

# Nirvana

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**Variable-Speed Drive, Oil-Free  
Rotary Screw Air Compressors**



# EXCEPTIONAL RELIABILITY

## **NIRVANA OIL-FREE.**

### **A TRUE VARIABLE SPEED DRIVE OIL-FREE AIR COMPRESSOR**

Only Ingersoll-Rand offers Nirvana Oil-Free, the world's first true variable speed oil-free compressor for critical oil-free applications requiring the highest quality of air and the greatest reliability. The two-stage Nirvana Oil-Free compressor offers:

- Fewer rotating parts than any other rotary air compressor in its class.
- Hybrid Permanent Magnet (HPM) motor has no bearings, thus raising the standard on compressor reliability to an unequalled level.
- No pulleys, belts or couplings to wear out or need replacing — the HPM motor directly drives the compressor.
- IR's time-proven, reliable two-stage oil-free airoend.

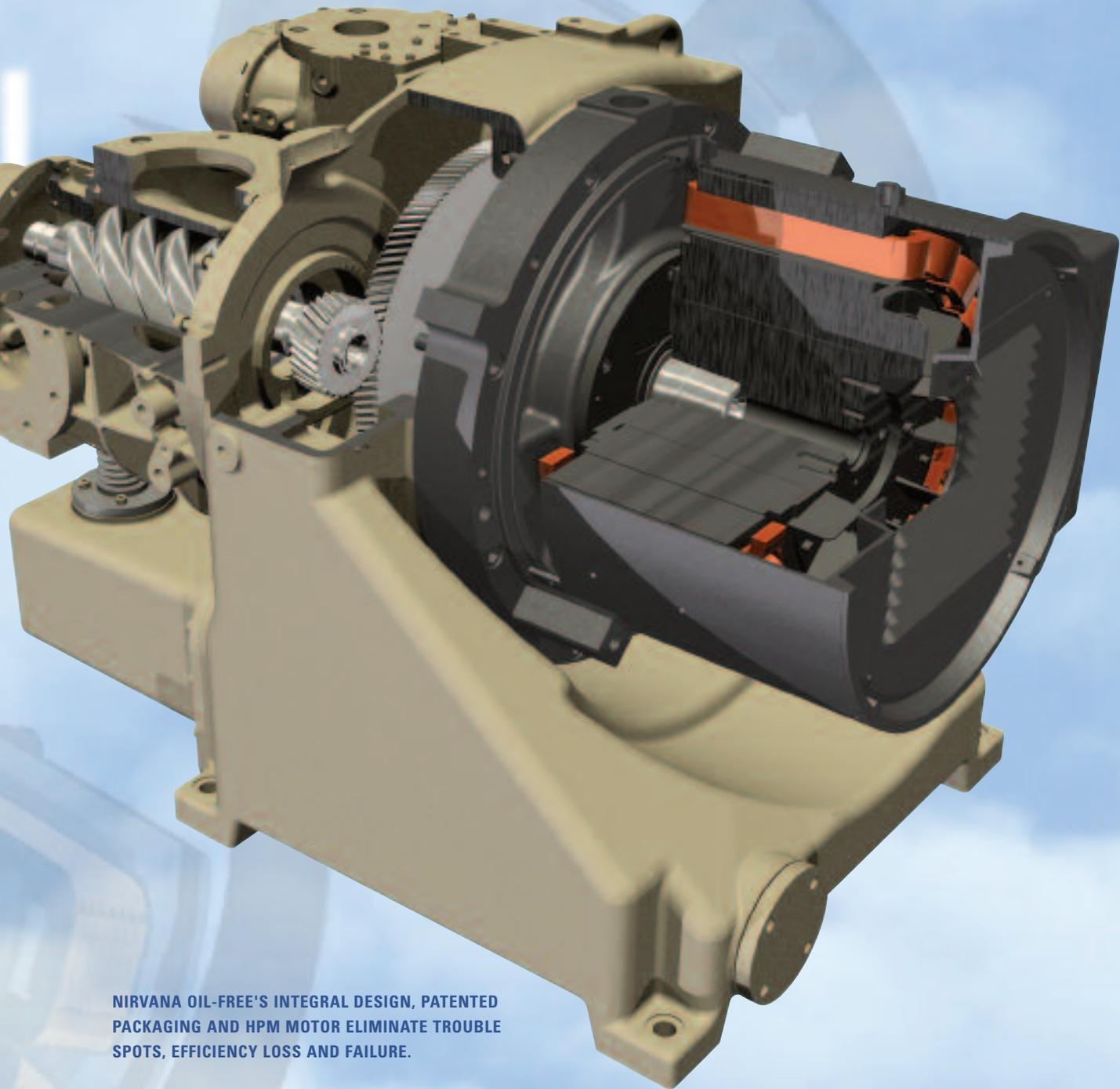
### **FIELD-REPLACEABLE MOTOR STATOR PROVIDES DRAMATICALLY IMPROVED UPTIME**

Nirvana Oil-Free's high-efficiency HPM motor has virtually no wearing parts. 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. The Nirvana stator exchange program provides:

- Quick, convenient turnaround.
- Less expense than a motor rewind.

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





**NIRVANA OIL-FREE'S INTEGRAL DESIGN, PATENTED PACKAGING AND HPM MOTOR ELIMINATE TROUBLE SPOTS, EFFICIENCY LOSS AND FAILURE.**

## **TIME-PROVEN QUALITY AIREND**

Not everything in the Nirvana Oil-Free compressor is brand new. At the core of every Nirvana Oil-Free compressor is IR's rugged, reliable, two-stage oil-free airend. Used in thousands of compressors worldwide, IR's advanced oil-free airend features:

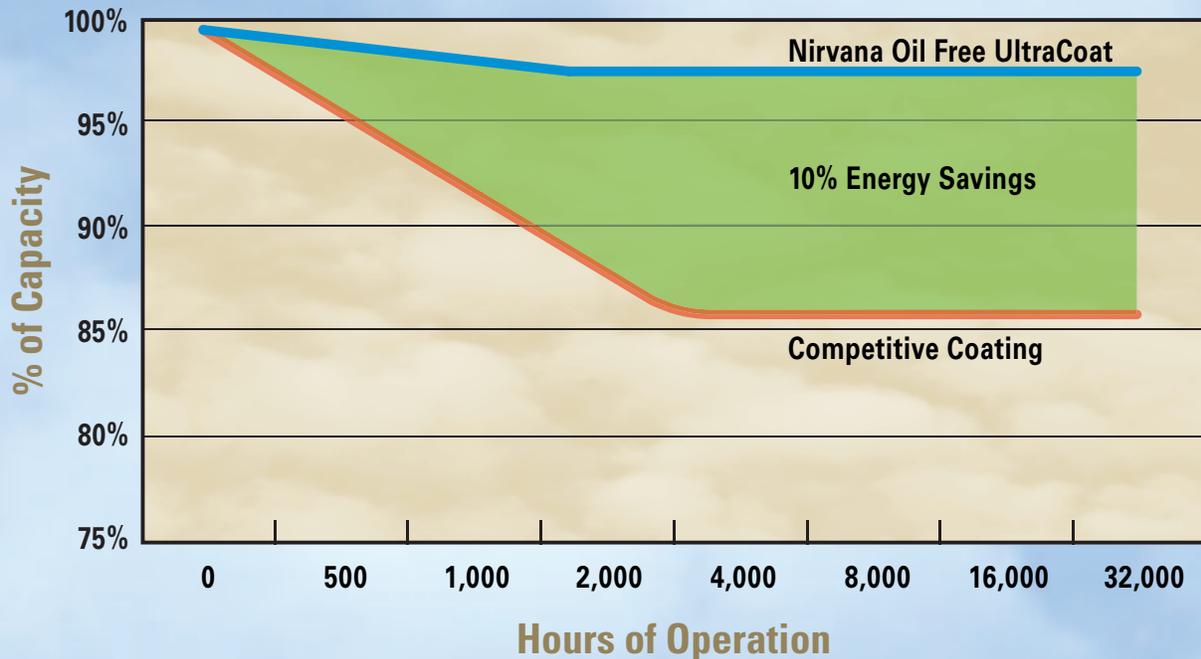
- Unmatched rotor profile accuracy and repeatability. The airend is precision-machined in a twenty-step manufacturing process.
- Rotors coated with UltraCoat — the most durable rotor coating available.

# UNEQUALLED PERFORMANCE

## ULTRACOAT. SOLVING THE NEED FOR BETTER OIL-FREE PERFORMANCE AND ENERGY SAVINGS

The challenge: to give our customers an oil-free rotary compressor that operates at peak performance throughout its lifetime. With the introduction of our fixed speed oil-free compressor, Sierra, we introduced UltraCoat.

- UltraCoat has proven to be unmatched in its performance.
- UltraCoat protects every Sierra airend and now every Nirvana Oil-Free airend.
- UltraCoat rotor and housing coating process uses a mechanical and chemical bond to insure that the microcoating interlocks with the rotor and casting material.
- UltraCoat delivers longer life and 10% energy savings.



WHEN COMPARED WITH OTHER COATINGS, ULTRACOAT IS A CLEAR WINNER. OUR CUSTOMERS GET MAXIMUM CAPACITY AND LOWER ENERGY COSTS OVER A LONGER AIREND LIFE

## 115°F/46°C AMBIENT RATED PACKAGE FOR LONGER RUNNING PERFORMANCE

Nirvana Oil-Free compressor is rated for 115°F/46°C throughout the entire package. This means that the motor, coolant, electrics, controller and cooler design are rated for high ambient conditions. This increases performance by allowing fewer nuisance shutdowns.

### ■ CONTROLLER/ELECTRICS

Controller and electrics are designed to handle the high ambients which can cause controller failures if not properly designed.

### ■ MOTOR

Many compressor manufacturers will simply put a high ambient motor on their package and claim that it's rated for higher temperatures. In the Nirvana Oil-Free, high ambient operation applies not only to the compressor motor, but to the entire package. This means that the motor, coolant, electrics, controller and cooler design are rated for high ambient conditions.

### ■ COOLERS

The Nirvana Oil-Free cooler design prevents nuisance shutdowns caused by fouled coolers.



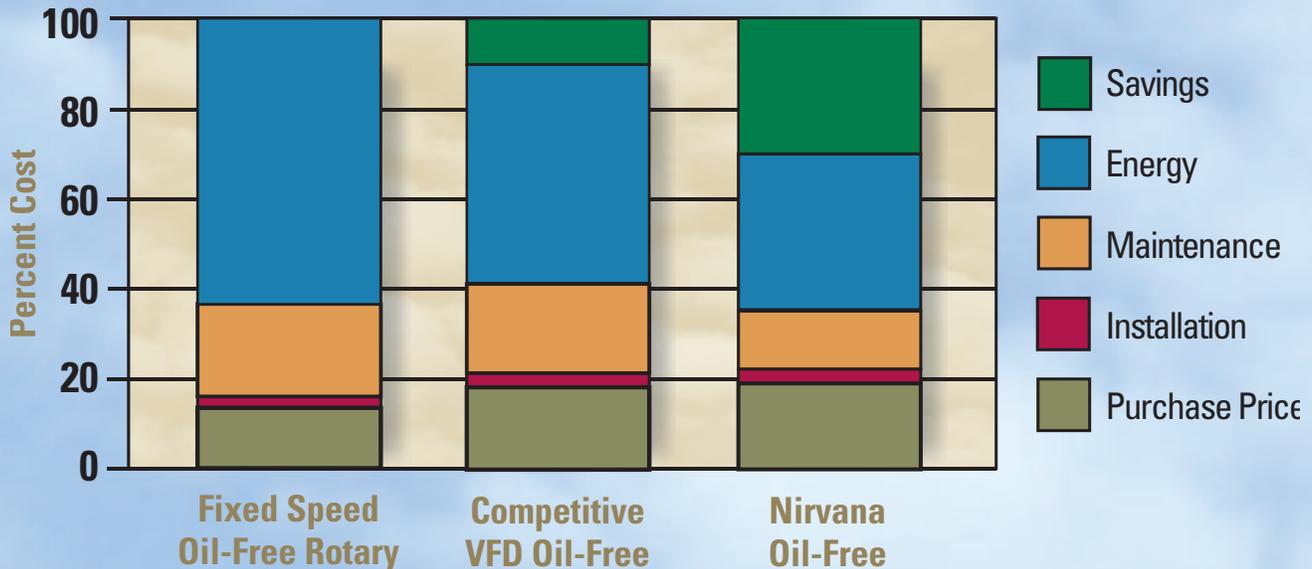
### ■ COOLANT

The coolant utilized in a Nirvana Oil-Free compressor is also rated for 115°F/46°C ambient so that its properties do not breakdown and cause nuisance shutdowns.

PERFORMANCE

# ENERGY EFFICIENCY

## OIL-FREE ROTARY 10 YEAR LIFE CYCLE COST



Comparison at 70% average volume capacity; 4,000 hours per year; .05/kWh

TRADITIONAL PURCHASE DECISION FACTORS REPRESENT ONLY 20% OF THE COST TO OWN AND OPERATE A ROTARY SCREW COMPRESSOR. ENERGY REPRESENTS 60% OF THE LIFE CYCLE COST. ONLY NIRVANA WILL SAVE AT LEAST 30% 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 provides unequalled 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:

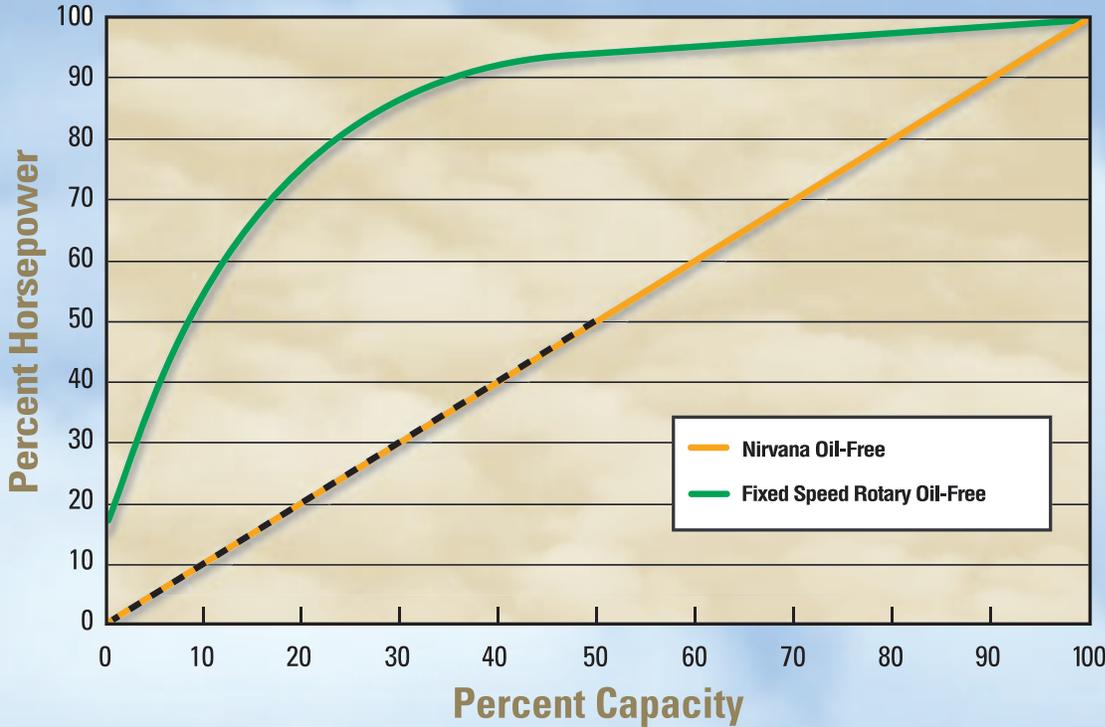
- Limits the in-rush current to less than 100%.
- Decreases starting amp requirements, minimizing peak charges.
- Results in lower energy bills.

**NIRVANA SAVES ENERGY WITH UNEQUALLED EFFICIENCY AND RELIABILITY**

Unlike conventional on-line/off-line air compressors, Nirvana does not unload. Instead, Nirvana compressors simply reduce speed and volume to meet demand. A Nirvana compressor:

- Simply shuts off, rather than run unloaded.
- Allows unlimited starts per hour with no decrease in motor life.
- Delivers a 30% energy savings compared to standard, fixed-speed oil-free compressors.

**Nirvana Oil-Free  
Competitive Energy Comparison at 200 HP**



Conditions are representative of a system with dry side storage of one gallon per compressor CFM.

EFFICIENCY

# TRANSCENDENT TECHNOLOGY

## ULTRACOAT. SOLVING THE NEED FOR BETTER OIL-FREE PERFORMANCE AND ENERGY SAVINGS

Ingersoll-Rand's exclusive UltraCoat rotor and housing coating process uses a mechanical and chemical bond to insure the thinnest coating with the tightest possible grip.

- UltraCoat has proven to be unmatched in its performance.
- UltraCoat protects every Sierra airend and now every Nirvana Oil-Free airend.
- UltraCoat rotor and housing coating process uses a mechanical and chemical bond to ensure that the microcoating interlocks with the rotor and casting material.
- UltraCoat delivers longer life and 10% energy savings.

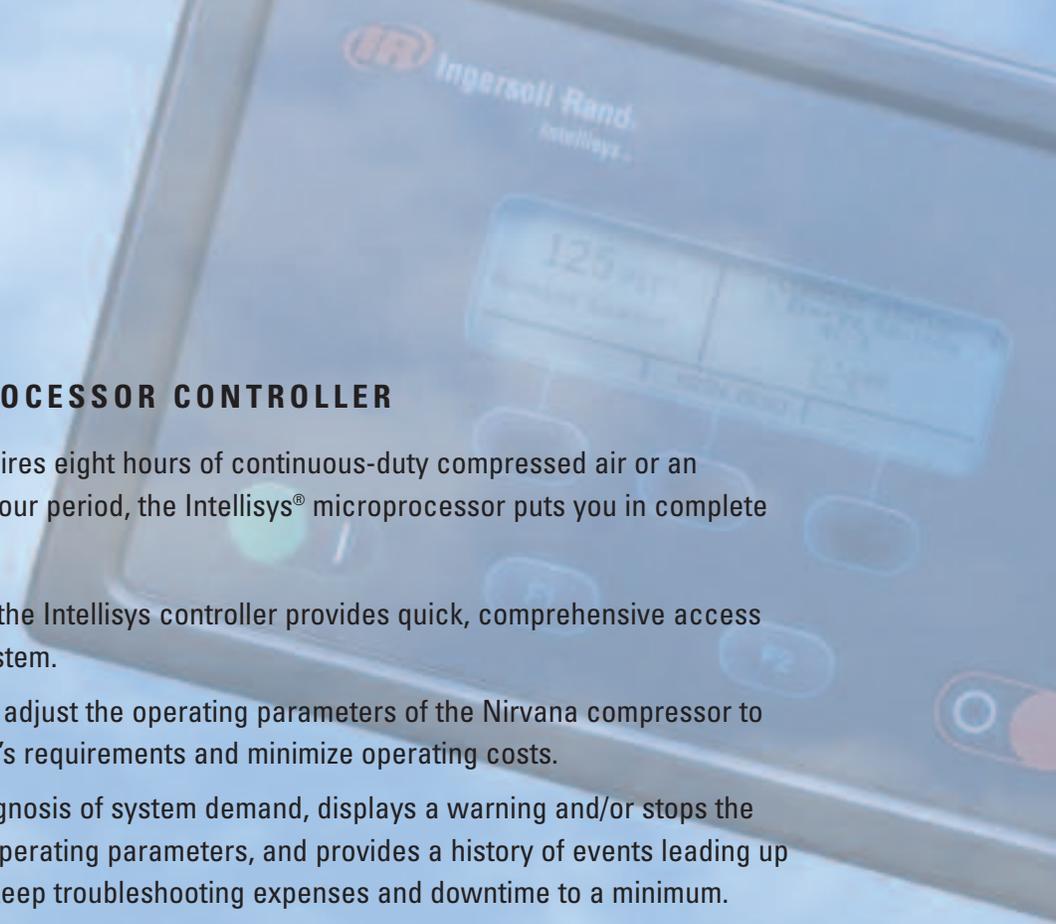


To help our customers get the best performance, we didn't limit our design efforts to the coating. We selected stainless steel and aluminum for the piping linking the intercooler with the stainless steel second-stage rotors.

- Condensation created in the cooling process cannot corrode these materials
- The elimination of rust formation further lengthens the life of the coating and rotors.
- These design innovations separate Nirvana Oil-Free from any other compressor in its class.

**THE SURFACE OF THE STAINLESS STEEL SECOND-STAGE ROTORS HAVE MINUTE CREVICES THAT TIGHTLY BOND THE ULTRACOAT COATING. THE RESULT IS THE MOST DURABLE PERFORMANCE ON THE MARKET, LOWERING OUR CUSTOMERS' ENERGY COSTS AND INCREASING THE LIFE OF THE AIREND IN THEIR NIRVANA OIL-FREE COMPRESSOR.**

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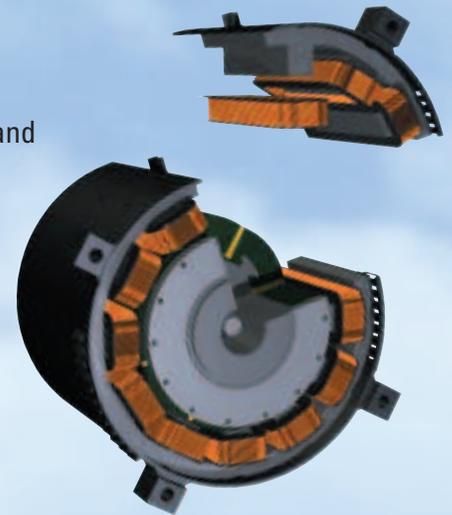
## INTELLISYS MICROPROCESSOR CONTROLLER

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.

- With finger-touch control, the Intellisys controller provides quick, comprehensive access to your compressed air system.
- 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.
- 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.

## HIGH-EFFICIENCY HPM MOTOR

- The HPM motor has virtually no wearing parts, making it efficient and economical.
- The HPM motor has no bearings, pulleys, belts or couplings to wear out, ensuring reliability of the package.
- The HPM motor is a technology that raises the standard of compressor reliability to an unequalled level.



## 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.

TECHNOLOGY

# NIRVANA OIL-FREE

## TWO-YEAR PACKAGE WARRANTY

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

## TIME PROVEN AIREND DESIGN

- The Sierra airend design updated for variable speed operation enables the Nirvana Oil-Free to yield the best performance at both full and part load.
- Maintaining a constant specific power efficiency at any point in the operating curve will maximize energy savings for the end user.

## 115°F/46°C AMBIENT RATED

- Nirvana compressors are designed to operate in high ambient conditions, making them ideal for locations anywhere in the world.
- Nirvana’s high temperature rating ensures fewer nuisance shutdowns caused by fouled coolers.



## NOBLE MATERIALS

- Inside the Nirvana compressor module, all components that come in contact with compressed air are coated with UltraCoat.
- From the second stage on, all materials are stainless steel or aluminum to prevent harmful particulate from going downstream.



## **MAXIMUM PERFORMANCE — FOR THE LIFE OF NIRVANA**

- Nirvana's patented UltraCoat rotor coating does not allow the performance of the compressor to degrade over time. That means that the performance attained in year one will be the same performance seen in year five.

## **QUIET AND AMBIENT COMPENSATED**

- Thanks to the patented Nirvana Air Conditioner, the Nirvana Oil-Free compressor compensates for ambient conditions and manages the cooling air flow to achieve a constant discharge temperature.
- Under average operating conditions, the Nirvana compressor will operate 9 db(A) quieter than the standard compressor.

## **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.

# RELIABILITY

## ADD UNEQUALLED RELIABILITY, EFFICIENCY AND PRODUCTIVITY TO YOUR CURRENT SYSTEM

Ingersoll-Rand's Solutionizing™ Process will save 25%-50% of the operating cost associated with the compressed air system.

### RELIABILITY

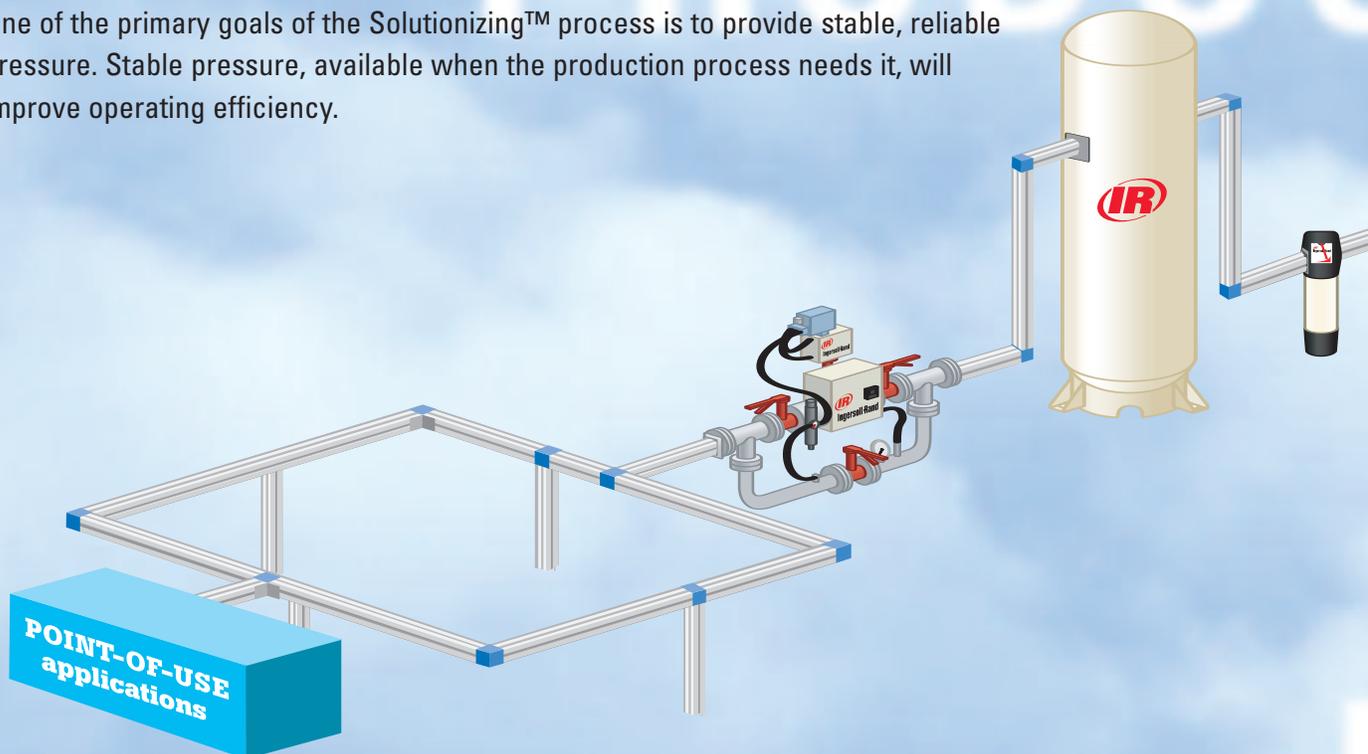
Few applications are as critical as those requiring oil-free air. And no compressor is more reliable than Nirvana.

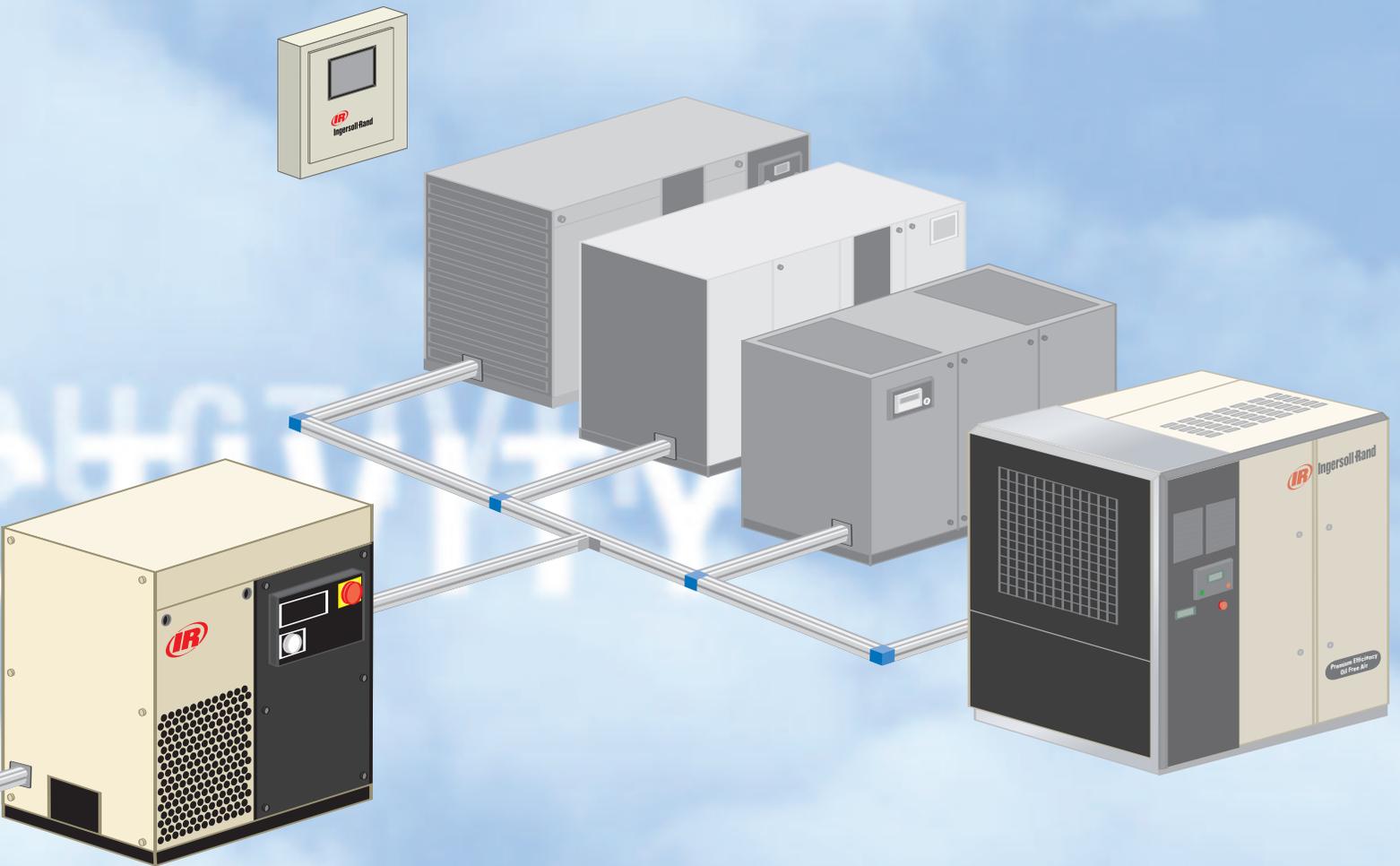
- Coupling superior compressor design for reliability with the exclusive IR Solutionizing™ process often will turn off a compressor in the average compressed air system.
- Off compressors mean a significant increase in system reliability and integrity.

### PRODUCTIVITY

When compressed air is an important part of the production process, the importance of the compressed air system to productivity and cost-saving becomes especially important.

- Adding a Nirvana oil-free compressor to your system not only reduces costs, it makes your entire system more efficient and more productive.
- One of the primary goals of the Solutionizing™ process is to provide stable, reliable pressure. Stable pressure, available when the production process needs it, will improve operating efficiency.



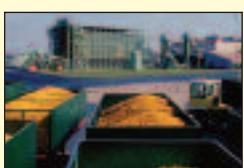


## EFFICIENCY

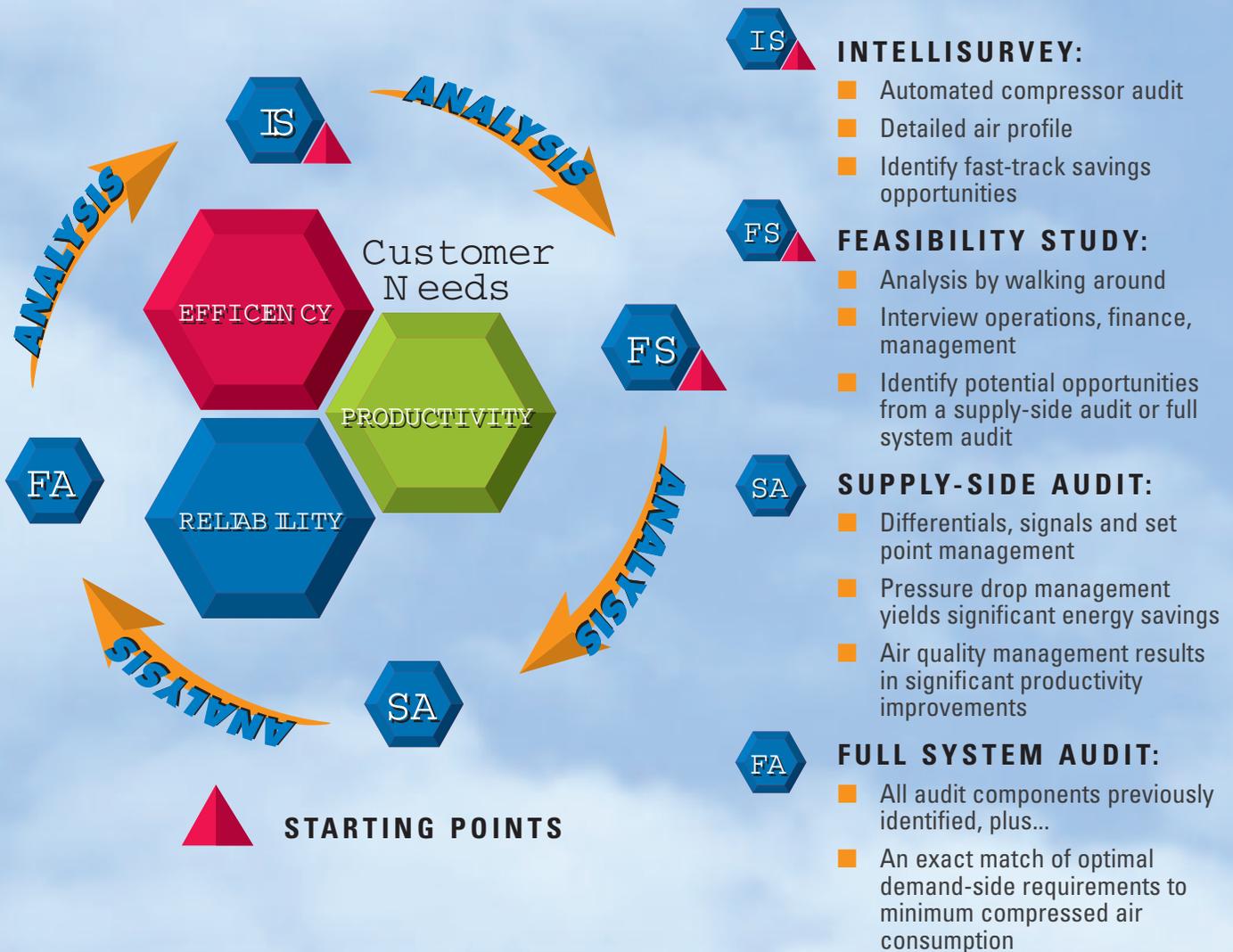
The compressed air system uses 10% of the energy consumed by the average plant or production facility. Even small improvements in efficiency can be valuable.

- The variable-speed Nirvana is the most efficient compressor ever built, resulting in major energy savings.
- Solutionizing™ also seeks out the energy wasting processes on the demand side and the supply side. Managing your compressed air system as a whole will lower operating costs.

# IR INDUSTRY CLASSIFICATIONS

CLASS	DESCRIPTION	APPLICATIONS	
<b>IN1</b> Instrument Grade Air: ISO Class 2.1.1	Efficient removal of solid particulates and oil. ISO Class 1 Pressure Dewpoint will be maintained.	Instrumentation, process, oil and gas, chemical, electronics	
<b>IN1 Odor Free</b> Instrument Grade Air: ISO Class 2.1.1, odor free	Efficient removal of solid particulates and oil, and oil vapor. ISO Class 1 Pressure Dewpoint will be maintained.	Pharmaceutical, food and beverage, clean rooms	
<b>IN2</b> Instrument Grade Air: ISO Class 2.2.1	Efficient removal of solid particulates and oil. ISO Class 2 Pressure Dewpoint will be maintained.	Instrumentation, process, oil and gas, chemical, electronics	
<b>IN2 Odor Free</b> Instrument Grade Air: ISO Class 2.2.1, odor free	Efficient removal of solid particulates and oil, and oil vapor. ISO Class 2 Pressure Dewpoint will be maintained.	Pharmaceutical, food and beverage, clean rooms	
<b>IG4</b> Industrial Grade Air: ISO Class 2.4.1	Efficient removal of solid particulates and oil. ISO Class 4 Pressure Dewpoint or a 30% (or less) Relative Humidity (RH) will be maintained.	General manufacturing, metal stamping, air tool use, forging, assembly, painting and finishing	
<b>IG4 Odor Free</b> Industrial Grade Air: ISO 2.4.1, odor free	Efficient removal of solid particulates and oil, and oil vapor. ISO Class 4 Pressure Dewpoint or a 30% (or less) Relative Humidity (RH) will be maintained.	Food and beverage, raw material mixing	
<b>IG6</b> Industrial Grade Air: ISO 2.6.1	Efficient removal of solid particulates and oil. ISO Class 6 Pressure Dewpoint or a 50% (or less) Relative Humidity (RH) will be maintained.	Sand blasting, home use, construction	

# INGERSOLL-RAND AUDIT PORTFOLIO



## AIRCARE. FLEXIBLE MAINTENANCE PROGRAMS AND CONSTANT QUALITY

With an understanding of your industry classification requirements, IR can provide the optimal air treatment equipment for your system, And with IR's AirCare extended warranty and preventive maintenance program, you'll continue to enjoy reduced costs and increased productivity.



- You can extend the drivetrain or full-package warranty out through five years.
- Certified professional technicians will perform routine inspections and diagnostic service.
- An all-inclusive fluid-analysis program monitors compressor lubricants for early detection of problems.
- Vibration analysis and trending can pinpoint an impending component replacement.
- Optional remote monitoring provides 24-hour, seven-day-a-week surveillance of your compressor installation for the utmost in peace of mind.

# MORE THAN AIR. RELIABILITY. PRODUCTIVITY. EFFICIENCY.

ONLINE SOLUTIONS: [WWW.AIR.IR.CO.COM/NIRVANA](http://WWW.AIR.IR.CO.COM/NIRVANA)

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[www.cagi.org](http://www.cagi.org)

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