

# Instructions – Parts List



## PrecisionFlo<sup>TM</sup> Metering Valve Upgrade 309384 rev.C

3500 psi (24 MPa, 240 bar) Maximum Working Fluid Pressure

For use when dispensing fluids that meet at least one of the following conditions for non-flammability:

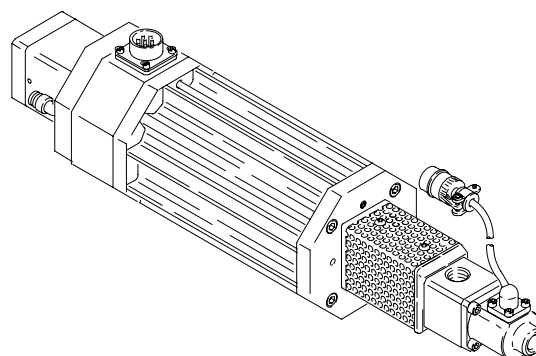
- The fluid has a flash point above 140°F (60°C) and a maximum organic solvent concentration of 20%, by weight, per ASTM Standard D93.
- The fluid does not sustain burning when tested per ASTM Standard D4206 Sustained Burn Test.

### Part No. 233678

PrecisionFlo Metering Valve for PVC application

### Part No. 233679

PrecisionFlo Metering Valve for HemFlange application



TI1394A

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### Important Safety Instructions

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

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# Symbols

## Warning Symbol



**WARNING**

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

## Caution Symbol



**CAUTION**

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

## ! WARNING



### SKIN INJECTION HAZARD

Spray from the dispensing device, hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Splashing fluid in the eyes or on the skin can also cause serious injury.

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate surgical treatment.**
- Do not point the dispensing device at anyone or at any part of the body.
- Do not put hand or fingers over the front of the dispensing device.
- Do not stop or deflect fluid leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** on page 5 whenever you: are instructed to relieve pressure; stop dispensing; clean, check, or service the equipment; or install or clean a spray tip or nozzle.
- Tighten all the fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn, damaged, or loose parts immediately. Permanently coupled hoses cannot be repaired; replace the entire hose.



### FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

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

- The system must only be installed and serviced by a qualified electrician.
- Ground the equipment and the object being sprayed. The Metering Valve is grounded through proper connection of the two electrical cables.
- Do not install the Metering Valve in a hazardous area, as defined in Article 500 of the National Electrical Code (USA).
- Keep the dispensing area free of debris, including solvent, rags, and gasoline.
- Do not smoke in the dispensing area.
- If there is any static sparking while using the equipment, **stop dispensing immediately**. Identify and correct the problem.
- Disconnect the two electrical cables from the Metering Valve before servicing the valve.

# ⚠ WARNING



## EQUIPMENT MISUSE HAZARD

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

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are uncertain about usage, call your Graco distributor.
- Only use the PrecisionFlo Metering Valve with the PrecisionFlo Control.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Check the equipment daily. Repair or replace worn or damaged parts immediately.
- Do not disassemble the Metering Valve motor. The motor contains powerful magnets, which could attract metal objects and create a hazardous condition if the motor end plates are removed. Contact your Graco distributor for motor service.
- Do not exceed the maximum working pressure of the lowest rated system component. This equipment has a **3500 psi (24 MPa, 240 bar) maximum working pressure**.
- Route the hoses away from the traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 180°F (82°C) or below -40°F (-40°C).
- Do not use the hoses to pull the equipment.
- Use fluids that are compatible with the equipment wetted parts. See the **Technical Data** section of all the equipment manuals. Read the fluid manufacturer's warnings.
- Comply with all applicable local, state and national fire, electrical and other safety regulations.
- Do not touch the metal heat sink when the surface is hot.
- Do not cover the Metering Valve; the motor needs air ventilation.



## TOXIC FLUID HAZARD

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

- Know the specific hazards of the fluid you are using. Read the fluid manufacturer's warnings.
- Provide fresh air ventilation to avoid the buildup of vapors from the fluid being dispensed.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Wear the appropriate protective clothing, gloves, eyewear, and respirator.



## MOVING PARTS HAZARD

Moving parts, such as the fluid needle, can pinch fingers. Parts of the Metering Valve are spring-loaded and parts may fly out or spring apart when the valve is disassembled and cause serious injury, including eye injuries.

- Do not operate the equipment with the guard removed.
- Keep clear of any moving parts when starting or operating the equipment.
- Wear eye protection during all service procedures.

# Installation

## ⚠ WARNING



### ELECTRIC SHOCK HAZARD

Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury if the work is not performed properly. Do not install or service this equipment unless you are trained and qualified.

### NOTES:

- Have the system binder (a collection of manuals and diagrams in a three-ring binder, supplied by Graco) available during installation.
  - Reference numbers and letters in parentheses in the text refer to the numbers and letters in the illustrations.
  - Be sure all accessories are adequately sized and pressure-rated to meet the system's requirements.
  - Only use the PrecisionFlo Metering Valve with the PrecisionFlo Control.
1. Mount the Metering Valve. See the mounting hole dimensions in Fig. 1.
  2. Connect the fluid supply line to the 3/8–18 npt fluid inlet (A). See Fig. 2.
  3. Connect a fluid line between the 3/8–18 npt fluid outlet (B) and the dispensing device.
  4. Connect the electrical cable (C) to the Metering Valve connector (E).
  5. Connect a 0.25 inch (6.35 mm) O.D. air line between the closer air inlet (G) and the closer actuating air valve.

## ⚠ WARNING



### FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

To reduce the risk of fire, explosion, or electric shock the Metering Valve must be grounded through proper connection of the two electrical cables.



A qualified electrician must complete all grounding and wiring connections.

|           |  |
|-----------|--|
| <b>A</b>  | <b>A= 19.0 in.</b><br><b>(482.6 mm)</b>  |
| <b>B</b>  | <b>B= 6.913 in.</b><br><b>(175.6 mm)</b> |
| <b>C</b>  | <b>C= 7.15 in.</b><br><b>(181.6 mm)</b>  |
| <b>D</b>  | <b>D= 1.25 in.</b><br><b>(31.8 mm)</b>   |
| <b>E</b>  | <b>E= 4 in.</b><br><b>(102 mm)</b>       |
| <b>FF</b> | <b>FF = 4 x 1/4–20 in.</b>               |

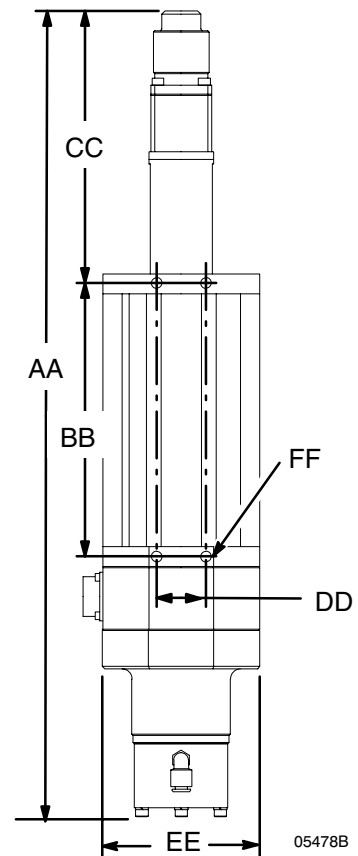


Fig. 1

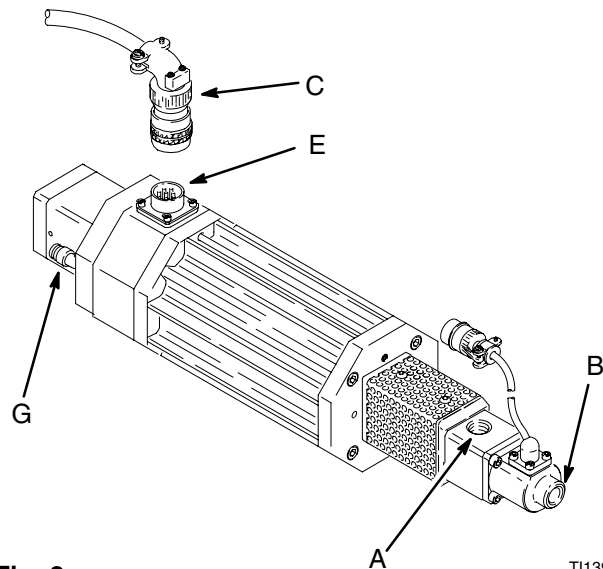


Fig. 2

# Operation and Maintenance

## Pressure Relief Procedure

### **WARNING**



#### **SKIN INJECTION HAZARD**

The system pressure must be manually relieved to prevent the system from starting or dispensing accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you

- Are instructed to relieve the pressure
- Stop dispensing
- Check or service any of the system equipment
- Install or clean a spray tip or nozzle

1. Shut off the fluid supply to the Metering Valve.
2. Actuate the Metering Valve and the dispensing device until the fluid stops flowing from them.

**NOTE:** Follow the manual purge procedure in the PrecisionFlo system manual to actuate the metering valve and dispensing device.

3. Relieve the system pressure as instructed in the separate instruction manuals.

## Operating the Metering Valve

The Metering Valve is operated through the PrecisionFlo Control. Follow the PrecisionFlo Control instructions to operate the Metering Valve.

### **WARNING**



#### **MOVING PARTS HAZARD**

Moving parts, such as the fluid needle, can pinch fingers. Do not operate the equipment with the guard (39) removed.

## Maintenance

Visually check the following items periodically:

- Check the fluid needle and seat area for leakage and wear.
- Check the fluid needle shaft for leakage and wear.
- Make sure the fluid connections are tight and are not leaking.
- Check the cables for damage and make sure they are securely connected.

### **Clean the Fluid Needle and Seat Assembly**

If the fluid flow from the dispensing device appears to be restricted, disassemble the fluid needle and seat as instructed on page 7 and clean the parts. Use a non-flammable cleaning fluid that is recommended by your material supplier.

# Service

## Troubleshooting the Metering Valve

### WARNING

#### EQUIPMENT MISUSE HAZARD

Do not disassemble the Metering Valve motor. The motor contains powerful magnets, which could attract metal objects and create a hazardous condition if the motor end plates are removed. Contact your Graco distributor for motor service.

### WARNING



#### MOVING PARTS HAZARD

Parts of the Metering Valve are spring-loaded and parts may fly out or spring apart when the valve is disassembled and cause serious injury, including eye injuries. Wear eye protection during all service procedures. Follow the instructions, paying special attention when you see the *Moving Parts Hazard* symbol in this warning.

1. If the fluid continues to flow after the dispense cycle has stopped, check for the following problems:
  - a. The fluid needle may be obstructed or damaged. Service the fluid needle as instructed on page 7.
  - b. The seat or seals may be worn or damaged. Service the fluid needle as instructed on page 7.
  - c. Check that the PrecisionFlo Control on/off delay is set properly. See the chart for the applicable PrecisionFlo Control Assembly manual.

| Form   | P/N      | Title                                 |
|--------|----------|---------------------------------------|
| 310531 | 918463 * | <i>PrecisionFlo™ Control Assembly</i> |
|        | 918644 ‡ |                                       |

\* Hand pendant

‡ Door Pendant

§ Single Application

2. If the pressure sensor needs replacement, follow the procedure on page 11.
3. Refer to the wiring diagram in Fig. 8, page 12, for cable wire connections.

# Service

## Fluid Needle and Seat Assembly Service

### ⚠ WARNING



#### SKIN INJECTION HAZARD

To reduce the risk of an injury, including an injection injury, follow the **Pressure Relief Procedure** on page 5 before checking or servicing the equipment and whenever you are instructed to relieve pressure.

**NOTE:** Adjusting the fluid needle is not necessary after installing the PrecisionFlo Upgrade.

1. Relieve the pressure in the system.
2. Disconnect the electrical cable (C) from the metering valve connector (E). See Fig. 2 on page 4.
3. Disconnect the fluid lines from the metering valve fluid inlet (A) and outlet (B). See Fig. 3.
4. Disconnect the closer air line from the closer air inlet (G).
5. Unmount the metering valve and take it to a clean work area with a compressed air supply.

6. Connect a compressed air supply to the closer air inlet (G). Actuate the cylinder with approximately 50 psi (0.35 MPa, 3.5 bar) air pressure to retract the closer rod and keep the closer springs compressed.

### ⚠ WARNING



#### MOVING PARTS HAZARD

The valve air cylinder is spring-loaded and parts may fly out or spring apart when the valve is disassembled and cause serious injury. During service procedures that will expose internal meter parts, wear protective eyewear and keep the closer spring compressed, as instructed in step 6.

7. Disconnect the pressure sensor cable (K) from the connector (L).
8. Remove the guard (39).
9. Slide the rubber boot (34) back to expose the two set screws (35).
10. Disconnect the fluid needle (29) from the connector (37) by unscrewing the two set screws (35).

### Part No. 233678 Shown

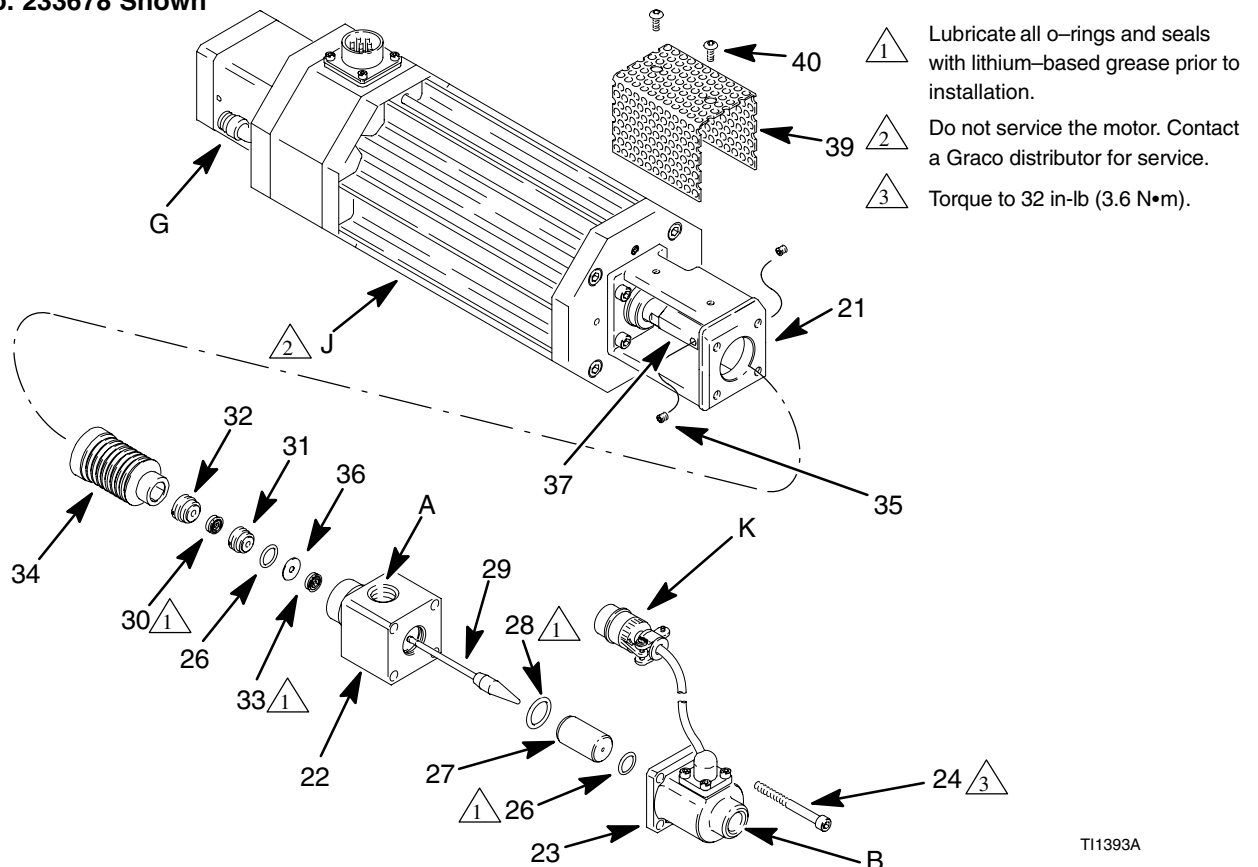


Fig. 3

TI1393A

# Service

11. Remove the screws (24), and separate the fluid section from the fluid head mount (21).
  12. Remove the rubber boot (34).
  13. Separate the fluid body (22) and adapter (23).
  14. Remove the seat (27) and fluid needle (29).
  15. Unscrew the seal housing (32).
  16. Remove the seals (30 and 33), o-ring (26), washer (36), and bushing (31).
  17. Clean the parts in a non-flammable cleaning fluid that is recommended by your material supplier. Replace parts as needed.
- NOTE:** Use lithium-based grease to lubricate o-rings and seals.
18. Lubricate seal (orange) (33) and press the seal into the fluid body (22), with the lips of the seal facing into the fluid body.
  19. Install the washer (36) on top of seal (33).
  20. Lubricate seal (black) (30) and press into the bushing (31), with the lips of the seal facing into the bushing.
  21. Install the o-ring (26) on the end of the bushing (31).
  22. Install the bushing (31) into the fluid body (22), with the o-rings facing into the fluid body.
  23. Screw seal housing (32) into fluid body (22).
  24. Lubricate the fluid needle shaft (29). Turn the needle as you install the shaft through the fluid body (22), seals (30 and 33), and bushing (31).
  25. Install the o-rings (26 and 28) and lubricate them.
  26. Press and turn the seat (27) into the fluid body (22).

27. Replace rubber boot (34) over the connector (37) and secure end to the motor face plate. Slide boot back to expose set screw holes.
28. Press the fluid body (22) and adapter (23) together and secure them with the four screws (24) and split lock washers (25). Torque the screws to 32 in-lb (3.6 N•m).
29. Slowly relieve the air pressure from the metering valve to release the closer.

## CAUTION

The motor shaft is forced to the full forward position by the closer. Slowly relieve the air pressure to prevent excessive impact of the shaft, which could damage the equipment.

30. Finger-tighten one set screw (35) on the connector (37). Tighten the second set screw and torque to 15 in-lb (1.7 N•m). Retighten the first set screw and torque to 15 in-lb (1.7 N•m).
31. Slide the rubber boot (34) back to cover the set screws (35), making sure the end is still secured over the motor face plate.
32. Install the guard (39).
33. Connect the pressure sensor cable (K) to the connector (L).
34. Mount the metering valve.
35. Connect the fluid lines to the metering valve fluid line inlet (A) and (B).
36. Connect the closer air line to the closer air inlet (G).
37. Turn on the fluid supply.
38. Recalibrate the PrecisionFlo system. See the PrecisionFlo control manual.

# Service

## Closer Service

### WARNING



#### SKIN INJECTION HAZARD

To reduce the risk of a serious injury, including an injection injury, follow the **Pressure Relief Procedure** on page 5 before checking or servicing the equipment and whenever you are instructed to relieve the pressure.

1. Relieve the pressure in the system.
2. Disconnect the electrical cable (C) from the Metering Valve connector (E). See Fig. 2, page 4.
3. Disconnect the fluid lines from the metering valve fluid inlet (A) and outlet (B).
4. Disconnect the closer air line from the closer air inlet (G). See Fig. 4.
5. Unmount the Metering Valve and take it to a clean work area with a compressed air supply.
6. Connect a compressed air supply to the closer air inlet (G). Actuate the cylinder with about 50 psi (3500 kPa, 3.5 bar) air pressure to retract the closer rod and keep the closer spring compressed.

### WARNING



#### MOVING PARTS HAZARD

The valve air cylinder is spring-loaded and parts may fly out or spring apart when the valve is disassembled and cause serious injury. During service procedures that will expose internal meter parts, wear protective eyewear and keep the closer spring compressed, as instructed in step 6.

7. Remove the eight screws (3) from the closer assembly (2), and remove the closer assembly. See Fig. 4.
8. Slowly relieve the air pressure from the Metering Valve to release the closer.

9. Disconnect the air line from the closer air inlet (G).
10. Press down on the cylinder body cover to prevent the parts from springing apart, and remove the screws (107) from the closer cover. See Fig. 6.
11. Remove the cylinder cap (111) from the cylinder (108).
12. Remove the o-rings (103) from the cover (104).

### WARNING



#### MOVING PARTS HAZARD

The rod extension (102) and spring cup (112) may fly apart as the rod extension is unscrewed from the cylinder rod (R), due to the pressure from the spring (113). Wear eye protection to reduce the risk of serious injury from moving parts.

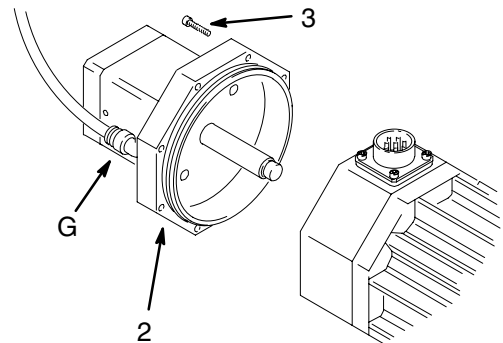


Fig. 4

TI1392A

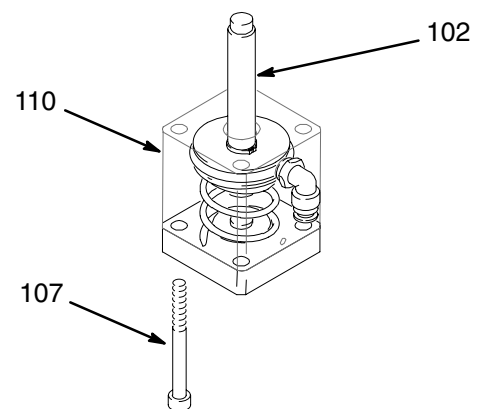


Fig. 5

TI1392A

# Service

## Closer Service (continued)

13. Remove the spring (109) from the cylinder body (108). See Fig. 6.
14. Remove the rubber bumpers (101) from the cylinder cap (111) and valve rod (102).
15. Inspect the parts for damage and clean or replace them as needed. Lubricate the o-rings with lithium-based grease before re-installing them.
16. Install the o-ring (114) in the cylinder body over the piston (113). Insert the piston and the spring (109) into the cylinder body (108).
17. Apply anaerobic sealant (Loctite® 242 or 243 or equivalent) to the threads of the four screws (107).
18. Compress the spring enough to engage the screw threads into the closer cover. Torque the four screws (107) to 24–30 in-lb (2.7–3.4 N•m).
19. Install the cover o-rings (103).
20. Install the rubber bumpers (101) on the end of the rod closer (102) and the cylinder cap (111).
21. Connect a compressed air supply to the closer air inlet (G). Actuate the cylinder to retract the closer rod and keep the closer spring compressed.
22. Secure the closer assembly to the metering valve with the eight screws (3). See Fig. 4.
23. Slowly relieve the air pressure from the Metering Valve to release the closer.
24. Disconnect the air line from the closer air inlet (G).

### CAUTION

The motor shaft is forced to the full forward position by the closer. Slowly relieve the air pressure to prevent excessive impact of the shaft, which could damage the equipment.

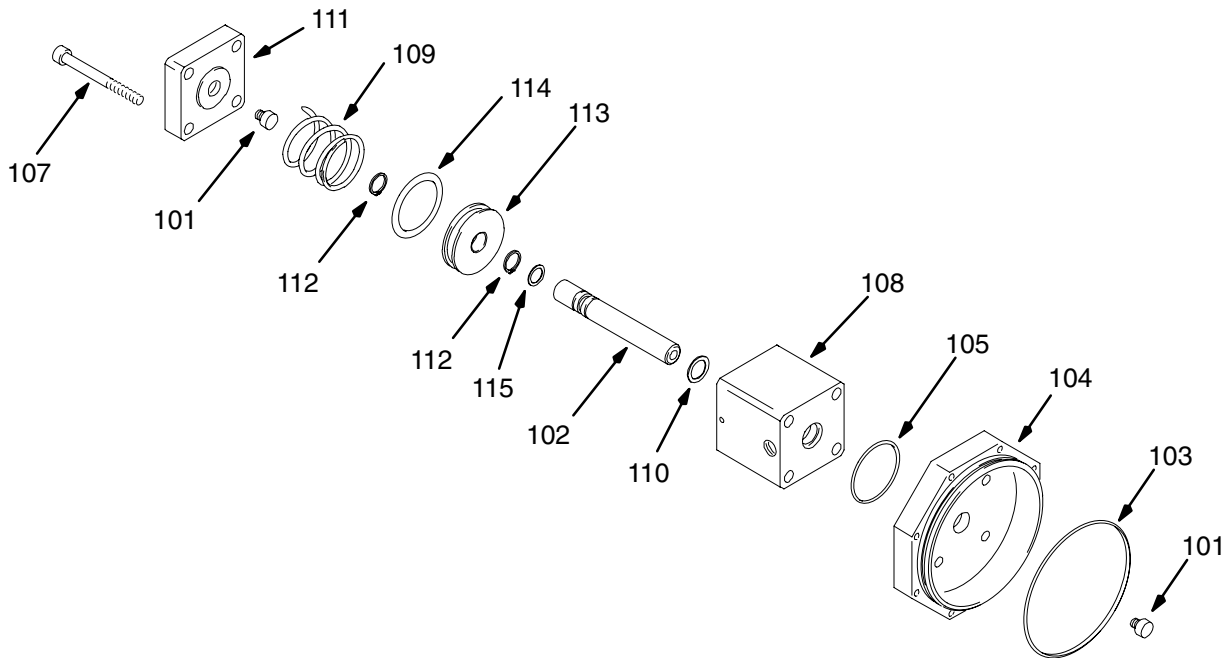


Fig. 6

T11392A

# Service

## Replacing the Pressure Sensor

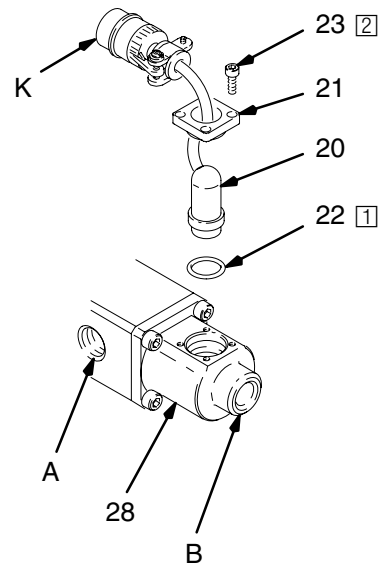
### WARNING



#### SKIN INJECTION HAZARD

To reduce the risk of a serious injury, including an injection injury, follow the **Pressure Relief Procedure** on page 5 before checking or servicing the equipment and whenever you are instructed to relieve the pressure.

1. Relieve the pressure in the system.
2. Disconnect the electrical cable (C) from the Metering Valve connector (E). See Fig. 2, page 4.
3. Disconnect the fluid lines from the metering valve fluid inlet (A) and outlet (B). See Fig. 7.
4. Disconnect the closer air line from the closer air inlet (G). See Fig. 2.
5. Unmount the Metering Valve and take it to a clean work area.
6. Disconnect the pressure sensor cable (K).
7. Remove the four screws (23), retainer (21), pressure sensor (20) and o-ring (22). Replace the o-ring if it is damaged.
8. Install the o-ring (22) on the new pressure sensor (20).
9. Lubricate the o-ring (22) with lithium-based grease, and re-install the pressure sensor (20), retainer (21), and screws (23). Torque the screws to 16 in-lbs (1.8 N•m).
10. Connect the pressure sensor cable (K).
11. Mount the Metering Valve.
12. Connect the fluid lines to the metering valve fluid inlet (A) and outlet (B). See Fig. 7.
13. Connect the electrical cable (C) to the Metering Valve connector (E). See Fig. 2, page 4.
14. Connect the closer air line to the closer air inlet (G).
15. Turn on the fluid supply.
16. Re-calibrate the PrecisionFlo system. See the applicable PrecisionFlo Control manual.

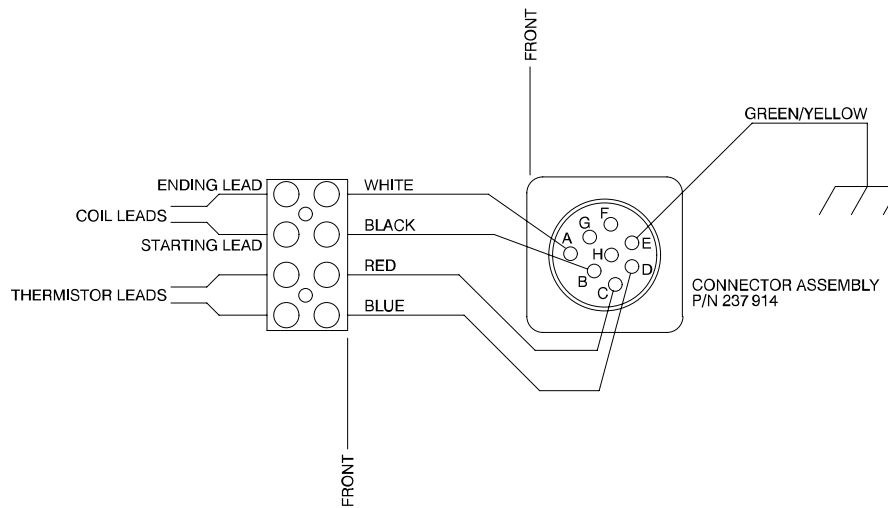


① Lubricate all o-rings and seals with lithium-based grease prior to installation

② Torque to 16 in-lbs (1.8 N•m).

**Fig. 7**

# Wiring Diagram

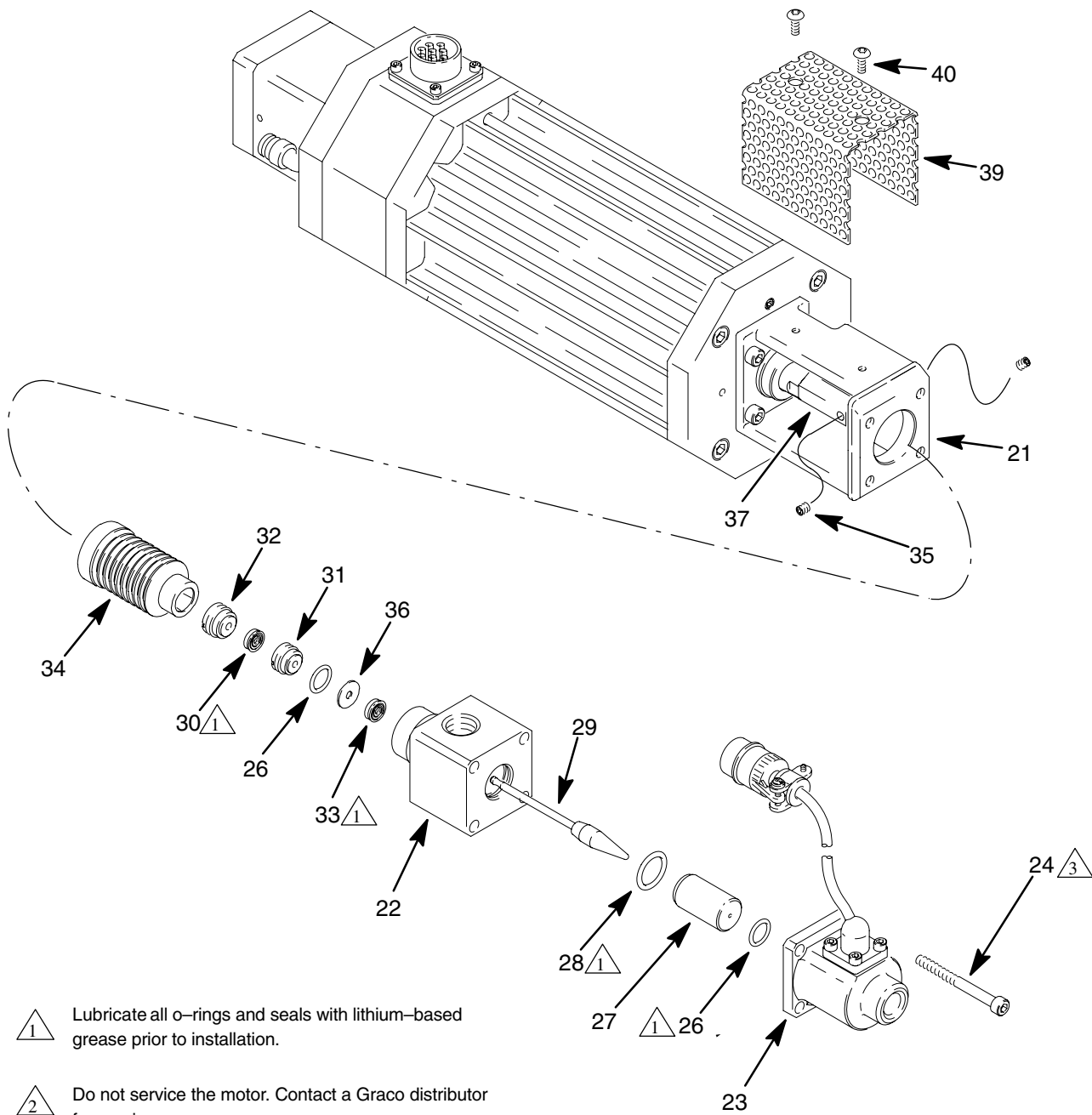


05480

Fig. 8

[illegible]

# Parts



Lubricate all o-rings and seals with lithium-based grease prior to installation.



Do not service the motor. Contact a Graco distributor for service.



Torque to 32 in-lb (3.6 N•m).

# Parts

Use Only Genuine Graco Parts and Accessories



## WARNING

### EQUIPMENT MISUSE HAZARD

Do not disassemble the Metering Valve motor. The motor contains powerful magnets, which could attract metal objects and create a hazardous condition if the motor end plates are removed. Contact your Graco distributor for motor service.

### Part No. 233678, Metering Valve Assembly

Includes items 1–40

| Ref. No. | Part No. | Description  | Qty. |
|----------|----------|--|------|
| 1        | 244706   | MOTOR ASSY.;<br>Includes items 2–14                                  | 1    |
| 2        | 233590   | CLOSER ASSY.;<br>see page 17 for parts                               | 1    |
| 3        | C19962   | .SCREW, cap; #6–32 x 3/4"  | 8    |
| 4        | C19950   | .SCREW, cap #4–40 x 3/8"   | 4    |
| 5        | 617559   | .SCREW, cap; #10–32 x 2–1/4"   | 4    |
| 6        | 113199   | .TERMINAL BLOCK, 4 pole  | 1    |
| 7        | C19952   | .SCREW, cap #4–50 x 5/8"   | 2    |
| 8        | 617746   | .REAR ENCLOSURE  | 1    |
| 9        | 237914   | .CONNECTOR ASSY., motor  | 1    |
| 10       | 112994   | .GASKET  | 1    |
| 11       | C38200   | .O–RING; buna–n; size –038   | 3    |
| 12       | 197951   | .SUPPORT, terminal strip   | 1    |
| 13       | 102063   | .LOCKWASHER  | 1    |
| 14       | 110981   | .SCREW, pan head; #8–32 x 5/16"                                      | 1    |
| 15*☆     | 918578   | PRESSURE SENSOR; 3500 psi<br>(not sold separately; order Kit 918428) | 1    |
| 16*      | 190518   | RETAINER, pressure sensor  | 1    |
| 17*†     | C20145   | O–RING; buna–n; size –014  | 1    |
| 18*      | 102410   | SCREW, cap; sst; #6–32 x 3/8"  | 4    |
| 19▲      | 290182   | TAG, warning   | 1    |

| Ref. No. | Part No. | Description                               | Qty. |
|----------|----------|---|------|
| 20       | 244972   | FLUID HEAD ASSY.;<br>Includes items 21–40 | 1    |
| 21       | 191381   | .FLUID HEAD MOUNT                         | 1    |
| 22       | 198304   | .FLUID BODY                               | 1    |
| 23       | 190517   | .ADAPTER                                  | 1    |
| 24       | 617559   | .SCREW; cap #10–32 x 2–1/4"               | 4    |
| 25       | C19277   | .LOCKWASHER; split #10                    | 8    |
| 26†      | 155685   | .O–RING; buna–n; size –012                | 2    |
| 27†      | 113005   | .SEAT, needle; carbide                    | 1    |
| 28†      | 104130   | .O–RING; buna–n; size –016                | 1    |
| 29†      | 198261   | .NEEDLE ASSY.                             | 1    |
| 30†      | 102921   | .SEAL, needle shaft; polyurethane         | 1    |
| 31†      | 198262   | .BUSHING                                  | 1    |
| 32†      | 188271   | .SEAL HOUSING                             | 1    |
| 33†      | 116632   | .SEAL, needle shaft; polymite             | 1    |
| 34†      | 198413   | .BOOT                                     | 1    |
| 35†      | 102279   | .SCREW, set; #8–32 x 3/16"                | 2    |
| 36†      | 116625   | .WASHER, flat                             | 1    |
| 37       | 198260   | .CONNECTOR                                | 1    |
| 38       | 113003   | SCREW, cap; #10–32 x 5/8"                 | 4    |
| 39       | 617742   | GUARD, support                            | 1    |
| 40       | 551787   | SCREW, cap; #10–32 x 3/8"                 | 2    |

\* These parts are included in Pressure Sensor Kit 198082, which may be purchased separately.

† These parts are included in Repair Kit 233681, which may be purchased separately.

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

☆ Some applications may require an optional 1500 psi (10.4 MPa, 104 bar) pressure sensor, which is available in Kit 918487. Contact your Graco distributor to order the kit.

# Parts

Use Only Genuine Graco Parts and Accessories

## WARNING

### EQUIPMENT MISUSE HAZARD

Do not disassemble the Metering Valve motor. The motor contains powerful magnets, which could attract metal objects and create a hazardous condition if the motor end plates are removed. Contact your Graco distributor for motor service.

### Part No. 233679, Metering Valve Assembly

Includes items 1–40

| Ref.<br>No. | Part No. | Description  | Qty. |
|-------------|----------|--|------|
| 1           | 918582   | MOTOR ASSY.;<br>Includes items 2–14                                  | 1    |
| 2           | 233590   | .CLOSER ASSY.;<br>see page 17 for parts                              | 1    |
| 3           | C19962   | .SCREW, cap; #6–32 x 3/4"  | 8    |
| 4           | C19950   | .SCREW, cap; #4–40 x 3/8"  | 4    |
| 5           | 617559   | .SCREW, cap; #10–32 x 2–1/4"   | 4    |
| 6           | 113199   | .TERMINAL BLOCK, 4 pole  | 1    |
| 7           | C19952   | .SCREW, cap; #4–40 x 5/8"  | 2    |
| 8           | 617746   | .REAR ENCLOSURE  | 1    |
| 9           | 237914   | .CONNECTOR ASSY., motor  | 1    |
| 10          | 112994   | .GASKET  | 1    |
| 11          | C38200   | .O–RING; buna–n; size –038   | 3    |
| 12          | 197951   | .SUPPORT, terminal strip   | 1    |
| 13          | 102063   | .LOCKWASHER  | 1    |
| 14          | 110981   | .SCREW, pan head; #8–32 x 5/16"                                      | 1    |
| 15*☆        | 918578   | PRESSURE SENSOR, 3500 psi<br>(not sold separately; order Kit 918428) | 1    |
| 16*         | 190518   | RETAINER, pressure sensor  | 1    |
| 17*†        | C20145   | O–RING; buna–n; size –014  | 1    |
| 18*         | 102410   | SCREW, cap; sst; #6–32 x 3/8"  | 4    |
| 19▲         | 290182   | TAG, warning   | 1    |

| Ref.<br>No. | Part No. | Description                               | Qty. |
|-------------|----------|---|------|
| 20          | 244973   | FLUID HEAD ASSY.;<br>Includes items 21–40 | 1    |
| 21          | 191381   | .FLUID HEAD MOUNT                         | 1    |
| 22          | 198304   | .FLUID BODY                               | 1    |
| 23          | 190517   | .ADAPTER                                  | 1    |
| 24          | 617559   | .SCREW, cap #10–32 x 2–1/4"               | 4    |
| 25          | C19277   | .LOCKWASHER, split #10                    | 8    |
| 26†         | 155685   | .O–RING; buna–n; size –012                | 2    |
| 27†         | 617524   | .SEAT, needle; carbide; high flow         | 1    |
| 28†         | 104130   | .O–RING; buna–n; size –016                | 1    |
| 29†         | 198293   | .NEEDLE ASSY.                             | 1    |
| 30†         | 102921   | .SEAL, needle shaft; polyurethane         | 1    |
| 31†         | 198262   | .BUSHING                                  | 1    |
| 32†         | 188271   | .SEAL HOUSING                             | 1    |
| 33†         | 116632   | .SEAL, needle shaft; polymite             | 1    |
| 34†         | 198413   | .BOOT                                     | 1    |
| 35†         | 102279   | .SCREW, set; #8–32 x 3/16"                | 2    |
| 36†         | 116625   | .WASHER, flat                             | 1    |
| 37          | 198260   | .CONNECTOR                                | 1    |
| 38          | 113003   | SCREW, cap; #10–32 x 5/8"                 | 4    |
| 39          | 617742   | GUARD, support                            | 1    |
| 40          | 551787   | SCREW, cap; #10–32 x 3/8"                 | 2    |

\* These parts are included in Pressure Sensor Kit 198082, which may be purchased separately.

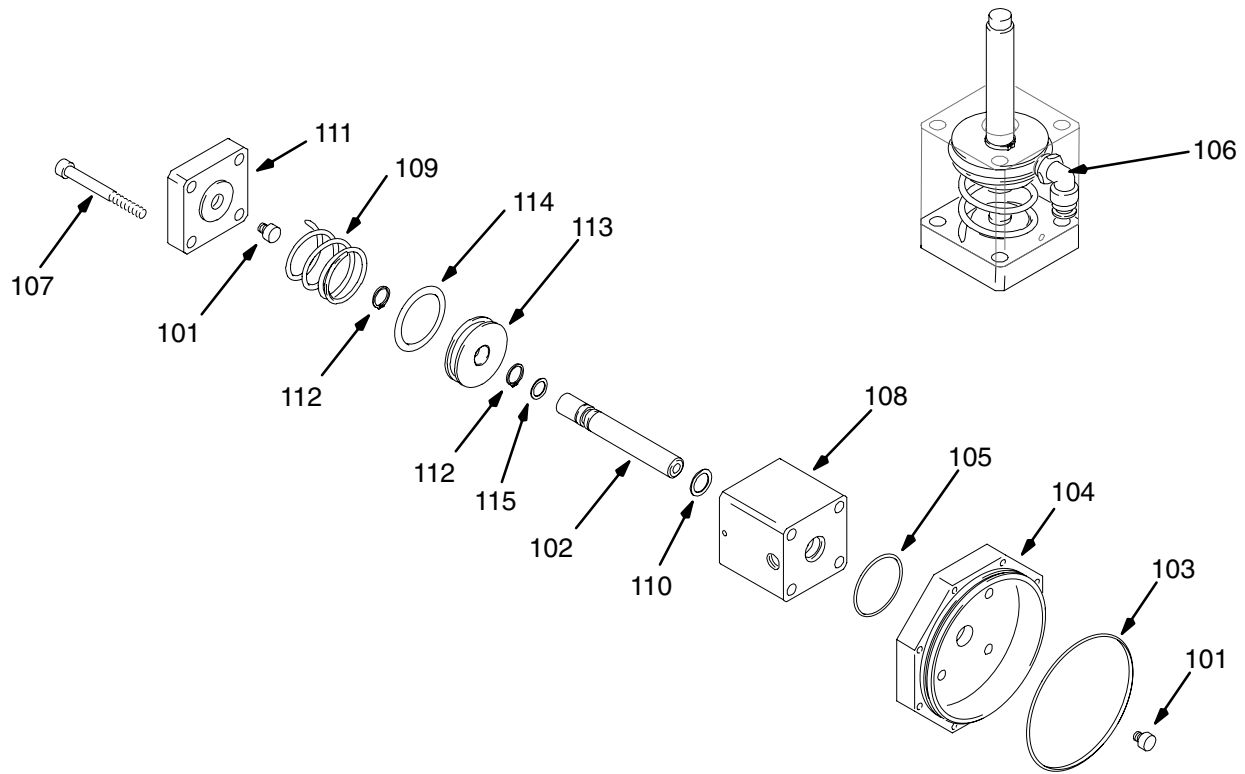
† These parts are included in Repair Kit 233680, which may be purchased separately.

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

☆ Some applications may require an optional 1500 psi (10.4 MPa, 104 bar) pressure sensor, which is available in Kit 918487. Contact your Graco distributor to order the kit.

# Parts

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TI1392A

## Part No. 233590 Closer Assembly

Includes items 101–115

| Ref. No. | Part No. | Description                 | Qty. | Ref. No. | Part No. | Description                 | Qty. |
|----------|----------|-----------------------------|------|----------|----------|-----------------------------|------|
| 101      | 112987   | BUMPER, rubber              | 2    | 109      | 111092   | SPRING, PrecisionFlo closer | 1    |
| 102      | 15E015   | VALVE ROD                   | 1    | 110      | 801050   | O-RING; buna-n; size -014   | 1    |
| 103      | 112106   | O-RING, buna-n, size -042   | 1    | 111      | 197933   | CYLINDER CAP                | 1    |
| 104      | 197936   | COVER, rear enclosure       | 1    | 112      | 15E017   | RING, retaining             | 2    |
| 105      | 111098   | O-RING, buna-n, size -028   | 1    | 113      | 111094   | PISTON, valve               | 1    |
| 106      | C19388   | FITTING, 90°; 1/4 x 1/8 npt | 1    | 114      | 111095   | O-RING; buna-n; -219        | 1    |
| 107      | 198314   | SCREW, cap; 1/4-20 x 2-1/2" | 4    | 115      | 155685   | O-RING; buna-n; size -012   | 1    |
| 108      | 197935   | CYLINDER, air closer        | 1    |          |          |                             |      |

[illegible]

# Technical Data

| Category                       | Data  |
|--------------------------------|---|
| Maximum Fluid Working Pressure | 3500 psi (24 MPa, 240 bar)  |
| Fluid Inlet and Outlet         | 3/8–18 npt  |
| Weight                         | 18 lbs. (8.16 kg)   |
| Wetted Parts                   | 303 stainless steel (SST), tungsten carbide, chrome-plated 17–4 PH SST, 15–5 PH SST, braze, cast polyurethane, buna-n, PTFE   |
| Fluid Specifications           | For use when dispensing fluids that meet at least one of the following conditions for non-flammability: <ul style="list-style-type: none"> <li>• The fluid has a flash point above 140°F (60°C) and a maximum organic solvent concentration of 20%, by weight, per ASTM Standard D93.</li> <li>• The fluid does not sustain burning when tested per ASTM Standard D4206 Sustained Burn Test.</li> </ul> |
|                                | Fluid Viscosity: 10,000 cps to 1,000,000 cps*   |
|                                | Maximum Fluid Temperature: 176°F (80°C)   |

\* Flow rate is dependent upon material viscosity, tip size and supply pressure.

## Related Publications

| Product                       | Form#  |
|-------------------------------|--------|
| PrecisionFlo Module           | 308540 |
| PrecisionFlo Control Assembly | 310531 |

PrecisionFlo™ and PrecisionFlo™ Plus are trademarks of Graco, Inc.

# Graco Standard Warranty

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

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

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

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

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

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

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

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## Graco Information

**TO PLACE AN ORDER**, contact your Graco distributor, or call one of the following numbers to identify the distributor closest to you:

**1-800-328-0211 Toll Free**

**612-623-6921**

**612-378-3505 Fax**

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