



# P31 Series Regenerative Turbine Pumps



- Capacities to 5 GPM
- Heads to 350 Feet
- Temperatures to 250°F



*Manufacturing MTH Pumps  
in the USA since 1965*



**MTH PUMPS**

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# P31 Series Regenerative Turbine Pumps

## Design Features

- Capacities to 5 GPM
- Heads to 350 Feet
- Temperatures to 250°F
- Stainless Steel Construction
- Compact Size
- Top Suction and Discharge
- Adjustable Casing for Extended Service Life and Expanded Performance Envelope
- Optional Integral Relief Valve



P31 with 3-phase D3 Motor



P31 with 1-phase D3 Motor

### Mechanical Seals

Stainless Steel pumps feature Viton elastomers, carbon seals, and ceramic seats. Optional seats and materials are available.

### 300 PSI Case Working Pressure

Rigid structure is designed for maximum casing strength.

### Water Flinger

A water flinger provides added protection to ball bearings in the event of seal leakage.

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### Top Suction/Top Discharge

P31 Series pumps are compact to allow installation in small areas. The pump end can be rotated to 90°, 180°, 270° positions to facilitate the most convenient installation.

major components, allowing for easy service.

### Best Efficiency

New pump designs optimize efficiency for each size.

### Non-Cavitating

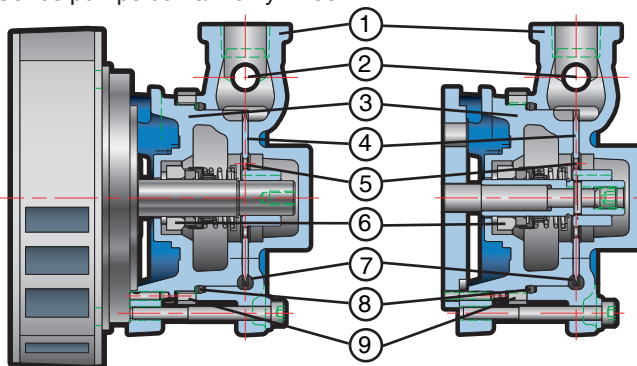
P31 Series pumps may be operated under adverse inlet conditions without audible or measurable cavitation.

### Simple Construction

P31 Series pumps contain only three

## Diagram & Specs

- (1) Stainless Steel Casing
- (2) Optional Integral Relief Valve
- (3) Stainless Steel Motor Bracket
- (4) Corrosion Resistant Impeller
- (5) Self-centering Balanced Impeller
- (6) Long lasting Mechanical Seals
- (7) High Efficiency Water Channel Design
- (8) High-Temp "O" Rings
- (9) Casing Adjusting Ring



P31 on a Reversible 48 Frame Motor

P31 on a Compact 36 Frame Motor

### STANDARD MATERIALS

PART	STANDARD CONSTRUCTION	OPTIONS
Motor Bracket and Casing	316 Stainless Steel (AISI 316)	---
Impeller	Bronze	W88 20% Nickel Silver (ASTM B584)
Seals and "O" Rings (All Elastomers)	Viton A	Buna EPR Neoprene
Seals	Carbon	G.L. Si Carbide
Seats	Ceramic	G.L. Si Carbide Silicon Carbide
Shaft	304 Stainless Steel	Ni-Resist ---

\*Be advised that due to the design of the relief valve, the relief valve reacts to the difference in pressure between the inlet and the outlet. As a result, the highest pressure, which the pump can develop at its discharge port, is the inlet pressure plus the specified relief valve setting.

### LIMITATIONS

Discharge Pressure	300 PSI (20.6 Bar)
Seal Pressure*	200 PSI (13.8 Bar)
Suction Pressure (Min.)	26" (880 mbar) Hg. Vac.
Speed** (Max.)	5500 RPM
<b>Temperature</b>	
Standard Construction	-20° F (-29° C)
Ceramic Seal Seat - Water	+230° F (+110° C)
Ni-Resist Seal Seat - Water	+230° F (+110° C)
Silicon Carbide Seal Seat & Internal Seal Flush	+250° F (+121° C)
<b>Horsepower</b>	
D3 - 1 Phase	1/3 ~ 2 HP (25-1.49kW)
D3 - 3 Phase	1/2 ~ 3 HP (.37-2.23kW)

\*Suction pressure plus 50 percent of differential pressure

\*\*With variable frequency drive @ 90Hz - 3450 RPM is standard



**P31 SERIES**

**Design Features**

**Low NPSH**

Special inlet design provides superior fluid handling ability with low head inlet conditions.

**100% Tested**

Every pump is fully tested to verify performance prior to shipment.

**Volatile Fluid Handling**

The turbine impeller handles vapors in excess of 20% by volume, minimizing the possibility of vapor lock.

**“O” Ring Gaskets**

“O” ring gaskets are used throughout the P31 Series pumps to assure positive sealing.

**Optional Features**

**Internal Flush Line**

The P31 Series offers an optional internal seal flush to extend operating temperature to 250°F.

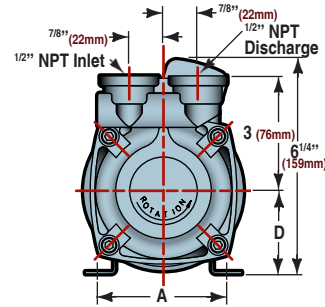
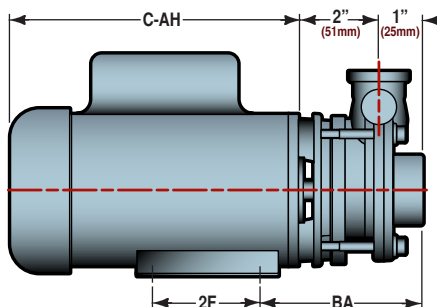
**Integrated Relief Valve**

P31 Pumps are available with or without a built-in relief valve\*. The relief valve temporarily protects against dangerous over-pressure. All relief valves are preset at the factory to your specifications (60 to 100 psi range available). At the specified relief valve setting, the flow will fully by-pass from the outlet to the inlet through the relief valve chamber. The specified relief valve setting is an average; individual pumps will vary both above and below the specified setting. The relief valve actually cracks open and begins to by-pass flow at approximately 50 psi below the relief valve setting. The standard relief valve is made of a special high temperature plastic.

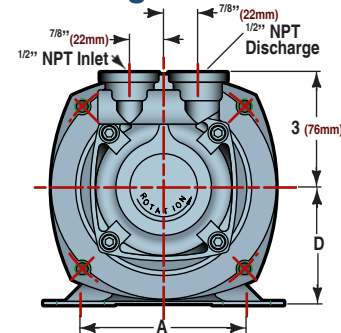
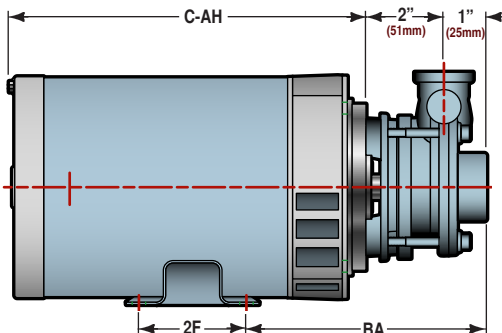
**Optional Motor Capabilities**

All P31 pumps can fit onto ultra compact 36 Frame UL and CE approved motors, as well as Standard MTH dual face motors. Optional motors with higher horsepower, solid state starting, TEFC enclosures, and 3 phase capabilities are also available.

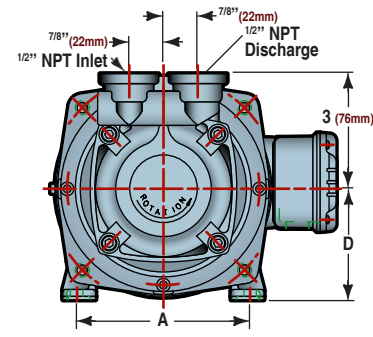
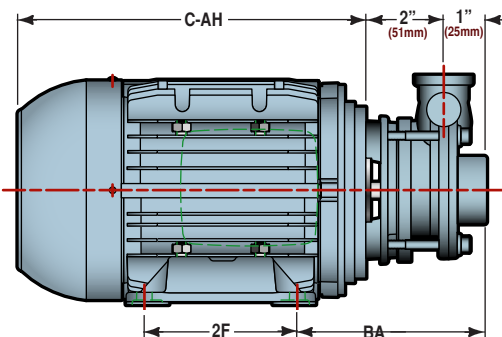
**36 Frame Single Phase Open**



**48 Frame Single Phase ODP**



**48 Frame Three Phase TEFC**



Motor	HP	Ph.	Voltage	Encl.	Frame	Suction	Discharge	A	D	2F	BA	C-AH*
FRC-5017-03-OPN	1/3	1	115/230	OPN**	36	1/2"	1/2"	3 (76mm)	2 1/4 (57mm)	2 1/2 (64mm)	3 5/8 (93mm)	8 (204mm)
DLC-5000-03-ODP	1/3	1	115/208-230	ODP	48	1/2"	1/2"	4 1/4 (108mm)	3 (76mm)	2 3/4 (70mm)	6 1/16 (154mm)	8 5/8 (220mm)
WEC-4524-05-TEF	1/2	3	208-230/460	TEF	71	1/2"	1/2"	4 7/16 (112mm)	2 13/16 (71mm)	3 9/16 (90mm)	5 (128mm)	8 7/8 (225mm)

All dimensions in inches (millimeters). May vary ±1/4 inches  
 \*Approximate maximum dimension

**Notes:**

A 20 mesh nominal strainer should be installed ahead of the pump suction to prevent foreign materials like pipe scale and rust from damaging the pump impeller and mechanical seal.  
 \*\*Motors have ball bearing construction and open ventilated enclosure. Motors are NOT drip-proof.  
 Rated for continuous duty operation at all ratings shown.



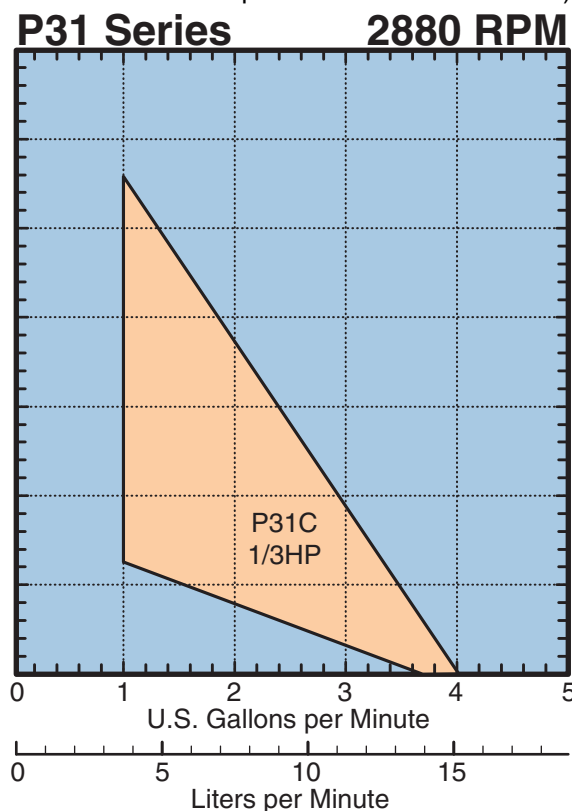
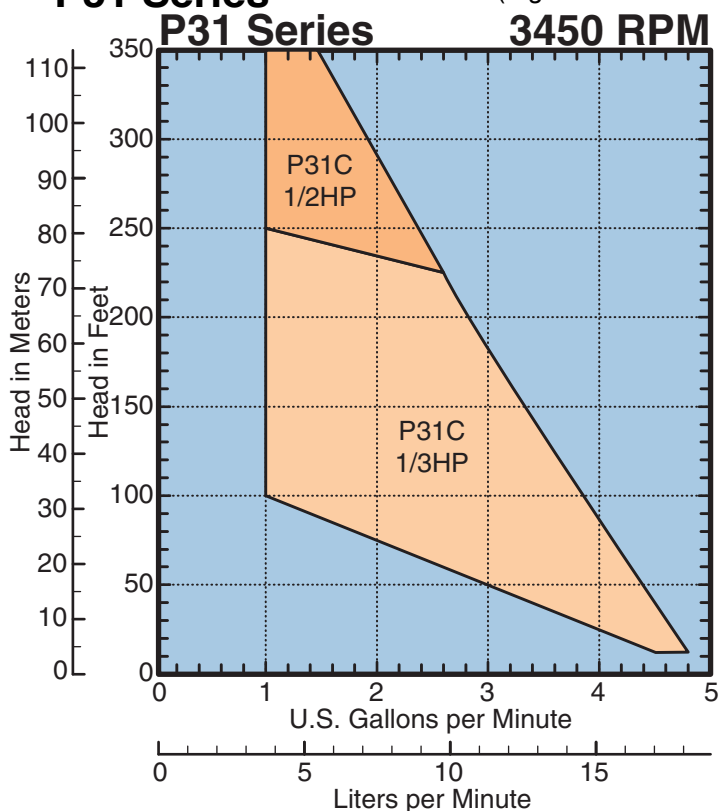


**P31 SERIES**

**Performance Curves**

**P31 Series**

(High Service Factor Open Vented Motor Horsepower Selections @ 1.0 S.G.)



**P31 SERIES**

**Engineering Specification**

**Horizontal Closed Coupled**

The contractor shall furnish (and install as shown on the plans) a P31 Series horizontal close coupled regenerative turbine type pump model \_\_\_\_\_ size 1/2" by 1/2" of 316 STAINLESS STEEL construction. Each pump shall have a capacity of \_\_\_\_\_ GPM when operating at a total head of \_\_\_\_\_ feet. Suction pressure will be \_\_\_\_\_ feet with a liquid temperature of \_\_\_\_\_ °F.

The pump is to be furnished with a mechanical seal with stainless steel

metal parts, (Viton) (Buna) (EPR) elastomers and (Carbon/Ceramic Seal/Seat) (Graphite Impregnated Silicon Carbide Seal/Seat). The pump casing shall be vertically split, two piece design, top suction and top discharge rotated (0°) (90°) (180°) (270°) with water passageways in the cover and motor bracket. Impeller shall be made of (20% Nickel Silver) (Bronze) (W88) material and be hydraulically self-centering. P31 Series pump will have an external casing adjustment feature that allows occasional renewal of performance

by tightening internal clearances that have increased due to normal wear (and will have an integral relief valve suitable for limiting pressure production to a value of \_\_\_\_\_ psi.)

The pump shall be close-coupled to a \_\_\_\_\_ HP, \_\_\_\_\_ Phase \_\_\_\_\_ Hertz \_\_\_\_\_ Volt \_\_\_\_\_ RPM horizontal (open vent) (ODP) (TEFC) motor, with 304SS shaft, ball bearings, and UL and CE Marks. The motor shall be sized to prevent overloading at the highest head condition listed in this specification.

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