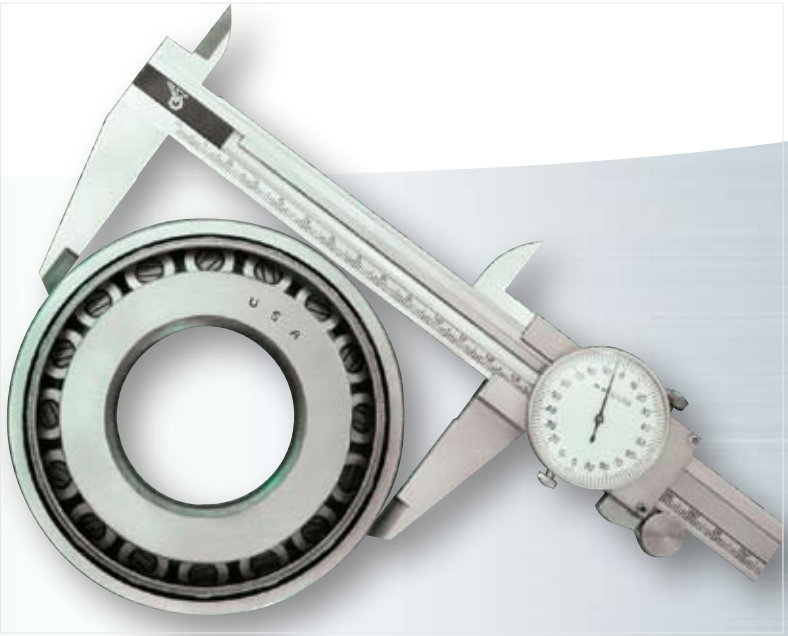
Dollars & Sense

Facts About Rotary Screw Air Compressors



GARDNER DENVER
1859 2009
SESQUICENTENNIAL

GD
GARDNER DENVER™
Experience Proven Results™

Make the Most of Your Dollar

Airend and rotor diameter determine bearing size. Large airends allow for the use of larger, more durable bearings, as much as 170% larger than bearings on high speed airends. The result is longer bearing life and greater system reliability.

Why Should Airend Size Be a Concern?

Miniaturization has many advantages in automobiles, computers and other products. Just the opposite is true in stationary rotary screw compressors. **Bigger is better!** In fact, the only advantage in downsizing a rotary compressor airend (the machinery that compresses the air) is reducing the manufacturing cost.

DURABILITY and **EFFICIENCY** of a compressor package are largely a function of the **SIZE** of the compressor airend. Although smaller airends can be manufactured at a lower cost, over the life of a compressor package, larger airends are more cost-effective. The greater operating efficiency of a larger airend reduces energy costs year after year, while the added durability reduces troublesome maintenance and the costs associated with downtime.

How Does Size Affect Durability?

In rotary screw airends, two intermeshing rotors compress an air/oil mixture. The volume per minute of air delivered by an airend is determined by the length, diameter and speed of the rotors. For a small airend to deliver the same volume as a larger airend, rotor **SPEED** must be increased.

Companies that downsize their airends use gears to increase the speed of the rotors to meet volume requirements. The gears on high speed airends will inevitably wear out and require replacement. Gardner Denver designs larger airends for its 40 through 200 HP Electra-Saver® II and 50 through 200 HP Electra-Saver® compressors so they can be direct driven at the drive motor speed (1780 RPM). These larger, slower running Gardner Denver airends *have no gears*.

Why Does Size Determine Efficiency?

In addition to being more durable, larger airends that have slower rotor speeds also deliver compressed air more efficiently than smaller airends. On an airend, the clearances between the rotors can be thought of as leakage areas. A smaller rotor set has a higher leakage area per unit displacement than a larger rotor set (displacement is measured in cubic feet of air per revolution). In addition, the oil that

50/100/150 HP Compressor Comparison*

	Gardner Denver	Ingersoll-Rand	Sullair	Atlas Copco
Motor Nameplate	50/100/150	50/100/150	50/100/150	50/100/150
CFM Volume Flow	238/490/760	231/495/739	235/500/750	248/487/750
Male Rotor Size (MM)	177/227/248	127/178/226	127/204/204	134/166/220
Male Rotor Speed (RPM)	1780	4274/3301/2053	4460/2265/2567	3662/4225/2807
BHP Power Usage	50.6/105.5/160.6	55/110/165	56.5/110/164	54/111/161
Specific Power (BHP/100 CFM)	21.3/21.5/21.1	23.8/22.8/22.3	24/22.4/21.9	21.9/22.6/21.5

*Published data at 100 PSIG, full load operation

is used to lubricate the rotors creates "drag." Efficiency losses due to drag are increased when rotor speed is increased. Gear driven units suffer further efficiency losses as a result of gear friction. The bottom line is that the inefficiencies of smaller airends show up as increased power usage.

The most important compressor efficiency measure to consider is the volume of compressed air delivered each minute and the corresponding brake horsepower required to produce that volume. The chart below shows that the 50 HP Gardner Denver compressor, with the larger rotor diameter and slower rotor speed, uses less brake horsepower per volume than competitive models. The Gardner Denver unit is more efficient and outperforms other brands because the airend is larger!

The superior efficiency of larger, slow speed airends most often results in substantial savings in power bills each year. This savings potential is demonstrated in the above chart which shows the annual dollar savings in energy cost that Gardner Denver compressors provide over competitive models. When compared to smaller, high speed airend designs, slow speed Gardner Denver compressors deliver the energy savings that make them the best value on the market.

The Gardner Denver Advantage

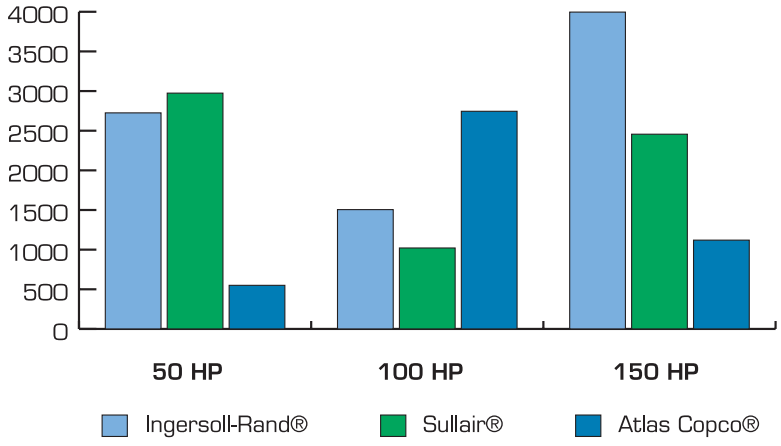
The airend is the heart and soul of your compressor package. It is the most expensive component to replace and determines the basic operating costs. Competitors will claim their compressors are durable and efficient because they know you value these product attributes. Gardner Denver does more than just claim in our literature that our compressors are durable and efficient. When considering compressors, compare the airends. If you want **EFFICIENCY** and **DURABILITY**, then **SIZE** and **SPEED** are your primary concerns.

Male Rotor Diameter [mm]

Ingersoll-Rand is a registered trademark of Ingersoll Rand Corporation. Sullair is a registered trademark of Sullair Corporation. Atlas Copco is a registered trademark of Atlas Copco Corporation.

Gardner Denver Compressors Save $$$

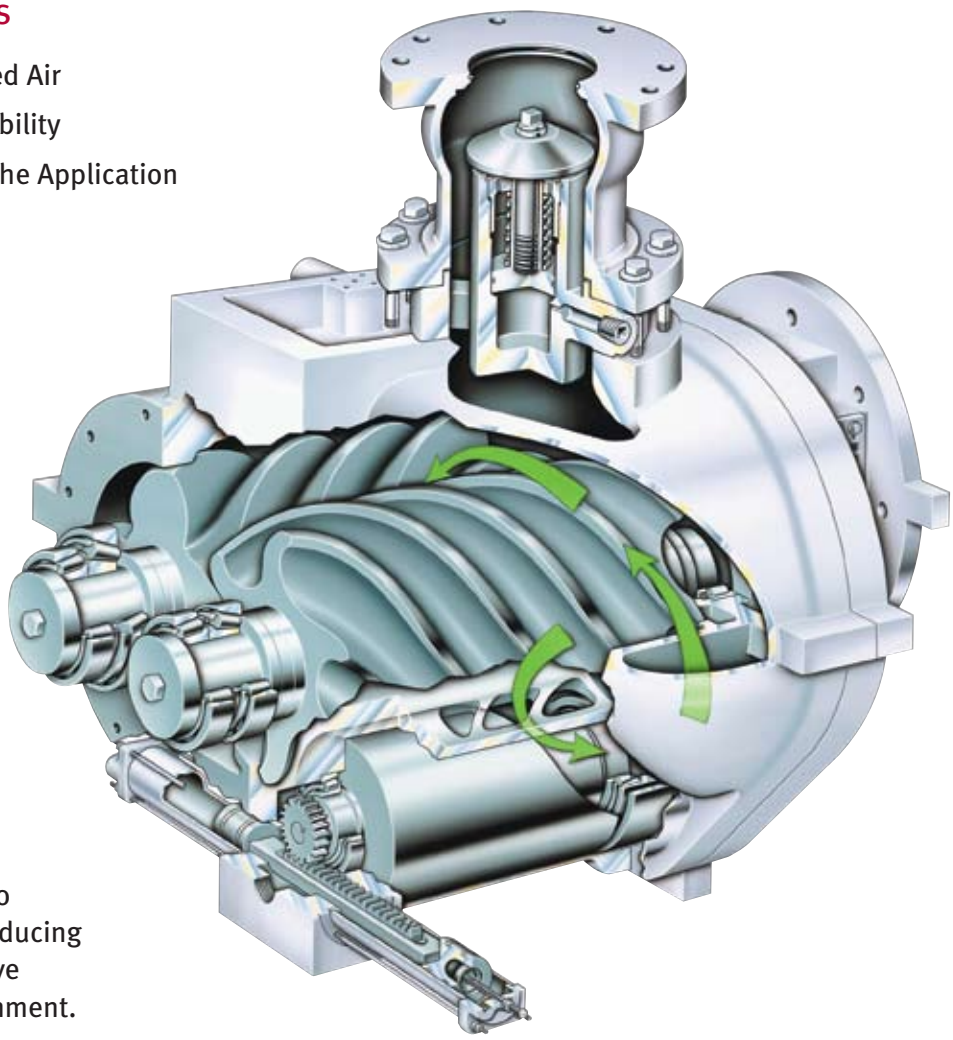
Additional Annual Energy Cost to Operate Competitive Models as Compared to Gardner Denver Compressors



Calculations (using published data) are based on the cost of providing the volume of air that Gardner Denver Electra-Saver II compressors can deliver in 8000 hours (approximately 1 year) of operation at full load. Assumes motor efficiency=.90, cost per kilowatt-hour=$0.07.

Gardner Denver
Rotary Screw Compressors

- Lowest Total Cost of Compressed Air
- Slow Speed for Maximum Reliability
- Compressor Choices to Match the Application



ENERGY STAR PARTNER

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

Gardner Denver®

www.GardnerDenverProducts.com maggie@gardnerdenver.com

Gardner Denver, Inc. 1800 Gardner Expressway, Quincy, IL 62305
Telephone: (800) 682-9868 FAX: (217) 224-7814

 GS-D&S-FAM 1st Ed. 9/09
Superseces 13-5-205 2nd Ed. 7/07

Member

Please recycle after use.