ENG

DRILLING MACHINING CENTRES

Increased productivity and flexibility

morbidelli

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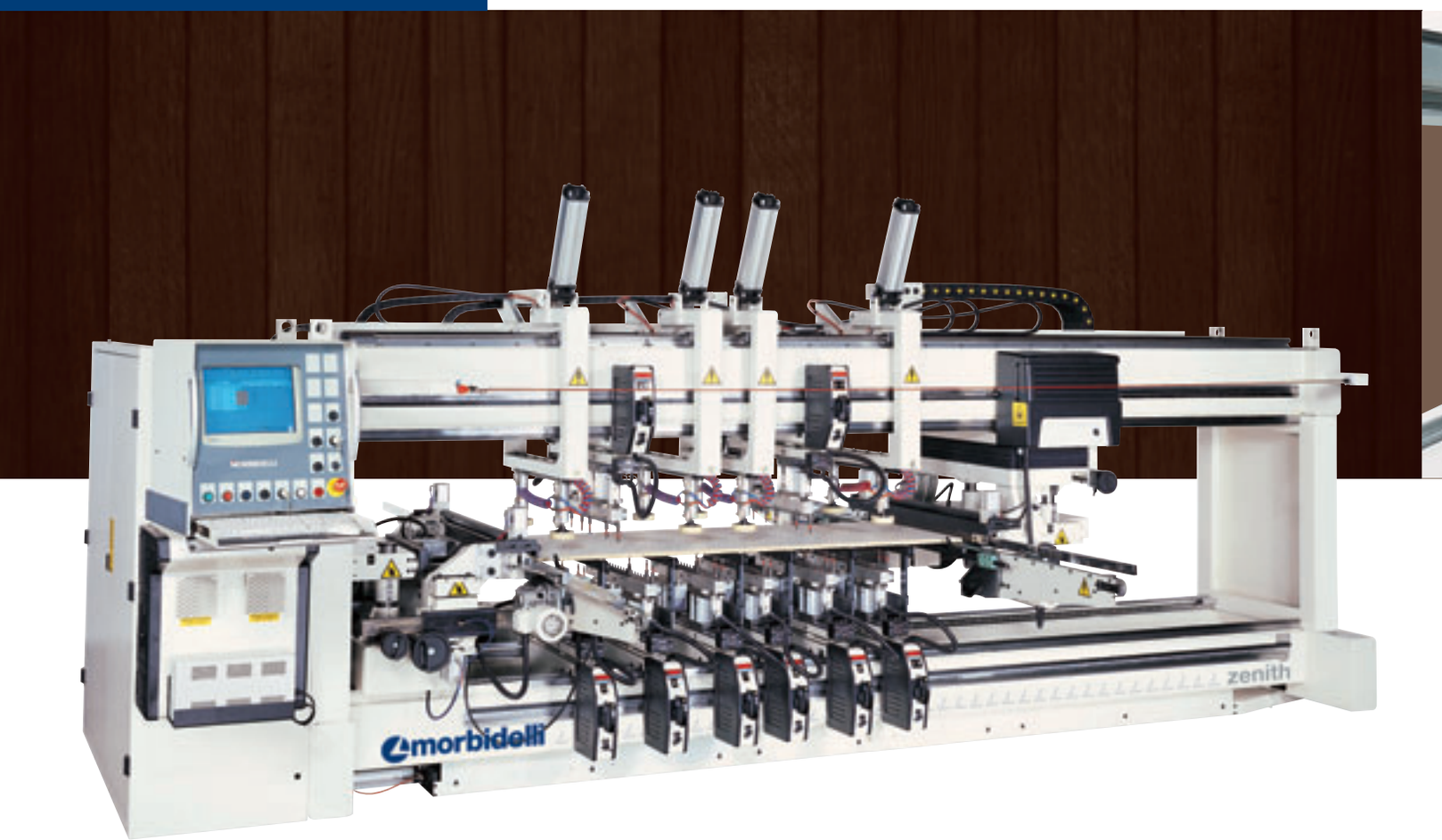
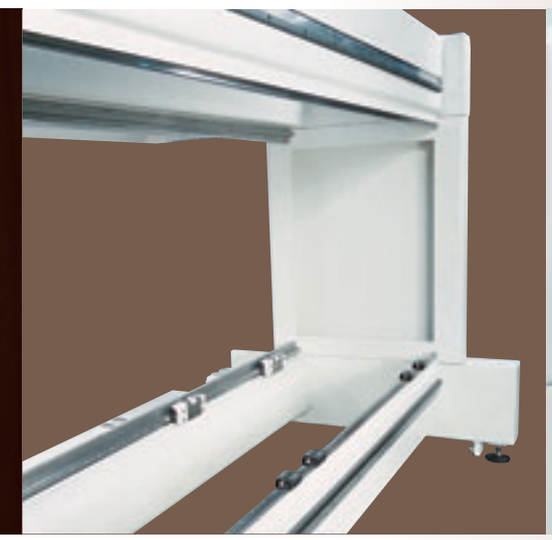
EXCELLENT PERFORMANCE FOR HIGH PRODUCTION CYCLES



Rigidity and reliability



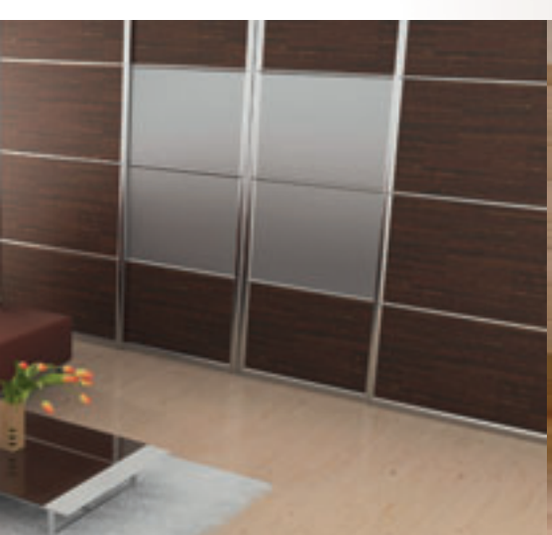
- Closed ring steel frame with double lower and upper beam.

Exceptional precision

- Absolute precise positioning of the drilling units with quota reading system using the digital display

High productivity

- Up to 30 working cycles per minute
- Machine down time reduced thanks to the ease of fixturing due to the ergonomic positioning of the devices.



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EXCEPTIONAL REPEATABILITY AND PRECISION

Over the last few years the choices of furniture manufacturers have also been based on statistical coefficients
that can numerically certify the precision of a machine and facilitate the assembly of the various parts
of a piece of furniture.
Often companies, before making a purchase, ask manufacturers for the drilling performance data.
The drilling repeatability is highlighted by the CM parameter (Machine Capability - the dispersion index of the quotas around the average value calculated on the bases of a set of drilled panels), is widely considered as extremely significant by both manufacturers and clients.
The CM parameter is measured by the maximum admissible tolerance, set by the client, related to the actual dispersion index of the quotas measured on the batch of panels tested.

$$CM = \frac{\text{Maximum admissible tolerance}}{\text{Dispersion index}}$$

A CM value of 1 (with tolerance around +/- 0.2 mm) is already an excellent result for a state of the art drilling machine.

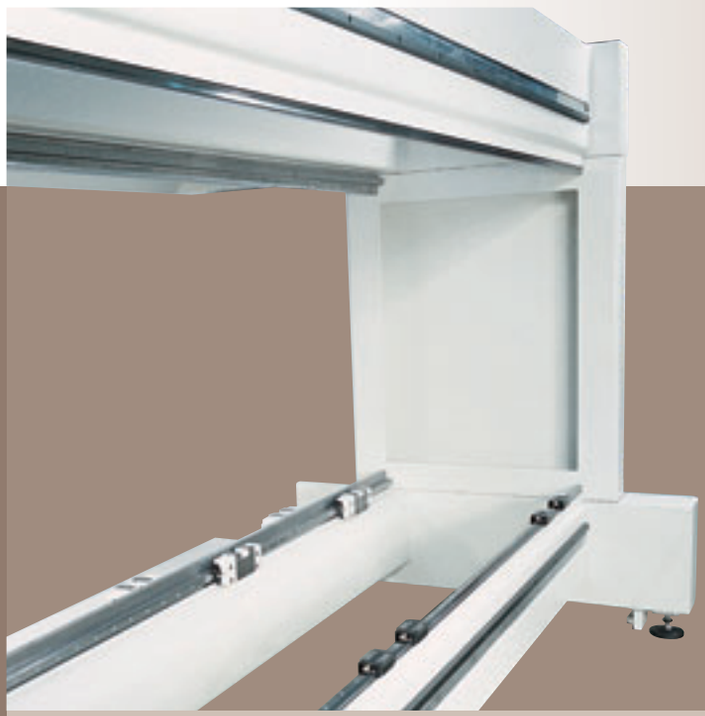
Zenith exceeds this reference threshold.

The operative tests performed on Zenith, shown in the table, have revealed exceptional results.The data refers to the measurement of 12 holes repeated on 30 panels; the final value is the average of the single CM for each hole, with a tolerance set at +/- 0.2 mm.
The table shows different CM values according to the statistical sample examined.

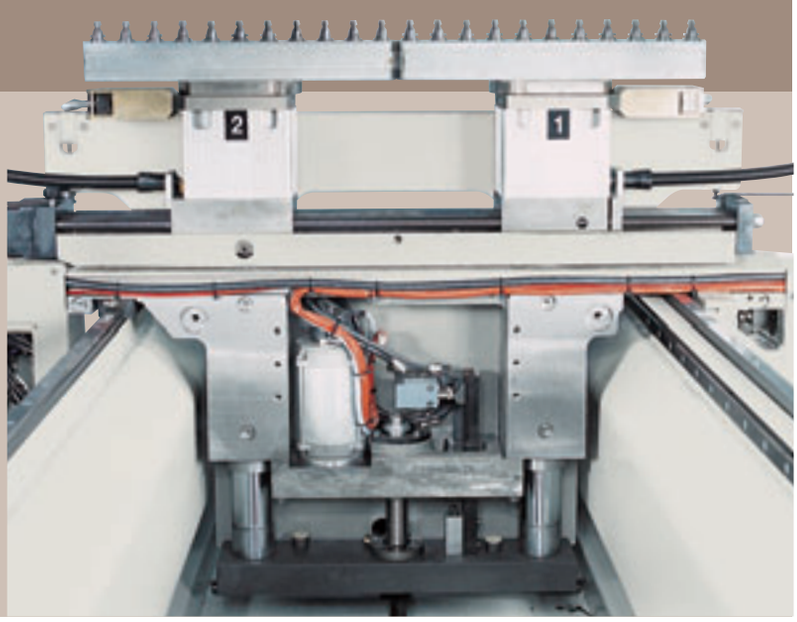
Average values of the Zenith CM index			
Statistical sample examined	**90%**	**80%**	**70%**
CM	**2,2**	**2,9**	**3,5**

The guarantee of a drilling repeatability parameter that is considerably higher than what the market can offer today, makes Zenith the best choice for your company.

RIGIDITY AND STIFFNESS: GUARANTEED PRECISION FOR A LONG TIME



The machine structure consists of a welded and ribbed frame designed to absorb all the stresses created when machining. A double beam, both in the lower and upper part of the machine, is the support and sliding base for the machining heads. The movements along X of the vertical units occur through recirculating ball screws and THK prismatic guides. This ensures high precision and ease of movement along the X axis. The frame has been designed and dimesioned to park the units that are not used in the machining cycle.



The distance of 700mm between the two lower beams ensures maximum stability and rigidity as it maintains the drilling thrust barycentre within the guides, even with the tools positioned at the ends of the heads.
Drilling precision is guaranteed in any situation due to the use of small sized motors, controlled by inverters.
The distance between the guides and the work table is very small thus reducing the deflections that can compromise precision.

The drilling units are fitted with new monolithic structure machining heads. The heads are machined from a single block of extruded aluminium, which has allowed the machining of the bearing seating in a single operation and the assembly of the moving mechanisms without separating the structure. The advantage of this operation is the perfect alignment between the spindles and an absolute perpendicularity between the spindles and the head. This has allowed us to achieve precision levels 5 times greater than with a traditional head structure (by machining the two units separately, and subsequently joining them together).
The maintenance operations are also facilitated by the new structure. Cleaning and greasing operations are much faster due to the removable side profiles.

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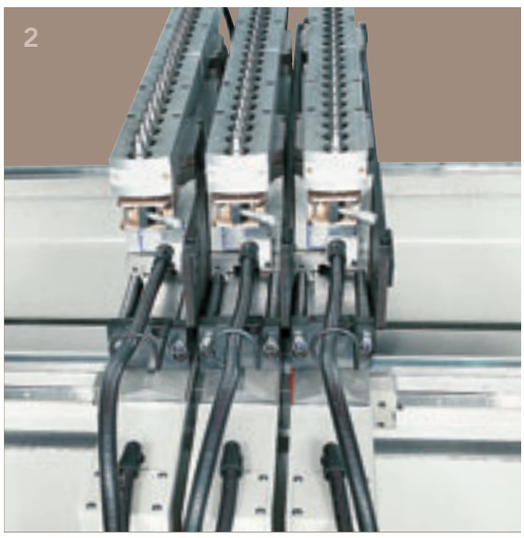
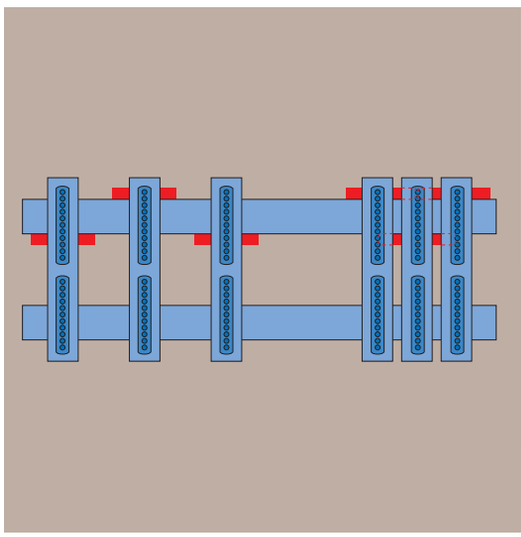
ALIGNMENT SYSTEM

1

2

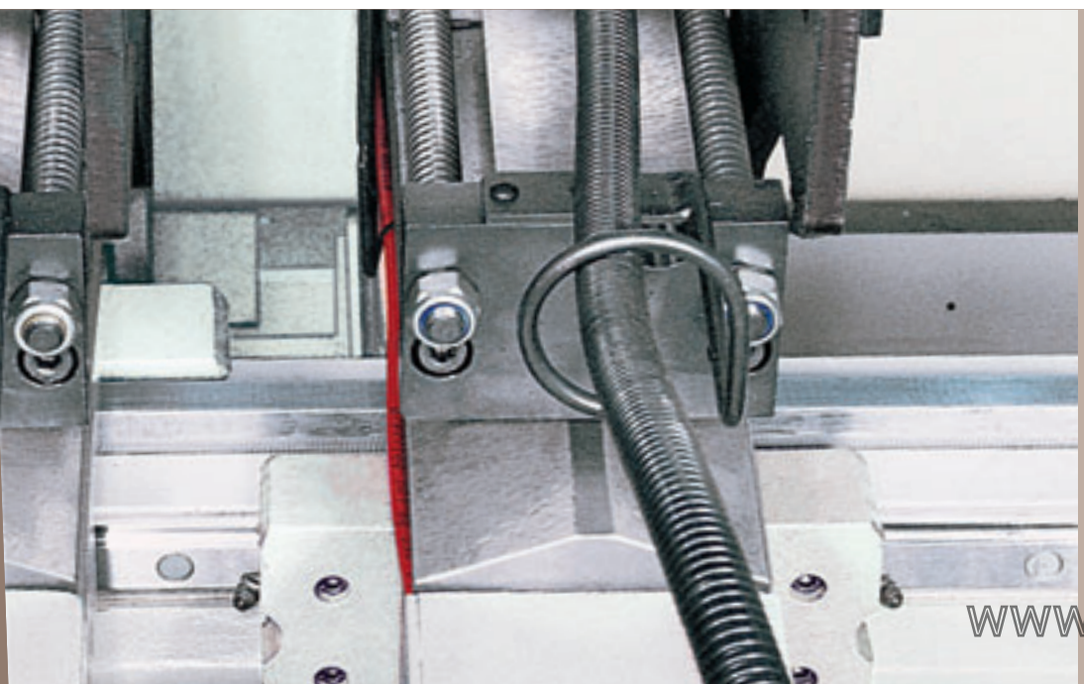


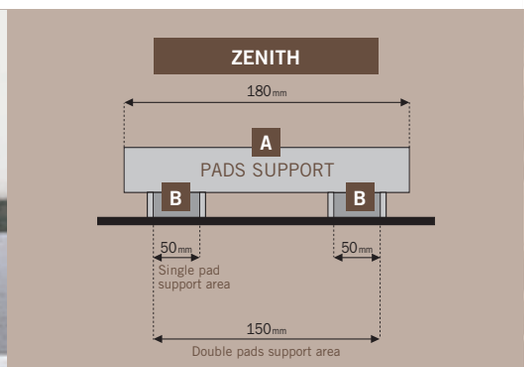


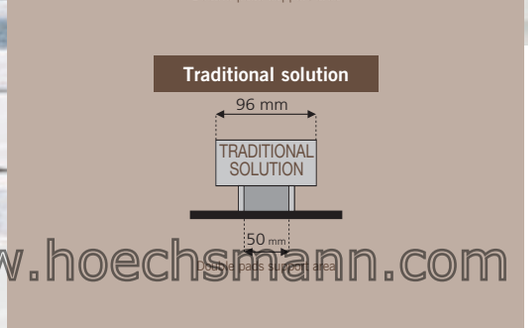
The dimensions and structure of the pads ensure that the groups are perfectly balanced . The supports, in fact, by sliding alternatively on the two THK guides fitted on the sides of the beam, penetrate each other, allowing the units to be brought together by up to 96 mm.

This solution has allowed us to increase the dimensions of the supports to 180 mm, in order to use a double pad.
The advantage of this innovation is a support and sliding zone up to three times larger than a traditional system with a single pad.

This gives Zenith greater orthogonal precision between the X-Z and X-Y planes and absolute stiffness of the machining heads-frame assembly, even in situations with considerable stresses







FAST AND PRECISE MACHINE TOOLING AND SETTING-UP

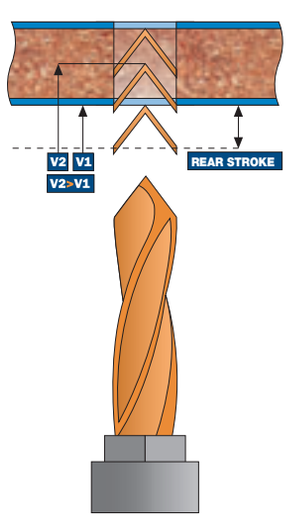
The pressers, thanks to a pneumatic system operated with a pushbutton located in easily accessible positions, raise and position themselves in the upper part of the beam, leaving the machine completely open for the various fixturing operations.

Zenith can be fitted with quick release drilling heads Q.R.H. (Quick Release Head-patent pending Morbidelli-opt.). In this way the heads can be fixtured outside the machine, whilst the machine is still operational and subsequently replaced on the units, with a considerable reduction of the machine down times and increased productivity. The drilling units are fitted with a new device that allows for the 90° rotation of the heads.

The drilling units positioning quotas are shown to the operator on digital displays, thus rendering the setup operations easier and more precise.

ZENITH CDM: LOW COST AND HIGH QUALITY PRODUCTION OF THE FINISHED PRODUCT

Switching from one program to the next, the control unit sends to all the displays the differential quotas between the old and the new program: the operator must simply move each unit in the direction indicated on the display until the value is zeroed.



Higher quality drilling in faster times. The machining heads are fitted with coaxial motors at the spindles and an inverter that manages the power generated by the motors to achieve a uniform rotation speed in any situation.
The movement of the units along Z is managed by the control unit, which is also used to change the spindles entry speed into the panels, compared to the transversal and exit speed. It can also manage the rear stroke to position the heads closer to the minimum distance from the panel.

DEDICATED SOFTWARE GUARANTEES PRECISE PROGRAMMING

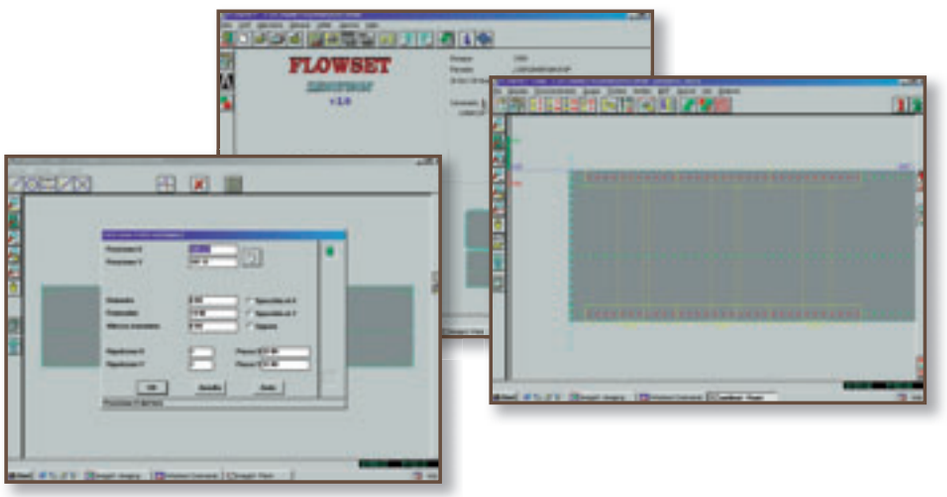
Software specifications

- Wizard guides the operator through every programming phase, easy to use even for non-specialist operators
- Electronic management of the drilling depth
- Optimised management of the advancement speed when drilling through holes
- Rear stroke control
- Electronic management of the fixturing (CDM)
- Automatic calibration cycle at power on
- Automatic management of the motors power on and off (only the operational motors are switched on)
- Counting of the produced workpieces

Hardware specifications

- Intel processor (2.0 GHz or greater)
- 15" colour monitor
- Keyboard and mouse
- 40 Gb hard disk (or greater)
- 3·1/2 floppy disk drive unit (1.44 Mb)
- CD ROM unit (48x)
- 128 Mb RAM memory (or greater)
- 2 serial ports, parallel port, 1 USB port (to connect any type of peripheral device: barcode reader, modem, printer, scanner, etc...)
- Network interface card (opt.), sound card

The presence of a specific Personal Computer, with a powerful hardware configuration,
which can be expanded and defined for the specific requirements of the single users lends the Numeric Control unparalleled familiarity and ease of use; the advanced software operates in the Windows environment and it ensures that all the programming operations are simple, effective and accessible.
This solution guarantees unlimited configurations, by using all the potentials of a PC: floppy disk and CD Rom units, sound card, barcode readers, serial or parallel line connection of printers, modems, scanners or any type of peripheral device.
The PC also guarantees, in a machining line, a perfect dialogue with the other components of the line, such as loading and unloading systems, edge banders, etc.



FLOW-SET uses the CAD drawing to draw the drilling diagram and to automatically configure the position of the units and the heads. The program can also check the feasibility of the drilling diagram, warning of any incompatibility with the machine configuration. In the P.C. version of Zenith, the positions are transferred to the machine via a serial port or with a disc.

TECHNICAL SPECIFICATIONS

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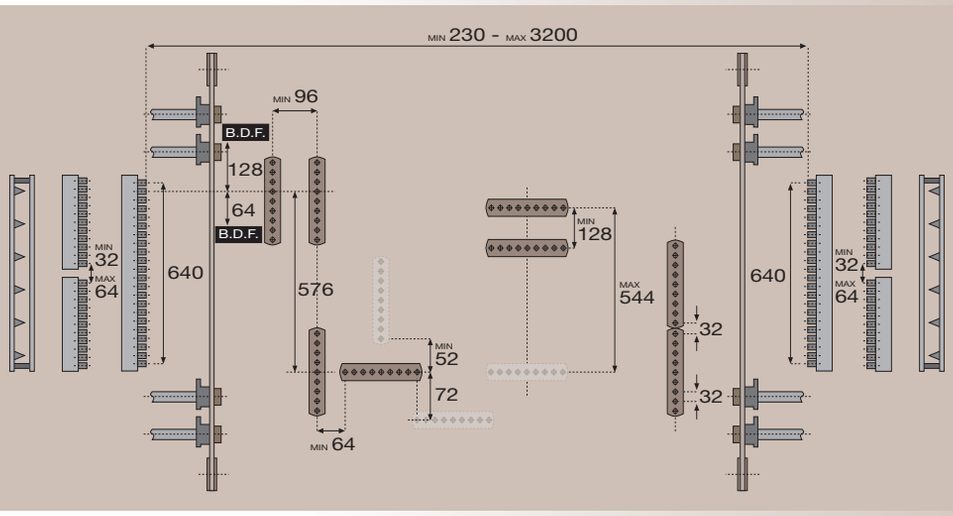
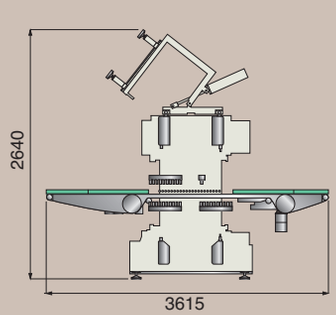
WORK AREA

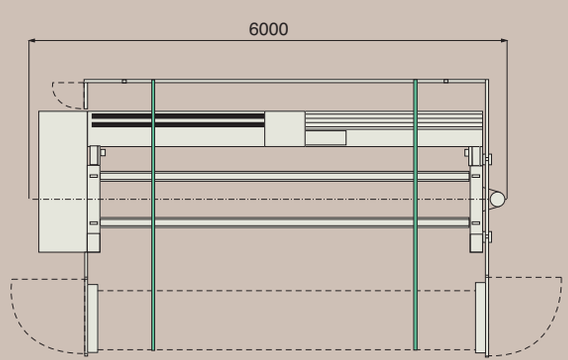


Panel length (mm)	230/3200
Panel width (mm)	50/800
Panel thickness (mm)	10/70
Z axis stroke (mm)	70
Work table height (mm)	900/950(A)
Vertical units motors power (Kw)	1,3
Minimum alignment between vertical heads(mm)	96
Minimum distance between parallel heads (mm)	121
Maximum distance between parallel heads (mm)	544
End stops excursion (mm)	+64/-128
No of vertical units (max)	8+4
Spindles rotation speed (rpm)	4500

Panels conveyor motors power (Hp)	0,35
Panels conveyor speed at 50 Hz (m/min)	50
Maximum excursion of the conveyor from the side stop (mm)	275
Operating pressure (bar)	6-7
Shavings extractions air speed (m/sec)	30
Z axis motor power (Hp)	0,85
Maximum drilling speed (m/min)	6
Z axis rear stroke adjustment (mm)	40
Drilling thrust (N)	4780
Maximum production capacity (panels/min)	30
Weight (kg)	6000

OVERALL DIMENSIONS





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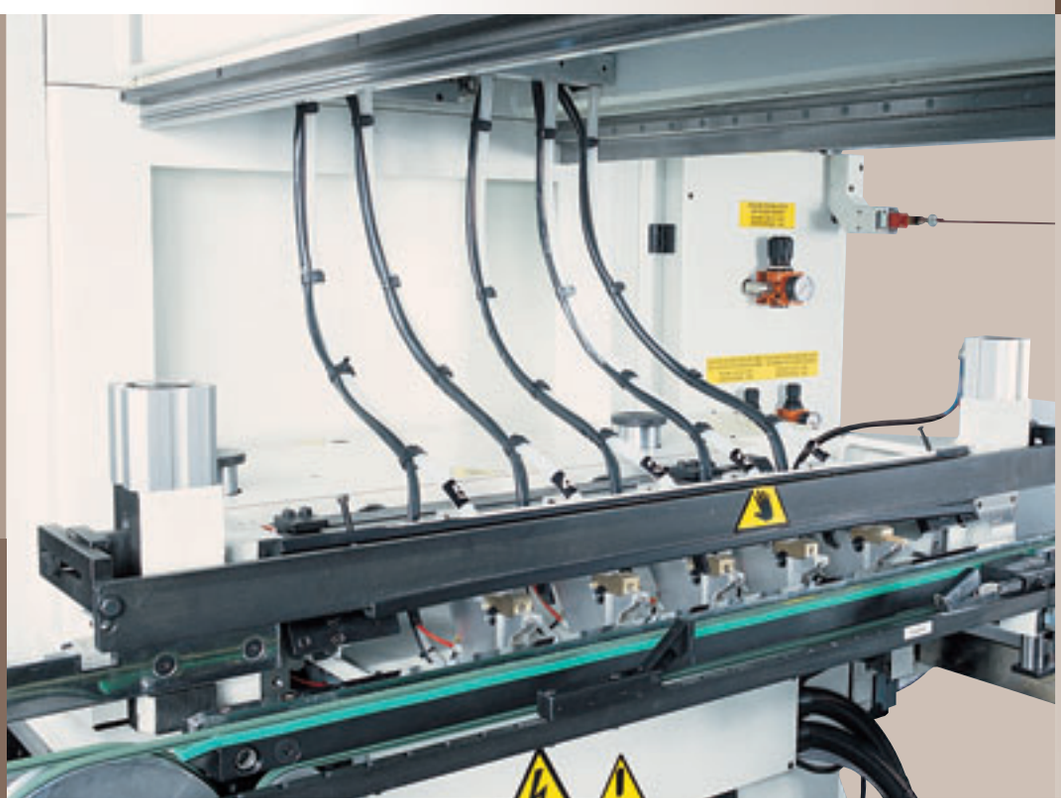
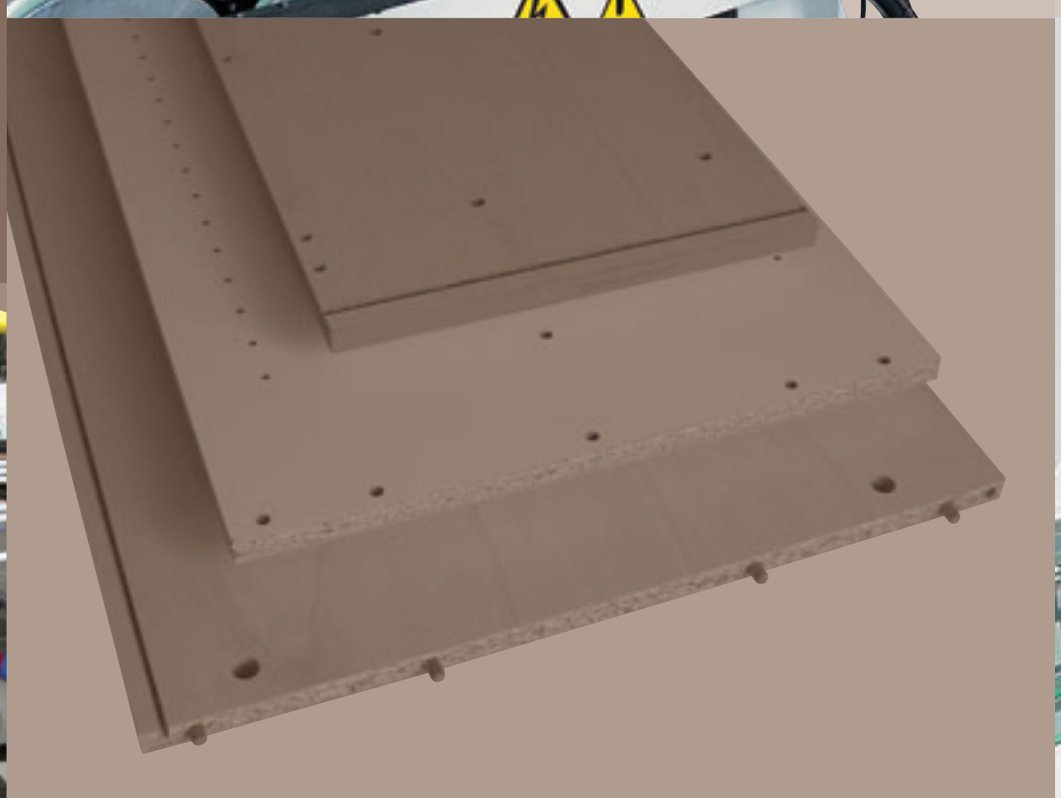
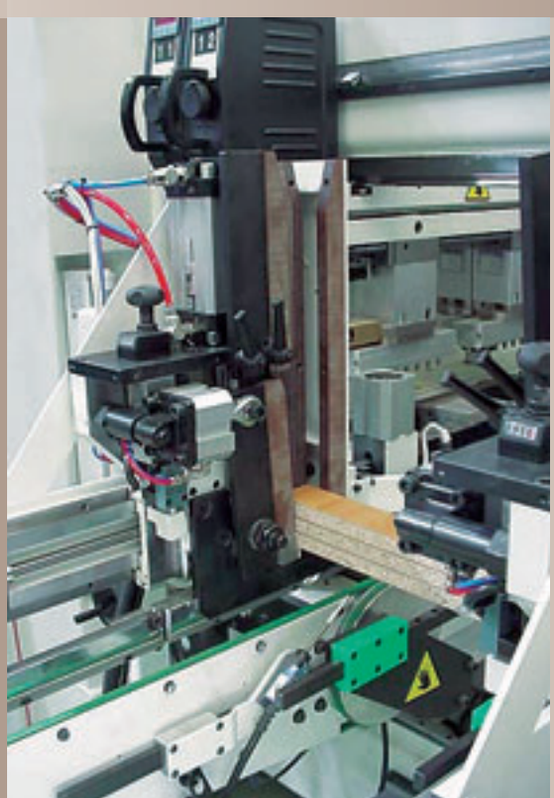


In the dowel gluing version, the machine is fitted with horizontal dowel inserters. They are constantly supplied, through a special circuit, from two containers with vibrators to ensure that the dowels do not jam.
The glue is sprayed from high pressure injectors that ensure maximum distribution; in the subsequent phase, the dowels, available in diameters from 6 to 12 mm, are pushed in to the hole.

A system for the perfect loading and unloading of small-sized workpieces is available to machine beads.





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