Pinnacle-Flo, Inc.

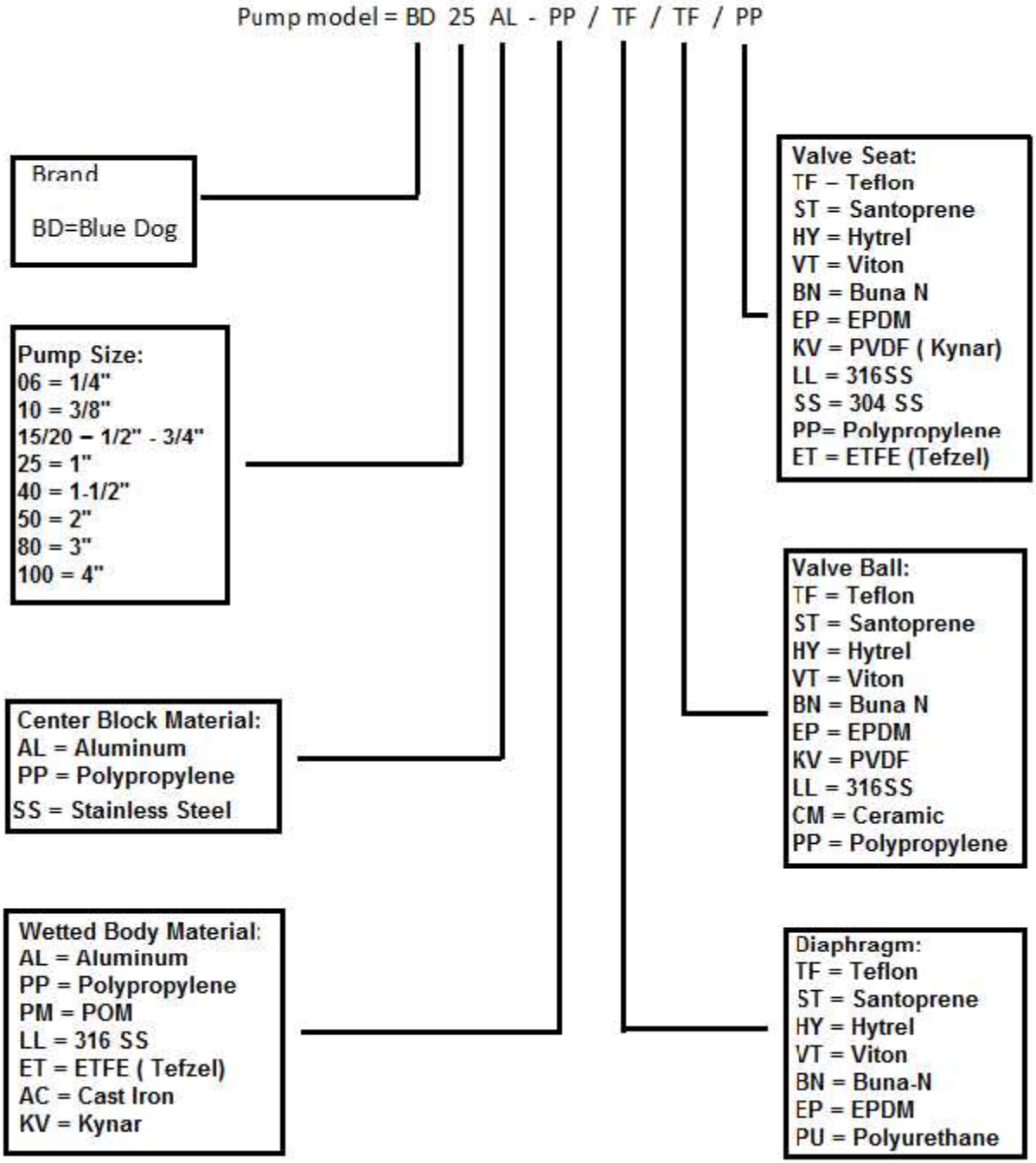
Blue Dog Series
AODD Diaphragm Pump
Manual Book

www.pinnacle-flo.com

Blue Dog Double Diaphragm Pumps

Content

Pump Model And Material Code



Operating Temperature Limitations

Diaphragm Material	Maximum	Minimum
Viton: Excellent corrosion resistance, resistance to various acids (including the median concentration of oxidizing acids), alkali, salt, petroleum products, hydrocarbons, etc.	350°F / 176.6°C	-40°F / -40°C
PTFE (Teflon): Excellent corrosion resistant, almost resistant to all chemical media (including concentrated nitric acid and aqua regia), Except melting of lithium, potassium, sodium, chlorine trifluoride, sulfur – speed liquid fluorine.	350°F / 176.6°C	40°F / 4.4°C
Santoprene: Good abrasion resistance, chemical resistance and heat resistance; suitable for general acid and alkali, not suitable for solvent. Good substitute for EPDM/EPR materials.	220°F / 104.4°C	-20°F / -28°C
Hytrel: Good abrasion resistance, used in most of the neutral fluids. Good substitute for Buna-N materials.	220°F / 104.4°C	-20°F / -28°C
EPDM: Abrasion resistance, aging resistance, ozone resistance; suitable for general acid and alkali.	250°F / 121.6°C	-40°F / -40°C
Buna-N: Widely used in gasoline and other petroleum base products; suitable for use at room temperature.	212°F / 100°C	-40°F / -40°C
Pump Body Materials		
PP: Medium abrasion resistance, good chemical resistance, good versatility, especially for common acid-based products.	150°F / 65°C	40°F / 4.4°C
POM: Good solvent resistance, abrasion resistance, low friction and low moisture absorption.	150°F / 65°C	40°F / 4.4°C
PVDF: Good strong chemical resistance, crush resistance, abrasion resistance, good corrosion resistance for acid, alkali and variety of organic solvents.	200°F / 93.3°C	40°F / 4.4°C

Note: The maximum and minimum temperature is the limited operating temperatures of these materials. Temperature and pressures will affect the diaphragm life. Operating under the maximum or minimum temperature, cannot achieve maximum life.

WARNING!

HAZARDOUS FLUIDS

Improper handling of hazardous fluids or inhaling toxic vapors can cause extremely serious injury, even death, due to splashing in the eyes, ingestion, or bodily contamination. Observe all the following precautions when handling all know or potentially hazardous products.

- Know what product you are pumping and its specific hazards. Take precautions to avoid a toxic fluid spill.
- Always wear appropriate clothing and equipment, such as eye protection and breathing apparatus, to protect yourself.
- Store hazardous products in an appropriate, approved container. Dispose of it according to all Local, State and Federal guidelines for hazardous products.
- Secure the discharge hose tightly into the receiving container to prevent it from coming loose.
- Pipe and dispose of the exhaust air safely, away from people. If the diaphragm ruptures, the fluid is exhausted along with the air. See **Air Exhaust Ventilation** in the Installation section of Manual.

EXPLOSION AND FIRE HAZARD

Static electricity is created by the flow of product through the pump and hose. If the equipment is not properly grounded, sparking may occur. Sparks can ignite fumes from solvents and the product being pumped, dust particles and other flammable substances, whether you are pumping indoors or outdoors, and can cause a fire or explosion and serious injury and property damage.

- To reduce the risk of static sparking, ground the pump and all other equipment used or located in the work area. Check your local electrical code for detailed grounding instructions for your area and type of equipment. Refer to the **Grounding** instruction on the next page.
- If you experience any static sparking or even a slight shock while using this equipment, **stop pumping immediately.** Check the entire system for proper grounding. Do not use the system again until the problem has been identified and corrected.
- Pipe and dispose of the exhaust air safely, away from all sources of ignition. If the diaphragm fails, the product is exhausted along with the air. See **Air Exhaust Ventilation** in the Installation section of this Manual.
- Do not smoke in the work area. Do not operate the equipment near a source of ignition or an open flame, such as a pilot light.

HALOGENATED HYDROCARBON HAZARD

Never use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or products containing such solvents in **Aluminum Pumps.** Such use could result in a serious chemical reaction, with the possibility of explosion, which could cause death, serious injury and or substantial property damage.

Installation and Start-Up

Locate the pump as close to the product being pumped as possible. Keep the suction line length and number of fitting to a minimum. Don't reduce the suction line diameter. For installation of rigid piping, a flex connector should be used between the pump and piping. The flexible hose reduces vibration and strain to the pumping system.

Tightening Screws Before First Use

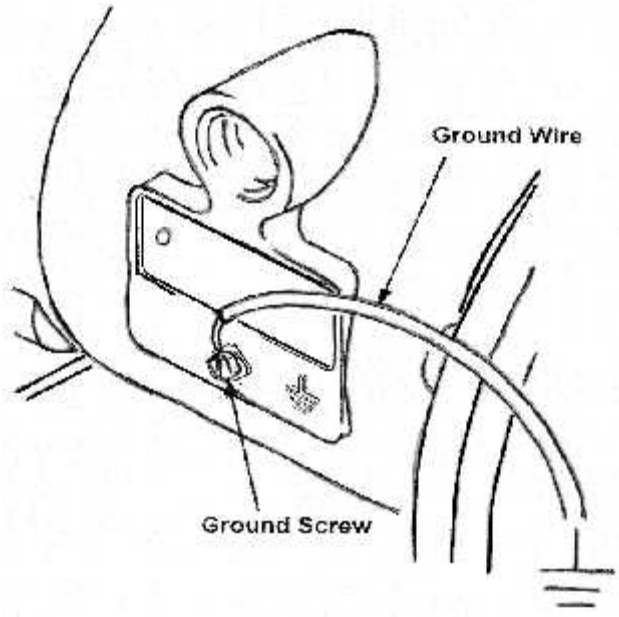
Check all bolts before operating the pump for the first time. Bolts may loosen due to temperature variances. It is recommended to check bolts every two months of operations.

Grounding

WARNING!

FIRE AND EXPLOSION HAZARD
This pump must be grounded. Before operating the pump, ground the system as explained below.

To reduce the risk of static sparking, ground the pump and all other equipment used in the area. Insert one end of a 12 gage (minimum) ground wire behind the grounding screw on the pump and tighten the screw securely. Connect the clamp end of the ground wire to a true earth ground.



Installation and Start-Up

Air Supply

Air supply pressure cannot exceed 125 PSI (8.6) bar. Connect the pump air inlet to an air supply of sufficient capacity and pressure required for desired performance. When the air supply line is solid piping, use a short length of flexible hose between the pump and the piping to reduce strain to the piping. The weight of the air supply line, regulators and filters must be supported by some means other than the air inlet capacity. Failure to provide support for the piping may result in damage to the pump. A pressure regulating valve should be installed to insure air supply pressure does not exceed recommended limits.

Air Valve Lubrication

The air distribution valve and the pilot valve are designed to operate without lubrication. This is the preferred mode of operation. There may be instances of personal preference or poor quality air supplies when lubrication of the compressed air supply is required. The pump air system will operate with properly lubricated compressed air supply. Proper lubrication requires the use of an air line lubricator set to deliver one drop of SAE 10 non-detergent oil for every 20 SCFM (9.4) liters/sec, of air the pump consumes at the point of operation. Consult the pump's published performance curve to determine this.

Air Line Moisture

Water in the compressed air supply can create problems such as icing or freezing of the exhaust air, causing the pump to cycle erratically or stop. Water in the air supply can be reduced by use of an air dryer to supplement the user's air drying equipment. This device removes water from the compressed air supply and alleviates the icing or freezing problem.

Air Inlet and Priming

To start the pump, open the air valve approximately ½ to ¾ turn. After the pump primes, the air valve can opened to increase air flow as desired. If opening the valve increases cycling rate, but does not increase the rate of flow, cavitation has occurred. The valve should be closed slightly to obtain the most efficient air flow to pump flow ratio.

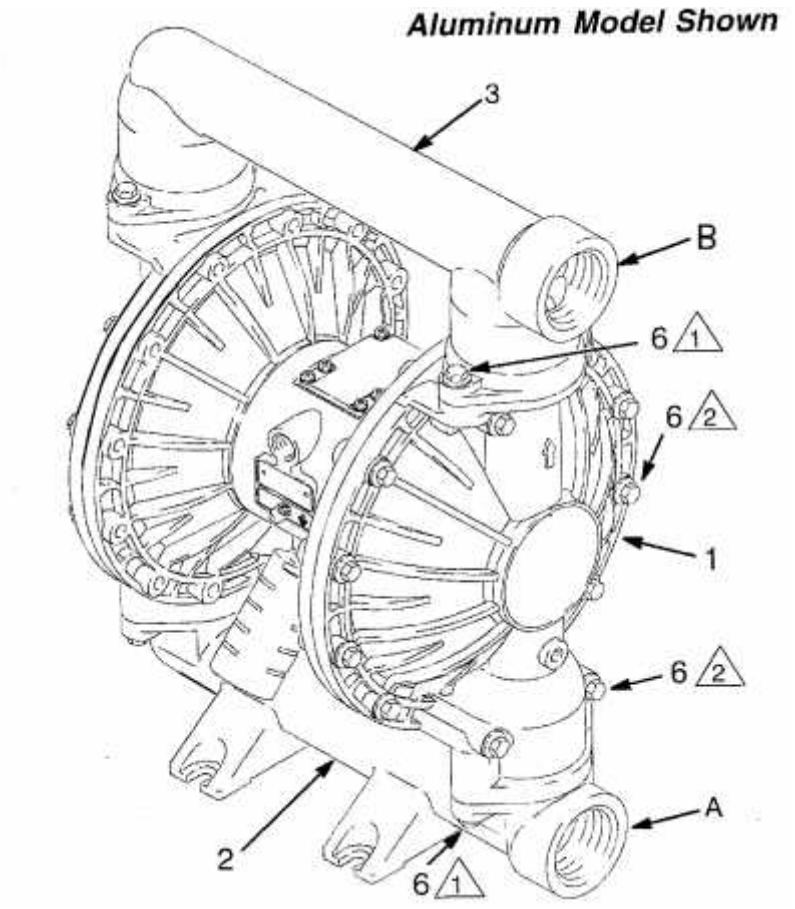
Installation and Start-Up

Changing the Orientation of the Pump's Inlet and Outlet Ports

The pump is shipped with the fluid inlet (A) and the outlet (B) ports facing the same direction. See figure below. To change the orientation of the inlet and or outlet port:

a) Remove the screws (6) holding the inlet (2) and or the outlet (3) manifold to the cover (1).

b) Reverse the manifold and reattach. Install the screws and torque to 120 to 150 in-lb. (14-17 N•m) on aluminum pumps. Torque to 190-220 in-lb. (22-25 N•m) on ductile iron and stainless steel pumps.



1 Apply medium strength (blue) Loctite® or equivalent to the threads. Torque to 120 to 150 in-lb. (14 to 17 N•m) on Aluminum pumps. Torque to 190-220 in-lb. (22-25 N•m) on ductile iron and stainless steel pumps. See Torque Sequence on page 8 of this manual.

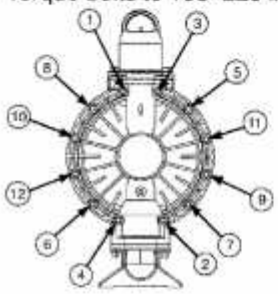
2 Apply medium strength (blue) Loctite® or equivalent to the threads. Torque to 190 to 220 in-lb (22 to 25 N•m).

Torque Sequence

Aluminum Pumps

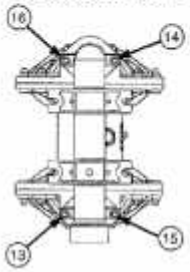
Always follow torque sequence when instructed to torque fasteners.

1. Left/Right Fluid Covers
   Torque bolts to 190–220 in–lb (22–25 N•m)



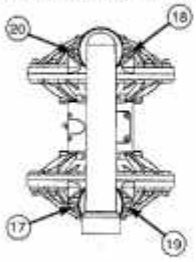
SIDE VIEW

2. Inlet Manifold
   Torque bolts to 120–150 in–lb (14–17 N•m)



BOTTOM VIEW

3. Outlet Manifold
   Torque bolts to 120–150 in–lb (14–17 N•m)

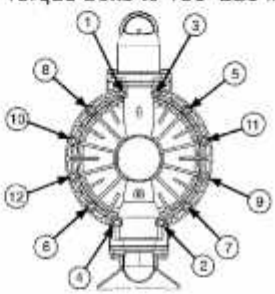


TOP VIEW

Ductile Iron and Stainless Steel Pumps

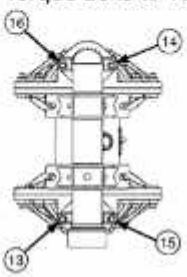
Always follow torque sequence when instructed to torque fasteners.

1. Left/Right Fluid Covers
   Torque bolts to 190–220 in–lb (22–25 N•m)



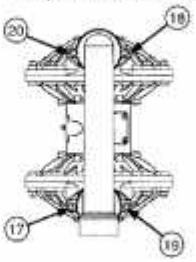
SIDE VIEW

2. Inlet Manifold
   Torque bolts to 190–220 in–lb (22–25 N•m)



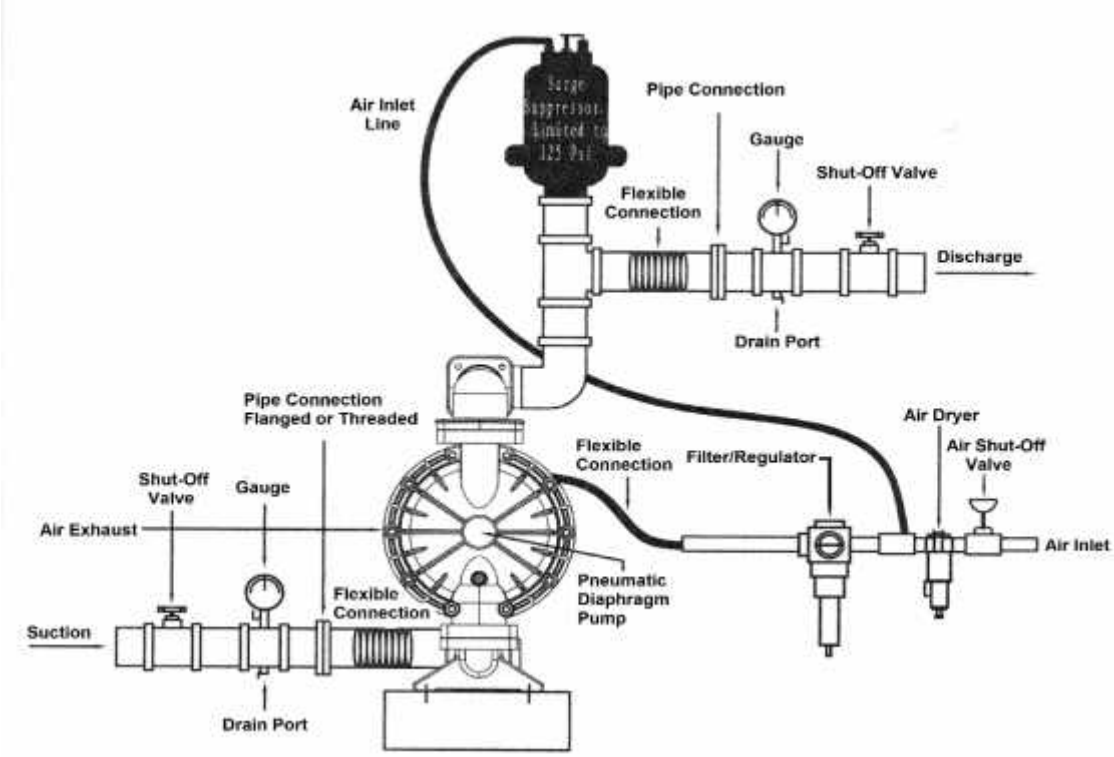
BOTTOM VIEW

3. Outlet Manifold
   Torque bolts to 190–220 in–lb (22–25 N•m)



TOP VIEW

Typical Installation Guide



Air Exhaust Ventilation

The air exhaust port is ¾" NPT (f). Do not restrict the air exhaust port. Excessive exhaust restriction can cause erratic pump operation. If the muffler is installed directly to the air exhaust port, apply PTFE thread taper or anti-seize thread lubricant to the muffler threads before assembly.

To provide a remote exhaust:

•Remove the muffler from the pump air exhaust port.

•Install a grounded air exhaust hose and connect the muffler to the other end of the hose. The minimum size for the air exhaust hose is ¾" (19 mm) ID. If the hose is longer than 15' (4.57 m), use a larger diameter hose.

• Place a container at the end of the air exhaust line to catch fluid in case a diaphragm ruptures.

Between Uses

When the pump is used for materials that tend to settle out or solidify when not in motion, the pump should be flushed after each use to prevent damage (product remaining in the pump between uses could dry out or settle out; this could cause problems with the diaphragms and check valves at restart). In freezing temperatures the pump must be completely drained between uses in all cases.

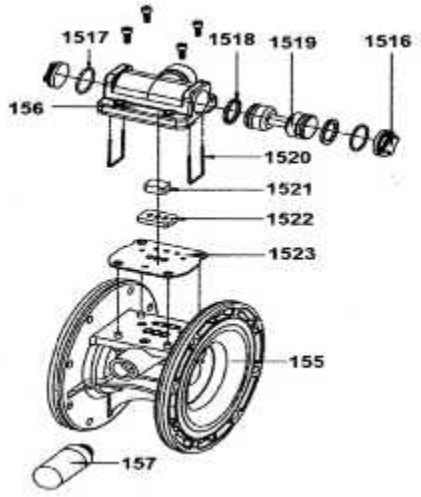
Troubleshooting

- **Pump will not cycle.**
- **Pump cycles, but produces no flow.**
- **Pump cycles, but flow rate is unsatisfactory**
- **Pump cycles seems unbalanced.**
- **Pump cycles seems to produce excessive vibration.**

What to Check	Corrective Action
Excessive suction lift in system	For lifts exceeding 20 feet (6 meters), filling the pumping chambers with liquid will prime the pump in most cases.
Excessive flooded suction pressure systems	For flooded conditions exceeding 10 feet (3 meters) of liquid, install a back pressure device.
System head exceeds air supply pressure	Increase the inlet air pressure to the pump. Most diaphragm pumps ae designed for 1:1 pressure ratio at zero flow.
Air supply pressure or volume exceeds system Head.	Decrease inlet air pressure and volume to the pump as calculated on the published performance curve. Pump is cavitating the fluid by fast cycling.
Undersized suction line.	Meet or exceed pump connection recommendations shown on the dimensional drawing.
Restricted or undersized air line.	Install a larger air line for proper SCFM.
Check the air distribution system of the pump	Disassemble and inspect the main air Distribution vavle, pilot valve and pilot valve Actuators.
Rigid pipe connections to pump.	Install flexible connectors.
Blocked air exhaust muffler.	Remove mufflerscreen, clean or de-ice and reinstall.
Pumped fluid in air exhaust muffler	Disassemble pump chambers. Inspect for diaphragm rupture or loose diaphragm plate assembly.
Suction side air leakage or air in product.	Visually inspect all suction side gaskets and Pipe connctions.
Worn or misaligned check valve or seats.	Inspect check valves and seats for wear and Proper seating. Replace if necessary.

Air Valve Servicing

BD15 air valve



To service the air vavle first shut off the compressed air, bleed pressure from the pump, and disconnect the air supply line from the pump.

Step 1. See Drawing Above

Using screwdriver, remove the four screws, remove the whole air valve assembly from the pump. Remove andinspect air valve gasket (item 1523) for crack or damage. Replace gasket if needed. Remove and inspect pilot valve (item 1521) and valve plate (item 1522) for crack or wear. Replace if needed.

Step 2. Disassembly of the air valve

Using plier, remove the two locking pins (item 1520) that fasten plug to the air vavle housing. Next remove the two plugs (item 1516). Inspect the two plug O-rings (item 1517) on each plug for damage or wear. Replace O-rings if needed. Remove the piston (item 1519), inspect the two piston V-rings (item 1518) on each side of pisto for damage or wear. Replace the piston V-rings if needed.

Step 3. Reassembly of the air valve

Note: Apply a light coating of grease to the O-ring or V-ring when installing.

Install one plug (item 1516) with plug O-ring (item 1517), and fasten with locking pin (item 1520) to the air vavle housing (item 156). Install the piston V-ring (item 1518) into the grooves on the piston (item 1519), insert the piston into the air valve housing (item 156). Then fasten another plug to the air valve housing. Insert pilot valve (item 1521) and valve plate (item 1522) into the groove of air

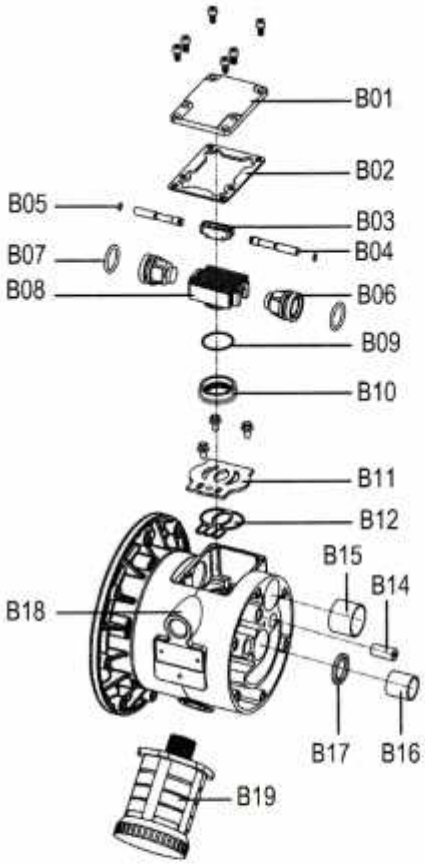
valve housing. Fasten the air valve assembly and air valve gasket (item 1523) to the pump. The pump is now ready for operation.

Air Valve Servicing

BD25,40,50,80 with Aluminum Center Block

Step 1, see the air valve drawing
Using screwdriver, remove the six screw. Remove the air valve cap (item B01), remove and inspect cap gasket (item B02) for cracks or damage. Replace gasket if needed.

Step 2, Disassembly of the air valve.
Remove the upper pilot valve (item B08), remove and inspect O-ring (item B09) and bottom pilot valve (item B10) for damage or wear. Replace if needed.
Remove and inspect the Reversing switch (item B03) for wear. Replace it if needed.
Using plier, remove the two reversing pins (item B04) and the two pistons (item B06), inspect O-ring (item B05) and V-ring (item B07) for wear. Replace if needed.
Using screwdriver, remove the valve plate (item B11) and gasket (Item B12), inspect the gasket for wear or damage, replace if needed.



Step 3. Reassembly of the air valve
Install the valve plate gasket into the groove of valve body (item B18), and fasten the valve plate with the three screw.
Install reversing pin with O-ring and Piston with V-ring, then insert reversing pin into pin bushing (item B14), insert piston into piston bushing (item B15).
Install the reversing pin and pilot valve.
Install air valve cap gasket, then fasten the air valve cap with the six screws.
Connect the compressed air line to the pump. The pump is now ready for operation.

Note: BD80 pump air valve parts B08, B09, B10 to be a whole.

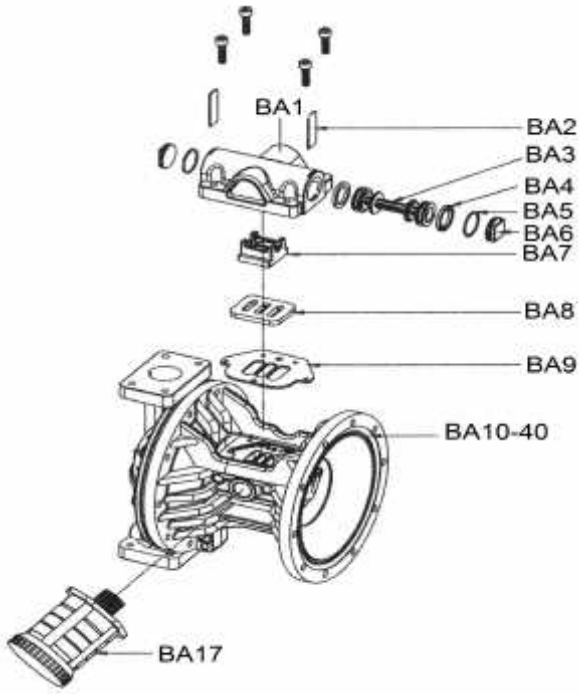
Air Valve Servicing

BD06,25,40,50,80 with PP Center Block

To service the air valve first shut off the compressed air, bleed pressure from the pump, and disconnect the air supply line from the pump.

Step 1, See Drawing

Using a screwdriver, remove the four screws, remove the whole air valve assembly from the pump. Remove and inspect air valve gasket (item BA9) for cracks or damage. Replace gasket if needed. Remove and inspect pilot valve (item BA7) and valve plate (item BA8) for cracks or wear. Replace if needed.



Step 2, Disassembly of the air valve

Using plier, remove the two locking plates (item BA2) that fasten plug to the air valve Housing. Next remove the two plugs (item BA6). Inspect the two plug O-rings (item BA5) on each plug for damage or wear. Replace O-rings if needed. Remove the piston (item BA3), inspect the two piston V-rings (item BA4) on each side of piston for damage or wear. Replace the piston V-rings if needed.

Step 3. Reassembly of the air valve

Install on plug (item BA6) with plug O-ring (item BA5), and fasten with locking plate (item BA2) to the air valve housing (item BA1).

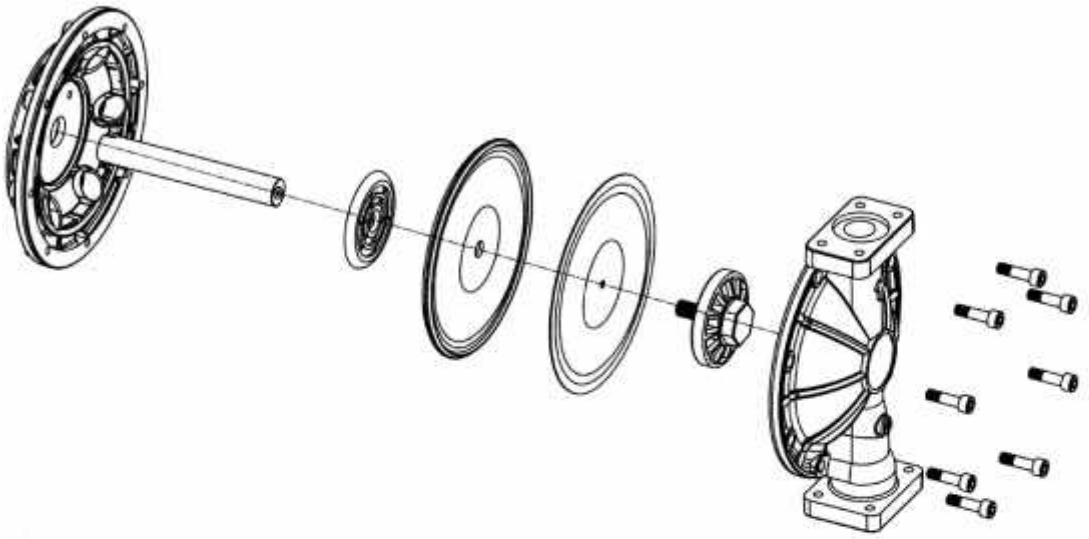
Install the piston V-ring (item BA4) into the grooves on the piston (item BA3), insert the piston into the air valve housing (item BA1). Then fasten another plug to the air valve housine.

Insert pilot valve (itemBA7) and valve plate (item BA8) into the groove of air valve housing.

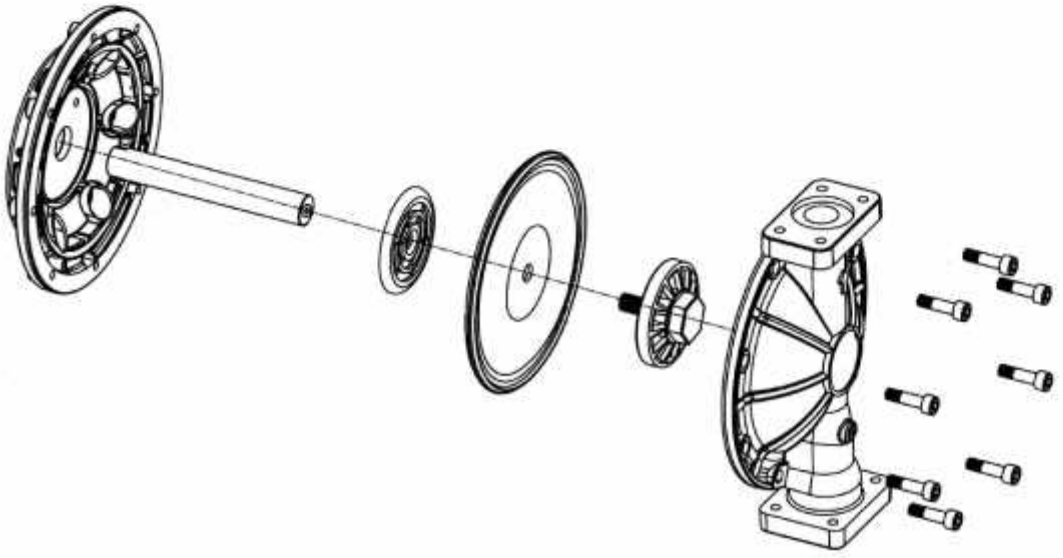
Fasten the air valve assembly and air valve gasket (item BA9) to the pump. Connect the compressed air line to the pump. The pump is now ready for operation

NOTE: Apply a light coating of grease to the O-ring or V-ring when installing them.

DIAPHRAGM SERVICING
Drawing, with Overlay Teflon Diaphragm



Drawing, Non-Overlay Teflon Diaphragm



Diaphragm Servicing

To service the diaphragms first shut off the suction, then shut off the discharge lines to the pump. Shut off the compressed air supply, bleed the pressure from the pump, and disconnect the air supply line from the pump. Drain any remaining liquid from the pump.

Step 1: Removing the manifold using a wrench or socket, remove the 16 capscrews and hex nuts that fasten the suction & discharge manifolds to the liquid chamber.

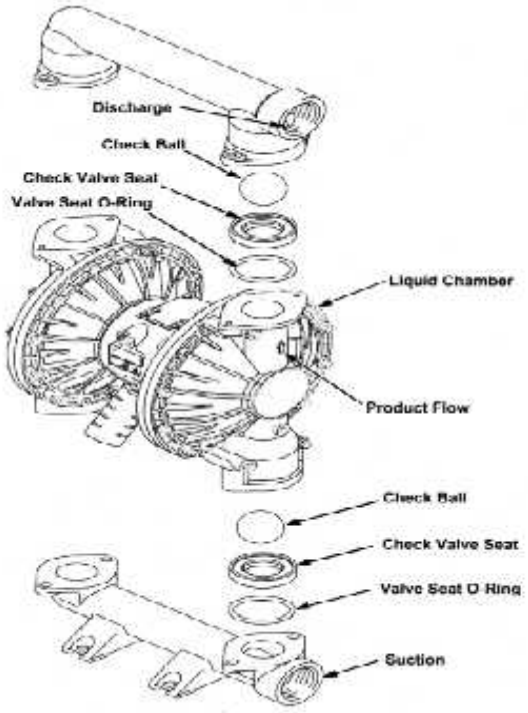
Step 2: Removing the liquid chamber using a wrench or socket, remove the 16 capscrews and hex nuts that fasten the liquid chamber and air chamber. Then remove the liquid chamber.

Step 3: Removing the diaphragm assemblies. Using a wrench or socket to remove the diaphragm assemblies (outer plate, diaphragm and inner plate) from the diaphragm rod. Using a wrench or socket to remove the outer diaphragm plate. Inspect the diaphragm for cuts, punctures, abrasive wear or chemical attack. Replace the diaphragms if necessary.

Step 4: Installing the diaphragm assemblies to the pump. Push the threaded stud of the diaphragm plate through the center hole of the diaphragm. Push the inner plate onto the stud. Use medium-strength (blue) Loctite ® or equivalent to the bolt threads and thread the stud of the one diaphragm assembly into the tapped hole at the end of the diaphragm rod until the inner plate is flush to the end of the rod. Grease the shaft and insert it into the pump. Assemble the other diaphragm assembly to the shaft as the first. Hold one shaft bolt with a wrench and torque the other bolt to 20 ft-lb. Make sure the edge of the diaphragm is inserted in the groove of the air chamber. Fasten the liquid chamber to the pump, making sure the arrows on the liquid chambers are facing up towards the discharge. **See Torque Sequence on page 8**.

Note: If this is a Teflon Fitted Pump, the Teflon diaphragms are designed to fit over the exterior of the Santoprene diaphragm. Follow the same procedures described for the standard diaphragm for removal and installation.

Check Valve Servicing



Before servicing the check valve components, first shut off the suction line and then the discharge line to the pump. Next, shut off the compressed air supply, bleed air pressure from the pump, and disconnect the air supply line from the pump. Drain any remaining fluid from the pump. The pump can now be removed for service.

Step 1: To access the check valve components, remove the manifold. Use a wrench or socket to remove the fasteners. Once the manifold is removed, the check valve components can be seen.

Step 2: Inspection

Inspect the check valve ball for wear, abrasion, or cuts on the spherical surface. The check valve seats should be inspected for cuts, abrasive wear, or embedded material on the surfaces of both the external and internal chambers. The spherical surface of the valve balls must seat flush to the surface of the valve seat for the pump to operate to peak efficiency. Replace any worn or damaged parts as necessary.

Step 3: Re-assemble

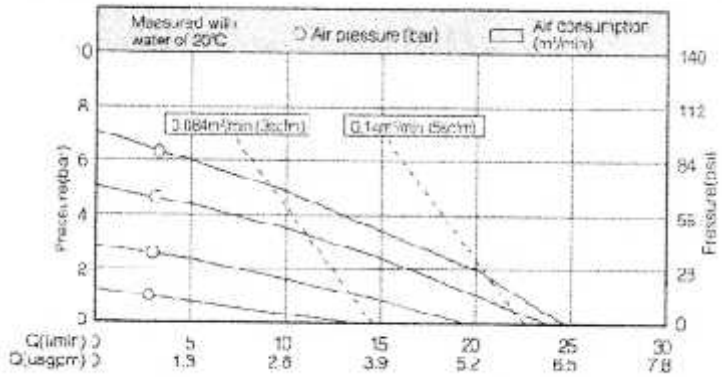
Re-assemble the check valve components. The seat should fit into the counter bore of the liquid chamber. The pump can now be reassembled, reconnected and returned to operation.

VALVE SEATS

One O-ring is required for valve seat, but some rubber valve seats have them as part of the seat and no additional O-rings are needed.

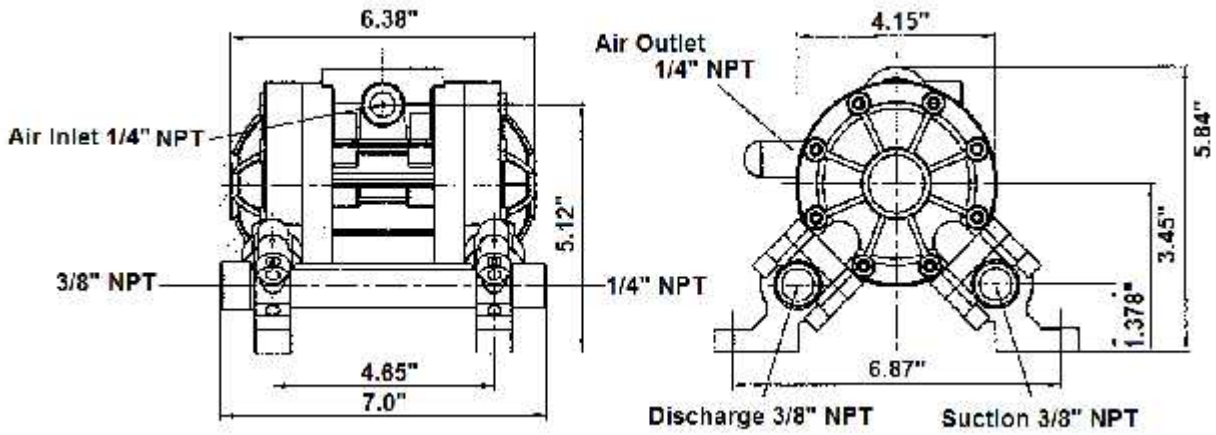
BD06/10
Plastic pump

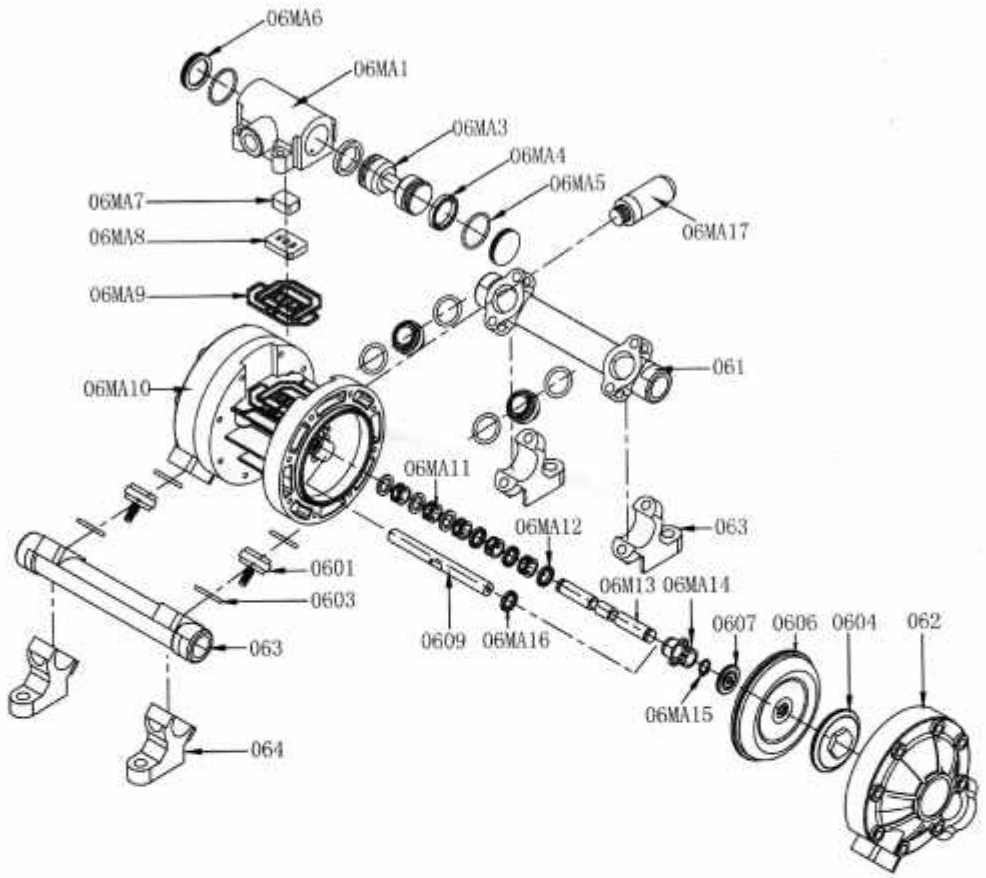
Performance curve



Technical Parameters	Material Specifications
Suction Lift (mwc) – Dry 2.1 Wet 3.7 – 6.4	Diaphragm: Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Max particle diameter (mm) 1.6	Pump Body: PP, PVDF, POM
Suction and Discharge ¼”- 3/8”	Check Valve: PP, PVDF, POM
Air inlet size ¼”	Center Block: PP
Max flow – 7 GPM	**WEIGHT**
Max Head – 162 Feet	PP Pump/POM Pump 3.3 lbs.
Max air inlet pressure 101 PSI	PVDF Pump: 4.4 lbs.

Dimensions





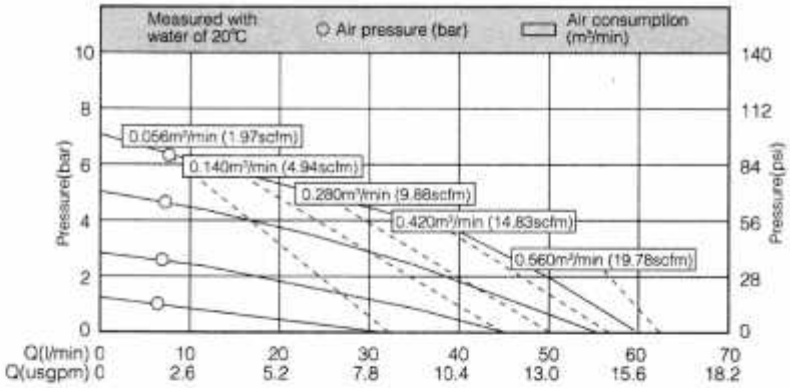
Air end parts						
Part code	Name	Qty		Part code	Name	Qty
06MA1-KV	Air valve housing	1		06MA10-PP	Center block	1
06MA3-PM	Piston	1		06MA11-PM	Reversing valve	5
06MA4-VT	Piston V-ring	2		06MA12-VT	Reversing shaft O-ring	6
06MA5-VT	Plug O-ring	2		06MA13-SS	Reversing shaft	1
06MA6-KV	Plug	2		06MA14-PP	Locking plate	2
06MA7-CM	Pilot valve	1		06MA15-SS	Snap ring	2
06MA8-CM	Valve plate	1		06MA16-VT	Rod V-ring	2
06MA9-ST	Air valve gasket	1		06MA17-PP	Muffler	1

Wet end parts						
Part code	Name	Qty		Part code	Name	Qty
061-PP	Suction manifold	1		0603-VT	Check valve O-ring	8
061-KV				0604-PP	Plate	2
062-PP	Fluid chamber	2		0604-KV		
062-KV				0606-ST	Diaphragm	2
063-PP	Discahrge manifold	1		0606-HY		
063-KV				0606-TF		
064-PP	Footing	4		0606-VT		
0601-PP	Check valve	4		0607-SS	Inner plate	2
0601-KV						

BD15
Aluminum pump
Stainless pump
Plastic pump

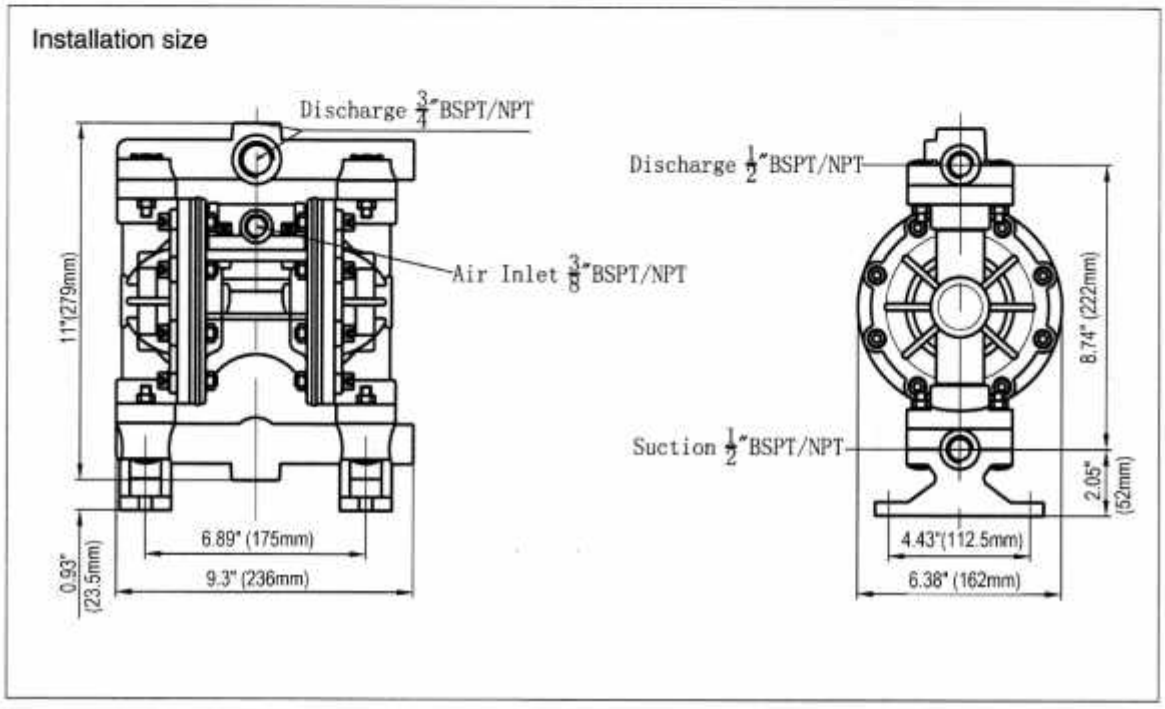
Weight:
Aluminum - 10 lbs.
Stainless Steel - 16.5 lbs.
Plastic - 10 lbs.

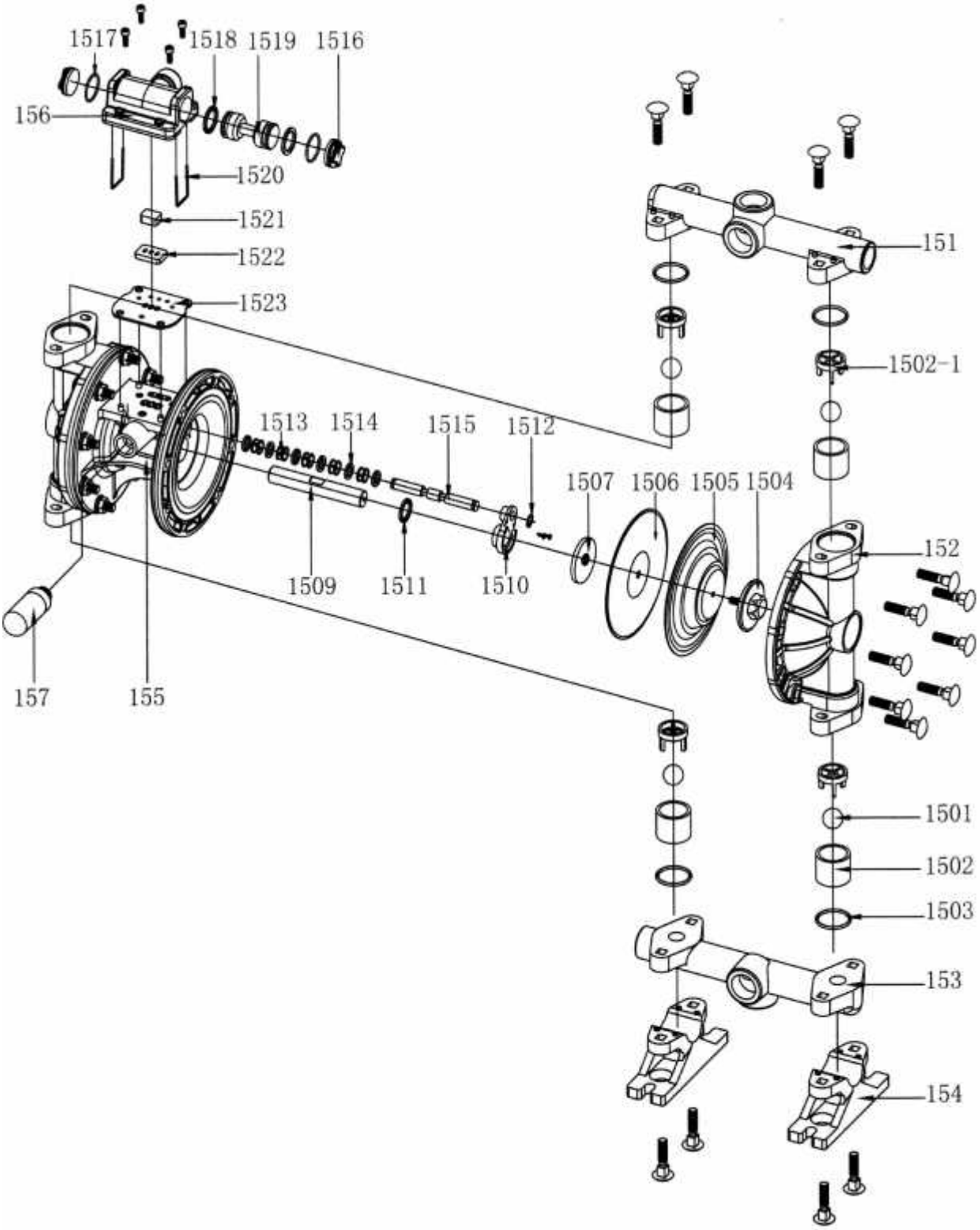
Performance curve



Technical parameters		
Suction lift[mwc]	dry	4
	wet	7.6
Max particle diameter[mm]		2.5
Suction and discharge size[in]		1/2 3/4
Air inlet size[in]		3/8
Max flow[l/min]		57
Max head[m]		84
Max air inlet presure[bar]		8.4

Installation size




1517
1518
1519
1516
156
1520
1521
1522
1523
151
1502-1
1513
1514
1515
1512
1507
1506
1505
1504
152
1509
1511
1510
157
155
1501
1502
1503
153
154

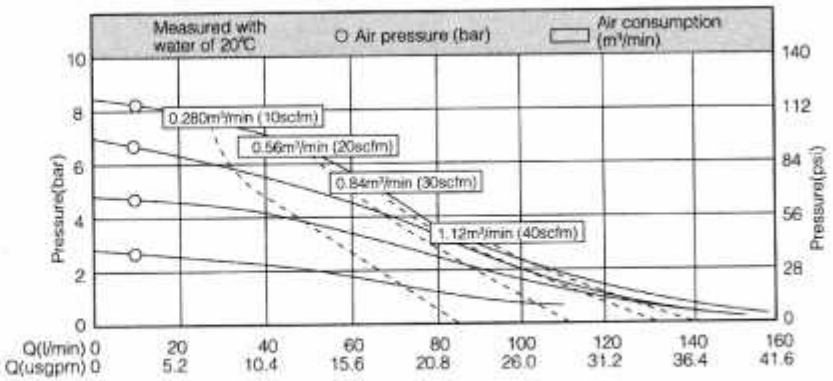
Air end parts						
Part code	Name	Qty		Part code	Name	Qty
155-PP	Center block	1		1515-SS	Reversing shaft	1
156-KV	Air valve housing	1		1516-PP	Plug	2
157-PE	Muffler	1		1517-VT	Plug O-ring	2
1509-SS	Diaphragm rod	1		1518-VT	Piston V-ring	2
1510-PP	Locking plate	2		1519-PM	Piston	1
1511-VT	Rod V-ring	2		1520-SS	Locking pin	2
1512-SS	Snap ring	2		1521-CM	Pilot valve	1
1513-PM	Reversing valve	5		1522-CM	Valve plate	1
1514-VT	Reversing shaft O-ring	6		1523-ST	Air valve gasket	1

Wet end parts						
Part code	Name	Qty		Part code	Name	Qty
151-PP	Discharge manifold	1		1502-1-PP	Baffle	4
151-AL				1502-1-PC		
151-KV				1502-1-KV		
151-PM				1502-1-PM		
151-SS				1502-1-SS		
151 -LL				1502-1 -LL		
152-PP	Fluid chamber	2		1503-TF	Seat O-ring	4
152-AL				1503-BN		
152-KV				1503-EP		
152-PM				1503-VT		
152-SS				1504-PP	Plate	2
152 -LL				1504-AL		
153-PP	Suction manifold	1		1504-KV		
153-AL				1504-PM		
153-KV				1504-SS		
153-PM				1504 -LL		
153-SS				1505-TF	Teflon diaphragm	2
153 -LL				1506-ST	Rubber diaphragm	2
154-PP		2		1506-HY		
1501-TF	Valve ball	4		1506-BN		
1501-PC				1506-EP		
1501-SS				1506-GE		
1501 -LL				1506-VT		
1502-PP	Valve seat	4		1507-PP	Inner plate	2
1502-PC						
1502-KV						
1502-PM						
1502-SS						
1502 -LL						

BD 25

Aluminum / cast iron pump

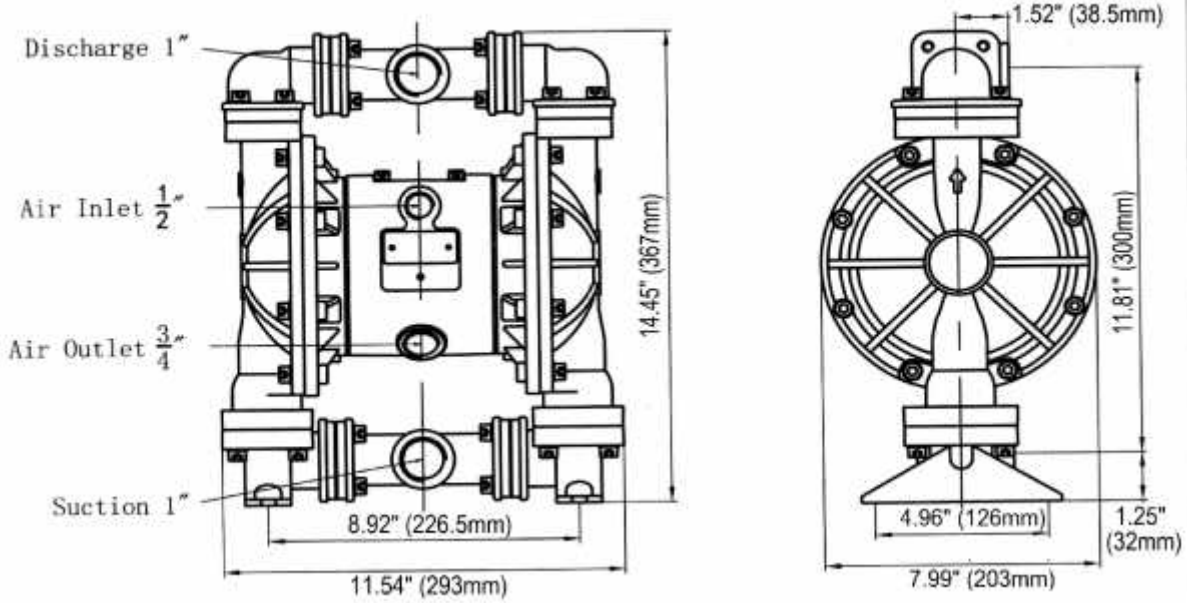
Performance curve



Technical parameters		
Suction lift[mwc]	dry	4
	wet	8
Max particle diameter[mm]		4
Suction and discharge size[in]		1
Air inlet size[in]		1/2
Max flow[l/min]		157
Max head[m]		84
Max air inlet presure[bar]		8.4

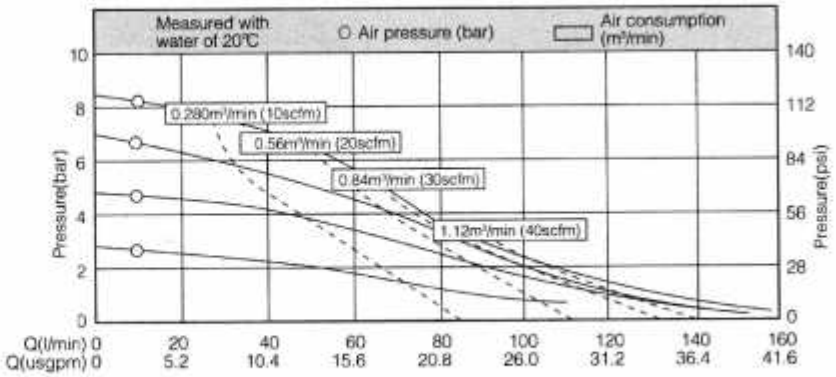
Material quality
Pumpbody: Aluminum, Cast iron
Diaphragm: Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Santoprene, Hytrel, Teflon, Viton, Stainless steel, Ceramic
Valve seat: Santoprene, Hytrel, Teflon, Viton, Stainless steel
Center block: PP, Aluminum, Stainless steel
Weight
Aluminum pump: 11 Kgs
Cast iron pump: 25 Kgs

Installation size



BD25
Stainless steel pump

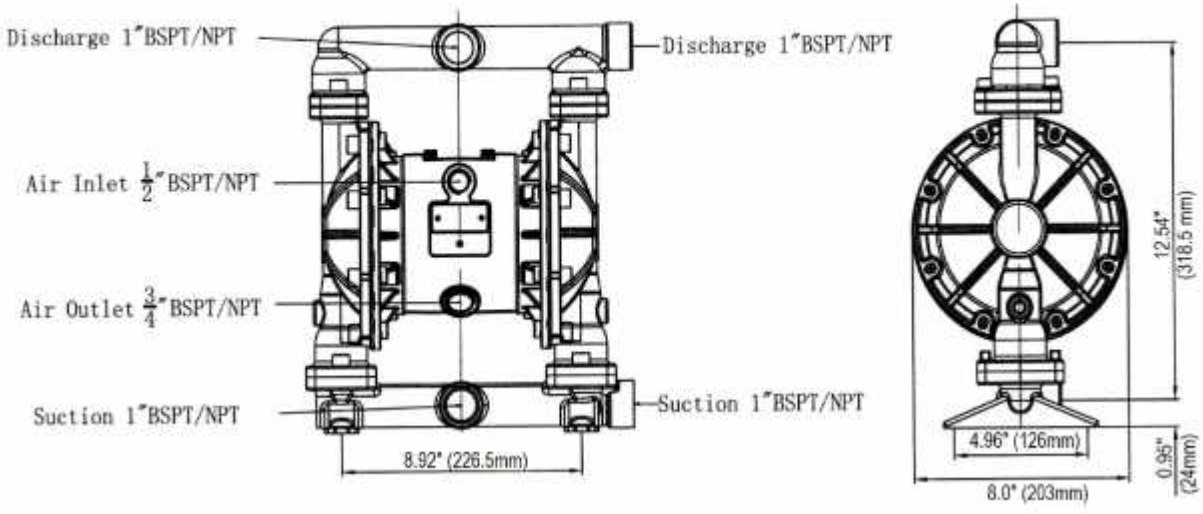
Performance curve



Technical parameters		
Suction lift[mwc]	dry	4
	wet	8
Max particle diameter[mm]		4
Suction and discharge size[in]		1
Air inlet size[in]		1/2
Max flow[l/min]		157
Max head[m]		84
Max air inlet presure[bar]		8.4

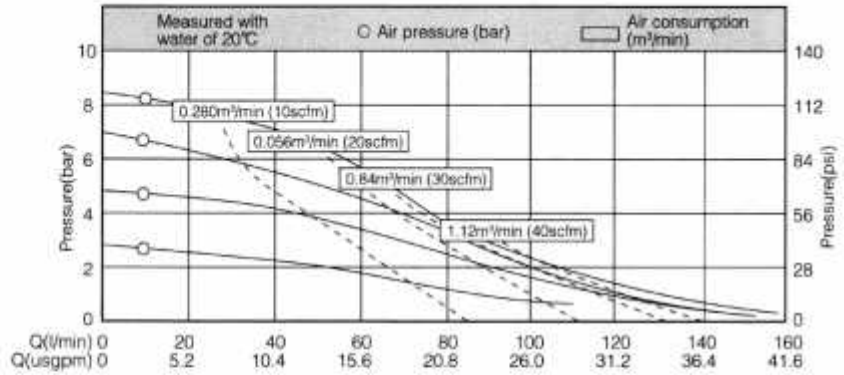
Material quality
Pumpbody：SS304, SS316, SS316L
Diaphragm：Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Santoprene, Hytrel, Teflon, Viton, Stainless steel, Ceramic
Valve seat: Santoprene, Hytrel, Teflon, Viton, Stainless steel
Center block: PP, Aluminum, Stainless steel
Weight
SS304 Pump: 16 Kgs
SS316 pump: 16 Kgs

Installation size



BD25
Plastic pump

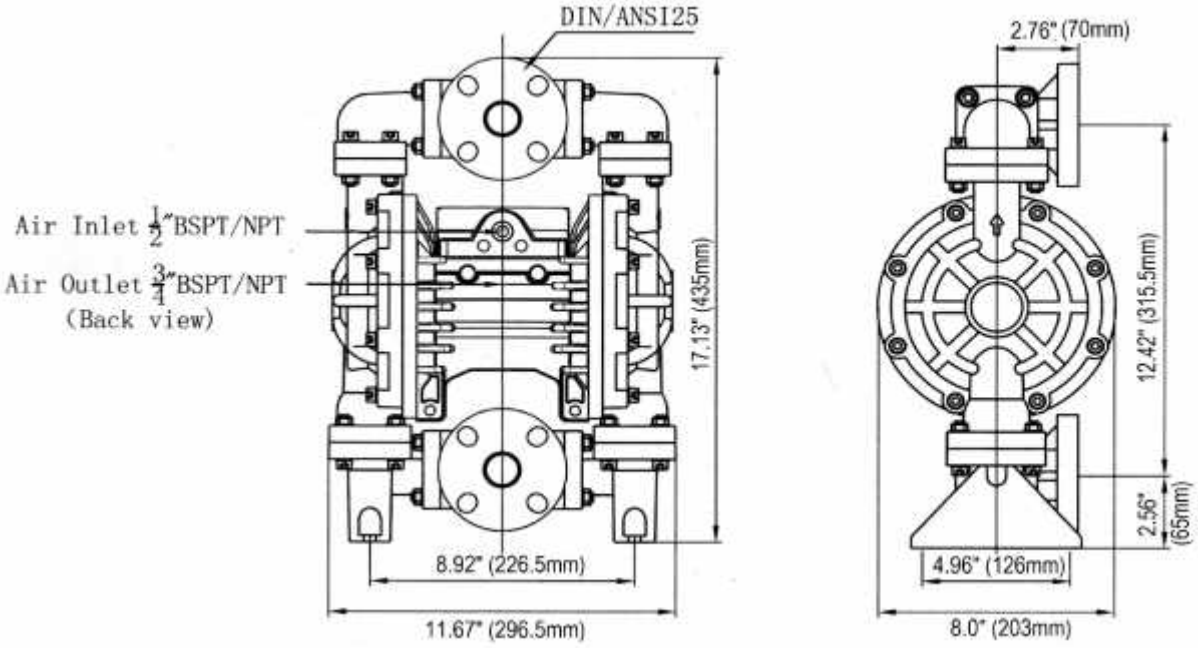
Performance curve



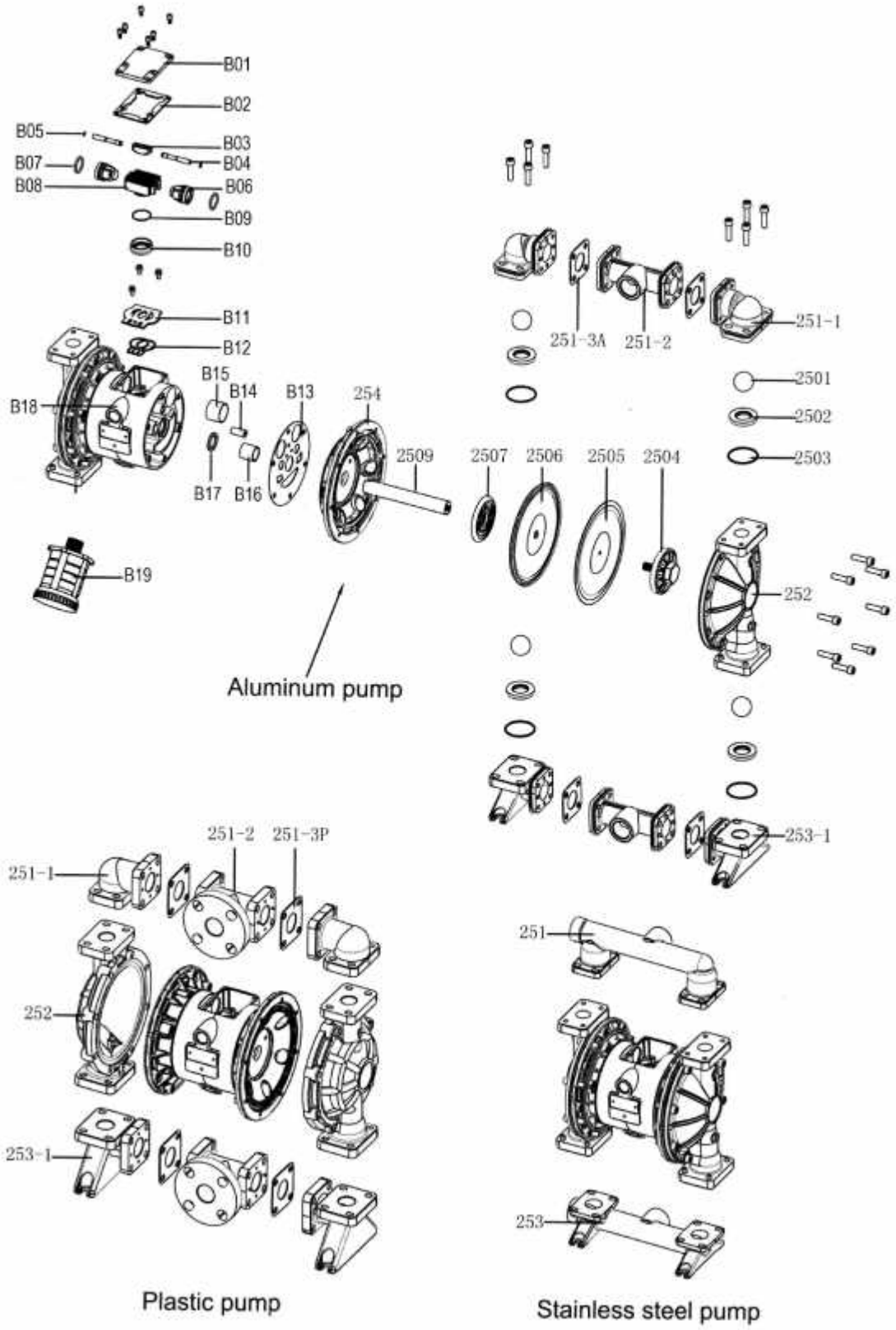
Technical parameters		
Suction lift[mwc]	dry	4
	wet	8
Max particle diameter[mm]		4
Suction and discharge size[in]		1
Air inlet size[in]		1/2
Max flow[l/min]		157
Max head[m]		84
Max air inlet presure[bar]		8.4

Material quality
Pumpbody: PP, PVDF, POM
Diaphragm: Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Teflon, Stainless steel, Santoprene, Hytrel, Viton, Ceramic
Valve seat: Teflon, Santoprene, Hytrel, Viton, PP
Center block: PP, Aluminum, Stainless steel
Weight
PP pump / POM pump: 9 Kgs
PVDF pump: 12 Kgs

Installation size



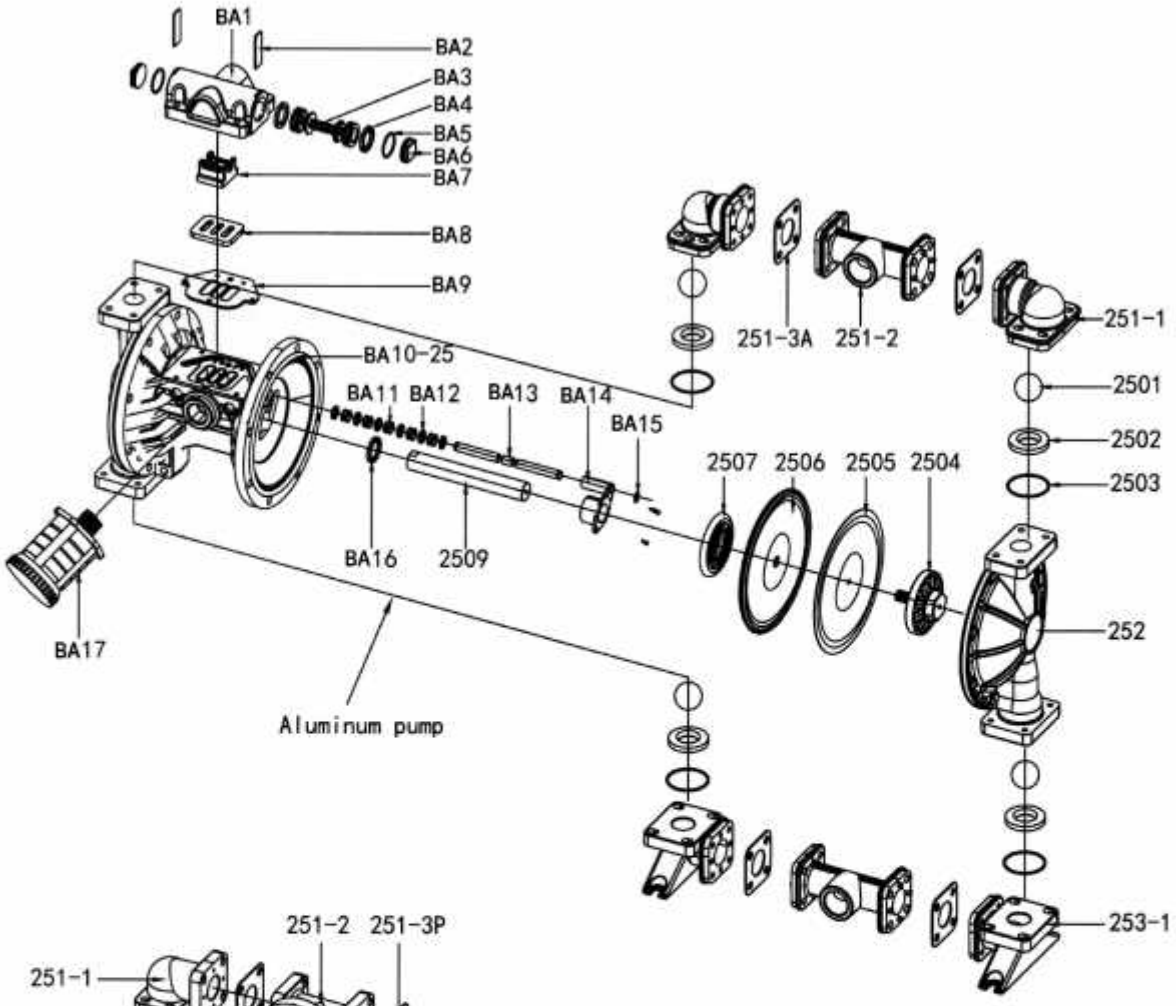
EXPLODED VIEW (AL CENTER BLOCK)

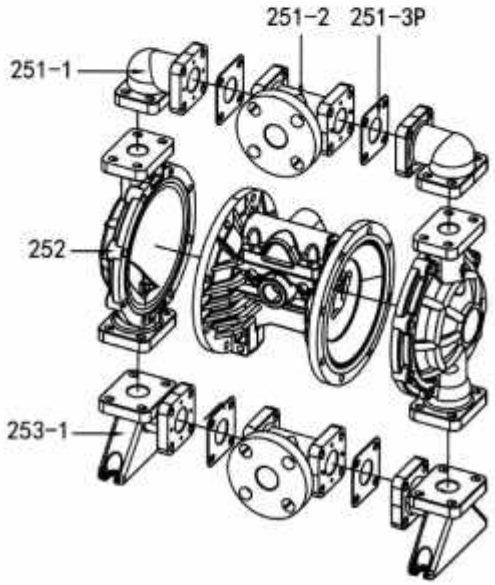


Air end parts						
Part code	Name	Qty		Part code	Name	Qty
B01-AL	Air valve cap	1		B11-CM	Valve plate	1
B02-BN	Air valve cap gasket	1		B11-SS		
B03-PM	Reversing switch	1		B12-VT	Valve plate gasket	1
B03-CM				B13-BN	Air chamber gasket	2
B04-SS	Reversing pin	2		B13-TF		
B05-VT	Reversing pin O-ring	2		B14-PM	Resersing pin bushing	2
B06-PM	Piston	2		B15-PM	Piston bushing	2
B07-VT	Piston V-ring	2		B16-PM	Rod bushing	2
B08-AL	Upper pilot valve	1		B17-VT	Rod V-ring	2
B09-VT	Pilot valve O-ring	1		B18-AL	Air valve body	1
B10-PM	Bottom Pilot valve	1		B19-PP	Muffler	1
B10-CM						

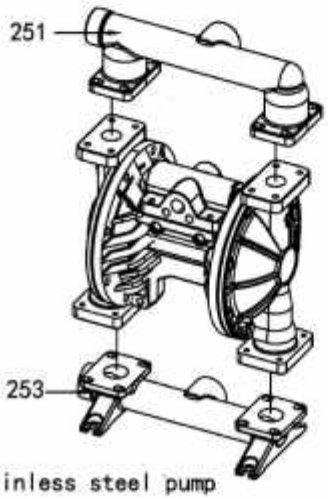
Wet end parts						
Part code	Name	Qty		Part code	Name	Qty
251-SS	Discharge Manifold	1		2502-PP	Valve seat	4
251-LL				2502-AL		
251-1-PP	Upper Elbow	2		2502-TF		
251-1-AL				2502-ST		
251-1-KV				2502-HY		
251-2-PP	TEE	2		2502-BN		
251-2-AL				2502-EP		
251-2-KV				2502-GE		
251-3P-HY	TEE Gasket (Plastic pump)	4		2502-VT		
251-3P-ST				2502-PC		
251-3P-TF				2502-SS		
251-3A-HY	TEE Gasket (AL pump)	4		2502-LL		
251-3A-ST				2503-TF	Seat O-ring	4
251-3A-TF				2503-BN		
253-SS	Suction Manifold	1		2503-EP		
253-LL				2503-VT		
253-1-PP	Bottom Elbow	2		2504-KV	Plate	2
253-1-AL				2504-PP		
253-1-KV				2504-AL		
252-KV	Fluid chamber	2		2504-SS		
252-PP				2504-LL		
252-AL				2505-TF	Teflon diaphragm	2
252-SS				2506-ST	Rubber diaphragm	2
252-LL				2506-HY		
254-AL	Air chamber	2		2506-BN		
2501-TF	Valve ball	4		2506-EP		
2501-ST				2506-GE		
2501-HY				2506-VT		
2501-BN				2506-PU		
2501-EP				2507-AL	Inner plate	2
2501-GE				2509-SS	Diaphragm Rod	1
2501-VT						
2501-PC						
2501-SS						
2501-LL						
2501-CM						

EXPLODED VIEW (PP CENTER BLOCK)





Plastic pump



Stainless steel pump

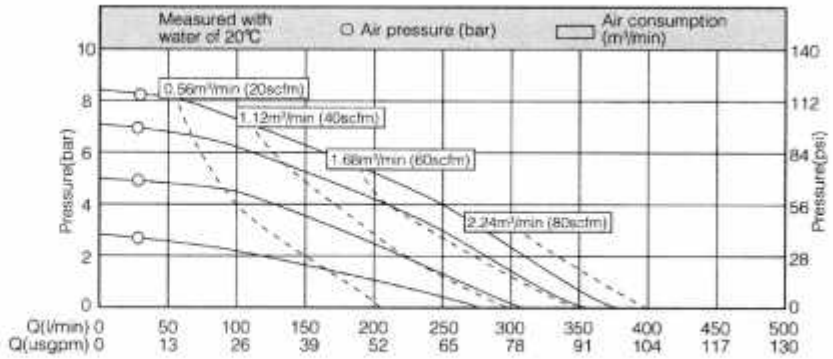
Air end parts						
Part code	Name	Qty		Part code	Name	Qty
BA1-KV	Air valve housing	1		BA10-25-PP	Center block	1
BA2-SS	Plug locking plate	2		BA11-PM	Reversing valve	5
BA3-PM	Piston	1		BA12-VT	Reversing shaft O-ring	6
BA4-VT	Piston V-ring	2		BA13-SS	Reversing shaft	1
BA5-VT	Plug O-ring	2		BA14-PP	Locking plate	2
BA6-KV	Plug	2		BA15-SS	Snap ring	2
BA7-PM	Pilot valve	1		BA16-VT	Rod V-ring	2
BA8-CM	Valve plate	1		BA17-PP	Muffler	1
BA9-ST	Air valve gasket	1				

Wet end parts						
Part code	Name	Qty		Part code	Name	Qty
251-SS	Discharge Manifold	1		2502-PP	Valve seat	4
251-LL				2502-AL		
251-1-PP	Upper Elbow	2		2502-TF		
251-1-AL				2502-ST		
251-1-KV				2502-HY		
251-2-PP	TEE	2		2502-BN		
251-2-AL				2502-EP		
251-2-KV				2502-GE		
251-3P-HY	TEE Gasket (Plastic pump)	4		2502-VT		
251-3P-ST				2502-PC		
251-3P-TF				2502-SS		
251-3A-HY	TEE Gasket (AL pump)	4		2502-LL		
251-3A-ST				2503-TF	Seat O-ring	4
251-3A-TF				2503-BN		
253-SS	Suction Manifold	1		2503-EP		
253-LL				2503-VT		
253-1-PP	Bottom Elbow	2		2504-KV	Plate	2
253-1-AL				2504-PP		
253-1-KV				2504-AL		
252-KV	Fluid chamber	2		2504-SS		
252-PP				2504-LL		
252-AL				2505-TF	Teflon diaphragm	2
252-SS				2506-ST	Rubber diaphragm	2
252-LL				2506-HY		
2501-TF	Valve ball	4		2506-BN		
2501-ST				2506-EP		
2501-HY				2506-GE		
2501-BN				2506-VT		
2501-EP				2506-PU		
2501-GE				2507-AL	Inner plate	2
2501-VT				2509-SS	Diaphragm Rod	1
2501-PC						
2501-SS						
2501-LL						
2501-CM						

BD40

Aluminum / cast iron pump

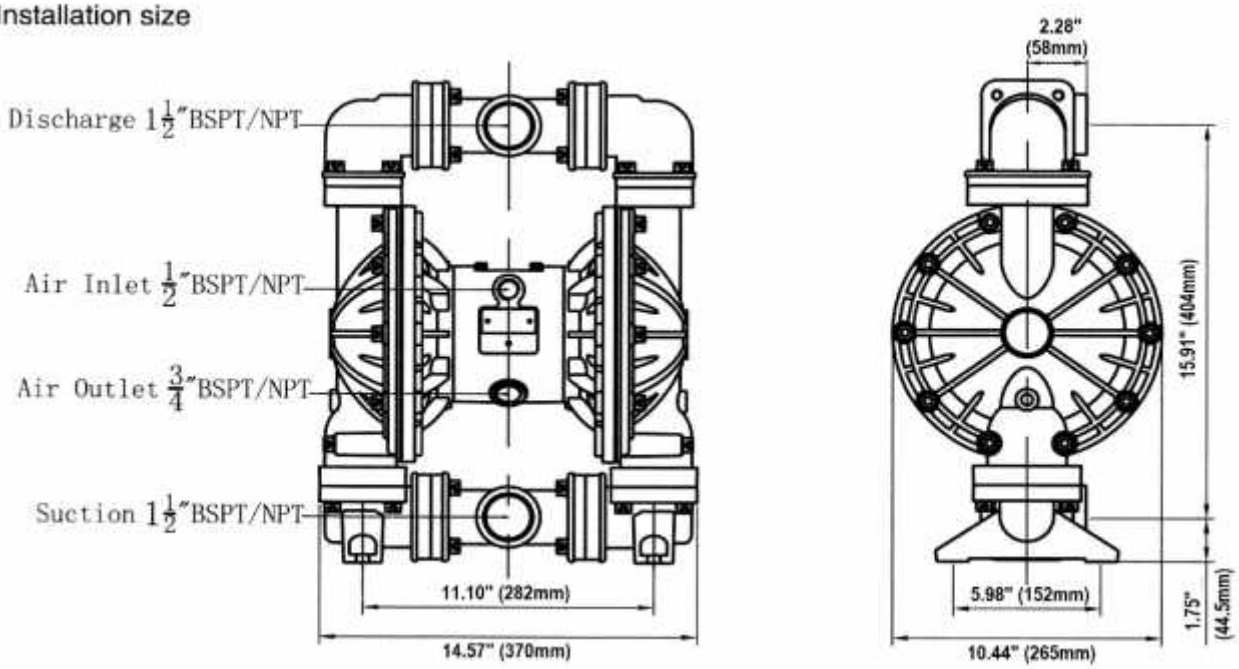
Performance curve



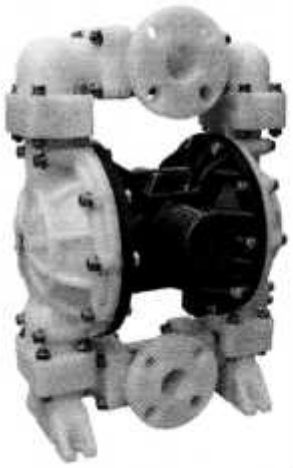
Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		5
Suction and discharge size[in]		1 1/2
Air inlet size[in]		1/2
Max flow[l/min]		358
Max head[m]		84
Max air inlet presure[bar]		8.4

Material quality
Pumpbody: Aluminum, Cast iron
Diaphragm: Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Santoprene, Hytrel, Teflon, Viton, Stainless steel, Ceramic
Valve seat: Santoprene, Hytrel, Teflon, Viton, Stainless steel
Center block: PP, Aluminum, Stainless steel
Weight
Aluminum pump: 20 Kgs
Cast iron pump: 50 Kgs

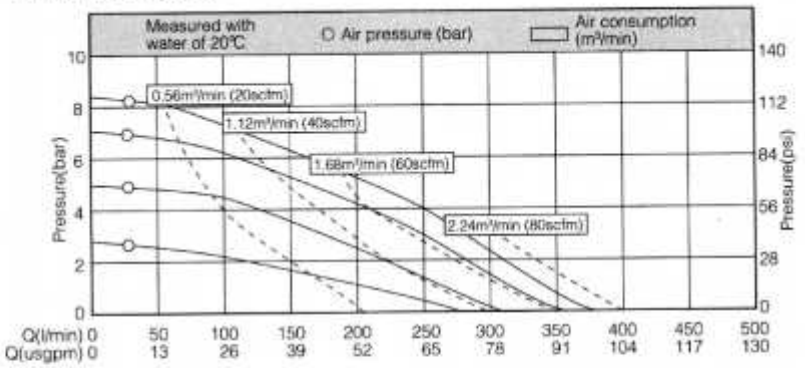
Installation size



BD40
Plastic pump



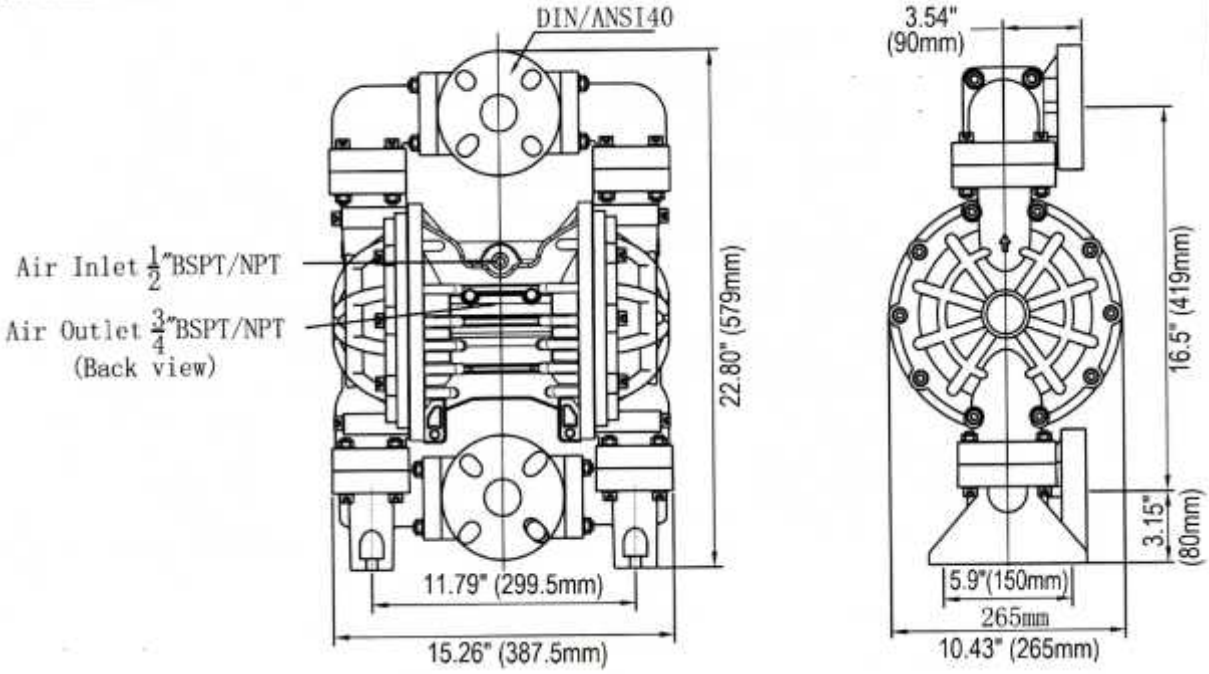
Performance curve



Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		5
Suction and discharge size[in]		1 1/2
Air inlet size[in]		1/2
Max flow[l/min]		358
Max head[m]		84
Max air inlet presure[bar]		8.4

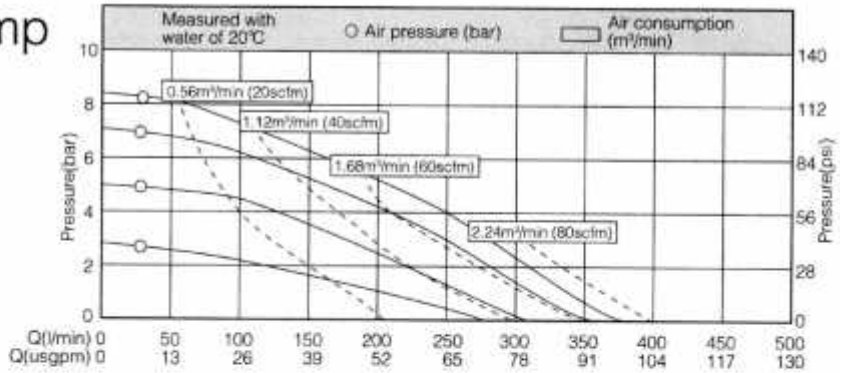
Material quality
Pumpbody: PP, PVDF
Diaphragm: Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Teflon, Stainless steel, Santoprene, Hytrel, Viton, Ceramic
Valve seat: Teflon, Santoprene, Hytrel, Viton, PP
Center block: PP, Aluminum, Stainless steel
Weight
PP pump: 17 Kgs
PVDF pump: 24 Kgs

Installation size



BD40
Stainless steel pump

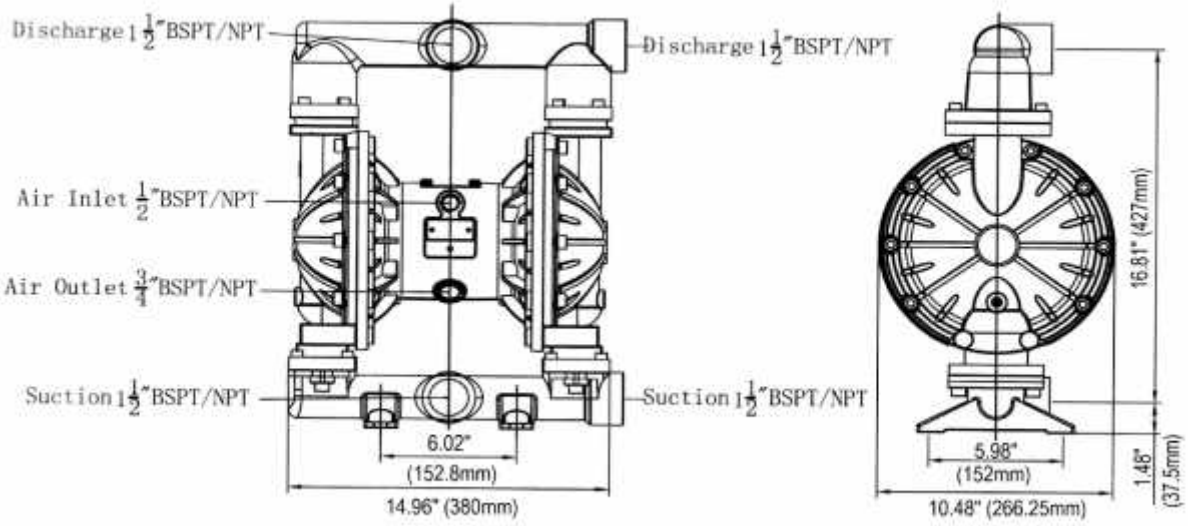
Performance curve



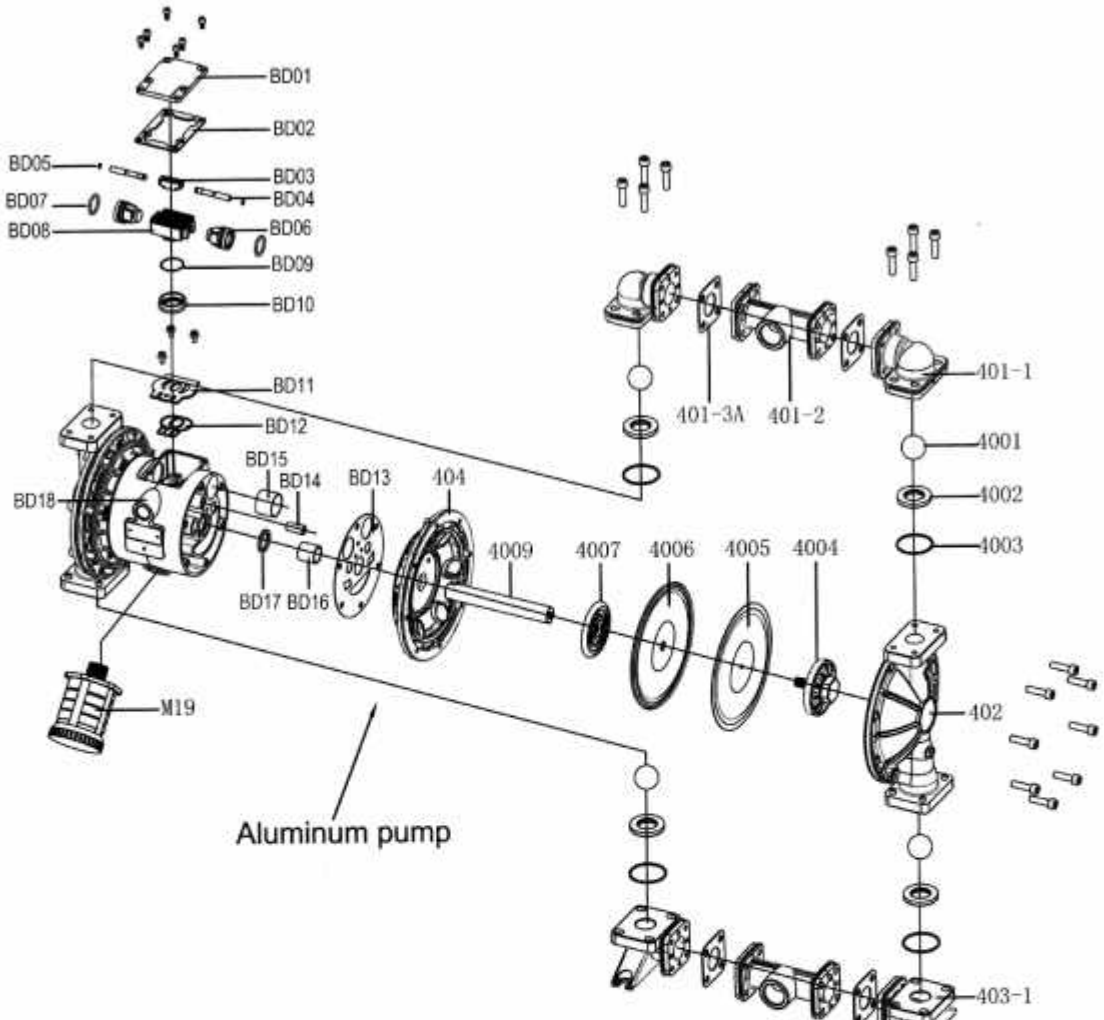
Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		5
Suction and discharge size[in]		1 1/2
Air inlet size[in]		1/2
Max flow[l/min]		358
Max head[m]		84
Max air inlet presure[bar]		8.4

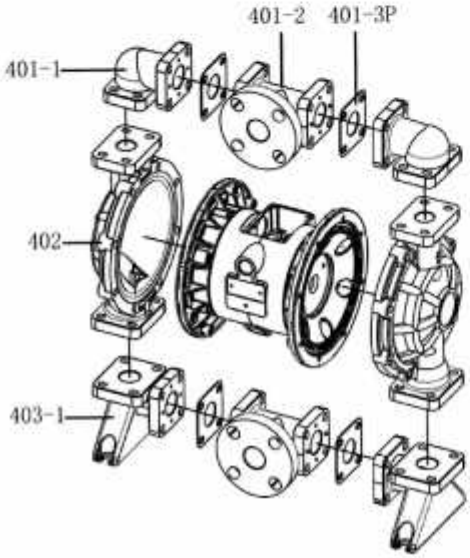
Material quality
Pumpbody: SS304, SS316, SS316L
Diaphragm: Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Santoprene, Hytrel, Teflon, Viton, Stainless steel, Ceramic
Valve seat: Santoprene, Hytrel, Teflon, Viton, Stainless steel
Center block: PP, Aluminum, Stainless steel
Weight
SS304 pump: 31 Kgs
SS316 pump: 31 Kgs

Installation size

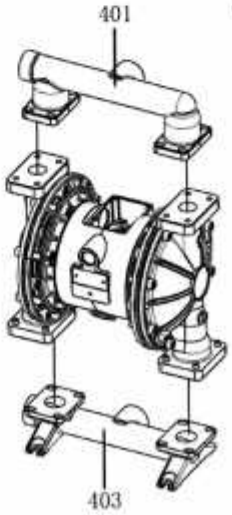


EXPLODED VIEW (AL CENTER BLOCK)





Plastic pump

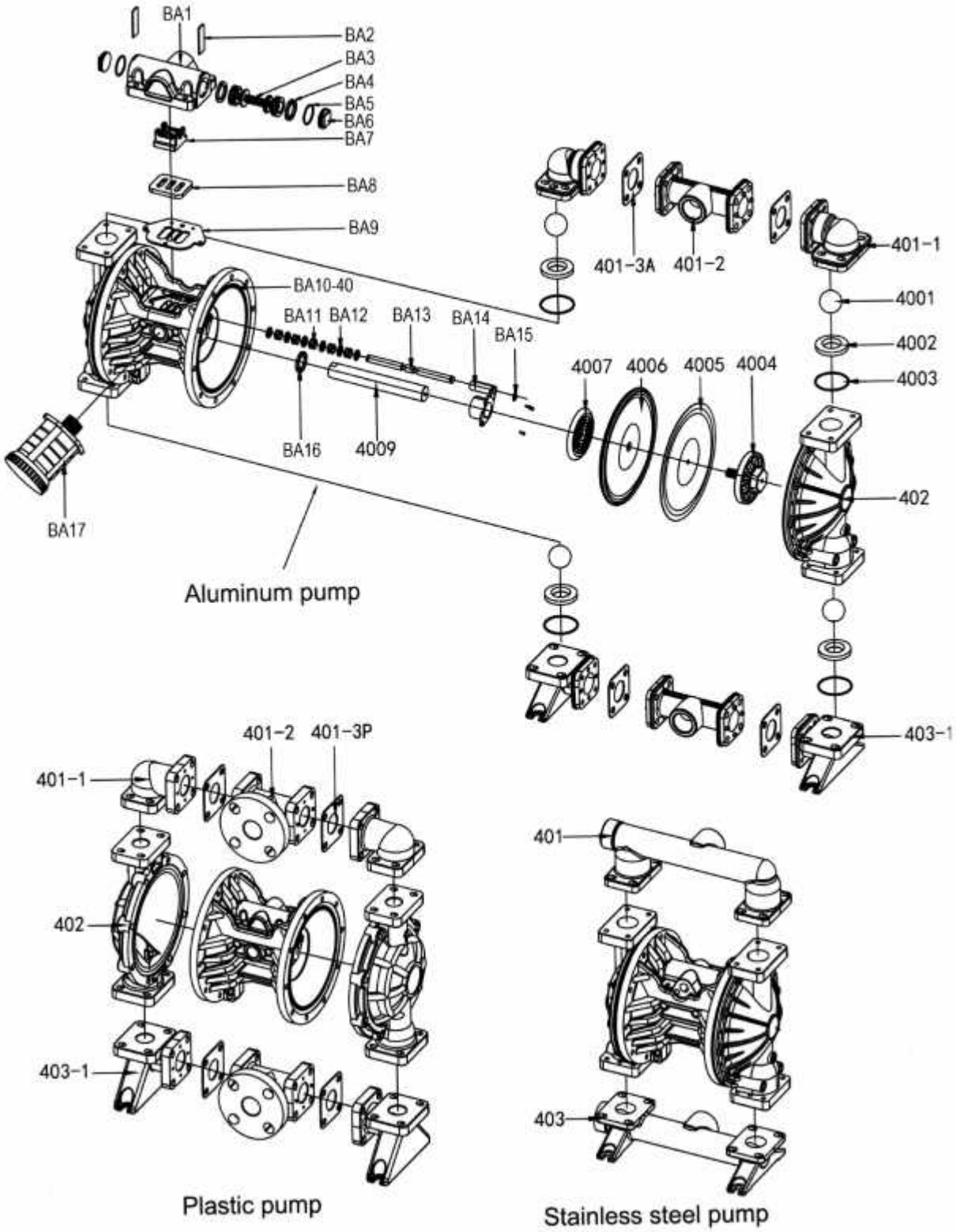


Stainless steel pump

Air end parts						
Part code	Name	Qty		Part code	Name	Qty
BD01-AL	Air valve cap	1		BD11-CM	Valve plate	1
BD02-BN	Air valve cap gasket	1		BD11-SS		
BD03-PM	Reversing switch	1		BD12-VT	Valve plate gasket	1
BD03-CM				BD13-BN	Air chamber gasket	2
BD04-SS	Reversing pin	2		BD13-TF		
BD05-VT	Reversing pin O-ring	2		BD14-PM	Resersing pin bushing	2
BD06-PM	Piston	2		BD15-PM	Piston bushing	2
BD07-VT	Piston V-ring	2		BD16-PM	Rod bushing	2
BD08-AL	Upper pilot valve	1		BD17-VT	Rod V-ring	2
BD09-VT	Pilot valve O-ring	1		BD18-AL	Air valve body	1
BD10-PM	Bottom Pilot valve	1		M19-PP	Muffler	1
BD10-CM						

Wet end parts						
Part code	Name	Qty		Part code	Name	Qty
401-SS	Discharge Manifold	1		4002-PP	Valve seat	4
401-LL				4002-AL		
401-1-PP	Upper Elbow	2		4002-TF		
401-1-AL				4002-ST		
401-1-KV				4002-HY		
401-2-PP	TEE	2		4002-BN		
401-2-AL				4002-EP		
401-2-KV				4002-GE		
401-3P-HY	TEE Gasket (Plastic pump)	4		4002-VT		
401-3P-ST				4002-PC		
401-3P-TF				4002-SS		
401-3A-HY	TEE Gasket (AL pump)	4		4002-LL		
401-3A-ST				4003-TF	Seat O-ring	4
401-3A-TF				4003-BN		
403-SS	Suction Manifold	1		4003-EP		
403-LL				4003-VT		
403-1-PP	Bottom Elbow	2		4004-KV	Plate	2
403-1-AL				4004-PP		
403-1-KV				4004-AL		
402-KV	Fluid chamber	2		4004-SS		
402-PP				4004-LL		
402-AL				4005-TF	Teflon diaphragm	2
402-SS				4006-ST	Rubber diaphragm	2
402-LL				4006-HY		
404-AL	Air chamber	2		4006-BN		
4001-TF	Valve ball	4		4006-EP		
4001-ST				4006-GE		
4001-HY				4006-VT		
4001-BN				4006-PU		
4001-EP				4007-AL	Inner plate	2
4001-GE				4009-SS	Diaphragm Rod	1
4001-VT						
4001-PC						
4001-SS						
4001-LL						
4001-CM						

EXPLODED VIEW (PP CENTER BLOCK)



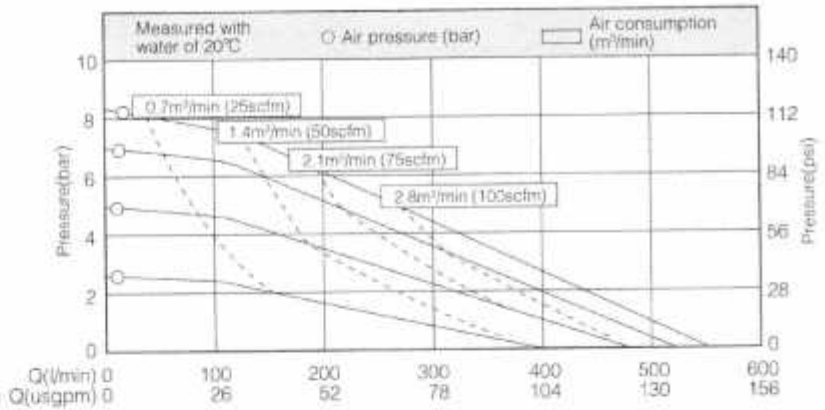
Air end parts						
Part code	Name	Qty		Part code	Name	Qty
BA1-KV	Air valve housing	1		BA10-40-PP	Center block	1
BA2-SS	Plug locking plate	2		BA11-PM	Reversing valve	5
BA3-PM	Piston	1		BA12-VT	Reversing shaft O-ring	6
BA4-VT	Piston V-ring	2		BA13-SS	Reversing shaft	1
BA5-VT	Plug O-ring	2		BA14-PP	Locking plate	2
BA6-KV	Plug	2		BA15-SS	Snap ring	2
BA7-PM	Pilot valve	1		BA16-VT	Rod V-ring	2
BA8-CM	Valve plate	1		BA17-PP	Muffler	1
BA9-ST	Air valve gasket	1				

Wet end parts						
Part code	Name	Qty		Part code	Name	Qty
401-SS	Discharge Manifold	1		4002-PP	Valve seat	4
401-LL				4002-AL		
401-1-PP	Upper Elbow	2		4002-TF		
401-1-AL				4002-ST		
401-1-KV				4002-HY		
401-2-PP	TEE	2		4002-BN		
401-2-AL				4002-EP		
401-2-KV				4002-GE		
401-3P-HY	TEE Gasket (Plastic pump)	4		4002-VT		
401-3P-ST				4002-PC		
401-3P-TF				4002-SS		
401-3A-HY	TEE Gasket (AL pump)	4		4002-LL		
401-3A-ST				4003-TF	Seat O-ring	4
401-3A-TF				4003-BN		
403-SS	Suction Manifold	1		4003-EP		
403-LL				4003-VT		
403-1-PP	Bottom Elbow	2		4004-KV	Plate	2
403-1-AL				4004-PP		
403-1-KV				4004-AL		
402-KV	Fluid chamber	2		4004-SS		
402-PP				4004-LL		
402-AL				4005-TF	Teflon diaphragm	2
402-SS				4006-ST	Rubber diaphragm	2
402-LL				4006-HY		
4001-TF	Valve ball	4		4006-BN		
4001-ST				4006-EP		
4001-HY				4006-GE		
4001-BN				4006-VT		
4001-EP				4006-PU		
4001-GE				4007-AL	Inner plate	2
4001-VT				4009-SS	Diaphragm Rod	1
4001-PC						
4001-SS						
4001-LL						
4001-CM						

BD50

Aluminum / cast iron pump

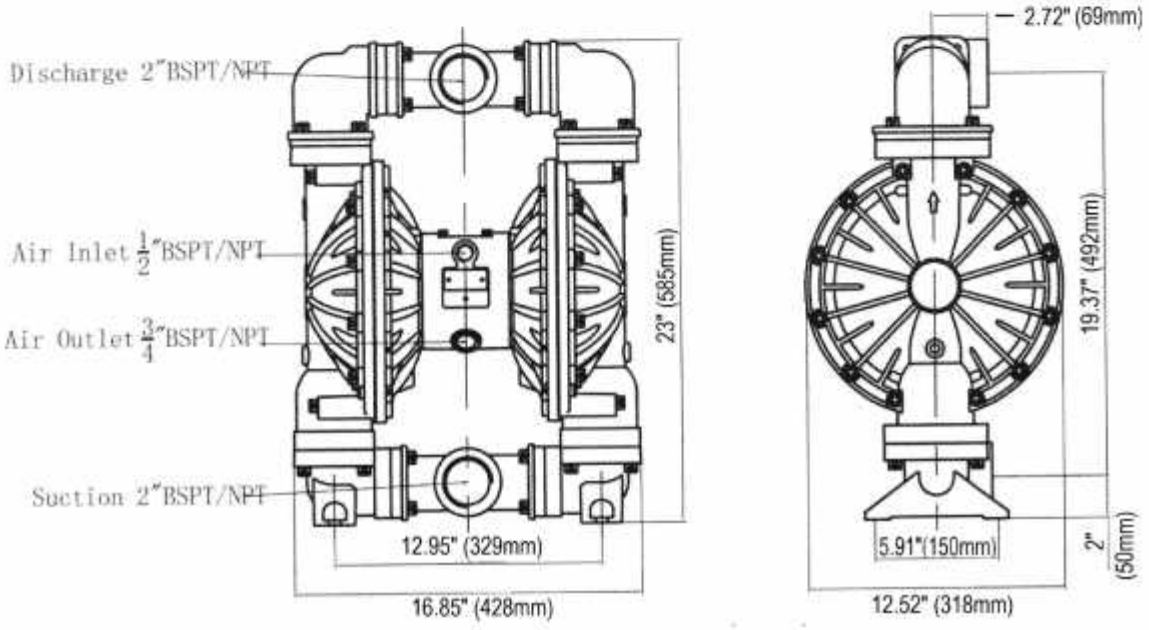
Performance curve



Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		6
Suction and discharge size[in]		2
Air inlet size[in]		1/2
Max flow[l/min]		587
Max head[m]		84
Max air inlet presure[bar]		8.4

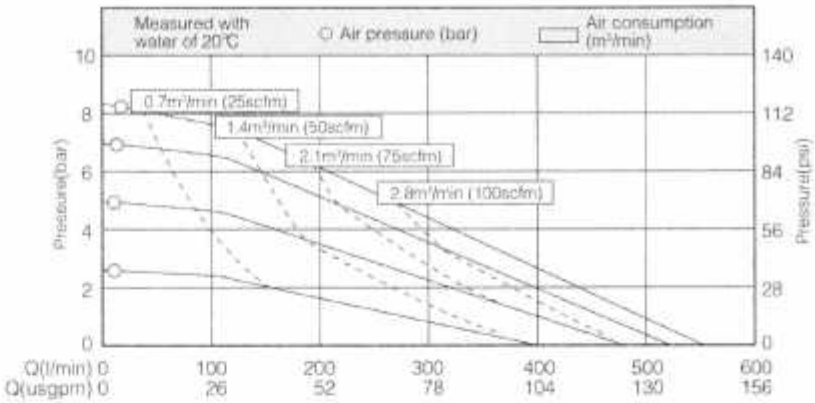
Material quality
Pumpbody: Aluminum, Cast iron
Diaphragm: Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Santoprene, Hytrel, Teflon, Viton, Stainless steel, Ceramic
Valve seat: Santoprene, Hytrel, Teflon, Viton, Stainless steel
Center block: PP, Aluminum, Stainless steel
Weight
Aluminum pump: 27 Kgs
Cast iron pump: 78 Kgs

Installation size



BD50
Plastic pump

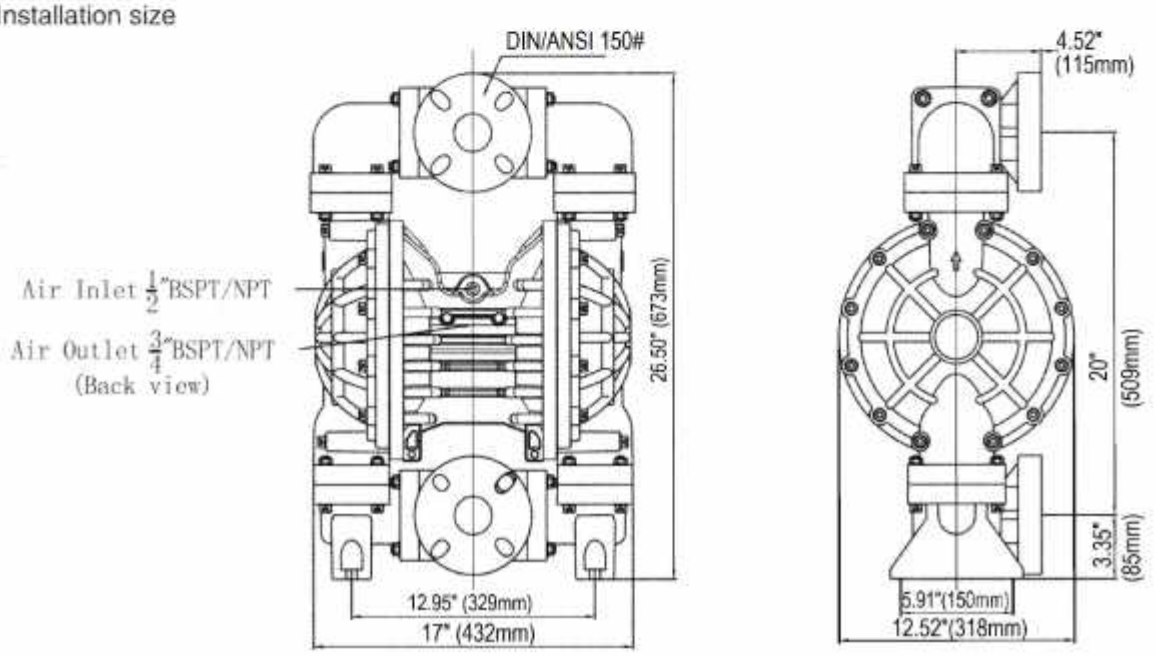
Performance curve



Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		6
Suction and discharge size[in]		2
Air inlet size[in]		1/2
Max flow[l/min]		587
Max head[m]		84
Max air inlet presure[bar]		8.4

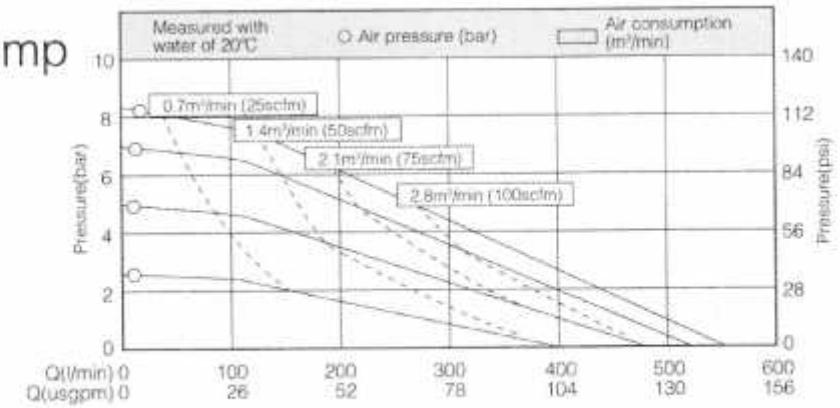
Material quality
Pumpbody：PP, PVDF
Diaphragm：Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Teflon, Stainless steel, Santoprene, Hytrel, Viton, Ceramic
Valve seat: Teflon, Santoprene, Hytrel, Viton, PP
Center block: PP, Aluminum, Stainless steel
Weight
PP pump: 25 Kgs
PVDF pump: 34 Kgs

Installation size



BD50
Stainless steel pump

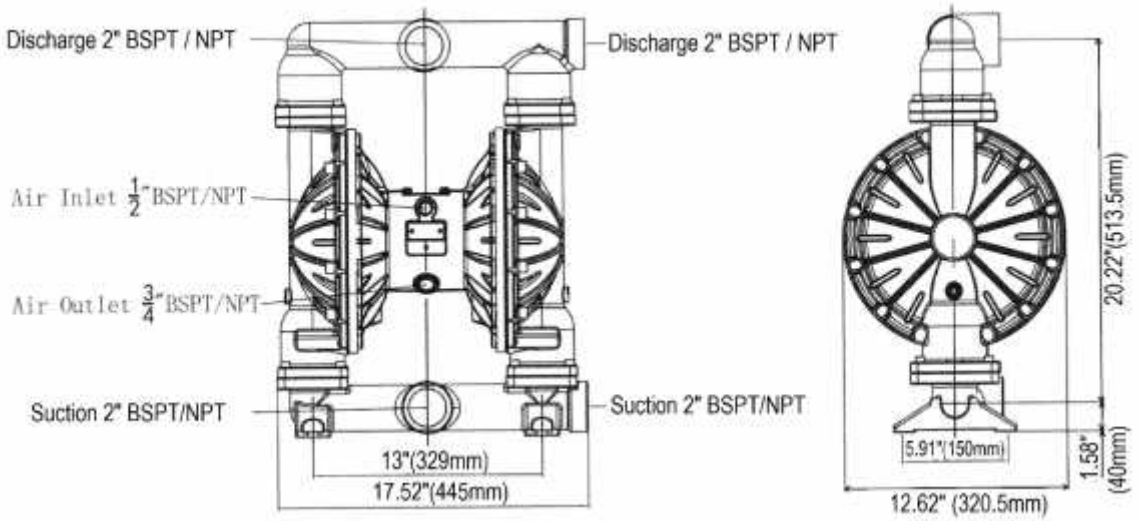
Performance curve



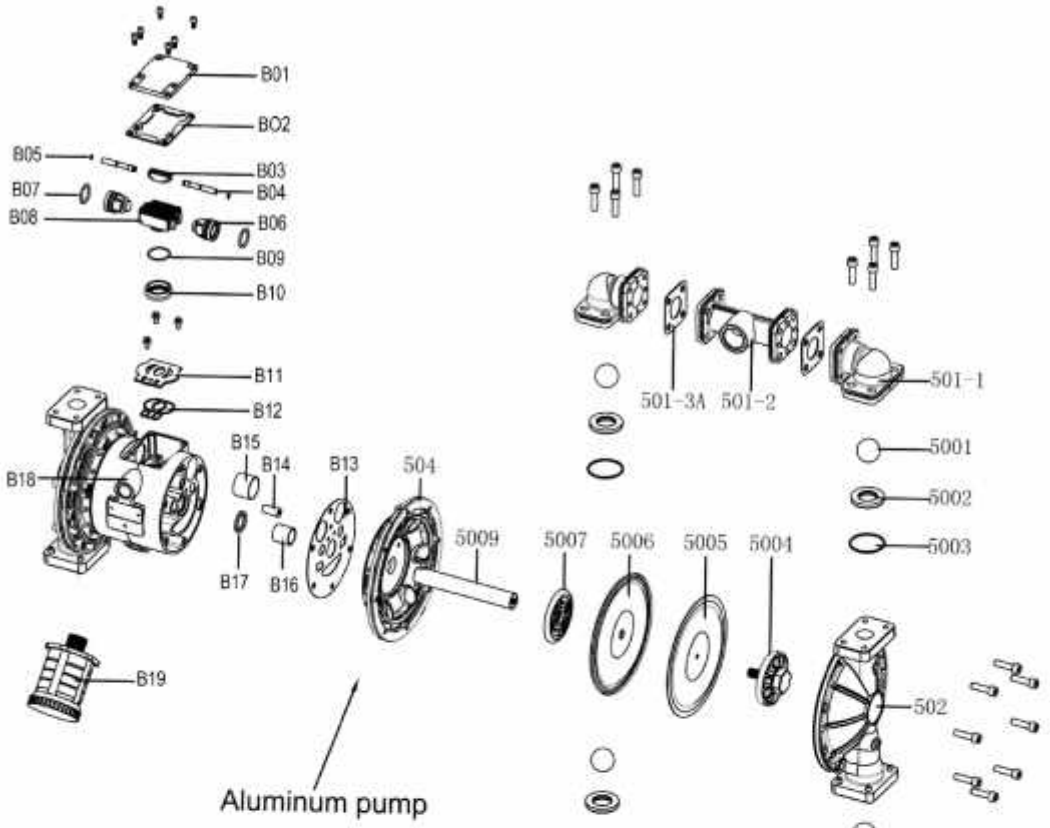
Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		6
Suction and discharge size[in]		2
Air inlet size[in]		1/2
Max flow[l/min]		587
Max head[m]		84
Max air inlet presure[bar]		8.4

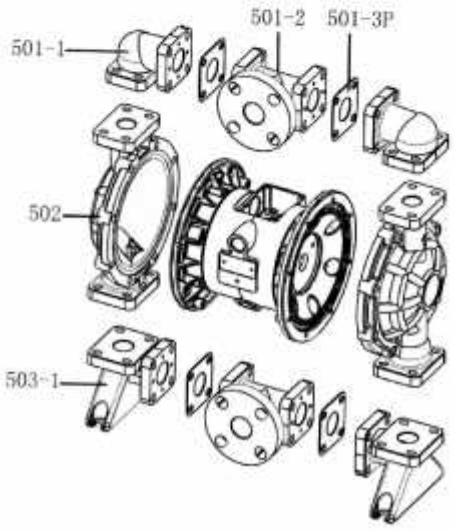
Material quality
Pumpbody：SS304, SS316, SS316L
Diaphragm：Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Santoprene, Hytrel, Teflon, Viton, Stainless steel, Ceramic
Valve seat: Santoprene, Hytrel, Teflon, Viton, Stainless steel
Center block: PP, Aluminum, Stainless steel
Weight
SS304 Pump: 48 Kgs
SS316 pump: 48 Kgs

Installation size

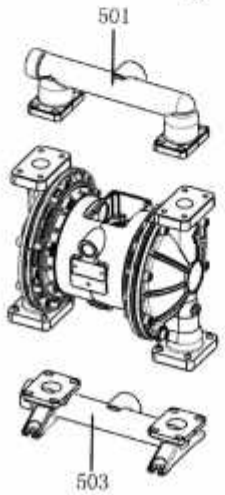


EXPLODED VIEW (AL CENTER BLOCK)





Plastic pump



Stainless steel pump

Air end parts

Part code	Name	Qty
B01-AL	Air valve cap	1
B02-BN	Air valve cap gasket	1
B03-PM	Reversing switch	1
B03-CM		
B04-SS	Reversing pin	2
B05-VT	Reversing pin O-ring	2
B06-PM	Piston	2
B07-VT	Piston V-ring	2
B08-AL	Upper pilot valve	1
B09-VT	Pilot valve O-ring	1
B10-PM	Bottom Pilot valve	1
B10-CM		

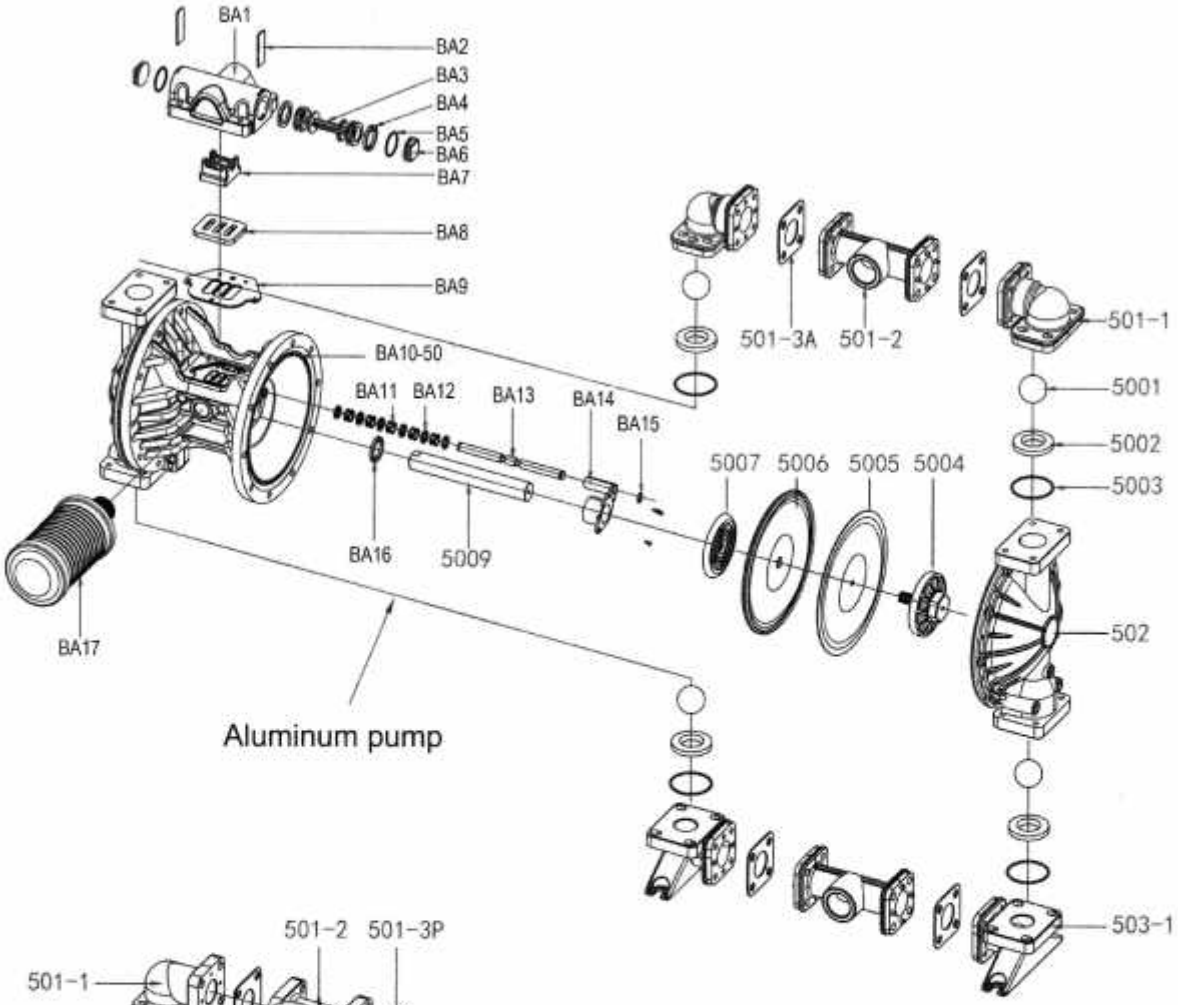
Part code	Name	Qty
B11-CM	Valve plate	1
B11-SS		
B12-VT	Valve plate gasket	1
B13-BN	Air chamber gasket	2
B13-TF		
B14-PM	Resersing pin bushing	2
B15-PM	Piston bushing	2
B16-PM	Rod bushing	2
B17-VT	Rod V-ring	2
B18-AL	Air valve body	1
B19-PP	Muffler	1

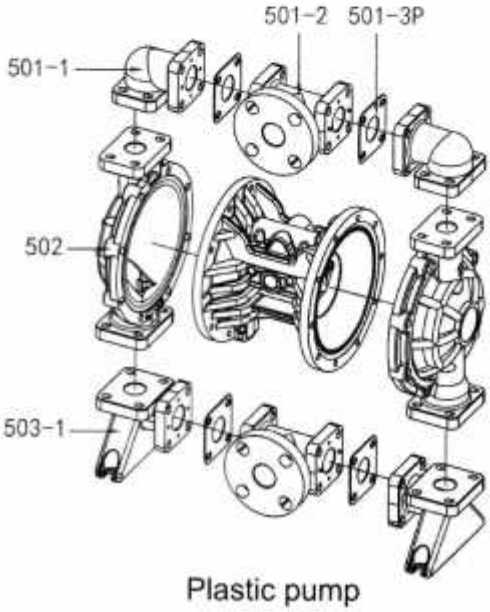
Wet end parts

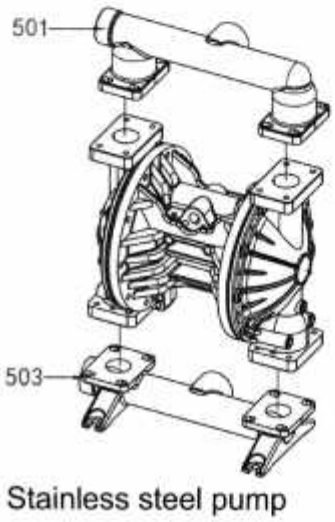
Part code	Name	Qty
501-SS	Discharge Manifold	1
501-LL		
501-1-PP	Upper Elbow	2
501-1-AL		
501-1-KV		
501-2-PP	TEE	2
501-2-AL		
501-2-KV		
501-3P-HY	TEE Gasket (Plastic pump)	4
501-3P-ST		
501-3P-TF		
501-3A-HY	TEE Gasket (AL pump)	4
501-3A-ST		
501-3A-TF		
503-SS	Suction Manifold	1
503-LL		
503-1-PP	Bottom Elbow	2
503-1-AL		
503-1-KV		
502-KV	Fluid chamber	2
502-PP		
502-AL		
502-SS		
502-LL		
504-AL	Air chamber	2
5001-TF	Valve ball	4
5001-ST		
2501-HY		
5001-BN		
5001-EP		
5001-GE		
5001-VT		
5001-PC		
5001-SS		
5001-LL		
5001-CM		

Part code	Name	Qty
5002-PP	Valve seat	4
5002-AL		
5002-TF		
5002-ST		
5002-HY		
5002-BN		
5002-EP		
5002-GE		
5002-VT		
5002-PC		
5002-SS		
5002-LL		
5003-TF	Seat O-ring	4
5003-BN		
5003-EP		
5003-VT		
5004-KV	Plate	2
5004-PP		
5004-AL		
5004-SS		
5004-LL		
5005-TF	Teflon diaphragm	2
5006-ST	Rubber diaphragm	2
5006-HY		
5006-BN		
5006-EP		
5006-GE		
5006-VT		
5006-PU		
5007-AL	Inner plate	2
5009-SS	Diaphragm Rod	1

EXPLODED VIEW (PP CENTER BLOCK)





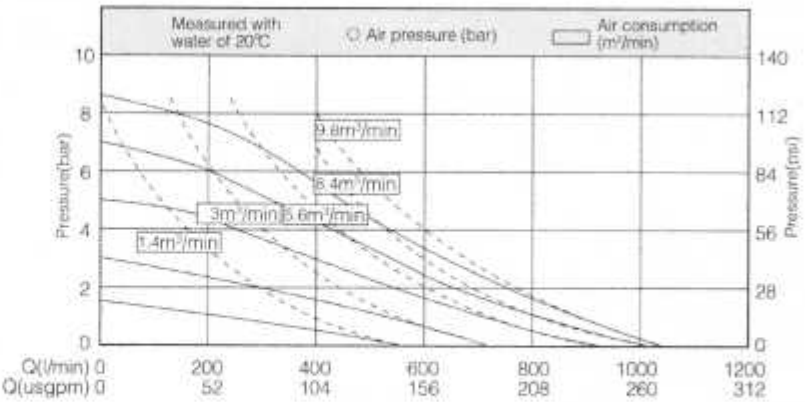


Air end parts						
Part code	Name	Qty		Part code	Name	Qty
BA1-KV	Air valve housing	1		BA10-50-PP	Center block	1
BA2-SS	Plug locking plate	2		BA11-PM	Reversing valve	5
BA3-PM	Piston	1		BA12-VT	Reversing shaft O-ring	6
BA4-VT	Piston V-ring	2		BA13-SS	Reversing shaft	1
BA5-VT	Plug O-ring	2		BA14-PP	Locking plate	2
BA6-KV	Plug	2		BA15-SS	Snap ring	2
BA7-PM	Pilot valve	1		BA16-VT	Rod V-ring	2
BA8-CM	Valve plate	1		BA17-PP	Muffler	1
BA9-ST	Air valve gasket	1				

Wet end parts						
Part code	Name	Qty		Part code	Name	Qty
501-SS	Discharge Manifold	1		5002-PP	Valve seat	4
501-LL				5002-AL		
501-1-PP	Upper Elbow	2		5002-TF		
501-1-AL				5002-ST		
501-1-KV				5002-HY		
501-2-PP	TEE	2		5002-BN		
501-2-AL				5002-EP		
501-2-KV				5002-GE		
501-3P-HY	TEE Gasket (Plastic pump)	4		5002-VT		
501-3P-ST				5002-PC		
501-3P-TF				5002-SS		
501-3A-HY	TEE Gasket (AL pump)	4		5002-LL		
501-3A-ST				5003-TF	Seat O-ring	4
501-3A-TF				5003-BN		
503-SS	Suction Manifold	1		5003-EP		
503-LL				5003-VT		
503-1-PP	Bottom Elbow	2		5004-KV	Plate	2
503-1-AL				5004-PP		
503-1-KV				5004-AL		
502-KV	Fluid chamber	2		5004-SS		
502-PP				5004-LL		
502-AL				5005-TF	Teflon diaphragm	2
502-SS				5006-ST	Rubber diaphragm	2
502-LL				5006-HY		
5001-TF				5006-BN		
5001-ST	Valve ball	4		5006-EP		
2501-HY				5006-GE		
5001-BN				5006-VT		
5001-EP				5006-PU		
5001-GE				5007-AL	Inner plate	2
5001-VT				5009-SS	Diaphragm Rod	1
5001-PC						
5001-SS						
5001-LL						
5001-CM						

BD80
Aluminum pump

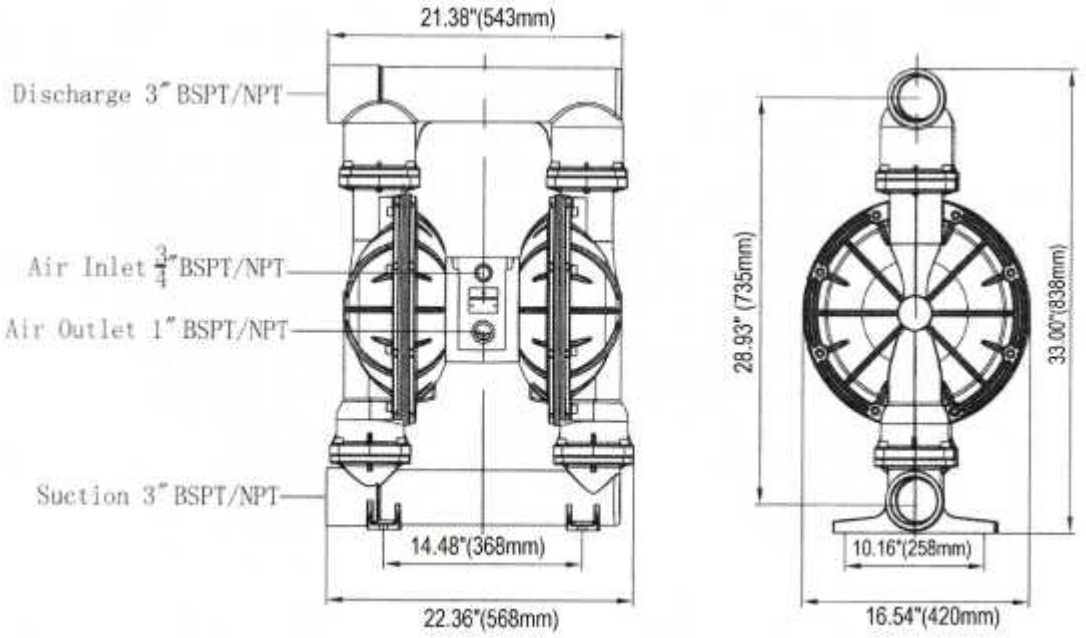
Performance curve



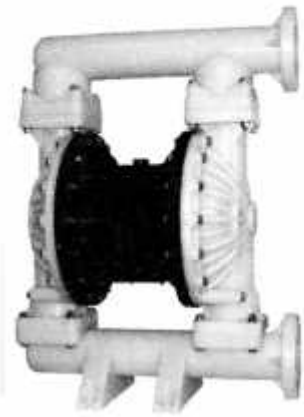
Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		9.4
Suction and discharge size[in]		3
Air inlet size[in]		3/4
Max flow[l/min]		1060
Max head[m]		84
Max air inlet presure[bar]		8.4

Material quality
Pumpbody: Aluminum
Diaphragm: Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Santoprene, Hytrel, Teflon, Viton, Stainless steel, Ceramic
Valve seat: Santoprene, Hytrel, Teflon, Viton, Stainless steel
Center block: PP, Aluminum, Stainless steel
Weight
Aluminum pump: 50 Kgs

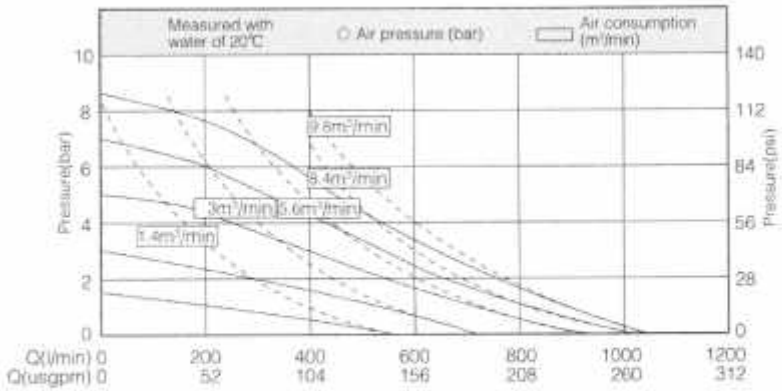
Installation size



BD80
Plastic pump



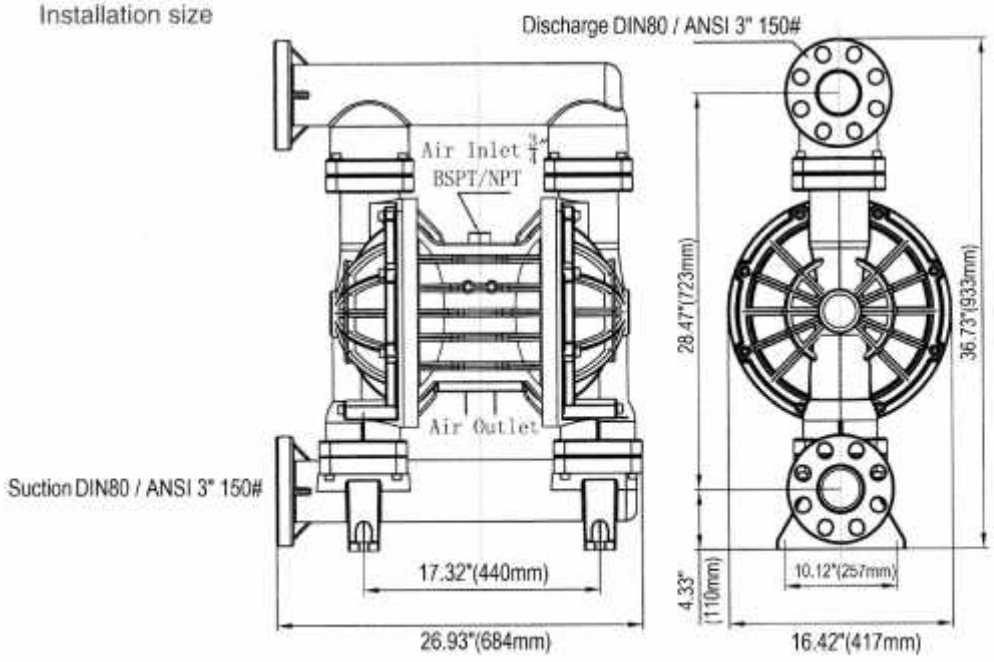
Performance curve



Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		9.4
Suction and discharge size[in]		3
Air inlet size[in]		3/4
Max flow[l/min]		1060
Max head[m]		84
Max air inlet presure[bar]		8.4

Material quality
Pumpbody：PP, PVDF
Diaphragm：Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Teflon, Stainless steel, Santoprene, Hytrel, Viton, Ceramic
Valve seat: Teflon, Santoprene, Hytrel, Viton, PP
Center block: PP, Aluminum, Stainless steel
Weight
PP pump: 50 Kgs
PVDF pump: 90 Kgs

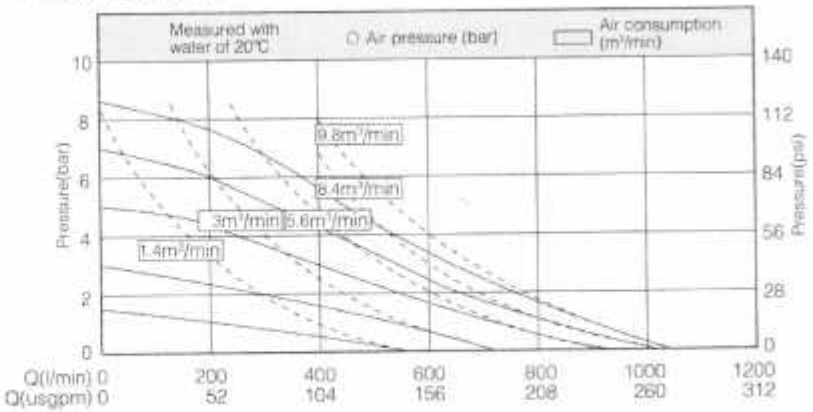
Installation size



BD80

Stainles steel pump

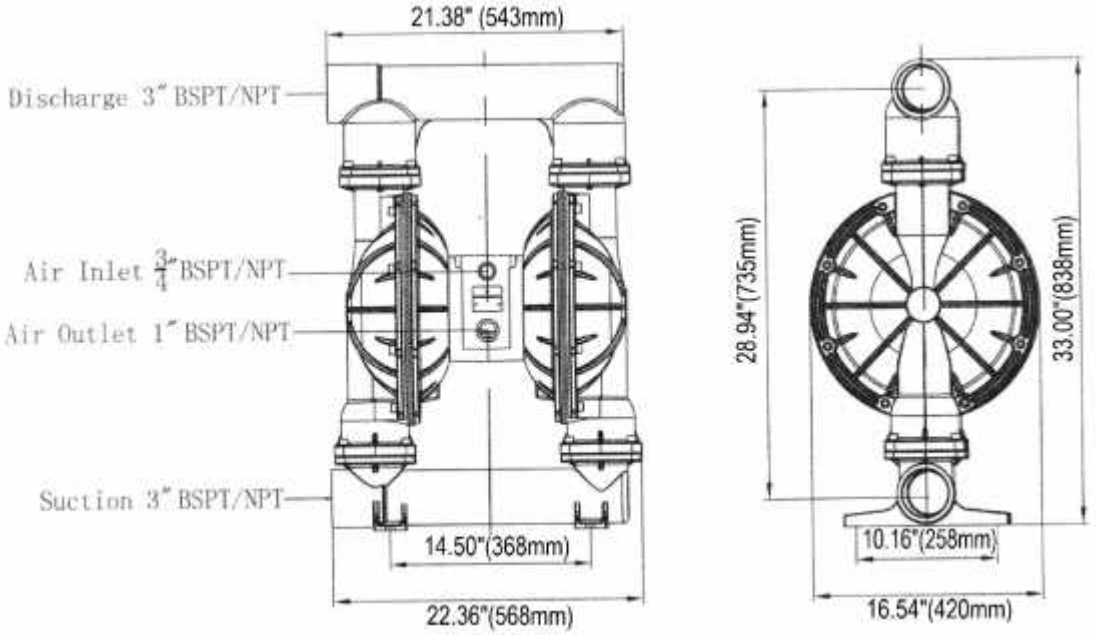
Performance curve



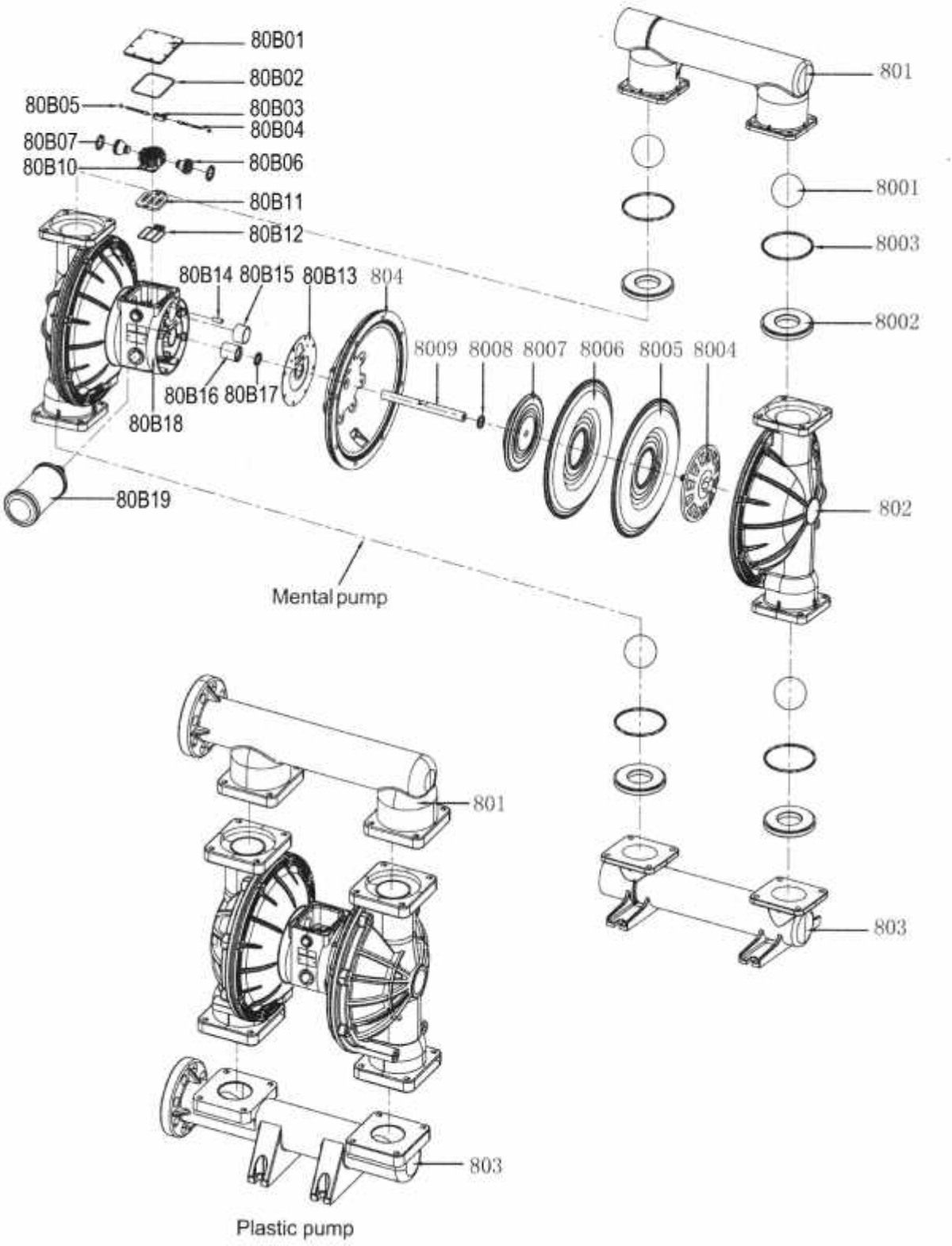
Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		9.4
Suction and discharge size[in]		3
Air inlet size[in]		3/4
Max flow[l/min]		1060
Max head[m]		84
Max air inlet presure[bar]		8.4

Material quality
Pumpbody: PP, PVDF
Diaphragm: Santoprene, Hytrel, Teflon, Viton, EPDM, Buna-N
Valve ball: Teflon, Stainless steel, Santoprene, Hytrel, Viton, Ceramic
Valve seat: Teflon, Santoprene, Hytrel, Viton, PP
Center block: PP, Aluminum, Stainless steel
Weight
PP pump: 50 Kgs
PVDF pump: 90 Kgs

Installation size



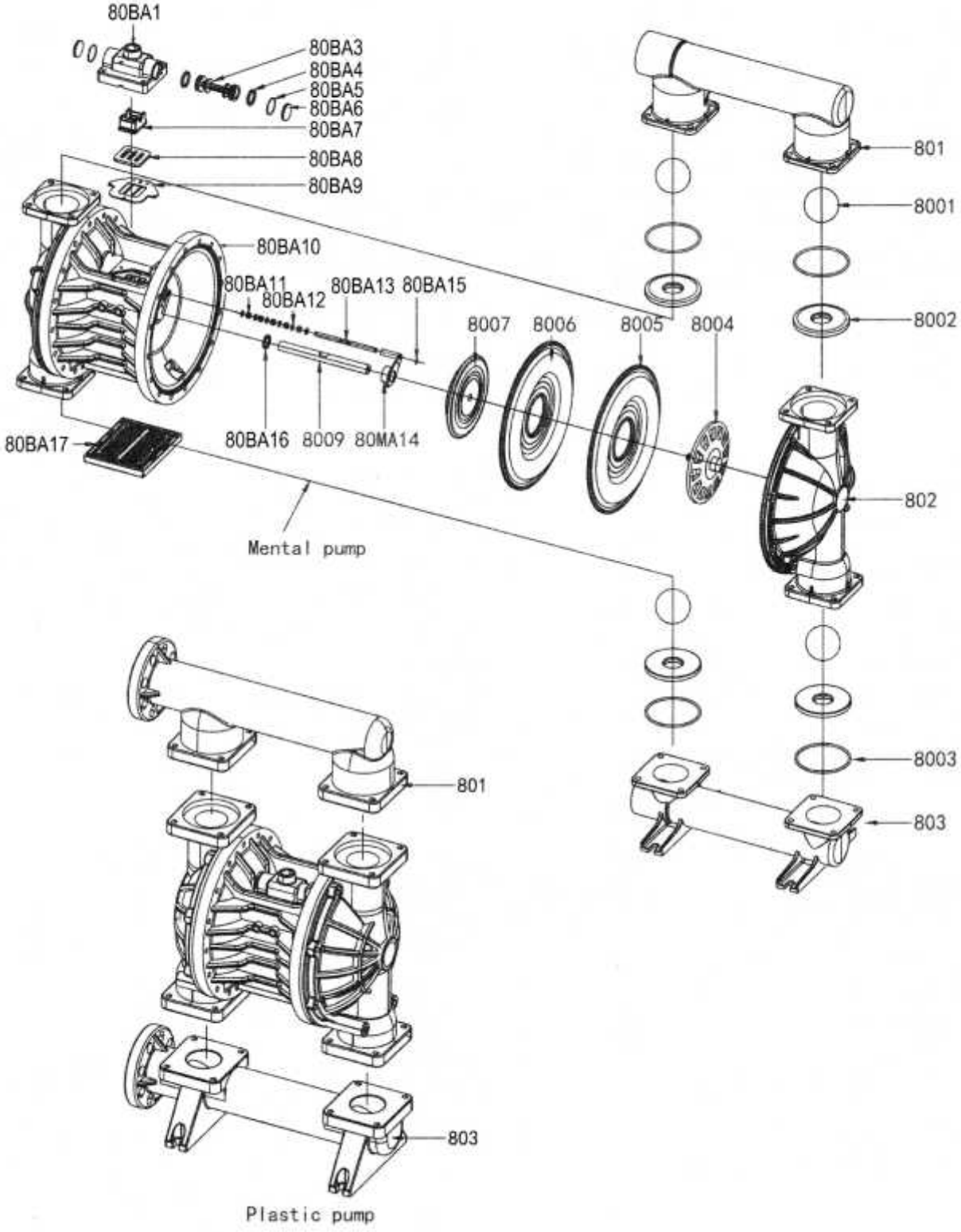
EXPLODED VIEW (AL CENTER BLOCK)



Air end parts						
Part code	Name	Qty		Part code	Name	Qty
80B01-AL	Air valve cap	1		80B12-VT	Valve plate gasket	1
80B02-BN	Air valve cap gasket	1		80B13-BN	Air chamber gasket	2
80B03-PM	Reversing switch	1		80B13-TF		
80B04-SS	Reversing pin	2		80B14-PM	Resersing pin bushing	2
80B05-VT	Reversing pin O-ring	2		80B15-PM	Piston bushing	2
80B06-PM	Piston	2		80B16-PM	Rod bushing	2
80B07-VT	Piston V-ring	2		80B17-VT	Rod V-ring	2
80B10-PM	Pilot valve	1		80B18-AL	Air valve body	1
80B11-SS	Valve plate	1		80B19-PP	Muffler	1

Wet end parts						
Part code	Name	Qty		Part code	Name	Qty
801-SS	Discharge Manifold	1		8002-ST	Valve seat	4
801-LL				8002-HY		
801-AL				8002-BN		
801-PP				8002-EP		
801-KV				8002-GE		
802-SS	Fluid chamber	2		8002-VT		
802-LL				8002-PC		
802-AL				8002-SS		
802-PP				8002-LL		
802-KV				8003-TF	Seat O-ring	4
803-SS	Suction Manifold	1		8003-BN		
803-LL				8003-EP		
803-AL				8003-VT		
803-PP				8004-KV	Plate	2
803-KV				8004-PP		
804-AL	Air chamber	2		8004-AL		
8001-TF	Valve ball	4		8004-SS		
8001-ST				8004-LL		
8001-HY				8005-TF	Teflon diaphragm	2
8001-BN				8006-ST	Rubber diaphragm	2
8001-EP				8006-HY		
8001-GE				8006-BN		
8001-VT				8006-EP		
8001-PC				8006-GE		
8001-SS				8006-VT		
8001-LL				8006-PU		
8002-PP	Valve seat	4		8007-AL	Inner plate	2
8002-AL				8009-SS	Diaphragm Rod	1
8002-TF						

EXPLODED VIEW (PP CENTER BLOCK)



Air end parts

Part code	Name	Qty	Part code	Name	Qty
80BA1-KV	Air valve housing	1	80BA10-PP	Center block	1
80BA3-PM	Piston	1	80BA11-PM	Reversing valve	5
80BA4-VT	Piston V-ring	2	80BA12-VT	Reversing shaft O-ring	6
80BA5-VT	Plug O-ring	2	80BA13-SS	Reversing shaft	1
80BA6-KV	Plug	2	80BA14-PP	Locking plate	2
80BA7-PM	Pilot valve	1	80BA15-SS	Snap ring	2
80BA8-SS	Valve plate	1	80BA16-VT	Rod V-ring	2
80BA9-ST	Air valve gasket	1	80BA17-PP	Muffler	1

Wet end parts

Part code	Name	Qty	Part code	Name	Qty
801-SS	Discharge manifold	1	8002-ST	Valve seat	4
801-LL			8002-HY		
801-AL			8002-BN		
801-PP			8002-EP		
801-KV			8002-GE		
802-SS	Fluid chamber	2	8002-VT		
802-LL			8002-PC		
802-AL			8002-SS		
802-PP			8002-LL		
802-KV			8003-TF	Seat O-ring	4
803-SS	Suction manifold	1	8003-BN		
803-LL			8003-EP		
803-AL			8003-VT		
803-PP			8004-KV	Plate	2
803-KV			8004-PP		
8001-TF	Valve ball	4	8004-AL		
8001-ST			8004-SS		
8001-HY			8004-LL		
8001-BN			8005-TF	Teflon diaphragm	2
8001-EP			8006-ST	Rubber diaphragm	2
8001-GE			8006-HY		
8001-VT			8006-BN		
8001-PC			8006-EP		
8001-SS			8006-GE		
8001-LL			8006-VT		
8002-PP			8006-PU		
8002-AL	Valve seat	4	8007-AL	Inner plate	2
8002-TF			8009-SS	Diaphragm rod	1