AIR MOTOR DRIVE FOR LIQUID PUMP APPLICATIONS

* Image courtesy of Finish Thompson
WHAT IS LIQUID PUMP DRIVE?

In the world of rotating equipment, liquid pumps make up a large number of the field population. A wide variety of rotating pump technologies exist, both in positive and non-positive displacements. Simply put, liquid pumping can be driven by an air motor connected to a rotating device. The number of applications and industries that use liquid pumps are almost endless. Applications such as, (but not limited to) chemical processing, hydraulic power units, and lubricant systems within industries that serve process manufacturing, pulp and paper, oil and gas, food and beverage, and many more.

Driving rotating liquid pumps can be accomplished by good old-fashioned manual hand turning or through the use of motors and engines that can handle heavier or prolonged use. Under the right conditions, an Air Motor is the best choice given the versatility of its technology.

WHAT IS A ROTARY VANE AIR MOTOR?

A rotational torque solution using compressed air and sliding vanes. Expanding air inside a Rotary Vane Air Motor will cause a difference in pressure behind each vane and result in rotation that produces torque and horsepower. Creating this power from a Rotary Vane Air Motor is a flexible alternative to electric motor sources.

SELECTING AN AIR MOTOR

Air motors differ in many ways from other power sources. These unique operating characteristics must be considered when selecting an air motor for a particular job. It is easy to change horsepower and speed of an air motor by throttling the air inlet. Therefore, the best rule of thumb for selecting an air motor is to choose one that will provide the horsepower and torque needed using only two-thirds (2/3) of the line pressure available. The full air line pressure will then be available for overloads and starting.

Key Characteristics when selecting your Rotary Vane Air Motor are:

- Output power vs. Speed
- Torque vs. Speed
- Air Consumption vs. Speed

Refer to your GAST Air Motor catalog for specific model performance data.
Why use a GAST Rotary Vane Air Motor?

Variable Speed and Power Output
GAST Rotary Vane Air Motor speed and power can be precisely controlled by changing air pressure and flow. Each air motor model provides a wide range of speed and power output. Air throttling and pressure control is cost effective over electric motor speed controls.

Long Life and Proven Dependability
You can put a GAST Rotary Vane Air Motor in places where they will not get much service and have the ability to run in dirty environments. With adequate air supply, GAST Rotary Vane Air Motors are very dependable.

Non-electrical Sparking
As a non-electrical device, the possibility of explosion from igniting flammable gases is greatly reduced. Most models meet the requirements of EC directive 94/9EC – ATEX 100a for use in Zones 1 and 2.

Will Not Burn Out
Unlike electric motors that can be damaged, GAST Rotary Vane Air Motors can be stalled or overloaded indefinitely without damage.

Easily Reversible
A four-way valve in the air line enables a GAST Rotary Vane Air Motor to be easily reversed. Actuating the valve causes a fast and complete reversal of rotation, even when the motor is running at full speed.

Operate In All Positions
Mount GAST Rotary Vane Air Motors sideways, upside-down, in any position and they provide consistent performance.

Cool Running
As the air motor turns, expanded air cools the motor. Units can be used in ambient temperatures up to 250°F (120°C) in a non-hazardous atmosphere.

Compact and Portable
GAST Rotary Vane Air Motors provide maximum horsepower with minimum size and weight, as compared to equivalent electric motors.

GAST Design Expertise
GAST Manufacturing’s Air Motor design team can look at customizing for special projects depending on size and scope. We can work with you on the best application and business solution.

Mounting flexibility
GAST Rotary Vane Air Motors provide multiple options with foot, hub, face mounting, and NEMA or IEC metric flange mounting available on most sizes. Combined flange and foot mounting is also available.
Use of Air Motors in Hazardous Atmospheres

Most of the Gast Air Motors and some of the Gast Gear Motors in this catalog meet the requirements of the EC directive 94/9EC (ATEX 100a). They may be used in zones 1 and 2 where explosive atmospheres of gas or dust are likely to occur.

These are marked with II 2 G D c T4 in the catalogue and on the product. This indicates the air motor is Group II, Category 2, Gas and Dust Atmospheres, and a maximum surface temperature of 275 °F/135 °C. Check that the product driven by the air motor meets ATEX directive.

There are several points regarding the safety of air motors. Our air motors are not a source of electric sparks. However, it is possible that an article which is not part of the air motor (e.g., wrenches, hammers, etc.) could create a spark by sharply impacting a cast iron or aluminum case or the steel shaft of the air motor. [Note that electric motor enclosures for both class I and II hazardous locations can be made of “...iron, steel, copper, bronze, or aluminum...” (UL 674, Electric Motors and Generators - Hazardous Locations, June 23, 1989; paragraph 4.2, page 6)].

Gast Air Motors are designed to be operated by compressed air, the expansion of which creates a cooling effect. As a result, the outside surface temperature of the air motor will not reach ignition temperature and a maximum surface temperature of 275 °F/135 °C.

Operation of the air motor with compressed air purges a flammable mixture from the inside of the air motor. To prevent static electricity from being an ignition source electrically ground the metal air motor.

We do not guarantee the safety of any application, but to ensure the safe operation of an air motor in your application, always follow the product operation manual, follow ATEX 100a when operating in a hazardous atmosphere and consult with a qualified engineer.