INSTRUCTIONS–PARTS LIST

VERDER

ACETAL*, CONDUCTIVE POLYPROPYLENE*, POLYPROPYLENE, AND PVDF

VERDERAIR VA 25
Air-Operated Diaphragm Pumps

819.4367

Rev. Y
EN

For fluid transfer applications. For professional use only.

8.4 bar Maximum Fluid Working Pressure
8.4 bar Maximum Air Input Pressure

INSTRUCTIONS

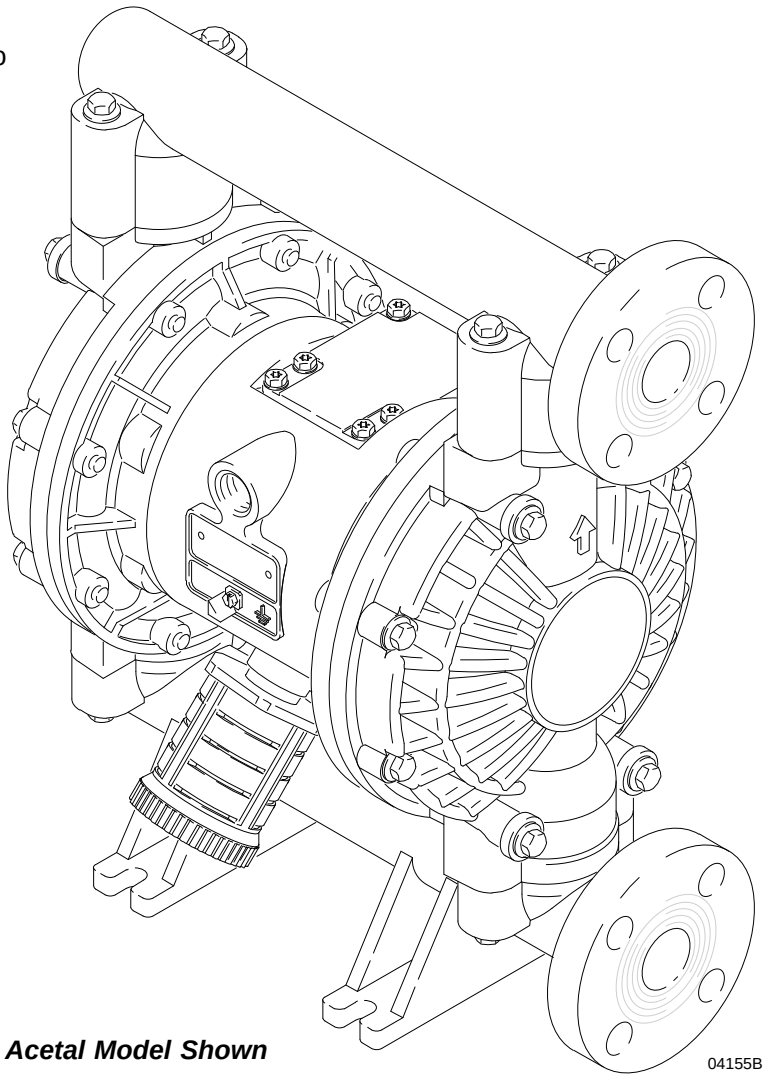
This manual contains important warnings and information.
READ AND RETAIN FOR REFERENCE

***NOTE:** Refer to the Pump Listing on page 22 to determine the Model No. of your pump.

Patent No.
CN ZL94102643.4
FR 9408894
JA 3517270
US 5,368,452

CE Ex* II 2 GD c IIC T4

*Applies only to pumps with Acetal and conductive polypropylene fluid sections.



Acetal Model Shown

04155B

Table of Contents

Symbols

Warning Symbol

⚠ Warning

This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

Caution Symbol

⚠ Caution

This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.

⚠ Warning

INSTRUCTIONS

EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call VERDER After Sales Service.
- Do not alter or modify this equipment.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated component in your system. This equipment has an **8.3 bar maximum working pressure at 8.3 bar maximum incoming air pressure.**
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Do not use hoses to pull equipment.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose VERDER hoses to temperatures above 82°C or below -40°C.
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

⚠ Warning

TOXIC FLUID HAZARD

Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.

- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state, and national guidelines.
- Always wear protective eyewear, gloves, clothing, and respirator as recommended by the fluid and solvent manufacturer.
- Pipe and dispose of the exhaust air safely, away from people, animals, and food handling areas. If the diaphragm fails, the fluid is exhausted along with the air. See **Air Exhaust Ventilation** on page 9.
- To pump acids, ***always*** use a PVDF or a polypropylene pump. Take precautions to avoid acid or acid fumes from contacting the pump housing exterior. Stainless steel parts will be damaged by exposure to acid spills and fumes. ***Never*** use an acetal pump to pump acids.

FIRE AND EXPLOSION HAZARD

Improper grounding, poor ventilation, open flames, or sparks can cause a hazardous condition and result in a fire or explosion and serious injury.

- Ground the equipment. Refer to **Grounding** on page 4.
- Never use a non–conductive polypropylene or PVDF pump with non-conductive flammable fluids as specified by your local fire protection code. Refer to **Grounding** on page 4 for additional information. Consult your fluid supplier to determine the conductivity or resistivity of your fluid.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop pumping immediately.** Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being pumped.
- Pipe and dispose of the exhaust air safely, away from all sources of ignition. If the diaphragm fails, the fluid is exhausted along with the air. See **Air Exhaust Ventilation** on page 9.
- Keep the work area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the work area.
- Extinguish all open flames or pilot lights in the work area.
- Do not smoke in the work area.
- Do not turn on or off any light switch in the work area while operating or if fumes are present.
- Do not operate a gasoline engine in the work area.

Installation

General Information

The Typical Installation shown in Fig. 2 is only a guide for selecting and installing system components. Contact your VERDER Customer Service for assistance in planning a system to suit your needs.

Always use Genuine VERDER Parts and Accessories.

Reference numbers and letters in parentheses refer to the callouts in the figures and the parts lists on pages 25–29.

⚠ Warning

TOXIC FLUID HAZARD
Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.

1. Read **TOXIC FLUID HAZARD** on page 3.
2. Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.

Grounding

⚠ Warning

FIRE AND EXPLOSION HAZARD
This pump must be grounded. Before operating the pump, ground the system as explained at right. Also read the section **FIRE AND EXPLOSION HAZARD** on page 3.

The acetal and conductive polypropylene pumps contain a conductive additive that makes the wetted parts conductive. Attaching the ground wire to the grounding screw grounds the air motor and the wetted parts. The non–conductive polypropylene and PVDF pumps are **not** conductive. Attaching the ground wire to the grounding screw grounds only the air motor.

When pumping conductive flammable fluids, **always** ground the fluid system by making sure the fluid has an electrical path to a true earth ground. See Fig. 1.

Never use a non–conductive polypropylene or PVDF pump with non-conductive flammable fluids as specified by your local fire protection code.
U.S. Code (NFPA 77 Static Electricity) recommends a conductivity greater than 50 x 10^{-12} Siemans/meter (mhos/meter) over your operating temperature range to reduce the hazard of fire. Consult your fluid supplier to determine the conductivity or resistivity of your fluid.
The resistivity must be less than 2 x 10^{12} ohm-centimeters.
To reduce the risk of static sparking, ground the pump and all other equipment used or located in the pumping area. Check your local electrical code for detailed grounding instructions for your area and type of equipment.

Ground all of this equipment:

- *Pump*: Connect a ground wire and clamp as shown in Fig. 1. Loosen the grounding screw (W). Insert one end of a 1.5 mm^2 minimum ground wire (Y) behind the grounding screw and tighten the screw securely. Connect the clamp end of the ground wire to a true earth ground. Order Part No. 819.0157 Ground Wire and Clamp.

NOTE: When pumping conductive flammable fluids with a non–conductive polypropylene or PVDF pump, **always** ground the entire fluid system. See the **WARNING** on left. Fig. 2. shows a recommended method of grounding flammable fluid containers during filling.

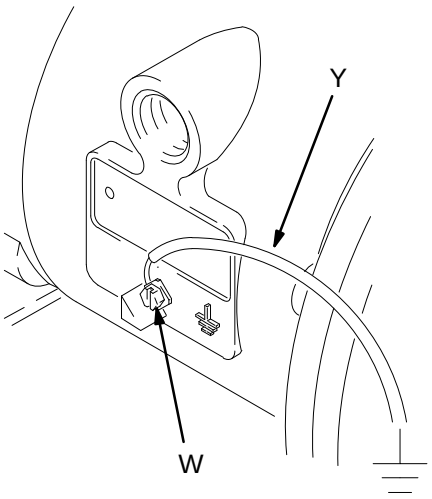


Fig. 1 02646E

- *Air and fluid hoses*: Use only grounded hoses with a maximum of 150 m combined hose length to ensure grounding continuity.
- *Air compressor*: Follow manufacturer's recommendations.
- *All solvent pails used when flushing*, according to local code. Use only grounded metal pails, which are conductive. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts the grounding continuity.
- *Fluid supply container:* Follow your local code.

Tightening Screws Before First Use

Before using the pump for the first time, check and retorque all external fasteners. See **Torque Sequence**, page 30. After the first day of operation, retorque the fasteners. Although pump use varies, a general guideline is to retorque fasteners every two months.

Installation

Air Line

⚠ Warning

A bleed-type master air valve (B) is required in your system to relieve air trapped between this valve and the pump. Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury, including splashing in the eyes or on the skin, injury from moving parts, or contamination from hazardous fluids. See Fig. 2.

1. Install the air line accessories as shown in Fig. 2. Mount these accessories on the wall or on a bracket. Be sure the air line supplying the accessories is grounded.

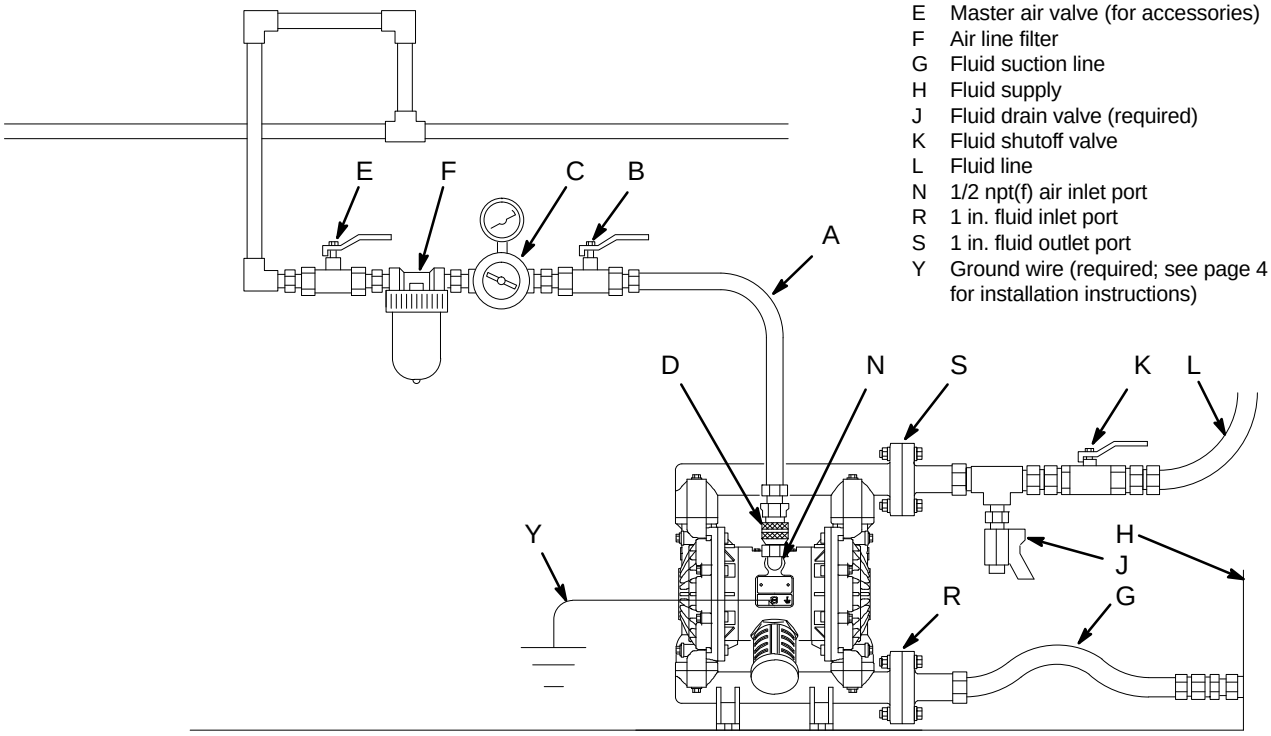
   a. Install an air regulator (C) and gauge to control the fluid pressure. The fluid outlet pressure will be the same as the setting of the air regulator.

   b. Locate one bleed-type master air valve (B) close to the pump and use it to relieve trapped air. See the **Warning** at left. Locate the other master air valve (E) upstream from all air line accessories and use it to isolate them during cleaning and repair.

   c. The air line filter (F) removes harmful dirt and moisture from the compressed air supply.

2. Install a grounded, flexible air hose (A) between the accessories and the 1/2 npt(f) pump air inlet (N). See Fig. 2. Use a minimum 10 mm ID air hose. Screw an air line quick disconnect coupler (D) onto the end of the air hose (A), and screw the mating fitting into the pump air inlet snugly. Do not connect the coupler (D) to the fitting until you are ready to operate the pump.

FLOOR MOUNT TYPICAL INSTALLATION



KEY

- A Air supply hose
- B Bleed-type master air valve (required for pump)
- C Air regulator
- D Air line quick disconnect
- E Master air valve (for accessories)
- F Air line filter
- G Fluid suction line
- H Fluid supply
- J Fluid drain valve (required)
- K Fluid shutoff valve
- L Fluid line
- N 1/2 npt(f) air inlet port
- R 1 in. fluid inlet port
- S 1 in. fluid outlet port
- Y Ground wire (required; see page 4 for installation instructions)

Fig. 2 04170B

Installation

Mountings

⚠ Caution

The pump exhaust air may contain contaminants. Ventilate to a remote area if the contaminants could affect your fluid supply. See **Air Exhaust Ventilation** on page 9.

1. Be sure the mounting surface can support the weight of the pump, hoses, and accessories, as well as the stress caused during operation.
2. For all mountings, be sure the pump is bolted directly to the mounting surface.
3. For ease of operation and service, mount the pump so the air valve cover (2), air inlet, and fluid inlet and outlet ports are easily accessible.
4. Rubber Foot Mounting Kit 819.4333 is available to reduce noise and vibration during operation.

Fluid Suction Line

1. If using a conductive (Acetal or conductive polypropylene) pump, use conductive hoses (G). If using a non-conductive (polypropylene or PVDF) pump, ground the fluid system. See **Grounding** on page 4. The pump fluid inlet (R) is a 1 in. raised face flange. Refer to **Flange Connections** on page 7.
2. If the fluid inlet pressure to the pump is more than 25% of the outlet working pressure, the ball check valves will not close fast enough, resulting in inefficient pump operation.
3. At inlet fluid pressures greater than 1.05 bar, diaphragm life will be shortened.
4. See the **Technical Data** on page 32 for maximum suction lift (wet and dry).

Fluid Outlet Line

⚠ Warning

A fluid drain valve (J) is required to relieve pressure in the hose if it is plugged. The drain valve reduces the risk of serious injury, including splashing in the eyes or on the skin, or contamination from hazardous fluids when relieving pressure. Install the valve close to the pump fluid outlet. See Fig. 2.

1. **Use grounded fluid hoses (L).** The pump fluid outlet (S) is a 1 in. raised face flange. Refer to **Flange Connections** on page 7.
2. Install a fluid drain valve (J) near the fluid outlet. See the **Warning** above.
3. Install a shutoff valve (K) in the fluid outlet line.

Installation

Flange Connections

The fluid inlet and outlet ports are 1 in. raised face flanges. Connect 1 in. flanged plastic pipe to the pump as follows. You will need:

- Torque wrench
- Adjustable wrench
- a 4.25 in. diameter, 1/8 in. thick PTFE gasket, with four 0.62 diameter holes and a 1.15 in. diameter center
- four 1/2 in. x 2.5 in. bolts
- four 1/2 in. spring lockwashers
- eight 1/2 in. flat washers
- four 1/2 in. nuts.

1. Place a lockwasher and a flat washer on each bolt. Refer to Fig. 3.
2. Align the holes in the gasket and the pipe flange with the holes in the pump flange.
3. Lubricate the threads of the four bolts. Install the bolts through the holes and secure with the washers and nuts.
4. Hold the nuts with a wrench. Refer to the tightening sequence in Fig. 3 and torque the bolts to 14–20 N•m. ***Do not over-torque.***

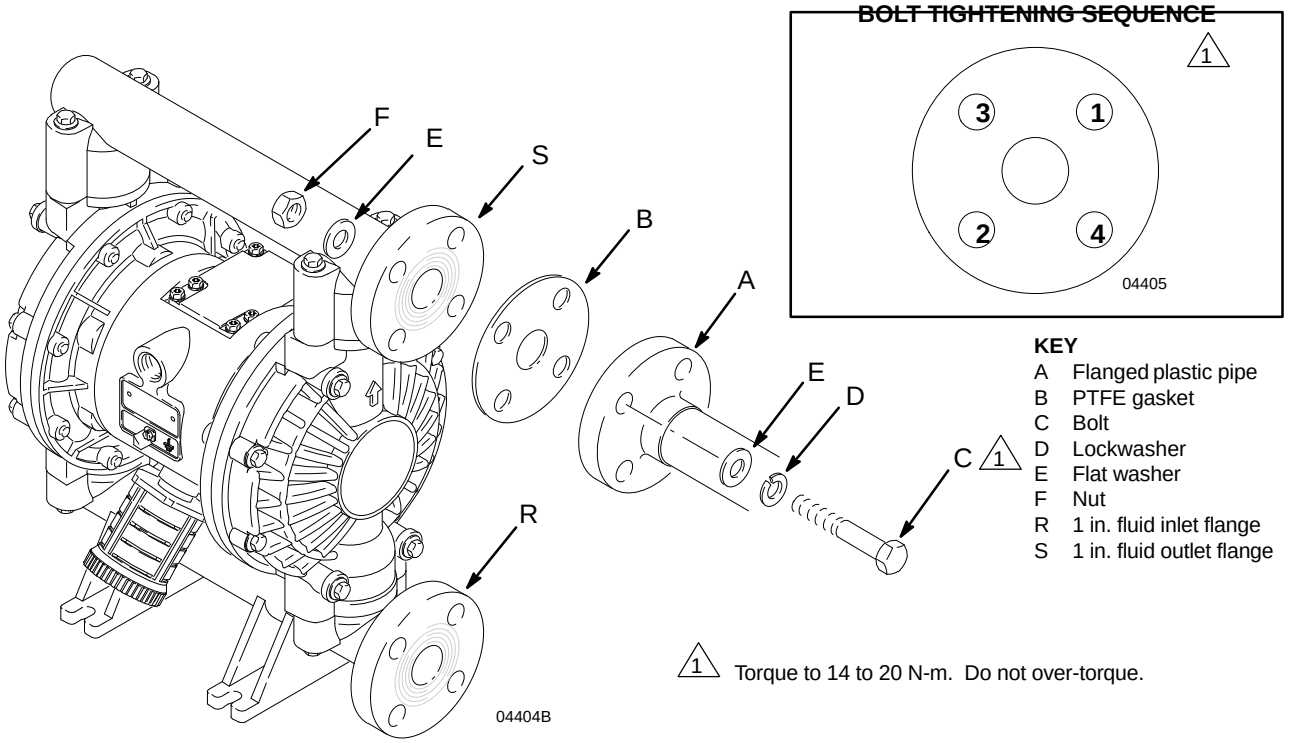


Fig. 3

Installation

Changing the Orientation of the Fluid Inlet and Outlet Ports

The pump is shipped with the fluid inlet (R) and outlet (S) ports facing the same direction. See Fig. 4. To change the orientation of the inlet and/or outlet port:

1. Remove the screws (106 or 112) holding the inlet (102) and/or outlet (103) manifold to the covers (101).

2. Reverse the manifold and reattach. Install the screws (106 or 112). Torque the manifold screws to 9–10 N•m. See Fig. 4. See **Torque Sequence**, page 30.

KEY

N	1/2 npt(f) air inlet port	101	Covers
P	Muffler; air exhaust port is 3/4 npt(f)	102	Fluid inlet manifold
		103	Fluid outlet manifold
R	1 in. fluid inlet port	106	Manifold screws
S	1 in. fluid outlet port	112	Manifold screws

1 Torque to 9 to 10 N•m. See **Torque Sequence**, page 30.

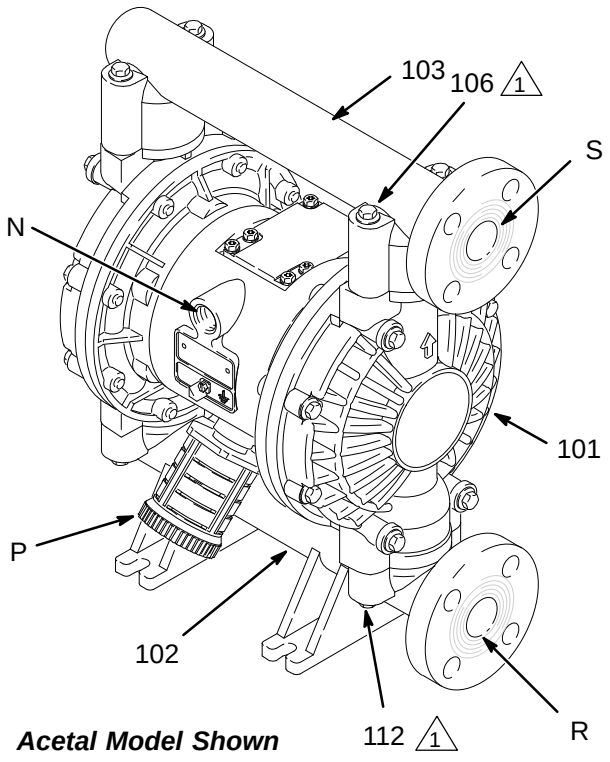


Fig. 4

Fluid Pressure Relief Valve

⚠ Caution

Some systems may require installation of a pressure relief valve at the pump outlet to prevent overpressurization and rupture of the pump or hose. See Fig. 5.

Thermal expansion of fluid in the outlet line can cause over-pressurization. This can occur when using long fluid lines exposed to sunlight or ambient heat, or when pumping from a cool to a warm area (for example, from an underground tank).

Overpressurization can also occur if the pump is being used to feed fluid to a piston pump, and the intake valve of the piston pump does not close, causing fluid to back up in the outlet line.

KEY

R 1 in. fluid inlet port
S 1 in. fluid outlet port
V Pressure relief valve
Part No. 819.0159 (Stainless Steel)

1 Install valve between fluid inlet and outlet ports.

2 Connect fluid inlet line here.

3 Connect fluid outlet line here.

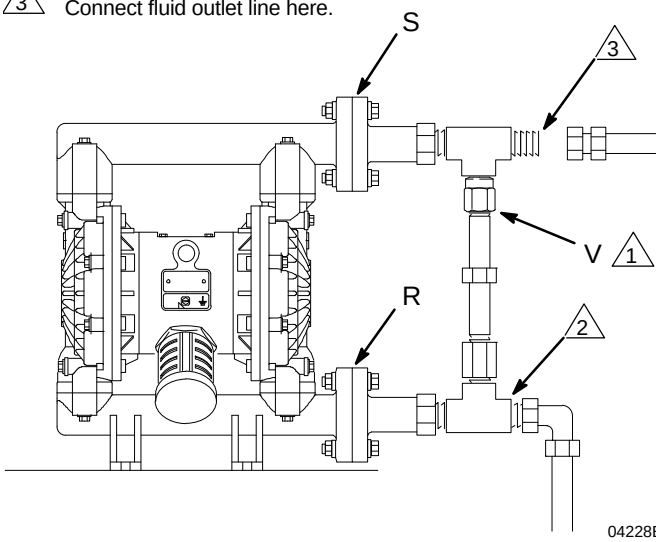


Fig. 5

Installation

Air Exhaust Ventilation

⚠ Warning

FIRE AND EXPLOSION HAZARD
Be sure to read **FIRE OR EXPLOSION HAZARD** and **TOXIC FLUID HAZARD** on page 3, before operating this pump.

Be sure the system is properly ventilated for your type of installation. You must vent the exhaust to a safe place, away from people, animals, food handling areas, and all sources of ignition when pumping flammable or hazardous fluids.

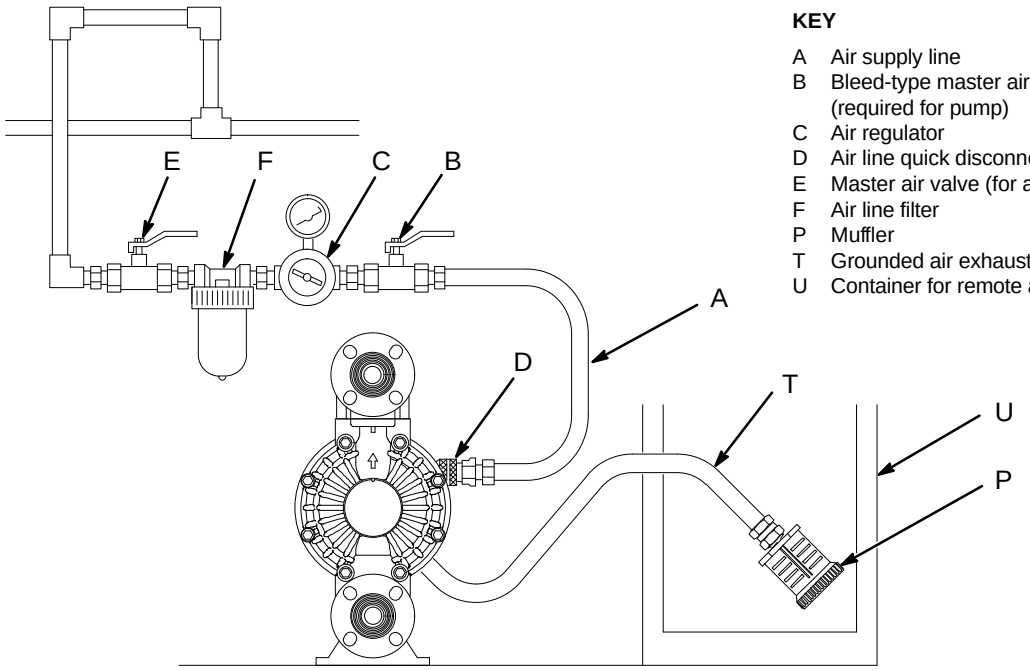
Diaphragm failure will cause the fluid being pumped to exhaust with the air. Place an appropriate container at the end of the air exhaust line to catch the fluid. See Fig. 6.

The air exhaust port is 3/4 npt(f). Do not restrict the air exhaust port. Excessive exhaust restriction can cause erratic pump operation.

To provide a remote exhaust:

1. Remove the muffler (P) from the pump air exhaust port.
2. Install a grounded air exhaust hose (T) and connect the muffler (P) to the other end of the hose. The minimum size for the air exhaust hose is 19 mm ID. If a hose longer than 4.57 m is required, use a larger diameter hose. Avoid sharp bends or kinks in the hose. See Fig. 6.
3. Place a container (U) at the end of the air exhaust line to catch fluid in case a diaphragm ruptures.

VENTING EXHAUST AIR



KEY

- A Air supply line
- B Bleed-type master air valve (required for pump)
- C Air regulator
- D Air line quick disconnect
- E Master air valve (for accessories)
- F Air line filter
- P Muffler
- T Grounded air exhaust hose
- U Container for remote air exhaust

Fig. 6 04168A

Operation

Pressure Relief Procedure

⚠ Warning

PRESSURIZED EQUIPMENT HAZARD
The equipment stays pressurized until pressure is manually relieved. To reduce the risk of serious injury from pressurized fluid, accidental spray from the gun or splashing fluid, follow this procedure whenever you:

- Are instructed to relieve pressure,
- Stop pumping,
- Check, clean or service any system equipment,
- Install or clean fluid nozzles.

1. Shut off the air to the pump.
2. Open the dispensing valve, if used.
3. Open the fluid drain valve to relieve all fluid pressure, having a container ready to catch the drainage.

Flush the Pump Before First Use

The pump was tested in water. If water could contaminate the fluid you are pumping, flush it thoroughly with a compatible solvent. Follow the steps under **Starting and Adjusting the Pump.**

Starting and Adjusting the Pump

⚠ Warning

TOXIC FLUID HAZARD
Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed. Do not lift a pump under pressure. If dropped, the fluid section may rupture. Always follow the **Pressure Relief Procedure** above before lifting the pump.

1. Be sure the pump is properly grounded. Refer to **Grounding** on page 4.
2. Check all fittings to be sure they are tight. Be sure to use a compatible liquid thread sealant on all male threads. Tighten the fluid inlet and outlet fittings securely.
3. Place the suction tube (if used) in the fluid to be pumped.

   NOTE: If the fluid inlet pressure to the pump is more than 25% of the outlet working pressure, the ball check valves will not close fast enough, resulting in inefficient pump operation.

4. Place the end of the fluid hose (L) into an appropriate container.
5. Close the fluid drain valve (J). See Fig. 2.
6. With the pump air regulator (C) closed, open all bleed-type master air valves (B, E).
7. If the fluid hose has a dispensing device, hold it open while continuing with the following step.
8. Slowly open the air regulator (C) until the pump starts to cycle. Allow the pump to cycle slowly until all air is pushed out of the lines and the pump is primed.

   If you are flushing, run the pump long enough to thoroughly clean the pump and hoses. Close the air regulator. Remove the suction tube from the solvent and place it in the fluid to be pumped.

Pump Shutdown

⚠ Warning

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** at left.

At the end of the work shift, relieve the pressure.

Maintenance

Lubrication

The air valve is designed to operate unlubricated, however if lubrication is desired, every 500 hours of operation (or monthly) remove the hose from the pump air inlet and add two drops of machine oil to the air inlet.

⚠ Caution

Do not over-lubricate the pump. Oil is exhausted through the muffler, which could contaminate your fluid supply or other equipment. Excessive lubrication can also cause the pump to malfunction.

Flushing and Storage

Flush the pump often enough to prevent the fluid you are pumping from drying or freezing in the pump and damaging it. Always flush the pump and follow the **Pressure Relief Procedure** on page 10 before storing it for any length of time. Use a compatible solvent.

Tightening Threaded Connections

Before each use, check all hoses for wear or damage, and replace as necessary. Check to be sure all threaded connections are tight and leak-free. Check fasteners. Tighten or retorque as necessary. Although pump use varies, a general guideline is to retorque fasteners every two months. See **Torque Sequence**, page 30.

Preventive Maintenance Schedule

Establish a preventive maintenance schedule, based on the pump's service history. This is especially important for prevention of spills or leakage due to diaphragm failure.

Troubleshooting

⚠ Warning

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

1. Relieve the pressure before checking or servicing the equipment.
2. Check all possible problems and causes before disassembling the pump.

PROBLEM	CAUSE	SOLUTION
Pump cycles at stall or fails to hold pressure at stall.	Worn check valve balls (301), seats (201) or o-rings (202).	Replace. See page 16.
Pump will not cycle, or cycles once and stops.	Air valve is stuck or dirty.	Disassemble and clean air valve. See pages 14–15. Use filtered air.
	Check valve ball (301) severely worn and wedged in seat (201) or manifold (102 or 103).	Replace ball and seat. See page 16.
	Check valve ball (301) is wedged into seat (201), due to overpressurization.	Install Pressure Relief Valve. See page 8.
	Dispensing valve clogged.	Relieve pressure and clear valve.
Pump operates erratically.	Clogged suction line.	Inspect; clear.
	Sticky or leaking balls (301).	Clean or replace. See page 16.
	Diaphragm ruptured.	Replace. See pages 17–19.
	Restricted exhaust.	Remove restriction.
Air bubbles in fluid.	Suction line is loose.	Tighten.
	Diaphragm ruptured.	Replace. See pages 17–19.
	Loose inlet manifold (102), damaged seal between manifold and seat (201), damaged o-rings (202).	Tighten manifold bolts (106 or 112) or replace seats (201) or o-rings (202). See page 16.
	Loose fluid side plate (105).	Tighten or replace (pages 17–19).
	Damaged o-ring (108).	Replace. See pages 17–19.

Troubleshooting

PROBLEM	CAUSE	SOLUTION
Fluid in exhaust air.	Diaphragm ruptured.	Replace. See pages 17–19.
	Loose fluid side plate (105).	Tighten or replace (pages 17–19).
Pump exhausts excessive air at stall.	Worn air valve block (7), o-ring (6), plate (8), pilot block (18), u-cups (10), or pilot pin o-rings (17).	Repair or replace. See pages 14–15.
	Worn shaft seals (402).	Replace. See pages 17–19.
Pump leaks air externally.	Air valve cover (2) or air valve cover screws (3) are loose.	Tighten screws. See page 15.
	Air valve gasket (4) or air cover gasket (22) is damaged.	Inspect; replace. See pages 14–15, 20–21.
	Air cover screws (25) are loose.	Tighten screws. See pages 20–21.
Pump leaks fluid externally from ball check valves.	Loose manifolds (102, 103), damaged seal between manifold and seat (201), damaged o-rings (202).	Tighten manifold bolts (106 or 112) or replace seats (201) or o-rings (202). See page 16.

Service

Repairing the Air Valve

Tools Required

- Torque wrench
- Torx (T20) screwdriver or 7 mm socket wrench
- Needle-nose pliers
- O-ring pick
- Lithium base grease

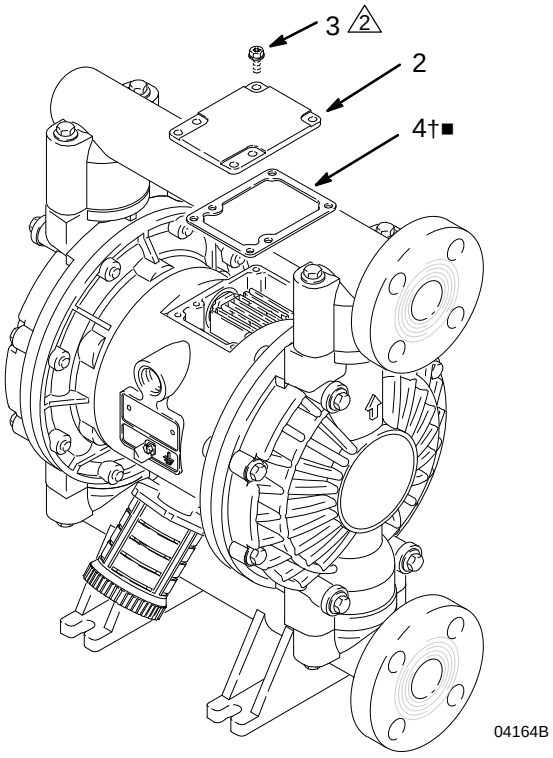
NOTE: Air Valve Repair Kits 819.4274 (aluminum center housing models) and 819.0249 (sst center housing models) are available. Refer to page 29. Parts included in the kit are marked with a symbol, for example (4†■). Use all the parts in the kit for the best results.

Disassembly

⚠ Warning

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

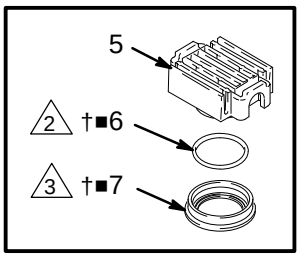
1. Relieve the pressure.
2. With a Torx (T20) screwdriver or 7 mm socket wrench, remove the six screws (3), air valve cover (2), and gasket (4). See Fig. 7.
3. Move the valve carriage (5) to the center position and pull it out of the cavity. Remove the valve block (7†■) and o-ring (6†■) from the carriage. Using a needle-nose pliers, pull the pilot block (18) straight up and out of the cavity. See Fig. 8.
4. Pull the two actuator pistons (11) out of the bearings (12). Remove the u-cup packings (10) from the pistons. Pull the pilot pins (16) out of the bearings (15). Remove the o-rings (17†■) from the pilot pins. See Fig. 9.
5. Inspect the valve plate (8) in place. If damaged, use a Torx (T20) screwdriver or 7 mm socket wrench to remove the three screws (3). Remove the valve plate (8) and, on aluminum center housing models, remove the seal (9). See Fig. 10.
6. Inspect the bearings (12, 15) in place. See Fig. 9. The bearings are tapered and, if damaged, must be removed from the outside. This requires disassembly of the fluid section. See page 20.
7. Clean all parts and inspect for wear or damage. Replace as needed. Reassemble as explained on page 15.



△2 Torque to 5.6–6.8 N-m.

Fig. 7

△1 See Detail at right.
△2 Grease.
△3 Grease lower face.



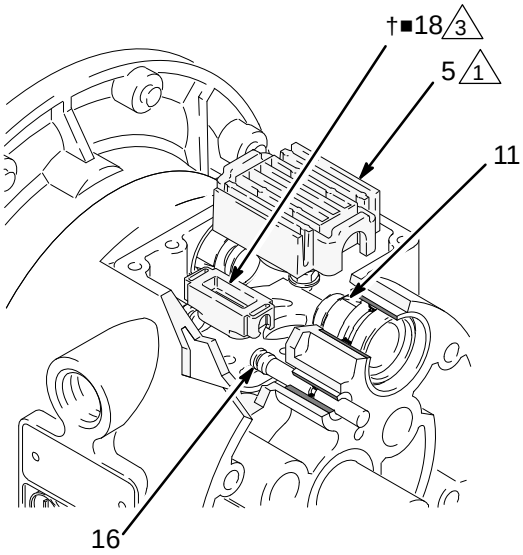


Fig. 8

Service

△1 Insert narrow end first.

△2 Grease.

△3 Install with lips facing narrow end of piston (11).

△4 Insert wide end first.

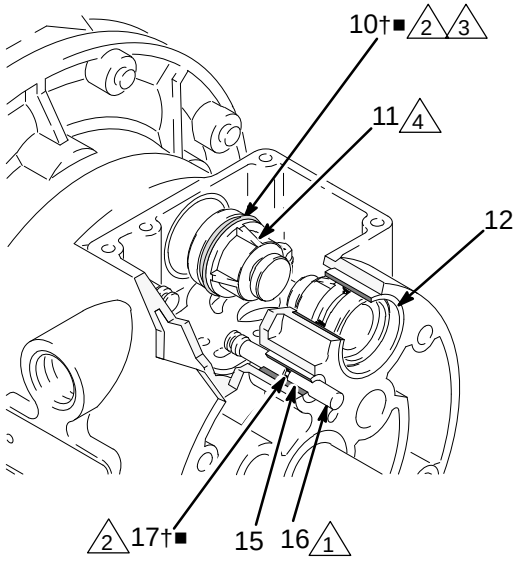


Fig. 9 04159B

△1 Rounded side must face down. (aluminum center housing models only).

△2 Tighten screws until they bottom out on the housing.

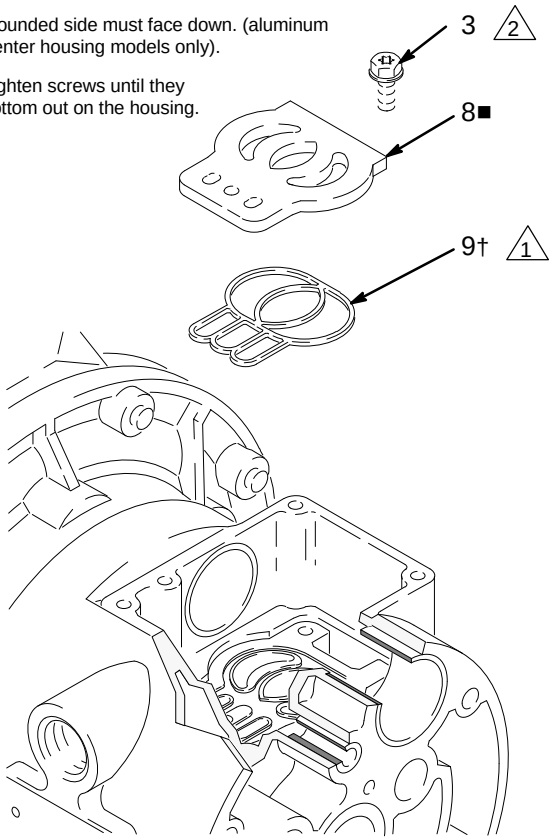


Fig. 10 04160

Reassembly

1. *If you removed the bearings (12, 15),* install new ones as explained on page 20. Reassemble the fluid section.

2. On aluminum center housing models, install the valve plate seal (9†) into the groove at the bottom of the valve cavity. The rounded side of the seal ***must face down*** into the groove. See Fig. 10.

3. Install the valve plate (8■) in the cavity. On aluminum center housing models, the plate is reversible, so either side can face up. Install the three screws (3), using a Torx (T20) screwdriver or 7 mm socket wrench. Tighten until the screws bottom out on the housing. See Fig. 10.

4. Install an o-ring (17†■) on each pilot pin (16). Grease the pins and o-rings. Insert the pins into the bearings (15), ***narrow*** end first. See Fig. 9.

5. Install a u-cup packing (10†■) on each actuator piston (11), so the lips of the packings face the ***narrow*** end of the pistons. See Fig. 9.

6. Lubricate the u-cup packings (10†■) and actuator pistons (11). Insert the actuator pistons in the bearings (12), ***wide*** end first. Leave the narrow end of the pistons exposed. See Fig. 9.

7. Grease the lower face of the pilot block (18†■) and install so its tabs snap into the grooves on the ends of the pilot pins (16). See Fig. 8.

8. Grease the o-ring (6†■) and install it in the valve block (7†■). Push the block onto the valve carriage (5). Grease the lower face of the valve block. See Fig. 8.

9. Install the valve carriage (5†■) so its tabs slip into the grooves on the narrow end of the actuator pistons (11). See Fig. 8.

10. Align the valve gasket (4†■) and cover (2) with the six holes in the center housing (1). Secure with six screws (3), using a Torx (T20) screwdriver or 7 mm socket wrench. Torque to 5.6–6.8 N•m. See Fig. 7.

Service

Ball Check Valve Repair

Tools Required

- Torque wrench
- 10 mm socket wrench
- O-ring pick

Disassembly

NOTE: A Fluid Section Repair Kit is available. Refer to page 23 to order the correct kit for your pump. Parts included in the kit are marked with an asterisk, for example (201*). Use all the parts in the kit for the best results.

NOTE: To ensure proper seating of the balls (301), always replace the seats (201) when replacing the balls.

⚠ Warning

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

1. Relieve the pressure. Disconnect all hoses.
2. Remove the pump from its mounting.
3. Using a 10 mm socket wrench, remove the four bolts (106) holding the outlet manifold (103) to the fluid covers (101). See Fig. 11.
4. Remove the seats (201), balls (301), and o-rings (202) from the manifold.

   NOTE: Some models use two o-rings (202), some models use four o-rings (202), and some models do not use o-rings.
5. Turn the pump over and remove the inlet manifold (102). Remove the seats (201), balls (301), and o-rings (202) from the fluid covers (101).

Reassembly

1. Clean all parts and inspect for wear or damage. Replace parts as needed.
2. Reassemble in the reverse order, following all notes in Fig. 11. Assemble the ball checks **exactly** as shown. The arrows (A) on the fluid covers (101) **must** point toward the outlet manifold (103).

△1 Torque to 9 to 10 N•m. See **Torque Sequence**, page 30.
△2 Arrow (A) must point toward outlet manifold (103).
△3 Not used on some models.
△4 Beveled seating surface must face ball (301).

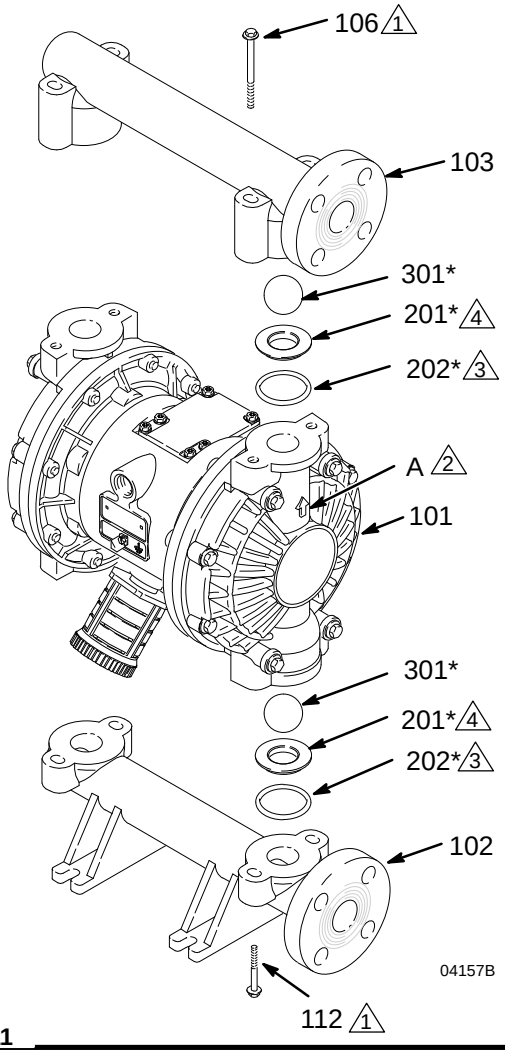


Fig. 11

Service

Diaphragm Repair

Tools Required

- Torque wrench
- 10 mm socket wrench
- 19 mm open–end wrench
- Adjustable wrench
- O-ring pick
- Lithium-base grease

Disassembly

NOTE: A Fluid Section Repair Kit is available. Refer to page 23 to order the correct kit for your pump. Parts included in the kit are marked with an asterisk, for example (401*). Use all the parts in the kit for the best results.

⚠ Warning

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

1. Relieve the pressure.
2. Remove the manifolds and disassemble the ball check valves as explained on page 16.
3. Using a 10 mm socket wrench, remove the screws (106 and 112) holding the fluid covers (101) to the air covers (23). Pull the fluid covers (101) off the pump. See Fig. 12.

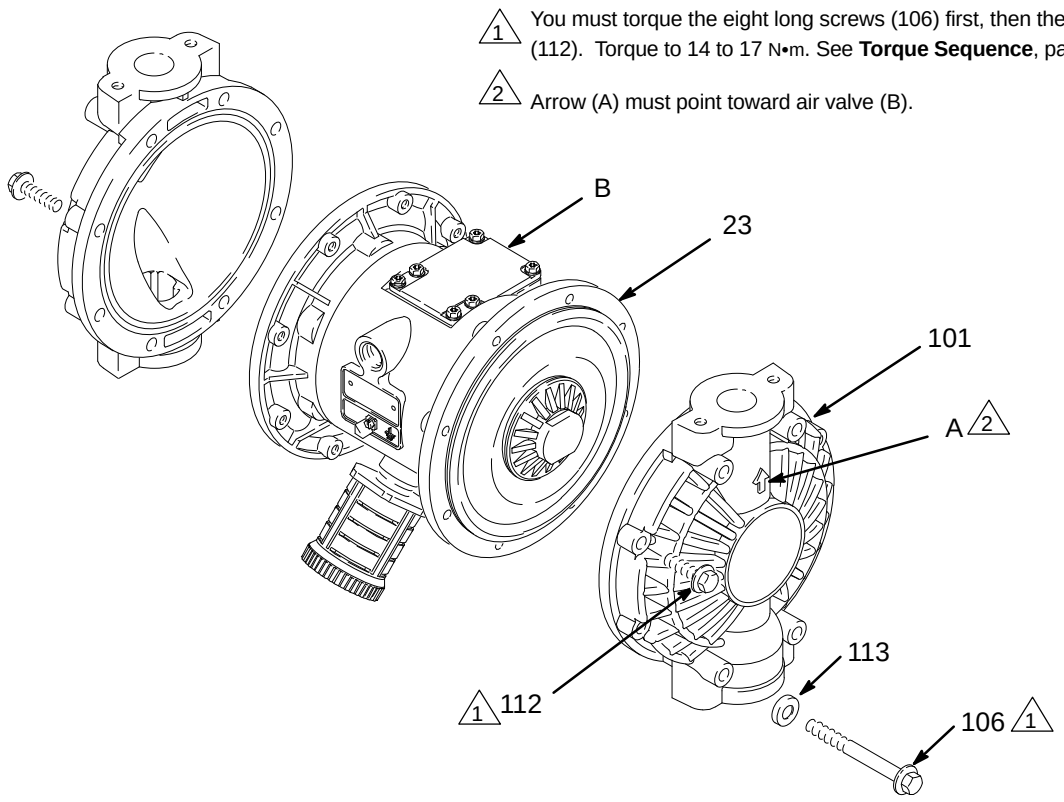


Fig. 12

Service

4. Unscrew one outer plate (105) from the diaphragm shaft (24). Remove one diaphragm (401), and the inner plate (104). See Fig. 13.

NOTE: PTFE models include a PTFE diaphragm (403) in addition to the backup diaphragm (401).

5. Pull the other diaphragm assembly and the diaphragm shaft (24) out of the center housing (1). Hold the shaft flats with a 19 mm open–end wrench, and remove the outer plate (105) from the shaft. Disassemble the remaining diaphragm assembly.

6. Inspect the diaphragm shaft (24) for wear or scratches. If it is damaged, inspect the bearings (19) in place. If the bearings are damaged, refer to page 20.

7. Reach into the center housing (1) with an o-ring pick and hook the u-cup packings (402), then pull them out of the housing. This can be done with the bearings (19) in place.

8. Clean all parts and inspect for wear or damage. Replace parts as needed.

Reassembly

1. Grease the shaft u-cup packings (402*) and install them so the lips face ***out*** of the housing (1). See Fig. 13.

2. Grease the length and ends of the diaphragm shaft (24), and slide it through the housing (1).

3. Assemble the inner diaphragm plates (104), diaphragms (401*), PTFE diaphragms (403*, if present), and outer diaphragm plates (105) *exactly* as shown in Fig. 13. These parts ***must*** be assembled correctly.

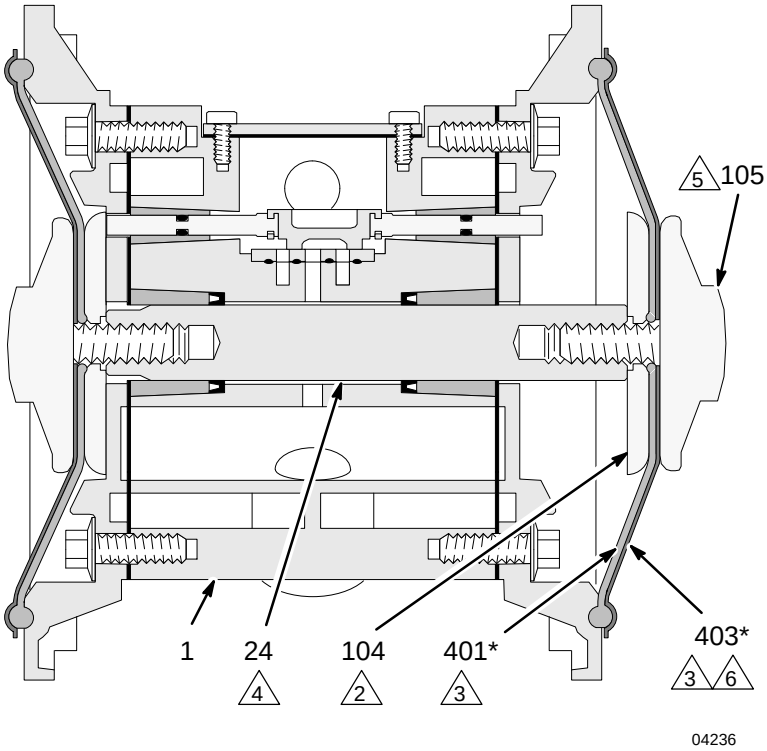
4. Apply medium strength (blue) Loctite® or equivalent to the threads of the fluid-side plates (105). Hold one of the outer plates (105) with a wrench, and torque the other outer plate to 27 to 34 N•m at 100 rpm max. Do not overtorque.

5. Align the fluid covers (101) and the center housing (1) so the arrows (A) on the covers face the same direction as the air valve (B). Secure the covers with the screws (106 and 112), handtight. Place the bolt caps (113*) on the longer screws (106), and install the longer screws in the top and bottom holes of the covers. See Fig. 12.

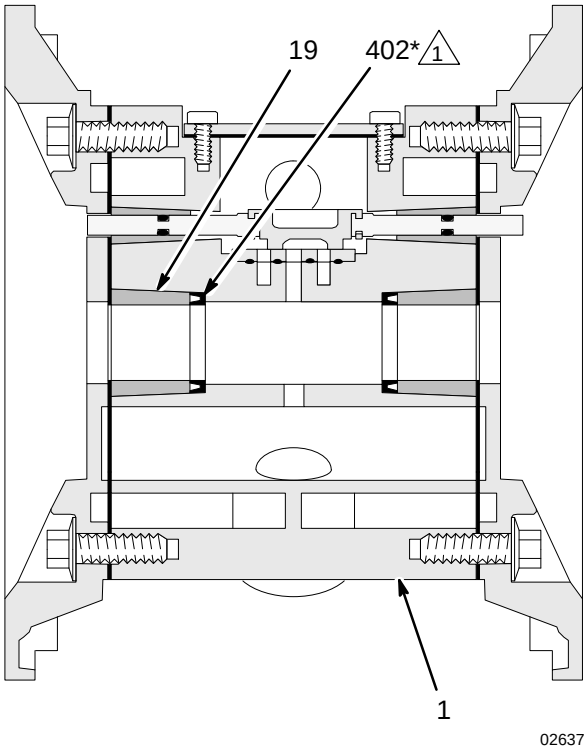
6. First, torque the longer screws (106) oppositely and evenly to 14 to 17 N•m, using a 10 mm socket wrench. Then torque the shorter screws (112). See **Torque Sequence**, page 30.

7. Reassemble the ball check valves and manifolds as explained on page 16.

Service



Cutaway View, with Diaphragms in Place



Cutaway View, with Diaphragms Removed

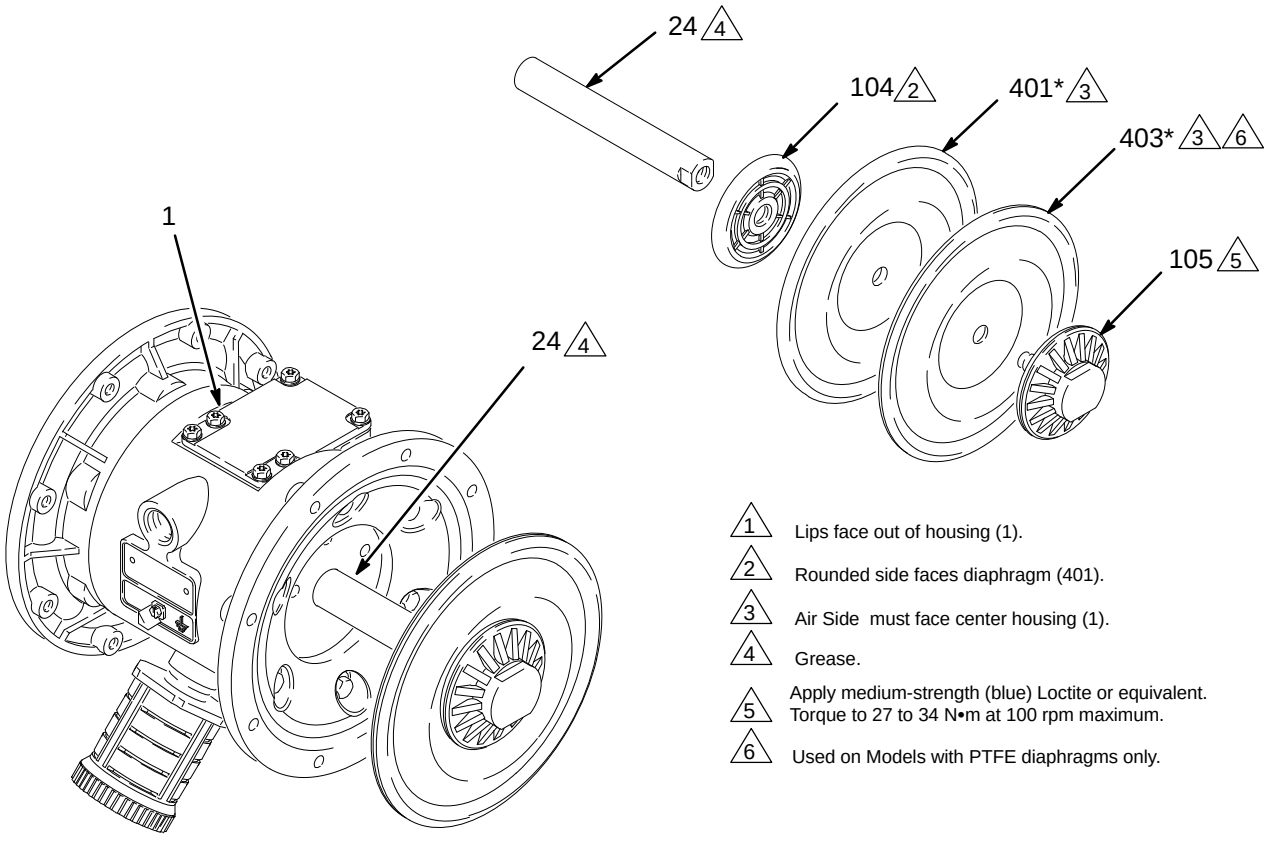


Fig. 13

Service

Bearing and Air Gasket Removal

Tools Required

- Torque wrench
- 10 mm socket wrench
- Bearing puller
- O-ring pick
- Press, or block and mallet

Disassembly

NOTE: Do not remove undamaged bearings.

⚠ Warning

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

1. Relieve the pressure.
2. Remove the manifolds and disassemble the ball check valves as explained on page 16.
3. Remove the fluid covers and diaphragm assemblies as explained on page 17.

NOTE: If you are removing only the diaphragm shaft bearing (19), skip step 4.

4. Disassemble the air valve as explained on page 14.
5. Using a 10 mm socket wrench, remove the screws (25) holding the air covers (23) to the center housing (1). See Fig. 14.
6. Remove the air cover gaskets (22). Always replace the gaskets with new ones.
7. Use a bearing puller to remove the diaphragm shaft bearings (19), air valve bearings (12) or pilot pin bearings (15). Do not remove undamaged bearings.
8. If you removed the diaphragm shaft bearings (19), reach into the center housing (1) with an o-ring pick and hook the u-cup packings (402), then pull them out of the housing. Inspect the packings. See Fig. 13.

Reassembly

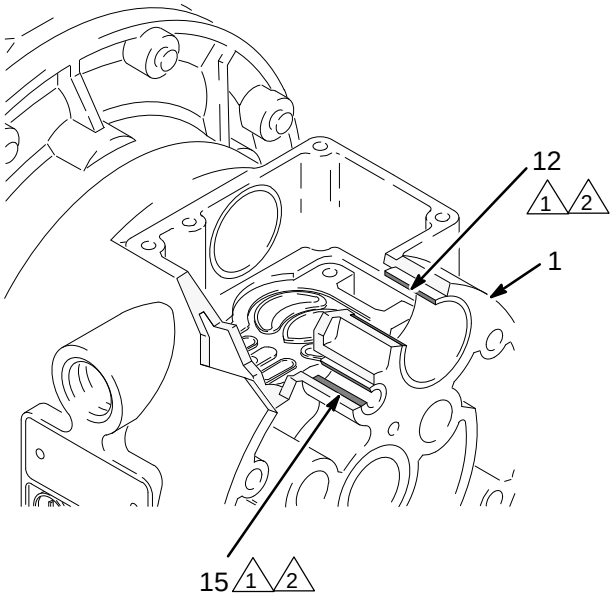
1. If removed, install the shaft u-cup packings (402*) so the lips face ***out*** of the housing (1).
2. The bearings (19, 12, and 15) are tapered and can only be installed one way. Insert the bearings into the center housing (1), ***tapered end first***. Using a press or a block and rubber mallet, press-fit the bearing so it is flush with the surface of the center housing.
3. Reassemble the air valve as explained on page 15.
4. Align the new air cover gasket (22) so the pilot pin (16) protruding from the center housing (1) fits through the proper hole (H) in the gasket.
5. Align the air cover (23) so the pilot pin (16) fits in the middle hole (M) of the three small holes near the center of the cover. Install the screws (25), handtight. See Fig. 14. Using a 10 mm socket wrench, torque the screws oppositely and evenly to 14–17 N•m.
6. Install the diaphragm assemblies and fluid covers as explained on page 17.
7. Reassemble the ball check valves and manifolds as explained on page 16.

Service

△1 Insert bearings tapered end first.

△2 Press-fit bearings flush with surface of center housing (1).

△3 Apply medium-strength (blue) Loctite® or equivalent to the threads. Torque to 14–17 N•m.



Detail of Air Valve Bearings

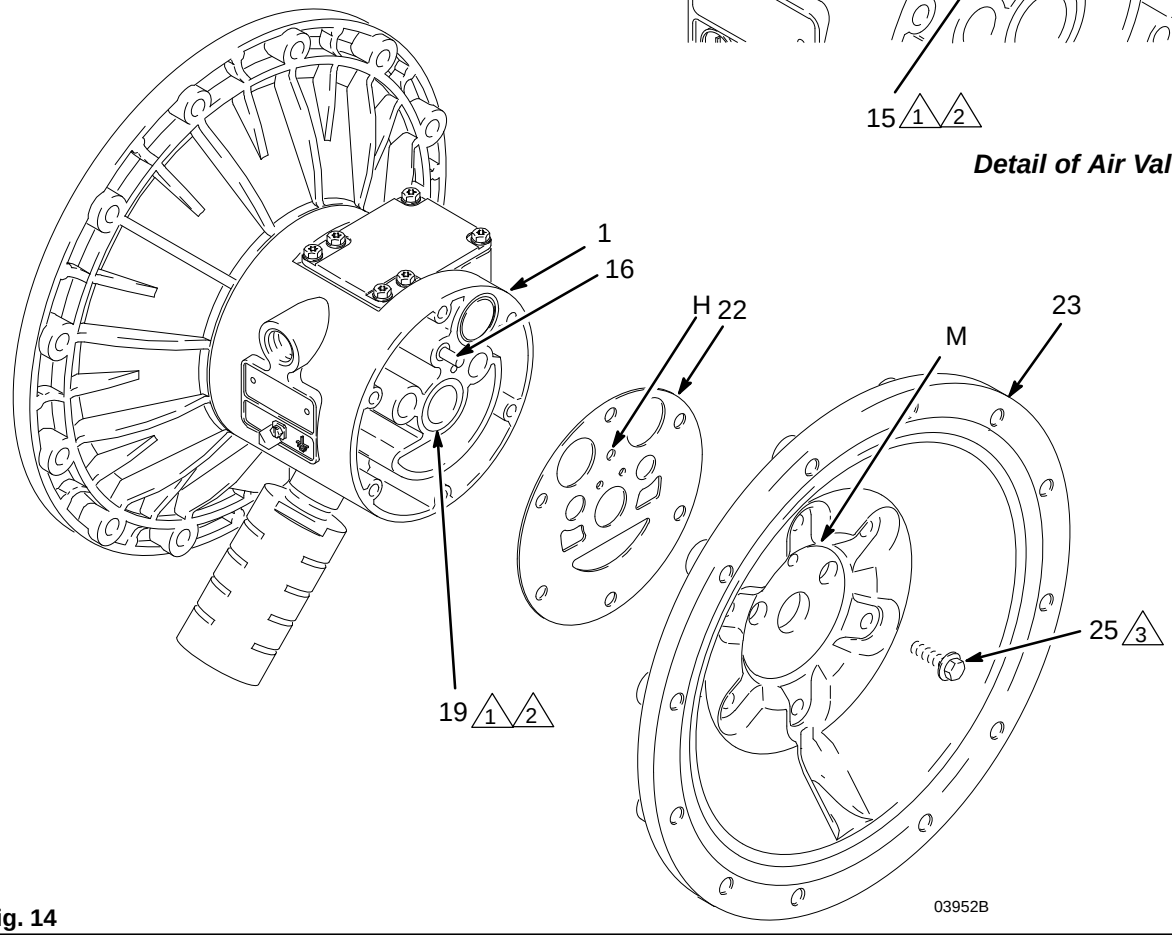


Fig. 14

Pump Listing

VERDERAIR VA 25 Acetal, Polypropylene, and PVDF Pumps, Series B

Your Model No. is marked on the pump's serial plate. The listing of existing *VERDERAIR VA 25* pumps is below:

Part No.	Air Section	Fluid Section	Seats	Balls	Diaphragms
810.2680	ALU	ACE	316	TF	TF
810.2725	ALU	ACE	174	316	TF
810.2855	ALU	ACE	POL	TF	TF
810.2925	ALU	POL	316	TF	TF
810.3100	ALU	POL	POL	TF	TF
810.3122	ALU	POL	POL	SAN	SAN
810.3128	ALU	POL	POL	BUN	BUN
810.3134	ALU	POL	POL	VIT	VIT
810.3169	ALU	POL	KYN	VIT	VIT
810.6976	ALU	POL	POL	GEO	GEO
810.3345	ALU	KYN	POL	TF	TF
810.3380	ALU	KYN	KYN	TF	TF
810.3414	ALU	KYN	KYN	VIT	VIT
810.6346	ALU	ACE	ACE	TF	TF
810.7011	ALU	POL	POL	TF	TF
810.0073	ALU	POL	SST	SST	BUN
810.0074	ALU	POL	SST	BUN	BUN
810.0075	ALU	POL	BUN	BUN	BUN
810.0076	ALU	POL	VIT	VIT	VIT
810.0082	ALU	KYN	VIT	VIT	VIT
810.0083	SST	POL	SST	SST	BUN
810.0084	SST	POL	POL	BUN	BUN
810.0356	ALU	CPP	316	TF	TF
810.0363	ALU	CPP	POL	TF	TF
810.0364	ALU	CPP	POL	SAN	SAN
810.0365	ALU	CPP	POL	BUN	BUN
810.0367	ALU	CPP	POL	VIT	VIT
810.0369	ALU	CPP	KYN	VIT	VIT
810.0368	ALU	CPP	POL	GEO	GEO
810.0370	ALU	CPP	POL	TF	TF
810.0358	ALU	CPP	SST	SST	BUN
810.0360	ALU	CPP	SST	BUN	BUN
810.0361	ALU	CPP	BUN	BUN	BUN
810.0362	ALU	CPP	VIT	VIT	VIT
810.0373	SST	CPP	SST	SST	SST
810.0374	SST	CPP	POL	BUN	BUN

ACE = Acetal BUN = Buna-N KYN = PVDF POL = Polypropylene 174 = 17–4PH 316 = 316 sst SAN = Santoprene
TF = PTFE VIT = fluoroelastomer GEO = Geolast CPP = Conductive Polypropylene

819.7137 Stainless Steel Air Motor Conversion Kit

Use kit 819.7137 and refer to instruction manual 819.7140 (included with kit) to convert from aluminum air motor to stainless steel air motor.

Repair Kit Listing

VERDERAIR VA 25 Acetal, Polypropylene, and PVDF Pumps, Series B

Repair Kits may only be ordered as kits. To repair the air valve, order **Part No. 819.4274** for aluminum center housing models and **Part No. 819.0249** for stainless steel center housing models (see page 25). Parts included in the Air Valve Repair Kit are marked with a symbol in the parts list, for example (2†■). The list of existing Repair Kits is below:

Part No.	O-Rings	Seats	Balls	Diaphragms
819.3457	PLA	ACE	TF	NUL
819.3458	PLA	ACE	TF	TF
819.3487	PLA	ACE	BUN	NUL
819.3491	PLA	ACE	BUN	BUN
819.3500	PLA	316	TF	TF
819.3554	PLA	174	316	TF
819.3589	PLA	HYT	ACE	NUL
819.3591	PLA	HYT	ACE	HYT
819.3652	PLA	SAN	SAN	SAN
819.3708	PLA	VIT	VIT	VIT
819.3709	PLA	POL	TF	NUL
819.3710	PLA	POL	TF	TF
819.3733	PLA	POL	SAN	NUL
819.3736	PLA	POL	SAN	SAN
819.3739	PLA	POL	BUN	NUL
819.3743	PLA	POL	BUN	BUN
819.3794	PLA	POL	GEO	GEO
819.3751	PLA	KYN	TF	NUL
819.3752	PLA	KYN	TF	TF
819.3787	PLA	KYN	VIT	NUL
819.3792	PLA	KYN	VIT	VIT
819.5700	PLA	NUL	NUL	TF
819.5701	PLA	NUL	NUL	HYT
819.5702	PLA	NUL	NUL	SAN
819.5703	PLA	NUL	NUL	BUN
819.5704	PLA	NUL	NUL	VIT

ACE = Acetal BUN = Buna-N HYT = TPE NULL = Null PLA = Plastic POL = Polypropylene 174 = 17–4PH sst 316 = 316 sst SAN = Santoprene TF = PTFE VIT = fluoroelastomer GEO = Geolast

Notes

Parts

Air Motor Parts List

Ref. No.	Part No.	Description	Qty
1	819.4275	HOUSING, center; alum.	1
	819.0247	HOUSING, center; stainless steel	1
2	819.4276	COVER, air valve; alum.	1
	819.7103	COVER, air valve; stainless steel	1
3	819.0221	SCREW, mach, hex flange hd; M5 x 0.8; 12 mm	9
4†■	819.4278	GASKET, cover; Santoprene®	1
5	819.4279	CARRIAGE; aluminum	1
6†■	819.4280	O-RING; nitrile	1
7†■	819.4281	BLOCK, air valve; acetal	1
8■	Alum. 819.4282	PLATE, air valve; sst	1
	SST 819.0248	PLATE, air valve, sst	1
9†	Alum. 819.4283	SEAL, valve plate; buna-N	1
	SST –	–	–
10†■	819.4284	PACKING, u-cup; nitrile	2
11	819.4285	PISTON, actuator; acetal	2
12	819.4286	BEARING, piston; acetal	2
15	819.4287	BEARING, pin; acetal	2
16	819.4288	PIN, pilot; stainless steel	2
17†■	819.4289	O-RING; buna-N	2
18†■	819.4290	BLOCK, pilot; acetal	1
19	819.4291	BEARING, shaft; acetal	2
20	819.0220	SCREW, grounding	1
22	819.4294	GASKET, air cover; foam	2
23	819.4368	COVER, air; aluminum	2
	819.7104	COVER, air; stainless steel	2
24	819.4369	SHAFT, diaphragm; sst	1
25	819.7051	SCREW; M8 x 1.25; 25 mm	12

Fluid Section Parts List

Fluid Section Material	Ref. No.	Part No.	Description	Qty
ACETAL	101	819.4370	COVER, fluid; acetal	2
	102	819.4371	MANIFOLD, inlet; acetal	1
	103	819.4372	MANIFOLD, outlet; acetal	1
	104	819.4373	PLATE, air side; aluminum	2
	105	819.4374	PLATE, fluid side; acetal	2
	106	819.4375	SCREW; M8 x 1.25; 70 mm; sst	12
	110▲	819.6314	LABEL, warning	1
	111	819.4376	MUFFLER	1
	112	819.4377	SCREW; M8 x 1.25; 40 mm; sst	12
	113	819.6878	CAP, bolt; SST	8
POLYPROPYLENE	101	819.4378	COVER, fluid; polypropylene	2
	102	819.4379	MANIFOLD, inlet; polypropylene	1
	103	819.4380	MANIFOLD, outlet; polypropylene	1
	104	819.4373	PLATE, air side; aluminum	2
	105	819.4381	PLATE, fluid side; polypropylene	2
	106	819.4375	SCREW; M8 x 1.25; 70 mm; sst	12
	110▲	819.6314	LABEL, warning	1
	111	819.4376	MUFFLER	1
	112	819.4377	SCREW; M8 x 1.25; 40 mm; sst	12
	113	819.6878	CAP, bolt; SST	8

Fluid Section Material	Ref. No.	Part No.	Description	Qty
PVDF	101	819.4382	COVER, fluid; PVDF	2
	102	819.4383	MANIFOLD, inlet; PVDF	1
	103	819.4384	MANIFOLD, outlet; PVDF	1
	104	819.4373	PLATE, air side; aluminum	2
	105	819.4385	PLATE, fluid side; PVDF	2
	106	819.4375	SCREW; M8 x 1.25; 70 mm; sst	12
	110▲	819.6314	LABEL, warning	1
	111	819.4376	MUFFLER	1
	112	819.4377	SCREW; M8 x 1.25; 40 mm; sst	12
	113	819.6878	CAP, bolt; SST	8
CONDUCTIVE POLYPROPYLENE	101	819.0265	COVER, fluid; CPP	2
	102	819.0267	MANIFOLD, inlet; CPP	1
	103	819.0266	MANIFOLD, outlet; CPP	1
	104	819.4373	PLATE, air side; aluminum	2
	105	819.4381	PLATE, fluid side; aluminum	2
	106	819.4375	SCREW; M8 x 1.25; 70 mm; sst	12
	110▲	819.6314	LABEL, warning	1
	111	819.4376	MUFFLER	1
	112	819.4377	SCREW; M8 x 1.25; 40 mm; sst	12
	113	819.6878	CAP, bolt; SST	8

Parts

Seat Parts List

Seat Material	Ref. No.	Part No.	Description	Qty
316 SST	201*	819.4386	SEAT; 316 stainless steel	4
	202*	819.6344	O-RING; PTFE	8
17–4 SST	201*	819.4388	SEAT; 17-4 stainless steel	4
	202*	819.6344	O-RING; PTFE	8
TPE	201*	819.4389	SEAT; TPE	4
	202	none	Not Used	0
SANTOPRENE	201*	819.6866	SEAT; Santoprene	4
	202*	819.6867	O-RING; PTFE en-capsulated	8
BUNA–N	201*	819.7118	SEAT; Buna–N	4
	202*	NONE	NOT USED	0
fluoro–elastomer	201*	819.7134	SEAT; fluoroelastomer	4
	202	none	Not Used	0
POLYPROPYLENE	201*	819.4392	SEAT; polypropylene	4
	202*	819.6344	O-RING; PTFE	8
PVDF	201*	819.4393	SEAT; PVDF	4
	202*	819.6344	O-RING; PTFE	8
ACETAL	201*	819.6343	SEAT;Acetal	4
	202*	819.6344	O-RING; PTFE	8

Ball Parts List

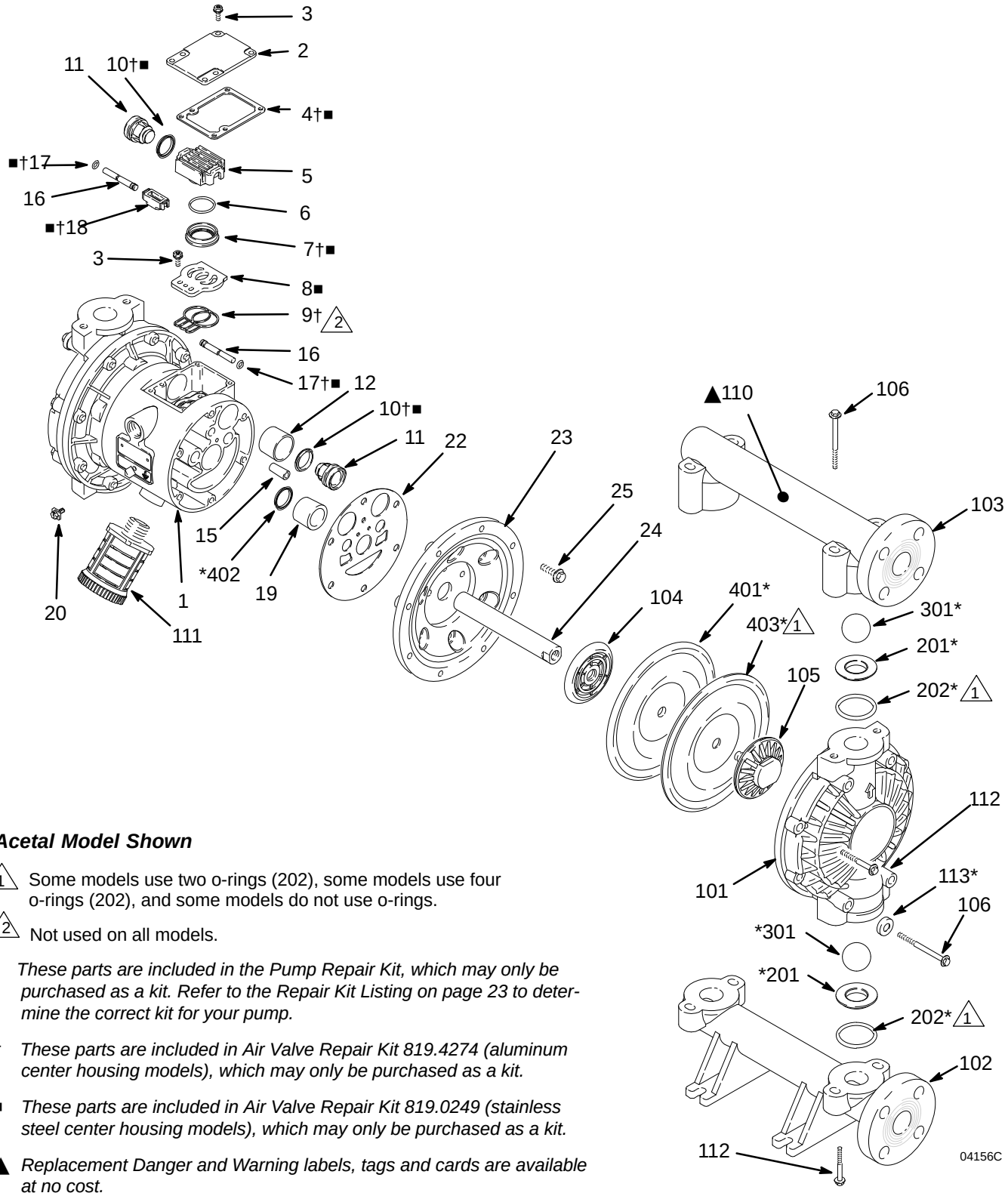
Ref. No.	Part No.	Description	Qty
301*	819.4394	BALL; PTFE	4
301*	819.4395	BALL; acetal	4
301*	819.4396	BALL; 316 stainless steel	4
301*	819.4397	BALL; 440C stainless steel	4
301*	819.6865	BALL; TPE	4
301*	819.4398	BALL; Santoprene	4
301*	819.7125	BALL; buna-N	4
301*	819.7124	BALL; fluoroelastomer	4
301*	819.7056	BALL; Geolast	4

Diaphragm Parts List

Dia-phragm Material	Ref. No.	Part No.	Description	Qty
PTFE	401*	not sold separately	DIAPHRAGM, backup; polychloroprene (CR)	2
	402*	819.4284	PACKING, u-cup; nitrile	2
	403*	819.4402	DIAPHRAGM; PTFE	2
TPE	401*	819.4401	DIAPHRAGM; TPE	2
	402*	819.4284	PACKING, u-cup; nitrile	2
SANTOPRENE	401*	819.4403	DIAPHRAGM; Santoprene	2
	402*	819.4284	PACKING, u-cup; nitrile	2
BUNA–N	401*	819.7130	DIAPHRAGM; buna-N	2
	402*	819.4284	PACKING, u-cup; nitrile	2
fluoro–elastomer	401*	819.7131	DIAPHRAGM; fluoroelastomer	2
	402*	819.4284	PACKING, u-cup; nitrile	2
GEOLAST	401*	819.7058	DIAPHRAGM; Geolast	2
	402*	819.4284	PACKING, u–cup; nitrile	2

* *These parts are included in the pump repair kit, purchased separately. See Repair Kit Listing on page 23 to determine the correct kit for your pump.*

Parts



Acetal Model Shown

△1 Some models use two o-rings (202), some models use four o-rings (202), and some models do not use o-rings.

△2 Not used on all models.

* *These parts are included in the Pump Repair Kit, which may only be purchased as a kit. Refer to the Repair Kit Listing on page 23 to determine the correct kit for your pump.*

† *These parts are included in Air Valve Repair Kit 819.4274 (aluminum center housing models), which may only be purchased as a kit.*

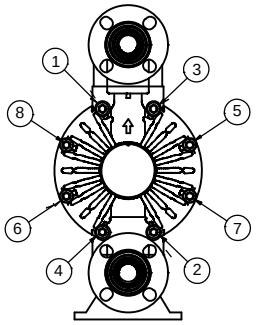
■ *These parts are included in Air Valve Repair Kit 819.0249 (stainless steel center housing models), which may only be purchased as a kit.*

▲ *Replacement Danger and Warning labels, tags and cards are available at no cost.*

Torque Sequence

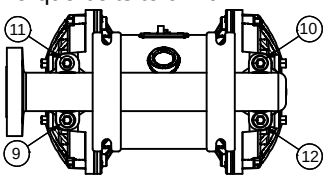
Always follow torque sequence when instructed to torque fasteners.

1. Left/Right Fluid Covers
   Torque bolts to 14–17 N•m



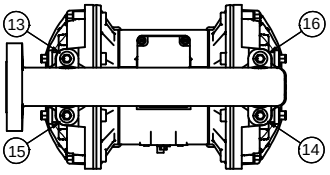
SIDE VIEW

2. Inlet Manifold
   Torque bolts to 9–10 N•m



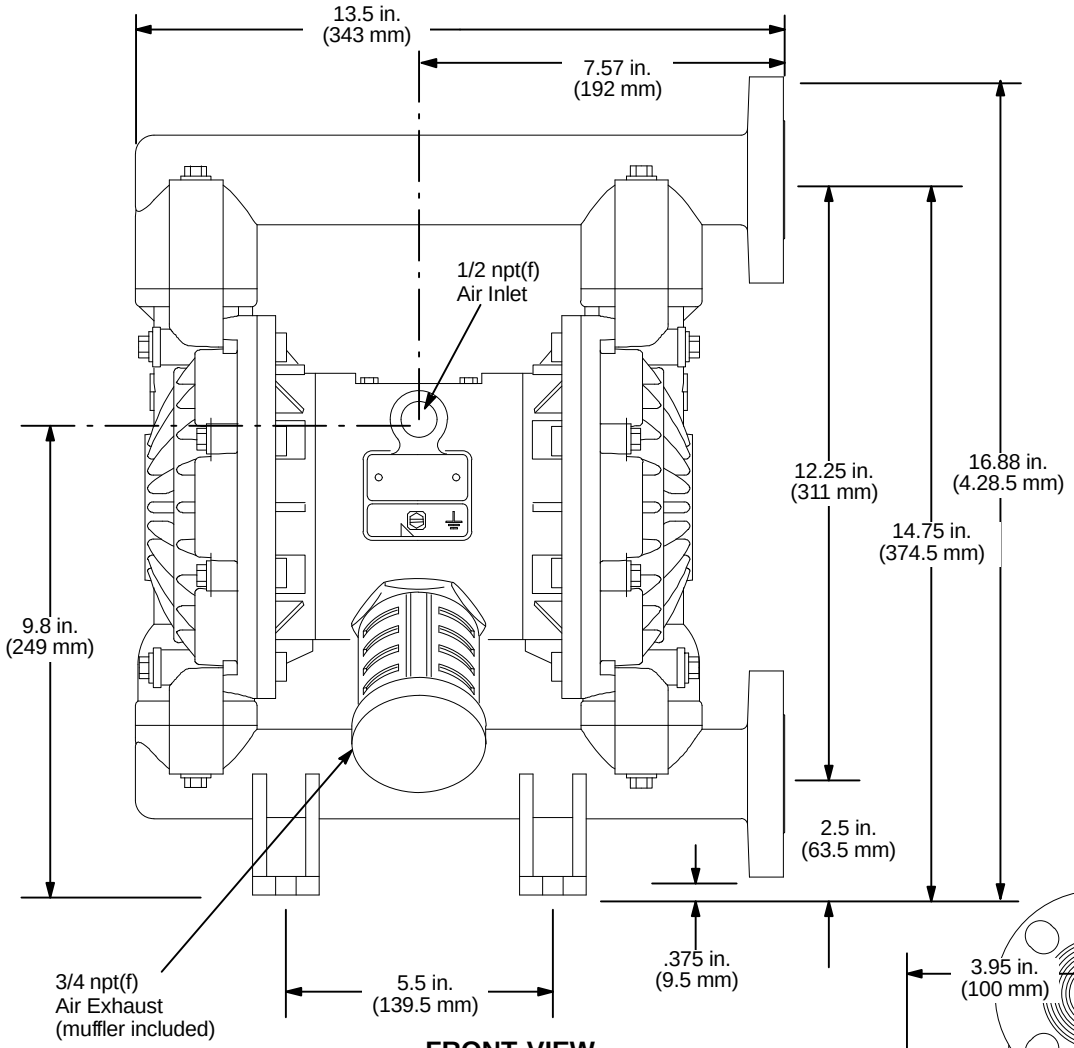
BOTTOM VIEW

3. Outlet Manifold
   Torque bolts to 9–10 N•m

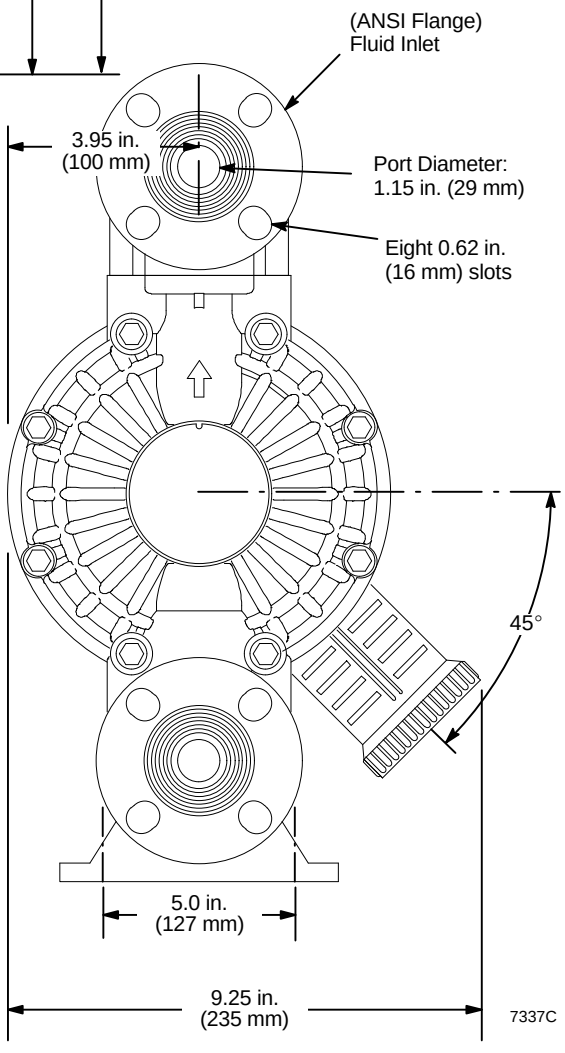


TOP VIEW

Dimensions

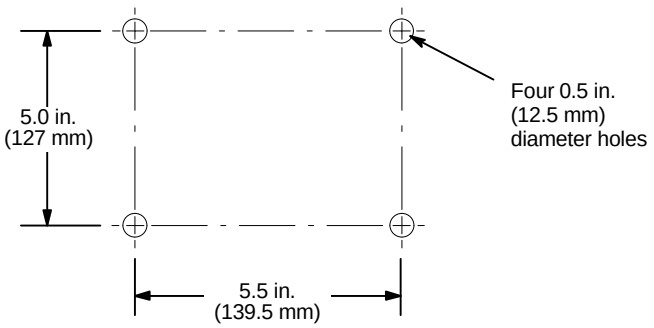


FRONT VIEW



SIDE VIEW

PUMP MOUNTING HOLE PATTERN



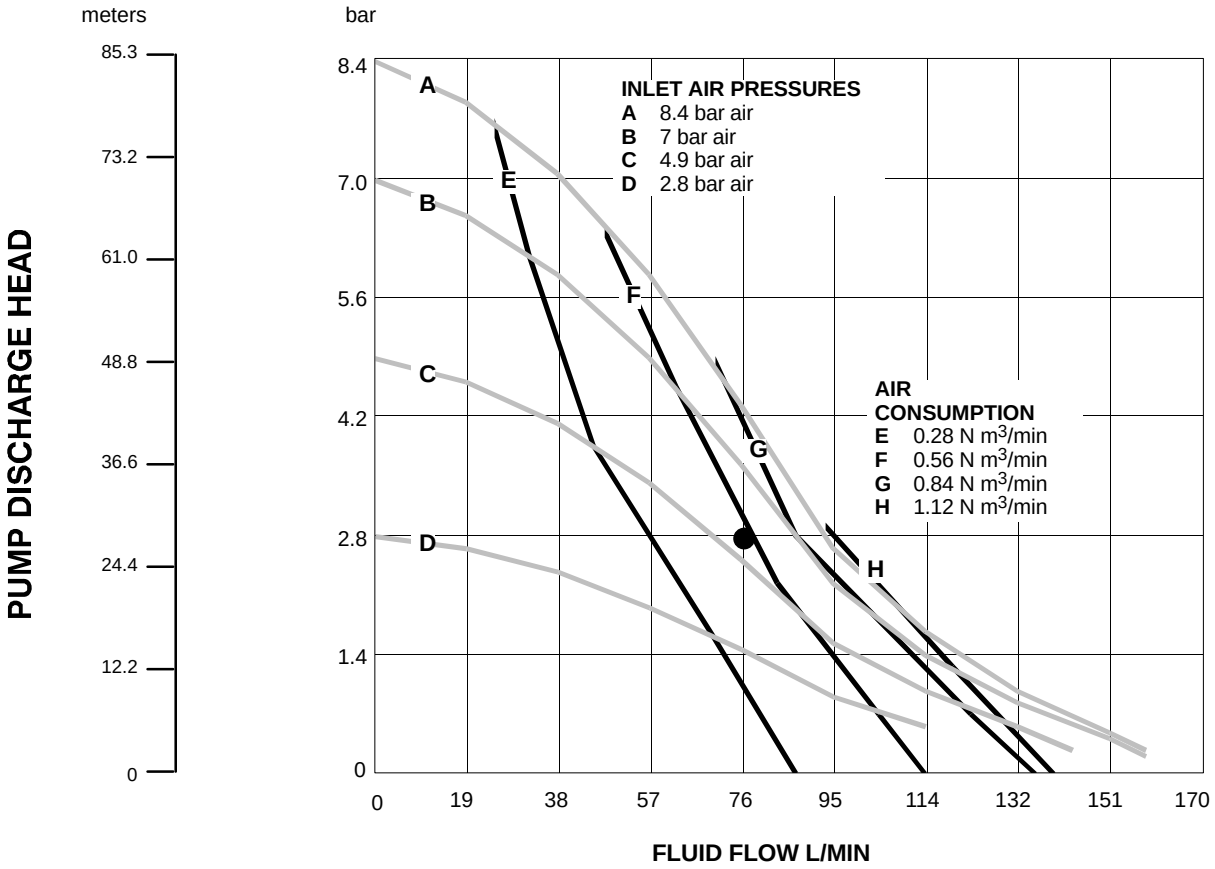
Technical Data

Maximum Fluid Working Pressure . . . . . 8.4 bar
Air Pressure Operating Range . . . . . 1.4–8.4 bar
Maximum Air Consumption . . . . . 60 N m^3/min
Air Consumption
at 4.9 bar/76 lpm . . . . . 0.56 N m^3/min (see chart)
Maximum Free Flow Delivery . . . . . 159 l/min
Maximum Pump Speed . . . . . 276 cpm
Liters per cycle 0.57
Maximum Suction Lift . . . . . 5.48 m wet or dry
Maximum Size Pumpable Solids . . . . . 3.2 mm
* Sound Pressure Level at 7 bar, 50 cpm . . . . . 89 dBa
* Sound Power Level at 7 bar, 50 cpm . . . . . 100 dBa
* Sound Pressure Level at 4.9 bar, 50 cycles/min . . . 78 dBa
Maximum Operating Temperature . . . . . 65.5°C; 93.3°C for models with PTFE diaphragms
Air Inlet Size . . . . . 1/2 npt(f)
Fluid Inlet Size. . . . . 1 in. Raised Face Flange
Fluid Outlet Size. . . . . 1 in. Raised Face Flange

Wetted Parts . . . . . Vary by Model. Refer to pages 25–27
Non-wetted External Parts . . . . . Aluminum, 302, 316 Stainless Steel Polyester (labels)
Weight (approximate) . . . . . *Polypropylene Models*
with aluminum air motor : 8.6 kg
with stainless steel air section: 14.6 kg
. . . . . *Acetal Models*
with aluminum air motor: 10 kg
. . . . . *PVDF Models*
with aluminum air motor: 11.3 kg
with stainless steel air section: 16.0 kg

Santoprene® is a registered trademark of the Monsanto Co.
Loctite® is a registered trademark of the Loctite Corporation.
PVDF is a registered trademark of Atochem North America, Inc.
* Sound pressure levels measured with the pump mounted on the floor, using Rubber Foot Kit 819.4333. Sound power measured per ISO Standard 9614–2.

Example of Finding Pump Air Consumption and Air Pressure at a Specific Fluid Delivery and Discharge Head:
To supply 76 liters fluid flow (horizontal scale) at 2.8 bar discharge head pressure (vertical scale) requires approximately 0.56 N m^3/min air consumption at 4.9 bar inlet air pressure.



TEST CONDITIONS
Pump tested in water with PTFE diaphragm and inlet submerged.

KEY — **FLUID PRESSURE AND FLOW**
N m^3/min AIR CONSUMPTION

Customer Services/Guarantee

CUSTOMER SERVICES

If you require spare parts, please contact your local distributor, providing the following details:

- Pump Model
- Type
- Serial Number, and
- Date of First Order.

GUARANTEE

All VERDER pumps are warranted to the original user against defects in workmanship or materials under normal use (rental use excluded) for two years after purchase date. This warranty does not cover failure of parts or components due to normal wear, damage or failure which in the judgement of VERDER arises from misuse.

Parts determined by VERDER to be defective in material or workmanship will be repaired or replaced.

LIMITATION OF LIABILITY

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WARRANTY DISCLAIMER

VERDER has made an effort to illustrate and describe the products in the enclosed brochure accurately; however, such illustrations and descriptions are for the sole purpose of identification and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustration or descriptions.

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Model

Modèle, Modell, Modello, Μοντέλο, Modelo, Malli, Mudel, Modelis, Mudell, Модел, Samhail

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Part

Bestelnr., Type, Teil, Codice, Del, Μέρος, Peça, Referencia, Osa, Součást, Részegység, Daļa, Dalis, Część, Taqsima, Časť, Част, Páirt, Parte

810.0077–810.0079, 810.0081, 810.0085–810.0088, 810.0184, 810.0186, 810.0220–810.0267, 810.0269–810.0354, 810.0382, 810.0429, 810.0430, 810.0500–810.0547, 810.0549–810.0779, 810.2679–810.2924, 810.5460–810.5539, 810.5594–810.5628, 810.6346, 810.6347, 810.6975, 810.6977–810.6982, 810.7002, 810.7003, 810.7007, 810.7010, 810.7014–810.7018, 810.0191–810.0202, 810.0356–810.0374

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2006/42/EC Machinery Directive

2014/34/EC ATEX Directive (Ex II 2 GD c IIC T4) - Tech file stored with NB 0359

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EN 1127-1	EN 13463-1
ISO 12100	ISO 9614-1

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Werner Bosman
Managing Director

15 February 2017

VERDER BV
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9723 TP Groningen
NETHERLANDS

819.5961	B

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810.0073–810.0076, 810.0082–810.0084, 810.2925–810.2937, 810.2939–810.2952, 810.2954–810.3098, 810.3100–810.3381, 810.3383–810.3414, 810.5629–810.5698, 810.6976, 810.7009, 810.7011–810.7013, 810.7019, 810.7038, 810.7039, 810.7046–810.7053

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ISO 12100

ISO 9614-1

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