Reliability. Accuracy. Peace of mind. These are things that Neptune™ provides through our innovative water treatment solutions. Since 1961, Neptune has manufactured the benchmark in hydraulic and mechanical diaphragm metering pumps, chemical feed systems, mixers and accessories. This commitment to quality and precision allows operators to maintain peace of mind and continued performance across a variety of industries, including agriculture, energy, mining, chemical processing, and water/wastewater treatment.

HYDRAULIC METERING SOLUTIONS

Neptune™ 500 Series Hydraulic Metering Pumps

The Neptune 500 Series hydraulic metering pumps are perfect for metering applications. Each pump features a variable Oil By-Pass™ stroke adjustment mechanism which will allow better valve performance than variable linkage designs. The valve checks have extra time to seat even in heavy liquids since they are idle during the by-pass portion of the suction and discharge strokes. 500 Series pumps are available in simplex and duplex configurations with capacities up to 94 gallons per hour.

FEATURES & BENEFITS:

- Ten turn micrometer dial calibrated in 1% increments
- Bright color contrasted dial protected from corrosion by clear PVC covering
- Stroke mechanism moves only when adjustment is made, eliminating wear
- Piston is powered through complete stroke length at all capacity adjustments eliminating stress, wear and shock of lost motion designs
- Standard integrally mounted motors are totally enclosed, fan-cooled, with built-in automatic thermal overload
- Internal relief valve automatically protects the piping and system from overpressure
- EZE-Clean™ valve system allows valve removal for cleaning without disturbing the piping to the pump (Exceptions: 500-E series and 560 series in PVC and PVDF construction)

Nomenclature HYDRAULIC SERIES PUMP DATA SHEET

X X X - X - N X

- MATERIAL OF CONSTRUCTION
- PUMP STYLE
- STROKING SPEED
- PISTON SIZE
- PUMP SERIES

PISTON SIZE

0 =	1/2"	(12.7 mm)
1 =	1/2"	(12.7 mm)
2 =	11/16"	(17.5 mm)
3 =	1-1/16"	(27 mm)
4 =	1-3/16"	(30 mm)
6 =	5/16"	(8 mm)

PUMP STYLE

- **A** = Simplex (Non-removable, oil head cannot be converted to Duplex)
- **D** = Duplex
- **E** = Economy Head on "A" Gear Box
- **S** = Simplex (Removable, or head can be converted to Duplex)

STROKING SPEED (Based on 1725 RPM Motor)

(60Hz)	(50Hz)
0 = 37 SPM	0 = 30 SPM
2 = 72 SPM	2 = 60 SPM
5 = 117 SPM	5 = 98 SPM
7 = 144 SPM	7 = 120 SPM
8 = 176 SPM	8 = 144 SPM

MATERIAL OF CONSTRUCTION

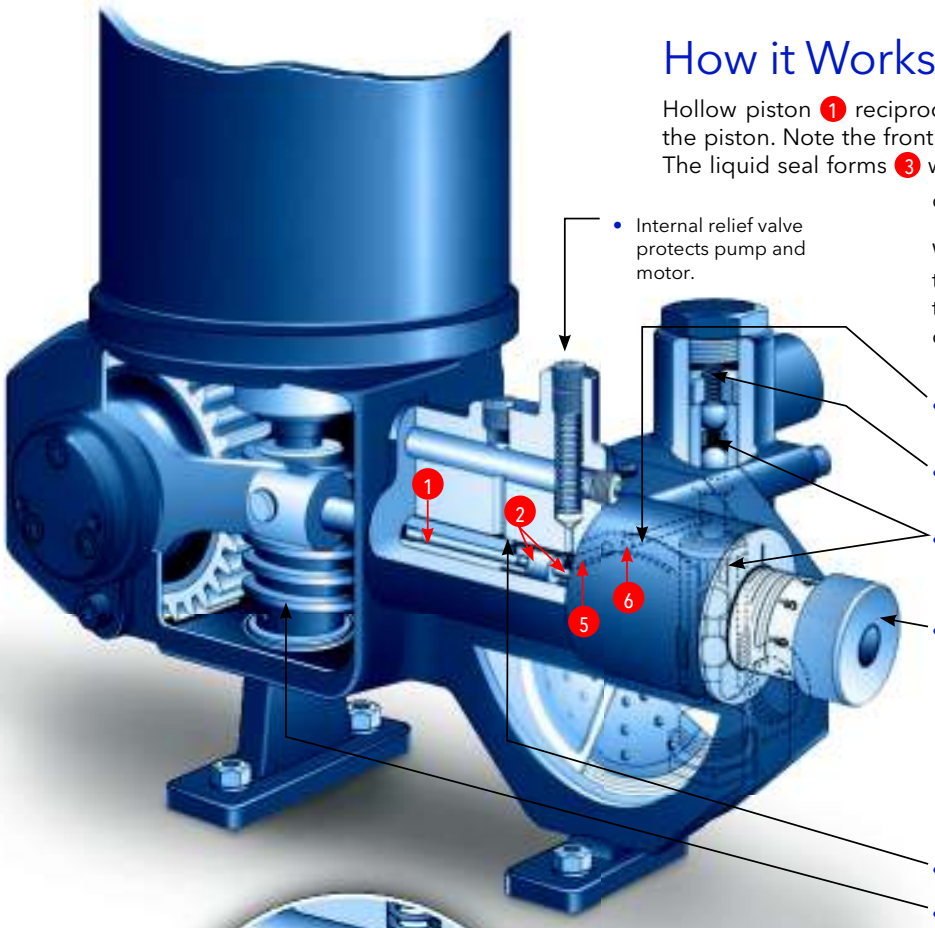
- **3** = 316SS Trim, FKM O-Rings, PTFE Diaphragm
- **4** = C-20, FKM O-Rings, PTFE Diaphragm
- **5** = PVC*, Glass** Ball Check, FKM O-Rings, PTFE Diaphragm
- **8** = PVDF, PTFE Diaphragm

* PVC head pumps satisfactory for temperatures to 125°F (52°C).
** Special materials available for services not compatible with glass.

How it Works

Hollow piston 1 reciprocates within a cylinder. Metering rod 2 fits into the piston. Note the front of the piston, or "nose," has a reduced diameter. The liquid seal forms 3 where the full diameter of the piston contacts the cylinder.

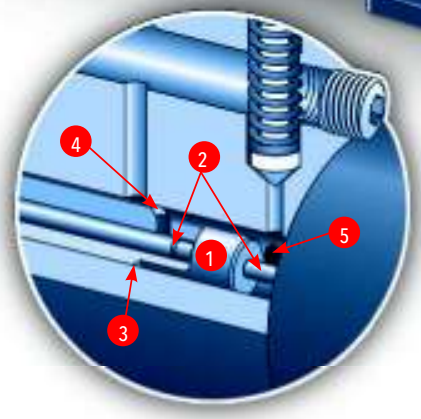
When the piston moves forward, oil by-passes over the reduced nose, through port 4 to the center of the piston and back to the gearbox. As the piston continues forward, port 4 is blocked by the tip of



- Internal relief valve protects pump and motor.
- Hydraulically balanced diaphragm eliminates diaphragm stress associated with mechanically flexed units.
- Antisiphon spring provides back pressure when pumping against low pressure.
- EZE-CLEAN™ Valves–feature cartridges that can be removed for cleaning without disturbing the piping to the pump.
- Micrometer dial–provides all Neptune pumps the ability to adjust capacity from 10% to 100%.

Variable Oil By-Pass™ Stroke Adjustment–provides a better valve performance when compared to variable linkage designs. This increase in performance is the result of valve checks that have extra time to seat even in viscous liquids since they are idle during the by-pass portion of the suction and discharge strokes.

- Vent–Refill mechanism operates once per stroke.
- Power train operates in oil for extended service.



Turning the micrometer dial moves the metering rod and changes the pump capacity. When the metering rod is moved in, the tip of the metering rod closes port 4 sooner in the stroke allowing for less by-pass and more pumping action. Likewise, when the metering rod is moved out, the tip of the metering rod closes port 4 later in the stroke allowing more by-pass and less pumping.

The motion of the piston pushes and pulls the hydraulic fluid through port 5, into and out of the diaphragm chamber. The action of the fluid pushes and pulls the diaphragm which, in turn, pushes and pulls chemical through port 6. The action of the check valves controls the direction of the liquid.