

Verderair VA 40 (HE)

Air-Operated Diaphragm Pump

859.0344
Rev.F
EN

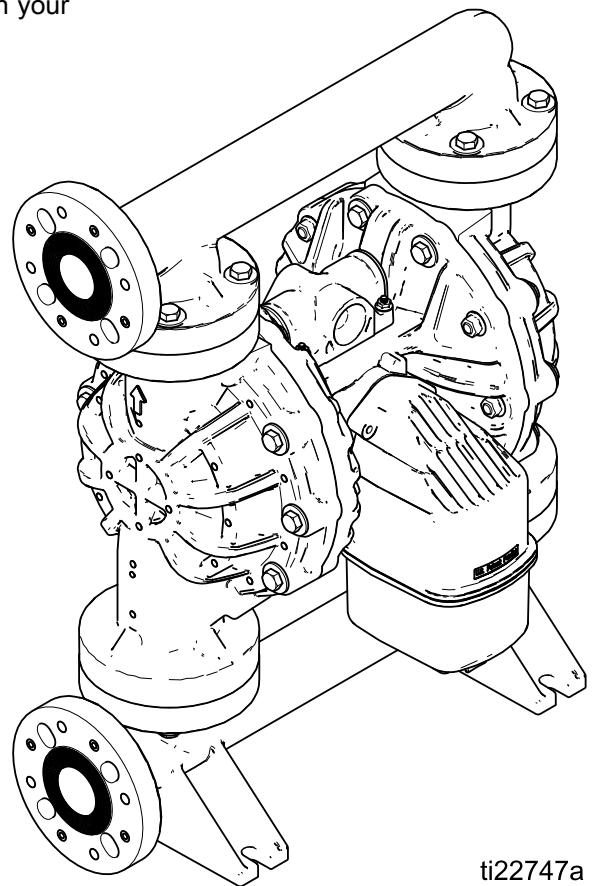
**Polypropylene and PVDF pumps for fluid transfer applications. For professional use only.
Not for use in European explosive atmosphere locations.**



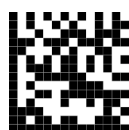
Important Safety Instructions

Read all warnings and instructions in this manual and in your Repair/Parts manual. **Save these instructions.**

*Maximum Working Pressure:
8.6 bar (0.86 MPa, 125 psi)*



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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>Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable vapors. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Clean plastic parts only in well ventilated area. • Do not clean with a dry cloth. • Do not operate electrostatic guns in equipment work area.
	<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.

 <h1 style="margin: 0;">WARNING</h1>	
  <p style="font-size: small; margin: 0;">MPa / bar / PSI</p>	<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 style="font-size: small; margin: 0;">MPa / bar / PSI</p>	<p>THERMAL EXPANSION HAZARD</p> <p>Fluids subjected to heat in confined spaces, including hoses, can create a rapid rise in pressure due to the thermal expansion. Over-pressurization can result in equipment rupture and serious injury.</p> <ul style="list-style-type: none"> Open a valve to relieve the fluid expansion during heating. Replace hoses proactively at regular intervals based on your operating conditions.
 	<p>PLASTIC PARTS CLEANING SOLVENT HAZARD</p> <p>Many solvents can degrade plastic parts and cause them to fail, which could cause serious injury or property damage.</p> <ul style="list-style-type: none"> Use only compatible water-based solvents to clean plastic structural or pressure-containing parts. See Technical Data in this and all other equipment instruction manuals. Read fluid and solvent manufacturer's MSDSs and recommendations.

 WARNING	
	<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>BURN HAZARD</p> <p>Equipment surfaces and fluid that's 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. 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.

Ordering Information

To Order a New Pump

NOTE: Do not configure and order a pump using only this manual. Work with your Verder representative or follow the steps below.

1. Visit www.verderair.com. Select Verderair Series VA.
2. Click on Pump Configurator.
3. Use the configurator to specify a pump. As you work through, the configurator offers only those options that work with the pump you are building.

To Order Parts for Your Existing Pump

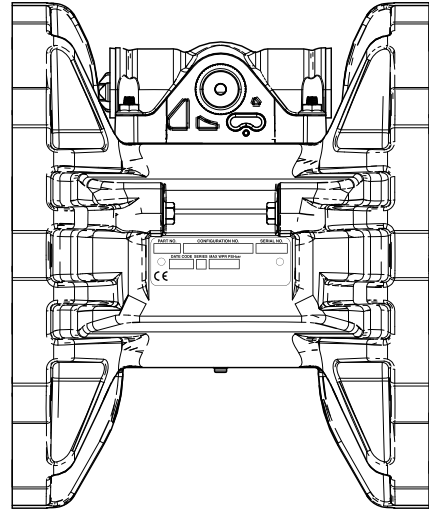
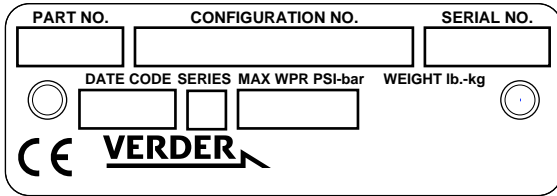
1. Check the identification plate (ID) for the Configuration Number of your pump.
2. Use the Configuration Number Matrix on the next page to understand which parts are described by each digit.
3. Refer to the Repair/Parts manual for the necessary part numbers.

Related Manuals

Manual Number	Title
859.0345	<i>Verderair</i> VA 40 Air-Operated Diaphragm Pump, Repair/Parts

Configuration Number Matrix

Check the identification plate (ID) for the Configuration Number of your pump. Use the following matrix to define the components of your pump.



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Sample Configuration Number: **VA40(HE)PP-SSSPSPFC00**

VA	40(HE)	P	P	SS	SP	SP	FC	00
Pump Type	Pump Size	Wetted Parts	Air Motor	Seats	Balls	Diaphragms	Manifolds	Options

Pump	Fluid Section Material		Air Section Material		Seat Material	
VA40(HE)	P	Polypropylene	P	Polypropylene	KY	PVDF
	K	PVDF			PP	Polypropylene
					SP	Santoprene
					SS	Stainless Steel

Ball Material		Diaphragm Material		Connections		Options	
SP	Santoprene	SP	Santoprene	FC	Center flange DIN/ANSI	00	Standard
TF	PTFE	TF	PTFE/Santoprene 2-Piece	FE	End flange DIN/ANSI		
VT	FKM	TO	PTFE/EPDM Overmolded				
		VT	FKM				

Installation

General Information

The Typical Installation shown is only a guide for selecting and installing system components. Contact your Verder representative for assistance in planning a system to suit your needs. Be sure all accessories are adequately sized and pressure rated to meet the system's requirements.

Reference letters in the text, for example (A), refer to the callouts in the figures.

Variations in color between the plastic components of this pump are normal. Color variation does not affect the performance of the pump.

Tighten Fasteners

Before mounting and using the pump for the first time, check and retorque all external fasteners. Follow [Torque Instructions, page 16](#), or see the torque tag on your pump. After the first day of operation, retorque the fasteners.

Tips to Reduce Cavitation

Cavitation in an AODD pump is the formation and collapse of bubbles in the pumped liquid. Frequent or excessive cavitation can cause serious damage, including pitting and early wear of fluid chambers, balls, and seats. It may result in reduced efficiency of the pump. Cavitation damage and reduced efficiency both result in increased operating costs.

Cavitation depends on the vapor pressure of the pumped liquid, the system suction pressure, and the velocity pressure. It can be reduced by changing any of these factors.

1. Reduce vapor pressure: Decrease the temperature of the pumped liquid.
2. Increase suction pressure:
 - a. Lower the installed position of the pump relative to the liquid level in the supply.
 - b. Reduce the friction length of the suction piping. Remember that fittings add friction length to the piping. Reduce the number of fittings to reduce the friction length.
 - c. Increase the size of the suction piping.

NOTE: Be sure the inlet fluid pressure does not exceed 25 % of the outlet working pressure.

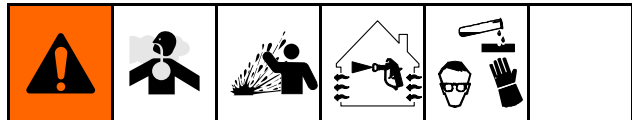
3. Reduce liquid velocity: Slow the cyclic rate of the pump.

Pumped liquid viscosity is also very important but normally is controlled by factors that are process dependent and cannot be changed to reduce cavitation. Viscous liquids are more difficult to pump and more prone to cavitation.

Verder recommends taking all the above factors into account in system design. To maintain pump efficiency, supply only enough air pressure to the pump to achieve the required flow.

Verder representatives can supply site specific suggestions to improve pump performance and reduce operating costs.

Mount The Pump



To avoid serious injury or death from toxic fluid or fumes:

- Ventilate to a remote area. The pump exhaust air may contain contaminants. See [Air Exhaust Ventilation, page 11](#).
- Never move or lift a pump under pressure. If dropped, the fluid section may rupture. Always follow the [Pressure Relief Procedure, page 14](#), before moving or lifting the pump.
- Do not expose pump or the plastic components to direct sunlight for prolonged periods. Prolonged exposure to UV radiation will degrade natural polypropylene components of the pumps.

1. Be sure the mounting surface can support the weight of the pump, hoses, and accessories, as well as the stress caused during operation.
2. For all mountings, be sure the pump is secured with screws through the mounting feet.
3. Make sure the surface is flat and that the pump doesn't wobble.
4. For ease of operation and service, mount the pump so air valve, air inlet, fluid inlet and fluid outlet ports are easily accessible.

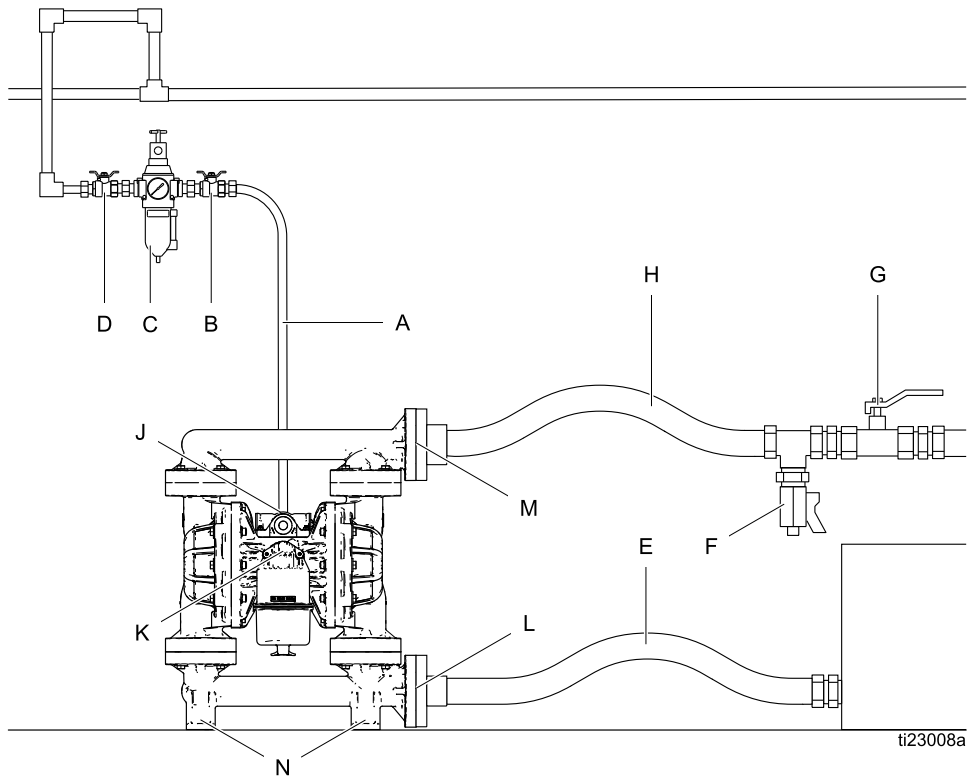


Figure 1 Typical Installation




Accessories/Components Not Supplied

- A Air supply line
- B Bleed-type master air valve (may be required for your pump)
- C Air filter/regulator assembly
- D Master air valve (to isolate the filter/regulator for service)
- E Grounded flexible fluid supply line
- F Fluid drain valve (may be required for your pump)
- G Fluid shutoff valve
- H Grounded, flexible fluid outlet line

System Components

- J Air inlet port (not visible)
- K Air outlet port and muffler
- L Fluid inlet port
- M Fluid outlet port
- N Mounting feet

Ground The System

					
<p>The equipment must be grounded to reduce the risk of static sparking. Static sparking can cause fumes to ignite or explode. Grounding provides an escape wire for the electrical current.</p> <ul style="list-style-type: none"> • 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. 					






Before operating the pump, ground the system as explained below.

- **Pump:** **Always** ground the entire fluid system by making sure the fluid has an electrical path to a true earth ground.
- **Air and fluid hoses:** Use only grounded hoses with a maximum of 500 ft (150 m) combined hose length to ensure grounding continuity.
- **Air compressor:** Follow manufacturer's recommendations.
- **Fluid supply container:** 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.

Check your system electrical continuity after the initial installation, and then set up a regular schedule for checking continuity to be sure proper grounding is maintained.








Air Lines

1. Install an air regulator and gauge (C) to control the fluid pressure. The fluid stall pressure will be the same as the setting of the air regulator.
2. Locate a bleed-type master air valve (B) close to the pump and use it to relieve trapped air. Be sure the valve is easily accessible from the pump and located downstream from the regulator.

						
<p>Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing.</p>						

3. Locate another master air valve (D) upstream from all air line accessories and use it to isolate them during cleaning and repair.
4. An air line filter (C) removes harmful dirt and moisture from the compressed air supply.
5. Install a grounded, flexible air hose (A) between the accessories and the 3/4 npt(f) pump air inlet.

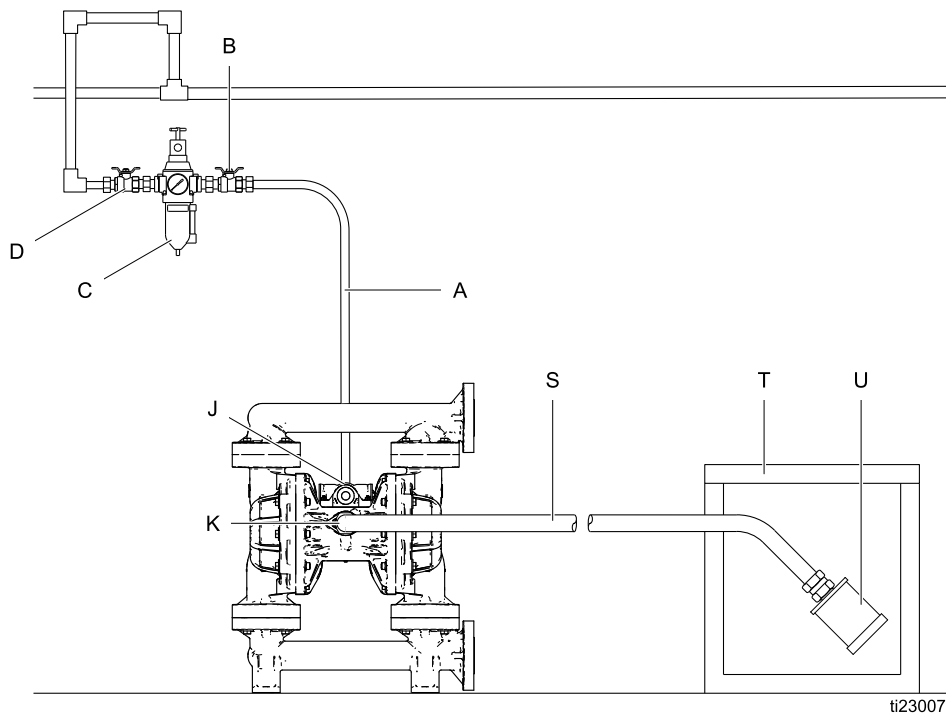
Air Exhaust Ventilation

						
<p>If pumping toxic fluids, you must vent the exhaust away from people, animals, food handling areas, and all sources of ignition. Follow all applicable codes.</p>						

NOTICE
<p>The air exhaust port is 1 in. npt(f). Do not restrict the air exhaust port. Excessive exhaust restriction can cause erratic pump operation.</p>

To provide a remote exhaust:

1. Remove the muffler (U) from the pump air exhaust port (K).
2. Install a grounded air exhaust hose (S) and connect the muffler to the other end of the hose. The minimum size for the air exhaust hose is 26 mm (1 in) ID. If a hose longer than 4.57 m (15 ft) is required, use a larger diameter hose. Avoid sharp bends or kinks in the hose.
3. Place a container (T) at the end of the air exhaust line to catch fluid in case a diaphragm ruptures. If the diaphragm ruptures, the fluid being pumped will exhaust with the air.



- | | | | |
|---|--|---|----------------------------------|
| A | Air supply line | K | Air exhaust port |
| B | Bleed-type master air valve (may be required for your pump installation) | S | Grounded air exhaust hose |
| C | Air filter/regulator assembly | T | Container for remote air exhaust |
| D | Master air valve (for accessories) | U | Muffler |
| J | Air inlet port (not visible) | | |

Fluid Supply Line

1. Connect a grounded, flexible fluid hose (E) to the 38 mm (1.5 in) ANSI/DIN pump fluid inlet flange (L). See [Ground The System, page 10](#).
2. 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. Excessive inlet fluid pressure also will shorten diaphragm life. Approximately 0.21–0.34 bar (0.02–0.03 MPa, 3–5 psi) should be adequate for most materials.
3. For maximum suction lift (wet and dry), see [Technical Data, page 22](#). For best results, always install the pump as close as possible to the material source. Minimize suction requirements to maximize pump performance.

Fluid Outlet Line

1. Connect a grounded, flexible fluid hose (H) to the 38 mm (1.5 in) ANSI/DIN pump fluid outlet flange. See [Ground The System, page 10](#).
2. Install a fluid drain valve (F) near the fluid outlet.
3. Install a shutoff valve (G) in the fluid outlet line.

Flange Connections

The fluid inlet and outlet ports are 38 mm (1.5 in) raised face, standard 68 kg (150 lb). class pipe flanges.

Standard pipe flange kits are available in polypropylene (819.6888) and PVDF (819.6889). These kits include:

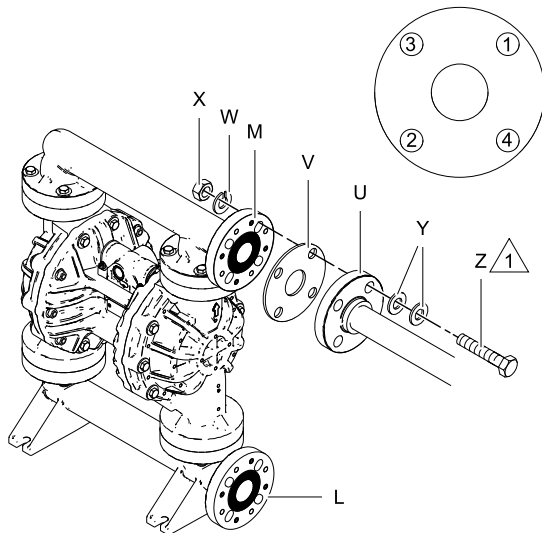
- the pipe flange
- a PTFE gasket
- four 1/2 in. bolts, lock washers, and nuts.
- eight flat washers,

Be sure to lubricate the threads of the bolts and torque to 14–20 N•m (10–15 ft-lb). Follow the bolt tightening sequence and **do not over-torque**.

L	38 mm (1.5 in.) fluid inlet flange
M	38 mm (1.5 in.) fluid outlet flange
U	Plastic pipe flange
V	PTFE gasket
W	Lock washer
X	Nut
Y	Flat washer
Z	Bolt



Lubricate threads. torque to 14 to 20 Nm (10 to 15 ft-lb). **Do not overtorque.**



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Figure 2

Operation

Pressure Relief Procedure



Follow the Pressure Relief Procedure whenever you see this symbol.

<p>This equipment stays pressurized until pressure is relieved manually. To help prevent serious injury from pressurized fluid, such as splashing in the eyes or on skin, follow the Pressure Relief Procedure when you stop pumping and before you clean, check, or service the equipment.</p>					

1. Shut off the air supply 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.

Tighten Fasteners

Before mounting and using the pump for the first time, check and retorque all external fasteners. Follow [Torque Instructions, page 16](#), or see the torque tag on your pump. After the first day of operation, retorque the fasteners.

Flush the Pump Before First Use

The pump was tested in water. If water could contaminate the fluid you are pumping, flush the pump thoroughly with a compatible solvent. See [Flushing and Storage, page 15](#).

Start and Adjust the Pump

1. Be sure the pump is properly grounded. See [Ground The System, page 10](#).
2. Check fittings to be sure they are tight. Use a compatible liquid thread sealant on male threads. Tighten fluid inlet and outlet fittings securely

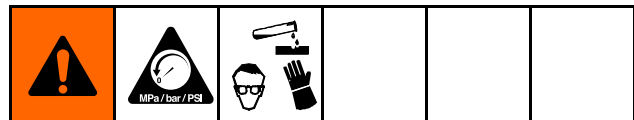
3. Place the suction tube (if used) in fluid to be pumped.

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.

NOTICE
Excessive fluid inlet pressure can reduce diaphragm life.

4. Place the end of the fluid hose into an appropriate container.
 5. Close the fluid drain valve.
 6. Turn the air regulator knob to 0. Open all bleed-type master air valves.
 7. If the fluid hose has a dispensing device, hold it open.
 8. Slowly increase air pressure with the air regulator until the pump just starts to cycle. Allow the pump to cycle slowly until all air is pushed out of the lines and the pump is primed.
- NOTE:** Use lowest possible air pressure to prime, just enough to cycle the pump. If the pump does not prime as expected, turn air pressure **DOWN**.
9. If you are flushing, run the pump long enough to thoroughly clean the pump and hoses.
 10. Close the bleed-type master air valve.

Pump Shutdown



At the end of the work shift and before you check, adjust, clean, or repair the system, follow the [Pressure Relief Procedure, page 14](#).

Maintenance

Maintenance Schedule

Establish a preventive maintenance schedule based on the pump's service history. Scheduled maintenance is especially important to prevent spills or leakage due to diaphragm failure.

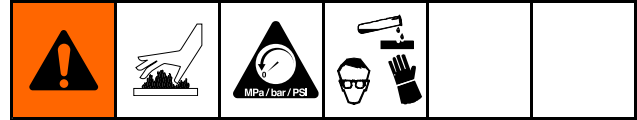
Lubrication

The pump is lubricated at the factory. It is designed to require no further lubrication for the life of the packings. There is no need to add an inline lubricator under normal operating conditions.

Tighten 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 mounting bolts. Check fasteners. Tighten or retorque as necessary. Although pump use varies, a general guideline is to retorque fasteners every two months. See [Torque Instructions, page 16](#).

Flushing and Storage



- Flush before fluid can dry in the equipment, at the end of the day, before storing, and before repairing equipment.
- Flush at the lowest pressure possible. Check connectors for leaks and tighten as necessary.
- Use solvent that is compatible with the equipment wetted parts and the material being dispensed.
- Always flush the pump and relieve the pressure before storing it for any length of time.

NOTICE

Flush the pump often enough to prevent the fluid you are pumping from drying or freezing in the pump and damaging it. Store the pump at 32°F (0°C) or higher. Exposure to extreme low temperatures may result in damage to plastic parts.

Torque Instructions

If fluid cover or manifold fasteners have been loosened, it is important to torque them using the following procedure to improve sealing.

NOTE: Fluid cover and manifold fasteners have a thread-locking adhesive patch applied to the threads. If this patch is excessively worn, the fasteners may loosen during operation. Replace screws with new ones or apply medium-strength (blue) Loctite or equivalent to the threads.

NOTE: Always completely torque fluid covers before torquing manifolds.

1. Start all fluid cover screws a few turns. Then, turn down each screw just until head contacts cover.
2. Turn each screw by 1/2 turn or less working in a crisscross pattern to specified torque.
3. Repeat for manifolds.

Fluid cover and manifold fasteners: 21 to 25 Nm (190 to 220 in-lb)

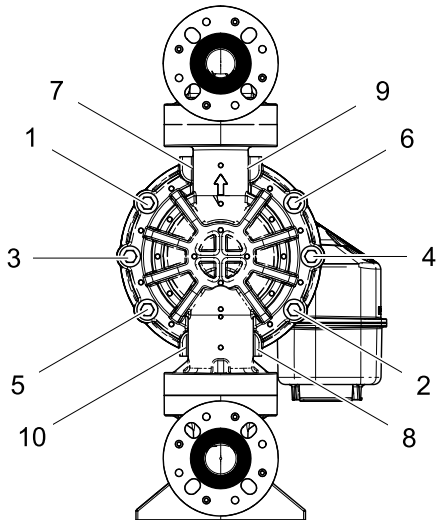
4. Retorque the air valve fasteners in a crisscross pattern to the specified torque.

Air valve fasteners: 5 to 6 Nm (45 to 55 in-lb)

5. Retorque the pilot valves to the specified torque. **Do not overtorque.**

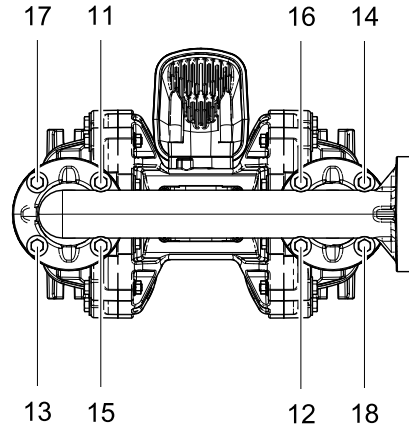
Pilot valves: 2 to 3 Nm (20 to 25 in-lb)

Fluid Cover Screws



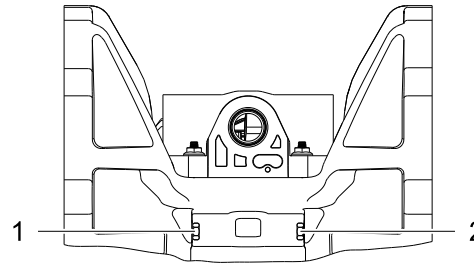
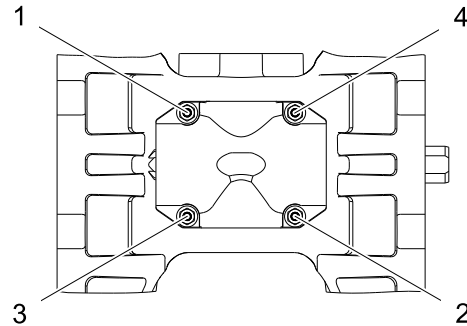
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Inlet and Outlet Manifold Screws



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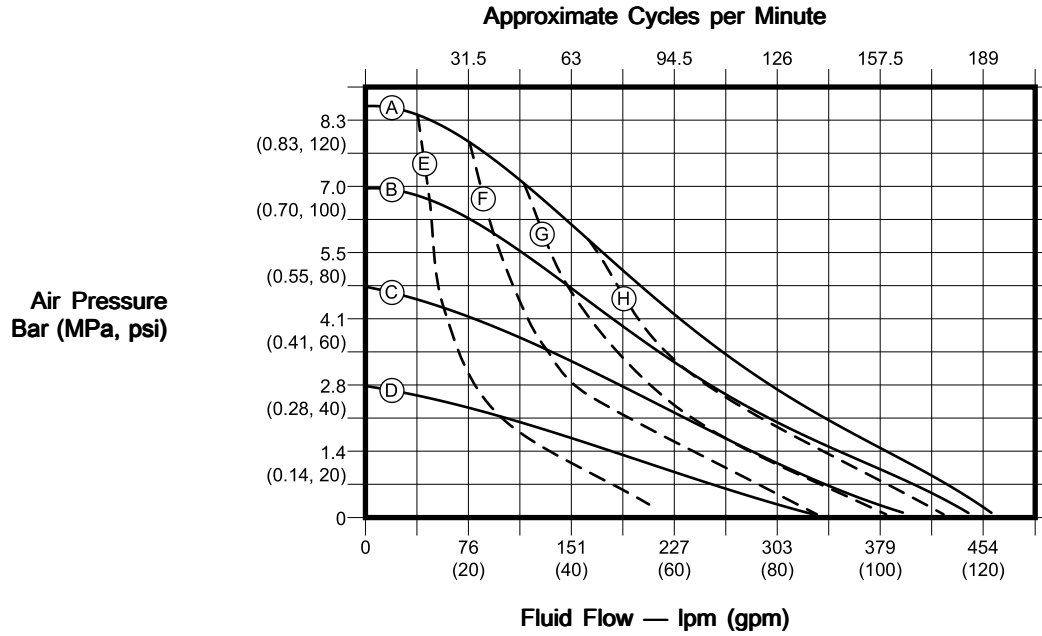
Air Valve Screws and Pilot Valves



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Performance Charts

1-Piece Bolt-through Diaphragms



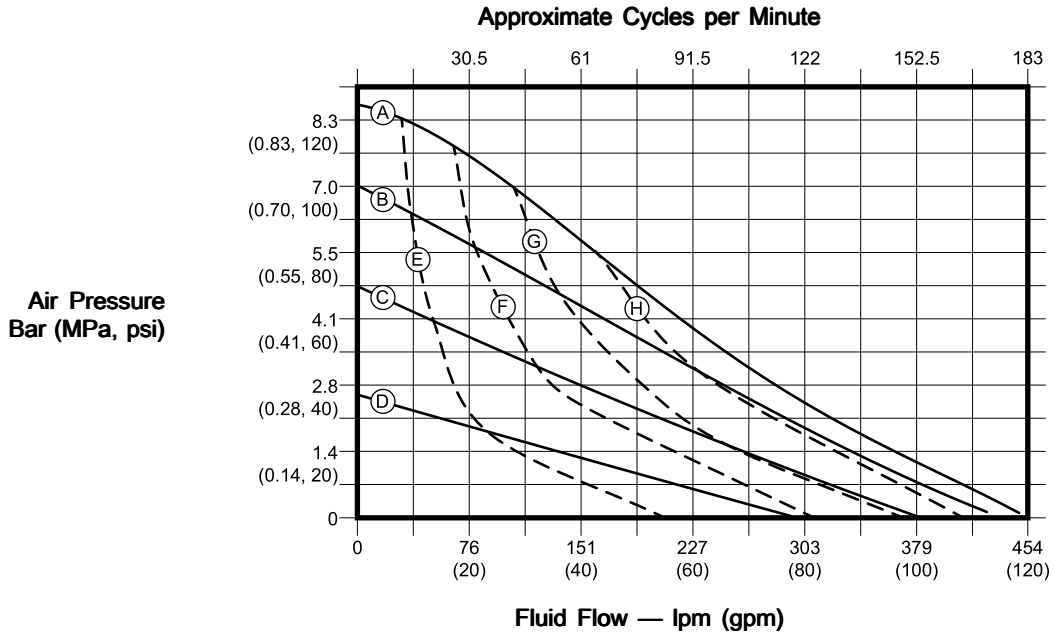
Air Inlet Pressure

- A**
8.6 bar (0.86 MPa, 125 psi)
- B**
7.0 bar (0.7 MPa, 100 psi)
- C**
4.8 bar (0.48 MPa, 70 psi)
- D**
2.8 bar (0.28 MPa, 40 psi)

Air Consumption

- E**
0.42 Nm³/min (15 scfm)
- F**
0.85 Nm³/min (30 scfm)
- G**
1.28 Nm³/min (45 scfm)
- H**
1.70 Nm³/min (60 scfm)

2-Piece Bolt-through Diaphragms



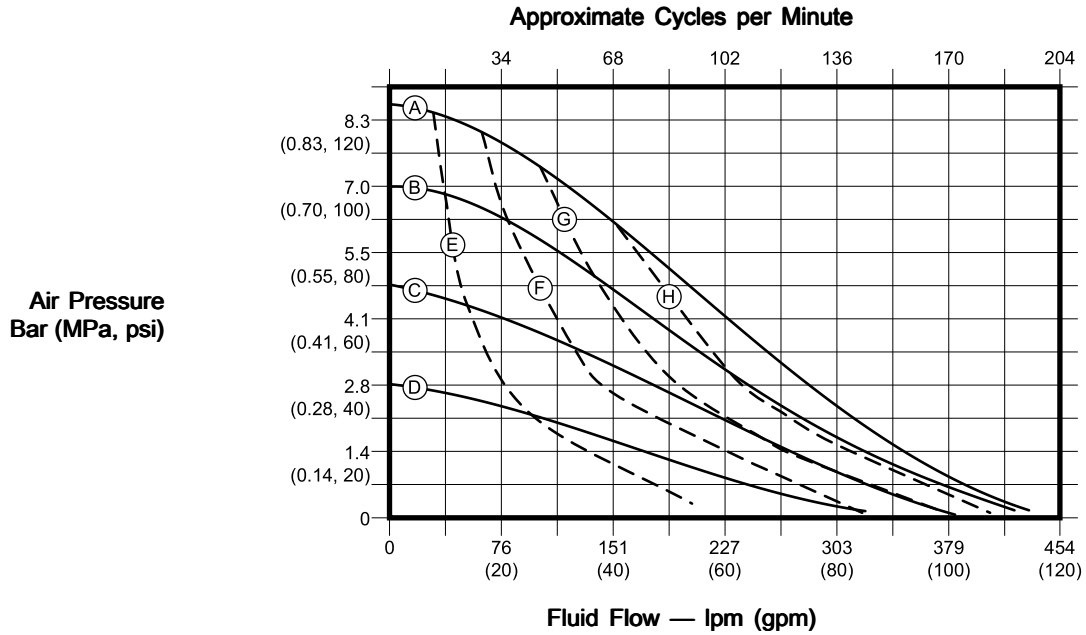
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Air Consumption

- E**
0.42 Nm³/min (15 scfm)
- F**
0.85 Nm³/min (30 scfm)
- G**
1.28 Nm³/min (45 scfm)
- H**
1.70 Nm³/min (60 scfm)

Overmolded Diaphragms



Air Inlet Pressure

A
8.6 bar (0.86 MPa, 125 psi)

B
7.0 bar (0.7 MPa, 100 psi)

C
4.8 bar (0.48 MPa, 70 psi)

D
2.8 bar (0.28 MPa, 40 psi)

Air Consumption

E
0.42 Nm³/min (15 scfm)

F
0.85 Nm³/min (30 scfm)

G
1.28 Nm³/min (45 scfm)

H
1.70 Nm³/min (60 scfm)

Dimensions

End Flange Models, Polypropylene and PVDF

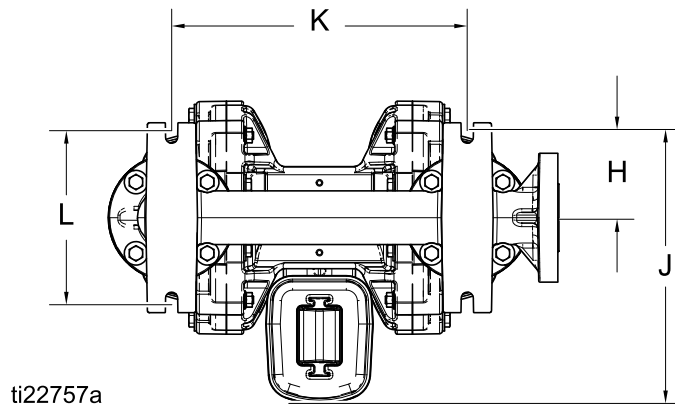
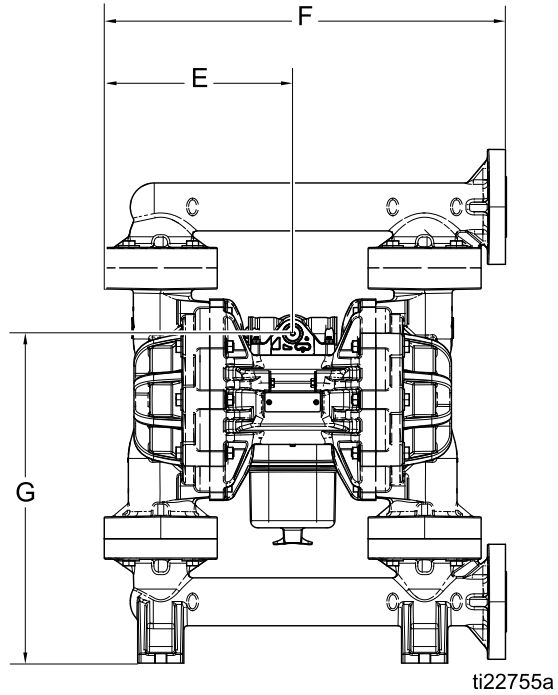
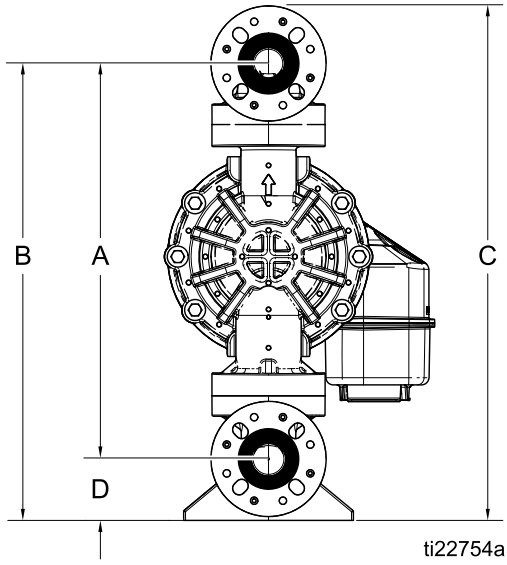


Table 1 Dimensions for Polypropylene or PVDF Pumps

Ref.	Inches	Centimeters
A	20.6	52.3
B	23.8	60.4
C	26.8	68.1
D	3.2	8.1
E	9.9	25.1
F	21.0	53.3

Ref.	Inches	Centimeters
G	17.2	43.7
H	3.8	9.6
J	12.4	31.5
K	13.8	35.1
L	7.5	19.1

Center Flange Models, Polypropylene Only

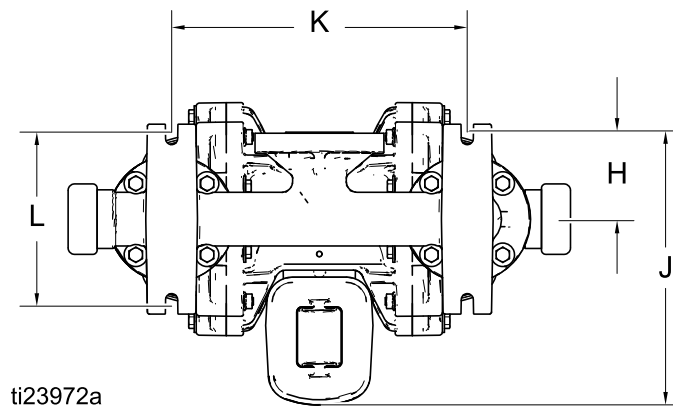
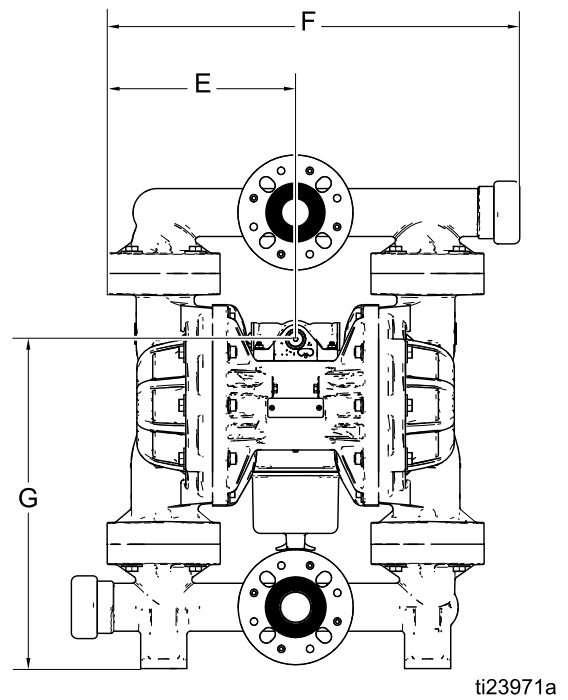
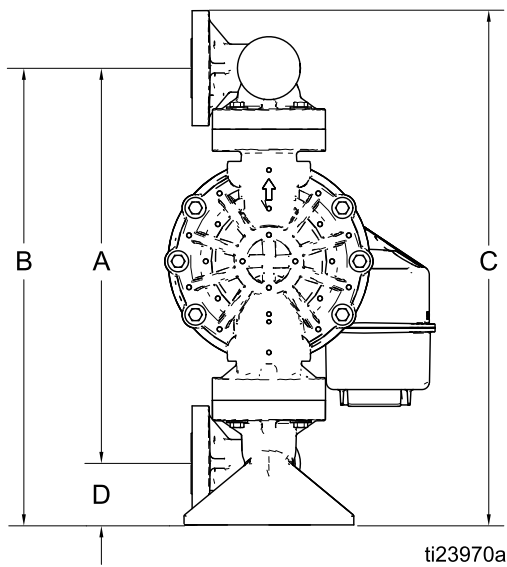


Table 1 Dimensions for Polypropylene Pumps

Ref.	Inches	Centimeters
A	20.6	52.3
B	23.8	60.4
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L	7.5	19.1

Technical Data

Verderair VA 40 (HE) Diaphragm Pump		
	US	Metric
Maximum fluid working pressure	125 psi	0.86 MPa, 8.6 bar
Air pressure operating range	20 to 125 psi	0.14 to 0.86 MPa, 1.4 to 8.6 bar
Air inlet size	1/2 in. (npt(f))	
Air exhaust size	1 in.	
Fluid inlet and outlet size (ANSI/DIN flange)	1.5 in	38 mm
Maximum suction lift (reduced if balls don't seat well due to damaged balls or seats, lightweight balls, or extreme speed of cycling)	Wet: 31 ft Dry: 16 ft	Wet: 9.4 m Dry: 4.9 m
Maximum size pumpable solids	1/4 in.	6.3 mm
Minimum ambient air temperature for operation and storage. NOTE: Exposure to extreme low temperatures may result in damage to plastic parts.	32° F	0° C
Air Consumption	43 scfm at 70 psi, 60 gpm	1.2 m ³ /min at 0.48 MPa, 4.8 bar, 227 lpm
Maximum Air Consumption	85 scfm	2.4 m ³ /min
Noise (dBa) Sound power measured per ISO-9614-2. Sound pressure was tested 3.28 ft (1 m) from equipment.		
Sound Power	90.9 at 70 psi and 50 cpm 102.1 at 100 psi and full flow	90.9 at 4.8 bar and 50 cpm 102.1 at 7.0 bar and full flow
Sound Pressure	83.6 at 70 psi and 50 cpm 95.7 at 100 psi and full flow	83.6 at 4.8 bar and 50 cpm 95.7 at 7.0 bar and full flow
Fluid flow per cycle		
1-piece bolt-through diaphragms	0.63 gallons	2.4 liters
2-piece bolt-through diaphragms	0.66 gallons	2.5 liters
Overmolded diaphragms	0.59 gallons	2.3 liters
Maximum free-flow delivery		
1-piece bolt-through diaphragms	122 gpm	462 lpm
2-piece bolt-through diaphragms	120 gpm	454 lpm
Overmolded diaphragms	115 gpm	435 lpm

Maximum pump speed		
1-piece bolt-through diaphragms	192 cycles per minute	
2-piece bolt-through diaphragms	183 cycles per minute	
Overmolded diaphragms	195 cycles per minute	
Weight		
Polypropylene	57 lb	25.9 kg
PVDF	74 lb	33.6 kg
Wetted Parts		
Wetted parts include material(s) chosen for seat, ball, and diaphragm options, plus the pump's material of construction: Polypropylene or PVDF		
Non-wetted external parts	stainless steel, polypropylene	

Fluid Temperature Range

Diaphragm/Ball/Seat Material	US		Metric	
	Polypropylene Pump	PVDF Pump	Polypropylene Pump	PVDF Pump
FKM Fluoroelastomer	32° to 150°	32° to 225°	0° to 66°	0° to 107°
Polypropylene	32° to 150°	32° to 150°	0° to 66°	0° to 66°
PTFE overmolded diaphragm	40° to 150°	40° to 180°	4° to 66°	4° to 82°
PTFE check balls	40° to 150°	40° to 220°	4° to 66°	4° to 104°
PVDF	32° to 150°	32° to 225°	0° to 66°	0° to 107°
Santoprene	32° to 150°	32° to 180°	0° to 66°	0° to 82°
2-piece PTFE/Santoprene diaphragm	40° to 150°	40° to 180°	4° to 66°	4° to 82°

Customer Services/Guarantee

CUSTOMER SERVICES

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

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

GUARANTEE

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

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

LIMITATION OF LIABILITY

To the extent allowable under applicable law, VERDER's liability for consequential damages is expressly disclaimed. VERDER's liability in all events is limited and shall not exceed the purchase price.

WARRANTY DISCLAIMER

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

PRODUCT SUITABILITY

Many regions, states and localities have codes and regulations governing the sale, construction, installation and/or use of products for certain purposes, which may vary from those in neighboring areas. While VERDER attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchasing and using a product, please review the product application as well as the national and local codes and regulations, and be sure that product, installation, and use complies with them.

Original instructions. This manual contains English.

Revision F, December 2019

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