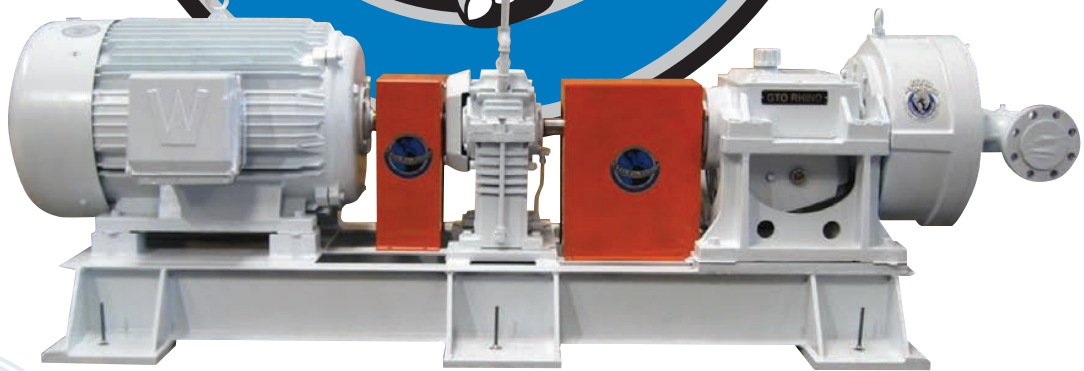
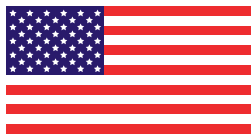


GTO RHINO[®]

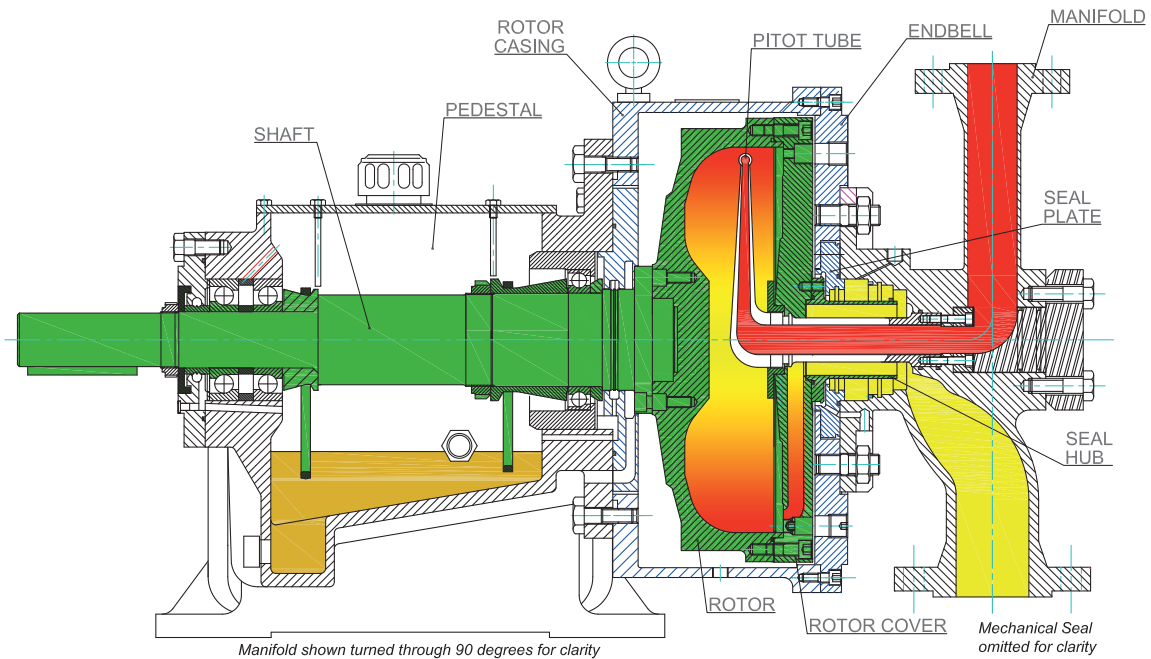


THOMAS PUMP & MACHINERY, INC.



MADE IN U.S.A.

How Does the GTO RHINO® Operate?



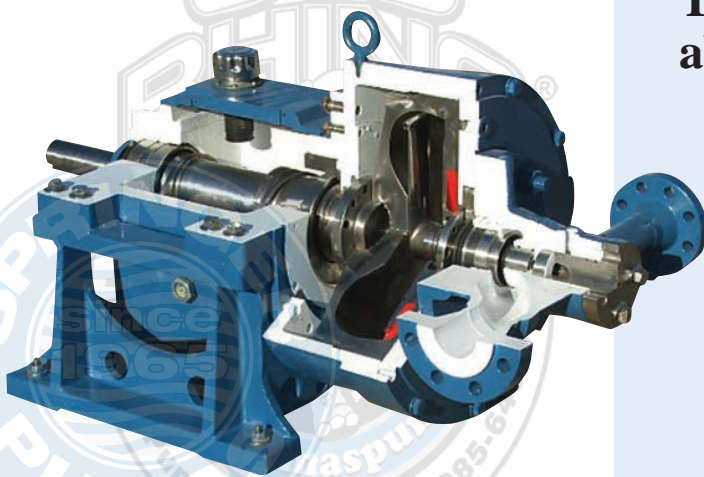
- Liquid enters the pump via the suction line (Yellow) of the specially designed, interchangeable distribution manifold, passes the mechanical seal (the mechanical seal is only under suction pressure), and enters the rotor cover where it is accelerated to a speed identical to the rotor speed creating a liquid ring.
- The liquid ring travels at the same peripheral speed as the rotor increasing pressure and rotational velocity.
- The stationary, wing-shaped Pitot tube is placed inside the rotor and has a circular opening located close to the inside of the rotor.
- This Pitot tube has a double function:
 - 1) The liquid enters the Pitot tube openings at the periphery of the rotating rotor. This is where pressure and velocity are the greatest.
 - 2) As the liquid enters the Pitot tube (Red) much of its kinetic energy is converted into pressure energy by the internal shape of the Pitot tube. Using this operating principle, relatively high pressures can be obtained in a single stage process.
- The pump generates a pulsation free flow and has a stable NPSHr curve.

Features

- **Large Sight Glass.** Bull's-eye sight glass 1-1/4" simplifies oil level and oil condition monitoring that is critical to bearing life.
- **Magnetic Drain Plug.** A safety feature designed to magnetically collect damaging metallic contaminants away from the bearings.
- **Heavy-Duty Shaft Bearings.** X-Life Precision Bearings have extremely high reliability and extend bearing life with added benefits of smooth running, noise reduction, and reduced energy consumption.
- **Monitoring Locations.** Power frame has bearing monitor feature to allow RTD insertion for bearing temperature monitoring and optional areas can be added for vibration monitoring.

Available Option

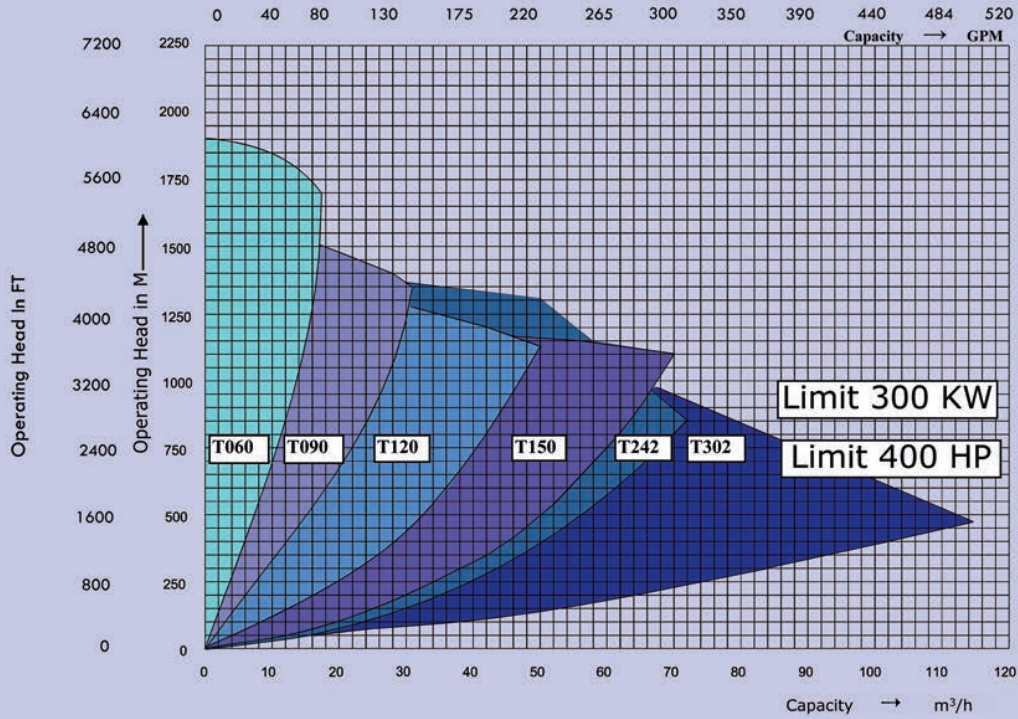
- **Inpro® Labyrinth Oil Seals.** High quality oil seals keep outside environmental contaminants from entering the lubrication media, greatly extending bearing life.



The GTO RHINO® has the above features PLUS:

- Meets API 610 Standards
- Heavy Duty Power Frame
- Higher Operating Speeds / Pressures
- Two Year Power Frame Warranty
- Mechanical Seal Options & Flush Plans
- CE Compliant

THE RHINO ENVELOPE



Sample Application

Boilerfeed water pump
Q=110GPM/25m³/hr
TDH= 3937 ft/1200 mtrs
Temp= 356F/180C
RPM= 5800



120 Bar
1740 PSI



Standard Materials of Construction

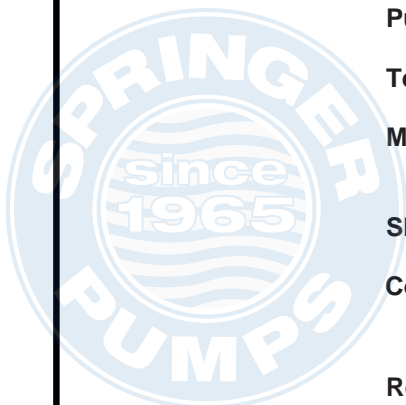
Description	Materials of Construction Code		
	Code 1 DI	Code 2 SS	Code 3 CD
*Rotor *Rotor Cover	Ductile Iron 65-45-12	Stainless Steel A351-CF8M	CD4 MCU ASTM A890 Grade 1A/1B
*Pitot Tube	Alloy Stainless Steel 17-4 PH 17Cr4Ni 718 Inconel		
2" X 2" NPT Manifold	Ductile Iron 65-45-12	Stainless Steel A351- CF8M	Stainless Steel A351- CF8M
*3" X 2" NPT and flanged Manifold	Carbon Steel A216 WCB GS		
Seal Hub	Stainless Steel AISI 316		Duplex Steel
Seal Plate	(not applicable on 2" X 2" screwed manifold)		
Pedestal Rotor Casing	Ductile Iron Steel 65-45-12		
*End Bell	Steel A-105 St		
Shaft	High Tensile, Low Alloy Carbon Steel A576- 4140 HT 42 CrMo4V		
*O Rings	Viton® is standard O-ring material Teflon®, Kalrez®, and Chemraz® are available as options		

***Note:** Other materials are available on request

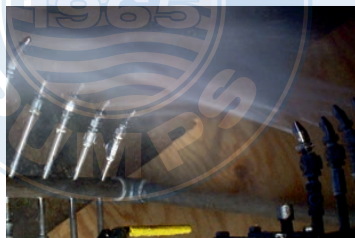
Viton®, Teflon® and Kalrez® are registered Trademarks of E.I. DuPont

Technical Data

Capacity:	400-GPM (90 m ³ /h) maximum
Delivery Head:	6200 FT (1900 meters) liquid column maximum
Casing Pressure:	2300-PSI (160 BarG) maximum
Pump Speed:	6800 RPM maximum
Temperature:	392°F (200 °C) maximum
Materials:	Ductile Iron, Stainless Steel, Cast Steel, CDMCu, and Hastelloy
Shaft Seal:	Mechanical Seal only sees suction pressure
Connections:	1500 lbs. or DIN up to 250 BarG NPT and flange options
Rotation:	Counter clockwise facing shaft
Standards:	API 610 8 th Edition with exceptions



Application



The **GTO RHINO**[®] has been developed for low flow, high pressure applications. The Pitot tube design produces a stable, pulsation free flow. The ability to operate with low minimum flow makes the pump suitable for a wide variety of applications, within its performance envelope.

The **GTO RHINO**[®] is used in a wide range of industries including:

- Chemical and Petro-chemical-boiler feed
- Refinery Service
- Carbon Black Feed Stock
- Pharmaceutical plants
- Power Generation
- Dust Suppression
- Paper mills-trim squirt and showers
- Steel mills-descaling
- Reverse osmosis in plants and offshore
- Poultry and food processing plants-central cleaning systems
- Environmental
- Produced water injections

The **GTO RHINO**[®] is used for cleaning, descaling, reactor feed, boiler feed, transport and process duties, system pressurization, and spraying systems.

GTO RHINO®

☐ Complies with the essential health and safety requirements of the 'Machinery Directive' and conforms to the relevant standards, listed below:

Directives:

Council Directive 98/37/EC and 2006/42/EC 'Machinery Directive'
Council Directive 2006/95/E 'Low Voltage Directive'

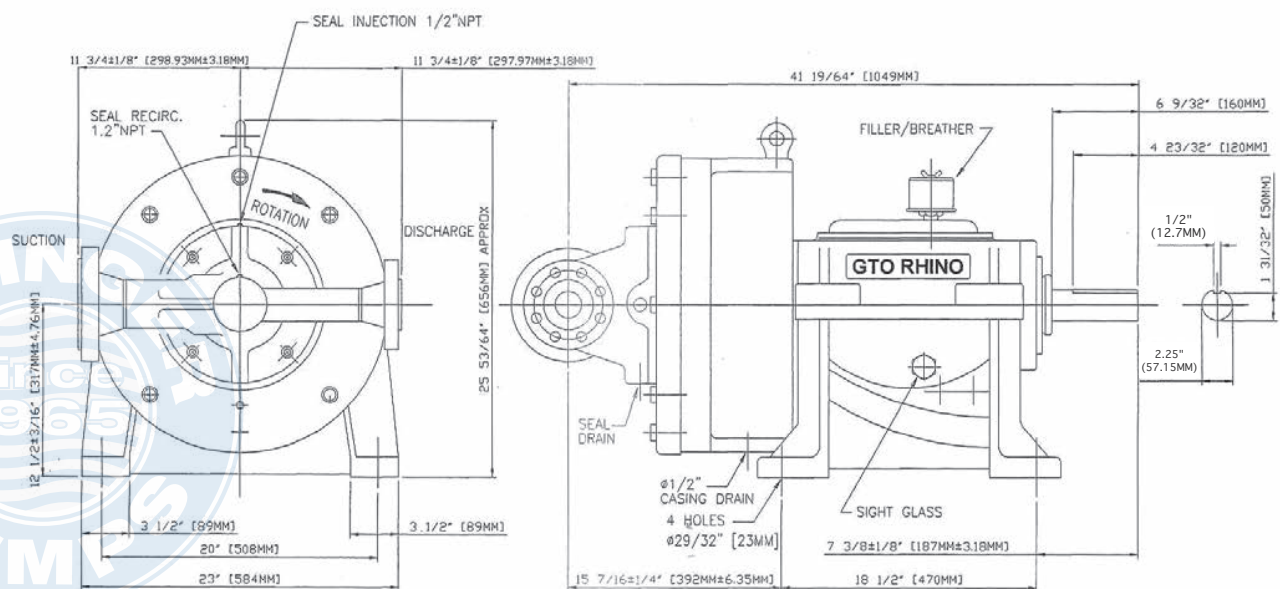
Harmonized Standards:

BS EN 809:1998 – Pumps and pump units for liquids - Common safety requirements
BS EN 60204-1:2006 - Safety of Machinery – Electrical Equipment of machines
– Part 1: General Requirements
BS EN ISO 12100-1:2003 Safety of Machinery - Basic concepts, general principles for design
– Part 1: Basic Terminology, Methodology
BS EN ISO 12100-2:2003 Safety of Machinery - Basic concepts, general principles for design
– Part 2: Technical Principles
BS EN ISO 13857:2006 – Safety Distances to prevent Hazard Zones being reached by upper and lower limbs
BS EN 349:1993 Safety of Machinery - Minimum gaps to avoid crushing parts of the human body

For pumps supplied without motors:

It is hereby certified that this equipment is intended to be incorporated into, or assembled with other machinery to constitute relevant machinery to comply with the essential health and safety requirements of the 'Council Directive' 98/37/EC and 2006/42/EC 'Machinery Directive'.

The machinery covered by this declaration must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of Directive 98/37/EC and 2006/42/EC '–'The Machinery Directive' and any other applicable Directives.





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