

NirvanaTM

**Variable Speed Drive, Contact-Cooled
Rotary Screw Compressors**

NIRVANATM

IR
Ingersoll Rand

EXCEPTIONAL

EXCEPTIONAL RELIABILITY

INTRODUCING NIRVANA™. A TRUE VARIABLE SPEED DRIVE COMPRESSOR NOW AVAILABLE IN SINGLE AND TWO-STAGE

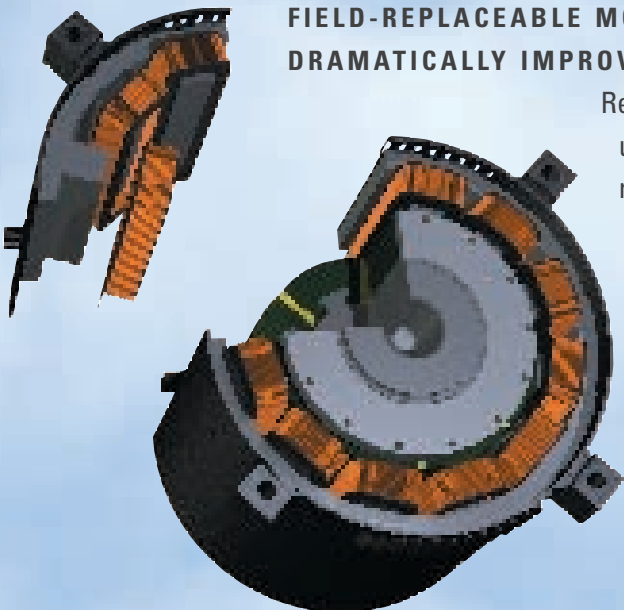
By matching a standard variable speed inverter with a HYBRID PERMANENT MAGNET® motor, IR is first-to-market with a true variable speed drive compressor. In both single and two-stage, the Nirvana compressor has fewer rotating parts than any other air compressor in its class. In addition the Hybrid Permanent Magnet motor driving the Nirvana compressor raises the standard on compressor reliability to an unequalled level.

There are no motor bearings in the HPM® motor. Since the HPM motor directly drives the compressor, there are no gears, pulleys, belts, couplings or motor shaft seals to wear out, leak or need replacing. Furthermore, any possibility of misalignment is eliminated. Coupled with IR's time-proven, reliable airend, Nirvana is as low-maintenance as an air compressor can get.



**NIRVANA'S INTEGRAL,
SINGLE-POINT
CONNECTION BETWEEN
AIREND AND SEPARATOR
IS VIRTUALLY LEAK-FREE.**

FIELD-REPLACEABLE MOTOR STATOR PROVIDES DRAMATICALLY IMPROVED UPTIME



Repairing the conventional air compressor motor usually means days or weeks of downtime and rental expense. Often the motor is sent to a motor repair centre, or back to the manufacturer, for costly rewinding, new bearings or other lengthy repair work.

**THE REVOLUTIONARY HYBRID
PERMANENT MAGNET MOTOR
HAS NO BEARINGS AND
VIRTUALLY NO WEARING PARTS**



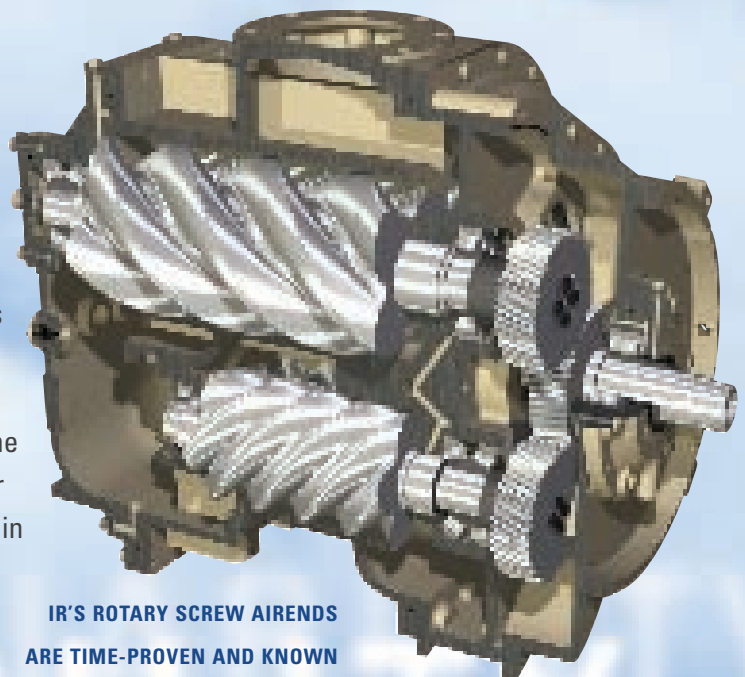
Nirvana's high-efficiency HPM motor has virtually no wearing parts. Electromagnetic coils on the stator produce a powerful magnetic force between the stator and an array of permanent magnets on the rotor, which causes rotation at variable speeds. Should the motor be subjected to a catastrophic electrical surge or other electro-thermal event that damages one or more of the motor coils, the stator is quickly and easily replaced in the field by authorized technicians at a fraction of the cost to rewind a conventional motor.

INTEGRAL DESIGN, FEWER PARTS AND FEWER CONNECTIONS HELP ELIMINATE TROUBLE SPOTS, LEAKS AND FAILURES

Nirvana's leak-free design uses a single-point connection between airend and separator, practically eliminating troublesome compressor piping and leak-prone connections that cause downtime and drive up operating and repair costs.

TIME-PROVEN QUALITY AIREND AND INVERTER

Not everything in the Nirvana compressor is brand new. At the core of all Nirvana compressors are IR's rugged, reliable single and two-stage airends. Used in hundreds of thousands of compressors worldwide, IR's advanced airend design is known everywhere for trouble-free operation and minimal maintenance. In addition the Variable Frequency Drive uses a standard inverter well recognized for providing dependable service in manufacturing operations all over the world.



IR'S ROTARY SCREW AIRENDS ARE TIME-PROVEN AND KNOWN AROUND THE WORLD FOR THEIR MATCHLESS RELIABILITY.

RELIABILITY

ENERGY EFFICIENCY

ENERGY EFFICIENCY

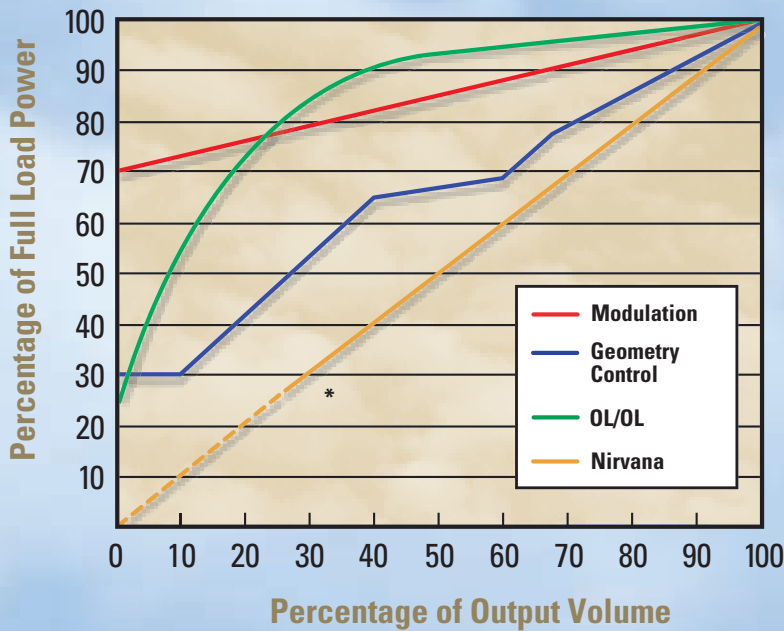
NIRVANA. MAXIMUM EFFICIENCY AT VIRTUALLY ANY LOAD

At full load, the Nirvana compressors will produce the most air using the least energy. Even more important, IR will guarantee these efficiencies down to loads as low as 25%.

A conventional, fixed-speed air compressor is controlled by an inlet control valve that modulates between open and closed positions. However, using the inlet valve to meet system air demand results in extreme pressure fluctuations and wasted energy, greatly reducing efficiency whenever the compressor operates outside its optimum performance range.

Using a frequency inverter and the Hybrid Permanent Magnet® motor, Nirvana compressors deliver the only true Variable Speed Drive. With a true VSD, air is delivered at a constant pressure, regardless of demand, at maximum efficiency. Remarkably, Nirvana compressors achieve constant pressure and maximum efficiency across their entire operating range, from 100% loaded down to as little as 25% loaded.

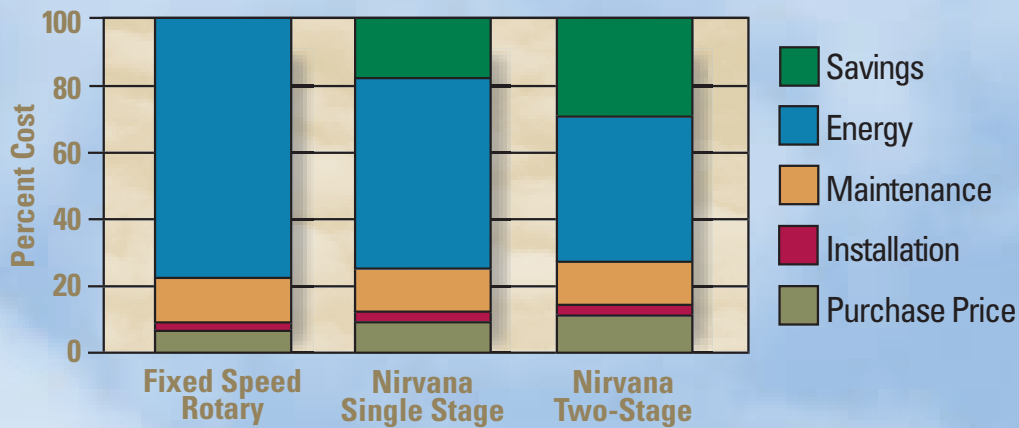
Comparison of Rotary Capacity Controls



NIRVANA COMPRESSORS DELIVER CONSTANT PRESSURE AND MAXIMUM EFFICIENCY AT ANY CAPACITY.

* The Nirvana motor turns off at 25% capacity and automatically turns on when air pressure decays.

Rotary 10 Year Life Cycle Cost



Rotary comparison at 70% average volume capacity; 4,000 hours per year; 0.05/kWh

TRADITIONAL PURCHASE DECISION FACTORS REPRESENT ONLY 20% OF THE COST TO OWN AND OPERATE A ROTARY SCREW COMPRESSOR WHILE ENERGY REPRESENTS 80% OF THE LIFE CYCLE COST. ONLY NIRVANA WILL SAVE AT LEAST 28% OF THE ENERGY COST OVER ITS LIFE.

NIRVANA WILL REDUCE THE TOTAL LIFE CYCLE COST TO OWN AND OPERATE AN AIR COMPRESSOR

IR's exclusive VSD makes possible a range of operating characteristics that produce this unequaled energy efficiency. In a conventional air compressor, starting up the motor creates an enormous energy draw, as much as 800% of the full-load normal running current. Nirvana's HPM drive system limits the in-rush current to less than 100%. This significant decrease in starting amp requirements minimizes peak charges, leading to a lower energy bill.

Unlike conventional on-line/off-line air compressors, Nirvana does not blowdown. Instead, Nirvana compressors simply reduce speed, and volume, to meet demand. Rather than run unloaded, a Nirvana compressor simply shuts off. Since Nirvana compressors allow unlimited starts per hour with no decrease in motor life, energy savings are tremendous.

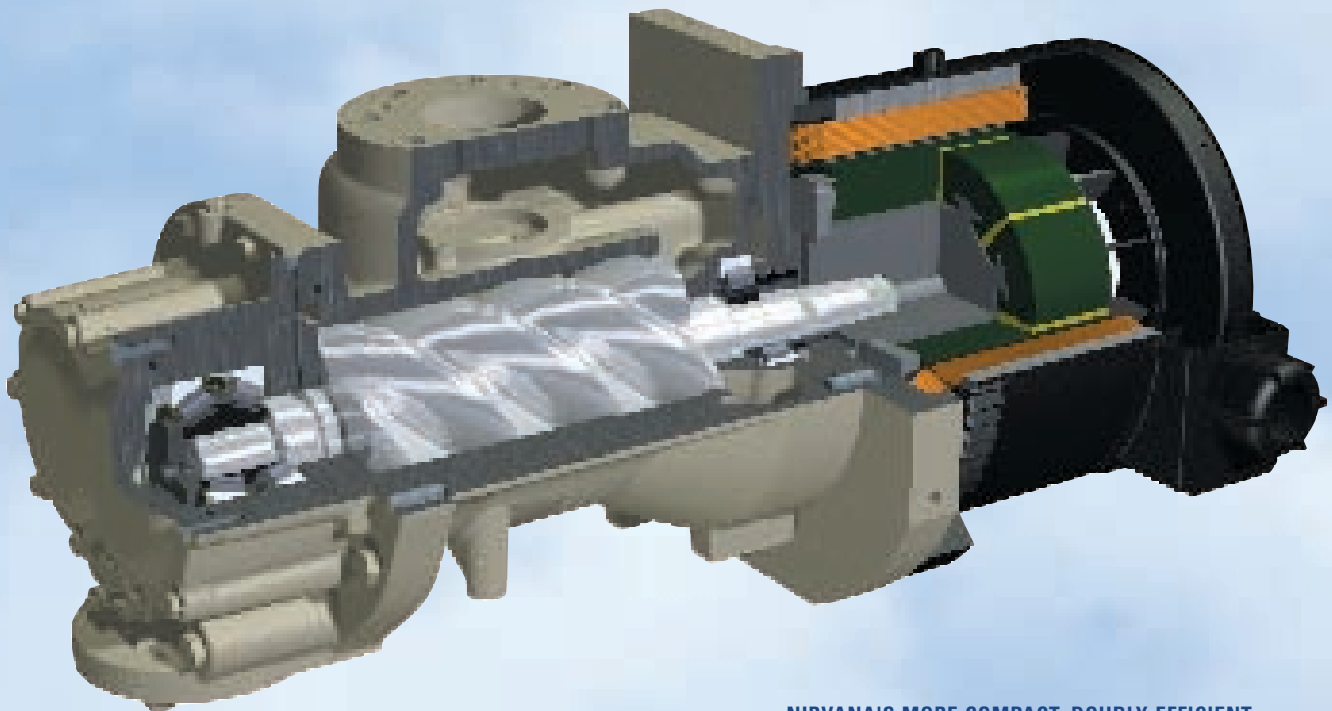
EFFICIENCY

TRANSCENDENT TECHNOLOGY

NIRVANA. MORE AIR. WIDER RANGE. MORE EFFICIENT.

Competitors attempt to achieve variable speeds using an inverter rigged to a conventional induction motor compressor drive train. But they end up using the same power to produce 10-15% less air. Whether in single or two-stage configuration, the double-efficient Nirvana compressors produce more air, across a wider operating range, with no increase in power consumption.

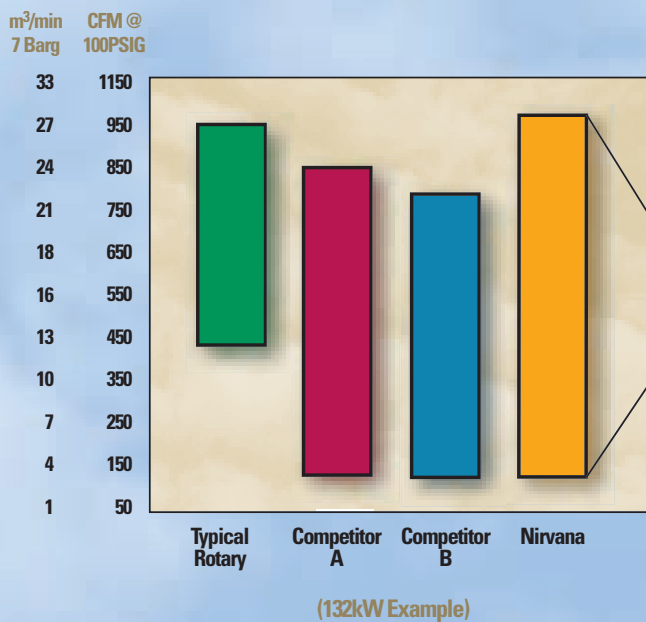
In addition, Nirvana at startup runs at 95% efficiency vs. the competitions' 90%, and maintains its 95% efficiency through its entire speed range.



**NIRVANA'S MORE COMPACT, DOUBLY-EFFICIENT
SINGLE AND TWO-STAGE AIREND AND HPM MOTOR
ASSEMBLY EACH DELIVER BOTH INCREASED
CAPACITY AND GREATER EFFICIENCY.**

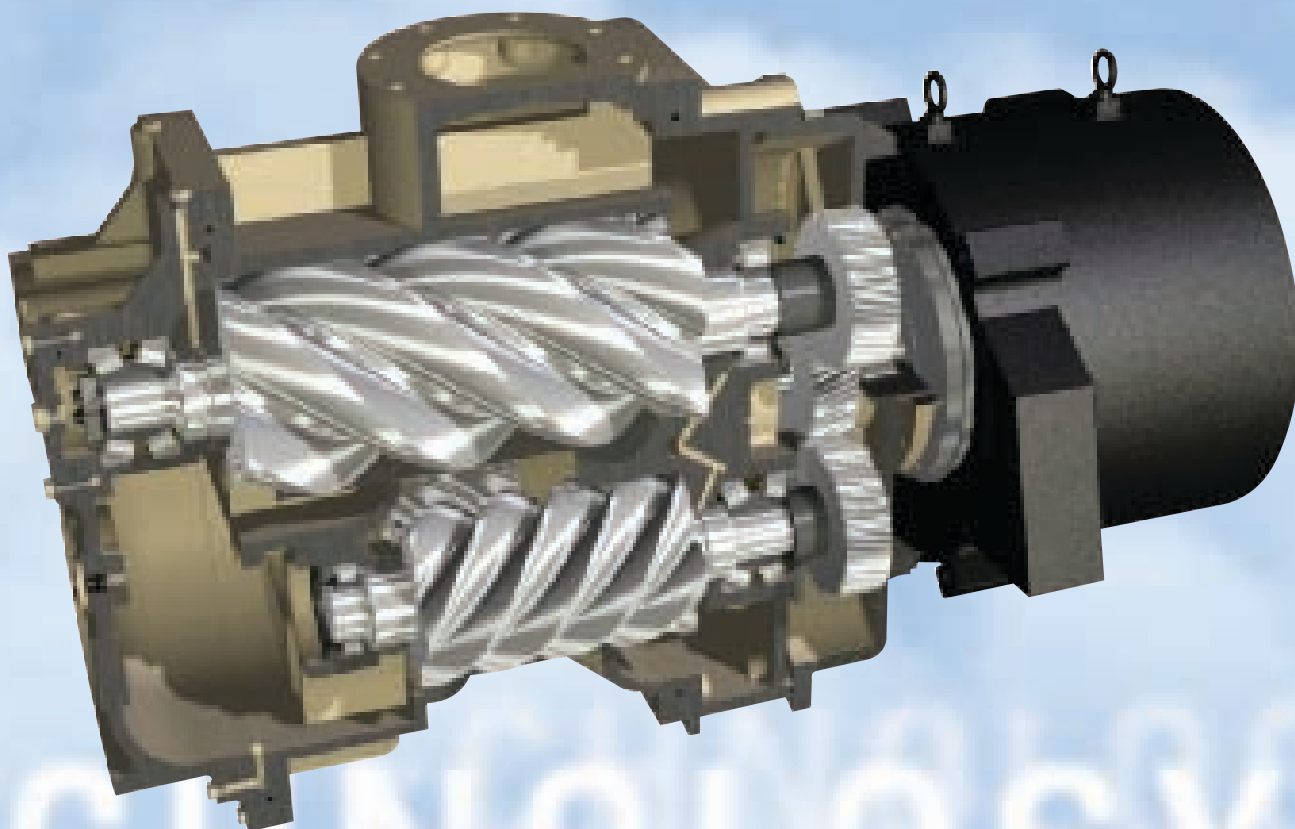
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The Nirvana Product Line Advantage



**Nirvana:
Most Air
Most Range
Best Efficiency**

**THE NIRVANA ADVANTAGE.
COMPARED TO BOTH STANDARD
ROTARY SCREW COMPRESSORS
AND OTHER VFD UNITS,
NIRVANA PRODUCES MORE AIR
ACROSS A WIDER OPERATING
RANGE, AND ALWAYS AT
MAXIMUM EFFICIENCY.**

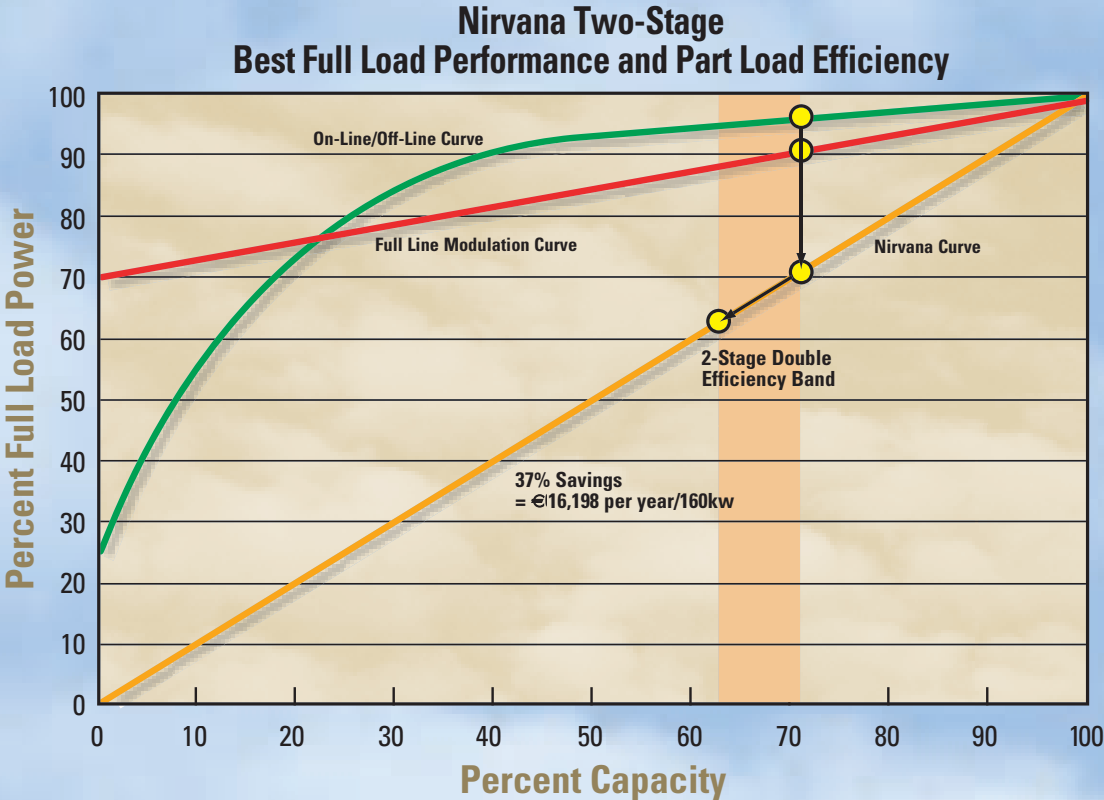


TECHNOLOGY

TWO-STAGE NIRVANA



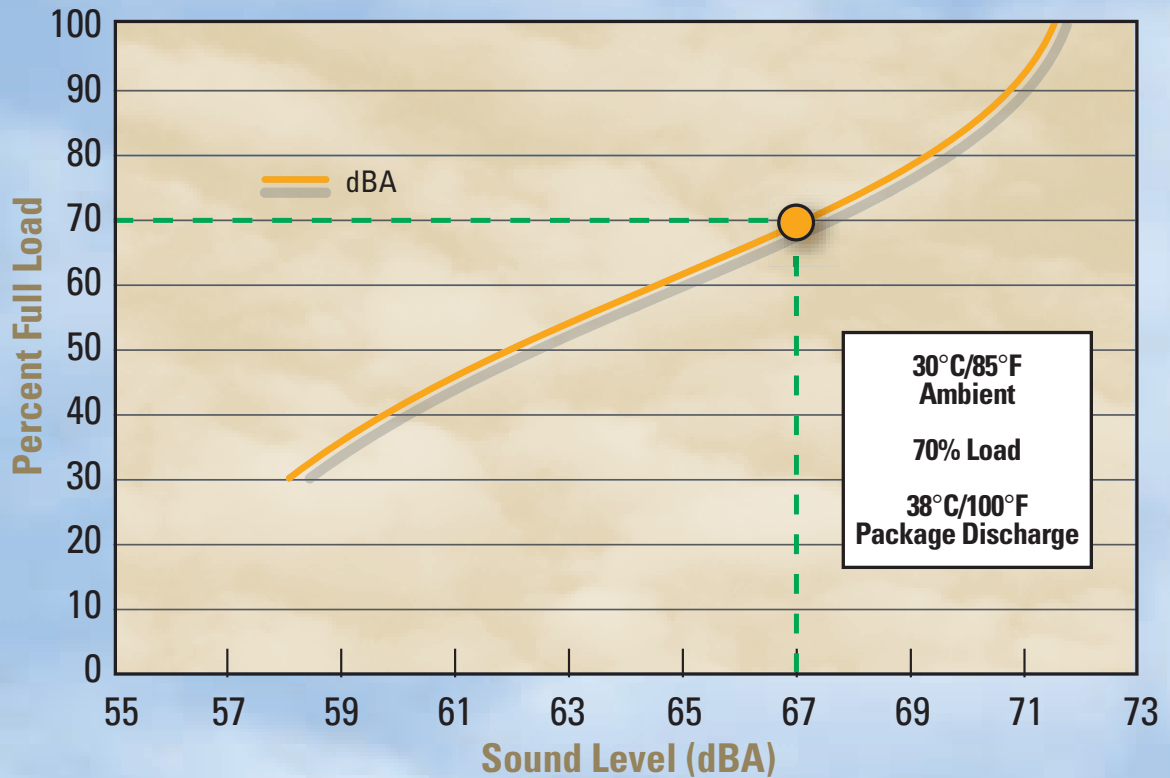
Nirvana Two-Stage Beats the Performance of Any Other VFD Compressor at Full or Part Load



*calculated at 6,000 hours/year operation and €0.04/kWh

- The typical compressor operates at an average of 70% load.
- The Nirvana VSD decreases the overall energy cost 22%- 30%, compared to a fixed speed rotary air compressor.
- The Nirvana two-stage produces approximately 11-15% more air than a single-stage air compressor.
- Maximum energy savings is achieved by the Nirvana two-stage yielding 33%-41% savings.

The Nirvana Coolant Conditioner™



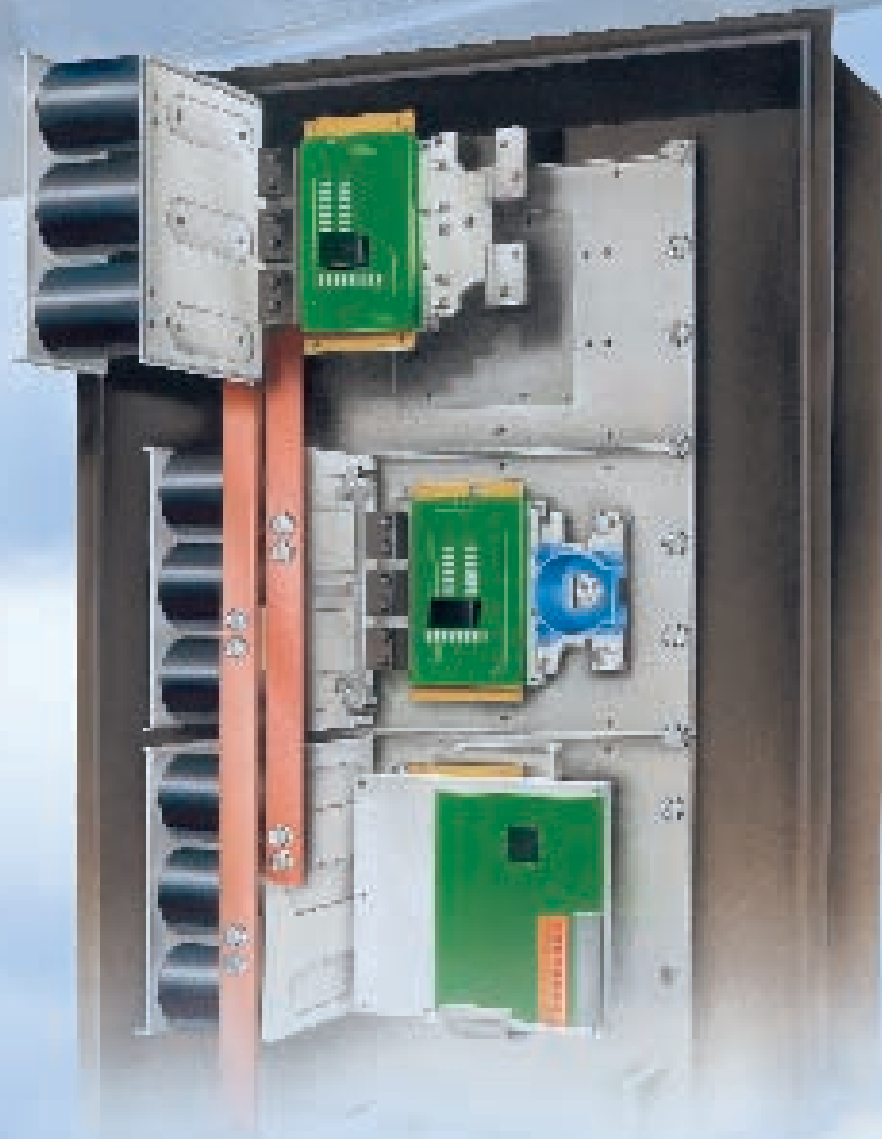
Nirvana's Coolant Conditioner™ (patent applied for) allows the compressor to run at constant package discharge temperature.

- Sound levels as low as 59 dB(A) and 67 dB(A) at typical conditions.
- The Nirvana Coolant Conditioner™ matches the performance of the cooling system to the performance of the compressor, maximizes bearing life, lowers energy cost and keeps compressor noise levels to a whisper.
- The VFD on the coolant circuit eliminates any chance of moisture gathering in the coolant system. Competitive variable frequency drive compressors will have a build-up of moisture in the coolant at partial loads, shortening bearing life.
- Nirvana's Coolant Conditioner™ manages to the optimum compressor coolant temperature, depending on the system load and ambient conditions.

MODULAR DRIVE

An all-new, compressor-specific modular drive, designed for Nirvana with the latest technology, but using all standard components for easy repair and diagnosis.

- Forced air ventilation over the modular drive heat sinks allows the drive to run cooler and the heat sinks to last longer.
- On-board drive diagnostics are displayed on the Intellisys™ controller.
- Field-replaceable standard modular components eliminate costly VFD replacement.
- The patented modular drive can be diagnosed and serviced on site by qualified IR service personnel, eliminating valuable downtime.
- 60% smaller than standard frequency inverters.



FEATURES

TWO-YEAR PACKAGE WARRANTY

Nirvana features a two-year “bumper-to-bumper” package warranty covering everything except periodic maintenance.

NIRVANA’S INHERENT LEAK-FREE DESIGN

Nirvana’s cast iron separator tank joins the airend using an integral, single-point connection. IR has eliminated all external discharge piping and the check valve, making the Nirvana compressor virtually leak free.

SWING-OUT COOLERS DELIVER COOL COMPRESSED AIR

The coolers, which swing out for easy inspection and cleaning (37-75kW), are located at the inlet end of the compressor package and consistently deliver compressed air at just 8°C/15°F above the ambient temperature.

46°C/115°F AMBIENT RATED

IR Nirvana compressors are designed to operate in high ambient conditions, making them ideal for locations anywhere in the world. Even if the compressor is not operated in sweltering climates, Nirvana’s high temperature rating ensures fewer nuisance shutdowns caused by fouled coolers.



FREQUENCY INVERTER DRIVE

This advanced, modular drive system gives the Nirvana compressor a controlled, soft start, eliminating current surges and extending component life for increased system reliability.

8000-HOUR/TWO-YEAR LUBRICANT

IR UltraCoolant reduces maintenance costs by significantly extending coolant changeout intervals. Also, UltraCoolant’s superior separating properties mean less coolant is passed downstream to the air system, resulting in cleaner air and minimal coolant costs.

EASY SERVICEABILITY

There are far fewer components requiring service in Nirvana than in any other compressor. Thus, the Nirvana compressor package is remarkably uncluttered, with everything readily accessible behind easily removable panels.

FACTORY-TESTED

Every Nirvana compressor undergoes rigorous computerized factory validation tests to ensure that Nirvana delivers its promised performance under a wide range of conditions.

INTELLISYS MICROPROCESSOR CONTROLLER PROVIDES TOTAL CONTROL OF YOUR NIRVANA COMPRESSOR

Whether your application requires eight hours of continuous-duty compressed air or an intermittent supply over a 24-hour period, the Intellisys[®] microprocessor puts you in complete control.

AT YOUR FINGERTIPS

With finger-touch control, the Intellisys controller provides quick, comprehensive access to your compressed air system. Nothing could be more intuitive and user-friendly than the Intellisys controller.

With Intellisys, you are always in command. You can quickly and easily adjust the operating parameters of the Nirvana compressor to meet your plant air system's requirements and minimize operating costs.

TIMESAVING DIAGNOSTICS

Intellisys provides fast diagnosis of system demand, displays a warning and/or stops the compressor if it exceeds operating parameters, and provides a history of events leading up to the condition. This will keep troubleshooting expenses and downtime to a minimum. An easy-to-read, liquid crystal display provides you with the critical details of your Nirvana compressor's operation, allowing you to make fast adjustments when necessary.



INGERSOLL-RAND. MORE THAN AIR. SOLUTIONS.

Ingersoll-Rand became the world leader in compressed air technology not by building more air compressors, but by providing more problem-solving system solutions for its customers. No one offers more solutions than IR: rotary screw or centrifugal, versatile controls, air system audits, turnkey installation, "air over the fence," financing, rentals and full service. Ingersoll-Rand customers know that IR is with them for the life of their compressed air installation.

INGERSOLL-RAND'S YEARS OF APPLICATION EXPERIENCE WILL HELP YOU ARRIVE AT YOUR COMPRESSED AIR SOLUTION.

Ingersoll-Rand has tackled virtually every conceivable compressed air system application in the world, and yet every day there is a new customer need to be addressed. You can be certain, whatever the size or nature of your application, IR will have the experience, the right product and the right system solution for you.

THE INGERSOLL-RAND TEAM. WITH YOU FOR THE LONG HAUL.

Ingersoll-Rand's team of professionals, from product design and development to sales consulting, application engineering, installation, startup and aftersale service, knows how to keep your compressed air system operating costs down while maintaining peak performance for the life of your system. IR's 24/7 parts and service network is ready to serve you 365 days a year with whatever it takes to keep your system up and running.



AIRCARE. FLEXIBLE MAINTENANCE. CONSTANT QUALITY.

AirCare, an Ingersoll-Rand exclusive, is a responsive and flexible contract maintenance program custom-designed to provide customers with factory-authorized scheduled maintenance for increased system reliability. AirCare helps eliminate unscheduled downtime and relieves customers of the costly investment in monitoring equipment, ongoing training and a thorough knowledge of compressor technology.

WARRANTY EXTENDED TO FIVE YEARS

IR's AirCare program allows you the opportunity to extend the drivetrain or full package warranty out through five years, providing you with total peace of mind.

COMPREHENSIVE COVERAGE FOR ANY COMPRESSOR

AirCare is available for new machines or with overhauls and exchanges. In addition, AirCare can be coupled with service contracts for total coverage of parts and preventive maintenance service.

LOWER COST. INCREASED PRODUCTIVITY.

A compressor installation covered by the AirCare program can expect:

- Reductions in emergency maintenance costs thanks to periodic inspections
- Reductions in energy costs thanks to increased operating efficiency
- Increased productivity thanks to dramatically shortened downtime

THE AIRCARE PROGRAM

No long-term maintenance program is more comprehensive than AirCare. The primary highlights of the program include:

- Certified, professional technicians will perform routine inspections and diagnostic service
- Performance will be enhanced through exclusive use of genuine IR parts and lubricants
- All-inclusive fluid analysis program will comprehensively monitor the lubricant in the compressor to detect problems at the earliest possible opportunity
- Vibration analysis diagnostics pinpoint the need for component replacement through monitoring and trend analysis that predicts the service life of critical components

REMOTE MONITORING

An added option to AirCare is IR's Intelliguard remote monitoring feature. This 24-hour-a-day, seven-days-a-week, surveillance of the air compressor installation helps identify potential problems at an early stage and prevent unexpected repairs.



MORE THAN AIR. RELIABILITY. PRODUCTIVITY. EFFICIENCY.

ONLINE SOLUTIONS: WWW.AIR.IR.CO.COM/NIRVANA



Ingersoll-Rand compressors are not designed, intended or approved for breathing air applications. Ingersoll-Rand does not approve specialized equipment for breathing air applications and assumes no responsibility or liability for compressors used for breathing air service.

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Product improvement is a continuing goal at Ingersoll-Rand. Designs and specifications are subject to change without notice or obligation.



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