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Shangcheng Pump and Valve
Being trustworthy because of its sincerity

SHANGHAI
SHANGCHENG

PUMP AND VALVE MANUFACTURING CO.,LTD

DIAPHRAGM PUMP

Product specification



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SHANGHAI SHANGCHENG PUMP AND VALVE MANUFACTURING CO.,LTD



Shanghai Shangcheng Pump and valve manufacturing Co.,Ltd. is an enterprise of Researching, developing, producing and selling; The company has an experienced team to develop high quality products, 2 senior engineers, 35 designing engineers, 68 technicians, which totally amounts to 298; The company has the domestic advanced automatical system to perform water pump test, which can make the customer to use our products safely, effective and easily.

The ISO 9001:2000 quality control system request "always be implemented effectively; since our company is opened, the quality control is always our first pursue goal and we are growing strong in the pump and valve industry.

Our main products are pumps and matched valves, which are sold to the strongly all over of China, it can be widely applied to petroleum, chemical industry, electric power, papermaking, food, drugs manufacturing and so on, "honesty oriented, quality comes first" is our management idea, which sincerely provides the high quality brand product and the consummation service for you.



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PUMP MODEL AND MATERIAL CODE

Pump model= SC 25 AL – PP / TF / TF / PP

Brand
SC=SHANGCHENG

Pump size:
06=1/4" 10=3/8"
15=1/2" 20=3/4"
25=1" 40=1.5"
50=2" 80=3"
100=4"

Center block material:
AL=Aluminum
PP=Polypropylene
SS=Stainless steel 304

Wetted body material:
AL=Aluminum
PP=Polypropylene
PM=POM
KV=PVDF
TF=Teflon
SS=Stainless steel 304
LL=Stainless steel 316
CS=Cast steel

Valve seat material:
TF=Teflon
ST=Santoprene
HY=Hytre
EP=EPDM
BN=Buna-N
GE=Geolast
VT=Viton
PC=PVC
SS=Stainless steel 304
LL=Stainless steel 316
PP=Polypropylene

Valve ball material:
TF=Teflon
ST=Santoprene
HY=Hytre
EP=EPDM
BN=Buna-N
GE=Geolast
VT=Viton
PC=PVC
SS=Stainless steel 304
LL=Stainless steel 316
CM=Ceramic

Diaphragm material:
TF=Teflon
ST=Santoprene
HY=Hytre
EP=EPDM
BN=Buna-N
GE=Geolast
VT=Viton
PU=Polyurethane

OPERATING TEMPERATURE LIMITATION

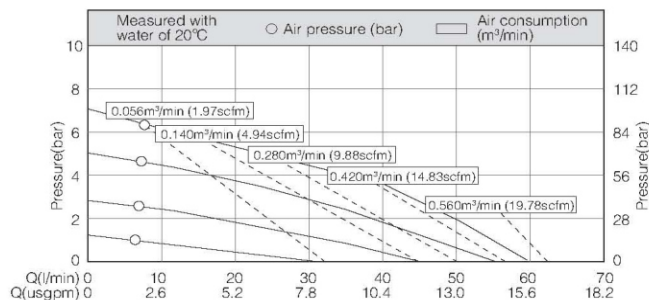
Material	Maximum	Minimum
Viton:excellent corrosion resistance, resistance to various acids (including the medianconcentration of oxidizing acid),alkali, salt, petroleum products, hydrocarbons, etc.	350 ℉ 176.6℃	-40 ℉ -40℃
PTFE(Teflon): excellen corrosion resistance, almost resistant to all chemical media (including concentrated nitric acid and aqua regia). Except melting of lithium, potassium,sodium, chlorine trifluoride, high-temperature oxygen trifluoride, sulfur-speed liquid fluorine.	350 ℉ 176.6℃	40 ℉ 4.4℃
Santoprene: good abrasion resistance, chemical resistance and heat resistance, suitable for general acid and alkali, not suitable solvent. Can replace the EPDM/EPR material.	220 ℉ 104.4℃	-20 ℉ -28.9℃
Hytre:good abrasion resistance, used in most of the neutral fluid. Can replace Bune-N materials.	220 ℉ 104.4℃	-20 ℉ -28.9℃
EPDM:abrasion resistance, aging resistance, ozone resistance , suitable for general acid and alkali.	250 ℉ 121.6℃	-40 ℉ 40℃
Buna-N: widely used in gasoline and other oil products. Suitable for use at room temperature.	212 ℉ 100℃	-40 ℉ 40℃
GE: better abrasion resistance than Hytre, the same chemical resistance as Buna-N.	220 ℉ 104.4℃	-20 ℉ -28.9℃
PP: Medium abrasion resistance, good chemical resistance, good versatility, especially for common acid-base.	150 ℉ 65.5℃	40 ℉ 4.4℃
POM: good solvent resistance, abrasion resistance. Low friction, low moisture absorption.	150 ℉ 65.5℃	40 ℉ 4.4℃
PVDF: strong chemical resistance, crush resistance, abrasion resistance. good corrosion resistance for acid,alkali and variety of organic solvents.	200 ℉ 93.3℃	40 ℉ 4.4℃

QBX15/20

Plastic pump



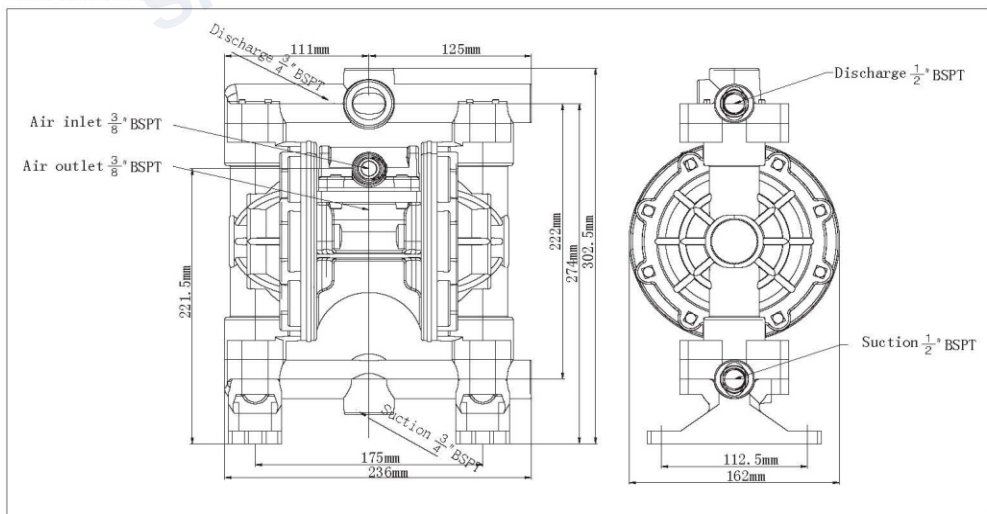
Performance curve



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 pressure[bar]	8.4	

Wetted body material	
PP, POM, PVDF	
Different materials, the performance will be slightly different	

Installation size

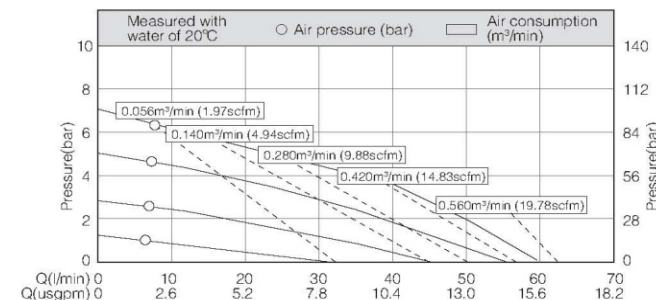


QBX15/20

Metal pump



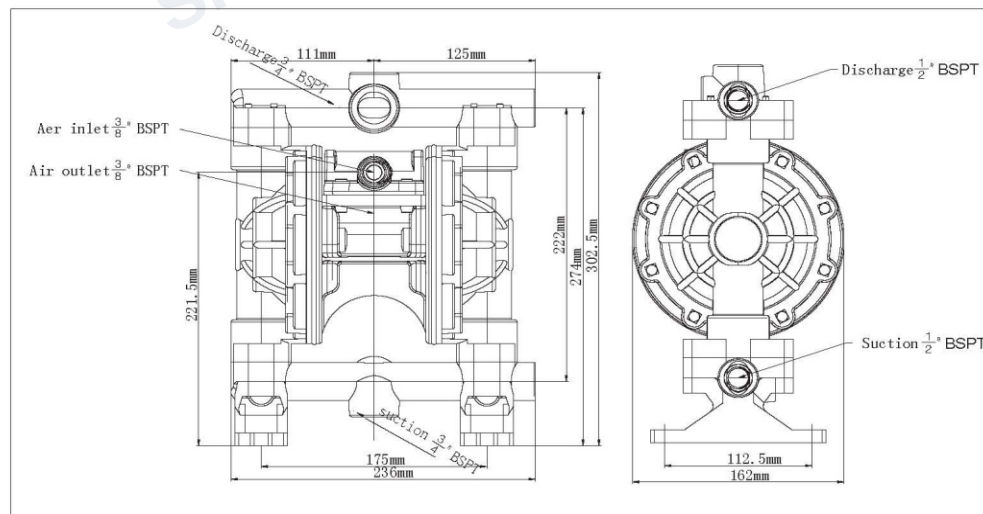
Performance curve

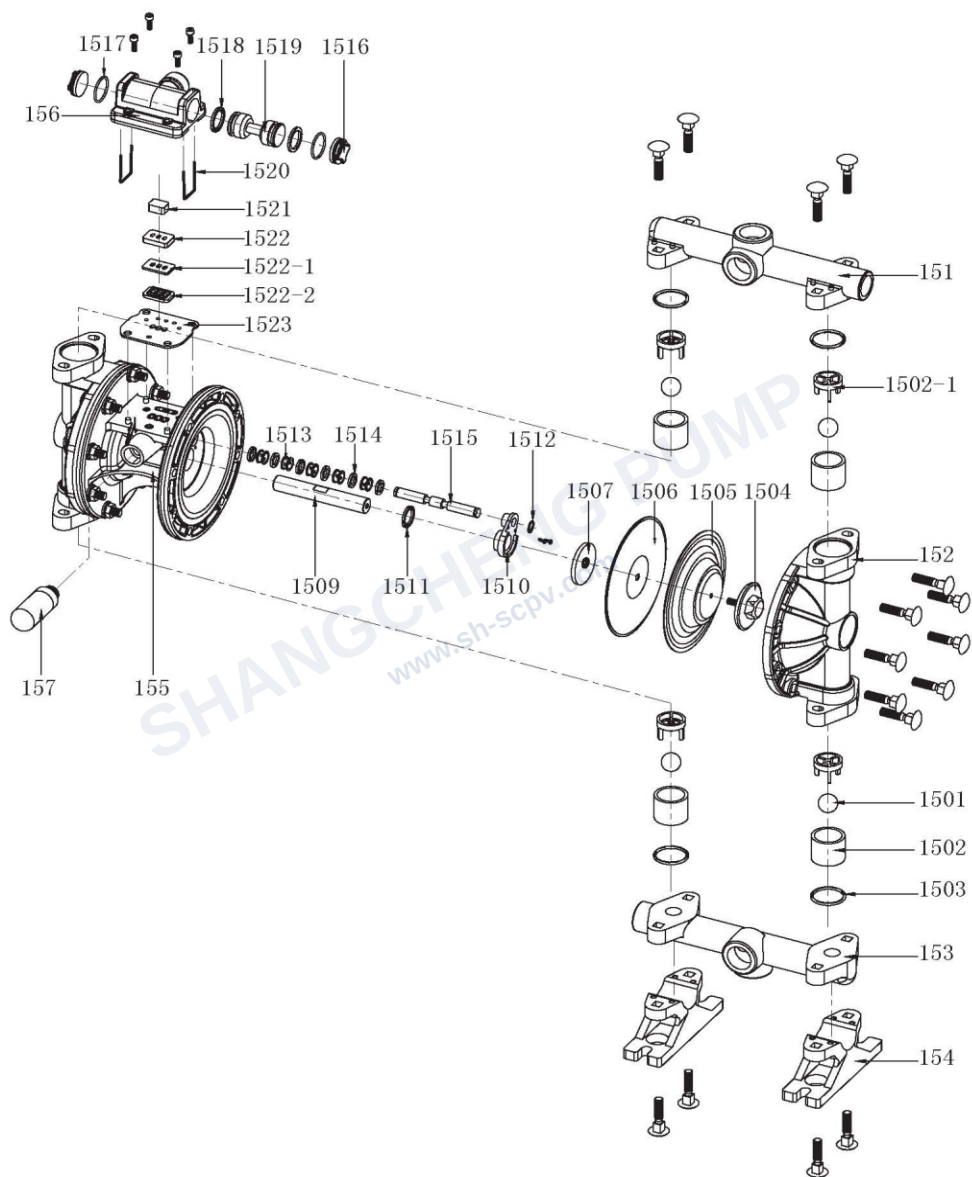


Technical parameters		
Suction lift[mwc]	dry	4
	wet	7.6
Max particle diameter[mm]	2.5	
Suction and discharge size[in]	1/2	3/4
Air inlet size[in]	3/8	
Max flow[l/min]	57	
Max head[m]	84	
Max air inlet pressure[bar]	8.4	

Wetted body material	
AL, SS, LL, CS	
Different materials, the performance will be slightly different	

Installation size





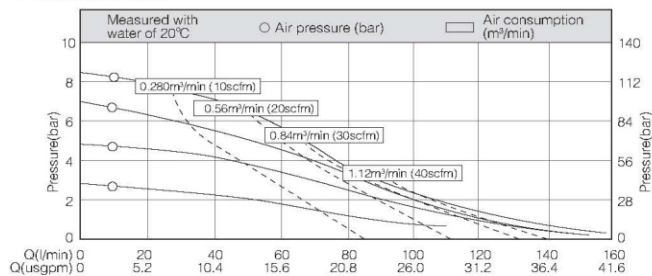
Air end parts					
Part code	Name	Qty	Part code	Name	Qty
155-PP	Air valve body	1	1516-PC	Piston locking plate	2
156-PP	Air valve housing	1	1517-VT	Locking plate O-ring	2
157-PE	Muffler	1	1518-VT	Piston V-ring	2
1509-SS	Rod	1	1519-PP	Piston	1
1510-PP	Rod locking plate	2	1520-SS	Piston locking pin	2
1511-VT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

Wet end parts					
Part code	Name	Qty	Part code	Name	Qty
151-PP	Upper 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	Bottom 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	Footing	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					

QBX25 Metal pump

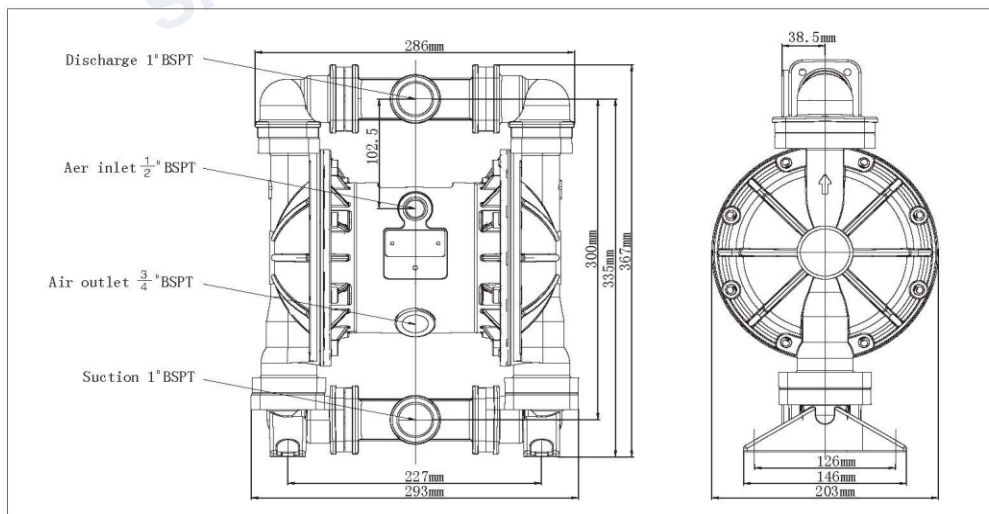


Performance curve

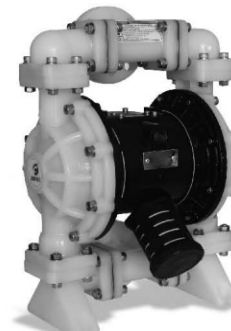


Technical parameters		Wetted body material
Suction lift[mwc]	dry 4 wet 8	AL, SS, LL, CS
Max particle diameter[mm]	4	Different materials, the performance will be slightly different
Suction and discharge size[in]	1	
Air inlet size[in]	1/2	
Max flow[l/min]	157	
Max head[m]	84	
Max air inlet pressure[bar]	8.4	

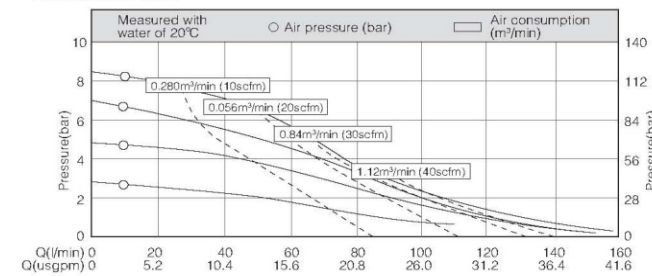
Installation size



QBX25 Plastic pump

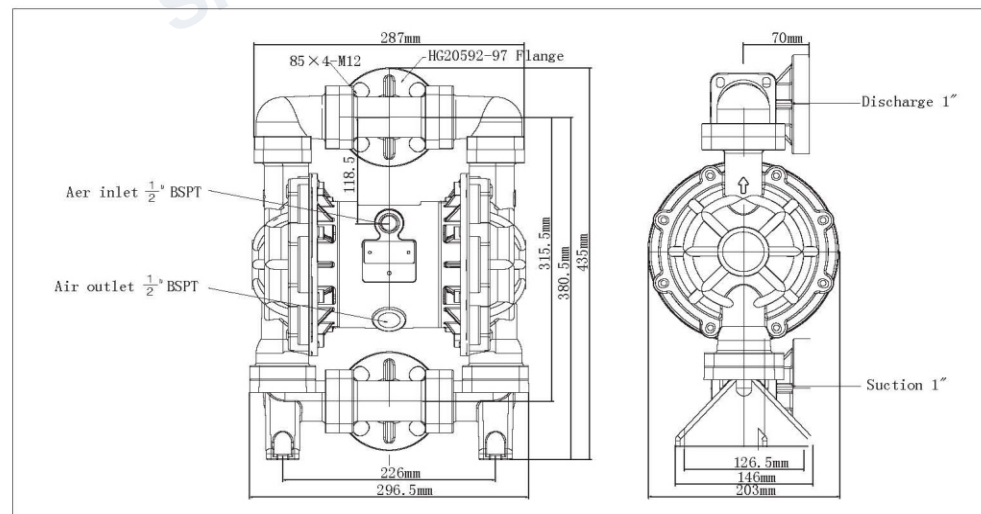


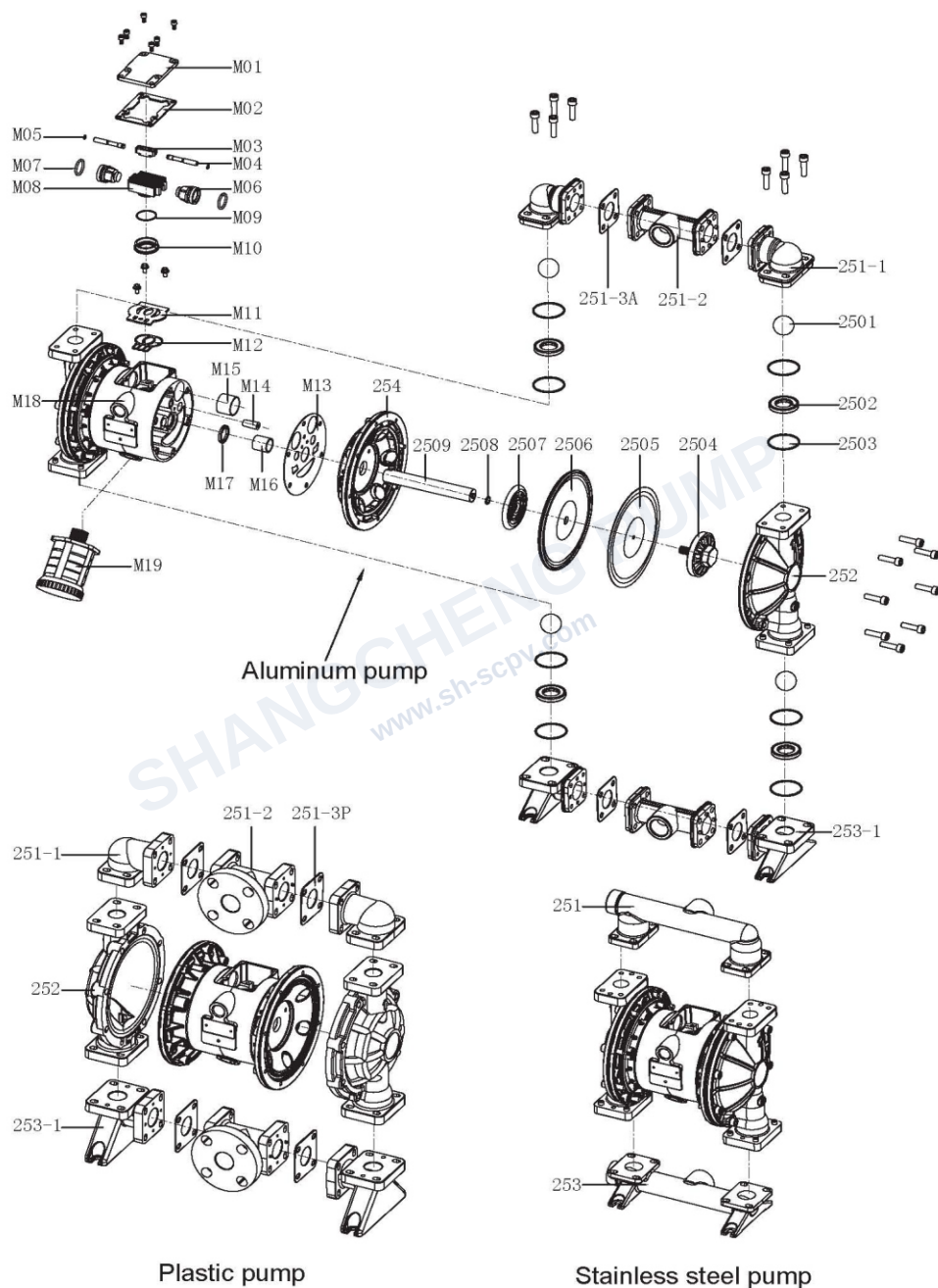
Performance curve



Technical parameters		Wetted body material
Suction lift[mwc]	dry 4 wet 8	PP, POM, PVDF
Max particle diameter[mm]	4	Different materials, the performance will be slightly different
Suction and discharge size[in]	1	
Air inlet size[in]	1/2	
Max flow[l/min]	157	
Max head[m]	84	
Max air inlet pressure[bar]	8.4	

Installation size



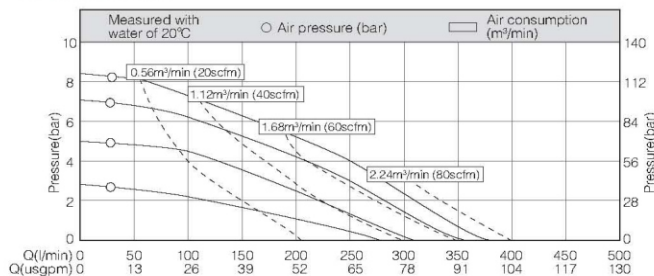


Air end parts					
Part code	Name	Qty	Part code	Name	Qty
M01-AL	Air valve cap	1	M11-CM	Valve plate	1
M02-BN	Air valve cap gasket	1	M11-SS	Valve plate gasket	1
M03-PM	Reversing switch	1	M12-VT	Valve plate gasket	1
M03-CM	Reversing pin	2	M13-BN	Air chamber gasket	2
M04-SS	Reversing pin O-ring	2	M13-TF	Resersing pin bushing	2
M05-VT	Piston	2	M14-PM	Piston bushing	2
M06-PM	Piston V-ring	2	M15-PM	Rod bushing	2
M07-VT	Upper pilot valve	1	M16-PM	Rod V-ring	2
M08-AL	Pilot valve O-ring	1	M17-VT	Air valve body	1
M09-VT	Bottom Pilot valve	1	M18-AL	Muffler	1
M10-PM					
M10-CM					
Wet end parts					
Part code	Name	Qty	Part code	Name	Qty
251-SS	Discharge Manifold	1	2502-PP	Valve seat	4
251-LL	Upper Elbow	2	2502-AL		
251-1-PP			2502-TF		
251-1-AL			2502-ST		
251-1-KV			2502-HY		
251-2-PP	TE	2	2502-BN		
251-2-AL			2502-EP	Seat O-ring	4
251-2-KV	TE Gasket (Plastic pump)	4	2502-GE		
251-3P-HY			2502-VT		
251-3P-ST			2502-PC		
251-3P-TF	TE Gasket (AL pump)	4	2502-SS	Plate	2
251-3A-HY			2502-LL		
251-3A-ST	Suction Manifold	1	2503-TF		
251-3A-TF			2503-BN	Rubber diaphragm	2
253-SS	Bottom Elbow	2	2503-EP		
253-LL			2503-VT		
253-1-PP	Fluid chamber	2	2504-KV		
253-1-AL			2504-PP	Inner plate	2
253-1-KV	Air chamber	2	2504-AL		
252-KV			2504-SS		
252-PP	Valve ball	4	2504-LL		
252-AL			2505-TF	Bumper	2
252-SS			2506-ST	Diaphragm Rod	1
252-LL			2506-HY		
254-AL			2506-BN		
2501-TF			2506-EP		
2501-ST			2506-GE		
2501-HY			2506-VT		
2501-BN			2506-PU		
2501-EP					
2501-GE					
2501-VT					
2501-PC					
2501-SS					
2501-LL					
2501-CM					

QBX40 Metal pump



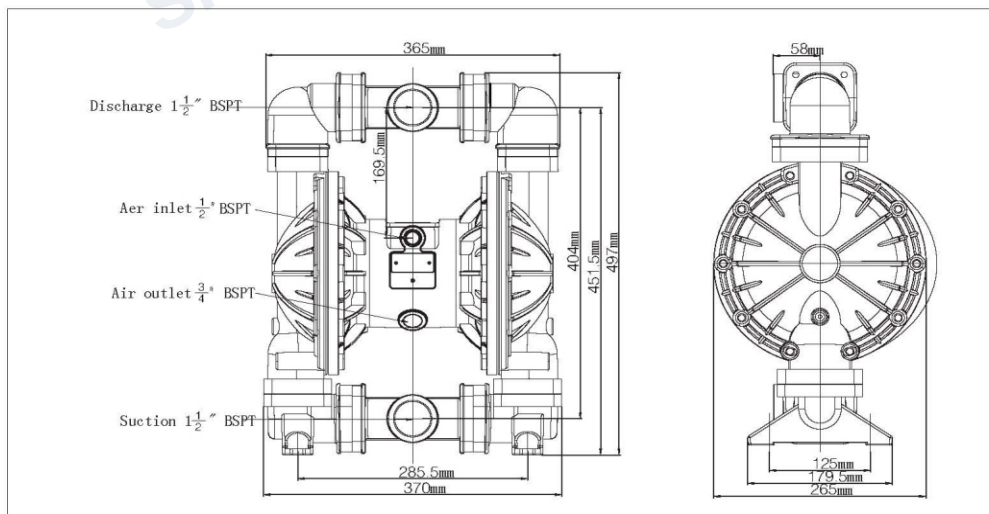
Performance curve



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 pressure[bar]		8.4

Wetted body material	
AL, SS, LL, CS	
Different materials, the performance will be slightly different	

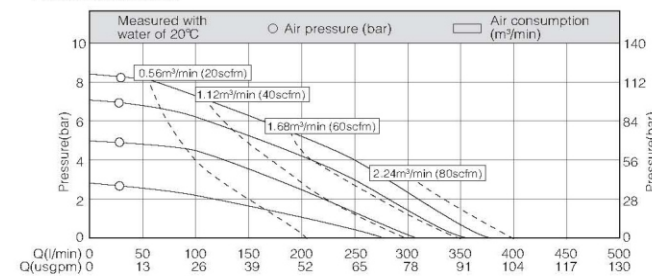
Installation size



QBX40 Plastic pump



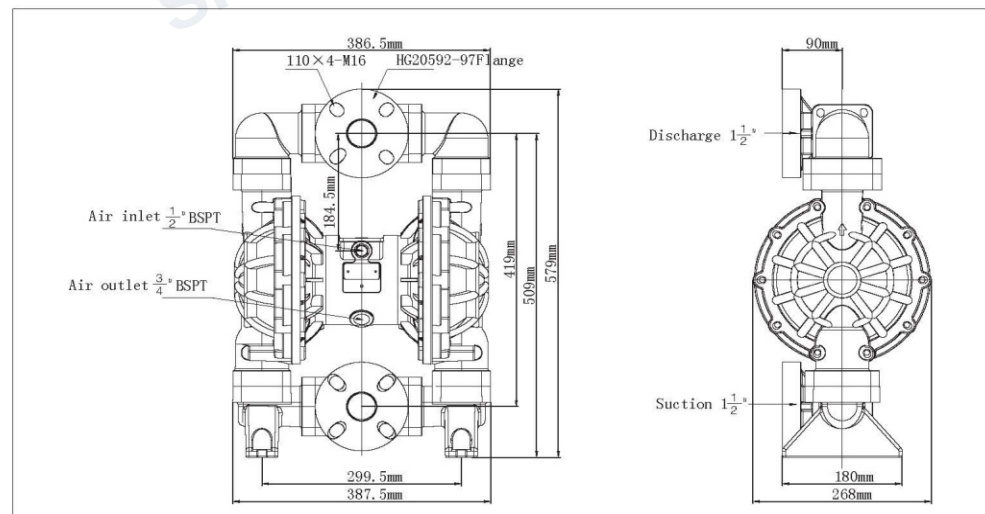
Performance curve

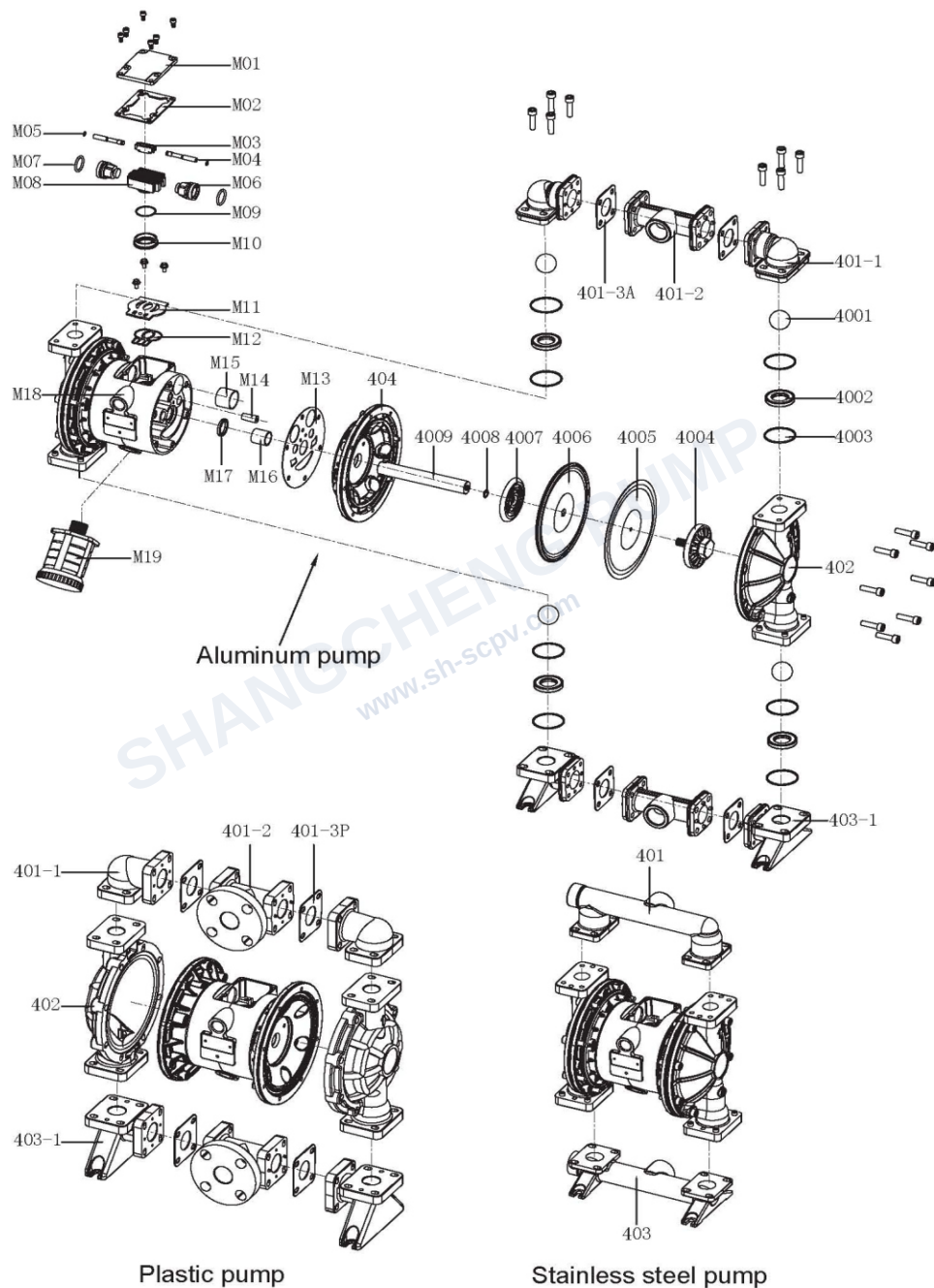


Technical parameters		
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		5
Suction and discharge size[in]		1 1/2
Air inlet size[in]		1/2
Max flow[l/min]		358
Max head[m]		84
Max air inlet pressure[bar]		8.4

Wetted body material	
PP, POM, PVDF	
Different materials, the performance will be slightly different	

Installation size



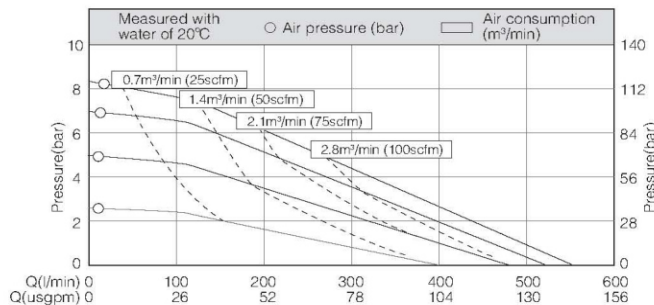


Air end parts					
Part code	Name	Qty	Part code	Name	Qty
M01-AL	Air valve cap	1	M11-CM	Valve plate	1
M02-BN	Air valve cap gasket	1	M11-SS	Valve plate gasket	1
M03-PM	Reversing switch	1	M12-VT	Air chamber gasket	2
M03-CM	Reversing pin	2	M13-BN	Resersing pin bushing	2
M04-SS	Reversing pin O-ring	2	M14-PM	Piston bushing	2
M05-VT	Piston	2	M15-PM	Rod bushing	2
M06-PM	Piston V-ring	2	M16-PM	Rod V-ring	2
M07-VT	Upper pilot valve	1	M17-VT	Air valve body	1
M08-AL	Pilot valve O-ring	1	M18-AL	Muffler	1
M09-VT	Bottom Pilot valve	1	M19-PP		
M10-PM					
M10-CM					
Wet end parts					
Part code	Name	Qty	Part code	Name	Qty
401-SS	Discharge Manifold	1	4002-PP	Valve seat	4
401-LL	Upper Elbow	2	4002-AL		
401-1-PP	TE	2	4002-TF		
401-1-AL	TE Gasket (Plastic pump)	4	4002-ST		
401-1-KV	TE Gasket (AL pump)	4	4002-HY		
401-2-PP	Suction Manifold	1	4002-BN		
401-2-AL	Bottom Elbow	2	4002-EP		
401-2-KV	Fluid chamber	2	4002-GE		
401-3P-HY	Air chamber	2	4002-VT		
401-3P-ST	Valve ball	4	4002-PC		
401-3P-TF			4002-SS		
401-3A-HY			4002-LL		
401-3A-ST			4003-TF		
401-3A-TF			4003-BN		
403-SS			4003-EP		
403-LL			4003-VT		
403-1-PP			4004-KV		
403-1-AL			4004-PP		
402-KV			4004-AL		
402-PP			4004-SS		
402-AL			4004-LL		
402-SS			4005-TF		
402-LL			4006-ST		
404-AL			4006-HY		
4001-TF			4006-BN		
4001-ST			4006-EP		
4001-HY			4006-GE		
4001-BN			4006-VT		
4001-EP			4006-PU		
4001-GE			4007-AL		
4001-VT			4008-TF		
4001-PC			4009-SS		
4001-SS					
4001-LL					
4001-CM					

QBX50 Metal pump



Performance curve



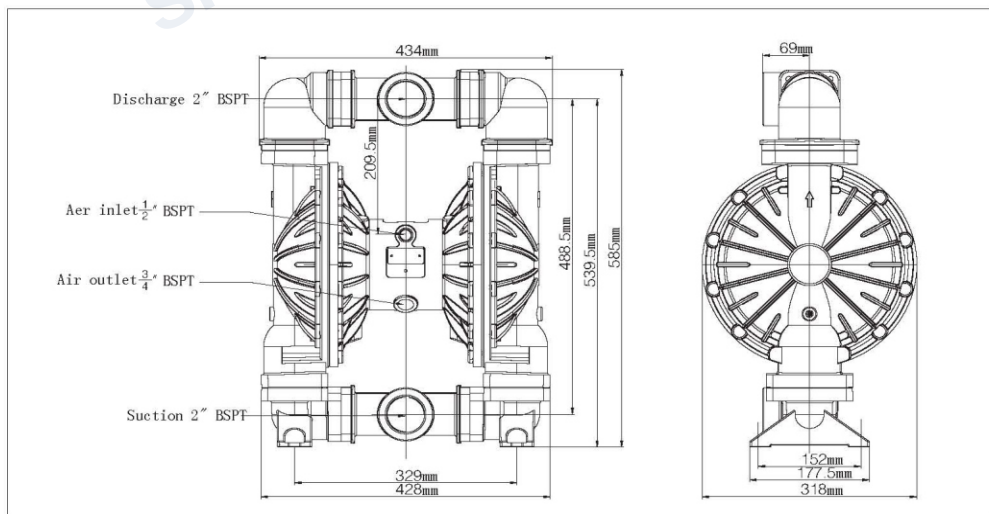
Technical parameters

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 pressure[bar]		8.4

Wetted body material

AL, SS, LL, CS
Different materials, the performance will be slightly different

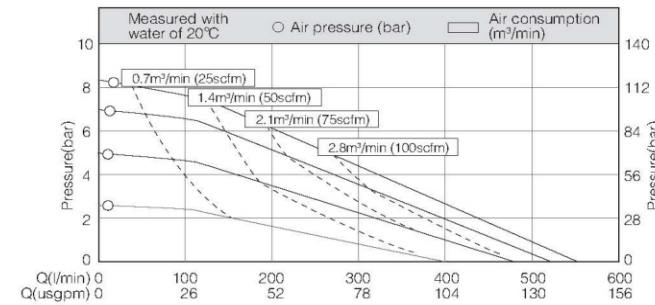
Installation size



QBX50 Plastic pump



Performance curve



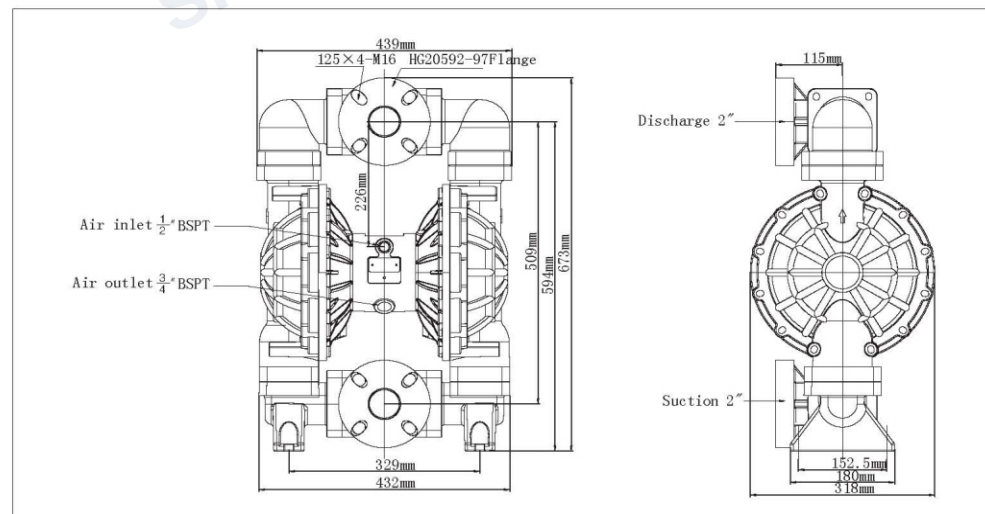
Technical parameters

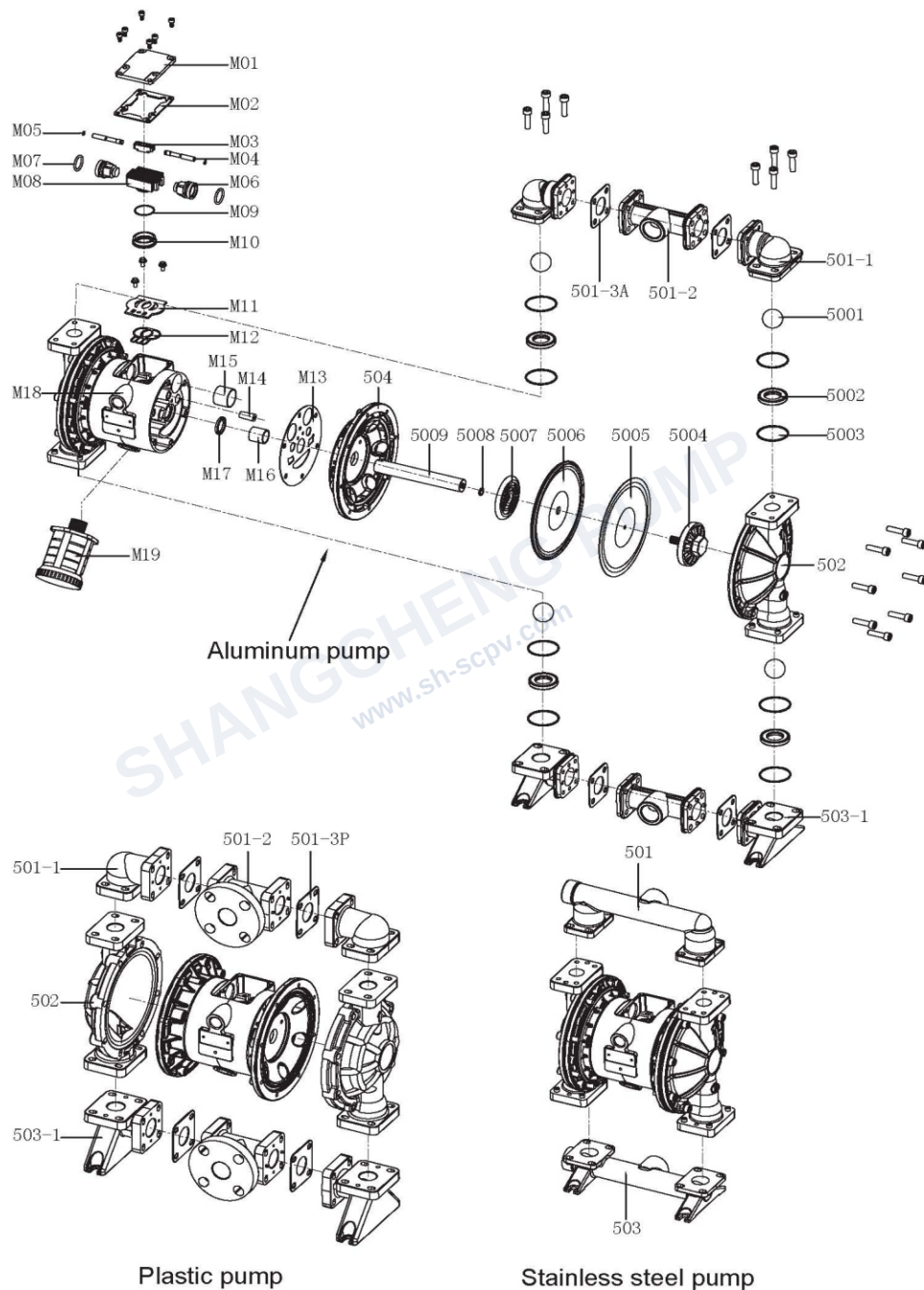
Suction lift[mwc]	dry	5
	wet	8
Max particle diameter[mm]		6
Suction and discharge size[in]		2
Air inlet size[in]		1/2
Max flow[l/min]		587
Max head[m]		84
Max air inlet pressure[bar]		8.4

Wetted body material

PP, POM, PVDF
Different materials, the performance will be slightly different

Installation size



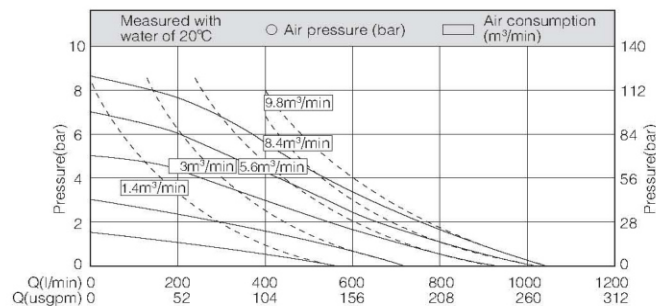


Air end parts					
Part code	Name	Qty	Part code	Name	Qty
M01-AL	Air valve cap	1	M11-CM	Valve plate	1
M02-BN	Air valve cap gasket	1	M12-VT	Valve plate gasket	1
M03-PM	Reversing switch	1	M13-BN	Air chamber gasket	2
M04-SS	Reversing pin	2	M13-TF	Resersing pin bushing	2
M05-VT	Reversing pin O-ring	2	M14-PM	Piston	2
M06-PM	Piston	2	M15-PM	Piston bushing	2
M07-VT	Piston V-ring	2	M16-PM	Rod bushing	2
M08-AL	Upper pilot valve	1	M17-VT	Rod V-ring	2
M09-VT	Pilot valve O-ring	1	M18-AL	Air valve body	1
M10-PM	Bottom Pilot valve	1	M19-PP	Muffler	1
M10-CM					
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			5002-TF		
501-1-AL	Upper Elbow	2	5002-ST		
501-1-KV			5002-HY		
501-2-PP			5002-BN		
501-2-AL	TE	2	5002-EP		
501-2-KV			5002-GE		
501-3P-HY	TE Gasket (Plastic pump)	4	5002-VT		
501-3P-ST			5002-PC		
501-3P-TF			5002-SS		
501-3A-HY	TE 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	Plate	2
503-1-PP	Bottom Elbow	2	5004-KV		
503-1-AL			5004-PP		
503-1-KV			5004-AL		
502-KV			5004-SS	Teflon diaphragm	2
502-PP	Fluid chamber	2	5004-LL		
502-AL			5005-TF	Rubber diaphragm	2
502-SS			5006-ST		
502-LL			5006-HY		
504-AL	Air chamber	2	5006-BN		
5001-TF	Valve ball	4	5006-EP		
5001-ST			5006-GE		
2501-HY			5006-VT		
5001-BN			5006-PU		
5001-EP			5007-AL	Inner plate	2
5001-GE			5008-TF	Bumper	2
5001-VT			5009-SS	Diaphragm Rod	1
5001-PC					
5001-SS					
5001-LL					
5001-CM					

QBX80 Metal pump

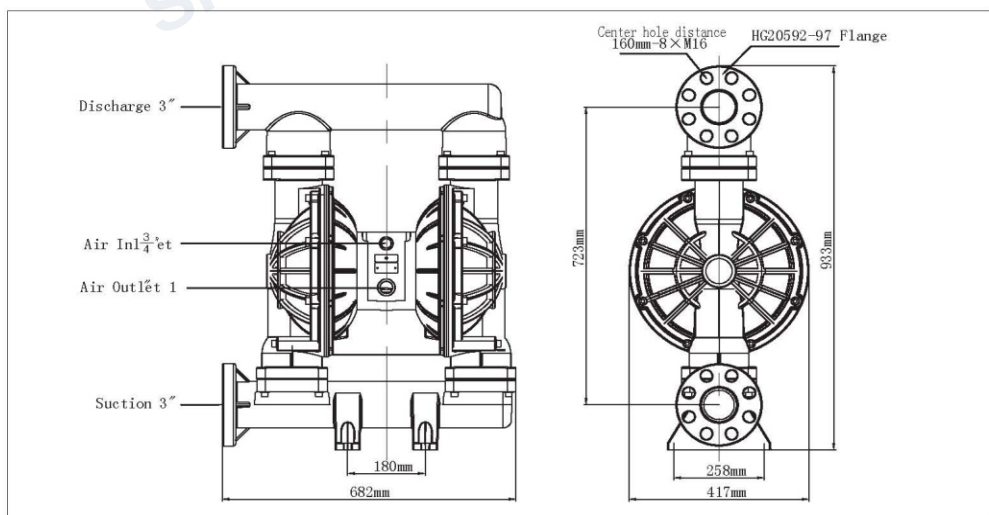


Performance curve



Technical parameters			Wetted body material	
Suction lift[mwc]	dry	5	AL, SS, LL, CS	
	wet	8	Different materials, the performance will be slightly different	
Max particle diameter[mm]		9.4		
Suction and discharge size[in]		3		
Air inlet size[in]		1		
Max flow[l/min]		1060		
Max head[m]		84		
Max air inlet pressure[bar]		8.4		

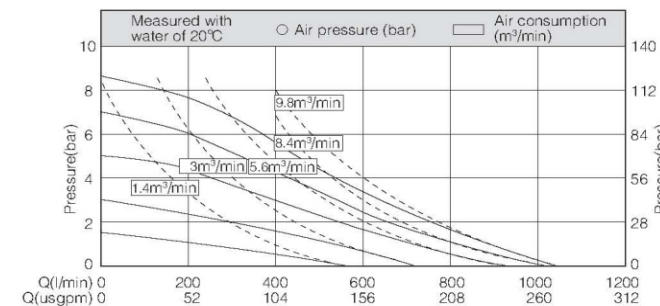
Installation size



QBX80 Plastic pump

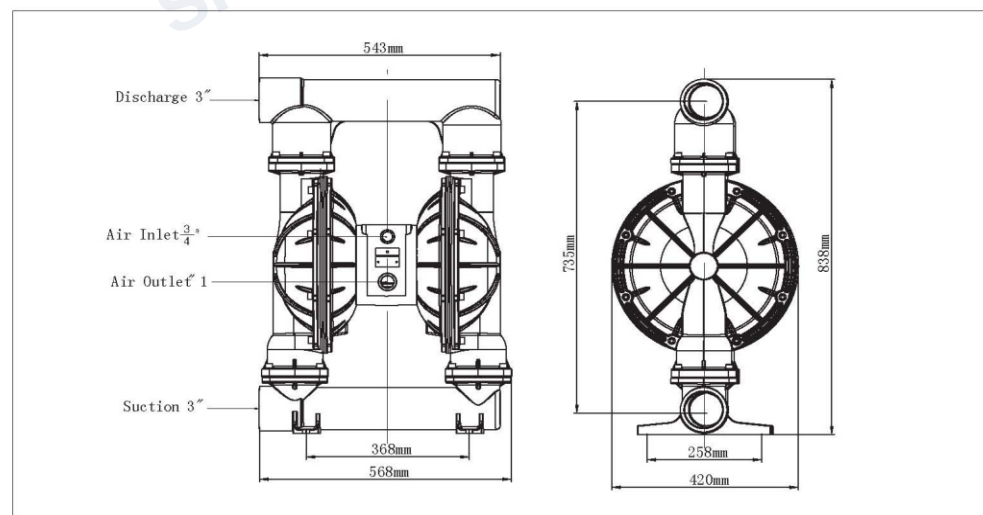


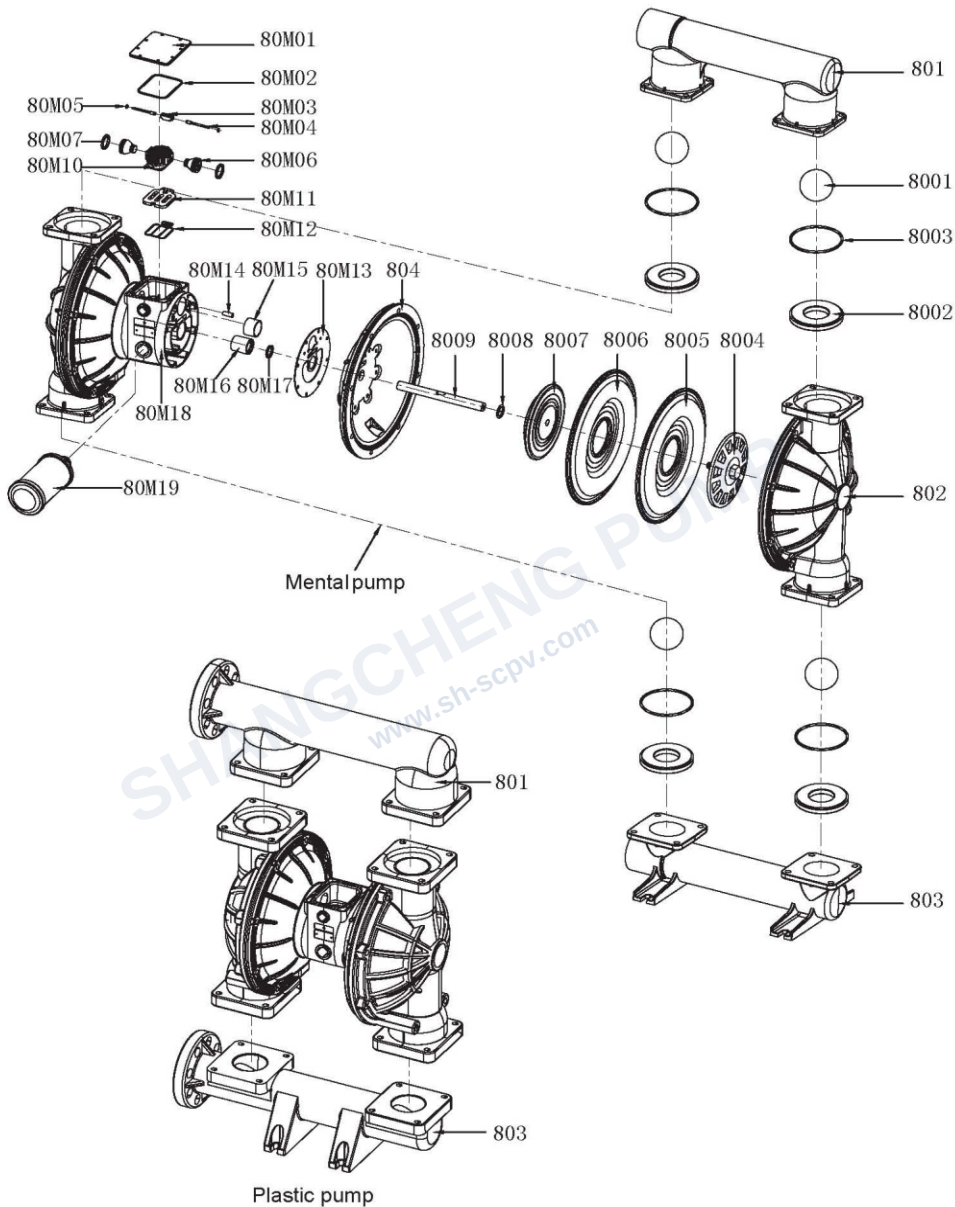
Performance curve



Technical parameters			Wetted body material	
Suction lift[mwc]	dry	5	PP, PVOF	
	wet	8	Different materials, the performance will be slightly different	
Max particle diameter[mm]		9.4		
Suction and discharge size[in]		3		
Air inlet size[in]		1		
Max flow[l/min]		1060		
Max head[m]		84		
Max air inlet pressure[bar]		8.4		

Installation size

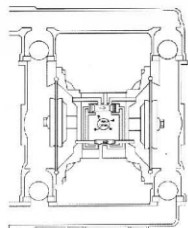




Air end parts					
Part code	Name	Qty	Part code	Name	Qty
80M01-AL	Air valve cap	1	80M12-VT	Valve plate gasket	1
80M02-BN	Air valve cap gasket	1	80M13-BN	Air chamber gasket	2
80M03-PM	Reversing switch	1	80M13-TF	Resersing pin bushing	2
80M04-SS	Reversing pin	2	80M14-PM	Piston bushing	2
80M05-VT	Reversing pin O-ring	2	80M15-PM	Rod bushing	2
80M06-PM	Piston	2	80M16-PM	Rod V-ring	2
80M07-VT	Piston V-ring	2	80M17-VT	Air valve body	1
80M10-PM	Pilot valve	1	80M18-PP	Muffler	1
80M11-SS	Valve plate	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	Seat O-ring	4
802-LL			8002-PC		
802-AL			8002-SS		
802-PP			8002-LL		
802-KV			8003-TF		
803-SS	Suction Manifold	1	8003-BN	Plate	2
803-LL			8003-EP		
803-AL			8003-VT		
803-PP			8004-KV		
803-KV			8004-PP		
804-AL	Air chamber	2	8004-AL	Teflon diaphragm	2
8001-TF	Valve ball	4	8004-SS		
8001-ST			8004-LL		
8001-HY			8005-TF		
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			8008-SS	Bumper	2
8002-TF			8009-SS	Diaphragm Rod	1

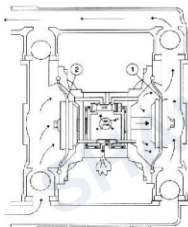
Operating principle

1



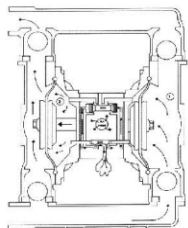
After connecting the compressed air, air valve control the compressed air impels diaphragm 1 moves toward right, meanwhile, the diaphragm 1 also extrude medium and cause it out of chamber. Diaphragm not only convey medium, also isolate compressed air and medium in the pump chamber. When one diaphragm is pushed away from the center body, another diaphragm will moves toward center body for these two diaphragms are connected by one rod. When diaphragm 2 moves toward center body, the following high pressure compressed air will be discharged out through the muffler, meanwhile, the pump inlet side will creates a vacuum, then atmospheric pressure will push the medium into suction pipeline. The pump entry valve ball will be raised and leaves the valve seat, the medium will enter into pump chamber.

2



When the diaphragm 1 under high pressure, will slowly move to maximum position of the stroke. Meanwhile, the compressed air will slowly enter into diaphragm 2 following space and impels the diaphragm 2 away the center body. The diaphragm 1 also will moves toward center body for these two diaphragms are connected by one rod. The diaphragm 2 will extrude the medium and function on entry valve ball and seal up the suction pipeline through the water power. The water power also will function on exit valve ball and open the discharge pipeline. Meanwhile, exit valve ball of pump another side will shut down for pressure function, entry valve ball will open, then the medium will enter into the pump chamber.

3



When one stroke finish. The compressed air will enter into diaphragm 1 following space again through reversing valve. simultaneously the diaphragm 2 following

INSTALLATION AND START-UP

Locate the pump as close to the product being pumped as possible. Keep the suction line length and number of fittings to a minimum. Don't reduce the suction line diameter.

For installations of rigid piping, short sections of flexible hose should be installed between the pump and piping. The flexible hose reduces vibration and strain to the pumping system.

AIR SUPPLY

Air supply pressure cannot exceed 125 psi (8.6bar). 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 support by some means other than the air inlet cap. 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 operating. Water in the air supply can be reduced by use a point-of-use 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 problems.

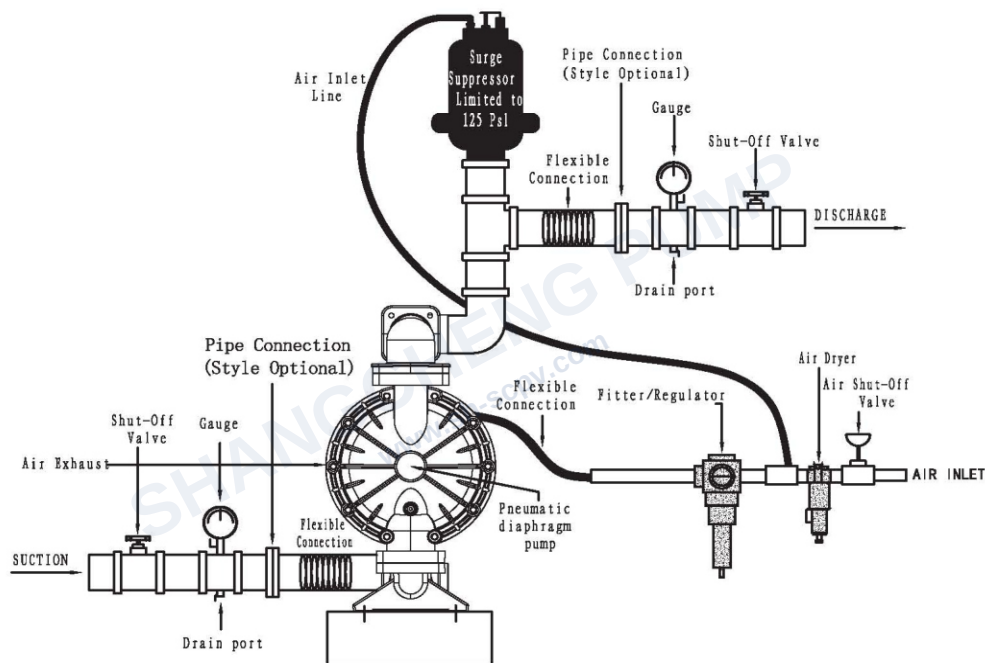
AIR INLET AND PRIMING

To start the pump, open the air valve approximately 1/2" to 3/4" turn. After the pump primes, the air valve can be 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.

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.

TYPICAL INSTALLATION GUIDE



TROUBLESHOOTING

Possible Symptoms:

- 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: Excessive suction lift in system.

Corrective Action: For lifts exceeding 20 feet (6 meter), filling the pumping chambers with liquid will prime the pump in most cases.

What to Check: Excessive flooded suction in system.

Corrective Action: For flooded conditions exceeding 10 feet (3 meters) of liquid, install a back pressure device.

What to Check: System head exceeds air supply pressure.

Corrective Action: Increase the inlet air pressure to the pump. Most diaphragm pumps are designed for 1:1 pressure ratio at zero flow.

What to Check: Air supply pressure or volume exceeds system head.

Corrective Action: Decrease inlet air pressure and volume to the pump as calculated on the published performance curve. Pump is cavitating the fluid by fast cycling.

What to Check: Undersized suction line.

Corrective Action: Meet or exceed pump connection recommendations shown on the dimensional drawing.

What to Check: Restricted or Restricted or undersized air line

Corrective Action: Install a large air line and connection.

What to Check: Check the air distribution system of the pump

Corrective Action: Disassemble and inspect the main air distribution valve pilot valve and pilot valve actuators.

What to Check: Rigid pipe connections to pump.

Corrective Action: Install flexible connectors.

What to Check: Blocked air exhaust muffler.

Corrective Action: Remove muffler screen, clean or de-ice and reinstall.

What to Check: Pumped fluid in air exhaust muffler.

Corrective Action: Disassemble pump chambers. Inspect for diaphragm rupture or loose diaphragm plate assembly.

What to Check: Suction side air leakage or air in product.

Corrective Action: Visually inspect all suction side gaskets and pipe connections.

What to Check: Obstructed check valve.

Corrective Action: Disassemble the wet end of the pump and manually dislodge obstruction in the check valve pocket.

What to Check: Worn or misaligned check valve or check valve seat.

Corrective Action: Inspect check valves and seat for wear and proper seating. Replace if necessary.

What to Check: Blocked suction line.

Corrective Action: Remove or flush obstruction. Check and clear all suction screens and strainers.

What to Check: Blocked discharge line.

Corrective Action: Check for obstruction or closed discharge line valves.

What to Check: Blocked pumping chamber.

Corrective Action: Disassemble and inspect the wetted chambers of the pump. Remove or flush any obstructions.

What to Check: Entrained air or vapor lock in one or both pumping chambers.

Corrective Action: Purge chambers through tapped chamber vent plugs.

IMPORTANT SAFETY INFORMATION



IMPORTANT

Read these safety warnings and instructions in this manual completely, before installation and start-up of the pump. It is the responsibility of the purchaser to retain this manual for reference. Failure to comply with the recommendations stated in this manual will damage the pump, and void factory warranty.



CAUTION

Before pump operation, inspect all gasketed fasteners for looseness caused by gasket creep. Retorque loose fasteners to prevent leakage. Follow recommended torques stated in this manual.



WARNING

Before maintenance or repair, shut off the compressed air line, bleed the pressure, and disconnect the air line from the pump. The discharge line may be pressurized and must be bled of its pressure.



WARNING

In the event of diaphragm rupture, pumped material may enter the air end of the pump, and be discharged into the atmosphere. If pumping a product which is hazardous or toxic, the air exhaust must be piped to an appropriate area for safe disposition.



WARNING

Take action to prevent static sparking. Fire or explosion can result, especially when handling flammable liquids. The pump, piping, valves, containers or other miscellaneous equipment must be grounded.



WARNING

This pump is pressurized internally with air pressure during operation. Always make certain that all bolting is in good condition and that all of the correct bolting is reinstalled during assembly.



WARNING

When used for toxic or aggressive fluids, the pump should always be flushed clean prior to disassembly.



WARNING

Before doing any maintenance on the pump, be certain all pressure is completely vented from the pump, suction, discharge, piping, and all other openings and connections. Be certain the air supply is locked out or made non-operational, so that it cannot be started while work is being done on the pump. Be certain that approved eye protection and protective clothing are worn all times in the vicinity of the pump. Failure to follow these recommendations may result in serious injury or death.



WARNING

Airborne particles and loud noise hazards. Wear ear and eye protection.

AIR VALVE SERVICING

MK15 Air valve servicing

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 wrench, remove the four hex capscrews, remove the whole air valve assembly from the pump.

Remove and inspect 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 piston locking pins (item 1520) that fasten locking plate to the valve body. Next remove the two piston locking plate (item 1516). Inspect the two O-rings (item 1517) on each locking plate for damage or wear. Replace O-rings if needed.

Remove the piston (item 1519), inspect the two V-rings on each side of piston for damage or wear. Replace the V-ring if needed.

Step 3. Reassembly of the air valve.

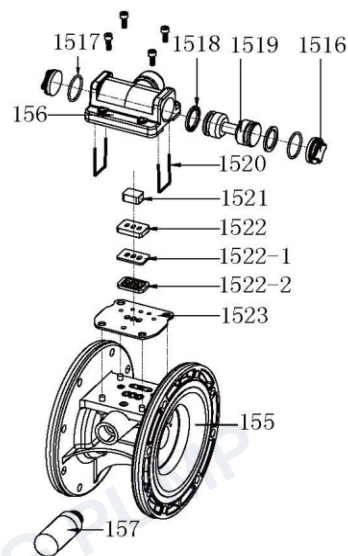
Install one locking plate (item 1516) with O-ring (item 1517), and fastened with locking pin (item 1520) to the valve housing (item 156).

Install the 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 locking plate 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 gasket (item 1523) to the pump. Connect the compressed air line to the pump. The pump is now ready for operation.

Please apply a light coating of grease to the O-ring or V-ring when installation



MK25, 40, 50, 80 air valve servicing.

Step 1, see the air valve drawing

Using screwdriver, remove the six screw. Remove the air valve cap (item M01), remove and inspect cap gasket (item M02) for cracks or damage. Replace gasket if needed.

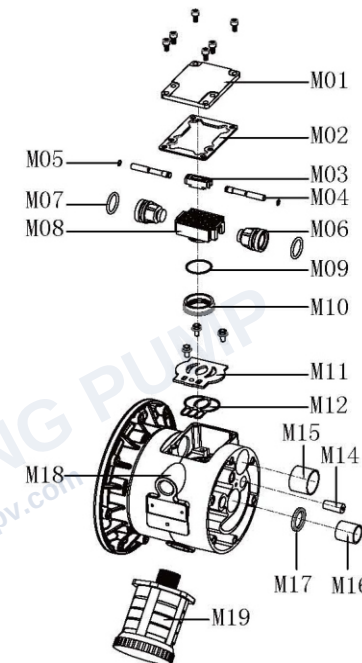
Step 2, Disassembly of the air valve.

Remove the upper pilot valve (item M08), remove and inspect O-ring (item M09) and bottom pilot valve (item M10) for damage or wear. Replace if needed.

Remove and inspect the Reversing switch (item M03) for wear. Replace it if needed.

Using plier, remove the two reversing pins (item M04) and the two pistons (item M06), inspect O-ring (item M05) and V-ring (item M07) for wear. Replace if needed.

Using screwdriver, remove the valve plate (item M11) and gasket (item M12), 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 M18), 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 M14), insert piston into piston bushing (item M15).

Install the reversing pin and pilot valve.

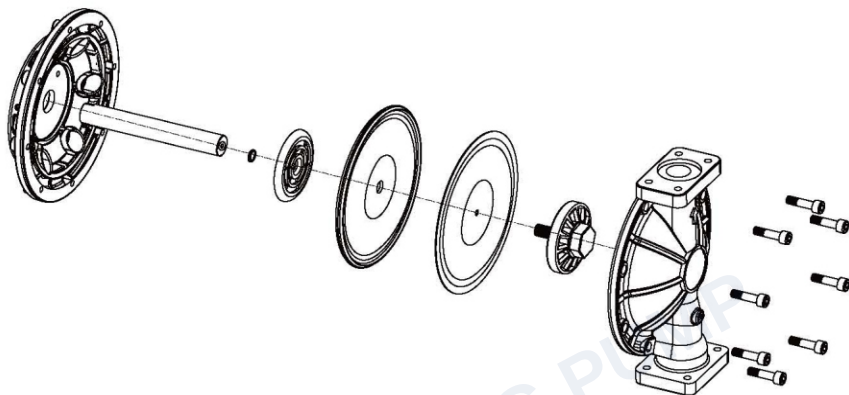
Install air valve cap gasket, then fasten the air valve cap with the six screws.

Connect the compressed air line to the pump. The pump is now ready for operation.

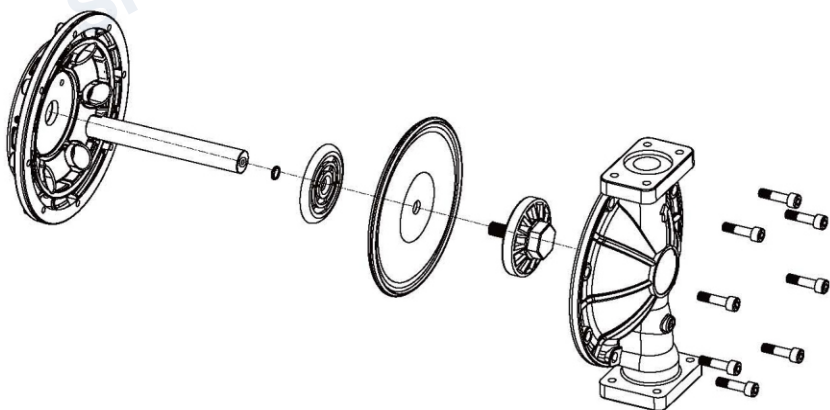
Note: MK80 pump air valve parts M08, M09, M10 to be a whole.

DIAPHRAGM SERVICE

Drawing, with Overlay Teflon Diaphragm



Drawing, Non-Overlay Teflon Diaphragm



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 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 six pointed socket to remove the diaphragm assemblies (outer plate, diaphragm and inner plate) from the diaphragm rod.

Using a wrench or socket to remove the out 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.

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. Insert rod into pump.

Make sure the edge of the diaphragm inset the groove of air chamber.

Fasten the liquid chamber to the pump, using the capscrews and hex nuts.

On the opposite of the pump, pull the diaphragm rod out as far as possible. Thread the stud of the remaining diaphragm assembly into the tapped hole at the end of the diaphragm rod as far as possible.

Fasten the remaining liquid chamber to the pump, using the capscrews and hex nuts.

Step 5: Re-install the manifolds to the pump, using the capscrews, hex nuts and flat washers.

The pump is now ready to be re-installed, connected and returned to operation.

OVERLAY DIAPHRAGM SERVICING
The overlay Teflon diaphragm is 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



! IMPORTANT

Read these instructions completely, before installation and start-up. It is the responsibility of the purchaser to retain this manual for reference. Failure to comply with the recommendations stated in this manual will damage the pump, and void factory warranty.

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

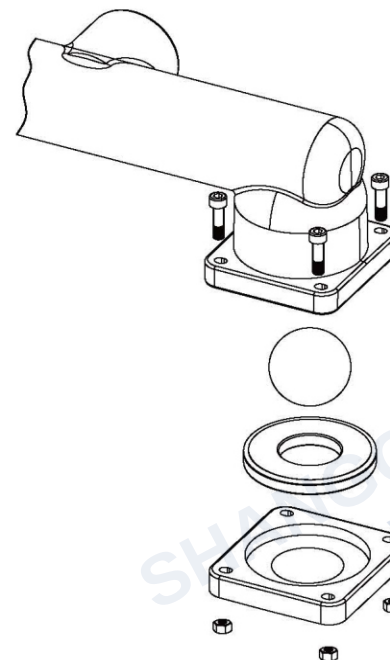
Re-assemble the check valve components. The seat should fit into the counter bore of the liquid chamber. The pump can now be reassembled, reconnected and returned to operation.

VALVE SEATS

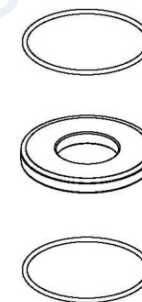
Two o-rings are required for non-rubber seats.

Rubber seats surface already with O-rings.

CHECK VALVE DRAWING



Rubber seats



non-rubber seats.

CONVERTED EXHAUST ILLUSTRATION

PUMPING HAZARDOUS LIQUIDS

When a diaphragm fails, the pumped liquid or fumes enter the air end of the pump. Fumes are exhausted into the surrounding environment. When pumping hazardous or toxic materials, the exhaust air must be piped to an appropriate area for safe disposal. See illustration 1.

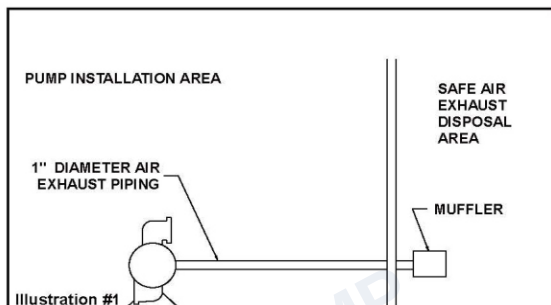


Illustration #1

The pump can be submerged if the pump materials of construction are compatible with the liquid being pumped. The air exhaust must be piped above the liquid level. Piping used for the air exhaust must not be smaller than 1" diameter. See illustration 2.

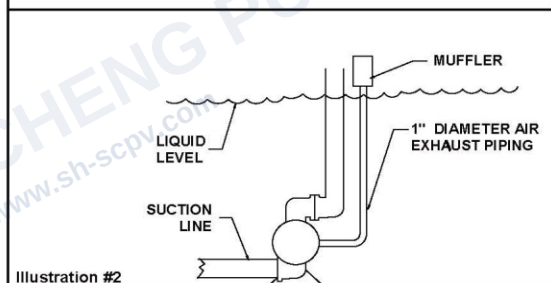


Illustration #2

When the pumped product source is at a higher condition, pipe the exhaust must higher than the produce source to prevent siphoning spills. See illustration 3.

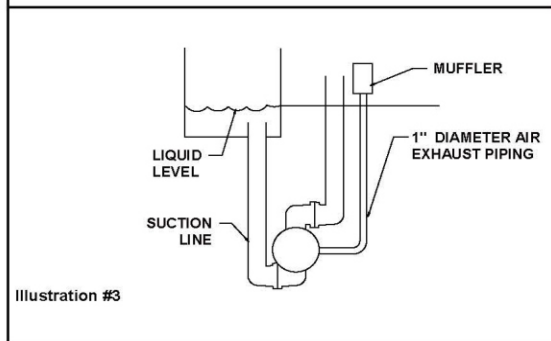


Illustration #3

GROUNDING THE PUMP



To reduce the risk of static electrical sparking, this pump must be grounded. Check the local electrical code for detailed grounding instruction and the type of equipment required.

