

# Ingersoll-Rand®

## Variable Frequency Drive (VFD)



 **Ingersoll-Rand®**

## Delivering Compressed Air Solutions For More Than 125 Years

For more than a century, Ingersoll-Rand air compressors have helped build dams, bridges and tunnels, produce cars, appliances and electrical equipment, and package foods and pharmaceuticals.

As more and more companies chose Ingersoll-Rand air compressors, we answered the call for new technologies and updated designs, ensuring that our customers would get the maximum benefits from their compressed air.

## Focused on Our Customers

Ingersoll-Rand strives to deliver value to our customers in everything we do. We stay focused on what you need, remaining true to our goal: to help you achieve the best results possible with your compressed air supply.

By maintaining solid relationships with our customers, our dedicated sales staff and distributor network relay changing requirements to our engineering team. With this information, our engineers make design improvements that ensure that our customers get the quality compressed air they've asked for.

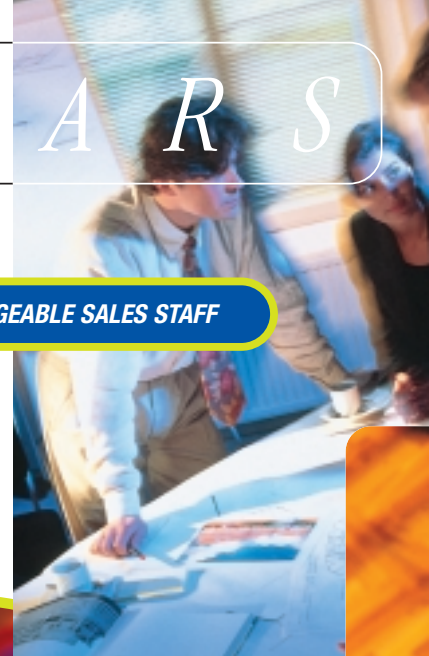
If you want a single source supplier, you can count on Ingersoll-Rand. Whether you need compressed air systems, parts and service, or technical support, we will be there to help your system run at peak efficiency now and in the future.

MORE THAN

125

YEARS

KNOWLEDGEABLE SALES STAFF



**TECHNOLOGY LEADERSHIP**



**TECHNICAL ASSISTANCE**



## **Ingersoll-Rand: Your Compressed Air Resource**

If you need compressed air, Ingersoll-Rand is here to help. We'll listen to what you need. Then we'll use our decades of leadership in the air systems market to help you design the best compressed air system for your application.

Today, we're the only manufacturer that can supply you with energy-efficient compressors in all three technologies: rotary screw, reciprocating and centrifugal. And since each technology has its benefits, we can help you select the one that works best for your application.

## Energy-Efficient & Reliable

If you are looking for a highly energy-efficient and reliable compressor control solution, then Variable Frequency Drive (VFD) is for you. Combined with our award winning air compressors, the VFD control system is one you can depend on for years to come. If you are interested in any of the following, then check out VFD from Ingersoll-Rand:

- **Constant Pressure Control**

The VFD control method allows for precise system pressure control. This ability to maintain a uniform system pressure impacts your plant in two ways: First, point-of-use pressure stabilizes which can result in more consistent processes or product quality. Second, VFD is capable of saving significant amounts of energy.

- **Energy Savings**

The energy savings realized by a VFD compressor as compared to a typically controlled compressor can be substantial. Depending on the application and air demand profile, a VFD compressor can achieve 25-35% energy savings!

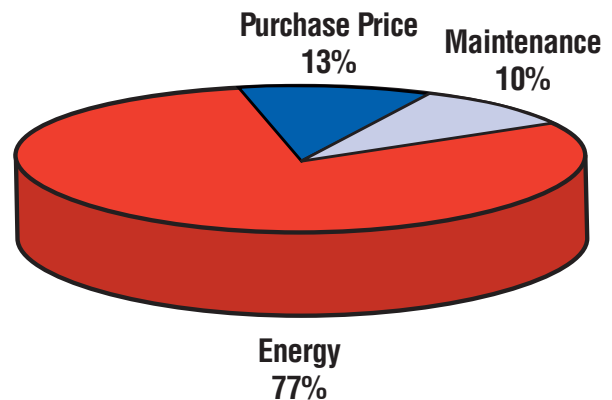
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**VFD saves up to 35% on energy costs.**  
**VFD saves up to 22% on lifetime ownership costs.**

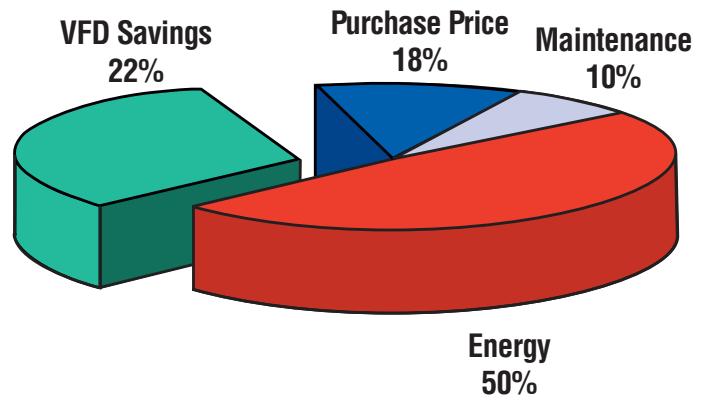
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- **Lower Cost of Ownership**

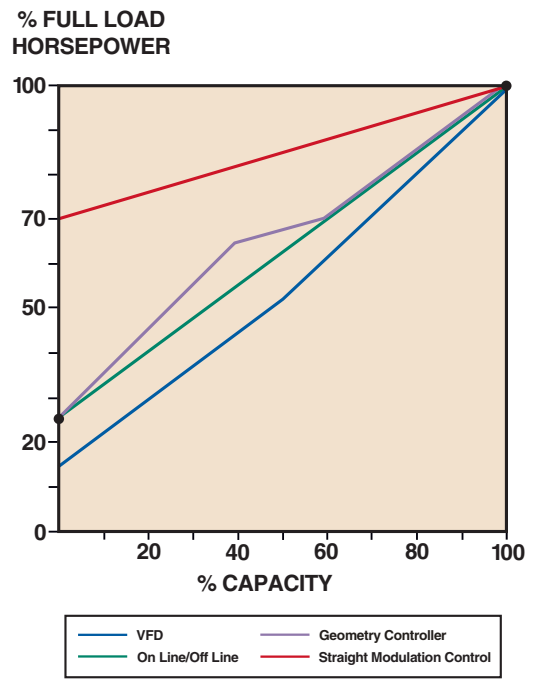
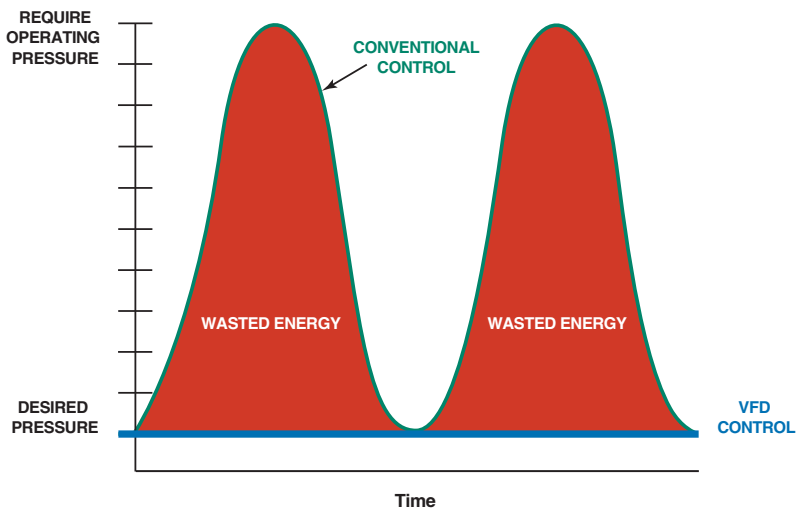
The energy savings attained by a VFD compressor equate directly to lower life cycle costs. The typical compressor cost of ownership consists of three components: initial purchase price, maintenance, and energy costs. Of these, energy costs consist of approximately 77% of the cost of operating an air compressor. By lowering energy costs by as much as 35%, VFD life cycle costs are dramatically reduced.



**Typical Installation**



**VFD Installation**



## VFD vs. Conventional Control System

Conventional compressor control systems require the air compressor to run at a higher pressure than is actually required by the user, or replace the air very inefficiently. Either system leads to higher energy costs. A VFD controlled compressor eliminates the need to operate the compressor at a higher pressure, and can reduce energy consumption by 25-35%.

## Precise Pressure Control

VFD provides the ability to exactly match the compressor's output to the capacity required by a plant air system. VFD maintains system pressure by varying the speed of the main drive motor: As the motor's speed decreases, the power requirement decreases, and so does the flow from the compressor. Precise control of the motor's speed allows most compressors to maintain system pressure within a 3- psig/0.2- bar band, eliminating the power penalty required by operating in other modes.





## Smooth Start-Up

The VFD is inherently soft starting which allows for controlled acceleration and deceleration. This results in reduced stress on mechanical components and enhanced system reliability — all of which extend the life of the compressor.

In addition, the VFD eliminates starting current peaks which can result in penalties from utility companies. VFD is also effective in applications where in-rush currents must be reduced to a minimum.

## Smooth, Reliable Operation

Our VFD design is one of the most conservative in the business. We use VFD to slow down our standard airend design rather than over-speed a smaller machine. The result is that an IR VFD compressor can run continuously at full load, just like our constant speed compressors.

This design philosophy results in more conservative motor and airend speeds — sometimes by half as much — and eliminates the need for a special inverter duty motor.

Reliability is something you just can't afford to compromise. By choosing the more conservative VFD compressor design, you're decreasing the risk of a production interruption due to a compressor problem.

## Noise Level Reduction

Slowing the main and fan motors down also results in another benefit: At lower speeds our compressors generate significantly less sound than at full speed. As a matter of fact, at half speed our 100HP Sierra operates at 10dB(A) less, or is 1.5 times quieter, than at full speed. You can hear the difference with VFD.

## Accurate Information

The VFD control panel displays a variety of operating data. Displayed information includes:

- Frequency (Hz)
- Power (kW)
- Motor RPM
- Motor current
- Hours run
- Torque



## Protect Your Investment

The IR-5000 Series of variable frequency drives has built-in protection to maximize system reliability against:

- System Overloads
- Motor Failures
- Heat
- Voltage Disturbances
- Power Surges
- Loss of Phase
- Ground Fault

## Utility Company Rebates

Utility companies around the world are looking for solutions to reduce power consumption. The energy savings potential of VFD allows you the opportunity to receive significant energy refunds. Contact your local power company for further details.

## Easy Installation

Our drives are designed to minimize their width, allowing drives to fit into crowded equipment rooms. Conduit entry is provided on the bottom of all drives. All of our drives provide for a vertical wall mount arrangement; a floor stand is also available for some models.

## Factory Option

When ordering VFD with a new IR compressor you can be sure that the drive has been selected to maximize uptime and ease of installation. The drive is easy to install, and requires very little in the way of preventative maintenance.

## Built-in Backup

The compressor also ships with a mounted and wired star-delta or full-voltage starter. In the unlikely event of drive problems, the starter can be easily and quickly re-wired to provide a back-up means of controlling the compressor's main and fan motors.

## Field Retrofit

For most existing rotary air compressors, it is possible to start saving money almost immediately. We have kits available to retrofit an existing installation with a variable frequency drive. The drives can be wall or floor mounted. Please contact your local authorized IR distributor for further details.



# More Than Air. Answers.

Online answers: <http://www.air.ingersoll-rand.com>



Ingersoll-Rand air compressors are not designed, intended or approved for breathing air. Compressed air should not be used for breathing air applications unless treated in accordance with all applicable codes and regulations.

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