

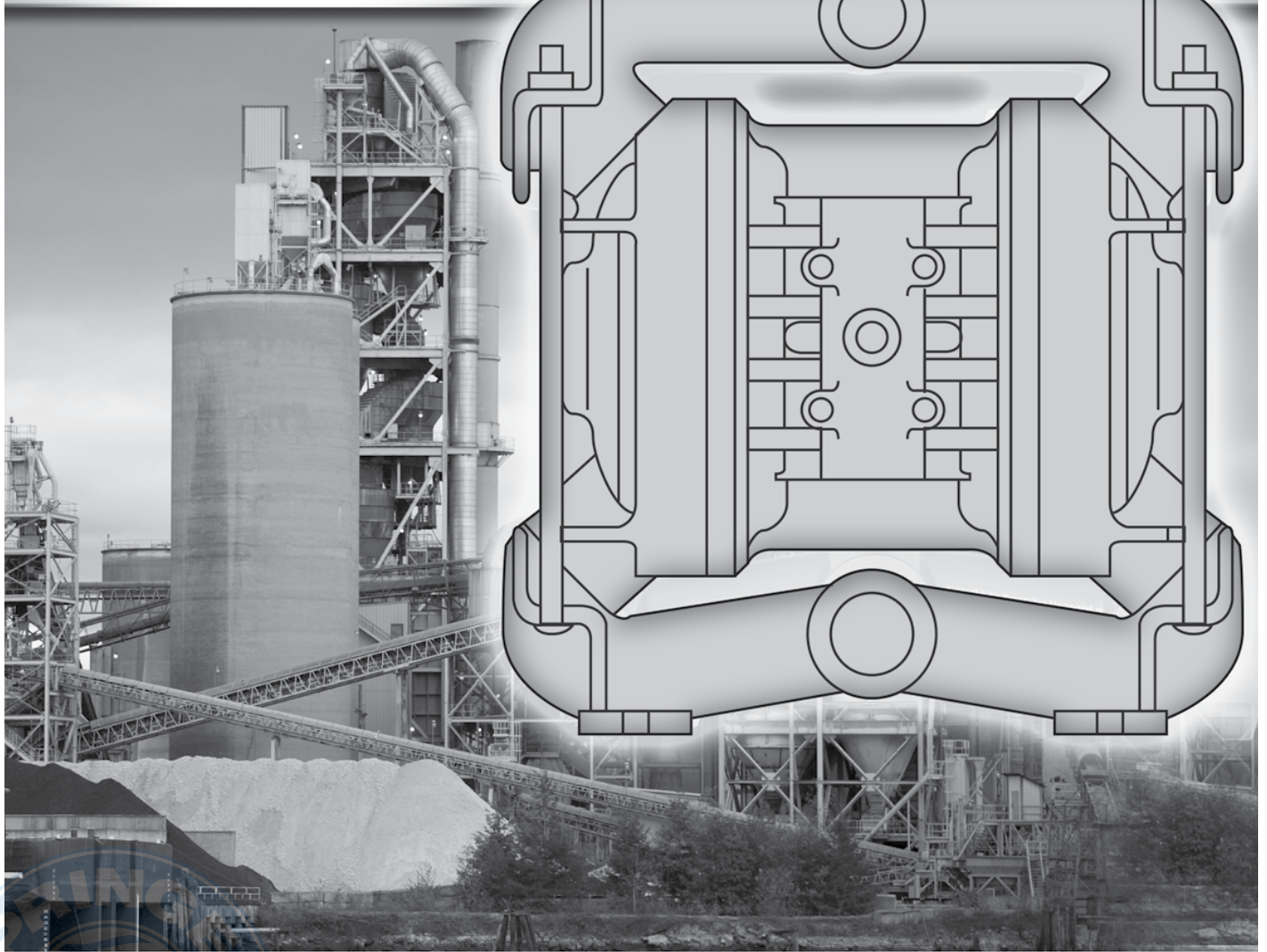
NOMAD



NOMAD™

OPERATION MANUAL

NTG25 NOMAD TRANS-FLO™



AIR-OPERATED



DOUBLE DIAPHRAGM



PUMPS

ALUMINUM Models

316 S.S. Models



A JDA Global Company

1/14 rev.3

Tel: 866-777-6060
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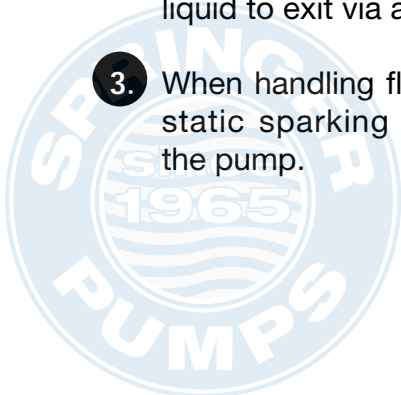
Springer Pumps, LLC

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CAUTION – SAFETY POINTS

TEMPERATURE LIMITS:		
Neoprene	-17.8°C to 93.3°C	0°F to 200°F
Buna-N	-12.2°C to 82.2°C	10°F to 180°F
EPDM	-51.1°C to 137.8°C	-60°F to 280°F
Viton®	-40°C to 176.7°C	-40°F to 350°F
Santoprene®	-40°C to 107.2°C	-40°F to 225°F
Polyurethane	12.2°C to 65.6°C	10°F to 150°F
Hytrel®	-28.9°C to 104.4°C	-20°F to 220°F
PTFE	4.4°C to 104.4°C	40°F to 220°F

1. Review the NOMAD Chemical Field Guide for all applications. The information provided is the “best thinking available” regarding chemical compatibility. The guide however, does not provide a recommendation.
2. Always wear safety glasses during pump operation. A diaphragm rupture may force liquid to exit via air exhaust.
3. When handling flammable fluids, prevent static sparking by properly grounding the pump.
4. Do not exceed 125 psig (8.6 bar).
5. Prior to maintenance, compressed air line should be disconnected to allow air pressure to bleed from pump.
6. Tighten all clamp bands and hardware parts prior to installation. Fittings may loosen during transportation.



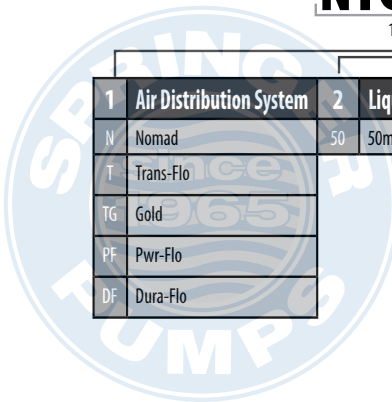
PUMP DESIGNATION SYSTEM

XXX XX / XXXX / XX / XX / XXX / X / X / X

1	Air Distribution System	2	Liquid Port Size	3	Wetted Parts	7,8	Diaphragms & Valve Balls	9	Valve Seats	11	Fittings	12	Connections	13	ATEX	
N	Nomad	07	07mm/.25"	A	Aluminum	BN	Buna - N/ Nitrile	A	Aluminum	N	NPT	C	Clamped			
T	Trans-Flo	15	15mm/.5"	W	Ductile	ND	Nordel/EPDM	S	Stainless Steel	B	BSP	B	Bolted			
TG	Gold	25	25mm/1"	S	Stainless Steel	NE	Neoprene	BN	Buna - N/Nitrile	TC	Tri-Clamp					
PF	Pwr-Flo	40	40mm/1.5"	P	Polypropylene	TF	PTFE (with Neoprene back-up)	NE	Neoprene	FL	Flanged					
DF	Dura-Flo	50	50mm/2"	4	Air Chambers	VT	Viton/FKM	ND	Nordel/EPDM							
				80	80mm/3"	A	Aluminum	FG	Hytrel®	VT	Viton					
				100	100mm/4"	W	Ductile	SN	Santoprene®	SP	Santoprene					
						S	Stainless Steel	SNF	Santoprene® - UFI	FG	Hytrel					
						W	Mild Steel	TFF	PTFE - UFI	P	Polypropylene					
						P	Polypropylene	TGN	Garlock® - NEO BACKED	K	Kynar					
						5	Center Block	TGE	Garlock® - EPDM BACKED	PU	Polyurethane					
						A	Aluminum	TGV	Garlock® - Viton BACKED	MTF	Mild Steel					
						P	Polypropylene	PU	Polyurethane	10	O-Ring					
						6	Air Valve	FGF	Hytrel UFI	BN	Buna - N/Nitrile					
						B	Brass	PUF	Polyurethane UFI	NE	Neoprene					
						P	Polypropylene			ND	Nordel/EPDM					
						A	Aluminum			VT	Viton					
								TF	PTFE							
								PU	Polyurethane							
								SN	Santoprene							
								PTV	Viton Encap.							

NTG 50 / AAAB / TF / TF / ATF / N / C / X

1	Air Distribution System	2	Liquid Port Size	3	Wetted Parts	7,8	Diaphragms & Valve Balls	9	Valve Seats	11	Fittings	12	Connections	13	ATEX
N	Nomad	50	50mm/2"	A	Aluminum	TF	PTFE (with Buna back-up)	A	Aluminum	N	NPT	C	Clamped		
T	Trans-Flo			4	Air Chambers			10	O-Ring						
TG	Gold			A	Aluminum			TF	PTFE						
PF	Pwr-Flo			5	Center Block										
DF	Dura-Flo			A	Aluminum										
				6	Air Valve										
				B	Brass										



AIR OPERATED DOUBLE DIAPHRAGM PUMPS FUNCTIONALITY AND FLOW PATTERN

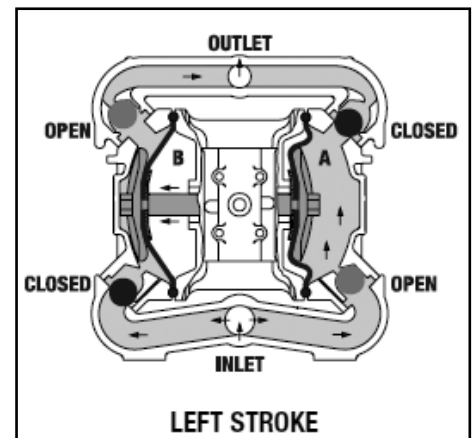
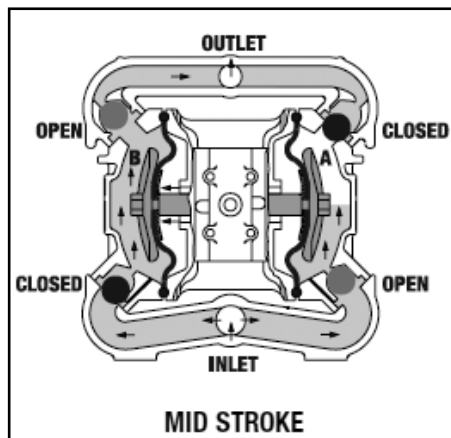
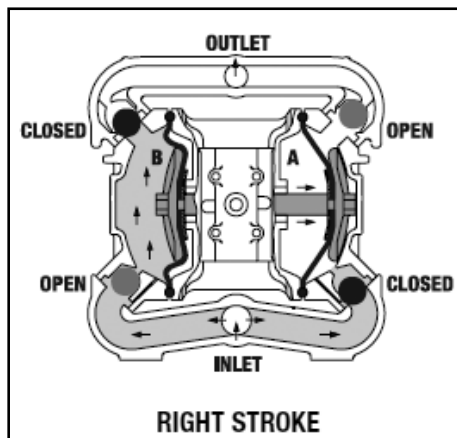
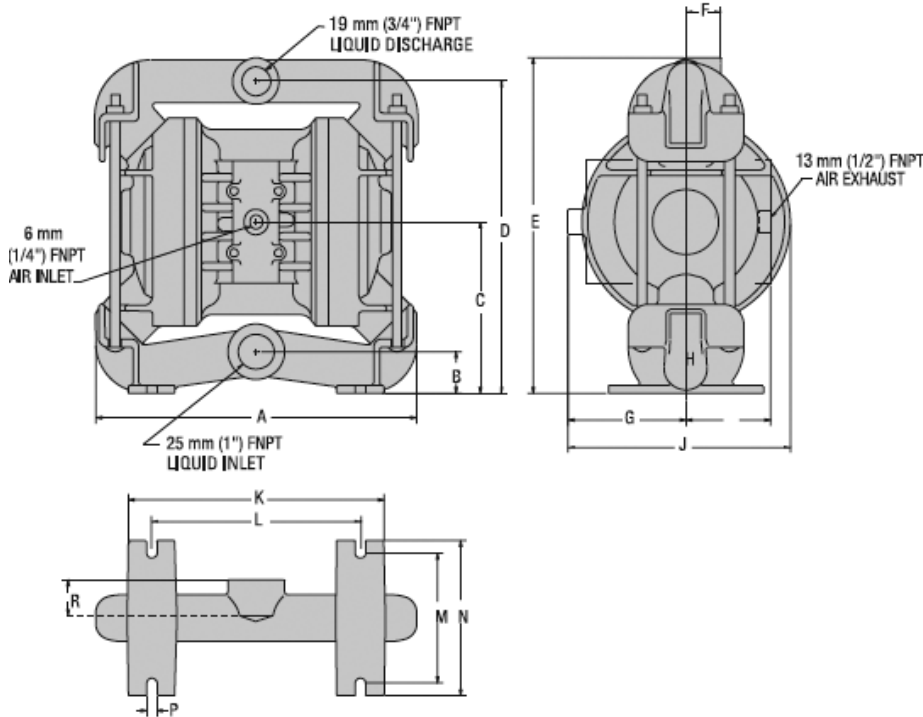


Figure 1: Air valve directs pressurized air to the back side of diaphragm A. Compressed air is applied directly to the liquid column separated by elastomeric diaphragms. The diaphragm acts as a separation membrane between the compressed air and liquid, balancing the load and removing mechanical stress from the diaphragm. The opposite diaphragm is pulled in by the shaft connected to the pressurized diaphragm. Diaphragm B is on its suction stroke; air behind the diaphragm has been forced out to the atmosphere through the exhaust port of the pump. Atmospheric pressure forces fluid into the inlet manifold forcing the inlet valve ball off its seat. Liquid is free to move past the inlet valve ball and fill the liquid chamber (see shaded area).

Figure 2: When the pressurized diaphragm, diaphragm A, reaches the limit of its discharge stroke, the air valve redirects pressurized air to the back side of the diaphragm B. The pressurized air forces diaphragm B away from the center block while pulling diaphragm A to the center block. Diaphragm B is now on its discharge stroke. These same hydraulic forces lift the discharge valve ball off its seat, while the opposite discharge valve ball is forced onto its seat, forcing fluid to flow through the pump discharge. Atmospheric pressure forces fluid into the inlet manifold of the pump. The inlet valve ball is forced off its seat allowing the fluid being pumped to fill the liquid chamber.

Figure 3: At completion of the stroke, the air valve again redirects air to the back side of diaphragm A, which starts diaphragm B on its exhaust stroke. As the pump reaches its original starting point, each diaphragm has gone through one exhaust and one discharge stroke. This constitutes one complete pumping cycle. The pump may take several cycles to completely prime depending on the conditions of the application.

DIMENSIONAL DRAWINGS



DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	267	10.5
B	36	1.4
C	137	5.4
D	254	10.0
E	279	11.0
F	28	1.1
G	97	3.8
H	76	3.0
J	185	7.3
K	211	8.3
L	173	6.8
M	107	4.2
N	127	5.0
P	8	0.3
R	33	1.3

BSPT threads available.

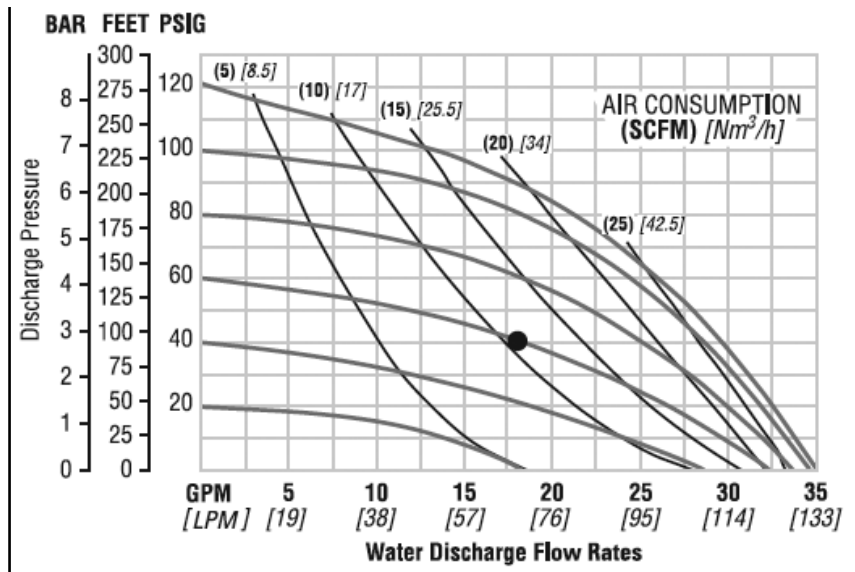
PERFORMANCE NTG25 METAL RUBBER-FITTED

Height279 mm (11.0")
 Width267 mm (10.5")
 Depth185 mm (7.3")
 Est. Ship Weight.....Aluminum 12 kg (26 lbs)
 316 S.S. 11.34 kg (25 lbs)
 Air Inlet 6 mm (1/4")
 Inlet.....25 mm (1")
 Outlet..... 19 mm (3/4")
 Suction Lift 5.18 m Dry (17')
 9.45 m Wet (31')
 Displacement/Stroke0.41 l (0.105 gal.)¹
 Max. Flow Rate132 lpm (35 gpm)
 Max. Size Solids 3.2 mm (1/8")

¹Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig) head pressure.

Example: To pump 68.1 lpm (18.0 gpm) against a discharge pressure head of 2.7 bar (40 psig) requires 4.1 bar (60 psig) and 18.7 Nm³/h (11 scfm) air consumption. (See dot on chart.)

Caution: Do not exceed 8.6 bar (125 psig) air supply pressure.



Flow rates indicated on chart were determined by pumping water.

For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump performance curve.

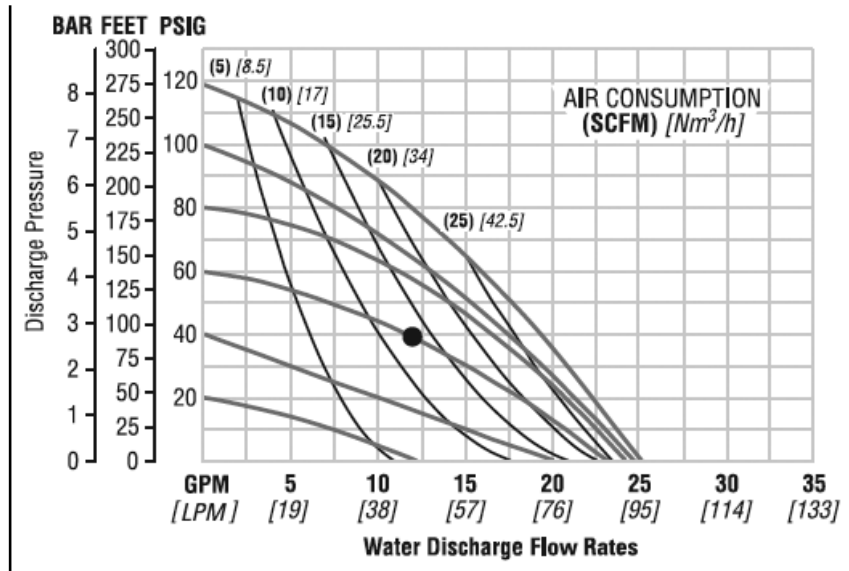
PERFORMANCE NTG25 METAL PTFE-FITTED

Height279 mm (11.0")
 Width267 mm (10.5")
 Depth185 mm (7.3")
 Est. Ship Weight.....Aluminum 12 kg (26 lbs)
 Air Inlet6 mm (1/4")
 Inlet.....25 mm (1")
 Outlet.....19 mm (3/4")
 Suction Lift1.83 m Dry (6')
 9.45 m Wet (31')
 Displacement/Stroke0.19 l (0.050 gal.)¹
 Max. Flow Rate95 lpm (25 gpm)
 Max. Size Solids3.2 mm (1/8")

¹Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig) head pressure.

Example: To pump 45.4 lpm (12.0 gpm) against a discharge pressure head of 2.7 bar (40 psig) requires 4.1 bar (60 psig) and 21.1 Nm³/h (13 scfm) air consumption. (See dot on chart.)

Caution: Do not exceed 8.6 bar (125 psig) air supply pressure.



Flow rates indicated on chart were determined by pumping water.

For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump performance curve.

SUGGESTED INSTALLATION

The suction pipe size should be at least 25mm (1") diameter or larger if highly viscous material is being pumped. The suction hose must be non-collapsible, reinforced type as the NTG25 is capable of pulling a high vacuum. Discharge piping should be at least 19mm (3/4"); larger diameter can be used to reduce friction losses. It is critical that all fittings and connections are airtight or a reduction or loss of pump suction capability will result.

Every pump location should have an air line large enough to supply the volume of air necessary to achieve the desired pumping rate.

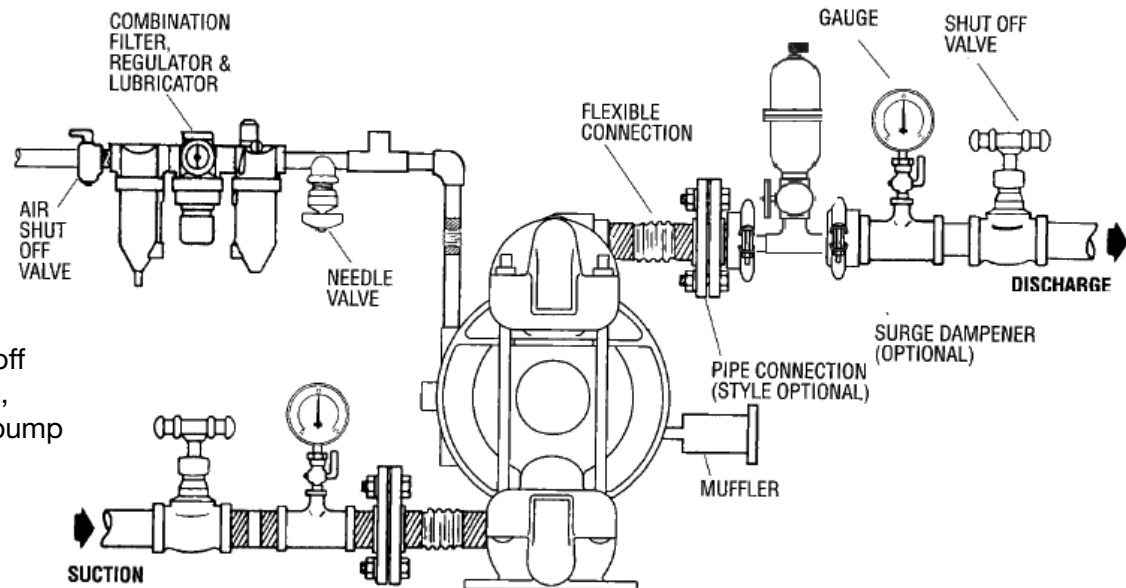
Unnecessary elbows, bends and fittings should be avoided. Pipe sizes should be selected so as to keep friction losses within practical limits. All piping should be supported independently of the pump.

Expansion joints can be installed to aid in absorbing the forces created by the natural reciprocating action of the pump. Flexible connections between the pump and rigid piping will also assist in minimizing pump vibration. A surge suppressor should be installed to protect the pump, piping and gauges from surges and water hammer.

When pumps are installed in applications involving flooded suction or suction head pressures, a gate valve should be installed in the suction line to permit closing of the line for pump service.

The NTG25 can be used in submersible applications only when both wetted and non-wetted portions are compatible with the material being pumped. If the pump is to be used in a submersible application, a hose should be attached to the pump's air exhaust and the exhaust air piped above the liquid level.

SUGGESTED INSTALLATION



Note: In the event of a power failure, the shutoff valve should be closed, if the restarting of the pump is not desirable once power is regained.

TROUBLESHOOTING

Pump will not run or runs slowly.

1. Check air inlet screen and air filter for debris.
2. Check for sticking air valve, flush air valve in solvent.
3. Check for worn out air valve. If piston face in air valve is shiny instead of dull, air valve is worn beyond working tolerances and must be replaced.
4. Check center block rings. If worn excessively, they will not seal and air will simply flow through pump and out air exhaust.
5. Check type of lubricant being used. ISO 15-5 wt. recommended.

Pump runs but little or no product flows.

1. Check for pump cavitation; slow pump speed down to match thickness of material being pumped.
2. Check for sticking ball valves. If material being pumped is not compatible with pump elastomers, swelling may occur.
3. Make sure all suction connections are air tight.

Pump air valve freezes.

Check for excessive moisture in compressed air.

Air bubbles in pump discharge.

1. Check for ruptured diaphragm.
2. Check for tightness for clamp bands, especially at intake manifold.

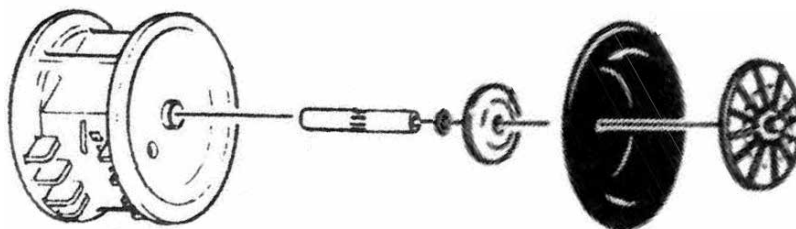
Product comes out air exhaust.

1. Check for diaphragm rupture.
2. Check tightness of piston plates to shaft.

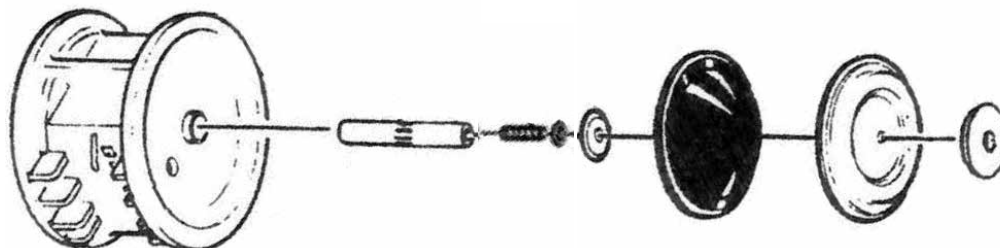
Pump rattles.

Create false discharge head or suction lift.

EXPLODED VIEW (RUBBER DIAPHRAGMS)



EXPLODED VIEW (PTFE DIAPHRAGMS)



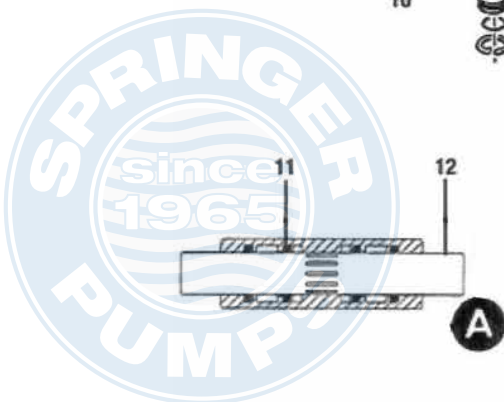
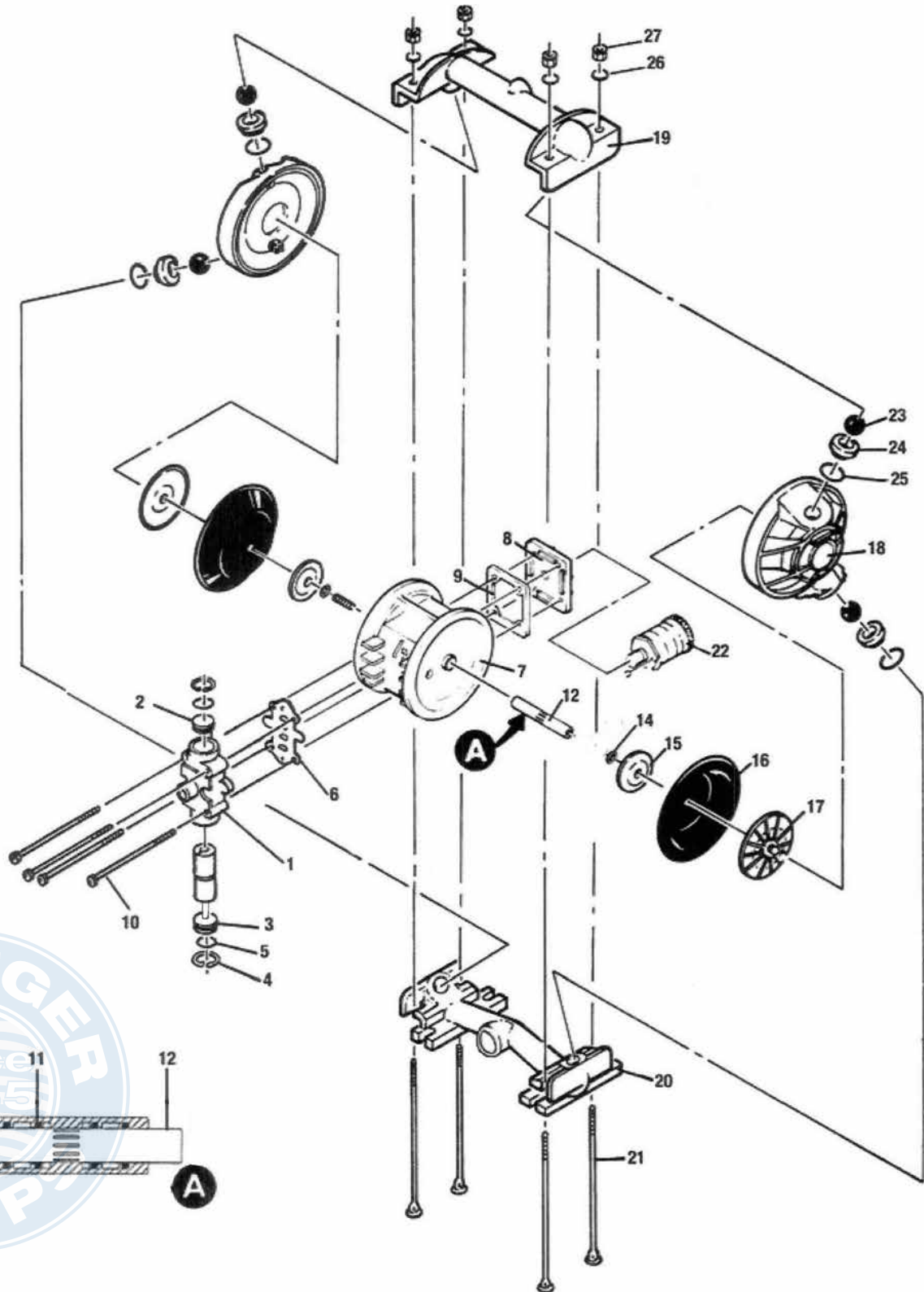
NTG25 RUBBER-FITTED (ALUMINUM)

Item	Description	Qty.	Aluminum	Stainless Steel
1	Air Valve Assembly	1	N02-2012-07	N02-2012-07
2	Air Valve End Cap w/Guide	1	N02-2332-01	N02-2332-01
3	Pressure Differential Cap	1	N02-2301-01	N02-2301-01
4	Air Valve Snap Ring	2	N02-2651-08	N02-2651-08
5	Air Valve Cap O-ring	2	N02-3201-52	N02-3201-52
6	Air Valve Gasket	1	N02-2600-52	N02-2600-52
7	Center Section	1	N02-3151-20-225	N02-3151-20-225
8	Muffler Plate	1	N02-3180-20	N02-3180-20
9	Muffler Plate Gasket	1	N02-3500-52-500	N02-3500-52-500
10	Air Valve Cap Screw 1/4" - 20 x 6 1/4"	4	N02-6000-08	N02-6000-03
	Hex Head Nut 1/4" -20 (Not Shown)	4	N02-6400-08	N02-6400-03
11	Center Block TRACKER™ Seal	4	N02-3210-77-225	N02-3210-77-225
12	Shaft	1	N02-3800-03-07	N02-3800-03-07
14	Disc Spring	2	N02-6802-08	N02-6802-08
15	Inner Piston	2	N02-3701-01	N02-3701-01
16	Diaphragm	2	*N02-1010-51	*N02-1010-51
17	Outer Piston	2	N02-4550-01	N02-4550-03
18	Liquid Chamber	2	N02-5000-01	N02-5000-03
19	Discharge Manifold	1	N02-5020-01	N02-5020-03
20	Inlet Manifold	1	N02-5080-01	N02-5080-03
21	Manifold Bolt 3/8" -16 x 8-1/2"	4	N02-6080-08	N02-6080-03
22	Muffler	1	N02-3510-99	N02-3510-99
23	Valve Ball	4	*N02-1080-51	*N02-1080-51
24	Valve Seat	4	N02-1120-01	N02-1120-03
25	Valve Seat O-ring	4	*N02-1200-51	*N02-1200-51
26	Manifold Bolt Washer 3/8"	4	N02-6720-08	N02-6720-03
27	Manifold Bolt Nut 3/8" - 16	4	N02-6430-08	N02-6430-03

*Consult Elastomer Options



NTG25 RUBBER-FITTED



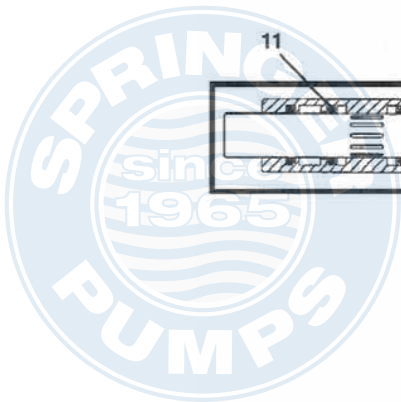
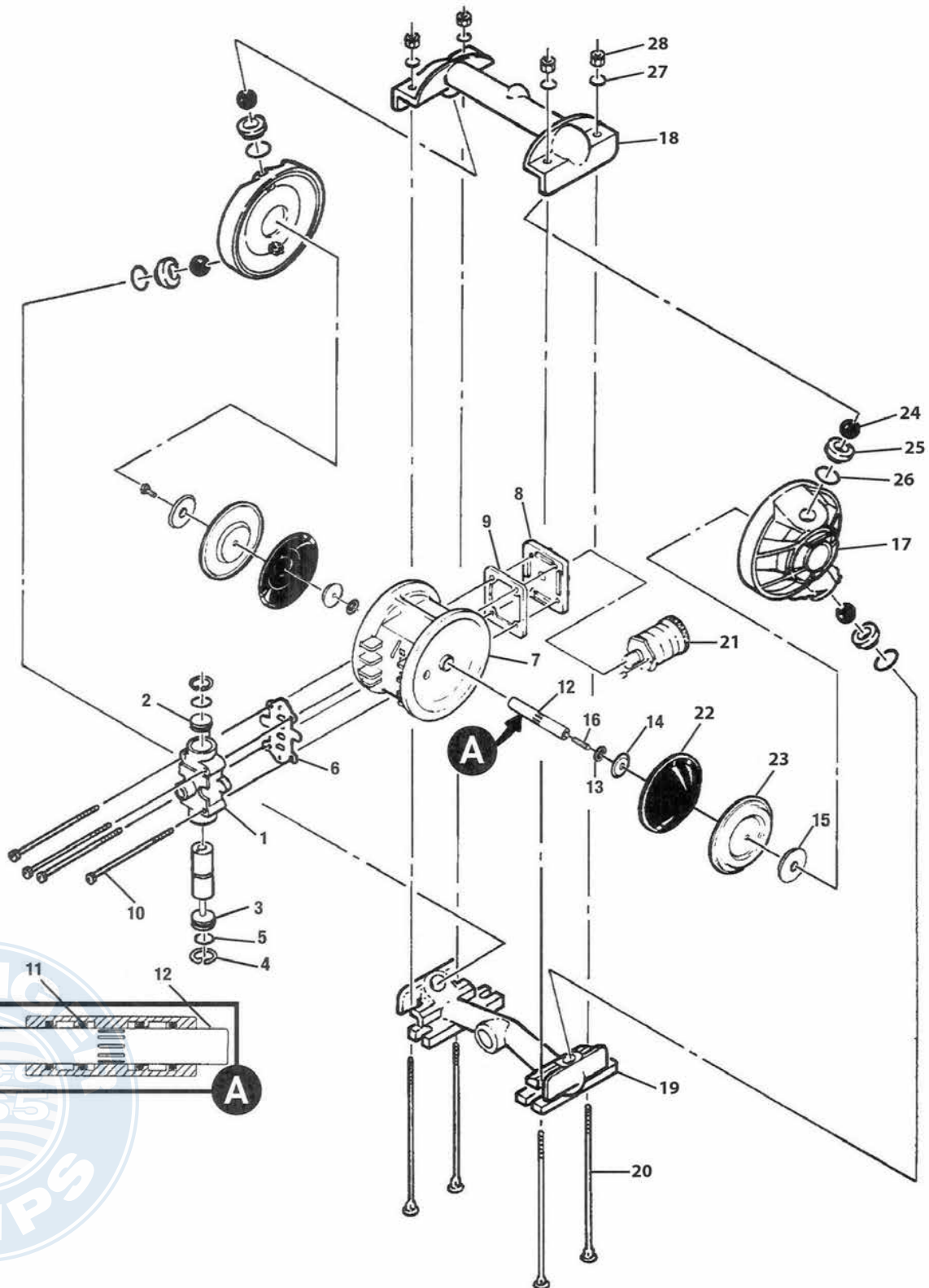
NTG25 PTFE-FITTED (ALUMINUM)

Item	Description	Qty.	Aluminum	Stainless Steel
1	Air Valve Assembly	1	N02-2012-07	N02-2012-07
2	Air Valve End Cap w/Guide	1	N02-2332-01	N02-2332-01
3	Pressure Differential Cap	1	N02-2301-01	N02-2301-01
4	Air Valve Snap Ring	2	N02-2651-01	N02-2651-01
5	Air Valve Cap O-ring	2	N02-3201-52	N02-3201-52
6	Air Valve Gasket	1	N02-2600-52	N02-2600-52
7	Center Section	1	N02-3151-20-225	N02-3151-20-225
8	Muffler Plate	1	N02-3180-20	N02-3180-20
9	Muffler Plate Gasket	1	N02-3500-52-500	N02-3500-52-500
10	Air Valve Cap Screw 1/4" - 20 x 6 1/4"	4	N02-6000-08	N02-6000-03
	Hex Head Nut 1/4" -20 (Not Shown)	4	N02-6400-08	N02-6400-08
11	Center Block TRACKER™ Seal	4	N02-3210-77-225	N02-3210-77-225
12	Shaft	1	N02-3820-09-07	N02-3820-09-07
13	Disc Spring	2	N02-6802-08	N02-6802-08
14	Inner Piston	2	N02-3750-01	N02-3750-01
15	Outer Piston	2	N02-4601-01	N02-4600-03
16	Shaft Stud	2	N02-6150-08	N02-6150-08
17	Liquid Chamber	2	N02-5000-01	N02-5000-03
18	Discharge Manifold	1	N02-5020-01	N02-5020-03
19	Inlet Manifold	1	N02-5080-01	N02-5080-03
20	Manifold Bolt 3/8" -16 x 8-1/2"	4	N02-6080-08	N02-6080-03
21	Muffler	1	N02-3510-99	N02-3510-99
22	Back-up Diaphragm	2	*N02-1060-51	*N02-1060-51
23	Diaphragm	2	*N02-1010-55	*N02-1010-55
24	Valve Ball	4	*N02-1080-55	*N02-1080-55
25	Valve Seat	4	N02-1120-01	N02-1120-03
26	Valve Seat O-ring - Teflon	4	*N02-1200-55	*N02-1200-55
27	Manifold Bolt Washer 3/8"	4	N02-6720-08	N02-6720-03
28	Manifold Bolt Nut 3/8" - 16	4	N02-6430-08	N02-6430-03

*Consult Elastomer Options



NTG25 PTFE-FITTED





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N O M A D



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