

VERDERAIR VA 25

Air-Operated Diaphragm Pump

859.0089

Rev. ZAB

EN

**1-inch pump with modular air valve for fluid transfer applications.
For professional use only.**

See page 3 for model information, including approvals.

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

125 psi (0.86 MPa, 8.6 bar) Maximum Air Input Pressure

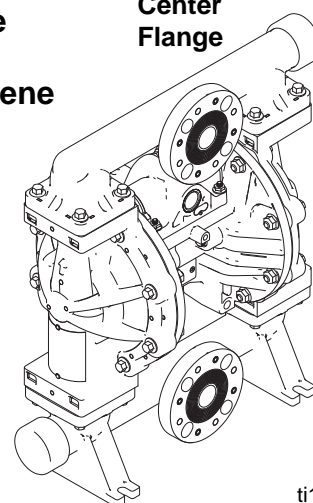


Important Safety Instructions

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

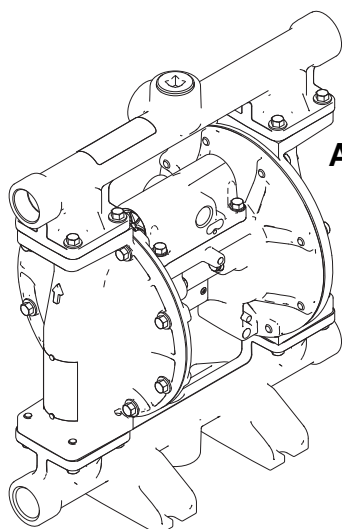
**Polypropylene
Conductive
Polypropylene
PVDF**

**Center
Flange**



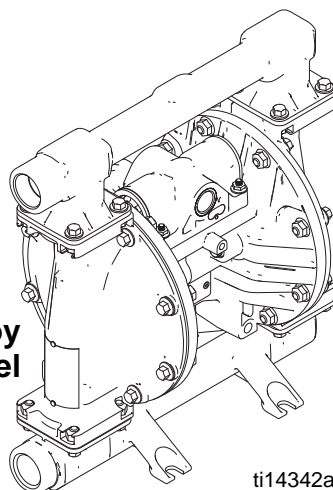
ti13843a

Aluminum



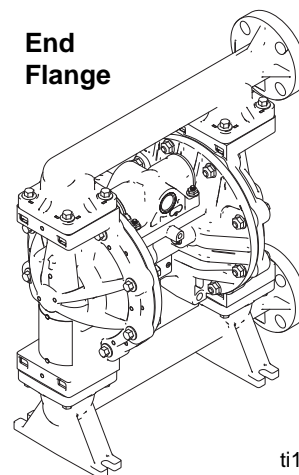
ti13946a

**Hastelloy
Stainless Steel**



ti14342a

**End
Flange**



ti13844a



Contents

Related Manuals	2	Parts	17
Pump Matrix	3	Parts/Kits Quick Reference	18
ATEX Certifications	4	Fluid Section	19
Warnings	4	Air Section	22
Troubleshooting	7	Air Valve and Data Monitoring	24
Repair	9	Seats	26
Pressure Relief Procedure	9	Check Balls	26
Repair or Replace Air Valve	9	Diaphragms	27
Check Valve Repair	12	Seat, Check Ball, and Diaphragm Kits	29
Diaphragms and Center Section	13	Accessories	31
Torque Instructions	16	Technical Data	32
		Customer Services/Guarantee	35

Related Manuals

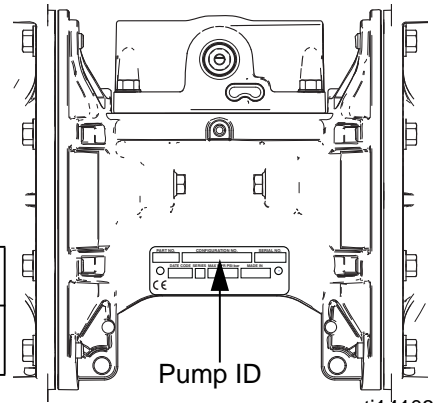
Manual	Description
859.0088	VERDERAIR VA 25 Air-Operated Diaphragm Pump, Operation
859.0101	Torque Instructions (Manifolds and Fluid Covers)

Pump Matrix

Check the identification plate (ID) for the 17-digit Configuration Number of your pump. Use the following matrix to define the components of your pump.

Sample Configuration Number: VA25AA-SSBNBNTNSS

VA25	A	A	SS	BN	BN	TN	SS
Pump Model	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options



ti14103a

NOTE: Some combinations are not possible. Please check with your local supplier or the pump configurator on www.verderair.com.


Pump Model	Fluid Section Material		Air Section Material		Check Valve Material		Check Valve Balls	
VA25	A	Aluminum★	A	Aluminum	AC	Acetal	AC	Acetal
	C	Conductive Polypropylene★	C	Conductive Polypropylene	AL	Aluminum	BN	Buna-N
	H	Hastelloy★	P	Polypropylene	BN	Buna-N	GE	Geolast
	K	PVDF			GE	Geolast®	HY	TPE
	P	Polypropylene			HY	TPE	NE	Polychloroprene Standard
	S	Stainless Steel★			KY	PVDF	NW	Polychloroprene Weighted
					PP	Polypropylene	SP	Santoprene
					SP	Santoprene®	SS	316 Stainless Steel
					SS	316 Stainless Steel	TF	PTFE
					VT	FKM Fluoroelastomer	VT	FKM Fluoroelastomer


★ See **ATEX Certifications**, page 4.

Diaphragm		Connections		Options	
BN	Buna-N	FC	Center Flange, DIN/ANSI	00	Standard
GE	Geolast	FE	End Flange, DIN/ANSI	RE	Remote
HY	TPE	TB	Threaded BSP	SS	Stroke Sensor ✕
NO	Polychloroprene Overmolded	TN	Threaded NPT	UL	UL-Listed
SP	Santoprene			✕ See ATEX Certifications , page 4.	
TF	PTFE/EPDM Two-Piece				
TO	PTFE/EPDM Overmolded				
VT	FKM Fluoroelastomer				

ATEX Certifications

- ★ All *VA25AA, VA25CC, VA25HC, VA25SA, and VA25SC* pumps are certified:



- ✖ *Stroke Sensor is certified:*










Ex ia IIA T3
ITS13ATEX27862

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.



WARNING

<div></div>	<div>FIRE AND EXPLOSION HAZARD</div> <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.• If there is static sparking or you feel a shock, stop operation immediately. Do not use equipment until you identify and correct the problem.• Keep a working fire extinguisher in the work area. <p>Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable materials and gases. To help prevent fire and explosion:</p> <ul style="list-style-type: none">• Clean plastic parts in a well ventilated area.• Do not clean with a dry cloth.• Do not operate electrostatic guns in equipment work area.
--	--



WARNING



EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- 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** in this manual 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.
- 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.



PRESSURIZED EQUIPMENT HAZARD

Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.

- Follow **Pressure Relief Procedure** in this manual, when you stop spraying 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.



THERMAL EXPANSION HAZARD

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.

- Open a valve to relieve the fluid expansion during heating.
- Replace hoses proactively at regular intervals based on your operating conditions.



PRESSURIZED ALUMINUM PARTS HAZARD

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.

- 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.



PLASTIC PARTS CLEANING SOLVENT HAZARD

Use only compatible water-based solvents to clean plastic structural or pressure-containing parts. Many solvents can degrade plastic parts and cause them to fail, which could cause serious injury or property damage. See **Technical Data** in this and all other equipment instruction manuals. Read fluid and solvent manufacturer's warnings.

WARNING



TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDS's to know the specific hazards of the fluids you are using.
- Route exhaust away from work area. If diaphragm ruptures, fluid may be exhausted with air.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear impervious gloves when spraying or cleaning equipment.



BURN HAZARD

Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns:

- Do not touch hot fluid or equipment.
- Wait until equipment/fluid has cooled completely.



PERSONAL PROTECTIVE EQUIPMENT

You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:

- Clothing and respirator as recommended by the fluid and solvent manufacturer
- Protective eyewear, gloves, and hearing protection.

Troubleshooting








Problem	Cause	Solution
Pump cycles but will not prime.	Pump is running too fast, causing cavitation before prime.	Lower air inlet pressure.
	Check valve ball severely worn or wedged in seat or manifold.	Replace ball and seat. See page 12.
	Seat severely worn.	Replace ball and seat. See page 12.
	Outlet or inlet clogged.	Unclog.
	Inlet or outlet valve closed.	Open.
	Inlet fittings or manifolds loose.	Tighten.
	Manifold o-rings damaged.	Replace o-rings. See page 12.
Pump cycles at stall or fails to hold pressure at stall.	Worn check valve balls, seats, or o-rings.	Replace. See page 26.
Pump will not cycle, or cycles once and stops.	Air valve is stuck or dirty.	Disassemble and clean air valve. See page 10. Use filtered air.
	Check valve ball severely worn and wedged in seat or manifold.	Replace ball and seat. See page 12.
	Pilot valve worn, damaged, or plugged.	Replace pilot valve. See page 13.
	Air valve gasket damaged.	Replace gasket. See page 9.
	Check valve ball is wedged into seat due to overpressurization.	Install pressure relief kit. See Accessories , page 31.
	Dispensing valve clogged.	Relieve pressure and clear valve.
	Air tubing is plugged (remote air control models).	Clear tube.
Pump operates erratically.	Clogged suction line.	Inspect; clear.
	Sticky or leaking check valve balls.	Clean or replace. See page 12.
	Diaphragm (and backup) ruptured.	Replace. See page 13.
	Restricted exhaust.	Remove restriction.
	Pilot valves damaged or worn.	Replace pilot valves. See page 13.
	Air valve damaged.	Replace air valve. See page 9.
	Air valve gasket damaged.	Replace air valve gasket. See page 9.
	Air supply erratic.	Repair air supply.
	Exhaust muffler icing.	Use drier air supply.

Problem	Cause	Solution
Air bubbles in fluid.	Suction line is loose.	Tighten.
	Diaphragm (and backup) ruptured.	Replace. See page 13.
	Loose manifolds, damaged seats or manifold o-rings.	Tighten manifold bolts or replace seats or o-rings. See page 12.
	Diaphragm shaft bolt o-ring damaged.	Replace o-ring.
	Pump cavitation.	Reduce pump speed or suction lift.
	Loose diaphragm shaft bolt.	Tighten.
Exhaust air contains fluid being pumped.	Diaphragm (and backup) ruptured.	Replace. See page 13.
	Loose diaphragm shaft bolt.	Tighten or replace. See page 13.
	Diaphragm shaft bolt o-ring damaged.	Replace o-ring. See page 13.
Moisture in exhaust air.	High inlet air humidity.	Use drier air supply.
Pump exhausts excessive air at stall.	Worn air valve cup or plate.	Replace cup and plate. See page 10.
	Damaged air valve gasket.	Replace gasket. See page 9.
	Damaged pilot valve.	Replace pilot valves. See page 13.
	Worn shaft seals or bearings.	Replace shaft seals or bearings. See page 13.
	Air tubing is damaged or loose (remote air control models).	Replace tubing or secure connection.
	Remote air pressure is higher than pump air pressure (remote air control models).	Regulate remote pilot air pressure to be equal to or less than main air.
Pump leaks air externally.	Air valve or fluid cover screws loose.	Tighten.
	Diaphragm damaged.	Replace diaphragm. See page 13.
	Air valve gasket damaged.	Replace gasket. See page 9.
	Remote air pressure is higher than pump air pressure (remote air control models).	Regulate remote pilot air pressure to be equal to or less than main air.
Pump leaks fluid externally from joints.	Loose manifold screws or fluid cover screws.	Tighten manifold screws or fluid cover screws. See page 16.
	Manifold o-rings worn out.	Replace o-rings. See page 12.
Pump leaks fluid externally through manifold or fluid cover.	Excessive pump speed or inlet starvation.	Replace manifold and reduce pump speed or improve pump feed.



Repair

Pressure Relief Procedure

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

Repair or Replace Air Valve

						
---	---	---	--	--	--	--

Replace Complete Air Valve

1. Stop the pump. Relieve the pressure. See **Pressure Relief Procedure** in previous section.
2. Disconnect the air line to the motor.
3. **For motors with reed switch:** Remove screw to disconnect the reed switch assembly from the air valve.

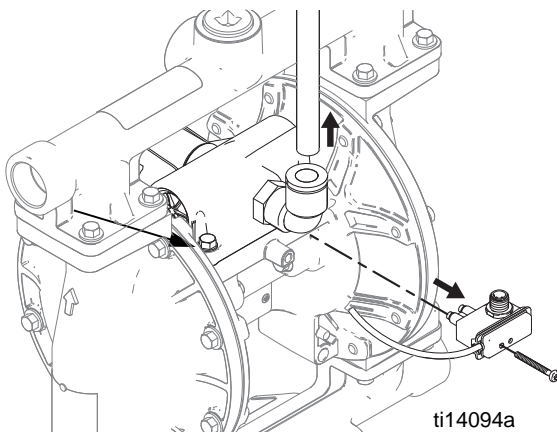


FIG. 1. Reed switch assembly and air line removal

4. Remove screws (109, metal pumps) or nuts (112, plastic pumps). Remove the air valve and gasket (108).
5. To repair the air valve, go to **Disassemble the Air Valve**, step 1, in next section. To install a replacement air valve, continue with Step 6.
6. Align the new air valve gasket (108) on the center housing, then attach the air valve. See **Torque Instructions**, page 16.
7. **For motors with reed switch:** Use screw to attach the reed switch assembly to the new air valve. Reconnect cable.
8. Reconnect the air line to the motor.

Replace Seals or Rebuild Air Valve

NOTE: Repair kits are available. See page 25 to order the correct kit(s) for your pump. Air Valve Seal Kit parts are marked with a †. Air Valve Repair Kit parts are marked with a ♦. Air Valve End Cap Kit parts are marked with a ⌘.

Disassemble the Air Valve

1. Perform steps 1-5 under **Replace Complete Air Valve**, page 9.
2. See FIG. 3. Use a Torx screwdriver (T8 for aluminum centers, T9 for plastic centers) to remove two screws (209). Remove the valve plate (205), cup assembly (212-214), spring (211), and detent assembly (203).
3. Pull the cup (213) off of the base (212). Remove the o-ring (214) from the cup.
4. See FIG. 3. Remove the retaining ring (210) from each end of the air valve. Use the piston (202) to push the end caps (207, 217) out of the ends. Remove end cap o-rings (206).
5. Remove the u-cup seals (208) from each end of the piston (202), then remove the piston. Remove the detent cam (204) from the air valve housing (201).

Reassemble the Air Valve

NOTE: Apply lithium-based grease whenever instructed to grease. Order Verder part number 819.0184.

1. Use all parts in the repair kits. Clean other parts and inspect for damage. Replace as needed.
2. Grease the detent cam (204) and install into housing (201).
3. Grease the u-cups (208) and install on the piston with lips facing toward the center of the piston.

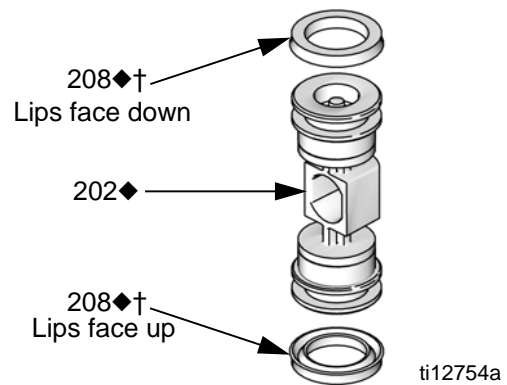


FIG. 2. Air valve u-cup installation

4. Grease both ends of the piston (202) and install it in the housing (201), with the flat side toward the cup (212). Be careful not to tear u-cups (208) when sliding piston into housing.
5. Grease new o-rings (206) and install on the end caps (207). Install the end caps into the housing.
6. Install a retaining ring (210) on each end to hold end caps in place.

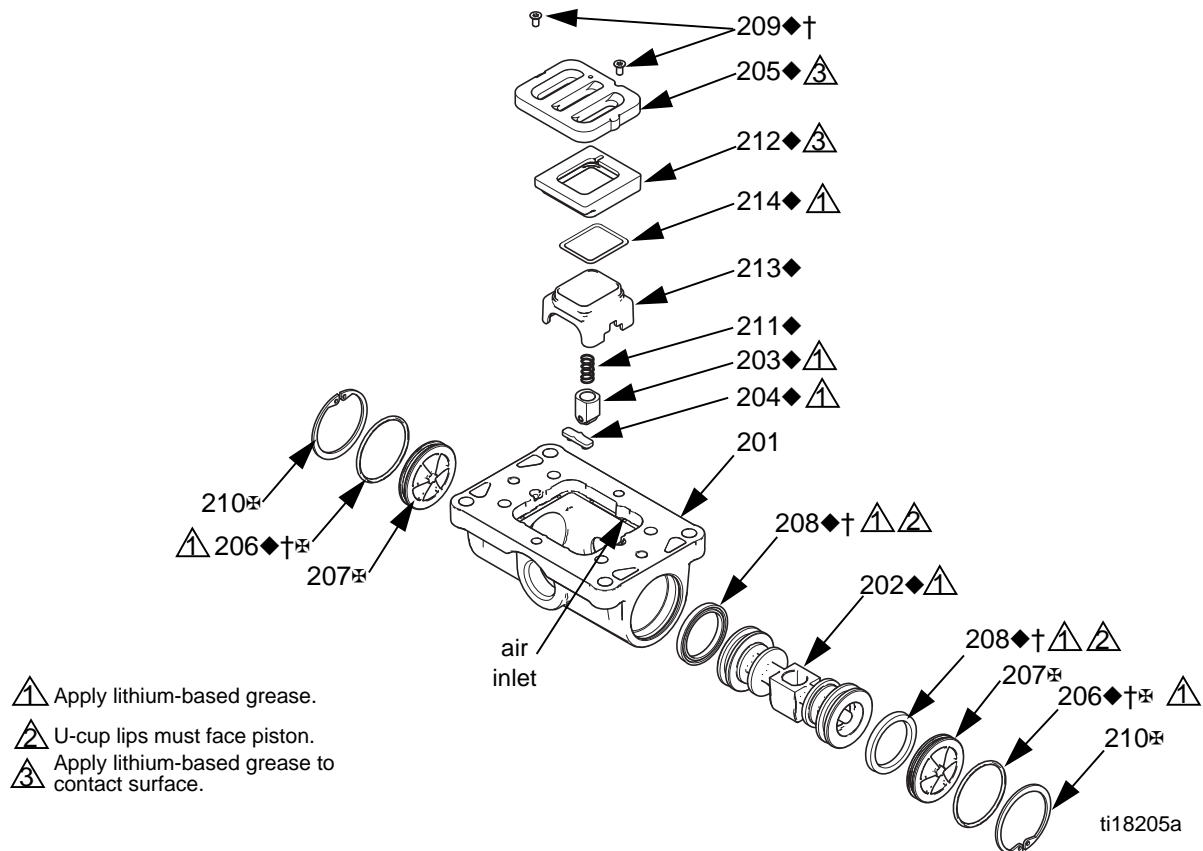


FIG. 3. Air valve assembly

- Grease and install the detent assembly (203) into the piston. Install the o-ring (214) on the cup (213). Apply a light film of grease to the outside surface of the o-ring and the inside mating surface of the base (212).

Orient the end of the base that has a magnet toward the end of the cup that has the larger cutout. Engage the opposite end of the parts. Leave the end with the magnet free. Tilt the base toward the cup and fully engage the parts, using care so that the o-ring remains in place. Install the spring (211) onto the protrusion on the cup. Align the magnet in the base with the air inlet and install the cup assembly.

- Grease the cup side and install the valve plate (205). Align the small hole in the plate with the air inlet. Tighten the screws (209) to hold it in place.

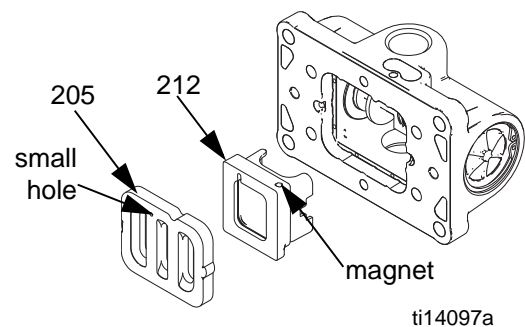


FIG. 5. Air valve cup and plate installation

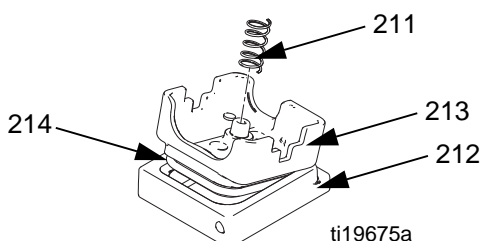


FIG. 4. Cup assembly

Check Valve Repair



NOTE: Kits are available for new check valve balls and seats in a range of materials. See page 26 to order kits in the material(s) desired. An o-ring kit and fastener kits also are available.

NOTE: To ensure proper seating of the check balls, always replace the seats when replacing the balls. Also, on models with manifold o-rings, replace the o-rings.

Disassembly

1. Follow the **Pressure Relief Procedure** on page 9. Disconnect all hoses.
2. Remove the pump from its mounting.
3. Use a 10 mm socket wrench to remove the outlet manifold fasteners (6). See FIG. 6.

NOTE: For plastic pumps (VA25CC, VA25PP, and VA25KP), use hand tools only until thread-locking adhesive patch releases.

4. Remove the o-rings (12, *not used on some models*), seats (10), and balls (11).
5. Turn the pump over and remove the inlet manifold. Remove the o-rings (12, *not used on some models*), seats (10), and balls (11).

Reassembly

1. Clean all parts and inspect for wear or damage. Replace parts as needed.
2. Reassemble in the reverse order, following all notes in FIG. 6. Be sure the ball checks (10-12) and manifolds (4, 5) are assembled **exactly** as shown. The arrows (A) on the fluid covers **must** point toward the outlet manifold (4).

⚠ Torque to 90 in-lb (10.2 N•m). See **Torque Instructions**, page 16.

➡ Arrow (A) must point toward outlet manifold.

⚠ Not used on some models.

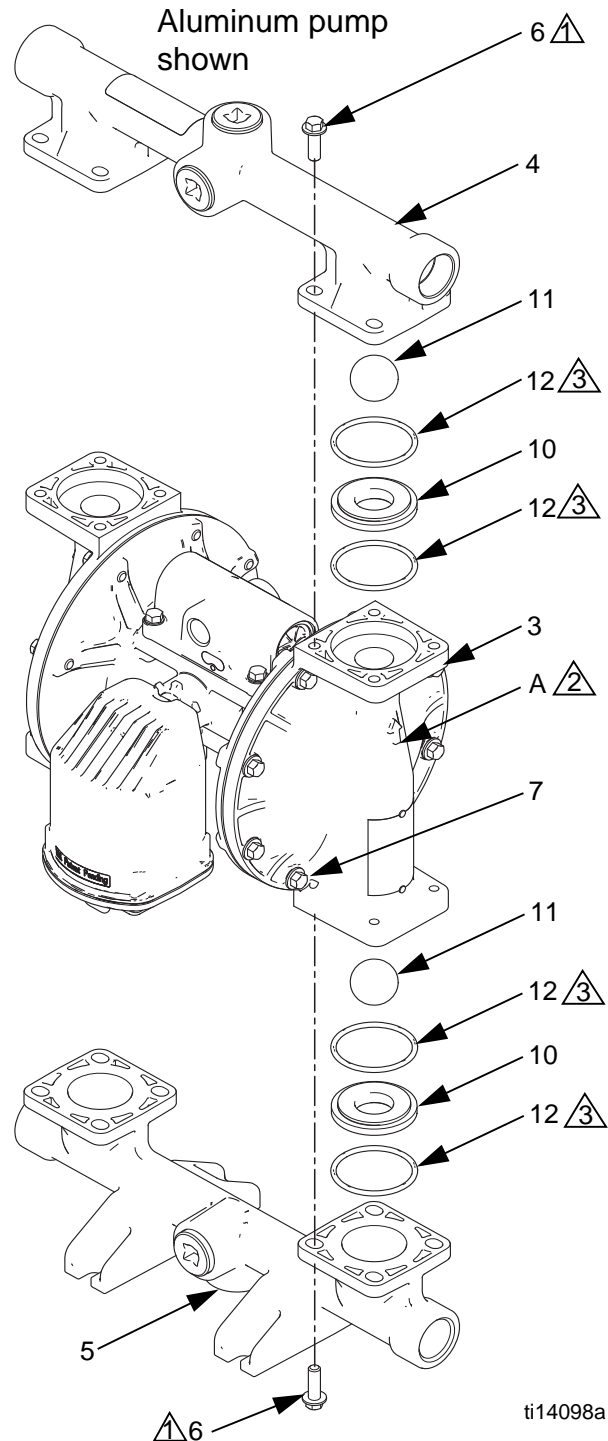
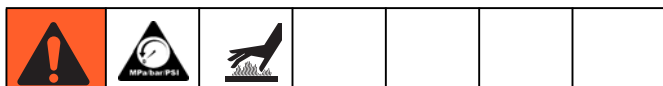


FIG. 6. Ball check valve assembly

Diaphragms and Center Section



Disassembly

NOTE: Diaphragm kits are available in a range of materials and styles. See page 27 to order the correct diaphragms for your pump. A Center Rebuild Kit also is available. See page 23. Parts included in the Center Rebuild Kit are marked with an *. For best results, use all kit parts.

1. Follow the **Pressure Relief Procedure** on page 9.
2. Remove the manifolds and disassemble the ball check valves as explained on page 12.

3. Overmolded Diaphragms

- a. Orient the pump so one of the fluid covers faces up. Use a 10 mm socket wrench to remove the fluid cover screws (7), then pull the fluid cover (3) up off the pump.
- b. The exposed diaphragm (15) will screw off by hand from the diaphragm shaft (104). The diaphragm shaft bolt will remain attached to the diaphragm. Remove the air side diaphragm plate (14).
- c. Turn the pump over and remove the other fluid cover. Pull the diaphragm and shaft up through the center housing.
- d. Grasp the diaphragm firmly and use a wrench on the flats of the shaft to remove. Also remove the air side diaphragm plate (14). Continue with Step 5.

4. All Other Diaphragms

- a. Orient the pump so one of the fluid covers faces up. Use a 10 mm socket wrench to remove the fluid cover screws (7), then pull the fluid cover up off the pump. Turn the pump over and remove the other fluid cover.

- b. **Plastic Pumps:** Use a 1-1/4 socket or box end wrench on the hex of a fluid side diaphragm plate to remove. Then remove all parts of the diaphragm assembly. See FIG. 7.

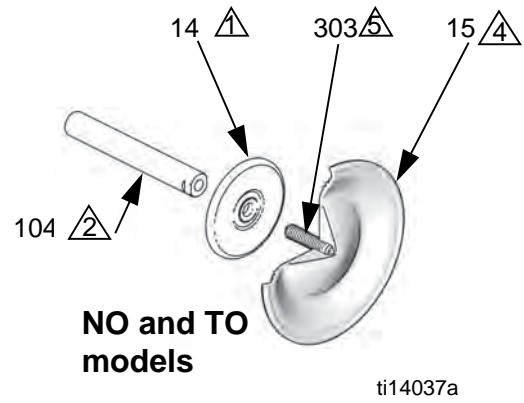
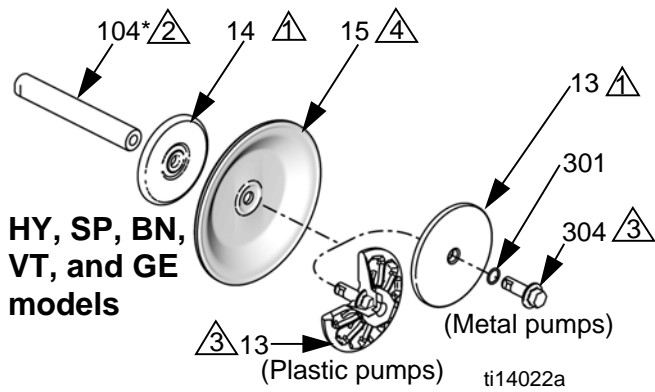
Metal Pumps: Remove the bolt (304) from one side of the diaphragm shaft, then remove all parts of that diaphragm assembly. See FIG. 7.

- c. Follow the same procedure to disassemble the other diaphragm assembly.
5. Inspect the diaphragm shaft (104) for wear or scratches. If it is damaged, inspect the bearings (105) in place. If they are damaged, use a bearing puller to remove them.

NOTE: Do not remove undamaged bearings.

6. Use an o-ring pick to remove the u-cup packings (106) from the center housing. Bearings (105) can remain in place.
7. Use a socket wrench to remove the pilot valves (101).
8. Remove the pilot valve cartridges only if necessary due to a known or suspected problem. **After removing pilot valves**, use a hex to remove the cartridges (102), then remove o-rings (103). If stripped, use two screwdrivers to screw out the cartridge.

NOTE: Do not remove undamaged pilot valve cartridges.



1 Rounded side faces diaphragm.

2 Apply lithium-based grease.

3 Torque to 20-25 ft-lb (27-34 N•m) at 100 rpm maximum.

4 AIR SIDE markings on diaphragm must face center housing.

5 If screw comes loose or is replaced, apply permanent (red) Loctite® or equivalent to diaphragm side threads. Apply primer and medium-strength (blue) Loctite® or equivalent to shaft side threads.

6 Lips must face out of housing.

7 Cartridges (102) must be installed in housing before pilot valves (101) or inserts (113, for remote air controls)..

8 Torque to 20-25 in.-lb (2.3-2.8 N•m).

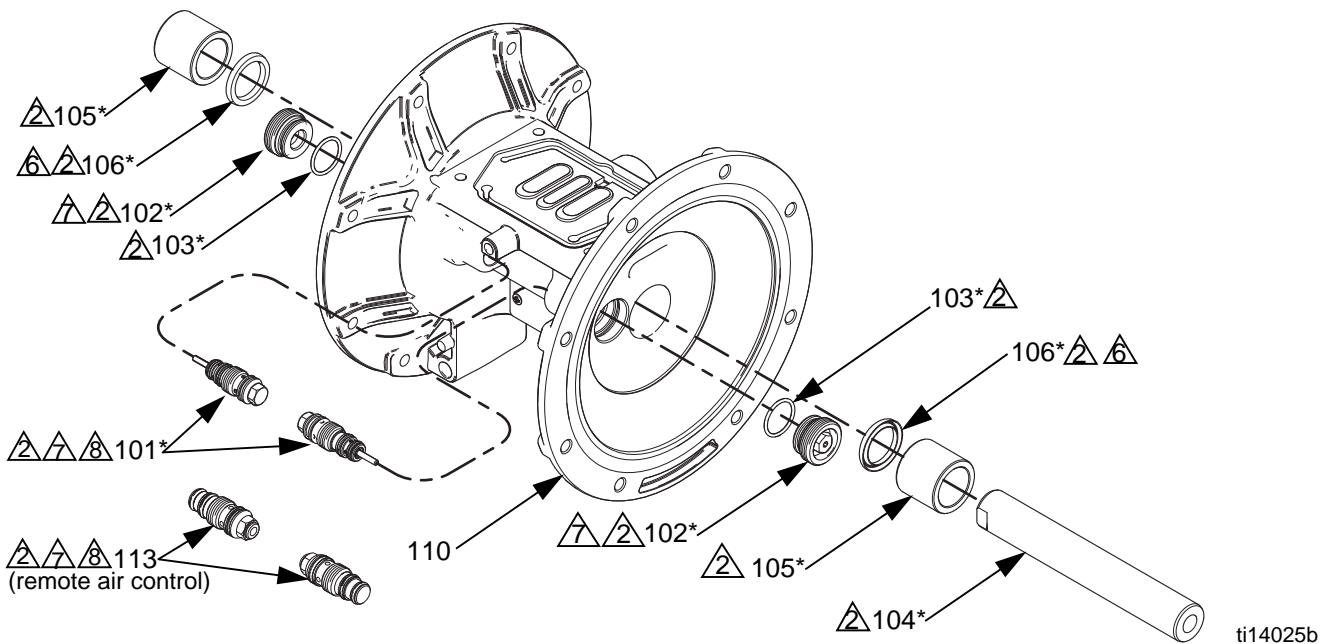
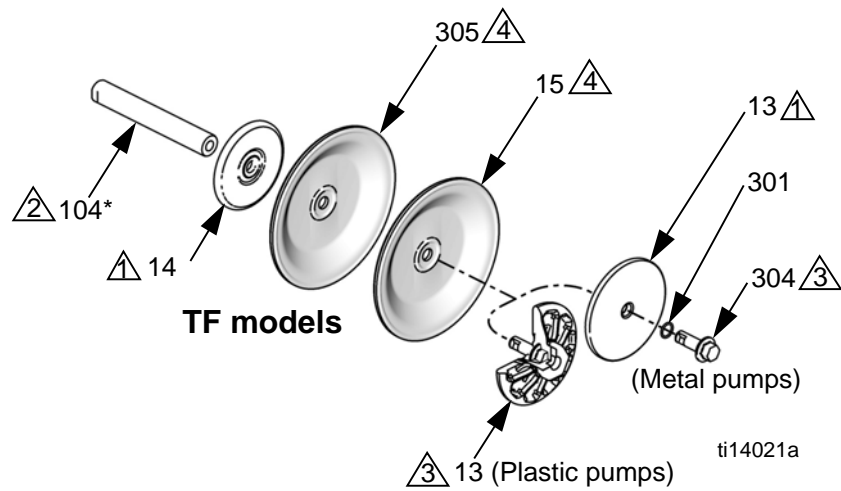


FIG. 7. Assemble diaphragms and center section

Reassembly

Follow all notes in FIG. 7. These notes contain **important** information.

NOTE: Apply lithium-based grease whenever instructed to grease. Order Verder part number 819.0184.

1. Clean all parts and inspect for wear or damage. Replace parts as needed.
2. If removed, grease and install the new pilot valve cartridges (102) and o-rings (103). Screw in until seated.

NOTE: Cartridges (102) must be installed before pilot valves (101).

3. Grease and install the pilot valves (101). Torque to 20-25 in.-lb (2.3-2.8 N•m). Do not over-torque.
4. Grease and install the diaphragm shaft u-cup packings (106) so the lips face **out** of the housing.
5. If removed, insert the new bearings (105) into the center housing. Use a press or a block and rubber mallet to press-fit the bearing so it is flush with the surface of the center housing.
6. **Overmolded Diaphragms:**
 - a. Clamp the shaft flats in a vise.
 - b. If diaphragm setscrew comes loose or is replaced, apply permanent (red) Loctite® or equivalent to diaphragm side threads. Screw into diaphragm until tight.
 - c. Assemble the air side plate (14) onto the diaphragm. The rounded side of the plate must face the diaphragm.
 - d. Apply medium-strength (blue) Loctite or equivalent to the threads of the diaphragm assembly. Screw the assembly into the shaft as tight as possible by hand.
 - e. Grease the shaft u-cups (106) and the length and ends of the diaphragm shaft (104). Slide the shaft into the housing.
 - f. Reattach the first fluid cover (3). See **Torque Instructions**, page 16.
 - g. Repeat Steps b and c for the other diaphragm assembly. Go to Step 7.

All Other Diaphragms - Metal Pumps:

- a. Install the o-ring (301) on the shaft bolt (304).
- b. Assemble the fluid side plate (13), the diaphragm (15), the backup diaphragm (305, if present), and the air side diaphragm plate (14) on the bolt exactly as shown in FIG. 7.
- c. Apply medium-strength (blue) Loctite or equivalent to the bolt (304) threads. Screw the bolt into the shaft hand tight.
- d. Grease the shaft u-cups (106) and the length and ends of the diaphragm shaft (104). Slide the shaft into the housing.
- e. Repeat Steps a-c for the other diaphragm assembly.
- f. Hold one shaft bolt with a wrench and torque the other bolt to 20-25 ft-lb (27-34 N•m) at 100 rpm maximum. Do not over-torque.
- g. Reattach the first fluid cover (3). See **Torque Instructions**, page 16. Go to Step 7.

All Other Diaphragms - Plastic Pumps:

- a. Assemble the diaphragm (15), the backup diaphragm (305, if present), and the air side diaphragm plate (14) on the fluid side plate (13) exactly as shown in FIG. 7.
- b. Apply medium-strength (blue) Loctite or equivalent to the threads of the screw on the fluid side plate. Screw the assembly into the shaft hand-tight.
- c. Grease the shaft u-cups (106) and the length and ends of the diaphragm shaft (104). Slide the shaft into the housing.
- d. Repeat for the other diaphragm assembly
- e. Hold one of the plates with a wrench, and torque the other plate to 20-25 ft-lb (27-34 N•m) at 100 rpm maximum. Do not over-torque.
- f. Reattach the first fluid cover (3). See **Torque Instructions**, page 16.

7. To ensure proper seating and extend diaphragm life, attach the second fluid cover with air pressure on the pump.
 - a. See FIG. 8. Place the supplied tool (302) where the air valve gasket (108) normally goes. Arrows (A) must face toward the fluid cover that is already attached.

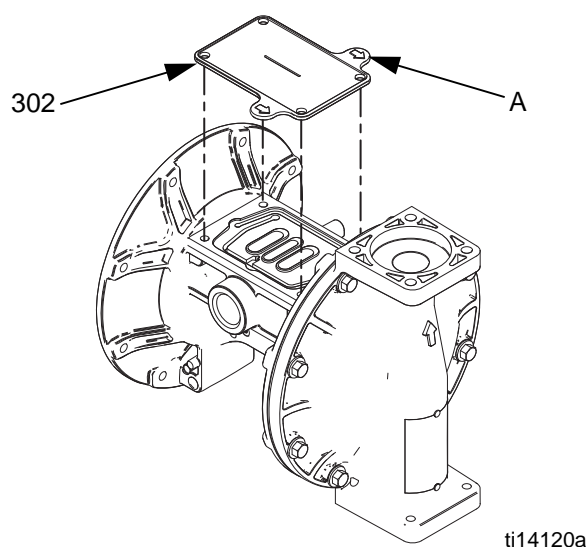


FIG. 8. Fluid cover tool

- b. Reattach the air valve.
- c. Supply a minimum of 20 psi (0.14 MPa, 1.4 bar) air pressure to the air valve. Shop air may be used. The diaphragm will shift so the second fluid cover will seat properly. Keep air pressure on until the second fluid cover is attached.
- d. Attach the second fluid cover (3). See **Torque Instructions**, page 16.
- e. Remove the air valve and the tool (302), replace the gasket (108), and reattach the air valve. See **Torque Instructions**, page 16.

NOTE: If you are replacing the diaphragms but not the air valve, you must remove the air valve and gasket, put the tool in place of the gasket, and put the air valve back on to get the air pressure needed for proper installation of the second fluid cover. Remember to remove the tool and replace the gasket when finished.

8. Reassemble the ball check valves and manifolds as explained on page 12.

Torque Instructions

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

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

NOTE: Always completely torque fluid covers before torquing manifolds.

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

Fluid cover and manifold fasteners:

90 in-lb (10.2 N•m)

Retorque the air valve fasteners (V) in a crisscross pattern to specified torque.

Plastic center sections: 55 in-lb (6.2 N•m)

Metal center sections: 80 in-lb (9.0 N•m)

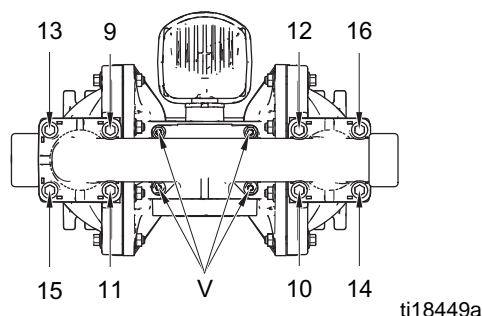
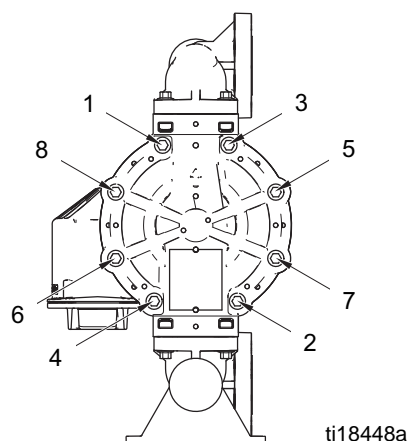
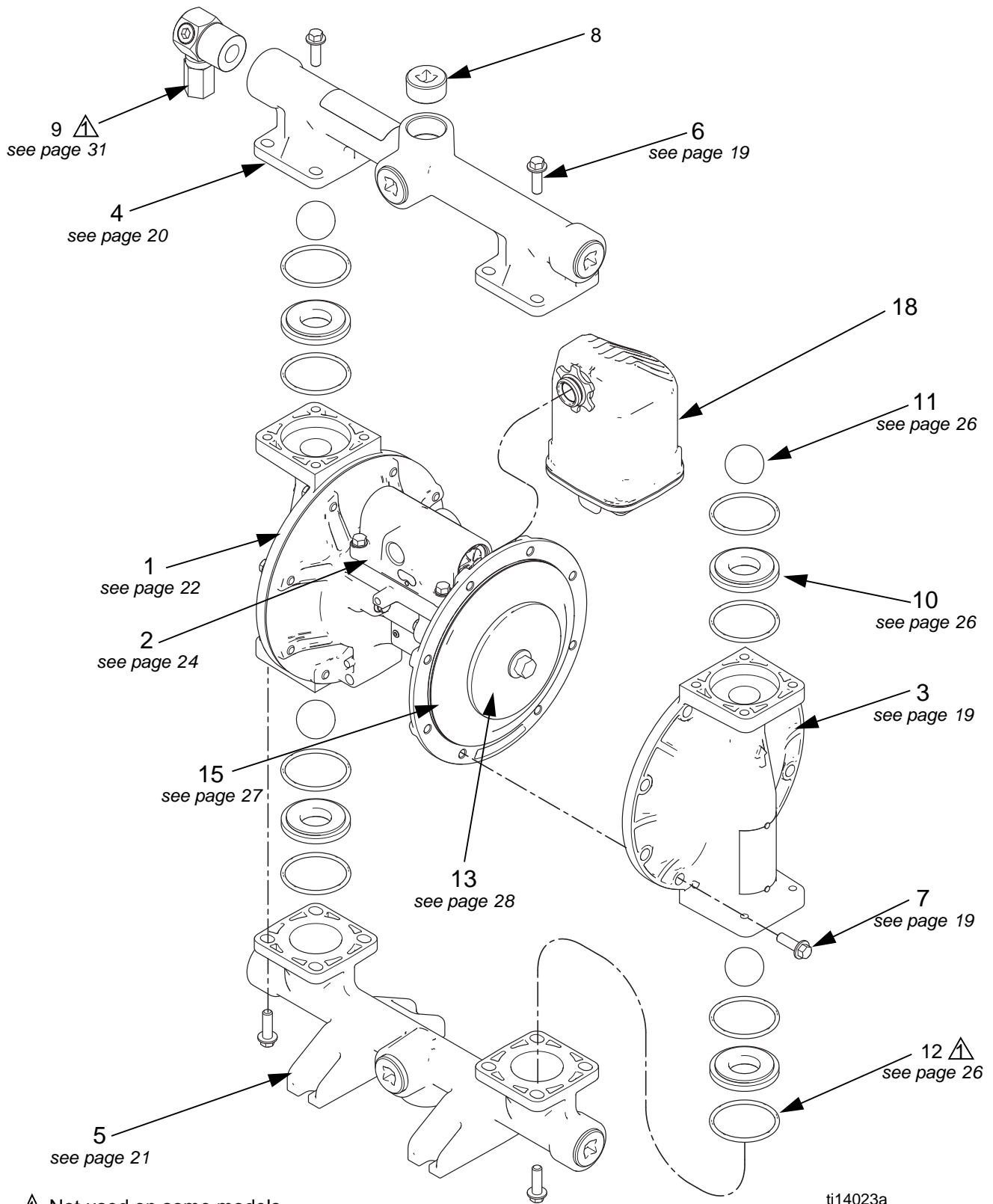


FIG. 9. Torque sequence

Parts



⚠ Not used on some models.

Parts/Kits Quick Reference

Use this table as a quick reference for parts/kits. See pages indicated in table for full description of kit contents.

Ref.	Part/Kit	Description	Qty.
1	859.0400 859.0402 859.0401	Center Section; <i>see page 22</i> Aluminum Conductive Polypropylene Polypropylene	1
2	Varies	Air Valve; <i>see page 24</i>	1
3	859.0032 859.0071 859.0712 859.0070 859.0072 859.0081	Fluid Cover Kits; <i>see page 19</i> Aluminum Conductive Polypropylene Hastelloy Polypropylene PVDF Stainless Steel	2
4	859.0028 859.0029 859.0059 859.0062 859.0713 859.0058 859.0061 859.0060 859.0063 859.0077 859.0078	Outlet Manifold Kits; <i>see page 20</i> Aluminum, npt Aluminum, bspt Conductive Poly, center flange Conductive Poly, end flange Hastelloy, npt Polypropylene, center flange Polypropylene, end flange PVDF, center flange PVDF, end flange Stainless Steel, npt Stainless Steel, bspt	1
5	859.0030 859.0031 859.0065 859.0068 859.0714 859.0064 859.0067 859.0066 859.0069 859.0079 859.0080	Inlet Manifold Kits; <i>see page 21</i> Aluminum, npt Aluminum, bspt Conductive Poly, center flange Conductive Poly, end flange Hastelloy, npt Polypropylene, center flange Polypropylene, end flange PVDF, center flange PVDF, end flange Stainless Steel, npt Stainless Steel, bspt	1
6	859.0033 859.0076 859.0084	Manifold Fasteners; 8-pack, <i>see page 19</i> Aluminum Conductive Polypropylene, Polypropylene, and PVDF Stainless Steel and Hastelloy	16
7	859.0033 859.0075 859.0083 859.0076	Fluid Cover Fasteners; 8-pack, <i>see page 19</i> Aluminum Conductive Polypropylene, Polypropylene, and PVDF Stainless Steel and hastelloy, aluminum center Stainless Steel and hastelloy, plastic center	16
8	859.0105 859.0106	Plug, 1 in.; 6-pack, for aluminum pumps npt bspt	6
9	859.0102	Pressure Relief Valve; fuel dispense model only, <i>see page 19</i>	1

Ref.	Part/Kit	Description	Qty.
10	859.0009 859.0010 859.0011 859.0017 859.0012 859.0014 859.0087 859.0015 859.0016 859.0753 859.0013	Seats; 4-pack, includes 8 o-rings where needed, <i>see page 26</i> Acetal Aluminum Buna-N FKM Fluoroelastomer Geolast Polypropylene PVDF Santoprene Stainless Steel (metal pumps) Stainless Steel (plastic pumps) TPE	4
11	859.0018 859.0019 859.0022 859.0023 859.0027 859.0020 859.0024 859.0025 859.0026 859.0021	Check Balls; 4-pack, includes 8 o-rings, <i>see page 26</i> Acetal Buna-N Polychloroprene Polychloroprene with SST core FKM Fluoroelastomer Geolast PTFE Santoprene Stainless Steel TPE	4
12	859.0034	Manifold O-Ring (not used on some models); ptfe, 8-pack, <i>see page 26</i>	8
13	859.0055 859.0056 859.0715 859.0056 859.0057 859.0082	Fluid Side Diaphragm Plate; included in Air and Fluid Plate Kits, <i>see page 28</i> Aluminum Conductive Polypropylene Hastelloy Polypropylene PVDF Stainless Steel	2
14	-----	Air Side Diaphragm Plate (not visible); included in Air and Fluid Plate Kits, <i>see Part 13 or page 28</i>	2
15	859.0001 859.0008 859.0002 859.0007 859.0003 859.0004 859.0005 859.0006	Diaphragm Kits; <i>see page 27</i> Buna-N Standard FKM Fluoroelastomer Standard Geolast Standard Santoprene Standard TPE Standard Polychloroprene Overmolded PTFE Overmolded PTFE/EPDM Two-Piece	2
18	859.0238	Muffler; 3/4 npt, polypropylene	1
19	819.0220 819.0221	Screw, ground, M5 x 0.8; not shown Pumps with aluminum air valve Pumps with conductive poly air valve	1
20▲	819.4313	Label, warning (not shown)	1

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

Fluid Section

Sample Configuration Number

Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

Manifold Fasteners (6)

Fluid Cover and Manifold Material	Kit	Description	Qty.
A	Aluminum	859.0033 BOLT, hex head, steel, M8 x 25,	8
C P K	Cond. Poly Polypropylene PVDF	859.0076 BOLT, flange head, M8 x 32, stainless steel, includes nuts	8
S H	Stainless steel Hastelloy	859.0084 BOLT, hex head, M8 x 20, stainless steel, includes nuts	8

Fluid Cover Fasteners (7)

Fluid Cover and Manifold Material	Kit	Description	Qty.
A	Aluminum	859.0033 BOLT, hex head, steel, M8 x 25	8
C P K	Cond. Poly Polypropylene PVDF	859.0075 BOLT, flange head, M8 x 45, stainless steel, includes nuts	8
S or H aluminum air section	Stainless steel or Hastelloy	859.0083 BOLT, flange head, M8 x 25, stainless steel	8
S or H plastic air section	Stainless steel or Hastelloy	859.0076 BOLT, flange head, M8 x 32, stainless steel, includes nuts	8

Fluid Covers

Kits include:

- 1 fluid cover (3)
- 4 o-rings, ptf (12)

Fluid Cover and Manifold Material		Fluid Cover Kit
A	Aluminum	859.0032
C	Conductive Polypropylene	859.0071
H	Hastelloy	859.0712
K	PVDF	859.0072
P	Polypropylene	859.0070
S	Stainless Steel	859.0081

Kit 859.0102, Fluid Pressure Relief Valve Fuel Dispense Model only

Kit includes:

- 1 valve, 3/8 nptf (9)

NOTE: See page 26 for manifold o-rings (12).

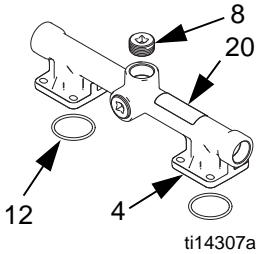
Sample Configuration Number							
Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

Outlet Manifolds

Aluminum

Kits include:

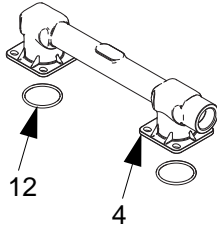
- 1 outlet manifold (4)
- 3 pipe plugs (8)
- 4 o-rings, ptfe (12)
- 1 warning label (20▲)



Hastelloy and Stainless Steel

Kits include:

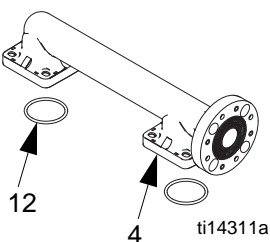
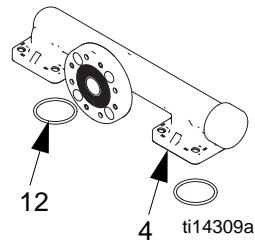
- 1 outlet manifold (4)
- 4 o-rings, ptfe (12)
- 1 warning label (20▲)



Fluid Cover and Manifold Material		Connections	Outlet Manifold Kit
A	Aluminum	TN, npt	859.0028
A	Aluminum	TB, bspt	859.0029

Fluid Cover and Manifold Material		Connections	Outlet Manifold Kit
H	Hastelloy	TN, npt	859.0713
S	Stainless Steel	TN, npt	859.0077
S	Stainless Steel	TB, bspt	859.0078

Plastic



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

Kits include:

- 1 outlet manifold (4)
- 4 o-rings, ptfe (12)
- 1 warning label (20▲)

Fluid Cover and Manifold Material		Porting	Outlet Manifold Kit
C	Conductive Polypropylene	FC, Center flange	859.0059
C	Conductive Polypropylene	FE, End flange	859.0062
P	Polypropylene	FC, Center flange	859.0058
P	Polypropylene	FE, End flange	859.0061
K	PVDF	FC, Center flange	859.0060
K	PVDF	FE, End flange	859.0063

Sample Configuration Number

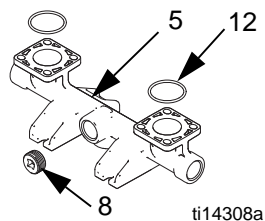
Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

Inlet Manifolds

Aluminum

Kits include:

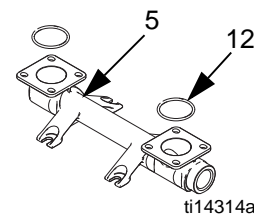
- 1 inlet manifold (5)
- 3 pipe plugs (8)
- 4 o-rings, ptfe (12)



Hastelloy and Stainless Steel

Kits include:

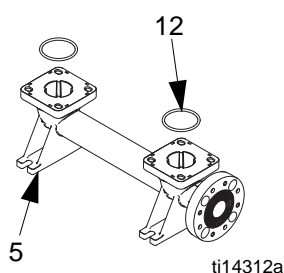
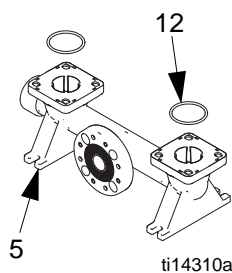
- 1 inlet manifold (5)
- 4 o-rings, ptfe (12)



Fluid Cover and Manifold Material	Porting	Inlet Manifold Kit
A Aluminum	TN , npt	859.0030
A Aluminum	TB , bspt	859.0031

Fluid Cover and Manifold Material	Porting	Inlet Manifold Kit
H Hastelloy	TN , npt	859.0714
S Stainless Steel	TN , npt	859.0079
S Stainless Steel	TB , bspt	859.0080

Plastic



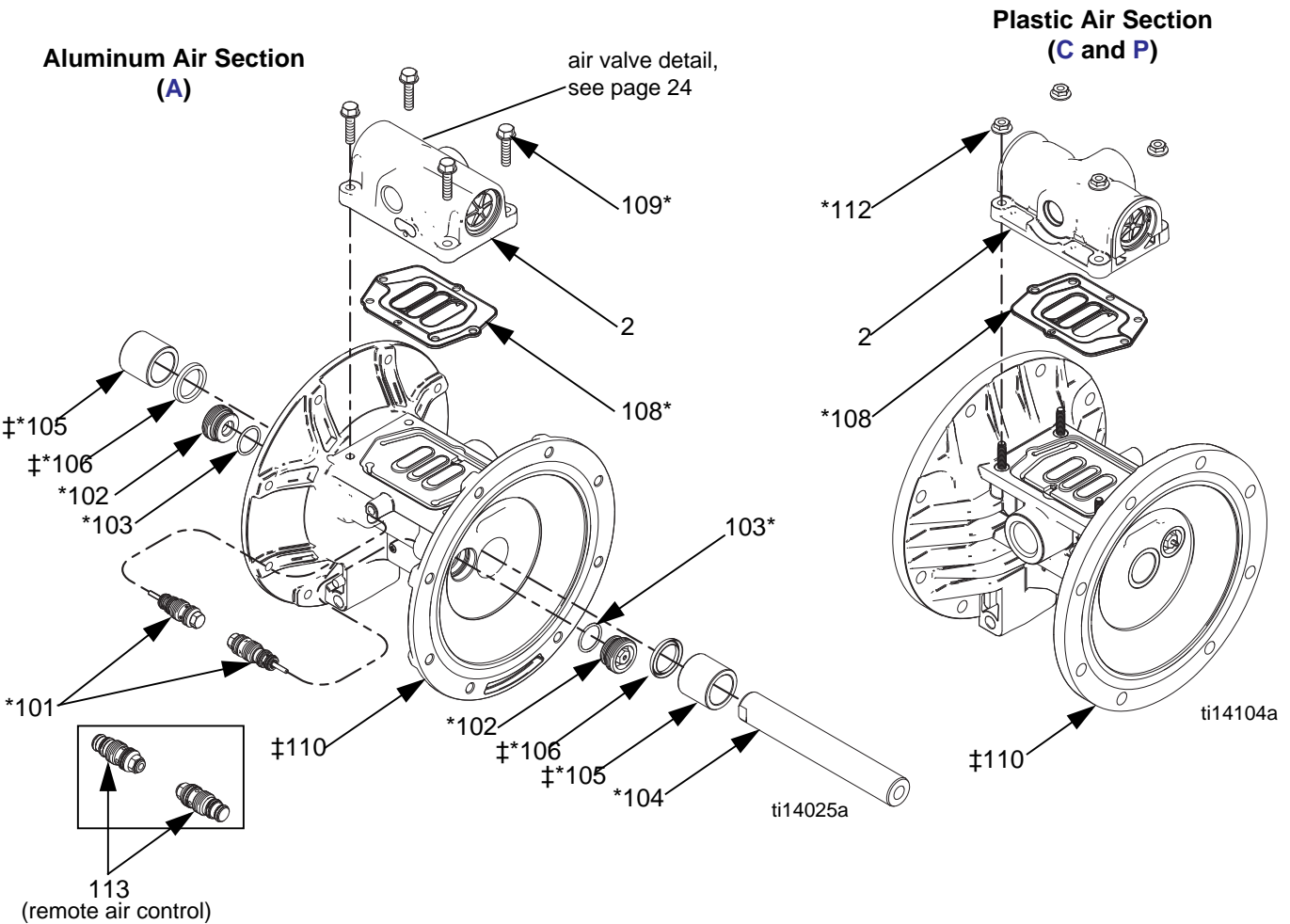
Kits include:

- 1 inlet manifold (5)
- 4 o-rings, ptfe (12)

Fluid Cover and Manifold Material	Porting	Inlet Manifold Kit
C Conductive Polypropylene	FC , Center flange	859.0065
C Conductive Polypropylene	FE , End flange	859.0068
P Polypropylene	FC , Center flange	859.0064
P Polypropylene	FE , End flange	859.0067
K PVDF	FC , Center flange	859.0066
K PVDF	FE , End flange	859.0069

Air Section

Sample Configuration Number							
Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00



Ref.	Description	Qty.
101*	VALVE, pilot	2
102*	CARTRIDGES, pilot valve receiver	2
103*	O-RING, receiver cartridge	2
104*	SHAFT, center	1
105*‡	BEARING, center shaft	2
106*‡	U-CUP, center shaft	2
108*	GASKET, air valve	1

Ref.	Description	Qty.
109*	SCREW, M6 x 25, stainless steel, (for aluminum center section models, A)	4
110‡	HOUSING, center	1
112*	NUTS (for plastic center section models, C and P)	4
113	INSERT, remote pilot (for remote air control models)	2

* Included in Center Section Rebuild Kit 859.0000.

‡ Included in Center Housing Kits.

Sample Configuration Number							
Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

Kit 859.0000, Center Section Rebuild (*) All Models

Kit includes:

- 2 pilot valves (101)
- 2 pilot cartridges (102)
- 2 cartridge o-rings, buna-N (103)
- 1 center shaft (104)
- 2 center shaft bearings (105)
- 2 center shaft u-cups (106)
- 1 air valve gasket (108)
- 4 bolts, M6 x 25, for **A** fluid sections (109)
- 4 nuts, for **P** and **C** fluid sections (112)
- 8 o-rings, PTFE (12)

Kit 859.0116, Pilot Valves All models

Kit includes:

- 2 pilot valve assemblies (101)

Pilot Valves w/Cartridges

Pilot Valve Assembly Kits	
All models	859.0036
Optional FKM Seals	859.0450

Kits include:

- 2 pilot valve assemblies (101)
- 2 pilot valve receiver cartridges (102)
- 2 receiver cartridge o-rings (103)

NOTE: RE (remote) models also require insert kit, shown below.

Kit 859.0112, Remote Pilot Inserts (RE, Remote Air Control)

Kit includes:

- 2 remote pilot inserts (113)

Kit 859.0035, Center Shaft Kit All models

Kit includes:

- 1 center shaft (104)
- 2 center shaft bearings (105)
- 2 center shaft u-cups (106)

Kit 859.0037, Center Shaft Bearing Kit All models

Kit includes:

- 2 center shaft bearings (105)
- 2 center shaft u-cups (106)

The center housing (110) is not sold separately.

Ground Screw Kits

Center Section Material		Ground Screw (19)
A	Aluminum	819.0220
C	Conductive Polypropylene	819.0221
P	Polypropylene	None

** Included in Center Section Rebuild Kit 859.0000.*

Center Housing Kits (‡)

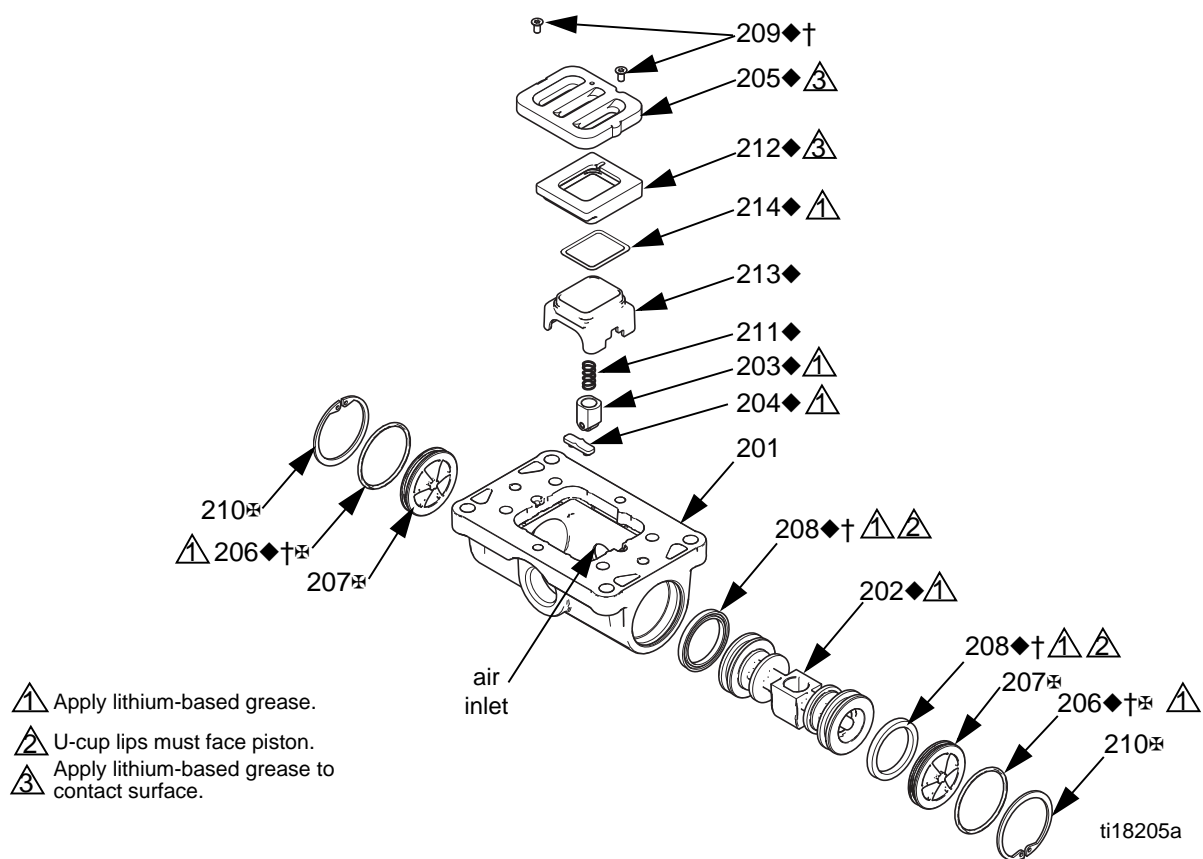
Aluminum	859.0400
Conductive Polypropylene	859.0402
Polypropylene	859.0401

Kit includes:

- 2 center shaft bearings (105)
- 2 center shaft u-cups (106)
- 1 center housing (110)

Sample Configuration Number							
Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

Air Valve and Data Monitoring



Ref.	Description	Qty.
201	HOUSING, not sold separately	1
202◆	PISTON	1
203◆	DETENT PISTON ASSEMBLY	1
204◆	CAM, detent	1
205◆	PLATE, air valve	1
206◆†‡	O-RING	2
207‡	CAP, end	2
208◆†	U-CUP	2
209◆†	SCREW	2
210◆‡	RETAINING RING	2
211◆	DETENT SPRING	1
212◆	BASE, cup	1
213◆	CUP	1
214◆	O-RING, cup	1
220	REED SWITCH ASSEMBLY (for SS models, includes fastener, not shown)	1

Air Valve Repair Kits (◆)	
00, SS, or UL (standard air valve)	859.0040
RE (remote air valve)	859.0113

- Kit includes:
- 1 air valve piston (202)
 - 1 detent piston assembly (203)
 - 1 detent cam (204)
 - 1 air valve plate (205)
 - 2 end cap o-rings (206)
 - 2 piston u-cups (208)
 - 2 screws, M3, shorter (209, for metal pumps)
 - 2 screws, #4, longer (209, for plastic pumps)
 - 1 detent spring (211)
 - 1 air cup base (212)
 - 1 air cup (213)
 - 1 air cup o-ring (214)
 - 1 air valve gasket (108)

◆ Parts included in Air Valve Repair Kit 859.0040.
† Parts included in Air Valve Seals Kit 859.0041.
‡ Parts included in Air Valve End Cap Kit. See page 25.
24 859.0089

Sample Configuration Number							
Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

Air Valve Seals (†)

All Models

Kit includes:

- 2 end cap o-rings (206)
- 2 piston u-cups (208)
- 2 screws, M3, shorter (209, for metal pumps)
- 2 screws, #4, longer (209, for plastic pumps)
- 1 air valve gasket (108)
- 1 solenoid release button o-ring (219)

Air Valve Seal Kits	
All models	859.0041
Optional FKM Seals	859.0452

Air Valve End Cap Kits (⌘)

Kits include:

- 2 end caps (207)
- 2 retaining rings (210)
- 2 o-rings (206)

Center Section Material		Air Valve End Cap Kit
A	Aluminum	859.0103
C	Conductive Polypropylene	859.0073
P	Polypropylene	859.0073

Remote Air Control Conversion Kits		
A	Aluminum	859.0108
C	Conductive Polypropylene	859.0118
P	Polypropylene	859.0109

Kits include:

- 1 air valve assembly (2) with restrictor
- 1 air valve gasket (108)
- 4 screws (109; models with aluminum centers)
- OR**
- 4 nuts (112; models with plastic centers)
- 2 remote pilot inserts

Complete Air Valve Replacement Kits

Aluminum

Kits include:

- 1 air valve assembly (2)
- 1 air valve gasket (108)
- 4 screws (109)

Center Section Material	Options		Air Valve Replacement Kit
A	Aluminum	00, SS, or UL (standard air valve)	859.0038
A	Aluminum	RE (remote air valve)	859.0110

Conductive Polypropylene and Polypropylene

Kits include:

- 1 air valve assembly (2)
- 1 air valve gasket (108)
- 4 nuts (112)

Center Section Material	Options		Air Valve Replacement Kit
C	Conductive Polypropylene	00, SS, or UL (standard air valve)	859.0042
C		RE (remote air valve)	859.0119
P	Polypropylene	00, SS, or UL (standard air valve)	859.0044
P		RE (remote air valve)	859.0111

Stroke Sensor Kit

Kit includes:

- reed switch module (220)
- mounting screw

Air Valve Material	Stroke Sensor Kit
Aluminum	859.0052
Conductive Polypropylene or Polypropylene	859.0051

Sample Configuration Number							
Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

Seats

NOTE: Some kits may not be available for your model. See the configurator tool at www.verderair.com or speak with your distributor.

Kits include:

- 4 seats, material indicated in table (10)
- 8 o-rings, PTFE (12), if needed

Seat Material		Kit
AC	Acetal	859.0009
AL	Aluminum	859.0010
BN	Buna-N (o-rings not used)	859.0011
GE	Geolast	859.0012
HY	TPE (o-rings not used)	859.0013
KY	PVDF	859.0087
PP	Polypropylene	859.0014
SP	Santoprene	859.0015
SS	Stainless steel (metal pumps)	859.0016
	Stainless steel (plastic pumps)	859.0753
VT	FKM Fluoroelastomer (o-rings not used)	859.0017

O-Ring Kits

Kit Includes:

- 8 o-rings, PTFE (12)

Seat Material	Kit	Qty.
AC, AL, GE, KY, PP, SP, SS	859.0034	8
BN, HY, VT	Model includes no seat o-rings	0

Check Balls

NOTE: Some kits may not be available for your model. See the configurator tool at www.verderair.com or speak with your distributor.

Kits Include:

- 4 balls, material indicated in table (11)
- 8 o-rings, PTFE (12)

Check Ball Material		Kit
AC	Acetal	859.0018
BN	Buna-N	859.0019
GE	Geolast®	859.0020
HY	TPE	859.0021
NE	Polychloroprene	859.0022
NW	Polychloroprene with stainless steel core	859.0023
SP	Santoprene®	859.0025
SS	Stainless Steel	859.0026
TF	PTFE	859.0024
VT	FKM Fluoroelastomer	859.0027

Diaphragms

Sample Configuration Number

Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

NOTE: Some kits may not be available for your model. See the configurator tool at www.verderair.com or speak with your distributor.

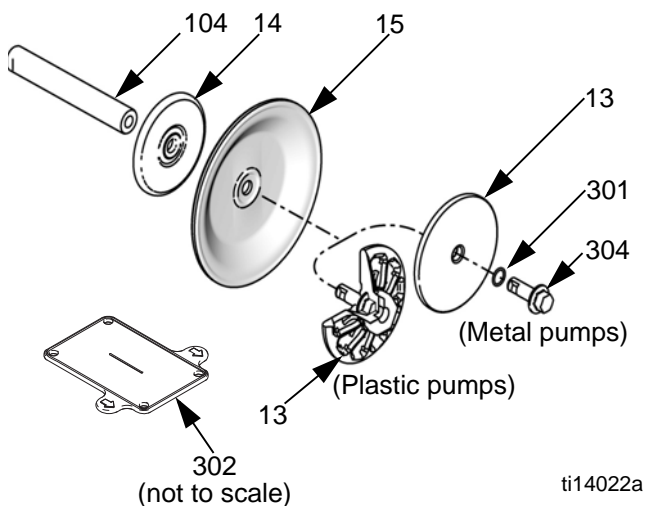
Standard Diaphragms

Kits include:

- 8 o-rings, ptfe (12)
- 2 diaphragms (15, material indicated in table)
- 2 o-rings for the bolt (301, used only on metal pumps)
- 1 diaphragm install tool (302)

NOTE: Fluid plates (13, 14) and diaphragm shaft bolts (304) are sold separately. See page 28. The shaft (104) is part of Kit 859.0000, the Center Section Rebuild Kit.

Diaphragm Material	Kit
BN Buna-N	859.0001
VT FKM Fluoroelastomer	859.0008
GE Geolast	859.0002
SP Santoprene	859.0007
HY TPE	859.0003



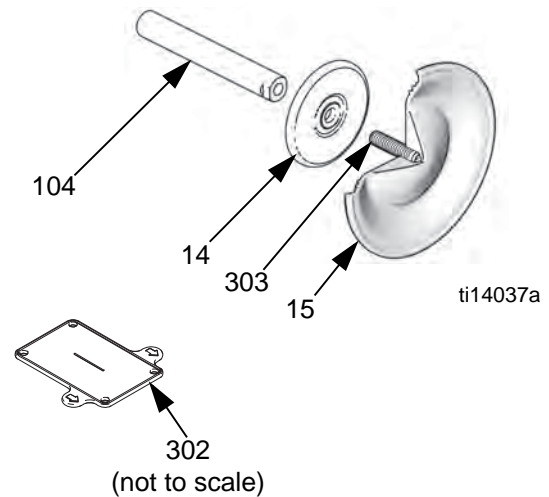
Overmolded Diaphragms

Kits include:

- 8 o-rings, ptfe (12)
- 2 overmolded diaphragms (15, material indicated in table)
- 2 diaphragm set screws, stainless steel (303)
- 1 diaphragm install tool (302)

NOTE: Fluid plates (13, 14) and diaphragm shaft bolts (304) are sold separately. See page 28. The shaft (104) is part of Kit 859.0000, the Center Section Rebuild Kit.

Diaphragm Material	Kit
NO Polychloroprene	859.0004
TO PTFE	859.0005



Diaphragms (continued)

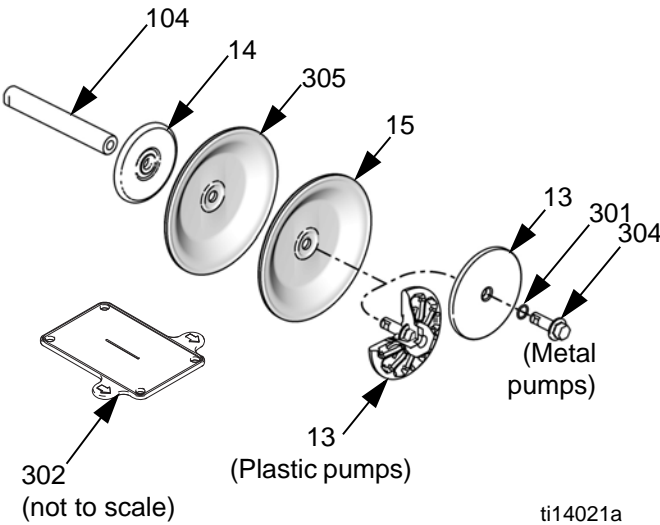
Sample Configuration Number							
Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

Two-Piece Diaphragms

- Kits include:
- 8 o-rings, PTFE (12)
 - 2 diaphragms, PTFE (15)
 - 2 backup diaphragms, EPDM (305)
 - 2 o-rings for the bolt (301, used only on metal pumps)
 - 1 diaphragm install tool (302)

Diaphragm Material		Kit
TF	PTFE and EPDM	859.0006

NOTE: Fluid plates (13, 14) and diaphragm shaft bolts (304) are sold separately. See page 28. The shaft (104) is part of Kit 859.0000, the Center Section Rebuild Kit.



Air and Fluid Plates

- Kits for **aluminum**, **hastelloy**, and **stainless steel** pumps include:
- air side diaphragm plate (14)
 - fluid side diaphragm plate (13)
 - o-ring (301)
 - bolt (304)
- Kits for **polypropylene**, **conductive polypropylene**, and **PVDF** pumps include:
- air side diaphragm plate (14)
 - fluid side diaphragm plate (13, includes bolt)

Pump Material	Air and Fluid Plate Kit
Aluminum	859.0055
Conductive Polypropylene	859.0056
Hastelloy	859.0715
Polypropylene	859.0056
PVDF	859.0057
Stainless Steel	859.0082

Diaphragm Shaft Bolt (Metal Pumps)

- Kit 859.0085 includes:
- 1 bolt, stainless steel, M12 x 35 (304)
 - 1 o-ring (301)

Seat, Check Ball, and Diaphragm Kits

Sample Configuration Number

Pump Size	Fluid Section	Air Section	Seats	Balls	Diaphragms	Connections	Options
VA25	A	A	SS	BN	BN	TB	00

Kit	Parts	Qty.
859.0131 (PP, TF, TF)	SEAT, polypropylene	4
	O-RING, PTFE	8
	BALL, PTFE	4
	O-RING	2
	DIAPHRAGM, PTFE	2
	DIAPHRAGM, EPDM	2
	TOOL, install	1
859.0132 (PP, TF, PO)	SEAT, polypropylene	4
	O-RING, PTFE	8
	BALL, PTFE	4
	ADHESIVE	1
	SCREW	2
	DIAPHRAGM, PTFE Overmolded	2
	TOOL, install	1
859.0133 (PP, BN, BN)	SEAT, polypropylene	4
	O-RING, PTFE	8
	BALL, buna-N	4
	O-RING	2
	DIAPHRAGM, buna-N	2
	TOOL, install	1
859.0134 (PP, SP, SP)	SEAT, polypropylene	4
	O-RING, PTFE	8
	BALL, santoprene	4
	O-RING	2
	DIAPHRAGM, santoprene	2
	TOOL, install	1
859.0135 (PP, VT, VT)	SEAT, polypropylene	4
	O-RING, PTFE	8
	BALL, FKM	4
	O-RING	2
	DIAPHRAGM, FKM	2
	TOOL, install	1
859.0139 (HY, AC, HY)	SEAT, TPE	4
	BALL, acetal	4
	O-RING	2
	DIAPHRAGM, TPE	2
	TOOL, install	1

Kit	Parts	Qty.
859.0140 (KY, TF, TF)	SEAT, PVDF	4
	O-RING, PTFE	8
	BALL, PTFE	4
	O-RING	2
	DIAPHRAGM, PTFE	2
	DIAPHRAGM, EPDM	2
	TOOL, install	1
859.0141 (KY, TF, PO)	SEAT, PVDF	4
	O-RING, PTFE	8
	BALL, PTFE	4
	ADHESIVE	1
	SCREW	2
	DIAPHRAGM, PTFE Overmolded	2
	TOOL, install	1
859.0142 (GE, GE, GE)	SEAT, geolast	4
	O-RING, PTFE	8
	BALL, geolast	4
	O-RING	2
	DIAPHRAGM, geolast'	2
	TOOL, install	1
859.0143 (AL, BN, BN)	SEAT, aluminum	4
	O-RING, PTFE	8
	BALL, buna-N	4
	O-RING	2
	DIAPHRAGM, buna-N	2
	TOOL, install	1
859.0144 (AL, GE, GE)	SEAT, aluminum	4
	O-RING, PTFE	8
	BALL, geolast	4
	O-RING	2
	DIAPHRAGM, geolast'	2
	TOOL, install	1
859.0145 (AL, SP, SP)	SEAT, aluminum	4
	O-RING, PTFE	8
	BALL, santoprene	4
	O-RING	2
	DIAPHRAGM, santoprene	2
	TOOL, install	1

Kit	Parts	Qty.
859.0146 (AL, TF, PO)	SEAT, aluminum	4
	O-RING, PTFE	8
	BALL, PTFE	4
	ADHESIVE	1
	SCREW	2
	DIAPHRAGM, PTFE Overmolded	2
	TOOL, install	1
859.0147 (AL, TF, TF)	SEAT, aluminum	4
	O-RING, PTFE	8
	BALL, PTFE	4
	O-RING	2
	DIAPHRAGM, PTFE	2
	DIAPHRAGM, EPDM	2
	TOOL, install	1
859.0148 (SP, SP, SP)	SEAT, santoprene	4
	O-RING, PTFE	8
	BALL, santoprene	4
	O-RING	2
	DIAPHRAGM, santoprene	2
	TOOL, install	1
859.0149 (VT, VT, VT)	SEAT, FKM	4
	BALL, FKM	4
	O-RING	2
	DIAPHRAGM, FKM	2
	TOOL, install	1
SS, BN, BN	SEAT, stainless steel	4
	O-RING, PTFE	8
859.0136 (metal pumps)	BALL, buna-N	4
	O-RING	2
859.0754 (plastic pumps)	DIAPHRAGM, buna-N	2
	TOOL, install	1
SS, TF, TF	SEAT, stainless steel	4
	O-RING, PTFE	8
859.0137 (metal pumps)	BALL, PTFE	4
	O-RING	2
859.0755 (plastic pumps)	DIAPHRAGM, PTFE	2
	DIAPHRAGM, EPDM	2
	TOOL, install	1
SS, TF, PO	SEAT, stainless steel	4
	O-RING, PTFE	8
859.0138 (metal pumps)	BALL, PTFE	4
	ADHESIVE	1
859.0756 (plastic pumps)	SCREW	2
	DIAPHRAGM, PTFE Overmolded	2
	TOOL, install	1

Kit	Parts	Qty.
SS, SP, SP 859.0251 (metal pumps) 859.0757 (plastic pumps)	SEAT, 316 stainless steel	4
	O-RING, PTFE	8
	BALL, santoprene	4
	O-RING	2
	DIAPHRAGM, santoprene	2
	TOOL, install	1
SS, NW, BN 859.0416 (metal pumps) 859.0758 (plastic pumps)	SEAT, stainless steel	4
	O-RING, PTFE	8
	BALL, polychloroprene	4
	O-RING	2
	DIAPHRAGM, buna-N	2
	TOOL, install	1
SS, NW, NO 859.0417 (metal pumps) 859.0759 (plastic pumps)	SEAT, stainless steel	4
	O-RING, PTFE	8
	BALL, polychloroprene	4
	O-RING	2
	ADHESIVE	2
	SCREW	2
	DIAPHRAGM, polychloroprene Overmolded	2
	TOOL, install	1
SS, SS, TF 859.0418 (metal pumps) 859.0760 (plastic pumps)	SEAT, stainless steel	4
	O-RING, PTFE	8
	BALL, stainless steel	4
	O-RING	2
	DIAPHRAGM, PTFE	2
	DIAPHRAGM, EPDM	2
	TOOL, install	1

Accessories

Fluid Pressure Relief Kit 819.6479

(for aluminum pumps)

Includes pipe bushings, hose adapter, relief valve, and tubing.

Fluid Pressure Relief Kit 819.0159

(for plastic pumps)

Includes fluid pressure relief valve.

Wall Mount Kit 859.0107

Includes bracket, 4 dampeners, 8 washers, and 8 lock nuts.

Wall Bracket Dampener Kit 859.0124

Includes 4 dampeners.

Rubber Foot Mounting Kit 819.4333

Includes washers, nuts, and rubber feet.

Grounding Wire Assembly Kit 819.0157

Includes ground wire and clamp.

Standard Pipe Flange Kits

819.6885 - Polypropylene

819.6886 - Stainless steel

819.6887 - PVDF

Each kit includes the pipe flange, a PTFE gasket, bolts, spring lock washers, flat washers and nuts.

Optional Muffler

Part No. 819.7000, 3/4 npt, aluminum

Technical Data

Maximum fluid working pressure	125 psi (0.86 MPa, 8.6 bar)
Air pressure operating range	20-125 psi (0.14-0.86 MPa, 1.4-8.6 bar)
Fluid displacement per cycle	0.17 gal. (0.64 liters)
Air consumption at 70 psi (0.48 MPa, 4.8 bar), 20 gpm (76 lpm).	25 scfm
Maximum values with water as media under submerged inlet conditions at ambient temperature:	
Maximum air consumption	67 scfm
Maximum free-flow delivery	50 gpm (189 lpm)
Maximum pump speed	280 cpm
Maximum suction lift	16 ft (4.9 m) dry, 29 ft (8.8 m) wet
Flooded volume	0.375 gal. (1.42 liters)
Maximum size pumpable solids	1/8 in. (3.2 mm)
Recommended cycle rate for continuous use	93 - 140 cpm
Recommended cycle rate for circulation systems	20 cpm
Sound Power*	
at 70 psi (0.48 MPa, 4.8 bar) and 50 cpm.	78 dBa
at 100 psi (0.7 MPa, 7.0 bar) and full flow	90 dBa
Sound Pressure**	
at 70 psi (0.48 MPa, 4.8 bar) and 50 cpm.	84 dBa
at 100 psi (0.7 MPa, 7.0 bar) and full flow	96 dBa
Operating temperature range.	see page 33
Air inlet size	1/2 npt(f)
Fluid inlet size	
Aluminum (VA25AA)	1 in. npt(f) or 1 in. bspt
Plastic (VA25PP, VA25CC, and VA25KP)	1 in. raised face ANSI/DIN flange
Hastelloy (VA25HC) and Stainless Steel (VA25SA, VA25SC, and VA25SP)	1 in. npt(f) or 1 in. bspt
Fluid outlet size	
Aluminum (VA25AA)	1 in. npt(f) or 1 in. bspt
Plastic (VA25PP, VA25CC, and VA25KP)	1 in. raised face ANSI/DIN flange
Hastelloy (VA25HC) and Stainless Steel (VA25SA, VA25SC, and VA25SP)	1 in. npt(f) or 1 in. bspt
Weight	
Aluminum (VA25AA)	23 lb. (10.5 kg)
Hastelloy (VA25HC)	41 lb. (18.6 kg)
Polypropylene and Conductive Polypropylene (VA25PP and VA25CC)	18 lb. (8.2 kg)
PVDF(VA25KP)	26 lb (11.8 kg)
Stainless Steel	
with conductive polypropylene center (VA25SC)	36.3 lb. (16.5 kg)
with polypropylene center (VA25SP)	37.3 lb. (16.9 kg)
with aluminum center (VA25SA)	41.4 lb. (18.8 kg)
Wetted parts include material(s) chosen for seat, ball, and diaphragm options, plus	the pump's material of construction
VA25AA	Aluminum
VA25HC	Hastelloy
VA25PP and VA25CC	Polypropylene
VA25KP	PVDF
VA25SA, VA25SC, and VA25SP	Stainless Steel

Non-wetted external parts

Aluminum (VA25AA)	aluminum, coated carbon steel
Hastelloy (VA25HC)	hastelloy, stainless steel, polypropylene or aluminum (if used in center section)
Plastic (VA25PP, VA25CC, and VA25KP)	stainless steel, polypropylene
Stainless Steel (VA25SA, VA25SC, and VA25SP)	stainless steel, polypropylene or aluminum (if used in center section)

* Sound power measured per ISO-9614-2.

** Sound pressure was tested 3.28 ft (1 m) from equipment.

All trademarks mentioned in this manual are the property of their respective owners.

Operating Temperature Range

NOTICE

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

Diaphragm/Ball/Seat Material	Fluid Temperature Range					
	Aluminum, Hastelloy, or Stainless Steel Pumps		Polypropylene or Conductive Polypropylene Pumps		PVDF Pumps	
	Fahrenheit	Celsius	Fahrenheit	Celsius	Fahrenheit	Celsius
Acetal (AC)	10° to 180°F	-12° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
Buna-N (BN)	10° to 180°F	-12° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
FKM Fluoroelastomer (VT)*	-40° to 275°F	-40° to 135°C	32° to 150°F	0° to 66°C	10° to 225°F	-12° to 107°C
Geolast® (GE)	-40° to 150°F	-40° to 66°C	32° to 150°F	0° to 66°C	10° to 150°F	-12° to 66°C
Polychloroprene over-molded diaphragm (NO) or Polychloroprene check balls (NE or NW)	0° to 180°F	-18° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
Polypropylene (PP)	32° to 150°F	0° to 66°C	32° to 150°F	0° to 66°C	32° to 150°F	0° to 66°C
PTFE overmolded diaphragm (TO)	40° to 180°F	4° to 82°C	40° to 150°F	4° to 66°C	40° to 180°F	4.0° to 82°C
PTFE check balls or two-piece PTFE/EPDM diaphragm (TF)	40° to 220°F	4° to 104°C	40° to 150°F	4° to 66°C	40° to 220°F	4° to 104°C
PVDF (KY)	10° to 225°F	-12° to 107°C	32° to 150°F	0° to 66°C	10° to 225°F	-12° to 107°C
Santoprene® (SP)	-40° to 180°F	-40° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
TPE (HY)	-20° to 150°F	-29° to 66°C	32° to 150°F	0° to 66°C	10° to 150°F	-12° to 66°C

* The maximum temperature listed is based on the ATEX standard for T4 temperature classification. If you are operating in a non-explosive environment, FKM fluoroelastomer's maximum operating temperature in aluminum or stainless steel pumps is 320°F (160°C).



EU-DECLARATION OF CONFORMITY

EU-KONFORMITEITSVERKLARING, DÉCLARATION UE DE CONFORMITÉ, EU-KONFORMITÄTSEKTLÄRUNG DICHIARAZIONE DI CONFORMITÀ UE, EU-OVERENSSTEMMELSESEKTLÆRING, 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 DEKLARACIJA DEKLARACJA ZGODNOŚCI UE, DIKJARAZZJONI TA' KONFORMITÀ TAL-UE, EU IZJAVA O SUKLADNOSTI, EU VYHLÁSENIE O ZHODE, ЕС ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ, DECLARAȚIA UE DE CONFORMITATE

Model

VERDERAIR VA 25

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

Part

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

810.0905, 810.0906, 810.0927, 850.0072*, 850.0073*, 850.0074*, 850.0078, 850.0081, 850.0082*-850.0084*, 850.0099*, 850.0100*, 850.0191-850.0194, 850.0248, 850.0255, 850.0265, 850.0283, 850.0331, 850.0371*, 850.0382, 850.0419, 850.0429, 850.0430, 850.0535, 850.0545, 850.0563, 850.0569, 850.0662, 850.0780, 850.0099*, 850.0100*, 850.2680, 850.2855, 850.2925*, 850.2935*, 850.2945*, 850.3100*, 850.3122*, 850.3128*, 850.3134*, 850.3282*, 850.3380*, 850.3402*, 850.3414*, 850.6346, 850.6976*, 850.6980-850.6982, 850.7007, 850.7011*, 850.7012*, 850.7048*, 850.7049*, 850.8000*-850.8007*, 850.8008-850.8014, 850.8015*, 850.8016*, 850.8017-850.8022, 850.8023*, 850.8025, 850.8031-850.8063, 850.8064-850.8088*, 850.8089-850.8094, 850.8095*, 850.8096*-850.8098, 850.8100*, 850.8101, 850.8145 (*Do not have ATEX approval)

Complies With The EC Directives:

Voldoet 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, Cumple las directivas de la CE, Täyttää EY-direktiivien vaatimukset, Uppfyller EG-direktiven, Shoda se směrnicemi ES, Vastab EÜ direktiividele, Kielégíti az EK irányelvek 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, Та ага teacht le Treoracha an CE, Respectă directivele CE

2006/42/EC Machinery Safety Directive

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

(See Part No. above for corresponding ATEX approved pumps.)

Standards Used:

Gebruikte 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, Užyte normy, Standards Užati, Uporabljeni standardi, Použité normy, Използвани стандарти, Caidheáin arna n-úsáid, Standarde utilizate

EN 1127-1 ISO 12100-2

EN 13463-1 ISO 9614-2

EN 13463-5

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, Διακονούμενο όργανο Οδηγίας, Organismo notificado relativamente à directiva, Organismo notificado de la directiva, Direktiivin mukaisesti ilmoitettu tarkastuslaitos, Anmält organ för direktivet, Úředně oznámený orgán pro směrnici, Teavitatud asutus (direktiivi järgi), Az irányelvvel kapcsolatban értesített testület, Pilnvarotā iestāde saskaņā ar direktīvu, Apie direktīvą Informuota institucija, Ciało 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

Approved By:

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

Werner Bosman
Managing Director

7 March 2019

VERDER BV

Leningradweg 5
9723 TP Groningen
NETHERLANDS

859.0086

C

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 overensstemmelseerklæring 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 yksinomaista 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. Št atbilstības deklarācija ir izdota vienīgi uz ražotāja atbildību. Ši atitikties deklaracija išduota tik gamintojo atsakomybe. Niniejsza deklaracja zgodności wydana zostaje na wyłączną odpowiedzialność producenta. Din idikjarazzjoni 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.

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.

Austria
Verder Austria
Eitnergasse 21/Top 8
A-1230 Wien
AUSTRIA
Tel: +43 1 86 51 074 0
Fax: +43 1 86 51 076
e-mail: office@verder.at

Belgium
Verder nv
Kontichsesteenweg 17
B-2630 Aartselaar
BELGIUM
Tel: +32 3 877 11 12
Fax: +32 3 877 05 75
e-mail: info@verder.be

China
Verder Shanghai Instruments and Equipment Co., Ltd
Building 8 Fuhai Business Park No. 299
Bisheng Road, Zhangjiang Hiteck Park
Shanghai 201204
CHINA
Tel: +86 21 33932950
Fax: +86 21 33932955
e-mail: info@verder.cn

Bulgaria
Verder Bulgaria Ltd
Vitosh department,
Manastriski Livadi Zapad
district,
110 Bulgaria Blvd., 2-nd
Floor, apt. 15-16,
1618 - Sofia
BULGARIA
Tel: 0878407370
Fax: 02 9584085
email: office@verder.bg

Czech Republic
Verder s.r.o.
Vodnanská 651/6 (vchod
Chlumecka 15)
198 00 Praha 9-Kyje
CZECH REPUBLIC
Tel: +420 261 225 386-7
Web: <http://www.verder.cz>
e-mail: info@verder.cz

Denmark
Verder A/S
Sales Denmark
Leningradweg 5
NL 9723 TP Groningen
THE NETHERLANDS
Tel: +45 3636 4600
e-mail: info@verder.dk

France
Verder France
8 Allée Rosa Luxembourg
Immeulde Arizona
95610 Eragny sur Oise
FRANCE
Tel: +33 173 43 98 41
Fax: +33 134 64 44 50
e-mail: info@verder.fr

Germany
Verder Deutschland GmbH
Retsch-Allee 1-5
42781 Haan
GERMANY
Tel: 02104/2333-200
Fax: 02104/2333-299
e-mail: info@verder.de

Hungary
Verder Hongary Kft
Budafoke ut 187 - 189
HU-1117 Budapest
HUNGARY
Tel: 0036 1 3651140
Fax: 0036 1 3725232
e-mail: info@verder.hu

India
Verder India Pumps Pvt
Ltd.
Plot No-3B, D-1 Block,
MIDC Chinchwad,
Pune - 411019
INDIA
e-mail:
Sales@verder.co.in
www.verder.co.in

Italy
Verder Italia
Via Maestri Del lavoro, 5
02100 Vazia, Rieti
ITALY
Tel: +39 07 46 229064
e-mail: info@verder.it

The Netherlands
Verder BV
Leningradweg 5
NL 9723 TP Groningen
THE NETHERLANDS
Tel: +31 50 549 59 00
Fax: +31 50 549 59 01
e-mail: info@verder.nl

Poland
Verder Polska
ul.Porcelanowa 23
PL-40 036 Katowice
POLAND
Tel: +48 32 78 15 032
Fax: +48 32 78 15 034
e-mail: verder@verder.pl

Romania
Verder România
Drumul Balta Doamnei
no 57-61
Sector 3
CP 72-117
032624 Bucuresti
ROMANIA
Tel: +40 21 335 45 92
Fax: +40 21 337 33 92
e-mail: office@verder.ro

Slovak Republik
Verder Slovakia s.r.o.
Silacska 1
SK-831 02 Bratislava
SLOVAK REPUBLIK
Tel: +421 2 4463 07 88
Fax: +421 2 4445 65 78
e-mail: info@verder.sk

South Africa
Verder SA
197 Flaming Rock Avenue
Northlands Business Park
Newmarket Street
ZA Northriding
SOUTH AFRICA
Tel: +27 11 704 7500
Fax: +27 11 704 7515
e-mail: info@verder.co.za

Switzerland
Verder Deutschland GmbH
Sales Switzerland
Retsch-Allee 1-5
D-42781 Haan
GERMANY
Tel: +41 (0)61 331 33 13
Fax: +41 (0)61 331 63 22
e-mail: info@verder.ch

United Kingdom
Verder UK Ltd.
Unit 3 California Drive
Castleford, WF10 5QH
UNITED KINGDOM
Tel: +44 (0) 1924 221 001
Fax: +44 (0) 1132 465 649
e-mail: info@verder.co.uk

United States of America
Verder Inc.
312 Corporate Parkway
Suite 101
Macon, GA 31210
USA
Tel: +1 877 783 7337
Fax: +1 478 476 9867
e-mail: sales@verder-us.com