

Ingersoll Rand

Centrifugal Air Compressors
Oil Free API Process Package

Innovation

Reliability

Efficiency



More than Air, a History of Innovation

For more than 100 years, Ingersoll Rand has inspired progress by driving innovation with revolutionary technology — creating new standards for how the world gets work done. We introduced our first oil-free compressor in 1912, and over the decades we've continued to develop rugged, reliable, industry-leading compressor technologies.

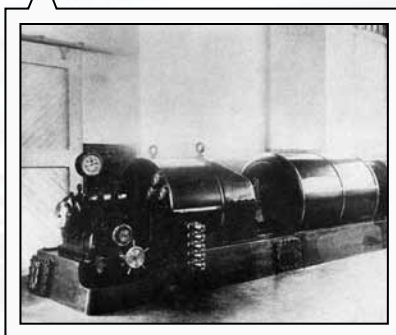
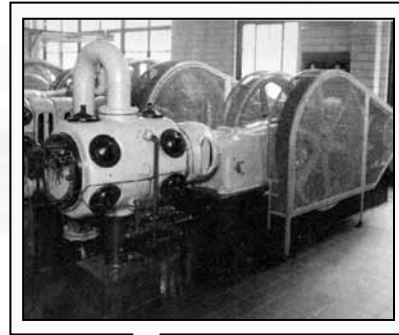
1871

Ingersoll Rock Drill Company was formed, later to become Ingersoll-Rand in 1905

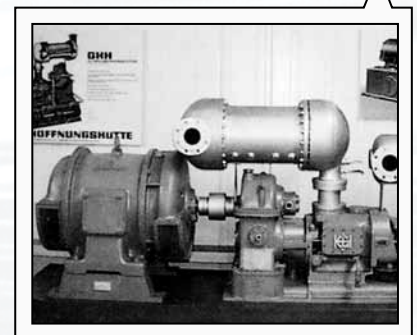


1933

Technology-leading, Ingersoll Rand oil-free reciprocating compressor goes to market



1912 Our first oil-free centrifugal compressor introduced



1952 The world's first oil-free rotary compressor is introduced

Ingersoll Rand is a technology leader in oil-free compressed air technologies not only because we develop class-leading products, but also because we know our customers' industries, the demands placed on productivity and quality, and then offer highly engineered system solutions that make sense. No matter what your product, process or location, Ingersoll Rand has the expertise, the oil-free technology and the unmatched service to meet your needs.

1980s
Centrifugal technology expanded to several different applications



2007
Ingersoll Rand is first to be Class 0 certified for centrifugal compressor technology



1960

1970

1980

1990

2000



1968 First packaged centrifugal compressor is introduced
(current model shown)



2005 Ingersoll Rand offers the first centrifugal compressor for standard industry capable of achieving 600 psig (40 bar g)

Reliable Air for Critical Applications



Iron and Steel ▲

Few industries pose tougher environmental conditions or place higher demands on compressed air systems. Ingersoll Rand centrifugal compressors are the perfect fit — offering rugged reliability even in the harshest environments and applications.

Air Separation ▲

With air separation, electricity costs are clearly a paramount concern. As such, the operational efficiency of an air compressor is critical. Ingersoll Rand multi-stage centrifugal compressors deliver the reliable performance our customers demand.

PET Blow Molding ▲

Ingersoll Rand drives productivity within this industry by delivering advanced technology solutions that provide the lowest life-cycle cost, highest reliability and uptime as well as energy efficiency.

There's a lot riding on your compressed air system, namely productivity and profitability. A compromised system — whether caused by inefficiencies, contaminants or breakdowns — can result in costly downtime, product liability and even damage to your brand reputation.



Textile ▲

High-tech air jet looms require super clean, dry, 100% oil-free compressed air, which is why Ingersoll Rand has been a critical supplier to this industry for many years.



Chemical ▲

Whether manufacturing cleaning solutions, base stock pharmaceuticals or anything in between, compressed air quality must be of the highest purity to minimize the risk of production interruption or higher cost liability.



Utilities ▲

Compressed air is too important to take chances, so when specifying instrument air for utilities, most engineers request oil-free compressors.

No matter what the industry or critical application, Ingersoll Rand centrifugal compressed air systems set the worldwide standards for reliability, energy efficiency and air quality, while reducing total life-cycle costs.

Oil-free, Risk-free

How pure is your air? One of the keys to ensuring you achieve and maintain acceptable air quality for your critical application is to know industry air quality standards and their allowable levels of contaminants. The lower the particulate class rating, the purer the air should be.

ISO 8573-1:2001 Air Quality Classes							
Quality Class	SOLIDS			WATER		OIL & OIL VAPOR	Quality Class
	0.1 – 0.5 micron	0.5 – 1.0 micron	1.0 – 5.0 micron	Pressure Dew Point		mg/m ³	
	Max. Particles Per m ³						
	°F	°C					
0	As specified by the end-user or manufacturer, and more stringent than Class 1						0
1	100	1	0	-100.0	-70.0	0.01	1
2	100,000	1,000	10	-40.0	-40.0	0.10	2
3	—	10,000	500	-4.0	-20.0	1.00	3
4	—	—	1,000	37.4	3.0	5.00	4
5	—	—	20,000	44.6	7.0	—	5
6	—	—	—	50.0	10.0	—	6

ISO 8573-1:2001 Class 0 specifies air quality standards for critical manufacturing processes within most industries. It is the most stringent class covering oil contamination in aerosol, vapor and liquid forms.

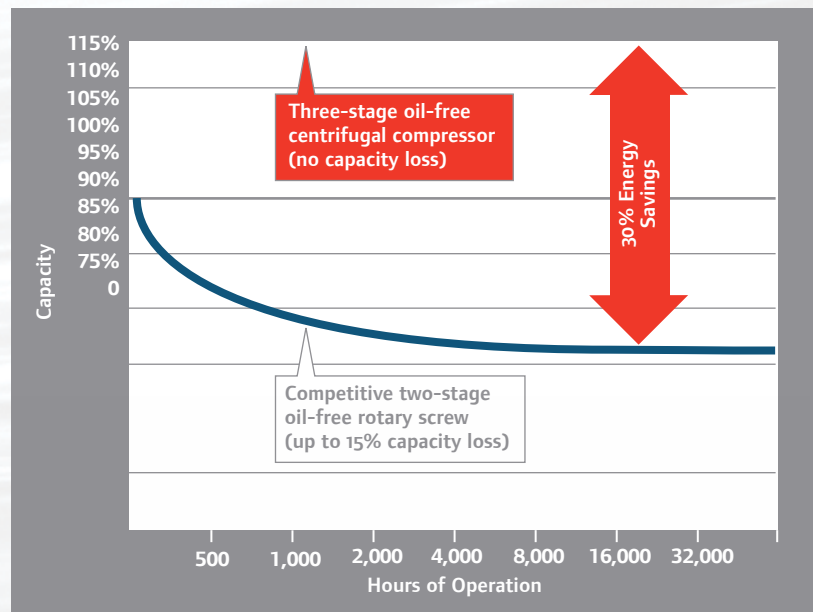
If you need guaranteed pure air for your critical application, then you need Ingersoll Rand. Our centrifugal compressors were rigorously tested by TÜV Rheinland® — a global leader in independent testing and assessment services — and earned ISO 8573-1:2001 Class 0 certification.



The World's First Certified Oil-free Centrifugal

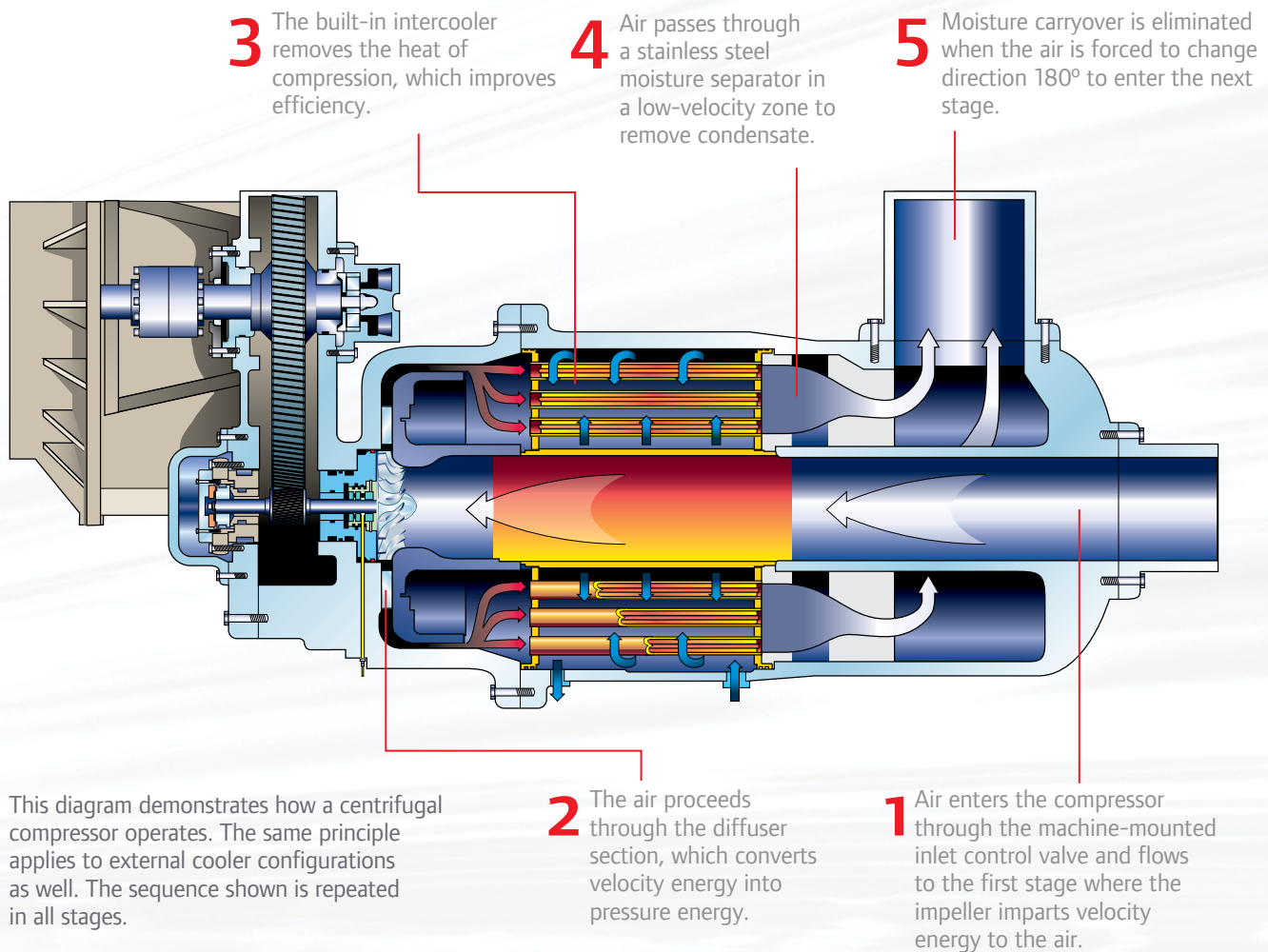
Engineered excellence. Our oil-free centrifugal compressors are not only the first to be certified ISO 8573-1:2001 Class 0, they also offer efficient, economical and reliable solutions for delivering compressed air. These high-performing, versatile compressors deliver the advantages of a compact design to a broader range of customers and applications.

An Ingersoll Rand centrifugal compressor comes with a capacity advantage of as much as 15% above competitive two-stage, oil-free compressors. This advantage increases to as much as 30% as our capacity remains consistent, while other technologies degrade by up to 15%.



Simplicity by Design

The easy choice. Our centrifugal compressors are the most efficient and reliable units on the market, and their packaged design makes them easy to install wherever needed. Every component of these compressors is mounted, piped and wired for convenient, single-point air and electrical connection.



Less is More

Fewer moving parts mean you get a more reliable, safer compressor with less downtime and less maintenance. With our multi-stage compressors, you can hit your performance requirements easily and with less wear and tear than with any other compressor on the market. Greater efficiency, reliability and unique features and controls provide you with an unbeatable combination of energy savings and trouble-free life.

Balanced and Stable Rotor Assemblies

Our impellers feature a vane geometry that allows maximum pressure control over the widest operating range. Each rotor assembly is dynamically balanced between two hydrodynamic bearings to ensure low vibration and peak operating efficiency.

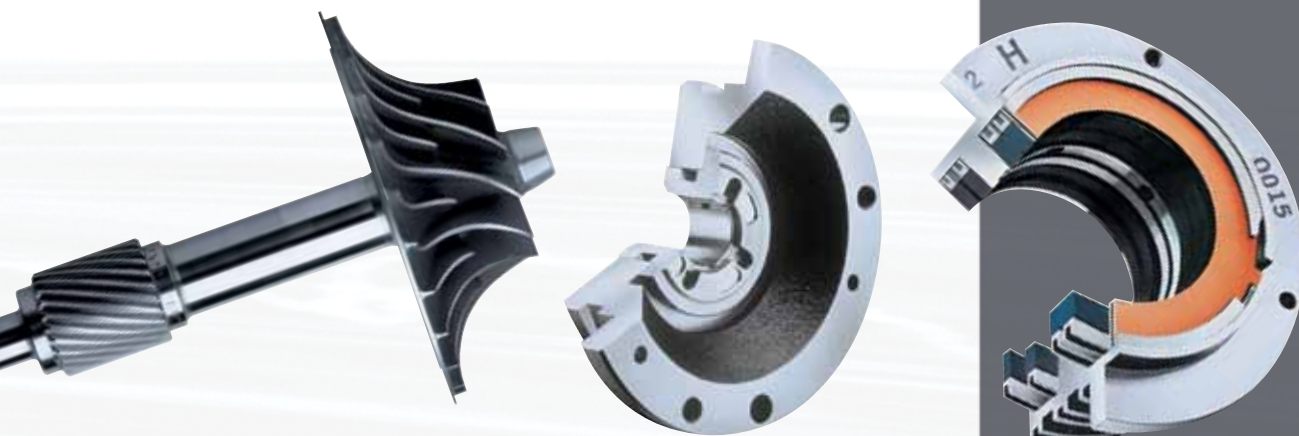
Superior Bearings and Carbon Ring Seals

Because our rotors are so stable, we're able to use simple bearings with no moving parts. The rotors never contact the bearings, but rather spin on a film of oil. This permits long intervals between scheduled maintenance checks.

Our compressors also feature full-floating, non-contact carbon ring seals to minimize air leakage and prevent oil from migrating up the rotor shaft.

Vertically Split Casing

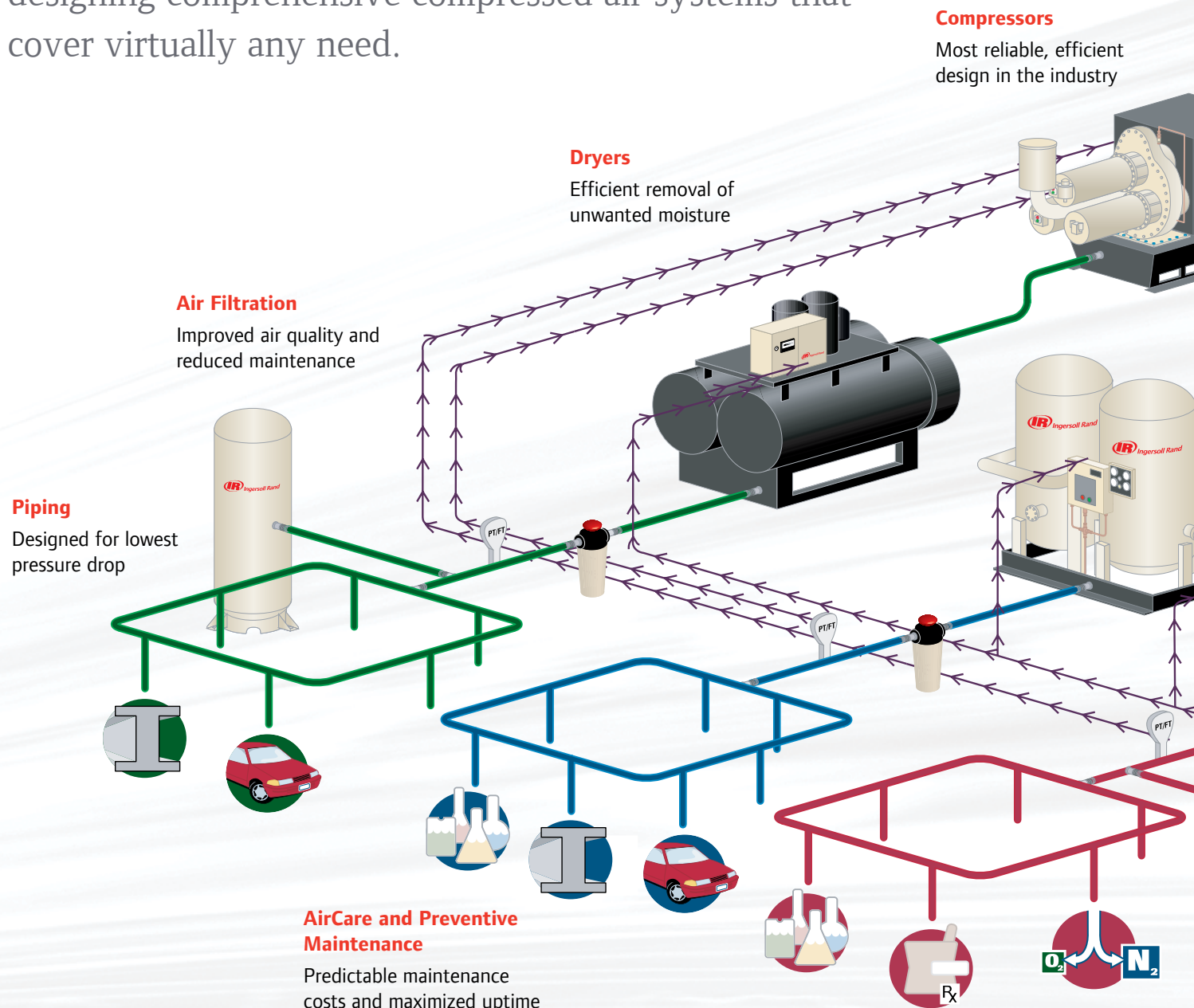
Our exclusive vertically split casing permits easy opening for servicing the compressor components as well as for setting running clearances externally, without opening the unit.



A Systematic Approach to Productivity

We do more than build products at Ingersoll Rand.

We bring our customers unmatched experience in designing comprehensive compressed air systems that cover virtually any need.



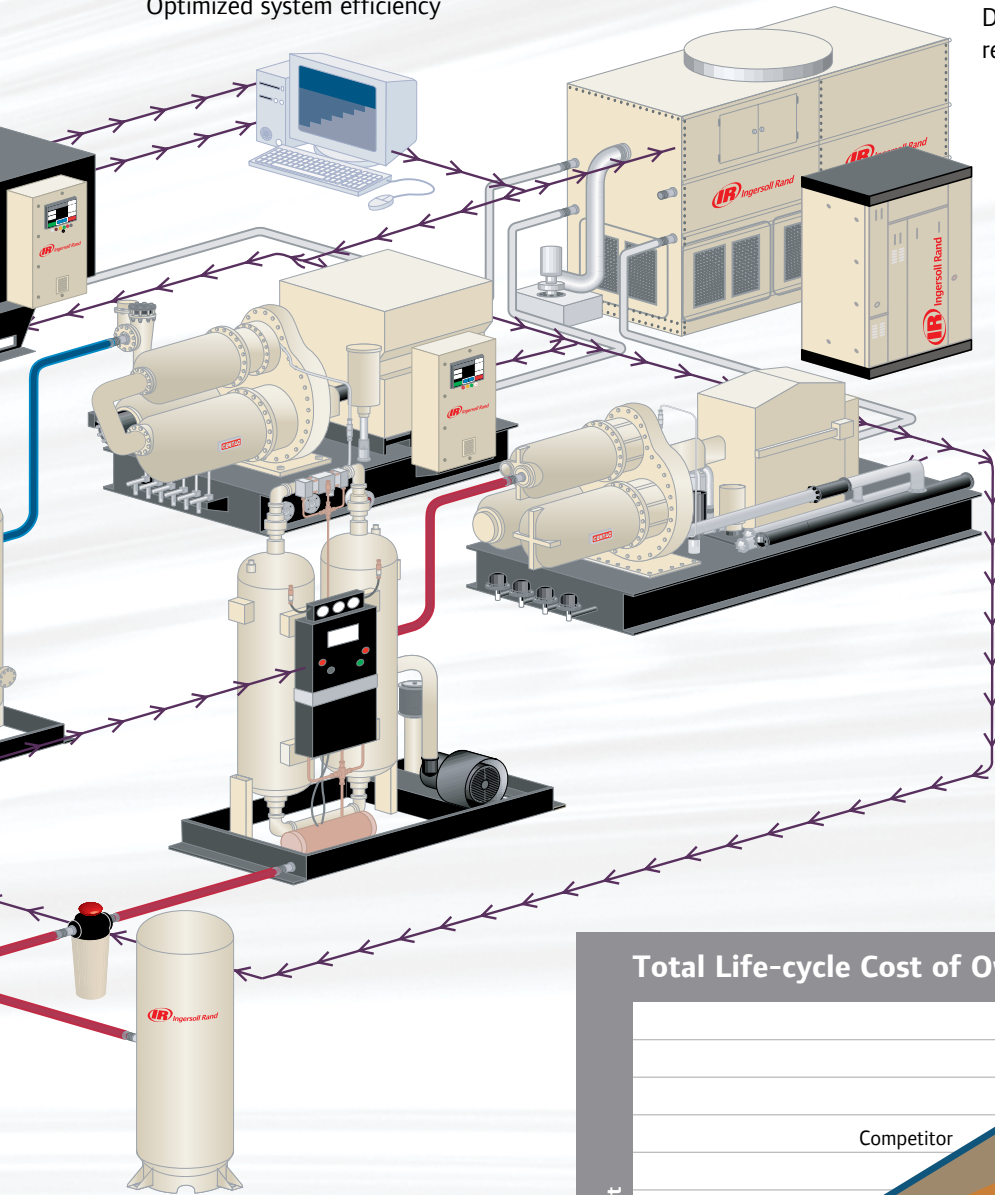
System Controls
Optimized system efficiency

Cooling Systems
Designed to match system requirements

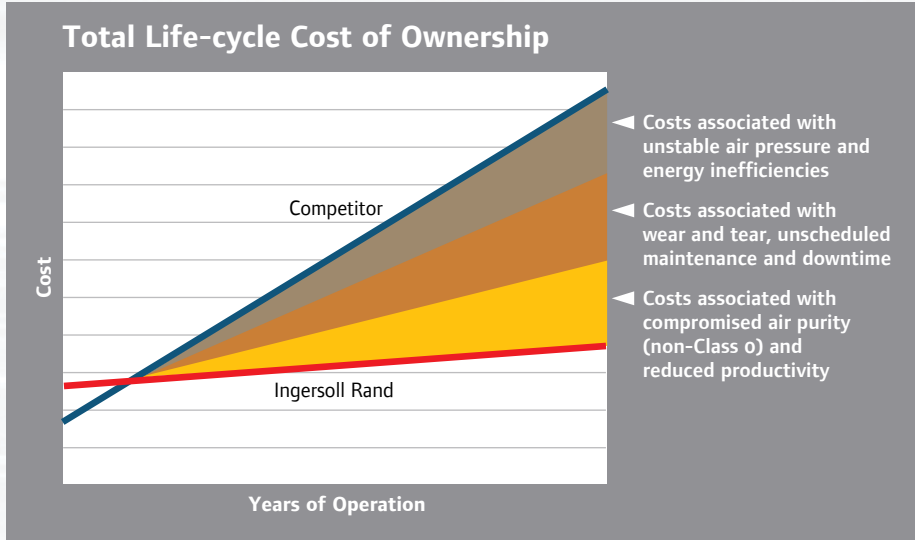
Leasing and Financing
Improved cash flow

Project Management and Installation
Single-source responsibility

Audits
System optimization for best performance



Ingersoll Rand centrifugal compressors deliver a lower total life cost of ownership than competitive models, thanks to time-proven engineering, class-leading performance and our outstanding aftermarket support.



Match Your Needs with Our Technology

Oil Free Centrifugal Air Compressors API Process Package

Frame Model	3 Stages of Compression							
	Air Flow Flow Range - Maximum				Operation Pressure - Maximum			
	M ³ /Hr		CFM		BAR		PSI	
	Start	End	Start	End	Start	End	Start	End
2ACII	9,005	11,044	5,300	6,500	7.0	10.5	100	150
C950	9,514	11,044	5,600	6,500	7.0	10.5	100	150
3CII	10,194	15,291	6,000	9,000	7.0	10.5	100	150
C3000	15,291	25,485	9,000	15,000	7.0	10.5	100	150
5CII	21,238	50,970	12,500	30,000	7.0	10.5	100	150
3C	9,345	16,990	5,500	10,000	10.5	42.7	150	610
4C	15,291	25,485	9,000	15,000	10.5	42.7	150	610

Progress is *greener* with Ingersoll Rand

Ingersoll Rand offers industry-leading products and solutions that enable businesses around the world to reduce energy consumption and costs and decrease harmful environmental emissions. From air compressors that reduce energy consumption to electric-powered golf cars with near-zero emissions, Ingersoll Rand provides the knowledge, experience and solutions to help our clients achieve their sustainability goals.

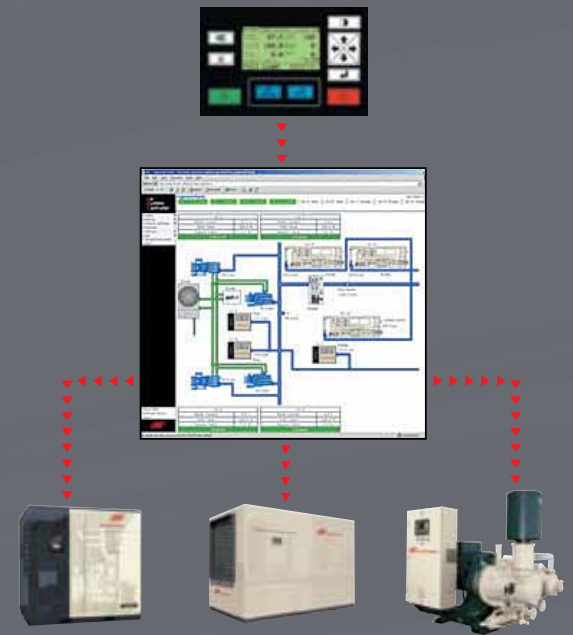


Advanced Controls

If you have a multiple-compressor installation, then you probably know that maintaining optimum average system pressure along the entire line can be challenging, inefficient and costly. Ingersoll Rand advanced air system controllers manage energy through load sharing.

When coupled with our extensive system audit services, these tools enable you to optimize air system efficiency, delivery consistent flow and pressure, avoid blow-off and extend the life of system components. Ultimately, you'll reduce energy costs.

And, you can include all compressor technologies, dryers and coolers in the control system, and monitor them from anywhere at any time.



Air System Controller (ASC)

The ASC provides a window into the compressor room by making raw data available to plant operators and managers in formats that are easy to understand, while yielding substantial energy savings. The ASC uses human machine interface (HMI) software specifically designed by Ingersoll Rand for compressed air systems.

Functions include:

- Total system control over compressors, dryers, cooling towers, pumps and accessories
- Energy management
- Pressure- and load-sharing
- System benchmarking and data management
- Enhanced communications

Global Reach, Local Service

No matter what the industry or location, Ingersoll Rand is committed to serving you 24 hours a day, seven days a week. Our worldwide network of distributors, engineers and certified, factory-trained technicians are a phone call away — ready to support you with innovative and cost-effective service solutions that will keep you running at peak performance.



No matter what, count on Ingersoll Rand

Even if you own an air compressor from another manufacturer, you can count on Ingersoll Rand to keep you up and running without a hitch. No matter what the make or model, Ingersoll Rand builds replacement parts designed to the same specifications and operational efficiencies you'd expect from the original equipment manufacturer.

Whether for parts, preventive maintenance or timely repairs, who better to maintain your compressed air system than the company who leads the world in building them...Ingersoll Rand.



Maximize uptime with Ingersoll Rand parts and service.



Ingersoll Rand Industrial Technologies provides products, services and solutions that enhance our customers' energy efficiency, productivity and operations. Our diverse and innovative products range from complete compressed air systems, tools and pumps to material and fluid handling systems and environmentally friendly microturbines. We also enhance productivity through solutions created by Club Car®, the global leader in golf and utility vehicles for businesses and individuals.

www.air.ingersollrandproducts.com

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