



PWR-FLOT

NPF40 METALLIC PUMP (BOLTED)
PWR-FLO™ AIR DISTRIBUTION SYSTEM



AIR-OPERATED O DOUBLE DIAPHRAGM

O PUMPS

BOLTED
ALUMINUM
STAINLESS STEEL Models





CAUTIONS - READ FIRST



CAUTION: Do not apply compressed air to the exhaust port - pump will not function.



CAUTION: Do not over-lubricate air supply – excess lubrication will reduce pump performance. Pump is pre-lubed.



TEMPERATURE LIMITS:

Neoprene -17.7°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 -15.1°C to 137.8°C -60°F to 280°F NOTE: Not all materials are available for all models. Refer to Section 2 for material options for your pump.



CAUTION: Check temperature limits for all wetted components. Example: Viton® has a maximum limit of 176.7°C (350°F) but polypropylene has a maximum limit of only 79°C (175°F).



CAUTION: Maximum temperature limit are based upon mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperatures.



WARNING: Prevention of static parking – if static sparking occurs, fire or explosion could result. Pump, valves, and containers must be grounded to a proper grounding point when handling flammable fluids and whenever discharge of static electricity is a hazard.



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



CAUTION: The process fluid and cleaning fluids must be chemically compatible with all wetted pump components.



CAUTION: Do not exceed 82°C (180°F) air inlet temperature.



CAUTION: Pumps should be thoroughly flushed before installing into process lines.



CAUTION: Always wear safety glasses when operating pump. If diaphragm rupture occurs, material being pumped may be forced out air exhaust.



CAUTION: Before any maintenance or repair is attempted, the compressed air line to the pump should be disconnected and all air pressure allowed to bleed from pump. Disconnect all intake, discharge and air lines. Drain the pump by turning it upside down and allowing any fluid to flow into a suitable container.



CAUTION: Blow out air line for 10 to 20 seconds before attaching to pump to make sure all pipeline debris is clear. Use an in-line air filter. A 5µ (micron) air filter is recommended.

NOTE: When installing PTFE diaphragms, it is important to tighten outer pistons simultaneously (turning in opposite directions) to ensure a tight fit. (See torque specifications.)

NOTE: Before starting disassembly, mark a line from each liquid chamber to its corresponding air chamber. This line will assist in proper alignment during reassembly.



CAUTION: Tighten all hardware prior to installation.



Pump Designation System

Aluminum

Air Valve

Brass

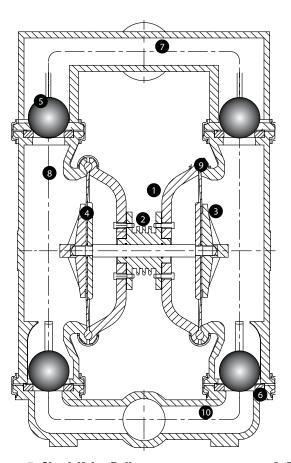


Air Distribution System Liquid Port Size **Wetted Parts Valve Balls Valve Seats** Connections ATEX Diaphragms **Fittings** Aluminum 07mm/.25" Aluminum NPT Clamped ATEX Nomad Pump Buna Buna Trans-Flo 15mm/.5" Ductile Buna Maxi-Flex Buna Bolted Trans-Flo Gold Nordel®/EPDM 25mm/1" Stainless Steel Hytrel® Tri-Clamp Hytrel® Pwr-Flo Polypropylene Neoprene Kynar®/PVDF 25mm/1" Hytrel® UFI FLA Flanged ANSI **Air Chambers** Geolast UFI Polyethylene Mild Steel Flanged DIN 40mm/1.5" Aluminum Nordel®/EPDM Polyurethane Nordel®/EPDM 50mm/2" Ductile Iron Nordel®/EPDM Maxi-Flex Neoprene 80mm/3" Stainless Steel Santoprene® 100mm/4" Neoprene Polypropylene Mild Steel Neoprene Maxi-Flex Stainless Steel Polyethylene Polypropylene PTFE Polyurethane Polyurethane Polyurethane UFI Stainless Steel Viton® Santoprene® Food Grade Aluminum Santoprene® Food Grade-UFI Stainless Steel Santoprene® Santoprene® Polypropylene Santoprene®-UFI Viton® 0-Ring Air Valve Santoprene® Food Grade Brass PTFE Neoprene back-up Buna Polypropylene PTFE - UFI Santoprene® back up Nordel®/EPDM PTFE - UFI Hytrel® back up Aluminum Neoprene Stainless Steel PTFE - Hytrel® back up Viton Encap. Garlock® - EPDM BACKED Polyurethane Garlock® - NEO BACKED Santoprene Food Grade Garlock® - Viton BACKED Santoprene PTFE Nordel back up PTFE Viton®/FKM Viton® Viton®/FKM Maxi-Flex NTG 50 / AAAB / TF / TF / ATF / N/C/X Liquid Port Size **Air Distribution System Wetted Parts** Diaphragms **Valve Balls** Valve Seats 11 Fittings Connections ATEX Nomad 50mm/2" Aluminum PTFE (with Neo back-up) PTFE Aluminum N NPT Clamped ATEX Trans-Flo 0-Ring Air Chambers Trans-Flo Gold PTFE Aluminum Pwr-Flo **Center Block**



How It Works - Pump

The NOMAD diaphragm pump is an air-operated, positive displacement, self-priming pump. These drawings show flow pattern through the pump upon its initial stroke. It is assumed the pump has no fluid in it prior to its initial stroke.



1. Air Chamber

The air chamber is the chamber that houses the air which powers the diaphragms.

2. Air Distribution System

The air distribution system is the heart of the pump. The air distribution system is the mechanism that shifts the pump in order to create suction and discharge strokes.

3. Lock Nut (Outer Diaphragm Piston)

The outer diaphragm pistons provide a means to connect the diaphragms to the reciprocating common shaft and to seal the liquid side from the air side of the diaphragm.

4. Holding plate (Inner Diaphragm Piston)

The inner piston is located on the air side of the pump and does not come into contact with the process fluid.

5. Check Valve Ball

NOMAD air-operated pumps use suction and discharge check valves to produce directional flow of process fluid in the liquid chamber. The check valve balls seal and release on the check valve seats allowing for discharge and suction of process fluid to occur.

6. Check Valve Seat

The removable seats provide the ball valves a site to check.

7. Discharge Manifold

Process fluid exits the pump from the discharge port located on the discharge manifold at the top of the pump.

8. Liquid Chamber

The liquid chamber is filled with the process fluid during the suction stroke and is emptied during the discharge stroke. It is separated from the compressed air by the diaphragms.

9. Diaphragm

The diaphragm membrane provides for separation of the process fluid and the compressed air power source. To perform adequately, diaphragms should be of sufficient thickness and of appropriate material to prevent degradation or permeation in specific process fluid applications. TABLA offers a variety of diaphragm materials for your specific application requirements.

10. Inlet Manifold

Process fluid enters the pump from the intake port located on the inlet manifold at the bottom of the pump.

Suggested Operation & Maintenance



Troubleshooting

Pump will not run or runs slowly.

- 1. Ensure that the air inlet pressure is at least 0.4 Bar (5 psig) above start up pressure and that the differential pressure (the difference between air inlet and liquid discharge pressures) is not less than 0.7 Bar (10 psig).
- 2. Check air inlet filter for debris
- 3. Check for extreme air leakage (blow by) which would indicate worn seals/bores in the air valve.
- 4. Disassemble pump and check for obstructions in the air passageway.
- 5. Check for sticking ball check valves. If material being pumped is not compatible with pump, elastomer, swelling may occur. Replace ball check valves and seals with proper elastomers. Also, as the check valve balls wear out, they become smaller and can become stuck in the seats. In this case, replace balls and seats.
- 6. Check for broken inner piston which will cause the air valve spool to be unable to shift.
- 7. Remove plug from pilot spool exhaust.

Pump runs but little or no product flows.

- Check for pump cavitation; slow pump speed down to allow thick material to flow into liquid chambers.
- 2. Verify that vacuum required to lift is not greater than the vapor pressure of the material being pumped (cavitation).
- 3. Check for sticking ball valves. If material being pumped is not compatible with pump elastomers, swelling may occur. Replace ball check valves and seats with proper elastomers. Also, as the check valve balls wear out, they become smaller and can become stuck in the seats. In this case, replace balls and seats.

Pump air valve freezes.

 Check for excessive moisture in compressed air. Either install a dryer or hot air generator for compressed air. Alternatively, a coalescing filter may be used to remove the water from the compressed air in some applications.

Air bubbles in pump discharge.

- 1. Check for ruptured diaphragm.
- 2. Check tightness of outer pistons.
- 3. Check tightness of fasteners and integrity of o-rings and seals, especially at intake manifold.
- 4. Ensure pipe connections are airtight

Product comes out air exhaust.

- 1. Check for diaphragm rupture.
- 2. Check tightness of outer pistons to shaft.



Suggested Installation

INSTALLATION:

- Suction pipe equal to/greater than pump diameter (same for discharge)
- Tighten all fasteners before use
- Suction connection should be non-collapsible

AIR SUPPLY:

- Air line size must be large enough to create desired volume (see performance curve section)
- Do not exceed 8.6 BAR (125 PSIG)
- For best results, use 5 micron air filter
- Use lubricator with 5 wt. oil

PIPING:

- Remove as many turns/elbows as possible
- Piping should be supported
- Flexible hose will avoid stress on pump fitting
- Gate Valve should be used in applications involving flooded suction
- In positive suction head conditions, limit inlet pressure to 0.5 - 0.7 BAR (7 - 10 PSI).
 Premature diaphragm failure will take place above the parameters.

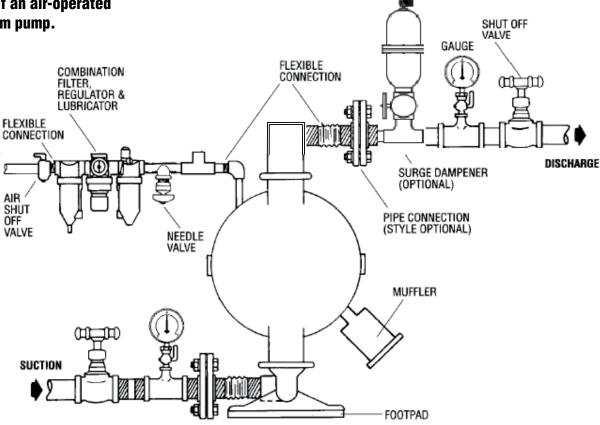
ALL NOMAD PUMPS ARE CAPABLE OF PASSING SOLIDS. A STRAINER SHOULD BE USED ON THE PUMP INTAKE TO ENSURE THAT THE PUMP'S RATED SOLIDS CAPACITY IS NOT EXCEEDED.

CAUTION: DO NOT EXCEED 8.6 BAR (125 PSIG) AIR SUPPLY PRESSURE.

Suggested Installation







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

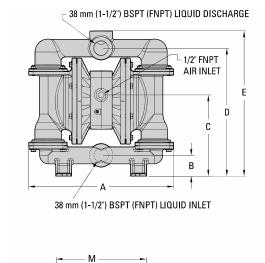
AIR OPERATED PUMPS: To stop the pump from operating in an emergency situation, simply shut off valve (user supplied) installed

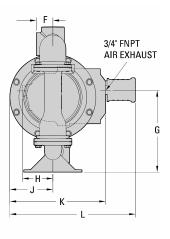
in the air supply line. A properly functioning valve will stop the air supply to the pump, therefore stopping output. The shut off valve should be located far enough away from the pumping equipment such that it can be reached safely in an emergency situation.



Dimensional Drawings

NPF 40 METAL BOLTED

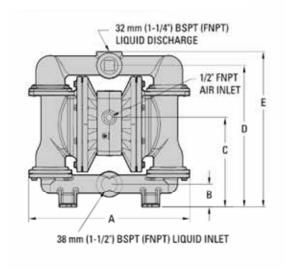


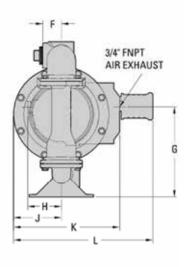


DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)		
Α	442	17.4		
В	64	2.5		
С	248	9.8		
D	391	15.4		
Е	445	17.5		
F	51	2.0		
G	250	9.8		
Н	93	3.7		
J	132	5.2		
K	292	11.5		
L	384	15.1		
М	274	10.8		
N	224	8.8		
Р	152	6.0		
R	178	7.0		
S	11	0.4		

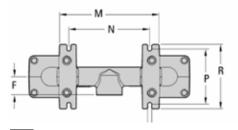
NPF 40 METAL BOLTED





DIMENSIONS

ITEM	METRIC	STANDARD
IIEW	(mm)	(inch)
Α	442 17.4	
В	64	2.5
С	248	9.8
D	391	15.4
Е	429	16.9
F	51	2.0
G	250	9.8
Н	H 93 3.7	
J		
K	292	11.5
L	384	15.1
М	274	10.8
N	224	8.8
Р	152	6.0
R	178	7.0
S 11		0.4



Performance



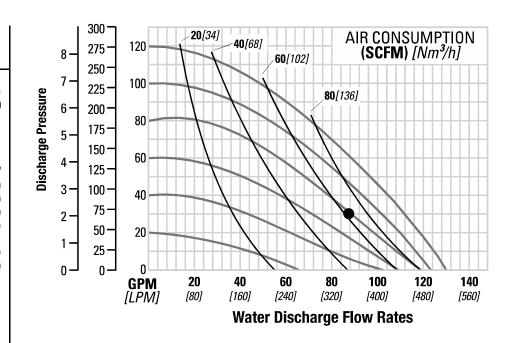
NPF40 METAL RUBBER FITTED

Ship Weights....... Threaded AL 26 kg (57 lb)
Threaded SS 50 kg (111 lb)

Air Inlet	1/0"
Inlet	38 mm (1-1/2")
Outlet	38 mm (1-1/2")
Suction Lift	5.5 m Dry (18.2')
	9.0 m Wet (29.5')
Disp. per Stroke ¹	1.2 L (0.32 gal)
Max. Flow Rate	492 lpm (130 gpm)
Max. Size Solids	6.4 mm (1/4")

¹Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2.1 bar (30 psig) head pressure.

Example: To pump 326 lpm (86 gpm) against a discharge head of 3.1 bar (30 psig) requires 5.5 bar (80 psig) and 101 Nm³/h (64 scfm) air consumption.



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's performance curve.

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

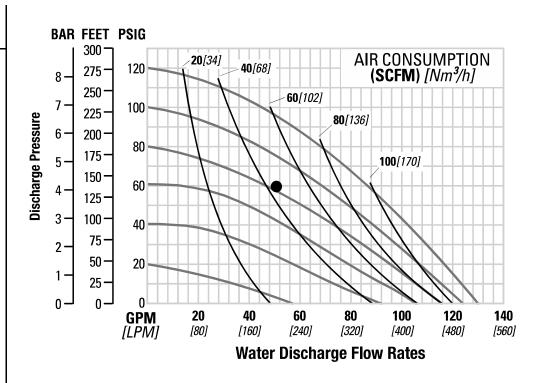
NPF40 METAL TPE-FITTED

Ship Weights.....Threaded AL 26 kg (57 lb)
Threaded SS 50 kg (111 lb)

Air Inlet	1/2"
Inlet	38 mm (1-1/2")
Outlet	38 mm (1-1/2")
Suction Lift	4.8 m Dry (15.9')
	9.0 m Wet (29.5')
Disp. per Stroke1	1.2 L (0.32 gal)
Max. Flow Rate	492 lpm (130 gpm)
Max. Size Solids	6.4 mm (1/4")

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 193 lpm (51 gpm) against a discharge head of 4.1 bar (60 psig) requires 5.5 bar (80 psig) and 68 Nm³/h (43 scfm) air consumption.



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's performance curve.

Performance

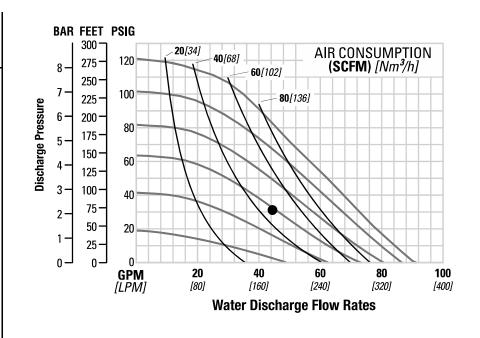
NPF40 METAL REDUCE STROKE PTFE-FITTED

Ship Weights... Threaded AL 26 kg (57 lb)
Threaded SS 50 kg (111 lb)

Air Inlet	1/2"
Inlet	38 mm (1-1/2")
Outlet	38 mm (1-1/2")
Suction Lift	
	9.0 m Wet (29.5')
Disp. per Stroke ¹	
Max. Flow Rate	341 lpm (90 gpm)
Max. Size Solids	6.4 mm (1/4")

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 167 lpm (44 gpm) against a discharge head of 2.1 bar (30 psig) requires 4.1 bar (60 psig) and 71 Nm³/h (45 scfm) air consumption.



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's performance curve.

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

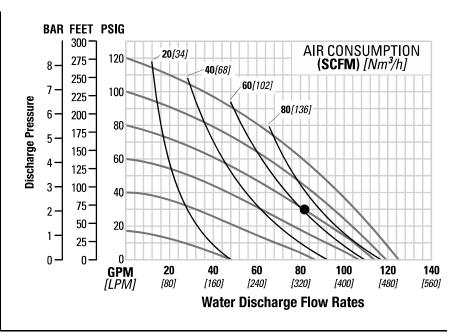
NPF40 METAL FULL STROKE PTFE-FITTED

Ship Weights... Threaded AL 26 kg (57 lb)
Threaded SS 50 kg (111 lb)

Air Inlet	1/2"
Inlet	38 mm (1-1/2")
Outlet	38 mm (1-1/2")
Suction Lift	5.2 m Dry (17.0')
	9.0 m Wet (29.5')
Disp. per Stroke ¹	1.1 L (0.28 gal)
Max. Flow Rate	473 lpm (125 gpm)
Max. Size Solids	6.4 mm (1/4")

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 307 lpm (81 gpm) against a discharge head of 2.1 bar (30 psig) requires 5.5 bar (80 psig) and 96 Nm³/h (61 scfm) air consumption.

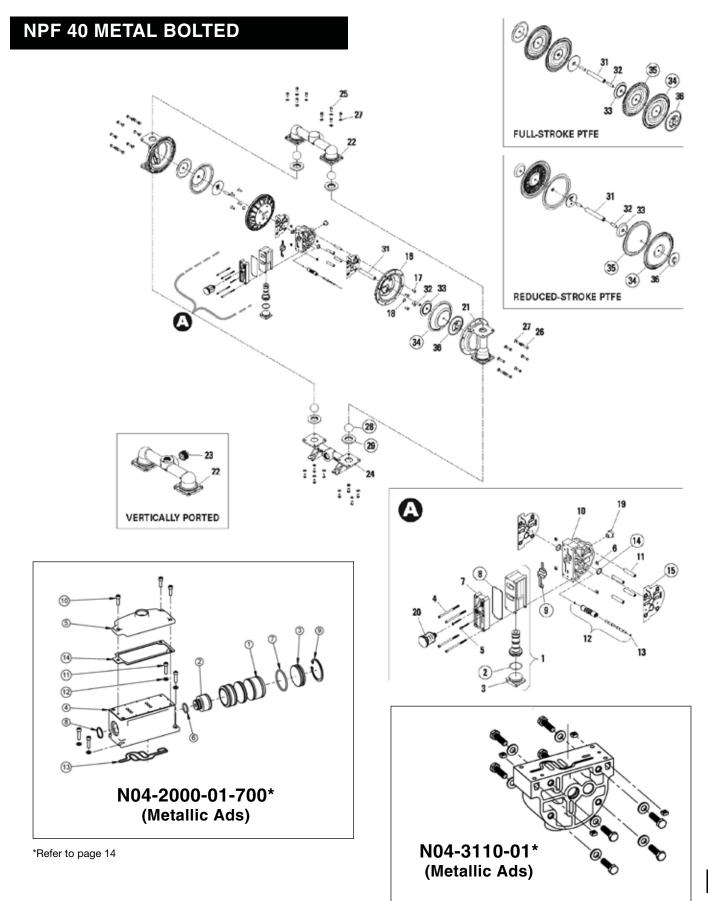


Flow rates indicated on chart were determined by pumping water. For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump's performance curve.

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

Exploded View & Parts Listing







N M A D Exploded View & Parts Listing

NPF 40 METAL BOLTED

No.	Part Description	Qty.	Aluminum	Stainless Steel
1	PWR-FLO® Air Valve	1	N04-2000-20-700	N04-2000-20-700
2	End Cap O-Ring	1	N04-2330-20-700	N04-2330-20-700
3	End Cap	1	N04-2390-52-700	N04-2390-52-700
4	Screw, SHC, Air Valve Gasket (1/4"-20 x 4-1/2")	4	N01-6000-03	N01-6000-03
5	Screw, Self Tapping, SHC (10-16 x 1 3/4")	2	N04-6351-03	N04-6351-03
6	Nut, Square (1/4"-20)	4	N00-6505-03	N00-6505-03
7	Muffler Plate, PWR-FLO®	1	N04-3180-20-700	N04-3180-20-700
8	Gasket, Muffler Plate, PWR-FLO®	1	N04-3500-52-700	N04-3500-52-700
9	Gasket, Air Valve, PWR-FLO®	1	N04-2600-52-700	N04-2600-52-700
10	Center Block Assembly, PWR-FLO®	1	N04-3110-20	N04-3110-20
11	Sleeve, Threaded, Center Block	4	N04-7710-08	N04-7710-08
12	Pilot Sleeve Assembly	1	N04-3880-99	N04-3880-99
13	Retaining O-Ring	2	N04-2650-49-700	N04-2650-49-700
14	Shaft O-Ring (Slyder Ring)	2	N08-3210-55-225	N08-3210-55-225
15	Gasket, Center Block PWR-FLO®	2	N04-3526-52	N04-3526-52
16	Air Chamber, Bolted FIT PWR-FLO®	2	N04-3681-01	N04-3681-01
17	Screw, HSFHS (3/8"-16 x 1")	8	N71-6250-08	N71-6250-08
18	Retaining Ring	2	N04-3890-03	N04-3890-03
19	Bushing, Reducer 3/4" MNPT to 1/2" FNPT	1	N04-6950-20-700	N04-6950-20-700
20	Muffler 3/4" MNPT	1	N04-3510-99	N04-3510-99
21	Liquid Chamber	2	N04-5015-01	N04-5015-01
22	Manifold, Discharge, 1-1/2" (NPT)	1	N04-5035-01	N04-5035-03
	Manifold, Discharge, 1-1/2" (BSPT)	1	N04-5036-01	N04-5036-03
	Manifold, Discharge, Vert 1-1/4" (NPT)	1	N04-5037-01	N04-5037-03
	Manifold, Discharge, Vert 1-1/4" (BSPT)	1	N04-5038-01	N04-5038-03
23	Square Pipe Plug 1-1/2" (NPT)	1	N04-7010-01	N04-7010-03
	Square Pipe Plug 1-1/2" (BSPT)	1	N04-7011-01	N04-7011-03
24	Manifold, Inlet, 1-1/2" (NPT)	1	N04-5095-01	N04-5095-03
	Manifold, Inlet, 1-1/2" (BSPT)	1	N04-5096-01	N04-5096-03
25	Screw, HHC (3/8"-16 x 1")	16	N08-6130-08	N08-6130-03
26	Screw, HHC (3/8"-16 x 1-1/4")	16	N04-6140-08	N04-6140-03
27	Washer, Flat,	32	N15-6740-08-50	N04-6740-03
28	Ball, Valve	4	*	*
29	Seat, Valve	4	*	*
30	Valve Seat O-Ring, PTFE Fitted (Not Shown)	4	① N71-1281-55*	① N71-1281-55*

^{*}Refer to the Elastomer Chart

① Used in conjuction with Metallic Seat

Exploded View & Parts Listing



Full-Stroke PTFE

No.	Part Description		Aluminum	Stainless Steel	
31	Shaft	1	N04-3800-03-700	N04-3800-03-700	
32	Shaft Stud 1/2"-20 x 1-7/8"	2	N08-6150-08	N08-6150-08	
33	Piston, Inner	2	N04-3700-01-700	N04-3700-01-700	
34	Primary Diaphragm	2	*	*	
35	Diaphragm, Back-Up	2	*	*	
36	Piston, Outer	2	N04-4552-01	N04-4550-03	
37	Washer, Reinforcing	2	N04-6800-08	N04-6800-08	
38	Screw, HHC	2	N04-6091-08	N04-6091-08	

Reduced-Stroke PTFE

No.	Part Description	Qty.	Aluminum	Stainless Steel
31	Shaft, Reduced Stroke PTFE	1	N04-3820-03-700	N04-3820-03-700
32	Shaft Stud 1/2"-20 x 1-7/8"	2	N08-6150-08	N08-6150-08
33	Piston, Inner, Reduced Stroke PTFE		N04-3752-01	N04-3752-01
34	Diaphragm, Primary, Reduced Stroke PTFE		*	*
35	Diaphragm, Back-Up, Reduced Stroke PTFE	2	*	*
36	Piston, Outer, Reduced Stroke PTFE	2	N04-4600-01	N04-4600-03

^{*}Refer to the Elastomer Chart

Manifold options:

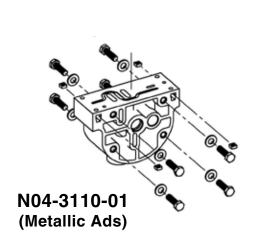
651 Vertically-Ported Discharge, NPT (1.50")

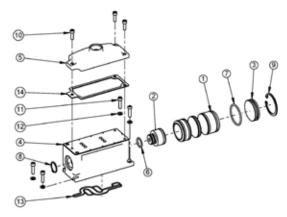
652 Vertically-Ported Discharge, BSPT (1.50")



N M A D Exploded View & Parts Listing

1.5" CENTRE PIECE WITH AIR VALVE ASSEMBLY





N04-2000-01-700 (Metallic Ads)

No.	Part Description	Qty.	Part Number	
1	SPOOL	1	N04-2251-99	No
2	END PLUG	1	N04-2261-99	No
3	END CAP	1	N04-2339-23	No
4	AIR VALVE BODY	1	N04-2000-01-700	Yes
5	MUFFLER PLATE, ALUMINUM, GUARD-EX	1	N04-3180-01-700	Yes
6	O RING	1	N04-2399-52	No
7	O RING	1	N04-2397-52	No
8	EXTERNAL CIRCLIP	1	N04-2658-03	No
9	INTERNAL CIRCLIP	1	N04-2659-03	No
10	ALLEN BOLT	3	N04-6600-08	Yes
11	ALLEN BOLT	4	N04-6006-08	Yes
12	PLAIN WASHER	4	N04-6656-08	Yes
13	AIR VALVE GASKET, BUNA, PWR-FLO	1	N04-2600-52-700	Yes
14	MUFFLER PLATE GASKET, BUNA GUARD-EX	1	N04-3504-52-700	Yes
15	AIR VALVE AND CENTER BLOCK ASSEMBLY COMPLETE	1	N04-9400-99-700	Yes
А	AIR VALVE, ALUMINUM, GUARD-EX, PWR-FLO	1	N04-2000-01-700	Yes
	CENTER BLOCK, ALUMINUM, GUARD-EX PWR-FLO	1	N04-3110-01	Yes



Elastomer Options

MATERIAL	DIAPHRAGM	UFI DIAPHRAGMS	UFI BACK-UP DIAPHRAGMS	UFI DIAPHRAGMS	REDUCED STROKE DIAPHRAGMS	REDUCED STROKE BACK-UP DIAPHRAGMS	VALVE BALLS	VALVE SEATS	VALVE SEATS O-RING
Polyurethane							N08-1080-62-50		
Neoprene	N04-1010-51			N04-1022-50		N04-1060-51	N08-1080-51-50	N04-1128-51	
Buna-N®	N04-1010-52						N08-1080-52-50	N04-1128-52	
EPDM	N04-1010-69					N04-1060-54	N08-1080-54-50	N04-1128-54	
FKM	N04-1010-53						N08-1080-53-50	N04-1128-53	
PTFE		N04-1040-55-42			N04-1010-55-42		N04-1085-55		N08-1080-53-50 ¹
HYTREL			N04-1065-56	N04-1022-56		N04-1060-56		N04-1128-56	
Santoprene			N04-1065-58	N04-1022-57					
Santoprene				N04-1022-58			N08-1080-58-50	N04-1128-58	
Aluminum								N04-1129-01	
S.S.								N04-1129-03	

① Used in conjuction with Metallic Seat



A JDA Global Company

150 Cassia Way, SUITE 400 Henderson, Nevada 89014 (702) 331-3740



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