

## Rotary Vane Compressors

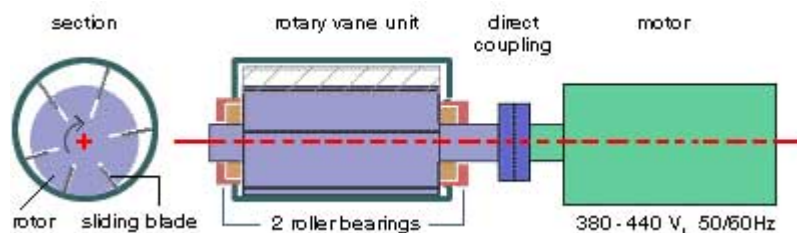
**Pressure Worx** are an authorised packager of sliding rotary vane compressors for Ro-Flo Compressors, LLC. Rotary vane compressors provide many distinct advantages over other types of compressor, in a wide variety of applications. In its niche operating envelope, the vane compressor is widely regarded as the most reliable and robust type of compressor available on the market.



As existing users know from experience, Ro-Flo vane compressors just keep on running! Vane compressors are not only reliable, they will continue to run much longer than other types of compressor, with a typical life exceeding 100,000 running hours. Ro-Flo has examples of vane compressors still operating after more than 50 yrs in service! Our packages are ideal for fuel gas boosters for gas engines.

### Principle of Operation

The rotary vane compressor feature a one-piece rotor eccentrically mounted inside a water-jacketed cylinder. The rotor is fitted with blades (vanes) that are free to move radially, in and out of longitudinal slots. These blades are forced out against the cylinder wall by centrifugal force, creating individual pockets of gas which are compressed as the rotor turns.



The concept is simple and this proven design offers many **attractive features and advantages**.

### Sour Gas Friendly

When dirty, corrosive or sour gases are present, the rotary sliding vane is the compressor of choice. They can handle almost any gas imaginable, including acid, sour, hydrogen or heavy hydrocarbons. Raw biogas is easy to a Ro-Flo and the units show absolutely no ill effect of sour and wet duty after years of service. In one case a Ro-Flo was used to compress a 90% H<sub>2</sub>S stream! The compressors may be lubricated with biodegradable oil. The lubricating oil may be recovered and can often be disposed by decomposition; i.e. anaerobic digestion.

### Reduced Maintenance

With fewer parts suffering little wear, rotary vane units offer very reliable operation, significantly reducing maintenance needs. Vane compressors can run for years with little to no maintenance. Of course, Pressure Worx don't recommend this approach and for long trouble free operations recommend a service plan which can include a quick 6 monthly 'health' check and a 12 monthly planned service. Vanes are field repairable. Infrequent wear part replacement requires just three hand tools and a few hours on site.

### ***Few Moving Parts and No Compressor Valves!***

This is a MAJOR advantage of the Ro-Flo compressor within the Pressure Worx packages. Unlike a reciprocating compressor which has a series of suction and discharge valves with many tiny springs and orifices, the vane principle is simple. There are no small valves to clog and break.

Ro-Flo compressors are often used on landfill and biogas which is inherently wet and dirty. This gas quickly clogs and damages reciprocating compressors valves. It can also damage piston packings and piston rings which not only provides inefficient running and trips but can lead to catastrophic failure, lots of maintenance, cost, down time and service headaches. Not the case with a vane compressor which can run continuously on dirty gas.



### ***Redundancy***

Due to the reliable nature of the vane compressor, it is not normally necessary to have a redundant compressor package. In fact, due to the compressor size and Pressure Worx package construction, complete change out is often the recommendation should a significant problem occur. Those clients with mission critical applications may chose to hold a complete spare compressor on the shelf. In the unlikely event of a serious compressor failure, a quick swap out replacement is available and the damaged unit is taken away for further inspection and repair for stock. As part of a service plan, Pressure Worx is often able to provide you with complete swap compressors as the simplest and cost-effective way to give redundancy and ensure high plant availability in the event of an unexpected failure.



### ***Simple, Compact Design***

Sturdy construction with few moving parts, easy to access and maintain, easy to replace parts, very reliable and durable. Rotary and low vibration design means no need for deep foundations associated with reciprocating and other types of compressors.

### ***Slow Speeds***

Ro-Flo compressors operate at very low running speeds. As an example, Fuel gas boosters typically can typically operate in the 300-900 rpm speed range. These slower speeds help ensure components have a long working life with total reliability, reduced service costs and low vibration.

### ***Direct Drive***

In most instances we offer packages with direct drive compressors, giving you 100% drive efficiency, no maintenance, no component changes, no belts, no pulleys, and no loss of performance. No complications! The majority of packages also utilise variable speed drive options to give efficient turndown.

### ***Low Temperatures***

The Ro-Flo Rotary Vane compressors are the premium Rotary Vane compressor available in the market. They have coolant jackets providing a lower operating temperature, which in turn provides reduced wear and longer life. Pressure Worx can export the warm compressor jacket coolant along with that from the inter and after cooler circuits to the client for energy recovery, typically utilised for digester heating.

## Single & Two Stage Compression

For lower pressure applications and vacuum pumps a single stage unit is sufficient. For higher pressure applications to 10 bar(g) we can utilise the Ro-Flo booster compressor which is provided with a drive through shaft, allowing an in-line 2 stage machine driven from a single electric motor.




## Ro-Flo® Design Features Include:

### Rugged, Long-Life Rotor Vanes

Durable Ro-Flo® rotor blades are the key component in ensuring continuous, reliable compressor service. Years of research and testing has resulted in a sliding vane that stands up to the toughest applications.

Rotor blade features:

- Self-adjusting, radially sliding vanes maintain constant pressure and flow rates.
- Constructed of durable laminated cloth impregnated with phenolic resin, heat-treated to minimize wear at elevated temperatures.




### Durable, Precision-Engineered Rotor Shaft

Our standard ASTM 1144 rotor shaft provides years of continuous worry-free service. Rotor shaft features:

- Resistant to acid gas and solvents, ideal for vapor recovery service.
- Radially machined blade slots are hand finished and fully dressed to ensure longer blade life.

### Quality High-Performance Seals

- Ro-Flo® custom-engineered shaft seals are crafted to perform consistently under the dirtiest and most corrosive conditions. "Double bellows" zero-leakage shaft seals are available. Single face mechanical seals are fully field-rebuildable.
- Balanced design and proper selection of seal face materials minimize heat build-up and maximize seal life.



### Oversized, Corrosion-Resistant Bearings

Ro-Flo® rotor shafts are supported by two identical cylinder roller bearings. These bearings offer the following special features not found in other bearings:

- Special cage material for corrosion resistance.
- Custom-designed internal clearances for high temperature operation.
- We use 400 Series roller bearings with higher load capacity than standard 300 Series bearings.

Detail view of dual, oil-buffered seal rings which prevent contamination in corrosive, dirty gas applications by effectively isolating the bearing and seal areas from the process gas.