

Ingersoll Rand

Air Filtration



Innovation

Reliability

Efficiency

You, Your Company and Our Environment

Ingersoll Rand

Ingersoll Rand's next generation of compressed air filters features our new Element Replacement Indicator (ERI) – an illuminating approach to filter maintenance that yields real, measurable benefits for you, for your company and for our environment.

As the world's leading air treatment technology company, Ingersoll Rand set out to find a better way. The solution: re-defining compressor air filter performance and maintenance using proactive time-based element replacement.

For You... The new Ingersoll Rand filter provides the ideal platform for an easier, more reliable and fully predictable maintenance schedule. By using a unique time-based approach, the ERI provides an easily visible indication to replace the filter element at the optimal time (bi-annually) to avoid high pressure drop and minimise energy consumption. In addition, the unique fit between the element and the filter body allows for a no-touch, no-hassle change out process that is quick and clean for you and your colleagues.

For Your Company... A standard schedule for element replacement significantly lowers your pressure drop loss across your air system. This leads to a more efficient air system with reduced energy consumption as well as providing a higher return on your filtration investment, and ultimately, longer compressor life.

For Our Environment... The environment is yours and ours...we all have a stake in making it the best we can, while remaining at necessary levels of productivity. For our environment, and yours, the ERI is a truly green solution: it reduces energy consumption and carbon footprint.

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.



From Reactive to Proactive

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:

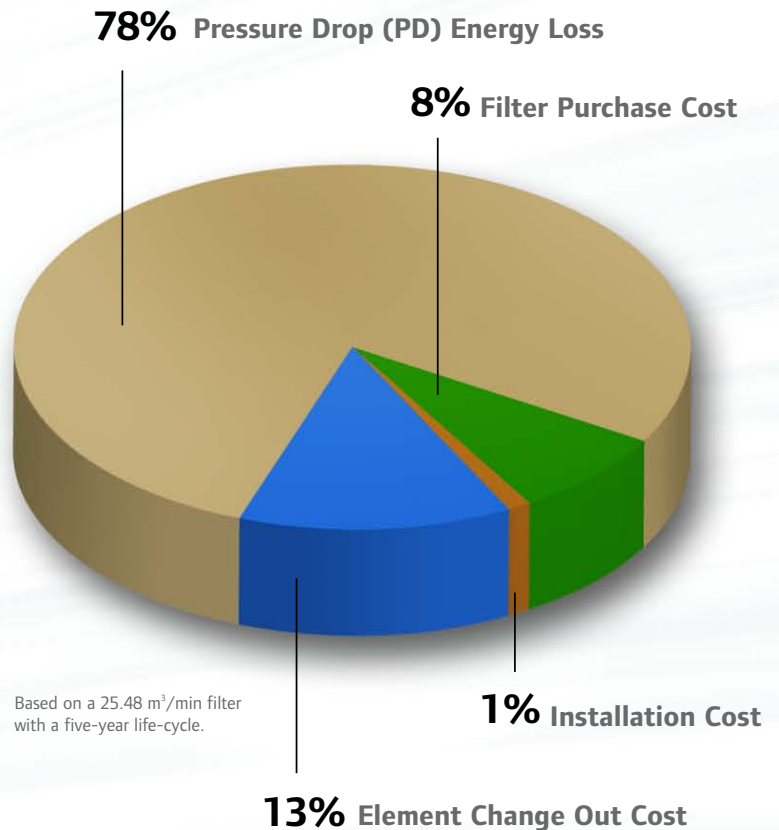
A New, Easy-to-use, Proactive Approach

The ERI 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 a proactive time-based approach. Traditional usage-based systems focus on extending the life of the filter element - the filtration system's least expensive component - to the point when the element is completely clogged. This reactive mindset neglects the high energy costs associated with clogged filters and ignores the overwhelming economics of the proactive time-based ERI.

Benefits for Our Environment:

Reduced Energy Use, Reduced Emissions

The reactive approach to air filtration only focuses on element change out, which represents 13% of overall cost. Our new filter technology reduces pressure drop energy losses, representing 78% of overall cost, by ensuring filter replacement before the pressure drop rises exponentially. This also results in lower emissions, longer compressor life and higher production quality. The new filters also deliver air quality in accordance with ISO 8573.1: 2001 when tested with the stringent requirements of the new ISO 12500-1 international standard for Compressed Air Filter Testing.



Benefits For Your Company:

Time is on Your Side, and Money is, Too!

The examples below indicate the kinds of typical savings that can be achieved through Ingersoll Rand's time-based filtration technology. While your operation may differ in detail, the basics still apply: proactive time-based technology generates substantial savings over traditional reactive approaches.

How does it work?

When the filter element is initially installed, the ERI flashes briefly, and then turns off. After six months, it automatically flashes to indicate that it's time for replacement. Seventy two hours later, the indicator stays illuminated continuously... alerting everyone within view that replacement is necessary! It's that simple, that reliable.

Net Energy Cost saving of €770

Typical Pressure Drop Energy Cost savings

150 kW Compressor with 1.1 Service Factor

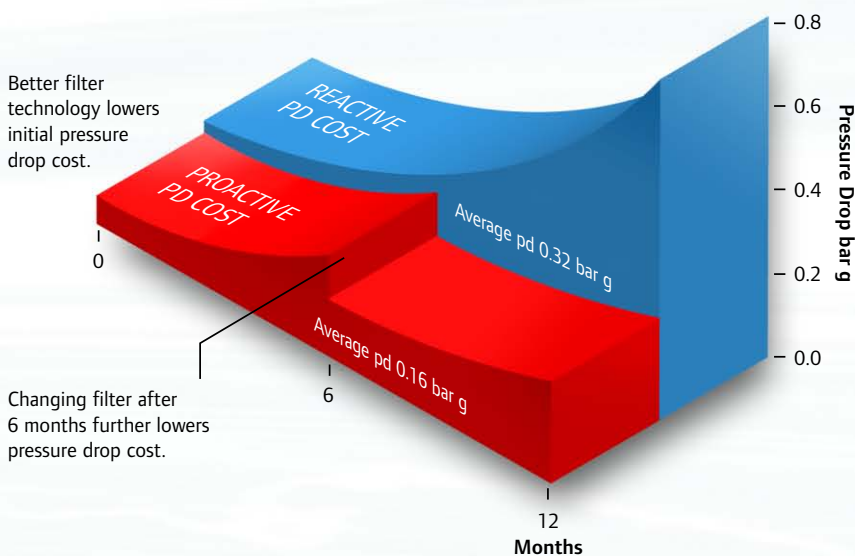
x 0.5% (0.07 bar g = 0.5% of power source)

x 8000 hrs

x €0.07/kWhr

x Average pressure drop

| | |
|-----------------------------|---------------|
| Reactive pressure drop cost | €1475 |
| Proactive pressure drop | - €705 |
| | <u>= €770</u> |



Note: The example above is of a typical coalescing filter providing filtration for a 150 kW compressor.

No-touch, No-hassle Element Change Out

A unique zero-clearance design with safety lock enables the user to remove the filter body's lower half and merely dispose of the old element... never touching the element itself. Standard element maintenance is an easy bi-annual event.



1. Turning the filter bowl anti-clockwise disengages the element from the filter head, allowing it to drop down into the bowl.



2. Simply remove the old dirty element out of the bowl and properly dispose.



3. To install a new element, simply place it into the bowl and screw the bowl back to the head of the filter body.

Enlightened Filtration Technology

Ingersoll Rand delivers next-generation improvements in filter performance, efficiency, reliability and quality.

Element Replacement Indicator (ERI) **A**

A visual indication of when it's time to change the filter element rated to IP55 and powered by (2) standard AA batteries.

Smooth Corners **B**

90° elbow to direct air into the filter element, significantly reducing turbulence and pressure losses.

High Efficiency Drainage Layer **C**

Improved liquid drainage properties and excellent chemical compatibility.

Deep Pleating **D**

Reduces air flow velocity within the media – lower flow velocities improve filtration efficiency and reduce pressure losses.

Flow Diffuser **E**

Provides turbulent-free distribution of air flow throughout the filter element.

Low Profile Endcap **F**

Removes coalesced liquid from the air flow path increasing liquid removal efficiency and providing more usable filtration surface area.

Surface Tension Breakers **G**

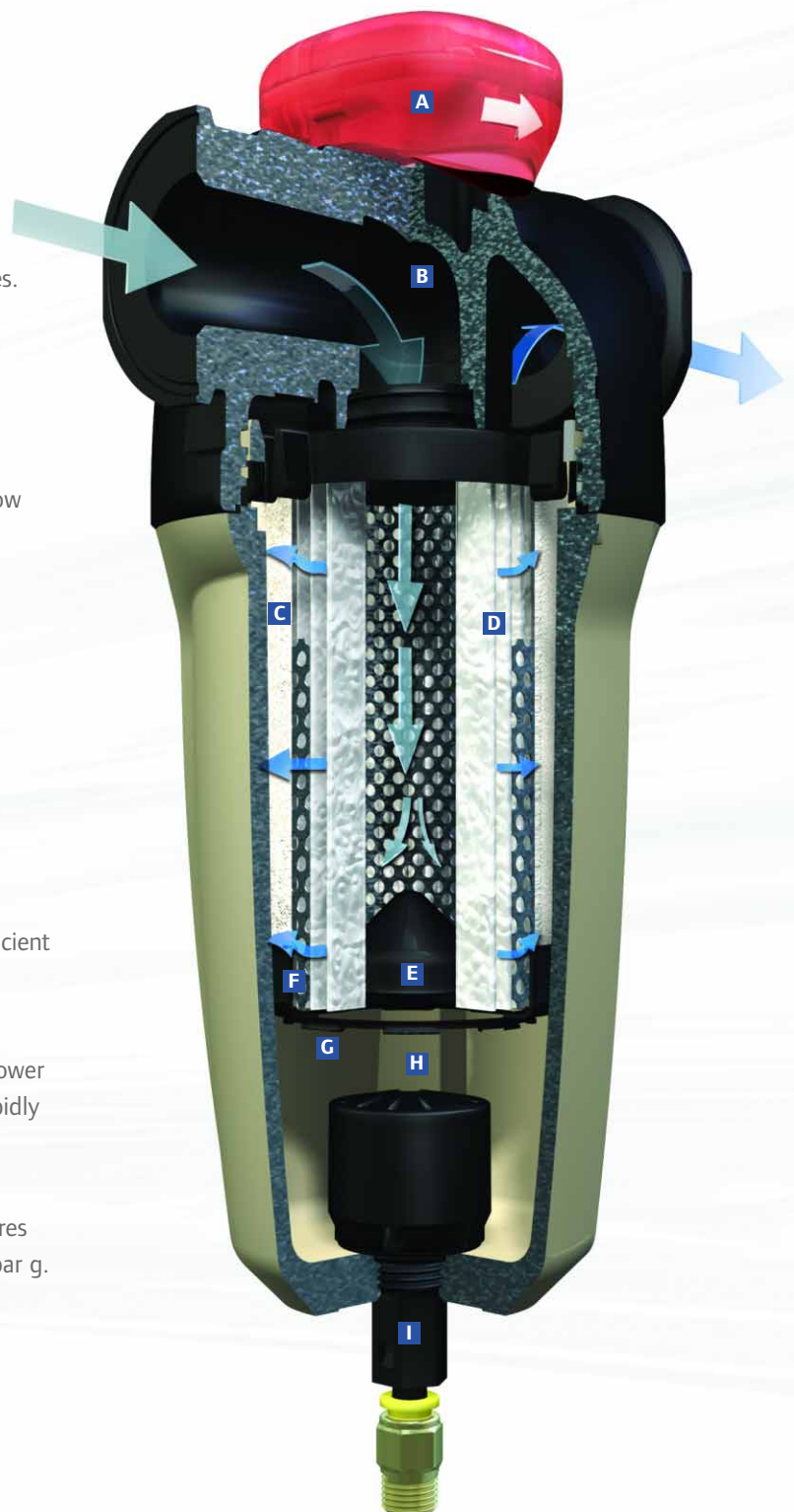
Prevents liquid from sticking, resulting in fast and efficient drainage of coalesced liquids.

Drainage Ribs **H**

Vertical ribs cast into the filter bowl compress the lower part of the filter element allowing bulk liquid to rapidly drain away.

Drain **I**

Reduces contamination clogging by 75% and features higher temperature and pressure ratings 80°C/17 bar g.



Filters...just the way you need them

All of this great new technology wouldn't provide value if we didn't deliver it in precisely the filter type you need. That's why we offer dust filters, general purpose filters, coalescing filters and activated carbon filters.

Specifications

| Filter Grade A, G, H, D | Port Size BSPT in | Flow Rates 7 bar g/100 psig | | Dimensions | | | | Weight kg |
|----------------------------|-------------------------|--------------------------------|--------|------------|---------|---------|---------|--------------|
| | | m ³ /min | cfm | A mm | B mm | C mm | D mm | |
| F35 I | 1/2" | 0.58 | 21 | 76 | 46 | 205 | 25 | 1 |
| F71 I | 3/4" | 1.18 | 42 | 98 | 53 | 261 | 32 | 1 |
| F108 I | 3/4" | 1.80 | 64 | 98 | 53 | 261 | 32 | 1 |
| F144 I | 1" | 2.40 | 85 | 129 | 61 | 290 | 38 | 2 |
| F178 I | 1" | 2.97 | 105 | 129 | 61 | 290 | 38 | 2 |
| F212 I | 1" | 3.53 | 125 | 129 | 61 | 290 | 38 | 2 |
| F395 I | 1 1/2" | 6.58 | 233 | 129 | 61 | 381 | 38 | 3 |
| F424 I | 1 1/2" | 7.07 | 250 | 129 | 61 | 381 | 38 | 3 |
| F577 I | 2" | 9.62 | 339 | 170 | 74 | 500 | 51 | 6 |
| F791 I | 2" | 13.18 | 466 | 170 | 74 | 500 | 51 | 6 |
| F985 I | 2" | 16.42 | 580 | 170 | 74 | 500 | 51 | 6 |
| F1155 I | 3" | 19.25 | 680 | 205 | 86 | 572 | 57 | 12 |
| F1529 I | 3" | 25.48 | 900 | 205 | 86 | 673 | 57 | 14 |
| F1817I | 3" | 30.28 | 1,070 | 205 | 86 | 756 | 57 | 16 |
| F2124 I* | 3" | 35.40 | 1,250 | 205 | 86 | 912 | 57 | 18 |
| F2378 I** | 3" | 39.63 | 1,400 | 205 | 86 | 912 | 57 | 18 |
| Flange Size | | | | | | | | |
| F770 I | DN 50 | 12.8 | 450 | 285 | 85 | 500 | 300 | 8 |
| F1320 I | DN 65 | 22.0 | 780 | 285 | 90 | 690 | 300 | 11 |
| F2100 I | DN 80 | 35.0 | 1,235 | 340 | 100 | 880 | 300 | 16 |
| F2800 I | DN 100 | 46.0 | 1,620 | 485 | 333 | 1,264 | 300 | 125 |
| F4200 I | DN 125 | 70.0 | 2,800 | 630 | 375 | 1,274 | 300 | 196 |
| F5700 I | DN 150 | 95.0 | 3,300 | 630 | 395 | 1,384 | 300 | 210 |
| F7500 I | DN 150 | 125.0 | 4,400 | 676 | 414 | 1,434 | 300 | 264 |
| F9300 I | DN 150 | 155.0 | 5,400 | 724 | 449 | 1,503 | 300 | 314 |
| F11000 I | DN 200 | 185.0 | 6,500 | 724 | 461 | 1,503 | 300 | 320 |
| F14200 I | DN 200 | 240.0 | 8,400 | 885 | 515 | 1,565 | 300 | 530 |
| F19900 I | DN 250 | 330.0 | 11,600 | 950 | 525 | 1,573 | 300 | 670 |
| F31000 I | DN 300 | 520.0 | 18,400 | 1,050 | 645 | 1,702 | 300 | 1,083 |

*H only **A, G, D only

Grade A - Activated Carbon Filtration

Oil vapour and hydrocarbon odour removal, providing a maximum remaining oil content of <0.003 mg/m³ (excluding methane) @ 21 °C. (Precede with Grade H filter)

Grade G - General Purpose Protection

Particle removal down to 1 micron including coalesced liquid, water and oil, providing a maximum remaining oil aerosol content of 0.6 mg/m³ @ 21 °C.

Grade H - High Efficiency Oil Removal Filtration

Particle removal down to 0.01 micron including water and oil aerosols, providing a maximum remaining oil aerosol content of 0.01 mg/m³ @ 21 °C. (Precede with Grade G filter)

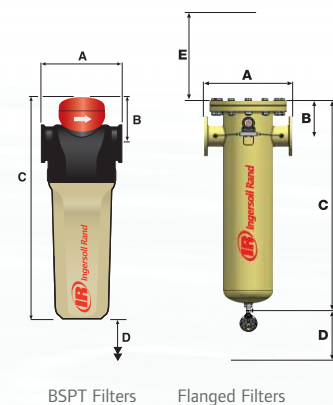
Grade D - General Purpose Dust Filtration

BSPT Filters: Dust particle removal down to 1 micron.
Flanged Filters: Dust particle removal down to 5 microns.

Maximum Operating Pressure
BSPT Filters 17 bar g (250 psig)
Flanged Filters 16 bar g (232 psig)

Minimum Recommended Operating Temperature = 1 °C

Maximum Recommended Operating Temperatures
Grade G, H & D = 80 °C
Grade A = 30 °C



| Line | bar g | 1 | 2 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 16 | 17 |
|--------------------|-------|------|------|------|------|------|------|------|------|------|------|------|
| Pressure | psig | 15 | 29 | 44 | 73 | 100 | 131 | 160 | 189 | 218 | 232 | 250 |
| Correction Factors | | 0.38 | 0.53 | 0.65 | 0.85 | 1.00 | 1.13 | 1.25 | 1.36 | 1.46 | 1.51 | 1.56 |



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.

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