

FDA Series Diaphragm Pumps

3A4550A

SPFG05 Models

EN

For use in sanitary applications. For professional use only.



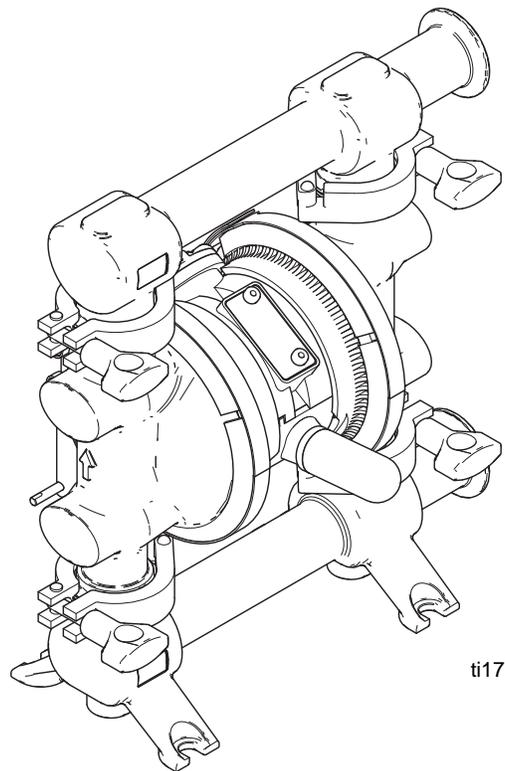
Important Safety Instructions

Read all warnings and instructions in this manual. Save these instructions.

See page 2 for approval information.

100 psi (0.7 MPa, 6.9 bar) Maximum Fluid Working Pressure

100 psi (0.7 MPa, 6.9 bar) Maximum Air Input Pressure



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Models

Model	Description	Seats	O-Rings	Balls	Diaphragms	Approvals
SPFG05PPP	1/2" FDA Series AODD Pump	Stainless Steel	PTFE	PTFE	PTFE	  
SPFG05PPT				PTFE	Overmolded PTFE	
SPFG05PPS				Santoprene	Santoprene	 

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. When these symbols appear in the body of this manual, refer back to these Warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

 <h2 style="margin: 0;">WARNING</h2>	
	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking). • Ground all equipment in the work area. See Grounding instructions. • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Use only grounded hoses. • Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area. • Route exhaust away from all ignition sources. If diaphragm ruptures, fluid may be exhausted with air.
	<p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read Safety Data Sheet (SDS) to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
	<p>PRESSURIZED EQUIPMENT HAZARD</p> <p>Fluid from the equipment, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</p> <ul style="list-style-type: none"> • Follow the Pressure Relief Procedure when you stop spraying/dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.



WARNING

 	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheet (SDS) from distributor or retailer. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	<p>BURN HAZARD</p> <p>Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns:</p> <ul style="list-style-type: none"> • Do not touch hot fluid or equipment.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Installation

General Information

- The typical installation shown in FIG. 2, page 7, is only a guide for selecting and installing system components. Contact your Standard Pump distributor for assistance in planning a system to suit your needs.
- Always use genuine Standard Pump parts and accessories.
- Reference numbers and letters in parentheses refer to the callouts in the figures.

<p>The pump is heavy and may cause injury if dropped. Lift the pump by grasping the outlet manifold securely.</p> <p>If dropped, the pump may rupture. To avoid serious injury from splashing fluid, follow the Pressure Relief Procedure, page 10 before moving the pump.</p>				

<p>To reduce the risk of serious injury due to burns, insulate the pump before pumping hot fluids.</p>				

Tighten Clamps Before First Use

After you unpack the pump, and before you use it for the first time, check all clamps and tighten as necessary.

Grounding

<p>The equipment must be grounded. Grounding reduces the risk of static and electric shock by providing an escape wire for the electrical current due to static build up or in the event of a short circuit.</p>				

- **Pump:** Attach a ground wire (Y) to the grounding strip (8) with the screw (9a), lockwasher (9b), and nut (9c), as shown in FIG. 1, and per local code. Connect the clamp end of the ground wire to a true earth ground. Order Part No. 400-295 Ground Wire and Clamp.

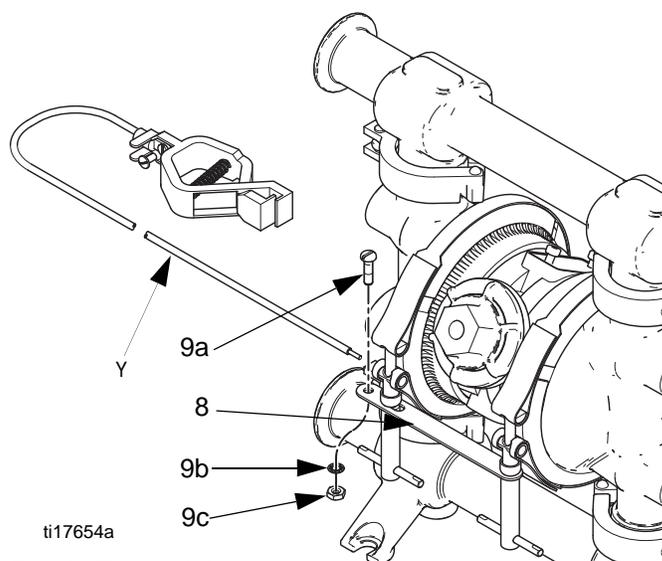


FIG. 1: Ground the pump

- **Fluid hoses:** Use only grounded hoses with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity.
- **Air compressor:** Follow the manufacturer's recommendations.
- **All solvent pails used when flushing:** Follow the local code. Use only 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 the local code.

Mounting

NOTICE

Pump exhaust air may contain contaminants that can contaminate the fluid supply. Ventilate to a remote area. See **Air Exhaust Ventilation** on page 9.

- Be sure the mounting surface can support the weight of the pump, hoses, and accessories, as well as the stress caused during operation.
- For all mountings, be sure the pump is bolted directly to the mounting surface.
- For ease of operation and service, mount the pump so the air valve cover, air inlet, and fluid inlet and outlet ports are easily accessible.

Air Line



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. A bleed-type master air valve (B) is required in the system to relieve air trapped between this valve and the pump. See FIG. 2, page 7.

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/filter assembly (C) and gauge to control the fluid pressure. The fluid outlet pressure will be the same as the setting of the air regulator. The air line filter removes harmful dirt and moisture from the compressed air supply.
 - b. Locate one bleed-type master air valve (B) close to the pump and use it to relieve trapped air. See the **WARNING** above. Locate the other master air valve (E) upstream from all air line accessories and use it to isolate them during cleaning and repair.



In the step below, do not connect the quick-disconnect coupler (D) on the air hose to the mating fitting on the pump until you are ready to operate the pump. Connecting the coupler too early can result in unintentional operation of the pump, leading to serious injury from moving parts, splashing fluid in the eyes or on the skin, and contact with hazardous fluids.

2. Install a grounded, flexible air hose (A) between the accessories and the 1/4 npt(f) pump air inlet. Use a minimum 1/4 in. (6.3 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.

Fluid Suction Line

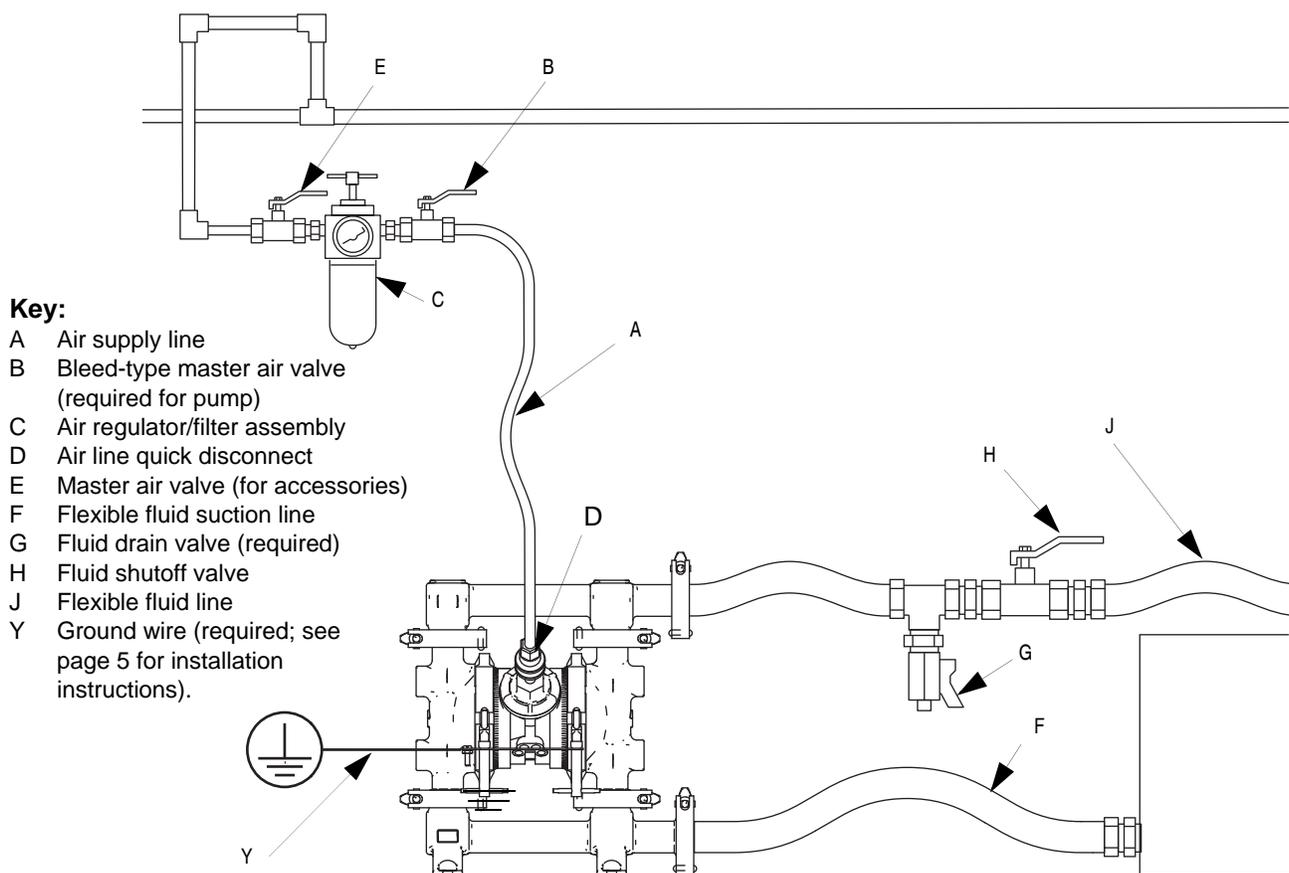
1. Use flexible, grounded fluid hoses (F). The inlet fits sanitary tubing of 1 to 1.5-inch OD.
2. For best sealing results, use a standard tri-clamp sanitary gasket of a flexible material such as EPDM or Buna-N.
3. If the fluid inlet pressure to the pump is more than 25% of the outlet working pressure, the ball check valves will not close fast enough, resulting in inefficient pump operation. Excessive inlet fluid pressure also will shorten diaphragm life. Approximately 3 - 5 psi (0.02 - 0.03 MPa, 0.21-0.34 bar) should be adequate for most materials.
4. For maximum suction lift (wet and dry), see **Technical Data**, page 25. For best results, always install the pump as close as possible to the material source.

Fluid Outlet Line



A fluid drain valve (G) 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 flexible grounded fluid hoses (J).
2. For best sealing results, use a standard tri-clamp sanitary gasket of a flexible material such as EPDM, Buna-N.
3. Install a fluid drain valve (G) near the fluid outlet. See the **WARNING**, and FIG. 2.
4. Install a shutoff valve (H) in the fluid outlet line.



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FIG. 2: Typical Floor-Mount Installation

Changing the Orientation of the Fluid Inlet and Outlet Ports

The pump is shipped with the ports facing the same direction. To reverse the orientation of the ports:

1. Remove the clamps (12) holding the inlet and/or outlet manifold to the covers.

NOTE: Inspect the o-rings and replace if necessary.

2. Reverse the manifold and reattach. Install and tighten clamps snugly.

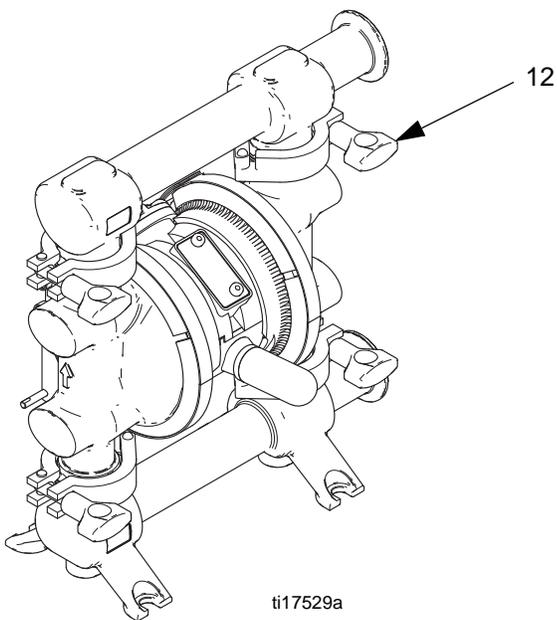


FIG. 3: Reverse the Manifolds

Air Exhaust Ventilation



To avoid serious injury from explosion or hazardous fluids:

- be sure the system is properly ventilated for your type of installation.
- vent the exhaust away from people, animals, food handling areas, and all sources of ignition

place an appropriate container at the end of the air exhaust line to catch fluid. If a diaphragm ruptures, the fluid being pumped will exhaust with the air. See FIG. 4.

The air exhaust port is 3/8 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 3/8 in. (9.5 mm) ID. If a hose longer than 15 ft (4.57 m) is required, use a larger diameter hose. Avoid sharp bends or kinks in the hose.
3. Place a container (U) at the end of the air exhaust line to catch fluid in case a diaphragm ruptures. See FIG. 4.

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)
- P Muffler
- T Grounded air exhaust hose
- U Container for remote air exhaust

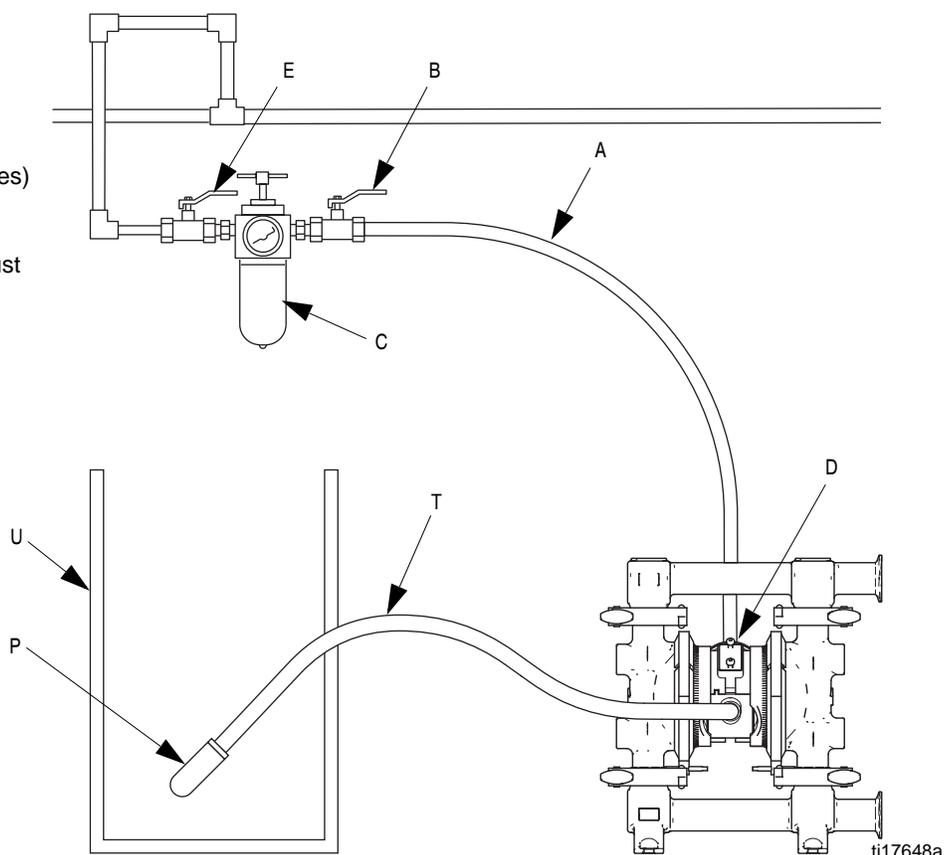


FIG. 4: Venting Exhaust Air

Operation

Pressure Relief Procedure



The equipment stays pressurized until pressure is manually relieved. To reduce the risk of serious injury from pressurized fluid or splashing fluid, follow this procedure whenever you stop pumping and before cleaning, checking, or servicing equipment.

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

Sanitize the Pump Before First Use

It is the user's responsibility to properly sanitize the pump before first use. It is up to the user whether this will include disassembling and cleaning individual parts or simply flushing pump with a sanitizing solution. As necessary, follow the steps under **Starting and Adjusting the Pump**, at right, under **Flushing** on page 11, or under **Disassembly** in the **Service** section, starting on page 15.



To avoid serious injury from splashing fluid, never move or lift a pump under pressure. If dropped, the fluid section may rupture. Always follow the **Pressure Relief Procedure** before lifting the pump.

Starting and Adjusting the Pump

1. Be sure the pump is properly grounded. Refer to **Grounding** on page 5.
2. Check connections to be sure they are tight. Tighten fluid inlet and outlet connections securely.
3. Connect suction line (F) to material supply.

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

4. Place the end of fluid hose (J) into an appropriate container.
5. Close the fluid drain valve (G).
6. Back out the air regulator (C) knob, and 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 increase air pressure with 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.

Pump Shutdown



At the end of the work shift, follow the **Pressure Relief Procedure**.

Maintenance

Air Valve 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.

NOTICE

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

Flushing



Insert suction tube into cleaning solution. Open air regulator to supply low pressure air to the pump. Run the pump long enough to thoroughly clean the pump and hoses. Close the air regulator. Remove the suction tube from the cleaning solution and drain pump. Place suction tube in the fluid to be pumped.

Flush the pump often enough to prevent the fluid you are pumping from drying or freezing in the pump and damaging it. Flushing schedule will be based on what the pump is being used for. Use a compatible cleaning solution and always cycle the pump during the entire flushing process.

Always flush the pump and relieve the pressure before storing it for any length of time.

Tightening Connections

Before each use, check all hoses for wear or damage, and replace as necessary. Check to be sure all connections are tight and leak-free.

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



1. Follow the **Pressure Relief Procedure**, page 10.
2. Check all possible problems and causes before disassembling the pump.

PROBLEM	CAUSE	SOLUTION
Pump will not cycle, or cycles once and stops.	Air valve is stuck or dirty.	Disassemble and clean air valve. See page 13. Use filtered air.
	Check valve ball is severely worn and wedged in seat or manifold.	Replace ball and seat. See page 15.
Pump cycles at stall or fails to hold pressure at stall.	Worn check valve balls, seats, or o-rings.	Replace. See page 15.
	Check valve ball wedged in seat.	Repair or replace. See page 15.
	Worn diaphragm shaft seals.	Replace. See page 15 (standard diaphragms).
Pump operates erratically.	Clogged suction line.	Inspect; clear.
	Sticky or leaking check valve balls.	Clean or replace. See page 15.
	Diaphragm ruptured.	Replace. See page 15 (standard diaphragms) or page 17 (overmolded diaphragms).
	Restricted exhaust.	Remove restriction.
Air bubbles in fluid.	Suction line is loose.	Tighten.
	Diaphragm ruptured.	Replace. See page 15 (standard diaphragms) or page 17 (overmolded diaphragms).
	Loose inlet manifold, damaged seal between manifold and seat, or damaged manifold o-rings.	Tighten manifold clamps, or replace seats or o-rings. See page 15.
	Loose diaphragm shaft bolt or fluid side diaphragm plates.	Tighten or replace. See page 15 (standard diaphragms).
Fluid in exhaust air.	Diaphragm ruptured.	Replace. See page 15 (standard diaphragms) or page 17 (overmolded diaphragms).
	Loose diaphragm shaft bolt or fluid side diaphragm plates.	Tighten. See page 15 (standard diaphragms).
	Worn diaphragm shaft seals.	Replace. See page 15 (standard diaphragms).
Pump exhausts air from clamps.	Loose manifolds, damaged seal between manifold and seat, or damaged manifold o-rings.	Tighten manifold clamps, or replace seats or o-rings. See page 15.
	Air valve o-ring is damaged.	Inspect; replace. See page 13.
Pump leaks fluid from check valves.	Worn or damaged check valve o-ring.	Inspect; replace. See page 15.
No fluid output, and pump cycles rapidly.	Pump mounted incorrectly.	Mount the pump in the upright position.
Pump leaks air through the exhaust port.	Worn air valve u-cups.	Inspect; replace. See page 13.

Service

Air Valve

NOTE: Air Valve Repair Kit 400-001 is available. Parts included in the kit are marked †. Use all parts in the kit.

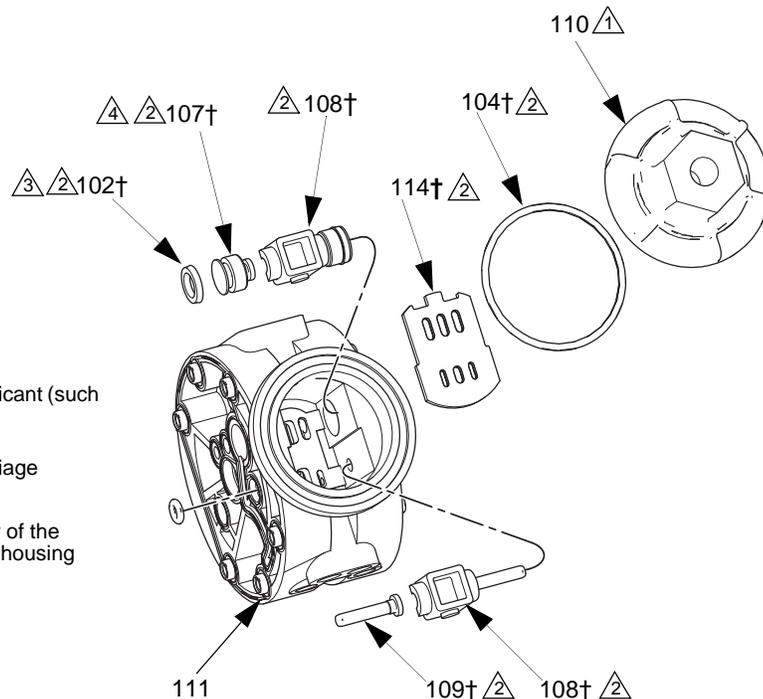


1. Follow the **Pressure Relief Procedure**, page 10.
2. Remove the air chamber cover (110) and the o-ring (104).
3. Remove the carriage plungers (107), carriages (108), carriage pins (109), and valve plate (114) from the center housing (111).
4. Remove the u-cups (102) from the carriage plungers (107).
5. Clean all parts and inspect them for wear or damage.

NOTE: When instructed to lubricate, apply appropriate waterproof sanitary lubricant (such as Standard Pump PN 400-294).

6. Lubricate the lapped surface of the valve plate (114), and install with the lapped surface facing up.
7. Lubricate and install the carriage pins (109).
8. Install the carriages (108). Make sure the carriages engage the clip ends of the carriage pins (109).
9. Lubricate the bores of the center housing (111), then install the u-cups (102) on the carriage plungers (107), **with the u-cups facing toward smaller end.**
10. Slide the carriage plungers into the bores, **with the smaller ends facing toward the center of the center housing (111).** See FIG. 5.
11. Lubricate and install the o-ring (104) on the cover (110).
12. Screw the cover (110) into the center housing.

Note: The center housing may remain assembled to the air and fluid covers for this service.



1 Torque to 80-100 in-lb. (9.0-13.6 N•m).

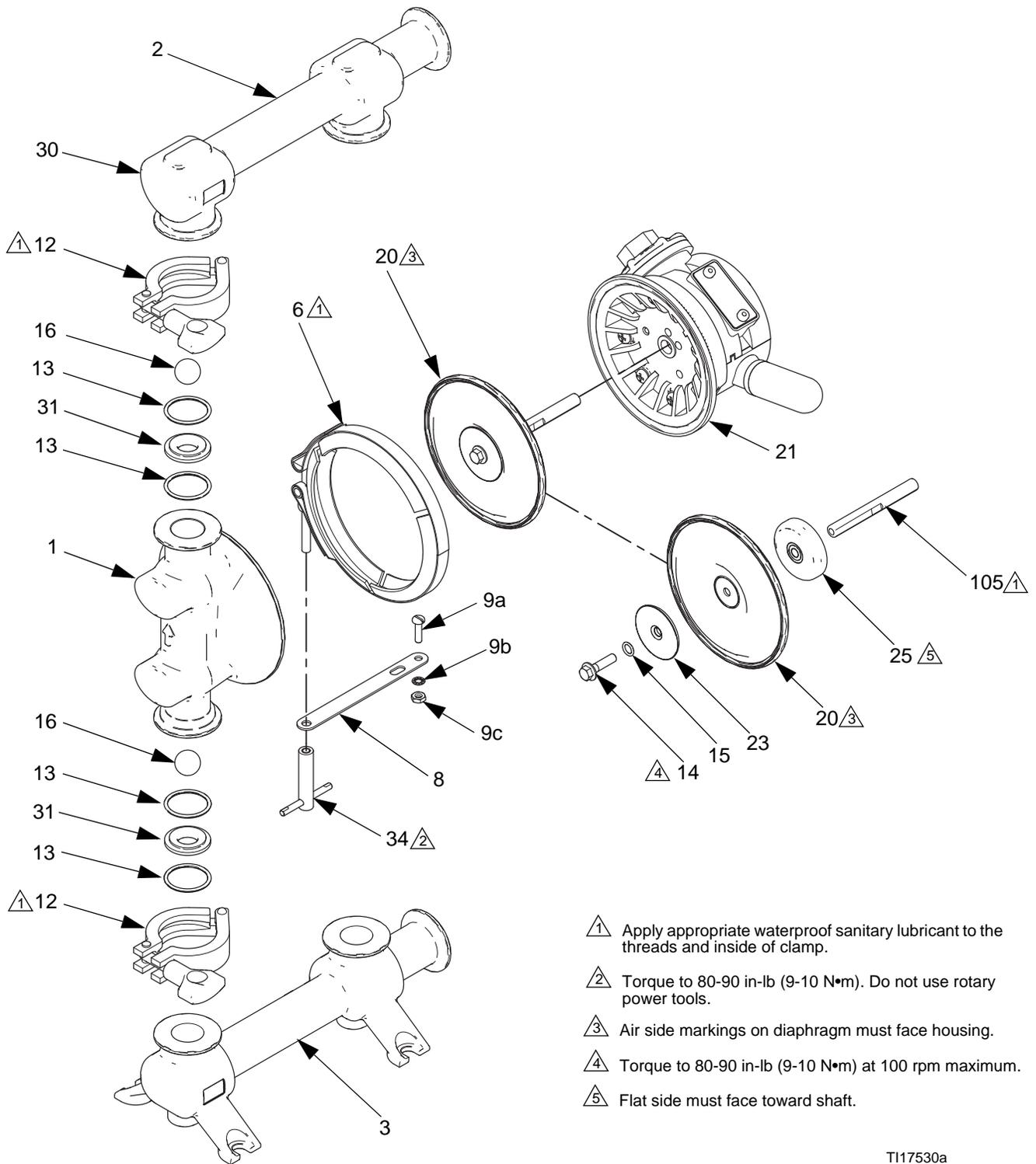
2 Apply appropriate waterproof sanitary lubricant (such as Standard Pump PN 400-294).

3 Lips must face the smaller end of the carriage plunger.

4 Smaller ends must face toward the center of the center housing. Lubricate bores of center housing before installing.

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FIG. 5. Disassemble/Reassemble the Air Valve



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FIG. 6: Disassemble/Reassemble the Pump

Ball Check Valve

Disassembly

NOTE:

- PTFE o-rings should be replaced every time manifolds are removed.



- Relieve the pressure. Disconnect all hoses.
- Remove the pump from its mounting.
- Remove the clamps (12) holding the outlet manifold (2) to the fluid covers (1). See FIG. 6.
- Remove the o-rings (13), seats (31), and balls (16).
- Remove the clamps (12) and the inlet manifold (3). Remove the o-rings (13), seats (31), and balls (16).

Reassembly

NOTE: When instructed to lubricate, apply appropriate waterproof sanitary lubricant.

- Clean all parts and inspect for wear or damage. Replace parts as needed.
- Reassemble in the reverse order, following all notes in FIG. 6, page 14. Be sure the ball checks and manifolds are assembled **exactly** as shown. The arrows (A) on the fluid covers (1) **must** point toward the outlet manifold (2).

Standard Diaphragms

NOTE: If your pump uses overmolded PTFE diaphragms, see page 17.

Disassembly



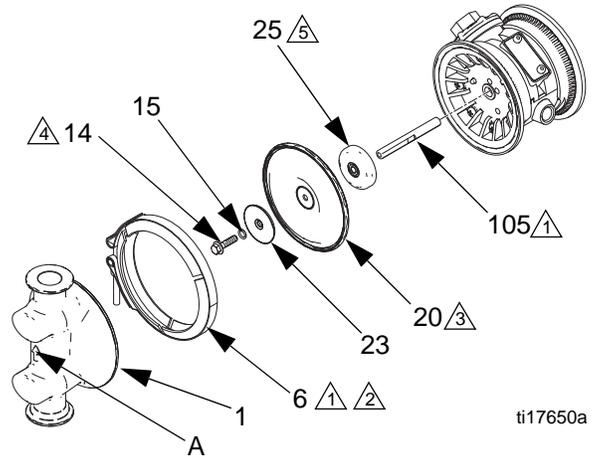
- Relieve the pressure.
- Remove the manifolds and disassemble the ball check valves as explained at left.
- Remove the nuts (34) and the grounding strip (8), then remove the clamps (6) holding the fluid covers (1) to the air covers (21). Pull the fluid covers (1) off the pump. See FIG. 6.
- Loosen but do not remove the diaphragm shaft bolts (14), using a 10 mm socket wrench on both bolts.
- Unscrew one bolt from the diaphragm shaft (105) and remove the o-ring (15), fluid side diaphragm plate (23), diaphragm (20), backer (24) used only on PTFE models, and air side diaphragm plate (25). See FIG. 7.
- Pull the other diaphragm assembly and the diaphragm shaft (105) out of the center housing. Hold the shaft flats with a 19 mm open end wrench, and remove the bolt (14) from the shaft. Disassemble the remaining diaphragm assembly.
- Clean all parts and replace o-rings as needed.

Reassembly

1. Install the diaphragm assembly on one end of the shaft (105) as follows:
 - a. Install the o-ring (15) on the shaft bolt (14).
 - b. Install the fluid side diaphragm plate (23) on the bolt so the rounded side faces the diaphragm (20).
 - c. Install the diaphragm (20). Make certain the side marked AIR SIDE faces the center housing.
 - d. On PTFE models only, install the backer on the bolt. Make certain the side marked AIR SIDE faces the center housing.
 - e. Install the air side diaphragm plate (25) so the rounded side faces the diaphragm (20).
 - f. Screw the bolt into the shaft (105) hand tight.
2. Grease the length and ends of the diaphragm shaft (105), and slide it through the housing.
3. Assemble the other diaphragm assembly to the shaft as explained in step 1.
4. Hold one shaft bolt (14) with a wrench and torque the other bolt to 80-90 in-lb (9-10 N•m) at 100 rpm maximum.

NOTE: When you install the clamps in Step 5, orient the center housing so the air inlet is approximately 45° above horizontal and the muffler is approximately horizontal.

5. Position the fluid covers (1) and the center housing so the arrows (A) on the covers face the same direction. See FIG. 7. Apply appropriate, waterproof sanitary lubricant and install the clamps around the fluid and air covers. Install the grounding strip on the clamps, and torque the t-handle nuts to 80-90 in-lb (9-10 N•m). Do not use rotary power tools.
6. Reassemble the ball check valves and manifolds as explained on page 15.



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- 1 Apply appropriate waterproof sanitary lubricant to the threads and inside of clamp.
- 2 Torque to 80-90 in-lb (9-10 N•m). Do not use rotary power tools..
- 3 Air side markings on diaphragm must face housing.
- 4 Torque to 80-90 in-lb (9-10 N•m) at 100 rpm maximum.
- 5 Flat side must face toward shaft.

FIG. 7: Standard Diaphragm

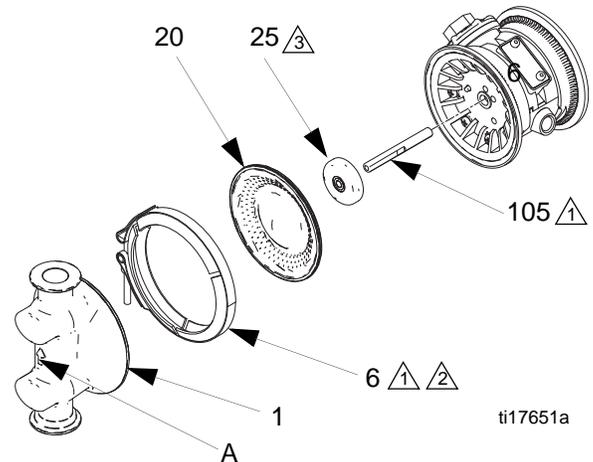
Overmolded PTFE Diaphragms

NOTE: If your pump uses standard diaphragms, see page 15.

Disassembly



1. Relieve the pressure.
2. Remove the manifolds and disassemble the ball check valves as explained on page 15.
3. Remove the clamps (6) holding the fluid covers (1) to the air covers (21). Pull the fluid covers (1) off the pump. See FIG. 8.
4. Once the fluid covers are removed, the diaphragm on the side of the pump which was last pressurized with air will be separated from the center section/air cover. This allows you to grip the diaphragms.
5. Diaphragms are assembled handtight. To loosen, grip both diaphragms securely around the outer edge and rotate counterclockwise. One diaphragm assembly will come free and the other will remain attached to the shaft. Remove the freed diaphragm (20) and air side plate (25).
6. Pull the opposite diaphragm assembly and shaft (105) out of the center housing. Hold the shaft flats with a 19 mm open end wrench and remove the diaphragm and air side plate from the shaft.
7. Clean all parts and replace as needed.



1 Apply appropriate waterproof sanitary lubricant to the threads and inside of clamp.

2 Torque to 80-90 in-lb (9-10 N•m).

3 Flat side must face toward shaft.

FIG. 8: Overmolded PTFE Diaphragm

Reassembly



To reduce the risk of serious injury, including amputation, do not put your fingers or hand between the air cover and the diaphragm.

1. Assemble the air side plate (25) onto the diaphragm (20). The wide, radiused side of the plate must face the diaphragm. Screw the assembly (diaphragm and plate) onto the shaft (105) hand tight.
2. Grease the length and ends of the diaphragm shaft (105). Insert the shaft/diaphragm assembly into one side of the pump.
3. Assemble the other diaphragm assembly to the shaft as explained in Step 1.
4. Push the assembly down on the work surface to raise the diaphragm up and out so the edges can be gripped. Hand tighten the second diaphragm onto the shaft.

NOTE: When you install the clamps in Step 5, orient the center housing so the air inlet is approximately 45° above horizontal and the muffler is approximately horizontal.

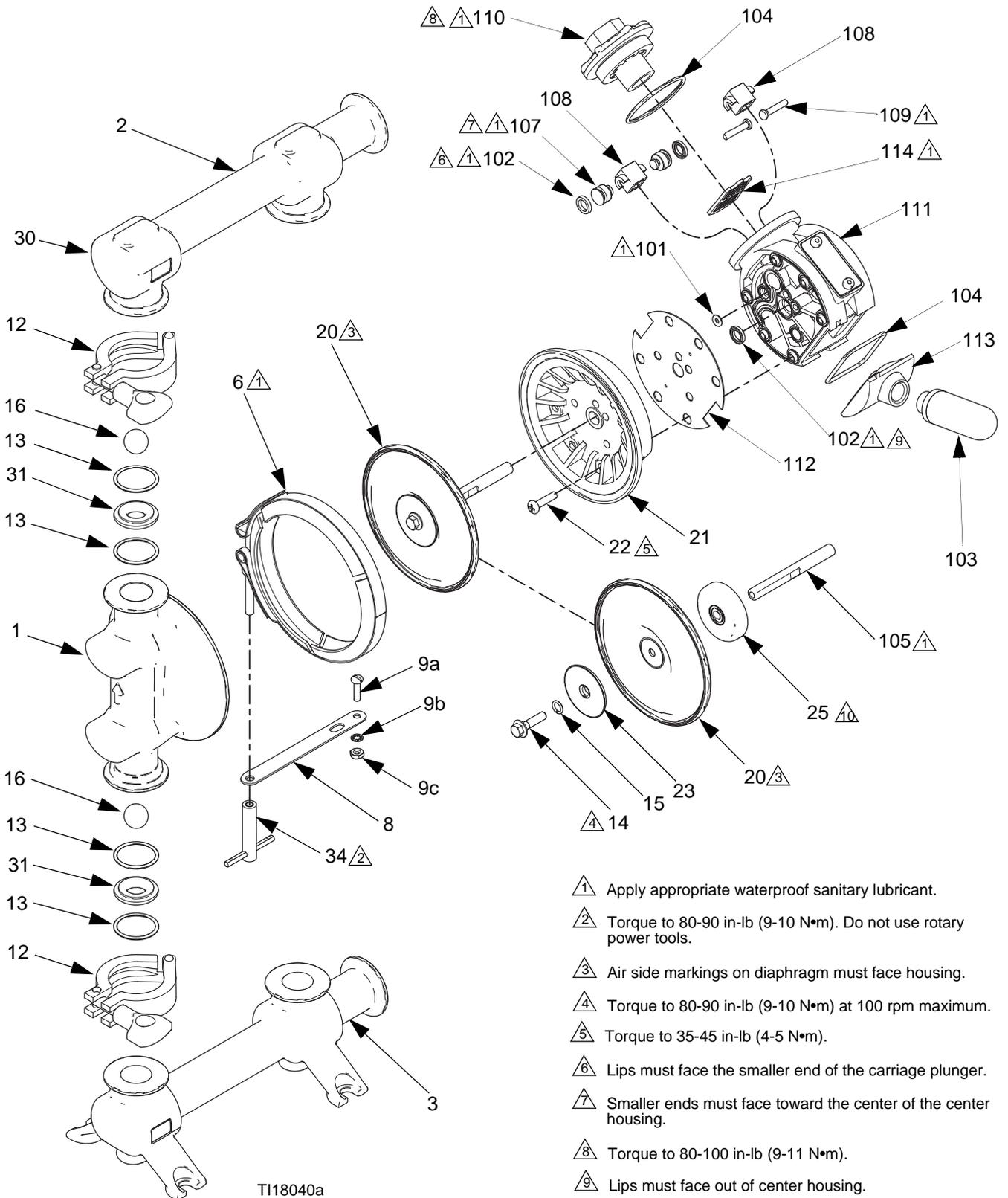
5. Position the fluid covers (1) and the center housing so the arrows (A) on the covers face the same direction. See FIG. 8. Apply appropriate, waterproof sanitary lubricant and install the clamps around the fluid and air covers. Install the grounding strip on the clamps, and torque the t-handle nuts to 80-90 in-lb (9-10 N•m). Do not use rotary power tools.
6. Reassemble the ball check valves and manifolds as explained on page 13.

Air Center Service

Remove air covers for easier replacement of u-cups and to replace the poppet o-ring, if needed. See parts illustration, page 19.

1. Follow all disassembly directions for diaphragm service. See **Standard Diaphragms**, page 15, or **Overmolded PTFE Diaphragms**, page 17.
2. Remove the muffler (103).
3. Use a phillip's screwdriver to remove 6 screws (22), and remove one air cover (21) and gasket (112).
4. Remove u-cup (102) and poppet o-ring (101).
5. Lubricate and install new u-cup (102) and poppet o-ring (101). U-cup lips must face out of center housing.
6. Reinstall the gasket (112) and air cover (21). Torque screws (22) to 35-45 in-lb (4-5 N•m).
7. Repeat for other side.
8. Reinstall the muffler (103).
9. Follow all reassembly directions for diaphragm service. See page 16 for standard diaphragms or page 17 for overmolded diaphragms.

Parts



T118040a

- ① Apply appropriate waterproof sanitary lubricant.
- ② Torque to 80-90 in-lb (9-10 N•m). Do not use rotary power tools.
- ③ Air side markings on diaphragm must face housing.
- ④ Torque to 80-90 in-lb (9-10 N•m) at 100 rpm maximum.
- ⑤ Torque to 35-45 in-lb (4-5 N•m).
- ⑥ Lips must face the smaller end of the carriage plunger.
- ⑦ Smaller ends must face toward the center of the center housing.
- ⑧ Torque to 80-100 in-lb (9-11 N•m).
- ⑨ Lips must face out of center housing.
- ⑩ Flat side must face toward shaft.

Ref.	Part	Description	Qty
1	400-267	COVER, fluid	2
2	400-266	MANIFOLD, outlet	1
3	400-265	MANIFOLD, inlet	1
4	400-269	PLATE, identification, not shown	1
6	400-254	CLAMP, vee; includes t-handle nut (Ref. 34)	2
8	400-243	STRIP, grounding	1
9	400-257	KIT, ground fasteners, stainless steel; includes Refs. 9a, 9b, and 9c	
9a	-----	SCREW, phillips head, #10-24 x 0.75	1
9b	-----	WASHER, #10, flat	1
9c	-----	NUT, #10-24 x 0.125	1
12	400-220	CLAMP, sanitary, 1.5 in.	4
13*	400-206	O-RING, PTFE	8
14		SCREW, 1/4-20 x 1	2
	400-216	Hex head flange (for standard diaphragms)	
	400-271	Socket head set (for overmolded diaphragms)	
15*	400-205	O-RING (not used with overmolded diaphragms)	2
16*		BALL	4
	400-215	Santoprene (SPFG05PPS)	
	400-202	PTFE (SPFG05PPP, SPFG05PPT)	
17	400-207	RIVET, pop, not shown	2
19	400-253	AIR MOTOR, <i>see Air Motor Parts</i>	1
20*		DIAPHRAGM	2
	-----	Santoprene (SPFG05PPS)	
	-----	Overmolded PTFE (SPFG05PPT)	
	-----	PTFE (SPFG05PPP)	
21	400-268	COVER, air	2
22	400-218	SCREW, phillips, pan head #12-14 x 7/8	12
23	400-293	PLATE, diaphragm, fluid side (not used with overmolded diaphragms)	2
24*	400-291	DIAPHRAGM, backup (SPFG05PPP)	2
25		PLATE, diaphragm, air side	2
	400-249	For use with standard diaphragms	
	400-292	For use with overmolded diaphragms	
30▲		LABEL, warning	1
	400-235	English	
	400-250	Multilingual	
31	400-258	KIT, seats, ball check, set of 4	1
34	-----	NUT, t-handle; included with vee clamp (Ref. 6)	2

Air Motor Parts

Ref.	Part	Description	Qty
101*	400-217	O-RING	2
102†*	400-204	U-CUP	4
103	400-214	MUFFLER	1
104†*	400-222	O-RING; included with exhaust cover (Ref. 113) and air chamber cover (Ref. 110)	1
105	400-246	SHAFT	1
107†	400-290	PLUNGER, carriage	2
108†	400-244	CARRIAGE	2
109†	400-245	PIN, carriage	2
110	400-256	COVER, air chamber; includes o-ring (Ref. 104)	1
111	-----	HOUSING, center	1
112*	400-247	GASKET	2
113	400-255	COVER, exhaust; includes o-ring (Ref. 104)	1
114†	400-248	PLATE, valve	1

* *These parts are included the the Fluid Section Repair Kit, sold separately. See page 21 for the correct kit for your model.*

† *These parts are included in Air Valve Repair Kit 400-001, sold separately.*

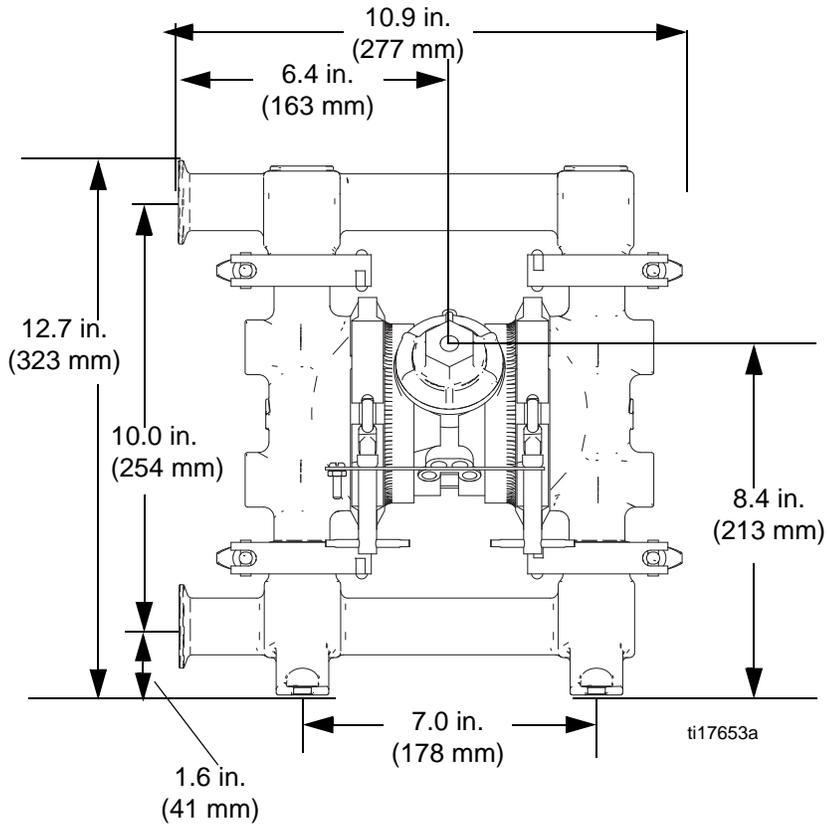
▲ *Replacement Warning labels, signs, tags, and cards are available at no cost.*

----- *These parts are not sold separately.*

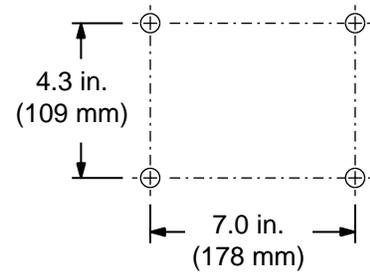
Fluid Section Repair Kits

Pump Model	Repair Kit
SPFG05PPP	400-010
SPFG05PPT	400-011
SPFG05PPS	400-012

Dimensions



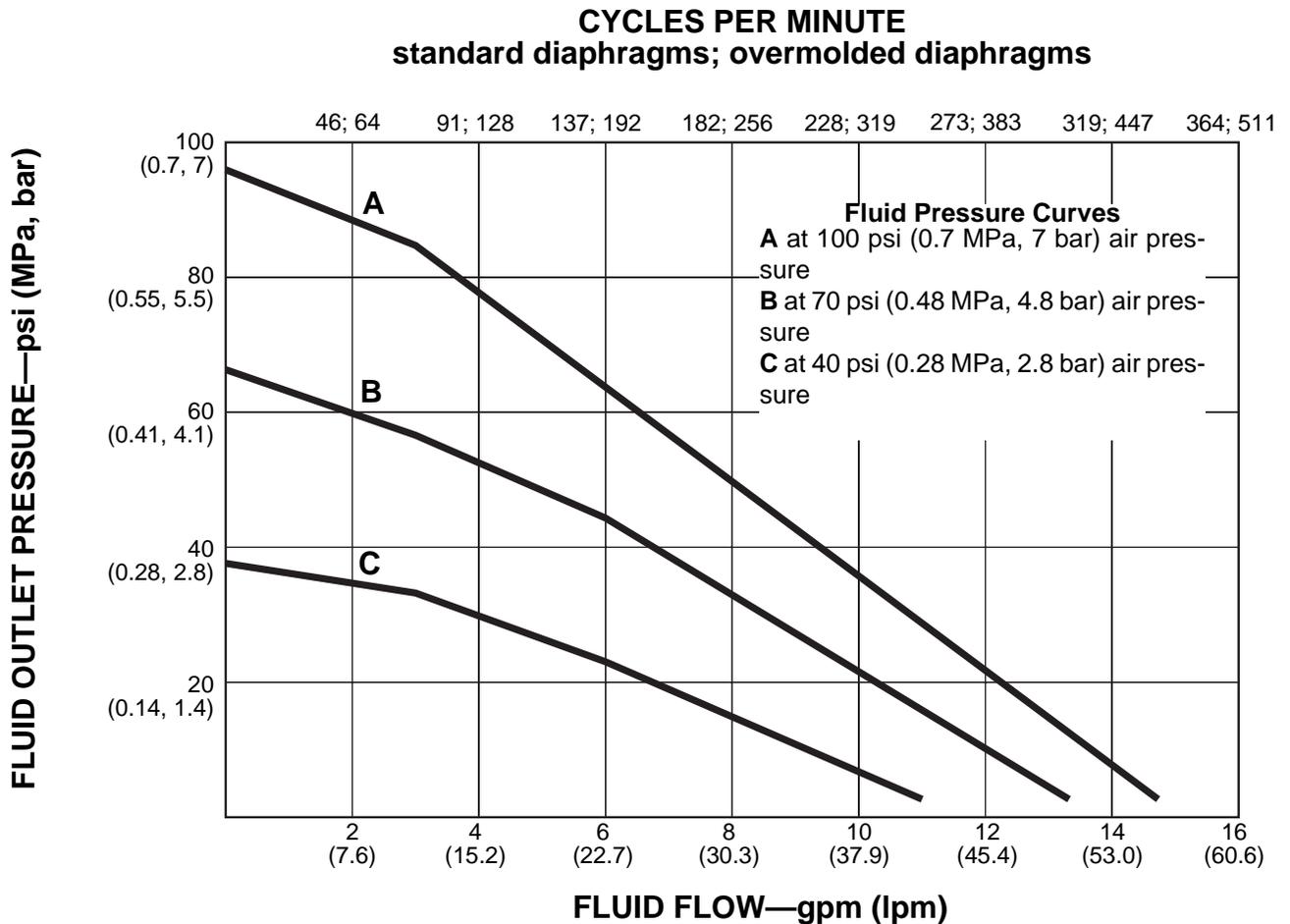
**Pump Mounting
Hole Pattern**



Performance Charts

Fluid Outlet Pressure

Test Conditions: Pump tested in water with inlet submerged.

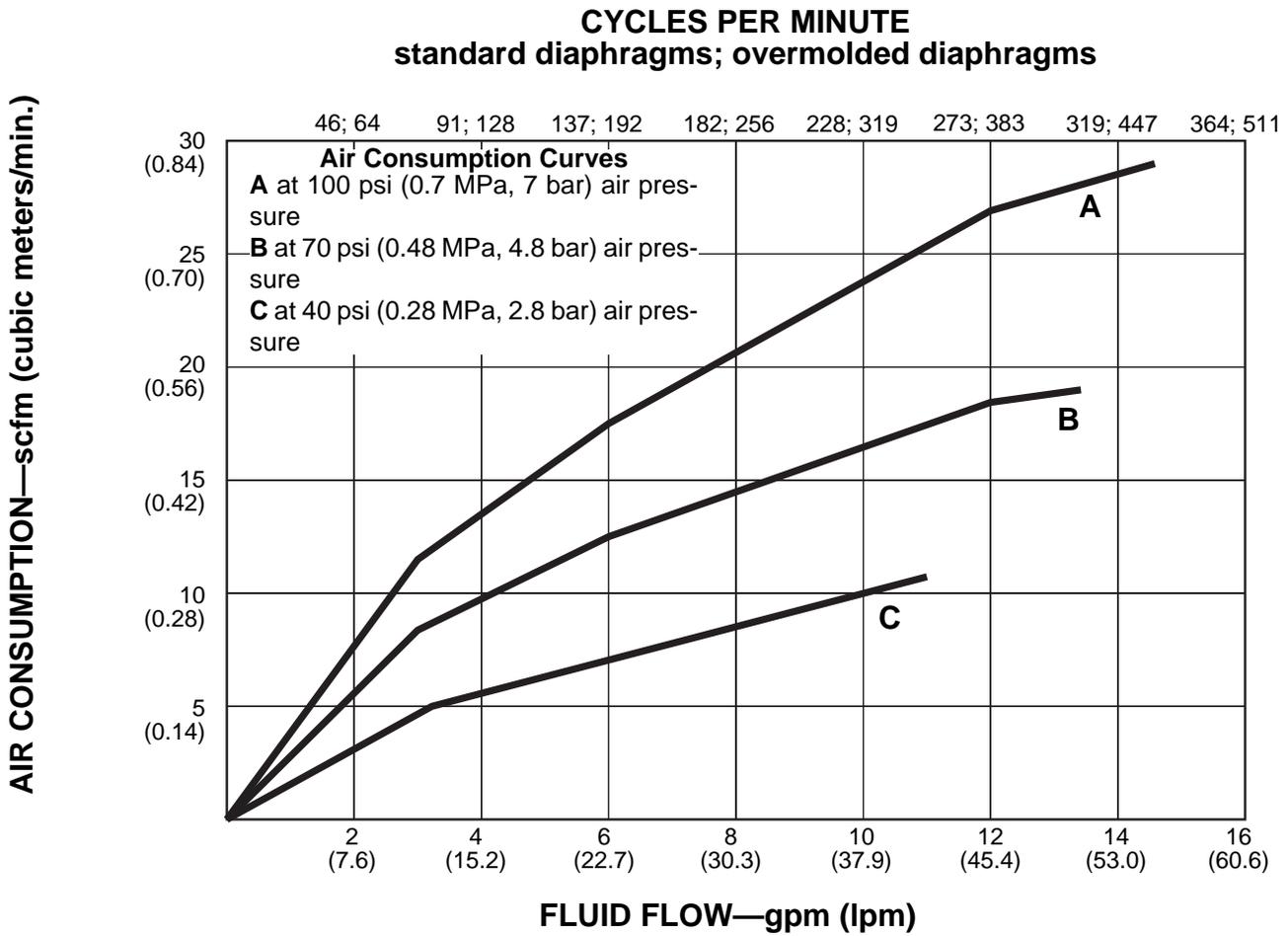


To find Fluid Outlet Pressure (psi/MPa/bar) at a specific fluid flow (gmp/lpm) and operating air pressure (psi/MPa/bar):

1. Locate fluid flow rate along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve.
3. Follow left to scale to read fluid outlet pressure.

Air Consumption

Test Conditions: Pump tested in water with inlet submerged.



To find Pump Air Consumption (scfm or m³/min) at a specific fluid flow (gpm/lpm) and operating air pressure (psi/MPa/bar):

1. Locate fluid flow rate along bottom of chart.
2. Follow vertical line up to intersection with selected air consumption curve.
3. Follow left to scale to read air consumption.

Technical Data

1/2" FDA SERIES		
	US	Metric
Maximum fluid working pressure	100 psi	0.7 MPa, 7 bar
Air pressure operating range*	20-100 psi	0.14-0.7 MPa, 1.4-7 bar
Maximum air consumption	28 scfm	0.8 m ³ /minute
Air consumption at 70 psi/13.5 gpm	18 scfm	0.5 m ³ /minute
Maximum free-flow delivery	16 gpm	61 l/min
Maximum recommended cycle rate for continuous duty	182 cycles per minute	
Maximum size pumpable solids	3/32 in.	2.4 mm
Maximum viscosity	10,000 cps	
Environmental temperature range	40°–120°F	4°–49°C
Minimum fluid temperature	40°F	4°C
Maximum fluid operating temperature (Do not exceed the lowest maximum depending on the diaphragm, ball, and seat used in your pump.)		
PTFE	220°F	104.4°C
Santoprene®	180°F	(82.2°C)
Maximum suction lift		
Dry	15 ft.	4.6 meters
Wet	25 ft.	7.6 meters
Maximum pump speed		
Standard Diaphragms	400 cycles per minute	
Overmolded Diaphragms	500 cycles per minute	
Fluid flow per cycle*		
Standard Diaphragms	0.04 gallons	0.14 liters
Overmolded Diaphragms	0.03 gallons	0.11 liters
Noise (dBa)		
Maximum sound pressure	78 dBa @ 70 psi (0.48 MPa, 4.8 bar)	
Inlet/Outlet Sizes		
Air inlet size	1/4 in. npt(f)	
Air exhaust port size	3/8 npt(f)	
Fluid inlet size	1 in. sanitary flange	
Fluid outlet size	1 in. sanitary flange	

Materials of Construction**		
Wetted materials on all models	316 SST	
Wetted material depending on model	PTFE, Santoprene® (NOTE: Santoprene® may be used only with non-fatty, non-oily foods or alcohols up to 15%.)	
Non-wetted external parts	300 series stainless steel, FDA-compliant polypropylene, polyester (labels)	
Weight		
All models	23 lb.	10 kg
Notes		
* <i>Startup pressures and displacement per cycle may vary based on suction condition, discharge head, air pressure, and fluid type.</i>		
** <i>All fluid contact materials are FDA-compliant and meet the United States Code of Federal Regulations (CFR) Title 21 for repeated use in food-processing machinery. The pump user must verify that the construction materials meet their specific application requirements.</i>		
<i>Santoprene® is a registered trademark of the Monsanto Co.</i>		

DECLARATION OF COMPLIANCE

**Statement of compliance with European Union regulation
(EC) no 1935/2004 on materials and articles intended to come into contact with food
Requirement per Article 16 of EC 1935/2004**



Standard Pump declares that the equipment listed below contains materials that have been demonstrated to meet the requirements of Regulations: **EC 1935/2004** of 27 October 2004 and **EC 2023/2006** of 22 December 2006

Model Standard Pump SPFG05PPX Diaphragm Pump

Part No SPFG05PPP, SPFG05PPT

Materials used in this equipment that are intended to contact food belong to the groups of materials listed in Annex 1 (EC) 1935/2004 (*List of groups of materials and articles which may be covered by specific measures*)

- | | |
|---|--|
| <input type="checkbox"/> Adhesives (2) | <input checked="" type="checkbox"/> Plastics (10) |
| <input type="checkbox"/> Ceramics (3) | <input type="checkbox"/> Printing Inks (11) |
| <input checked="" type="checkbox"/> Rubbers (5) | <input type="checkbox"/> Silicones (13) |
| <input checked="" type="checkbox"/> Metals and Alloys (8) | <input type="checkbox"/> Varnishes and Coatings (15) |

Materials used in this equipment that are intended to contact food were assessed using one or more of the regulations and/or texts referenced in ANNEX 1 of this declaration. Compliance is subject to material and equipment storage, handling and usage recommended by the equipment instruction manual, and supplemental technical publications published by Standard Pump.

The establishment of this declaration is based on the following:

- Statements of raw material suppliers
- Analysis of global migration
- Analysis of materials is subject to limitations (Listed in ANNEX 2)
- Other (Listed in ANNEX 3)

Standard Pump will make available to the competent authorities appropriate documentation to demonstrate this compliance.

APPROVED BY:

Christopher Murphy
Director of Operations

Date: 05 DEC 2016

Manufactured By:
Standard Pump, Inc.

1610 Satellite Blvd., Suite D
Duluth, GA 30097

Part Number:	Rev
199632	A

ANNEX 1 TO DECLARATION OF COMPLIANCE References and Regulations Used

All Materials:

Framework Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109 EEC

Commission Regulation (EC) No 2023/2006 of 22 December 2006 on good manufacturing practices for materials and articles intended to come into contact with food

Metals and Alloys:

Technical Document – Guidelines on Metals and Alloys Used as Food Contact Materials (09.03.2001)

Plastics:

Commission Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food

Commission Regulation (EU) No 1282/2011 amending and correcting Commission Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food

Rubber and Elastomers:

Council of Europe Committee of Ministers Resolution ResAP(2004)4 on rubber products intended to come into contact with foodstuffs

US Food and Drug Administration 21 CFR Ch.1 Title 177.26 Rubber Articles Intended for Repeated Use.

ANNEX 2 TO DECLARATION OF COMPLIANCE

Analysis of Materials Subject to Limitations

The following wetted parts have special conditions for use and are therefore subject to the following limitations.

Part No	Description	Limitation
400-011	OVERMOLD DIAPHRAM	Contact not to exceed 24 hours for temps above 85°C

All wetted parts and/or materials used in this product have not been tested under all conditions using all simulants. It is the responsibility of the end user to assure compliance under the specific conditions used by the end user.

ANNEX 3 TO DECLARATION OF COMPLIANCE

Other Items Used to Establish this Declaration

None

Date: **05 DEC 2016**

Part Number:	Rev
199632	A

EU-DECLARATION OF CONFORMITY

EU-CONFORMITEITSVERKLARING, DÉCLARATION UE DE CONFORMITÉ, EU-KONFORMITÄTSEKTLÄRUNG DICHIARAZIONE DI CONFORMITÀ UE, EU-OVERENSSTEMMELSESERKLÆRING, ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ ΕΕ, DECLARAÇÃO UE DE CONFORMIDADE, DECLARACIÓN UE DE CONFORMIDAD, EU-VAATIMUSTENMUKAISUUSVAKUUTUS, EU-FÖRSÄKRAN OM ÖVERENSSTÄMMELSE, EU PROHLÁŠENÍ O SHODĚ, ELI VASTAVUSDEKLARATSIOON, EU-MEGFELELŐSÉGI NYILATKOZAT, ES ATBILSTĪBAS DEKLARĀCIJA, ES ATITIKTIES DEKLARĀCIJA DEKLARACJA ZGODNOŚCI UE, DIKJARAZZJONI TA' KONFORMITÀ TAL-UE, EU IZJAVA O SUKLADNOSTI, EU VYHLÁSENIE O ZHODE, ЕС ДЕКЛАРАЦІЯ ЗА СЪОТВЕТСТВИЕ, DECLARAȚIA UE DE CONFORMITATE

Model

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

SPFG05PPX Diaphragm Pump

Part

Bestelnr., Type, Teil, Codice, Del, Μέρος, Peça, Referencia, Osa, Součást, Részegység, Dajla, Dalis, Część, Taqsim, Čast', Част', Páirt, Parte

SPFG05PPP, SPFG05PPT, SPFG05PPS

Complies With The EC Directives:

Volddet aan de EG-richtlijnen, Conforme aux directives CE, Entspricht den EG-Richtlinien, Conforme alle direttive CE, Overholder EF-direktiverne, Σύμφωνα με τις Οδηγίες της ΕΚ, Em conformidade com as Directivas CE, Cumples las directivas de la CE, Täyttää EY-direktiivien vaatimukset, Uppfyller EG-direktiven, Shoda se směrnicemi ES, Vastab EU direktiividele, Kieļēgiti az EK irānyelvek követelményeit, Atbilst EK direktīvām, Atitinka šias ES direktyvas, Zgodność z Dyrektywami UE, Konformi mad-Direttivi tal-KE, V skladu z direktivami ES, Je v súlade so smernicami ES, Съвместимост с Директиви на ЕО, Tá ag teacht le Treoracha an CE, Respectă directivele CE

2006/42/EC Machinery Directive

2014/34/EU Atex Directive (Ex II 2 GD c IIA T4) – Tech File 0793 stored with NB 0359.

Standards Used:

Gebuikte maatstaven, Normes respectées, Verwendete Normen, Norme applicate, Anvendte standarder, Πρότυπα που χρησιμοποιήθηκαν, Normas utilizadas, Normas aplicadas, Sovellettavat standardit, Tillämpade standarder, Použité normy, Rakendatud standardid, Alkalmazott szabványok, Izmantotie standarti, Taikyti standartai, Uzyte normy, Standarts Uzati, Uporabljeni standardi, Použité normy, Използвани стандарти, Caighdeán arna n-úsáid, Standarde utilizate

ISO 12100

ISO 9614-1

EN 1127-1

EN 13463-1

EN1672-2, ISO 14159

Notified Body for Directive

Aangemelde instantie voor richtlijn, Organisme notifié pour la directive, Benannte Stelle für diese Richtlinie, Ente certificatore della direttiva, Bemyndiget organ for direktiv, Διακοινωμένο όργανο Οδηγίας, Organismo notificado relativamente à directiva, Organismo notificado de la directiva, Direktiivini mukaisesti ilmoitettu tarkastuslaitos, Anmält organ för direktivet, Úředně oznámený orgán pro směrnici, Teavitatud asutus (direktiivi järgi), Az irányelvet kapcsolatosan értesített testület, Plinvarotā iestāde saskaņā ar direktīvu, Apie direktīvu Informuota institūcija, Cialo powiadomione dla Dyrektywy, Korp avzat bid-Direttiva, Priglašeni organ za direktivo, Notifikovaný orgán pre smernicu, Нотифициран орган за Директива, Comhlacht ar tugadh fógra dó, Organism notificat în conformitate cu directiva

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Approved By:

Goedgekeurd door, Approuvé par, Genehmigt von, Approvato da, Godkendt af, Έγκριση από, Aprobado por, Aprobado por, Hyväksynyt, Intygas av, Schváll, Kinnitanud, Jóváhagyta, Apstiprināts, Patvirtino, Zatwierdzone przez, Approvat minn, Odobril, Schválené, Одобрено от, Faofa ag, Aprobat de

Chris Murphy

Christopher Murphy
Director of Operations

05 DEC 2016

Manufactured By:

Standard Pump, Inc.
1610 Satellite Blvd., Suite D

Duluth, GA 30097

199628

A

This declaration of conformity is issued under the sole responsibility of the manufacturer. Deze conformiteitsverklaring wordt verstrekt onder volledige verantwoordelijkheid van de fabrikant. La présente déclaration de conformité est établie sous la seule responsabilité du fabricant. Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante. Denne overensstemmelseserklæring udstedes på fabrikantens ansvar. Η παρούσα δήλωση συμμόρφωσης εκδίδεται με αποκλειστική ευθύνη του κατασκευαστή. A presente declaração de conformidade é emitida sob a exclusiva responsabilidade do fabricante. La presente declaración de conformidad se expide bajo la exclusiva responsabilidad del fabricante. Tämä vaatimustenmukaisuusvakuutus on annettu valmistajan yksinomaisella vastuulla. Denna försäkran om överensstämmelse utfärdas på tillverkarens eget ansvar. Toto prohlášení o shodě se vydává na výhradní odpovědnost výrobce. Käesolev vastavusdeklaratsioon on välja antud tootja ainuvastutusel. Ezt a megfelelőségi nyilatkozatot a gyártó kizárólagos felelőssége mellett adják ki. Ši atbilstības deklarācija ir izdota vienīgi uz ražotāja atbildību. Šī atitiktības deklarācija išduota tik gaminājuma atsakomība. Niniejsza deklaracja zgodności wydana zostaje na wyłączną odpowiedzialność producenta. Din iddikjarazzjoni tal-konformità qiegħda tinħareġ taħt ir-responsabbiltà unika tal-manifattur. Ta izjava o skladnosti je izdana na lastno odgovornost proizvajalca. Toto vyhlásenie o zhode sa vydáva na výhradnú zodpovednosť výrobcu. Настоящая декларация за съответствие е издадена на отговорността на производителя. Prezenta declarație de conformitate este emisă pe răspunderea exclusivă a producătorului.

Standard Pump Warranty

Standard Pump warrants all equipment referenced in this document which is manufactured by Standard Pump and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Standard Pump, Standard Pump will, for a period of three years from the date of sale, repair or replace any part of the equipment determined by Standard Pump to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Standard Pump's written recommendations.

This warranty does not cover, and Standard Pump shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Standard Pump component parts. Nor shall Standard Pump be liable for malfunction, damage or wear caused by the incompatibility of Standard Pump equipment with structures, accessories, equipment or materials not supplied by Standard Pump, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Standard Pump.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Standard Pump distributor for verification of the claimed defect. If the claimed defect is verified, Standard Pump will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Standard Pump's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Standard Pump MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY Standard Pump. These items sold, but not manufactured by Standard Pump (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Standard Pump will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Standard Pump be liable for indirect, incidental, special or consequential damages resulting from Standard Pump supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Standard Pump, or otherwise.

Standard Pump Information

For the latest information about Standard Pump products, visit www.standardpump.com.

TO PLACE AN ORDER, contact your Standard Pump distributor or call to identify the nearest distributor.

Phone: 770-307-1003 **or Toll Free:** 1-866-558-8611 **Fax:** 770-307-1009

All written and visual data contained in this document reflects the latest product information available at the time of publication. Standard Pump reserves the right to make changes at any time without notice.

Original instructions. This manual contains English. MM 3A4550

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