



# Ingersoll Rand Compressed Air Industrial Solutions



Ingersoll Rand Industrial Technologies provides products, services and solutions to enhance the efficiency and productivity of our commercial, industrial and process customers. Our innovative products include air compressors, air systems components, tools, pumps, material and fluid handling systems and microturbines.

[www.ingersollrand.co.in](http://www.ingersollrand.co.in) [www.ingersollrandproducts.com](http://www.ingersollrandproducts.com)

Ingersoll Rand (India) Ltd.  
21-30, GIDC Estate, Naroda,  
Ahmedabad - 382 330, India.  
Phone : (079) 2282 0123, 2282 0323  
Fax : (079) 2282 1003, 2282 1256  
Email : [airsolutionsindia@irco.com](mailto:airsolutionsindia@irco.com)



Customer Support Center 1-800-233-7926  
[customersupport@ingersollrand.co.in](mailto:customersupport@ingersollrand.co.in)

Regional Offices' Phone Numbers • WEST - Mumbai: (022) 61540500, Nagpur: (0712) 2533697/2533386, Pune: (020) 41005400 Surat: (0261) 3917335/ 2350065, Indore: (0731) 2435622, Raipur: (0) 9370806664 • EAST - Kolkata: (033) 24011224/ 24014258 Jamshedpur: (0657) 2233128/ 129 • SOUTH - Bangalore, Karnataka: (080) 22166001, Chennai, TN & Kerala: (044) 28523362/ 28520900 Coimbatore: (0) 9344601020, Secunderabad, AP: (040) 27849813/ 16/ 24 • NORTH - Chandigarh: (0172) 3247151/ 2664334 New Delhi: (011) 43206400, Haridwar: (0) 9358631990

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.

Nothing contained on these pages is intended to extend any warranty or representation, expressed or implied, regarding the product described herein. Any such warranties or other terms and conditions of sale of products shall be in accordance with Ingersoll Rand's standard terms and conditions of sale for such products, which are available upon request.

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

© 2011 Ingersoll Rand Company

February 2011

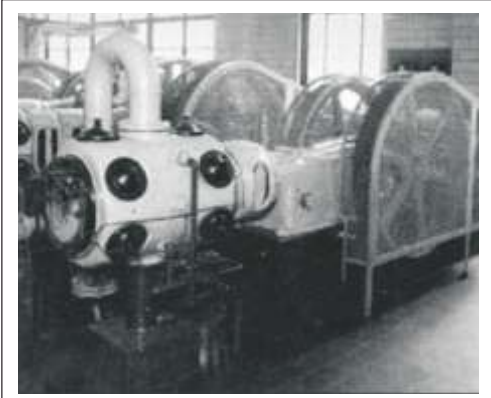
Progress is  greener with Ingersoll Rand



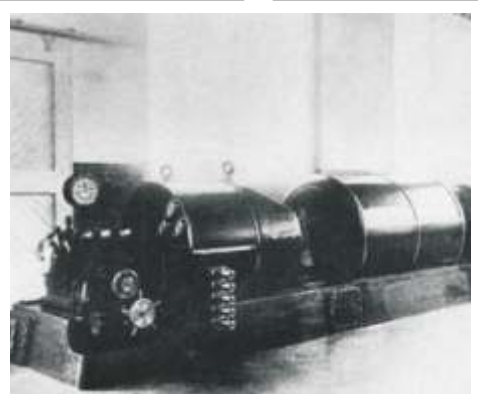
# More Than Air, A History of Innovation



**1906**  
Ingersoll Rand becomes publicly traded company on NYSE



**1933**  
Technologically advanced oil-free reciprocating compressor goes to market



**1912**  
Ingersoll Rand pioneers oil-free centrifugal compressor technology



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



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



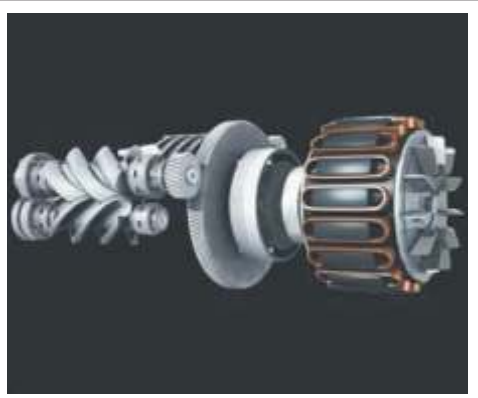
**1993**  
37-300 kW packaged rotary screw compressor is introduced featuring Intellisys™, rotor protectant & 115°F design

## For more than 135 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.

## 2003

Ingersoll Rand offers 'Nirvana' - industry's first true variable-speed drive, oil-free and contact cooled compressor, featuring HPM motor technology



Ingersoll Rand is the technology leader in compressed air technology not only because we develop class-leading products, but also because we know our customers' industries, understand the demands based 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 and the unmatched service support to meet your needs.

## Glossary

**Adsorption**  
The process by which a desiccant with a highly porous surface attracts and removes the moisture from compressed air. The desiccant is capable of being regenerated.

**Aftercooler**  
A heat exchanger used for cooling air discharged from a compressor.

**CFM (Cubic Feet per Minute)**  
The standard measurement of air flow. Flow rate of air measured and converted to a standard set of reference conditions.

**Compressed Air**  
Free air that has been pressed into a volume smaller than it normally occupies. Compressed air performs work when the air is released and allowed to expand to its normal free state.

**Compressors**  
Machines designed for compressing air from an initial intake pressure to a higher discharge pressure.

**Constant Speed Control**  
A system in which a compressor is run continuously and matches air supply to air demand by varying compressor load.

**Demand**  
Flow of air at specific conditions required at a point or by the overall facility.

**Desiccant**  
A material having a large proportion of surface pores, capable of attracting and removing water vapor from the air.

**Dew Point**  
The temperature at which moisture in the air will begin to condense if the air is cooled at constant pressure. At this point the relative humidity is 100%.

**Duty**  
The percentage of time that a compressor is designed to actually run.

**Free Air Delivery (FAD)**  
Actual quantity of air delivered at the conditions of temperature and pressure existing at the inlet to the compressor.

**Full Load**  
Air compressor operation at full speed with a fully open inlet and discharge delivering maximum air flow.

**Intercooler**  
Device that removes the heat of compression of the air between consecutive stages of multi-stage compressors.

**l/min (Litres per minute)**  
The standard measurement of air flow. Flow rate of air measured and converted to a standard set of reference conditions.

**m<sup>3</sup>/min (Meter<sup>3</sup> per minute)**  
The standard measurement of air. Flow rate of air measured and converted to a standard set of reference conditions.

**Online/ Offline Pressure**  
The minimum and maximum discharge pressure at which the compressor will switch from unload to load operation (online) or from load to unload (offline).

**Piston Displacement (PD)**  
The theoretical volume of air swept through by the pistons.

**Pneumatic Tools**  
Tools that operate by air pressure.

**Barg (Bar Gauge)**  
The standard metric measurement of air pressure.

**PSI (Pounds per Square Inch)**  
The standard imperial measurement of air pressure.

**Receiver**  
A vessel or tank used for storage of air under pressure.

**Refrigerated**  
Cools compressed air by mechanical refrigeration.

**Single Stage**  
Compression in one step. Pressures upto 135 PSI.

**Start/Stop Control**  
A system in which air supply is matched to demand by the starting and stopping of the unit.

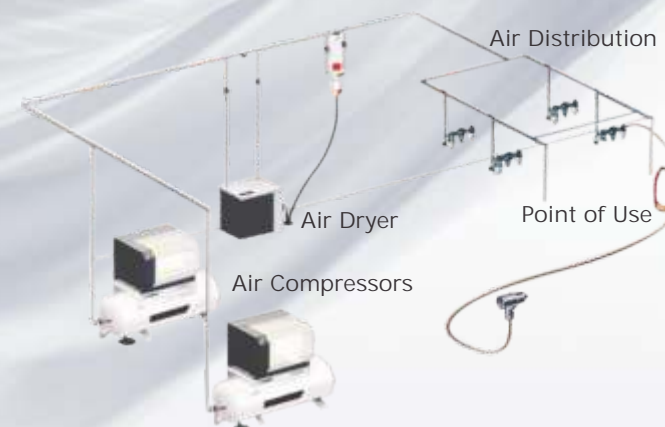
**Two-Stage**  
Compression in two steps with intercooling in-between for greater efficiency. Pressures upto 175 PSI.

## What is Compressed Air ?

Compressed air is used widely throughout industry and is often considered the “fourth utility” at many facilities. Almost every industrial plant, from a small machine shop to an immense pulp and paper mill, has some type of compressed air system. In many cases, the compressed air system is so vital that the facility cannot operate without it. Plant air compressor systems can vary in size from a small unit of 5 horsepower (hp) to huge systems with over 50,000 hp.

In many industrial facilities, air compressors use more electricity than any other type of equipment. Inefficiencies in compressed air systems can therefore be significant. Energy savings from systems improvements can range from 20-50% or more of electricity consumption. For many facilities this is equivalent to thousands, or even hundreds of thousands of dollars of potential annual savings, depending on use. A properly managed compressed air system can save energy, reduce maintenance, decrease downtime, increase production throughput, and improve product quality.

Compressed air systems consist of a supply side, which includes compressors and air treatment, and a demand side, which includes distribution and storage systems and end-use equipment. A properly managed supply side will result in clean, dry, stable air being delivered at the appropriate pressure in a dependable, cost-effective manner. A properly managed demand side minimizes wasted air and uses compressed air for appropriate applications. Improving and maintaining peak compressed air system performance requires addressing both the supply and demand sides of the system and how the two interact.



We cover all facets of the compressed air system



Contents	
45–250 kW Single Stage	02
90–350 kW Premium Efficiency Two Stage	04
37–225 kW Premium Efficiency Nirvana	06
37–160 kW Premium Efficiency Nirvana Oil Free	08
37–300 kW Fixed Speed, Oil Free	10
Industrial Star (IndStar)	11
AIR Star + LP Star	12
Air Quality Guide	13
Air Treatment Accessories	14
Air System Controller	16
Pressure Controller & Condensate Management	17
Air Distribution Solutions	18
Ingersoll Rand After Sales Service Contracts	19

**IR Ingersoll Rand**  
Industrial Technologies

Ingersoll Rand delivers AIR SOLUTIONS that spans entire range of compressed air system, from compressor to point of use, while improving efficiency of the entire system, increasing reliability, quality and uptime availability of compressed air – 4th utility.

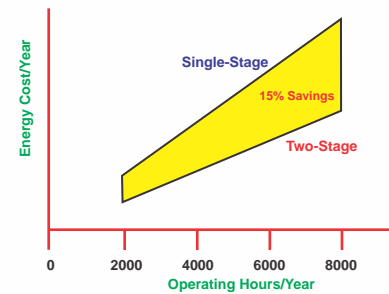
The above process is enabled by air audits, timely service, remote monitoring, controls, installation & piping solutions, extended maintenance and financing its delivered by solutions & service providers, focused on customer delight.



# 90–350 kW Premium Efficiency Two-Stage Rotary Screw Compressor

## What's a true two-stage rotary screw compressor?

In a true rotary two-stage screw compressor technology, the compression is shared between the first & second stages flowing in series. As the compression is split in two steps with inter-cooling between the two stages, this increases the overall compression efficiency upto 15% of the total full load power consumption.

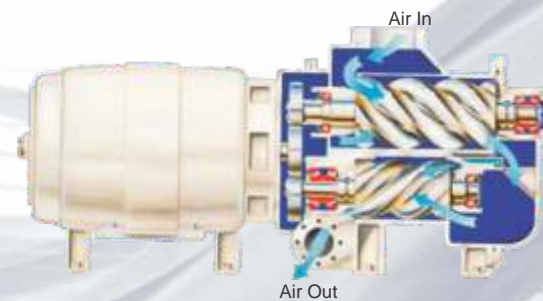


- Air is compressed in two stages, which allows “More Flow/ Unit Power”.
- Optimization of power usage – ability to upgrade existing systems by replacing with 2 stage compressor to get more flow with same/ lower power consumption



### True 2 stage stack design airend

- The compression is shared between the first & second stages flowing in series
- This increases the overall compression efficiency up to 15% of the total full load power consumption

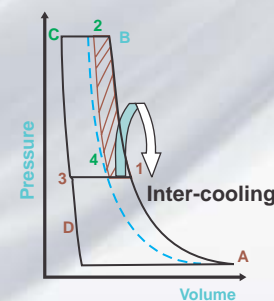


True 2 stage compression design eR+ airend series



### Advance Inter-cooling within airend housing

- Coolant is injected at 1st stage discharge port
- Contact intercooling of compressed air lowers 2nd stage inlet temperature
- This patented process eliminates the need for complex Heat exchangers
- Integral to design - no external connections



Single-Stage: DABC  
Two-Stage  
1st-Stage: DA13  
2st-Stage: 342C  
Savings: 1B24

PV Diagram – 2 Stage



R Series 90-160Kw



## Features

### Progressive Adaptive Control™

#### PAC™ Protection

An integrated, intelligent system that continuously monitors key operating parameters and adapts to prevent unexpected downtime.

#### V-Shield™ Technology

A totally integrated, leak-free design using stainless steel pipes and long-life metal-flex hoses.

#### Intuitive Controller

- Easily adjustable operating parameters, on-board diagnostics.
- Multiple languages.
- Built-in optimization sequencing for up to four compressors.

#### Trouble-free operation

- Increased uptime, reduced maintenance and improved performance with our unique two-stage filtration, extended filtration life, superior synthetic Ultra Coolant™ and on-board, time-saving diagnostics.
- High-quality air delivered through high efficiency coolant separation allowing no more than 3 ppm carryover.

### 50Hz Rotary 90–350 kW Two Stage Performance

Nominal Kw	7.5 bar g	Free Air Delivery-m <sup>3</sup> /min(cfm)			Length mm	Width mm	Height mm	Weight kg
		8.5 bar g	10 bar g	14 bar g				
R90ie	18.01(636)	17.5(618)	15.43(545)	13.03(460)	2855	1836	2032	2744
R110ie	22.09(780)	20.39(720)	18.89(667)	15.4(544)	2855	1836	2032	2744
R132ie	26.19(925)	25.34(895)	22.79(805)	18.35(648)	2855	1836	2032	3198
R160ie	31.09(1098)	30.3(1070)	27.21(961)	21.95(775)	2855	1836	2032	3198

Nominal Kw	7.5 bar g	Free Air Delivery-m <sup>3</sup> /min(cfm)			Length mm	Width mm	Height mm	Weight kg
		8.5 bar g	10 bar g	14 bar g				
200-2S	41.5 (1466)	38.8 (1370)	36.2 (1278)	29.6 (1045)	4000	1930	2146	5460
250-2S	49.2 (1738)	47.4 (1675)	44.2 (1560)	36.4(1286)	4000	1930	2146	5560
300-2S	60.2(2127)	56.0 (1978)	52.1 (1840)	44.3(1565)	4000	1930	2146	7190
350-2S	69.2 (2445)	64.1 (2265)	59.5 (2102)	50.2 (1773)	4000	1930	2146	7630

(1) FAD (Free Air Delivery) m<sup>3</sup>/min (cfm) are ratings of full package performance in accordance with CAGI-PNEUROP acceptance test standard PN2CPTC2 or ISO1217: 1996 Annex C.

(2) 250–350 kW models are available both in LT & HT voltage options.

(3) Above models are available with stand alone VFD (Variable Frequency Drive) as option.

(4) For detailed technical specification, please refer to our technical offer.

# 37-225 kW Premium Efficiency Nirvana Single & Two Stage Rotary Screw Compressor

## True Variable Speed Drive, Contact-Cooled Rotary Screw Compressors

**NIRVANA™**  
A true variable speed drive compressor available in single and two-stage



- Integral design, fewer parts and fewer connections help eliminate trouble spots, leaks and failures
- Time-proven quality airend and inverter
- Maximum efficiency at virtually any load

By matching a standard variable speed inverter with a HYBRID PERMANENT MAGNET® motor, Ingersoll Rand 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.

And 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.

And 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. And there is nothing to get out of alignment.

Coupled with Ingersoll Rand'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.

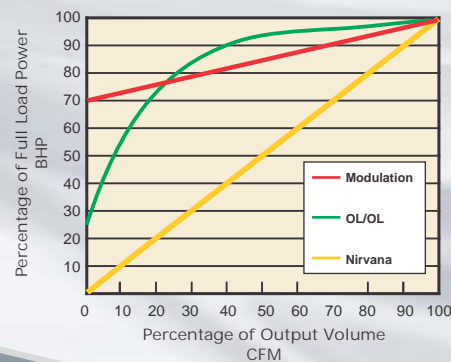
### Virtual Transmission

- No belts
- No coupling
- No gears
- No alignment



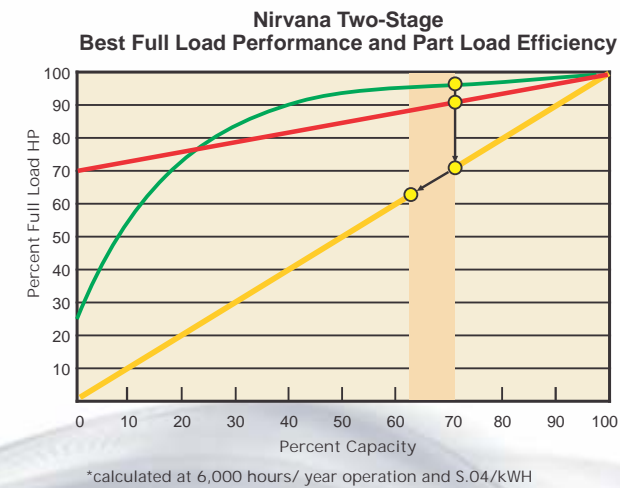
Unmatched Uptime - HPM ensure maximum uptime & reduces plant shutdowns.

Nirvana compressors deliver constant pressure and maximum efficiency at any capacity.



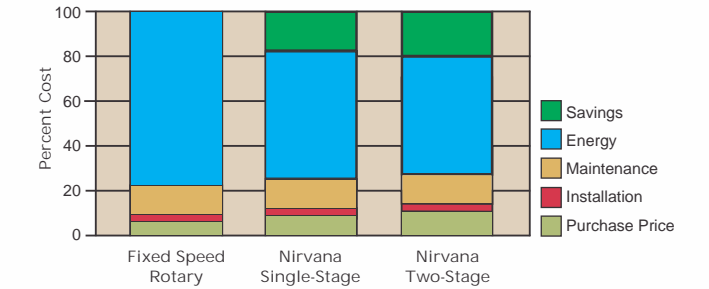
\* The Nirvana motor turns off when no demand and automatically turns on when air pressure decays.

Nirvana two-stage beats the performance of any other VFD compressor at full or part load



- 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

## Rotary 10 Year Life Cycle Cost



Rotary comparison at 70% average volume capacity; 4,000 hours per year; Rs. 5/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.



Two-stage efficiency 15% higher efficiency. The compression is shared between the first & second stages flowing in series. This increases the overall compression efficiency up to 15% of the total full load power consumption.

### 50 Hz Nirvana 37-160 kW Single Stage Performance

Model	Pressure Range bar g	Nominal Power kw	Capacity Range (FAD) m3/ min	Capacity Range (FAD) cfm	Dimensions mm	Weight kg
IRN37K-CC	4.5-10	37	1.78-6.62	63-234	1345/1579/1770	1048
IRN45K-CC	4.5-10	45	1.75-7.42	62-262	1345/1579/1770	1048
IRN55K-CC	4.5-10	55	3.65-10.53	129-372	1345/1800/1955	1530
IRN75K-CC	4.5-10	75	3.62-13.56	128-479	1345/1800/1955	1530

### 50 Hz Nirvana 75-225 kW 2-Stage Performance

Model	Pressure Range bar g	Nominal Power kw	Capacity Range (FAD) m3/ min	Capacity Range (FAD) cfm	Dimensions mm	Weight kg
R90n	4.5-10	90	8.47-17.95	299-634	2703/1466/2032	2060
R110n	4.5-10	110	8.47-21.66	299-765	2703/1466/2032	2060
R132n	4.5-10	132	8.55-24.4	302-863	2855/1836/2032	2363
R160n	4.5-10	160	8.66-28.9	306-1020	2855/1836/2032	2363

### 50 Hz Nirvana 75-225 kW 2-Stage Performance

Model	Pressure Range bar g	Nominal Power kw	Capacity Range (FAD) m3/ min	Capacity Range (FAD) cfm	Dimensions mm	Weight kg
IRN75K-2S	4.5-10	75	9.51-15.85	336-560	2554/1830/2439	3497
IRN190K-2S	4.5-10	190	18.29-39.07	646-1380	3757/1927/2145	5933
IRN225K-2S	4.5-10	225	18.74-46.00	662-1625	3757/1927/2145	5933

### 50 Hz Nirvana 75-225 kW 2-Stage Performance

Model	Pressure Range bar g	Nominal Power kw	Capacity Range (FAD) m3/ min	Capacity Range (FAD) cfm	Dimensions mm	Weight kg
R90ne	4.5-10	90	8.86-18.70	313-661	2855/1836/2302	2495
R110ne	4.5-10	110	8.86-23.00	313-811	2855/1836/2302	2495
R132ne	4.5-10	132	9.80-27.20	346-962	2855/1836/2302	2495
R160ne	4.5-10	160	9.29-32.10	328-1132	2855/1836/2302	2495

- (1) FAD (Free Air Delivery) m<sup>3</sup>/min are ratings of full package performance in accordance with CAGI-PNEUROP acceptance test stand ard PN2CPTC2 or ISO1217: 1996 Annex C.
- (2) Above models are available with in-built VFD (Variable Frequency Drive) as standard.
- (3) For detailed technical specifications please refer to our technical offer.
- (4) Minimum and Maximum flow is rated at 7 bar g.

# 37–160 kW Premium Efficiency Nirvana Oil Free Rotary Screw Compressor



## Unleashing the full potential of true variable frequency drive technology

If you have a critical oil-free application requiring the lowest operating cost, you can't afford to take chances with a compressor system that delivers anything but the absolute highest quality air, reliability, and efficiency. Not a problem with an Ingersoll Rand Nirvana – the world's first true variable-speed drive (VSD) oil-free compressor system.



## All standard Nirvana features+



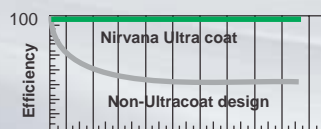
### Reliable airend coupled with HPM motor

- Fewer rotating parts than any other rotary air compressor in its class
- Constant and high efficiency HPM motor
- Ingersoll Rand's time-proven, reliable and efficient two-stage oil-free airend



### Advanced two-stage airend design

- Time proven oil-free 2-stage airend combined with innovative, market leading Nirvana HPM motor
- Rotors coated with UltraCoat - the most durable rotor coating available



### Unmatched efficiency through the life of compressor

UltraCoat has no degradation for the most air delivered per input power



### UltraCoat

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 delivers longer life and 10% energy savings

## Limitless starts and stops

Nirvana is designed to start and stop limitlessly to meet your compressed air demands while never going above full-load amps. HPM motor technology also has unmatched efficiency throughout the turn-down range, providing savings no matter what your demand profile requires.

## No wasted energy

The Nirvana HPM motor requires less power at start-up, never operates at more than full-load amps, and shuts down immediately at minimum speed to avoid wasted energy. Nirvana ensures constant pressure throughout the entire operating range. At start-up, induction motors require a power surge of up to twice full-load current in order to overcome initial inertia. They also run unloaded when demand is below minimum, reducing efficiency and driving up energy costs.

## Proven airends

Our rotary-screw airends deliver full potential through unparalleled rotor profile accuracy and repeatability. Stainless-steel rotors are used in the demanding second stage for maximum corrosion resistance. UltraCoat surface coating is also applied to the rotors and all housing surfaces for unmatched durability and performance.

## Simpler and more reliable

The Nirvana HPM motor has fewer moving parts, and flanges directly onto the compressor drive shaft, making the motor more reliable and 100% maintenance-free. Its bearing-free design eliminates the need for greasing or replacing motor bearings. The HPM motor is also designed to operate continuously in temperatures up to 115° F (46° C).



A revolutionary motor coupled with advanced controls and proven compressor technologies

50 Hz								
Model (HPM Style)	Nominal kW	Free Air Delivery-m <sup>3</sup> /min(cfm)			Length mm	Width mm	Height mm	Weight kg
		7 bar g	8.6 bar g	10.3 bar g				
IRN37K-OF	37	5.66(200)	5.07(179)	4.50(159)	2080	1120	2030	1632
IRN45K-OF	45	6.7(237)	6.20(219)	5.61(198)	2080	1120	2030	1632
IRN55K-OF	55	9.37(331)	8.47(299)	7.62(269)	2080	1320	1950	2045
IRN75K-OF	75	12.32(435)	11.33(399)	10.42(369)	2080	1320	1950	2045
IRN90K-OF	90	15.40(544)	13.70(484)	12.10(428)	2570	1830	2440	3222
IRN110K-OF	110	18.80(664)	17.10(604)	15.40(544)	2570	1830	2440	3222
IRN132K-OF	132	22.30(787)	20.40(720)	18.60(657)	2570	1830	2440	3222
IRN160K-OF	160	25.60(904)	24.40(862)	22.80(805)	2570	1830	2440	3222

(1) FAD (Free Air Delivery) m<sup>3</sup>/min are ratings of full package performance in accordance with CAGI-PNEUROP acceptance test standard PN2CPTC2 or ISO1217: 1996 Annex C.

(2) For detailed technical specifications please refer to our technical offer.

## 37-300 kW Fixed Speed, Oil Free Rotary Screw Compressor



### The reliable workhorse

Since its introduction in 1993, the Ingersoll Rand oil-free rotary-screw compressor has earned a reputation for being a highly reliable supplier of pure air.

Its rugged design sets the standard for efficiency and durability. With an Ingersoll Rand oil-free rotary screw compressor in your operation, you benefit from knowing you can run 24/7 with virtually no downtime.

### Advanced two stage airend design

- Time proven oil-free two-stage airend combined with innovative, market leading Nirvana HPM motor
- Rotors coated with UltraCoat - the most durable rotor coating available



- Superior technology
- Oil-free heritage
- Stainless-steel HP rotor
- Inlet valve superiority
- Dual-vented seals

50 Hz Sierra 200-300 kW Performance

kW	Free Air Delivery-m <sup>3</sup> /min			Length mm	Width mm	Height mm	Weight kg
	SL 7 bar g	SM 8.5 bar g	SH 10 bar g				
37	6.0 (211)	5.1 (181)	NA	2248	1372	1914	2410
45	7.6 (268)	6.5 (230)	NA	2248	1372	1914	2560
55	9.6 (339)	8.6 (303)	*7.7 (272)	2248	1372	1914	2600
75	12.5 (442)	11.6 (410)	*10.7 (378)	2248	1372	1914	2705
90	15.9 (564)	13.6 (480)	13.0 (459)	2692	1588	2362	3195
110	19.4 (684)	18.0 (636)	15.3 (543)	2692	1588	2362	3250
132	22.8 (804)	21.4 (756)	18.8 (664)	2692	1588	2362	3430
150	25.9 (914)	24.6 (869)	22.1 (780)	2692	1588	2362	3430
200	35.0 (1236)	32.6 (1153)	27.4 (969)	3050	1930	2440	4186
250	45.2 (1598)	40.5 (1430)	35.5 (1254)	3050	1930	2440	4766
300		43.3 (1530)		3050	1930	2440	4902

- (1) FAD (free air delivery) m<sup>3</sup>/min are ratings of full package performance in accordance to CAGI-PNEUROP acceptance test standard PN2CPTC2 or ISO1217: 1996 Annex C..
- (2) \*Available in water cooled configuration only.
- (3) Above models are available with stand alone VFD (Variable Frequency Drive) as option.
- (4) For detailed technical offer, please refer to our technical offer.
- (5) Models performance is with standalone VFD. Models S250 and S300-VSD include the inverter shipped loose for mounting in motor control room or location of customer preference. Inverter Unit is pre-engineered for plug-and-play and is 2000 mm H x 600 mm W x 538 mm D.

### UltraCoat™ - energy savings and longer life

Surface preparation creates minute crevices in our rotors and housing that tightly grip 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.



## Industrial Star (IndStar)

### Reciprocating Oil-Free Air Compressors

The Ingersoll Rand industrial star range Oil-Free Compressor Packages are self contained compressed air power plants, engineered into an unusually compact skid mounted unit that has everything you need, to generate dependable low-cost air power. There is nothing more to buy or install.

The completely assembled unit with interconnecting piping and cabling is factory tested and eliminates costly start-up delays due to elaborate installation and commissioning at site, incorrectly placed accessories, defective switches, lost components etc.

The compact unit is easy to install, occupies less floor space and is equipped so as to offer a single point water inlet / outlet connection and air outlet connection.

Available in Oil-Free construction, these packages are economical to use on account of its lower installation costs, lower maintenance as well as operating costs. The standard package includes a compressor, Vee belt drive & belt guard, electric motor, vertical after cooler & air receiver with standard fittings, starter and control panel with adequate safety shutdown systems, necessary piping & hardware, and with optional air dryer and compressed air filters.



50 Hz Industrial Star 20-240 HP Performance

Model	Discharge pressure PSIG	Motor HP	Capacity m <sup>3</sup> /min (cfm)
IS 1-20	100	20	1.91 (68)
IS 1-30	100	30	2.96 (104)
IS 1-40	100	40	4.20 (148)
IS 1-50	100	50	5.12 (181)
IS 1-60	100	60	6.42 (227)
IS 2-75	100	75	8.74 (309)
IS 2-100	100	100	11.96 (423)
IS 2-125	100	125	14.88 (526)
IS 2-150	100	150	18.3 (647)
IS 2-180	100	180	22.3 (788)
IS 2-215	100	215	26.22 (927)
IS 2-240	100	240	28.25 (998)

- Atmospheric pressure : 14.7 PSIA, Temperature - 95°F & 70% RH considered
- Cooling water inlet temperature 32°C considered & cooler CTD will be 20°F
- The performance is at the compressor discharge flange
- The performance is subjected to tolerances as per test standard

50 Hz Industrial Star 20-240 HP Performance

Model	Discharge pressure PSIG	Motor HP	Capacity m <sup>3</sup> /min (cfm)
IS 1-20H	125	20	1.64 (58)
IS 1-30H	125	30	2.56 (90)
IS 1-40H	125	40	3.61 (128)
IS 1-50H	125	50	4.57 (161)
IS 1-60H	125	60	6.75 (238)
IS 2-75H	125	75	8.38 (296)
IS 2-100H	125	100	11.07 (391)
IS 2-125H	125	125	13.68 (483)
IS 2-150H	125	150	17.08 (603)
IS 2-180H	125	180	19.81 (700)
IS 2-215H	125	215	24.40 (862)
IS 2-240H	125	240	26.8 (947)



## AIR Star (For high pressure applications)

AIR Stars are reciprocating type, water cooled air compressor designed for continuous duty applications in air separation industry. The air compressor are designed to deliver required volume of air at high discharge pressure, in the range of 35–45 bar g for air / Oxygen separation application.



Model	hp	Motor kW	507 psig (35 bar g) acfm m <sup>3</sup> /min	580 psig (40 bar g) acfm m <sup>3</sup> /min	650 psig (45 bar g) acfm m <sup>3</sup> /min
A. S.4.180	180	134	440	439	439
A. S.4.200	200	149	493	493	492
A. S.4.215	215	160	512	511	511
A. S.4.240	240	179	586	586	586
A. S.4.270	270	201	649	649	648
A. S.4.300	300	224	-	-	749
A. S.4.350	350	260	-	-	906
A. S.4.400	400	300	-	-	1013
A. S.P.B.600	300-300	224-224	-	-	1454
A. S.P.B.800	440-370	330-275	-	-	1953

## LP Star (For low pressure applications)

Presenting Ingersoll-Rand's highly reliable and packaged solution for low pressure oil-free compressed air systems requiring flows from 707 to 1322 ACFM. It comes with skid mounted package complete with motor, starter and PPLC based control panel fully tested and ready to use. With its advance pre-programmed controller the LP Star package offers flexibility for future compressed air system requirements, as well as integration with other components in management of total compressed air system operations.



LP Star Package option

Model	30 psig m <sup>3</sup> /min (cfm)	35 psig m <sup>3</sup> /min (cfm)	40 psig m <sup>3</sup> /min (cfm)	45 psig m <sup>3</sup> /min (cfm)
LPS-1000	17.9 (631)	17.5 (617)	17.1 (603)	16.7 (589)
LPS-1200	21.4 (757)	21.0 (740)	20.5 (723)	20.0 (707)
LPS-1400	25.9 (915)	25.3 (894)	24.8 (874)	24.2 (855)
LPS-1700	31.1 (1097)	30.4 (1072)	29.7 (1048)	29.0 (1025)
LPS-1900	34.1 (1204)	33.0 (1169)	32.2 (1136)	31.3 (1104)
LPS-2200	40.9 (1443)	39.7 (1402)	38.6 (1362)	37.4 (1322)

Model	50 psig m <sup>3</sup> /min (cfm)	55 psig m <sup>3</sup> /min (cfm)	60 psig m <sup>3</sup> /min (cfm)	65 psig m <sup>3</sup> /min (cfm)
LPS-900M	16.3 (576)	15.9 (563)	15.6 (551)	15.2 (538)
LPS-1100M	19.6 (691)	19.1 (676)	18.7 (661)	18.3 (646)
LPS-1400M	26.9 (949)	25.9 (913)	24.9 (878)	23.9 (844)

Model	ACFM	Nominal Capacity m <sup>3</sup> /hr
LPS 125	707	1,201
LPS 150	924	1,569
LPS 175	1,025	1,741
LPS 200	1,236	2,100
LPS 215	1,322	2,247

Pressure range available 30-45 psig

- LPS-xxx models (30 to 45 psig) shall use standard channel valves and standard FT rings.
- Bare compressor offered as standard.
- LPS-xxxM models (50 to 65 psig) shall use Hoerbiger valves and CPI ring.
- Package performance.

## Air Quality Guide



### ISO 8573.1 Air Quality Classes

Maintaining air quality is so important that the International Standards Organization (ISO) developed six compressed air quality classes, as defined by ISO 8573.1. To determine which industry classification you require, ask yourself these simple questions:

- Does compressed air quality affect my production process and the quality of my end products?
- Will poor compressed air quality decrease my productivity, cost-savings and product quality standards?
- What internal and external ambient conditions affect the quality of my compressed air produced by my system?

### ISO Air Quality Standards

Air quality ratings have three parts : 1. Solids 2. Water 3. Oil

Each part has a class level ; for example, referring to the chart below, an ISO class 6.1.3 has a 5 micron solid particle size limit, a -70°C pressure dew point limit, and a 1 mg/m<sup>3</sup> oil limit.

### ISO 8573-1:2001

Quality Class	Particle Size (micron)	Concentration (# part/m <sup>3</sup> )	Dew Point		Oil Carryover (mg/ m <sup>3</sup> )
			(°C)	(°F)	
0	As specified by the user, and more stringent than Class				
1	0.1 - 0.5 0.5 - 1.0	100	-70	-94	0.01
2	1.0 - 5.0 0.1 - 0.5 0.5 - 1.0 1.0 - 5.0	0 100,000 1,000 10	-40	-40	0.1
3	0.5 - 1.0 1.0 - 5.0	10,000 500	-20	37	5
4	1.0 - 5.0	1,000	3	37	5
5	1.0 - 5.0	20,000	7	45	
6	5	5	10	45	
7	40	10			

Point of use Filter only; Pre & After Filters

Dirt Particle Filter; Dust Filters & After Filters

Desiccant Dryer; HL, EH, HB dryers

Refrigerated Dryer; TSC Series

High Efficiency Coalescing Filter; After Filters & Activated Carbon Filters

Standard Efficiency, Coalescing Filter, Mist Elimination; NL Module & After Filters

Particulate / oil; NL Module

### Industry Standards

ISO Class	Application
2.1.1	Instrumentation, process, oil and gas, chemical electronics
2.2.1	Instrumentation, process, oil and gas, chemical electronics
2.4.1	General manufacturing, metal stamping, air tool use, forging, assembly, painting and finishing
2.6.1	Sand blasting, home use, construction

# Air Treatment Accessories

## Refrigeration Air Dryers

The 'D' Refrigerated Dryer Range – one range for all applications.

These units provide a small footprint with complete, affordable solutions for applications ranging from dry cleaning to automotive body shops, to light processing and manufacturing applications.

The high capacity units are designed for large-scale industrial, automotive and petrochemical applications.

### Features

- Consistently delivers dry process air with minimal drop
- Microprocessor control with easy-to-use graphic interface lets you adjust and manage system parameters easily and efficiently
- Design use environment friendly refrigerants
- A fully adjustable programmable electronic drain valve helps minimize air loss



Model	Rated Flow* cfm	Length mm	Width mm	Height mm
D1200IN-N	706	754	1318	1440
D1700IN-N	1000	754	1318	1440
D2200IN-N	1295	754	1318	1440
D2700IN-N	1589	754	1318	1440
D3600IN-N	2119	1321	1510	1571
D4200IN-N	2472	1321	1510	1571
D5300IN-N	3120	1321	1510	1571
D6000IN-N	3531	1321	1510	1571

\* Rated at 45°C inlet temp, 35°C ambient temp and 7 bar g working pressure.

- Maximum pressure 16 bar g (12 bar g for D950)
- Correction factors to be used for other operating conditions
- Above models are available in water cooled version also
- Maximum allowable inlet temp 55°C, Maximum allowable ambient temp 45°C

## HOC Dryers

Heat-of-compression (HOC) dryers are dual tower, desiccant designs. These dryers recover the heat that is a natural by-product of the compression process. This "free" heat is utilized in the air drying process to provide moisture-free air while consuming virtually no energy.



- Ingersoll Rand HOC dryers, both H-Series and HC-Series, are the world's simplest, and most reliable regenerative dryers.
- Heat-of-compression dryers are the most cost-effective means to protect air lines, tools and expensive instrumentation. Consumes less than 24 watts – the equivalent of a light bulb.
- Productivity: The HOC dryer can prevent productivity losses due to contamination throughout your operation by delivering a continuously low dew point range depending on the operating conditions.
- HOC dryers are designed to protect the health and safety of the operators and the environment in which they are installed.

Model	Flow rate nm <sup>3</sup> /hr	cfm
HC7	1089	677
HC9	1345	836
HC14	1937	1204
HC21	3024	1880
HC30	4356	2708
HC41	5920	3680
HC54	7744	4814
HC69	9801	6093
HC85	12100	7522
HC103	14640	9101
HC122	17424	10832
HC143	20449	12712
HC166	23716	14743

\* Rated at 107°C inlet temp, 35°C ambient, 30°C cooling water inlet temp and 100 psig working pressure

- Maximum working pressure is 10.3 bar g

Model	Flow rate nm <sup>3</sup> /hr	cfm
H8	1192	741
H10	1509	938
H13	1863	1158
H19	2682	1667
H30	4189	2604
H43	6032	3750
H58	8212	5105
H75	10725	6667
H95	13573	8438
H18	16758	10418
H142	20278	12606
H170	24132	15002

## Desiccant Dryers



Heatless (HL series)  
120 - 1800 scfm  
@100 psig



Externally Heated (EH series)  
400 - 2100 scfm  
@100 psig



Heated Blower (HB series)  
1000 - 8000 scfm  
@100 psig

All of our desiccant dryers are designed with energy efficiency, reliability, productivity and safety in mind:

- Engineered for low pressure drop through valve selection, tower size and filter design Optional Energy Management System (EMS) reduces purge consumption while maintaining a constant dew point, monitors the dew point and extends the dryer cycle, greatly reducing energy costs
- Large sound attenuating purge mufflers minimize noise and include built-in relief valves to enhance safety
- Low profile places valves at operator's level and provides ready access to fill and drain ports, increasing operator safety and ease of maintenance
- Pre-filter and after-filter protect desiccant and downstream air from oil contamination and particulates to help improve air quality, increasing productivity
- Easy to replace stainless steel desiccant screen keeps downtime to a minimum
- Heater and/ or blower controlled by outlet regeneration temperature that shuts off to save electrical power once desiccant has been thoroughly regenerated (available with EMS on heated dryers)

Note: For Desiccant Dryers models and capacities please contact Ingersoll Rand sales team

## Compressed Air Filters

Proactive time-based replacement of your air filter reduces energy use, the largest percentage of your filtration operating costs (78%) – unlike the traditional reactive approach that focuses only on element change out cost (13%).

### Benefits for You:

A New, Easy-to-use, Proactive Approach

The Element Replacement Indicator is truly elegant in its simplicity: after six months of use, it provides a visual warning through an integral indicator to replace the element. That's it! How can such a simple solution provide such tremendous benefits? Easy.... with traditional usage-based systems, the focus is on extending filter element life – until the element is clogged to a predetermined level. This reactive mind set neglects the high energy costs associated with clogged filters and ignores the overwhelming economics of the proactive time based Element Replacement Indicator.



Filter Grade G/ H/ A/D	Flow Rates@7 bar g (100 psi g) m <sup>3</sup> / hr (cfm)	Pipe Size
Grade F 35	35 (21)	G1/ 2
Grade F 35	71 (42)	G3/ 4
Grade F 108	108 (64)	G3/ 4
Grade F 144	144 (85)	G1
Grade F 178	178 (105)	G2
Grade F 212	212 (125)	G3
Grade F 395	395 (232)	G11/ 2
Grade F 424	577 (340)	G11/ 2
Grade F 577	577 (340)	G2
Grade F 791	791 (466)	G2
Grade F 985	985 (580)	G2
Grade F 1155	1155 (680)	G3
Grade F 1529	1529 (900)	G3
Grade F 817	1817 (1070)	G3
Grade F 2123	2124 (1250)	G3
Grade F 2378	2378 (1400)	G3

# Air System Controller

## Non Lubricated Module (NLM)



Range: 500- 8000 cfm  
 Maximum Working Pressure: up to 10 barg  
 The Top- Performing filtration module, Ingersoll Rand's NL Module is the best long-term buy compressed air filtration. It provides true oil-free air while requiring virtually no maintenance or added cost for throwaway filter elements. Its high quality design means no system downtime from premature failure of poorly constructed elements.

The NL Module is a self-cleaning, coalescing – type filter separator designed to remove oil and water aerosols with a minimum of pressure drop. Its special fiberglass filtration system is capable of removing aerosol down to 0.5 parts per million by weight.

This reliable, remarkably efficient filter offers the following features:

- The unique pleated element design results in element life of up to 3 years under normal service.
- Based on field experience, expected pressure drop after 3 years is approximately 1.0 psig.
- It collects particles greater than 3 microns at 100 % efficiency and filters out particles down to 0.1 at 99.98 %. Non –Lube Module date: 99.99999% D.O.P.
- Efficiency: Removes oil and water liquid / mist down to 0.5 PPM by weight.

Model	Flow Rate at 100 psig CFM	Delta P Indicator	Inlet/ Discharge
F850NG	500	Standard	3" BSPT
F1360NG	800	Standard	3" BSPT
F1870NG	1100	Standard	3" BSPT
F2550NG	1500	Standard	DN100 FLG
F3220NG	1895	Standard	DN100 FLG
F4070NG	2400	Standard	DN100 FLG
F5100NG	3000	Standard	DN100 FLG
F7600NG	4472	Standard	DN150FLG
F10200NG	6000	Standard	DN200FLG
F13600NG	8000	Standard	DN200FLG

## X-Series Automation



A Better Way to View Your System, simply add a VX module to any X8I or X12I network, complete some basic configuration, connect to your Local Area Network (LAN) or directly to a PC and view your compressed air system on your computer monitor. No special software is required.

With X-Series System Visualization you can monitor critical system and equipment parameters, drill down to individual compressors to view operational status and be alerted to any alarm messages. Complete system viewing from a local or remote PC has never been easier.

### Benefits

- Convenient remote view of system and equipment status
- Critical parameter monitoring and fault notification
- Parameter graphing and trending
- System performance reporting and operating summaries
- Historical event recording
- Equipment maintenance scheduler
- Easy connection to the X-Series control network
- No special software to buy or maintain

Model	Description
X4I	Controlling up to 4 compressors
X8I	Controlling up to 8 compressors
X12I	Controlling up to 12 compressors

# Pressure Controller

## IntelliFlow™ Variable Flow & Constant Pressure Controller



In a properly audited compressed air system an Ingersoll Rand IntelliFlow system pressure controller can lower demand system pressure significantly. By performing an audit on a compressed air system, the lowest possible operating air pressure will be learned. Using this knowledge, proper storage and IntelliFlow's unique ability to meter compressed air at a constant pressure, overall demand side pressure can be lowered.

By lowering demand side pressure, leaks will consume less compressed air, thus saving considerable energy.

### Salient Features

- Increase your facilities reliability and productivity by providing consistent tight downstream pressure control
- Significantly reduce energy consumption by reducing flow through leaks and artificial demand
- Eliminate compressed air interruptions by allowing compressors sufficient time to react to events

## Air Receiver

We need an Air Receiver for...

- Adequate Storage to maintain pressure
- Maintain the required flow rate without significant pressure decay
- Primary receiver – Isolate the compressor from demand events
- Reduce/eliminate compressor cycling
- Allow the compressor to remain unloaded for a longer time
- Backup for compressor failure



Model	Diameter mm	Height mm	Weight (kg)
0.5M <sup>3</sup>	610	2032	175
1.0M <sup>3</sup>	762	2526	330
1.5M <sup>3</sup>	914	2588	569
2.0M <sup>3</sup>	914	3503	775
2.5M <sup>3</sup>	1067	3681	825
3.0M <sup>3</sup>	1067	3881	945
4.0M <sup>3</sup>	1422	3104	1350
5.0M <sup>3</sup>	1422	3805	1620
10.0M <sup>3</sup>	1676	5278	3089

- Air receiver manufactured as per BS5169 STD.
- Contact us for any non-standard/high pressure receiver requirements

## Condensate Management

Compressed air waste due to drain operation is often a major source of energy costs. Condensate often contains aggressive contaminants which makes conventional drain traps unreliable or high maintenance items. In most applications, a perfectly chosen drain valves saves enough compressed air to pay for itself in six months or less.

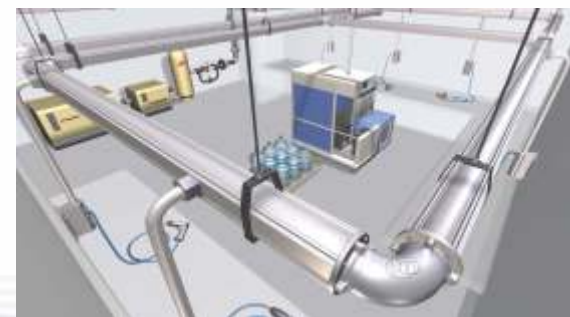
## Air Distribution Solutions



Simplair. Simplicity, Versatility, Performance In One Integrated System



SimplAIR Easy Line



SimplAIR Evolution

In the past, compressed air users have been burdened by the limitations of traditional piping systems – difficult installation and modification, poor air quality, and high-pressure losses are all common problems. Now, Simplair solves these problems with its unique 20 mm to 150 mm Piping System that makes installation fast, simple, and economical.

Thanks to a revolutionary design, Simplair means big benefits for your business like:

- Low operation costs
- Fast installation
- Simple connections
- High flow performance
- Low pressure drip
- Outstanding structural strength
- Lightweight components
- Non-corrosive

Constructed of anodized aluminum extrusion, Simplair is a modular piping system that's ideal for compressed air installations of any size. Yet despite its quick, easy assembly, Simplair offers unexpected flow rates of up to 8,000 cfm for compressor room applications and 16,000 cfm for most factory loop systems.

With Simplair, you gain advantages formerly unheard of in integrated piping systems.

### Advantages

<i>Flexible Design</i>	<i>Simplair's modular design means quick, easy installation. Even system modifications can be completed in seconds, minimizing downtime.</i>
<i>Superior Performance</i>	<i>The smooth bore of tubing prevents high-pressure losses, and allows higher flow rates than traditional piping systems.</i>
<i>Easy Expansion</i>	<i>Because outlets and connections can be made in seconds, expansion is simple with minimum cost and production disruptions.</i>
<i>High Air Quality</i>	<i>Each tube is anodized to prevent corrosion from forming inside pipes, affording contaminant-free air throughout the system.</i>
<i>Leak-Free Seals</i>	<i>Our positive "O" ring seal ensures that leaks will not occur at any stage of the system's life.</i>
<i>Lightweight Material</i>	<i>Simplair offers the same structural strength of traditional piping, but with less than a quarter of the weight, making it the perfect choice for roof structures, walls or machinery.</i>
<i>Sleek Appearance</i>	<i>Ergonomically designed to fit the demands of modern production facilities, Simplair can enhance any working environment.</i>

## Audit Solutions

### Air Audit: What's in it for me?

The problems associated with operating a modern compressed air system are fairly complex and often camouflaged to the untrained eye. At the same time, many companies have cut back the internal resources dedicated to defining and solving those problems. That's where a professional Air Audit can help by addressing the total process of producing compressed air... not just the compressors.

Air Audits help plant operators optimize their systems and often result in turning off compressors! This may sound crazy, but it's true.

- Reduced operating costs
- Improved manufacturing productivity & Reduced capital spending

### Remote Monitoring

Remotely monitoring the real time performance of the compressor plant installed at customer's premises and observe/ analyze the operating parameters, alarms history & graphical trending to not only provide faster and prompt service support but also help give proactive suggestions." An alarm or fault warning from the compressor's controller can notify an Ingersoll Rand service representative within seconds".

### Advantages

- Reduced down time and possibility of eliminating service call and saving cost
- Pro-active actions possible and keeping track of the health of the machines becomes easy
- Speedy planning and resource arrangement in case counter actions are required
- Easier trouble shooting/ diagnosis and Remote-technical support becomes easy



### Operations & Maintenance (O&M) contracts

Ingersoll Rand takes the overall responsibility of the compressed air system installed at customer's plant by not only maintaining but also operating it 24x7x365 through 'Operation & Maintenance Contracts' with or without parts. O&M contracts are designed based on customized need of Customers for Ingersoll Rand and Non-Ingersoll Rand compressors.

Outsourcing O&M to Ingersoll Rand means, we take care of complete plant management for compressed air system. This helps customer to concentrate on their core business and other activities by allowing the experts to take care of the compressed air systems of the plant.

### PackageCare™ - Eliminate the inconvenience: The easiest way to protect your air system and budgets is PackageCare

Much more than Extended Warranty, is a Long-Term Comprehensive Service Contract covering visits of expertly trained service engineers, consumables and all parts including wear tear and breakdowns, if any. Moreover, it's at fixed and predictable cost.

