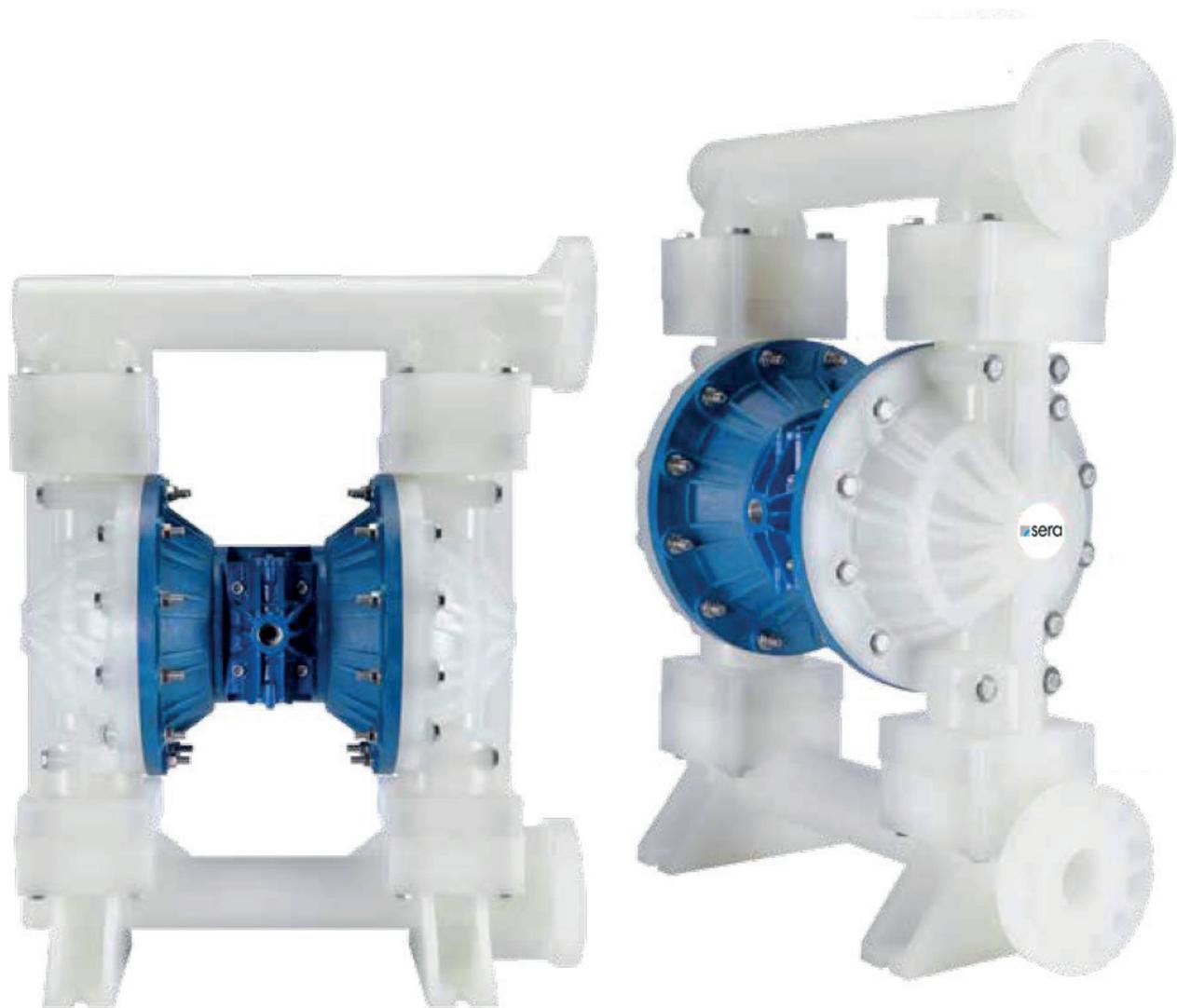


AIR OPERATED DIAPHRAGM PUMP

**airPUMP AP20** (*plastic design*)





**TABLE OF CONTENT**

- IMPORTANT INFORMATION .....4**
  - Export Information ..... 4
  - Chemical Reaction Disclaimer..... 4
  - Unpacking & Inspection ..... 4
- SAFETY PRECAUTIONS.....4**
- MATERIAL SPECIFICATION .....7**
  - Material Profiles.....7
  - Dimensions..... 8
  - Characteristic curves ..... 8
  - Performance data ..... 9
- INSTALLATION/OPERATION .....9**
  - Installation Drawing ..... 9
  - installation / Start up..... 10
  - Troubleshooting Tips and Suggestions..... 11
- MAINTENANCE .....12**
  - Recommended tools for servicing pump ..... 12
  - Wet End Servicing (Installing Wet End Kit)..... 12
    - Disassembly ..... 12
    - Mounting ..... 14
  - Air End Servicing (Installing Air End Kit)..... 18
    - Shaft, Bushing and O-ring Replacement ..... 18
    - Air Valve O-Ring Replacement ..... 20
    - Valve and Muffler Gasket Replacement ..... 21
    - Replacement Air Valve Kit Installation ..... 22
  - Exploded View and Spare Parts List..... 22
- CLEARANCE CERTIFICATE .....26**
- DECLARATION OF CONFORMITY.....27**

## 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



### 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**

Never use a natural polypropylene or natural PVDF pump with flammable or combustible fluids/materials.

**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**

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.

**CAUTION**

Before attaching air supply to pump to make sure all airline debris is clear. It is recommended to use a minimum 5 $\mu$  (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 and longest service life.

 CAUTION

Check the temperature limits for all wetted components when choosing pump materials. See table below.

## 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<br>(32°F)                   | 70°C<br>(158°F)  |
| PVDF            | Pure Polyvinylidene Fluoride  | Strong fluoropolymer with excellent chemical resistance.  | -12°C<br>(10°F)                 | 104°C<br>(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<br>(10°F)                 | 88°C<br>(190°F)  |
| EPDM            | Ethylene Propylene Diene Rubber   | Good resistance to mild acids, detergents, alkalis, ketones, and alcohols.  | -40°C<br>(-40°F)                | 121°C<br>(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<br>(-40°F)                | 177°C<br>(350°F) |
| Neopren         | Chloroprene Rubber  | General purpose elastomer with good resistance to moderate chemicals, oils, grease, solvents, and some refrigerants.  | -18°C<br>(0°F)                  | 100°C<br>(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<br>(-40°F)                | 107°C<br>(225°F) |
| Hytrel          | 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<br>(-20°F)                | 104°C<br>(220°F) |
| PU              | Polyester Urethane  | Thermoplastic that exhibits excellent abrasion resistance. Injection molded with no fabric layer.   | 0°C<br>(32°F)                   | 66°C<br>(150°F)  |
| PTFE            | Polytetrafluoroethylene   | Chemically inert. Resistant to a wide range of chemicals.   | 4°C<br>(40°F)                   | 107°C<br>(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<br>(-40°F)                | 107°C<br>(225°F) |



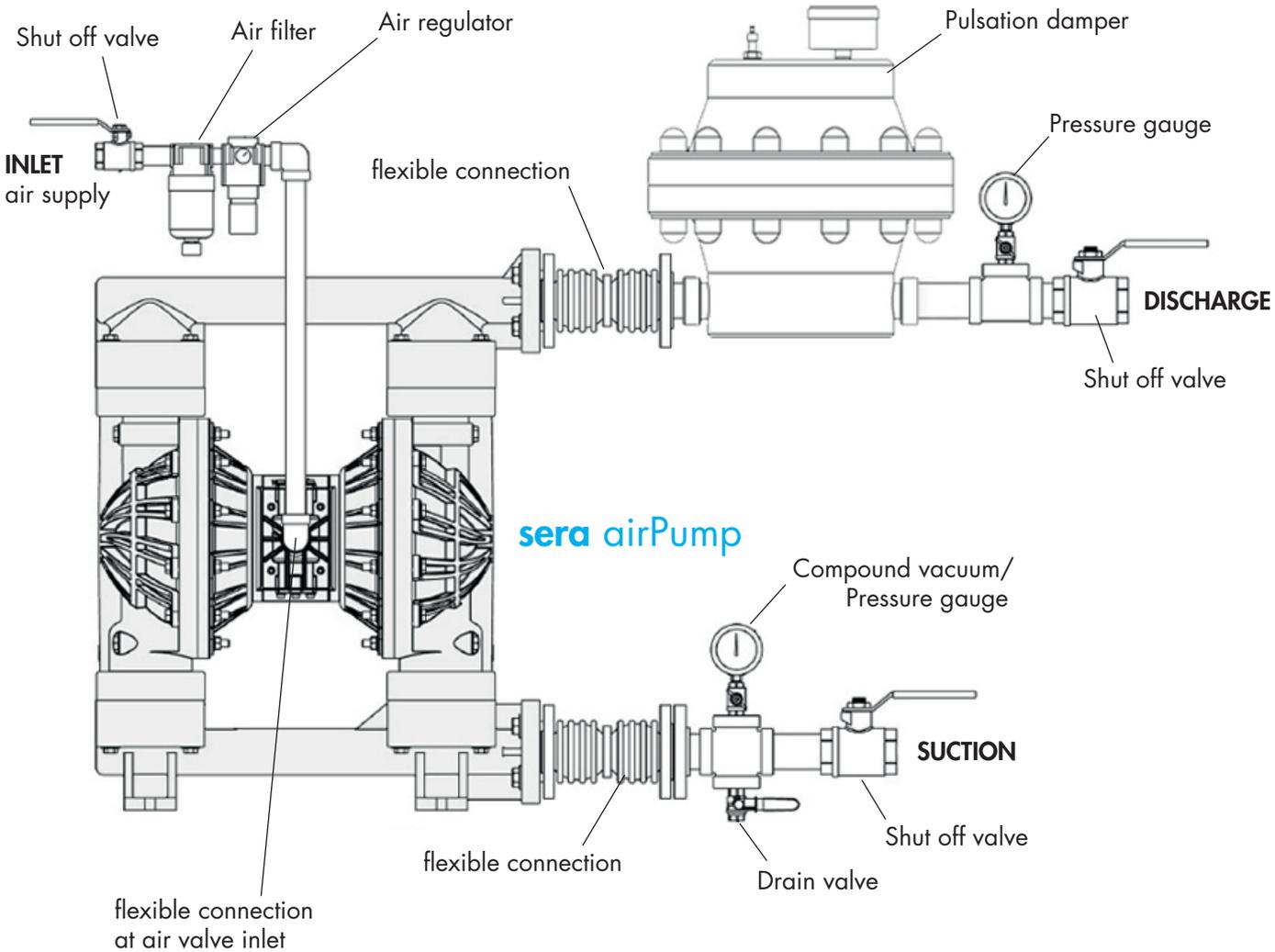
**PERFORMANCE DATA**

**Druckluftmembranpumpe AP20 (Kunststoff)**

|                        |                            |                              |                                   |
|------------------------|----------------------------|------------------------------|-----------------------------------|
| Max. Fördermenge       | 583 Liter/min. (154 gal/m) | Anschluss Saug-/Druckseite:  | 2" ANSI/DIN/ISO Flansch           |
| Verdrängung je Hub     | 1,2 Liter (0.31 gal)       | Anschluss Luft Ein-/Auslass: | ¾" FNPT                           |
| Max. Ausgangsdruck     | 6,9 bar (100 psig)         | Luftverbrauch bei 6,9 bar:   | 170 Nm <sup>3</sup> /h (100 scfm) |
| Max. Vordruck          | 0,7 bar (10 psig)          | Max. Eingangsluftdruck:      | 6,9 bar (100 psig)                |
| Max. Feststoffgröße    | 8,9 mm (0.35")             | Schallpegel:                 | 77 dB(A)                          |
| Max. Saughöhe (Wasser) | trocken:                   | 2,8 mWS (9,3 ft.)            | Gewicht:                          |
|                        | nass:                      | 8,5 mWS (28 ft.)             |                                   |

**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 diameter 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 wrenches (13mm, 15mm and 17mm)
- 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)

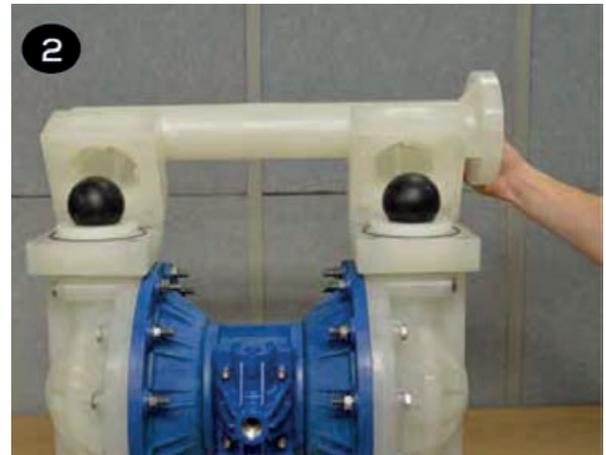
- Relieve airline pressure and fluid line pressures before conducting maintenance.
- The pump can be drained by turning it upside down and allowing fluid to drain into an appropriate container. Use proper safety equipment when conducting maintenance as internal components may still contain the pumped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

## DISASSEMBLY

**1)**  
Remove the eight discharge manifold bolts & washers (items 11 & 12) from the discharge manifold (item 39) using a 17 mm wrench.

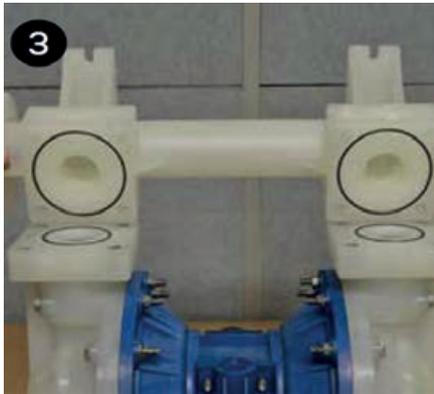


**2)**  
The discharge seat o-rings, valve seats, and valve balls (items 14, 15, 16, & 17) can now be accessed and replaced if needed.



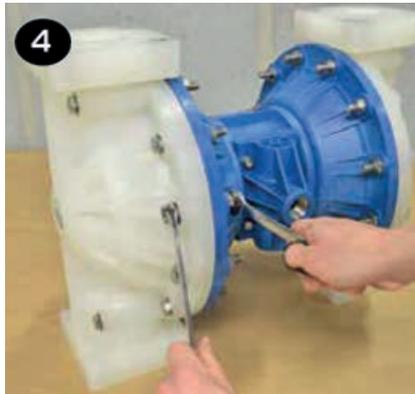
3)

Repeat the above steps for the suction manifold (item 13). The seat o-rings, valve seats and valve balls (items 14, 15, 16, & 17) are located in the liquid chambers (item 19).



4)

Remove both liquid chambers by removing the (12) bolts, washers & nuts (items 11, 12, 18 & 27) on each liquid chamber using a 17mm wrench and nuts can be removed using a 15mm wrench. Inspect and replace diaphragms if needed.



5)

To remove the diaphragms (items 21/22), begin by loosening the two outer plates (item 20) using two 30 mm 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 20, 21/22 & 23) from the side that is loosened. Pull or push the shaft (item 32) 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 21/22) and plates (items 20 & 23) from the shaft (item 32), place the shaft in a vise. Using a 6-sided 30 mm wrench, remove the remaining diaphragm(s) and plates.



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 „MOUNTING“ beginning on page 14.

**MOUNTING**

**1)**  
Slide the center hole of one diaphragm (item 22) over the molded-in bolt of an outer plate (item 20). The air side of the diaphragm is labeled and should face away from the plastic portion of the outer plate.

If the pump is fitted with PTFE diaphragms (item 21), first place a PTFE diaphragm over the molded in bolt of the outer plate (item 20). Then place the backup diaphragm (item 22) on the outer plate. The shape of the PTFE diaphragm and back up diaphragm should roughly conform to one another.

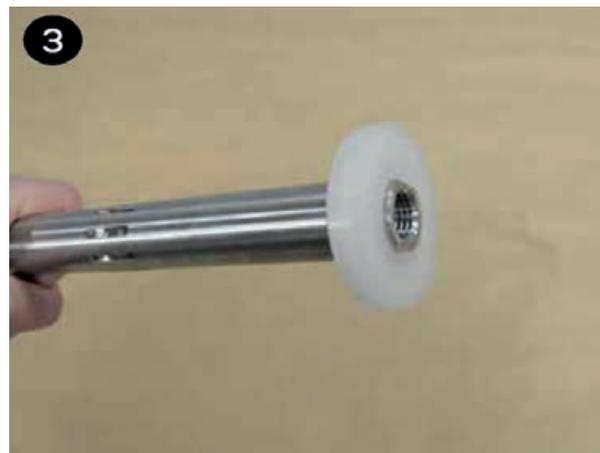
See the exploded view drawing for proper orientation.



**2)**  
Place the inner plate (item 23) over the molded-in bolt. Ensure the round recess in the plate faces the diaphragm (item 22).



**3)**  
Place the bump stop (item 31) onto one end of the shaft (item 32).



**4)**  
Apply a couple drops of a medium strength thread locker, such as Loctite® 246, to the molded in outer plate bolt (item 20). Thread the shaft (item 32) onto the molded in bolt until it is snug to the flat back side of the inner plate (item 22).



**5)**  
The shaft (item 32) and shaft o-rings (item 30) 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.



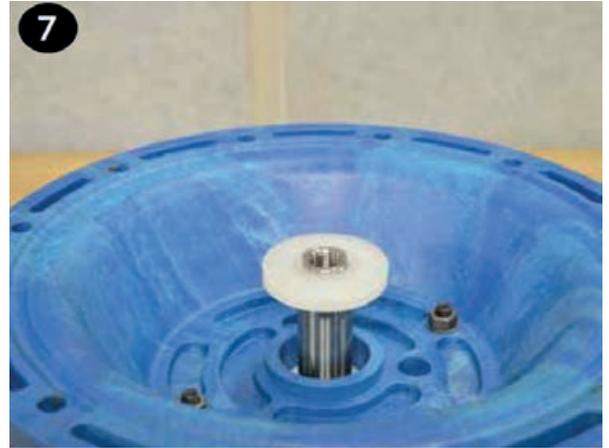
6)

Push the shaft (item 32) through the center of the shaft bushing (item 29). It is normal for this to be a tight fit, especially if the shaft and shaft o-rings (item 30) are in good condition.



7)

Place the remaining bump stop (item 31) on the other end of the shaft.



8)

It may be easier to thread the molded in bolt into the shaft if the diaphragm(s) is inverted on one or both sides. This can be done by hand.



9)

The other diaphragm(s) (items 21/22) and inner/outer plates (items 20 & 23) can be installed onto the opposite end of the shaft (item 32).



10)

Tighten and torque the outer plates (item 20). If the pump is fitted with PTFE diaphragms (item 21), it is necessary to restrict their ability to rotate when tightening the outer plates. This can be done by inserting all the liquid chamber bolts (items 12 & 18) through the PTFE diaphragm holes and into the center section (item 35) 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.



11)

Install the liquid chambers (item 19) by placing one side over the diaphragm. Start all bolts, washers & nuts (items 11, 12, 18 & 27) 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.



**Note:** When installing polytetrafluoroethylene (PTFE) diaphragms, it is important to tighten outer plates simultaneously (turning in opposite directions) to ensure tight fit.

12)

Flip the pump upside down and drop the suction valve balls (item 17) into the liquid chamber (item 19) ball cages.



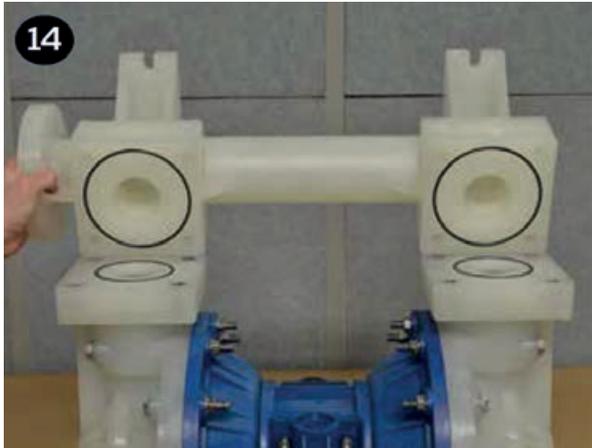
13)

Place the valve seats (item 16) into the seat counter bores of the liquid chambers (item 19). The o-ring (item 14) gland in the valve seat should be facing away from the valve ball.



**14)**

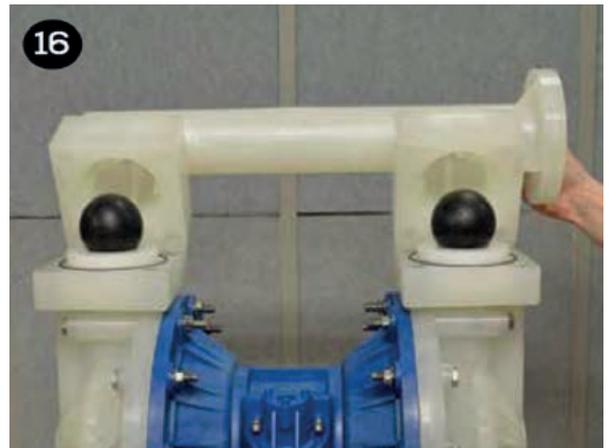
Place the manifold o-rings (item 15) into the o-ring gland on the suction manifold (item 39). Place the suction manifold atop the pump and install, tighten and torque the eight manifold bolts & washers (items 11 & 12).

**15)**

Stand the pump upright onto the suction manifold feet (item 13). Place the large o-rings (item 15) into the glands in the face of the liquid chambers (item 19) followed by the small o-ring (item 14) in the gland of the valve seats (item 16). Place the valve seats on the liquid chambers with the o-ring down against the liquid chamber.

**16)**

Place the valve balls (item 17) on the valve seats and discharge manifold (item 39) atop the components that are stacked on top of the liquid chambers. Install, tighten and torque the eight manifold bolts & washers (items 11 & 12).



**AIR END SERVICING (INSTALLING AIR END KIT)**

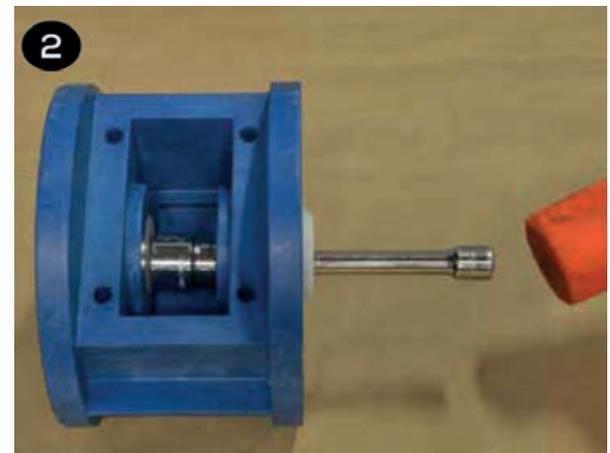
**SHAFT, BUSHING AND O-RING REPLACEMENT**

- Follow steps 1 – 7 in the Wet End Servicing disassembly section to access the shaft bushing (item 29) and o-rings (items 28 & 30).

**1)**  
Remove both air chambers by removing the four bolts and four nuts using a 13mm (or ½") wrench.



**2)**  
Remove and set aside the air valve (item 3) using a 6 mm hex wrench (see "Valve & Muffler Gasket Replacement" section for more details). The shaft bushings (item 29) can be removed by placing a large socket between the two bushings. Place an extension into the socket from one side of the center section. Tap with a rubber mallet to remove the bushing. Repeat for the remaining bushing.



**3)**  
Use the supplied grease packets to lightly grease the OD and ID o-rings (items 28 & 30) that come preinstalled in the new shaft bushings supplied in air end kits.



**3)**  
Insert both bushings into the center section. Ensure the bushing is fully installed and the large rib on the outside of the bushing is flat against the center section.



5)

Inspect the shaft (item 32) 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.



6)

After determining if the condition of the shaft is acceptable, ensure both center section o-rings (items 33 & 34) are in place on both sides of the center section.



7)

Install both air chambers (item 26) by placing one side on top of the center section (item 35). Ensure the air path hole of the center section lines up with the through hole in the air chamber. Insert the bolts & washers (items 24 & 25) through the air chamber and center section.



8)

Flip the components over and place the remaining air chamber on the center section. Thread the nuts & washers onto the bolts (items 24, 25 & 40). Tighten and torque the fasteners.



- To rebuild the rest of the pump, follow steps 5 – 16 in the Wet End Servicing – Wet End Reassembly section „MOUNTING“.

**AIR VALVE O-RING REPLACEMENT**

**1)**  
**Plastic Air Valve**  
To replace the valve cap o-ring remove the retaining ring (item 8), than unthread the valve cap (item 6) using an 8mm hex wrench.



**1)**  
**Aluminum 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. Repeat for the remaining cap.



**2)**  
**Plastic Air Valve**  
Remove and replace o-ring (item 5). Install cap (item 6) and tighten until groove for the retaining ring is visible. Install retaining ring (item 8).



**2)**  
**Aluminum 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 & lock washers (items 1 & 2) that attach the valve body to the muffler plate (item 38) with a 6mm hex wrench.



2)

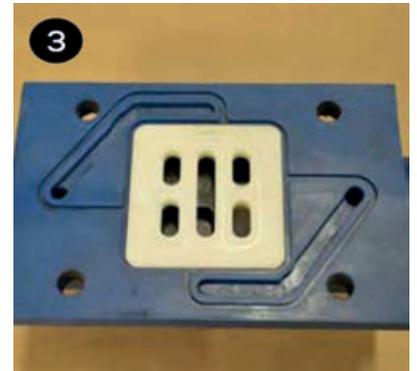
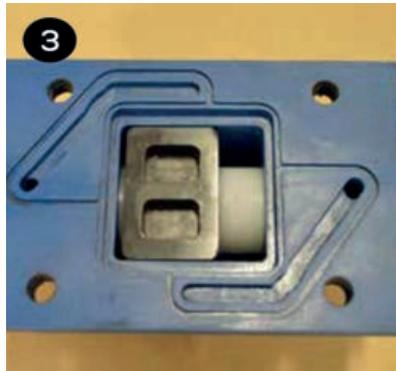
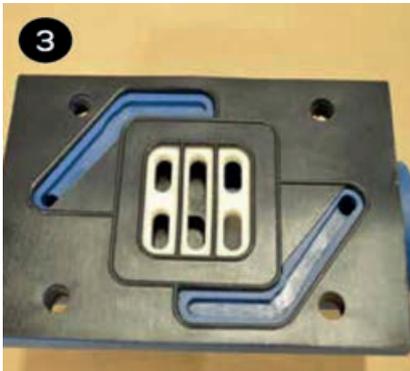
Pull the valve body and gasket (items 3 & 36) off the front of the center section (item 35) and the muffler plate gasket, muffler plate and muffler (items 37, 38 & 41) off the back.



3)

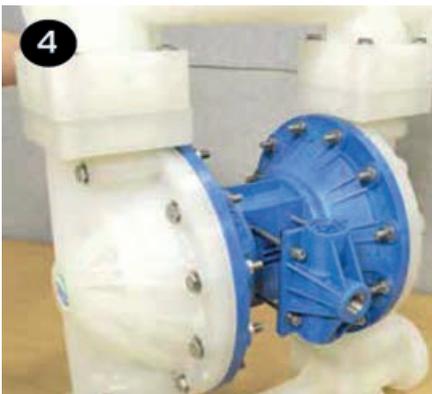
Place the new gasket (item 36) on the air valve (item 3) and ensure the slots in the gasket align with the slots in the air valve and valve plate (item 10).

**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.



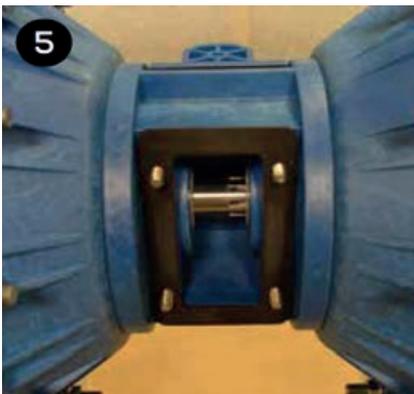
3)

Insert the cap screws (item 1) through the valve body and gasket (items 3 & 36) and place onto the center section (item 35). Ensure the slide valve and valve plate (items 9 & 10) are in place and the valve sits flat on the center section.



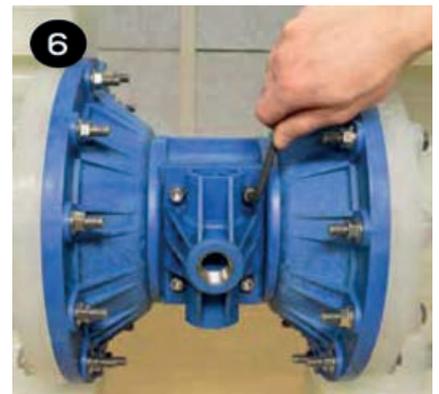
4)

Place the muffler gasket (item 37) over the cap screws & lock washers (items 1 & 2) on the back side of the center section (item 35) followed by the muffler plate and muffler (items 38 & 41).



5)

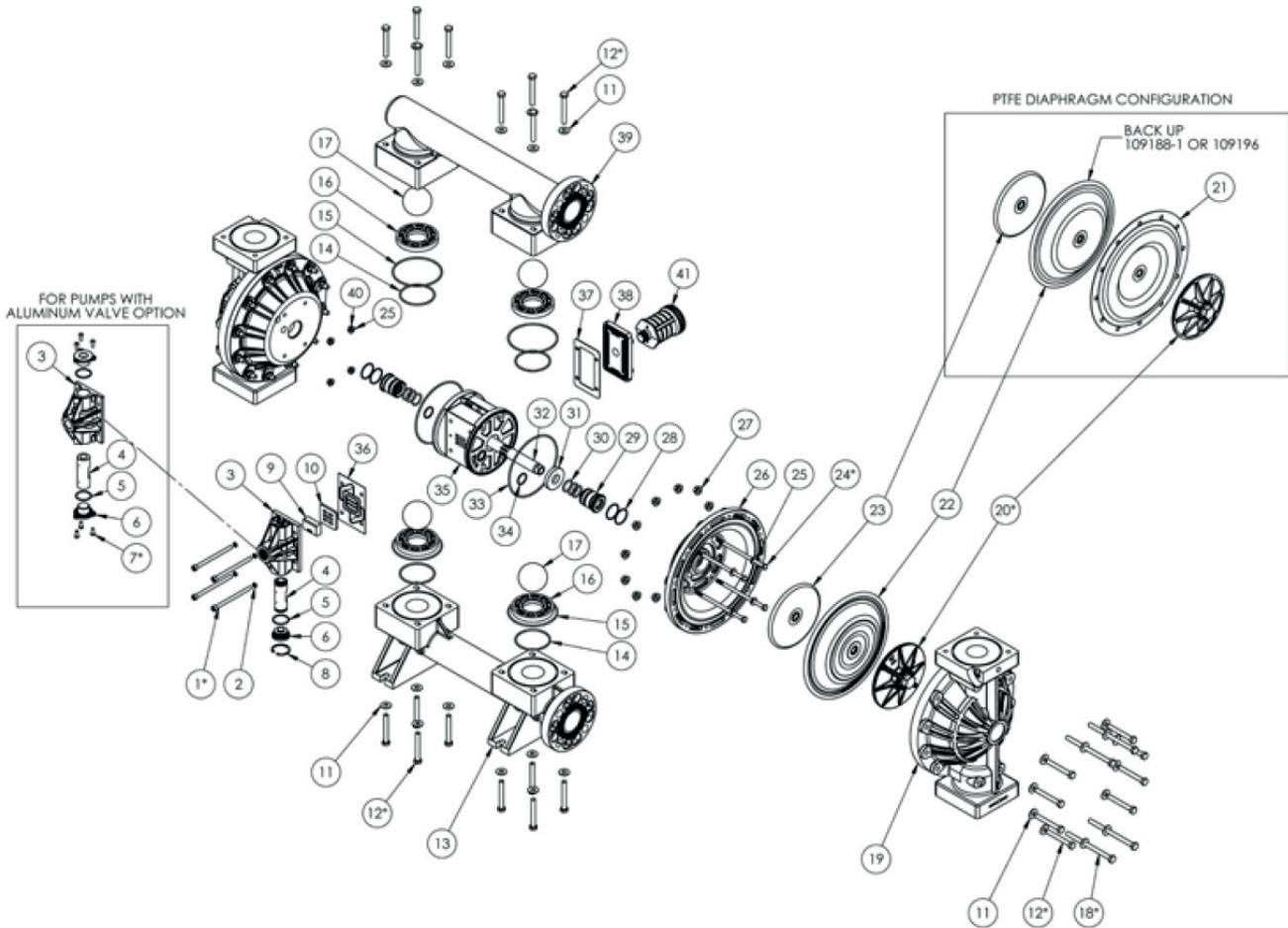
Tighten and torque the four cap screws into the muffler plate.



**REPLACEMENT AIR VALVE KIT INSTALLATION**

- 1. Remove the valve that is to be replaced by removing the (4) socket head cap screws with a 6 mm hex wrench that attaches the valve body to the muffler plate.
- 2. Save the 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         |
|------|---|----------|----------------------|------|-------------|
| 1    | CAP SCREW, SOCKET HD M8X1.25 X 120MM SS |          | 109520               | 4    | —           |
| 2    | WASHER, LOCK M8 HIGH-COLLAR SSSL        |          | 109518               | 4    | —           |
| 3    | VALVE BODY                              |          | SEE AIR VALVE TABLES |      | V1/V2       |
| 4    | VALVE CARRIER                           |          | SEE AIR VALVE TABLES |      | V1/V2       |
| 5    | VALVE CAP O-RING                        |          | SEE AIR VALVE TABLES |      | A1/A2/V1/V2 |
| 6    | VALVE CAP                               |          | SEE AIR VALVE TABLES |      | V1/V2       |
| 7    | CAP SCREW, SOCKET HD M6X1.0X16MM SS     |          | SEE AIR VALVE TABLES |      | V2          |
| 8    | RETAINING RING, HO-137 SS               |          | SEE AIR VALVE TABLES |      | V1/V2       |
| 9    | SLIDE VALVE                             |          | 109259               | 1    | V1/V2       |
| 10   | VALVE PLATE                             |          | 109263               | 1    | V1/V2       |
| 11   | WASHER, FLAT 3/8" REG. TYPE B SS        |          | 109514               | 40   | —           |

| Pos.            | Description                                 | Material                | Part-No.  | Qty. | Set   |
|-----------------|---|-------------------------|-----------|------|-------|
| 12              | CAP SCREW, HEX HD FLNG M10X1.5 X 80MM SSSL  |                         | 109515    | 32   |       |
| 13              | MANIFOLD, SUCTION                           | PP                      | 109276    | 1    |       |
|                 |   | PVDF                    | 109277    |      |       |
| 14              | O-RING, VALVE SEAT                          | Buna-N                  | 109308    | 4    | W     |
|                 |   | FKM                     | 109323    |      |       |
|                 |   | PU                      | 109537    |      |       |
|                 |   | Santoprene              | 109538    |      |       |
|                 |   | FEP-covered             | 109536    |      |       |
| 15              | O-RING, MANIFOLD                            | Buna-N                  | J104095   | 4    | W     |
|                 |   | FKM                     | J102389   |      |       |
|                 |   | PU                      | 109541    |      |       |
|                 |   | Santoprene              | 109542    |      |       |
|                 |   | FEP-covered             | 109328    |      |       |
| 16              | VALVE SEAT                                  | PP (FDA)                | 109293    | 4    | W     |
|                 |   | PVDF                    | 109298    |      |       |
| 17              | VALVE BALL                                  | Neoprene                | 109205    | 4    | W     |
|                 |   | Buna                    | 109209    |      |       |
|                 |   | EPDM                    | 109213    |      |       |
|                 |   | FKM                     | 109217    |      |       |
|                 |   | Santoprene              | 109221    |      |       |
|                 |   | Santoprene (FDA)        | 109221-1  |      |       |
|                 |   | PTFE (FDA)              | 109201    |      |       |
|                 |   | Stainless Steel         | 109370    |      |       |
| PTFE (weighted) | 109379                                      |                         |           |      |       |
| 18              | CAP SCREW, HEX HD FLNG M10X1.5 X 150MM SSSL |                         | 109516    | 8    | –     |
| 19              | LIQUID CHAMBER                              | PP (FDA)                | 109767-11 | 2    | –     |
|                 |   | PVDF                    | 109767-12 |      |       |
| 20              | OUTER PLATE                                 | PP (FDA)                | 109155    | 2    | –     |
|                 |   | PVDF                    | 109158    |      |       |
| 21              | DIAPHRAGM                                   | PTFE (requires Pos. 22) | 109184    | 2    | W     |
| 22              | DIAPHRAGM                                   | Neoprene                | 109188-1  | 2    | W     |
|                 |   | Buna-N                  | 109188-2  |      |       |
|                 |   | EPDM                    | 109188-3  |      |       |
|                 |   | FKM                     | 109188-4  |      |       |
|                 |   | Santoprene              | 109196    |      |       |
|                 |   | Santoprene (FDA)        | 109196-1  |      |       |
|                 |   | Hytrel                  | 109192    |      |       |
|                 |   | Hytrel (FDA)            | 109192-1  |      |       |
|                 |   | PU                      | 109437    |      |       |
| 23              | INNER PLATE                                 | Aluminium               | 109170    | 2    | –     |
|                 |   | Stainless Steel         | 109715    |      |       |
| 24              | CAP SCREW, M8X1.25 X 160MM                  |                         | 109473    | 4    | –     |
| 25              | WASHER, FLAT M8                             |                         | 109469    | 8    | –     |
| 26              | AIR CHAMBER                                 | PP-FRP                  | 109146    | 2    | –     |
| 27              | NUT, HEX HD FLNG M10X1.5 SSSL               |                         | 109509    | 24   | –     |
| 28              | O-RING, BUSHING OD                          |                         | 109420    | 4    | A1/A2 |

## airPUMP AP20 (plastic)

| Pos. | Description                   | Material | Part-No. | Qty. | Set         |
|------|-------------------------------|----------|----------|------|-------------|
| 29   | SHAFT BUSHING                 |          | 109180   | 2    | A1/A2       |
| 30   | O-RING, SHAFT                 |          | 109424   | 6    | A1/A2       |
| 31   | BUMP STOP                     |          | 109429   | 2    |             |
| 32   | SHAFT                         |          | 109175   | 1    |             |
| 33   | O-RING, CENTER SECTION, LARGE |          | 109434   | 2    | A1/A2       |
| 34   | O-RING, CENTER SECTION, SMALL |          | 109418   | 2    | A1/A2       |
| 35   | CENTER SECTION                | PP-FRP   | 109151   | 1    |             |
| 36   | GASKET, AIR VALVE             |          | 109267   | 1    | A1/A2/V1/V2 |
| 37   | GASKET, MUFFLER               |          | 109428   | 1    | A1/A2/V1/V2 |
| 38   | MUFFLER PLATE                 |          | 109271   | 1    |             |
| 39   | MANIFOLD, DISCHARGE           | PP (FDA) | 109280   | 1    |             |
|      |                               | PVDF     | 109281   |      |             |
| 40   | NUT, HEX HD M8X1.25           |          | 109474   | 4    |             |
| 41   | MUFFLER                       |          | 109562   | 1    |             |

### KIT COLUMN KEY

- W** PARTS SUPPLIED IN A WET SIDE KIT
- A1** PARTS SUPPLIED IN PLASTIC VALVE AIR END KIT 109674
- A2** PARTS SUPPLIED IN ALUMINUM VALVE AIR END KIT 109596
- V1** PARTS SUPPLIED IN PLASTIC REPLACEMENT VALVE KIT 109677
- V2** PARTS SUPPLIED IN ALUMINUM REPLACEMENT VALVE KIT 109590

| AP20 with air valve PP-FRP |                           |          |      |       |
|----------------------------|---------------------------|----------|------|-------|
| Pos.                       | Description               | Part-No. | Qty. | Set   |
| 3                          | VALVE BODY, GFRPP         | 109251   | 1    | V1    |
| 4                          | VALVE CARRIER WITH SEALS  | 109655   | 1    | V1    |
| 5                          | VALVE CAP O-RING          | 109644   | 1    | A1/V1 |
| 6                          | VALVE CAP, GFRPP          | 109275   | 1    | V1    |
| 8                          | RETAINING RING, HO-165 SS | 109645   | 1    | V1    |

| AP20 with air valve Aluminium |                             |           |      |       |
|-------------------------------|-----------------------------|-----------|------|-------|
| Pos.                          | Description                 | Part-No.  | Qty. | Set   |
| 3                             | VALVE BODY, ALUMINUM        | s.Pos. 42 | 1    | V2    |
| 4                             | VALVE CARRIER, ALUMINUM     | 109456    | 1    | V2    |
| 5                             | VALVE CAP O-RING            | 109416    | 2    | A2/V2 |
| 6                             | VALVE CAP, ALUMINUM         | s.Pos. 42 | 2    | V2    |
| 7                             | CAP SCREW, M6X1.0X16MM      | 109513    | 6    | V2    |
| 42                            | CONTAINS Pos. 3, 4, 5, 6, 7 | 109593    | 1    | V2    |

**Maximum Torque Settings (Plastic designs)**

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: PP or PVDF |                      |
|--------------------|----------------------|
| Pos.               | Torque               |
| 1                  | 8,5 Nm (75 in-lbs) + |
| 7                  | 8 Nm (72 in-lbs)     |
| 12                 | 38 Nm (336 in-lbs) + |
| 18                 | 38 Nm (336 in-lbs) + |
| 20                 | 95 Nm (840 in-lbs) + |
| 24                 | 20 Nm (180 in-lbs)   |

CLEARANCE CERTIFICATE

**i NOTE**  
 Inspection / repair of machines and machine parts is only carried out after the clearance certificate was filled in correctly and completely by authorized and qualified personnel.

**i NOTE**  
 Acceptance will be refused if parts are returned to the manufacturer without a proper clearance certificate.

All industrial companies are obligated by the legal provisions for occupational health, e.g. the workplaces ordinances, the Ordinance on Hazardous Substances, the regulations for prevention of accidents and the environmental protection regulations such as the Waste Management Act and the German Household Water Act to protect their employees or man and the environment from detrimental effects when handling hazardous substances.

Should special safety precautions be necessary despite careful draining and cleaning of the product the necessary information are to be provided.

Machines which are operated with radioactive media shall only be inspected and/or repaired in the safety area of the owner by a **sera** specialized fitter.

The clearance certificate is part of the inspection-/repair order.  
**sera** reserves the right to refuse acceptance of the order for other reasons.

**DOWNLOAD**

Clearance certificate

Or directly scan the QR code opposite:



Clearance Certificate

**RECIPIENT**

**sera ProDos GmbH**  
 Wareneingang z. Hd. Abt. Service  
 sera Straße 1  
 D-34376 Immenhausen/Hessen

**SENDER**

|                  |  |                    |  |
|------------------|--|--------------------|--|
| Company:         | <input style="width: 90%;" type="text"/> | Phone:             | <input style="width: 90%;" type="text"/> |
| Contact partner: | <input style="width: 90%;" type="text"/> | Fax:               | <input style="width: 90%;" type="text"/> |
| Street address:  | <input style="width: 90%;" type="text"/> | E-Mail:            | <input style="width: 90%;" type="text"/> |
| Postcode, City:  | <input style="width: 90%;" type="text"/> | Your order number: | <input style="width: 90%;" type="text"/> |

We confirm that we have entered the information in this clearance certificate (decontamination certificate) correctly and completely and that the returned parts have been carefully cleaned.  
 The parts sent in are therefore free of residues in dangerous quantities.

|  |  |  |
|--|--|--|
| <input style="width: 95%;" type="text"/> | <input style="width: 95%;" type="text"/> | <input style="width: 95%;" type="text"/> |
| Place, Date                              | Department                               | Signature (and company stamp)            |

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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 ¼" AP025 PP Santo  
airPUMP ¼" AP025 PVDF Santo

airPUMP ¼" AP025 PP PTFE  
airPUMP ¼" AP025 PVDF PTFE

airPUMP ½" AP05 PP Santo  
airPUMP ½" AP05 PVDF Santo

airPUMP ½" AP05 PP PTFE  
airPUMP ½" AP05 PVDF PTFE

airPUMP 1" AP10 PP Santo  
airPUMP 1" AP10 PVDF Santo

airPUMP 1" AP10 PP PTFE  
airPUMP 1" AP10 PVDF PTFE

airPUMP 1½" AP15 PP Santo  
airPUMP 1½" AP15 PVDF Santo

airPUMP 1½" AP15 PP PTFE  
airPUMP 1½" AP15 PVDF PTFE

airPUMP 2" AP20 PP Santo  
airPUMP 2" AP20 PVDF Santo

airPUMP 2" AP20 PP PTFE  
airPUMP 2" AP20 PVDF PTFE

The machinery fulfils all the relevant provisions of this Directive:

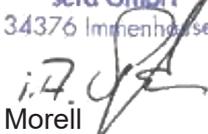
2006/42/EC Machinery

Where appropriate, harmonised standards used:

EN ISO 12100:2010

Place and date of the declaration: Immenhausen, 11.02.2022

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

  
34376 Immenhausen  
  
S. Morell  
Quality Management

FOLLOW US



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