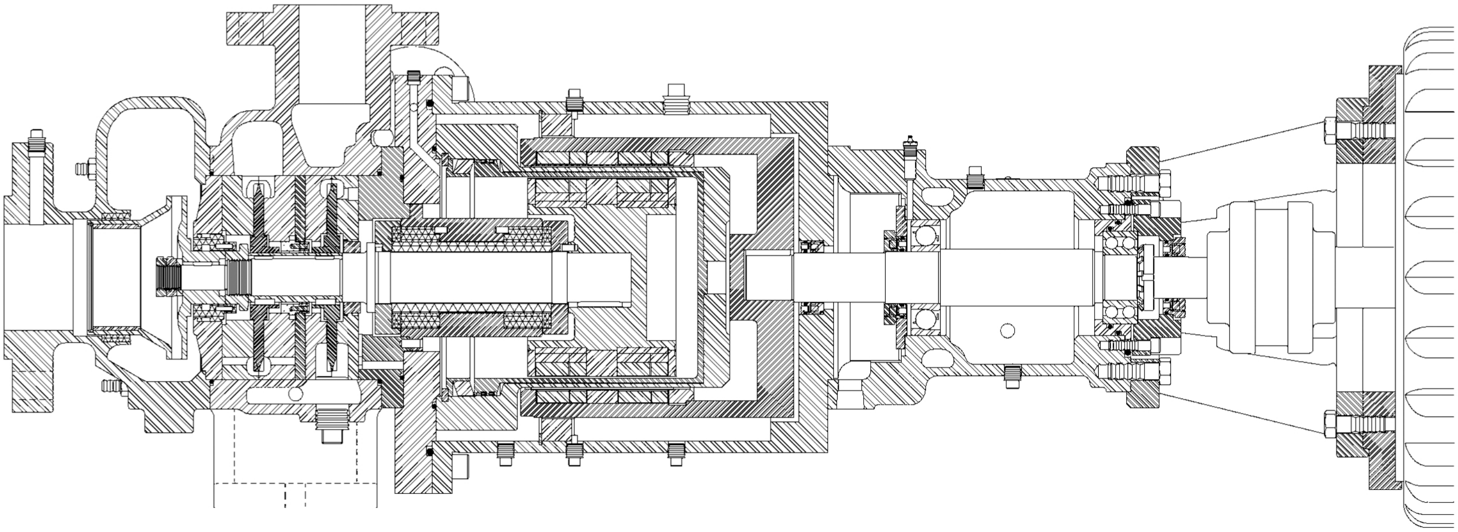
Bulletin M105R3

ROTH
PUMP COMPANY

# Roth Sealless
# One Foot NPSHr
# Regenerative Turbine Magnetic Drive Pumps
# For Continuous High Pressure Pumping of Liquefied Gases
# For Flows to 180 GPM / 40 m³/hr
# For TDH of up to 1500 ft. / 457 m
# (900 ft. / 275 m greater than centrifugal pumps)



## ROTH PIONEERING

The Roth Pump Company has been a pioneer in the industry for over seventy years in developing NPSH data on its products for use by engineers. In 1954 it was the first manufacturer of regenerative turbine pumps to publish NPSH data on individual models. At that time the Roth Pump Company developed and published the first NPSH curves on regenerative turbine pumps. It is the only manufacturer of regenerative turbine pumps today with numerous patents designed to improve the NPSH characteristics of its pumps. It also is the only regenerative turbine pump rugged enough to meet American Petroleum Institute (API) specifications.

## ROTH ONE-FOOT NPSH PUMPS

Roth Pump Company is the only pump manufacturer in the world today that offers a line of pumps with full performance at 1 foot/0.3 meters NPSHr at speeds of both 1750/1440 and 3500/2880 RPM in a range of differential heads up to 1500 ft./ 450 m. TDH, capacities up to 180 GPM/ 40m$^3$/hr.

All Roth pumps in this bulletin are guaranteed to deliver full rated capacity on boiling liquids with only 1 foot/ 0.3 meters NPSHr.

## PUMPING PROBLEMS

The problems of liquids close to the boiling point mostly relate to temperature. As the temperature approaches boiling point, it becomes possible for ordinary pumps to cavitate due to upset liquid state through pressure drop and/or additional heat.

## SUCTION LINE PROBLEMS

Pressure drop can occur in the pipe on the suction side of the pump due to friction loss in the pipe and fittings. Pressure drop across valves and strainers is usually the largest factor. A clogged strainer in the suction line can create enough pressure drop to completely vapor bind the line between the strainer and the pump.

## ELIMINATING SUCTION LINE LOSSES

Friction loss in the suction line can be virtually eliminated by over-sizing all pipe and fittings.

Where liquid velocity can be reduced to 3 feet/ 1 meter per second or less and the suction line is kept at 10 feet/ 3 meters length or less very little friction loss is accumulated.

It is recommended that the pipe and fitting size on the suction side of the pumps be based on a velocity of 3 feet/ 1 meter per second or less.

## PRESSURE DROP IN THE PUMP SUCTION

Both centrifugal and regenerative turbine pumps must increase liquid velocity to provide velocity head.

Any such velocity increase in the suction entrance of the pump before the addition of equivalent pressure results in additional pressure drop. In pump parlance this drop is known as “entrance losses.”

The designers of pumps for liquids close to the boiling point must virtually eliminate entrance losses to achieve satisfactory pump performance. This problem has been completely solved in Roth 1 foot/ 0.3 meter NPSHr pumps.

## DEFINITION OF NPSH

NPSHa (net positive suction head available) for a boiling liquid is defined as the height of the liquid above the suction of the pump less any entrance losses in the suction line.

## SELECTION OF LOW NPSH MAGNETIC DRIVE PUMPS

The prevailing concern today of engineers selecting “leak proof” pumps for low boiling point liquids is the Net Positive Suction Head characteristics of the pumps. This concern indicates alertness to developments in the pump manufacturing industry, and an awareness of the causes of success and failure of “leak proof” pumps in handling low boiling point liquids.

## THE ROTH REGENERATIVE TURBINE MAGNETIC DRIVE PUMP

The floating, self-centering regenerative turbine impeller(s) are able to produce any level of differential pressure up to 1,500 feet/ 450 meters. The self-centering regenerative turbine impeller is unique to only Roth Pumps and is protected under USA Patent Number 5137418.

Coolant flow from the discharge (at discharge pressure) is routed through the inboard cover of the pump to the inside of a "High Efficiency Containment Can". The cooling liquid then flows around the inside surface of the can and is finally diverted to flow between the alpha sintered silicon carbide radial and thrust bearings, after which it return to a 50% lower pressure in the pump and joins the pump output.

Due to the use of a "High Efficiency Containment Can" very little heat is added to the liquid due to the relative motion of driver and driven inside to outside the can producing eddy currents that add heat.

The major purpose of the cooling circuit is the control of product liquid vapor pressure from the heating effect of the eddy currents.

A secondary purpose of the cooling circuit is the forcing the liquid through the bearings circuits, the alpha sintered silicon carbide shaft sleeve and alpha sintered silicon carbide radial, and thrust bearings. Each bearing surface is provided with lubrication grooves to assure constant wetting on these bearing surfaces.

The high discharge pressure of Roth Pumps provides a sufficient margin above vapor pressure and insures maintenance of liquid phase to avoid dry-run and damage.

The non-cavitating design of the Roth regenerative turbine pump insures that destructive vibration will not destroy the bearings.

## ROTH REGENERATIVE TURBINE MAGNETIC DRIVE PUMP FEATURES

Continuous pumping of liquids with the following characteristics is now possible with ZERO leakage.

- Liquefied gases
- Hazardous liquids
- Toxic liquids
- Caustic liquids
- Liquids that react when released to the atmosphere

Primary containment with secondary control stops "errant emissions".

Hermetic seal between magnetic coupling and liquid end.

Static O'ring or gasket seal between containment shell and pump casing, no external dynamic shaft seal required.

Hastelloy C containment shell reduces hysteresis losses providing:

- Reduced "eddy current" losses
- Less heat generation
- Lower power consumption
- Higher torque capability

High pressure process liquid form the regenerative turbine stage assures liquid phase flush flow through the hydrodynamic bearings. This liquid phase flush flow provides cooling and lubrication for the (alpha grade silicon carbide) hydrodynamic bearings in the drive. Primary containment shell is self venting back to the supply vessel.

**Material of Construction:**

- Pump Case: Ductile Iron, 316 Stainless Steel, Hastelloy C
- Standard Magnetic Can: Hastelloy C with 316 Duplex Stainless Steel flange for pressures up to 362 PSI/ 24.9 BAR.
- High Efficiency Can for applications requiring more than 25 HP/ 18.6 KW: 316 Stainless Steel (segmented primary containment shell) for pressures up to 660 PSI / 45.5 BAR.
- Inner Bearings: Alpha Grade Silicon Carbide
- Inner Rotor: 316 Duplex Stainless Steel and 316Ti Stainless Steel
- Bearing Housing: 316 Duplex Stainless Steel
- Outer Rotor: Carbon Steel

## NOTES:

1) Depending on the application cooling flow may reduce attached chart flow performance by 1.5 GPM/ 0.34 $m^3$/hr.
2) Depending on the application sleeve bearing drag may increase attached chart BHP/ KW requirements up to 4.0 BHP/ 3 KW.
3) Motor BHP/KW is given for 1.0 specific gravity, modify BHP/KW for higher or lower specific gravities.
4) Maximum hydrostatic test pressure for 316 Stainless pump casing is 1100 PSI/ 75.8 BAR.

## 3500 RPM or 60 Cycle

| Model | Suction (in) | Discharge (in) | NPSHr (ft) | TDH (ft) | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5128 | 2 | 1.5 | 1 | GPM | 7.2 | 6.6 | 6.1 | 5.5 | | | | | | | | | | | | | | |
| | | | | BHP | 1.6 | 1.6 | 1.7 | 1.8 | | | | | | | | | | | | | | |
| 5428 | 2 | 1.5 | 1 | GPM | | | | | 5.3 | 4.7 | 4.3 | 3.3 | 2.4 | | | | | | | | | |
| | | | | BHP | | | | | 2.5 | 3.6 | 2.8 | 3.2 | 3.6 | | | | | | | | | |
| 5129 | 2 | 1.5 | 1 | GPM | 10.2 | 9.2 | 8.3 | 7.6 | | | | | | | | | | | | | | |
| | | | | BHP | 1.4 | 1.5 | 1.7 | 1.8 | | | | | | | | | | | | | | |
| 5429 | 2 | 1.5 | 1 | GPM | | | | | 7.2 | 6.6 | 6.2 | 5.3 | 4.5 | 3.7 | 3.0 | | | | | | | |
| | | | | BHP | | | | | 2.4 | 2.6 | 2.8 | 3.4 | 3.9 | 4.3 | 5.0 | | | | | | | |
| 5228B | 2 | 1.5 | 1 | GPM | 12.0 | 11.5 | 10.8 | 10.1 | 9.5 | 8.9 | | | | | | | | | | | | |
| | | | | BHP | 3.2 | 3.4 | 3.6 | 3.8 | 4.0 | 4.2 | | | | | | | | | | | | |
| 5429B | 2 | 1.5 | 1 | GPM | | | | | 13.3 | 12.4 | 11.7 | 10.2 | 8.8 | 7.4 | 6.1 | | | | | | | |
| | | | | BHP | | | | | 4.1 | 4.5 | 4.8 | 5.5 | 5.8 | 6.2 | 6.5 | | | | | | | |
| 5828B | 2 | 1.5 | 1 | GPM | | | | | | | 12.3 | 11.2 | 10.1 | 9.0 | 8.0 | 7.0 | 6.0 | 5.0 | 4.0 | 3.2 | | |
| | | | | BHP | | | | | | | 7.0 | 7.4 | 7.9 | 8.3 | 8.8 | 9.3 | 9.9 | 10.5 | 11.0 | 12.0 | | |
| 5129B | 2 | 1.5 | 1 | GPM | 16.2 | 15.1 | 14.1 | 13.2 | | | | | | | | | | | | | | |
| | | | | BHP | 1.5 | 1.7 | 2.0 | 2.3 | | | | | | | | | | | | | | |
| 5133 | 2 | 1.5 | 1 | GPM | 22.0 | 21.0 | 19.1 | 17.6 | | | | | | | | | | | | | | |
| | | | | BHP | 2.0 | 2.3 | 2.6 | 2.9 | | | | | | | | | | | | | | |
| 5433 | 2 | 1.5 | 1 | GPM | | | | | 18.4 | 17.3 | 16.3 | 14.5 | 12.6 | 11.0 | 9.4 | 7.9 | | | | | | |
| | | | | BHP | | | | | 4.0 | 4.5 | 4.8 | 5.4 | 6.5 | 7.5 | 8.0 | 9.0 | | | | | | |
| 5141 | 2 | 1.5 | 1 | GPM | 32.0 | 31.6 | 28.6 | 26.0 | | | | | | | | | | | | | | |
| | | | | BHP | 2.8 | 3.0 | 3.3 | 3.8 | | | | | | | | | | | | | | |
| 5441 | 2 | 1.5 | 1 | GPM | | | | | 22.4 | 20.8 | 19.5 | 17.0 | 14.6 | 12.4 | 10.4 | 8.0 | | | | | | |
| | | | | BHP | | | | | 5.2 | 5.8 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | 11.0 | | | | | | |
| 5251 | 2 | 1.5 | 1 | GPM | 30.8 | 28.5 | 26.0 | 25.4 | 24.4 | 22.8 | | | | | | | | | | | | |
| | | | | BHP | 4.4 | 4.9 | 5.0 | 5.8 | 6.0 | 6.5 | | | | | | | | | | | | |
| 5851 | 2 | 1.5 | 1 | GPM | | | | | | | 24.2 | 22.6 | 21.2 | 19.8 | 18.6 | 17.2 | 16.0 | 14.8 | 13.7 | 12.4 | 11.3 | 10.0 |
| | | | | BHP | | | | | | | 6.8 | 8.5 | 9.5 | 10.2 | 11.0 | 12.0 | 13.0 | 14.0 | 14.8 | 16.0 | 17.3 | 18.5 |
| 5142 | 2 | 1.5 | 1 | GPM | 30.3 | 28.1 | 26.2 | 24.4 | | | | | | | | | | | | | | |
| | | | | BHP | 2.7 | 3.6 | 3.6 | 4.2 | | | | | | | | | | | | | | |
| 5253 | 2 | 1.5 | 1 | GPM | 39.0 | 37.0 | 36.0 | 34.0 | 32.0 | 31.0 | | | | | | | | | | | | |
| | | | | BHP | 3.5 | 4.0 | 4.7 | 5.3 | 6.0 | 6.7 | | | | | | | | | | | | |
| 5853 | 2 | 1.5 | 1 | GPM | | | | | | | 30.0 | 29.0 | 27.2 | 25.5 | 24.0 | 22.5 | 21.1 | 19.6 | 17.9 | 16.9 | 15.2 | 14.2 |
| | | | | BHP | | | | | | | 9.0 | 11.0 | 12.0 | 13.1 | 14.5 | 15.5 | 16.8 | 18.0 | 19.4 | 20.4 | 22.4 | 23.0 |
| 5143 | 2 | 1.5 | 1 | GPM | 44.0 | 41.5 | 28.5 | 35.6 | | | | | | | | | | | | | | |
| | | | | BHP | 3.5 | 3.7 | 4.2 | 4.7 | | | | | | | | | | | | | | |
| 5145 | 2 | 1.5 | 1 | GPM | 52.4 | 50.0 | 46.0 | 42.2 | | | | | | | | | | | | | | |
| | | | | BHP | 4.0 | 4.3 | 5.0 | 5.9 | | | | | | | | | | | | | | |
| 5147 | 2 | 1.5 | 1 | GPM | 53.8 | 52.3 | 50.0 | 46.7 | | | | | | | | | | | | | | |
| | | | | BHP | 4.3 | 5.0 | 5.7 | 6.5 | | | | | | | | | | | | | | |
| 5255 | 3 | 2 | 1 | GPM | 55.0 | 52.0 | 50.0 | 47.0 | 44.0 | 42.0 | | | | | | | | | | | | |
| | | | | BHP | 5.5 | 6.0 | 6.8 | 7.5 | 8.3 | 9.0 | | | | | | | | | | | | |
| 5855 | 3 | 2 | 1 | GPM | | | | | | | 50.5 | 47.0 | 43.7 | 40.5 | 37.3 | 34.3 | 31.3 | 28.2 | 25.4 | 23.2 | | |
| | | | | BHP | | | | | | | 15.0 | 16.5 | 18.0 | 20.0 | 22.0 | 24.0 | 26.0 | 28.2 | 31.8 | 35.4 | | |
| 5256 | 3 | 2 | 1 | GPM | 56.5 | 54.5 | 52.0 | 49.8 | 47.5 | 45.5 | | | | | | | | | | | | |
| | | | | BHP | 7.0 | 7.8 | 8.8 | 9.5 | 10.4 | 11.3 | | | | | | | | | | | | |
| 5856 | 3 | 2 | 1 | GPM | | | | | | | 55.0 | 49.8 | 47.5 | 45.5 | 43.5 | 41.5 | 39.8 | 37.7 | 36.0 | 34.2 | 33.0 | 32.0 |
| | | | | BHP | | | | | | | 14.5 | 19.0 | 20.8 | 22.6 | 24.8 | 26.0 | 28.0 | 30.0 | 31.6 | 33.6 | 35.0 | 37.0 |
| 5258 | 3 | 2 | 1 | GPM | 65.5 | 63.8 | 62.0 | 60.2 | 58.2 | 56.4 | | | | | | | | | | | | |
| | | | | BHP | 8.5 | 10.0 | 11.0 | 12.2 | 13.6 | 15.0 | | | | | | | | | | | | |
| 5858 | 3 | 2 | 1 | GPM | | | | | | | 64.0 | 61.0 | 58.5 | 56.0 | 53.5 | 51.0 | 49.3 | 46.5 | 44.2 | 42.0 | 40.0 | 37.6 |
| | | | | BHP | | | | | | | 22.5 | 23.5 | 25.0 | 26.5 | 29.5 | 31.0 | 33.5 | 35.2 | 37.5 | 40.0 | 42.0 | 44.0 |
| 5261 | 3 | 2 | 1 | GPM | 70.0 | 68.0 | 66.0 | 64.0 | 62.0 | 59.0 | | | | | | | | | | | | |
| | | | | BHP | 7.0 | 8.0 | 9.0 | 10.0 | 11.0 | 12.0 | | | | | | | | | | | | |
| 5861 | 3 | 2 | 1 | GPM | | | | | | | 68.0 | 66.5 | 64.2 | 61.0 | 57.5 | 54.0 | 50.2 | 46.4 | 42.5 | 38.5 | 34.2 | |
| | | | | BHP | | | | | | | 17.0 | 20.0 | 22.5 | 25.0 | 27.5 | 30.0 | 33.0 | 34.5 | 37.5 | 39.5 | 42.0 | |
| 5263 | 4 | 2 | 1 | GPM | 99.0 | 98.0 | 97.0 | 95.0 | 93.0 | 90.0 | | | | | | | | | | | | |
| | | | | BHP | 8.0 | 9.0 | 10.5 | 12.0 | 13.5 | 15.0 | | | | | | | | | | | | |
| 5863 | 4 | 2 | 1 | GPM | | | | | | | 90.0 | 84.0 | 81.0 | 76.5 | 72.0 | 68.0 | 63.0 | 58.0 | 54.0 | 49.0 | 44.0 | 39.0 |
| | | | | BHP | | | | | | | 28.0 | 29.0 | 32.0 | 35.0 | 37.0 | 40.0 | 43.0 | 46.0 | 50.0 | 53.0 | 56.0 | 60.0 |
| 5268 | 4 | 2 | 1 | GPM | 121.0 | 117.0 | 116.0 | 114.0 | 111.0 | 109.0 | | | | | | | | | | | | |
| | | | | BHP | 21.0 | 21.5 | 22.0 | 22.5 | 23.5 | 24.0 | | | | | | | | | | | | |
| 5865 | 4 | 2 | 1 | GPM | | | | | | | 106.0 | 102.0 | 98.0 | 93.0 | 89.0 | 84.0 | 80.0 | 74.5 | 70.0 | 65.0 | 60.0 | |
| | | | | BHP | | | | | | | 37.0 | 38.0 | 44.0 | 48.0 | 50.0 | 56.0 | 60.0 | 64.0 | 68.0 | 71.0 | 74.0 | |
| 5265 | 4 | 2 | 1 | GPM | 135.0 | 133.0 | 130.0 | 125.0 | 118.0 | 113.0 | | | | | | | | | | | | |
| | | | | BHP | 15.5 | 17.0 | 18.5 | 19.5 | 22.0 | 24.0 | | | | | | | | | | | | |
| 5868 | 4 | 2 | 1 | GPM | | | | | | | 109.5 | 106.0 | 103.0 | 99.0 | 96.0 | 92.0 | 88.0 | 84.0 | 80.0 | 75.0 | 70.0 | 65.0 |
| | | | | BHP | | | | | | | 44.0 | 45.0 | 47.0 | 48.0 | 50.0 | 54.0 | 58.0 | 62.0 | 66.0 | 70.0 | 74.0 | 73.0 |
| 5267 | 4 | 2 | 1 | GPM | 175.0 | 167.0 | 158.0 | 149.0 | 140.0 | 130.0 | | | | | | | | | | | | |
| | | | | BHP | 18.0 | 20.0 | 22.0 | 24.0 | 26.0 | 28.0 | | | | | | | | | | | | |
| 5867 | 4 | 2 | 1 | GPM | | | | | | | 131.0 | 121.0 | 118.0 | 108.0 | 100.0 | 93.0 | 85.0 | | | | | |
| | | | | BHP | | | | | | | 44.0 | 48.0 | 53.0 | 56.0 | 60.0 | 64.0 | 68.0 | | | | | |
| 5269 | 4 | 2 | 1 | GPM | 189.0 | 186.0 | 183.0 | 180.0 | 174.0 | 166.0 | | | | | | | | | | | | |
| | | | | BHP | 28.5 | 29.0 | 29.5 | 30.5 | 32.5 | 33.0 | | | | | | | | | | | | |
| 5869 | 4 | 2 | 1 | GPM | | | | | | | 165.0 | 159.0 | 152.0 | 144.0 | 137.0 | 130.0 | 122.0 | 113.0 | 105.0 | | | |
| | | | | BHP | | | | | | | 59.0 | 61.0 | 65.0 | 66.0 | 72.0 | 76.0 | 82.0 | 88.0 | 95.0 | | | |

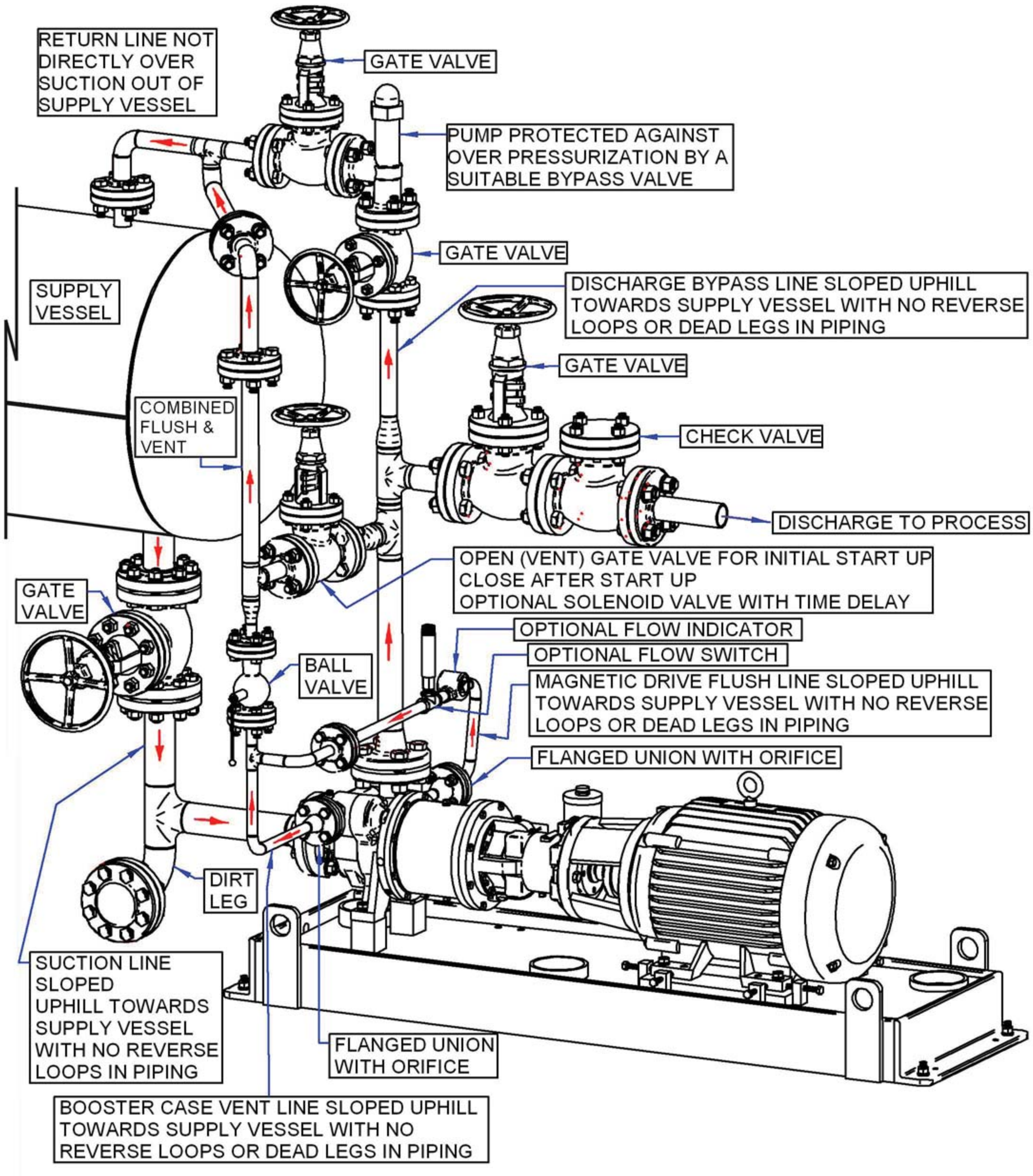
## 2880 RPM or 50 Cycle

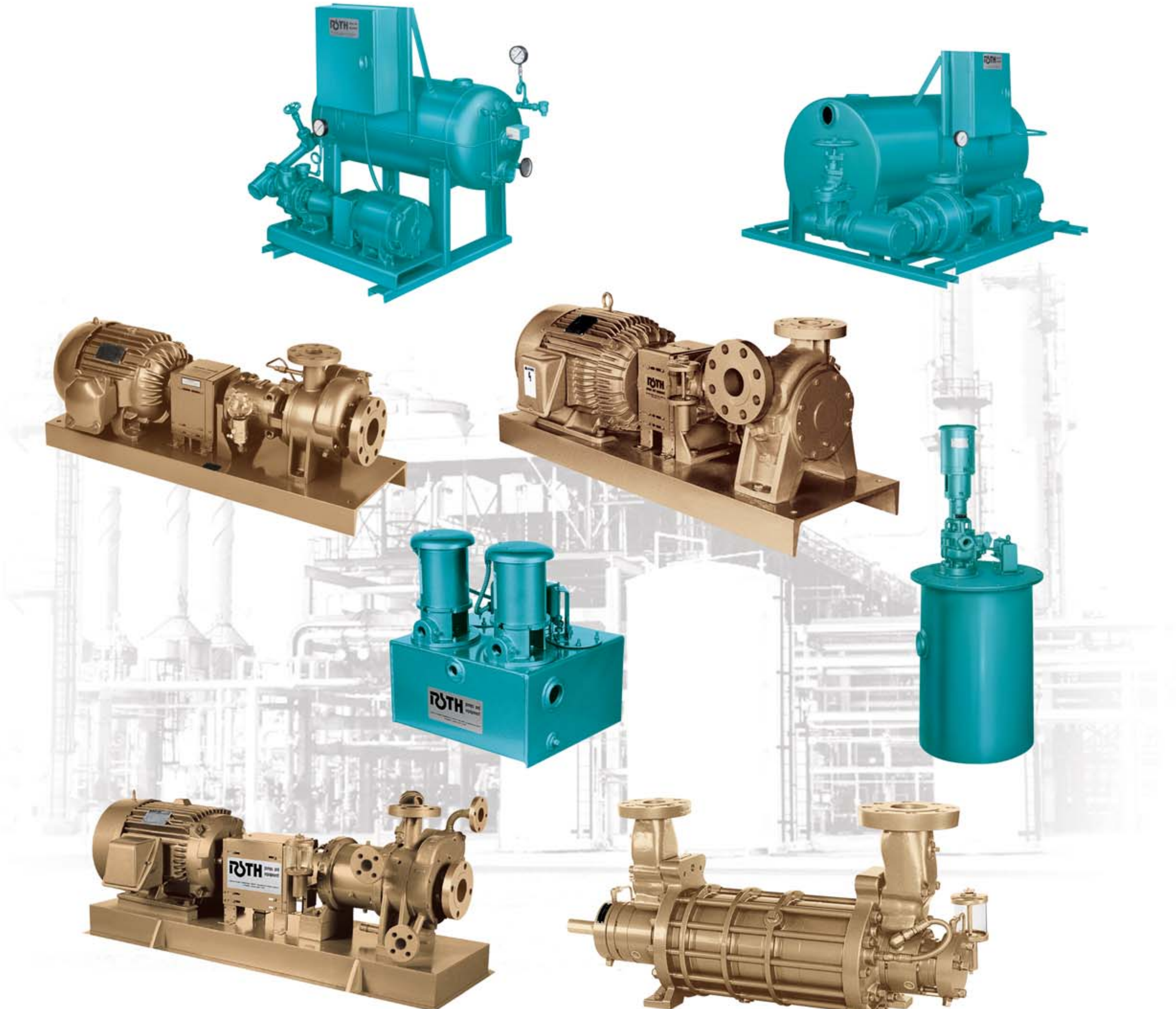
| Model | Suction (cm) | Discharge (cm) | NPSHr (meters) | TDH (m) | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 | 350 | 400 | 450 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5128 | 5.08 | 3.81 | 0.3 | $m^3$/hr | 1.3 | 1.05 | 0.8 | | | | | | | | | | |
| | | | | KW | 0.65 | 0.72 | 0.84 | | | | | | | | | | |
| 5428 | 5.08 | 3.81 | 0.3 | $m^3$/hr | | | 0.86 | 0.65 | 0.45 | | | | | | | | |
| | | | | KW | | | 1.1 | 1.3 | 1.5 | | | | | | | | |
| 5129 | 5.08 | 3.81 | 0.3 | $m^3$/hr | 1.85 | 1.4 | 1.1 | | | | | | | | | | |
| | | | | KW | 0.6 | 0.75 | 0.9 | | | | | | | | | | |
| 5228B | 5.08 | 3.81 | 0.3 | $m^3$/hr | 2.2 | 1.9 | 1.6 | 1.35 | | | | | | | | | |
| | | | | KW | 1.35 | 1.58 | 1.8 | 2.05 | | | | | | | | | |
| 5429B | 5.08 | 3.81 | 0.3 | $m^3$/hr | | | 2.3 | 1.95 | 1.65 | 1.35 | 1 | 0.7 | | | | | |
| | | | | KW | | | 1.9 | 2.25 | 2.4 | 2.55 | 2.8 | 3.1 | | | | | |
| 5828B | 5.08 | 3.81 | 0.3 | $m^3$/hr | | | | 2.13 | 1.87 | 1.64 | 1.4 | 1.19 | 0.73 | | | | |
| | | | | KW | | | | 3.05 | 3.3 | 3.5 | 3.7 | 4 | 4.6 | | | | |
| 5129B | 5.08 | 3.81 | 0.3 | m3/hr | 2.95 | 2.5 | 2.05 | | | | | | | | | | |
| | | | | KW | 0.65 | 0.9 | 1.25 | | | | | | | | | | |
| 5133 | 5.08 | 3.81 | 0.3 | $m^3$/hr | 4 | 3.3 | 2.7 | | | | | | | | | | |
| | | | | KW | 0.9 | 1.2 | 1.45 | | | | | | | | | | |
| 5433 | 5.08 | 3.81 | 0.3 | $m^3$/hr | | | 3.2 | 2.75 | 2.35 | 2 | 1.65 | 1.25 | 0.5 | | | | |
| | | | | KW | | | 1.9 | 2.2 | 2.7 | 3.2 | 3.45 | 4 | 4.9 | | | | |
| 5141 | 5.08 | 3.81 | 0.3 | $m^3$/hr | 5.85 | 5 | 3.85 | | | | | | | | | | |
| | | | | KW | 1.2 | 1.5 | 2.1 | | | | | | | | | | |
| 5441 | 5.08 | 3.81 | 0.3 | $m^3$/hr | | | 3.85 | 3.25 | 2.7 | 2.25 | 1.7 | 1.2 | | | | | |
| | | | | KW | | | 2.4 | 2.8 | 3.4 | 3.8 | 4.4 | 4.9 | | | | | |
| 5251 | 5.08 | 3.81 | 0.3 | m3/hr | 5.55 | 4.7 | 4.2 | 3.48 | | | | | | | | | |
| | | | | KW | 1.9 | 2.3 | 2.75 | 3.25 | | | | | | | | | |
| 5851 | 5.08 | 3.81 | 0.3 | $m^3$/hr | | | | 4.26 | 3.95 | 3.61 | 3.36 | 3.07 | 2.53 | 1.96 | 1.45 | 0.9 | 0.36 |
| | | | | KW | | | | 3.45 | 3.95 | 4.36 | 4.75 | 5.26 | 6.1 | 6.95 | 8.5 | 9.6 | 10.7 |
| 5142 | 5.08 | 3.81 | 0.3 | $m^3$/hr | 5.5 | 4.6 | 3.85 | | | | | | | | | | |
| | | | | KW | 1.2 | 1.7 | 2.25 | | | | | | | | | | |
| 5253 | 5.08 | 3.81 | 0.3 | $m^3$/hr | 7.2 | 6.4 | 5.6 | 4.95 | | | | | | | | | |
| | | | | KW | 1.6 | 2.2 | 2.8 | 3.3 | | | | | | | | | |
| 5853 | 5.08 | 3.81 | 0.3 | $m^3$/hr | | | | 5.45 | 5.05 | 4.7 | 4.35 | 4.05 | 3.35 | 2.65 | 1.8 | 1.12 | 0.45 |
| | | | | KW | | | | 4.5 | 5.05 | 5.6 | 6.2 | 6.8 | 8.1 | 9.7 | 10.8 | 11.8 | 12.7 |
| 5143 | 5.08 | 3.81 | 0.3 | $m^3$/hr | 8 | 6.8 | 5.65 | | | | | | | | | | |
| | | | | KW | 1.5 | 2 | 2.55 | | | | | | | | | | |
| 5145 | 5.08 | 3.81 | 0.3 | $m^3$/hr | 9.6 | 8 | 6.3 | | | | | | | | | | |
| | | | | KW | 1.75 | 2.3 | 3.1 | | | | | | | | | | |
| 5147 | 5.08 | 3.81 | 0.3 | $m^3$/hr | 9.9 | 8.85 | 7.2 | | | | | | | | | | |
| | | | | KW | 1.9 | 2.65 | 3.45 | | | | | | | | | | |
| 5255 | 7.62 | 5.08 | 0.3 | $m^3$/hr | 10.1 | 8.85 | 7.75 | 6.85 | | | | | | | | | |
| | | | | KW | 2.4 | 3.1 | 3.9 | 4.7 | | | | | | | | | |
| 5855 | 7.62 | 5.08 | 0.3 | $m^3$/hr | | | | 8.9 | 8.15 | 7.45 | 6.7 | 6.05 | 4.7 | 3.6 | 2.4 | 1.2 | |
| | | | | KW | | | | 6.7 | 7.5 | 8.5 | 9.5 | 10.5 | 13.5 | 16.6 | 19.6 | 22.6 | |
| 5256 | 7.62 | 5.08 | 0.3 | $m^3$/hr | 10.4 | 9.4 | 8.4 | 7.55 | | | | | | | | | |
| | | | | KW | 3 | 3.9 | 4.85 | 5.7 | | | | | | | | | |
| 5856 | 7.62 | 5.08 | 0.3 | $m^3$/hr | | | | 9.4 | 8.9 | 8.4 | 7.95 | 7.55 | 6.68 | 6 | 5.18 | 4.35 | 3.57 |
| | | | | KW | | | | 7.7 | 8.5 | 9.6 | 10.5 | 11.5 | 13.2 | 15 | 16.5 | 18 | 19.4 |
| 5258 | 7.62 | 5.08 | 0.3 | $m^3$/hr | 12.1 | 11.3 | 10.5 | 9.55 | | | | | | | | | |
| | | | | KW | 3.7 | 5 | 6.3 | 7.5 | | | | | | | | | |
| 5858 | 7.62 | 5.08 | 0.3 | $m^3$/hr | | | | 11.5 | 10.9 | 10.3 | 9.8 | 9.2 | 8.2 | 7.25 | 6.15 | 5.05 | 4 |
| | | | | KW | | | | 9.6 | 10.4 | 11.2 | 12.3 | 13.7 | 15.7 | 17.9 | 21 | 24 | 27.1 |
| 5261 | 7.62 | 5.08 | 0.3 | $m^3$/hr | 12.9 | 12.1 | 10.9 | 9.4 | | | | | | | | | |
| | | | | KW | 3.1 | 4 | 5.1 | 6 | | | | | | | | | |
| 5861 | 7.62 | 5.08 | 0.3 | $m^3$/hr | | | | 12.5 | 12 | 11.2 | 10.5 | 9.6 | 7.9 | 6.05 | 4.5 | 2.9 | |
| | | | | KW | | | | 8.2 | 9.4 | 10.7 | 12 | 13.3 | 15.7 | 17.8 | 19.7 | 21.6 | |
| 5263 | 10.16 | 5.08 | 0.3 | $m^3$/hr | 18.4 | 17.8 | 16.8 | 15.2 | | | | | | | | | |
| | | | | KW | 3.5 | 4.9 | 6.7 | 8.1 | | | | | | | | | |
| 5863 | 10.16 | 5.08 | 0.3 | $m^3$/hr | | | | 15.9 | 15.1 | 14.1 | 13.1 | 12.1 | 10.1 | 7.8 | 5.6 | 3.7 | |
| | | | | KW | | | | 12 | 13.4 | 14.8 | 16 | 17.5 | 21 | 24 | 27.3 | 30 | |
| 5268 | 10.16 | 5.08 | 0.3 | $m^3$/hr | 22.4 | 21.3 | 20.1 | 18 | | | | | | | | | |
| | | | | KW | 8.8 | 9.4 | 10.1 | 11.8 | | | | | | | | | |
| 5865 | 10.16 | 5.08 | 0.3 | $m^3$/hr | | | | 19.2 | 18.3 | 17.2 | 16.2 | 15.2 | 13 | 10.8 | 8.7 | 6.7 | |
| | | | | KW | | | | 15.6 | 18.5 | 20.1 | 21.8 | 24.6 | 28.5 | 31.8 | 35.7 | 39.1 | |
| 5265 | 10.16 | 5.08 | 0.3 | $m^3$/hr | 25 | 23.5 | 20.7 | 20.7 | | | | | | | | | |
| | | | | KW | 6.8 | 8.1 | 9.8 | 9.9 | | | | | | | | | |
| 5868 | 10.16 | 5.08 | 0.3 | $m^3$/hr | | | | 19.9 | 19.2 | 18.3 | 17.6 | 16.7 | 14.9 | 12.7 | 10.5 | 8.5 | |
| | | | | KW | | | | 18.5 | 19.6 | 20.1 | 21.5 | 23.5 | 27.6 | 31 | 35 | 41 | |
| 5267 | 10.16 | 5.08 | 0.3 | $m^3$/hr | 32 | 28.2 | 23.9 | 19.4 | | | | | | | | | |
| | | | | KW | 7.8 | 9.9 | 11.9 | 13.8 | | | | | | | | | |
| 5867 | 10.16 | 5.08 | 0.3 | m3/hr | | | | 22.8 | 21.2 | 19.9 | 18.2 | 16.3 | 12.6 | 9.2 | | | |
| | | | | KW | | | | 19.6 | 22 | 23.5 | 25.8 | 27.9 | 31.7 | 35.5 | | | |
| 5269 | 10.16 | 5.08 | 0.3 | $m^3$/hr | 35.1 | 33.6 | 30.9 | 27.6 | | | | | | | | | |
| | | | | KW | 11.9 | 12.7 | 14.4 | 16.7 | | | | | | | | | |
| 5869 | 10.16 | 5.08 | 0.3 | $m^3$/hr | | | | 29.9 | 28.4 | 26.8 | 25 | 23.3 | 19.5 | 16.6 | 13.7 | | |
| | | | | KW | | | | 25.2 | 27 | 28.1 | 30.5 | 33.5 | 39.5 | 44 | 48 | | |

## PARTIAL LIST OF ROTH MAG DRIVE APPLICATIONS

| Model Number | Liquid | Capacity GPM | Suction Pressure PSIG | Discharge Pressure PSIG | Differential Pressure PSI | Specific Gravity | TDH Feet | Vapor Pressure PSIA | Temp. F |
|---|---|---|---|---|---|---|---|---|---|
| MD5131SA | 20Be Caustic | 10 | 40 | 220 | 180.0 | 1.15 | 361.6 | | 100 |
| MDW5255DI | 29% Aqueous Ammonia | 26 | 0 | 238.5 | 238.5 | 0.95 | 580.0 | | 90 |
| MD5128ASA | 70% Isoprene w/C5 H.C. | 4.5 | 18 | 130 | 112.0 | 0.64 | 404.3 | 29.92 | 135-300 |
| MD5141DI | Anhydrous Ammonia | 6 | 126 | 146 | 20.0 | 0.604 | 76.5 | 128 | 70 |
| MDW5443DI | Anhydrous Ammonia | 22 | 24/45 | 219 | 194 | 0.64 | 700 | | 11.3 |
| MD5258SA | Anhydrous Ammonia | 22-50 | 48.6 | 71.2 | 24.4 | 0.63 | 97.2 | 226.7 | 104 |
| MD5253SHC | Anhydrous HF | 21 | 10 | 266 | 256 | 0.96 | 616 | 22 | 70 |
| MD2128SA | Antioxidant | 4 | 0 | 182 | 182 | 0.88 | 477.75 | 38.6 | 225-300 |
| MD5441DI | Butane & Propane | 10 - 12.2 | 40 | 225 | 185 | 0.56 | 763.1 | 27 | 60 |
| MD2133SA | DCPAE | 13 | 9.7 | 120 | 110.3 | 1.15 | 221.56 | 5 | 120 |
| MDW5253SA | Dilute Caustic & Water | 20 | 110 | 320 | 210.0 | 1 | 485.1 | 1.7 | 120 |
| MDW5857DI | F152a | 50 | 117.3 | 312.3 | 195.0 | 0.85 | 529.9 | 88 | 104 |
| MD5147SI | Genetron AZ-50 | 50 | 11.3 | 112.3 | 101.0 | 1.26 | 185.2 | 26 | -65 |
| MD5267DI | Genetron AZ-50 | 162 | 11.3 | 112.3 | 101.0 | 1.26 | 185.2 | 26 | -10 |
| M5129SA | HF | 3 | 10 | 197 | 187 | 1.05 | 411.4 | 24.7 | Amb. |
| M5229BSA | HF | 12 | 10 | 197 | 187 | 1.05 | 411.40 | 24.7 | Amb. |
| MD5141SA | Hydrocarbon w/28% H2S | 2 - 3 | 100 | 130 | 30.0 | 0.55 | 126.0 | 257 | 48 |
| MD5129SA | Methyl Chloride | 4 | 26.8 / 133 | 104 | 77.2 | 0.98 / 0.88 | 215 | 25.2 / 126.4 | 14 / 104 |
| M5129SA | Methyl Chloride | 4 | 26.8 / 133 | 104 | 77.2 | 0.98 / 0.88 | 215 | 25.2 / 126.4 | 14 / 104 |
| MD5253SA | Propylene Oxide | 3.2 / 14.5 | 0 | 50 - 99 | 50 - 99 | 0.83 | 275/140 | 1.2 - 17.8 | Amb. |
| MDV5129BSA | Styrene Condensate | 3 - 12 | -10 to -14 | 40 | - | 0.9 | 129-139 | | 30 |
| M5142SA | Trimethyl Amines | 18 | 4 / 22 | 140 | 136 - 118 | 0.65 - 0.62 | 483 | 19 - 37 | 40 - 90 |
| MDW5143SA | Vac. Dist. & Sour Water | 28.9 | 5.4 | 112.3 | 106.9 | 0.95 | 270.5 | | 150 |
| M5229BSA | VCM | 9 | 25 | 263 | 238 | 0.95 | 578.72 | 40 | Amb. |
| MDW5856SA | Vinylidene Fluoride | 30 | 248 | 760 | 512.0 | 0.854 | 1384.9 | | 16 |
| MD2133SA | VOCL13 | 14.5 | 14.7 | 120 | 105.3 | 1.83 | 132.92 | >1.0 | 100 |
| MDW5128SA | Water | 5 | 0 | 50-75 | 50-75 | 1 | 174.0 | 14.7 | 140 |

## RECOMMENDED SYSTEM SETUP FOR MAGNETIC DRIVE PUMP






**ROTH PUMP COMPANY**

**P.O. BOX 4330**
**ROCK ISLAND, IL 61204 U.S.A.**
**TOLL FREE: 1-888-444-ROTH**
**309-787-1791 FAX: 309-787-5142**
**www.rothpump.com**

**BULLETIN M105R2**

**Contact Your Authorized Roth Representative Today!**