevents oil recirculation at standstill under vacuum
- > Elastic motor coupling effectively absorbs shocks
- > Universal motor according to IE class 2 with wide voltage spectrum for worldwide use
- > Horizontal mounting position

#### Notes

- > Designed for continuous operation for vacuum level between 60 % to 99.95 %, gas ballast available, can tolerate water vapor

#### Ordering notes

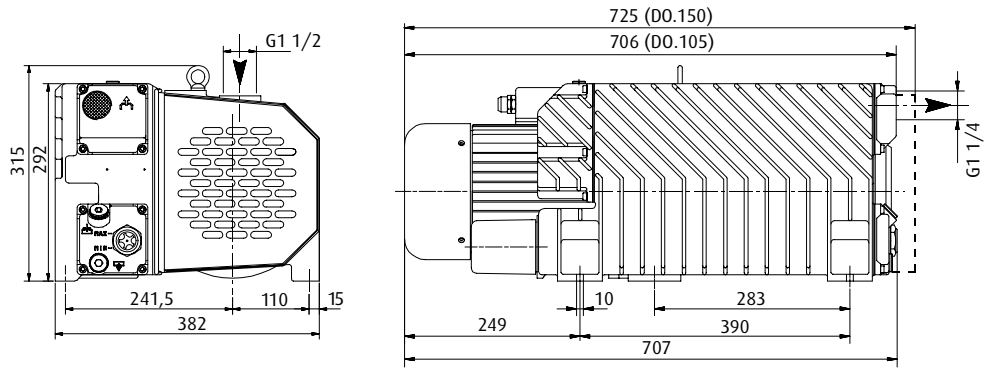
- > Scope of supply: Condensate exhaust filter, gas ballast, oil non-return valve, oil SW 100

#### Technical data

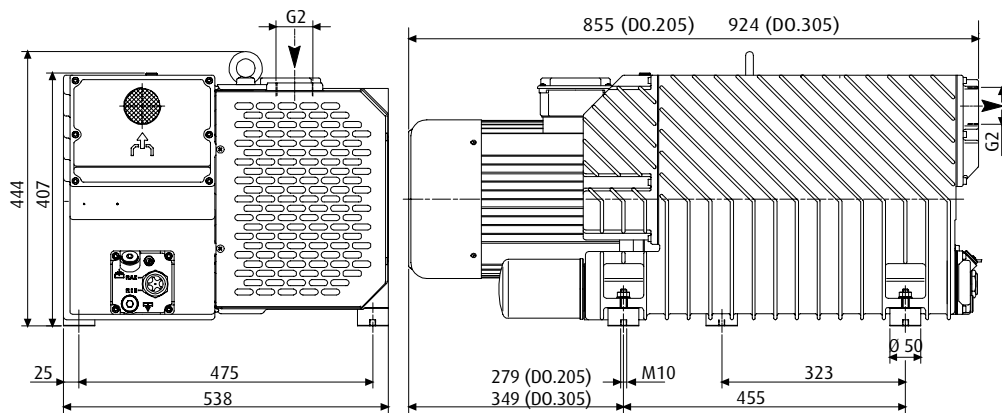
Item no.	DO.105C-3	DO.150C-3	DO.205C-3	DO.305C-3
Suction power at 50 Hz [m <sup>3</sup> /h]	105	150	205	305
Suction power at 60 Hz [m <sup>3</sup> /h]	125	180	245	365
Final vacuum [%]	99.95	99.95	99.95	99.95
Gas ballast	Yes	Yes	Yes	Yes
Max. inlet pressure for water vapour [mbar]	30	25	25	25
Steam capacity [l/h]	2.2	2.5	3.5	5
Check valve	Yes	Yes	Yes	Yes
Power supply at 50 (60) Hz [V]	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)	Delta: 230 (265) Star: 400 (460)
Current consumption at 50 (60) Hz [A]	Delta: 8.8 (9.0) Star: 5.1 (5.2)	Delta: 8.8 (9.0) Star: 5.1 (5.2)	Delta: 20 (20.3) Star: 11.6 (11.7)	Delta: 27.7 (26.8) Star: 16 (15.5)
Rated power at 50 (60) Hz [kW]	2.2 (2.7)	3 (3.6)	4 (4.8)	7.5 (8.6)
Noise level at 50 (60) Hz [dB(A)]	68 (70)	70 (72)	72 (74)	74 (76)
Operating temperature [°C]	75 - 85	75 - 85	70 - 80	75 - 85
Weight [kg]	70	82	154	164
Suitable accessories	Spare part kit KIT-DO.105C/K*** Spare part kit KIT-DO.105C/G* Pre-filter FB 40 (p.626)	Spare part kit KIT-DO.150C/K*** Spare part kit KIT-DO.150C/G* Pre-filter FB 50 (p.626) Pre-filter FB 60 (p.626)	Spare part kit KIT-DO.205C/K*** Spare part kit KIT-DO.205C/G** Pre-filter FB 50 (p.626) Pre-filter FB 60 (p.626)	Spare part kit KIT-DO.305C/K*** Spare part kit KIT-DO.305C/G** Pre-filter FB 60 (p.626)



### Dimensions



DO.105C-3 | DO.150C-3

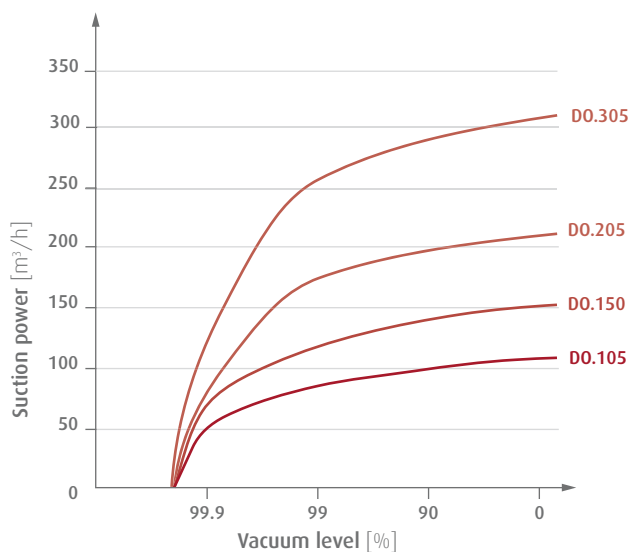


DO.205C-3 | DO.305C-3

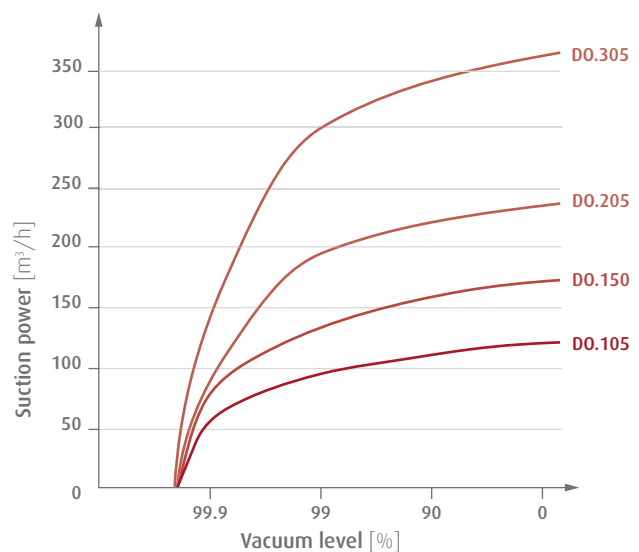
- \* = Rubber link, seals, 3 vanes, FKM shaft seal, FKM O-rings, oil filter with bypass
- \*\* = Rubber link, FKM and NBR O-rings, 3 x vanes, oil recirculation pipe, gas ballast pipe, filters, oil inspection glass
- \*\*\* = Oil filter with bypass valve, exhaust filter, gasket

### Diagrams

> Suction power against vacuum level at 50 Hz

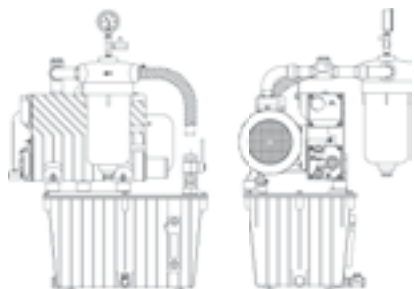


> Suction power against vacuum level at 60 Hz





### Portable vacuum units with condensate discharge for liquids



#### Product Description

- > Portable system for vacuum supply for i.e. suction cups or fixing tools
- > Specially developed for the extraction of non-aggressive liquids such as e.g. cooling lubricants in the glass, marble and CNC machine markets

#### Ordering notes

Included in scope of delivery:

- > Vacuum tank
- > Oil-lubricated vacuum pump
- > Vacuum gauge
- > Condensate trap filter
- > Non-return valve at the tank inlet to separate the pump for maintenance
- > Float level control for automatic discharge of the collected liquid
- > Condensate discharge
- > Non-return valve and gas ballast for trapping and discharge the condensed water from the oil at standstill

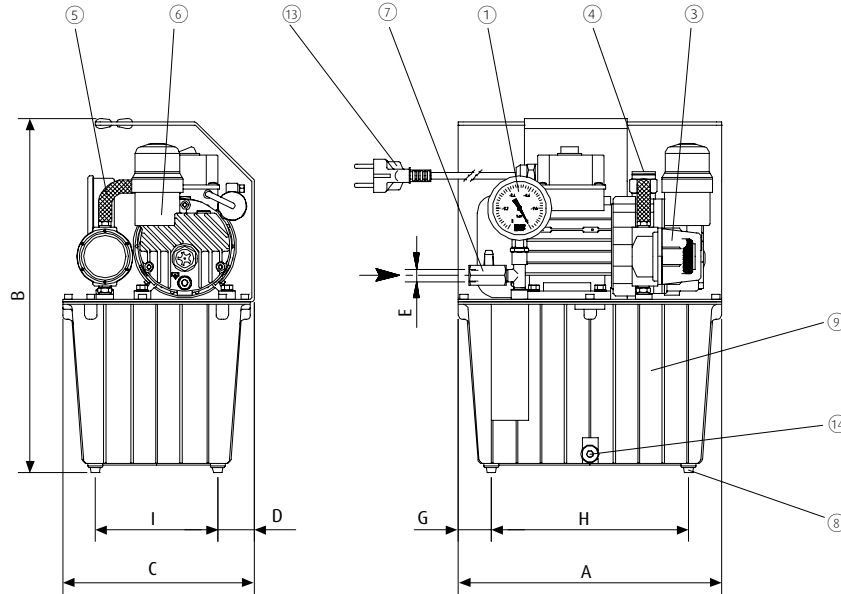
#### Technical data

Item no.	Safety tank volume of vacuum tank [l]	Suction power at 50 Hz [m <sup>3</sup> /h]	Suction power at 60 Hz [m <sup>3</sup> /h]	Final vacuum [%]	Rated power at 50 Hz [kW]	Rated power at 60 Hz [kW]	Weight [kg]
VZ.DO.4B-1/8L	8	4	4.4	99.8	0.12	0.15	11
VZ.DO.5B-1/25L	25	5	6	99	0.25	0.25	31
VZ.DO.25C-3/25L	25	25	29	99.5	0.75	0.9	55
VZ.DO.40C-3/25L	25	40	48	99.5	1.1	1.35	71
VZ.DO.60C-3/25L	25	60	75	99.5	1.5	1.8	72

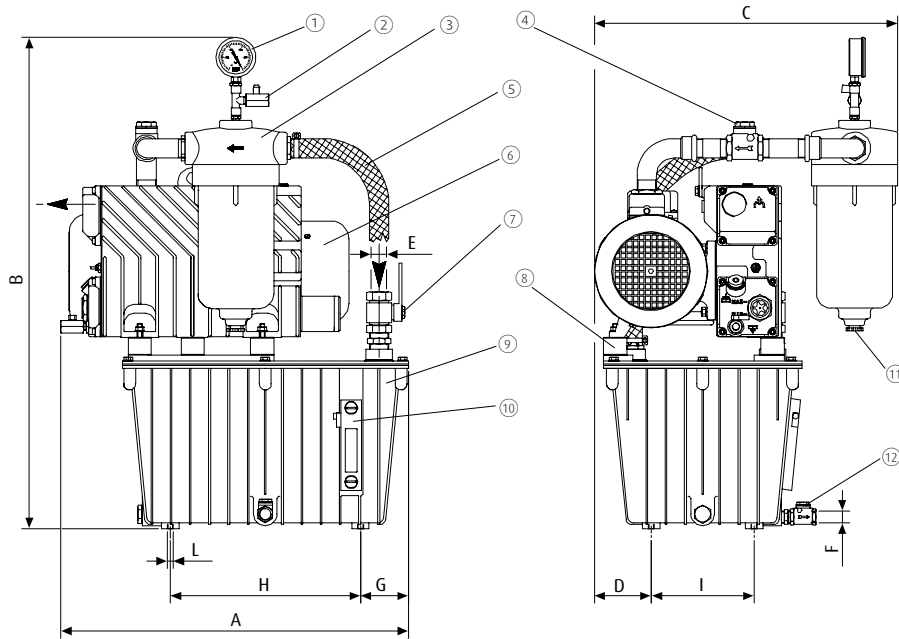




## Dimensions



VZ.DO.4B-1/8L



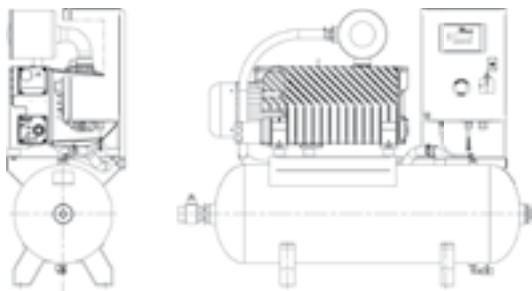
VZ.DO.5B-1/25L | VZ.DO.25C-3/25L | VZ.DO.40C-3/25L | VZ.DO.60C-3/25L

- ① = Vacuum gauge    ② = Blow-off valve    ③ = Filter    ④ = Check valve    ⑤ = Reinforced PVC tubing    ⑥ = Vacuum pump
- ⑦ = Connection valve of the system    ⑧ = Vibration absorber    ⑨ = Vacuum tank    ⑩ = Liquid display    ⑪ = Condensate blow-off valve
- ⑫ = Automatic blow-off valve    ⑬ = Power cable    ⑭ = Blow-off vacuum tank

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	E	F	G [mm]	H [mm]	I [mm]	L
VZ.DO.4B-1/8L	280	371	204	39	G1/4	--	35	210	130	--
VZ.DO.5B-1/25L	490	712	362	82	G1	G1/2	82	326	176	4xM10
VZ.DO.25C-3/25L	526	703	437	82	G1	G1/2	82	326	176	4xM10
VZ.DO.40C-3/25L	595	831	520	98	G1	G1/2	82	326	176	4xM10
VZ.DO.60C-3/25L	595	841	520	98	G1	G1/2	82	326	176	4xM10



### Vacuum units with one pump



#### Product Description

- > Centralised vacuum supply with horizontal buffer tank

#### Ordering notes

Included in scope of delivery:

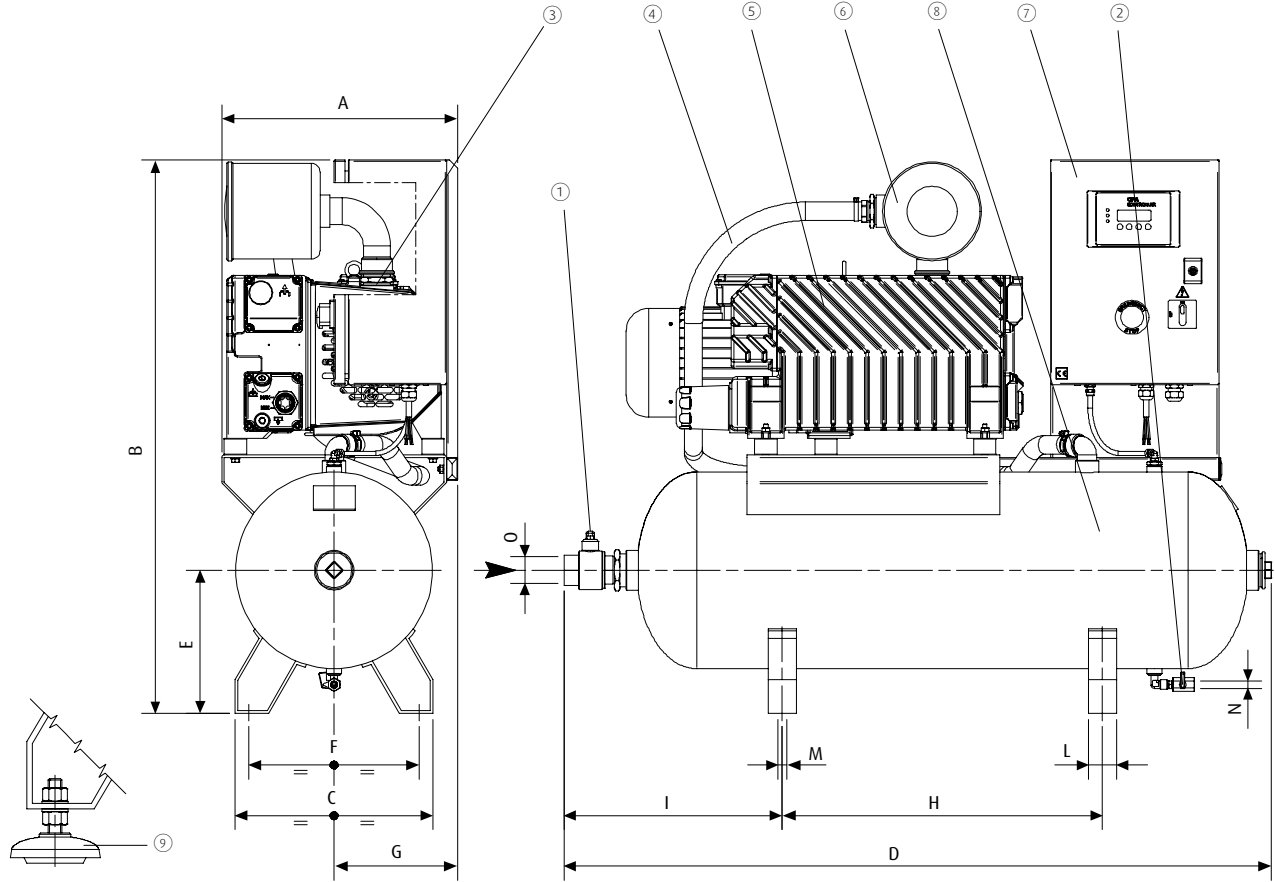
- > Oil-lubricated rotary vane pump with integrated oil mist separator at the outlet
- > Horizontal vacuum tank with condensate discharge valve
- > Particle filter to protect the pump
- > Non-return valve to maintain the vacuum when the pump is at standstill
- > Control panel (400 VAC, 50/60 Hz) with current protection, pressure sensor and PLC for manual and automatic operation
- > Switching cabinet IP 55
- > On request: Optional filter between the non-return valve and the vacuum system

#### Technical data

Item no.	Safety tank volume of vacuum tank [l]	Suction power at 50 Hz [m <sup>3</sup> /h]	Suction power at 60 Hz [m <sup>3</sup> /h]	Final vacuum [%]	Rated power at 50 Hz [kW]	Rated power at 60 Hz [kW]	Weight [kg]
VZ.1xDO.25C-3/100L	100	25	29	99	0.75	0.9	88
VZ.1xDO.25C-3/300L	300	25	29	99	0.75	0.9	133
VZ.1xDO.40B-3/100L	100	40	48	99	1.1	1.35	109
VZ.1xDO.40B-3/300L	300	40	48	99	1.1	1.35	154
VZ.1xDO.40B-3/500L	500	40	48	99	1.1	1.35	214
VZ.1xDO.60B-3/100L	100	60	75	99	1.5	1.8	112
VZ.1xDO.60B-3/300L	300	60	75	99	1.5	1.8	157
VZ.1xDO.60B-3/500L	500	60	75	99	1.5	1.8	217
VZ.1xDO.105C-3/100L	100	105	125	99	2.2	2.7	137
VZ.1xDO.105C-3/300L	300	105	125	99	2.2	2.7	182
VZ.1xDO.105C-3/500L	500	105	125	99	2.2	2.7	242
VZ.1xDO.205C-3/500L	500	205	245	99	4	4.8	400
VZ.1xDO.305C-3/500L	500	305	365	99	5.5	6.5	410



## Dimensions

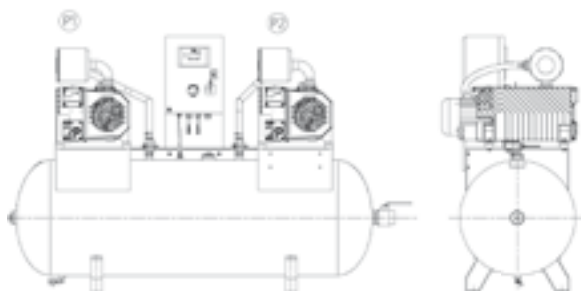


① = Connection valve of the system ② = Condensate blow-off valve ③ = Check valve ④ = Reinforced PVC tubing ⑤ = Vacuum pump  
 ⑥ = Filter ⑦ = Switchbox ⑧ = Vacuum tank ⑨ = Vibration absorber (on request)

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	L [mm]	M	N	O
VZ.1xDO.25C-3/100L	488	985	353	1,235	255	295	220	570	364	50	4xØ13	G1/4	G1
VZ.1xDO.25C-3/300L	493	1,220	512	1,626	330	454	245	895	410	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.40B-3/100L	493	985	353	1,260	255	295	236	570	389	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.40B-3/300L	502	1,220	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.40B-3/500L	624	1,329	540	2,020	385	480	300	1,020	541	60	4xØ13	G1/4	G2
VZ.1xDO.60B-3/100L	493	985	353	1,260	255	295	236	570	389	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.60B-3/300L	502	1,220	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.60B-3/500L	624	1,329	540	2,025	385	480	300	1,020	541	60	4xØ13	G1/4	G2
VZ.1xDO.105C-3/100L	420	985	353	1,260	255	295	220	570	389	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.105C-3/300L	450	1,220	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.1xDO.105C-3/500L	707	1,329	540	2,025	385	480	396	1,020	548	60	4xØ13	G1/4	G1 1/2
VZ.1xDO.205C-3/500L	600	1,412	540	2,020	385	480	300	1,020	543	60	4xØ13	G1/4	G2
VZ.1xDO.305C-3/500L	600	1,412	540	2,020	385	480	300	1,020	543	60	4xØ13	G1/4	G2



### Vacuum units with two pumps



#### Product Description

- > Centralised vacuum supply with two pumps and horizontal buffer tank
- > Redundant system that enables maintenance work to be done during operation

#### Ordering notes

Included in scope of delivery:

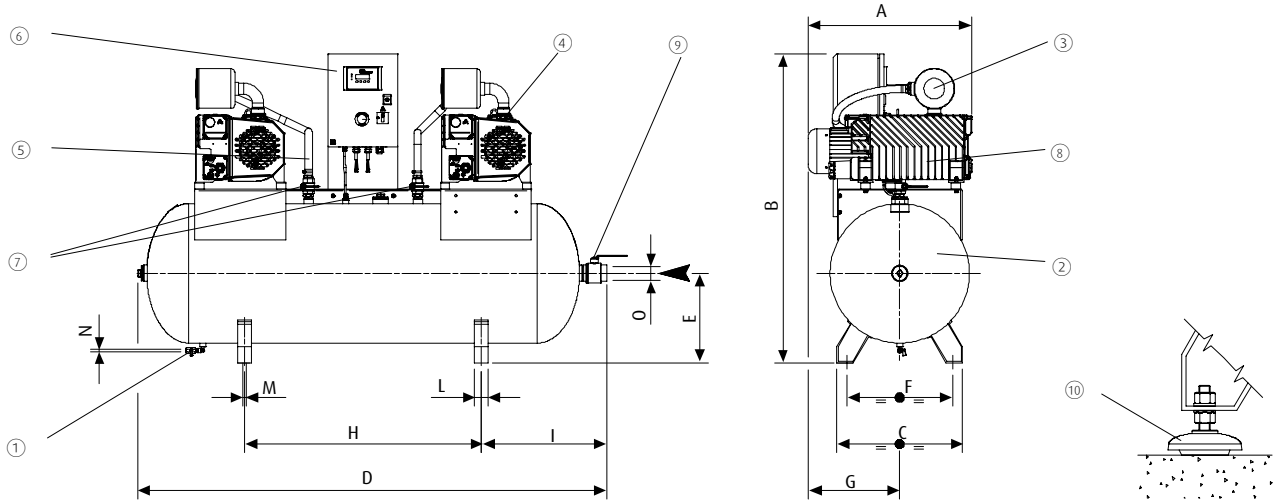
- > Two oil-lubricated rotary vane pumps with integrated oil mist separator at the outlet
- > Integrated non-return valve at the suction inlet to maintain the vacuum at standstill
- > Horizontal vacuum tank with condensate discharge valve
- > Two manual valves at the tank inlet to separate the pump from the system for maintenance
- > Particle filter to protect the pump
- > Control panel (400 VAC, 50/60 Hz) with current protection, pressure sensor and PLC for manual and automatic operation
- > Switching cabinet IP 55
- > On request: Optional filter between non-return valve and load end

#### Technical data

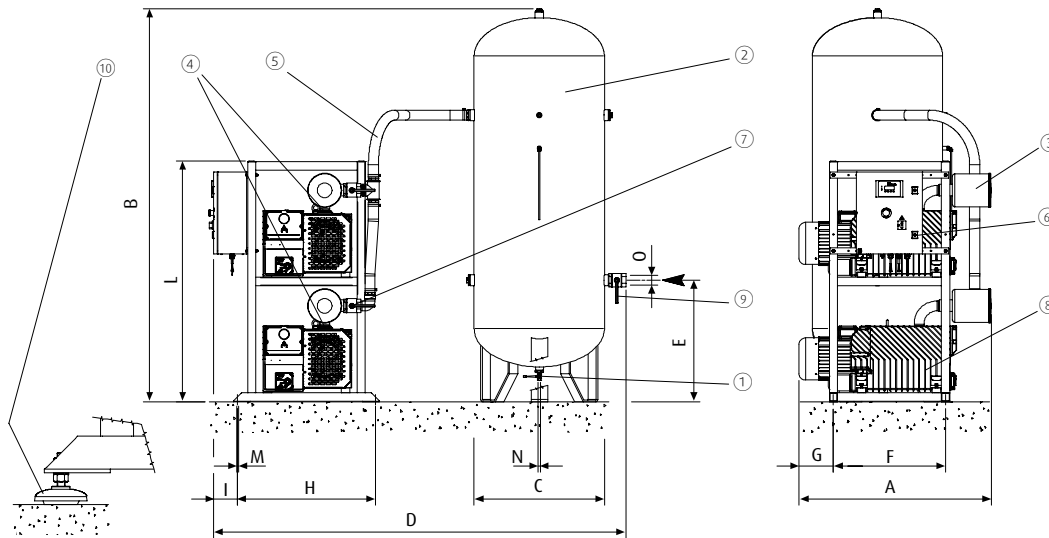
Item no.	Safety tank volume of vacuum tank [l]	Suction power at 50 Hz [m <sup>3</sup> /h]	Suction power at 60 Hz [m <sup>3</sup> /h]	Final vacuum [%]	Rated power at 50 Hz [kW]	Rated power at 60 Hz [kW]	Weight [kg]
VZ.2xDO.25C-3/300L	300	50	58	99	2x0.75	2x0.90	165
VZ.2xDO.40B-3/300L	300	80	96	99	2x1.1	2x1.35	195
VZ.2xDO.40B-3/500L	500	80	96	99	2x1.1	2x1.35	280
VZ.2xDO.60B-3/300L	300	120	150	99	2x1.5	2x1.8	200
VZ.2xDO.60B-3/500L	500	120	150	99	2x1.5	2x1.8	285
VZ.2xDO.105C-3/500L	500	210	250	99	2x2.2	2x2.7	340
VZ.2xDO.205C-3/1000L	1,000	410	490	99	2x4	2x4.8	580
VZ.2xDO.305C-3/1000L	1,000	610	730	99	2x7.5	2x9	600



### Dimensions



VZ.2xDO.25C-3/300L | VZ.2xDO.40B-3/300L | VZ.2xDO.40B-3/500L | VZ.2xDO.60B-3/300L | VZ.2xDO.60B-3/500L | VZ.2xDO.105C-3/500L



VZ.2xDO.205C-3/1000L | VZ.2xDO.305C-3/1000L

- ① = Condensate blow-off valve
- ② = Vacuum tank
- ③ = Filter
- ④ = Check valve
- ⑤ = Reinforced PVC tubing
- ⑥ = Switchbox
- ⑦ = Vacuum pump blocking valve
- ⑧ = Vacuum pump
- ⑨ = Connection valve of the system
- ⑩ = Vibration absorber

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	L [mm]	M	N	O
VZ.2xDO.25C-3/300L	498	1,322	512	1,626	330	454	245	895	410	50	4xØ13	G1/4	G1 1/2
VZ.2xDO.40B-3/300L	502	1,320	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.2xDO.40B-3/500L	624	1,329	540	2,020	385	480	300	1,020	543	60	4xØ13	G1/4	G2
VZ.2xDO.60B-3/300L	502	1,320	512	1,620	330	454	245	895	404	50	4xØ13	G1/4	G1 1/2
VZ.2xDO.60B-3/500L	624	1,429	540	2,020	385	480	300	1,020	541	60	4xØ13	G1/4	G2
VZ.2xDO.105C-3/500L	707	1,429	540	2,020	385	480	396	1,020	541	60	4xØ13	G1/4	G2
VZ.2xDO.205C-3/1000L	1,068	2,381	790	2,500	738	680	109	835	145	1,460	4xØ13	G1/2	G2
VZ.2xDO.305C-3/1000L	1,138	2,381	790	2,500	738	680	179	835	145	1,460	4xØ13	G1/2	G2



### Vacuum units with three pumps



#### Product Description

- > Centralised vacuum supply with three pumps and vertical buffer tank
- > Redundant system that enables maintenance work to be done during operation

#### Ordering notes

Included in scope of delivery:

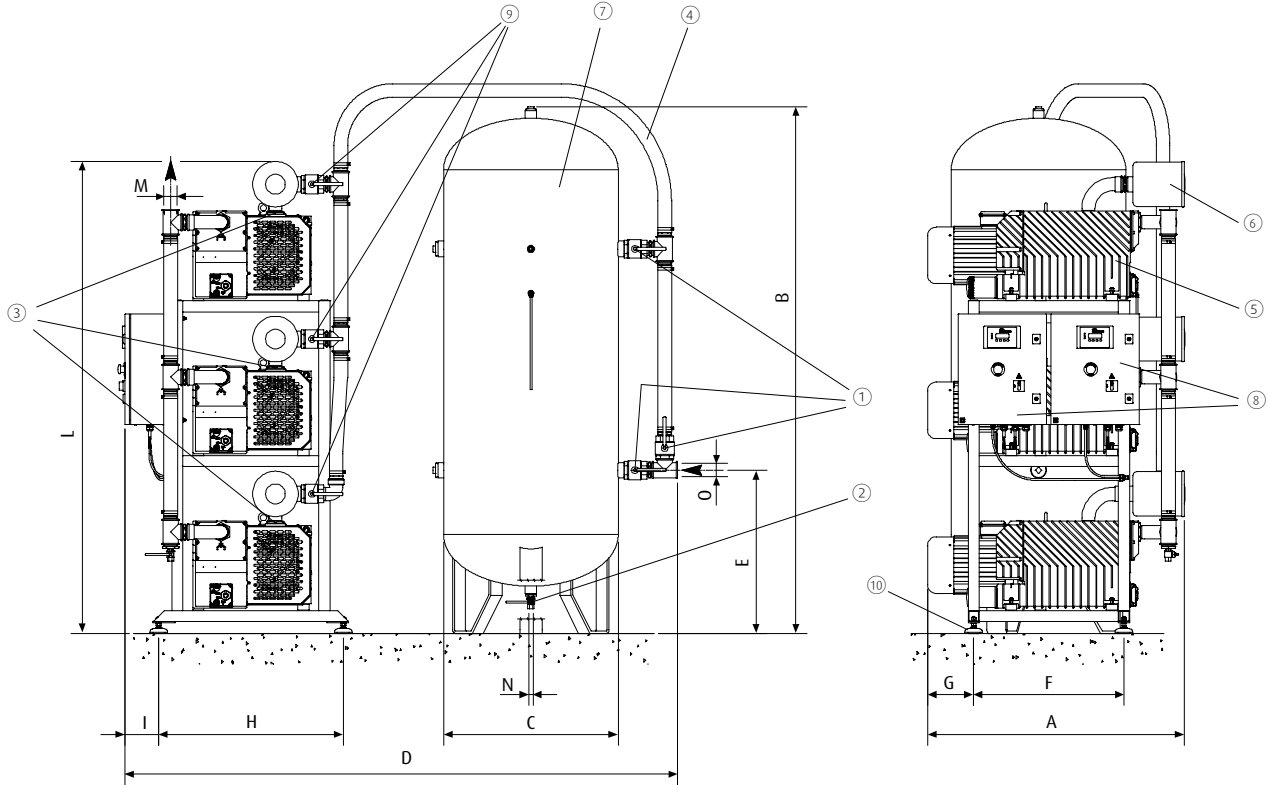
- > Three oil-lubricated rotary vane pumps mounted on one frame to conserve space
- > One vertical vacuum tank with condensate discharge valve and additional bypass system to separate the system
- > Three non-return valves integrated in the suction line of the pumps to maintain vacuum at standstill
- > Three particle filter elements to protect the pumps
- > Two independent control panels (400 VAC, 50/60 Hz) with current protection, pressure sensor and PLC for manual and automatic operation
- > Switching cabinet IP 55
- > Optional GFB hygiene filter element (Standard EN 773/3) with bypass system between the non-return valve and the load

#### Technical data

Item no.	Safety tank volume of vacuum tank [l]	Suction power at 50 Hz [m <sup>3</sup> /h]	Suction power at 60 Hz [m <sup>3</sup> /h]	Final vacuum [%]	Rated power at 50 Hz [kW]	Rated power at 60 Hz [kW]	Weight [kg]
VZ.3xDO.25C-3/300L	300	75	87	99	3x0.75	3x0.90	240
VZ.3xDO.25C-3/500L	500	75	87	99	3x0.75	3x0.90	300
VZ.3xDO.40B-3/500L	500	120	144	99	3x1.1	3x1.35	395
VZ.3xDO.60B-3/500L	500	180	125	99	3x1.5	3x1.8	410
VZ.3xDO.105C-3/500L	500	315	375	99	3x2.2	3x2.7	520
VZ.3xDO.105C-3/1000L	1,000	315	375	99	3x2.2	3x2.7	580
VZ.3xDO.150C-3/1000L	1,000	450	540	99	3x3	3x3.6	620
VZ.3xDO.205C-3/1000L	1,000	615	735	99	3x4	3x4.8	850
VZ.3xDO.305C-3/1000L	1,000	915	1,095	99	3x7.5	3x9	880



### Dimensions

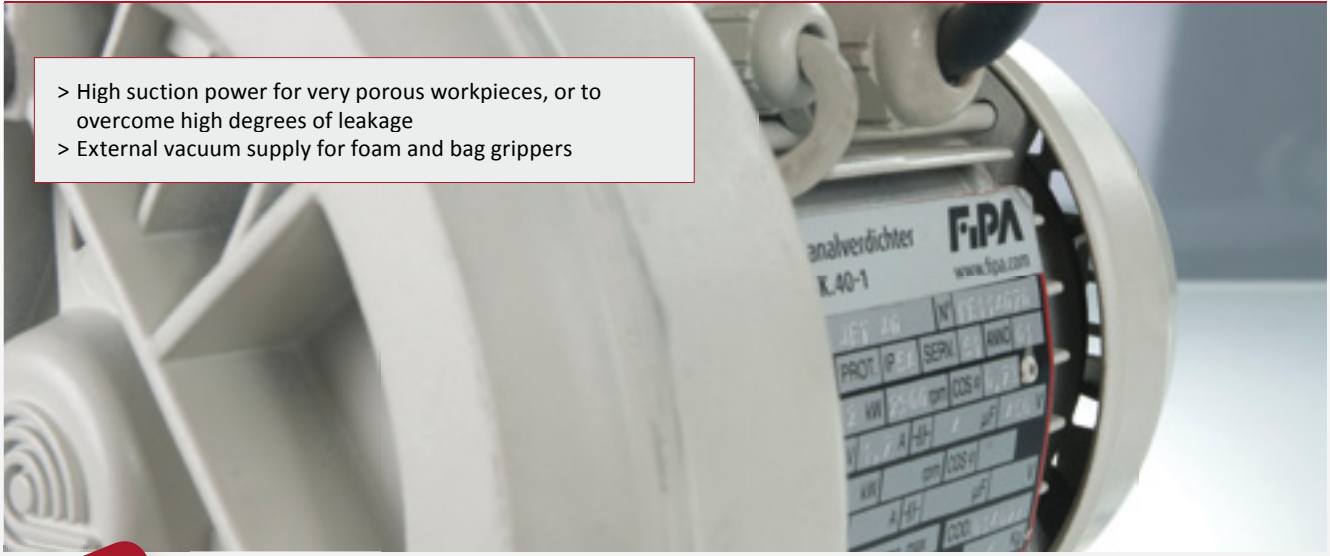


① = Vacuum tank bypass valve ② = Condensate blow-off valve ③ = Check valve ④ = Reinforced PVC tubing ⑤ = Vacuum pump  
 ⑥ = Filter ⑦ = Vacuum tank ⑧ = Switchbox ⑨ = Vacuum pump blocking valve ⑩ = Vibration absorber

Item no.	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	L [mm]	M	N	O
VZ.3xDO.25C-3/300L	750	1,677	500	1,821	612	670	40	550	245	1,407	G1	G1/2	G1
VZ.3xDO.25C-3/500L	750	2,139	600	1,810	708	670	40	550	245	1,407	G1	G1/2	G1
VZ.3xDO.40B-3/500L	750	2,142	600	2,071	708	670	40	550	245	1,567	G1	G1/2	G1 1/2
VZ.3xDO.60B-3/500L	796	2,142	600	2,045	708	670	40	550	245	1,592	G1	G1/2	G1 1/2
VZ.3xDO.105C-3/500L	874	2,142	600	2,515	708	670	109	550	245	1,643	G1 1/2	G1/2	G1 1/2
VZ.3xDO.105C-3/1000L	874	2,381	790	2,509	738	670	109	550	245	1,643	G1 1/2	G1/2	G1 1/2
VZ.3xDO.150C-3/1000L	897	2,381	790	2,453	738	670	129	550	245	1,643	G1 1/2	G1/2	G2
VZ.3xDO.205C-3/1000L	1,068	2,381	790	2,504	738	680	109	835	145	2,133	G2	G1/2	G2
VZ.3xDO.305C-3/1000L	1,138	2,381	790	2,500	738	680	179	835	145	2,133	G2	G1/2	G2



## FIPA Side channel blowers



- > High suction power for very porous workpieces, or to overcome high degrees of leakage
- > External vacuum supply for foam and bag grippers

On request



### Side channel blowers - single-stage and double-stage

- > Handling of porous workpieces, such as cardboard boxes or untreated wooden plates
- > Double-stage design offers higher suction power at the same vacuum level for effective leak compensation
- > Suitable for use in wet and dry areas
- > Suitable for continuous operation
- > Horizontal and vertical installation
- > Practically maintenance free



### Accessories

#### Additional silencer for side channel blowers

- > Open silencer for "further processing" of the exhaust air

> See page 618



#### Vacuum pressure changeover valve

- > Fast switching between vacuum mode (vacuum) and pressure mode (blow-off)
- > Enables short cycle times
- > Installation of a vacuum relief valve at the suction inlet is recommended

> See page 619





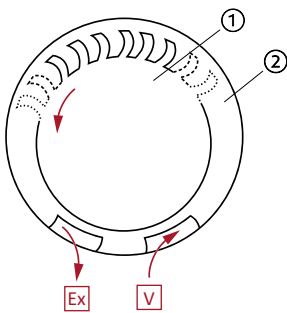
## FIPA Side channel blowers

### Examples of use

- > Vacuum generation for the TC/TL series foam grippers or TG series bag grippers
- > Handling of cardboard packaging with vacuum cups
- > Pneumatic conveying
- > Extraction of particles which are not too coarse, such as wood dust in woodworking

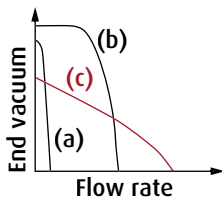
### Principle of operation

- > Side channel blowers use the momentum principle for generating vacuums or compressed air
- > The rapidly rotating blade wheel ① accelerates the air within the annular housing ②
- > In addition, a swirling motion is created in the side channels which increases efficiency
- > The shape of the inlet channel [V] or the outlet channel [Ex] allows air to be suctioned in or expelled



### Performance characteristics

- (a) Characteristic of ejectors
- (b) Characteristic of vacuum pumps
- (c) Side channel blowers have an extremely high output, but achieve only a low ultimate vacuum







### Vacuum tanks 5 - 60 liters



#### Product Description

- > Storage for compressed air, vacuum and non-aggressive liquids
- > Energy saving assembly of compressed air and vacuum
- > For compressed air / vacuum networks with fluctuating demand
- > For preventing frequent startup of the compressor system
- > To cover high demands short-term
- > As supplement to screw / piston compressors, rotary compressors or vacuum pumps

#### Notes

- > 92.001: Two fittings in line with G1/2-female with 90° offset  
One fitting per front face with G1/4-female
- > 92.002 to 92.004: One fitting in line with G1/2-female  
2 x one fitting with G3/4-female and distance 120 mm and 1 x one fitting with G3/4-female on the front faces

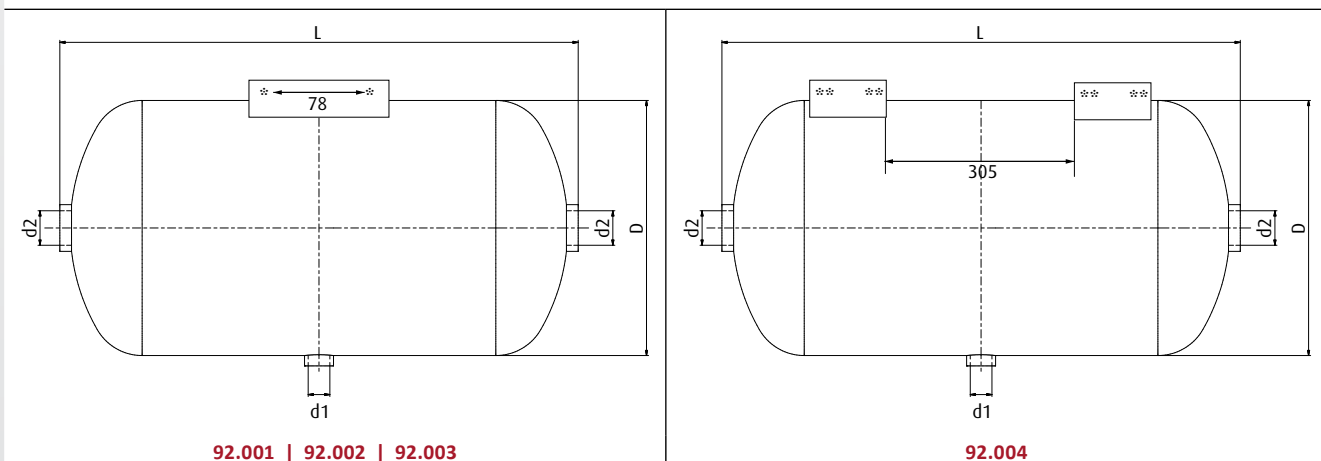
#### Technical data

Item no.	Safety tank volume [l]	Operating pressure [bar]	Medium	Design	Weight [kg]
92.001	5	0 - 11	Compressed air / vacuum	Aluminium	1.7
92.002	10	0 - 11	Compressed air / vacuum	Aluminium	2.4
92.003	20	0 - 11	Compressed air / vacuum	Aluminium	3.7
92.004	60	0 - 11	Compressed air / vacuum	Aluminium	9.3

#### Dimensions

d1	d2	D [mm]	L [mm]
G1/2	G3/4	152	356
G1/2	G3/4	206	355
G1/2	G3/4	245	500
G1/2	G3/4	276	1,111

#### Dimensions



92.001 | 92.002 | 92.003

92.004

\* = Two pairs of fixing bores, each with 2x M12x14    \*\* = Two pairs of fixing bores, each with 4x M12x14



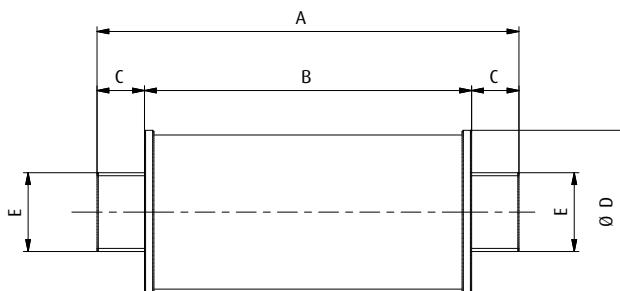
### Additional silencer for side channel blowers



#### Product Description

- > Silencer with direct opening
- > Suitable for "processing" of the exhaust air: e.g. ventilation or heating of halls or use as silencer and release into the open

#### Dimensions



Item no.	E	A [mm]	B [mm]	C [mm]	Ø D [mm]
72.038	G1	178	138	20	69
72.039	G1 1/4	242	138	52	69
72.040	G1 1/2	232	168	32	80
72.041	G2	262	198	32	89
72.042	G2 1/2	262	198	32	100



### Electro-pneumatic reversing valves for side channel blowers



#### Product Description

- > Operation of a side channel blower as a vacuum pump for suction or compressor for blow-off
- > Blow-off volume flow is directed to the vacuum cup / load, without reversing the direction of rotation of the blower
- > Three settig positions: Suction, blow-off, neutral
- > Working principle: Rotation of a cylinder, which is operated by an electrical motor-driven actuator

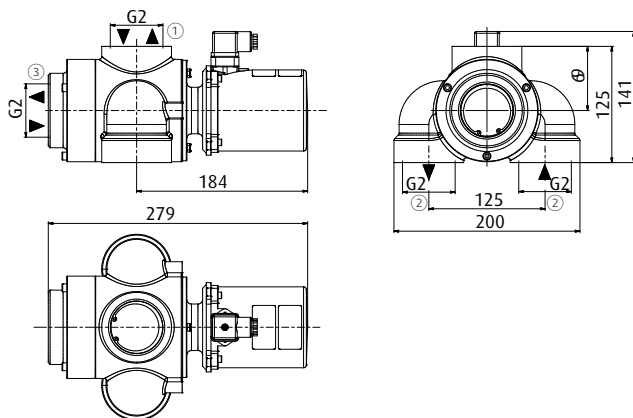
#### Notes

- Please note for the neutral position (0°):
- > If operation with closed suction inlets cannot be excluded, a vacuum limiting valve (safety valve) must be installed before the suction inlet

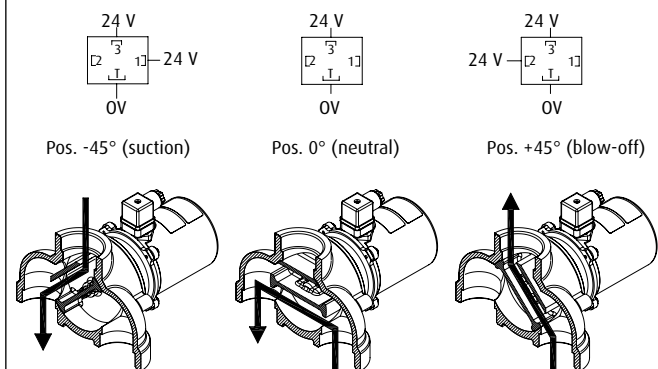
#### Technical data

Item no.	Suction power [m³/h]	Power supply [VDC]	Power consumption [W]	Duty ratio [%]	Direction of rotation [°]	Mean control time [s]	Minimum time interval between successive cycles [s]	Protection class	Weight [kg]
33.074	300	24	10	100	-45 / 0 / +45	0.5	0.1	IP55	3.2

#### Dimensions



#### Wiring diagrams



① = System connection ② = Side channel blower connection ③ = Air inlet / outlet

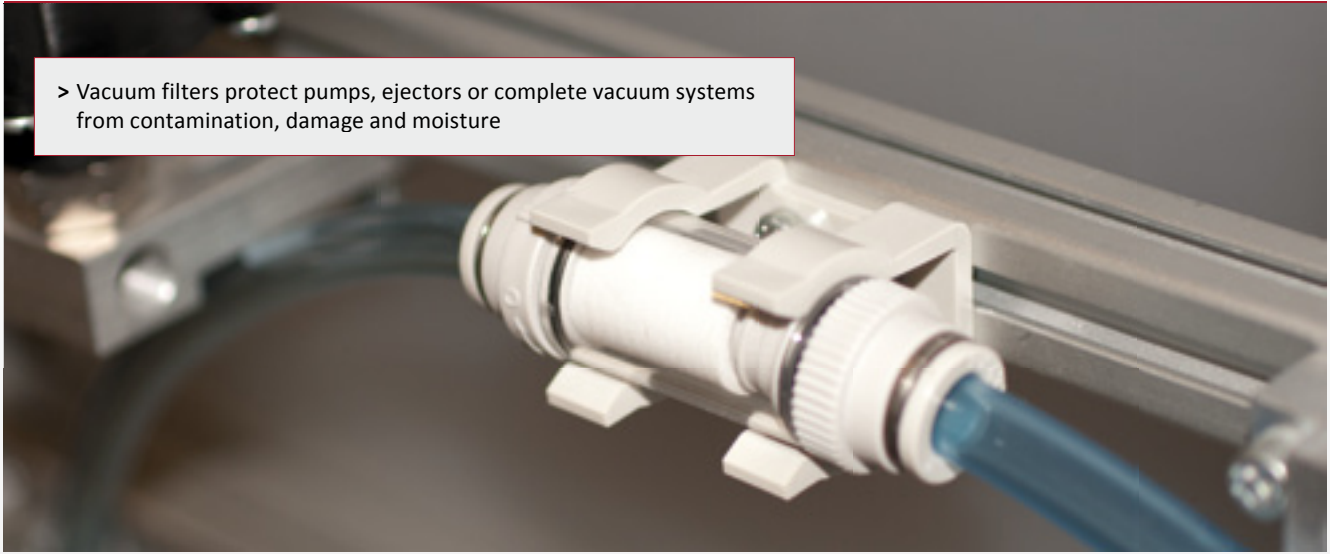


Vacuum filters at a glance .....	622
Universal filters for large volume flows .....	624
Filters for wet areas .....	627
Inline filters .....	628



### FIPA Vacuum filters

> Vacuum filters protect pumps, ejectors or complete vacuum systems from contamination, damage and moisture



#### **Pump filters / pre-filters with paper cartridge**

- > Installation at suction inlet of vacuum pumps or side channel blowers
- > Separation of fine particles using a very fine filter mesh of 5 to 7  $\mu\text{m}$
- > Suitable for dry areas

#### **FC 10F - FC 100F**

- > Aluminium housing with quick release for filtration control or for cartridge change

> See page 624

#### **71.032 - 71.043**

- > Plastic housing with sight glass for checking the filtration effect

> See page 625



#### **Universal filters with steel cartridge (FB 5 - FB 60)**

- > Installation at the suction inlet or in the suction line of vacuum pumps or side channel blowers
- > Suitable for wet and dry areas
- > Separation of coarse particles, dust and dirt using a 60  $\mu\text{m}$  filter mesh
- > Robust filter inserts made of stainless steel
- > Filter bowl and connection cover made from die-cast aluminium  
**with the exception of FB 5 - FB 20: filter bowl made from transparent plastic**

> See page 626





## FIPA Vacuum filters



### Filters / condensate traps

- > Installation at suction inlet of vacuum pumps or side channel blowers
- > Suitable for wet and dry areas
- > Protects vacuum generators from excessive water uptake
- > Separation of coarse particles, dust and dirt using a filter mesh of between 30 and 100  $\mu\text{m}$
- > Plastic housing with sight glass for checking the filtration effect
- > Drainage screw on the bottom for draining the collected liquid

> See page 627



### Inline, plug-in and ring filters

- > Installation between vacuum cup and ejector or generally in the tubing line of vacuum systems
- > Separation of fine particles and moisture using a 10  $\mu\text{m}$  filter mesh
- > Suitable for wet and dry areas

> See page 628



### Disposable filters

- > Installation between vacuum cup and ejector or generally in the tubing of vacuum systems
- > Suitable for wet and dry areas

#### 71.030

- > Separation of very fine particles using a 7  $\mu\text{m}$  filter mesh

#### 71.031

- > Separation of coarse particles, dust and dirt using a 152  $\mu\text{m}$  filter mesh

> See page 630



### Filters for feed ejectors

- > Separation of fine particles using a 10  $\mu\text{m}$  filter mesh

#### 71.012 - 71.016

- > Mounting in front of compressed air inlet on ejector

> See page 631

#### 71.017 - 71.021

- > Mounting behind ejector as collection or separation vessel

> See page 632



# Vacuum filters | Universal filters for large volume flows

Pump filters / pre-filters with paper cartridge

## Pump filters / pre-filters with paper cartridge

Suitable for dry areas



### Product Description

- > For use directly on the suction opening of dry-running rotary-vane pumps
- > To protect vacuum pumps from damage or excessive wear
- > High filtration efficiency due to large filter surface
- > Robust metallic housing for long service life
- > Quick fastener for prompt checking or replacement of the filter cartridge

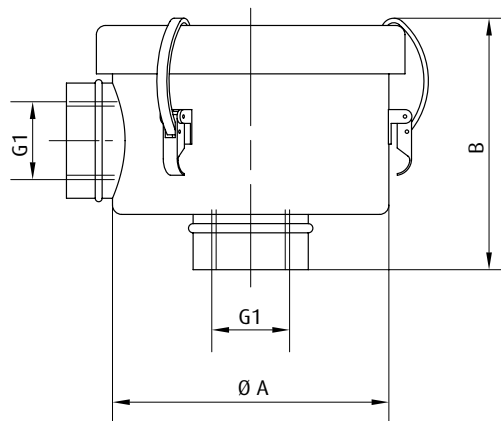
### Technical data

Item no.	Max. volume flow [m <sup>3</sup> /h]	Grade of filtration [µm]	Weight [kg]	Suitable spare cartridges
<b>FC 10F</b>	25	5 - 7	0.36	FC 10F-Kartusche
<b>FC 20F</b>	45	5 - 7	0.72	FC 20F/25F-Kartusche
<b>FC 25F</b>	50	5 - 7	0.73	FC 20F/25F-Kartusche
<b>FC 30F</b>	90	5 - 7	1	FC 30F/35F-Kartusche
<b>FC 35F</b>	110	5 - 7	1	FC 30F/35F-Kartusche
<b>FC 40F</b>	150	5 - 7	1.88	FC 40F-Kartusche
<b>FC 50F</b>	200	5 - 7	2.5	FC 50F-Kartusche
<b>FC 60F</b>	320	5 - 7	3.75	FC 60F-Kartusche
<b>FC 80F</b>	360	5 - 7	3.3	FC 80F-Kartusche
<b>FC 100F</b>	540	5	5	FC 100F-Kartusche

### Dimensions

G1	Ø A [mm]	B [mm]
G3/8	83	80
G1/2	108	93
G3/4	108	93
G1	133	96
G1 1/4	133	96
G1 1/4	176	161
G1 1/2	176	200
G2	200	258
G3	200	258
G4	305	320

### Dimensions





### Pump filters / pre-filters with paper cartridge

Suitable for dry areas



#### Product Description

- > For use directly on the suction opening of dry-running rotary-vane pumps
- > To protect vacuum pumps from damage or excessive wear
- > High filtration efficiency due to large filter surface
- > Light-weight plastic housing
- > Inspection glass to monitor the filtration effect
- > Examples of use: graphics, textile and pharmaceutical industries

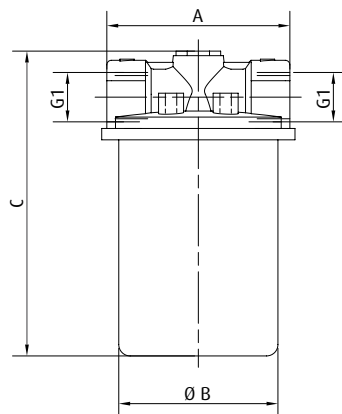
#### Technical data

Item no.	Max. volume flow [m <sup>3</sup> /h]	Grade of filtration [µm]	Weight [g]	Suitable spare cartridges
71.032	12	30	180	71.032-Kartusche
71.033	24	30	370	71.033-Kartusche
71.034	30	30	360	71.033-Kartusche
71.043	100	25	900	71.043-Kartusche

#### Dimensions

G1	A [mm]	Ø B [mm]	C [mm]
G1/4	62	62	82
G3/8	85	85	138
G1/2	85	85	138
G1	145	145	240

#### Dimensions





# Vacuum filters | Universal filters for large volume flows

Universal filter with steel cartridge

## Universal filter with steel cartridge

Suitable for dry and wet areas



FB 25 to FB 60

### Product Description

- > To protect vacuum pumps from damage or excessive wear
- > Separation of coarser particles, dust and dirt
- > Resistant filter elements made of stainless steel (INOX)
- > Filter incl. condensate trap

### Notes

- > FB 5 to FB 20: filter bowl made of transparent plastic
- > FB 25 to 60: filter bowl made of die cast aluminium

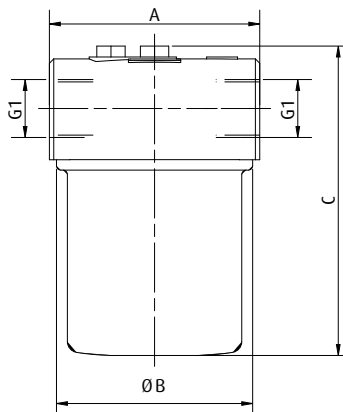
### Technical data

Item no.	Max. volume flow [m <sup>3</sup> /h]	Grade of filtration [µm]	Operating pressure [bar]	Max. operating temperature [°C]	Weight [kg]
<b>FB 5</b>	5	60	2	90	0.14
<b>FB 10</b>	10	60	2	90	0.26
<b>FB 20</b>	20	60	2	90	0.34
<b>FB 25</b>	40	60	4	90	0.87
<b>FB 30</b>	70	60	4	90	0.83
<b>FB 40</b>	150	60	4	90	3
<b>FB 50</b>	200	60	4	90	3.1
<b>FB 60</b>	300	60	4	90	3.2

### Dimensions

G1	A [mm]	Ø B [mm]	C [mm]
G1/4	61	59	74.5
G3/8	81	79	89
G1/2	81	79	117
G3/4	120	120	175
G1	120	112	175
G1 1/4	190	182	255
G1 1/2	190	182	300
G2	182	260	420

### Dimensions





### Filter / Condensate trap Precipitation of condensable vapors



#### Product Description

- > Efficient and reliable separation of water droplets out of vacuum systems
- > Easy installation after vacuum pumps or ejectors
- > Housing made of transparent plastics for filtration monitoring
- > Drainage valve at the bottom to discharge the collected condensate

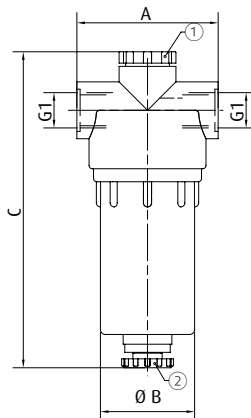
#### Notes

- > Filter needs to be ventilated before opening

#### Technical data

Item no.	Max. volume flow [m³/h]	Max. filling capacity [cm³]	Grade of filtration [µm]	Filter material	Max. input pressure [bar]	Max. operating temperature [°C]	Weight [kg]	Suitable spare cartridges
71.035	10.6	30	100	Stainless steel mesh	7.3	122	0.6	71.035-Kartusche
71.036	17.7	25	50	Polyethylene - sintered	7.3	122	0.8	71.036-Kartusche
71.037	21.2	40	30	Synthetic felt	7.3	122	1.7	71.037-Kartusche
71.038	35.3	50	30	Synthetic felt	7.3	122	5	71.038-Kartusche
71.039	58.9	100	30	Synthetic felt	7.3	122	9.3	71.039-Kartusche

#### Dimensions



① = Bleeding screw ② = Blow-off screw

Item no.	G1	A [mm]	Ø B [mm]	C [mm]
71.035	G3/8	80	75	135
71.036	G1/2	87	60	196
71.037	G3/4	125	100	255
71.038	G1	175	150	370
71.039	G1 1/2	220	190	450



### Plug-in filters



71.070 and 71.071: Plug-in pipe ( $\varnothing d1$ ) fits in  $\varnothing 4$  mm / 6 mm tubing connections

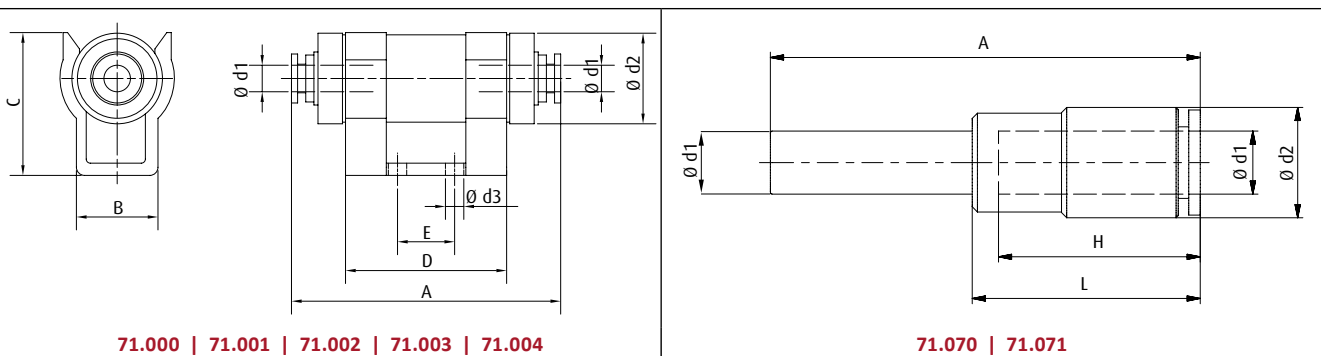
### Product Description

- > Trapping impurities and liquids, which can be suctioned via the vacuum cup or other systems
- > To protect vacuum components (e.g. ejectors) from damage or excessive wear
- > 71.000 to 71.004: Economical use due to replaceable filter cartridges

### Technical data

Item no.	Filter surface [cm <sup>2</sup> ]	Grade of filtration [ $\mu$ m]	Weight [g]	Suitable accessories
71.000	7.5	10	16	Holder VFUH2 Spare cartridge 71.005-Kartusche
71.001	7.5	10	17	Holder VFUH2 Spare cartridge 71.005-Kartusche
71.002	12.5	10	25	Holder VFUH3 Spare cartridge 71.006-Kartusche
71.003	12.5	10	27	Holder VFUH3 Spare cartridge 71.006-Kartusche
71.004	12.5	10	33	Holder VFUH3 Spare cartridge 71.006-Kartusche
71.070	0.8	10	1.5	--
71.071	1.1	10	2.5	--

### Dimensions



Item no.	$\varnothing d1$ [mm]	$\varnothing d2$ [mm]	$\varnothing d3$ [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	H [mm]	L [mm]
71.000	4	18.5	4.5	55	18	29	33	10	--	--
71.001	6	18.5	4.5	58	18	29	33	10	--	--
71.002	6	22.5	4.5	66	20	35	39.5	14	--	--
71.003	8	22.5	4.5	67.5	20	35	39.5	14	--	--
71.004	10	22.5	4.5	75	20	35	39.5	14	--	--
71.070	4	8	--	38.6	--	11	--	--	11	21.5
71.071	6	10.5	--	41	--	11.6	--	--	11.6	21.8



Ring filters

Used in connection with ejectors



Product Description

- > Installation between vacuum cup (IN) and ejector (OUT)
- > Absorption of dust and dirt that is introduced by the vacuum cup
- > Application primarily for inline and base ejectors
- > Economical use due to replaceable filter cartridges

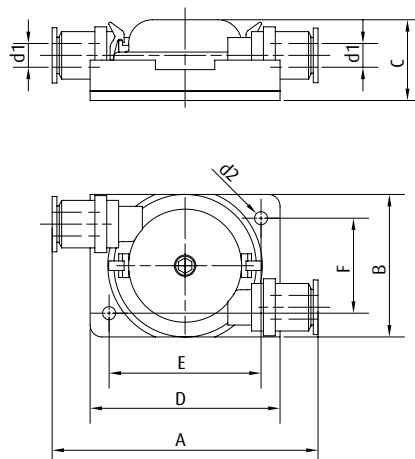
Technical data

Item no.	Filter surface [cm <sup>2</sup> ]	Grade of filtration [µm]	Weight [g]	Suitable spare cartridges
71.007	20	10	206	71.022-Kartusche
71.008	20	10	204.5	71.022-Kartusche
71.009	20	10	198	71.022-Kartusche
71.010	20	10	190.5	71.022-Kartusche
71.011	20	10	231.5	71.022-Kartusche

Dimensions

d1 [mm]	d2 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
6	5.5	113	60	37.5	80	60	40
8	5.5	113	60	37.5	80	60	40
10	5.5	114	60	37.5	80	60	40
12	5.5	113	60	37.5	80	60	40
16	5.5	128	60	37.5	80	60	40

Dimensions





### Disposable filters



71.030



71.031

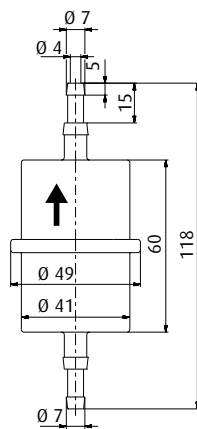
### Product Description

- > 71.030: Separation of very fine particles with a 7 $\mu$ m filter mesh
- > 71.031: Separation of coarse particles, dust and dirt using a 152 $\mu$ m filter unit

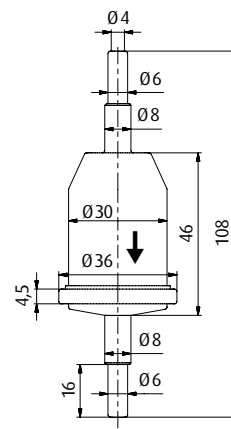
### Technical data

Item no.	Max. volume flow [l/min]	Grade of filtration [ $\mu$ m]	Filter material	Max. operating temperature [ $^{\circ}$ C]	Weight [g]
71.030	120	7	Paper	50	30
71.031	100	152	PP, PE	50	12

### Dimensions



71.030



71.031





Filters for feed ejectors



Product Description

> Filter is connected, for instance, at the outlet of the feed ejectors, to separate particles out of the transport flow

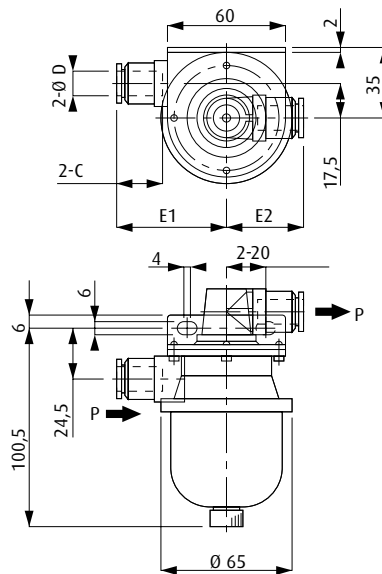
Technical data

Item no.	Filter surface [cm <sup>2</sup> ]	Grade of filtration [μm]	Weight [g]
71.012	20	10	232.2
71.013	20	10	230.5
71.014	20	10	224.5
71.015	20	10	217
71.016	20	10	240

Dimensions

∅ D [mm]	C [mm]	E1 [mm]	E2 [mm]
6	17	48	38
8	18.5	48	38
10	21	48.5	38.5
12	23.5	48	38
16	25	55.5	43.5

Dimensions





# Vacuum filters | Inline filters

Filters for feed ejectors

## Filters for feed ejectors



### Product Description

Filter is used at the exhaust outlet of an ejector (IN) to collect the transported particles. The air is released via OUT.

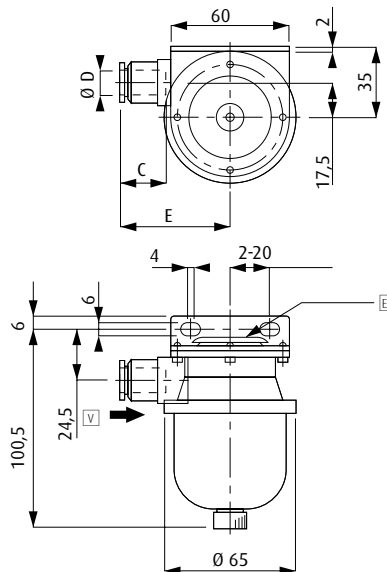
### Technical data

Item no.	Filter surface [cm <sup>2</sup> ]	Grade of filtration [μm]	Weight [g]
71.017	20	10	195.5
71.018	20	10	194.5
71.019	20	10	191.5
71.020	20	10	187.5
71.021	20	10	199

### Dimensions

Ø D [mm]	C [mm]	E [mm]
6	17	48
8	18.5	48
10	21	48.5
12	23.5	48
16	25	55.5

### Dimensions



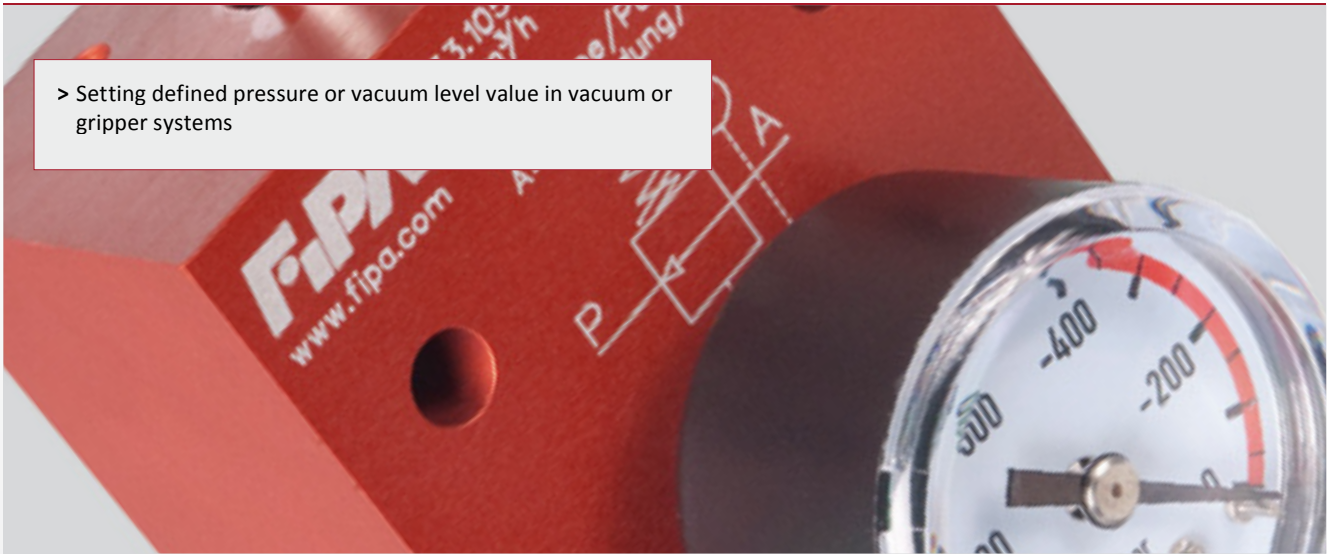
V = Vacuum connection O = Output

Control technology at a glance .....	635
Pressure regulators .....	636
Vacuum regulators .....	640





FIPA control technology



> Setting defined pressure or vacuum level value in vacuum or gripper systems



**Pressure regulators**

- > Defined reduction in operating pressure for compressed air-operated vacuum generators (ejectors)
- > Limitation of gripper holding force in End-of-Arm-Tooling
- > Simple adjustment
- > Models for inline installation available

> See page 636



**Vacuum regulators with external leakage**

- > Limitation of vacuum level, e.g. from rotary-vane pumps or vacuum tanks (safety adjustment)
- > Can also be used in dust-contaminated environments
- > Simple adjustment

> See page 640



**Vacuum regulators**

- > Maintenance of system vacuum independently of air-permeability of workpiece and of fluctuations in the vacuum supply
- > Precise adjustment
- > Suitable for measuring or testing purposes

> See page 642



### Pressure regulators - screw-in type



#### Product Description

- > Defined reduction in operating pressure for ejectors, limitation of holding force of grippers
- > Pressure adjustment by means of knurled screw
- > Integrated overpressure protection

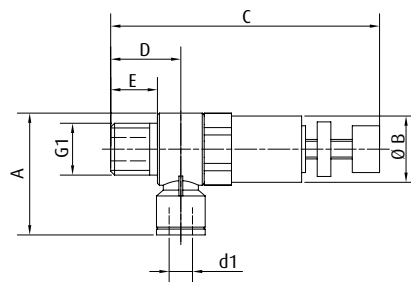
#### Notes

- > Only suitable for compressed air

#### Technical data

Item no.	Operating pressure [bar]	Regulating range [bar]	Accuracy ( $\pm$ ) [%]	Operating temperature [ $^{\circ}$ C]	Weight [g]
32.570	0 - 9	1 - 8	5	0 - 60	16
32.571	0 - 9	1 - 8	5	0 - 60	36
32.572	0 - 9	1 - 8	5	0 - 60	17
32.573	0 - 9	1 - 8	5	0 - 60	37
32.574	0 - 9	1 - 8	5	0 - 60	59
32.575	0 - 9	1 - 8	5	0 - 60	38
32.576	0 - 9	1 - 8	5	0 - 60	60

#### Dimensions



Item no.	G1	d1 [mm]	A [mm]	Ø B [mm]	C [mm]	D [mm]	E [mm]
32.570	M5	4	20.5	10	48.5	9	3.5
32.571	R1/8	4	28.5	14	60	14.5	8
32.572	M5	6	22.5	10	48.5	9.5	3.5
32.573	R1/8	6	30.5	14	60	14.5	8
32.574	R1/4	6	34	17	65	17.5	11
32.575	R1/8	8	34	14	60	15.5	8
32.576	R1/4	8	37	17	65	18.5	11



### Pressure regulators - screw-in type, with pressure gauge



#### Product Description

- > Defined reduction in operating pressure for ejectors, limitation of holding force of grippers
- > Pressure adjustment by means of knurled screw, pressure monitoring by means of gauge (readout in MPa)
- > Integrated overpressure protection

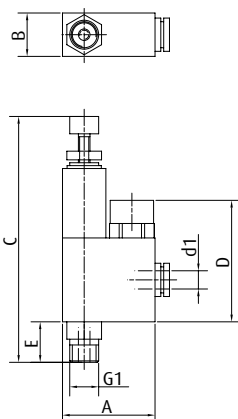
#### Notes

- > Only suitable for compressed air

#### Technical data

Item no.	Operating pressure [bar]	Regulating range [bar]	Accuracy ( $\pm$ ) [%]	Operating temperature [ $^{\circ}$ C]	Weight [g]
32.587	0 - 9	1 - 8	5	0 - 60	28
32.588	0 - 9	1 - 8	5	0 - 60	55
32.589	0 - 9	1 - 8	5	0 - 60	28
32.590	0 - 9	1 - 8	5	0 - 60	55
32.591	0 - 9	1 - 8	5	0 - 60	84
32.592	0 - 9	1 - 8	5	0 - 60	55
32.593	0 - 9	1 - 8	5	0 - 60	84

#### Dimensions



Item no.	G1	d1 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
32.587	M5	4	27.5	15	57.5	42	3.5
32.588	R1/8	4	36	15	81.5	42	8
32.589	M5	6	28	15	57.5	42	3.5
32.590	R1/8	6	36.5	15	81.5	42	8
32.591	R1/4	6	39.5	19	89.5	42	11
32.592	R1/8	8	36.5	15	81.5	42	8
32.593	R1/4	8	39.5	19	89.5	42	11



### "Inline" pressure regulators



#### Product Description

- > Defined reduction in operating pressure for ejectors, limitation of holding force of grippers
- > Pressure adjustment by means of knurled screw
- > Integrated overpressure protection

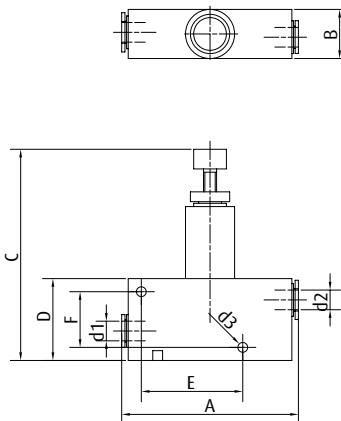
#### Notes

- > Only suitable for compressed air

#### Technical data

Item no.	Operating pressure [bar]	Regulating range [bar]	Accuracy ( $\pm$ ) [%]	Operating temperature [ $^{\circ}$ C]	Weight [g]
32.577	0 - 9	1 - 8	5	0 - 60	36
32.578	0 - 9	1 - 8	5	0 - 60	36
32.579	0 - 9	1 - 8	5	0 - 60	36
32.580	0 - 9	1 - 8	5	0 - 60	60
32.581	0 - 9	1 - 8	5	0 - 60	60

#### Dimensions



Item no.	d1 [mm]	d2 [mm]	d3 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
32.577	4	4	3.2	44	15	63	25	30	17
32.578	6	4	3.2	44.5	15	63	25	30	17
32.579	6	6	3.2	45	15	63	25	30	17
32.580	8	6	3.2	57	19	68	29	39	21
32.581	8	8	3.2	57	19	68	29	39	21





### "Inline" pressure regulators with pressure gauge



#### Product Description

- > Defined reduction in operating pressure for ejectors, limitation of holding force of grippers
- > Easy installation thanks to vertical and horizontal cross-holes
- > Pressure adjustment by means of knurled screw, pressure monitoring by means of gauge (readout in MPa)
- > Integrated overpressure protection

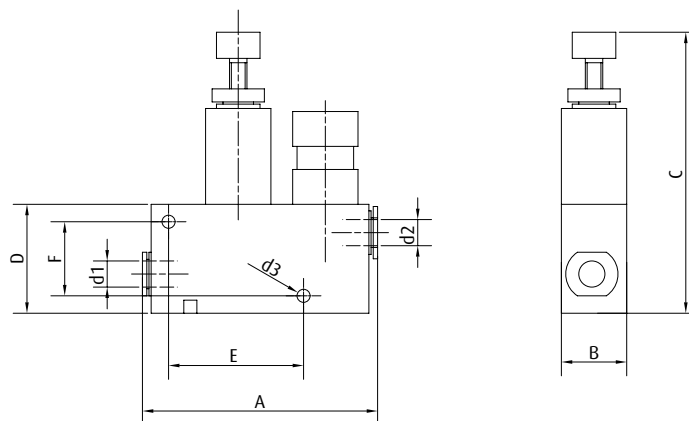
#### Notes

- > Only suitable for compressed air

#### Technical data

Item no.	Operating pressure [bar]	Regulating range [bar]	Accuracy ( $\pm$ ) [%]	Operating temperature [ $^{\circ}$ C]	Weight [g]
32.582	0 - 9	1 - 8	5	0 - 60	48
32.583	0 - 9	1 - 8	5	0 - 60	48
32.584	0 - 9	1 - 8	5	0 - 60	48
32.585	0 - 9	1 - 8	5	0 - 60	73
32.586	0 - 9	1 - 8	5	0 - 60	73

#### Dimensions



Item no.	d1 [mm]	d2 [mm]	d3 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
32.582	4	4	3.2	55	15	63	25	30	17
32.583	6	4	3.2	55.5	15	63	25	30	17
32.584	6	6	3.2	56	15	63	25	30	17
32.585	8	6	3.2	69	19	67.5	29	39	21
32.586	8	8	3.2	69	19	67.5	29	39	21



### Vacuum regulators with external leakage

Safety control valve particularly for oil-free rotary-vane pumps



#### Product Description

- > Setting a constant vacuum level when handling workpieces with varying porosities or leakage
- > Suitable as safety valve if dry-running rotary-vane pumps are to run continuously at maximum vacuum
- > Control of vacuum through automatic venting when a preset vacuum level is reached
- > Manual adjustment via fine thread, mechanical opening via spring load

#### Notes

- > Turn the knob towards the (+) to increase the vacuum threshold value at which the regulator will start drawing in outside air. Turn the knob towards the (-) to reduce this value.

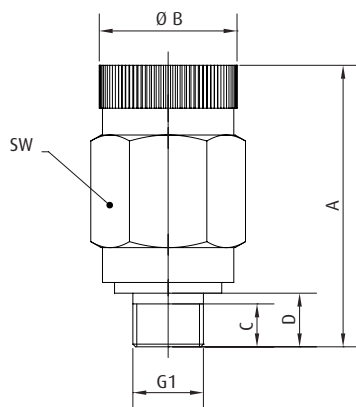
#### Ordering notes

- > On request suitable as safety valve for side channel blowers to limit the max. vacuum level (diameter of regulator and blower inlet should be identical)

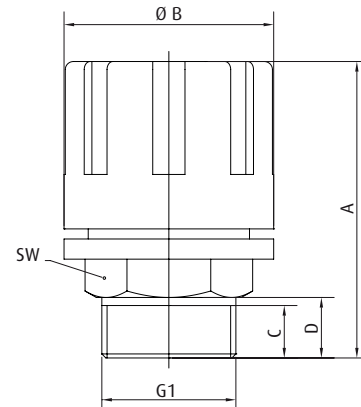
#### Technical data

Item no.	Maximum control volume [m <sup>3</sup> /h]	Regulating range [mbar]	Operating temperature [°C]	Weight [g]
73.002	16	-999 - 0	-20 - 80	270
73.003	40	-999 - 0	-20 - 80	658

#### Dimensions



73.002



73.003

Item no.	G1	A [mm]	Ø B [mm]	C [mm]	D [mm]	SW
73.002	G1/4	63	26	8	10	25
73.003	G1	82	52	13	15	32



### Vacuum regulators



#### Product Description

- > Vacuum adjustment of consumer loads, such as vacuum cups in handling systems
- > Automatic compensation of fluctuations in vacuum supply
- > Highly precise, continuous vacuum adjustment via a rotary knob with locking mechanism
- > Suitable for conducting leakage tests for inspection / measurement purposes

#### Notes

- > Turning the rotary knob clockwise increases the vacuum on the consumer side (SET) with the vacuum generator connected (VAC)

#### Ordering notes

- > Included in scope of delivery: Vacuum gauge incl. connection adapter

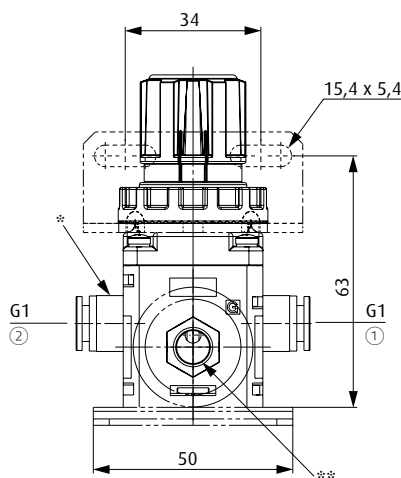
#### Technical data

Item no.	Maximum flow rate [m <sup>3</sup> /h]	Regulating range [mbar]	Accuracy [mbar]	Operating temperature [°C]	Weight [g.]	Suitable vacuum gauge
<b>33.220</b>	8.4	-999 - 0	< 1.3	5 - 60	135	91.001-R (p.696)
<b>33.220-G1/4</b>	8.4	-999 - 0	< 1.3	5 - 60	135	91.001-R (p.696)
<b>33.230</b>	14	-999 - 0	< 1.3	5 - 60	250	91.001-R (p.696)
<b>33.230-G1/2</b>	14	-999 - 0	< 1.3	5 - 60	250	91.001-R (p.696)
<b>33.230-G1/4</b>	14	-999 - 0	< 1.3	5 - 60	250	91.001-R (p.696)

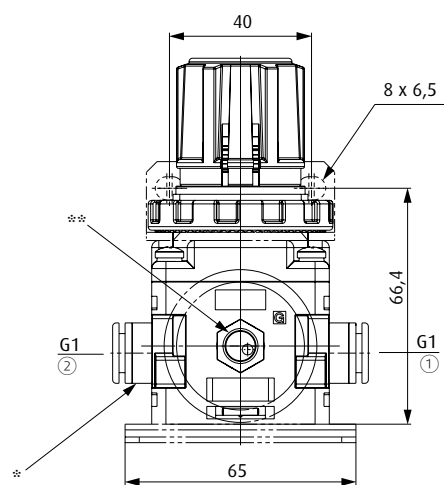
#### Dimensions

G1	d1 [mm]
--	8
G1/4	--
--	8
G1/2	--
G1/4	--

#### Dimensions



**33.220 | 33.220-G1/4**



**33.230 | 33.230-G1/2 | 33.230-G1/4**

① = Connection to the vacuum cup / product side (description SET) ② = Pump connection (description VAC) \* = Plug connection  
 \*\* = R1/8 Gauge connection



### Vacuum regulators



Vacuum regulator 33.105 with vacuum gauge

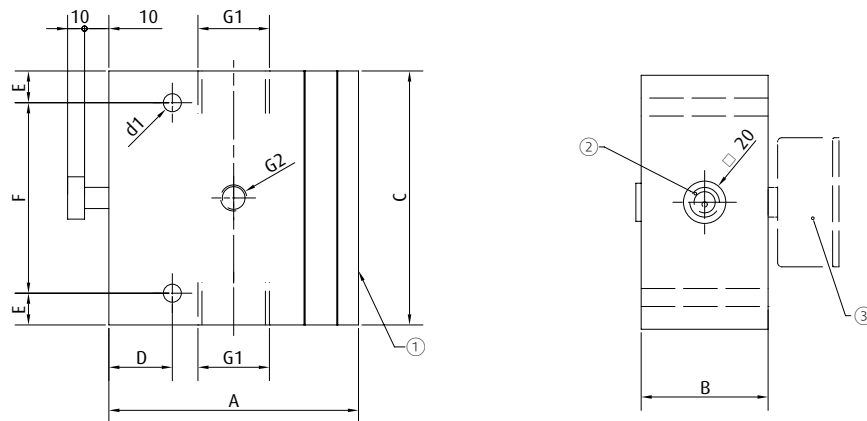
#### Product Description

- > Vacuum adjustment of consumer loads, such as vacuum cups in handling systems
- > Integration of a vacuum gauge recommended
- > Blow-off is possible if vacuum gauge is not connected
- > Any installation position

#### Technical data

Item no.	Maximum flow rate [m <sup>3</sup> /h]	Regulating range [mbar]	Operating temperature [°C]	Weight [kg]	Suitable vacuum gauge
<b>33.105</b>	10	-200 - -999	-10 - 80	0.6	91.001 (p.696)
<b>33.120</b>	80	-200 - -999	-10 - 80	2.1	91.003 (p.696)

#### Dimensions



① = The bottom side must not be covered ② = Adjusting screw ③ = Vacuum gauge (optional)

Item no.	G1	G2	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]
<b>33.105</b>	G3/8	G1/8	89	40	60	20	6.5	10	40
<b>33.120</b>	G1	G1/4	118	60	120	30	8.5	15	90

Electromagnetic and pneumatic valves at a glance .....	644
Solenoid valves for vacuum .....	646
Pneumatic valves for vacuum .....	657
Solenoid valves for compressed air .....	660
Base valves at a glance .....	662
Flow control valves .....	665
Touch valves .....	670
Non-return valves .....	672
Butterfly valves .....	675
Manual valves .....	678



## FIPA Valve technology



- > Control of suction, blow-off or ventilation processes in vacuum systems
- > Fast switching between suction and air intake for short cycle times



### 2/2-way solenoid valves for vacuum, directly controlled

- > NC version - closed without current
- > No compressed air required
- > Short switching times
- > Small, compact design for small throughputs

> See page 646



### 3/2-way solenoid valves for vacuum, directly controlled

- > NC version - closed without current, or NO - open without current
- > No compressed air connection required
- > Short switching times
- > Small, compact design for small throughputs
- > Optional construction of valve clusters

> See page 648



### 3/2-way solenoid valves for vacuum, internal vacuum piloted

- > NC version - closed without current, or NO - open without current
- > No compressed air connection required
- > Short switching times
- > Minimum vacuum level required: 40 %
- > NO: Holds workpiece in the event of a power failure

> See page 652



### 3/2-way solenoid valve, supported by compressed air

- > Suction on/off, blow-off, ventilation
- > Short switching times
- > NC version - closed without current, or NO - open without current
- > NO: Holds workpiece in the event of a power failure

> See page 654



## FIPA Valve technology



### 3/2-way valves, pneumatically controlled

- > Suction on/off, blow-off, ventilation
- > Shortest switching times compared to vacuum piloted and compressed air supported valves
- > No electrical power connection required
- > NO: Holds workpiece in the event of a power failure
- > Combination with pneumatic vacuum switch: Activation of the "suction" function when the set switching point is reached

> See page 657



### 3/2-way and 5/2-way solenoid valves for compressed air, indirectly controlled

#### 36.061 (3/2 way)

- > Control of compressed air, e.g. for the vacuum generation of ejectors or foam grippers with integrated ejectors
- > Control of pneumatically controlled valves, e.g. 36.810 - 36.825

#### 36.060 (5/2 way)

- > Vacuum control as with article 36.061
- > Additional blow-off function resulting in short release times for ejectors with direct connection between compressed air and vacuum chamber
- Examples: Heavy-duty ejectors 65.111 and 65.130

> See page 660

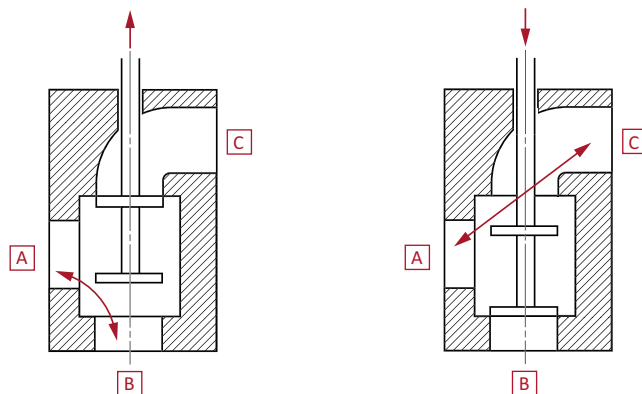
### Examples of use

- > Packaging machines
- > Bottle openers
- > Paper feeding
- > Robotic applications
- > General automation

### Construction and functional principle of the 3/2-way valve

[A] = vacuum cup output | [B] = compressed air supply | [C] = to the vacuum pump

- > Versions in plastic or metal housings
- > Protection class up to IP65
- > Directly controlled
- > Piloted by internal vacuum
- > Supported by compressed air
- > Controlled by compressed air
- > NC and NO switching functions available





# Valve technology | Solenoid valves for vacuum

2/2-way electromagnetic vacuum valves, directly controlled

## 2/2-way electromagnetic vacuum valves, directly controlled



### Product Description

- > Very high suction power at small size for short evacuation time and fast vacuum build-up
- > Short response time
- > Robust brass housing and compact design for demanding applications
- > Also suitable for positive pressure
- > Incl. energy saving coil for minimised power consumption and less heat development

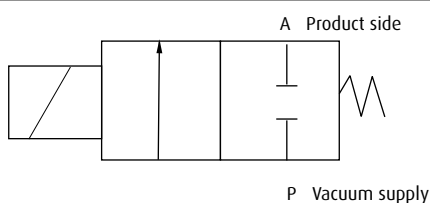
### Ordering notes

- > Energy saving coil 24 VDV or 230 VAC and DIN plug IP65 included
- > Further available voltages:
  - VAC: 115, 48, 24
  - VDC: 12

### Technical data

Item no.	36.004-24VDC	36.004-230VAC
Nominal width [mm]	7	7
Nominal flow rate [m <sup>3</sup> /h]	4.8	4.8
Pressure range [bar]	-1 - 4	-1 - 4
Operating principle	NC	NC
Switching time [ms]	20	20
Power-on time [ED]	100 %	100 %
Max. Power consumption [W]	12	9
Protection class	IP65	IP65
Operating temperature [°C]	-10 - 60	-10 - 60
Weight [g]	520	520
Suitable accessories	Plug 10.007 Coil 10.0050/24VDC	Plug 10.007 Coil 10.0050/230VAC

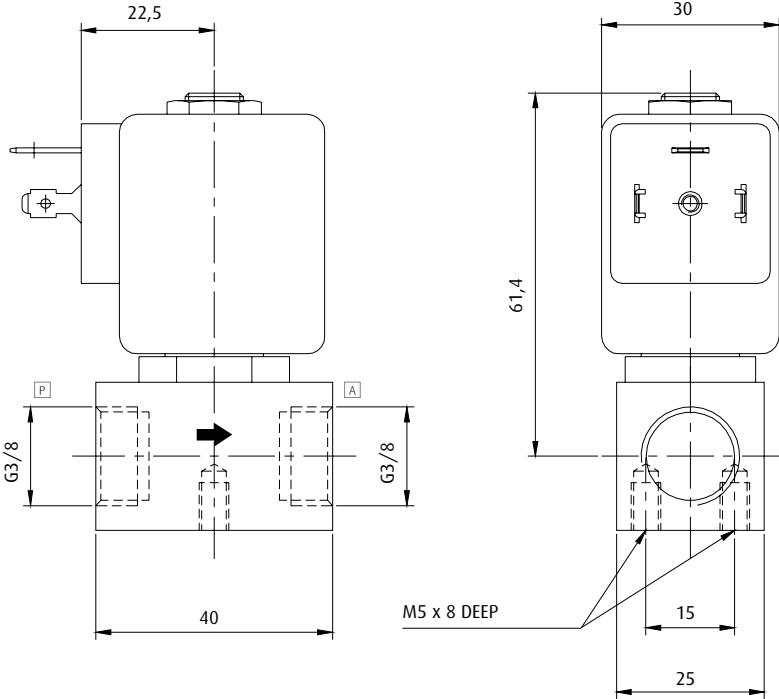
### Wiring diagram







Dimensions



A = Product side P = Vacuum supply



# Valve technology | Solenoid valves for vacuum

3/2-way solenoid vacuum valves, directly controlled

## 3/2-way solenoid vacuum valves, directly controlled

RESISTANCE AGAINST LOW OZONE CONCENTRATIONS



### Product Description

- > Very high suction power at small size for short evacuation time and fast vacuum build-up
- > Small, compact and lightweight
- > Suction on/off, blow-off or ventilation of vacuum cups
- > HNBR - Diaphragm allows for flexible installation due to resistance against low ozone concentrations
- > Fast switching time
- > Factory set NO, can be switched to NC by the customer
- > To be mounted in any position

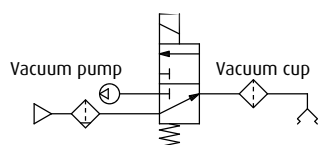
### Ordering notes

- > Included in scope of delivery: Coil 24 VDC and DIN plug
- > Other voltages on request

### Technical data

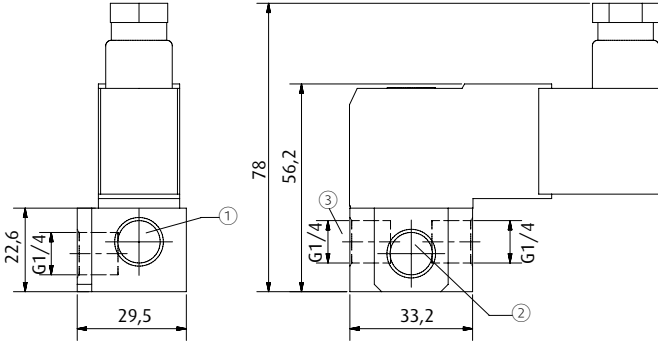
Item no.	36.003
Connection	G 1/4
Nominal width [mm]	4.5
Nominal flow rate [m <sup>3</sup> /h]	2.1
Pressure range [bar]	-1 - 0
Max. switching frequency [Hz]	10
Response time [ms]	20
Protection class	IP65
Operating principle	NC/NO
Duty ratio [%]	75
Operating voltage [VDC]	24
Power consumption [W]	4
DIN-plug	Yes
Operating temperature [°C]	-10 - 50
Weight [g]	155

### Wiring diagram

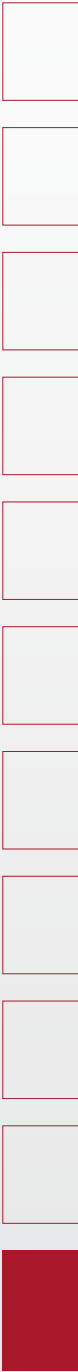




Dimensions



① = Vacuum supply ② = Compressed air, blow-off ③ = Vacuum connection (Product side)





# Valve technology | Solenoid valves for vacuum

## 3/2-way solenoid vacuum valves, directly controlled

### 3/2-way solenoid vacuum valves, directly controlled



#### Product Description

- > Very high suction power at small construction size for short evacuation time and fast vacuum build-up
- > Fast product release due to integrated vent port
- > Suction on/off, blow-off or ventilation of vacuum systems
- > Also suitable for positive pressure
- > Short response time
- > Robust brass housing in compact design for demanding applications
- > Incl. energy saving coil for minimised power consumption and less heat development

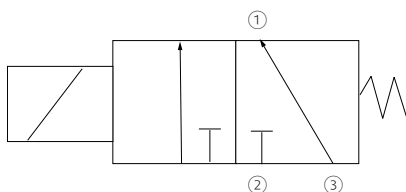
#### Ordering notes

- > Included in scope of delivery: Energy saving coil 24 VDC or 230 VAC for minimised power consumption and less generation of heat and DIN IP65 plug
- > Further available voltages:
  - VAC: 115, 48, 24
  - VDC: 12
- > Standard seal is NBR, different material, such as EPDM, for higher temperatures on request

#### Technical data

Item no.	36.009-24VDC	36.009-230VAC
Nominal width [mm]	13	13
Nominal flow rate [m <sup>3</sup> /h]	8.8	8.8
Pressure range [bar]	-0.99 - 4	-0.99 - 4
Operating principle	NC	NC
Closing time [ms]	21	21
Duty ratio [%]	100	100
Power consumption [W]	12	12
Protection class	IP65	IP65
Operating temperature [°C]	-10 - 60	-10 - 60
Weight [g]	540	540
Suitable accessories	Push-in fitting 30.017 (p.724) Plug 10.007 Coil 10.0050/24VDC	Push-in fitting 30.017 (p.724) Plug 10.007 Coil 10.0050/230VAC

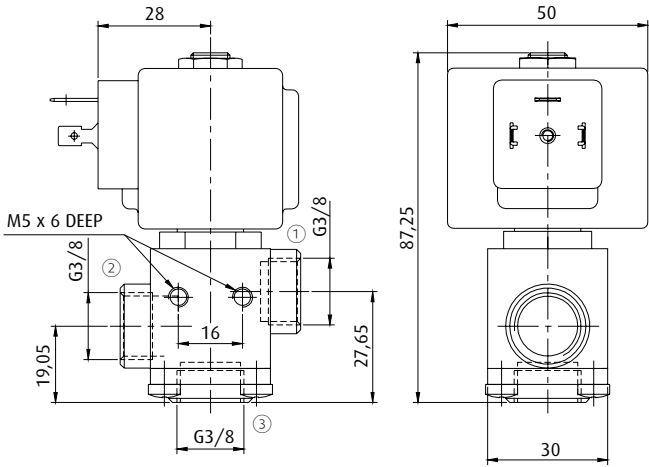
#### Wiring diagram



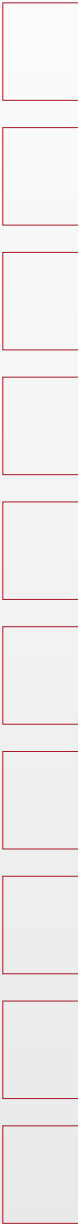
- Assignment:
- ① = A (Product side)
  - ② = P (Vacuum supply)
  - ③ = R (Ventilation (Blow-off))



Dimensions



① = Vacuum supply ② = Product side ③ = Ventilation (Blow-off)





# Valve technology | Solenoid valves for vacuum

3/2-way solenoid vacuum valves, internally vacuum pilot operated

## 3/2-way solenoid vacuum valves, internally vacuum pilot operated



36.610 | 36.611



36.615 to 36.626

### Product Description

- > Suction on/off, blow-off, ventilation of vacuum cups
- > High suction power at small construction for short evacuation time and fast vacuum build-up
- > Valve operation requires no compressed air connection due to internal vacuum control
- > Required minimum vacuum level 40 %
- > Short switching times
- > NO: Safe gripping of workpiece during power failure
- > Robust and light-weight housing

### Ordering notes

- > 36.610 and 36.611: Coil and DIN plug included in scope of delivery
- > 36.615 to 36.625: Delivery without coil and plug; please order: Power consumption: 24 VDC: 5 W, 230 VAC: 5 VA

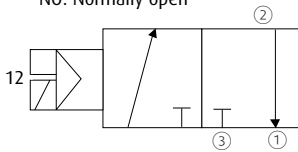
### Technical data

Item no.	Nominal width [mm]	Nominal flow rate [m <sup>3</sup> /h]	Pressure range [bar]	Operating principle	Switching time at -800 mbar [ms]	Material	Operating temperature [°C]	Weight [g]	Suitable accessories
36.610	10	10	-0.99 - 0	NO	30	Aluminium anodised	-5 - 50	420	-
36.611	10	10	-0.99 - 0	NC	30	Aluminium anodised	-5 - 50	420	--
36.615	15	20	-0.99 - 0	NO	85	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	390	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.616	15	20	-0.99 - 0	NC	85	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	390	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.620	20	40	-0.99 - 0	NO	85	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	370	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.621	20	40	-0.99 - 0	NC	85	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	370	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.625	25	90	-0.99 - 0	NO	100	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	520	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.626	25	90	-0.99 - 0	NC	100	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	520	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006



## Wiring diagrams

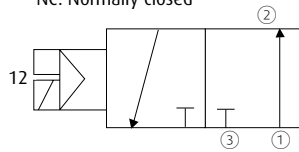
NO: Normally open



Assignment:

- ① = P (Vacuum supply)
- ② = A (Product side)
- ③ = R (Ventilation (Blow-off))

NC: Normally closed



Assignment:

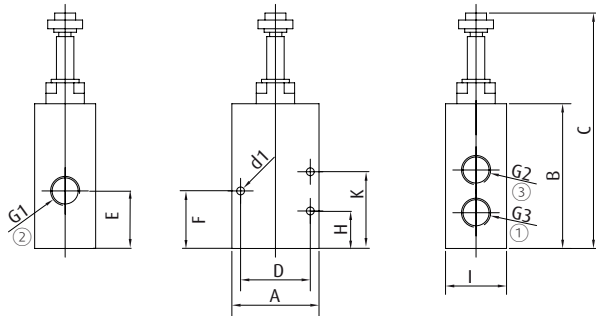
- ① = P (Ventilation (Blow-off))
- ② = A (Product side)
- ③ = R (Vacuum supply)

## Pilot valve

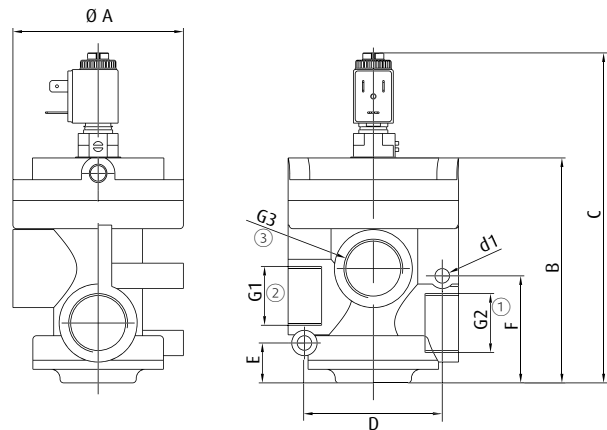


- > Manual mode for functional test: Setscrew in zero position
- > Automatic mode: Setscrew in position "1"

## Dimensions



36.610 | 36.611



36.615 | 36.616 | 36.620 | 36.621 | 36.625 | 36.626

① = Vacuum supply / Ventilation (Blow-off) ② = Product side ③ = Ventilation (Blow-off) / Vacuum supply

Item no.	G1	G2	G3	Ø A [mm]	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]	H [mm]	I [mm]	K [mm]
36.610	G3/8	G3/8	G3/8	--	50	83	137	40	4.5	22.5	33	21.5	35	44
36.611	G3/8	G3/8	G3/8	--	50	83	137	40	4.5	35	33	21.5	35	44
36.615	G1/2	G1/2	G1/2	75	--	101	155	63	6.5	22.5	55	--	--	--
36.616	G1/2	G1/2	G1/2	75	--	101	155	63	6.5	22.5	55	--	--	--
36.620	G3/4	G3/4	G3/4	75	--	101	155	63	6.5	22.5	55	--	--	--
36.621	G3/4	G3/4	G3/4	75	--	101	155	63	6.5	22.5	55	--	--	--
36.625	G1	G1	G1	94	--	124	178	63	8.2	22	58	--	--	--
36.626	G1	G1	G1	94	--	124	178	63	8.2	22	58	--	--	--



# Valve technology | Solenoid valves for vacuum

3/2-way solenoid vacuum valves, pneumatically supported with spring reset

## 3/2-way solenoid vacuum valves, pneumatically supported with spring reset



36.210 | 36.211



36.515 to 36.525

### Product Description

- > Suction, blow-off, ventilation of vacuum cups
- > High suction power at small construction for short evacuation times and fast vacuum build-up
- > Short switching times
- > Function: NC/NO as vacuum supply and blow-off / ventilation inlets can be exchanged
- > NO: Safe gripping of workpiece during power failure
- > Robust and lightweight housing

### Ordering notes

- > 36.210 and 36.211: Coil and DIN plug included in scope of delivery
- > 36.515 to 36.525: Delivery without coil and plug; please order: Power consumption: 24 VDC: 5 W, 230 VAC: 5 VA

### Technical data

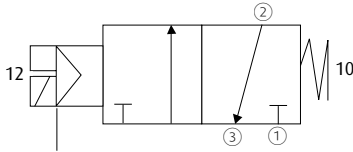
Item no.	Nominal width [mm]	Nominal flow rate [m <sup>3</sup> /h]	Pressure range [bar]	Operating principle	Control pressure [bar]	Switching time [ms]	Material	Operating temperature [°C]	Weight [g]	Suitable accessories
36.210	10	10	-0.99 - 0	NC	2.5	22	Aluminium anodised	-5 - 50	360	--
36.211	10	10	-0.99 - 0	NO	2.5	22	Aluminium anodised	-5 - 50	360	--
36.515	15	20	-0.99 - 0	NO/NC	2.5	90	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	390	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.520	20	40	-0.99 - 0	NO/NC	2.5	90	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	370	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006
36.525	25	90	-0.99 - 0	NO/NC	2.5	90	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	500	Solenoid coil 10.0058/230VAC Solenoid coil 10.0052/24VDC Plug 10.006





### Wiring diagrams

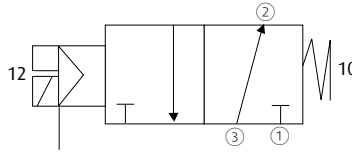
NO: Normally open



Assignment:

- ① = P (Ventilation (Blow-off))
- ② = A (Product side)
- ③ = R (Vacuum supply)

NC: Normally closed



Assignment:

- ① = P (Vacuum supply)
- ② = A (Product side)
- ③ = R (Ventilation (Blow-off))

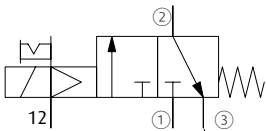
### Pilot valve



- > Manual mode for functional test: Setscrew in zero position
- > Automatic mode: Setscrew in position "1"

### Wiring diagram: how to combine vacuum valve with pneumatic control valve for blow-off

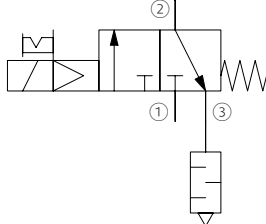
Vacuum valve 36.520



Assignment

- ① Vacuum supply
- ② Product side
- ③ Ventilation (Blow-off)

Control valve 36.061



Assignment

- ① Compressed air inlet
- ② Compressed air output
- ③ Use of silencer (e.g. 72.016): this connects valve to atmospheric pressure and enables release of product in case of failure of compressed air line

Application example: 3/2-way vacuum valves 36.520 with control valve 36.061

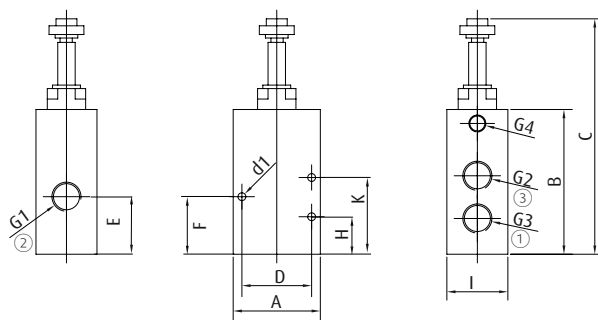
Continued on the next page →



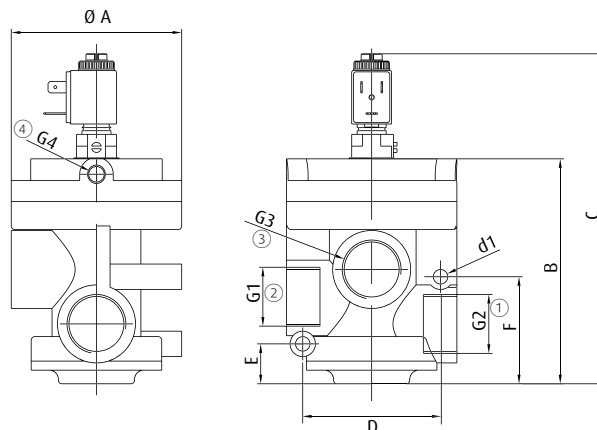
# Valve technology | Solenoid valves for vacuum

3/2-way solenoid vacuum valves, pneumatically supported with spring reset

## Dimensions



36.210 | 36.211



36.515 | 36.520 | 36.525

① = Vacuum supply / Ventilation (Blow-off) ② = Product side ③ = Ventilation (Blow-off) / Vacuum supply ④ = Control pressure connection

Item no.	G1	G2	G3	G4	Ø A [mm]	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	E [mm]	F [mm]	H [mm]	I [mm]	K [mm]
36.210	G3/8	G3/8	G3/8	G1/8	--	50	83	137	40	4.5	33	32.8	22.5	35	44
36.211	G3/8	G3/8	G3/8	G1/8	--	50	83	137	40	4.5	33	32.8	22.5	35	44
36.515	G1/2	G1/2	G1/2	G1/8	75	--	101	155	63	6.5	22.5	55	--	--	--
36.520	G3/4	G3/4	G3/4	G1/8	75	--	101	155	63	6.5	22.5	55	--	--	--
36.525	G1	G1	G1	G1/8	92	--	114.5	168.5	63	6.9	22	58	--	--	--



### 3/2-way vacuum valve, pneumatically controlled with spring reset



#### Product Description

- > Suction blow-off, ventilation of vacuum cups
- > High suction power at small construction for short evacuation time and fast vacuum build-up
- > Assembly of pneumatically controlled vacuum systems
- > Valve operation requires no electric connection
- > Shortest switching times compared to vacuum piloted and compressed air supported valves
- > 36.815 to 36.825: Function: NC or NO as vacuum supply and blow-off / ventilation inlets can be exchanged

#### Ordering notes

- > 36.335 to 36.341: Electronic valve for switching control independent of compressed air supply available on request; ordering example for version with electronic valve: 36.335\_24VDC, 36.341\_230VAC etc.

#### Technical data

Item no.	Nominal width [mm]	Nominal flow rate [m <sup>3</sup> /h]	Control pressure [bar]	Pressure range [bar]	Operating principle	Switching time [ms]	Material	Operating temperature [°C]	Weight [g]
36.810	10	10	2 - 6	-0.99 - 0	NO	22	Aluminium anodised	-5 - 50	360
36.811	10	10	2 - 6	-0.99 - 0	NC	22	Aluminium anodised	-5 - 50	360
36.815	15	20	2 - 6	-0.99 - 0	NO/NC	60	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	350
36.820	20	40	2 - 6	-0.99 - 0	NO/NC	50	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	330
36.825	25	90	2 - 6	-0.99 - 0	NO/NC	50	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	500
36.335	32	130	4 - 8	-0.99 - 0	NC	200	High resistant, fiber-glass reinforced Polyamide (GPR)	-5 - 50	470
36.336	32	130	4 - 8	-0.99 - 0	NO	200	High resistant, fiber-glass reinforced Polyamide (GPR)	-5 - 50	470
36.340	50	310	4 - 8	-0.99 - 0	NC	300	High resistant, fiber-glass reinforced Polyamide (GPR)	-5 - 50	990
36.341	50	310	4 - 8	-0.99 - 0	NO	300	High resistant, fiber-glass reinforced Polyamide (GPR)	-5 - 50	990

Continued on the next page →

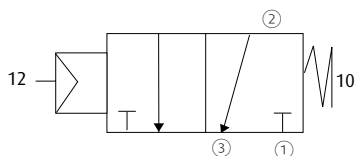


# Valve technology | Pneumatic valves for vacuum

## 3/2-way vacuum valve, pneumatically controlled with spring reset

### Wiring diagrams

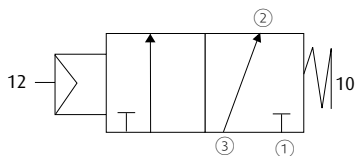
NO: Normally open



Description of connections:

- ① = R (Compressed air, blow-off)
- ② = A (Product side)
- ③ = P (Vacuum supply)

NC: Normally closed



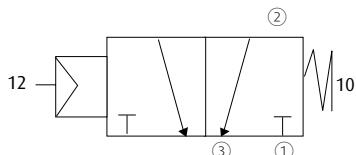
Description of connections:

- ① = R (Compressed air, blow-off)
- ② = A (Product side)
- ③ = P (Vacuum supply)

36.810 | 36.811

### Wiring diagrams

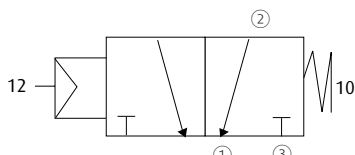
NO: Normally open



Description of connections:

- ① = R (Compressed air, blow-off)
- ② = A (Product side)
- ③ = P (Vacuum supply)

NC: Normally closed

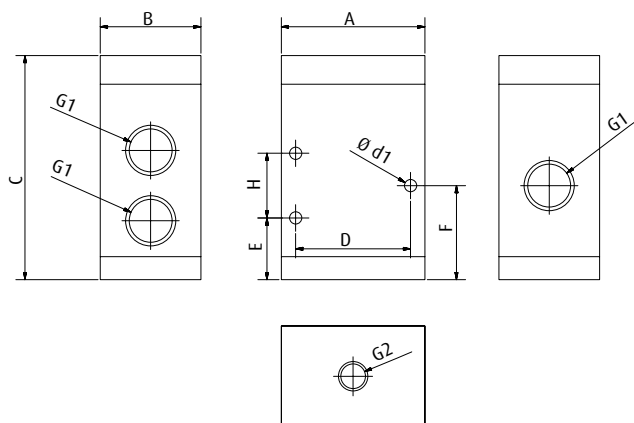


Description of connections:

- ① = R (Compressed air, blow-off)
- ② = A (Product side)
- ③ = P (Vacuum supply)

36.815 | 36.820 | 36.825 | 36.835 | 36.836 | 36.840 | 36.841

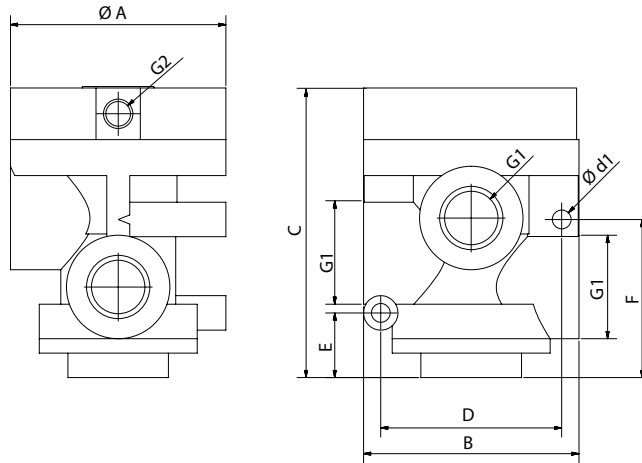
### Dimensions



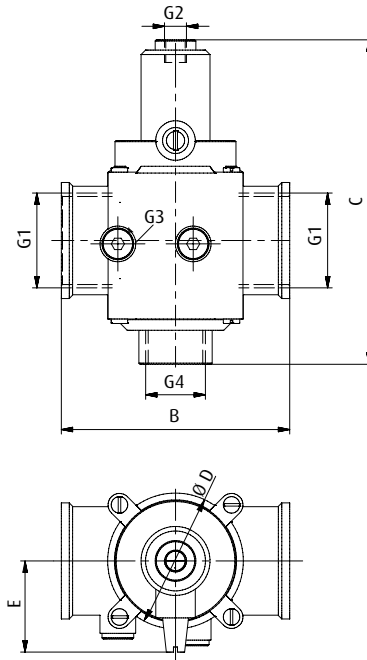
36.810 | 36.811



### Dimensions



36.815 | 36.820 | 36.825



36.335 | 36.336 | 36.340 | 36.341

Item no.	G1	G2	G3	G4	Ø A [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Ø D [mm]	Ø d1 [mm]	E [mm]	F [mm]	H [mm]
36.810	G3/8	G1/8	--	--	--	50	35	78	40	--	4.25	21.5	32.75	22.5
36.811	G3/8	G1/8	--	--	--	50	35	78	40	--	4.25	21.5	32.75	22.5
36.815	G1/2	G1/8	--	--	75	--	75	101	63	--	6.5	22.5	55	--
36.820	G3/4	G1/8	--	--	75	--	75	101	63	--	6.5	22.5	55	--
36.825	G1	G1/8	--	--	75	--	75	101	63	--	6.5	22.5	55	--
36.335	G1 1/4	G1/8	G1/8	G 3/4	--	--	101	144	--	60	--	43	--	--
36.336	G1 1/4	G1/8	G1/8	G 3/4	--	--	101	144	--	60	--	43	--	--
36.340	G2	G1/8	G3/8	G1 1/4	--	--	142	183.5	--	90	--	56	--	--
36.341	G2	G1/8	G3/8	G1 1/4	--	--	142	183.5	--	90	--	56	--	--



### Solenoid valves for compressed air

Indirectly controlled, with spring reset



36.060



36.061

#### Product Description

- > Suitable for compressed air
- > 36.060: For use e.g. to increase cycle times for ejectors without valve technology  
Example: Vacuum and blow-off control for multi-chamber ejectors e.g. 65.410
  - 1x compressed air vacuum generation
  - 1x compressed air blow-off
- > 36.061: For use e.g. as a blow-off control valve for 3/2-way vacuum valves
- > Robust and lightweight housing

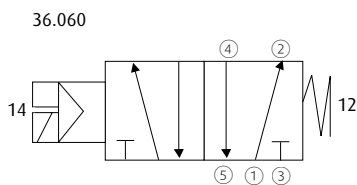
#### Ordering notes

- > Included in scope of delivery: Coil and DIN plug 10.006 for 24 VDC, IP65
- > Spare part kits available on request

#### Technical data

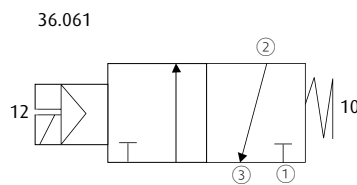
Item no.	Nominal width [mm]	Nominal flow rate at 6 bar [m <sup>3</sup> /h]	Control pressure [bar]	Design	Supply voltage [VDC]	Duty ratio [%]	Max. Power consumption [W]	Protection class	Material	Operating temperature [°C]	Weight [g]
36.060	6	37.2	2.5 - 10	5/2	24	100	3.8	IP 65	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	180
36.061	6	37.2	2.5 - 10	3/2	24	100	3.8	IP 65	High resistant, fiber-glass reinforced Polyarylamide (IXEF®)	-5 - 50	260

#### Wiring diagrams



Assignment

- ① Compressed air inlet
- ②, ④ Working connection
- ③, ⑤ Bleeding



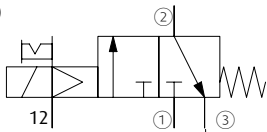
Assignment

- ① Compressed air inlet
- ② Working connection
- ③ Bleeding (e.g. 72.016): This connects valve to atmospheric pressure and enables release of product in case of failure of compressed air line



### Application example: Usage of 36.061 as control valve to activate blow-off of 3/2-way vacuum valves (here: Valve 36.520)

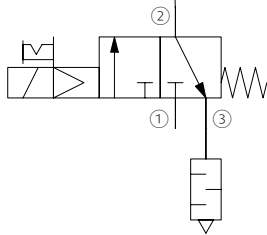
36.520



Assignment

- ① Vacuum supply
- ② Product side
- ③ Ventilation (Blow-off)

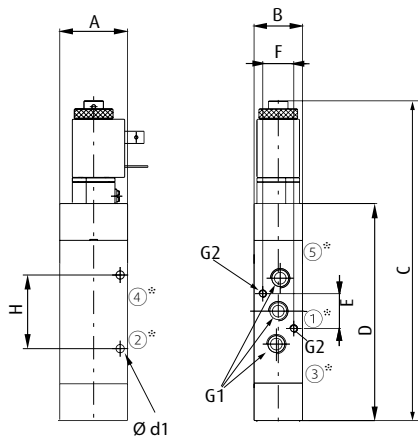
36.061



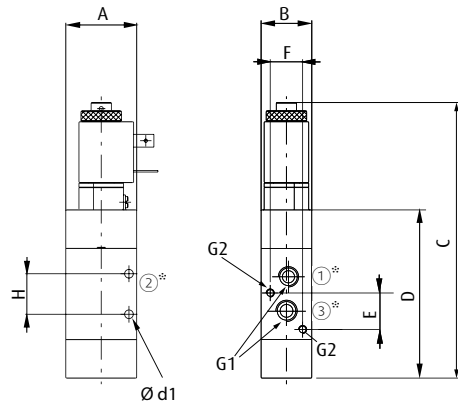
Assignment

- ① Compressed air inlet
- ② Compressed air output
- ③ Use of silencer (e.g. 72.016): This connects valve to atmospheric pressure and enables release of product in case of failure of compressed air line

### Dimensions



**36.060**



**36.061**

\* = Assignment see wiring diagrams

Item no.	G1	G2	A [mm]	B [mm]	C [mm]	D [mm]	Ø d1 [mm]	E [mm]	F [mm]	H [mm]
<b>36.060</b>	G1/8	M4	35	25	153	100	4.25	18	16	38
<b>36.061</b>	G1/8	M4	35	25	136	83	4.25	18	16	20



## FIPA Base valves

> System vacuum is maintained by closing unused suction openings



### Flow control valves with flow pin

- > Installation near to vacuum cup
- > Sealing of unused suction openings to maintain the system vacuum for vacuum cups still in use
- > Handling of porous workpieces, as there is no, or very little leakage
- > Suitable for short cycle times
- > Partially suited for dusty environments due to basic self-cleaning by means of blow-off

> See page 665



### Touch valves

- > Installation directly in vacuum cups
- > Sealing of unused suction openings to maintain the system vacuum for vacuum cups still in use
- > Spring-loaded push-button plunger opens vacuum channel following mechanical scanning
- > Any installation position

> See page 670



### Check valves

- > Maintenance of the vacuum level in suction systems in cases of vacuum generator failure

#### 32.631 to 32.635

- > Inline version for mounting in the tubing line

#### 32.647 to 32.653

- > Suitable for installation between vacuum pumps and storage device
- > Prevents oil return into the vacuum system in vacuum pumps without built-in check valve



#### 32.638

- > Check valves with compressed air inlet for short release times
- > Installation directly between vacuum cup and ejector

> See page 672





## FIPA Base valves



### Butterfly valves

- > Reduction of air flow at a constant vacuum level to compensate leakages through unused vacuum openings
- > Also suitable for compressed air
- > Inline-model available

> See page 675



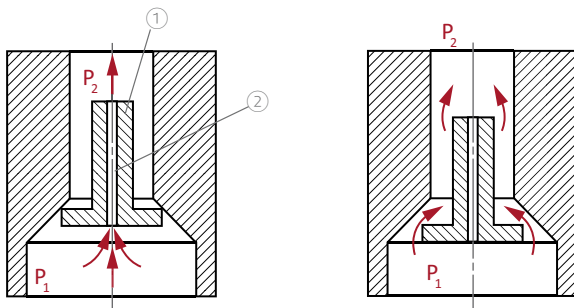
### Manual valves

- > Valves for manual switching on/off of pressure or vacuum circuits
- > 3/2-way versions for the manual aeration of vacuum circuits
- > Inline-models available
- > Any installation position

> See page 678

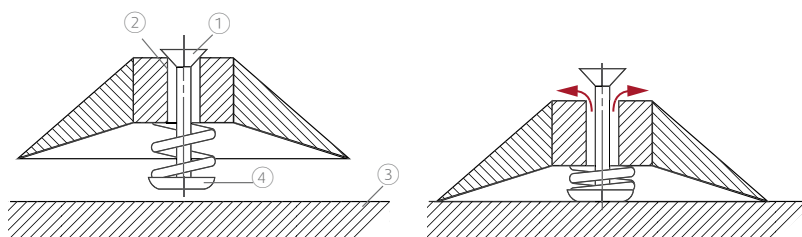
### Method of operation: Flow valves

Flow valves are generally installed vertically, close to the vacuum cup. The vacuum cups are applied under vacuum, without these touching the goods being handled, and the flow control pin ① is forced upwards by the pressure difference between P1 and P2. The flow control pin then closes the valve and only a small amount of leakage flows through the central bore ②. When the vacuum cups are placed on the goods being handled, air flows through the central bore until the pressures P1 and P2 are equalised, at which point the flow control pin falls down.



### Method of operation: Touch valves

The touch valve is attached directly to the vacuum cup. A spring presses a sealing element ① (e.g. a pin) against a sealing seat ② and maintains the vacuum in the system. When the vacuum cup is placed on the workpiece ③, the valve plunger ④ is pushed upwards and the touch valve opens.



Continued on the next page →



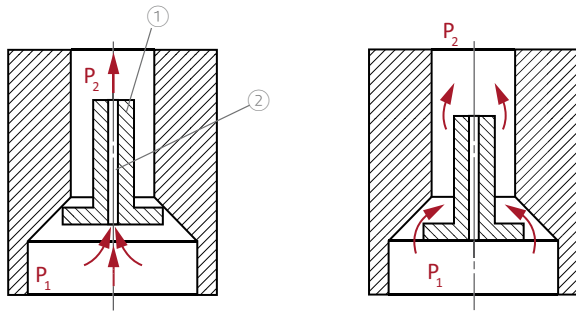
## FIPA Base valves

### Method of operation: Check valves

A spring presses a sealing element ① (e.g. a pin) against a sealing seat ②. If a pressure difference  $\Delta P$  is applied to the valve, the medium is only able to flow in one direction. The valve locks in the other direction.

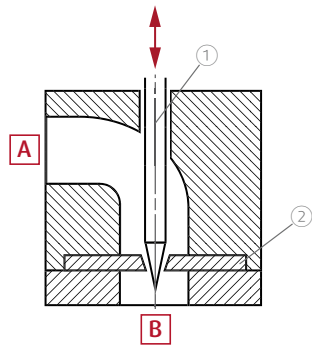
Type A: Flow pattern from vacuum cup to vacuum generator

Type B: Flow pattern from vacuum generator to vacuum cup



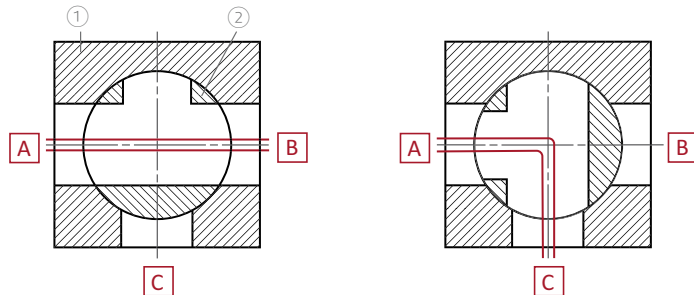
### Method of operation: Butterfly valves

The resulting annular gap between the control needle ① and the cavity plate ② acts as a control valve for the air flow. The higher the flow rate, the higher the pressure difference between A and B. The cross-section of the annular gap, and therefore also the action of the control valve, can be adjusted via the axial position of the control needle. Butterfly valves are bidirectional.



### Method of operation: Manual valves

A housing ① has three air connections (A, B, C). A rotary vane ② which can pivot up to 90° is mounted inside the housing. In the initial position, there is a free passage from A to B. If the rotary vane is rotated by 90°, B closes and a passage is opened from A to C. Alternatively, C can be fixed closed, making it a 2/2-way valve.





### Flow control valves with flow pin

For handling of porous products



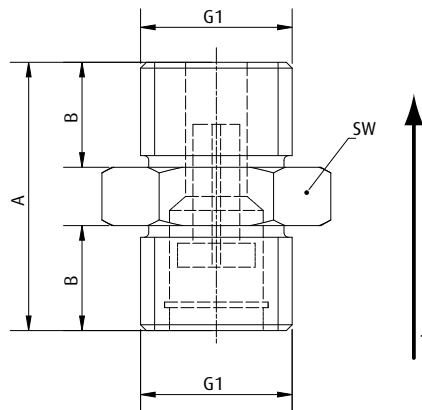
#### Product Description

- > Sealing of unused suction openings to maintain the system vacuum
- > Limited leakage prevents premature triggering with porous workpieces
- > Very short design
- > Optimal installation position is vertical

#### Technical data

Item no.	Suction power to achieve 30 % vacuum [NI/min]	Suction power to achieve 60 % vacuum [NI/min]	Max. flow rate with blow-off at 5 bar [NI/min]	Flow pin bore hole diameter [mm]	Leakage loss [m <sup>3</sup> /h]	Weight [g]
63.036	5	5	370	0.8	0.46	8
63.037	11	11	620	1.2	1.04	8
63.038	17	18	480	1.5	1.62	8
63.055	3	3	320	0.6	0.21	8

#### Dimensions



\* = Flow direction

Item no.	G1	A [mm]	B [mm]	SW
63.036	G1/4	23	9	17
63.037	G1/4	23	9	17
63.038	G1/4	23	9	17
63.055	G1/8	16	5	17



### Flow control valves with flow pin, self-cleaning

For harsh environmental conditions



#### Product Description

- > Sealing of unused suction openings to maintain the system vacuum
- > Limited leakage prevents premature triggering with porous workpieces
- > Self-cleaning by blow-off
- > Suitable for harsh environmental conditions (Heavy-duty)
- > Optimal installation position is vertical

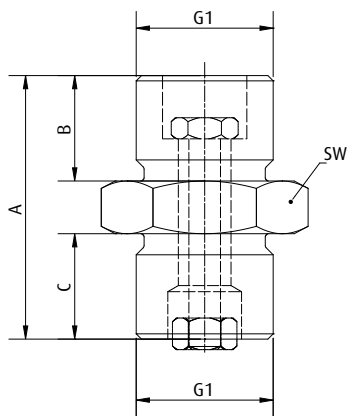
#### Notes

- > 63.015 can be plugged directly into a vacuum cup to conserve space

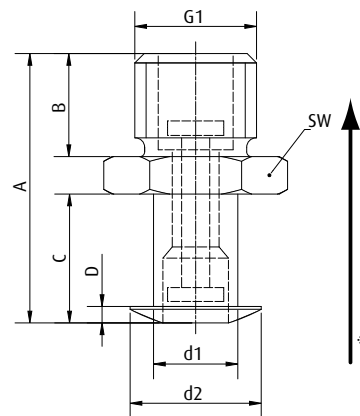
#### Technical data

Item no.	Suction power to achieve 30 % vacuum [NI/min]	Suction power to achieve 60 % vacuum [NI/min]	Max. flow rate with blow-off at 5 bar [NI/min]	Weight [g]
63.013	38	55	450	10
63.015	38	55	450	8

#### Dimensions



63.013



63.015

\* = Flow direction

Item no.	G1	A [mm]	B [mm]	C [mm]	D [mm]	d1 [mm]	d2 [mm]	SW
63.013	G1/4	25	10	10	--	--	--	17
63.015	G1/4	29	11	14	2	9	14	17



### Flow control valves with flow pin and filter, low leakage loss

Inch thread



#### Product Description

- > Sealing of unused suction openings to maintain the system vacuum
- > Ball seat valve with filter (not suitable for high levels of dust or dirt)
- > Suitable for short cycle times
- > Limited leakage prevents premature triggering with porous workpieces
- > Preset at the factory, 63.003 can be adjusted if necessary
- > Vertical mounting, exception of 63.001 to 63.003: Any mounting position

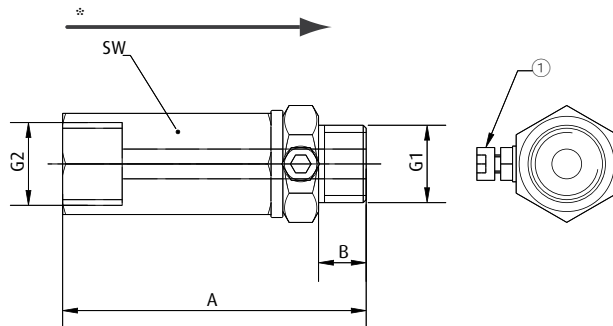
#### Technical data

Item no.	Suction power to achieve 30 % vacuum [Nl/min]	Suction power to achieve 60 % vacuum [Nl/min]	Max. flow rate with blow-off at 5 bar [Nl/min]	Weight [g]
63.001	4	7	260	15
63.002	4	8	360	24
63.003	0 - 22.6	0 - 28.6	550	25
63.008	3	3	340	17
63.011	7	8	590	31
63.012	8	9	790	49
63.060	7	8	590	10

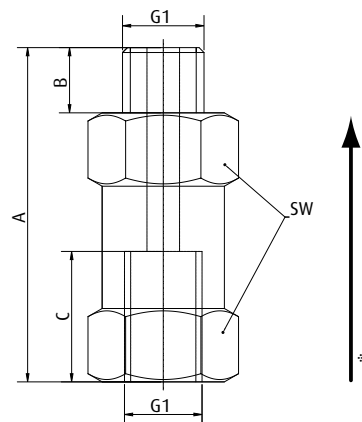
#### Dimensions

G1	G2	A [mm]	B [mm]	C [mm]	SW
G1/8	G1/8	48.5	6	--	14
G1/4	G1/4	50	10	--	17
G1/4	G1/4	50	8	--	17
G1/4	--	36	10	11	17
G3/8	--	39	10	12	22
G1/2	--	41	12	14	27
R1/8	--	39	10	12	22

#### Dimensions



63.001 | 63.002 | 63.003



63.008 | 63.011 | 63.012 | 63.060

① = Adjusting screw for 63.003 \* = Flow direction



# Valve technology | Flow control valves

Flow control valves with flow pin and filter, low leakage loss

## Flow control valves with flow pin and filter, low leakage loss

Metric thread



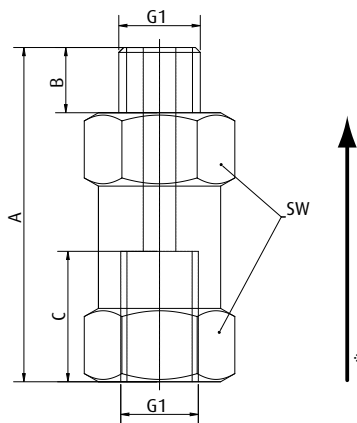
### Product Description

- > Sealing of unused suction openings to maintain the system vacuum
- > Ball seat valve with filter (not suitable for high levels of dust or dirt)
- > Suitable for short cycle times
- > Low leakage prevents premature triggering with porous workpieces

### Technical data

Item no.	Suction power to achieve 30 % vacuum [NI/min]	Suction power to achieve 60 % vacuum [NI/min]	Max. flow rate with blow-off at 5 bar [NI/min]	Leakage loss [m <sup>3</sup> /h]	Weight [g]
63.058	1	1	80	0.105	6
63.059	1.5	1.5	100	0.105	12

### Dimensions



\* = Flow direction

Item no.	G1	A [mm]	B [mm]	C [mm]	SW
63.058	M5	19.9	3	4.5	10
63.059	M6	28.1	4	4.9	12



## Flow control valves with flow pin, without leakage loss



### Product Description

- > Sealing of unused suction openings to maintain the system vacuum
- > No leakage loss, which means it is particularly well suited for dense workpieces
- > Closed valves are reset by switching off the vacuum
- > Can be mounted in any installation position

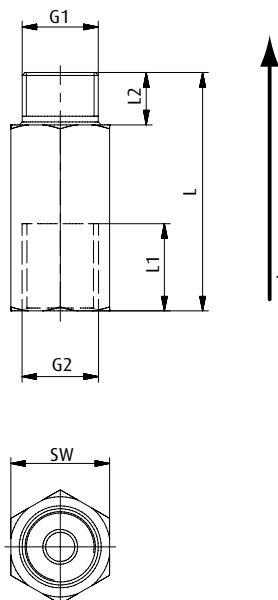
### Notes

- > These valves work only if the vacuum is switched on after the vacuum cup has been set in position

### Technical data

Item no.	Suction power [NI/min]	Min. vacuum level required [mbar]
63.017	28.3	-250
63.018	28.3	-250

### Dimensions



\* = Flow direction

Item no.	G1	G2	L [mm]	L1 [mm]	L2 [mm]	SW
63.017	G1/8	G1/4	41	15	9	17
63.018	G1/4	G1/4	41	15	9	17



### Touch valves



### Product Description

- > Maintains the vacuum level in vacuum systems
- > Mechanical scanning leaves unused suction openings closed
- > Spring-loaded spring leveler allows for any mounting position
- > Low susceptibility to dirt and very safe operation

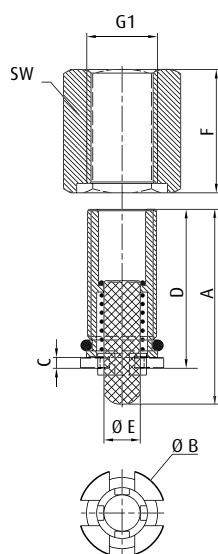
### Notes

- > Touch valves are directly screwed into vacuum cup, no further fittings needed

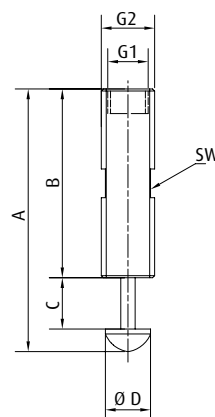
### Technical data

Item no.	Weight [g]	Suitable holder
270.129	7	--
270.130	62	270.268 (p.438), 270.266 (p.438), 270.286 (p.438)
63.026	29	270.268 (p.438), 270.266 (p.438), 270.286 (p.438)
63.027	21	270.268 (p.438), 270.266 (p.438), 270.286 (p.438)
63.032	8	270.090 (p.752)

### Dimensions



270.129 | 270.130

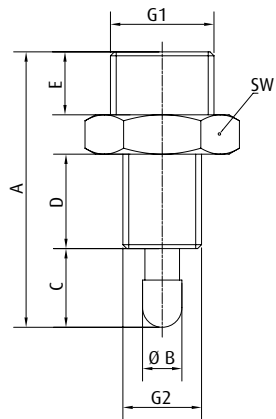


63.026 | 63.027





Dimensions



63.032

Item no.	G1	G2	A [mm]	B [mm]	Ø B [mm]	C [mm]	D [mm]	Ø D [mm]	E [mm]	Ø E [mm]	F [mm]	SW
270.129	G1/8	--	27	--	12	1.5	22	--	--	5	17	14
270.130	G1/2	--	43	--	25	1.5	35	--	--	8	32	30
63.026	G1/8	G1/4	65	45	--	13	--	11	--	--	--	11
63.027	G1/8	G1/4	56	46	--	5	--	11	--	--	--	11
63.032	G1/4	G1/4	45	--	7.2	10	6.5	--	10	--	--	17



### "Inline" non-return valves



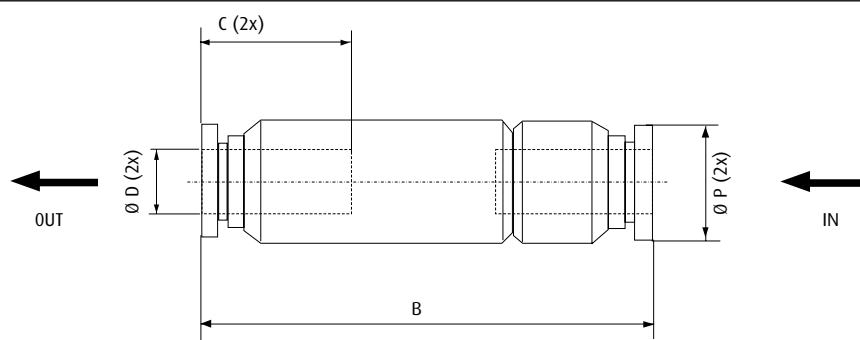
#### Product Description

- > Maintenance of the vacuum level in suction systems in cases of vacuum generator failure
- > Can also be used with dense workpieces as an energy-saving system
- > Two-sided quick fittings for fast installation in existing vacuum systems
- > Robust metal bodies
- > Very small design
- > Can be mounted in any installation position

#### Technical data

Item no.	Effective surface area [mm <sup>2</sup> ]	Material	Weight [g]
32.631	2.7	Aluminium	5
32.632	6.8	Aluminium anodised	9.5
32.633	15.5	Aluminium anodised	20
32.634	32	Aluminium anodised	61.5
32.635	46	Aluminium anodised	68

#### Dimensions



Item no.	Ø D [mm]	B [mm]	C [mm]	Ø P [mm]
32.631	4	34	11	9
32.632	6	38.5	12	12
32.633	8	55.5	18.5	15
32.634	10	82.5	21	25
32.635	12	87.5	23.5	25



### Non-return valves for very high volume flows



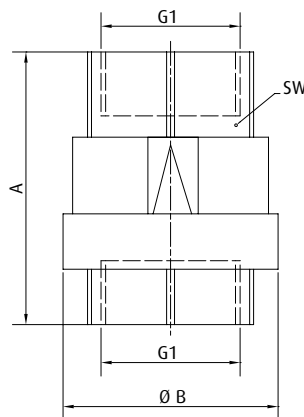
#### Product Description

- > Maintenance of the vacuum level in suction systems in cases of vacuum generator failure
- > Suitable for installation between the vacuum pump and vacuum tank
- > Prevents return flow of the oil into the vacuum system with vacuum pumps without an integrated non-return valve
- > Can be mounted in any installation position

#### Technical data

Item no.	Nominal flow rate [m <sup>3</sup> /h]	Material	Weight [g]
32.647	20	Bronze with oil-resistant seals	151
32.648	26	Bronze with oil-resistant seals	196
32.649	45	Bronze with oil-resistant seals	280
32.650	75	Bronze with oil-resistant seals	421
32.651	125	Bronze with oil-resistant seals	658
32.652	200	Bronze with oil-resistant seals	897
32.653	350	Bronze with oil-resistant seals	1,346

#### Dimensions



Item no.	G1	A [mm]	Ø B [mm]	SW
32.647	G3/8	55	34.5	23
32.648	G1/2	58	35	27
32.649	G3/4	65	41	33
32.650	G1	74.5	48	40
32.651	G1 1/4	83	60.5	50
32.652	G1 1/2	93	71	55
32.653	G2	101	87	70



### Non-return valves with blow-off device



Handling of wooden plates with ejector EIL.09 and check valve 32.638 (vacuum cup 102.070.234.4 for wood)

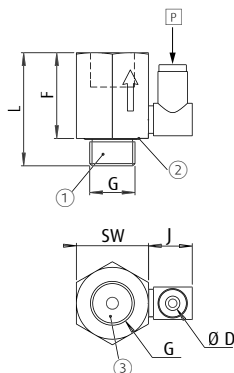
#### Product Description

- > Installation directly between vacuum cup and ejector
- > Short release time thanks to blow-off function via compressed air inlet P
- > Suitable as a safety valve: In cases of tubing damage, malfunction or emergency shutdown of the vacuum generator, the vacuum is maintained
- > Metal screen made from stainless steel (Inox) with mesh width of 200  $\mu$  prevents dirt from entering the ejector

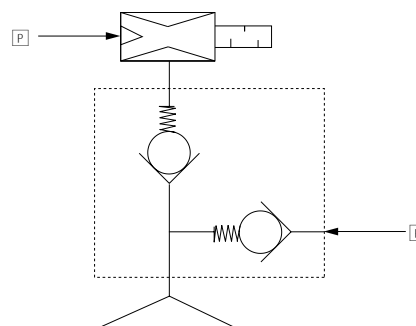
#### Technical data

Item no.	Minimum blow-off pressure [bar]	Suitable blow-off device
32.638	5	32.660 (p.525)

#### Dimensions



#### Wiring diagram



P = Compressed air blow-off at 5 bar 4/6 tubing ① = To the vacuum cup ② = O-ring ③ = To vacuum generator

Item no.	G	Ø D [mm]	F [mm]	L [mm]	J [mm]	SW
32.638	G1/4	4	25	33	12.8	21



### Butterfly valves - screw-in type



#### Product Description

- > Limitation of suction flow at a constant vacuum level
- > Reducing leakage at unoccupied vacuum cups maintains an adequate vacuum level for vacuum cups covered by products and thus prevents products from being dropped
- > Manual adjustment using knurled screw
- > Flexible installation using horizontal swivel air connector

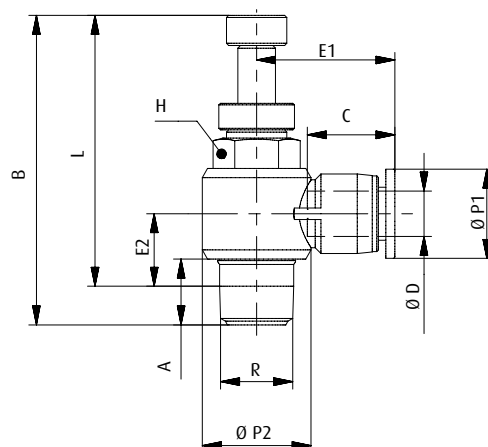
#### Technical data

Item no.	Operating pressure [bar]	Operating temperature [°C]	Weight [g]
32.500	-1 - 8	0 - 60	9
32.501	-1 - 8	0 - 60	20
32.502	-1 - 8	0 - 60	10
32.503	-1 - 8	0 - 60	20
32.504	-1 - 8	0 - 60	36
32.505	-1 - 8	0 - 60	20
32.506	-1 - 8	0 - 60	36
32.507	-1 - 8	0 - 60	67
32.508	-1 - 8	0 - 60	40
32.509	-1 - 8	0 - 60	69
32.510	-1 - 8	0 - 60	72
32.511	-1 - 8	0 - 60	103

#### Dimensions

R	Ø D [mm]	A [mm]	B [mm]	C [mm]	E1 [mm]	E2 [mm]	H [mm]	L [mm]	Ø P1 [mm]	Ø P2 [mm]
M5	4	3.5	27 - 29.5	15	20	6.5	8	23.5 - 26	10	10
G1/8	4	8	34 - 40.5	15	21.5	10.5	10	30 - 36.5	10	14.5
M5	6	3.5	27 - 29.5	17	24	7.5	8	23.5 - 26	12.5	10
G1/8	6	8	34 - 40.5	17	23.5	10.5	10	30 - 36.5	12.5	14.5
G1/4	6	11	41 - 47.5	17	25.5	12	14	35 - 41.5	12.5	18.5
G1/8	8	8	34 - 40.5	18.5	27	11.5	10	30 - 36.5	14.5	14.5
G1/4	8	11	41 - 47.5	18.5	28.5	13	14	35 - 41.5	14.5	18.5
G3/8	8	12	46.5 - 53.5	18.5	29	15	19	40 - 47	14.5	22
G1/4	10	11	41 - 47.5	20.5	31	14.5	14	35 - 41.5	18	18
G3/8	10	12	46.5 - 53.5	20.5	31.5	16.5	19	40 - 47	18	22
G3/8	12	12	46.5 - 53.5	23.5	37	18	19	40 - 47	21.5	22
G1/2	12	15	51.5 - 59	23.5	36.5	19.5	24	45.5 - 51	21.5	28

#### Dimensions





### "Inline" - butterfly valves



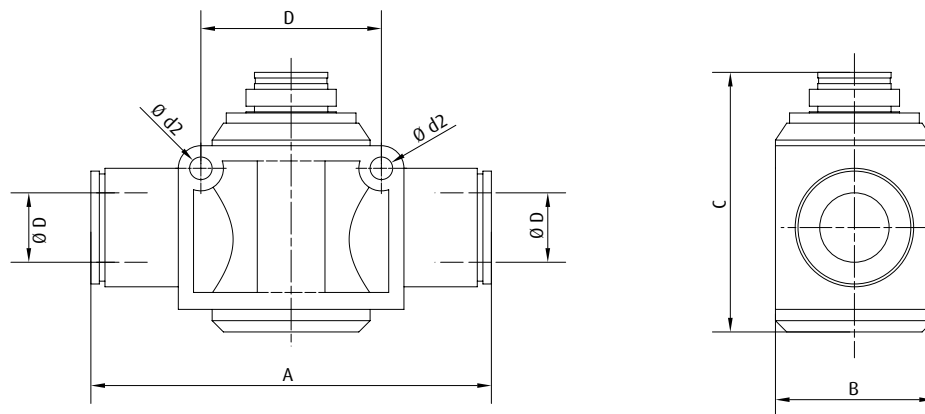
#### Product Description

- > Limitation of suction flow at a constant vacuum level
- > Reducing leakage at unoccupied vacuum cups maintains an adequate vacuum level for vacuum cups covered by products and thus prevents products from being dropped
- > Manual adjustment using knurled screw
- > Simple installation in the tubing line

#### Technical data

Item no.	Operating pressure [bar]	Operating temperature [°C]	Weight [g]
32.540	-1 - 9	0 - 60	12
32.541	-1 - 9	0 - 60	33
32.542	-1 - 9	0 - 60	44
32.543	-1 - 9	0 - 60	77
32.544	-1 - 9	0 - 60	127

#### Dimensions



Item no.	Ø D [mm]	A [mm]	B [mm]	C [mm]	D [mm]	d2 [mm]
32.540	4	37.5	11	29.5	14	3.2
32.541	6	46	15	44	20	4.3
32.542	8	51.5	18	48	22	4.3
32.543	10	59.5	21	53.5	26	4.3
32.544	12	72	28	58	32	4.3



### "Inline" - one-way flow control valves



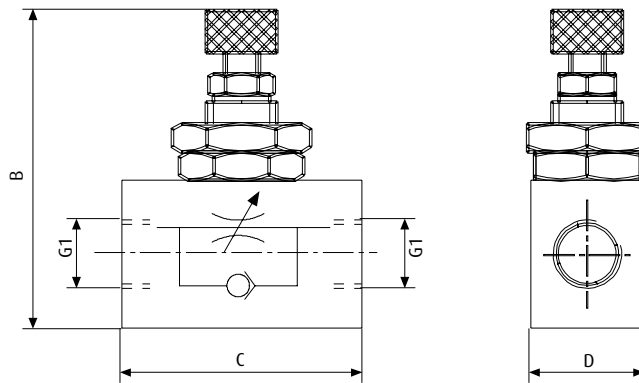
#### Product Description

- > Limitation of suction power at a constant vacuum level
- > Reducing leakage at unoccupied vacuum cups maintains an adequate vacuum level for vacuum cups covered by products and thus prevents products from being dropped
- > Manual adjustment using knurled screw

#### Technical data

Item no.	Maximum flow rate [m <sup>3</sup> /h]	Regulating range [mbar]	Operating temperature [°C]	Weight [g]
73.001	2.4	-999 - 0	-20 - 80	95
73.004	5.4	-999 - 0	-20 - 80	95

#### Dimensions



Item no.	G1	B [mm]	C [mm]	D [mm]
73.001	G1/4	60	39	22
73.004	G1/2	75	56	30



### 2/2-way manual shut-off valves



#### Product Description

> Use when electro valves are not possible or uneconomical

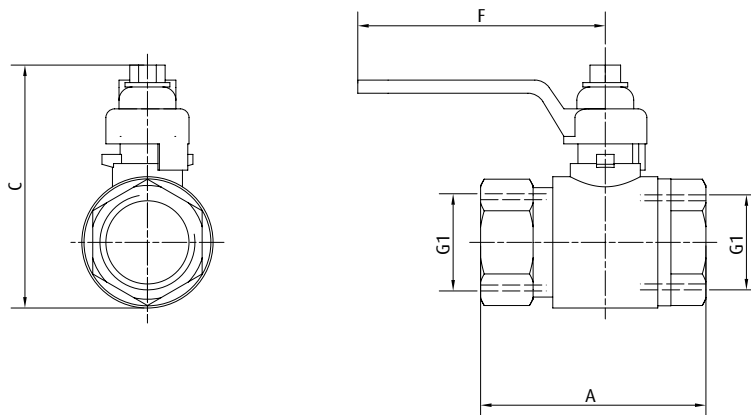
#### Technical data

Item no.	Free passage [mm]	Pressure range [bar]	Weight [g]
33.075	10	0 - 30	121
33.076	10	0 - 30	121
33.077	15	0 - 30	177
33.078	20	0 - 30	298
33.079	25	0 - 30	560
33.080	32	0 - 30	830
33.081	40	0 - 30	1,000
33.082	50	0 - 30	1,600
33.083	80	0 - 30	2,200

#### Dimensions

G1	A [mm]	C [mm]	F [mm]
G1/4	44	49	80
G3/8	44	51	80
G1/2	50	57	80
G3/4	57	74	113
G1	70	83	113
G1 1/4	80	90	138
G1 1/2	94	110	138
G2	112	115	157
G3	157	175	250

#### Dimensions







### 3/2-way manual shut-off valves



#### Product Description

- > Switching on/off individual vacuum cups in vacuum systems
- > Blow-off and ventilation of vacuum cups
- > Valve type with L-bore

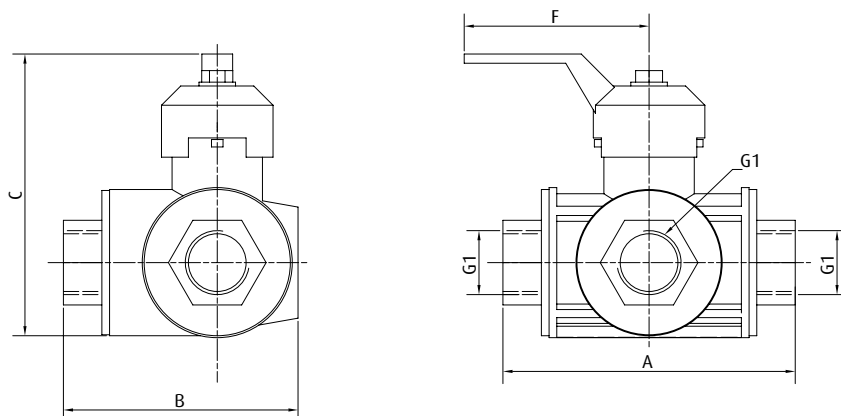
#### Technical data

Item no.	Free passage [mm]	Pressure range [bar]	Weight [g]
33.084	10	0 - 30	160
33.085	12	0 - 30	190
33.086	14	0 - 30	300
33.087	18	0 - 30	490
33.088	23	0 - 30	850
33.089	29	0 - 30	1,760
33.090	36	0 - 30	2,490

#### Dimensions

G1	A [mm]	B [mm]	C [mm]	F [mm]
G1/4	77	58	85	125
G3/8	77	58	85	125
G1/2	77	58	85	125
G3/4	92	70	107	145
G1	104	80	124	170
G1 1/4	118	92	134	170
G1 1/2	138	109	145	170

#### Dimensions





# Valve technology | Manual valves

3/2-way manual shut-off valves with quick fittings on both sides

## 3/2-way manual shut-off valves with quick fittings on both sides



### Product Description

- > Switching on/off individual vacuum cups in vacuum systems
- > Blow-off and ventilation of vacuum cups
- > Easy in line installation in the tubing line

### Ordering notes

- > Other connections available on request

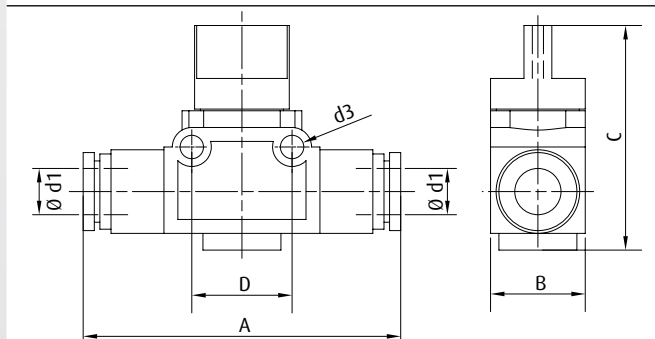
### Technical data

Item no.	Pressure range [bar]	Weight [g]
33.000	-1 - 9	24
33.001	-1 - 9	24.5
33.002	-1 - 9	25.5
33.003	-1 - 9	27
33.004	-1 - 9	44
33.005	-1 - 9	47.5
33.006	-1 - 9	50

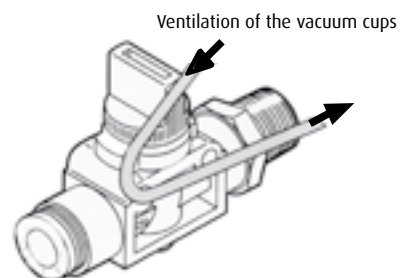
### Dimensions

d1 [mm]	A [mm]	B [mm]	C [mm]	D [mm]	d3 [mm]
4	52	17	40.5	18	4.2
6	52	17	40.5	18	4.2
8	54	17	40.5	18	4.2
8	56	17	40.5	18	4.2
10	65	21	41	24	4.2
12	68	21	41	24	4.2
12	71	21	41	24	4.2

### Dimensions



### Operating principle





### 3/2-way manual shut-off valves with quick fitting / threaded connection



#### Product Description

- > Switching on/off individual vacuum cups in vacuum systems
- > Blow-off and ventilation of vacuum cups

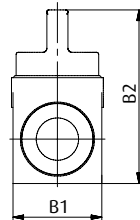
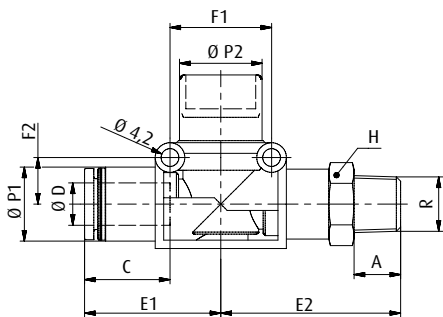
#### Technical data

Item no.	Free passage [mm]	Pressure range [bar]	Weight [g]
33.016	5	-1 - 9	33
33.017	5	-1 - 9	39.5
33.018	5	-1 - 9	52
33.019	5	-1 - 9	34.5
33.020	5	-1 - 9	40.5
33.021	5	-1 - 9	53.5
33.022	7	-1 - 9	61.5
33.023	7	-1 - 9	70
33.024	7	-1 - 9	91.5
33.025	7	-1 - 9	65
33.026	7	-1 - 9	73
33.027	7	-1 - 9	95

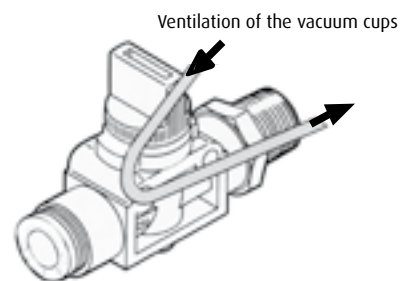
#### Dimensions

R	Ø D [mm]	A [mm]	B1 [mm]	B2 [mm]	C [mm]	E1 [mm]	E2 [mm]	F1 [mm]	F2 [mm]	H [mm]	Ø P1 [mm]	Ø P2 [mm]
R1/8	6	8	17	40.5	17	26	33.5	18	8	14	12.5	16.5
R1/4	6	11	17	40.5	17	26	36.5	18	8	14	12.5	16.5
R3/8	6	12	17	40.5	17	26	38.5	18	8	17	12.5	16.5
R1/8	8	8	17	40.5	18	28	33.5	18	8	14	15	16.5
R1/4	8	11	17	40.5	18	28	36.5	18	8	14	15	16.5
R3/8	8	12	17	40.5	18	28	38.5	18	8	17	15	16.5
R1/4	10	11	21	41	20	32.5	42.5	24	11	17	17.5	19.5
R3/8	10	12	21	41	20	32.5	43.5	24	11	17	17.5	19.5
R1/2	10	15	21	41	20	32.5	46.5	24	11	21	17.5	19.5
R1/4	12	11	21	41	23.5	35	42.5	24	11	17	21	19.5
R3/8	12	12	21	41	23.5	35	43.5	24	11	17	21	19.5
R1/2	12	15	21	41	23.5	35	46.5	24	11	21	21	19.5

#### Dimensions



#### Operating principle





System monitoring at a glance .....	684
Vacuum switches .....	686
Vacuum / Pressure switches .....	694
Pressure switches .....	695
Vacuum and pressure gauges .....	696
Accessories .....	698



## FIPA System monitoring

> Monitoring and control of vacuum systems



### Vacuum and pressure switches

- > Regulation and monitoring of vacuum circuits
- > High degree of user flexibility thanks to models with digital, analogue, pneumatic or mechanical controls
- > See next page for overview

> See page 691






### Vacuum and pressure gauge

- > Visual monitoring of vacuum circuits
- > Analogue or digital display

> See page 696



FIPA System monitoring - Overview

		Vacuum and pressure switches							
Item no.	Page	Product	Special applications	Signal output	Hysteresis	Protection class	Operation	Display	
	20.002	687	Vacuum switch - pneumatic	No electrical connection required	1 x pneumatic	120 mbar	--		
	20.011	686	Vacuum switch - electromechanical	NO/NC change-over contact function, for example for controlling solenoid valves	1 x electric, 250 V max.	6 % from switching point	IP65	--	
	20.007	688	Vacuum switch - electronic with analogue output	Monitoring of the continuous vacuum trend	1 x 1-5 V	0 - 30 % from switching point	IP50	Adjustment screw	
	20.040	689	Mini vacuum switch with digital output	Vacuum measurement at vacuum cup or ejector, Switch freely rotatable after mounting	1 x PNP	3 % from switching point	IP 40	Red LED	
	20.041	689			1 x NPN				
	20.020	690	Vacuum switch - electronic with analogue and digital output	Switch freely rotatable after mounting	1 x PNP 1 x 1-5 V		Keys	Yellow LED	
	20.021	691	Vacuum switch with two digital outputs	Monitoring of a pressure range possible, Switch freely rotatable after mounting	2 x PNP	IP65	Keys with menu navigation	Red / green LED 7-segment	
	20.022	691		Round design, Monitoring of a pressure range possible, Switch freely rotatable after mounting					
	20.023	695	Pressure switch - electronic with two digital outputs			freely programmable			
	20.035	692	Vacuum switch - electronic with two digital outputs and analogue output	Monitoring of two switching points (digital) as well as of the continuous vacuum trend (analogue)	2 x PNP 1 x 1-5 V	IP40			
	20.036	692			2 x NPN 1 x 1-5 V				
	20.026 / 20.027	694	Vacuum pressure switch - electronic with two digital outputs	Small design Monitoring of a pressure window possible, 20.027 with plug-in connection for ejector or tubing line	1 x PNP		IP65	Self-learning via connection cable, PC or preset Red / green LED	



### Vacuum switch - electromechanical

With NO/NC function for DC- and AC-connection



#### Product Description

- > An electrical signal is triggered when set vacuum value is reached
- > Switching point set via setscrew
- > Hysteresis is fixed
- > Standard vacuum connection via galvanised steel G1/8 screw-in port
- > Long service life due to high quality, robust design
- > Can be mounted in any position

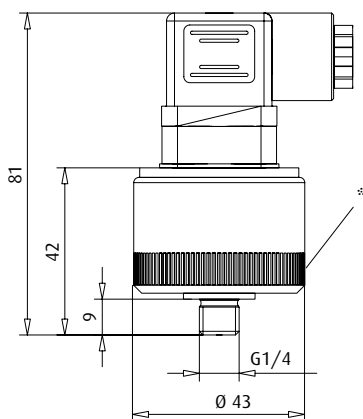
#### Ordering notes

- > If desired the switching point can be preset

#### Technical data

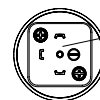
<b>Item no.</b>	<b>20.011</b>
Adjustable range [mbar]	20 - 800
Hysteresis	6 % switch point
Switching capacity DC up to 28 V [A]	max. 2
Switching capacity AC up to 250 V [A]	max. 2
Max. switching frequency [Hz]	200
Protection class	IP65
Suitable media	Filtered, oiled or unoled air or neutral gases
Operating temperature [°C]	-25 - 85
Weight [g]	120

#### Dimensions



\* = Knurled screw

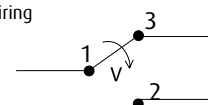
#### Electrical connection / changeover contact



Setting screw  
M3 DIN 914

1. Completely screw in with hex-wrench
2. Apply switching vacuum
3. Ease screw until contact toggles

Wiring







### Vacuum switch - pneumatic

**NEW**



#### Product Description

- > Switch outputs a pneumatic signal when the set vacuum level is reached
- > No electrical connection required
- > Usable as switch element for pneumatic valves

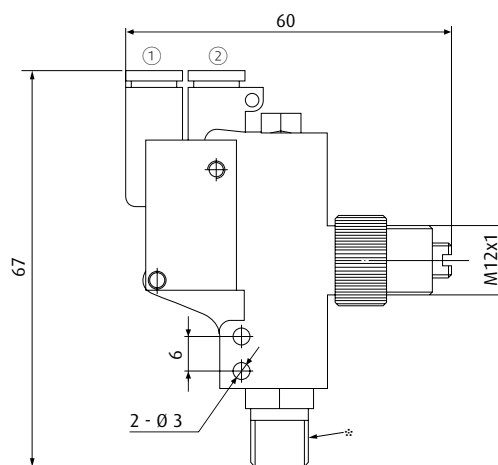
#### Notes

- > Vacuum switch 20.002 is part of the air-saving function for multi-chamber ejectors 65.340-LSE to 65.390-LSE

#### Technical data

<b>Item no.</b>	<b>20.002</b>
Adjustable range [mbar]	-950 - -150
Hysteresis [mbar]	120
Operating pressure [bar]	1.5 - 8
Operating principle	NC
Repeat accuracy [%]	± 5
Suitable media	Dry, unooled air and non-abrasive gases
Operating temperature [°C]	10 - 60
Weight [g]	44

#### Dimensions



① = Compressed air inlet, quick fitting  $\varnothing$  4 mm    ② = Compressed air output, quick fitting  $\varnothing$  4 mm    \* = G1/8-male



### Vacuum switch - electronic with analogue output



#### Product Description

- > Analogue output enables monitoring of the continuous vacuum trend
- > Compact and light design for installation directly on the vacuum cup
- > LED display in plug connection

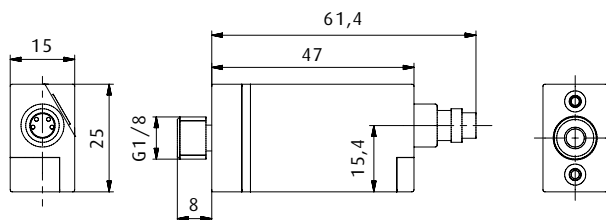
#### Notes

- > As an option: Mounting rail 20.008-H incl. channel nut for mounting the vacuum switch, e.g. on FIPA SLine extrusions

#### Technical data

Item no.	20.007
Adjustable range [mbar]	-999 - 0
Hysteresis	0 - 30 %
Analogue output [VDC]	1 - 5
Switching logic	Contact breaker (NC)
Response time [ms]	< 5
Thermal error	± 3 % from measuring range
Overpressure safety [bar]	3
Supply voltage [VDC]	18 - 30
Current consumption [mA]	< 20
Protection class	IP50
Suitable media	Dry, unoled air and non-abrasive gases
Operating temperature [°C]	0 - 50
Weight [g]	85
Electric connection	Plug M8x1, 4-pin
Suitable accessories	Mounting rail 20.008-H Connector cable 20.501 (p.717) Connector cable 20.502 (p.717)

#### Dimensions





### Mini vacuum switch - electronic with digital output



Example: Mini vacuum switch 20.040 on ejector EBA.08H.2-A and flat vacuum cup  $\varnothing$  40 mm

#### Product Description

- > Switch outputs a digital signal when a specific vacuum level is reached
- > Vacuum level is manually set with a potentiometer screw
- > Hysteresis is fixed
- > Red LED indicates set level reached
- > Space-saving installation on ejectors thanks to very small design

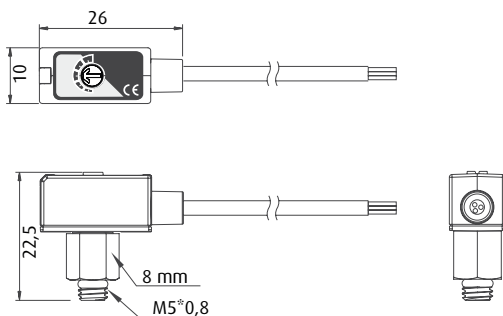
#### Ordering notes

- > Included in scope of delivery: Cable 1.5 meter, 3-pole, open wire

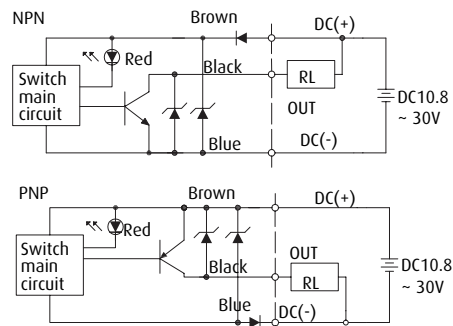
#### Technical data

Item no.	20.040	20.041
Adjustable range [mbar]	-990 - 0	-990 - 0
Hysteresis	3 % from default setting	3 % from default setting
Digital switching outputs	PNP	NPN
Response time [ms]	~ 1	~ 1
Repeat accuracy [%]	$\leq \pm 1$ % from measuring range	$\leq \pm 1$ % from measuring range
Overpressure safety [bar]	2	2
Supply voltage [VDC]	10.8 - 30	10.8 - 30
Max. Current consumption [mA]	10	10
Vacuum connection	M5	M5
Protection class	IP40	IP40
Suitable media	Filtered, oiled or unoled air or neutral gases	Filtered, oiled or unoled air or neutral gases
Operating temperature [°C]	0 - 60	0 - 60
Weight [g]	20	20

#### Dimensions



#### Wiring diagrams





# System monitoring | Vacuum switches

Vacuum switch - electronic with analogue and digital output

## Vacuum switch - electronic with analogue and digital output



### Product Description

- > Monitoring of vacuum levels e.g. in handling systems
- > Intelligent sensor with "teaching" feature
- > Suitable for all vacuum levels due to flexible setting of switching point and hysteresis
- > Small and robust
- > Easy operation
- > Protection class IP65 (no ventilation tube required)
- > Flexible mounting: Control panel can be rotated 360° after installation

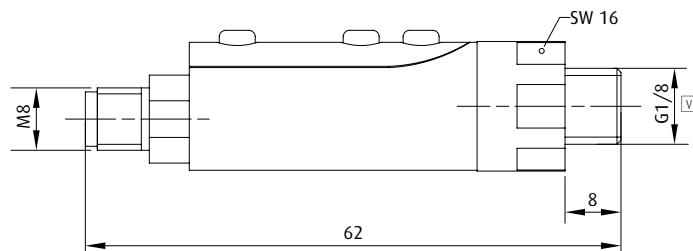
### Notes

- > Transient emissions: EN 61000-6-4:2007; EN 61326-2-3:2006
- > Interference resistance: EN 61000-6-2:2005; EN 61326-2-3:2006

### Technical data

<b>Item no.</b>	<b>20.020</b>
Measuring range [bar]	-1 - 0
Digital switching outputs	1x PNP (NO or NC)
Analogue output [V]	1 - 5
Repeat accuracy [%]	± 0.2 % from measuring range
Overpressure safety [bar]	6
Supply voltage [VDC]	11 - 30
Current consumption [mA]	< 25
Maximum switching current [mA]	125
Electric connection	Plug M8x1, 4-pin
Protection class	IP65
Suitable media	Dry, unoled air and non-abrasive gases
Operating temperature [°C]	0 - 50
Weight [g]	20
Suitable accessories	Connector cable 20.501 (p.717), Connector cable 20.502 (p.717), Adapter 20.511 (p.698), Adapter 20.523 (p.698), Adapter 20.522 (p.698), Wall clip 20.520 (p.700)

### Dimensions



∇ = Vacuum connection



### Vacuum switch - electronic with two digital outputs and display



#### Product Description

- > Monitoring of vacuum levels, e.g. in handling systems
- > Optimisation of cycle times to improve the economy of vacuum systems
- > Two freely adjustable digital outputs to set lower and upper threshold values
- > Additional analogue output
- > 7-segment LED-display
- > Protection class IP65 (no ventilation tube required)
- > Integrated reverse voltage protection
- > Compact, lightweight and robust design
- > Flexible mounting: 20.021 can be rotated 360° after installation

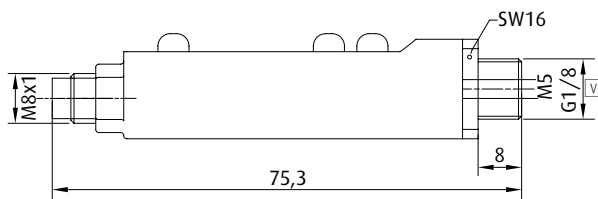
#### Notes

- > Transient emissions: EN 61000-6-4:2007; EN 61326-2-3:2006
- > Interference resistance: EN 61000-6-2:2005; EN 61326-2-3:2006
- > Vacuum values can be displayed and adjusted by the customer in following units: MPa, bar, inHg, mmHg

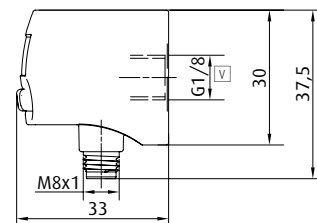
#### Technical data

Item no.	20.021	20.022
Measuring range [bar]	-1 - 0	-1 - 0
Digital switching outputs	2x PNP (NO or NC)	2x PNP (NO or NC)
Repeat accuracy [%]	± 0.2 % from measuring range	± 0.2 % from measuring range
Overpressure safety [bar]	6	6
Supply voltage [VDC]	11 - 30	11 - 30
Current consumption [mA]	< 55	< 55
Maximum switching current [mA]	125	125
Electric connection	Plug M8x1, 4-pin	Plug M8x1, 4-pin
Protection class	IP65	IP65
Suitable media	Filtered, oiled or unoled air or neutral gases	Filtered, oiled or unoled air or neutral gases
Operating temperature [°C]	0 - 50	0 - 50
Weight [g]	25	45
Suitable accessories	Connector cable 20.501, 20.502 (p.717), Adapter 20.522, 20.523, 20.511 (p.698), Wall clip 20.520 (p.700)	Connector cable 20.501, 20.502 (p.717), Mounting bracket 20.514 (p.699), Mounting bracket 20.515 (p.699)

#### Dimensions



20.021



20.022

∇ = Vacuum connection



# System monitoring | Vacuum switches

Vacuum switch - electronic with two digital outputs and analogue output

## Vacuum switch - electronic with two digital outputs and analogue output



### Product Description

- > Monitoring of vacuum levels, e.g. in handling systems
- > Optimisation of cycle times to improve the economy of vacuum systems
- > Two freely adjustable digital outputs to set lower and upper threshold values
- > Analogue output for continuous monitoring of vacuum level
- > Stable measurement even with short fluctuations of the supply pressure due to anti-chattering function
- > 7-segment 3 digit LED display
- > Integrated reverse voltage protection
- > Compact and lightweight design

### Notes

- > Vacuum values can be displayed and adjusted by the customer in following units: kPa, kgf/cm<sup>2</sup>, bar, psi, inHg, mmHg

### Ordering notes

- > Connector cable 0.3 meter with plug (M12 5-pin, straight) included in delivery
- > Connector cable optional
  - 20.508: M12, 5-pin, straight, open wires, 2 m
  - 20.509: M12, 5-pin, 90°, open wires, 2 m

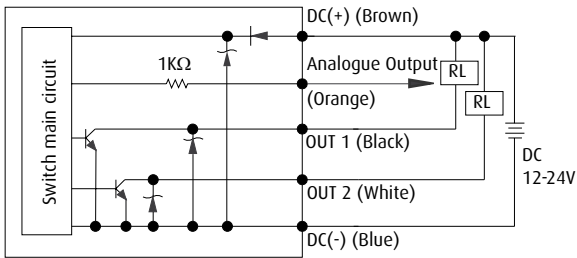
### Technical data

Item no.	20.035	20.036
Measuring range [bar]	-1 - 0	-1 - 0
Digital switching outputs	2 x PNP	2 x NPN
Analogue output [V]	1 - 5	1 - 5
Repeat accuracy [%]	≤ ± 0.2 % from measuring range	≤ ± 0.2 % from measuring range
Overpressure safety [bar]	3	3
Supply voltage [VDC]	10.8 - 30	10.8 - 30
Current consumption [mA]	≤ 55	≤ 55
Maximum switching current [mA]	80	80
Electric connection	Plug M12x1, 5-pin	Plug M12x1, 5-pin
Protection class	IP40	IP40
Suitable media	Dry, unoled air and non-abrasive gases	Dry, unoled air and non-abrasive gases
Operating temperature [°C]	0 - 50	0 - 50
Weight [g]	35	35
Suitable connector cable	20.508 (p.717) 20.509 (p.717)	20.508 (p.717) 20.509 (p.717)

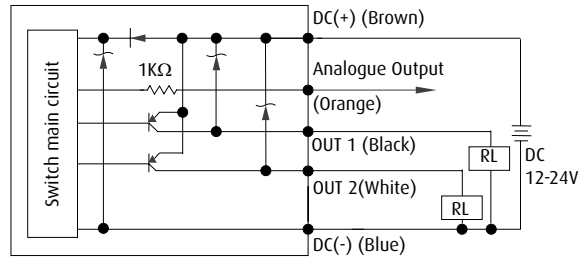


### Wiring diagrams

20.035 (NPN)

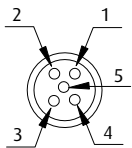


20.036 (PNP)



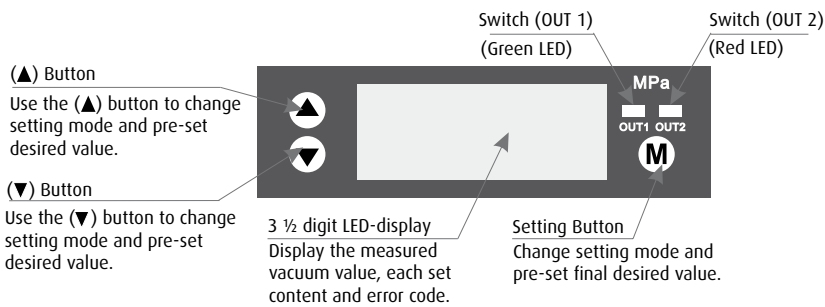
### Plug assignment

20.035 and 20.036

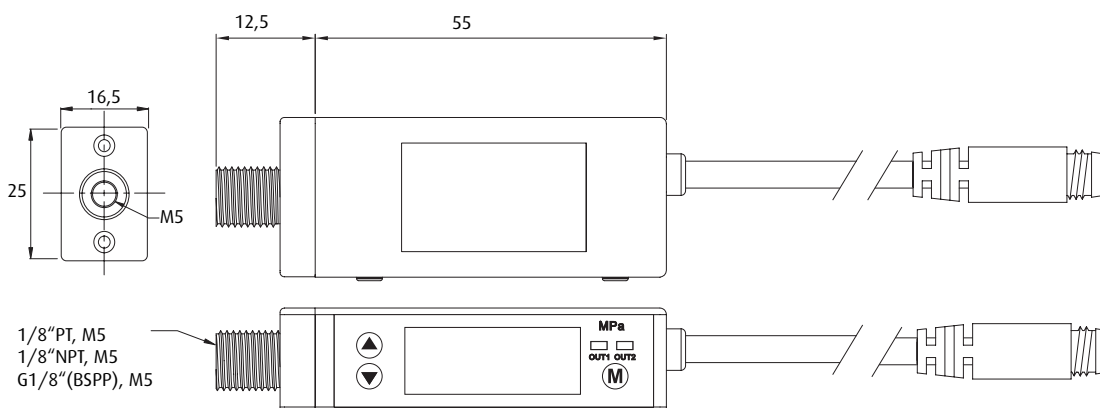


- (1) Brown (+)
- (2) White (OUT 2)
- (3) Blue (-)
- (4) Black (OUT 1)
- (5) Orange (analogue OUT 1-5)

### Panel instructions



### Dimensions





### Vacuum / Pressure switches - electronic with digital output

Compact design



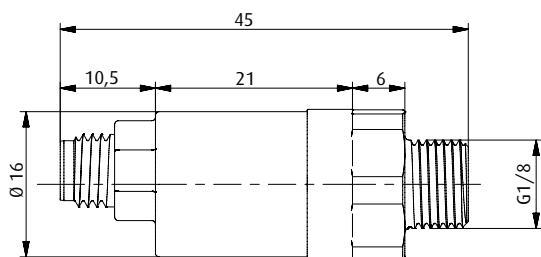
#### Product Description

- > Digital monitoring of vacuum and pressure in handling and automation systems
- > Small, lightweight and compact
- > Transistor output
- > Simple programming of the switching point, hysteresis and switching logic NC/NO
- > Monitoring of a pressure window is possible
- > Locking feature
- > LED operation and status indication
- > Item 20.027: With fitting pipe  $\varnothing$  6 mm to be inserted into tubing or ejectors (e.g. inline or base ejectors)

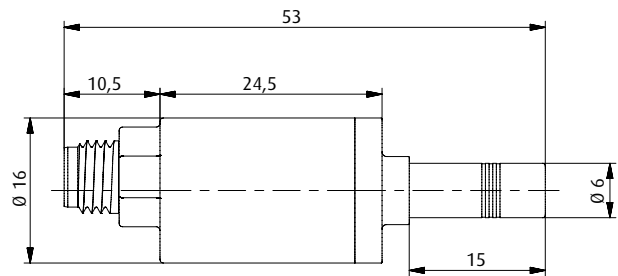
#### Technical data

Item no.	20.026	20.027
Adjustable range [mbar]	-999 - 999	-999 - 999
Hysteresis	0 - 100 %	0 - 100 %
Digital switching outputs	PNP Transistor	PNP Transistor
Switching logic	NO/NC	NO/NC
Repeat accuracy [%]	$\pm$ 0.2 % from measuring range	$\pm$ 0.2 % from measuring range
Supply voltage [VDC]	9 - 30 (reverse polarity, short circuit protected)	9 - 30 (reverse polarity, short circuit protected)
Current consumption [mA]	< 20	< 20
Maximum switching current [mA]	250	250
Voltage at the output	ca. $U_b$ -1,5 V	ca. $U_b$ -1,5 V
EMI / EMC	According to EU-directive 2004 / 108 / EG	According to EU-directive 2004 / 108 / EG
Protection class	IP65	IP65
Suitable media	Dry, unoiled air and non-abrasive gases	Dry, unoiled air and non-abrasive gases
Operating temperature [°C]	-10 - 80	-10 - 80
Electric connection	Plug M8x1, 4-pin	Plug M8x1, 4-pin
Suitable accessories	Connector cable 20.501 (p.717) Connector cable 20.502 (p.717) Adapter 20.511 (p.698), Adapter 20.522 (p.698) Adapter 20.523 (p.698)	Connector cable 20.501 (p.717) Connector cable 20.502 (p.717) Adapter 20.511 (p.698), Adapter 20.522 (p.698) Adapter 20.523 (p.698)

#### Dimensions



20.026



20.027

\* = M5-female





### Pressure switches - electronic with two digital switching outputs



Diagram with installation kit 20.515 for control panel installation

#### Product Description

- > Intelligent sensor for pressure monitoring
- > Adjustable with "teaching" feature
- > Switching point and hysteresis can be programmed as desired
- > Simple operation using button functions and LCD display
- > Small and robust

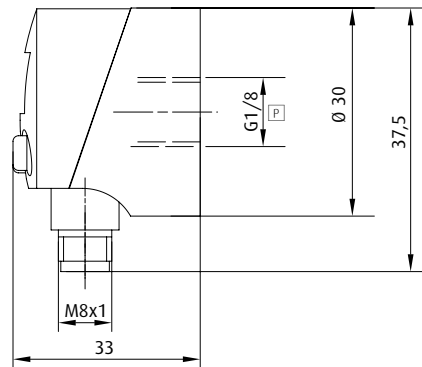
#### Notes

- > Transient emissions: EN 61000-6-4:2007; EN 61326-2-3:2006
- > Interference resistance: EN 61000-6-2:2005; EN 61326-2-3:2006
- > Vacuum values can be displayed and adjusted by the customer in following units: MPa, bar, psi

#### Technical data

Item no.	20.023
Measuring range [bar]	0 - 10
Digital switching outputs	2x PNP (NO/NC)
Repeat accuracy [%]	± 0.2 % from measuring range
Overpressure safety [bar]	0.2
Supply voltage [V]	11 - 30
Current consumption [mA]	< 55
Maximum switching current [mA]	125
Electric connection	Plug M8x1, 4-pin
Protection class	IP65
Suitable media	Filtered, oiled or unoled air or neutral gases
Operating temperature [°C]	0 - 50
Weight [g]	40
Suitable accessories	Connector cable 20.501 (p.717), Connector cable 20.502 (p.717), Mounting bracket 20.514 (p.699), Mounting bracket 20.515 (p.699)

#### Dimensions



**P** = Compressed air connection



### Vacuum - and pressure gauge

With red-green indication



Vacuum gauge



Pressure gauge

### Product Description

- > Visual monitoring of the vacuum and/or pressure level in gripper systems
- > Standardised design for flexible use in vacuum and/or pressure systems

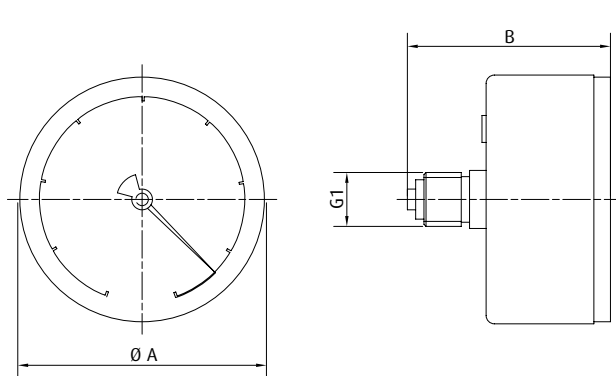
### Technical data

Item no.	Measuring range [bar]	Measuring range [mbar]	Connection	Weight [g]
91.001	--	0 - -1,000	At the rear	45
91.001-R	--	0 - -1,000	At the rear	40
91.003	--	0 - -1,000	At the rear	90
91.000	--	0 - -1,000	At the bottom	47
91.002	--	0 - -1,000	At the bottom	92
91.004	--	0 - -1,000	At the bottom	975
91.013	1 - 10	--	At the bottom	90
91.014	1 - 10	--	At the rear	90

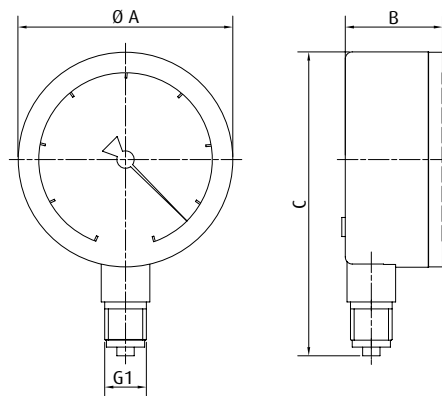
### Dimensions

G1	Ø A [mm]	B [mm]	C [mm]
G1/8	40	41	--
R1/8	40	41	--
G1/4	63	49	--
G1/8	40	26.5	55.5
G1/4	63	27.5	86
G1/2	160	50	200
G1/4	63	27.5	86
G1/4	63	27.5	86

### Dimensions



91.001 | 91.001-R | 91.003 | 91.014



91.000 | 91.002 | 91.004 | 91.013



### Digital pressure gauge - connection at the bottom



Diagram with installation kit 20.515 for front panel mounting

#### Product Description

- > Visual monitoring of the vacuum and/or pressure level in gripper systems
- > Calibration feature
- > Very compact
- > LCD display with selectable pressure units
- > Robust aluminium housing

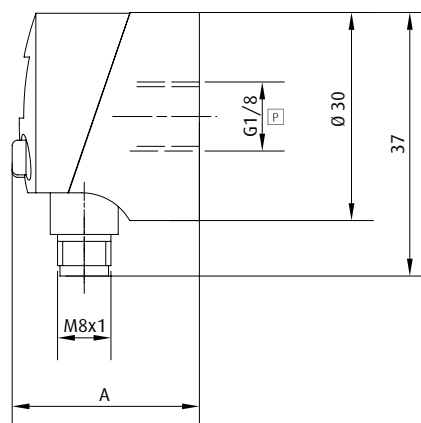
#### Notes

- > Vacuum values can be displayed and adjusted by the customer in following units: MPa, bar, psi

#### Technical data

Item no.	91.012
Measuring range [bar]	-1 - 1
Overpressure safety [bar]	5
Supply voltage [VDC]	10.8 - 30 (with reverse current protection)
Current consumption [mA]	< 30
Response time [ms]	2.5
Insulation resistance [mOhm]	> 100 (500 VDC)
Electric connection	Plug M8x1, 4-pin
Mounting position	any
EMI / EMC	According to EN 50081-1 / 50082-2
Operating temperature [°C]	-10 - 0
Weight [g]	45
Suitable accessories	Connector cable 20.501 (p.717), Connector cable 20.502 (p.717), Mounting bracket 20.514 (p.699), Mounting bracket 20.515 (p.699)

#### Dimensions



**P** = Pressure / Vacuum connection



# System monitoring | Accessories

Adapter and mounting brackets for vacuum switches and pressure switches

## Adapter and mounting brackets for vacuum switches and pressure switches



20.522 | 20.523



20.511

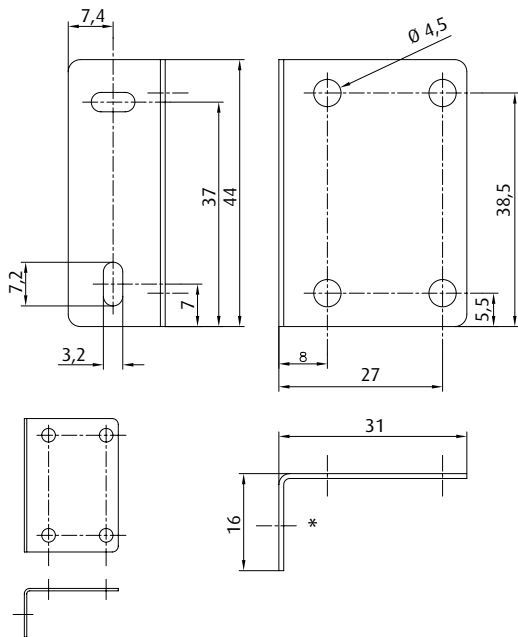
### Ordering notes

> Mounting material included in scope of delivery

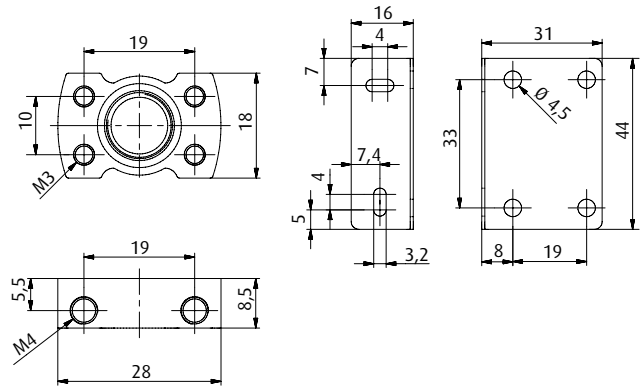
### Technical data

Item no.	Description	Suitable for vacuum / pressure switches
20.511	Push-In Fitting G1/8, tubing- $\varnothing$ 6 mm with mounting angle	20.020, 20.021, 20.026, 20.027
20.522	Adapter with angle bracket for flange assembly	20.020, 20.021, 20.026, 20.027
20.523	Adapter for flange assembly	20.020, 20.021, 20.026, 20.027

### Dimensions



20.511



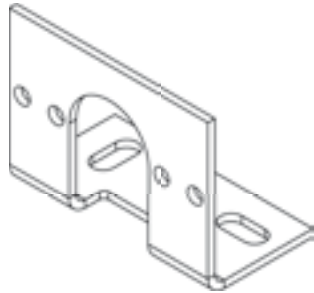
20.522 | 20.523

\* = Push-In Fitting G1/8, tubing- $\varnothing$  6 mm not displayed



### Mounting frame and brackets for front panel mounting

**NEW**



Example application: Gauge 20.023 with installation kit 20.515

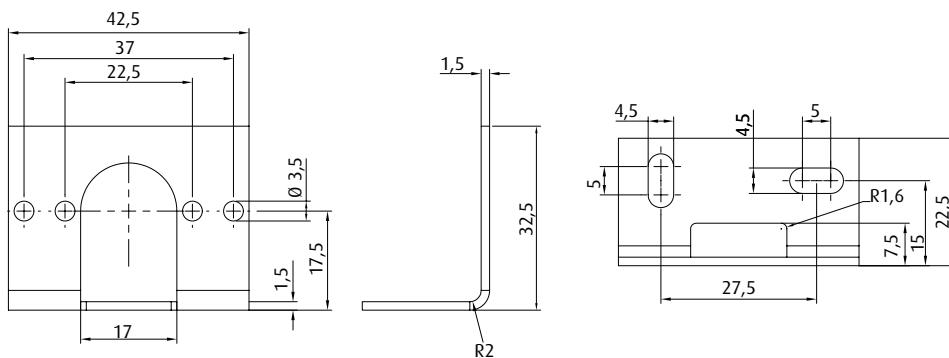
#### Ordering notes

> Mounting material included in scope of delivery

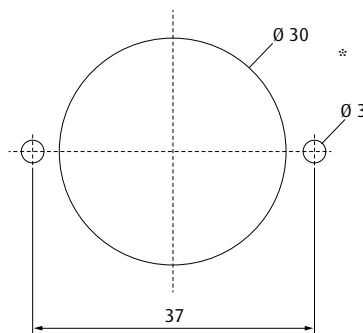
#### Technical data

Item no.	Description	Suitable for vacuum / pressure switches
20.514	Bracket	20.022, 20.023, 91.012
20.515	Mounting frame with bracket	20.022, 20.023, 91.012

#### Dimensions



20.514



20.515

\* = Installation frame drilling dimensions



## System monitoring | Accessories

Clip 16 mm for wall mounting

### Clip 16 mm for wall mounting

Suitable for vacuum switches 20.020 and 20.021

**NEW**



#### Notes

> Mounting via through hole  $\varnothing$  5 mm located centric at bottom side

#### Technical data

Item no.	Suitable for vacuum / pressure switches
<b>20.520</b>	20.020, 20.021

Tubing and cables at a glance .....	702
Tubing .....	704
Cables .....	717
Push-in fittings at a glance .....	718
Vacuum manifolds and rotary feedthroughs .....	720
Push-in fittings and plug-in connectors .....	724
Quick couplings with vacuum / pressure lock .....	748
Accessories .....	750



## FIPA Tubings and cables



- > Piping of vacuum and compressed air systems
- > Control cables for ejectors and vacuum switches



### Flexible vacuum pressure tubing made from polyurethane (PUR)

- > Very small bending radius
- > Standard blue transparent or intransparent

#### 61.090 - 61.096

- > High chemical stability and mechanical resistance
- > Outer diameter toleranced tubing, making them suitable for quick fittings

#### 61.056 - 61.062

- > Available in a wide range of colors
- > Outer diameter toleranced tubing, making them suitable for quick fittings

#### 61.020 - 61.030

- > Suitable for use in trailing chains, corrugated external surface

#### 61.005S - 61.011S

- > Self-extinguishing, flame-resistant according to DIN 4102 B1, corrugated external surface

> See page 704



### Vacuum-pressure tubing made from transparent fluoroelastomer (PFA)

- > Excellent resistance to chemicals, temperature and weather conditions
- > Used predominantly in chemical, foodstuff and medical industries

> See page 706



### Vacuum-pressure tubing made from highly flexible PVC, reinforced

- > Very abrasion-resistant
- > Suitable for use as transport tubing thanks to smooth interior walls

#### 61.160 - 61.169

- > Smooth external surface

> See page 707





## FIPA Tubings and cables



### Highly flexible, soft PVC tubing for pressure applications

- > Suitable for frequently occurring pivoting motions and oscillations
- > Not suitable for vacuum

> See page 710



### Spiral tubings made from black polyurethane (PUR) for vacuum and pressure applications

- > Space-saving tubings for mobile vacuum or pressure systems without straining the connections
- > Suitable for pneumatic tools

> See page 711



### Accessories:

Tubing nipples with male M and G threads

> See page 713



Reinforcing sleeves, especially for soft tubings

> See page 715



Tubing cutter with measuring tape

> See page 715



### Connection cable made from polyurethane (PUR)

- > Connection of vacuum switches, sensors or ejectors
- > Weather and oil resistant

> See page 717



# Connectors | Tubing

Flexible vacuum and pressure tubing made from PUR blue transparent

Flexible vacuum and pressure tubing made from PUR blue transparent

SUITABLE FOR INSTALLATION IN DRAG CHAINS



## Product Description

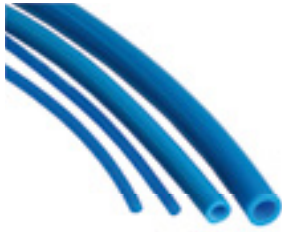
- > High flexibility enables small bending curve to build compact tubing systems
- > Suitable for air and tap water
- > Cut marks at 500 mm intervals facilitate installation
- > High chemical and mechanical resistance
- > Very high oil resistance

## Notes

- > Rule of thumb for installation in drag chain: Bending radius = 10 x outer diameter of tubing

## Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.090	3	2	8	-1 - 8	29	-15 - 60	7	20
61.091	4	2.5	10	-1 - 8	29	-15 - 60	9	20
61.092	6	4	15	-1 - 8	29	-15 - 60	19	20
61.093	8	5	15	-1 - 8	29	-15 - 60	36	20
61.094	10	6.5	20	-1 - 8	29	-15 - 60	54	20
61.095	12	8	30	-1 - 8	29	-15 - 60	74	20
61.096	12	9	30	-1 - 8	29	-15 - 60	68	20



Flexible vacuum and pressure tubing made of blue PUR

SUITABLE FOR INSTALLATION IN DRAG CHAINS

### Product Description

- > High flexibility enables small bending curve to build compact tubing systems
- > Suitable for air and tap water
- > Cut marks at 500 mm intervals facilitate installation

### Notes

- > Rule of thumb for installation in drag chain: Bending radius = 10 x outer diameter of tubing

### Ordering notes

- > Standard length 20 meters, colour blue
- > Available in various tubing lengths and a wide selection of colours (black, red, orange, ocher, yellow, green, blue, light blue, transparent, pure white)
- > 61.062 The standard colour is black
- > Length of 50 meters generally only available in black

### Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.056	3	2	8	-1 - 8	29	-15 - 60	7	20 / 50 / 100
61.057	4	2.5	10	-1 - 8	29	-15 - 60	9	20 / 50 / 100
61.058	6	4	15	-1 - 8	29	-15 - 60	19	20 / 50 / 100
61.059	8	5	15	-1 - 8	29	-15 - 60	36	20 / 50 / 100
61.060	10	6.5	20	-1 - 8	29	-15 - 60	54	20 / 50 / 100
61.061	12	8	30	-1 - 8	29	-15 - 60	74	20 / 50 / 100
61.062	16	11	60	-1 - 8	29	-15 - 60	128	20 / 50 / 100



## Connectors | Tubing

Vacuum and pressure tubing made of transparent Fluororesin (PFA)

### Vacuum and pressure tubing made of transparent Fluororesin (PFA)



FOR CHEMICAL, FOODSTUFF AND MEDICAL INDUSTRIES

#### Product Description

- > Excellent resistance to chemicals, temperature and weather conditions
- > Very smooth, transparent inner surface
- > Suitable for air, water and corrosive fluids

#### Notes

- > 61.069 to 61.073: Suitable for cleanroom applications

#### Ordering notes

- > Standard packaging unit: 5 meters

#### Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range for air / gas [bar]	Pressure range for liquids [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.063	4	2.5	20	-0.99 - 9	3	49	-65 - 260	18	5 / 20
61.064	6	4	30	-0.99 - 9	3	49	-65 - 260	36	5 / 20
61.065	8	6	48	-0.99 - 9	3	39	-65 - 260	50	5 / 20
61.066	10	7.5	60	-0.99 - 9	3	39	-65 - 260	78	5 / 20
61.067	12	9	72	-0.99 - 9	3	59	-65 - 260	112	5 / 20
61.068	16	13	78	-0.99 - 9	3	34	-65 - 260	154	5 / 20
61.069	4	2.5	20	-0.99 - 9	3	49	-65 - 260	55	5
61.070	6	4	30	-0.99 - 9	3	49	-65 - 260	95	5
61.071	8	6	30	-0.99 - 9	3	39	-65 - 260	125	5
61.072	10	7.5	60	-0.99 - 9	3	39	-65 - 260	190	5
61.073	12	9	72	-0.99 - 9	3	39	-65 - 260	270	5



Vacuum and pressure tubing made of highly flexible transparent PVC, reinforced with wire spiral



### Product Description

- > Vacuum applications up to 95 %
- > Very smooth inner surface for residue-free transport of materials such as granulate
- > Suitable for continuous movement
- > High abrasion-proof

### Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.160	13	8	32	-0.9 - 16	-5 - 65	140	1
61.161	16	10	20	-0.95 - 8	-5 - 65	155	1
61.162	18	12	25	-0.95 - 8	-5 - 65	180	1
61.163	20	14	30	-0.95 - 8	-5 - 65	200	1
61.164	22	16	35	-0.95 - 8	-5 - 65	225	1
61.165	24	18	40	-0.95 - 7	-5 - 65	280	1
61.166	27	20	50	-0.95 - 7	-5 - 65	340	1
61.167	33	25	60	-0.95 - 7	-5 - 65	510	1
61.168	42	32	75	-0.95 - 7	-5 - 65	730	1
61.169	53	40	100	-0.95 - 7	-5 - 65	1,220	1



# Connectors | Tubing

Highly flexible vacuum and pressure tubing made of PUR, reinforced with PVC spiral

Highly flexible vacuum and pressure tubing made of PUR, reinforced with PVC spiral



SUITABLE FOR INSTALLATION IN DRAG CHAINS

## Product Description

- > Vacuum applications up to 40 % vacuum
- > Very smooth inner surface for residue-free transport of materials such as granulate
- > Resistant to weather conditions and many chemicals
- > Outer surface slightly corrugated
- > Colour transparent

## Notes

- > Rule of thumb for installation in drag chain: Bending radius = 10 x outer diameter of tubing

## Ordering notes

- > Other sizes on request

## Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.020	25	20	20	-0.4 - 1	-10 - 70	100	20
61.021	30	25	25	-0.4 - 1	-10 - 70	150	20
61.022	36	30	30	-0.4 - 1	-10 - 70	190	20
61.023	38	32	32	-0.3 - 0.5	-10 - 70	200	20
61.024	41	35	35	-0.3 - 0.5	-10 - 70	230	20
61.025	44	38	38	-0.3 - 0.5	-10 - 70	230	20
61.026	46	40	40	-0.3 - 0	-10 - 70	250	20
61.027	51	45	45	-0.3 - 0	-10 - 70	280	20
61.028	57	50	50	-0.3 - 0	-10 - 70	310	20
61.029	62	55	55	-0.3 - 0	-10 - 70	350	20
61.030	67	60	60	-0.3 - 0	-10 - 70	390	20
61.031	70	63	63	-0.3 - 0	-10 - 70	410	20
61.033	78	70	70	-0.3 - 0	-10 - 70	500	20
61.034	84	76	76	-0.3 - 0	-10 - 70	555	20
61.035	89	80	80	-0.3 - 0	-10 - 70	610	20
61.036	99	90	90	-0.3 - 0	-10 - 70	715	20
61.037	112	102	102	-0.3 - 0	-10 - 70	835	20
61.038	120	110	110	-0.3 - 10	-10 - 70	890	20
61.039	131	120	120	-0.3 - 0	-10 - 70	950	20
61.040	138	127	127	-0.2 - 0	-10 - 70	1,015	20
61.043	164	152	152	-0.2 - 0	-10 - 70	1,380	20



## PUR highly flexible vacuum pressure tubing, reinforced, self-extinguishing



SUITABLE FOR INSTALLATION IN DRAG CHAINS

### Product Description

- > Highly flexible polyurethane for pressure and vacuum application tubing
- > Self-extinguishing, flame resistant according to DIN 4102 B 1
- > Alternative product in case of flying sparks, weld spatter or special fire safety obstructions
- > Reinforced with PVC-coated spring coil
- > Highly abrasion-proof
- > Smooth inner walls, corrugated external surface
- > Colour transparent

### Notes

- > Tubing built acc. to TRBS 2153 (zone 1 and 21) suitable for non-combustible dusts / bulk goods and gases / liquids of low conductivity Spiral ends shall be earthed at both sides to ensure good dissipation
- > Rule of thumb for installation in drag chain: Bending radius = 10 x outer diameter of tubing

### Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.005S	18	13	13	-0.5 - 2	-40 - 90	82	10
61.006S	25	20	20	-0.45 - 1.8	-40 - 90	147	10
61.007S	30	25	25	-0.4 - 1.6	-40 - 90	183	10
61.008S	35	30	30	-0.35 - 1.5	-40 - 90	220	10
61.009S	45	40	40	-0.3 - 1.4	-40 - 90	380	10
61.010S	50	45	45	-0.28 - 1.5	-40 - 90	410	10
61.011S	56	50	50	-0.28 - 1.5	-40 - 90	460	10



# Connectors | Tubing

Highly flexible tubing made of soft PVC for light pressure applications

Highly flexible tubing made of soft PVC for light pressure applications



SUITABLE FOR FOODSTUFFS

## Product Description

- > Unpressurised and low-pressure applications with concurrent pivoting motions and oscillations
- > High flexibility enables small bending curves for compact tubing systems
- > FDA approval for aqueous foods
- > Extremely resistant to acids and bases
- > Colour transparent

## Notes

- > Not suitable for vacuum

## Technical data

Item no.	Outer diameter [mm]	Inner diameter [mm]	Minimum bending radius [mm]	Pressure range [bar]	Usage temperature [°C]	Weight [g/m]	Packing unit [m]
61.211	4	2	5	0 - 1	-5 - 60	9	20
61.212	6	4	14	0 - 1	-5 - 60	17	20
61.213	8	6	25	0 - 0.5	-5 - 60	23	20
61.214	10	7	25	0 - 0.5	-5 - 60	36	20
61.215	12	9	35	0 - 0.5	-5 - 60	52	10





## Spiral tubing made of black PUR for vacuum and pressure applications



### Product Description

- > Space-saving tubing for mobile vacuum or pressure systems without straining the connections
- > Suitable for pneumatic tools

### Technical data

Item no.	Pressure range [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]
61.100	-1 - 7	29	-15 - 60
61.101	-1 - 7	29	-15 - 60
61.102	-1 - 7	29	-15 - 60
61.103	-1 - 7	29	-15 - 60
61.104	-1 - 7	29	-15 - 60
61.105	-1 - 7	29	-15 - 60
61.106	-1 - 7	29	-15 - 60
61.107	-1 - 7	29	-15 - 60
61.108	-1 - 7	29	-15 - 60
61.109	-1 - 7	29	-15 - 60
61.110	-1 - 7	29	-15 - 60
61.135	-1 - 7	29	-15 - 60
61.111	-1 - 7	29	-15 - 60
61.112	-1 - 7	29	-15 - 60
61.113	-1 - 7	29	-15 - 60
61.114	-1 - 7	29	-15 - 60
61.115	-1 - 7	29	-15 - 60
61.116	-1 - 7	29	-15 - 60
61.117	-1 - 7	29	-15 - 60
61.118	-1 - 7	29	-15 - 60
61.119	-1 - 7	29	-15 - 60
61.120	-1 - 7	29	-15 - 60
61.121	-1 - 7	29	-15 - 60
61.122	-1 - 7	29	-15 - 60
61.123	-1 - 7	29	-15 - 60

### Dimensions

A [mm]	ø d [mm]	ø D [mm]	L [mm]
70	3	16	210
150	3	16	450
230	3	16	700
390	3	16	1,200
120	4	24	360
180	4	24	540
350	4	24	1,100
480	4	24	1,500
700	4	24	2,100
1,040	4	24	3,200
1,450	4	24	4,400
90	6	30	270
160	6	30	500
230	6	30	700
430	6	30	1,300
620	6	30	1,900
910	6	30	2,800
1,300	6	30	3,900
1,850	6	30	5,600
250	8	42	750
390	8	42	1,200
540	8	42	1,700
770	8	42	2,400
1,045	8	42	3,200
1,550	8	42	4,700

Continued on the next page →



# Connectors | Tubing

Spiral tubing made of black PUR for vacuum and pressure applications

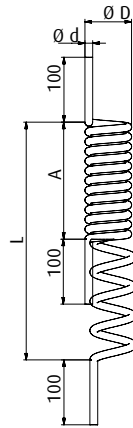
## Technical data

Item no.	Pressure range [bar]	Operating pressure at 20 °C [bar]	Usage temperature [°C]
61.124	-1 - 7	29	-15 - 60
61.125	-1 - 7	29	-15 - 60
61.126	-1 - 7	29	-15 - 60
61.127	-1 - 7	29	-15 - 60
61.128	-1 - 7	29	-15 - 60
61.129	-1 - 7	29	-15 - 60
61.130	-1 - 7	29	-15 - 60
61.131	-1 - 7	29	-15 - 60
61.132	-1 - 7	29	-15 - 60
61.133	-1 - 7	29	-15 - 60

## Dimensions

A [mm]	Ø d [mm]	Ø D [mm]	L [mm]
330	10	58	1,000
470	10	58	1,400
680	10	58	2,100
970	10	58	3,000
1,380	10	58	4,200
310	12	72	1,000
450	12	72	1,400
660	12	72	2,000
920	12	72	2,800
1,320	12	72	4,000

## Dimensions





## Tubing nipple with external thread



### Ordering notes

> Select the tubing inner diameter about 1 - 2 mm smaller than the tubing nipple

### Technical data

Item no.	For hose inner Ø [mm]	Material
62.019	9	Nickel-plated brass
62.020	6	Nickel-plated brass
62.021	8	Nickel-plated brass
62.022	10	Nickel-plated brass
62.023	6	Nickel-plated brass
62.024	8	Nickel-plated brass
62.025	10	Nickel-plated brass
62.026	12	Nickel-plated brass
62.027	16	Nickel-plated brass
62.028	19	Nickel-plated brass
62.029	25	Nickel-plated brass
62.030	10	Nickel-plated brass
62.031	12	Nickel-plated brass
62.033	16	Nickel-plated brass
62.034	18	Nickel-plated brass
62.035	25	Nickel-plated brass
62.036	32	Nickel-plated brass
62.037	38	Nickel-plated brass
62.038	32	Brass
62.040	50	Brass
62.041	50	Brass
62.042	63	Brass
62.045	6	Brass
62.046	9	Brass
62.047	12	Brass
62.048	16	Nickel-plated brass
62.060	14	Nickel-plated brass
62.061	32	Brass
62.062	4	Brass
62.063	6	Brass

### Dimensions

G1	Ø D [mm]	SW
G1/8	9	12
G1/8	6	12
G1/8	8	12
G1/8	10	12
G1/4	6	14
G1/4	8	14
G1/4	10	14
G1/4	12	14
G3/4	16	17
G3/4	19	32
G3/4	25	32
G1/2	10	22
G1/2	12	22
G1/2	16	22
G1/2	18	22
G1	25	37
G1 1/4	32	50
G1 1/2	38	55
G1 1/2-male	32	48
G1 1/2-male	50	52
G2-male	50	70
G2 1/2-male	63	80
G3/8-male	6	19
G3/8-male	9	19
G3/8-male	12	19
R3/8-male	16	17
G1/2-male	14	24
G1-male	32	36
M5	4	7
M5	6	7



### Tubing clamps

Material: Steel, galvanised



### Product Description

> Corrosion-proof thanks to the use of galvanised steel

### Technical data

Item no.	Adjustment range of diameter [mm]	Weight [g]
66.010	8 - 12	6
66.011	12 - 22	6
66.015	16 - 27	10
66.017	25 - 40	15
66.019	30 - 43	18
66.020	40 - 60	22



Reinforcing sleeves  
Material: Stainless steel



### Product Description

- > We recommend the use of reinforcing for all soft tubing
- > Reinforced sleeves also recommended for water transportation

### Technical data

Item no.	Hose outer $\varnothing$ [mm]	Hose inner $\varnothing$ [mm]
WR 0425	4	2.5
WR 0640	6	4
WR 0850	8	5
WR 0860	8	6
WR 1065	10	6.5
WR 1075	10	7.5
WR 1280	12	8
WR 1290	12	9
WR 1613	16	13

Tubing cutter with measuring tape



### Technical data

Item no.	Compatible hose diameter [mm]
61.083	3 - 16





## Connector cable M8, M12, 2-5-pin, Material PUR



## Product Description

> Electric connection e. g. of vacuum switches, sensors or ejectors

## Technical data

Item no.	Contact	Plug Design	Cable length [mm]	Suitable for
20.550	Plug with plastic housing, 2-pin, open cable	Straight	1,500	Connection of base ejectors with blow-off boost EBA.08H.2-A
20.503	Plug M8, 3-pin, open cable	Straight	2,500	Connection of sensors and sensor grippers
20.504	Plug M8, 3-pin, jack M8, 3-pin	90° elbow	300	Connection of sensors and sensor grippers
20.507	Plug M8, 3-pin, jack M8, 3-pin	90° elbow	2,000	Connection of sensors and sensor grippers
20.570	Plug M8, 3-pin, jack M8, 3-pin	Straight	1,500	Connection of sensors and sensor grippers
20.501	M8, 4-pin, female, open cable	Straight	5,000	Connection of vacuum switches or compact ejectors
20.502	M8, 4-pin, female, open cable	90° elbow	5,000	Connection of vacuum switches or compact ejectors
20.518	M12, 4-pin, female, open cable	Straight	2,000	Connection of vacuum switches or compact ejectors
20.519	M12, 4-pin, female, open cable	90° elbow	2,000	Connection of vacuum switches or compact ejectors
20.508	Plug M12, 5-pin, open cable	90° elbow	2,000	Connection of compact ejectors
20.509	Plug M12, 5-pin, open cable	90° elbow	2,000	Connection of compact ejectors



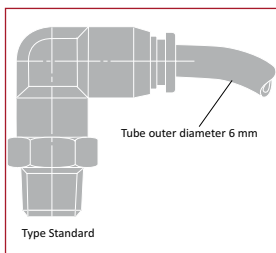
## FIPA Push-in fittings



### Vacuum manifolds

- > Construction of vacuum systems by means of simple installation of Push-in fittings or quick fittings
- > Inlets on one or both sides
- > Up to six inlets or outlets, male and female threads from M5 to G1 1/4
- > Design: Aluminium or brass

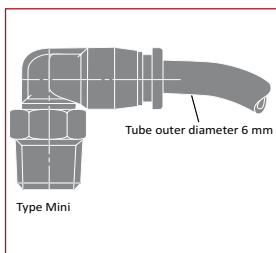
> See page 720



### Push-in fittings and plug-in connectors - Standard

- > Suitable for vacuum and pressure applications (-1 to 10 bar)
- > M, G and R male and female threads, straight or 90° version
- > T and Y manifolds, 2-way and 3-way angle swivel screw connections
- > Stackable plug-in connector (QC-3-3M - QC 8-8)
- > Lock connection push-in connectors 30.761 - 20.765 (straight); 30.774 - 30.778 (90°): locking of compressed air or vacuum during hose disassembly, release after reconnection
- > Rotation screw connections for mounting in with fast-running machines

> See page 724



### Push-in fittings and plug-in connectors - Mini

- > Suitable for vacuum and pressure applications (-1 to 10 bar)
- > 40 % smaller than standard version
- > M, R and G male and female threads, straight, 45° or 90° version
- > T-manifold
- > Easy assembly and disassembly thanks to elliptical mini-release-ring

> See page 744





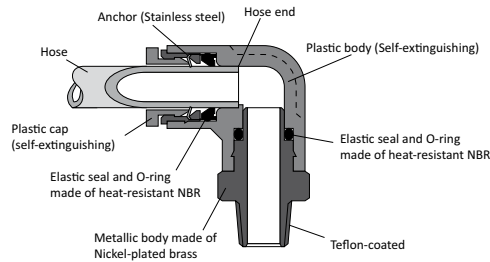
## FIPA Push-in fittings



### Push-in fittings and plug-in connectors - self-extinguishing

- > These quick-action Push-in fittings with spark protection are specifically designed for use with flying sparks and weld spatter
- > No chance of release ring malfunctions, for example due to the penetration of dirt or scale
- > The Push-in fittings are made from self-extinguishing plastic (UL94 V-0) and brass

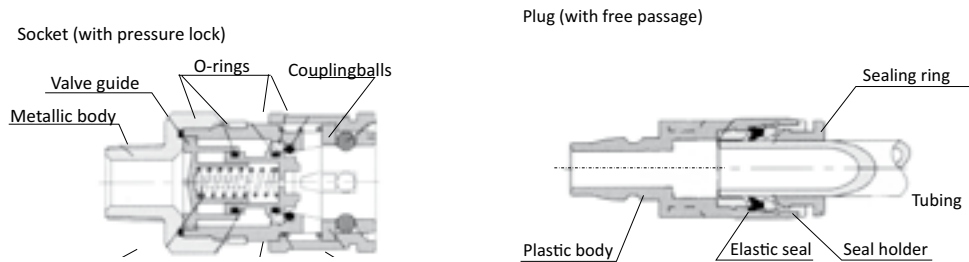
> See page 741



### Quick-action couplings with pressure / vacuum lock

- > Locking of compressed air or vacuum during disassembly, release after reconnection
- > Coupling can be operated with one hand

> See page 748



### Accessories

- > Double nipples
- > Thread adapters
- > Threaded sockets
- > Screw plugs
- > Sealing rings

> See page 750



# Connectors | Vacuum manifolds

Manifolds for simple assembly of vacuum loads

## Manifolds for simple assembly of vacuum loads

Outputs on one side, at the front



### Product Description

- > Construction of vacuum systems by means of simple installation of push-in fittings or quick fittings
- > Material: Aluminium

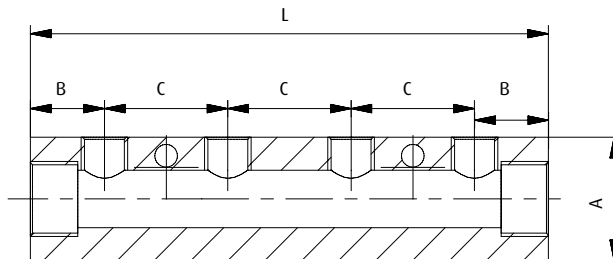
### Technical data

Item no.	Input connection	Output connection	Suitable sealing plugs
79.000	2x 1/8	2x M5	77.000 (p.753), 77.009 (p.753)
79.001	2x 1/8	4x M5	77.000 (p.753), 77.009 (p.753)
79.002	2x 1/8	6x M5	77.000 (p.753), 77.009 (p.753)
79.003	2x 1/4	2x 1/8	77.008 (p.753), 77.009 (p.753)
79.004	2x 1/4	4x 1/8	77.008 (p.753), 77.009 (p.753)
79.005	2x 1/4	6x 1/8	77.008 (p.753), 77.009 (p.753)
79.006	2x 3/8	2x 1/4	77.008 (p.753), 77.010 (p.753)
79.007	2x 3/8	4x 1/4	77.008 (p.753), 77.010 (p.753)
79.008	2x 3/8	6x 1/4	77.008 (p.753), 77.010 (p.753)
79.009	2x 3/8	2x 1/8	77.009 (p.753), 77.010 (p.753)
79.010	2x 3/8	4x 1/8	77.009 (p.753), 77.010 (p.753)
79.011	2x 3/8	6x 1/8	77.009 (p.753), 77.010 (p.753)
79.012	2x 1/2	2x 1/4	77.007 (p.753), 77.008 (p.753)
79.013	2x 1/2	4x 1/4	77.007 (p.753), 77.008 (p.753)
79.014	2x 1/2	6x 1/4	77.008 (p.753), 77.007 (p.753)

### Dimensions

A [mm]	B [mm]	C [mm]	L [mm]
20	15	15	45
20	15	15	75
20	15	15	105
30	15	30	60
30	15	30	120
30	15	30	180
40	18	36	72
30	18	36	144
30	18	36	216
40	18	30	66
30	18	30	126
30	18	30	186
40	22	36	80
40	22	36	152
40	22	36	224

### Dimensions





## Manifolds for simple assembly of vacuum loads

Outputs on both sides, at the front and rear



### Product Description

- > Construction of vacuum systems by means of simple installation of push-in fittings or quick fittings
- > Material: Aluminium

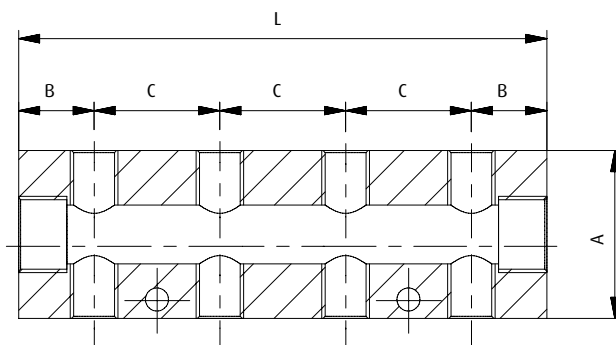
### Technical data

Item no.	Input connection	Output connection	Suitable sealing plugs
79.015	2x 1/8	2+2 x M5	77.000 (p.753) 77.009 (p.753)
79.016	2x 1/8	4+4 x M5	77.000 (p.753) 77.009 (p.753)
79.017	2x 1/4	2+2 x 1/8	77.008 (p.753) 77.009 (p.753)
79.018	2x 1/4	4+4 x 1/8	77.008 (p.753) 77.009 (p.753)
79.019	2x 3/8	2+2 x 1/4	77.008 (p.753) 77.010 (p.753)
79.020	2x 3/8	4+4 x 1/4	77.008 (p.753) 77.010 (p.753)
79.023	2x 1/2	2+2 x 1/4	77.007 (p.753) 77.008 (p.753)
79.024	2x 1/2	4+4 x 1/4	77.007 (p.753) 77.008 (p.753)

### Dimensions

A [mm]	B [mm]	C [mm]	L [mm]
20	15	15	45
20	15	15	75
30	15	30	60
30	15	30	120
40	18	36	72
40	18	36	144
40	22	36	80
40	22	36	152

### Dimensions





### Distributors

With two or three outputs



### Product Description

- > Construction of vacuum systems by means of simple installation of push-in fittings or quick fittings
- > Suitable for vacuum and compressed air

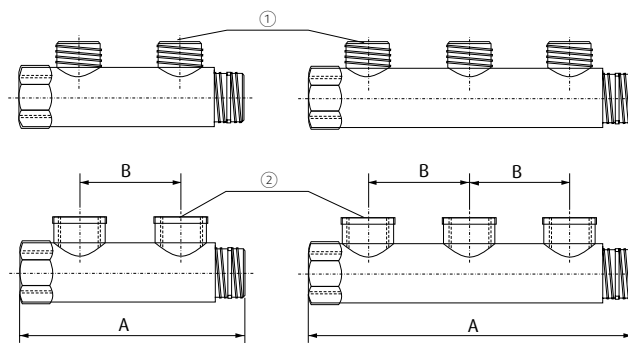
### Technical data

Item no.	Input connection	Output connection	Material	Suitable sealing caps
79.025	2x 3/4	2x 1/2 male	Brass blank	79.040, 79.041
79.026	2x 3/4	2x 1/2 female	Brass blank	79.040, 79.041
79.027	2x 1	2x 1/2 male	Brass blank	79.040, 79.042
79.028	2x 1	2x 1/2 female	Brass blank	79.040, 79.042
79.029	2x 1 1/4	2x 1/2 male	Brass blank	79.040, 79.043
79.030	2x 1 1/4	2x 1/2 female	Brass blank	79.040, 79.043
79.031	2x 3/4	3x 1/2 male	Brass blank	79.040, 79.041
79.032	2x 3/4	3x 1/2 female	Brass blank	79.040, 79.041
79.033	2x 1	3x 1/2 male	Brass blank	79.040, 79.042
79.034	2x 1	3x 1/2 female	Brass blank	79.040, 79.042
79.035	2x 1 1/4	3x 1/2 male	Brass blank	79.040, 79.043
79.036	2x 1 1/4	3x 1/2 female	Brass blank	79.040, 79.043

### Dimensions

A [mm]	B [mm]
114	50
114	50
114	50
114	50
137	60
137	60
164	50
164	50
164	50
164	50
197	60
197	60

### Dimensions



① = Connection output (male thread) ② = Connection output (female thread)



### Rotary feedthroughs for vacuum

Rotary feedthroughs for revolving machine parts



#### Product Description

- > Vacuum inlet for revolving machine parts
- > Suitable for fast moving machinery or gripping systems

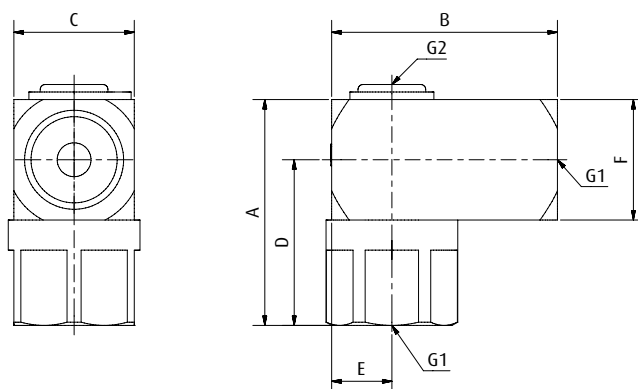
#### Notes

- > Only suitable for vacuum, not for compressed air
- > Construction: Housing of brass, nickel-plated, NBR seals, guide pins, flange screws and retaining ring: Steel galvanised

#### Technical data

Item no.	Nominal width [mm]	Flow rate solenoid valve [Nl/min]	U max. [1/min]	Operating temperature [°C]	Weight [g]
30.816	5	425	500	-10 - 85	69
30.817	5	465	550	-10 - 85	58
30.818	8	1,350	300	-10 - 85	150
30.819	11	3,200	200	-10 - 85	549

#### Dimensions



Item no.	G1	G2	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
30.816	G1/8	--	32	30	16	22	8	16
30.817	G1/4	--	32	30	16	22	8	16
30.818	G3/8	G1/8	39	40	25	26	12.5	20
30.819	G1/2	G3/8	55	65	40	35	20	30

## Straight male stud connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.000	-0.95 - 15	0 - 60	4	M5
30.001	-0.95 - 15	0 - 60	4	M6
30.002	-0.95 - 15	0 - 60	4	R1/8
30.003	-0.95 - 15	0 - 60	4	R1/4
30.004	-0.95 - 15	0 - 60	6	M5
30.005	-0.95 - 15	0 - 60	6	M6
30.006	-0.95 - 15	0 - 60	6	R1/8
30.007	-0.95 - 15	0 - 60	6	R1/4
30.008	-0.95 - 15	0 - 60	6	R3/8
30.009	-0.95 - 15	0 - 60	8	R1/8
30.010	-0.95 - 15	0 - 60	8	R1/4
30.011	-0.95 - 15	0 - 60	8	R3/8
30.012	-0.95 - 15	0 - 60	10	R1/8
30.013	-0.95 - 15	0 - 60	10	R1/4
30.014	-0.95 - 15	0 - 60	10	R3/8
30.015	-0.95 - 15	0 - 60	10	R1/2
30.016	-0.95 - 15	0 - 60	12	R1/4
30.017	-0.95 - 15	0 - 60	12	R3/8
30.018	-0.95 - 15	0 - 60	12	R1/2
30.019	-0.95 - 15	0 - 60	16	R3/8
30.020	-0.95 - 15	0 - 60	16	R1/2
30.002-G	-0.95 - 15	-20 - 80	4	G1/8
30.003-G	-0.95 - 15	-20 - 80	4	G1/4
30.006-G	-0.95 - 15	-20 - 80	6	G1/8
30.007-G	-0.95 - 15	-20 - 80	6	G1/4
30.008-G	-0.95 - 15	-20 - 80	6	G3/8
30.011-G	-0.95 - 15	-20 - 80	8	G3/8
30.012-G	-0.95 - 15	-20 - 80	10	G1/8
30.014-G	-0.95 - 15	-20 - 80	10	G3/8
30.015-G	-0.95 - 15	-20 - 80	10	G1/2
30.016-G	-0.95 - 15	-20 - 80	12	G1/4
30.017-G	-0.95 - 15	-20 - 80	12	G3/8
30.018-G	-0.95 - 15	-20 - 80	12	G1/2
30.019-G	-0.95 - 15	-20 - 80	16	G3/8
30.020-G	-0.95 - 15	-20 - 80	16	G1/2
30.021-G	-0.95 - 15	-20 - 80	28	G1



## Mini male stud connectors, round, hex key



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.200	-0.95 - 15	0 - 60	4	M5
30.201	-0.95 - 15	0 - 60	4	M6
30.202	-0.95 - 15	0 - 60	4	R1/8
30.203	-0.95 - 15	0 - 60	6	M5
30.204	-0.95 - 15	0 - 60	6	M6
30.205	-0.95 - 15	0 - 60	6	R1/8
30.206	-0.95 - 15	0 - 60	6	R1/4
30.207	-0.95 - 15	0 - 60	8	R1/8
30.208	-0.95 - 15	0 - 60	8	R1/4
30.209	-0.95 - 15	0 - 60	8	R3/8
30.210	-0.95 - 15	0 - 60	10	R1/4
30.211	-0.95 - 15	0 - 60	10	R3/8
30.212	-0.95 - 15	0 - 60	10	R1/2
30.213	-0.95 - 15	0 - 60	12	R3/8
30.214	-0.95 - 15	0 - 60	12	R1/2

## Straight push-in fittings with cutoff valve

Locking of compressed air or vacuum during disassembly, release after reconnection



Technical data			Dimensions		
Item no.	Effective passage area [mm²]	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.761	1.6	-0.95 - 15	0 - 60	4	M5
30.762	2	-0.95 - 15	0 - 60	4	R1/8
30.763	2.3	-0.95 - 15	0 - 60	6	M5
30.764	7.3	-0.95 - 15	0 - 60	6	R1/8
30.765	7.3	-0.95 - 15	0 - 60	6	R1/4

## Female stud connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.050	-0.95 - 15	0 - 60	4	R1/8
30.051	-0.95 - 15	0 - 60	4	R1/4
30.052	-0.95 - 15	0 - 60	6	R1/8
30.053	-0.95 - 15	0 - 60	6	R1/4
30.054	-0.95 - 15	0 - 60	8	R1/8
30.055	-0.95 - 15	0 - 60	8	R1/4
30.056	-0.95 - 15	0 - 60	8	R3/8
30.057	-0.95 - 15	0 - 60	10	R1/4
30.058	-0.95 - 15	0 - 60	10	R3/8
30.059	-0.95 - 15	0 - 60	12	R1/4
30.060	-0.95 - 15	0 - 60	12	R3/8
30.062	-0.95 - 15	0 - 60	10	G1/2
30.063	-0.95 - 15	0 - 60	12	G1/2
30.056-G	-0.95 - 15	-20 - 80	8	G3/8
30.057-G	-0.95 - 15	-20 - 80	10	G1/4
30.058-G	-0.95 - 15	-20 - 80	10	G3/8
30.059-G	-0.95 - 15	-20 - 80	12	G1/4
30.060-G	-0.95 - 15	-20 - 80	12	G3/8

## Straight tube connector - equal



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	
30.223	-0.95 - 15	0 - 60	4	
30.224	-0.95 - 15	0 - 60	6	
30.225	-0.95 - 15	0 - 60	8	
30.226	-0.95 - 15	0 - 60	10	
30.227	-0.95 - 15	0 - 60	12	
30.228	-0.95 - 15	0 - 60	16	





## Straight tube reducer



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D1 [mm]	Ø D2 [mm]
30.075	-0.95 - 15	0 - 60	6	4
30.076	-0.95 - 15	0 - 60	8	6
30.077	-0.95 - 15	0 - 60	10	8
30.078	-0.95 - 15	0 - 60	12	10
30.080	-0.95 - 15	0 - 60	16	12

## Male stud connector with ball bearing

Ball bearing enables applications with fast rotation or pivoting



Technical data				Dimensions	
Item no.	Max. revolutions [1/min.]	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.800	500	-0.95 - 15	0 - 60	4	M5
30.801	500	-0.95 - 15	0 - 60	4	M6
30.802	500	-0.95 - 15	0 - 60	4	R1/8
30.803	500	-0.95 - 15	0 - 60	6	M6
30.804	500	-0.95 - 15	0 - 60	6	R1/8
30.805	500	-0.95 - 15	0 - 60	6	R1/4
30.806	400	-0.95 - 15	0 - 60	8	R1/8
30.807	400	-0.95 - 15	0 - 60	8	R1/4
30.808	400	-0.95 - 15	0 - 60	8	R3/8
30.809	300	-0.95 - 15	0 - 60	10	R1/8
30.810	300	-0.95 - 15	0 - 60	10	R1/4
30.811	300	-0.95 - 15	0 - 60	10	R3/8
30.812	300	-0.95 - 15	0 - 60	10	R1/2
30.813	250	-0.95 - 15	0 - 60	12	R1/4
30.814	250	-0.95 - 15	0 - 60	12	R3/8
30.815	250	-0.95 - 15	0 - 60	12	R1/2

## Push-in stud connectors for high speed rotation

Locking of compressed air or vacuum during disassembly, release after reconnection



Technical data				Dimensions	
Item no.	Max. revolutions [1/min.]	Pressure range [bar]	Operating temperature [°C]	$\varnothing D$ [mm]	G
30.846	1,500	-0.95 - 15	0 - 60	4	M5
30.847	1,500	-0.95 - 15	0 - 60	4	M6
30.848	1,500	-0.95 - 15	0 - 60	4	R1/8
30.849	1,200	-0.95 - 15	0 - 60	6	R1/8
30.850	1,200	-0.95 - 15	0 - 60	6	R1/4
30.851	1,200	-0.95 - 15	0 - 60	8	R1/8
30.852	1,200	-0.95 - 15	0 - 60	8	R1/4
30.853	900	-0.95 - 15	0 - 60	10	R3/8
30.854	900	-0.95 - 15	0 - 60	10	R1/2
30.855	900	-0.95 - 15	0 - 60	12	R3/8
30.856	900	-0.95 - 15	0 - 60	12	R1/2



## 90° elbow male connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	$\varnothing D$ [mm]	G
30.100	-0.95 - 15	0 - 60	4	M5
30.101	-0.95 - 15	0 - 60	4	M6
30.102	-0.95 - 15	0 - 60	4	R1/8
30.103	-0.95 - 15	0 - 60	4	R1/4
30.104	-0.95 - 15	0 - 60	6	M5
30.105	-0.95 - 15	0 - 60	6	M6
30.106	-0.95 - 15	0 - 60	6	R1/8
30.107	-0.95 - 15	0 - 60	6	R1/4
30.108	-0.95 - 15	0 - 60	6	R3/8
30.109	-0.95 - 15	0 - 60	8	R1/8
30.110	-0.95 - 15	0 - 60	8	R1/4
30.111	-0.95 - 15	0 - 60	8	R3/8
30.112	-0.95 - 15	0 - 60	10	R1/8
30.113	-0.95 - 15	0 - 60	10	R1/4
30.114	-0.95 - 15	0 - 60	10	R3/8
30.115	-0.95 - 15	0 - 60	10	R1/2
30.116	-0.95 - 15	0 - 60	12	R1/4
30.117	-0.95 - 15	0 - 60	12	R3/8
30.118	-0.95 - 15	0 - 60	12	R1/2
30.119	-0.95 - 15	0 - 60	16	R3/8
30.120	-0.95 - 15	0 - 60	16	R1/2
30.102-G	-0.95 - 15	-20 - 80	4	G1/8
30.103-G	-0.95 - 15	-20 - 80	4	G1/4
30.106-G	-0.95 - 15	-20 - 80	6	G1/8
30.107-G	-0.95 - 15	-20 - 80	6	G1/4
30.108-G	-0.95 - 15	-20 - 80	6	G3/8
30.109-G	-0.95 - 15	-20 - 80	8	G1/8
30.110-G	-0.95 - 15	-20 - 80	8	G1/8
30.111-G	-0.95 - 15	-20 - 80	8	G3/8
30.112-G	-0.95 - 15	-20 - 80	10	G1/8
30.113-G	-0.95 - 15	-20 - 80	10	G1/4
30.114-G	-0.95 - 15	-20 - 80	10	G3/8
30.115-G	-0.95 - 15	-20 - 80	10	G1/2
30.116-G	-0.95 - 15	-20 - 80	12	G1/4
30.117-G	-0.95 - 15	-20 - 80	12	G3/8
30.118-G	-0.95 - 15	-20 - 80	12	G1/2
30.119-G	-0.95 - 15	-20 - 80	16	G3/8
30.120-G	-0.95 - 15	-20 - 80	16	G1/2

90° extended elbow male connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.279	-0.95 - 15	0 - 60	4	M5
30.280	-0.95 - 15	0 - 60	4	R1/8
30.281	-0.95 - 15	0 - 60	6	R1/8
30.282	-0.95 - 15	0 - 60	6	R1/4
30.283	-0.95 - 15	0 - 60	6	R3/8
30.284	-0.95 - 15	0 - 60	8	R1/8
30.285	-0.95 - 15	0 - 60	8	R1/4
30.286	-0.95 - 15	0 - 60	8	R3/8
30.287	-0.95 - 15	0 - 60	10	R1/4
30.288	-0.95 - 15	0 - 60	10	R3/8
30.289	-0.95 - 15	0 - 60	10	R1/2
30.290	-0.95 - 15	0 - 60	12	R1/4
30.291	-0.95 - 15	0 - 60	12	R3/8
30.292	-0.95 - 15	0 - 60	12	R1/2



## 90° elbow female connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.170	-0.95 - 15	0 - 60	4	M5
30.171	-0.95 - 15	0 - 60	4	M6
30.172	-0.95 - 15	0 - 60	4	R1/8
30.173	-0.95 - 15	0 - 60	4	R1/4
30.174	-0.95 - 15	0 - 60	6	M5
30.175	-0.95 - 15	0 - 60	6	M6
30.176	-0.95 - 15	0 - 60	6	R1/8
30.177	-0.95 - 15	0 - 60	6	R1/4
30.178	-0.95 - 15	0 - 60	6	R3/8
30.179	-0.95 - 15	0 - 60	8	R1/8
30.180	-0.95 - 15	0 - 60	8	R1/4
30.181	-0.95 - 15	0 - 60	8	R3/8
30.182	-0.95 - 15	0 - 60	10	R1/4
30.183	-0.95 - 15	0 - 60	10	R3/8
30.184	-0.95 - 15	0 - 60	10	R1/2
30.172-G	-0.95 - 15	-20 - 80	4	G1/8
30.173-G	-0.95 - 15	-20 - 80	4	G1/4
30.176-G	-0.95 - 15	-20 - 80	6	G1/8
30.178-G	-0.95 - 15	-20 - 80	6	G3/8
30.179-G	-0.95 - 15	-20 - 80	8	G1/8
30.180-G	-0.95 - 15	-20 - 80	8	G1/4
30.181-G	-0.95 - 15	-20 - 80	8	G3/8
30.182-G	-0.95 - 15	-20 - 80	10	G1/4
30.183-G	-0.95 - 15	-20 - 80	10	G3/8

## 90° male elbow with cutoff valve

Locking of compressed air or vacuum during disassembly, release after reconnection



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.774	-0.95 - 15	0 - 60	4	M5
30.775	-0.95 - 15	0 - 60	4	G1/8
30.776	-0.95 - 15	0 - 60	6	M5
30.777	-0.95 - 15	0 - 60	6	G1/8
30.778	-0.95 - 15	0 - 60	6	G1/4

## 90° elbow connectors - equal



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	
30.270	-0.95 - 15	0 - 60	4	
30.271	-0.95 - 15	0 - 60	6	
30.272	-0.95 - 15	0 - 60	8	
30.273	-0.95 - 15	0 - 60	10	
30.274	-0.95 - 15	0 - 60	12	
30.275	-0.95 - 15	0 - 60	16	



## 90° male elbow with ball bearing

Ball bearing enables applications with fast rotation or pivoting



Technical data				Dimensions	
Item no.	Max. revolutions [1/min.]	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.823	500	-0.95 - 15	0 - 60	4	M5
30.824	500	-0.95 - 15	0 - 60	4	M6
30.825	500	-0.95 - 15	0 - 60	4	R1/8
30.826	500	-0.95 - 15	0 - 60	6	M6
30.827	500	-0.95 - 15	0 - 60	6	R1/8
30.828	500	-0.95 - 15	0 - 60	6	R1/4
30.829	400	-0.95 - 15	0 - 60	8	R1/8
30.830	400	-0.95 - 15	0 - 60	8	R1/4
30.831	400	-0.95 - 15	0 - 60	8	R3/8
30.832	300	-0.95 - 15	0 - 60	10	R1/8
30.833	300	-0.95 - 15	0 - 60	10	R1/4
30.834	300	-0.95 - 15	0 - 60	10	R3/8
30.835	300	-0.95 - 15	0 - 60	10	R1/2
30.836	250	-0.95 - 15	0 - 60	12	R1/4
30.837	250	-0.95 - 15	0 - 60	12	R3/8
30.838	250	-0.95 - 15	0 - 60	12	R1/2

## 90° Male elbow for high speed rotation



Technical data				Dimensions	
Item no.	Max. revolutions [1/min.]	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.863	1,500	-0.95 - 15	0 - 60	4	M5
30.864	1,500	-0.95 - 15	0 - 60	4	M6
30.865	1,500	-0.95 - 15	0 - 60	4	R1/8
30.866	1,200	-0.95 - 15	0 - 60	6	R1/8
30.867	1,200	-0.95 - 15	0 - 60	6	R1/4
30.868	1,200	-0.95 - 15	0 - 60	8	R1/8
30.869	1,200	-0.95 - 15	0 - 60	8	R1/4
30.870	900	-0.95 - 15	0 - 60	10	R3/8
30.871	900	-0.95 - 15	0 - 60	10	R1/2
30.872	900	-0.95 - 15	0 - 60	12	R3/8
30.873	900	-0.95 - 15	0 - 60	12	R1/2

## Male banjo connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
<b>30.300</b>	-0.95 - 15	0 - 60	4	M6
<b>30.301</b>	-0.95 - 15	0 - 60	4	R1/8
<b>30.302</b>	-0.95 - 15	0 - 60	6	M5
<b>30.303</b>	-0.95 - 15	0 - 60	6	M6
<b>30.304</b>	-0.95 - 15	0 - 60	6	R1/8
<b>30.305</b>	-0.95 - 15	0 - 60	6	R1/4
<b>30.306</b>	-0.95 - 15	0 - 60	8	R1/8
<b>30.307</b>	-0.95 - 15	0 - 60	8	R1/4
<b>30.308</b>	-0.95 - 15	0 - 60	8	R3/8
<b>30.309</b>	-0.95 - 15	0 - 60	10	R1/4
<b>30.310</b>	-0.95 - 15	0 - 60	10	R3/8
<b>30.311</b>	-0.95 - 15	0 - 60	12	R3/8
<b>30.312</b>	-0.95 - 15	0 - 60	12	R1/2
<b>30.313</b>	-0.95 - 15	0 - 60	16	R3/8





## Male branch tee connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.332	-0.95 - 15	0 - 60	4	M5
30.333	-0.95 - 15	0 - 60	4	M6
30.334	-0.95 - 15	0 - 60	4	R1/8
30.335	-0.95 - 15	0 - 60	4	R1/4
30.336	-0.95 - 15	0 - 60	6	M5
30.337	-0.95 - 15	0 - 60	6	M6
30.338	-0.95 - 15	0 - 60	6	R1/8
30.339	-0.95 - 15	0 - 60	6	R1/4
30.340	-0.95 - 15	0 - 60	6	R3/8
30.341	-0.95 - 15	0 - 60	8	R1/8
30.342	-0.95 - 15	0 - 60	8	R1/4
30.343	-0.95 - 15	0 - 60	8	R3/8
30.344	-0.95 - 15	0 - 60	10	R1/4
30.345	-0.95 - 15	0 - 60	10	R3/8
30.346	-0.95 - 15	0 - 60	10	R1/2
30.347	-0.95 - 15	0 - 60	12	R1/4
30.348	-0.95 - 15	0 - 60	12	R3/8
30.349	-0.95 - 15	0 - 60	12	R1/2
30.350	-0.95 - 15	0 - 60	16	R3/8
30.351	-0.95 - 15	0 - 60	16	R1/2

## Equal tube tee connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	
30.390	-0.95 - 15	0 - 60	4	
30.391	-0.95 - 15	0 - 60	6	
30.392	-0.95 - 15	0 - 60	8	
30.393	-0.95 - 15	0 - 60	10	
30.394	-0.95 - 15	0 - 60	12	
30.395	-0.95 - 15	0 - 60	16	

## Unequal tube tee connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D1 [mm]	Ø D2 [mm]
30.399	-0.95 - 15	0 - 60	6	4
30.400	-0.95 - 15	0 - 60	8	6
30.401	-0.95 - 15	0 - 60	10	8
30.402	-0.95 - 15	0 - 60	12	10

## Equal Y connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	
30.431	-0.95 - 15	0 - 60	4	
30.432	-0.95 - 15	0 - 60	6	
30.433	-0.95 - 15	0 - 60	8	
30.434	-0.95 - 15	0 - 60	10	
30.435	-0.95 - 15	0 - 60	12	
30.436	-0.95 - 15	0 - 60	16	

## Unequal Y connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D1 [mm]	Ø D2 [mm]
30.440	-0.95 - 15	0 - 60	6	4
30.441	-0.95 - 15	0 - 60	8	6
30.442	-0.95 - 15	0 - 60	10	8
30.443	-0.95 - 15	0 - 60	12	10



## Male Y connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.403	-0.95 - 15	0 - 60	4	M5
30.404	-0.95 - 15	0 - 60	4	R1/8
30.405	-0.95 - 15	0 - 60	4	R1/4
30.406	-0.95 - 15	0 - 60	6	M5
30.407	-0.95 - 15	0 - 60	6	M6
30.408	-0.95 - 15	0 - 60	6	R1/8
30.409	-0.95 - 15	0 - 60	6	R1/4
30.410	-0.95 - 15	0 - 60	6	R3/8
30.411	-0.95 - 15	0 - 60	8	R1/8
30.412	-0.95 - 15	0 - 60	8	R1/4
30.413	-0.95 - 15	0 - 60	8	R3/8
30.414	-0.95 - 15	0 - 60	10	R1/4
30.415	-0.95 - 15	0 - 60	10	R3/8
30.416	-0.95 - 15	0 - 60	10	R1/2
30.417	-0.95 - 15	0 - 60	12	R1/4
30.418	-0.95 - 15	0 - 60	12	R3/8
30.419	-0.95 - 15	0 - 60	12	R1/2
30.420	-0.95 - 15	0 - 60	16	R3/8
30.421	-0.95 - 15	0 - 60	16	R1/2

## Elbow Y male connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.518	-0.95 - 15	0 - 60	4	M5
30.519	-0.95 - 15	0 - 60	4	M6
30.520	-0.95 - 15	0 - 60	4	R1/8
30.521	-0.95 - 15	0 - 60	4	R1/4
30.522	-0.95 - 15	0 - 60	6	M5
30.523	-0.95 - 15	0 - 60	6	M6
30.524	-0.95 - 15	0 - 60	6	R1/8
30.525	-0.95 - 15	0 - 60	6	R1/4
30.526	-0.95 - 15	0 - 60	6	R3/8
30.527	-0.95 - 15	0 - 60	8	R1/8
30.528	-0.95 - 15	0 - 60	8	R1/4
30.529	-0.95 - 15	0 - 60	8	R3/8
30.530	-0.95 - 15	0 - 60	10	R1/4
30.531	-0.95 - 15	0 - 60	10	R3/8
30.532	-0.95 - 15	0 - 60	10	R1/2
30.533	-0.95 - 15	0 - 60	12	R1/4
30.534	-0.95 - 15	0 - 60	12	R3/8
30.535	-0.95 - 15	0 - 60	12	R1/2

## Push-in connectors QC

Available as an option: Connecting strap for parallel circuit = QB-H, for series circuit = QB-T



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D1 [mm]	Ø D2 [mm]
QC3-3M	-0.95 - 15	0 - 60	3	3
QC3-4M	-0.95 - 15	0 - 60	3	4
QC3-6M	-0.95 - 15	0 - 60	3	6
QC4-3M	-0.95 - 15	0 - 60	4	3
QC4-4M	-0.95 - 15	0 - 60	4	4
QC4-6M	-0.95 - 15	0 - 60	4	6
QC6-3M	-0.95 - 15	0 - 60	6	3
QC6-4M	-0.95 - 15	0 - 60	6	4
QC6-6M	-0.95 - 15	0 - 60	6	6
QC6-6	-0.95 - 15	0 - 60	6	6
QC6-8	-0.95 - 15	0 - 60	6	8
QC8-6	-0.95 - 15	0 - 60	8	6
QC8-8	-0.95 - 15	0 - 60	8	8



## Two stack banjo



### Technical data

Item no.	Pressure range [bar]	Operating temperature [°C]
30.599	-0.95 - 15	0 - 60
30.600	-0.95 - 15	0 - 60
30.601	-0.95 - 15	0 - 60
30.602	-0.95 - 15	0 - 60
30.603	-0.95 - 15	0 - 60
30.604	-0.95 - 15	0 - 60
30.605	-0.95 - 15	0 - 60
30.606	-0.95 - 15	0 - 60
30.607	-0.95 - 15	0 - 60
30.608	-0.95 - 15	0 - 60
30.609	-0.95 - 15	0 - 60
30.610	-0.95 - 15	0 - 60
30.611	-0.95 - 15	0 - 60
30.612	-0.95 - 15	0 - 60
30.613	-0.95 - 15	0 - 60
30.614	-0.95 - 15	0 - 60

### Dimensions

Ø D [mm]	G
4	R1/8
4	R1/4
4	R3/8
6	R1/8
6	R1/4
6	R3/8
8	R1/8
8	R1/4
8	R3/8
8	R1/2
10	R1/4
10	R3/8
10	R1/2
12	R1/4
12	R3/8
12	R1/2

## Two stack, twin banjo



### Technical data

Item no.	Pressure range [bar]	Operating temperature [°C]
30.649	-0.95 - 15	0 - 60
30.650	-0.95 - 15	0 - 60
30.651	-0.95 - 15	0 - 60
30.652	-0.95 - 15	0 - 60
30.653	-0.95 - 15	0 - 60
30.654	-0.95 - 15	0 - 60
30.655	-0.95 - 15	0 - 60
30.656	-0.95 - 15	0 - 60
30.657	-0.95 - 15	0 - 60
30.658	-0.95 - 15	0 - 60
30.659	-0.95 - 15	0 - 60
30.660	-0.95 - 15	0 - 60
30.661	-0.95 - 15	0 - 60
30.662	-0.95 - 15	0 - 60
30.663	-0.95 - 15	0 - 60
30.664	-0.95 - 15	0 - 60

### Dimensions

Ø D [mm]	G
4	R1/8
4	R1/4
4	R3/8
6	R1/8
6	R1/4
6	R3/8
8	R1/8
8	R1/4
8	R3/8
8	R1/2
10	R1/4
10	R3/8
10	R1/2
12	R1/4
12	R3/8
12	R1/2

## 3-way male elbow connector



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.490	-0.95 - 15	0 - 60	4	M5
30.491	-0.95 - 15	0 - 60	4	M6
30.492	-0.95 - 15	0 - 60	4	R1/8
30.493	-0.95 - 15	0 - 60	4	R1/4
30.494	-0.95 - 15	0 - 60	6	M5
30.495	-0.95 - 15	0 - 60	6	M6
30.496	-0.95 - 15	0 - 60	6	R1/8
30.497	-0.95 - 15	0 - 60	6	R1/4
30.498	-0.95 - 15	0 - 60	6	R3/8
30.499	-0.95 - 15	0 - 60	8	R1/8
30.500	-0.95 - 15	0 - 60	8	R1/4
30.501	-0.95 - 15	0 - 60	8	R3/8
30.502	-0.95 - 15	0 - 60	10	R1/4
30.503	-0.95 - 15	0 - 60	10	R3/8
30.504	-0.95 - 15	0 - 60	10	R1/2
30.505	-0.95 - 15	0 - 60	12	R1/4
30.506	-0.95 - 15	0 - 60	12	R3/8
30.507	-0.95 - 15	0 - 60	12	R1/2

## Three stack, twin banjo



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.674	-0.95 - 15	0 - 60	4	R1/8
30.675	-0.95 - 15	0 - 60	4	R1/4
30.676	-0.95 - 15	0 - 60	4	R3/8
30.677	-0.95 - 15	0 - 60	6	R1/8
30.678	-0.95 - 15	0 - 60	6	R1/4
30.679	-0.95 - 15	0 - 60	6	R3/8
30.680	-0.95 - 15	0 - 60	8	R1/8
30.681	-0.95 - 15	0 - 60	8	R1/4
30.682	-0.95 - 15	0 - 60	8	R3/8
30.683	-0.95 - 15	0 - 60	8	R1/2
30.684	-0.95 - 15	0 - 60	10	R1/4
30.685	-0.95 - 15	0 - 60	10	R3/8
30.686	-0.95 - 15	0 - 60	10	R1/2
30.687	-0.95 - 15	0 - 60	12	R1/4
30.688	-0.95 - 15	0 - 60	12	R3/8
30.689	-0.95 - 15	0 - 60	12	R1/2



## Self-extinguishing male stud connector



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
32.000	-0.95 - 15	0 - 60	4	M5
32.001	-0.95 - 15	0 - 60	4	M6
32.002	-0.95 - 15	0 - 60	4	R1/8
32.003	-0.95 - 15	0 - 60	4	R1/4
32.004	-0.95 - 15	0 - 60	6	R1/8
32.005	-0.95 - 15	0 - 60	6	R1/4
32.006	-0.95 - 15	0 - 60	6	R3/8
32.007	-0.95 - 15	0 - 60	8	R1/8
32.008	-0.95 - 15	0 - 60	8	R1/4
32.009	-0.95 - 15	0 - 60	8	R3/8
32.010	-0.95 - 15	0 - 60	10	R1/8
32.011	-0.95 - 15	0 - 60	10	R1/4
32.012	-0.95 - 15	0 - 60	10	R3/8
32.013	-0.95 - 15	0 - 60	10	R1/2
32.014	-0.95 - 15	0 - 60	12	R1/4
32.015	-0.95 - 15	0 - 60	12	R3/8
32.016	-0.95 - 15	0 - 60	12	R1/2

## Self-extinguishing equal tube connector



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	
32.055	-0.95 - 15	0 - 60	4	
32.056	-0.95 - 15	0 - 60	6	
32.057	-0.95 - 15	0 - 60	8	
32.058	-0.95 - 15	0 - 60	10	
32.059	-0.95 - 15	0 - 60	12	



## 90° male elbow connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
32.033	-0.95 - 15	0 - 60	4	M5
32.034	-0.95 - 15	0 - 60	4	M6
32.035	-0.95 - 15	0 - 60	4	R1/8
32.036	-0.95 - 15	0 - 60	4	R1/4
32.037	-0.95 - 15	0 - 60	6	R1/8
32.038	-0.95 - 15	0 - 60	6	R1/4
32.039	-0.95 - 15	0 - 60	6	R3/8
32.040	-0.95 - 15	0 - 60	8	R1/8
32.041	-0.95 - 15	0 - 60	8	R1/4
32.042	-0.95 - 15	0 - 60	8	R3/8
32.043	-0.95 - 15	0 - 60	10	R1/8
32.044	-0.95 - 15	0 - 60	10	R1/4
32.045	-0.95 - 15	0 - 60	10	R3/8
32.046	-0.95 - 15	0 - 60	10	R1/2
32.047	-0.95 - 15	0 - 60	12	R1/4
32.048	-0.95 - 15	0 - 60	12	R3/8
32.049	-0.95 - 15	0 - 60	12	R1/2

## 90° male elbow connectors - equal



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	
32.050	-0.95 - 15	0 - 60	4	
32.051	-0.95 - 15	0 - 60	6	
32.052	-0.95 - 15	0 - 60	8	
32.053	-0.95 - 15	0 - 60	10	
32.054	-0.95 - 15	0 - 60	12	





## Male branch tee connectors, self-extinguishing



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
32.017	-0.95 - 15	0 - 60	4	M5
32.018	-0.95 - 15	0 - 60	4	M6
32.019	-0.95 - 15	0 - 60	4	R1/8
32.020	-0.95 - 15	0 - 60	4	R1/4
32.021	-0.95 - 15	0 - 60	6	R1/8
32.022	-0.95 - 15	0 - 60	6	R1/4
32.023	-0.95 - 15	0 - 60	6	R3/8
32.024	-0.95 - 15	0 - 60	8	R1/8
32.025	-0.95 - 15	0 - 60	8	R1/4
32.026	-0.95 - 15	0 - 60	8	R3/8
32.027	-0.95 - 15	0 - 60	10	R1/4
32.028	-0.95 - 15	0 - 60	10	R3/8
32.029	-0.95 - 15	0 - 60	10	R1/2
32.030	-0.95 - 15	0 - 60	12	R1/4
32.031	-0.95 - 15	0 - 60	12	R3/8
32.032	-0.95 - 15	0 - 60	12	R1/2

## Equal tube tee connectors, self-extinguishing



Technical data			Dimensions
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]
32.060	-0.95 - 15	0 - 60	4
32.061	-0.95 - 15	0 - 60	6
32.062	-0.95 - 15	0 - 60	8
32.063	-0.95 - 15	0 - 60	10
32.064	-0.95 - 15	0 - 60	12



## Mini male stud connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.900	-0.95 - 15	0 - 60	3	M3
30.901	-0.95 - 15	0 - 60	3	M5
30.902	-0.95 - 15	0 - 60	3	M6
30.903	-0.95 - 15	0 - 60	4	M3
30.904	-0.95 - 15	0 - 60	4	M5
30.905	-0.95 - 15	0 - 60	4	M6
30.906	-0.95 - 15	0 - 60	4	R1/8
30.907	-0.95 - 15	0 - 60	6	M5
30.908	-0.95 - 15	0 - 60	6	M6
30.906-G	-0.95 - 15	-20 - 80	4	G1/8
30.910-G	-0.95 - 15	-20 - 80	6	G1/8

## Mini male stud connectors, round, hex key



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.920	-0.95 - 15	0 - 60	3	M3
30.921	-0.95 - 15	0 - 60	3	M5
30.922	-0.95 - 15	0 - 60	4	M3
30.923	-0.95 - 15	0 - 60	4	M5
30.924	-0.95 - 15	0 - 60	4	M6
30.925	-0.95 - 15	0 - 60	4	R1/8
30.926	-0.95 - 15	0 - 60	6	M5
30.927	-0.95 - 15	0 - 60	6	M6
30.928	-0.95 - 15	0 - 60	6	R1/8



## Mini tube fitting, cartridge



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.932	-0.95 - 15	0 - 60	3	M6
30.933	-0.95 - 15	0 - 60	4	M6
30.934	-0.95 - 15	0 - 60	4	M8
30.935	-0.95 - 15	0 - 60	6	M8

## Mini female stud connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.914	-0.95 - 15	0 - 60	3	M3
30.915	-0.95 - 15	0 - 60	3	M5
30.916	-0.95 - 15	0 - 60	4	M3
30.917	-0.95 - 15	0 - 60	4	M5

## Mini 45° male elbow connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.977	-0.95 - 15	0 - 60	4	M5
30.978	-0.95 - 15	0 - 60	4	M6
30.979	-0.95 - 15	0 - 60	4	R1/8
30.980	-0.95 - 15	0 - 60	6	M5
30.981	-0.95 - 15	0 - 60	6	M6
30.982	-0.95 - 15	0 - 60	6	R1/8



## Mini unequal tube tee connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D1 [mm]	Ø D2 [mm]
<b>31.025</b>	-0.95 - 15	0 - 60	4	3
<b>31.026</b>	-0.95 - 15	0 - 60	6	4

## Mini extended male elbow connector



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
<b>30.963</b>	-0.95 - 15	0 - 60	3	M3
<b>30.964</b>	-0.95 - 15	0 - 60	4	M3
<b>30.965</b>	-0.95 - 15	0 - 60	4	M5
<b>30.966</b>	-0.95 - 15	0 - 60	4	M6
<b>30.967</b>	-0.95 - 15	0 - 60	4	R1/8
<b>30.968</b>	-0.95 - 15	0 - 60	6	M5
<b>30.969</b>	-0.95 - 15	0 - 60	6	M6
<b>30.970</b>	-0.95 - 15	0 - 60	6	R1/8



## Mini male elbow connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.949	-0.95 - 15	0 - 60	3	M3
30.950	-0.95 - 15	0 - 60	3	M5
30.951	-0.95 - 15	0 - 60	3	M6
30.952	-0.95 - 15	0 - 60	4	M3
30.953	-0.95 - 15	0 - 60	4	M5
30.954	-0.95 - 15	0 - 60	4	M6
30.955	-0.95 - 15	0 - 60	4	R1/8
30.956	-0.95 - 15	0 - 60	6	M5
30.957	-0.95 - 15	0 - 60	6	M6
30.958	-0.95 - 15	0 - 60	6	R1/8

## Mini male branch equal tee connectors



Technical data			Dimensions	
Item no.	Pressure range [bar]	Operating temperature [°C]	Ø D [mm]	G
30.993	-0.95 - 15	0 - 60	3	M3
30.994	-0.95 - 15	0 - 60	3	M5
30.995	-0.95 - 15	0 - 60	3	M6
30.996	-0.95 - 15	0 - 60	4	M3
30.997	-0.95 - 15	0 - 60	4	M5
30.998	-0.95 - 15	0 - 60	4	M6
30.999	-0.95 - 15	0 - 60	4	R1/8
31.000	-0.95 - 15	0 - 60	6	M5
31.001	-0.95 - 15	0 - 60	6	M6
31.002	-0.95 - 15	0 - 60	6	R1/8



## Sockets with threaded connection

Locking of compressed air or vacuum during disassembly, release after reconnection

Coupling: Socket (lock) and plug (open)



### Technical data

Item no.	Pressure range [bar]	Operating temperature [°C]
<b>CPS20-02W</b>	-0.95 - 13	0 - 60
<b>CPS20-03W</b>	-0.95 - 13	0 - 60
<b>CPS20-04W</b>	-0.95 - 13	0 - 60

### Dimensions

G	Ø P [mm]
R1/4	12
R3/8	12
R1/2	12

## Sockets with plug-in connection

Locking of compressed air or vacuum during disassembly, release after reconnection



### Technical data

Item no.	Pressure range [bar]	Operating temperature [°C]
<b>CPS20-6W</b>	-0.95 - 13	0 - 60
<b>CPS20-8W</b>	-0.95 - 13	0 - 60
<b>CPS20-10W</b>	-0.95 - 13	0 - 60
<b>CPS20-12W</b>	-0.95 - 13	0 - 60

### Dimensions

Ø D [mm]	Ø P [mm]
6	12
8	12
10	12
12	12

## Connectors

Locking of compressed air or vacuum during disassembly, release after reconnection



### Technical data

Item no.	Pressure range [bar]	Operating temperature [°C]
<b>CPP20-6W</b>	-0.95 - 13	0 - 60
<b>CPP20-8W</b>	-0.95 - 13	0 - 60
<b>CPP20-10W</b>	-0.95 - 13	0 - 60
<b>CPP20-12W</b>	-0.95 - 13	0 - 60

### Dimensions

Ø D [mm]	Ø P [mm]
6	16
8	16
10	20
12	20



## Angle plugs

Locking of compressed air or vacuum during disassembly, release after reconnection



### Technical data

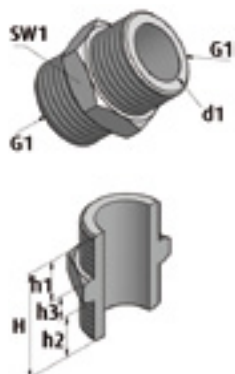
Item no.	Pressure range [bar]	Operating temperature [°C]
<b>CPP20L-6W</b>	-0.95 - 13	0 - 60
<b>CPP20L-8W</b>	-0.95 - 13	0 - 60
<b>CPP20L-10W</b>	-0.95 - 13	0 - 60
<b>CPP20L-12W</b>	-0.95 - 13	0 - 60

### Dimensions

$\varnothing D$ [mm]	$\varnothing P$ [mm]
6	14.5
8	14.5
10	21
12	21



## Double nipple, equal thread - SZ-GA-MM



Technical data		Dimensions						
Item no.	Material	G1 (male)	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	Ø d1 [mm]	SW1
270.420	Brass	M5	13	5	5	3	2.5	7
270.059	Brass	G1/8	18	7	7	4	5	14
270.120	Brass	G1/4	25.5	10.5	10.5	--	--	60
270.121	Nickel-plated brass	G3/8	23	9	9	5	11	19
270.122	Brass	G1/2	35	14	14	--	--	60
270.123	Brass	G3/4	33.5	13.5	13.5	--	--	60
270.124	Brass	G1	36	14.5	14.5	--	--	60
270.125	Brass	G1 1/4	37	15	15	--	--	60
270.126	Brass	G1 1/2	40	16.5	16.5	--	--	60
270.127	Brass	G2	40	16.5	16.5	--	--	60

## Reducing bushes with hex socket - SZ GA- MMI

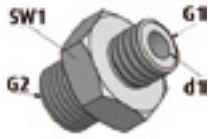


Technical data		Dimensions						
Item no.	Material	G1 (male)	G2 (male)	H [mm]	h1 [mm]	h2 [mm]	Ø d1 [mm]	SW
270.561	Aluminium	G3/8	G1/4	25	15	10	6	6
270.562	Aluminium	G3/8	M10	27	15	12	4	5
270.563	Aluminium	G3/8	M14x1.5	27	15	12	6	6
270.564	Aluminium	G1/4	G1/4	22	--	--	4	5
270.565	Aluminium	G1/4	M10	24	12	12	4	5
270.566	Aluminium	G1/4	M14x1.5	24	13	11	4	5





Reducing nipples - SZ-GA-RMM



Technical data		Dimensions							
Item no.	Material	G1 (male)	G2 (male)	H [mm]	h1 [mm]	h2 [mm]	h3 [mm]	∅ d1 [mm]	SW1
270.280	Nickel-plated brass	G1/8	M5	15.5	4.8	6.5	4.2	2.4	14
270.279	Aluminium	G1/8	M6	21	7	9	5	3	14
270.131	Brass	G1/8	M8	18	6	7	5	4	14
270.107	Aluminium	G1/8	M12	21	7.5	8.5	5	5.5	17
270.227	Brass	G1/4	M5	19	5	9	5	2.5	17
270.320	Aluminium	G1/4	M10x1.25	25	10	10	5	5.5	17
270.108	Aluminium	G1/4	M12	21	8	8	5	5.5	17
270.181	Nickel-plated brass	G1/4	G1/8	22	8	9	5	4	17
270.297	Nickel-plated brass	G1/2	G1/4	25	9	10.5	5.5	8	24
270.323	Nickel-plated brass	G1/2	G3/8	25.5	9	10.5	6	11	24
270.148	Nickel-plated brass	G3/4	M14x1.5	30	12	12	6	20	36
270.138	Nickel-plated brass	G3/4	G1/2	30	12	12	6	15	32



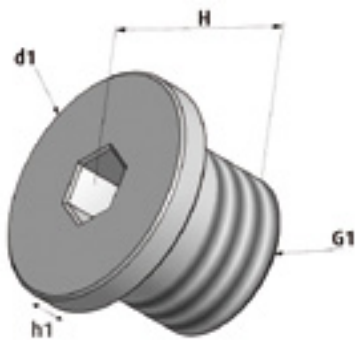
Reducing bushings male/female - SZ-GA-MF



Technical data		Dimensions						
Item no.	Material	G1 (male)	G2 (female)	H [mm]	h1 [mm]	h2 [mm]	Ø D [mm]	SW1
<b>270.423</b>	Nickel-plated brass	M5	M5	11	7	4	2	8
<b>270.079</b>	Brass	M5	G1/8	17	12	5	2.4	14
<b>270.576</b>	Steel galvanised	M12	G1/4	22	12	10	6.5	17
<b>270.577</b>	Steel galvanised	M16	G3/8	25	15	10	10	24
<b>270.302</b>	Nickel-plated brass	G1/8	M5	10	4	6	--	14
<b>270.303</b>	Nickel-plated brass	G1/8	M6	13	5	8	--	13
<b>270.334</b>	Nickel-plated brass	G1/8	G1/4	20	13.6	6.5	5.4	17
<b>270.304</b>	Aluminium	G1/4	M6	15	5	10	--	17
<b>270.090</b>	Brass	G1/4	M10x1.25	11.5	5.8	5.7	17	19
<b>270.088</b>	Aluminium	G1/4	M10	28	16	12	4	17
<b>270.245</b>	Brass	G1/4	G1/8	13	4.5	8.5	--	17
<b>270.078</b>	Brass	G1/4	G1/4	28	19	9	7.5	17
<b>270.567</b>	Aluminium	G1/4	G3/8	27	11	10	4	20
<b>270.560</b>	Aluminium	G3/8	G1/4	16	11	16	--	22
<b>270.229</b>	Brass	G1/2	G1/4	18	6	12	--	24
<b>270.230</b>	Brass	G1/2	G3/8	18	6	12	--	24
<b>270.102</b>	Brass	G3/4	G3/8	18	6	12	--	32
<b>270.600</b>	Brass	G1	G1/2	21	6	15	--	36
<b>270.601</b>	Brass	G1	G3/4	21	6	15	--	36
<b>270.604</b>	Brass	G1 1/2	G1	24	8	16	--	50
<b>270.605</b>	Brass	G1 1/4	G1	23	7	16	--	42

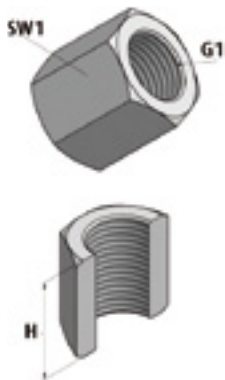


Blanking plugs with O-ring seal - SZ-SCV



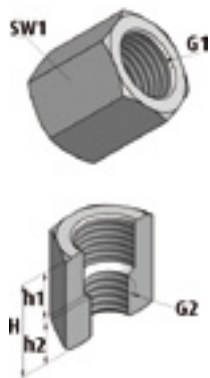
Technical data		Dimensions			
Item no.	Material	G1 (male)	H [mm]	h1 [mm]	Ø d1 [mm]
77.000	Nickel-plated brass	M5	6	2	8
77.009	Nickel-plated brass	G1/8	10	3	14
77.008	Nickel-plated brass	G1/4	11	3	17
77.010	Nickel-plated brass	G3/8	12.5	3.5	20
77.007	Nickel-plated brass	G1/2	14.5	4.5	26

Threaded bush - SZ-GA-FF



Technical data		Dimensions		
Item no.	Material	G1 (female)	H [mm]	SW1
270.343	Nickel-plated brass	G1/8	17	14
270.182.O	Aluminium	G1/4	20	19
270.130.O	Aluminium	G1/2	32	30
270.579	Aluminium	G3/8	23	22

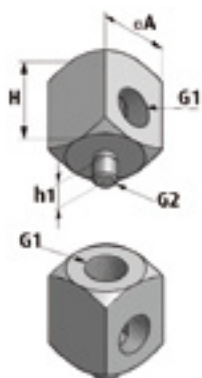
Reducing bush - SZ-GA-RFF



Technical data		Dimensions					
Item no.	Material	G1 (female)	G2 (female)	H [mm]	h1 [mm]	h2 [mm]	SW1
270.306	Aluminium	G1/8	M5	14	9.5	4.5	13
270.307	Aluminium	G1/8	M6	14	9.5	4.5	13
270.308	Aluminium	G1/4	M6	17.5	11	6.5	17
270.089	Aluminium	G1/4	M10	18	9	9	17
270.228	Nickel-plated brass	G3/8	G1/4	21.5	11.5	10	22

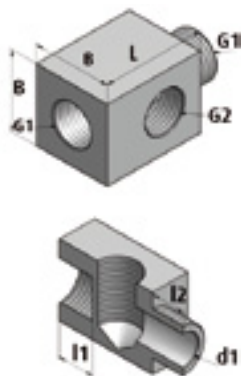


## Elbow connectors AG - SZ-WAA



Technical data		Dimensions				
Item no.	Material	G1 (female)	G2 (male)	H [mm]	h1 [mm]	$\square A$ [mm]
GR07.010	Steel nickel-plated	G1/8	M5	20	6	16
GR07.011	Steel nickel-plated	G1/4	M6	33	10	25
GR07.012	Steel nickel-plated	G1/4	M8	33	10	25

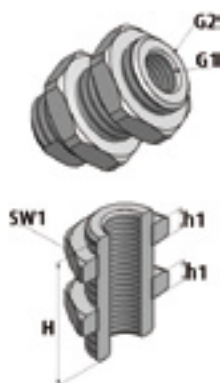
## Elbow connectors IG - SZ-WAI



Technical data		Dimensions						
Item no.	Material	G1 (female+male)	G2 (female)	$\phi d1$ [mm]	L [mm]	B [mm]	l1 [mm]	l2 [mm]
270.395	Aluminium	G1/8	G1/8	6.6	21	16	6	7
270.396	Aluminium	G1/4	G1/8	8	26	18	10	10
270.397	Steel galvanised	G1/2	G3/8	10	35	24	12	10

## Bulkhead connectors - SZ-SVS

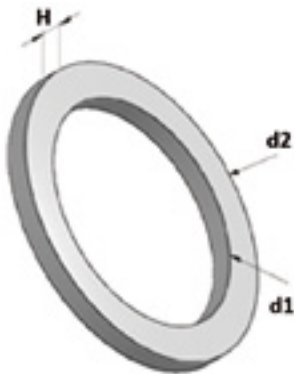
Allow for height adjustment during vacuum cup installation



Technical data			Dimensions				
Item no.	Material bushing	Material screw nut	G1 (female)	G2 (male)	H [mm]	h1 [mm]	SW1
270.518	Stainless steel	Steel galvanised	G1/8	M16x1	30	5	22
270.519	Stainless steel	Steel galvanised	G1/4	M20x1.5	30	5	24



## Sealing rings - SZ-DR



Technical data			Dimensions		
Item no.	For outside thread	Material	H [mm]	∅ d1 [mm]	∅ d2 [mm]
78.052	M5	Rigid PVC white	1	5.4	7.9
78.053	G1/8	Rigid PVC white	2	10.3	13.5
78.054	G1/4	Rigid PVC white	2	13.3	17.9
78.051	G3/8	Rigid PVC white	2	17.2	21.2
78.055	G1/2	Rigid PVC white	2	21.2	27.9
78.056	G3/4	Rigid PVC white	2	26.7	32.5

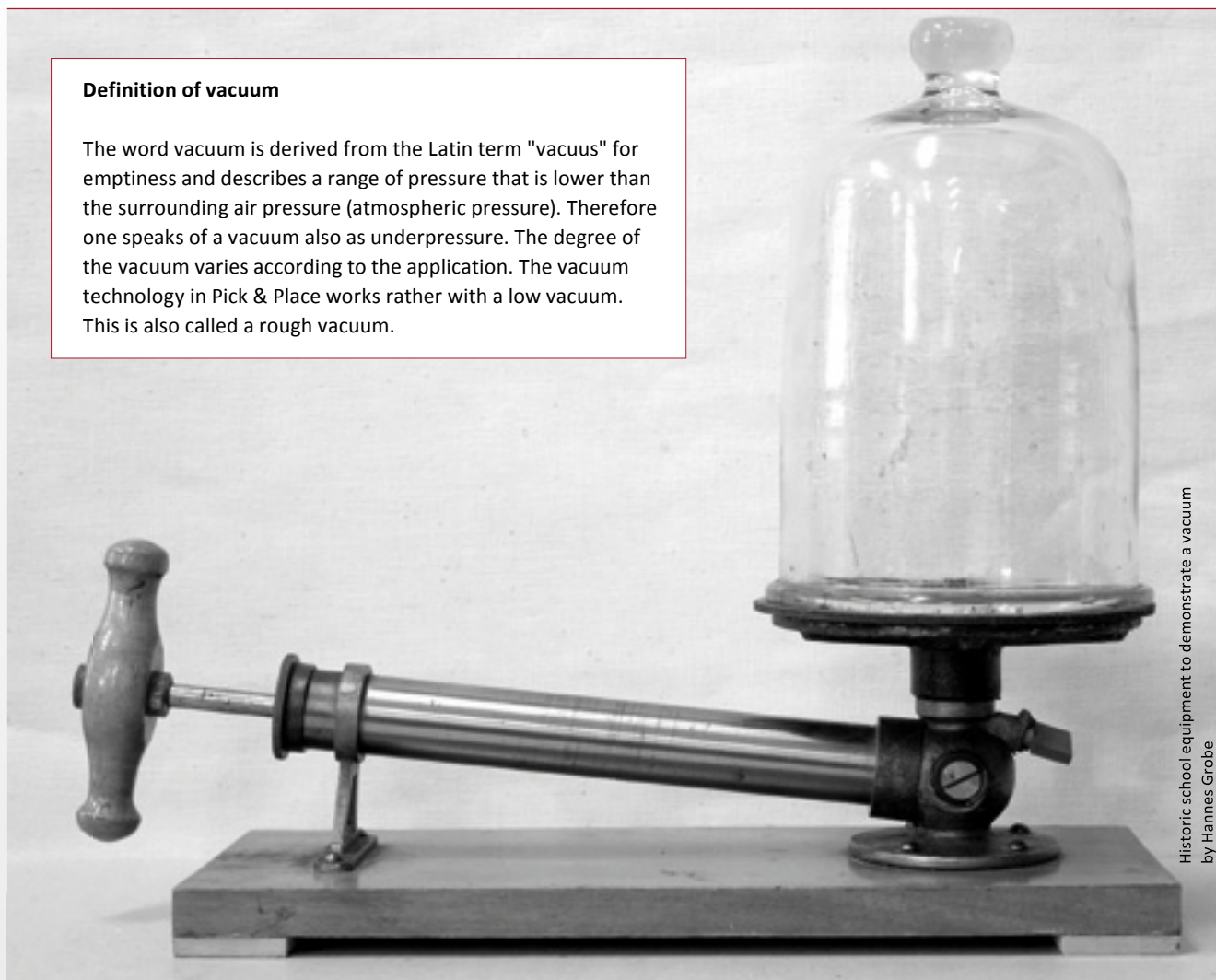
**Ordering notes:**

1 packing unit = 100 pieces

## Vacuum: Basics

### Definition of vacuum

The word vacuum is derived from the Latin term "vacuus" for emptiness and describes a range of pressure that is lower than the surrounding air pressure (atmospheric pressure). Therefore one speaks of a vacuum also as underpressure. The degree of the vacuum varies according to the application. The vacuum technology in Pick & Place works rather with a low vacuum. This is also called a rough vacuum.

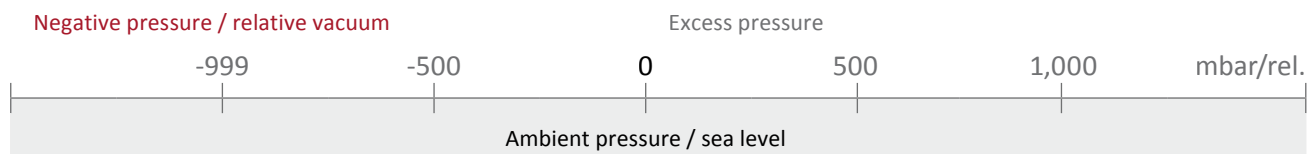


Historic school equipment to demonstrate a vacuum by Hannes Grobe

## Vacuum values

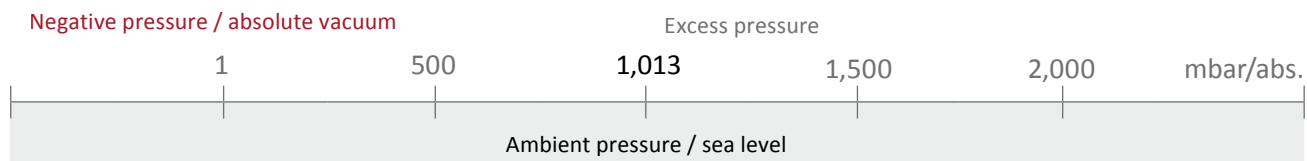
The vacuum is specified as a relative or absolute value. In vacuum technology, as a rule, the vacuum is specified as a relative value with a negative prefix. The reference point for measuring the relative pressure is the air pressure at 0 mbar.

Negative pressure / relative vacuum



The absolute vacuum, in contrast, always has a positive prefix. Background: The conventional value used in science relates the negative pressure (vacuum) to the absolute zero point or vacuum.

Negative pressure / absolute vacuum



## Units of vacuum

Pascal (Pa), kilopascals (kPa), bar (bar) and millibars (mbar) are used as pressure units in vacuum technology. The conversion of these units is as follows:

$$0.001 \text{ bar} = 0.1 \text{ kPa} = 1 \text{ mbar} = 100 \text{ Pa}$$

or as indicated in the conversion table:

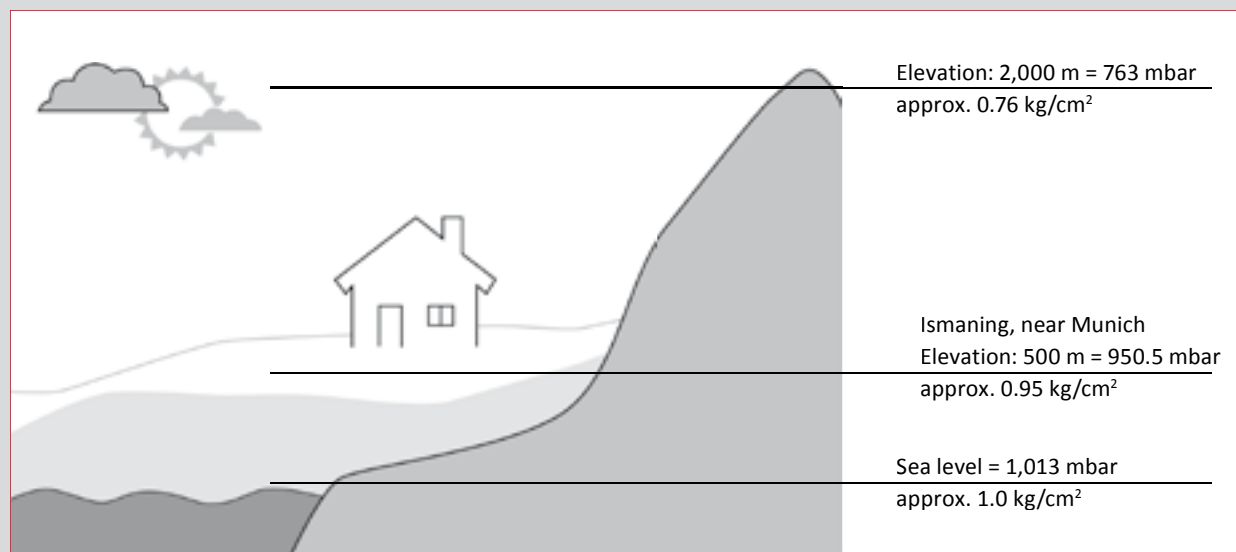
Vacuum / pressure conversion table

Residual pressure absolute [mbar]	Relative vacuum	bar relative	N/cm <sup>2</sup>	kPa	atm.kp/cm <sup>2</sup>	mm H <sub>2</sub> O	Torr; mmHg	inHg
900	10 %	-0.101	-1.01	-10.1	-0.103	-1,030	-76	-3
800	20 %	-0.203	-2.03	-20.3	-0.207	-2,070	-152	-6
700	30 %	-0.304	-3.04	-30.4	-0.31	-3,100	-228	-9
600	40 %	-0.405	-4.05	-40.5	-0.413	-4,130	-304	-12
500	50 %	-0.507	-5.07	-50.7	-0.517	-5,170	-380	-15
400	60 %	-0.608	-6.08	-60.8	-0.62	-6,200	-456	-18
300	70 %	-0.709	-7.09	-70.9	-0.723	-7,230	-532	-21
200	80 %	-0.811	-8.11	-81.1	-0.827	-8,270	-608	-24
100	90 %	-0.912	-9.12	-91.2	-0.93	-9,300	-684	-27

## Relationship between air pressure and vacuum

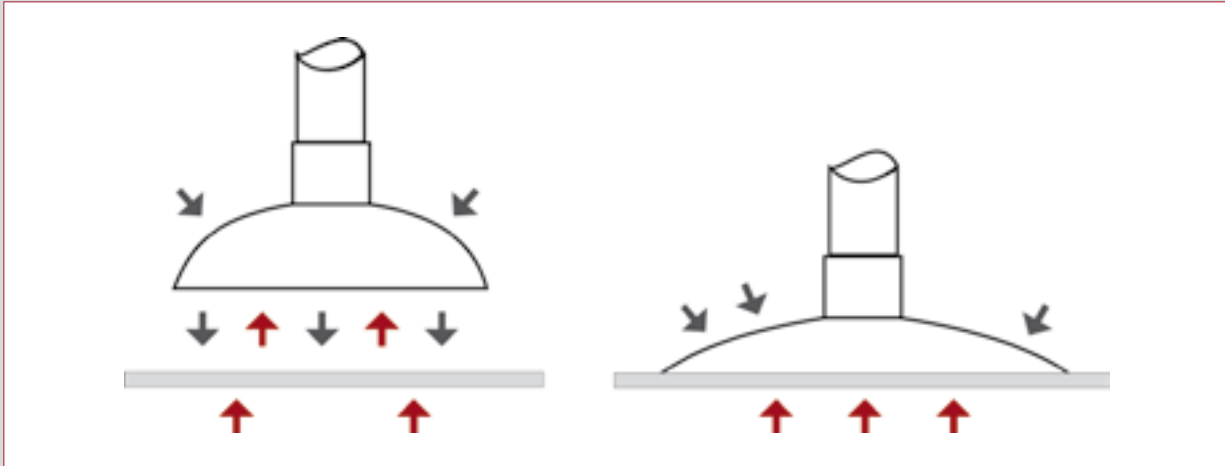
The ambient pressure or atmospheric pressure at 0 mbar is the reference quantity for the manufacture of a vacuum. The air pressure in turn depends on the height at which it is measured.

In general: Air pressure decreases with increasing altitude. Thus, the ambient pressure on the Zugspitze (2,963 metres height; 695 mbar) is much lower than at sea level (1,013 mbar) which at 0 metres marks the ideal state for vacuum generation. For vacuum technology that means: As air pressure is reduced, the difference in pressure between ambient pressure and the vacuum cup pressure narrows. The maximum holding force of the vacuum is thus reduced. The benchmark: For every 100 metre increase in altitude, the ambient pressure falls by about 12.5 mbar. That must correspondingly be considered when using components in producing a vacuum.



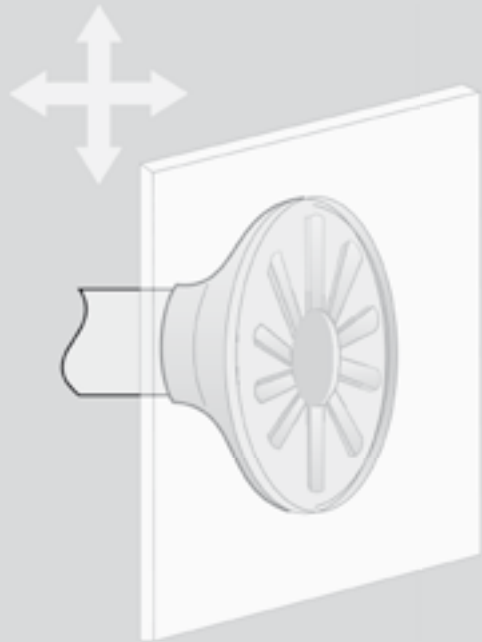
## Vacuum cups: Functional principle

It is not the vacuum unit that sucks up the workpiece to be moved, but the good to be handled that is pressed firmly to the vacuum unit. This happens due to the negative pressure that is created by the built-in vacuum cup or the connected vacuum generator.



The functional principle is straightforward: The vacuum generator draws out the air located between the vacuum cup and workpiece. After contact, the vacuum cup seals off the workpiece surface against the surrounding air pressure. The underpressure or vacuum is created.

Depending on the application, different shapes and sizes of vacuum cups and vacuum cup materials are used. Example: For handling movements parallel to the vacuum surface, flat vacuum cups with cleats or knobs are especially suitable because of their high frictional resistance.





**Vacuum cups: Holding forces**



**Calculation**

The force exerted by a vacuum cup holding or lifting a workpiece depends on many factors. These include the acceleration, the safety factor, turning and tilting moments, the elasticity of the material and even the design of the vacuum cup.

Regardless of such factors, the holding power of a vacuum cup can easily be identified by the following formula:

$$\text{Holding power in N} = \frac{\text{active suction surface in cm}^2 \times \text{vacuum available in \%}}{10}$$

In short form:

$$F = \frac{A \times P}{10}$$

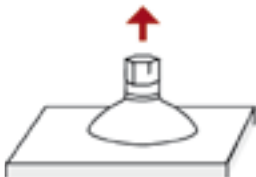
The following applies: The holding power of a vacuum cup is proportional to the active suction surface.

To determine the necessary vacuum cup diameter or the required active suction surface, the following formula helps:

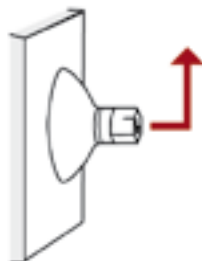
$$\text{Vacuum cup diameter in mm} = 113 \times \sqrt{\frac{\text{Weight in kg} \times \text{Safety factor}}{\text{Underpressure in \%} \times \text{Number of vacuum cups}}}$$

**Important: The safety factor (dependent on the lifting direction)**

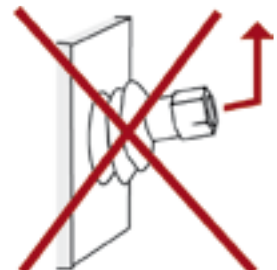
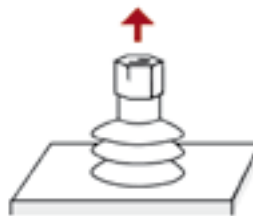
min. 2x safety factor



min. 4x safety factor



min. 2x safety factor



## Average values for vacuum cups in standard applications

Vacuum cup diameter [mm]	Effective diameter approx. [mm]	Effective suction surface approx. [cm <sup>2</sup> ]	Theoretical holding force 20 % vacuum [N]	Theoretical holding force 60 % vacuum [N]	Theoretical holding force 80 % vacuum [N]	Volume flat approx. [cm <sup>3</sup> ]	Volume folds approx. [cm <sup>3</sup> ]	Recommended internal tubing diameter approx. [mm]
1	0.80	0.0050	0.01	0.03	0.04	0.001	0.05	2
2	1.60	0.0201	0.04	0.12	0.16	0.001	0.05	2
3	2.40	0.0452	0.09	0.27	0.36	0.002	0.05	2
4	3.20	0.0804	0.16	0.48	0.64	0.003	0.05	2
5	4.00	0.1257	0.25	0.75	1.01	0.005	0.1	2
6	5.17	0.2101	0.42	1.26	1.68	0.008	0.1	2
7	6.03	0.2860	0.57	1.72	2.29	0.015	0.1	2
8	6.90	0.3736	0.75	2.24	2.99	0.03	0.2	2
9	7.76	0.4728	0.95	2.84	3.78	0.05	0.2	2
10	8.62	0.5837	1.17	3.50	4.67	0.07	0.5	4
11	9.48	0.7063	1.41	4.24	5.65	0.1	0.5	4
12	10.34	0.8405	1.68	5.04	6.72	0.1	1	4
13	11.21	0.9864	1.97	5.92	7.89	0.2	1	4
14	12.07	1.1440	2.29	6.86	9.15	0.3	1	4
15	12.93	1.3133	2.63	7.88	10.51	0.4	3	4
16	13.79	1.4942	2.99	8.97	11.95	0.5	3	4
17	14.66	1.6868	3.37	10.12	13.49	0.5	3	4
18	15.52	1.8911	3.78	11.35	15.13	0.6	3	4
19	16.38	2.1071	4.21	12.64	16.86	0.7	5	4
20	17.24	2.3347	4.67	14.01	18.68	0.8	5	4
25	21.55	3.6480	7.30	21.89	29.18	1.3	5	4
30	25.86	5.2531	10.51	31.52	42.02	1.3	5	4
35	30.17	7.1501	14.30	42.90	57.20	2.7	10	4
40	34.48	9.3389	18.68	56.03	74.71	3.8	10	4
45	38.79	11.8195	23.64	70.92	94.56	5	20	4
50	43.10	14.5920	29.18	87.55	116.74	7	20	6
60	51.72	21.0124	42.02	126.07	168.10	10	30	6
70	60.34	28.6003	57.20	171.60	228.80	20	50	6
80	68.97	37.3554	74.71	224.13	298.84	25	60	6
90	77.59	47.2780	94.56	283.67	378.22	30	100	6
100	86.21	58.3679	116.74	350.21	466.94	40	200	9
125	107.76	91.1998	182.40	547.20	729.60	80	300	9
150	129.31	131.3277	262.66	787.97	1,050.62	180	500	9
175	150.86	178.7516	357.50	1,072.51	1,430.01	250	650	12
200	172.41	233.4715	466.94	1,400.83	1,867.77	430	800	12
250	215.52	364.7992	729.60	2,188.80	2,918.39	500	1,600	12
300	258.62	525.3109	1,050.62	3,151.87	4,202.49	600	2,000	12
350	301.72	715.0065	1,430.01	4,290.04	5,720.05	1,500	3,000	12
400	344.83	933.8860	1,867.77	5,603.32	7,471.09	2,000	5,000	12
500	431.03	1,459.1969	2,918.39	8,755.18	11,673.58	4,000	x	16
600	517.24	2,101.2436	4,202.49	12,607.46	16,809.95	6,500	x	16

The information provided above consists of average values for smooth, dry product surfaces without a safety factor. The application, shape of the vacuum cup and product qualities (e.g. surface texture or air permeability) may result in deviations.

## Air volume to be evacuated per meter of tubing, dependent on the internal tubing diameter

Internal tubing diameter [mm]	Cross section [mm <sup>2</sup> ]	Air volume per meter [cm <sup>3</sup> ]	Air volume per meter [l]
2	3.14	3.1	0.003
3	7.07	7.1	0.007
4	12.56	12.6	0.013
6	28.26	28.3	0.028
7	38.47	38.5	0.038
8	50.24	50.2	0.050
9	63.59	63.6	0.064
10	78.50	78.5	0.079
11	94.99	95.0	0.095
12	113.04	113.0	0.113
14	153.86	153.9	0.154
16	200.96	201.0	0.201
18	253.34	254.3	0.254
20	314.00	314.0	0.314
25	490.63	490.6	0.491
32	803.84	803.8	0.804
35	961.63	961.6	0.962
38	1,133.54	1,133.5	1.134
40	1,256.00	1,256.0	1.256

## Required inner diameter D in the case of the branching of tubing

Number of tubing	Calculation [diameter D x factor]
1	D x 1
2	D x 0.71
4	D x 0.50
8	D x 0.36
16	D x 0.25
32	D x 0.18

### Example calculation

If a tubing with an inner diameter of 40 mm branches out to become 4 tubing, each of these tubing requires an internal diameter of 20 mm.

If a tubing with an inner diameter of 40 mm branches out to become 16 tubing, each of these tubing requires an internal diameter of 10 mm.

## Required internal diameter for compressed air tubing lines

Air flow rate [liters/min.]	Tubing length [m]																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
100	3	4	4	4	4	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6
200	4	5	5	5	5	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7
300	5	5	6	6	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9
400	5	6	7	7	7	8	8	8	8	8	9	9	9	9	9	9	9	9	10	10
500	6	7	7	8	8	8	9	9	9	9	9	9	10	10	10	10	10	10	10	11
600	6	7	8	8	9	9	9	9	10	10	10	10	10	10	11	11	11	11	11	11
700	7	8	8	9	9	9	10	10	10	10	10	11	11	11	11	11	11	12	12	12
800	7	8	9	9	9	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13
900	7	8	9	9	10	10	11	11	11	11	11	12	12	12	12	12	12	13	13	13
1,000	7	9	9	10	10	11	11	11	12	12	12	12	12	13	13	13	13	13	13	14
1,100	8	9	10	10	11	11	11	12	12	12	12	13	13	13	13	13	14	14	14	14
1,200	8	9	10	11	11	11	12	12	12	13	13	13	13	14	14	14	14	14	14	15
1,300	8	9	10	11	11	12	12	12	13	13	13	14	14	14	14	14	14	15	15	15
1,400	8	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	15	15	15	15
1,500	9	10	11	11	12	12	13	13	13	14	14	14	14	15	15	15	15	15	16	16
1,600	9	10	11	12	12	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16
1,700	9	10	11	12	13	13	13	14	14	14	14	15	15	15	16	16	16	16	16	17
1,800	9	11	12	12	13	13	14	14	14	15	15	15	15	16	16	16	16	17	17	17
1,900	9	11	12	12	13	14	14	14	15	15	15	16	16	16	16	16	17	17	17	17
2,000	10	11	12	13	13	14	14	15	15	15	16	16	16	16	17	17	17	17	17	18
2,100	10	11	12	13	14	14	14	15	15	16	16	16	16	17	17	17	17	18	18	18
2,200	10	11	12	13	14	14	15	15	15	16	16	16	16	17	17	17	18	18	18	18
2,300	10	12	13	13	14	15	15	15	16	16	16	17	17	17	17	18	18	18	18	18
2,400	10	12	13	14	14	15	15	16	16	16	17	17	17	17	18	18	18	18	19	19
2,500	10	12	13	14	14	15	15	16	16	17	17	17	17	18	18	18	18	19	19	19
2,600	11	12	13	14	15	15	16	16	16	17	17	17	18	18	18	18	19	19	19	19
2,700	11	12	13	14	15	15	16	16	17	17	17	18	18	18	19	19	19	19	19	20
2,800	11	13	14	14	15	16	16	17	17	17	18	18	18	19	19	19	19	19	20	20
2,900	11	13	14	15	15	16	16	17	17	18	18	18	18	19	19	19	19	20	20	20
3,000	11	13	14	15	15	16	17	17	17	18	18	18	19	19	19	20	20	20	20	20
3,100	11	13	14	15	16	16	17	17	18	18	18	19	19	19	19	20	20	20	20	21
3,200	11	13	14	15	16	16	17	17	18	18	18	19	19	19	20	20	20	20	20	21
3,300	12	13	14	15	16	17	17	18	18	18	19	19	19	20	20	20	20	21	21	21
3,400	12	13	15	15	16	17	17	18	18	19	19	19	20	20	20	20	21	21	21	21
3,500	12	14	15	16	16	17	18	18	18	19	19	19	20	20	20	21	21	21	21	22
3,600	12	14	15	16	17	17	18	18	19	19	19	20	20	20	21	21	21	21	22	22
3,700	12	14	15	16	17	17	18	18	19	19	20	20	20	21	21	21	21	22	22	22
3,800	12	14	15	16	17	17	18	19	19	19	20	20	20	21	21	21	22	22	22	22
3,900	12	14	15	16	17	18	18	19	19	20	20	20	21	21	21	21	22	22	22	22
4,000	12	14	16	16	17	18	18	19	19	20	20	20	21	21	21	22	22	22	22	23
4,100	13	14	16	17	17	18	19	19	20	20	20	21	21	21	22	22	22	22	23	23
4,200	13	15	16	17	18	18	19	19	20	20	20	21	21	21	22	22	22	23	23	23
4,300	13	15	16	17	18	18	19	19	20	20	21	21	21	22	22	22	23	23	23	23
4,400	13	15	16	17	18	18	19	20	20	20	21	21	21	22	22	22	23	23	23	23
4,500	13	15	16	17	18	19	19	20	20	21	21	21	22	22	22	23	23	23	23	24
4,600	13	15	16	17	18	19	19	20	20	21	21	22	22	22	22	23	23	23	24	24
4,700	13	15	16	17	18	19	20	20	21	21	21	22	22	22	23	23	23	24	24	24
4,800	13	15	17	18	18	19	20	20	21	21	22	22	22	23	23	23	23	24	24	24
4,900	13	15	17	18	19	19	20	20	21	21	22	22	22	23	23	23	24	24	24	24
5,000	14	16	17	18	19	19	20	21	21	21	22	22	23	23	23	24	24	24	24	25
5,500	14	16	17	18	19	20	21	21	22	22	23	23	23	24	24	24	25	25	25	26
6,000	14	17	18	19	20	21	21	22	22	23	23	24	24	25	25	25	26	26	26	26
6,500	15	17	19	20	21	21	22	23	23	24	24	25	25	25	26	26	26	27	27	27
7,000	15	18	19	20	21	22	23	23	24	24	25	25	26	26	26	27	27	27	28	28
7,500	16	18	20	21	22	22	23	24	24	25	25	26	26	27	27	27	28	28	28	29
8,000	16	18	20	21	22	23	24	24	25	26	26	27	27	28	28	28	29	29	29	29
8,500	16	19	21	22	23	24	24	25	26	26	27	27	28	28	28	29	29	29	30	30
9,000	17	19	21	22	23	24	25	25	26	27	27	28	28	29	29	29	30	30	30	31
9,500	17	20	21	23	24	25	25	26	27	27	28	28	29	29	29	30	30	31	31	31
10,000	17	20	22	23	24	25	26	27	27	28	28	29	29	30	30	30	31	31	32	32

Values at an operating pressure of 6 bar and a pressure drop of 0.5 bar  
 Design example: At a required air flow rate of 2,000 liters per minute and a tubing length of 10 meters, the required internal diameter is 15 mm.



# Questionnaire F 100 | Vacuum Technology

To:

**FIPA GmbH**

Freisinger Str. 30  
85737 Ismaning / Germany

Fax +49 (0)89/96 24 89 - 11  
info@fipa.com

Company
Name
Street
City, State, Zip Code
Phone/Fax

## Vacuum Unit

Please answer the following questions carefully, so we can select the vacuum unit best suited for your purpose.

1. Please quote the following application:

---

2. What kind of parts are you handling?

---

3. The objects are:

- round
- oval
- square
- rectangular
- curved
- unstable

3a. Material:

---

4. Dimensions / Weight:

Length \_\_\_\_\_ mm

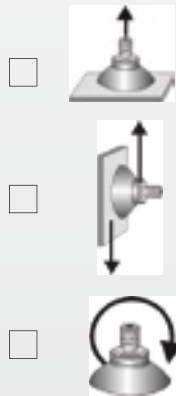
Width \_\_\_\_\_ mm

Height / Thickness  
\_\_\_\_\_ mm

Ø \_\_\_\_\_ mm

Weight \_\_\_\_\_ g/kg

5. Lifting direction:



6. Surface:

- smooth
- rough
- textured
- rippled
- oily
- scaled
- wet
- dry
- porous

7. Temperature:

briefly  
\_\_\_\_\_ °C

continuously  
+ \_\_\_\_\_ °C  
- \_\_\_\_\_ °C

8. Use:

- indoor
- outdoor

9. Vacuum generating:

- Vacuum pump
- Vacuum ejector
- existing
- not existing

Power capacity \_\_\_\_\_

## Vacuum Cups

16. In use?

- no
- yes, following type \_\_\_\_\_

17. Annual requirement? approx. \_\_\_\_\_ pieces

10. Duty cycle \_\_\_\_\_

11. Distance \_\_\_\_\_

12. Suck in time \_\_\_\_\_

13. Positioning accuracy \_\_\_\_\_

14. Acceleration \_\_\_\_\_

15. Environment \_\_\_\_\_

FIPA will gladly perform individual handling tests free of charge on samples of the objects to be carried. Alternatively please feel free to request sample cups for your own tests.

Online forms and  
downloads: [www.fipa.com](http://www.fipa.com)

To:

**FIPA GmbH**

Freisinger Str. 30  
85737 Ismaning / Germany

Fax +49 (0)89 / 96 24 89 - 11  
info@fipa.com

Company
Name
Street
City, State, Zip Code
Phone/Fax

## Vacuum Pumps

Please answer the following questions carefully, so we can select the vacuum unit best suited for your purpose.

1. Please specify the branch of industry in which the pump will be used

- Packaging     Food & Beverage     Glass  
 Graphic arts     Wood-working     Plastic  
 Marble / Stone     Sheet metal  
 \_\_\_\_\_

2. What will the pump be used for?

- Handling     Degasification of silicon mixture  
 Vacuum Clamping     Degasification of synthetic resin  
 Degasification of laminated materials  
 Evacuating tanks: Liters: \_\_\_\_\_ / Time: \_\_\_\_\_

3. Location of pump

- Indoor     Outdoor     Mobile  
 Temperature range: \_\_\_\_\_ to \_\_\_\_\_ °F  
 Relative humidity (e.g. tropical areas) \_\_\_\_\_ %

4. Medium to be sucked

- Dry air     Humid air     Oily air  
 Water vapor     Water     Grinding sludge  
 Aggressive gases (which): \_\_\_\_\_  
 Temperature of medium: \_\_\_\_\_ °C

5. Suction capacity: \_\_\_\_\_ m<sup>3</sup>/h or \_\_\_\_\_ NI/min

6. Vacuum Level (in continuous operation):

\_\_\_\_\_ mbar or \_\_\_\_\_ % vacuum

7. Duty cycle

- Continuous operation  8-10 h/day     16-18 h/day  
 Intermittent operation:  
 Operating interval of pump? \_\_\_\_\_

8. Back diffusion

- Does leakage of the medium have to be prevented when the pump is switched off? (Check valve for oil-lubricated vacuum pump)  
 Yes     No

9. Maintenance of vacuum

- Does the vacuum have to be maintained for a certain period (e.g. for putting down loads in case of power failure)?  
 Yes     No

10. Vacuum tank

- available ( \_\_\_\_\_ liters)     desired ( \_\_\_\_\_ liters)  
 Capacity suggested by FIPA

11. Maintenance

- Is the pump accessible for maintenance?     Yes     No  
 Is sufficient cooling available for the pump?     Yes     No  
 Is remote monitoring of pump condition possible? (e.g. oil level)  
 Yes     No

12. General information if new pump is desired:

- Only one pump is required  
 Number of pumps needed per year: \_\_\_\_\_  
 Delivery desired within: \_\_\_\_\_  
 Replacement

13. In case of replacement please fill out

- Brand until now \_\_\_\_\_     Suction capacity \_\_\_\_\_  
 Vacuum level \_\_\_\_\_     Electricity supply \_\_\_\_\_

Online forms and downloads: [www.fipa.com](http://www.fipa.com)

# Questionnaire F 300 | Vacuum grippers

To:

**FIPA GmbH**

Freisinger Str. 30  
85737 Ismaning / Germany

Fax +49 (0)89 / 96 24 89 - 11  
info@fipa.com

<i>Company</i>
<i>Name</i>
<i>Street</i>
<i>City, State, Zip Code</i>
<i>Phone/Fax</i>

## Vacuum Grippers

Please answer the following questions carefully, so we can select the vacuum gripper best suited for your purpose.

### Product Information

1. What kind of parts are you handling (product, material)?

---

2. The objects are:

- round
- oval
- square
- rectangular
- curved
- inherent stable
- deformable

3. Surface:

- smooth
- rough
- textured
- rippled
- oily
- wet
- dry
- porous
- airtight

4. Dimensions, weight:

Length \_\_\_\_\_ mm

Width \_\_\_\_\_ mm

Height / Thickness  
\_\_\_\_\_ mm

Ø \_\_\_\_\_ mm

Weight \_\_\_\_\_ g/kg

5. Available surface for gripping:

Length \_\_\_\_\_ mm

Width \_\_\_\_\_ mm

Ø \_\_\_\_\_ mm

6. Is the height of the product greater than the width?  no  yes [mm / cm]: \_\_\_\_\_

7. Do you have to evacuate a volume of air?  no  yes [m<sup>3</sup>]: \_\_\_\_\_

8. Kind of packaging (strength, elasticity etc.)?

---

---

9. Remarks:

---

---

---



## Information on product layers

1. Do you transport single products or layers of products?  single  in layers
2. Number of cycles? \_\_\_\_\_
3. Measurements of layers  
Length \_\_\_\_\_ mm    Height / Thickness \_\_\_\_\_ mm  
Width \_\_\_\_\_ mm     $\varnothing$  \_\_\_\_\_ mm  
Weight \_\_\_\_\_ g
4. Amount of products / layers \_\_\_\_\_ units

5. Minimum depth of coverage of a single layer? [%]: \_\_\_\_\_
6. Maximum level difference of a single layer? \_\_\_\_\_
7. Is there a progressive deformation?  no  yes
8. Remarks:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Application Information

1. Please describe your application:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. Number of cycles per minute: \_\_\_\_\_
3. Max. available time to pick and place the product: \_\_\_\_\_
4. Product acceleration: \_\_\_\_\_
5. Max. carrying capacity : \_\_\_\_\_
6. Utilisation [operating hours / day / week]: \_\_\_\_\_
7. Housing required?  no  yes \_\_\_\_\_
8. Can parts get inside the gripper (e.g. dust, parts of the product or similar)  no  yes \_\_\_\_\_
9. Remarks:  
\_\_\_\_\_  
\_\_\_\_\_

Online forms and  
downloads: [www.fipa.com](http://www.fipa.com)

# Questionnaire F 400 | Customised grippers

To:

## FIPA GmbH

Freisinger Str. 30  
85737 Ismaning / Germany

Fax +49 (0)89 / 96 24 89 - 11  
info@fipa.com

<i>Company</i>
<i>Name</i>
<i>Street</i>
<i>City, State, Zip Code</i>
<i>Phone/Fax</i>

## Customised grippers

Please complete the following questionnaire carefully, so that we can select the optimal product for you.

### Robot-Gripper Interface

1. Robot type: _____		
2. Handling type	3. Media supply	4. Vacuum generation
<input type="checkbox"/> Linear	Number of vacuum circuits _____	<input type="checkbox"/> by FIPA
<input type="checkbox"/> Swivel axes _____ No. of axes	Number of compressed air circuits	<input type="checkbox"/> by the customer
<input type="checkbox"/> Delta robot (3-leg); FlexPicker	_____ bar	<input type="checkbox"/> Number of ejectors _____
Model name: _____	Tubing diameter _____ mm	Model name: _____
_____	Tubing length _____ mm	<input type="checkbox"/> Pump
<input type="checkbox"/> Other _____		Model name: _____
		<input type="checkbox"/> Side channel blower
		Model name: _____
		<input type="checkbox"/> Other: _____
5. Comments: _____		
_____		
_____		

### Application

1. Type of product to be handled: _____		
Product weight: _____ g		
Product dimensions (LxWxH): _____ mm		
CAD available: <input type="checkbox"/> yes <input type="checkbox"/> no		
2. Item picked from:	3. Item placed on:	4. Cycle time
<input type="checkbox"/> Conveyor belt	<input type="checkbox"/> Conveyor belt	Pick-up _____ seconds
<input type="checkbox"/> Pallet	<input type="checkbox"/> Pallet	Placement _____ seconds
<input type="checkbox"/> Container	<input type="checkbox"/> Container	
<input type="checkbox"/> Tray	<input type="checkbox"/> Tray	
<input type="checkbox"/> Fixture	<input type="checkbox"/> Fixture	
<input type="checkbox"/> Other	<input type="checkbox"/> Other:	

5. Description of application:

---

---

---

---

**Gripper Design**

Integrated vacuum generation required  yes  no

Media feed-through required:  yes  no

Interference contours (e.g. gripping space between products): \_\_\_\_\_

---

---

Labelling: \_\_\_\_\_

Colouring: \_\_\_\_\_

Special cleaning regulations: \_\_\_\_\_

Description of process: \_\_\_\_\_

---

---

---

---

Current solution: \_\_\_\_\_

---

---

---

---

Improvements required:

---

---

---

---

---

---



# Your request | Fax form

Simply copy the form, fill it out and fax to +49(0)89 / 96 24 89 – 11.

Online forms and  
downloads: [www.fipa.com](http://www.fipa.com)

Please send me an offer for:

Item number	Description	Quantity	Remarks

### Could it be something else?

Would you like to have more information from FIPA?  
Just ask for it here and now or else at [www.fipa.com](http://www.fipa.com).

#### Brochures

- FIPA End-of-Arm-Tooling
- FIPA Image brochure

\_\_\_\_\_  
 \_\_\_\_\_

For up-to-date and concise information regarding the company, service offers and FIPA dealers in your region please visit [www.fipa.com](http://www.fipa.com).

FIPA News is available for all tubing interested in the company FIPA, its products and services and the current developments and latest innovations in the fields of vacuum technology and End-of-Arm-Tooling. Keep yourself updated and subscribe to the newsletter via e-mail using this fax form or by registering at [www.fipa.com](http://www.fipa.com).

Please send me the **FIPA Newsletter** to the e-mail address given below.

### My contact details:

Company	
Forename   Surname	
Street	Postal code   City
Phone	Fax
E-mail	

Item no.	Page	Item no.	Page	Item no.	Page
3.13.001._XX	26	9.110x40.009._*	160, 384	20.037.150._*	110, 325
3.16.003._XX	26	9.120x30.062._*	384	20.040	689
3.16.007._XX	26	9.120x65.088._*	158, 385	20.040.054._*	329
3.17.002._XX	26	9.125x55.012._*	160, 385	20.041	689
3.19.004._XX	26	9.135x75.066._*	385	20.050.064._*	335
3.19.005._XX	26	9.150x55.013._*	160, 386	20.050.065._*	336
3.19.011._XX	26	9.150x55.083._*	160, 386	20.053.151._*	110, 340
3.21.006._XX	26	9.160x80.075._*	388	20.053.152._*	110, 340
3.22.008._XX	26	9.190x90.061._*	158, 388	20.053.153._*	110, 340
3.22.012._XX	26	9.200x20.063._*	389	20.060.101._*	341
3.24.010._XX	26	9.200x30.031._*	389	20.077.154._*	110, 347
3.25.013._XX	26	9.200x35.065._*	389	20.077.155._*	110, 347
3.25.014._XX	26	9.200x40.010._*	160, 390	20.088.123._*	89, 352
3.25.015._XX	26	9.200x55.014._*	160, 390	20.088.124._*	89, 352
3.27.016._XX	26	9.200x55.020._*	160, 390	20.115.114._*	354
3.27.017._XX	26	9.200x80.067._*	391	20.501	717
3.27.018._XX	26	9.200x100.015._*	160, 388	20.502	717
3.29.019._XX	26	9.250x55.016._*	160, 392	20.503	717
3.29.020._XX	26	9.250x80.033._*	392	20.504	717
3.29.021._XX	26	9.280x100.017._*	160, 393	20.507	717
3.30.022._XX	26	9.280x107.070._*	393	20.508	717
3.30.023._XX	26	9.290x55.071._*	394	20.509	717
3.30.024._XX	26	9.300x30.069._*	393	20.511	698
3.32.025._XX	26	9.300x40.064._*	394	20.514	699
3.32.026._XX	26	9.300x55.019._*	160, 395	20.515	699
3.32.027._XX	26	9.300x55.020._*	395	20.518	717
3.32.028._XX	26	9.300x55.046._*	160, 396	20.519	717
3.32.046._XX	26	9.300x115.068._*	396	20.520	700
3.32.047._XX	26	9.300x120.021._*	397	20.522	698
3.35.029._XX	26	9.370x70.022._*	160, 398	20.523	698
3.35.030._XX	26	9.430x180.024._*	160, 399	20.550	717
3.35.031._XX	26	9.450x130.025._*	160, 400	20.570	717
3.38.032._XX	26	9.450x150.026._*	400	21.004.083._*	89, 285
3.38.033._XX	26	9.470x60.072._*	401	21.004.142._*	116, 285
3.38.034._XX	26	9.470x470.027._*	401	21.005.057._*	89, 94, 286
3.38.035._XX	26	9.500x180.028._*	402	21.005.058._*	286
3.38.045._XX	26	9.580x180.029._*	160, 402	21.005.086._*	286
3.41.036._XX	26	9.750x200.049._*	403	21.005.088._*	286
3.41.037._XX	26	9.800x400.048._*	403	21.005.146._*	92, 286
3.41.038._XX	26	20.002	687	21.006.001._*	116, 288
3.41.039._XX	26	20.007	688	21.006.087._*	89, 288
3.44.040._XX	26	20.011	686	21.006.093._*	89, 287
3.44.041._XX	26	20.016.145._*	110, 299	21.007.089._*	94, 288
3.44.042._XX	26	20.016.146._*	110, 299	21.007.096._*	288
3.44.043._XX	26	20.018.125._*	301	21.007.120._*	288
3.50.044._XX	26	20.020	690	21.007.147._*	92, 287
9.23x11.036._*	154, 371	20.021	691	21.008.094._*	89, 288
9.40x20.041._*	375	20.021.147._*	110, 309	21.008.126._*	289
9.40x20.057._*	375	20.022	691	21.009.029._*	89, 94, 290
9.45x15.038._*	377	20.023	695	21.009.029._*	289
9.50x20.001._*	377	20.026	694	21.009.100._*	290
9.50x20.034._*	377	20.026.148._*	110, 313	21.009.106._*	97, 290
9.60x20.003._*	379	20.027	694	21.009.148._*	92, 290
9.80x30.004._*	381	20.030.044._*	316	21.010.004._*	291
9.85x55.006._*	382	20.035	692	21.010.005._*	291
9.100x30.007._*	383	20.036	692	21.010.056._*	291
9.100x55.020._*	160, 384	20.037.149._*	110, 325	21.010.061._*	291

# Item numbers | Index

Item no.	Page	Item no.	Page	Item no.	Page
21.010.070.*	116, 292	21.032.091.*	97, 317	22.044.034.*	333
21.010.071.*	291	21.032.154.*	92, 320	22.044.054.*	332
21.010.078.*	292	21.034.179.*	126, 322	22.050.056.*	104, 338
21.010.119.*	89, 292	21.035.080.*	323	22.050.058.*	333
21.010.127.*	293	21.037.177.*	110, 325	22.050.183.*	133, 337
21.011.095.*	293	21.040.024.*	328	22.050.184.*	133, 337
21.012.079.*	125, 294	21.040.025.*	328	22.050.185.*	133, 337
21.012.108.*	294	21.040.027.*	116, 328	22.050.186.*	133, 337
21.012.135.*	89, 94, 294	21.040.028.*	329	22.050.187.*	133, 337
21.012.149.*	92, 294	21.040.132.*	130, 328	22.050.188.*	133, 337
21.014.006.*	295	21.040.141.*	23, 328	22.053.259.*	107, 339
21.014.007.*	89, 297	21.042.155.*	92, 331	22.053.260.*	107, 339
21.014.046.*	295	21.043.049.*	89, 94, 331	22.053.261.*	107, 339
21.014.053.*	94, 295	21.050.031.*	335	22.060.107.*	342
21.014.133.*	89, 296	21.050.032.*	337	22.060.142.*	341
21.014.150.*	92, 296	21.050.065.*	335	22.060.143.*	341
21.015.008.*	297	21.050.084.*	116, 335	22.060.189.*	133, 344
21.015.009.*	296	21.051.097.*	97, 336	22.060.190.*	133, 344
21.015.050.*	299	21.052.033.*	338	22.060.191.*	133, 344
21.016.072.*	299	21.052.156.*	92, 338	22.060.192.*	133, 344
21.016.175.*	110, 299	21.053.178.*	110, 340	22.060.193.*	133, 344
21.018.010.*	89, 94, 302	21.060.035.*	342	22.060.194.*	133, 344
21.018.011.*	302	21.060.038.*	342	22.070.127.*	345
21.018.012.*	302	21.060.051.*	94, 342	22.075.262.*	107, 346
21.018.013.*	302	21.060.074.*	126, 343	22.075.263.*	107, 346
21.018.047.*	302	21.060.099.*	342	22.078.071.*	348
21.018.068.*	116, 304	21.062.055.*	89, 343	22.078.163.*	104, 349
21.018.118.*	301	21.062.092.*	97, 342	22.078.166.*	104, 349
21.018.151.*	92, 302	21.062.157.*	92, 343	22.078.169.*	104, 349
21.020.014.*	306	21.070.041.*	345	22.080.144.*	347
21.020.015.*	306	21.085.107.*	351	22.080.161.*	119, 348
21.020.016.*	89, 94, 307	22.016.253.*	107, 298	22.080.195.*	133, 350
21.020.073.*	307	22.016.254.*	107, 298	22.080.196.*	133, 350
21.020.090.*	97, 307	22.020.020.*	104, 308	22.080.197.*	133, 350
21.020.152.*	92, 307	22.021.255.*	107, 309	22.080.198.*	133, 350
21.021.176.*	110, 309	22.025.029.*	311	22.080.199.*	133, 350
21.023.066.*	116, 310	22.026.256.*	107, 313	22.080.200.*	133, 350
21.023.102.*	310	22.030.033.*	104, 321	22.088.158.*	81, 351
21.024.017.*	311	22.030.035.*	316	22.088.159.*	81, 351
21.025.059.*	312	22.030.036.*	318	22.100.201.*	133, 353
21.025.060.*	89, 312	22.030.171.*	133, 319	22.100.202.*	133, 353
21.025.153.*	92, 312	22.030.172.*	133, 319	22.100.203.*	133, 353
21.026.162.*	23, 314	22.030.173.*	133, 319	22.100.204.*	133, 353
21.026.177.*	110, 313	22.030.174.*	133, 319	22.100.205.*	133, 353
21.029.069.*	116, 315	22.030.175.*	133, 319	22.100.206.*	133, 353
21.030.018.*	317	22.030.176.*	133, 320	22.110.080.*	354
21.030.019.*	317	22.037.257.*	107, 324	22.117.164.*	104, 355
21.030.021.*	316	22.037.258.*	107, 324	22.117.167.*	104, 355
21.030.022.*	317	22.040.045.*	104, 332	22.125.207.*	133, 356
21.030.023.*	319	22.040.046.*	327	22.125.208.*	133, 356
21.030.030.*	130, 317	22.040.048.*	327	22.125.209.*	133, 356
21.030.076.*	97, 319	22.040.177.*	133, 330	22.125.210.*	133, 356
21.031.048.*	319	22.040.178.*	133, 330	22.125.211.*	133, 356
21.032.067.*	320	22.040.179.*	133, 330	22.125.212.*	133, 356
21.032.075.*	89, 94, 320	22.040.180.*	133, 330	22.150.020.*	357
21.032.081.*	321	22.040.181.*	133, 330	22.150.084.*	137, 357
21.032.082.*	116, 320	22.040.182.*	133, 331	22.150.109.*	136, 357

Item no.	Page	Item no.	Page	Item no.	Page
22.160.165.*	104, 358	23.019.119.*	81, 303	23.042.049.*	332
22.160.168.*	104, 358	23.019.168.*	23, 304	23.043.096.*	81, 86, 332
22.200.087.*	137, 359	23.019.179.*	303	23.043.242.*	84, 332
22.210.115.*	136, 360	23.019.254.*	23, 304	23.044.091.*	333
22.250.088.*	137, 361	23.020.026.*	100, 308	23.047.246.*	333
22.300.091.*	137, 361	23.020.027.*	306	23.049.199.*	333
22.350.102.*	137, 362	23.020.103.*	304	23.050.029.*	336
23.004.189.*	285	23.020.114.*	113, 305	23.050.054.*	100, 338
23.005.095.*	113, 285	23.020.121.*	305	23.050.056.*	336
23.005.178.*	86, 100, 286	23.020.124.*	86, 309	23.050.061.*	334
23.005.181.*	81, 285			23.050.127.*	340
23.005.231.*	287	23.020.133.*	23, 305	23.050.135.*	334
23.006.145.*	122, 287	23.020.140.*	119, 306	23.050.143.*	119, 334
23.006.161.*	287	23.020.149.*	122, 306	23.050.171.*	97, 334
23.007.112.*	113, 287	23.020.154.*	305	23.050.188.*	334
23.008.057.*	289	23.020.169.*	97, 306	23.052.116.*	113, 336
23.008.146.*	122, 289	23.020.238.*	84, 305	23.052.117.*	336
23.008.166.*	86, 100, 289	23.021.264.*	107, 309	23.053.033.*	81, 339
23.008.225.*	289	23.022.028.*	81, 113, 310	23.053.243.*	84, 339
23.010.123.*	293	23.022.239.*	84, 310	23.053.267.*	107, 339
23.010.139.*	119, 290	23.023.099.*	23, 310	23.055.058.*	338
23.010.147.*	122, 290	23.025.030.*	311	23.056.150.*	340
23.010.163.*	291	23.025.032.*	311	23.060.059.*	341
23.011.007.*	100, 293	23.025.137.*	81, 310	23.060.172.*	341
23.011.008.*	81, 86, 294	23.025.200.*	312	23.063.244.*	84, 344
23.011.131.*	293	23.025.240.*	84, 311	23.070.060.*	113, 345
23.011.138.*	292	23.026.115.*	313	23.075.063.*	346
23.011.173.*	292	23.026.118.*	313	23.075.130.*	347
23.011.234.*	84, 293	23.026.265.*	107, 313	23.075.151.*	81, 346
23.013.097.*	113, 294	23.028.113.*	113, 314	23.078.065.*	100, 349
23.013.120.*	81, 295	23.030.035.*	318	23.078.067.*	348
23.014.010.*	295	23.030.037.*	100, 321	23.080.144.*	119, 348
23.014.235.*	84, 295	23.030.038.*	316	23.085.201.*	351
23.015.098.*	113, 296	23.030.088.*	314	23.110.070.*	354
23.015.122.*	86, 297	23.030.107.*	113, 315	23.117.069.*	100, 355
23.015.148.*	122, 296	23.030.125.*	86, 320	23.150.090.*	357
23.015.164.*	296	23.030.141.*	119, 315	23.160.072.*	100, 358
23.016.015.*	100, 297	23.030.155.*	315	23.210.009.*	360
23.016.016.*	81, 86, 298	23.030.170.*	97, 316	24.020.033.*	104, 308
23.016.086.*	300	23.030.193.*	315	24.030.039.*	104, 318
23.016.104.*	298	23.030.230.*	130, 315	24.040.074.*	104, 330
23.016.174.*	297	23.031.192.*	113, 318	24.050.087.*	104, 337
23.016.232.*	130, 297	23.033.039.*	81, 321	25.004.087.*	285
23.016.236.*	84, 298	23.033.134.*	316	25.010.044.*	124, 292
23.016.263.*	107, 298	23.033.241.*	84, 321	25.018.031.*	96, 303
23.017.100.*	300	23.035.106.*	322	25.018.032.*	303
23.017.102.*	23, 300	23.035.111.*	113, 322	25.019.037.*	304
23.017.105.*	300	23.037.266.*	107, 324	25.020.002.*	308
23.018.019.*	301	23.040.042.*	327	25.020.025.*	100, 308
23.018.082.*	23, 301	23.040.044.*	327	25.020.045.*	124, 307
23.018.101.*	301	23.040.045.*	100, 332	25.024.057.*	311
23.018.175.*	23, 300	23.040.084.*	330	25.025.003.*	314
23.018.183.*	25, 300	23.040.126.*	331	25.025.004.*	312
23.018.237.*	84, 301	23.040.142.*	119, 327	25.025.005.*	96, 312
23.019.021.*	303	23.040.176.*	328	25.030.026.*	100, 318
23.019.109.*	113, 303	23.040.223.*	327	25.030.030.*	317
23.019.110.*	304	23.042.048.*	331		

# Item numbers | Index

Item no.	Page	Item no.	Page	Item no.	Page
25.030.046.*	124, 318	30.007-G	724	30.107	729
25.035.010.*	323	30.008	724	30.107-G	729
25.035.011.*	323	30.008-G	724	30.108	729
25.035.069.*	128, 323	30.009	724	30.108-G	729
25.036.040.*	323	30.010	724	30.109	729
25.036.041.*	323	30.011	724	30.109-G	729
25.036.072.*	324	30.011-G	724	30.110	729
25.037.012.*	325	30.012	724	30.110-G	729
25.038.014.*	326	30.012-G	724	30.111	729
25.038.015.*	326	30.013	724	30.111-G	729
25.038.016.*	126, 326	30.014	724	30.112	729
25.038.039.*	325	30.014-G	724	30.112-G	729
25.040.019.*	330	30.015	724	30.113	729
25.040.027.*	100, 330	30.015-G	724	30.113-G	729
25.040.043.*	126, 329	30.016	724	30.114	729
25.040.047.*	124, 329	30.016-G	724	30.114-G	729
25.040.058.*	126, 329	30.017	724	30.115	729
25.040.066.*	128, 329	30.017-G	724	30.115-G	729
25.048.056.*	333	30.018	724	30.116	729
25.050.028.*	100, 337	30.018-G	724	30.116-G	729
25.050.048.*	124, 335	30.019	724	30.117	729
25.050.054.*	335	30.019-G	724	30.117-G	729
25.058.049.*	341	30.020	724	30.118	729
25.060.033.*	343	30.020-G	724	30.118-G	729
25.069.050.*	345	30.050	726	30.119	729
25.084.051.*	350	30.051	726	30.119-G	729
25.091.052.*	352	30.052	726	30.120	729
25.102.053.*	353	30.053	726	30.120-G	729
26.025.009.*	164, 217	30.054	726	30.170	731
26.037.010.*	164, 238	30.055	726	30.171	731
26.070.011.*	164, 250	30.056	726	30.172	731
26.090.001.*	164, 352	30.056-G	726	30.172-G	731
26.120.002.*	164, 355	30.057	726	30.173	731
26.160.003.*	164, 359	30.057-G	726	30.173-G	731
27.016.001.*	125, 299	30.058	726	30.174	731
27.026.005.*	314	30.058-G	726	30.175	731
27.026.015.*	314	30.059	726	30.176	731
27.030.006.*	319	30.059-G	726	30.176-G	731
27.033.008.*	129, 322	30.060	726	30.177	731
27.033.017.*	321	30.060-G	726	30.178	731
27.034.003.*	322	30.062	726	30.178-G	731
27.034.023.*	129, 322	30.063	726	30.179	731
27.036.011.*	324	30.075	727	30.179-G	731
27.038.012.*	326	30.076	727	30.180	731
27.038.020.*	326	30.077	727	30.180-G	731
27.039.017.*	126, 326	30.078	727	30.181	731
30.000	724	30.080	727	30.181-G	731
30.001	724	30.100	729	30.182	731
30.002	724	30.101	729	30.182-G	731
30.002-G	724	30.102	729	30.183	731
30.003	724	30.102-G	729	30.183-G	731
30.003-G	724	30.103	729	30.184	731
30.004	724	30.103-G	729	30.200	725
30.005	724	30.104	729	30.201	725
30.006	724	30.105	729	30.202	725
30.006-G	724	30.106	729	30.203	725
30.007	724	30.106-G	729	30.204	725



Item no.	Page	Item no.	Page	Item no.	Page
30.205	725	30.339	735	30.495	740
30.206	725	30.340	735	30.496	740
30.207	725	30.341	735	30.497	740
30.208	725	30.342	735	30.498	740
30.209	725	30.343	735	30.499	740
30.210	725	30.344	735	30.500	740
30.211	725	30.345	735	30.501	740
30.212	725	30.346	735	30.502	740
30.213	725	30.347	735	30.503	740
30.214	725	30.348	735	30.504	740
30.223	726	30.349	735	30.505	740
30.224	726	30.350	735	30.506	740
30.225	726	30.351	735	30.507	740
30.226	726	30.390	735	30.518	738
30.227	726	30.391	735	30.519	738
30.228	726	30.392	735	30.520	738
30.270	732	30.393	735	30.521	738
30.271	732	30.394	735	30.522	738
30.272	732	30.395	735	30.523	738
30.273	732	30.399	736	30.524	738
30.274	732	30.400	736	30.525	738
30.275	732	30.401	736	30.526	738
30.279	730	30.402	736	30.527	738
30.280	730	30.403	737	30.528	738
30.281	730	30.404	737	30.529	738
30.282	730	30.405	737	30.530	738
30.283	730	30.406	737	30.531	738
30.284	730	30.407	737	30.532	738
30.285	730	30.408	737	30.533	738
30.286	730	30.409	737	30.534	738
30.287	730	30.410	737	30.535	738
30.288	730	30.411	737	30.599	739
30.289	730	30.412	737	30.600	739
30.290	730	30.413	737	30.601	739
30.291	730	30.414	737	30.602	739
30.292	730	30.415	737	30.603	739
30.300	734	30.416	737	30.604	739
30.301	734	30.417	737	30.605	739
30.302	734	30.418	737	30.606	739
30.303	734	30.419	737	30.607	739
30.304	734	30.420	737	30.608	739
30.305	734	30.421	737	30.609	739
30.306	734	30.431	736	30.610	739
30.307	734	30.432	736	30.611	739
30.308	734	30.433	736	30.612	739
30.309	734	30.434	736	30.613	739
30.310	734	30.435	736	30.614	739
30.311	734	30.436	736	30.649	739
30.312	734	30.440	736	30.650	739
30.313	734	30.441	736	30.651	739
30.332	735	30.442	736	30.652	739
30.333	735	30.443	736	30.653	739
30.334	735	30.490	740	30.654	739
30.335	735	30.491	740	30.655	739
30.336	735	30.492	740	30.656	739
30.337	735	30.493	740	30.657	739
30.338	735	30.494	740	30.658	739

# Item numbers | Index

Item no.	Page	Item no.	Page	Item no.	Page
30.659	739	30.828	733	30.932	745
30.660	739	30.829	733	30.933	745
30.661	739	30.830	733	30.934	745
30.662	739	30.831	733	30.935	745
30.663	739	30.832	733	30.949	747
30.664	739	30.833	733	30.950	747
30.674	740	30.834	733	30.951	747
30.675	740	30.835	733	30.952	747
30.676	740	30.836	733	30.953	747
30.677	740	30.837	733	30.954	747
30.678	740	30.838	733	30.955	747
30.679	740	30.846	728	30.956	747
30.680	740	30.847	728	30.957	747
30.681	740	30.848	728	30.958	747
30.682	740	30.849	728	30.963	746
30.683	740	30.850	728	30.964	746
30.684	740	30.851	728	30.965	746
30.685	740	30.852	728	30.966	746
30.686	740	30.853	728	30.967	746
30.687	740	30.854	728	30.968	746
30.688	740	30.855	728	30.969	746
30.689	740	30.856	728	30.970	746
30.761	725	30.863	733	30.977	745
30.762	725	30.864	733	30.978	745
30.763	725	30.865	733	30.979	745
30.764	725	30.866	733	30.980	745
30.765	725	30.867	733	30.981	745
30.774	732	30.868	733	30.982	745
30.775	732	30.869	733	30.993	747
30.776	732	30.870	733	30.994	747
30.777	732	30.871	733	30.995	747
30.778	732	30.872	733	30.996	747
30.800	727	30.873	733	30.997	747
30.801	727	30.900	744	30.998	747
30.802	727	30.901	744	30.999	747
30.803	727	30.902	744	31.000	747
30.804	727	30.903	744	31.001	747
30.805	727	30.904	744	31.002	747
30.806	727	30.905	744	31.025	746
30.807	727	30.906	744	31.026	746
30.808	727	30.906-G	744	32.000	741
30.809	727	30.907	744	32.001	741
30.810	727	30.908	744	32.002	741
30.811	727	30.910-G	744	32.003	741
30.812	727	30.914	745	32.004	741
30.813	727	30.915	745	32.005	741
30.814	727	30.916	745	32.006	741
30.815	727	30.917	745	32.007	741
30.816	723	30.920	744	32.008	741
30.817	723	30.921	744	32.009	741
30.818	723	30.922	744	32.010	741
30.819	723	30.923	744	32.011	741
30.823	733	30.924	744	32.012	741
30.824	733	30.925	744	32.013	741
30.825	733	30.926	744	32.014	741
30.826	733	30.927	744	32.015	741
30.827	733	30.928	744	32.016	741

Item no.	Page	Item no.	Page	Item no.	Page
32.017	743	32.509	675	33.020	681
32.018	743	32.510	675	33.021	681
32.019	743	32.511	675	33.022	681
32.020	743	32.540	676	33.023	681
32.021	743	32.541	676	33.024	681
32.022	743	32.542	676	33.025	681
32.023	743	32.543	676	33.026	681
32.024	743	32.544	676	33.027	681
32.025	743	32.570	636	33.074	619
32.026	743	32.571	636	33.075	678
32.027	743	32.572	636	33.076	678
32.028	743	32.573	636	33.077	678
32.029	743	32.574	636	33.078	678
32.030	743	32.575	636	33.079	678
32.031	743	32.576	636	33.080	678
32.032	743	32.577	638	33.081	678
32.033	742	32.578	638	33.082	678
32.034	742	32.579	638	33.083	678
32.035	742	32.580	638	33.084	679
32.036	742	32.581	638	33.085	679
32.037	742	32.582	639	33.086	679
32.038	742	32.583	639	33.087	679
32.039	742	32.584	639	33.088	679
32.040	742	32.585	639	33.089	679
32.041	742	32.586	639	33.090	679
32.042	742	32.587	637	33.105	642
32.043	742	32.588	637	33.120	642
32.044	742	32.589	637	33.220	641
32.045	742	32.590	637	33.220-G1/4	641
32.046	742	32.591	637	33.230	641
32.047	742	32.592	637	33.230-G1/2	641
32.048	742	32.593	637	33.230-G1/4	641
32.049	742	32.631	672	36.003	648
32.050	742	32.632	672	36.004-24VDC	646
32.051	742	32.633	672	36.004-230VAC	646
32.052	742	32.634	672	36.009-24VDC	650
32.053	742	32.635	672	36.009-230VAC	650
32.054	742	32.638	674	36.060	660
32.055	741	32.647	673	36.061	660
32.056	741	32.648	673	36.210	654
32.057	741	32.649	673	36.211	654
32.058	741	32.650	673	36.335	657
32.059	741	32.651	673	36.336	657
32.060	743	32.652	673	36.340	657
32.061	743	32.653	673	36.341	657
32.062	743	32.660	525	36.515	654
32.063	743	33.000	680	36.520	654
32.064	743	33.001	680	36.525	654
32.500	675	33.002	680	36.610	652
32.501	675	33.003	680	36.611	652
32.502	675	33.004	680	36.615	652
32.503	675	33.005	680	36.616	652
32.504	675	33.006	680	36.620	652
32.505	675	33.016	681	36.621	652
32.506	675	33.017	681	36.625	652
32.507	675	33.018	681	36.626	652
32.508	675	33.019	681	36.810	657

# Item numbers | Index

Item no.	Page	Item no.	Page	Item no.	Page
36.811	657	50.175	456	61.005S	709
36.815	657	50.176	456	61.006S	709
36.820	657	50.177	456	61.007S	709
36.825	657	50.230	444	61.008S	709
36.900	492	50.310	447	61.009S	709
36.901	492	50.311	447	61.010S	709
50.005	456	50.312	447	61.011S	709
50.018	454	50.315	447	61.020	708
50.019	454	50.316	447	61.021	708
50.020	454	50.317	447	61.022	708
50.021	451	50.330	454	61.023	708
50.028	451	50.340	447	61.024	708
50.029	451	50.341	447	61.025	708
50.030	451	50.342	447	61.026	708
50.037	456	50.345	447	61.027	708
50.050	452	50.346	447	61.028	708
50.054	450	50.347	447	61.029	708
50.055	450	50.350	447	61.030	708
50.056	451	50.351	447	61.031	708
50.066	450	50.353	447	61.033	708
50.085	454	50.354	447	61.034	708
50.086	454	50.360	447	61.035	708
50.095	456	50.361	447	61.036	708
50.096	456	50.363	447	61.037	708
50.097	456	50.364	447	61.038	708
50.098	456	50.366	447	61.039	708
50.103	454	50.367	447	61.040	708
50.104	454	50.368	447	61.043	708
50.106	451	50.369	447	61.056	705
50.120	446	50.370	447	61.057	705
50.121	450	50.371	447	61.058	705
50.122	450	50.372	447	61.059	705
50.123	446	50.373	447	61.060	705
50.124	446	50.374	447	61.061	705
50.125	454	50.375	447	61.062	705
50.126	454	55.000	468	61.063	706
50.127	454	55.001	468	61.064	706
50.128	454	55.002	468	61.065	706
50.129	454	55.004	468	61.066	706
50.130	454	55.005	466	61.067	706
50.141	456	55.100	462	61.068	706
50.145	456	55.101	464	61.069	706
50.146	456	55.102	462	61.070	706
50.149	444	55.103	464	61.071	706
50.150	444	55.104	462	61.072	706
50.152	444	55.105	464	61.073	706
50.153	444	55.106	462	61.083	715
50.158	444	55.107	464	61.090	704
50.160	444	55.108	462	61.091	704
50.162	444	55.109	464	61.092	704
50.164	444	55.110	462	61.093	704
50.166	444	55.111	464	61.094	704
50.170	456	55.112	462	61.095	704
50.171	456	55.113	464	61.096	704
50.172	456	55.114	462	61.100	711
50.173	456	55.115	464	61.101	711
50.174	456	55.120	464	61.102	711

Item no.	Page	Item no.	Page	Item no.	Page
61.103	711	62.029	713	65.390	550
61.104	711	62.030	713	65.410	548
61.105	711	62.031	713	65.510	498
61.106	711	62.033	713	65.510-PK	500
61.107	711	62.034	713	65.520	498
61.108	711	62.035	713	65.520-PK	500
61.109	711	62.036	713	65.530	498
61.110	711	62.037	713	65.530-PK	500
61.111	711	62.038	713	65.540	498
61.112	711	62.040	713	65.540-PK	500
61.113	711	62.041	713	65.701	570
61.114	711	62.042	713	65.701-S	570
61.115	711	62.045	713	65.711	570
61.116	711	62.046	713	65.711-S	570
61.117	711	62.047	713	65.731	570
61.118	711	62.048	713	65.731-S	570
61.119	711	62.060	713	65.742	572
61.120	711	62.061	713	65.752	572
61.121	711	62.062	713	65.762	572
61.122	711	62.063	713	65.772	572
61.123	711	63.001	667	65.792	572
61.124	711	63.002	667	65.802	572
61.125	711	63.003	667	66.010	714
61.126	711	63.008	667	66.011	714
61.127	711	63.011	667	66.015	714
61.128	711	63.012	667	66.017	714
61.129	711	63.013	666	66.019	714
61.130	711	63.015	666	66.020	714
61.131	711	63.017	669	67.010	487
61.132	711	63.018	669	67.011	487
61.133	711	63.026	670	71.000	628
61.135	711	63.027	670	71.001	628
61.160	707	63.032	670	71.002	628
61.161	707	63.036	665	71.003	628
61.162	707	63.037	665	71.004	628
61.163	707	63.038	665	71.007	629
61.164	707	63.055	665	71.008	629
61.165	707	63.058	668	71.009	629
61.166	707	63.059	668	71.010	629
61.167	707	63.060	667	71.011	629
61.168	707	64.001.*	168	71.012	631
61.169	707	64.002.*	168	71.013	631
61.211	710	64.003.*	168	71.014	631
61.212	710	64.004.*	168	71.015	631
61.213	710	64.005.*	168	71.016	631
61.214	710	65.102A	544	71.017	632
61.215	710	65.111	544	71.018	632
62.019	713	65.120	544	71.019	632
62.020	713	65.130	544	71.020	632
62.021	713	65.310	548	71.021	632
62.022	713	65.320	548	71.030	630
62.023	713	65.330	548	71.031	630
62.024	713	65.340	550	71.032	625
62.025	713	65.350	550	71.033	625
62.026	713	65.360	550	71.034	625
62.027	713	65.370	550	71.035	627
62.028	713	65.380	550	71.036	627

# Item numbers | Index

Item no.	Page	Item no.	Page	Item no.	Page
71.037	627	78.031	476	79.035	722
71.038	627	78.032	476	79.036	722
71.039	627	78.033	476	91.000	696
71.043	625	78.034	476	91.001	696
71.070	628	78.051	755	91.001-R	696
71.071	628	78.052	755	91.002	696
72.000	578	78.053	755	91.003	696
72.001	578	78.054	755	91.004	696
72.002	578	78.055	755	91.012	697
72.003	578	78.056	755	91.013	696
72.007	578	78.080	475	91.014	696
72.008	578	78.081	475	92.001	617
72.009	578	78.082	475	92.002	617
72.015	579	78.200	474	92.003	617
72.016	579	78.201	474	92.004	617
72.017	579	78.202	474	100.010.100.*	62
72.018	579	78.203	474	100.010.110.*	62
72.019	579	78.204	474	100.020.101.*	62, 201
72.020	579	78.205	474	100.020.111.*	62, 201
72.021	579	78.206	474	100.030.102.*	62, 219
72.022	579	78.214	474	100.030.112.*	62, 219
72.022-1*	579	78.215	474	100.040.103.*	62, 231
72.023	579	78.216	474	100.040.113.*	62, 231
72.024	579	78.217	474	100.050.104.*	62, 239
72.025	579	79.000	720	100.050.114.*	62, 239
72.026	579	79.001	720	100.083.060.*	256
72.027	579	79.002	720	100.109.059.*	261
72.028	577	79.003	720	100.120.036.*	264
72.029	577	79.004	720	100.130.058.*	266
72.030	577	79.005	720	102.001.002.*	32, 175
72.031	577	79.006	720	102.001.425.*	38, 175
72.032	577	79.007	720	102.001.463.*	38, 175
72.033	577	79.008	720	102.002.004.*	32, 176
72.038	618	79.009	720	102.002.279.*	38, 175
72.039	618	79.010	720	102.002.464.*	38, 175
72.040	618	79.011	720	102.003.005.*	32, 176
72.041	618	79.012	720	102.003.280.*	38, 176
72.042	618	79.013	720	102.003.480.*	176
72.045	578	79.014	720	102.004.216.*	50, 176
73.001	677	79.015	721	102.004.281.*	38, 176
73.002	640	79.016	721	102.005.009.*	32, 177
73.003	640	79.017	721	102.005.081.*	178
73.004	677	79.018	721	102.005.090.*	42, 177
77.000	753	79.019	721	102.005.115.*	177
77.007	753	79.020	721	102.005.391.*	177
77.008	753	79.023	721	102.005.496.*	36, 178
77.009	753	79.024	721	102.006.013.*	32, 179
77.010	753	79.025	722	102.006.217.*	50, 178
77.101	25	79.026	722	102.006.282.*	38, 178
78.000	475	79.027	722	102.006.297.*	179
78.001	475	79.028	722	102.007.091.*	42, 179
78.002	475	79.029	722	102.007.109.*	179
78.003	475	79.030	722	102.007.266.*	22, 179
78.011	475	79.031	722	102.007.484.*	180
78.012	475	79.032	722	102.008.017.*	32, 182
78.013	475	79.033	722	102.008.187.*	180
78.030	476	79.034	722		

Item no.	Page	Item no.	Page	Item no.	Page
102.008.218.*	50, 181	102.018.442.*	24, 196	102.027.298.*	20, 214
102.008.227.*	181	102.019.036.*	197	102.028.159.*	217
102.008.228.*	183	102.019.110.*	200	102.028.163.*	215
102.008.283.*	38, 181	102.019.139.*	195	102.028.164.*	215
102.008.362.*	181	102.020.041.*	32, 203	102.028.175.*	216
102.008.392.*	180	102.020.083.*	20, 198	102.028.194.*	217
102.008.395.*	180	102.020.095.*	42, 205	102.028.375.*	216
102.008.497.*	36, 182	102.020.140.*	24, 198	102.028.461.*	215
102.009.092.*	42, 183	102.020.221.*	50, 200	102.029.160.*	218
102.009.111.*	182	102.020.271.*	202	102.029.509.*	20, 217
102.009.174.*	182	102.020.272.*	198	102.030.053.*	32, 218
102.010.024.*	32, 185	102.020.286.*	38, 203	102.030.086.*	220
102.010.219.*	50, 184	102.020.299.*	24, 199	102.030.096.*	42, 223
102.010.284.*	38, 183	102.020.300.*	24, 199	102.030.178.*	221
102.010.498.*	36, 184	102.020.308.*	24, 199	102.030.215.*	222
102.011.093.*	42, 185	102.020.312.*	203	102.030.222.*	50, 219
102.011.171.*	185	102.020.321.*	199	102.030.288.*	38, 218
102.011.172.*	185	102.020.330.*	203	102.030.322.*	220
102.011.173.*	185	102.020.355.*	198	102.030.459.*	70, 218
102.011.181.*	185	102.020.365.*	200	102.030.502.*	36, 218
102.012.101.*	186	102.020.458.*	70, 201	102.031.313.*	222
102.012.267.*	22, 186	102.020.500.*	36, 203	102.032.104.*	21, 224
102.012.332.*	24, 187	102.021.063.*	22, 204	102.033.112.*	225
102.013.012.*	187	102.021.179.*	202	102.033.226.*	225
102.013.070.*	186	102.021.399.*	204	102.033.398.*	21, 224
102.013.077.*	186	102.022.043.*	58, 206	102.035.056.*	32, 229
102.013.363.*	187	102.022.071.*	206	102.035.176.*	228
102.014.089.*	20, 188	102.022.150.*	204	102.035.320.*	227
102.014.333.*	24, 187	102.022.185.*	22, 204	102.036.106.*	228
102.015.030.*	32, 190	102.022.406.*	205	102.036.342.*	21, 229
102.015.220.*	50, 192	102.022.526.*	22, 204	102.038.136.*	230
102.015.285.*	38, 190	102.023.149.*	207	102.038.157.*	230
102.015.309.*	32, 191	102.023.331.*	207	102.039.154.*	230
102.015.339.*	22, 189	102.023.356.*	207	102.039.235.*	231
102.015.367.*	190	102.024.123.*	208	102.040.061.*	32, 235
102.015.414.*	189	102.024.457.*	20, 207	102.040.094.*	42, 234
102.015.431.*	20, 190	102.025.047.*	32, 208	102.040.223.*	50, 232
102.015.499.*	36, 191	102.025.085.*	208	102.040.289.*	38, 233
102.016.098.*	42, 192	102.025.102.*	24, 209	102.040.310.*	230
102.016.122.*	193	102.025.103.*	209	102.040.357.*	66, 231
102.016.138.*	191	102.025.113.*	209	102.040.364.*	233
102.016.145.*	192	102.025.119.*	209	102.040.503.*	36, 235
102.016.146.*	191	102.025.126.*	212	102.042.184.*	236
102.016.151.*	193	102.025.192.*	213	102.042.232.*	235
102.016.255.*	24, 193	102.025.225.*	210	102.043.170.*	236
102.016.319.*	191	102.025.287.*	38, 208	102.043.252.*	236
102.017.132.*	194	102.025.373.*	213	102.045.460.*	70, 237
102.017.133.*	194	102.025.417.*	212	102.046.046.*	237
102.017.193.*	194	102.025.501.*	36, 213	102.048.274.*	238
102.017.276.*	22, 195	102.026.121.*	214	102.050.065.*	32, 239
102.017.420.*	193	102.026.128.*	210	102.050.097.*	42, 242
102.018.143.*	196	102.026.180.*	214	102.050.290.*	38, 239
102.018.144.*	196	102.027.124.*	212	102.050.433.*	240
102.018.277.*	195	102.027.167.*	214	102.050.504.*	36, 240
102.018.345.*	58, 195	102.027.246.*	216		



Item no.	Page	Item no.	Page	Item no.	Page
102.060.291.*	38, 244	103.100.062.*	64, 260	104.034.054.*	21, 226
102.060.303.*	32, 244	103.100.063.*	64, 260	104.035.038.*	227
102.060.505.*	36, 244	103.100.064.*	64, 260	104.035.048.*	226
102.070.234.*	66, 248	103.100.065.*	64, 260	104.035.050.*	226
102.070.325.*	249	103.125.066.*	64, 265	104.038.039.*	229
102.075.275.*	251	103.125.067.*	64, 265	104.040.014.*	232
102.076.263.*	251	103.125.068.*	64, 265	104.040.018.*	21, 233
102.080.304.*	32, 256	103.125.069.*	64, 265	104.040.068.*	231
102.095.182.*	258	103.125.070.*	64, 265	104.040.088.*	166, 233
102.095.305.*	32, 258	103.125.071.*	64, 265	104.050.022.*	238
102.100.100.*	259	104.008.070.*	20, 181	104.050.064.*	240
102.100.269.*	66, 259	104.008.082.*	166, 181	104.050.069.*	239
102.110.483.*	263	104.009.083.*	166, 182	104.060.024.*	244
102.130.258.*	266	104.010.001.*	183	104.061.060.*	245
102.135.256.*	266	104.010.065.*	183	104.063.041.*	246
102.145.257.*	267	104.010.071.*	20, 184	104.080.078.*	253
102.160.031.*	270	104.013.084.*	166, 187	107.009.001.*	182
102.160.195.*	270	104.014.020.*	187	107.011.103.*	60
102.170.259.*	271	104.014.025.*	188	107.012.002.*	186
102.200.350.*	66, 273	104.015.002.*	189	107.012.106.*	60
102.210.260.*	274	104.015.072.*	20, 190	107.013.095.*	404
102.250.261.*	275	104.015.085.*	166, 189	107.013.101.*	60
102.290.262.*	278	104.016.003.*	42, 194	107.013.105.*	60
103.030.024.*	217	104.017.026.*	194	107.014.005.*	188
103.030.030.*	64, 222	104.018.005.*	196	107.015.062.*	189
103.030.031.*	64, 222	104.018.049.*	194	107.015.102.*	60
103.030.032.*	64, 222	104.018.051.*	196	107.016.008.*	58, 192
103.030.033.*	64, 222	104.020.042.*	198	107.017.066.*	60
103.030.034.*	64, 222	104.020.066.*	201	107.017.093.*	404
103.030.035.*	64, 222	104.020.073.*	20, 201	107.018.004.*	58, 195
103.040.036.*	64, 234	104.020.075.*	201	107.018.104.*	60
103.040.037.*	64, 234	104.020.086.*	166, 200	107.019.054.*	197
103.040.038.*	64, 234	104.024.006.*	207	107.019.076.*	60
103.040.039.*	64, 234	104.025.027.*	210	107.019.112.*	60
103.040.040.*	64, 234	104.025.030.*	210	107.020.013.*	202
103.040.041.*	64, 234	104.025.031.*	210	107.020.014.*	200
103.050.042.*	64, 241	104.025.037.*	213	107.020.015.*	202
103.050.043.*	64, 241	104.025.040.*	210	107.021.049.*	204
103.050.044.*	64, 241	104.025.043.*	20, 211	107.022.016.*	206
103.050.045.*	64, 241	104.025.056.*	213	107.022.107.*	60
103.050.046.*	64, 241	104.025.094.*	20, 211	107.024.060.*	404
103.050.047.*	64, 241	104.026.033.*	213	107.024.061.*	404
103.060.048.*	64, 246	104.027.032.*	214	107.025.019.*	211
103.060.049.*	64, 246	104.027.055.*	214	107.025.020.*	211
103.060.050.*	64, 246	104.027.062.*	215	107.025.109.*	60
103.060.051.*	64, 246	104.029.053.*	217	107.026.111.*	60
103.060.052.*	64, 246	104.029.093.*	21, 216	107.027.022.*	215
103.060.053.*	64, 246	104.030.007.*	221	107.027.052.*	215
103.075.025.*	250	104.030.008.*	220	107.027.121.*	405
103.080.054.*	64, 255	104.030.009.*	21, 221	107.028.108.*	60
103.080.055.*	64, 255	104.030.059.*	221	107.030.023.*	220
103.080.056.*	64, 255	104.030.067.*	219	107.031.079.*	405
103.080.057.*	64, 255	104.030.087.*	166, 219	107.031.091.*	405
103.080.058.*	64, 255	104.032.044.*	225	107.032.113.*	60
103.080.059.*	64, 255	104.033.034.*	225	107.033.046.*	405
103.100.060.*	64, 260	104.033.057.*	225	107.033.047.*	406
103.100.061.*	64, 260	104.034.036.*	21, 225	107.035.055.*	228



Item no.	Page	Item no.	Page	Item no.	Page
107.036.037.*	229	114.075.012.*	250	125.025.007.*	42, 216
107.037.027.*	229	114.080.020.*	254	125.030.010.*	42, 223
107.037.114.*	60	114.080.021.*	254	125.040.013.*	42, 235
107.038.119.*	406	114.100.022.*	258	125.050.017.*	42, 242
107.045.115.*	60	115.015.002.*	188	125.065.026.*	247
107.048.031.*	237	115.030.005.*	221	125.066.027.*	248
107.050.042.*	239	115.035.007.*	228	126.015.002.*	190
107.070.029.*	249	115.048.008.*	237	126.016.003.*	192
107.105.035.*	261	115.060.009.*	245	126.020.004.*	24, 198
107.114.118.*	406	116.034.001.*	21, 226	126.020.005.*	24, 199
108.032.002.*	224	120.019.003.*	200	126.025.009.*	211
108.034.003.*	226	120.020.006.*	47, 205	126.025.010.*	209
108.120.006.*	265	120.022.011.*	206	126.030.013.*	219
110.042.068.*	236	120.025.086.*	211	126.040.016.*	232
110.050.078.*	241	120.030.013.*	47, 223	126.050.017.*	238
110.050.080.*	240	120.032.025.*	224	126.050.018.*	241
110.060.085.*	245	120.038.021.*	229	126.065.019.*	247
110.065.091.*	247	120.040.032.*	236	127.018.001.*	197
110.080.095.*	254	120.040.076.*	47, 234	127.045.002.*	237
110.100.103.*	258	120.040.084.*	230	127.050.003.*	240
112.004.001.*	52, 177	120.050.040.*	243	127.050.004.*	238
112.005.002.*	52, 177	120.050.078.*	47, 242	127.065.006.*	248
112.006.003.*	52, 178	120.060.045.*	245	130.10x4.068.*	152, 365
112.006.004.*	179	120.075.075.*	250	130.10x4.115.*	152, 365
112.008.007.*	52, 180	120.080.052.*	254	130.10x5.071.*	152, 366
112.008.009.*	180	120.082.063.*	255	130.10x5.116.*	152, 366
112.010.011.*	52, 184	121.030.006.*	47, 223	130.10x6.073.*	152, 366
112.010.027.*	184	121.040.007.*	47, 234	130.10x6.117.*	152, 366
112.012.015.*	52, 186	121.050.008.*	47, 242	130.20x4.069.*	152, 369
112.015.021.*	188	122.006.002.*	56, 178	130.20x4.118.*	152, 369
112.015.022.*	52, 188	122.010.005.*	56, 184	130.20x5.081.*	152, 369
112.018.024.*	52, 196	122.015.004.*	189	130.20x5.119.*	152, 369
112.018.111.*	197	122.016.006.*	192	130.20x6.074.*	152, 370
112.019.073.*	197	122.016.009.*	56, 193	130.20x6.120.*	152, 370
112.020.031.*	52, 202	122.016.012.*	42, 195	130.20x8.076.*	152, 370
112.022.037.*	52, 206	122.016.076.*	193	130.20x8.121.*	152, 370
112.025.042.*	52, 208	122.019.014.*	197	130.30x5.072.*	152, 372
112.025.043.*	208	122.020.017.*	202	130.30x5.123.*	152, 372
112.030.051.*	221	122.022.022.*	42, 206	130.30x6.075.*	152, 373
112.030.052.*	52, 220	122.025.025.*	56, 212	130.30x6.124.*	152, 373
112.035.059.*	227	122.025.077.*	212	130.30x8.077.*	152, 373
112.035.060.*	52, 228	122.030.034.*	224	130.30x8.125.*	152, 373
112.035.064.*	228	122.032.036.*	42, 224	130.30x12.057.*	157, 374
112.035.065.*	227	122.034.038.*	226	130.38x19.085.*	375
112.039.069.*	230	122.040.001.*	232	130.40x12.058.*	157, 375
112.040.071.*	52, 232	122.040.043.*	56, 236	130.42x18.037.*	376
112.045.077.*	52, 237	122.040.044.*	232	130.50x20.102.*	377
112.055.086.*	243	122.060.059.*	56, 245	130.50x25.094.*	378
112.057.087.*	243	123.020.003.*	47, 205	130.55x12.082.*	157, 378
112.060.091.*	52, 244	123.025.010.*	47, 216	130.60x38.091.*	379
112.065.093.*	247	123.030.019.*	47, 223	130.62x42.111.*	379
112.070.096.*	249	123.040.028.*	47, 235	130.67x28.104.*	380
112.085.102.*	52, 256	123.050.034.*	47, 242	130.70x30.095.*	380
112.087.089.*	256	124.030.002.*	47, 223	130.70x35.089.*	380
113.050.014.*	241	124.040.006.*	47, 235	130.75x25.080.*	380
114.052.008.*	243	124.050.009.*	47, 242	130.90x50.113.*	158, 382
114.061.010.*	245	125.020.004.*	42, 205	130.92x92.006.*	382

Item no.	Page	Item no.	Page	Item no.	Page
130.96x27.036.*	382	137.205x82.1.*	392	152.600.087.*	282
130.97x55.126.*	149, 383	138.25x8.002.*	148, 372	152.630.107.*	74
130.100x32.067.*	383	138.35x28.001.*	149, 374	152.720.108.*	74
130.100x40.096.*	383	138.43x15.001.*	376	152.920.109.*	74
130.100x40.105.*	383	138.45x15.003.*	148, 377	154.055.060.*	243
130.145x34.55.*	386	138.45x28.013.*	149, 377	154.065.002.*	246
130.152x51.092.*	387	138.75x25.004.*	148, 381	154.065.003.*	70, 248
130.204x76.86.*	391	138.200x100.005.*	391	154.078.027.*	42, 252
132.4x2.001.*	141, 364	138.300x150.007.*	397	154.080.055.*	253
132.4x2.031.*	141, 146, 364	138.350x100.009.*	398	154.090.010.*	257
132.4x2.079.*	144, 364	138.400x200.011.*	399	154.110.014.*	70, 262
132.7x4.002.*	141, 364	150.030.031.*	68, 218	154.113.028.*	42, 262
132.7x4.034.*	141, 146, 364	150.050.032.*	68, 240	154.120.017.*	264
132.7x4.080.*	144, 364	150.075.033.*	68, 251	154.120.018.*	32, 263
132.10x4.003.*	365	150.100.034.*	68, 259	154.150.020.*	32, 268
132.10x5.007.*	366	150.150.010.*	68, 267	154.150.021.*	70, 268
132.10x6.011.*	366	150.190.015.*	273	154.155.026.*	42, 269
132.12x4.004.*	141, 367	150.225.018.*	68, 274	154.160.024.*	271
132.15x5.008.*	141, 367	150.340.030.*	280	154.160.049.*	271
132.15x5.067.*	146, 367	152.055.092.*	243	154.177.053.*	271
132.15x5.081.*	144, 367	152.070.093.*	249	154.191.025.*	32, 272
132.15x7.073.*	154, 368	152.078.133.*	47, 252	155.40x35.004.*	376
132.15x8.5.33.*	368	152.078.136.*	47, 252	155.60x42.005.*	379
132.18x6.012.*	141, 368	152.078.139.*	47, 252	155.150x75.3.*	387
132.18x6.082.*	144, 368	152.080.069.*	253	160.042.001.*	72, 227
132.19x5.044.*	368	152.080.083.*	253	160.067.003.*	72, 244
132.20x4.005.*	369	152.090.089.*	257	160.107.006.*	72, 259
132.20x5.009.*	369	152.105.094.*	261	160.145.014.*	72, 266
132.20x6.013.*	370	152.113.134.*	47, 262	160.215.009.*	72, 273
132.20x8.015.*	370	152.113.137.*	47, 262	160.315.012.*	72, 279
132.20x11.077.*	371	152.115.095.*	263	201.10x3.005.*	154, 365
132.21x17.047.*	371	152.120.017.*	263	201.10x6.006.*	154, 367
132.24x8.016.*	141, 371	152.120.064.*	264	201.12x9.007.*	154, 367
132.24x8.066.*	146, 371	152.120.115.*	264	201.79x29.002.*	150, 381
132.24x8.083.*	144, 371	152.140.096.*	267	206.064.006.*	247
132.25x5.045.*	372	152.145.045.*	267	206.092.007.*	257
132.30x5.010.*	372	152.150.019.*	268	208.064.001.*	247
132.30x6.014.*	373	152.155.135.*	47, 269	208.092.002.*	257
132.30x8.017.*	373	152.155.138.*	47, 269	209.52x25.006.*	150, 378
132.30x10.018.*	141, 374	152.160.097.*	270	209.60x29.001.*	150, 379
132.30x10.084.*	144, 374	152.160.127.*	73, 270	209.80x30.003.*	150, 381
132.30x12.025.*	374	152.180.067.*	272	209.80x40.004.*	150, 382
132.36x12.019.*	141, 374	152.190.080.*	272	209.80x50.005.*	150, 382
132.36x12.068.*	146, 375	152.191.025.*	272	216.150x75.3.*	387
132.40x12.027.*	375	152.200.128.*	73, 273	270.001	409
132.45x15.020.*	141, 376	152.240.046.*	275	270.002	428
132.45x15.064.*	146, 376	152.250.031.*	276	270.003	416
132.45x15.085.*	144, 376	152.250.129.*	73, 276	270.005	412
132.50x30.030.*	378	152.260.068.*	277	270.007	422
132.55x12.029.*	378	152.285.099.*	74, 277	270.009	417
132.60x20.022.*	141, 378	152.300.098.*	278	270.010	411
132.60x20.086.*	144, 379	152.300.130.*	73, 279	270.011	408
132.60x42.052.*	380	152.350.131.*	73, 280	270.012	421
132.69x32.060.*	380	152.400.085.*	281	270.013	410
132.75x25.023.*	141, 381	152.450.105.*	74	270.014	408
132.75x25.087.*	144, 381	152.500.086.*	281	270.015	421
132.100x35.26.*	141, 383	152.540.106.*	74	270.019	423

Item no.	Page	Item no.	Page	Item no.	Page
270.020	423	270.112	419	270.204	427
270.022	409	270.113	425	270.205	416
270.024	410	270.114	422	270.207	426
270.025	408	270.116	432	270.208	425
270.026	408	270.120	750	270.210	430
270.030	419	270.121	750	270.213	428
270.033	416	270.122	750	270.216	431
270.034	428	270.123	750	270.224	438
270.037	411	270.124	750	270.227	751
270.038	432	270.125	750	270.228	753
270.039	414	270.126	750	270.229	752
270.040	415	270.127	750	270.230	752
270.042	431	270.129	670	270.233	438
270.043	425	270.130	670	270.234	438
270.044	426	270.130.O	753	270.235	438
270.049-1	426	270.131	751	270.236	440
270.056	437	270.132	417	270.237	430
270.059	750	270.134	409	270.238	417
270.060	417	270.138	751	270.242	417
270.061	422	270.141	430	270.244	410
270.063	419	270.145	430	270.245	752
270.064	418	270.147	419	270.247	415
270.065	422	270.148	751	270.248	433
270.067	441	270.153	409	270.249	427
270.068	441	270.155	440	270.250	418
270.070	439	270.158	438	270.251	423
270.072	470	270.161	438	270.252	424
270.073/1	470	270.164	438	270.254	415
270.075	470	270.167	438	270.255	415
270.076	439	270.171	438	270.256	415
270.077	419	270.173	438	270.262	438
270.078	752	270.175	429	270.264	438
270.079	752	270.176	430	270.266	438
270.085	418	270.177	416	270.268	438
270.086	422	270.178	431	270.269	440
270.088	752	270.179	438	270.270	440
270.089	753	270.180	438	270.274	427
270.090	752	270.181	751	270.275	432
270.092	424	270.182	434	270.279	751
270.093	421	270.182.O	753	270.280	751
270.094	411	270.182.U	431	270.281	428
270.095	418	270.183	431	270.282	433
270.096	422	270.184	431	270.283	409
270.097	426	270.185	471	270.284	438
270.098	432	270.186	471	270.286	438
270.099	427	270.187	471	270.289	438
270.100	431	270.188	417	270.297	751
270.101	426	270.190	428	270.300	411
270.102	752	270.192	432	270.302	752
270.103	413	270.194	425	270.303	752
270.104	413	270.195	409	270.304	752
270.105	414	270.196	420	270.306	753
270.107	751	270.199	472	270.307	753
270.108	751	270.200	411	270.308	753
270.109	421	270.201	472	270.309	753
270.110	422	270.202	472	270.310	411
270.111	408	270.203	472	270.311	411

# Item numbers | Index

Item no.	Page	Item no.	Page	Item no.	Page
270.312/19	414	270.464	412	270.560	752
270.313	415	270.465	439	270.561	750
270.314	415	270.478	421	270.562	750
270.315	414	270.479	423	270.563	750
270.317	410	270.480	420	270.564	750
270.320	751	270.481	423	270.565	750
270.323	751	270.482	420	270.566	750
270.324	432	270.483	429	270.567	752
270.332	438	270.484	433	270.576	752
270.334	752	270.485	423	270.577	752
270.335	438	270.486	420	270.579	753
270.338	438	270.487	429	270.600	752
270.339	413	270.488	434	270.601	752
270.340	413	270.489	423	270.604	752
270.343	753	270.490	420	270.605	752
270.347	412	270.491	429	CPP20-6W	748
270.352	420	270.492	434	CPP20-8W	748
270.354	420	270.493	420	CPP20-10W	748
270.356	433	270.494	423	CPP20-12W	748
270.358	433	270.498	414	CPP20L-6W	749
270.359	427	270.499	414	CPP20L-8W	749
270.361	433	270.500-S	413	CPP20L-10W	749
270.364	430	270.501-S	424	CPP20L-12W	749
270.372	437	270.502-S	424	CPS20-02W	748
270.373	413	270.503-S	418	CPS20-03W	748
270.378	415	270.504-S	429	CPS20-04W	748
270.382	412	270.505-S	434	CPS20-6W	748
270.392	439	270.506-S	428	CPS20-8W	748
270.395	754	270.507-S	435	CPS20-10W	748
270.396	754	270.508	439	CPS20-12W	748
270.397	754	270.509	439	DO.3B-1	594
270.399	410	270.510	439	DO.3B-3	594
270.400	436	270.511	439	DO.4B-1	594
270.402	436	270.512	416	DO.4B-3	594
270.404	436	270.513	434	DO.5B-1	596
270.415	440	270.514	429	DO.5B-3	596
270.419	441	270.515	425	DO.8B-1	598
270.420	750	270.518	754	DO.8B-3	598
270.423	752	270.519	754	DO.12C-1	598
270.427	408	270.521	412	DO.12C-3	598
270.431	418	270.524	408	DO.20C-1	600
270.434	431	270.526	435	DO.20C-3	600
270.438	427	270.527-S	424	DO.25C-1	600
270.439	424	270.528-S	436	DO.25C-3	600
270.440	424	270.529-S	436	DO.40B-1	602
270.441	424	270.530-S	437	DO.40B-3	602
270.442	435	270.531-S	437	DO.60B-1	602
270.443	410	270.532-S	437	DO.60B-3	602
270.451	426	270.533-S	437	DO.105C-3	604
270.452	431	270.534	425	DO.150C-3	604
270.457	414	270.535	440	DO.205C-3	604
270.458	408	270.536	409	DO.305C-3	604
270.459	414	270.539	434	DT.3A-1	582
270.460	414	270.540	429	DT.3A-3	582
270.461	414	270.541	421	DT.6B-1	582
270.462	416	270.543	419	DT.6B-3	582
270.463	412	270.554	434	DT.10B-1	582

Item no.	Page	Item no.	Page	Item no.	Page
DT.10B-3	582	EBA.12H.1-MV	537	EBO.10P.1	530
DT.16B-1	585	EBA.12H.1-MV-I	537	EBO.10P.1-S	530
DT.16B-3	585	EBA.12H.1-W	533	EBO.12H.1	530
DT.25B-1	585	EBA.12H.2	533	EBO.12H.1-S	530
DT.25B-3	585	EBA.12H.2-MV	537	EBO.12P.1	530
DT.40B-1	585	EBA.12H.2-MV-I	537	EBO.12P.1-S	530
DT.40B-3	585	EBA.12H.2-W	533	EFO.30L.1	574
DT.60C-3	588	EBA.12P.1	533	EFO.30L.2	574
DT.80C-3	588	EBA.12P.1-MV	537	EFO.30L.3	576
DT.100C-3	590	EBA.12P.1-MV-I	537	EFO.40L.1	574
DT.140C-3	590	EBA.12P.1-W	533	EFO.40L.2	574
EBA.05H.1-MV	537	EBA.12P.2	533	EFO.40L.3	576
EBA.05H.1-MV-I	537	EBA.12P.2-MV	537	EFO.60L.1	574
EBA.05H.2-MV	537	EBA.12P.2-MV-I	537	EFO.60L.2	574
EBA.05H.2-MV-I	537	EBA.12P.2-W	533	EFO.60L.3	576
EBA.05L.1-MV	537	EBA.15H.1	533	EFO.75L.1	574
EBA.05L.1-MV-I	537	EBA.15H.1-MV	537	EFO.75L.2	574
EBA.05L.2-MV	537	EBA.15H.1-MV-I	537	EFO.75L.3	576
EBA.05L.2-MV-I	537	EBA.15H.1-W	533	EIL.05	520
EBA.07H.1	533	EBA.15H.2	533	EIL.05H.1	514
EBA.07H.1-MV	537	EBA.15H.2-W	533	EIL.05H.1-B	517
EBA.07H.1-MV-I	537	EBA.15L.1	533	EIL.05H.2	514
EBA.07H.1-W	533	EBA.15L.1-MV	537	EIL.05H.4	514
EBA.07H.2	533	EBA.15L.1-MV-I	537	EIL.05H.4-B	517
EBA.07H.2-W	533	EBA.15L.1-W	533	EIL.05-HO	524
EBA.07L.1-MV	537	EBA.15L.2	533	EIL.05L.1	514
EBA.07L.1-MV-I	537	EBA.15L.2-W	533	EIL.05L.1-B	517
EBA.07L.2-MV	537	EBA.15P.1	533	EIL.05L.2	514
EBA.07L.2-MV-I	537	EBA.15P.1-MV	537	EIL.05L.4	514
EBA.07P.1	533	EBA.15P.1-MV-I	537	EIL.05L.4-B	517
EBA.07P.1-MV	537	EBA.15P.1-W	533	EIL.07	520
EBA.07P.1-MV-I	537	EBA.15P.2	533	EIL.07H.1	514
EBA.07P.1-W	533	EBA.15P.2-W	533	EIL.07H.1-B	517
EBA.07P.2	533	EBA.20H.1	533	EIL.07H.2	514
EBA.07P.2-W	533	EBA.20H.1-W	533	EIL.07H.4	514
EBA.08H.2-A	528	EBA.20L.1	533	EIL.07H.4-B	517
EBA.10H.1	533	EBA.20L.1-W	533	EIL.07-HO	524
EBA.10H.1-MV	537	EBA.20P.1	533	EIL.07L.1	514
EBA.10H.1-MV-I	537	EBA.20P.1-W	533	EIL.07L.1-B	517
EBA.10H.1-W	533	EBM.05H.5	541	EIL.07L.2	514
EBA.10H.2	533	EBM.05H.5-W	541	EIL.07L.4	514
EBA.10H.2-MV	537	EBM.05H.6	541	EIL.07L.4-B	517
EBA.10H.2-MV-I	537	EBM.05H.6-W	541	EIL.07P.1	514
EBA.10H.2-W	533	EBO.05H.4	530	EIL.07P.1-B	517
EBA.10L.1-MV	537	EBO.05H.4-S	530	EIL.07P.4	514
EBA.10L.1-MV-I	537	EBO.05L.4	530	EIL.07P.4-B	517
EBA.10L.2-MV	537	EBO.05L.4-S	530	EIL.09	520
EBA.10L.2-MV-I	537	EBO.07H.1	530	EIL.10	520
EBA.10P.1	533	EBO.07H.1-S	530	EIL.12	520
EBA.10P.1-MV	537	EBO.07L.1	530	EIL.14	520
EBA.10P.1-MV-I	537	EBO.07L.1-S	530	EKP.60x12	563
EBA.10P.1-W	533	EBO.07P.1	530	EKP.60x15	563
EBA.10P.2	533	EBO.07P.1-S	530	EKP.60x20	563
EBA.10P.2-MV	537	EBO.10H.1	530	EKP.60x25	563
EBA.10P.2-MV-I	537	EBO.10H.1-S	530	EKP.60x30	563
EBA.10P.2-W	533	EBO.10L.1	530	EKP.90x12	563
EBA.12H.1	533	EBO.10L.1-S	530	EKP.90x15	563



Item no.	Page	Item no.	Page	Item no.	Page
EKP.90x20	563	PPF-600x400-20	490	VTB-Set	502
EKP.90x25	563	PPF-600x400-28	490	VZ.1xDO.25C-3/100L	608
EKP.90x30	563	PPF-600x400-40	490	VZ.1xDO.25C-3/300L	608
EMA.90x14	559	PPF-1300x260-20	490	VZ.1xDO.40B-3/100L	608
EMM.60x10	556	PPF-1300x260-28	490	VZ.1xDO.40B-3/300L	608
EMM.60x12	556	PPF-1300x260-40	490	VZ.1xDO.40B-3/500L	608
EMM.60x14	556	PPF-1300x500-20	490	VZ.1xDO.60B-3/100L	608
EMM.90x10	556	PPF-1300x500-28	490	VZ.1xDO.60B-3/300L	608
EMM.90x12	556	PPF-1300x500-40	490	VZ.1xDO.60B-3/500L	608
EMM.90x14	556	PPF-TL-100x250x12	490	VZ.1xDO.105C-3/100L	608
FB 5	626	PPF-TL-100x250x24	490	VZ.1xDO.105C-3/300L	608
FB 10	626	PPF-TL-150x300x12	490	VZ.1xDO.105C-3/500L	608
FB 20	626	PPF-TL-150x300x24	490	VZ.1xDO.205C-3/500L	608
FB 25	626	PPF-TL-200x350x12	490	VZ.1xDO.305C-3/500L	608
FB 30	626	PPF-TL-200x350x24	490	VZ.2xDO.25C-3/300L	610
FB 40	626	PPF-TL-250x400x12	490	VZ.2xDO.40B-3/300L	610
FB 50	626	PPF-TL-250x400x24	490	VZ.2xDO.40B-3/500L	610
FB 60	626	QC3-3M	738	VZ.2xDO.60B-3/300L	610
FC 10F	624	QC3-4M	738	VZ.2xDO.60B-3/500L	610
FC 20F	624	QC3-6M	738	VZ.2xDO.105C-3/500L	610
FC 25F	624	QC4-3M	738	VZ.2xDO.205C-3/1000L	610
FC 30F	624	QC4-4M	738	VZ.2xDO.305C-3/1000L	610
FC 35F	624	QC4-6M	738	VZ.3xDO.25C-3/300L	612
FC 40F	624	QC6-3M	738	VZ.3xDO.25C-3/500L	612
FC 50F	624	QC6-4M	738	VZ.3xDO.40B-3/500L	612
FC 60F	624	QC6-6	738	VZ.3xDO.60B-3/500L	612
FC 80F	624	QC6-6M	738	VZ.3xDO.105C-3/500L	612
FC 100F	624	QC6-8	738	VZ.3xDO.105C-3/1000L	612
GR02.230	458	QC8-6	738	VZ.3xDO.150C-3/1000L	612
GR02.231	458	QC8-8	738	VZ.3xDO.205C-3/1000L	612
GR02.232	458	TC120x230-P20	480	VZ.3xDO.305C-3/1000L	612
GR05.201-X	494	TC120x230-P40	480	VZ.DO.4B-1/8L	606
GR05.202-X	494	TC120x400-P20	480	VZ.DO.5B-1/25L	606
GR05.203-X	494	TC120x400-P40	480	VZ.DO.25C-3/25L	606
GR05.204-X	494	TC200x400-P20	480	VZ.DO.40C-3/25L	606
GR05.205-X	494	TC200x400-P40	480	VZ.DO.60C-3/25L	606
GR07.010	754	TC600x400-P20-OV*	480	WR 0425	715
GR07.011	754	TC600x400-P28-OV*	480	WR 0640	715
GR07.012	754	TC600x400-P40-OV*	480	WR 0850	715
GR09.xx1	508	TC1300x260-P20-OV*	480	WR 0860	715
GR09.xx2	506	TC1300x260-P28-OV*	480	WR 1065	715
GR09.xx3	507	TC1300x260-P40-OV*	480	WR 1075	715
KE.1.9A-1	592	TC1300x500-P20-OV*	480	WR 1280	715
MG35	503	TC1300x500-P28-OV*	480	WR 1290	715
MG55	503	TC1300x500-P40-OV*	480	WR 1613	715
MG70	503	TG100x250	488		
PMG24	504	TG150x300	488		
PMG40	504	TG200x350	488		
PMG70	504	TG250x400	488		
PPF120.230-P20	490	TG300x500	488		
PPF120.230-P40	490	TG400x600	488		
PPF120.400-P20	490	TL100x250	484		
PPF120.400-P40	490	TL150x300	484		
PPF160.600-P20	490	TL200x350	484		
PPF160.600-P40	490	TL250x400	484		
PPF200.400-P20	490	VTA-Set	502		
PPF200.400-P40	490	VTA-Set-1	502		



## Imprint

Our General Terms and Conditions apply; they can be viewed at our website [www.fipa.com](http://www.fipa.com) or requested by calling +49 (0)89 / 96 24 89 - 0.

### Copyrights

All pages and their contents are copyright protected (all rights reserved). All names, trademarks, logos, text and images are the property of the respective owners and must be treated as such.

Realization: FIPA GmbH, Ismaning / Germany

Printed by: T.K.S. Technologies PCL, Samut Sakhon / Thailand

### Exclusion of liability

This catalogue was compiled with the greatest possible care. Nevertheless, FIPA provides no warranty that the information contained herein will be accurate and free of errors. FIPA rules out any liability for damages that result directly or indirectly from the use of the FIPA catalogue to the extent that these damages were not caused by premeditation or gross negligence on behalf of FIPA.

FIPA shall not be held liable for any damage resulting from ready-made modules preassembled by FIPA if a check as to their suitability for the particular application has not been made prior to them being put into operation by the customer.

Created in July 2014

**FIPA GmbH**

**Freisinger Straße 30**

**85737 Ismaning / Germany**

**Phone +49 (0)89 / 96 24 89 - 0**

**Fax +49 (0)89 / 96 24 89 - 11**

**[info@fipa.com](mailto:info@fipa.com)**

**[www.fipa.com](http://www.fipa.com)**

**Executive Manager: Rainer Mehrer**

**Company headquarters: Ismaning**

**Commercial register: München, HRB 104 684**

**Sales tax ID No.: DE161864784**

# www.grippers24.com

www.vacuumcomponents24.com

www.vacuumcups24.com

Stay up-to-date on everything related to material flow with the free FIPA newsletter. Subscribe now at [www.fipa.com](http://www.fipa.com)!



- > Do you have a technical question about our products?
- > Do you request a quote?
- > Or are you interested in CAD data or datasheets of our products?

You will get what you need quickly by calling us at **+49 (0)89 / 96 24 89 - 0**, by sending us an email at [info@fipa.com](mailto:info@fipa.com) or just by visiting our website [www.fipa.com](http://www.fipa.com).



Contact information for your smartphone

## FIPA worldwide

### FIPA GmbH

Freisinger Straße 30  
85737 Ismaning / Germany  
Phone +49 (0)89/96 24 89 – 0  
Fax +49 (0)89/96 24 89 – 11  
[info@fipa.com](mailto:info@fipa.com) | [www.fipa.com](http://www.fipa.com)

### FIPA Inc.

1855 Evans Road  
Cary, NC 27513 / USA  
Phone +1 (919) 651 9888  
Fax +1 (919) 573 0871  
[sales.us@fipa.com](mailto:sales.us@fipa.com) | [www.fipa.com](http://www.fipa.com)

### FIPA Ltd.

The Trendy Plaza, 10/30 1A Floor  
Sukhumvit 13 Klong Toey Nua, Wattana  
10110 Bangkok / Thailand  
Phone +66 (0) 2 168 7036  
Fax +66 (0) 2 168 7037  
[sales.th@fipa.com](mailto:sales.th@fipa.com) | [www.fipa.com](http://www.fipa.com)

Your local FIPA partner

**FIPA**  
*Material in Motion*