



Air Operated Diaphragm Pump

Selection Guide

Overview

FAP air operated diaphragm pump is a kind of fluid transportation equipment, which is one of the most advanced pumps in china. Using compressed air as the power source, it can pump various fluids drastically, corrosive, volatile, flammable, poisonous liquid or drastically with particles and high vesicosity.

Working Principle

FAP pump size range from 1/4", 3/8", 1/2", 3/4", 1", 1.5", 2" and 3", the components which contact with the fluids are usually made of aluminum alloy, cast iron, polypropylene, stainless steel. Depend on the varied applications, and the materials of diaphragm can be BunaN, Neoprene, EPDM, Santoprene, Hytrel, Viton, Teflin, So that it can meet requirements of different fluid mediums.

The air-operated diaphragm pump are based on the following working principle : two flexible diaphragm are fitted into two symmetrical chambers of the diaphragm pump severally and connected as a whole part by a link rod. The compressed air enters the central body through the in-suck terminal and impels the diaphragms in two chambers to drive the whole part move synchronously. At the same time, the air in the other chamber is expelled from the back side of the diaphragm. when piston reaches the end of the stroke, the air-distributing valve guide compressed air into the other chamber automatically and drive diaphragm pump to rotate reversely, so that the synchronous reciprocating movement is realized.

FAP air-operated diaphragm pumps are distinguished obviously by the structure of the air-distributing valve replaces the traditional O-ring and cylindrical structure with a three-direction pilot-operated structure, eliminating consequently the dead center of valve and shutdown phenomenon of pumps. It provides an accurate and reliable reversing signal to avoid downtime and realize faster reversing, so that pumps have greater flow and the transportation is more stable, with lower pulse.

FAP air-operated diaphragm pump has a simple designs and highly reliable reversing valve. It can ensure non-stop operation and therefore reduces the expensive downtime cost. All components of the valve can be replaced without disassemble. Aluminum parts have been specially processed, so can resist the corrosion resulted from unclean air. The slide block made of plastic material is robust and anti-tempered, and needn't lubricate. It can ensure a smooth air way and flexible reverse.

Main Application

1. Chemical industry : Acids, alkali, selvents, suspended solids, decentralized system.
2. Petrochemical industry : Crude oil, heavy oil, grease, mud, sludge, etc.
3. Coating industry : Resins, solvents, coloring agent, paint, etc.
4. Cosmetic industry : Detergent, shampoo, lotion, emulsion, camphor ice, surface active agents.
5. Ceramics : Mud, slurry pottery, lime milk, clay slurry.
6. Mining industry : Coal slurry, magma, mud, mortar and explosives, lubricant, etc.
7. Water treatment : Lime milk, soft sediments, sewage, chemicals, waste water.
8. The food industry : Liqued semi-solid, chocolate, salt water, vinegar, syrup, vegetable oil, soybean oil, honey, animal blood.
9. Beverage industry : Yeast, sugar syrup, concentrations, has-liqued, cream, plasma and other liqued drugs.
10. Pharmaceutical industry : Solvents, acids, alkali, plant extract liquid, cream, plasma and other liquid drugs.
11. Paper industry : Solvent, electroplating fluid, cleaning fluid, sulfuric acid, nitric acid, waste acid, corrosive acid, polishing liquid.
12. Electronics industry : Solvent, electroplating fluid, cleaning fluid, slufuric acid, nitric acid, waste acid, corrosive acid polishing liquid.
13. Textile solution : Chemical dyes, resins, rubbers, etc.
14. Construction industry : Grout, ceramic tile adhesives, rock slurry, ceiling finish, etc.
15. Automotive industry : Polishing emulsion, oil, coolant, automative priming, oil emulsion paint, varnish, varnish additives, degreasing fluid, paint, etc.
16. Furniture industry : Adhesives, varnishes, varnish additives, degreasing fluid, paint, etc.
17. Metallurgy, casting and dyeing industry : metal slurry, hydroxides and carbide slurry, dust cleaning slurry.
18. Nuclear power : Pipe system, nuclear station lubrication system, CI waste water treatment.
19. New energy : Fluid transportation, sewage discharge, solid-liquid separation.

Performance Introduction

FAP pneumatic diaphragm pump can not only pump fluid liquids and powders, but also some mediums that usually hard to flow. It possesses the advantages of self-priming pump, submerged pump, shielding pump, slurry pump, impurity pump and other transportation machines.

1. No need to pilot water, suction lift up to 7m, pump head up to 80m, outlet pressure > 0.8 MPa.
2. Spacious flowing way with good through-pass performance, the largest size of particles allowed can be up to 9.4mm. while pumping slurry and impurity, the abrasion is very low.
3. The pump head and capacity can be adjusted via the pressure of air source (between $0.1 \sim 0.84$ MPa).
4. Temperature range of working environment : $5 \sim 65^{\circ}\text{C}$
5. The pump has no rotating parts and shaft seals. The diaphragms separate the pumped medium from moving part and working medium absolutely, so that the pumped medium does not leak to outside. So there are no risks of environment pollution and personal injury while pumping poisonous, volatile or corrosive media.
6. It works without electricity and is safe and reliable in inflammable and explosive conditions.
7. Can be immersed into the medium.
8. Easy to use and works reliably. To turn on/off the pump, just open and close the air valve. Even in cases of unexpected long-term operation without medium or sudden shutdown, it will not be damaged. Once overloaded, it has self-protecting function and will shut down automatically. As long as the load goes back to normal, it starts up automatically again.
9. Simple structure, less vulnerable parts. The pump has a simple structure design and thus easy to install and maintain. The pumped medium does not contact with moving parts such as air-distributing valve and link rod, so the performance will not go worse with the abrasion of rotors, pistons, gears and vanes as other types of pumps.
10. Can pump the viscous liquids (viscosity below 10000 centipoise)
11. Without lubrication. There are no effects to the pump in dry operation mode. This is a key feature of the pump.

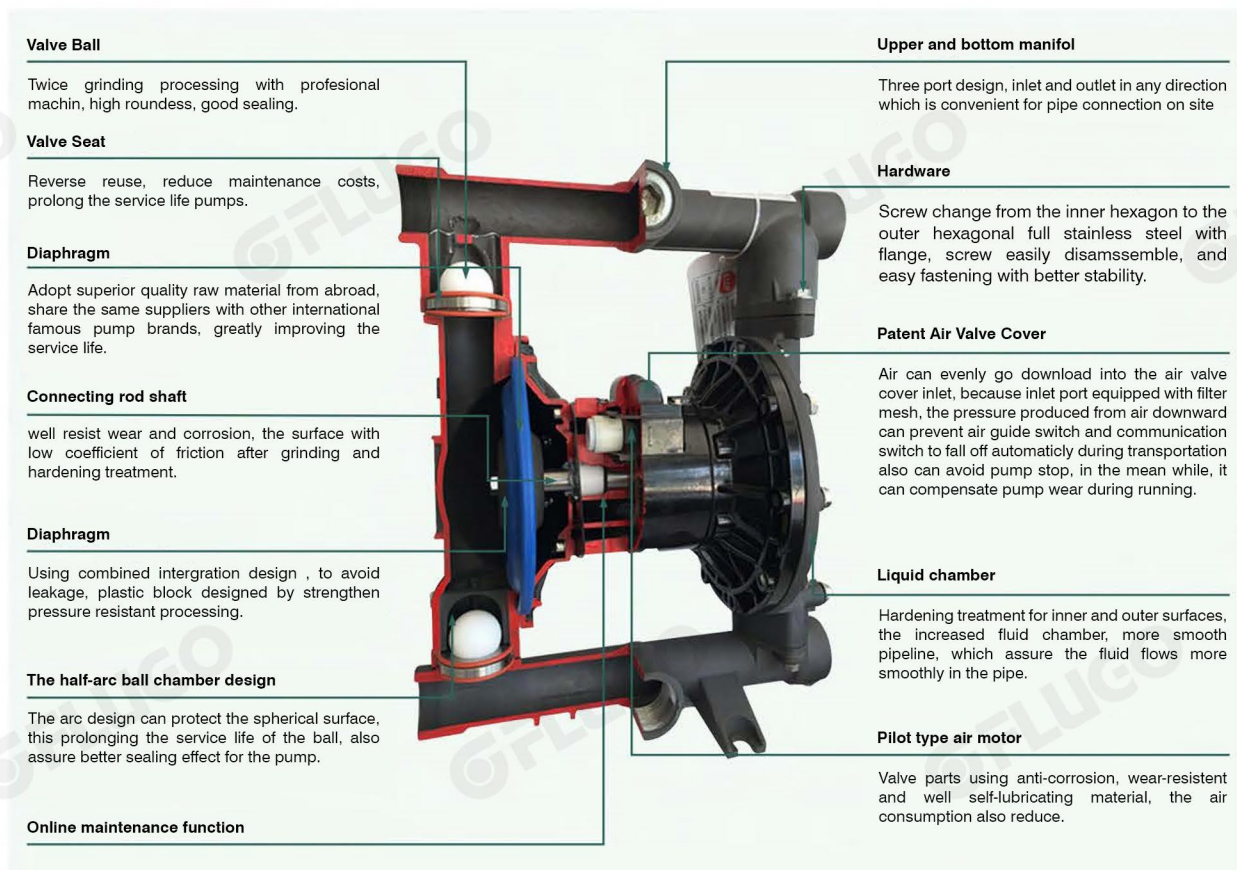
Performance Introduction

The pneumatic diaphragm pump is provided with the simple and highly reliable air reversing valve that makes the full series of diaphragm pumps realize the maximum reliability under various service conditions.

The reversing valve is the three-way pilot valve that can ensure no "sticky" in a real sense. All parts can be replaced without the need of opening the liquid cavity. The aluminum parts have been subjected to anodic oxidation treatment and coated with epoxy coatings to resist corrosion caused by dirty air.

1. Central shaft is of integrative structure, ensure the concentricity and make the action more fluent.
 2. Increase the filter unit, ensure the normal operation of air motor.
 3. The material of air - guided plate is ceramic and stainless steel to suitable for different workplace.
 4. The piston and adopts no screw structure and easy to install.
 5. External air motor, easy to maintain,
 6. Engineering plastic is adopted, saving resources.
 7. Compared with other diaphragm pumps, moving parts are less.
 8. One reversing valve suitable for pumps of multiple specifications.
 9. Quality assurance of air motor is 15 years and pump body is 5 years.
- * Specific terms can be found in the operation manual.

FAP Diaphragm Pump Advantages



Mode Selection Instruction

Center Block	Body	Valve Seat	Ball	Diaphragm	Connection
FAP-A Aluminum center body	M = Acetal (AC) P = Polypropylene (PP) A = Aluminum (ADC12)	M = Acetal (AC) S = SS304	F = PTFE C = Ceramic S = SS304	F = PTFE H = Hytrel (HY) T = Santoprene (SP)	F(C) = Flange (center port) F(S) = Flange (side port)
FAP-S Stainless steel center body	S = SS304 K = PVDF (KY) Q = Ductile Iron (DI)	H = Hytrel (HY) T = Santoprene (SP) V = Viton (VT)	L = SS316 H = Hytrel (HY) T = Santoprene (SP)	B = Buna N (NBR) V = Viton (VT) E = EPDM	T(C) = Threaded (center port) T(S) = Threaded (side port)
FAP-P Plastic center body	L = SS316 G = SS316L W = WCB (C)	P = Polypropylene (PP) K = PVDF (KY) G = SS316L R = Neoprene Rubber N = Teflon (TF) F = PTFE	B = Buna N (NBR) V = Viton (VT) E = EPDM G = SS316L R = Neoprene Rubber N = Teflon (TF)	R = Neoprene Rubber N = Teflon (TF)	
FAP-W Carbon steel center body					

Model Examples

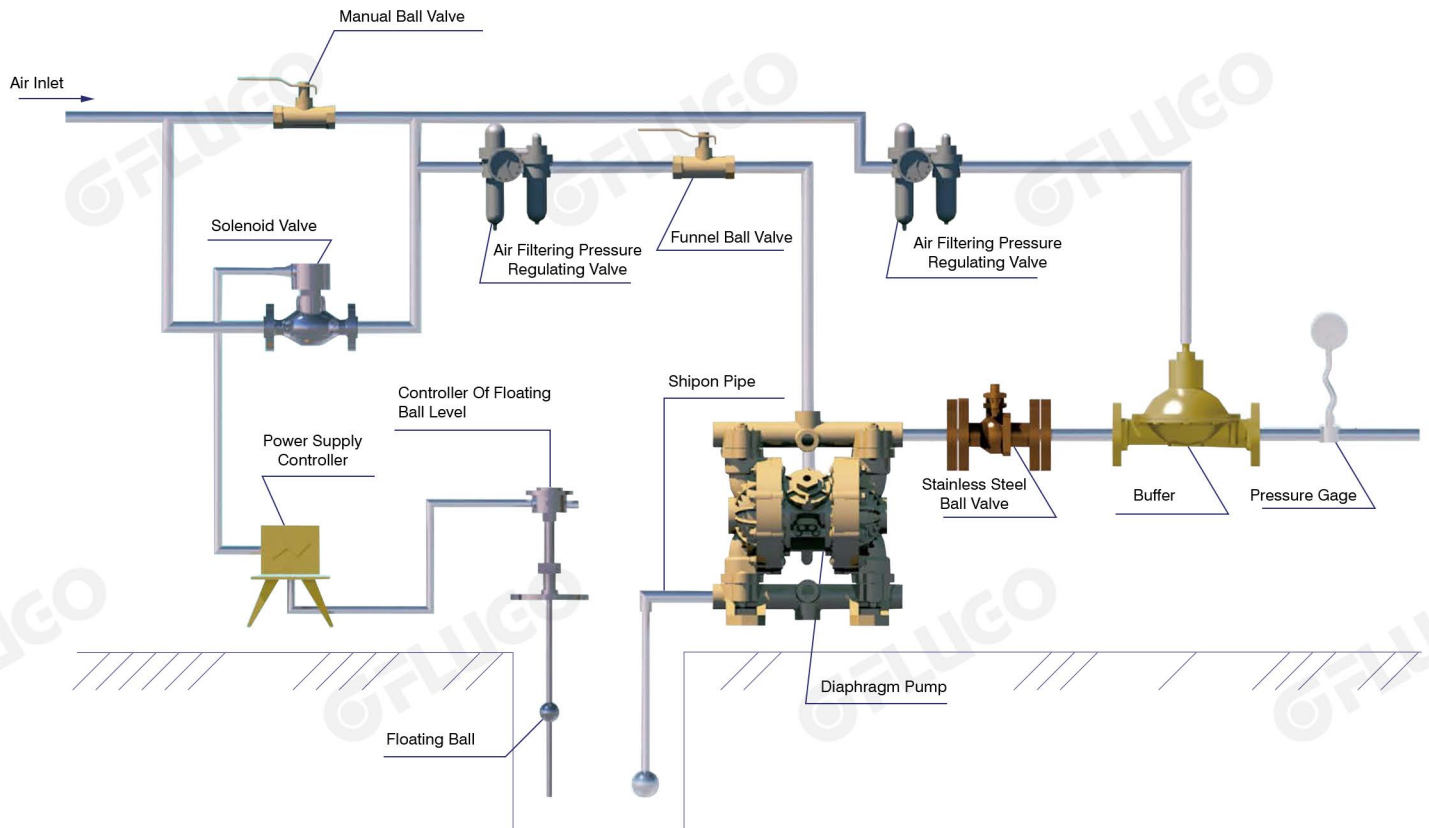
Regural Model:

FAP-A-73311-T(C) FAP-P-72A11-F(S)

Pump with Leakage Detection Configuration:

FAP-A-73311-T(C)-LD FAP-P-72A11-F(C)-LDC

System Diagram of FAP Pneumatic Diaphragm Pump



Advantages of FAP Pneumatic Diaphragm Pump

A. Convenient Maintenance

The internal volume is reduced to decrease waste and make cleaning convenient.
The stainless steel bolt can resist corrosion and provide reasonable positioning for the convenience of reassembly.

B. Unique Patented Air Valve

Three-way control valve makes sure the non-blocking operation all parts can be easily subjected to external maintenance no need of lubrication in the air pipeline.

C. Precisely Designed Spare Parts

The wear resistant end bearing can ensure correct positioning of stem and its replacement is simple.

D. Discharge Outlet Provide With Protection

All discharge outlets adopt a common port to prevent vaporized liquid in the room from eroding seals of the air motor.
Idling function that makes the operations of loading and unloading of the storage tank convenient

E. Solid External Structure

The corrosion resistant structure can prevent leakage and ensure replacement of clean fluid.
The aluminum central part is provide with epoxy coatings.
The corrosion resistant central part is made of 316 stainless steel.

F. Compatibility Of Fluid

The shell materials that can be supplied include aluminum, stainless steel, ductile iron, polypropylene, conductive acetal or Kynar fluoropolymer

G. Reasonable Seal Design

The diaphragm is tightly locked at the position.
The forming plate that plays the function of active liquid seal.
One through hole.

H. Heavy-duty Diaphragm Plate

The diaphragm plate with reliable holding can eliminate leakage and dropping and prevent the occurrence of expensive shut-down time.

i. Stem Design With Long Service Life

The 300 series stainless steel stem has longer service life and still has good corrosion resistance in damp air.

J. Easy Positioning

Bolt connected, self positioning air and fluid unit.

K. Multiple Choice of Rubber Material

Various seat and ball options can ensure compatibility and reliable sealing, and therefore, it is provide with highly efficient and long-term service life as well as better suction lift height.

Full Stainless Steel Diaphragm Pump
Stainless steel center body series

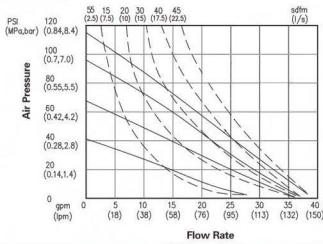
FAP25		1 inch Metal Pump Series	4. gpm (150 lpm)	120 psi (8.4 bar)	1 inch Inlet and Outlet	Stainless Steel 316 Stainless Steel 304	0.16 inch (4mm)
FAP40		1.5 inch Metal Pump Series	90 gpm (340 lpm)	120 psi (8.4 bar)	1.5 inch Inlet and Outlet	Stainless Steel 316 Stainless Steel 304	0.2 inch (5mm)
FAP50		2 inch Metal Pump Series	150 gpm (570 lpm)	120 psi (8.4 bar)	2 inch Inlet and Outlet	Stainless Steel 316 Stainless Steel 304	0.24 inch (6mm)

FAP-S25

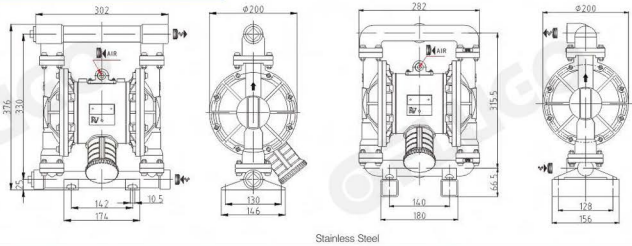


Pneumatic Diaphragm Pump (Full Stainless Steel)

Technical Curve



Dimensional Drawing



Model Selection

Series	Size	Body	Valve Seat	Ball	Diaphragm	Connection
FAP-S (Stainless steel center body)	7 = 1" (25mm)	S = SS304 L = SS316 G = SS316L	N = Teflon S = SS304 L = SS316 G = SS316L R = Neoprene Rubber	N = Teflon S = SS304 L = SS316 G = SS316L R = Neoprene Rubber	N = Teflon H = Hytrel T = Santropene B = Buna N V = Viton E = EPDM R = Neoprene Rubber	T = Threaded

Main Spare Parts & Accessories



Inner Splint, ball, diaphragm, ball seat, sealing ring



Air Filter Regulator



Patent No. : 201220464127.5
Ball Valve



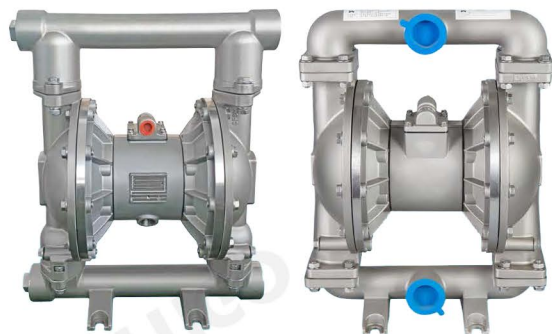
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Technical Specifications

Max. Working Pressure	120 psi (0.84Mpa, 8.4bar)
Max. Flow Rate	40 gpm (150 lpm)
Max. Reciprocating Speed	276 cpm
Max. Suction Height (Dry Sucking)	5m
Max. Permitted Grain	0.16 in. (4mm)
Max. Air Consumption	45 scfm (22.5 L/s)
Air Inlet Size	1/2 in.
Air Outlet Size	3/4 in.
Fluid Inlet Size	1 in.
Fluid outlet Size	1 in.
Weight	Stainless Steel Pump 21kg

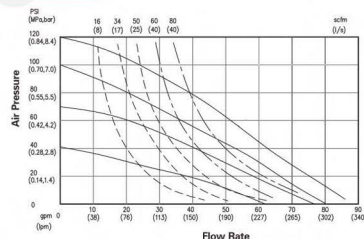
Thread connection standard :
BSP Thread : GB/T7306.1 - 2000 (Customized NPT Thread is available)

FAP-S40

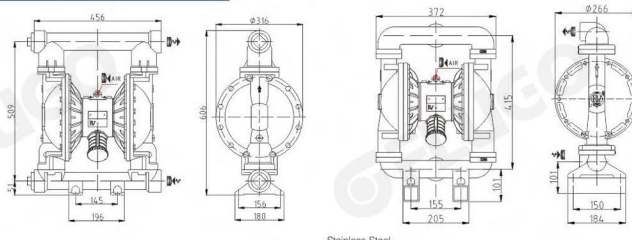


Pneumatic Diaphragm Pump (Full Stainless Steel)

Technical Curve



Dimensional Drawing



Stainless Steel

Model Selection

Series	Size	Body	Valve Seat	Ball	Diaphragm	Connection
FAP-S (Stainless steel center body)	B = 1 1/2" (40mm)	S = SS304 L = SS316 G = SS316L	N = Teflon S = SS304 L = SS316 G = SS316L R = Neoprene Rubber	N = Teflon S = SS304 L = SS316 G = SS316L R = Neoprene Rubber	N = Teflon H = Hytrel T = Santoprene B = Buna N V = Viton E = EPDM R = Neoprene Rubber	T = Threaded

Main Spare Parts & Accessories



Inner Splint, ball, diaphragm, ball seat, sealing ring



Air Filter Regulator



Patent No. : 201220464127.5
Ball Valve



Patent No. : 201611249334.8
Buffer

Technical Specifications

Max. Working Pressure	120 psi (0.84Mpa, 8.4bar)
Max. Flow Rate	90 gpm (340 lpm)
Max. Reciprocating Speed	200 cpm
Max. Suction Height (Dry Sucking)	5m
Max. Permitted Grain	0.21 in. (5mm)
Max. Air Consumption	80 scfm (40 L/s)
Air Inlet Size	1/2 in.
Air Outlet Size	3/4 in.
Fluid Inlet Size	1-1/2 in.
Fluid outlet Size	1-1/2 in.
Weight	Stainless Steel Pump 41kg

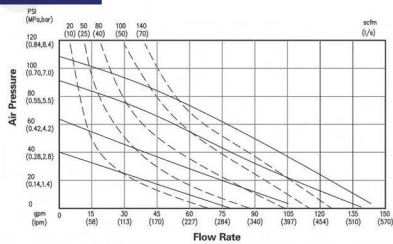
Thread connection standard :
BSP Thread : GB/T7306.1 - 2000 (Customized NPT Thread is available)

FAP-S50

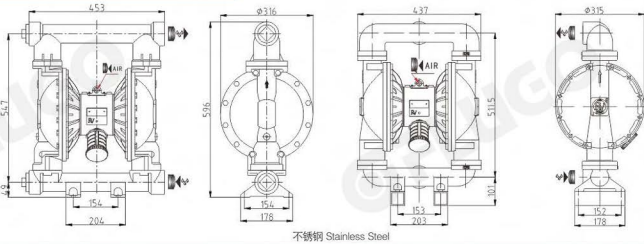


Pneumatic Diaphragm Pump (Full Stainless Steel)

Technical Curve



Dimensional Drawing



Model Selection

Series	Size	Body	Valve Seat	Ball	Diaphragm	Connection
FAP-S (Stainless steel center body)	F = 2" (50mm)	S = SS304 L = SS316 G = SS316L	N = Teflon S = SS304 L = SS316 G = SS316L R = Neoprene Rubber	N = Teflon S = SS304 L = SS316 G = SS316L R = Neoprene Rubber	N = Teflon H = Hytrel T = Santropene B = Buna N V = Viton E = EPDM R = Neoprene Rubber	T = Threaded

Main Spare Parts & Accessories



Inner Splint, ball, diaphragm, ball seat, sealing ring



Air Filter Regulator



Patent No. : 201220464127.5
Ball Valve



Patent No. : 201611249334.8
Buffer

Technical Specifications

Max. Working Pressure	120 psi (0.84Mpa, 8.4bar)
Max. Flow Rate	150 gpm (570 lpm)
Max. Reciprocating Speed	145 cpm
Max. Suction Height (Dry Sucking)	5m
Max. Permitted Grain	0.24 in. (6mm)
Max. Air Consumption	140 scfm (70 L/s)
Air Inlet Size	1/2 in.
Air Outlet Size	3/4 in.
Fluid Inlet Size	2 in.
Fluid outlet Size	2 in.
Weight	Stainless Steel Pump 58kg

Thread connection standard :
BSP Thread : GB/17306.1 - 2000 (Customized NPT Thread is available)

Authorized Distributor



Air Operated Diaphragm Pump