

Series 500 "dia-PUMP"

Neptune
CHEMICAL PUMP CO., INC.

*Innovative
design, quality
workmanship,
long-term
reliability.*



Neptune Series 500 “dia-PUMP”

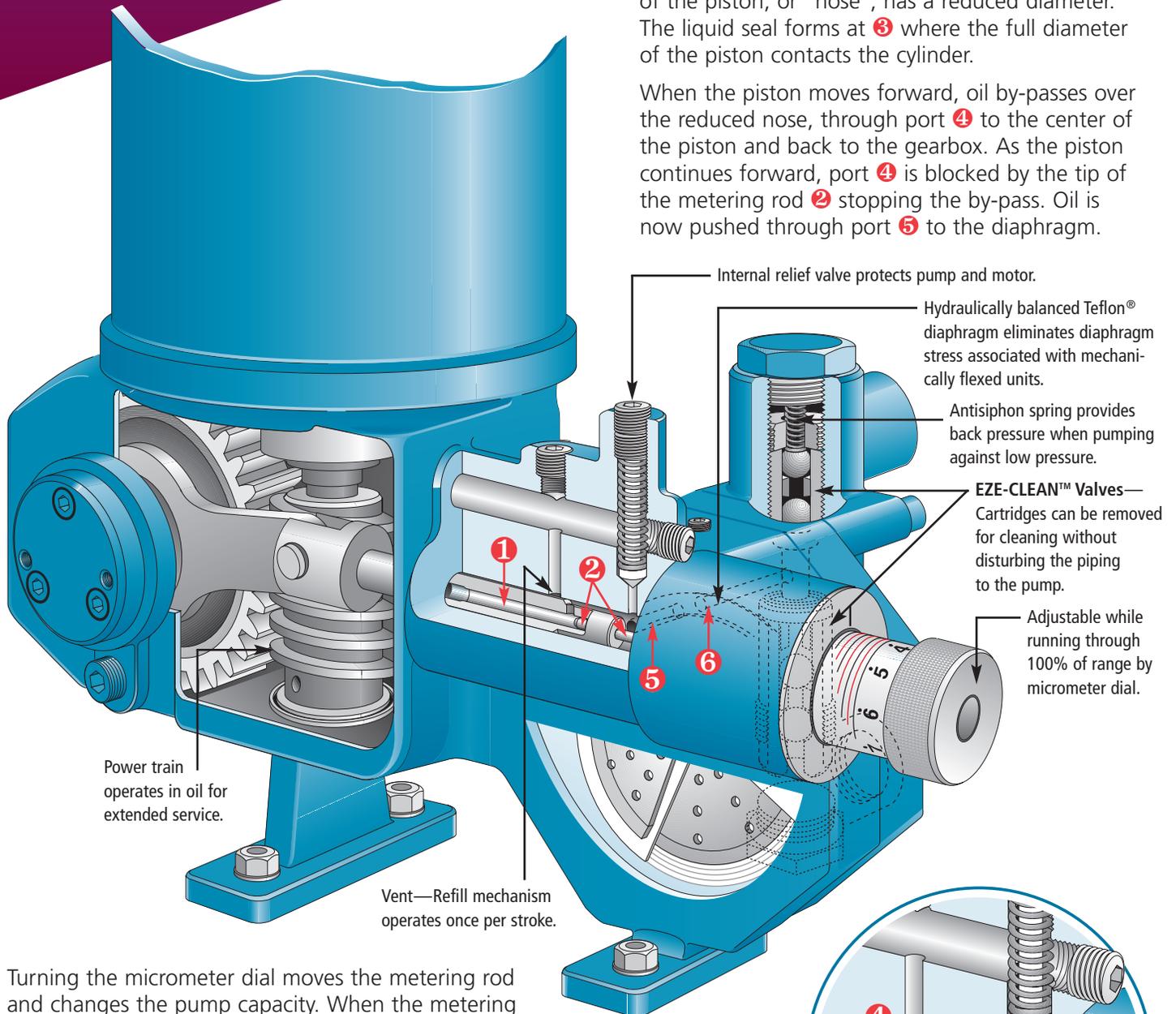
The only pumps with
EZE-CLEAN™ Valves

Variable Oil By-pass™ stroke adjustment allows 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.*

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 at 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 the metering rod ② stopping the by-pass. Oil is now pushed through port ⑤ to the diaphragm.



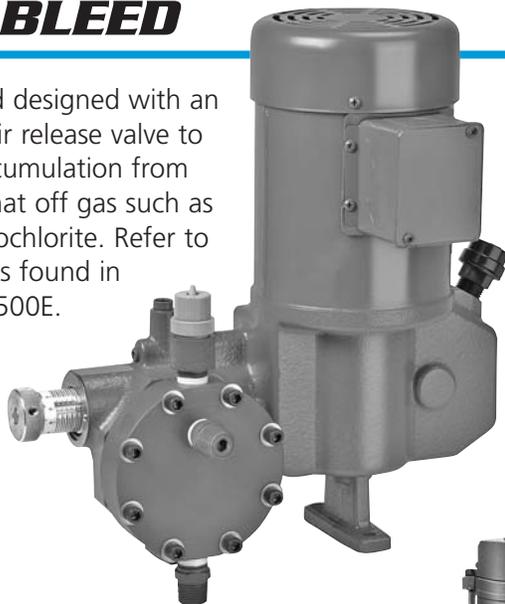
Turning the micrometer dial moves the metering rod and changes the pump capacity. When the metering rod is moved in, the tip of the metering rod closes port ④ sooner in the stroke allowing for less by-pass and more pumping action. Likewise, when the metering rod is moved out, the tip of the metering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

Automatic Control Options

SODIUM HYPOCHLORITE GAS BLEED

Special head designed with an automatic air release valve to vent gas accumulation from chemicals that off gas such as sodium hypochlorite. Refer to "AR" models found in Bulletin DP-500E.



PNEUMATIC STROKE CONTROL

The flow rate of any Neptune "dia-PUMP" can be controlled by an instrument air signal when using the pneumatic stroke control to change stroke length.



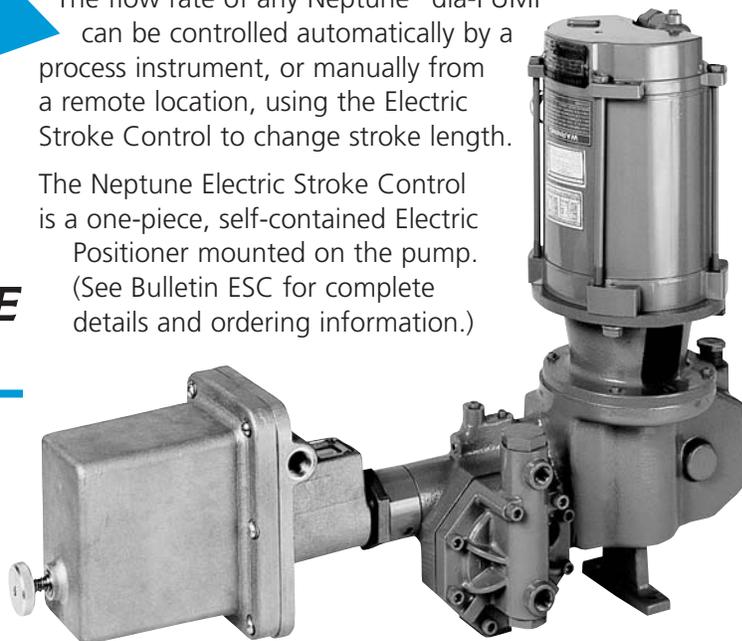
- Explosion-proof (be certain to order proper motor for hazardous locations)
- Unit follows 3-15 psi signal as standard; other signal ranges are available
- Direct (forward) or indirect (reverse) response to changing signal
- Local stroke position indicator on controller

Note: Can be mounted on both heads of duplex pumps.

ELECTRIC STROKE CONTROL

The flow rate of any Neptune "dia-PUMP" can be controlled automatically by a process instrument, or manually from a remote location, using the Electric Stroke Control to change stroke length.

The Neptune Electric Stroke Control is a one-piece, self-contained Electric Positioner mounted on the pump. (See Bulletin ESC for complete details and ordering information.)



- 50/60 Hz, 110/220 V
- Explosion-proof (be certain to order proper motor for hazardous locations)
- Unit follows 4-20 mA or 1-5V signal
- Adjustable ratio signal to stroke 1:2 or 2:1
- Direct (forward) or indirect (reverse) response to changing signal
- Manual override in event of instrument signal or power loss, a unique feature

Note: Can be added on only one head of duplex pumps.

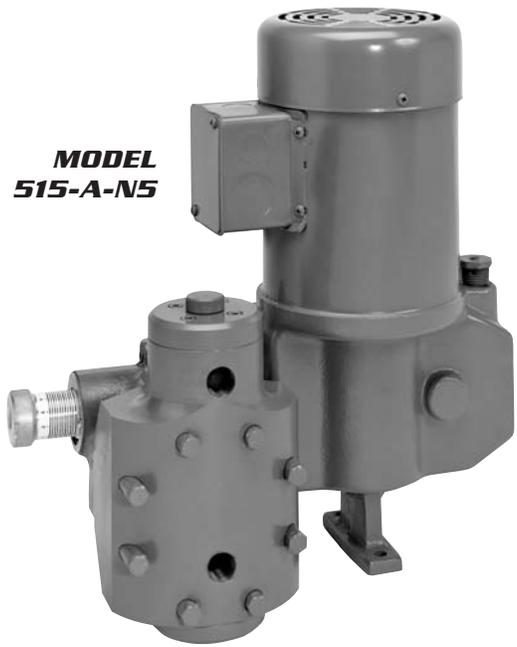
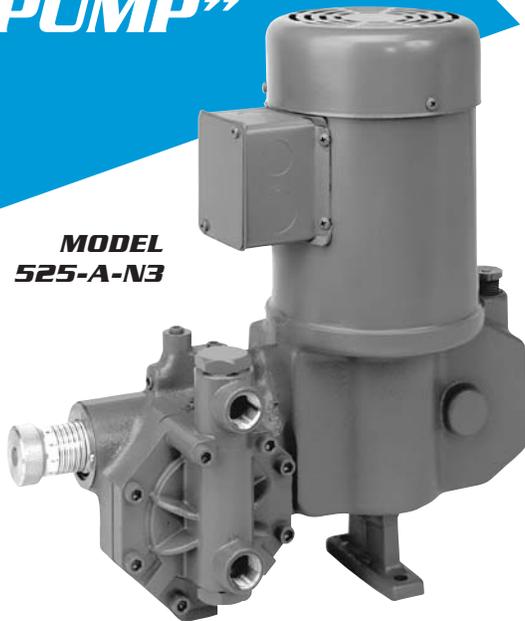
VARIABLE SPEED CONTROL

The flow rate of any Neptune "dia-PUMP" can be controlled automatically by a process instrument using a variable speed drive to change pump stroke speed.

Optional 56C frame motor flange adapter allows convenient mounting of any AC or DC variable speed motor control package.

Note: Select pump with stroking speed sufficiently high that, at minimum speed, pump operates at 15spm minimum.

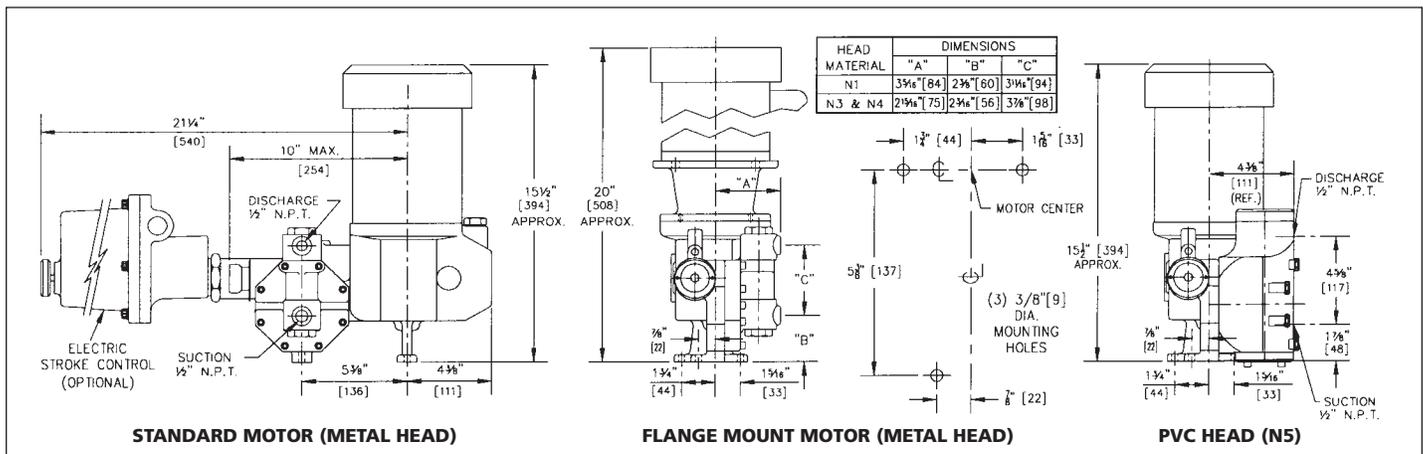
Neptune Series 500-A “dia-PUMP”



Features

- Standard Motor—TEFC:
1/3HP-1ph-115VAC-60c-Totally Enclosed Fan-Cooled with built-in automatic thermal overload
- 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.

Series 500-A “dia-PUMP” Dimensions Except Kynar® Models (Code N8)*



Dimensions are approximate. Specifications subject to change without notice.

*See Bulletin DP-500E for Kynar® (N8).

SERIES 500-A “dia-PUMP” SELECTION CHART

Standard Motor: 1/3HP-1ph-115VAC-60c-TEFC†

SIMPLEX ONLY

MODEL NUMBER	CAPACITY AT 100 PSI		MATERIALS OF CONSTRUCTION	MAXIMUM PRESSURE		PISTON DIAMETER (INCHES)	STROKES PER MINUTE	SHIPPING WEIGHT LBS.
	GPH	LPH		PSI	KG/CM ²			
500-A-N1	1.0	3.7	Cast Iron	1000	70	0.500	37	60
500-A-N3			316SS	1000	70			
500-A-N4			C-20	1000	70			
500-A-N5			PVC	150	11			
510-E-N8	0.8	3.0	Kynar**	150	11			
515-A-N1	3.0	11.3	Cast Iron	1100	77	0.500	117	60
515-A-N3			316SS	1100	77			
515-A-N4			C-20	1100	77			
515-A-N5			PVC*	400	28			
515-E-N8			Kynar**	150	11			
520-A-N1	2.0	7.5	Cast Iron	700	49	0.687	37	60
520-A-N3			316SS	700	49			
520-A-N4			C-20	700	49			
520-A-N5			PVC	400	28			
520-E-N8			Kynar**	150	11			
522-A-N1	4.0	15.1	Cast Iron	700	49	0.687	72	60
522-A-N3			316SS	700	49			
522-A-N4			C-20	700	49			
522-A-N5			PVC*	400	28			
522-E-N8			Kynar**	150	11			
525-A-N1	7.0	26.5	Cast Iron	900	63	0.687	117	60
525-A-N3			316SS	900	63			
525-A-N4			C-20	900	63			
525-A-N5			PVC*	400	28			
525-E-N8			Kynar**	150	11			
530-A-N1	5.5	20.8	Cast Iron	350	25	1.062	37	60
530-A-N3			316SS	350	25			
530-A-N4			C-20	350	25			
530-A-N5			PVC	300	21			
530-E-N8			Kynar**	150	11			
532-A-N1	11.0	41.6	Cast Iron	350	25	1.062	72	60
532-A-N3			316SS	350	25			
532-A-N4			C-20	350	25			
532-A-N5			PVC	300	21			
532-E-N8			Kynar**	150	11			
535-A-N1	18.0	68.1	Cast Iron	350	25	1.062	117	60
535-A-N3			316SS	350	25			
535-A-N4			C-20	350	25			
535-A-N5			PVC	300	21			
535-E-N8			Kynar**	150	11			

† See page 10 for motor options available.

* For sodium hypochlorite service, refer to Bulletin DP-500E.

** Kynar® models do not include Eze-Clean™ valves.

** See Bulletin DP-500E for dimensions.

For Higher Capacities see page 8.

For Higher Capacities and Pressures request Bulletin DP-2000.

For Ultra-Low Capacity High Pressure Models request Bulletin LV.

For Viscous Chemicals and Slurries request Bulletin TP or VP.

For Economy Models request Bulletin DP-500E.

Neptune Series 500 "dia-PUMP"



MODEL 515-S-N3-TE1
with low profile
flange adapter

MODEL 525-S-N3



MODEL 535-D-N5



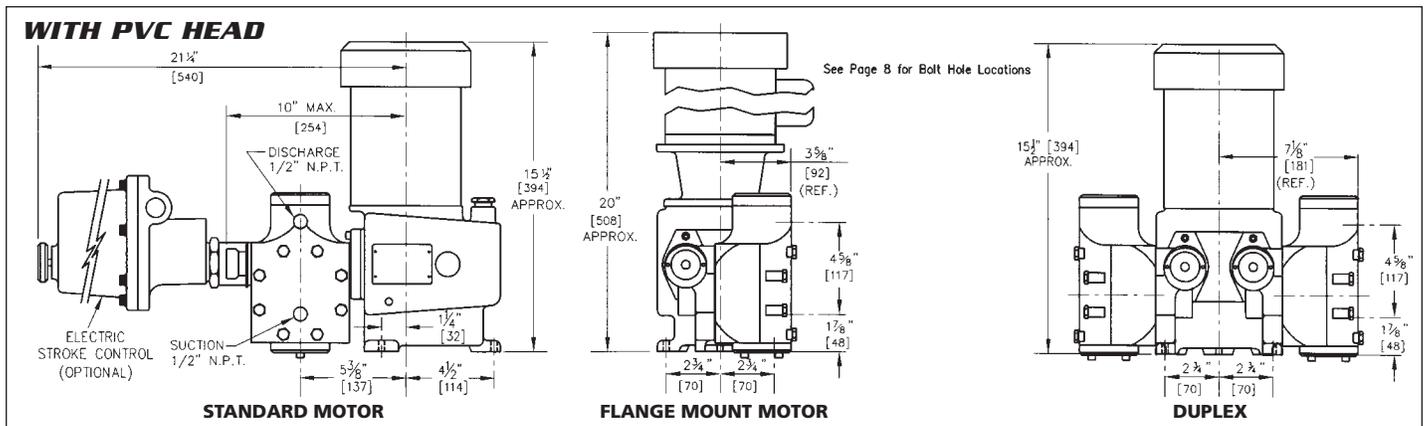
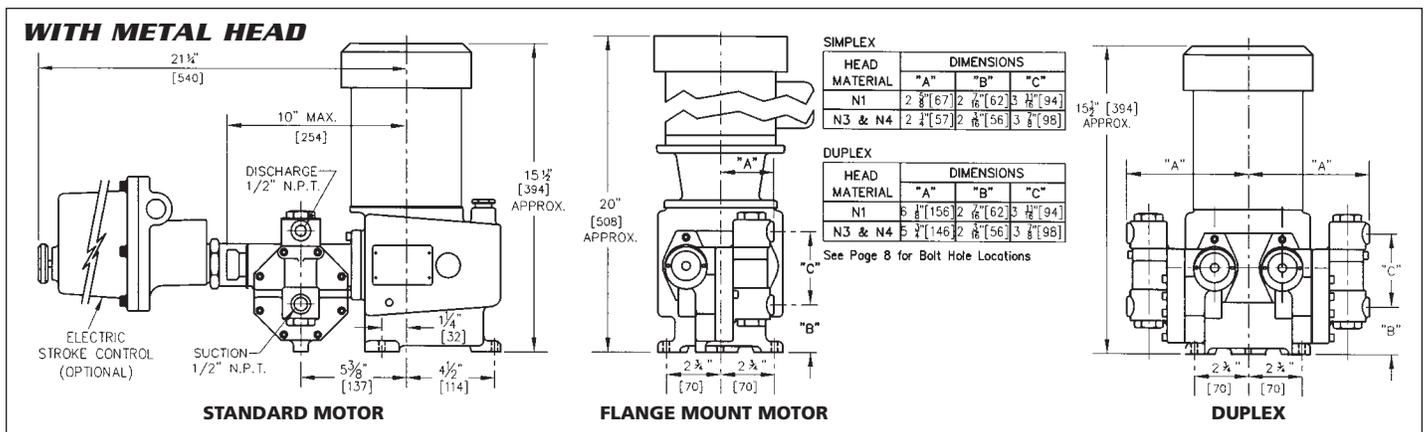
Features

Series 500 has the same features as Series 500-A (see page 4) except these models can be duplexed.

Any duplex combination can be created using any models on pages 7 and 8, as long as both have the same stroking speed.

(Add 15 lbs. to shipping weight.)

Series 500 "dia-PUMP" Dimensions*



*Dimensions are approximate. Specifications subject to change without notice.

SERIES 500 "dia-PUMP" SELECTION CHART

Standard Motor: 1/3HP-1ph-115VAC-60c-TEFC†

DUPLIX AVAILABLE Change the letter "S" in the model number to the letter "D" to define a duplex pump with both heads the same. Any duplex combination can be created using any models on pages 7 and 8, as long as both have the same stroking speed.

MODEL NUMBER	CAPACITY AT 100 PSI		MATERIALS OF CONSTRUCTION	PRESSURE ¼ OR ½ MOTOR		PRESSURE ½ HP MOTOR*		PISTON DIAMETER (INCHES)	STROKES PER MINUTE	STYLE	SHIPPING WEIGHT LBS.**
	GPH	LPH		PSI	KG/CM²	PSI	KG/CM²				
500-S-N1	0.8	3.0	Cast Iron	1000	70	N/A	N/A	0.500	37	Simplex	70
500-S-N3			316SS	1000	70	3000	210				
500-S-N4			C-20	1000	70	N/A	N/A				
500-S-N5			PVC	150	11	N/A	N/A				
515-S-N1	3.0	11.3	Cast Iron	1100	77	N/A	N/A	0.500	117	Simplex	70
515-S-N3			316SS	1100	77	1800	125				
515-S-N4			C-20	1100	77	N/A	N/A				
515-S-N5			PVC	400	28	N/A	N/A				
520-S-N1	2.0	7.5	Cast Iron	700	49	N/A	N/A	0.687	37	Simplex	70
520-S-N3			316SS	700	49						
520-S-N4			C-20	700	49						
520-S-N5			PVC	400	28						
522-S-N1	4.0	15.1	Cast Iron	700	49	N/A	N/A	0.687	72	Simplex	70
522-S-N3			316SS	700	49						
522-S-N4			C-20	700	49						
522-S-N5			PVC	400	28						
525-S-N1	7.0	26.5	Cast Iron	900	63	1500	105	0.687	117	Simplex	70
525-S-N3			316SS	900	63	1500	105				
525-S-N4			C-20	900	63	1500	105				
525-S-N5			PVC	400	28	N/A	N/A				
530-S-N1	5.5	20.8	Cast Iron	350	25	N/A	N/A	1.062	37	Simplex	70
530-S-N3			316SS	350	25						
530-S-N4			C-20	350	25						
530-S-N5			PVC	300	21						
532-S-N1	11.0	41.6	Cast Iron	350	25	600	42	1.062	72	Simplex	70
532-S-N3			316SS	350	25	600	42				
532-S-N4			C-20	350	25	600	42				
532-S-N5			PVC	300	21	N/A	N/A				
535-S-N1	18.0	68.0	Cast Iron	350	25	600	42	1.062	117	Simplex	70
535-S-N3			316SS	350	25	600	42				
535-S-N4			C-20	350	25	600	42				
535-S-N5			PVC	300	21	N/A	N/A				
537-S-N1	22.0	83.0	Cast Iron	350	25	400	28	1.062	144	Simplex	70
537-S-N3			316SS	350	25	400	28				
537-S-N4			C-20	350	25	400	28				
537-S-N5			PVC	300	21	N/A	N/A				
547-S-N1†	30.0	113.0	Cast Iron	200	14	350	25	1.187	144	Simplex	70
547-S-N3†			316SS	200	14	350	25				
547-S-N4†			C-20	200	14	350	25				
547-S-N5†			PVC	200	14	300	21				

† Models 547 furnished with integral 1/2HP-1ph-115VAC-TEFC motor as standard.

* Neptune recommends that ½ HP high pressure models be used only in flooded suction applications.

** Standard motor only. For flange mounted motor, add 20 lbs.

For Higher Capacities see page 8.

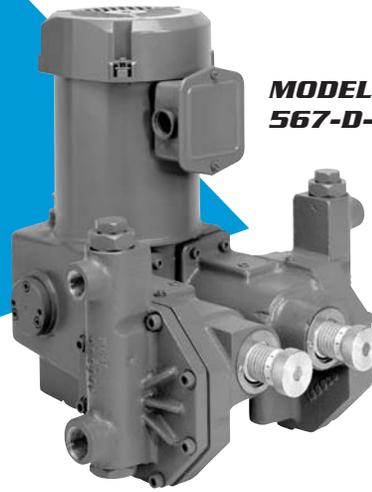
For Higher Capacities and Pressures request Bulletin DP-2000.

For Ultra-Low Capacity High Pressure Models request Bulletin LV.

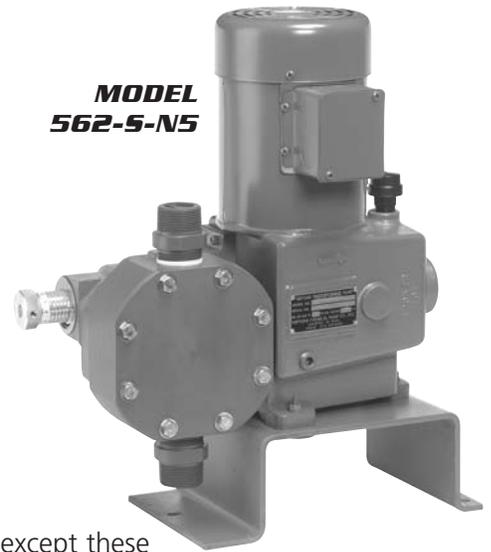
For Viscous Chemicals and Slurries request Bulletin TP or VP.

For Economy Models request Bulletin DP-500E.

Neptune Series 560 "dia-PUMP"



**MODEL
567-D-N3**



**MODEL
562-S-N5**

Features

Series 560 has the same features as Series 500-A (see page 4) except these models can be duplexed. **Any duplex combination can be created using any models on pages 7 and 8, as long as both have the same stroking speed.** (Add 30 lbs. to shipping weight.)

SERIES 560 "dia-PUMP" SELECTION CHART

Standard Motor: 1/2HP-1ph-115VAC-60c-TEFC†

DUPLIX AVAILABLE Change the letter "S" in the model number to the letter "D" to define a duplex pump with both heads the same. Any duplex combination can be created using any models on pages 7 and 8, as long as both have the same stroking speed.

MODEL NUMBER	CAPACITY AT 100 PSI		MATERIALS OF CONSTRUCTION	PISTON DIAM. (INCHES)	STROKES PER MINUTE	PRESSURE/HORSEPOWER								STYLE	SHIP. WT. LBS.*
	GPH	LPH				1/2 HP*		3/4 HP*		1 HP*		1 HP*			
						PSI	KG/CM ²	PSI	KG/CM ²	PSI	KG/CM ²	PSI	KG/CM ²		
562-S-N3 562-S-N4 562-S-N5 562-S-N8	40	151	316SS C-20 PVC ^{1,2} Kynar ²	2.0	72	100	7	175	12	250	18	350	25	Simplex	80
565-S-N3 565-S-N4 565-S-N5 565-S-N8	65	246	316SS C-20 PVC ^{1,2} Kynar ²	2.0	117	100	7	175	12	250	18	350	25	Simplex	80
567-S-N3 567-S-N4 567-S-N5 567-S-N8	80	302	316SS C-20 PVC ^{1,2} Kynar ²	2.0	144	100	7	175	12	250	18	350	25	Simplex	80

† For optional motors rated 1/2 HP and larger, add "FA" flange adapter option, plus 56C end mount motor of choice.

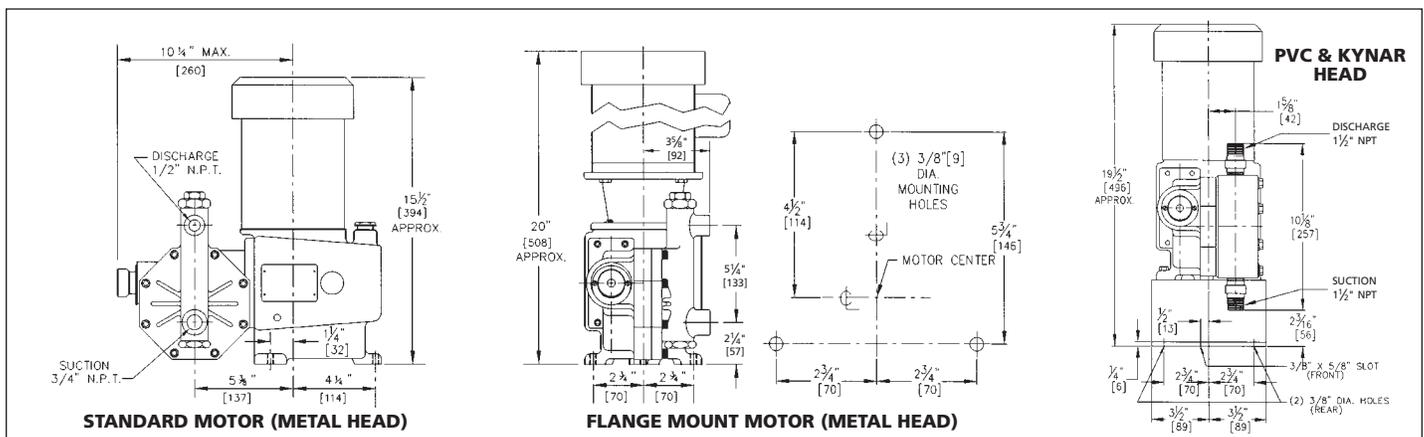
* Standard motor only. For flange mounted motor, add 20 lbs.

¹ PVC Models 150 psi Maximum; 125°F Maximum.

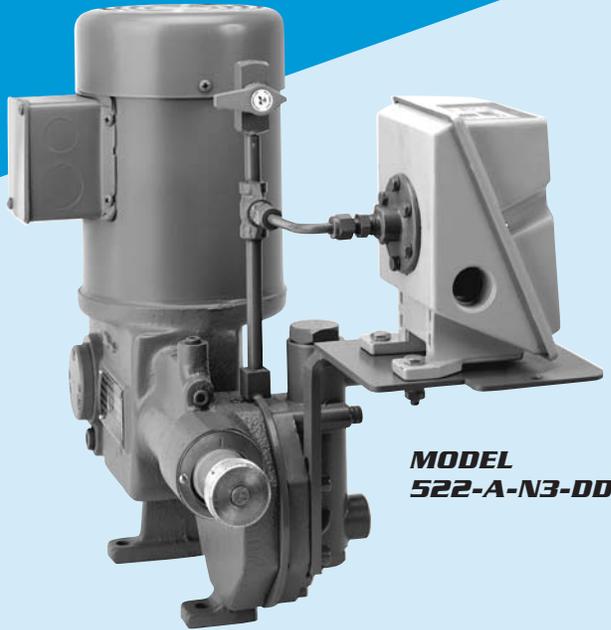
² PVC and Kynar® models do not include Eze-Clean™ valves.

For Higher Capacities and Pressures request Bulletin DP-2000.
For Motor Options Available see page 10.

Series 560 "dia-PUMP" Dimensions*



Double Diaphragm With Leak Detection



**MODEL
522-A-N3-DD**

Neptune offers a double diaphragm leak detection option for applications where contamination of the process fluid by the pump hydraulic fluid cannot be tolerated or where diaphragm failure must be sensed immediately.

The Neptune double diaphragm design uses two “dry” coupled diaphragms. The area between the diaphragms is evacuated.

Hydraulic pumping action is transmitted from one diaphragm to the other without the use of any intermediate fluids.

The diaphragm condition is monitored by a pressure switch which can be wired to shut off the pump and/or sound a remote alarm. This design eliminates conductivity probes which could fail to detect the presence of oil or low conductivity liquids in the event of a diaphragm failure.

The double diaphragm option “DD” is available on all Neptune Series 500, Series 500-A or Series 560 “dia-PUMPS”.

Contact the factory for full specifications and applications information.

PLANNING YOUR INSTALLATION

Do not oversize the pump. A metering pump should be sized so the maximum expected flow rate is 80% to 85% of the pump capacity. The minimum capacity should never be planned less than 10% of the pump nameplate rating.

For outdoor applications the pump motor should be sheltered from direct sunlight to prevent overheating. The pump will operate in freezing temperature provided it runs continuously and provided the liquid being pumped will not freeze.

Consider dust, which can ignite, as well as fumes or vapors when determining if a hazardous environment exists.

Always use a suction strainer 40–60 mesh to prevent foreign matter from clogging the check valves.

Provide suction and discharge isolation valves for maintenance. Select large port, quick opening valves.

Calibration Column—A suction draw down column is the most accurate and convenient method to measure pump performance.

Relief Valve—The internal relief valve furnished with these pumps is to protect the pump. Provide an external relief valve to protect the system piping.

Back pressure valves are required when the system does not provide sufficient back pressure. Do not depend on a spring-loaded check valve when feeding from bulk tanks to a low-pressure application where the discharge is below the tank.

Pulsation dampener is used when long discharge runs (between the pump and injection point) need dampening to reduce water-hammer or pressure spikes caused by acceleration in the discharge line.

Suction Piping—Keep the piping as short as possible, minimizing bends, elbows and other restrictions. The safest rule of thumb is to use piping one size larger than the pump suction connection. Piping may be the same size as pump suction connection for slow speed pumps used with low viscosity chemical.

Feel free to contact the Neptune factory for application assistance.

For additional information, request our bulletins “Sizing and Selecting Metering Pumps” or “Considerations for a Successful Chemical Feed Installation”. Both are available at no charge.

MATERIALS OF CONSTRUCTION

PART	CODE N1	CODE N3	CODE N4	CODE N5	CODE N8
Liquid Head	Cast Iron	316SS	C-20	PVC*	Kynar
Diaphragm	Teflon®	Teflon®	Teflon®	Teflon®	Teflon®
Valve Body & Seat	316SS	316SS	C-20	PVC*	Kynar
Valve Checks	316SS	316SS	C-20	Glass**	Glass**
"O"-rings	Viton	Viton	Viton	Viton	N/A

*PVC head pumps satisfactory for temperatures to 125°F/52°C.

**Special materials available for services not compatible with glass.

NOTES

1. MOTORS:

Series 500 "dia-PUMPS" are supplied with an integrally mounted 1/3HP-1ph-60c-115VAC-TEFC motor as standard. This motor is provided with automatic thermal overload protection.

Stock motor options available as follows:

- A. Integrally Mounted 1/2HP-1ph-60c-115VAC-TEFC—Add Suffix **"2"** to model number.
Integrally Mounted 1/2HP-3ph-60c-230/460VAC-TEFC—Add Suffix **"3"** to model number.
- B. Explosion-Proof Motors—Flange Mounted
(Class I, Groups C & D; Class II, Groups E, F & G Hazardous Locations)
1/3HP-1ph-60c-115/230VAC-Explosion-Proof—Add Suffix **"EX1"** to model number.
1/3HP-3ph-60c-230/460VAC-Explosion-Proof—Add Suffix **"EX3"** to model number.
- C. Totally Enclosed Fan-Cooled Motors—Flange Mounted
1/3HP-1ph-60c-115/230VAC-TEFC—Add Suffix **"TE1"** to model number.
1/3HP-3ph-60c-230/460VAC-TEFC—Add Suffix **"TE3"** to model number.
- D. Severe-Chemical Duty Motors—Flange Mounted
1/3HP-1ph-60c-115/230VAC-TENV-Class F, 1.15 service factor
—Add Suffix **"SXT1"** to model number.
1/3HP-3ph-60c-230/460VAC-TENV-Class F, 1.15 service factor
—Add Suffix **"SXT3"** to model number.

2. CAPACITY:

Capacity figures are listed at 100 psi discharge pressure, based on water using 1725 rpm motor. Capacity will decrease by approximately 1.5% for each 100 psi increase in pressure.

To derate capacity for 50 Hz operation (1425 rpm), multiply capacity by ⁵⁰/₆₀ (0.83).

3. ACCURACY:

Accuracy is ±1% of full scale over the range of 10% to 100% of capacity.

4. TEMPERATURE/VISCOSITY:

Contact factory for temperatures over 200°F (93°C) or viscosity greater than 1000 centipoise.

ORDERING INFORMATION

When ordering, please include the following information:

1. Description of liquid to be pumped. Include chemical name, concentration, viscosity, pH and temperature of solution.
2. Maximum, normal and minimum pump capacity required.
3. Discharge pressure required.
4. Suction conditions.
5. Motor characteristics required.



TEFC motor with standard flange adapter



TEFC motor with low profile flange adapter

Low profile flange adapter is 2 inches shorter than the standard flange adapter.

Feel free to contact the Neptune factory for application assistance.

For additional information, request our bulletins "Sizing and Selecting Metering Pumps" or "Considerations for a Successful Chemical Feed Installation". Both are available at no charge.

Quality Accessories by Neptune

CALIBRATION COLUMNS

Standard sizes 100,
250, 500, 1,000
and 4,000 ml.

Request Bulletin CC



EZE-GRAB PLATFORMS

Molded polyethylene base provides
elevated platform for use indoors
or outdoors. Handles allow the
pump to be moved easily.



BACK PRESSURE VALVES

PVC, 316SS
and Alloy 20.
Standard.

Request Bulletin BP



▲ 316SS

◀ PVC

PULSATION DAMPENERS

PVC, polypropylene, 316SS
and Alloy 20 bodies
with Viton or
EPDM bladders.

Request Bulletin PD



▲ 316SS

◀ PVC

RELIEF VALVES

PVC, 316 and
Alloy 20 standard.

Request Bulletin RV



Other Quality Products by Neptune

CHEMICAL FEED SYSTEMS

Neptune manufactures a complete selection of standard and custom chemical feed systems. Skid-mounted systems include all components, factory piped, wired and tested. Flexible configurations to fit any requirements.



CUSTOM SYSTEM

CUSTOM SYSTEM

Built to your specifications or designed to meet your needs

Request Bulletins FDP, CFS & ECF

STANDARD SYSTEM



POLYMER BLEND & FEED

Neptune's Polymaster™ dilutes, mixes and thoroughly activates emulsion, dispersion and solution polymers including new high molecular weight products.

Request Bulletin PM



PORTABLE MIXERS

Neptune mixers have been designed, engineered and built to provide long life and trouble-free service in a wide variety of blending/mixing operations.

Request Portable Mixer Catalog



Neptune
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