

Techni-flow 100

332522C

Air-Operated Diaphragm Pumps

EN

For fluid transfer applications. For professional use only.
Only models marked with (*) are approved for use in European explosive atmosphere locations.



Important Safety Instructions

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

100 psi (0.7 MPa, 7 bar) Maximum Fluid Working Pressure
100 psi (0.7 MPa, 7 bar) Maximum Air Input Pressure

Model TF24T064

Polypropylene BSPT Pump

Model TF24T065

Polypropylene BSPT Pump

Model TF24T066

PVDF BSPT Pump

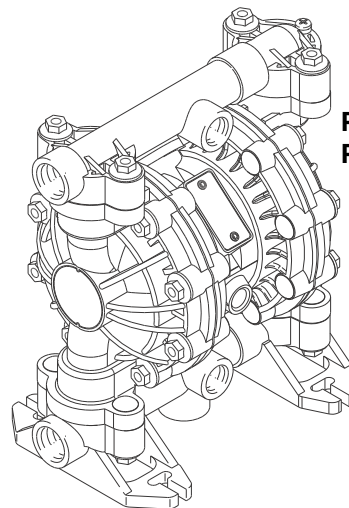
Model TF24T067*

Aluminum BSPT Pump

Model TF24T068*

Stainless Steel BSPT Pump

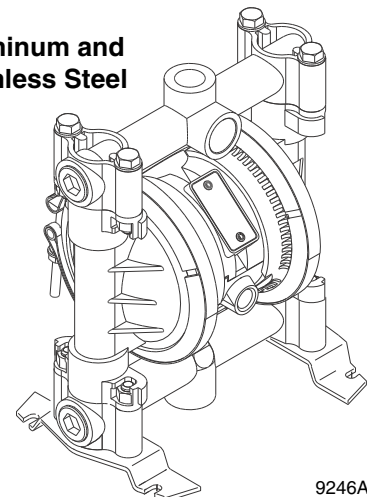
* These models are certified:



Polypropylene and PVDF

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Aluminum and Stainless Steel



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Models

Sample Configuration Number

TFG100	P	SP
Pump Model	Fluid Covers and Manifolds	Diaphragms

Pump Model		Fluid Section		Diaphragms	
3/4 bspt ports, 60 l/min.	TFG100	Polypropylene	P	PTFE	TF
		PVDF	K	Santoprene	SP
		Aluminum★	A		
		Stainless Steel★	S		
★: See ATEX Certifications , below.					

Your Part Number and Configuration Number are marked on the pump's serial plate. The listing of existing Techni-flow 100 pumps is below.


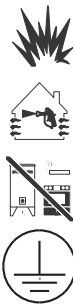

Part No.	Configuration Number	Components			
		Fluid Section	Guides	Balls	Diaphragms
TF24T064	TFG100PSP	Polypropylene	Polypropylene	Santoprene	Santoprene
TF24T065	TFG100PTF	Polypropylene	Polypropylene	PTFE	PTFE
TF24T066	TFG100KTF	PVDF	PVDF	PTFE	PTFE
TF24T067★	TFG100ATF	Aluminum	Polypropylene	PTFE	PTFE
TF24T068★	TFG100STF	Stainless Steel	316 Stainless Steel	PTFE	PTFE

★ These models are certified:









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 symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear 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. 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 arc). • 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. • Ground all equipment in the work area. See Grounding instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive. • 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>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 MSDS 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>PRESSURIZED ALUMINUM PARTS HAZARD</p> <p>Use of fluids that are incompatible with aluminum in pressurized equipment can cause serious chemical reaction and equipment rupture. Failure to follow this warning can result in death, serious injury, or property damage.</p> <ul style="list-style-type: none"> • Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents. • Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.
 	<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 MSDSs to know the specific hazards of the fluids you are using. • Route exhaust away from work area. If diaphragm ruptures, fluid may be exhausted into the air. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
	<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. This 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 Installations in FIG. 2 and FIG. 3 are only guides for selecting and installing system components. Contact your Techni-flow representative for assistance in planning a system to suit your needs.
- Use a compatible, liquid thread sealant on all male threads. Tighten all connections firmly to avoid air or fluid leaks.

Tightening Threaded Fasteners Before First Use

Before using the pump for the first time, check and retorquer all external fasteners. See **Torque Sequence**, page 27. After the first day of operation, retorquer the fasteners. Although pump use varies, a general guideline is to retorquer fasteners every two months.

Toxic Fluid Hazard



Use fluids and solvents that 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.

Operating Temperatures

NOTICE

Temperature limits are based on mechanical stress only. Certain chemicals will further limit the fluid temperature range. Stay within the temperature range of the most restricted wetted component. Operating at a fluid temperature that is too high or too low for the components of your pump may cause equipment damage.

Minimum (all pumps): 40° F (4° C)

Maximum

Polypropylene: 150° F (66° C)

Aluminum, stainless steel, PVDF: 225° F (107° C)

Consult engineering guides for chemical compatibilities and temperature limits, or contact your Techni-flow representative.




Mountings





- These pumps can be used in a variety of installations. Be sure the mounting surface can support the weight of the pump, hoses, and accessories, as well as the stress caused during operation.
- FIG. 2 and FIG. 3 show some installation examples. On all installations, mount the pump using screws and nuts.

Pumping High-Density Fluids

High density fluids may prevent the lighter non-metallic check valve balls from seating properly, which reduces pump performance significantly. Stainless steel balls should be used for such applications.

Air Line

						
<p>A bleed-type master air valve (B) is required in your system to relieve air trapped between this valve and the pump. See FIG. 2. 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.</p>						




						
<p>The pump exhaust air may contain contaminants. Ventilate to a remote area. Read Air Exhaust Ventilation, page 8.</p>						

1. Install the air line accessories as shown in FIG. 2 and FIG. 3. Mount these accessories on the wall or on a bracket. Be sure the air line supplying the accessories is electrically conductive.
 - a. The fluid pressure can be controlled in either of two ways. To control it on the air side, install an air regulator (G). To control it on the fluid side, install a fluid regulator (J) near the pump fluid outlet (see FIG. 2).
 - b. Locate one bleed-type master air valve (B) close to the pump and use it to relieve trapped air. Read 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.
 - c. The air line filter (F) removes harmful dirt and moisture from the compressed air supply.
2. Install an electrically conductive, flexible air hose (C) 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 (C), 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.

Fluid Suction Line

- If using a conductive pump, use conductive hoses. If using a non-conductive pump, ground the fluid system. Read **Grounding** on page 11. Polypropylene and PVDF pumps have 1/2 in. or 3/4 bspt fluid inlet ports. Aluminum and stainless steel pumps have a 3/4 bspt inlet port.
- At inlet fluid pressures greater than 15 psi (0.1 MPa, 1 bar), diaphragm life will be shortened.

Fluid Outlet Line

						
<p>A fluid drain valve (H) is required to relieve pressure in the hose if it is plugged. See FIG. 2. 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.</p>						

1. Use electrically conductive fluid hoses (K). Polypropylene and PVDF pumps have 1/2 in. or 3/4 bspt fluid outlet ports. Aluminum and stainless steel pumps have a 3/4 bspt outlet port. Screw the fluid fitting into the pump outlet snugly. **Do not overtighten.**
2. Install a fluid regulator (J) at the pump fluid outlet to control fluid pressure, if desired (see FIG. 2). See **Air Line**, step 1a, for another method of controlling pressure.
3. Install a fluid drain valve (H) near the fluid outlet. Read the **WARNING** above.

Fluid Pressure Relief Valve



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. 1.

Thermal expansion of fluid in the outlet line can cause overpressurization. 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.

- ▲ Install valve between fluid inlet and outlet ports.
- ▲ Connect fluid inlet line here.
- ▲ Connect fluid outlet line here.

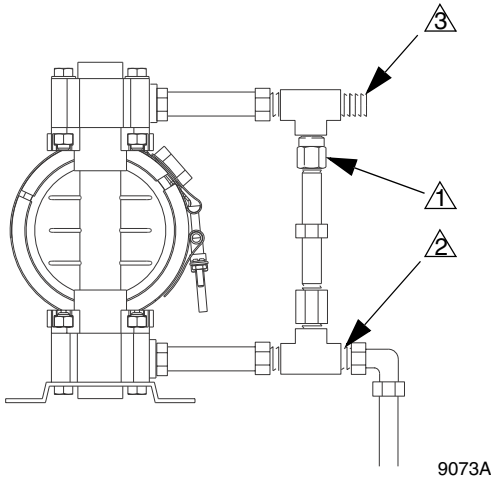


FIG. 1

Air Exhaust Ventilation



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.

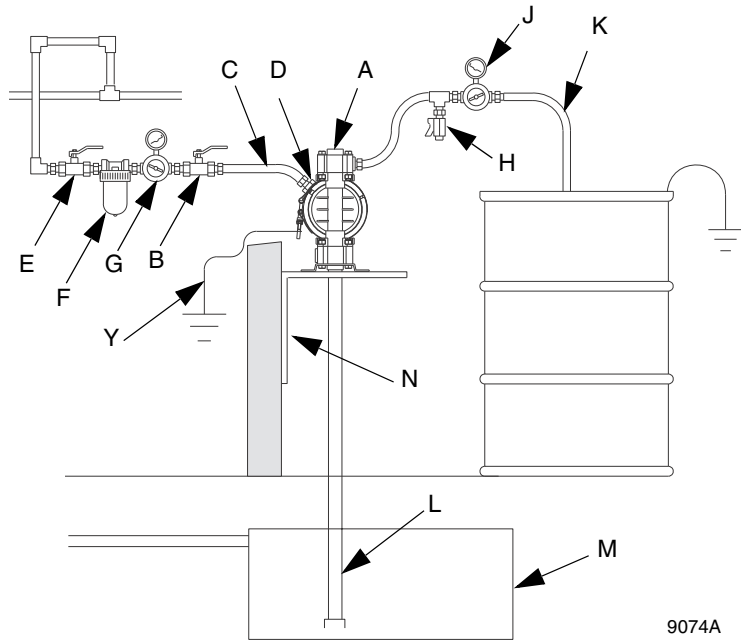
Diaphragm failure will cause the fluid being pumped to exhaust with the air. Place an appropriate container at the end of the air exhaust line to catch the fluid. See FIG. 2 .

The air exhaust port is 3/8 npt(f). Do not restrict the air exhaust port. Excessive exhaust restriction can cause erratic pump operation.

See **Venting Exhaust Air** in FIG. 3. Exhaust to a remote location as follows:

1. Remove the muffler (W) from the pump air exhaust port.
2. Install an electrically conductive air exhaust hose (X) and connect the muffler to the other end of the hose. The minimum size for the air exhaust hose is 3/8 in. (10 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 (Z) at the end of the air exhaust line to catch fluid in case a diaphragm ruptures.

Above-Ground Transfer Installation

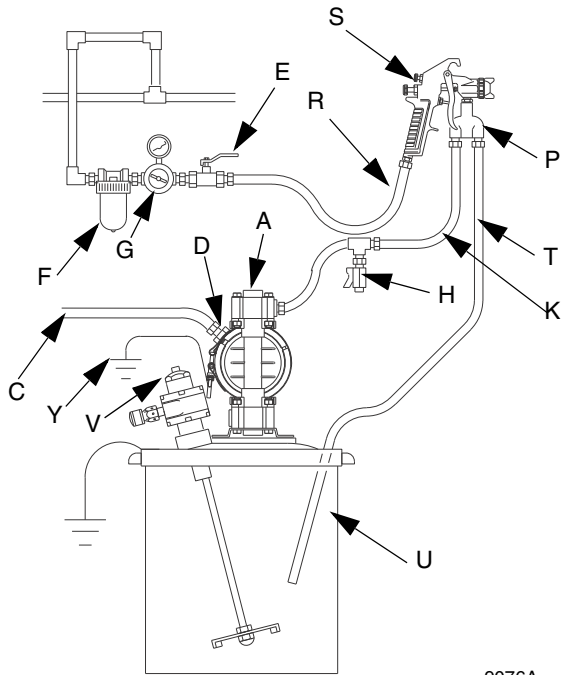


KEY

- A Pump
- B Bleed-type master air valve (required for pump)
- C Electrically conductive air supply line
- D Air line quick disconnect
- E Master air valve (for accessories)
- F Air line filter
- G Pump air regulator
- H Fluid drain valve (required)
- J Fluid regulator (optional)
- K Electrically conductive fluid supply hose
- L Fluid suction line
- M Underground storage tank
- N Wall mounting bracket
- Y Ground wire (required, see page 11 for installation instructions.)

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Air Spray Installation



KEY

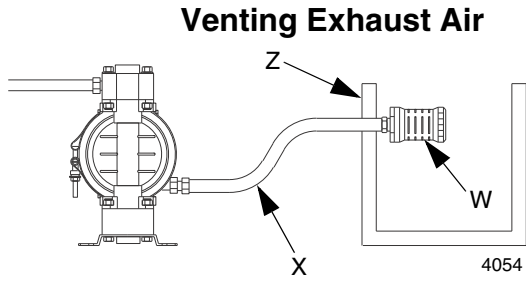
- A Pump
- C Electrically conductive air line to pump
- E Gun air line shutoff valve
- F Air line filter
- G Gun air regulator
- H Fluid drain valve (required)
- K Electrically conductive fluid supply hose
- P Circulating valve
- R Electrically conductive air line to gun
- S Air spray gun
- T Electrically conductive fluid return line
- U 5-gallon pail
- V Agitator
- Y Ground wire (required, see page 11 for installation instructions.)

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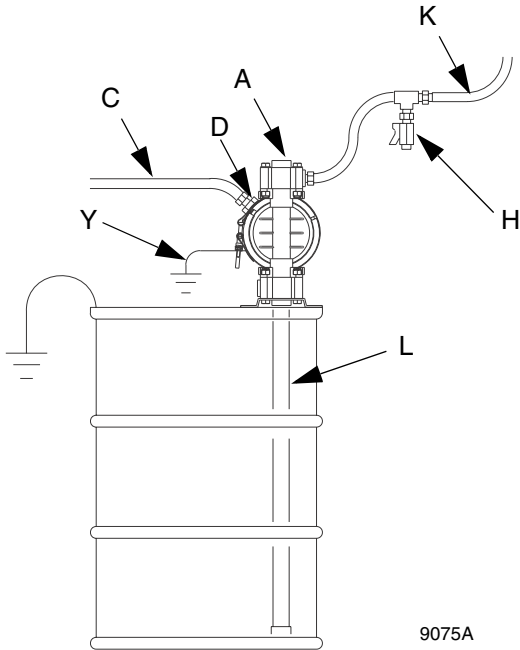
FIG. 2, Typical Installations

KEY:

- W Muffler
- X Electrically conductive air exhaust hose
- Z Container for remote air exhaust



55-Gallon Bung Pump Installation



KEY:

- A Pump
- C Electrically conductive air supply line
- D Air line quick disconnect
- H Fluid drain valve (required)
- K Electrically conductive fluid supply hose.
- L Fluid suction line
- Y Ground wire (required, see page 11 for installation instructions.)

FIG. 3, Typical Installations

Grounding

<p>To reduce the risk of static sparking, ground the pump and all other equipment used or located in the pumping area. Static sparking can cause fumes to ignite or explode. Grounding provides an escape wire for the electric current.</p> <ul style="list-style-type: none"> Aluminum and stainless steel pumps have a ground screw. Always ground the entire fluid system as described below. Polypropylene and PVDF pumps are not conductive and are not for use with flammable fluids. Follow your local fire codes. <p>US Code (NFPA 77 Static Electricity) recommends a conductivity greater than 50×10^{-12} Siemens/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 2×10^{12} ohm-centimeters.</p>					

Pump: See FIG. 4. Metal pumps have a grounding strip in front of the center housing. Loosen the grounding screw (GS). Connect one end of a 12 ga. minimum ground wire (R) to the grounding strip. Connect the clamp end of the ground wire to a true earth ground. A ground wire and clamp, Part 238909, is available.

<p>Polypropylene and PVDF: Only aluminum and stainless steel pumps have a ground screw. Standard polypropylene and PVDF pumps are not conductive. Never use a non-conductive polypropylene or PVDF pump with non-conductive flammable fluids. Follow your local fire codes. When pumping conductive flammable fluids, always ground the entire fluid system as described.</p>					

Air and fluid hoses: use only electrically conductive hoses with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity. Check electrical resistance of hoses. If total resistance to ground exceeds 29 megohms, replace hose immediately.

Air compressor: follow manufacturer's recommendations.

Spray gun / Dispense valve: ground through connection to a properly grounded fluid hose and pump.

Fluid supply container: follow local code.

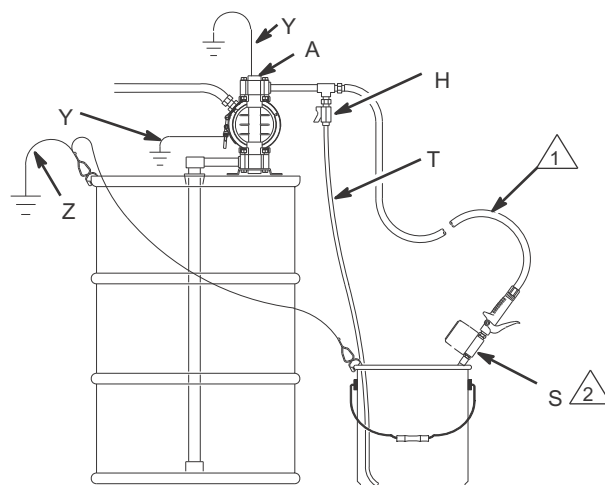
Object being sprayed: follow local code.

Solvent pails used when flushing: follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.

To maintain grounding continuity when flushing or relieving pressure: hold metal part of the spray gun/dispense valve firmly to the side of a grounded metal pail, then trigger the gun/valve.

Hose must be conductive.

Dispense valve nozzle must be in contact with the container.



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Key:

- A Pump
- H Fluid drain valve (required)
- S Dispense valve
- T Fluid drain line
- Y Fluid section grounding using grounding strip (required for metal pumps).
- Z Container ground wire (required)

FIG. 4, Grounding a Pump


Changing the Orientation of the Fluid Inlet and Outlet Ports


You can change the orientation of the fluid inlet and outlet ports by repositioning the manifolds.

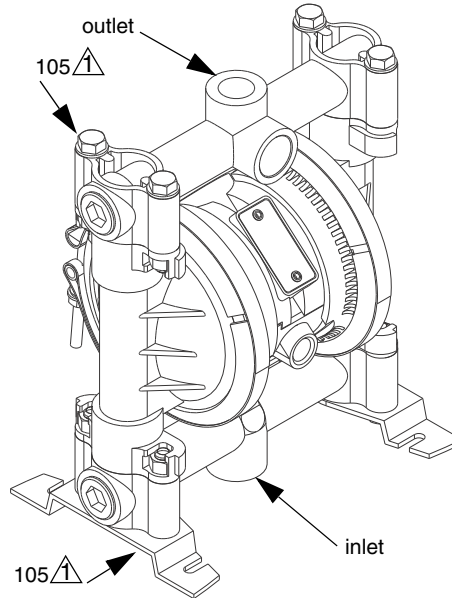


1. Follow the **Pressure Relief Procedure**, page 13.
2. Remove the four manifold nuts (109) or bolts (105).
3. Turn the manifold to the desired position, reinstall the nuts or bolts, and torque to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.

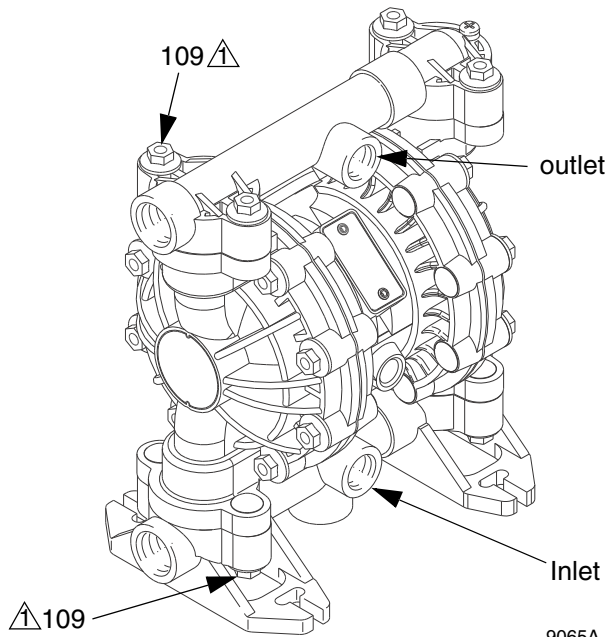
NOTE: Make sure all manifold o-rings are positioned correctly before you fasten the manifold. Manifold o-rings (139) are shown in FIG. 7 and FIG. 8.

 Torque to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.

 Torque to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.



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FIG. 5

Operation

Pressure Relief Procedure



Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, accidental spray, or splashing fluid, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

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

NOTE: If the inlet fluid 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 (K) into an appropriate container.
5. Close the fluid drain valve (H).
6. With the pump air regulator (G) 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. Slowly open the air regulator (G) 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.

Flush Before Using Equipment

The equipment was tested with water. If water could contaminate the fluid you are pumping, flush the equipment with a compatible solvent before using the equipment. Follow the steps under **Starting and Adjusting Pump**.

Pump Shutdown

Follow the **Pressure Relief Procedure**, page 13.

Starting and Adjusting Pump



1. Make sure the pump is properly grounded. See **Grounding**, page 11.
2. Check all fittings to be sure they are tight. Use a compatible liquid thread sealant on all male threads. Tighten the fluid inlet and outlet fittings snugly. Do not overtighten the fittings into the pump.
3. Place the suction tube (if used) in the fluid to be pumped.

Maintenance

Lubrication

The air valve is lubricated at the factory to operate without additional lubrication. If you want to provide additional lubrication, remove the hose from the pump air inlet and add two drops of machine oil to the air inlet every 500 hours of operation or every month.

NOTICE

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 to prevent the fluid you are pumping from drying or freezing in the pump and damaging it. Use a compatible solvent.

Always flush the pump and follow the **Pressure Relief Procedure**, page 13, before you store it for any length of time.

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 27.

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 **Pressure Relief Procedure**, page 13, before checking or repairing the pump.
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.	Use filtered air.
Pump cycles at stall or fails to hold pressure at stall.	Leaky check valves or o-rings.	Replace.
	Worn check balls or guides.	Replace.
	Check ball wedged in guide.	Repair or replace.
	Worn diaphragm shaft seals.	Replace.
Pump operates erratically.	Clogged suction line.	Inspect; clear
	Sticky or leaking check valve balls.	Clean or replace.
	Diaphragm ruptured.	Replace.
Air bubbles in fluid.	Suction line is loose.	Tighten
	Diaphragm ruptured.	Replace.
	Loose manifolds or damaged manifold o-rings.	Tighten manifold bolts or nuts; replace o-rings.
	Loose fluid side diaphragm plates.	Tighten
Fluid in exhaust air.	Diaphragm ruptured.	Replace.
	Loose fluid side diaphragm plates.	Tighten.
	Worn diaphragm shaft seals.	Replace.
Pump exhausts air from clamps (metal pumps).	Loose clamps.	Tighten clamp nuts.
	Air valve o-ring is damaged.	Inspect; replace.
Pump leaks fluid from check valves.	Worn or damaged check valve o-rings.	Inspect; replace.

Service



Air Valve

NOTE: Air Valve Repair Kit 241657 is available. Parts included in the kit are marked with a dagger (†) in FIG. 6 and in the Parts Drawings and Lists. A tube of general purpose grease 111920 is supplied in the kit. Service the air valve as follows.

1. Follow the **Pressure Relief Procedure**, page 13.
2. Remove the cover (10) and the o-ring (4).
3. Remove the carriage plungers (7), carriages (8), carriage pins (9), and valve plate (14) from the center housing (11).
4. Clean all the parts, and inspect them for wear or damage.

NOTE: If you are installing the new Air Valve Repair Kit 241657, use all the parts in the kit.

5. Grease the lapped surface of the valve plate (14), and install the valve plate with the lapped surface facing up.

NOTE: Center housing (11) is shown separated from the air covers, but it is not necessary to remove the air covers for this service. Leave the center housing and air covers assembled for this service.

† Included in Air Valve Repair Kit 241657.

- ① Torque to 80 to 100 in-lb (9 to 13.6 N•m).
- ② Apply grease.
- ③ Apply grease to lapped face.
- ④ Apply grease to bores of center housing (11) before installing.
- ⑤ Seal lips face clip end (the smaller end) of carriage plunger (7).
- ⑥ Install with the clip ends (the smaller ends) facing toward center of center housing (11).

6. Grease the bores of the center housing (11), install the u-cup packings (2) on the carriage plungers (7), and slide the carriage plungers into the carriage plunger bores. See the following important installation notes:

NOTES:

- When you install each u-cup packing (2) on each carriage plunger (7), make sure the lips of the u-cup packing face toward the clip end (the smaller end) of the carriage plunger.
 - When you slide the carriage plungers (7) into the bores, the clip ends (the smaller ends) must face toward the center of the center housing (11).
7. Grease the carriage pins (9), and slide the carriage pins into the carriage pin bores.
 8. Install the carriages (8). Make sure the carriages engage the clip ends of the carriage plungers (7) and carriage pins (9).
 9. Grease the o-ring (4), and seat it in the groove around the cover opening of the center housing (11).
 10. Screw the cover (10) into the center housing, and torque the cover to 80 to 100 in-lb (9.0 to 13.6 N-m).

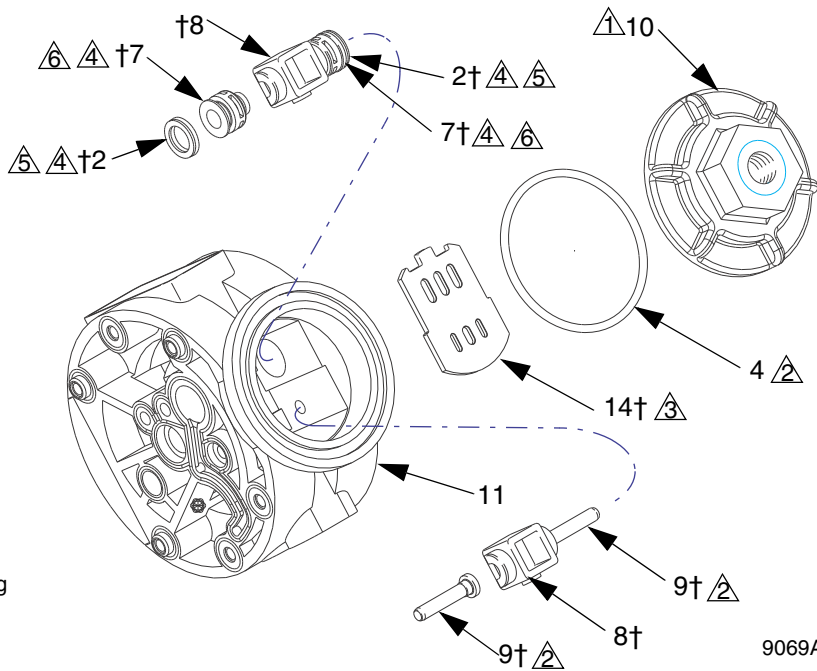


FIG. 6

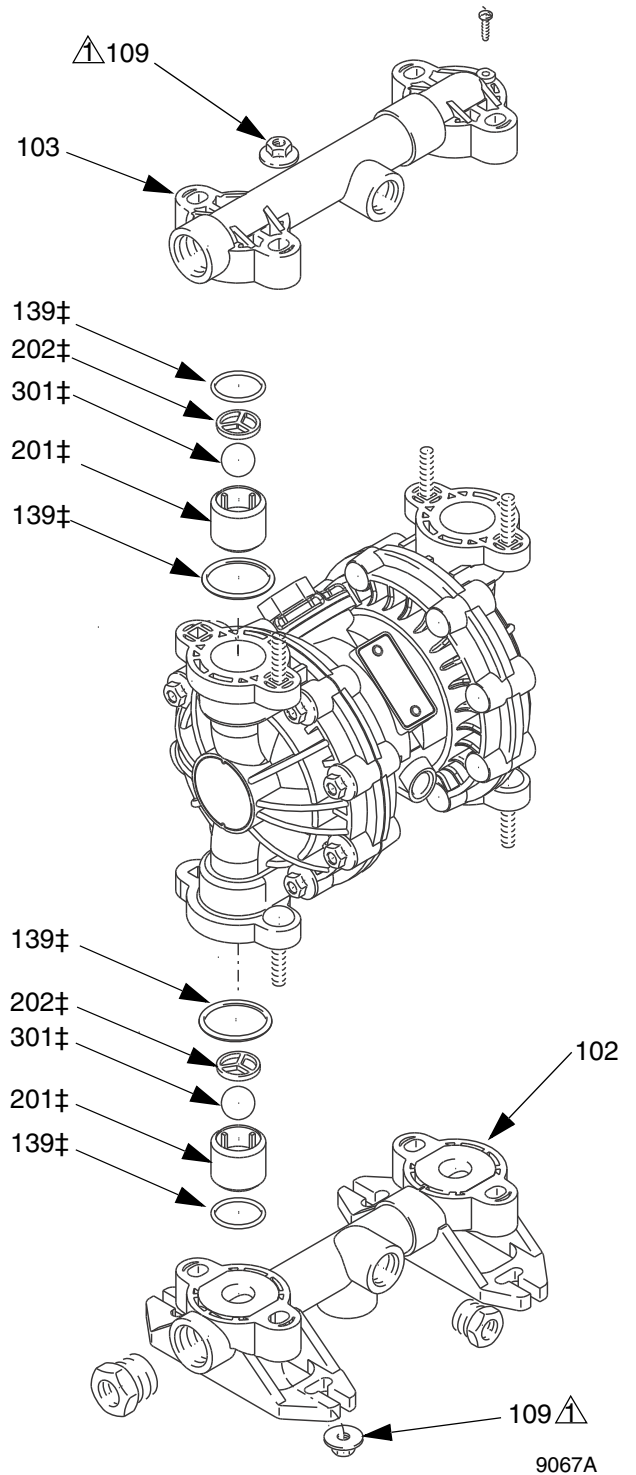
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Ball Check Valves

NOTE: Fluid Section Repair Kit D05XXX is available. See page 26 to order the correct kit for your pump. Parts included in the kit are marked with a double dagger (‡) in FIG. 7 and FIG. 8 and in the Parts Drawings and Lists. General purpose grease 111920 and Adhesive 113500 are supplied in the kit.

1. Follow the **Pressure Relief Procedure**, page 13.
2. Remove the top and bottom manifolds (102, 103).
3. Remove all parts shown with a double dagger (‡) in FIG. 7 and FIG. 8.
4. Clean all parts, and replace worn or damaged parts.
5. Reassemble the pump.

NOTE: Torque the manifold nuts (109) or bolts (105) to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.




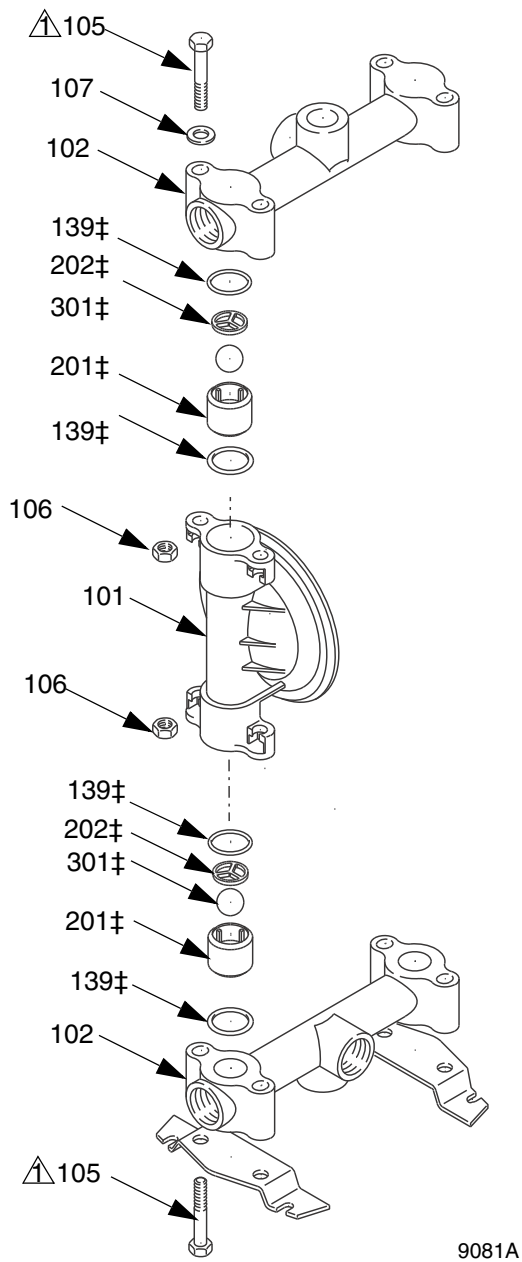

 Torque to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.

FIG. 7, Polypropylene and PVDF Pumps



 Torque to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.

Diaphragms, Polypropylene and PVDF Pumps

NOTE: Fluid Section Repair Kit D05XXX is available. See page 26 to order the correct kit for your pump. Parts included in the kit are marked with a double dagger (‡) in FIG. 9 and in the Parts Drawings and Lists. General purpose grease 111920 and Adhesive 113500 are supplied in the kit. Service the diaphragms as follows. See FIG. 9.

Disassembly

1. Follow the **Pressure Relief Procedure**, page 13.
2. Remove manifolds (102 and 103) and fluid covers (101).

NOTE: Make sure all the check valve parts stay in place. See FIG. 7 on page 17.

3. Remove one of the fluid-side diaphragm plates (105) (whichever one comes loose first when you use a wrench on the hex of each), and pull the diaphragm shaft out of the center housing (11).
4. Use a wrench on the flats of the diaphragm shaft (15) to remove the other fluid-side diaphragm plate (105) from the diaphragm shaft.
5. Remove the screws (106), remove the left (114) and right (113) air covers, and remove all old gasket (12) material from the ends of the center housing (11) and the surfaces of the air covers.
6. Remove the diaphragm shaft u-cups (416) and pilot pin o-rings (1).
7. Inspect all parts for wear or damage, and replace as necessary.

FIG. 8, Aluminum and Stainless Steel Pumps

Reassembly

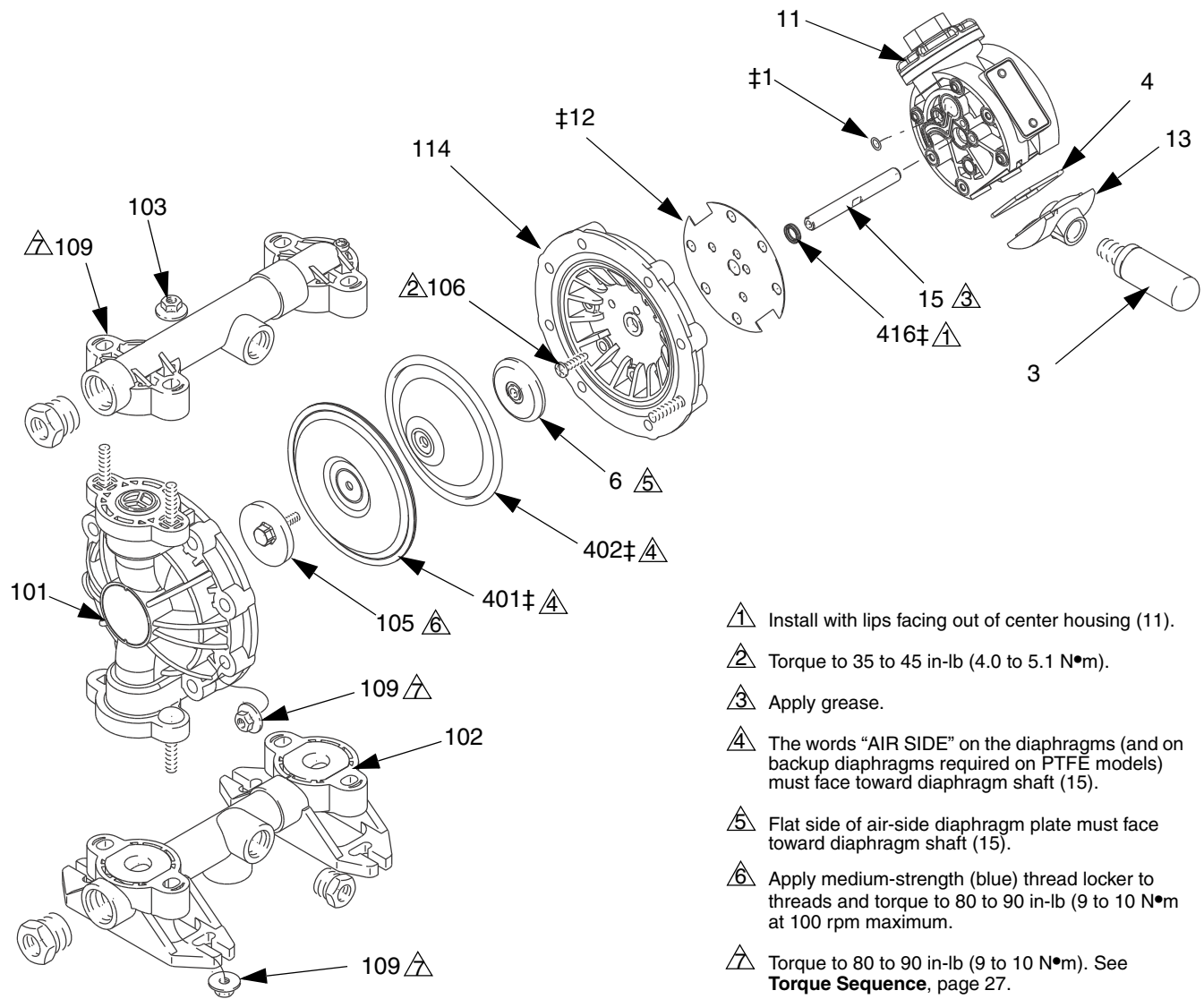
1. Insert a diaphragm shaft u-cup (416) and a pilot pin o-ring (1) into the bores of the center housing (11).

NOTE: Make sure the lips of the u-cup face out of the center housing.

2. Line up the holes in the gasket (12) with the holes in the end of the center housing (11), and use six screws (106) to fasten an air cover (113 or 114) to the end of the center housing (11). Torque the screws to 35 to 45 in-lb (4.0 to 5.1 N•m).
3. Position the exhaust cover (13) and o-ring (4) on the center housing (11).
4. Repeat steps 1 and 2 for the other end of the center housing and the remaining air cover.
5. Apply medium-strength (blue) thread locker to the threads of the fluid-side diaphragm plates (105). Install on one end of the diaphragm shaft (15) the following parts (see proper order in FIG. 9): air-side diaphragm plate (6), backup diaphragm (402, used only on models with PTFE diaphragms), diaphragm (401), and fluid-side diaphragm plate (105).

NOTE: The words "AIR SIDE" on the diaphragm (401), the backup diaphragm (402, used only on models with PTFE diaphragms) and the flat side of the air-side diaphragm plate (6) must face toward the diaphragm shaft (15).

6. Put grease on the diaphragm shaft (15), and carefully (do not damage the shaft u-cups) run the diaphragm shaft (15) through the center housing (11) bore.
7. Repeat step 5 for the other end of the diaphragm shaft (15), and torque the fluid-side diaphragm plates (105) to 80 to 90 in-lb (9 to 10 N•m) at 100 rpm maximum.
8. Install the muffler (3).
9. Make sure all the check valve parts are in place. See FIG. 7 on page 17.
10. Reinstall the fluid covers (101) and manifolds (102 and 103), and torque the fluid cover and manifold nuts (109) to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.



- ▲ Install with lips facing out of center housing (11).
- ▲ Torque to 35 to 45 in-lb (4.0 to 5.1 N•m).
- ▲ Apply grease.
- ▲ The words "AIR SIDE" on the diaphragms (and on backup diaphragms required on PTFE models) must face toward diaphragm shaft (15).
- ▲ Flat side of air-side diaphragm plate must face toward diaphragm shaft (15).
- ▲ Apply medium-strength (blue) thread locker to threads and torque to 80 to 90 in-lb (9 to 10 N•m) at 100 rpm maximum.
- ▲ Torque to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.

FIG. 9, Diaphragms, Polypropylene and PVDF Pumps

Diaphragms, Aluminum and Stainless Steel

NOTE: Fluid Section Repair Kit D05XXX is available. See page 26 to order the correct kit for your pump. Parts included in the kit are marked with a double dagger (‡) in FIG. 10 and in the Parts Drawings and Lists. General purpose grease 111920 and Adhesive 113500 are supplied in the kit. Service the diaphragms as follows. See FIG. 10.

Disassembly

1. Follow the **Pressure Relief Procedure**, page 13.
2. Remove the manifolds (102) and fluid covers (101).

NOTE: Make sure all the check valve parts stay in place. See FIG. 8 on page 18.

3. Remove the grounding strip from the vee clamps (109), and remove the vee clamps.
4. Remove one of the fluid-side diaphragm plates (133) (whichever one comes loose first when you use a wrench on the hex of each), and pull the diaphragm shaft out of the center housing (11).
5. Use a wrench on the flats of the diaphragm shaft (15) to remove the other fluid-side diaphragm plate (133) from the diaphragm shaft.
6. Remove the screws (141) and air covers (136), and remove all old gasket (12) material from the ends of the center housing (11) and the surfaces of the air covers.
7. Remove the diaphragm shaft u-cups (416) and pilot pin o-rings (1).
8. Inspect all parts for wear or damage, and replace as necessary.

Reassembly

1. Insert a diaphragm shaft u-cup (416) and a pilot pin o-ring (1) into the end of the diaphragm shaft bore of the center housing (11).

NOTE: Make sure the lips of the u-cup face out of the center housing.

2. Line up the holes in the gasket (12) with the holes in the end of the center housing (11), and use six screws (141) to fasten an air cover (136) to the end of the center housing (11). Torque the screws to 35 to 45 in-lb (4.0 to 5.1 N•m).
3. Position the exhaust cover (13) and o-ring (4) on the center housing (11).
4. Repeat steps 1 and 2 for the other end of the center housing and the remaining air cover.
5. Apply medium-strength (blue) thread locker to the threads of the screws (140). Install on one end of the diaphragm shaft (15) the following parts (see proper order in FIG. 10): air-side diaphragm plate (6), backup diaphragm (402, used only on models with PTFE diaphragms), diaphragm (401), fluid-side diaphragm plate (133), o-ring (115), and screw (140).

NOTE: The words "AIR SIDE" on the diaphragm (401), the backup diaphragm (402, used only on models with PTFE diaphragms), and the flat side of the air-side diaphragm plate (6) must face toward the diaphragm shaft (15).

6. Put grease on the diaphragm shaft (15), and carefully (do not damage the shaft u-cups) run the diaphragm shaft (15) through the center housing (11) bore.
7. Repeat step 5 for the other end of the diaphragm shaft (15), and torque the diaphragm shaft screws (140) to 80 to 90 in-lb (9 to 10 N•m) at 100 rpm maximum.
8. Install the muffler (3).

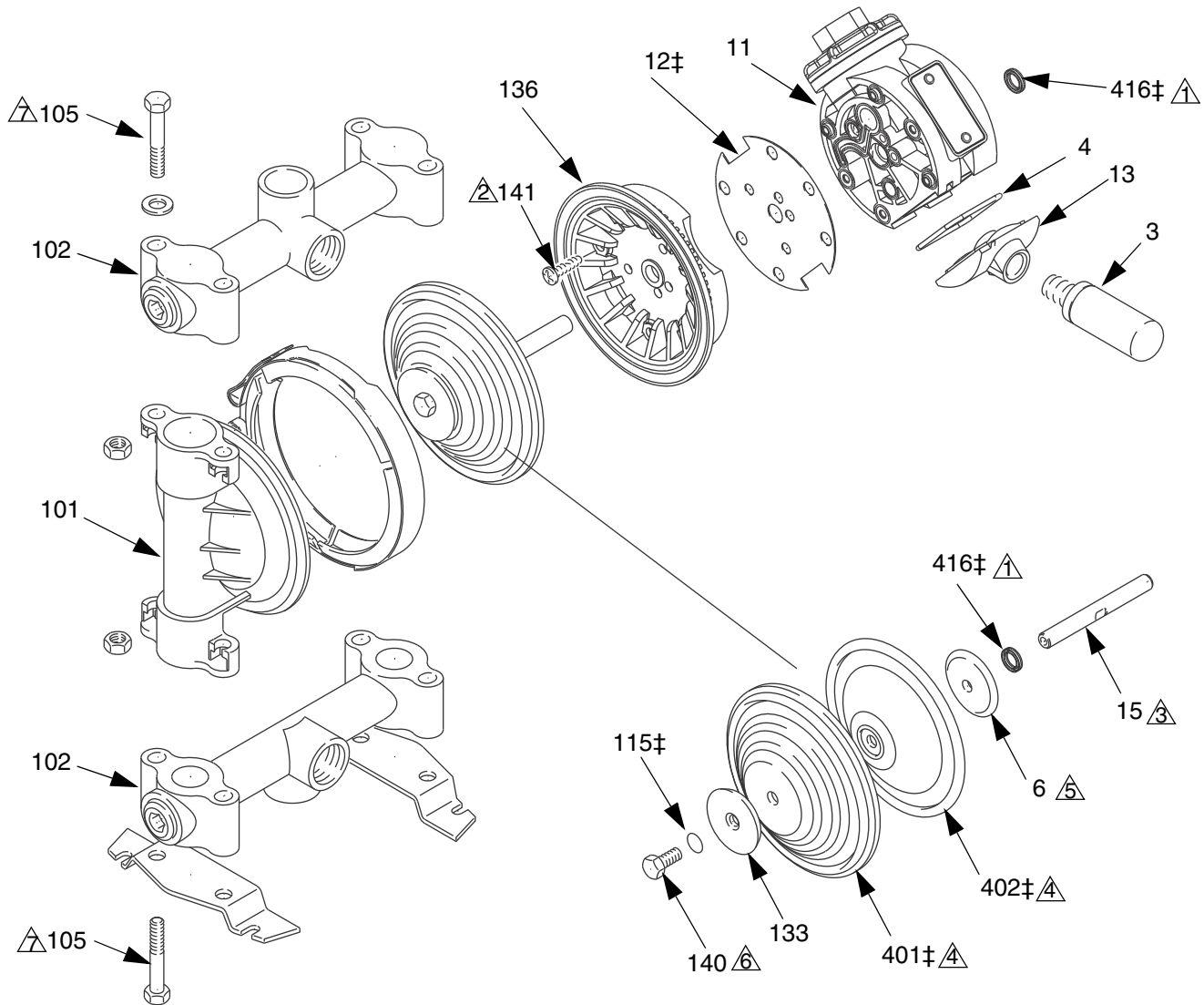
When you install the vee clamps in step 10, orient the center housing (11) so the air inlet is approximately 45° above horizontal and the muffler (3) is approximately horizontal.

9. Apply thin, even film of grease to inside of vee clamp (109).

10. Position the fluid covers (101), install the vee clamps (109) around the fluid and air covers, install the grounding strip on the vee clamps, and torque the vee clamp nuts to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.

11. Make sure all the check valve parts are in place. See FIG. 8 on page 18.

12. Install the manifolds (102), and torque the manifold bolts (105) to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.



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⚠ Install with lips facing out of center housing (11).

⚡ Torque to 35 to 45 in-lb (4.0 to 5.1 N•m).

⚙ Apply grease.

⚠ The words "AIR SIDE" on the diaphragms (and on backup diaphragms required on PTFE models) must face toward diaphragm shaft (15).

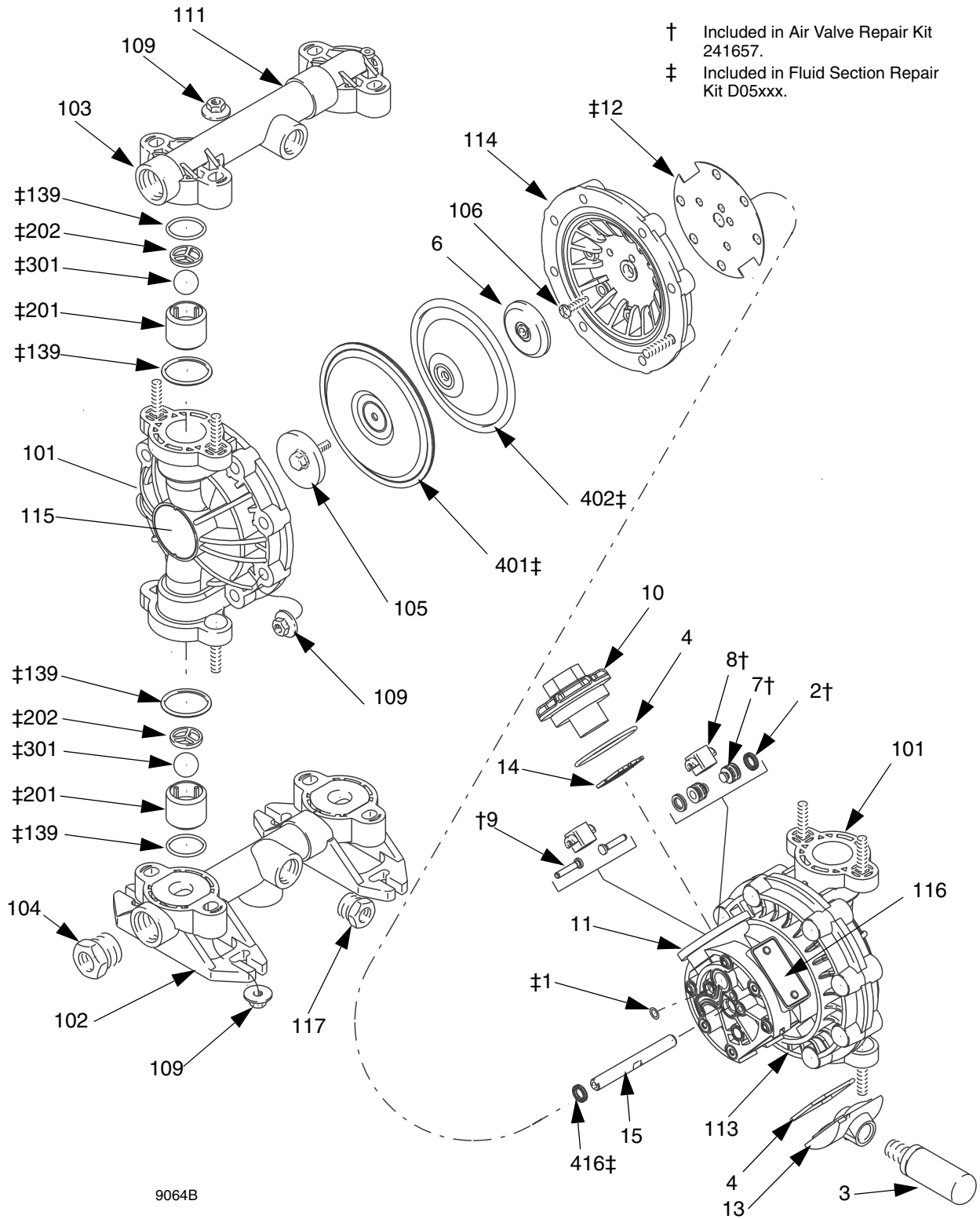
⚠ Flat side of air-side diaphragm plate must face toward diaphragm shaft (15).

⚠ Apply medium-strength (blue) thread locker to threads and torque to 80 to 90 in-lb (9 to 10 N•m) at 100 rpm maximum.

⚠ Torque to 80 to 90 in-lb (9 to 10 N•m). See **Torque Sequence**, page 27.

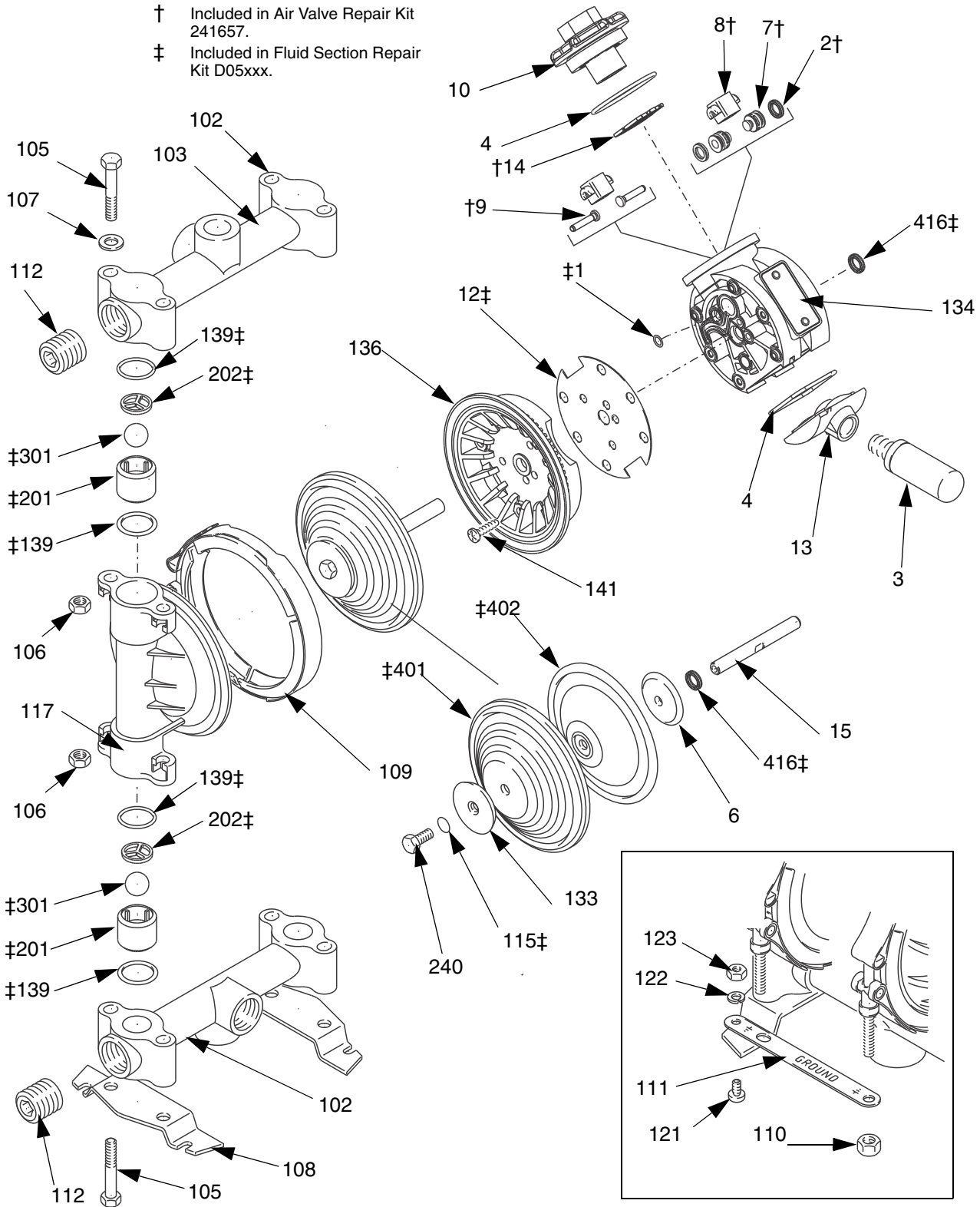
FIG. 10, Diaphragms, Aluminum and Stainless Steel Pumps

Parts, Polypropylene and PVDF Pumps



Parts, Aluminum and Stainless Steel Pumps

† Included in Air Valve Repair Kit 241657.
 ‡ Included in Fluid Section Repair Kit D05xxx.



Common Parts - All Pumps

Air Motor

Ref.	Part	Description	Qty.
1‡	114866	O-RING	2
2†	108808	U-CUP	2
3	112933	MUFFLER	1
4†	162942	O-RING	2
6	195025	PLATE, diaphragm, air side	2
7†	15Y825	PLUNGER, carriage	2
8†	192595	CARRIAGE	2
9†	192596	PIN, carriage	2
10	192597	COVER, valve chamber	1
11	192602	HOUSING, center	1
12‡	192765	GASKET	2
13	194247	COVER, exhaust	1
14†	194269	PLATE, valve	1
15	192601	SHAFT, diaphragm	1

Seats, Balls, Diaphragms

Ref.	Part	Description	Qty.
201‡	186776	GUIDE; polypropylene	4
	192665	GUIDE; PVDF	4
202‡	186777	STOP, polypropylene	4
	192668	STOP; PVDF	4
301‡	108639	BALL; PTFE	4
	112946	BALL; Santoprene	4
401‡	108839	DIAPHRAGM, PTFE	2
	189536	DIAPHRAGM, Santoprene	2
402‡	183542	DIAPHRAGM, backup; polyurethane (used with PTFE diaphragms)	2
416‡	108808	U-CUP	2

† Included in Air Valve Repair Kit 241657.

‡ Included in Fluid Section Repair Kit DO5xxx.

Fluid Section - Polypropylene and PVDF Pumps

Ref.	Polypropylene Pumps			PVDF Pumps		
	Part	Description	Qty.	Part	Description	Qty.
101	192558	COVER, fluid	2	192560	COVER, fluid	2
102	192575	MANIFOLD, inlet; BSPT	1	192577	MANIFOLD, inlet; BSPT	1
103	192566	MANIFOLD, outlet; BSPT	1	192568	MANIFOLD, outlet; BSPT	1
104	194367	PLUG, 3/4 BSPT	2	194369	PLUG, 3/4 BSPT	2
105	187712	PLATE, diaphragm, fluid	2	192679	PLATE, diaphragm, fluid	2
106	114882	SCREW, torx	12	114882	SCREW, torx	12
109	114850	NUT, hex, large flng	24	114850	NUT, hex, large flng	24
111▲	187732	LABEL, warning	1	187732	LABEL, warning	1
113	192599	COVER, air, right	1	192599	COVER, air, right	1
114	192600	COVER, air, left	1	192600	COVER, air, left	1
117	194364	PLUG, 1/2 BSPT	2	194366	PLUG, 1/2 BSPT	2
134▲	15J192	LABEL, warning, retorque	1	15J192	LABEL, warning, retorque	1
139	114849	O-RING, encapsulated	8	114849	O-RING, encapsulated	8

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

Fluid Section - Aluminum and Stainless Steel Pumps

Ref.	Aluminum Pumps			Stainless Steel Pumps		
	Part	Description	Qty.	Part	Description	Qty.
101	185622	COVER, fluid	2	187241	COVER, fluid	2
102	192061	MANIFOLD; BSPT	2	192060	MANIFOLD, BSPT	2
103▲	189220	LABEL, warning	1	189220	LABEL, warning	1
105	112912	SCREW, 3/8-16, 2.25 in. (57.2 mm)	8	112912	SCREW, 3/8-16, 2.25 in. (57.2 mm)	8
106	112913	NUT, hex; 3/8-16; sst	8	112913	NUT, hex; 3/8-16; sst	8
107	112914	WASHER, flat, 3/8 in; sst	4	112914	WASHER, flat, 3/8 in; sst	4
108	186207	BASE, feet	2	186207	BASE, feet	2
109	189540	CLAMP, vee	2	189540	CLAMP, vee	2
110	112499	NUT, clamp; 1/4-28	2	112499	NUT, clamp; 1/4-28	2
111	191079	STRIP, grounding	1	191079	STRIP, grounding	1
112	113989	PLUG, steel; BSPT	2	113990	PLUG, sst; BSPT	2
115	110004	O-RING, PTFE	2	110004	O-RING, PTFE	2
117	186205	LABEL, warning	1			
121	102790	SCREW; 10-24; 0.31 in (8 mm)	1	102790	SCREW; 10-24; 0.31 in (8 mm)	1
122	100718	LOCKWASHER, #10	1	100718	LOCKWASHER, #10	1
123	100179	NUT, hex, 10-24	1	100179	NUT, hex, 10-24	1
133	191837	PLATE, diaphragm, fluid-side, sst	2	16M908	PLATE, diaphragm, fluid-side, sst, machined	2
136	194246	COVER, air	2	194246	COVER, air	2
139	110636	O-RING, PTFE	8	110636	O-RING, PTFE	8
140	113747	SCREW, flange, hex head	2	113747	SCREW, flange, hex head	2
141	114882	SCREW, machine, torx	12	114882	SCREW, machine, torx	12

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

Fluid Section Repair Kits

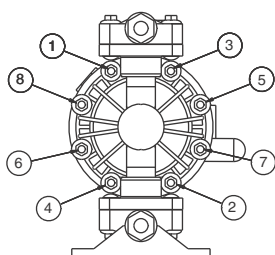
Part Number	Configuration Number	Kit
TF24T064	TFG100PSP	D05966
TF24T065	TFG100PTF	D05911
TF24T066	TFG100KTF	D05A11
TF24T067	TFG100ATF	D05911
TF24T068	TFG100STF	D05311

Torque Sequence

Always follow the torque sequence when instructed to torque fasteners.

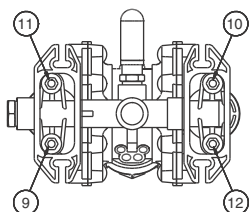
Polypropylene and PVDF Pumps

1. Left/Right Fluid Covers
Torque bolts to 80 to 90 in-lb (9 to 10 N•m).



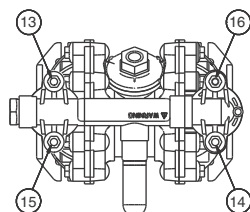
SIDE VIEW

2. Inlet Manifold
Torque bolts to 80 to 90 in-lb (9 to 10 N•m).



BOTTOM VIEW W

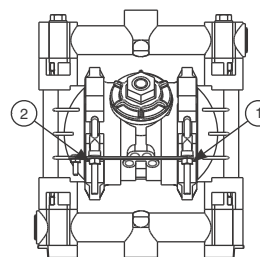
3. Outlet Manifold
Torque bolts to 80 to 90 in-lb (9 to 10 N•m).



TOP VIEW W

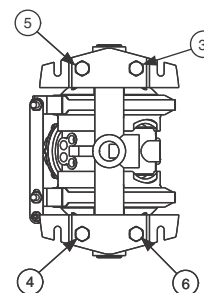
Aluminum and Stainless Steel Pumps

1. Left/Right Fluid Covers
Torque bolts to 80 to 90 in-lb (9 to 10 N•m).



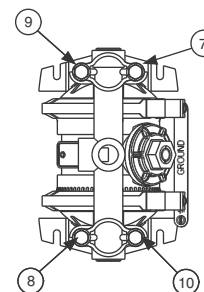
FRONT VIEW W

- Inlet Manifold
Torque bolts to 80 to 90 in-lb (9 to 10 N•m).



BOTTOM VIEW W

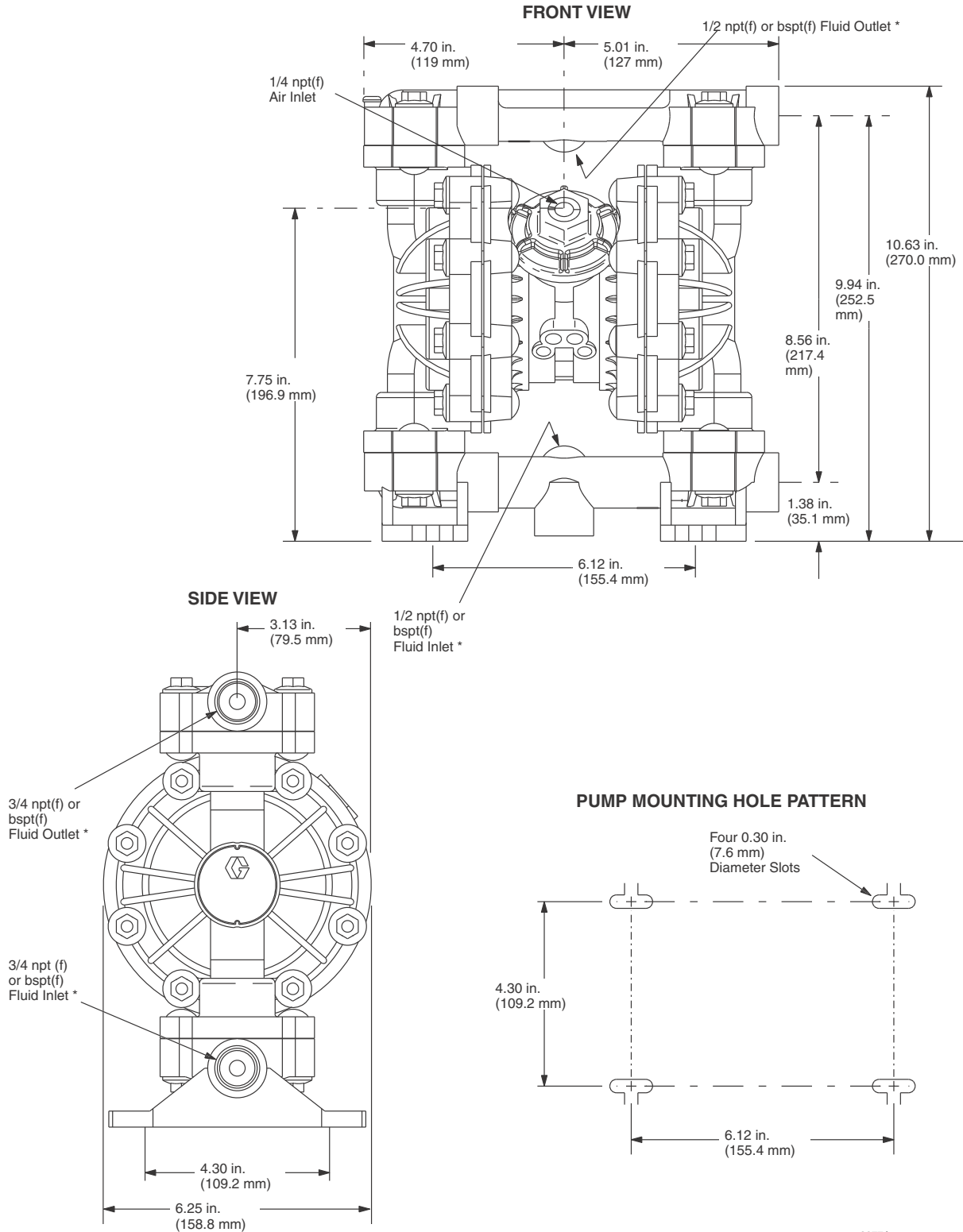
- Outlet Manifold
Torque bolts to 80 to 90 in-lb (9 to 10 N•m).



TOP VIEW W

Dimensions

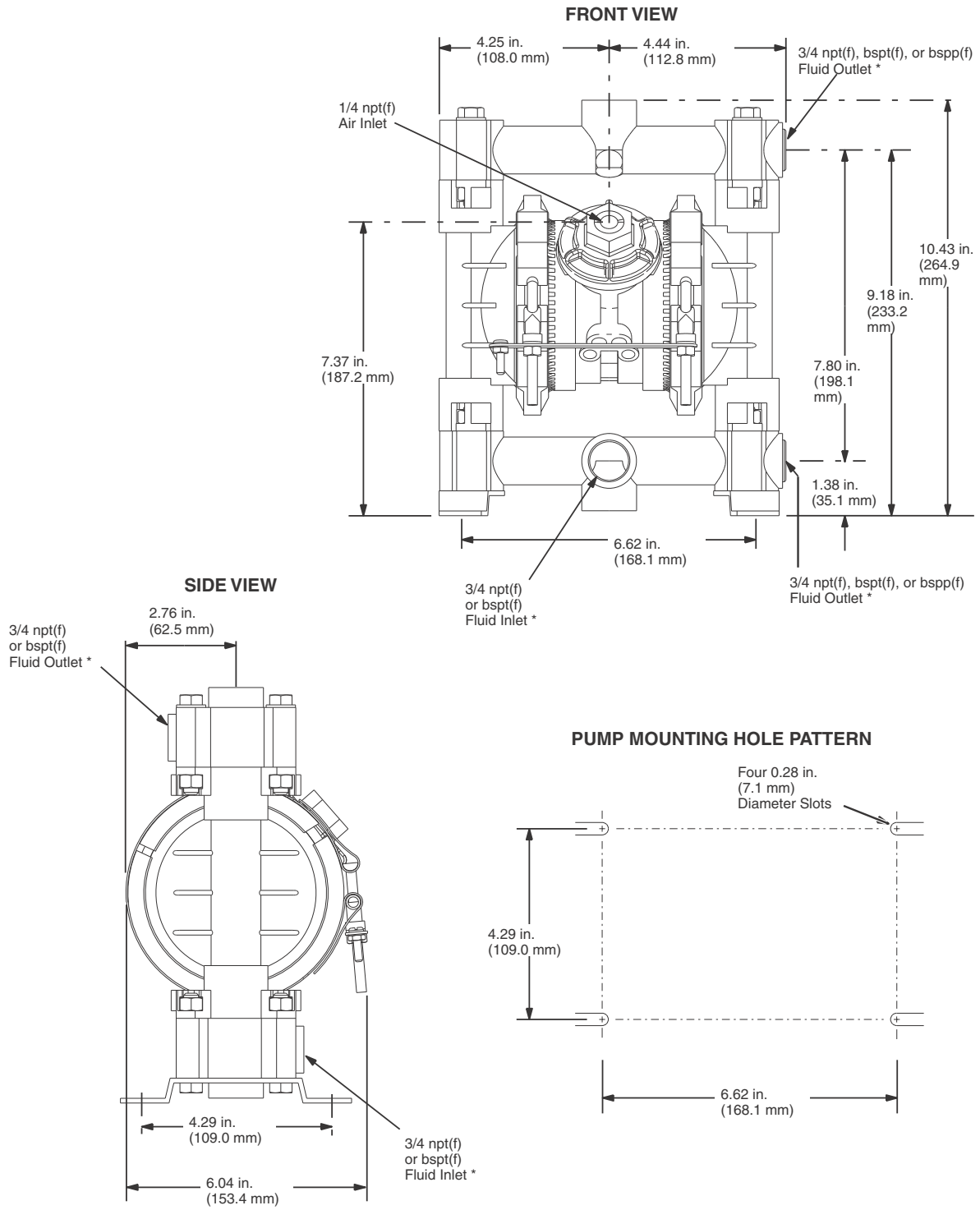
Polypropylene and PVDF Pumps



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Dimensions

Aluminum and Stainless Steel Pumps

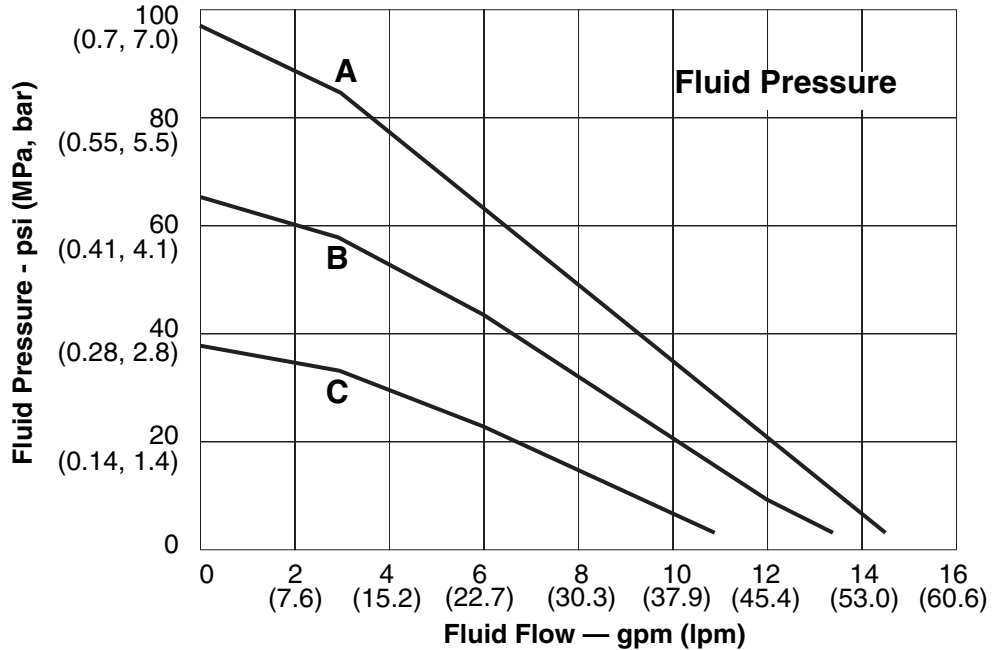


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Performance Charts

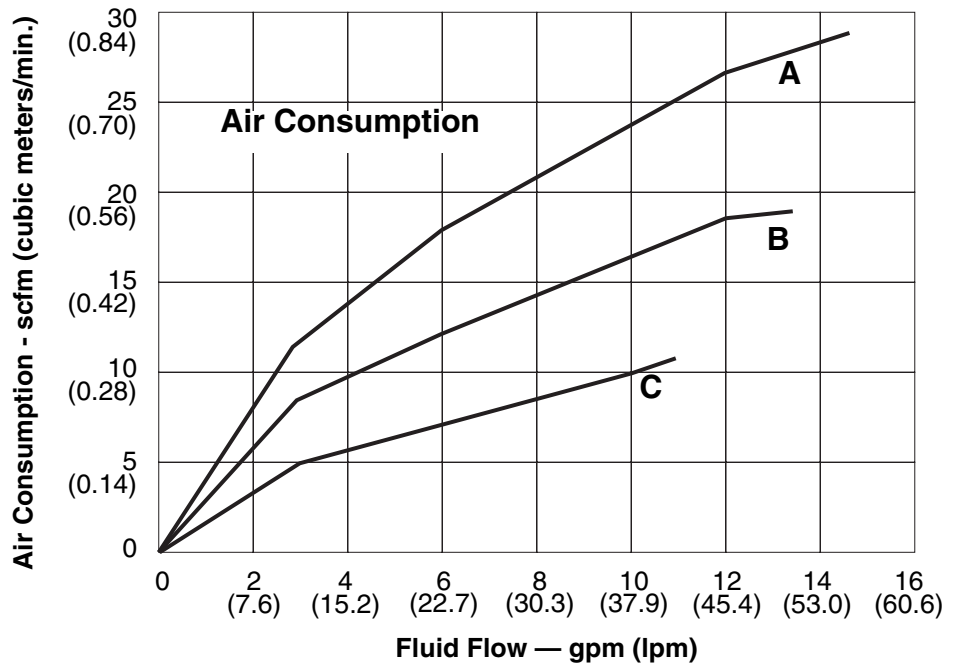
Operating Air Pressure

- A**
100 psi (0.7 MPa, 7.0 bar)
- B**
70 psi (0.48 MPa, 4.8 bar)
- C**
40 psi (0.28 MPa, 2.8 bar)



How to Read the Charts

1. Locate fluid flow rate along bottom of chart.
2. Follow vertical line up to intersection with selected operating air pressure curve.
3. Follow left to scale to read **fluid outlet pressure** (top chart) or **air consumption** (bottom chart).



Technical Data

	US	Metric
Maximum fluid working pressure	100 psi	0.7 MPa, 7 bar
Air pressure operating range	30 to 100 psi	0.2 to 0.7 MPa, 2.1 to 7 bar
Maximum air consumption	28 scfm	0.672 m ³ /minute
Maximum pump speed	400 cpm	
Maximum size pumpable solids	3/32 in.	2.5 mm
Fluid flow per cycle	0.04 gallons	0.15 liters
Air inlet size	1/4 in. npt(f)	
Air exhaust port size	3/8 npt(f)	
Operating temperature range* (Do not exceed the lowest maximum depending on the diaphragm, ball, and seat used in your pump.)		
Minimum (all pumps)	40°F	4°C
Maximum		
Polypropylene	150°F	66°C
Aluminum, PVDF, stainless steel	225°F	107°C
Maximum suction lift (water with buna-N balls)		
Dry	15 ft.	4.5 meters
Wet	25 ft.	7.6 meters
Sound power level (measured per ISO standard 9614-2)		
At 70 psig (0.48 MPa, 4.8 bar) at 50 cycles per minute	77 dBa	
At 100 psig (0.7 MPa, 7 bar) at maximum cycles per minute	95dBa	
Sound pressure level (measured 1 meter from pump)		
At 70 psig (0.48 MPa, 4.8 bar) at 50 cycles per minute	67 dBa	
At 100 psig (0.7 MPa, 7 bar) at maximum cycles per minute	85 dBa	
Fluid inlet and outlet sizes		
Polypropylene and PVDF pumps	1/2 and 3/4 bspt(f)	
Aluminum and stainless steel pumps	3/4 bspt(f)	
Wetted parts (in addition to ball, seat, and diaphragm materials, which vary by pump)		
Polypropylene pumps	polypropylene, PTFE	
PVDF pumps	PVDF, PTFE	
Aluminum pumps	aluminum, stainless steel, PTFE, zinc-plated steel	
Stainless steel pumps	316 stainless steel, PTFE	
Non-wetter external parts		
Polypropylene and PVDF pumps	polypropylene, stainless steel, polyester and aluminum (labels), nickel-plated brass	
Aluminum and stainless steel pumps	polypropylene, stainless steel, polyester (labels), nickel plated brass, epoxy-coated steel (feet)	
Weight (approximate)		
Polypropylene pumps	6.5 lb	2.9 kg
PVDF pumps	8.5 lb	3.9 kg
Aluminum pumps	8.5 lb	3.9 kg
Stainless steel pumps	18 lb	8.2 kg
* These temperatures are based on mechanical stress only and may be altered significantly by pumping certain chemicals. Consult engineering guides for chemical compatibilities and temperature limits, or contact your distributor.		

Techni-flow Standard Warranty

Techni-flow warrants all equipment referenced in this document which is manufactured by Techni-flow 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 Techni-flow, Techni-flow will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Techni-flow to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Techni-flow's written recommendations.

This warranty does not cover, and Techni-flow 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-Techni-flow component parts. Nor shall Techni-flow be liable for malfunction, damage or wear caused by the incompatibility of Techni-flow equipment with structures, accessories, equipment or materials not supplied by Techni-flow, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Techni-flow.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Techni-flow distributor for verification of the claimed defect. If the claimed defect is verified, Techni-flow 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.

Techni-flow'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.

TECHNI-FLOW 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 TECHNI-FLOW. These items sold, but not manufactured by Techni-flow (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Techni-flow will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Techni-flow be liable for indirect, incidental, special or consequential damages resulting from Techni-flow 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 Techni-flow, or otherwise.

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Original instructions. This manual contains English. MM 332522

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