

AIR OPERATED DIAPHRAGM PUMP AP10
(metal design)

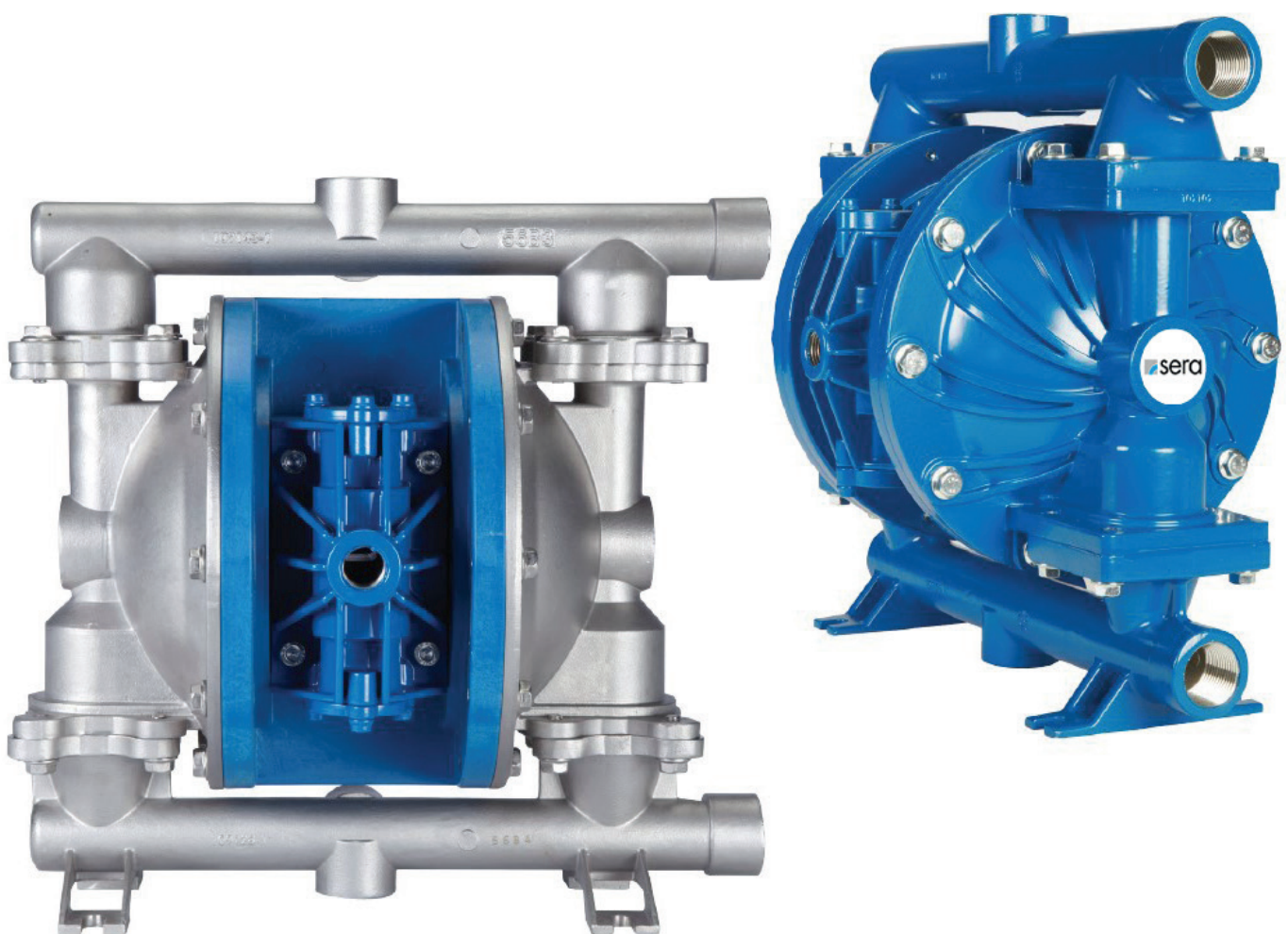


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IMPORTANT INFORMATION

Export Information

U.S. Export Administration Regulations, pursuant to ECCN 2B350, prohibit the export or re-export to certain enumerated countries of air operated double diaphragm pumps in which all wetted materials are constructed from fluoropolymers without first applying for and obtaining a license from the U.S. Bureau of Industry and Security(BIS). This affects all sera airPUMP pumps constructed from PVDF with PTFE balls and diaphragms. Please

Chemical Reaction Disclaimer

The user must exercise primary responsibility in selecting the product's materials of construction which are compatible with the fluid(s) that come(s) in contact with the product. The user may consult a manufacturer's representative/distributor agent to seek a recommendation of the product's material of construction that offers the optimum available chemical compatibility. However neither manufacturer nor agent shall be liable for product damage or failure, injuries, or any other damage or loss arising out of a reaction, interaction or any chemical effect that occurs between the materials of the product's construction and fluids that come into contact with the product's components.

Unpacking & Inspection

Unpack the pump and examine for any signs of shipping damage. If damage is detected, save the packaging and notify the carrier immediately. To install the pump, follow the installation instructions provided.

SAFETY PRECAUTIONS for ATEX-pumps

WARNING

READ THIS SUPPLEMENTAL INSERT COMPLETELY BEFORE INSTALLING AND OPERATING THIS PUMP. FAILURE TO FOLLOW THESE PRECAUTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.

WARNING

Static sparking can cause explosion. When operating in a hazardous area or pumping a hazardous fluid, the pump's grounding screw and entire pump system must be grounded to earth to prevent static discharge. This includes but is not limited to pipes, hoses, tanks, containers, valves, etc. Before operating the pump, ensure the electrical continuity throughout the pumping system and earth ground is 1 Ohm or less. If it is greater than 1 Ohm, re-check all grounding connections.

WARNING

Static sparking can cause explosion. Excessive fluid flow rates and improper tank filling methods can produce static electricity causing an explosion. Ensure safe fluid velocities and tank filling procedures in compliance with EN 13463-1 and CLC/TR 50404.

WARNING

Vibrations from operation may cause mounting surfaces and connections to loosen and generate a spark. Ensure the pump and connections are securely mounted and fastened prior to each operation.

 **WARNING**

Do not exceed minimum and maximum temperature limits of pump components. A table of temperature limits is provided in the "Pump Data" section of the manual.

 **WARNING**

Prior to operating, check pump for any worn o-rings, gaskets, or seals. Any leaking or damaged o-rings, gaskets, or seals must be repaired or replaced immediately.

 **WARNING**

Do not exceed maximum pressure stated on the pump serial number sticker.

 **WARNING**

Pump exhaust may be loud and contain particles. Wear appropriate ear and eye protection. In the event of a diaphragm rupture material can be forced out of the air exhaust muffler. If product is hazardous or toxic, pipe exhaust to appropriate safe area.

 **WARNING**

Pump must be cleaned on a regular basis to avoid dust buildup greater than 5mm.

 **WARNING**

The surface temperature of the pump depends upon the temperature of the fluid that is being pumped. The chart below lists different fluid temperatures and the corresponding pump surface temperatures, which determine the Temperature Class when used in a hazardous area.

| Fluid Temperature | Maximum Surface Temperature | Temperature Class | Maxium Allowable Surface Temperature |
|-------------------|-----------------------------|-------------------|--------------------------------------|
| 78°C (172°F) | 78°C (172°F) | T6 | 85°C (185°F) |
| 95°C (203°F) | 95°C (203°F) | T5 | 100°C (212°F) |
| 130°C (266°F) | 130°C (266°F) | T4 | 135°C (275°F) |
| 195°C (383°F) | 195°C (383°F) | T3 | 200°C (392°F) |

SAFETY PRECAUTIONS (general)



EXPLOSION HAZARD

sera airPUMP with standard materials of construction should not be used with halogenated hydrocarbons. Halogenated hydrocarbon solvents can cause explosion when used with aluminum components in a closed (pressurized) system. sera airPUMPs with standard materials of construction contain aluminum components and will be affected by halogenated hydrocarbon solvents.

1-1-1 Trichloroethane and Methylene Chloride are the most common halogenated hydrocarbons. However, other halogenated hydrocarbon solvents are suspect if used either as part of paint or adhesive formulation, or for clean-up flushing. For applications that may involve halogenated hydrocarbons, contact sera to discuss the availability of alternative pump materials of construction.



WARNING

sera airPUMPs maximum temperature limits are based upon the material's mechanical stress only. Maximum temperature is application dependent. Consult a chemical resistance guide or the chemical manufacturer for chemical compatibility and temperature limits.



WARNING

Chemical Hazard. This pump is used for transferring many types of potentially dangerous chemicals. Always wear protective clothing, eye protection and follow standard safety procedures when handling corrosive or personally harmful materials. Proper procedures should be followed for draining and decontaminating the pump before disassembly and inspection of the pump. There may be small quantities of chemicals present during inspection.



WARNING

Hot surfaces. sera airPUMPs are capable of handling liquids with temperatures as high as 104°C (220°F). This may cause the outer areas of the pump to become hot as well and could cause burns.



WARNING

If a diaphragm rupture occurs, material being pumped may be forced out of the air exhaust. Proper care should be taken, always wear protective clothing, eye protection & follow standard safety procedures.



WARNING

For polypropylene or PVDF pumps do not exceed 6.9 bar (100 psig) air supply and 8.3 bar (120 psig) for aluminum and stainless steel.

 **WARNING**

When pumping hazardous liquids, or operating the pump in an enclosed room, it is important to pipe the exhaust air to a safe area.

 **WARNING**

The air outlet from the pump can be noisy and contain particles. Wear appropriate protection for your ears and eyes. Should a seal tear, the conveyed material can escape with the exhaust air. If the conveyed material is a dangerous or poisonous product, the exhaust air must be routed to a safe zone.

 **CAUTION**

Before attaching air supply to pump to make sure all airline debris is clear. It is recommended to use a minimum 5 μ (micron) air filter before the air valve.

 **CAUTION**

Do not over-tighten the air inlet fitting or muffler. Too much torque could damage the air valve or muffler plate.

 **CAUTION**

Before maintenance or repair, close the compressed air line supply valve, bleed the pressure and disconnect air line from the pump. Discharge line may also be pressurized. Any pressure must be relieved prior to servicing. Remove suction/discharge lines & drain the pump.

 **CAUTION**

If pump is used with materials that tend to solidify or settle, the pump should be flushed after each use to prevent damage.

 **CAUTION**

Use only genuine **sera** replacement parts to assure compatibility & longest service life.

 **CAUTION**

Check the temperature limits for all wetted components when choosing pump materials. See Materials Profiles table on page 8.

MATERIAL SPECIFICATION

MATERIAL PROFILES

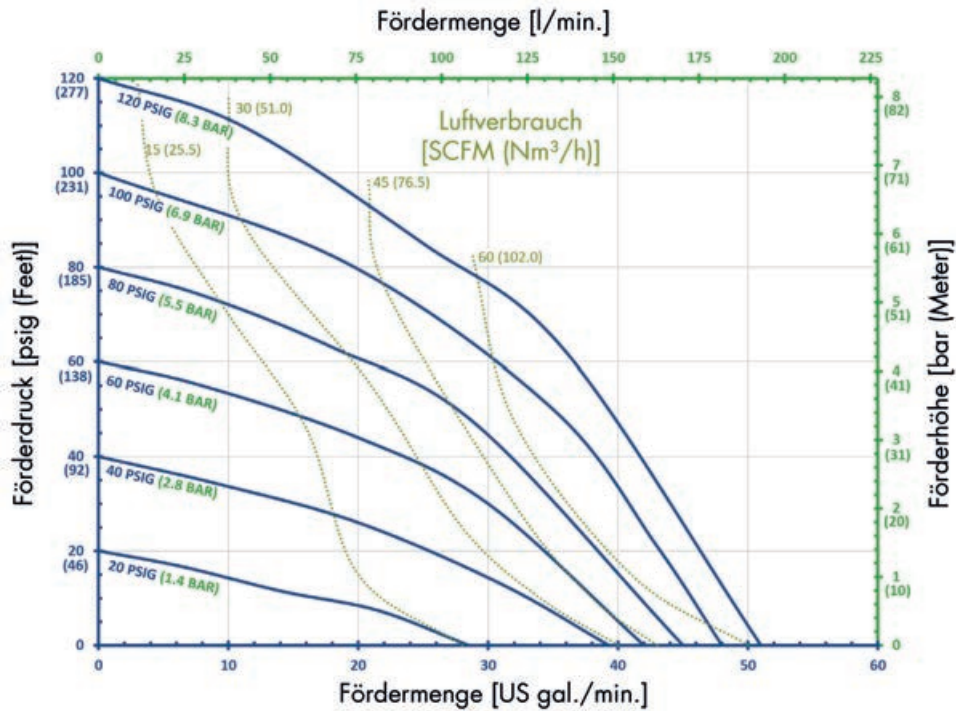
| Material | Chemical composition | Description | Operating temperature | |
|-----------------|---|---|---------------------------------|------------------|
| | | | min. | max. |
| PP | Pure Polypropylene | Thermoplastic that is resistant to alkali and strong acids. | 0°C (32°F) | 70°C (158°F) |
| PVDF | Pure Polyvinylidene Fluoride | Strong fluoropolymer with excellent chemical resistance. | -12°C (10°F) | 104°C (220°F) |
| Stainless Steel | 316 Stainless Steel | Excellent chemical resistance, high tensile and impact strength, abrasion resistant. | Limited by other materials used | |
| Aluminium | ADC 12, LM24, LM25 | Moderate chemical resistance with good impact strength and abrasion resistance. | Limited by other materials used | |
| Buna | Acrylonitrile-butadiene Rubber | General purpose elastomer. Resistant to oil, water, solvent, and hydraulic fluid. | -12°C (10°F) | 88°C (190°F) |
| EPDM | Ethylene Propylene Diene Rubber | Good resistance to mild acids, detergents, alkalis, ketones, and alcohols. | -40°C (-40°F) | 121°C (250°F) |
| FKM | Fluorocarbon Rubber | Good chemical resistance and high temperature properties. Resistant to most acids, aliphatic, aromatic, and halogenated hydrocarbons, oils, grease, and fuels. | -40°C (-40°F) | 177°C (350°F) |
| Neopren | Chloroprene Rubber | General purpose elastomer with good resistance to moderate chemicals, oils, grease, solvents, and some refrigerants. | -18°C (0°F) | 100°C (212°F) |
| Santopren | Fully cured EPDM rubber particles encapsulated in a polypropylene (PP) matrix | Thermoplastic elastomer with good abrasion resistance with chemical resistance to a wide range of solvents and chemicals. Injection molded with no fabric layer. | -40°C (-40°F) | 107°C (225°F) |
| Hytrell | Thermoplastic polyester elastomer | Combines resistance and flexibility of elastomers with the strength of plastics. Resistant to acids, bases, amines, and glycols. Injection molded with no fabric layer. | -29°C (-20°F) | 104°C (220°F) |
| PU | Polyester Urethane | Thermoplastic that exhibits excellent abrasion resistance. Injection molded with no fabric layer. | 0°C (32°F) | 66°C (150°F) |
| PTFE | Polytetrafluoroethylene | Chemically inert. Resistant to a wide range of chemicals. | 4°C (40°F) | 107°C (225°F) |
| FEP | Fluorinated Ethylene Propylene | Similar to PTFE in composition and chemical resistance. Used to encapsulate FKM o-rings for superior chemical resistance. | -40°C (-40°F) | 107°C (225°F) |

PERFORMANCE DATA

Air operated diaphragm pump AP10 (Metal)

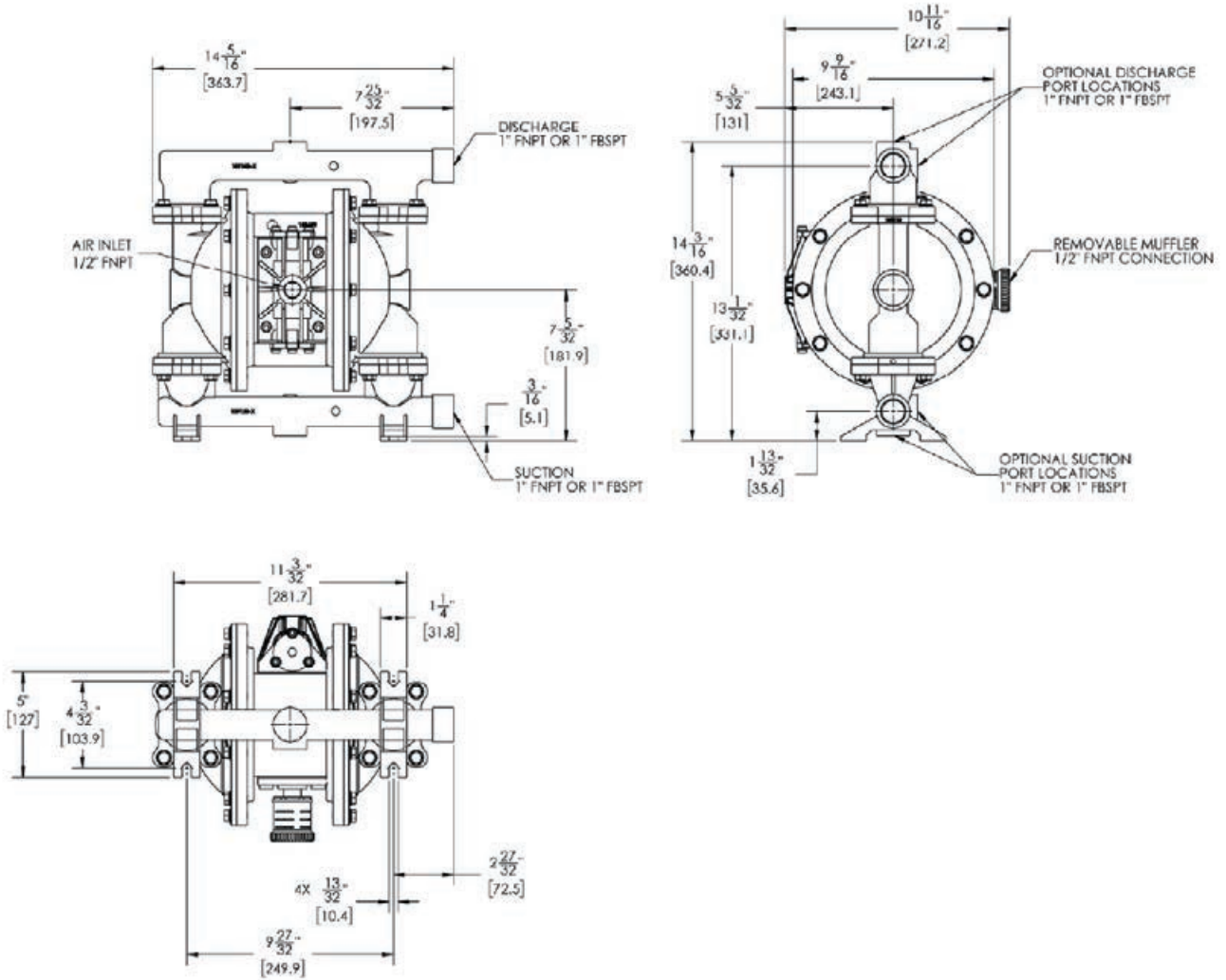
| | | | |
|--------------------------|--|------------------------------|--|
| Max Flow Rate: | 193 Litre/min. (51 gal/m) | Suction/Discharge Size: | 1" FBSP or FNPT |
| Displacement Per Stroke: | 0,32 Litre (0.084 gal) | Air Inlet/Exhaust Size: | ½" FNPT |
| Max Outlet Pressure: | 8,3 bar (120 psig) | Air Consumption @ 6,9 bar: | 144 Nm ³ /h (85 scfm) |
| Max Particle Size: | 0,7 bar (10 psig) | Max Material Inlet Pressure: | 8,3 bar (120 psig) |
| Noise Level: | 6,4 mm (0.25") | Max Air Inlet Pressure: | 77 dB(A) |
| Max Suction Lift (Water) | dry: 5,5 mWC (18 ft.) wet: 8,5 mWC (28 ft.) | Weight: | Aluminium: 15,5 kg (34.2 lbs) Stainless st.: 22,1 kg (48.7 lbs) |

CHARACTERISTIC CURVES

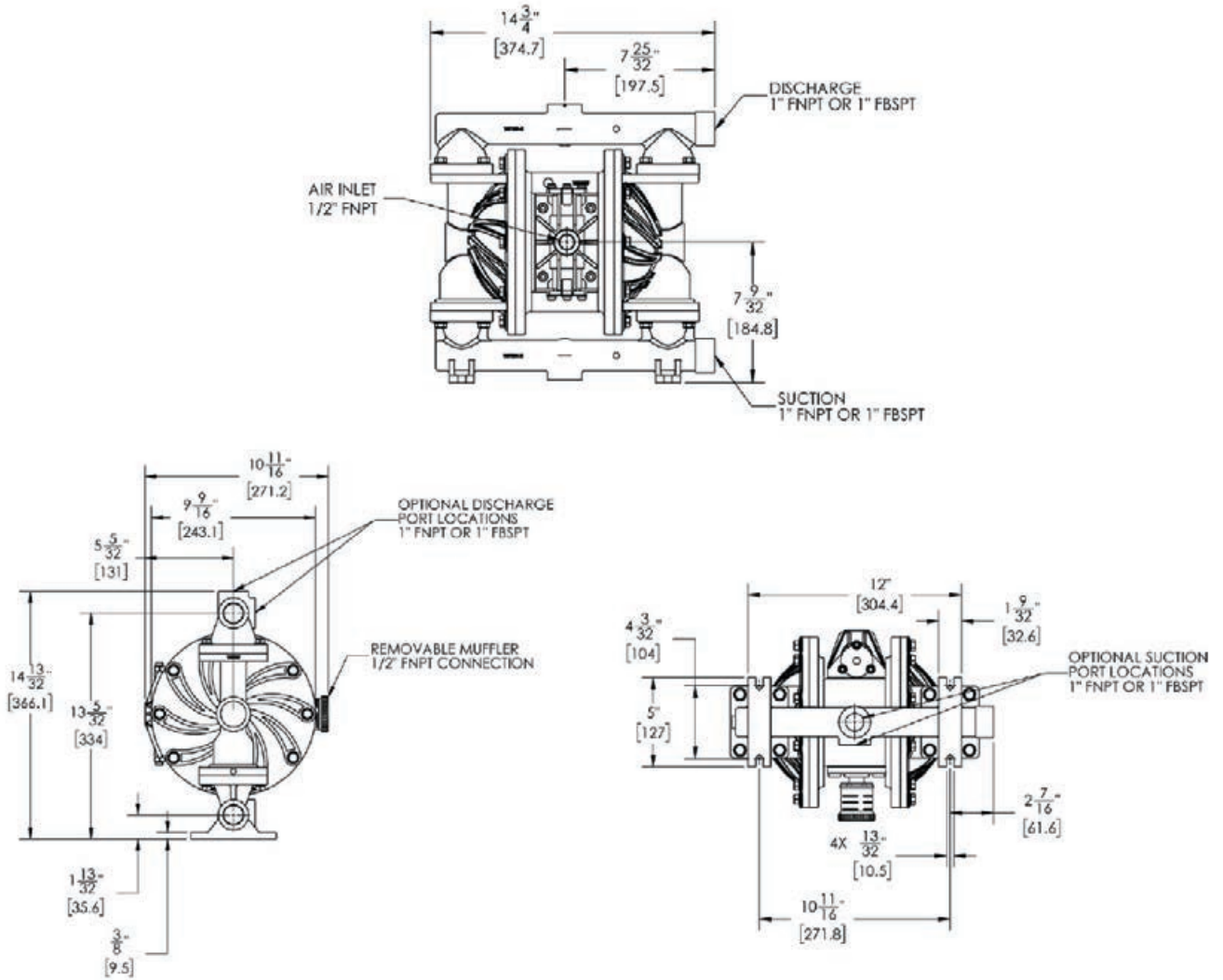


DIMENSIONS

Stainless steel

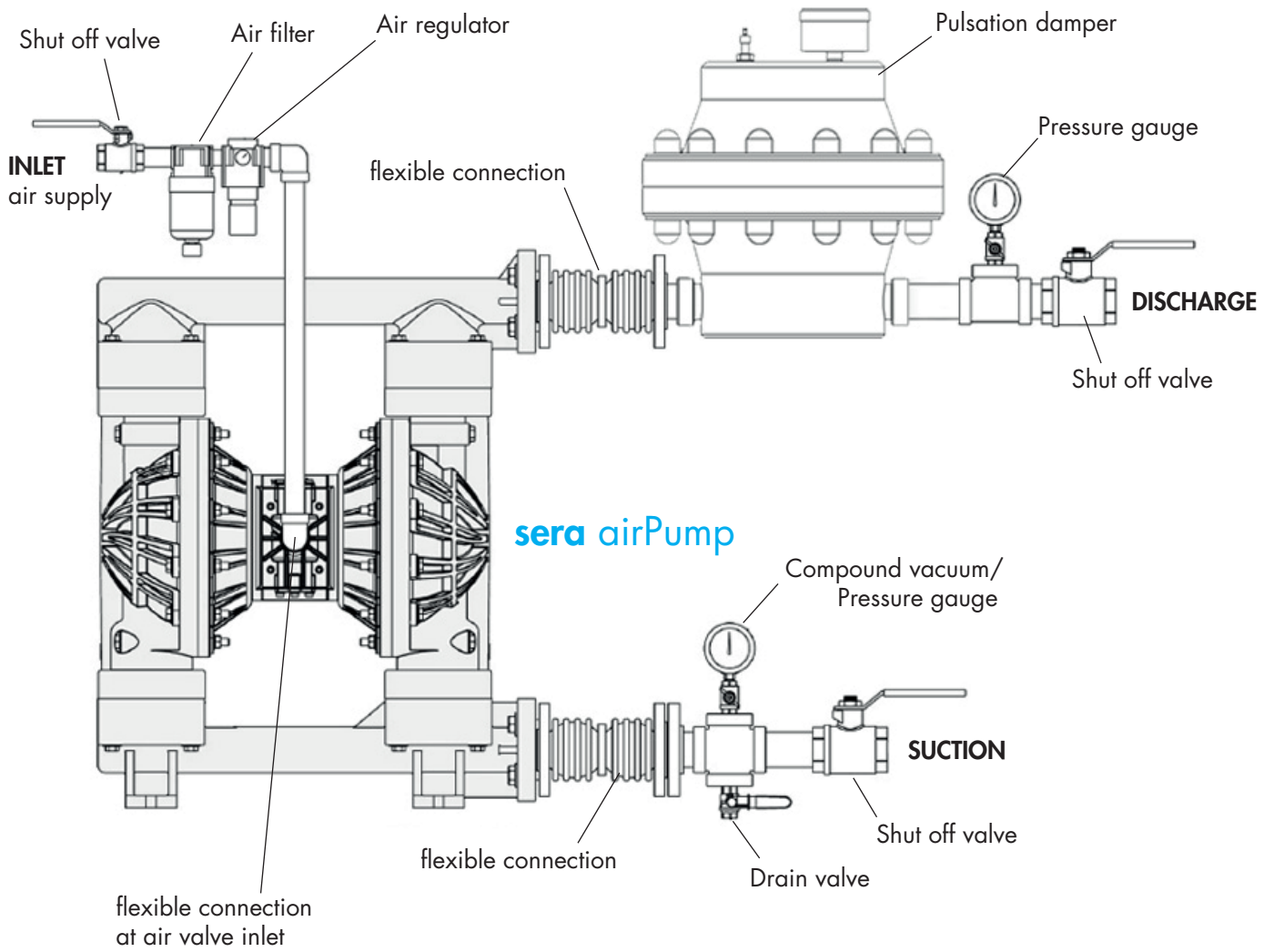


Aluminium



INSTALLATION/OPERATION

INSTALLATION DRAWING



INSTALLATION / START UP

Installation and Start up

Install the pump in a vertical position or it may not prime properly. Pump should be located as close to the product being pumped as possible. Suction line length should be as short as possible and limit the number of fittings. Suction line di-iameter should not be reduced smaller than the suction diameter of the pump. When using rigid pipe run short sections of flexible hose or flexible connections between the pump & piping. Secure the pump to a suitable surface.

Air Supply

Connect the pump air inlet to an air supply with sufficient capacity to achieve desired performance. A pressure regulating valve should be installed to insure air supply pressure does not exceed recommended limits.

Air Valve Lubrication

No lubrication is required for the air distribution system.

Fasteners

Re-torque all fasteners before operation. Creep of housing and gasket materials may cause fasteners to loosen. Re-torque all fasteners to the torque specifications listed on the exploded view drawing in this manual.

Air Inlet & Priming

Pump will start to operate as soon as the shut-off valve is opened. It is recommended to open the shut-off valve slowly at first. Once the pump primes; the shut-off valve can be opened additionally to increase the pump's flow. If the pump is operating but not pumping any liquid see the troubleshooting section for tips & suggestions.

Accessories

Surge suppressors, spill stops & filter regulators are available and should be used with **sera airPUMP**.

TROUBLESHOOTING TIPS AND SUGGESTIONS

PUMP WILL NOT START OR CYCLE:

- Blocked liquid pipe or hose - Clean out or replace
- Clogged liquid chamber - Remove debris
- Diaphragm shaft bushing / o-ring leak - Replace o-rings
- Air valve carrier not shifting - Inspect, clean, re-oil with 10 wt. air tool oil. (aluminum air valve)
- Air valve carrier not shifting - Inspect, replace seals (polypropylene air valve)

ERRATIC CYCLING:

- Diaphragm failure - Replace diaphragm
- Valve ball not seating properly, worn or damaged – Inspect, remove debris or replace
- Leak in suction line - Inspect, repair or replace
- Diaphragm shaft bushing / o-ring leak - Replace o-rings
- Air valve carrier not shifting - Inspect, clean, re-oil with 10 wt. air tool oil. (aluminum air valve)
- Air valve carrier not shifting - Inspect, replace seals (polypropylene air valve)
- Over lubrication in air valve - Inspect, degrease, reuse. Adjust lubrication
- Excess moisture in air valve – Inspect, dry, reuse. Consider installing an air dryer
- For aluminum air valves, worn carrier or valve bore – measure carrier and valve bore, diametrical clearance should be between 0,05 - 0,088mm. Replace worn components as needed
- For plastic air valves, worn carrier seals – replace carrier seals if there is no longer interference between seals and valve bore

PUMP CYCLES BUT WILL NOT PUMP:

- Too much suction lift - Reduce suction lift or fill liquid chambers with liquid
- Leak in suction line - Inspect, repair or replace
- Valve ball not seating properly, worn or damaged - Inspect, remove debris or replace
- Clogged suction pipe or hose - Inspect & clear
- Clogged strainer if used - Inspect & clear
- Diaphragm failure - Replace diaphragm

PUMPED LIQUID RELEASED FROM AIR EXHAUST:

- Diaphragm failure - Replace diaphragm
- Outer plate unthreading - Tighten & re-torque

MAINTENANCE

Recommended tools for servicing pump

- Box wrench (13mm)
- Socket wrenches (30mm (2x))
- Snap ring pliers
- Hex wrenches (5mm, 6mm and 8mm)
- O-Ring pick
- Torque wrench

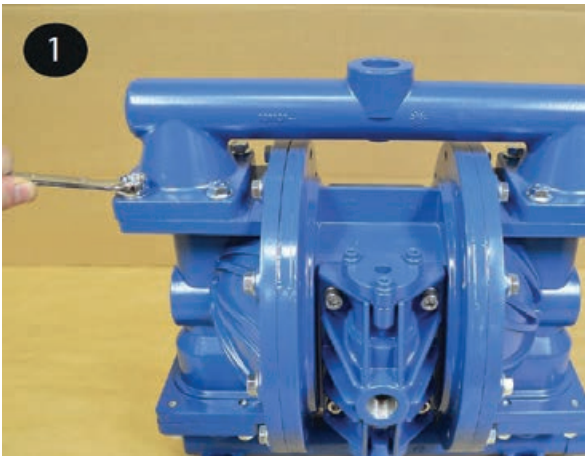
Wet End Servicing (Installing Wet End Kit)

- Relieve airline pressure and fluid line pressures before conducting maintenance.
- The pump can be drained by turning it upside down and allowing fluid to drain into an appropriate container. Use proper safety equipment when conducting maintenance as internal components may still contain the pumped media.
- Lubricate all stainless steel to stainless steel fasteners to prevent galling.
- Torque values listed in the back of this manual (see page 24).

DISASSEMBLY

1)

Remove the (8) discharge manifold bolts (item 11) from the discharge manifold (item 32) using a 13mm (or ½") wrench.



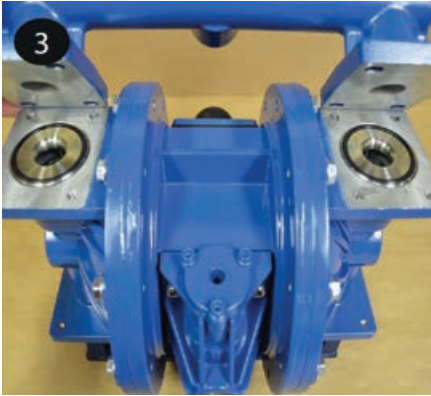
2)

The discharge seat o-rings, valve seats and valve balls (items 13, 14, & 15) can now be accessed and replaced if needed.



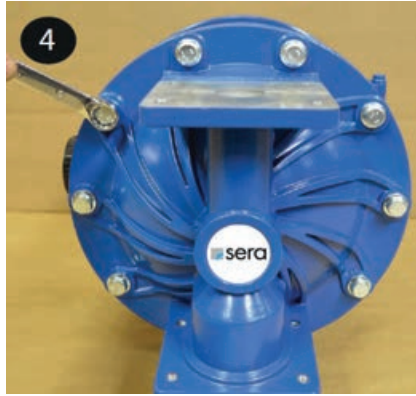
3)

Repeat the above steps for the suction manifold (item 12). The seat o-rings, valve seats and valve balls (items 13, 14, & 15) are located in the liquid chambers (item 17).



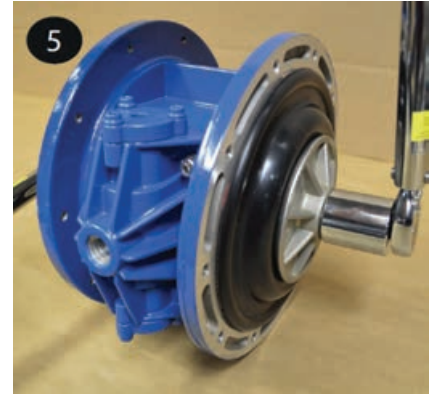
4)

Remove both liquid chambers (item 17) by removing the (10) bolts (item 16) on each liquid chamber using a 13mm (or 1/2") wrench. Inspect and replace diaphragms if needed.



5)

To remove the diaphragms (items 20/ 21), begin by loosening the (2) outer plates (item 18) using 2-30mm wrenches. Use 6-sided sockets or wrenches to prevent damage to the hex portion of the outer plate.



6)

Remove the outer plate, diaphragm(s), and inner plate (items 18, 20/21 & 22) from the side that is loosened. Pull or push the shaft (item 27) and remaining plates and diaphragms out of the center section. If pulling, it may be easier to grip the diaphragm if it is inverted.



7)

To remove the remaining diaphragm(s) (items 20/21) and plates (items 18 & 22) from the shaft (item 27), place the shaft in a vise fitted with soft jaws. Using a 6-sided 30mm wrench, remove the remaining diaphragm(s) and plates.

Soft jaws are required to prevent damaging the shaft. A damaged shaft will result in accelerated o-ring wear. Jaws can be fitted with wood, plastic, rubber, or other soft material to prevent shaft damage.



After performing required maintenance, the pump can be reassembled. The pump can also be reassembled using the disassembly instructions in the reverse order as listed above. For detailed assembly instructions, follow the steps in the Wet End Reassembly section beginning on the following pages.

MOUNTING

1)

Slide the center hole of one diaphragm (item 21) over the cast/threaded bolt of an outer plate (item 18). The air side of the diaphragm is labeled and should face away from the outer plate.

If the pump is fitted with PTFE diaphragms (item 20), first place a PTFE diaphragm over the cast/threaded bolt of the outer plate (item 18). Then place the backup diaphragm (item 21) on the outer plate. The shape of the PTFE diaphragm and back up diaphragm should roughly conform to one another. See the exploded view drawing for proper orientation.



2)

Place the inner plate (item 22) over the cast/threaded bolt. Ensure the round recess in the plate faces the diaphragm (item 21).
Note: Diaphragms in this image are inverted for ease of assembly in step 6.



3)

Apply a couple drops of a medium strength thread locker, such as Loctite® 246, to the cast/threaded outer plate bolt (item 19). Thread the shaft (item 27) onto the bolt until it is snug to the flat back side of the inner plate (item 22).



4)

The shaft (item 27) and shaft o-rings (item 26) should retain the lubricant that was factory applied. If they appear dry, apply a light coat of lithium thickened grease. Avoid over lubrication as it can cause decreased performance of the air distribution system.



5)

Push the shaft (item 27) through the center of the shaft bushing (item 24). It is normal for this to be a tight fit, especially if the shaft and shaft o-rings (item 26) are in good condition.



6)

The other diaphragm(s) (items 20/21) and inner/outer plates (items 18 & 22) can be installed onto the opposite end of the shaft (item 27). It may be easier to thread the bolt into the shaft if the diaphragm(s) is inverted on one or both sides. This can be done by hand.



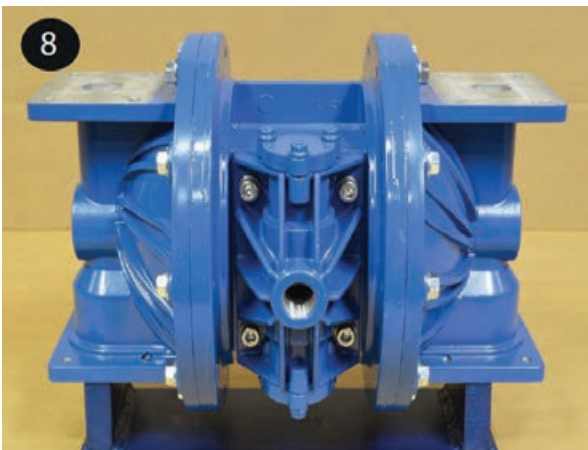
7)

Tighten and torque the outer plates (item 18). If the pump is fitted with PTFE diaphragms (item 20), it is necessary to restrict their ability to rotate when tightening the outer plates. This can be done by threading the liquid chamber bolts (item 16) through the PTFE diaphragm holes and into the center section (item 28) on each side. This will ensure that the PTFE diaphragm does not obstruct the bolts ability to thread into the center section when the liquid chambers are installed. Remove these bolts once the outer plates are torqued.



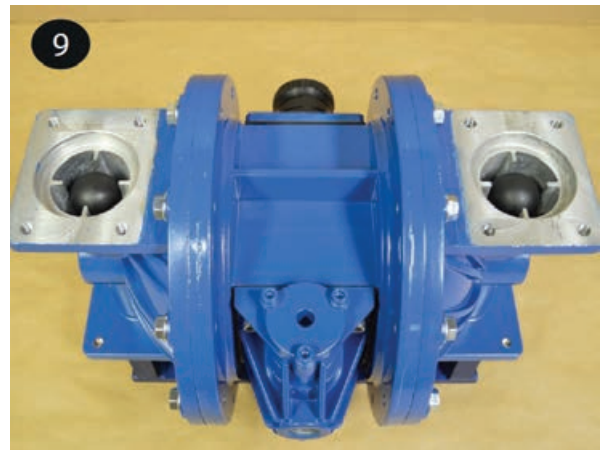
8)

Install the liquid chambers (item 17) by placing one side over the diaphragm. Start all bolts (item 16) before tightening and torquing. Torque all fasteners in a star pattern. Repeat to install the second liquid chamber. Ensure both chambers are orientated the same and that the inlet and outlet ports are vertical when facing the front of the pump as shown.



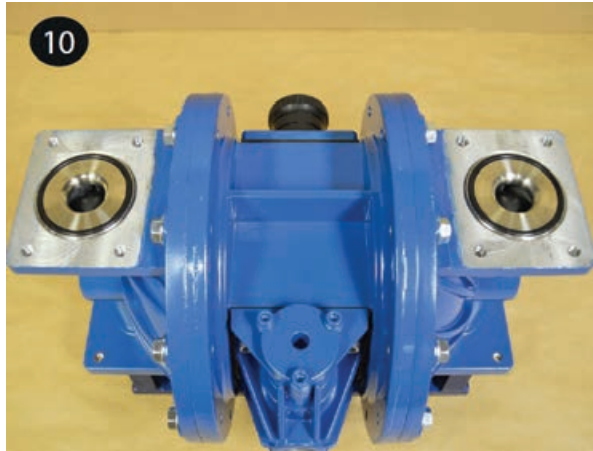
9)

Flip the pump upside down and drop the suction valve balls (item 15) into the liquid chamber (item 17) ball cages.



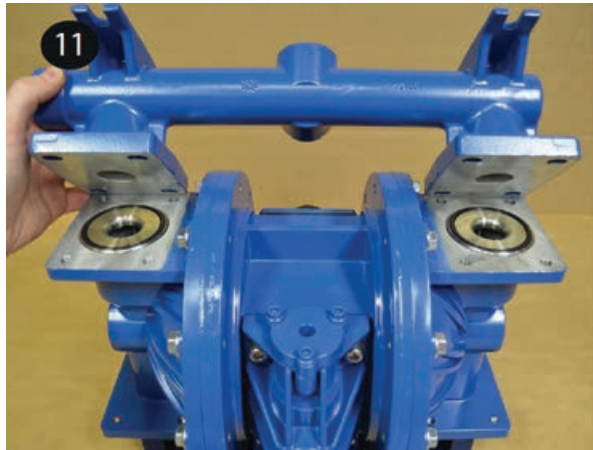
10)

Install the valve seat o-rings (item 13) into both sides of the valve seat (item 14). Install the valve seats into the liquid chambers. Valve seats are symmetrical.



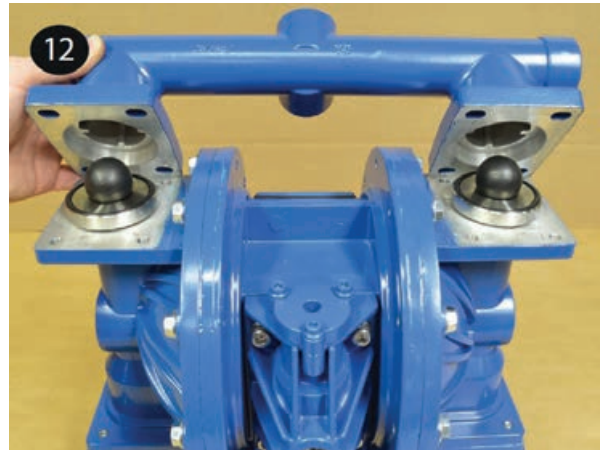
11)

Place the suction manifold atop the pump. Install, tighten, and torque the (8) manifold bolts (item 11).



12)

Stand the pump upright onto the suction manifold feet (item 12). Install the valve seat o-rings (item 13) into both sides of the valve seats (item 14). Place the valve seats on top of the liquid chambers (item 17), followed by the valve balls (item 15) on top of the valve seats. The valve seats are symmetrical. Place the manifold atop the pump, over the components that are stacked on top of the liquid chambers. Install, tighten and torque the manifold bolts (item 11).



AIR END SERVICING (INSTALLING AIR END KIT)

- Follow steps 1 – 7 in the Wet End Servicing disassembly section to access the shaft bushing (item 24) and o-rings (items 23 & 26), then follow steps below.

SHAFT, BUSHING AND O-RING REPLACEMENT

1)

Remove the shaft bushing retaining ring (item 25) and push the shaft bushing out of the center section.



2)

Use the supplied grease packets to lightly grease the OD and ID o-rings (items 23 & 26) that come preinstalled in the new shaft bushing supplied in air end kits. Insert the shaft bushing into the center section (item 28) and reinstall the retaining ring.



3)

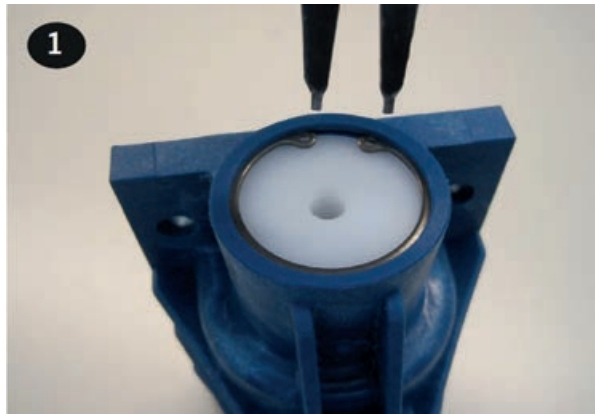
Inspect the shaft (item 27) for damage. It is common for shafts to become grooved during service. Grooving is normally caused by carbonized oil and/or abrasive foreign material getting trapped between the seal and the shaft. Over time, deep grooves can form in the shaft. When that occurs, it is recommended that the shaft be replaced.



After determining if the condition of the shaft is acceptable, follow steps 5 – 12 in the Wet End Servicing – Wet End Reassembly section to rebuild the rest of the pump.

AUSTAUSCH DES/DER LUFSTEUERVENTIL O-RING(E)

1)
Plastic Air Valve
To replace the valve cap o-ring remove the retaining ring (item 8), then pull the valve cap (item 6) straight up. The use of an M8 bolt, vise grip, and pry bars may be necessary. See 1 and 1A pictures below.



2)
Plastic Air Valve
Remove and replace o-rings (item 5). Insert cap (item 6) and push down until groove for the retaining ring is visible. Install retaining ring. Make sure to lubricate the o-rings prior to inserting into the valve body with a compatible lubricant.



1)
Aluminium Air Valve
To replace the valve cap o-rings (item 5), remove the (3) button head cap screws (item 7) using a 5mm hex wrench.



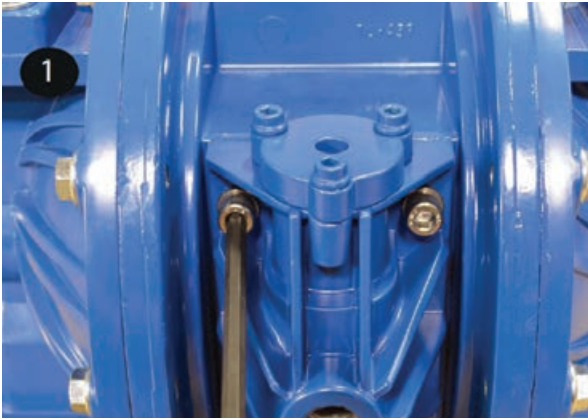
2)
Aluminium Air Valve
Remove and replace o-ring (item 5). Install cap (item 6), tighten, and torque the valve cap screws (item 7). Repeat for the remaining cap.



VALVE AND MUFFLER GASKET REPLACEMENT

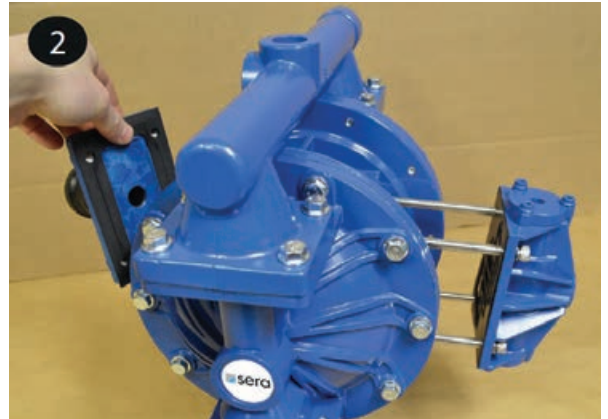
1)

Remove the valve body (item 3) by removing the four socket head cap screws (item 1) that attach the valve body to the muffler plate (item 31) with a 6mm hex wrench.



2)

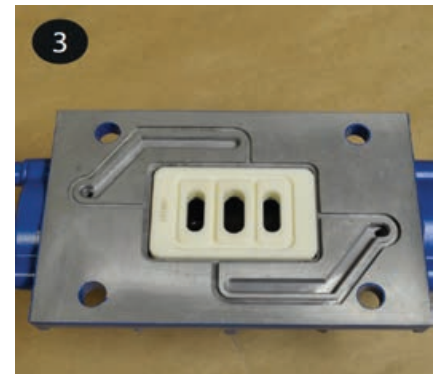
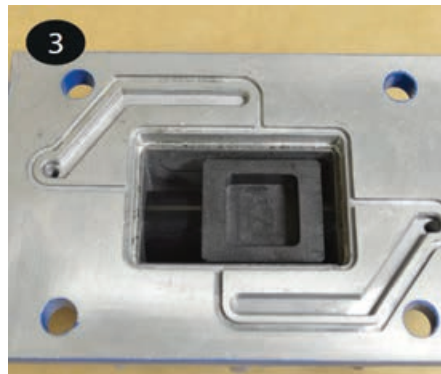
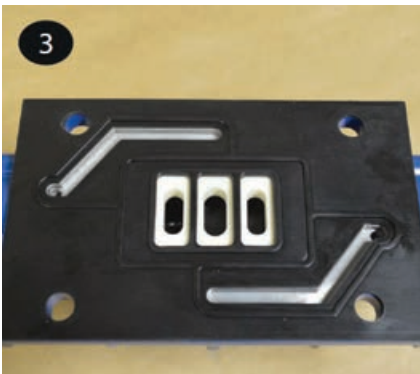
Pull the valve body and gasket (items 3 & 30) off the front of the center section (item 28) and the muffler plate gasket, muffler plate and muffler (items 29, 31, & 33) off the back.



3)

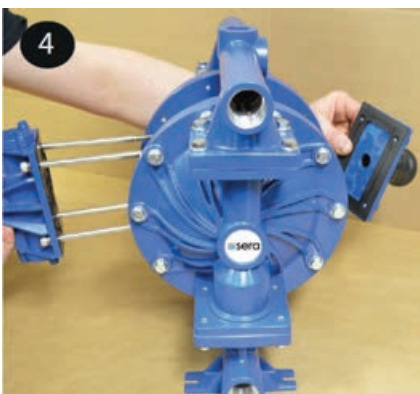
Place the new gasket (item 30) on the air valve (item 3) and ensure the slots in the gasket align with the slots in the air valve and valve plate (item 10).

Air Valve Slide, Plate & Gasket Orientation: If the valve plate (item 10) and slide valve (item 9) are removed, ensure they are installed in the proper orientation. The flat face of the slide valve sits in the pocket of the valve carrier (item 4) so that the square cut out on the slide valve faces the smooth polished side of the valve plate



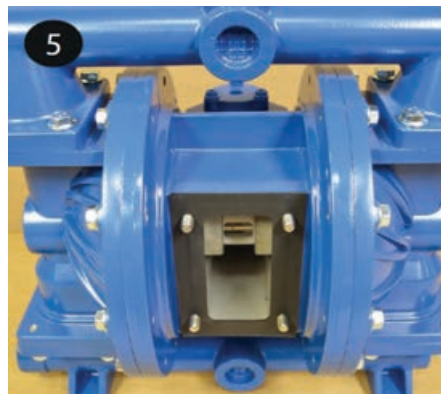
4)

Insert the four cap screws & washers (items 1 & 2) through the valve body and gasket (items 3 & 30) and place onto the center section (item 28). Ensure the slide valve and valve plate (items 9 & 10) are in place and the valve sits flat on the center section.



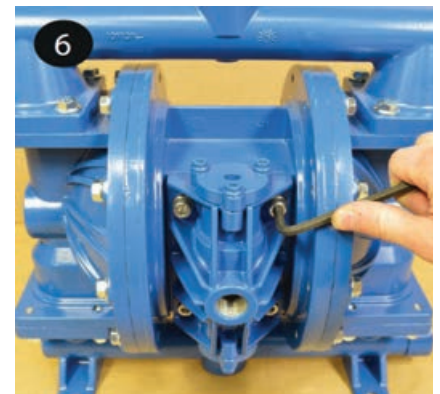
5)

Place the muffler gasket (item 29) over the (4) cap screws (item 1) on the back side of the center section (item 28) followed by the muffler plate and muffler (items 31 & 33).



6)

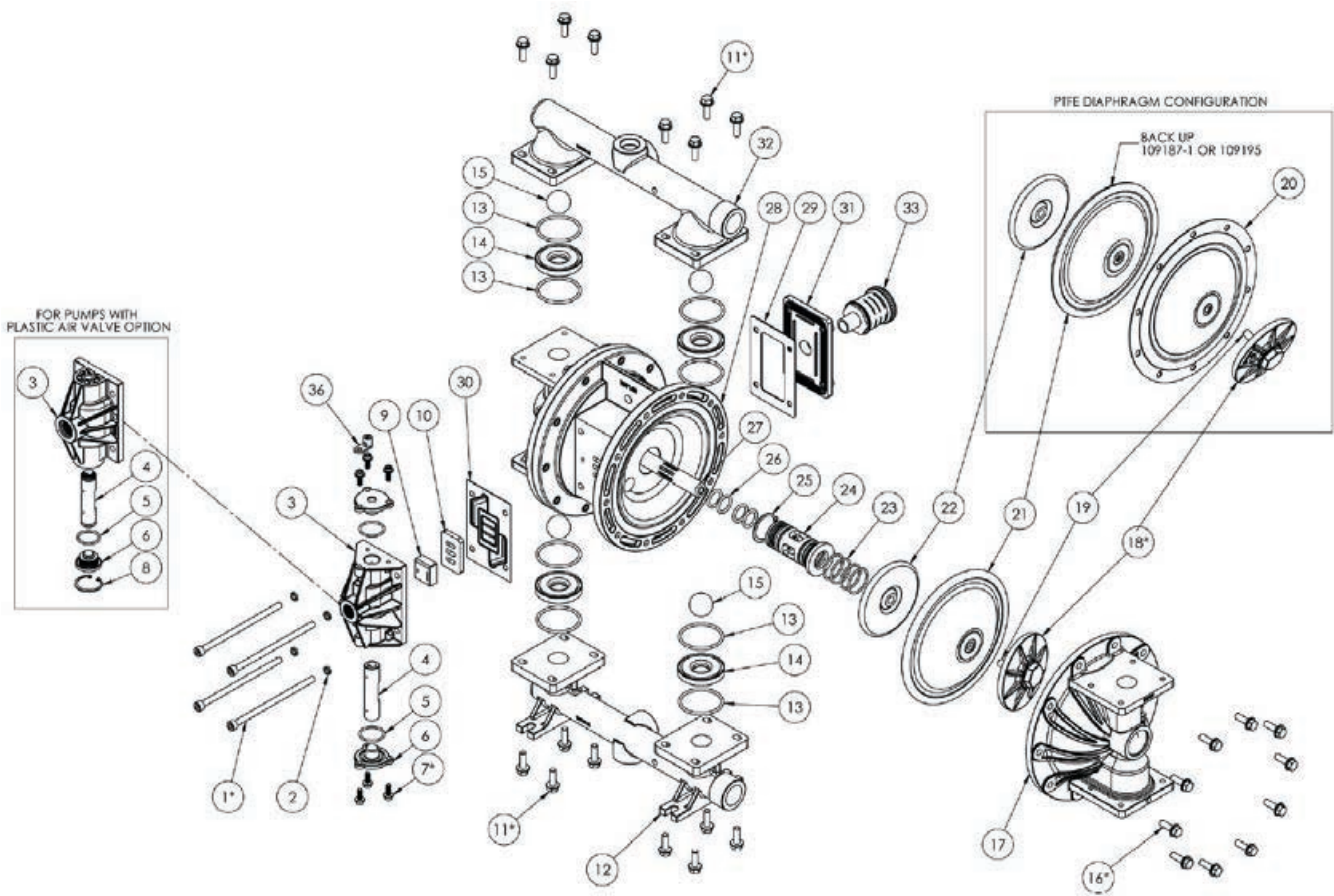
Tighten and torque the four cap screws into the muffler plate.



REPLACEMENT AIR VALVE KIT INSTALLATION

- 1) Remove the valve that is to be replaced by removing the four socket head cap screws with a 5mm hex wrench that attaches the valve body to the muffler plate.
- 2) Save the four four cap screws, four lock washers, muffler plate, and muffler. All other valve components can be discarded.
- 3) Remove the packing tape that holds the air valve components in place during shipping.
- Follow steps 3 – 6 in the Valve and Muffler Gaskets section of Air End Servicing above.

EXPLODED VIEW AND SPARE PARTS LIST



| Pos. | Description | Material | Part-No. | Qty. | Set |
|------|-----------------------------|----------|--------------------------------------|------|-------------|
| 3 | Luftsteuerventil | | siehe Tabellen für Luftsteuerventile | | V1/V2 |
| 4 | Ventilkolben | | siehe Tabellen für Luftsteuerventile | | V1/V2 |
| 5 | O-Ring (f. Ventildeckel) | | siehe Tabellen für Luftsteuerventile | | A1/A2/V1/V2 |
| 6 | Ventildeckel | | siehe Tabellen für Luftsteuerventile | | V1/V2 |
| 9 | Steuerschieber | | 109258 | 1 | V1/V2 |
| 10 | Ventilplatte | | 109262 | 1 | V1/V2 |
| 12 | Saugstutzen, Aluminium | | siehe Tabelle für Saugstutzen | | — |
| | Saugstutzen, Edelstahl, FDA | | | | |

| Pos. | Description | Material | Part-No. | Qty. | Set |
|------|----------------------------|-----------------------|--------------------------------|------|-------------|
| 13 | O-Ring (für Ventilsitz) | Buna | 109307 | 8 | W |
| | | EPDM | 105078 | | |
| | | Neoprene | 109312 | | |
| | | FKM | 105077 | | |
| | | PTFE, FDA | 109317 | | |
| | | FEP-ummantelt, FDA | 109601 | | |
| 14 | Ventilsitz | Aluminium | 109337 | 4 | W |
| | | Edelstahl, FDA | 109241 | | |
| | | PTFE, FDA | 109225 | | |
| 15 | Ventilkugel | Neoprene | 109204 | 4 | W |
| | | Buna | 109208 | | |
| | | EDPM | 109212 | | |
| | | FKM | 109216 | | |
| | | PTFE, FDA | 109200 | | |
| | | Santoprene | 109220 | | |
| | | Edelstahl | 109369 | | |
| | | PTFE (gewichtet), FDA | 109378 | | |
| 17 | Flüssigkeitskammer | Neoprene | 109767-9 | 2 | – |
| | | Buna | 109767-10 | | |
| 18 | Membranteller (außen) | Aluminium | 109160 | 2 | – |
| | | Edelstahl | 109164 | | |
| 20 | Membrane | PTFE, FDA | 109183 | 2 | – |
| 21 | Membrane | Neoprene | 109187-1 | 2 | – |
| | | Buna | 109187-2 | | |
| | | EPDM | 109187-3 | | |
| | | FKM | 109187-4 | | |
| | | Santoprene | 109195 | | |
| | | Santoprene, FDA | 109195-1 | | |
| | | Hytrel | 109191 | | |
| | | Hytrel, FDA | 109191-1 | | |
| 22 | Membranteller (innen) | Aluminium | 109169 | 2 | – |
| | | Edelstahl | 109716 | | |
| | | | | | |
| 23 | O-Ring (f. Führungsbuchse) | | 109416 | 4 | A1/A2 |
| 24 | Führungsbuchse | | 109179 | 1 | A1/A2 |
| 25 | Sicherungsring | | 109468 | 1 | A1/A2 |
| 26 | O-Ring (f. Kolbenstange) | | 109423 | 4 | A1/A2 |
| 27 | Kolbenstange | | 109174 | 1 | – |
| 28 | Mittelblock | Aluminium | 109459 | 1 | – |
| | | PP-GFK | 109150 | | |
| 29 | Dichtung (Schalldämpfer) | | 109427 | 1 | A1/A2/V1/V2 |
| 30 | Dichtung (Lufsteuerventil) | | 109266 | 1 | A1/A2/V1/V2 |
| 31 | Schalldämpferplatte | Standard | 109270 | 1 | – |
| | | ATEX | 109270-1 | 1 | – |
| 32 | Druckstutzen | Aluminium | siehe Tabelle für Druckstutzen | | – |
| | | Edelstahl | siehe Tabelle für Druckstutzen | | – |

airPUMP AP10 (metal)

| Pos. | Description | Material | Part-No. | Qty. | Set |
|------|-------------------|-----------------|---------------------|------|-----|
| 33 | MUFFLER | Standard | 109562 | 1 | – |
| | | ATEX | 109700 | 1 | – |
| 35 | PIPE PLUG | Stainless steel | SEE MANIFOLD TABLES | | |
| 36 | GROUNDING LUG | | 108091 | 1 | – |
| 37 | SHIM | PU | SEE MANIFOLD TABLES | | – |
| 41 | SPLIT FLANGE HALF | | SEE MANIFOLD TABLES | | – |

KIT COLUMN KEY:

- W** PARTS SUPPLIED IN A WET SIDE KITS
- A1** PARTS SUPPLIED IN PLASTIC VALVE AIR END KIT 109673
- A2** PARTS SUPPLIED IN ALUMINUM VALVE AIR END KIT 109595
- V1** PARTS SUPPLIED IN PLASTIC REPLACEMENT VALVE KIT 111247
- V2** PARTS SUPPLIED IN ALUMINUM REPLACEMENT VALVE KIT 109589

| AP10 with air valve PP-GFK | | | | |
|----------------------------|----------------------------|----------|------|-------|
| Pos. | Description | Part-No. | Qty. | Set |
| 3 | VALVE BODY, GFRPP | 109250 | 1 | V1 |
| 4 | VALVE CARRIER WITH SEALS | 109654 | 1 | V1 |
| 5 | VALVE CAP O-RING | 109646 | 1 | A1/V1 |
| 6 | VALVE CAP, DELRIN | 109274 | 1 | V1 |
| 8 | RETAINING RING, HO-137SSTL | 109647 | 1 | V1 |

| AP10 with air valve Aluminium | | | | |
|-------------------------------|---------------------------|-----------|------|-------|
| Pos. | Description | Part-No. | Qty. | Set |
| 3 | VALVE BODY, ALUMINUM | s.Pos. 34 | 1 | V2 |
| 4 | VALVE CARRIER, ALUMINUM | 109453 | 1 | V2 |
| 5 | VALVE CAP O-RING | 109415 | 2 | A2/V2 |
| 6 | VALVE CAP, ALUMINUM | s.Pos. 34 | 2 | V2 |
| 7 | CAP SCREW, M6X1.0X16 MM | 109513 | 6 | V2 |
| 34 | CONTAINS Pos. 3,4,5,6 & 7 | 109592 | 1 | V2 |

Maximum Torque Settings AP10 (metal design)

Asterisk (*) from the exploded view diagram indicates fasteners to be torqued. Stainless Steel to Stainless Steel fasteners should be lubricated to prevent galling. A Plus sign (+) on the above torque values indicates a lubricated fastener.

| design: Aluminium | |
|-------------------|--------------------|
| Pos. | Torque |
| 1 | 10 Nm (89 in-lbs) |
| 7 | 8 Nm (71 in-lbs) |
| 11 | 20 Nm (177 in-lbs) |
| 16 | 20 Nm (177 in-lbs) |
| 18 | 56 Nm (496 in-lbs) |

| design: Stainless Steel | |
|-------------------------|------------------------|
| Pos. | Torque |
| 1 | 8,5 Nm (75 in-lbs) + |
| 7 | 8 Nm (71 in-lbs) |
| 11 | 17,6 Nm (156 in-lbs) + |
| 16 | 17,6 Nm (156 in-lbs) + |
| 18 | 56 Nm (496 in-lbs) + |

Connection / Porting location:

- | | |
|---|---|
| N1 Connection: FNPT Position: side (Standard) | B1 Connection: FBSP Position: end (Standard) |
| N2 Connection: FNPT Position: center, horizontal | B2 Connection: FBSP Position: center, horizontal |
| N3 Connection: FNPT Position: center, vertical | B3 Connection: FBSP Position: center, vertical |
| N4 Connection: FNPT Position: center, vertical suction & end discharge | B4 Connection: FBSP Position: center, vertical suction & end discharge |
| F1 Connection: Flanges Position: side (Standard) | T1 Connection: 2" Tri-Clamp Position: side (Standard) |

| MANIFOLD, SUCTION (POS. 12) | | | | | | | | | | | | | | | | |
|-----------------------------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|
| | N1 | | N2 | | N3 | | N4 | | B1 | | B2 | | B3 | | B4 | |
| | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. |
| AP10 Aluminium | 109124 | 1 | 109614 | 1 | 109614-1 | 1 | 109614-1 | 1 | 109124-1 | 1 | 109614-2 | 1 | 109614-3 | 1 | 109614-3 | 1 |
| Pos.35 (not shown) | N/A | – | 109574 | 1 | 109574 | 1 | 109574 | 1 | N/A | – | 109574 | 1 | 109574 | 1 | 109574 | 1 |
| AP10 Stainless St. | 109128 | 1 | 109128 | 1 | 109614-4 | 1 | 109614-4 | 1 | 109128-1 | 1 | 109128-1 | 1 | 109614-5 | 1 | 109614-5 | 1 |
| Pos.35 (not shown) | 109574 | 1 | 109574 | 1 | 109574 | 2 | 109574 | 2 | 109575 | 1 | 109575 | 1 | 109575 | 2 | 109575 | 2 |

| MANIFOLD, SUCTION (POS. 12) | | | | |
|-----------------------------|----------|------|-----------|------|
| | F1 | | T1 | |
| | Part-No. | Qty. | Part-No. | Qty. |
| AP10 Aluminium | N/A | – | N/A | – |
| Pos.35 (not shown) | N/A | – | N/A | – |
| AP10 Stainless St. | 109128F | 1 | 109128-10 | 1 |
| Pos.35 (not shown) | 109574 | 1 | 109574 | 1 |

| MANIFOLD, DISCHARGE (POS. 32) | | | | | | | | | | | | | | | | |
|-------------------------------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|
| | N1 | | N2 | | N3 | | N4 | | B1 | | B2 | | B3 | | B4 | |
| | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. | Part-No. | Qty. |
| AP10 Aluminium | 109139 | 1 | 109613 | 1 | 109613-1 | 1 | 109139 | 1 | 109139-1 | 1 | 109613-2 | 1 | 109613-3 | 1 | 109139-1 | 1 |
| Pos.35 (not shown) | N/A | – | 109574 | 1 | 109574 | 1 | N/A | – | N/A | – | 109575 | 1 | 109575 | 1 | N/A | – |
| AP10 Stainless St. | 109143 | 1 | 109143 | 1 | 109613-4 | 1 | 109143 | 1 | 109143-1 | 1 | 109143-1 | 1 | 109613-5 | 1 | 109143-1 | 1 |
| Pos.35 (not shown) | 109574 | 1 | 109574 | 1 | 109574 | 2 | 109574 | 2 | 109575 | 1 | 109575 | 1 | 109575 | 2 | 109575 | 2 |

| MANIFOLD, DISCHARGE (POS. 32) | | | | |
|-------------------------------|----------|------|-----------|------|
| | F1 | | T1 | |
| | Part-No. | Qty. | Part-No. | Qty. |
| AP10 Aluminium | N/A | – | N/A | – |
| Pos.35 (not shown) | N/A | – | N/A | – |
| AP10 Stainless St. | 109143F | 1 | 109143-10 | 1 |
| Pos.35 (not shown) | 109574 | 1 | 109574 | 1 |

Note: Open, unused ports must be sealed with pipe plugs (item 35). Order if not reusing existing plugs.

| AP10 Aluminium „CONNECTING ELEMENTS“ | | | |
|--------------------------------------|---------------------------------------|---------------------------------------|------|
| Pos. | Description | Part-No. | Qty. |
| 1 | CAP SCREW, SOCKET HD M8X1.25 X 150MM | 109496 | 4 |
| 2 | WASHER, LOCK M8 HIGH-COLLAR | 109493 | 4 |
| 11 | CAP SCREW, HEX HD FLNG M8X1.25 X 25MM | 109483 | 16 |
| 16 | CENTER SECTION (28) Aluminium: | CAP SCREW, HEX HD FLNG M8X1.25 X 25MM | 20 |
| | CENTER SECTION (28) PP-GFK: | CAP SCREW, HEX HD FLNG M8X1.25 X 30MM | |

| AP10 Stainless steel „CONNECTING ELEMENTS“ | | | |
|--|--|----------|------|
| Pos. | Description | Part-No. | Qty. |
| 1 | CAP SCREW, SOCKET HD M8X1.25 X 150MM SS | 109521 | 4 |
| 2 | WASHER, LOCK M8 HIGH-COLLAR SS | 109518 | 4 |
| 11 | CAP SCREW, HEX HD FLNG M8X1.25 X 25MM SS | 109506 | 16 |
| 16 | CAP SCREW, HEX HD FLNG M8X1.25 X 20MM SS | 109506 | 20 |
| 19 | DOUBLE END STUD M10X1.5X35 | 109522 | 2 |
| 38 | WASHER, FLAT 5/16" SS | 110614 | 8 |
| 39 | CAP SCREW, HEX HD 5/16"-18X1-3/4" SS | 107532 | 4 |
| 40 | NUT, HEX 5/16"-18 SS | J101257 | 4 |

Original

Business name and full address of the manufacturer:

sera GmbH, sera-Straße 1, D - 34376 Immenhausen

Name and address of the person authorised to compile the technical file:

Sabine Morell, sera-Straße 1, D – 34376 Immenhausen

Description and identification of the machinery:

Air-operated diaphragm pump for dosing fluids for industrial applications.

| | |
|-----------------------------|----------------------------|
| airPUMP ½" AP05 AI Santo | airPUMP ½" AP05 AL PTFE |
| airPUMP ½" AP05 316SS Santo | airPUMP ½" AP05 316SS PTFE |
| airPUMP 1" AP10 AI Santo | airPUMP 1" AP10 AL PTFE |
| airPUMP 1" AP10 316SS Santo | airPUMP 1" AP10 316SS PTFE |
| airPUMP 1½" AP15 AI Santo | airPUMP 1½" AP15 AL PTFE |
| airPUMP 1½" AP15 SS Santo | airPUMP 1½" AP15 SS PTFE |
| airPUMP 2" AP20 AI Santo | airPUMP 2" AP20 AI PTFE |
| airPUMP 2" AP20 316SS Santo | airPUMP 2" AP20 PTFE |
| airPUMP 3" AP30 AI Santo | airPUMP 3" AP30 AI PTFE |
| airPUMP 3" AP30 316SS | airPUMP 3" 316SS PTFE |

The machinery fulfils all the relevant provisions of this Directive:

2006/42/EC Machinery

Where appropriate, harmonised standards used:

EN ISO 12100:2010

Place and date of the declaration: Immenhausen, 23.06.2021

Identity and signature of the person empowered to draw up the declaration on behalf of the manufacturer or his authorised representative:

The signature is a handwritten name in blue ink, appearing to read 'i. Morell', written over a blue stamp.
sera GmbH
34376 Immenhausen
S. Morell
Quality Management

NOTES

FOLLOW US



sera GmbH

sera-Str. 1
34376 Immenhausen
Germany
Tel. +49 5673 999 00
Fax +49 5673 999 01
info@sera-web.com
www.sera-web.com