

## **Electra-Saver® II**

Direct Drive, Slow Speed, Premium Quality  
Rotary Screw Compressors

40-200 HP 60 Hz, 45-112 kW 50 Hz



Experience Proven Results™

## Electra-Saver II Models



The **50 HP ELECTRA-SAVER II®** has the largest, most efficient airend in its class.



The **15-30 HP ELECTRA-SAVER II®** is shown tank-mounted.



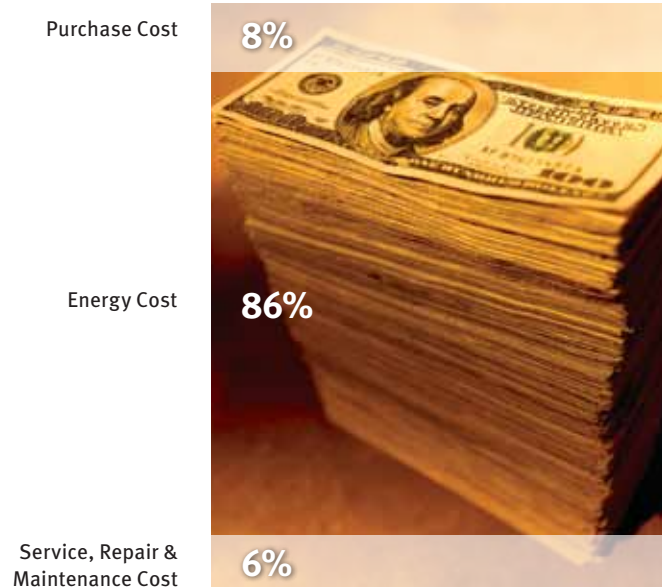
The **150 HP ELECTRA-SAVER II®** is a gearless, direct drive compressor built to provide results.

## Our Philosophy

### THE APPLICATION DRIVES THE COMPRESSOR TYPE

Many manufacturers try to sell one type of compressor for all applications. The truth is, compressor selection should follow an analysis of the application. One type of compressor does not fit all needs. That's why Gardner Denver® offers the broadest line of machines and control options in the industry. If you want the right compressor, you need choices. At Gardner Denver, we manufacture a variety of compressors for all your needs and applications.

### COST OF COMPRESSED AIR OVER 5 YEARS



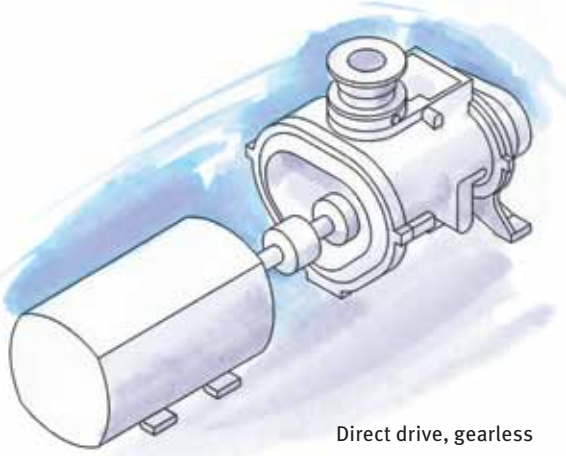
### HIGHER INITIAL COST, LOWEST TOTAL COST

At Gardner Denver, we know the Electra-Saver II® rotary screw air compressor will cost more to purchase than other brands. That's because Gardner Denver compressors are designed to be "low cost provider of air over the product's life" when all costs—energy, maintenance, repair and purchase price are considered. Since the design objective is lowest total cost—energy efficiency, reliability and long-term durability are given paramount consideration. Take a look at Gardner Denver compressors and you will agree that the incremental purchase cost of an Electra-Saver II is easily justified by lower total operating costs.

# Why direct drive, slow speed compressors?

## BIGGER IS BETTER – GREATER ENERGY EFFICIENCY

The only reason to make a compressor air end small and turn it at high speed is to minimize production cost. To maximize energy efficiency, the air end should be large and run at slow speed, typically 1800 RPM. Why? For several reasons:

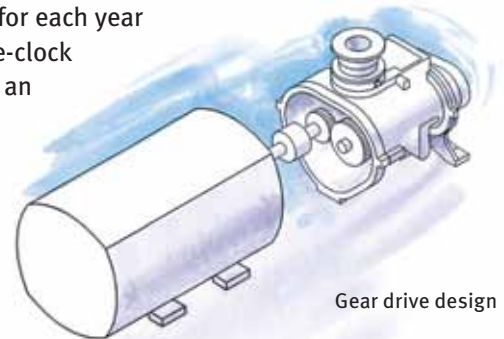


Direct drive, gearless

## SLOW SPEED DESIGN – 100 HP Example

The Gardner Denver ST 100 has a dedicated 227 mm rotor set that turns at 1780 RPM. This gear-less unit produces 490 CFM and requires 105.5 BHP at full load for a BHP/100 CFM – an indication of efficiency – of 21.5.

A typical competitor's gear-driven unit turns 85% faster at 3300 RPM because the 178 mm rotor set is 22% smaller. This unit produces 483 CFM requiring 110 BHP for a less efficient BHP/100 CFM of 22.8. The 6% efficiency advantage of the Gardner Denver unit generates about \$2,700 in energy cost savings for each year of around-the-clock operation, at an energy cost of 8¢/kWh.



Gear drive design

## COMPRESSED AIR IS NOT FREE

Choose the nominal size of an air compressor and cost of electricity to estimate annual energy costs.

Nominal HP	Operating Cost per Year (5000 hours) at Cost per kWh (\$)				
	.04	.06	.08	.10	.12
10	\$ 1,834	\$ 2,751	\$ 3,667	\$ 4,584	\$ 5,501
15	2,705	4,058	5,411	6,763	8,116
25	4,474	6,712	8,949	11,186	13,423
30	5,329	7,993	10,657	13,321	15,986
50	8,824	13,235	17,647	22,059	26,471
75	13,081	19,621	26,162	32,702	39,242
100	17,441	26,162	34,822	43,603	52,323
150	25,914	38,871	51,827	64,784	77,741
200	34,552	51,827	69,103	86,379	103,655
300	51,181	76,771	102,362	127,952	153,543
400	68,241	102,362	136,482	170,603	204,723
500	85,036	127,554	170,073	212,591	255,109

Note: Hours of operation based on two 8-hour shifts, six days a week. BHP based on nominal horsepower plus 10%.

## GEAR-LESS OPERATION

A true direct drive unit operates at motor rpm without speed-increasing gears. Gears consume power in the form of mechanical losses. Thus, direct drive, slow speed, gear-less compressor air ends have a 3–5% efficiency advantage—by design.

## REDUCED AIR BLOW BACK

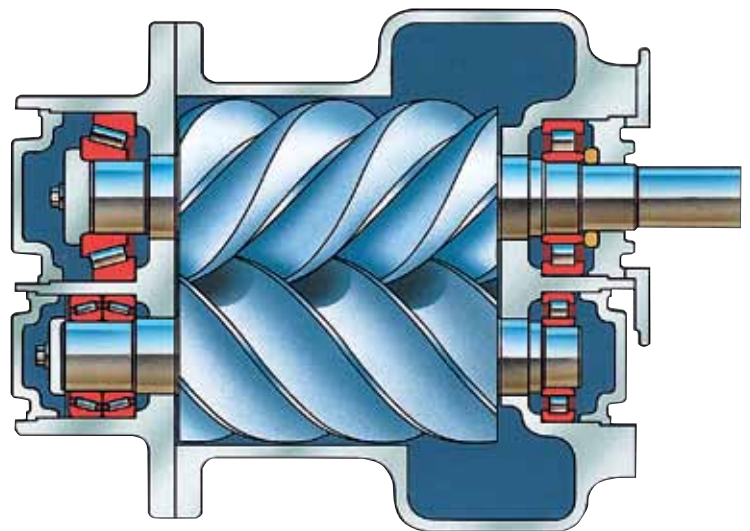
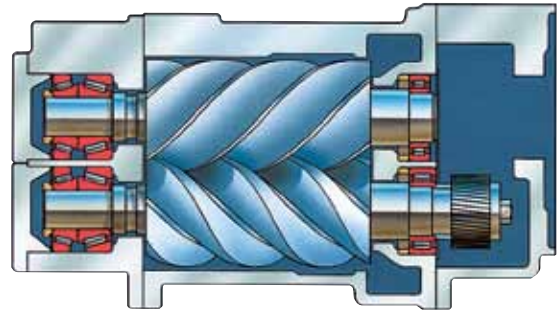
At high speeds, more air leaks across the rotors during the compression process. Simply put, the faster rotors turn, the harder it is to trap and hold all the air that is compressed. Rotor production technique cannot offset the advantage of slower speeds since large rotors can be machined to the same tolerances as small ones. Also, some smaller air ends even require sealing strips to reduce this blow back. To maximize efficiency, minimize speed!

## REDUCED LUBRICANT DRAG

In an air end, the rotors have to “cut through” heat reducing lubricant. And the fact is, less drag on the rotors occurs at slower speeds. In addition, lubricant is intensively injected into Gardner Denver air ends through numerous ports rather than isolated to a single point, further reducing viscous drag. Every area of the Gardner Denver compressor is designed to maximize energy efficiency.

## SMALLER LEAKAGE AREAS AS A PERCENTAGE OF AIR OUTPUT

Though this sounds technical, it is quite simple. The areas between the rotors and the rotor housing are leakage areas where air can escape, thus reducing efficiency. As rotor size increases, this leakage becomes a smaller percentage of air output. Think of a small and large circle where the circumference represents leakage points and the area of the circle represents air output. For a circle with a 10” diameter, the circumference (i.e. leakage area) is 40% of the area (air output). Double the



Up to 41% larger, Gardner Denver air ends operate more slowly and efficiently than smaller, gear-driven products.

diameter to 20” and the circumference (leakage area) becomes just 20% of the area (air output). In summary, leakage areas have less influence on performance when you make a compressor large and turn it slowly.

## Bigger is better!



- Lower total cost of ownership
- Less downtime
- Lower lifetime maintenance costs
- Greater efficiencies

### **BIGGER IS BETTER – GREATER RELIABILITY**

Bigger not only means more energy efficient but also more reliable. Slow-turning mechanical equipment simply lasts longer than its high-speed counterpart. It's the reason that special formulations of oil were developed in recent decades to handle high-speed engines. Higher speed causes more heat and more thermal expansion, which results in a greater risk of wear and failure. They all go together. To maximize reliability, rotating equipment should be designed to turn slowly.

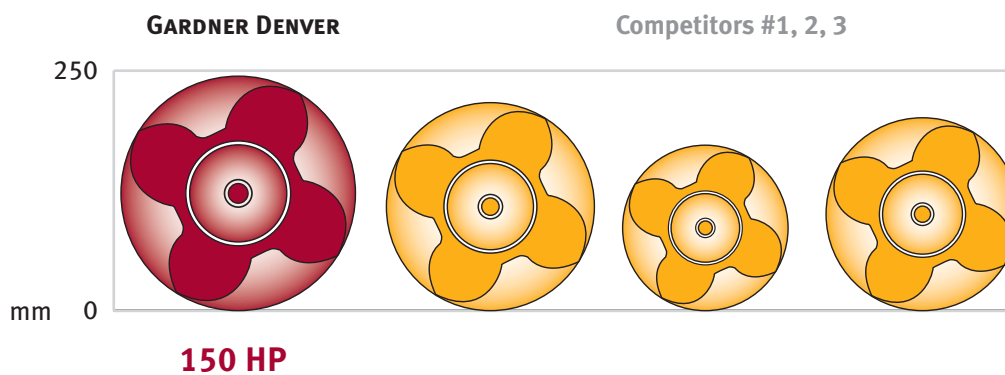
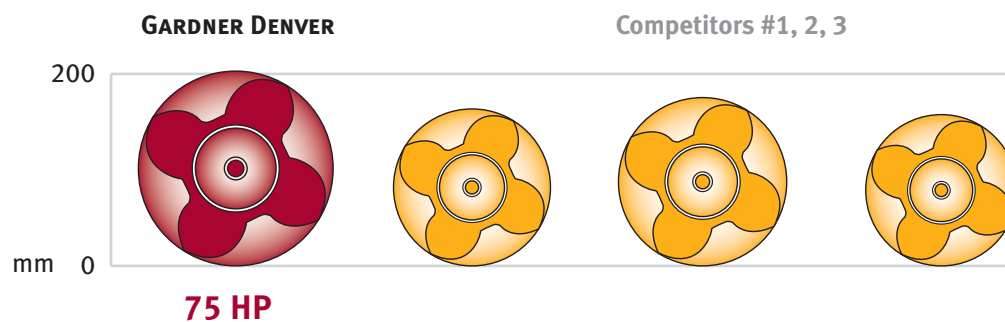
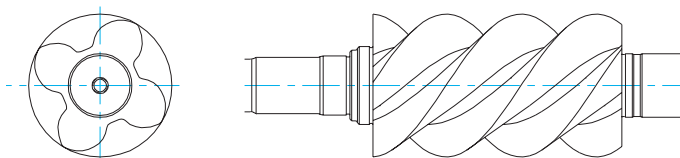
## Thousands of Hours of Reliable Use

### LARGE, DURABLE, SUPER-SIZED BEARINGS

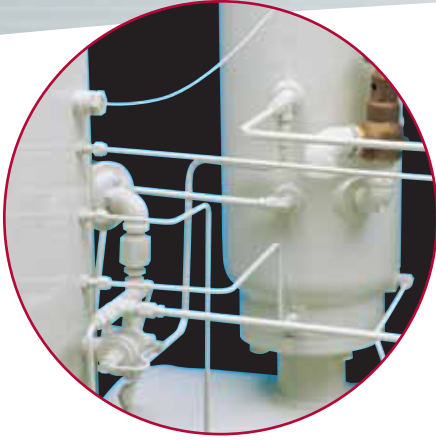
Of course, a larger rotor weighs more than a small rotor, so you would expect it to have larger bearings. The key, however, is that large rotors provide more area to “super-size” the bearings. That’s why for years Gardner Denver has been one of the few manufacturers to quote bearing life in our literature. When you super-size this critical component, you’re proud to say you design for a minimum L10 life of 100,000 hours.



### ROTOR SIZE COMPARISON



## Premium Package Features



### STAINLESS STEEL RATHER THAN HOSE

Our premium compressor utilizes seamless stainless steel control lines and tubing for lubricant circulation. If offered by a competitor, it can cost an additional \$400–\$1500. Why accept leaks and long-term failures when you don't have to?

### COOL AIR THROUGH PROPER COOLING

Some compressors overheat or deliver hot air when the going gets tough. This happens when heat exchangers are downsized to cut cost. All Electra-Saver II heat exchangers are sized for operation in 115°F ambient while delivering air to within 15°F of the inlet air temperature. Big coolers, big air ends...big difference.



### DIRECT DRIVE, GEAR-LESS COMPRESSOR AIR END

For decades, the trademark of these premium compressors has been service life. Direct drive, gear-less air ends typically run for more than 10 years. (See pages 4–7 for details).

### THE BEST MOTOR IN THE BUSINESS

Other brands are less expensive, but the Electra-Saver II motor is the most durable motor available. These cast iron, EPAct efficient motors contain more winding material than any other motor. The best motor with the best compressor provides the best drive train you can buy. These motors come with a standard 5-year warranty.



### HEAVY DUTY, TWO-STAGE INLET FILTER

An inlet filter is no place to cut corners. Dirt and dust that enter the compressor greatly impact lubricant and machine life. This 5 micron filter is 99% efficient and standard on the Electra-Saver II. This feature is a separate option on many compressor designs.

### SERVICEABILITY SUPREME

Our “bigger is better” design also means superior serviceability. Maintenance personnel love the Gardner Denver Electra-Saver II. Components are accessible, not crammed into a constrictive footprint like with other brands. All filters are easily accessible and piping need not be disconnected to service the separator.

### OPTIONAL ENCLOSURE

Why pay for an enclosure you don't need? Many installations are better off without one. When of benefit, Gardner Denver can supply an enclosure that is right for the installation. The Electra-Saver II design allows you to put your money where you benefit most.



# Compressor Control

CONTROL THAT IS

## Sheer Brilliance



### SIMPLE

# S

Our first priority is to offer a controller that is user friendly. If you wish, just use the easy push buttons to turn the compressor on when you need air and off when you don't. How much additional power you use is up to you.

### HELPFUL

# H

Prior to microprocessor controllers, servicing and troubleshooting compressors were time consuming and complex. Now, the AutoSentry® microprocessor controller tells you what is needed in an easy-to-read text display. Using the Auto Sentry leaves more time to focus on the important things—production and profit.

### ENERGY

# E

### EFFICIENT

# E

With a microprocessor-controlled compressor, response time to changes in air demand is practically instantaneous. This response reduces pressure fluctuations in the plant, maximizing productivity while minimizing energy use. An energy efficient controller combined with an energy efficient compressor equals savings year after year.

### RELIABLE

# R

Gardner Denver was the first to introduce the microprocessor controls on compressors more than a decade ago. Control in this manner is far more reliable than it was with mechanical valves and switches. In addition, this technology offers the greatest degree of resistance to electrical surges in the industry.

### QUALITY FEATURES

AutoSentry® ES+ microprocessor based, fully programmable touch pad controller with the following functions:

- Full text Vacuum Florescent Display (VFD) with interactive compressor diagram
- Operating mode selection: constant run, low demand with reservoir blowdown, automatic stop/start with timed blowdown and sequence (up to 8 units), all with modulating inlet valve or load/no load control
- Emergency stop button
- Complete system diagnostics through VFD
  - Displays for hourmeter, loaded hours, total runtime, discharge air temperature, system/reservoir pressure, separator differential pressure and motor amps (optional)
  - VFD advisory lamps, light yellow on diagram, displays service for air filter, change separator, oil and oil filter change, low/high temperature, sequencing communication error and high motor amps
  - VFD protective shutdown lamps, light red on diagram, displays high temperature, low oil pressure, main motor overload, fan motor overload, high pressure, change separator, choice of one field-selectable message: high vibration, phase relay, motor protector, low voltage
- Power interruption protection
- High speed electronic modulation control
- Thermally controlled fan motor on air cooled units
- Contacts for remote start/stop operation plus remote monitoring

### ON BOARD SEQUENCING

Built-in sequencing capability of the ES+ handles up to 8 compressors for large multiple machine applications or for future air system expansion. Simple RS485 “telephone jack” style connections allow fast, easy and flexible sequencing set up.



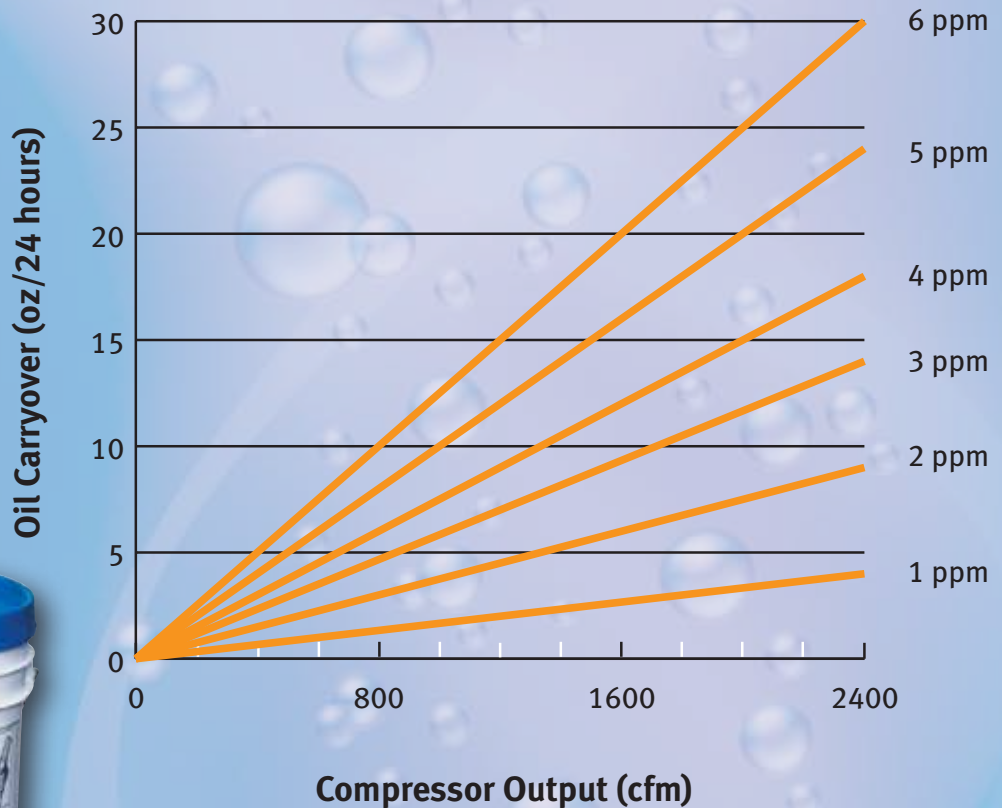
And much more!

# Lowest Total Cost through Genuine GD Parts

Gardner Denver filters and separators are simply the highest quality parts available. Attention is given to every detail. O-ring gaskets are designed to stay in place and resist cracking. Protective mesh keeps filter media securely in place. Choosing a Gardner Denver filter or separator eliminates problems such as clogged oil lines, that result in failed compressor air ends. Don't be fooled by cheaper "will fit" filters—the expense is greater to you in the long run.

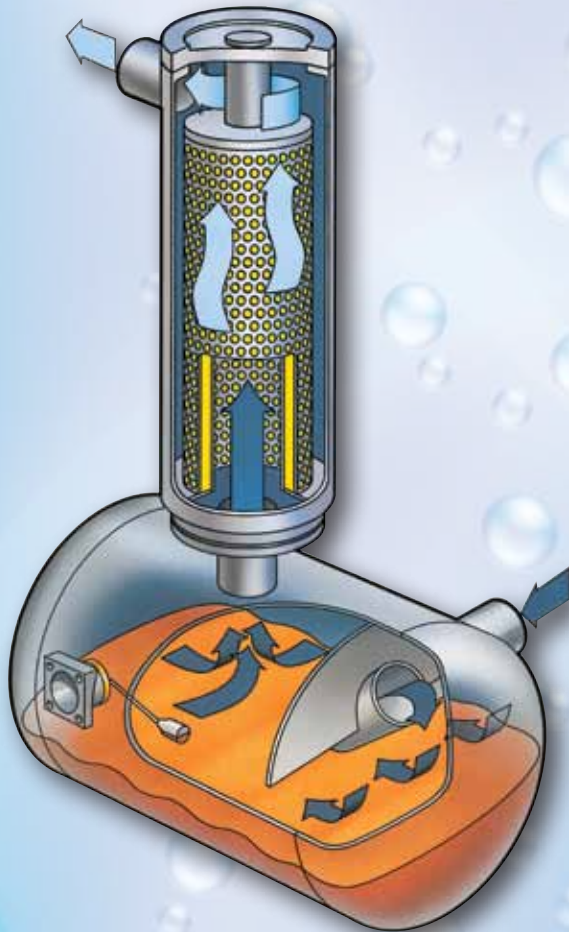
## LOW OIL CARRYOVER SAVES YOU CASH

Remember, oil carryover costs 15¢ to 35¢ per ounce or \$20 to \$45 per gallon. Genuine parts minimize oil carryover.

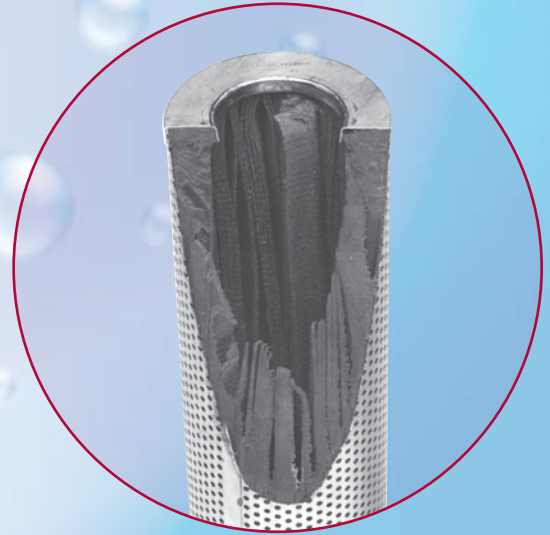


## LUBRICANTS EXTRAORDINAIRE

AEON® Lubricants contain a design-specific additive package that cannot be duplicated by other brands. The result is everything you want in a lubricant—long life, thermal and oxidative stability, high flash point, superior film strength, low oil carryover and more. These non-hazardous lubricants separate quickly from water to minimize disposal cost and maximize protection. Using AEON Lubricants guarantees lowest total lubricant cost over the life of your compressor.



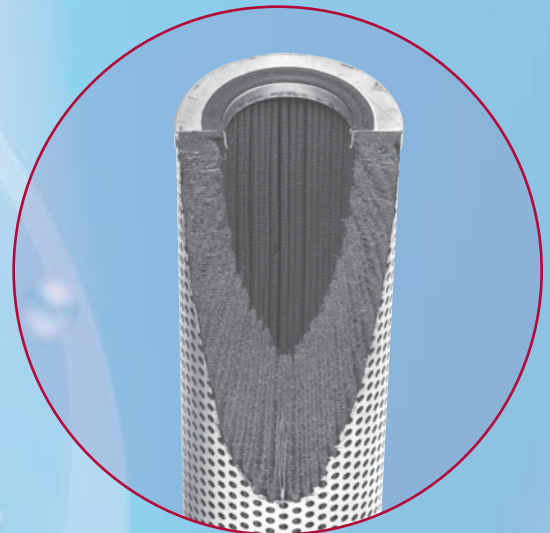
Patented ELIMINATOR™ Air-Oil Separator, inside our specially designed oil reservoir and tower, limits oil carryover to less than 2 PPM by weight – the lowest in the industry. Notice that piping connections do not have to be broken to service the separator element.



### FILTER CUTAWAYS

Top: Replicator Filter without protective mesh allows filter media to migrate downstream.

Below: Genuine Gardner Denver Filter contains a protective mesh layer that keeps filter media intact.



# Total System Solutions

## SERVICEABILITY & PRODUCT SUPPORT

### Support Network

Gardner Denver has a network of trained service providers available whenever needed to keep your compressors in top form. We are committed to stocking components to support your compressed air system needs.



Gardner Denver, an **ENERGY STAR PARTNER**, is committed to developing products and introducing technologies that help conserve energy and protect the environment.

## LET GARDNER DENVER TAKE CONTROL OF YOUR SYSTEM

To ensure total system reliability, Gardner Denver provides a broad range of dryers, filters, oil/water separators, drains, cleaning fluids, and aftercoolers. ONE-STOP shopping from Gardner Denver assures that all components of the system are designed to work together and are backed by customer support today and for years to come.



**FIL Series**  
High Efficiency Filters

A full range of filters 20–21,250 cfm; coalescing, particulate, and activated carbon for the removal of water, oil, and particulates from compressed air.



**DS2 Series**  
Evacuator Drain Valves

A full family of zero air loss, energy efficient demand drains. Ruggedly designed to effectively and reliably prevent moisture damage to dryers, air tools, gauges, and other critical components.



**RNC Series**  
Refrigerated Dryers

A full line of high quality refrigerated dryers with features and benefits unmatched by the competition. Designed to produce dew points as low as 38°F in compressed air.



**DGH Series**  
Desiccant Dryers

A complete line of desiccant dryers for the removal of water vapor in compressed air to dew points as low as -100°F.

<http://www.esp2020.com>

## ESP 20/20

### Single Compressor Remote Monitoring

ESP 20/20 is a wireless remote monitoring solution that upgrades the air compressor to an intelligent asset providing system performance and advisory notification. Interfacing directly to Gardner Denver or third party compressors via discrete inputs and outputs, any compressor asset can be transformed to provide critical operational information through a single web-based application.

### WIRELESS:

#### Installation Has Never Been Easier

One of the unique features of ESP 20/20 remote monitoring is wireless access to the compressor. This feature is only offered by Gardner Denver's ESP 20/20 and provides significant advantages over IP/Network or RS232/Serial based systems.

- Eliminates time and expense of running CAT5 or other types of cabling to the compressor.
- Eliminates IP configuration and Network setup.
- No need to access IT experts for installation.
- Remote monitoring channel is isolated from your IP network for excellent security.
- Flexibility in where a compressor can be located.
- Ease of relocating a compressor, if needed, without having to re-route wires.



Avoid IT wiring headaches with a wireless solution

## ENTERPRISE/WEB BASED SOLUTION:

### Anytime, Anywhere Access

ESP 20/20 is an enterprise web-based solution, a Gardner Denver exclusive feature, which provides substantial advantages over peer to peer solutions offered in most competitive products.

- Allows multiple compressor assets, at single or multiple locations, to be viewed from single web-based interface.
- No application software needed to view and monitor compressor assets.
- Easy access from any computer anywhere with access to the internet.
- Enterprise password protection allows passwords to be assigned to specific personnel at appropriate levels.
- Alert preferences for personnel are assignable to meet individual needs.
- Automatic notifications of advisories, alarms, or scheduled maintenance via email, text, page, or voice to match today's mobile technology and work environment.

**GD XTRA**  
10 Year Protection

ESP 20/20 qualifies the compressor for **GD XTRA**, Gardner Denver's extended warranty program on airends, delivering the tools to ensure the compressor is operating at peak performance with the peace of mind that the compressor is protected.

# Gardner Denver®

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Member

