

# EnDure™ Automatic Dispense Valves

309376R

EN

**Air-operated dispense valves used for sealant and adhesive materials. *For professional use only.***

*3500 psi (24.10 MPa, 241 bar) Maximum Dynamic Discharge Fluid Working Outlet Pressure*

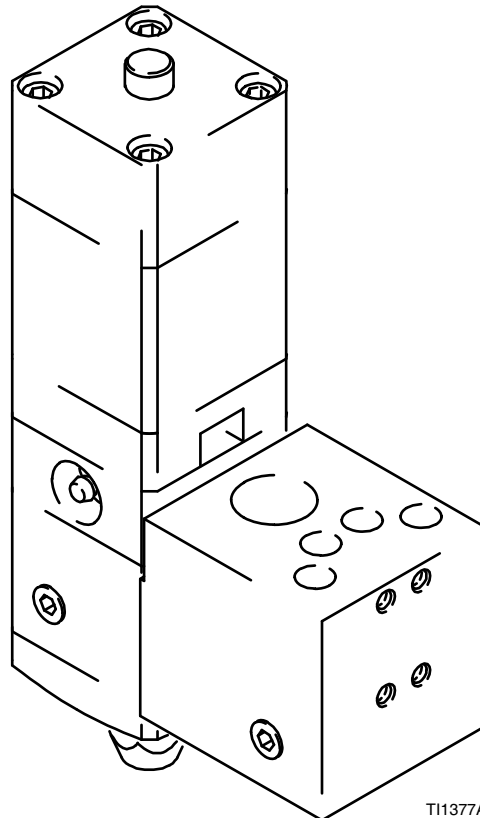
*5000 psi (34.5 MPa, 345 bar) Maximum Static Working Pressure*

*120 psi (.83 MPa, 8.3 bar) Maximum Air Pressure*



## **Important Safety Instructions**

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



06540A

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# Models

| Basic Valve Part | Complete Valve Part | Description (Replaces ...)  | Maximum Fluid Temperature Rating °C (°F) | Heater Voltage Pin Connector   | Wattage | Valve Outlet Connection                                 | Parts Page |
|------------------|---------------------|---|--|--|---------|---|------------|
| 244535           | 244910              | Valve, ambient or water conditioned. Replaces C27340 hard seat and 918512 soft seat snuff-back, if application is under 95 C (200 F).   | 95 °C (200 °F)                           | Nonpowered ambient or water circulation for temperature conditioning | 0       | 5/8-18 male thread.<br><br>Retainer nut with 1/8 npt(f) | 29         |
|                  | 244962              | Valve, 230 Volt E-Heat Replaces 243694 hard seat and 243696 soft seat snuff-back valves. Any Therm-O-Flow Plus (after July 2000) if application is under 95 C (200 F).                  | 95 °C (200 °F)                           | 230 VAC<br>8 Pin square  | 200     | 5/8-18 male thread.<br><br>Retainer nut with 1/8 npt(f) | 23         |
|                  | 244909              | Valve, 230 Volt E-Heat Replaces 243694 hard seat and 243696 soft seat snuff-back valves. Any Therm-O-Flow Plus (after July 2000) if application is 95 C (200 F) to 204 C (400 F).       | 204 °C (400 °F)                          | 230 VAC<br>8 Pin square  | 200     | 5/8-18 male thread.<br><br>Retainer nut with 1/8 npt(f) | 23         |
| 244937           | 244951              | Valve, 230 Volt E-Heat Replaces valve 243695 hard seat with 1/2" npt (m) outlet. Any Therm-O-Flow before Therm-O-Flow Plus (July 2000) if application is 95 C (200 F) to 204 C (400 F). | 204 °C (400 °F)                          | 230 VAC<br>8 Pin square  | 150     | 1/2 npt (m)   | 23         |

# Warnings

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

## WARNING



INSTRUCTIONS



### 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, warnings, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are uncertain, call your Graco distributor.
- 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 exceed the maximum air working pressure of 1 MPa (8.3 bar, 120 psi) to the applicator.
- Do not exceed the maximum fluid working pressure of 24 MPa (241 bar, 3500 psi) to the applicator or manifold.
- Never exceed the recommended working pressure or the maximum air inlet pressure stated on your pump or in the **Technical Specifications** on page 29.
- Be sure that all spray/dispensing equipment and accessories are rated to withstand the maximum working pressure of the pump. Do not exceed the maximum working pressure of any component or accessory used in the system.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not expose Graco standard hoses to temperatures above 180°F (82°C) or below -40°F (-40°C). Do not expose Graco electrically heated hoses to temperatures above 400°F (222°C) or below -40°F (-40°C).
- Do not use the hoses to pull the equipment.
- Use only fluids and solvents that are compatible with the equipment wetted parts. See the **Technical Specifications** sections of all the equipment manuals. Read the fluid manufacturer's warnings.
- Always wear protective eyewear, gloves, clothing, and respirator as recommended by the fluid and solvent manufacturers.
- Wear hearing protection when operating this equipment.
- Comply with all applicable local, state and national fire, electrical and other safety regulations.

# WARNING



## HOT SURFACE AND FLUID HAZARD

Heated fluid can cause severe burns and can cause equipment surfaces to become very hot.

- Wear protective gloves and clothing when operating this equipment in a heated system.
- Do not touch the metal heat sink when the surface is hot.
- Allow the equipment to cool thoroughly before servicing.

Some heated systems are designed to dispense Polyurethane (PUR) heated materials. PUR systems are supplied with ventilation hoods, and require proper ventilation and specially designed system components.



## SKIN INJECTION HAZARD

Spray from the applicator, hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed 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 applicator at anyone or at any part of the body.
- Do not put hand or fingers over the front of the applicator.
- Do not stop or deflect fluid leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** on page 14 whenever you are instructed to: relieve pressure; stop dispensing; clean, check, or service the equipment; or install or clean a 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.
- ALWAYS wear eye protection and protective clothing when installing, operating, or servicing this dispensing equipment.
- Do not remove or modify any part of the applicator; this can cause a malfunction and result in serious bodily injury.
- Use extreme caution when cleaning or changing tips. If the tip clogs while applying material, ALWAYS follow the **Pressure Relief Procedure** on page 14, then remove the tip to clean it.
- NEVER wipe off build-up around the tip or air cap until pressure is fully relieved.

# WARNING



## 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.



- Ground the equipment and the object being sprayed. The Heated Automatic Dispense Valve is grounded to truth earth ground inside the electrical control panel. See **Grounding** on page 9.
- Ground the equipment and the object being sprayed, and all other electrically conductive objects in the dispense area. Proper grounding dissipates static electricity generated in the equipment. See **Grounding** on page 9.
- Do not use this equipment with flammable liquids.
- Keep the dispense area free of debris, including solvent, rags, and gasoline.
- If there is any static sparking or you feel an electric shock while using the equipment, **stop dispensing immediately**. Do not use the equipment until you have identified and corrected the problem.
- Make sure all electrical work is performed by a qualified electrician only.
- Have any checks, installation, or service to electrical equipment performed by a qualified electrician only.
- Make sure all electrical equipment is installed and operated in compliance with applicable codes.
- Make sure power is disconnected when servicing and repairing equipment.
- Before operating the equipment, extinguish all open flames or pilot lights in the dispense area.
- Do not smoke in the dispensing area.
- Keep liquids away from the electrical components
- Disconnect electrical power at the main switch before servicing the equipment.
- Never exceed maximum wattage of the supply unit.



## 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.

- Provide fresh air ventilation to avoid the buildup of vapors from the fluid being dispensed.
- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.
- Avoid exposure to heated material fumes.

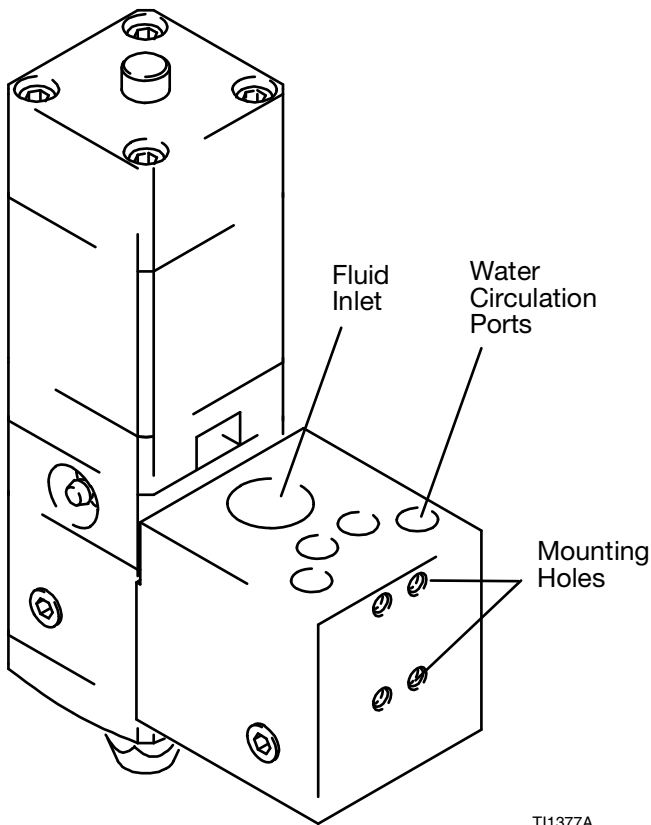
# Installation

Install the automatic applicator as follows:

- mount the automatic dispense valve
- attach dispense tip or nozzle
- connect the air lines
- connect material hose
- if heated, connect the electrical cable
- if temperature conditioned, connect the water circulation
- make sure the automatic dispense valve is grounded

## Mount the Automatic Dispense Valve

Mount the automatic dispense valve to the mounting bracket on a stationary support or robotic arm (Fig. 1), using two M6x1.0 socket head screws and two flat washers. If your application is heated, be sure to position the insulation block between the dispense valve and the mounting bracket, (Fig. 2). Refer to the dimensions on page 28.



T11377A

Ambient or temperature conditioned model shown

Fig. 1 \_\_\_\_\_

# Installation

## Connect Air Lines to Dispense Valve

### **CAUTION**

Only use air fittings that are rated at a temperature equal to or higher than the operating temperature of your fluid dispensing system. Lower rated air fittings could melt and cause damage to the automatic dispense valve.

These valves are air to open and air to close with a spring to bias them closed. Use a 4-way exhausting solenoid to operate these valves.

Be sure to connect the appropriate air lines to the appropriate ports (Fig. 2), and securely connect air lines to dispense valve air ports. See page 28.

## Connect Material Hose to Dispense Valve

Securely connect the material hose to the dispense valve material inlet port. See Fig. 2.

## Connect Electrical Cable to Electrically Heated Dispense Valves

Connect electrical cable plug from your Therm-O-Flow, Therm-O-Flow Plus, or PrecisionFlo hose or control. A six-pin round connector is used on 120 volt valves and an eight-pin square connector is used on 240 volt valves.

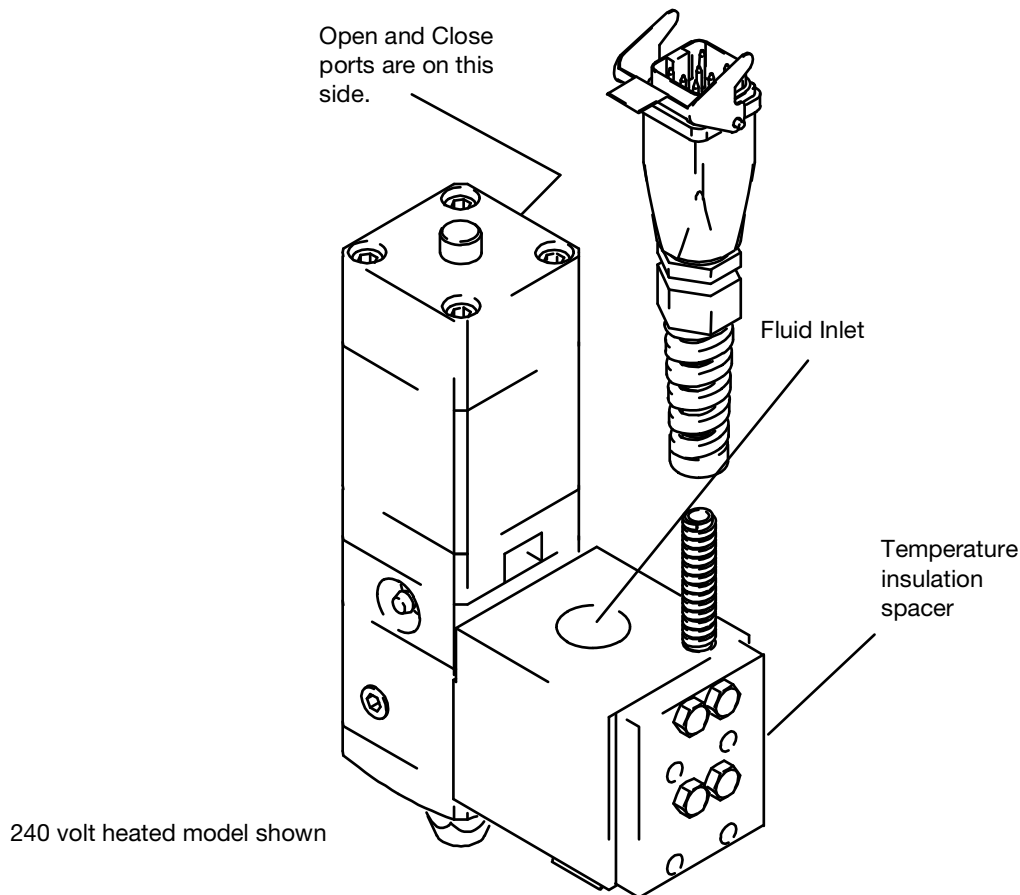


Fig. 2



# Installation

## Grounding

**⚠ WARNING**

**FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD**

To reduce the risk of fire, explosion, or electric shock:

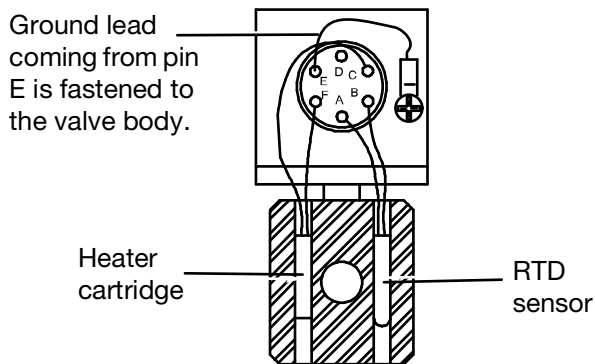
- The power source conduit is not an adequate ground for the system. The unit must be grounded to either the building ground or a true earth ground.
- A qualified electrician must complete all grounding and wiring connections and check the resistance.

- Refer to your local code for the requirements for a "true earth ground" in your area.
- Also read and follow the warnings on page 6.

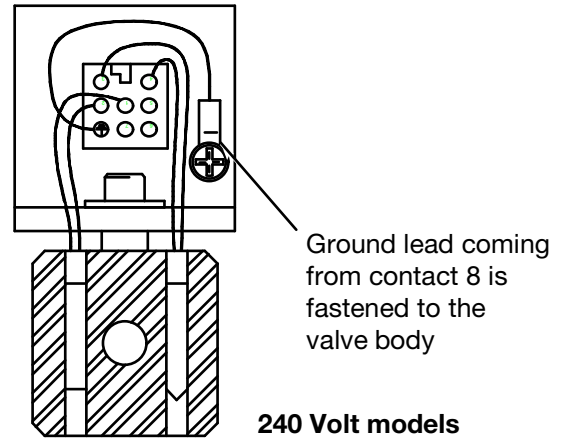
### Electrically Heated Models.

Ground the automatic dispense valve:

1. Connect the connector from a heated hose to the receptacle on the dispense valve.



**Fig. 3** **120 Volt models**



**Fig. 4**

2. Connect the electrical cable to the electrical control panel.
3. Verify that socket contact E on six pin models (see Fig. 5) or contact eight on eight pin models (see Fig. 4), inside control panel receptacle, is connected to true earth ground.

See page 31 for schematics.

### Snuff-Back

Snuff-back is created when the needle is pulled back through a restrictive ring before it closes against the carbide seat.

For maximum snuff-back, leave the ring in place. For maximum flow with less snuff-back, remove the ring. For additional snuff-back, use a quick exhaust valve (104661) on the "open" air port.

Nozzle selection and gun movement also effect fluid cut-off characteristics.

# Installation

## Connecting the Electrical Cable from a Therm-O-Flow Plus Heated Hose

1. Wrap the hose cable around the hose one time. Connect the electrical cable from the hose to the valve cable; lock the metal clip on the top of the connector. See Fig. 5.
2. Place the flat side of the cable connection against the hose, making sure the metal clip faces away from the hose. This will prevent damage to the hose from the clip rubbing against it. See Fig. 6.
3. Secure the cable connector to the hose with heavy tape or Velcro straps. For installations where the dispense valve is moving, it is recommended that the connector be wrapped with the Graco accessory Velcro wrap (198422) and 2 Velcro straps (198442) as shown in Fig. 7.



Fig. 5

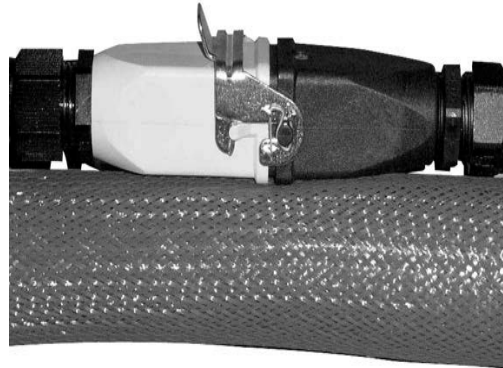


Fig. 6



Fig. 7

# Maintenance

The following tables list recommended maintenance procedures and frequencies. The maintenance is divided between mechanical and electrical tasks. A typical application is a valve mounted on a robot dispensing a moderately abrasive sealant.

## Mechanical

| Task                             | Daily | Weekly | Monthly or 30,000 cycles | 3-6 months or 125,000 cycles | 6-12 months or 250,000 cycles | 18-24 months or 500,000 cycles | 36-48 months or 1,000,000 cycles | 6-8 years or 2,000,000 cycles |
|----------------------------------|-------|--------|--------------------------|------------------------------|-------------------------------|--------------------------------|----------------------------------|-------------------------------|
| Inspect for leaks                |       | ✓      |                          |                              |                               |                                |                                  |                               |
| Check hoses for wear*            |       | ✓      |                          |                              |                               |                                |                                  |                               |
| Check/tighten fluid connections* |       | ✓      |                          |                              |                               |                                |                                  |                               |
| Check/tighten air connections*   |       | ✓      |                          |                              |                               |                                |                                  |                               |
| Lube packings                    |       |        | ✓                        |                              |                               |                                |                                  |                               |
| Rebuild dispense valve           |       |        |                          |                              | ✓                             |                                |                                  |                               |
| Replace valve                    |       |        |                          |                              |                               |                                |                                  | ✓                             |

\* Assumes movement from automation.

## Electrical

| Task                                  | Daily | Weekly | Monthly | 6 Months | 12 Months |
|---------------------------------------|-------|--------|---------|----------|-----------|
| Check cables for wear                 |       | ✓      |         |          |           |
| Verify cable connections              |       | ✓      |         |          |           |
| Verify resistance of electric heaters |       |        | ✓       |          |           |
| Verify resistance of RTD sensors      |       |        | ✓       |          |           |

### Packing Lubrication

This valve has a primary seal, a pressurized grease area, and a secondary seal. The key to long seal life is that the secondary seal only has to seal grease.

When dispensing filled materials this grease should be refreshed once a month.

1. Remove one of the zerk grease fittings (23).
2. Using a grease gun, pump a high quality grease like #115982 (high temperature moisture free) into the remaining zerk fitting until fresh grease comes out the other side.
3. Replace the grease fittings and give the valve one more shot of grease to pressurize the cavity.

# Maintenance

## Factors affecting valve life

The maintenance tables should be used as a guideline for frequency of maintenance tasks. Additional factors that affect valve life include the following:

- **Process fluid** - Abrasive or fiber filled fluids are much harder on seals, shafts, and seats than non-abrasive fluids such as oil.
- **Pressure drop across the valve seat** - As the valve opens or closes, the fluid is accelerated to a high velocity at the needle/seat contact area. The rate of wear at the valve will be much greater at 3000 psi than at 1000 psi. Changing nozzle or tip size can have a substantial affect on wear.
- **Number of cycles** - This has a much greater affect on valve wear than number of gallons. If you can do the same job with fewer on/off cycles, the valve will last longer.
- **Speed of actuation** - Snapping the valve open and closed quickly will give longer needle and seat life. Avoid long air tube runs after the solenoid, or use quick exhaust valves (104661) on the dispense valve.
- **Air pressure** - This is what provides the force to hold the hardened SST needle against the carbide seat to seal against fluid pressure. Any leakage on these hard parts, at high pressure, will quickly "worm-hole" the parts and cause the valve to fail. This valve has been designed with two air pistons to give it an exceptionally high, 68:1 advantage of air pressure to fluid pressure. This means that you can reliably operate at 60 psi of air, even with 4000 psi of downstream pressure.

# Troubleshooting

Some solutions require disassembling the automatic dispense valve. Always relieve system pressure before performing these procedures.

## ! WARNING



To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** (page 14).

See PARTS section for the parts that need to be serviced.

| Problem   | Cause(s)  | Solution(s)   |
|---|---|---|
| Air leaks from automatic dispense valve               | Loose air connections   | Check air connections.  |
|   | Worn o-rings  | Replace o-rings in cylinder.  |
| Material leaks from front of automatic dispense valve | Seal, needle, or seat is worn   | Replace seat seals (12 & 26), needle (7), and seat (13).  |
|   | Obstruction inside dispense valve                                       | Remove nose piece (6). Check and replace if necessary, seals (12 & 26), needle (7), and seat (13).                |
|   | Worn needle   | Check and replace needle (7), if necessary. If replacing needle, you must reverse or replace seat (13).           |
|   | Worn seat (Base seal models)  | Check and replace or reverse seat (13) if necessary. Replace needle (7) with seat (13).                           |
| Material leaks from automatic dispense valve body     | Seal not installed correctly  | Check seals (15 & 16) and replace if necessary.   |
|   | Seal is worn  |   |
| Automatic dispense valve does not shut off            | Loose air connections   | Check air connections.  |
|   | Worn needle-seal interface  | Replace rod seal (12 & 26), needle (7), and seat (13).  |
| Automatic dispense valve does not shut off            | Broken retaining ring (10) or debris in air cylinder.                   | Disassemble dispense valve. Check and replace, if necessary, retaining ring (10) and o-rings (17, 18, 19 and 21). |
| Automatic dispense valve does not shut off            | Spring broken or not installed correctly                                | Disassemble dispense valve. Check spring (24) and replace, if necessary.  |
| Automatic dispense valve does not heat material       | Loose heater wires  | Check and reconnect wire connections.   |
|   | Loose sensor wires  | Check and reconnect wire connections.   |
|   | Heater unit failed  | Replace heater.   |
|   | Sensor failed   | Replace sensor.   |
|   | Temperature controller failed   | Replace temperature controller.   |
| Automatic dispense valve will not open                | No power to heating circuitry   | Apply power to heating circuitry.   |
|   | Fluid pressure in outlet line greater than 24.1 MPa (241 bar, 3500 psi) | Reduce outlet restrictions  |
|   |   | Reduce fluid pressure   |
|   | Air cylinder pressure too low   | Increase air pressure   |

# Service

## Pressure Relief Procedure

### **WARNING**



#### **HOT SURFACE AND FLUID HAZARD**

**The material and equipment will be hot!**

To reduce risk of injury, wear eye protection, gloves and protective clothing when installing, operating, or servicing this dispensing system.



#### **SKIN INJECTION HAZARD**

The system pressure must be manually relieved to prevent the system from starting or spraying 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 spraying/dispensing
- install or clean the nozzle
- check or service any of the system equipment



#### **PRESSURIZED FLUID HAZARD**

High pressures can cause serious personal injury. Be sure to **open the dispense valve during system heat-up** to alleviate pressure which might occur in the system due to material expansion.

This procedure describes how to relieve pressure from the automatic dispense valve. See your supply unit or system documentation for instructions on relieving pressure for the entire dispensing system. Use this procedure whenever you shut off the dispense valve and before checking or adjusting any part of the system, to reduce the risk of serious injury.

1. Shut off the material supply.
2. If heated, shut off electrical power to the automatic dispense valve.
3. Close all self bleeding air supply valves for supply unit.
4. Have a container ready to catch the drainage, then bleed off material pressure by actuating the dispense valve.
5. Shut off air supply to valve.

**NOTE:** *If you suspect that the nozzle or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, **very slowly** loosen the tip retaining nut or hose end coupling to relieve pressure gradually, then loosen completely. Then clear the tip/nozzle or hose.*

# Service

## Prepare to Service Automatic Dispense Valve

If the unit is hot, determine whether or not you can service the unit after it has cooled down. Some materials, like polyurethanes, may cure permanently when cooled and exposed to air, preventing you from disassembling the dispense valve. If you are working with such a material, service the unit while the material is at a temperature where the material is soft enough to work with. If the material can be reheated at a later time, you can service the unit after it has cooled, reheating the material as necessary.

Perform this procedure before servicing the automatic dispense valve.

1. **Relieve the system pressure.**

### **WARNING**

To reduce the risk of serious injury, whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** (page 14).

2. Make sure material flow has been shut off.
3. Make sure system air has been shut off.

4. Remove power from the automatic dispense valve.

### **WARNING**



#### **HOT SURFACE AND FLUID HAZARD**

**The material and equipment will be hot!**

To reduce risk of injury, wear eye protection, gloves and protective clothing when servicing this dispensing system component.

5. If the material in the dispense valve can be reheated, wait for the dispense valve to cool thoroughly before servicing it.

If the material in the dispense valve cures permanently when cooled and/or exposed to air, service the unit while the material is at a temperature where the material is soft enough to work with.

# Service

## Service the Automatic Dispense Valve

The dispense valves can be serviced or replaced without disconnecting the fluid hose or temperature control cables or tubes.


### Disconnect Automatic Dispense Valve from its Inlet Manifold

Remove the automatic dispense valve from its mounting bracket.

1. Perform the procedures in **Prepare to Service Automatic Dispense Valve** on page 15.

**⚠ WARNING**

**HOT SURFACE AND FLUID HAZARD**  
**The material and equipment will be hot!**  
To reduce risk of injury, wear eye protection, gloves and protective clothing when servicing this dispensing system component.



2. Disconnect air lines from dispense valve air ports.
3. Remove 4 M-6 socket head screws that connect the valve body to the inlet manifold. (see Fig. 8.)
4. Pull the valve body straight away from the inlet manifold.

### Reconnect Automatic Dispense Valve to Mounting Bracket

1. Install new o-ring on fluid passage and water passages if used.
2. Line up valve body with locating pins and heater and sensor if used.
3. Push valve straight on to pins. Torque retaining screws evenly to 50-60 in/lb.
4. Reconnect air lines to dispense valve air ports.

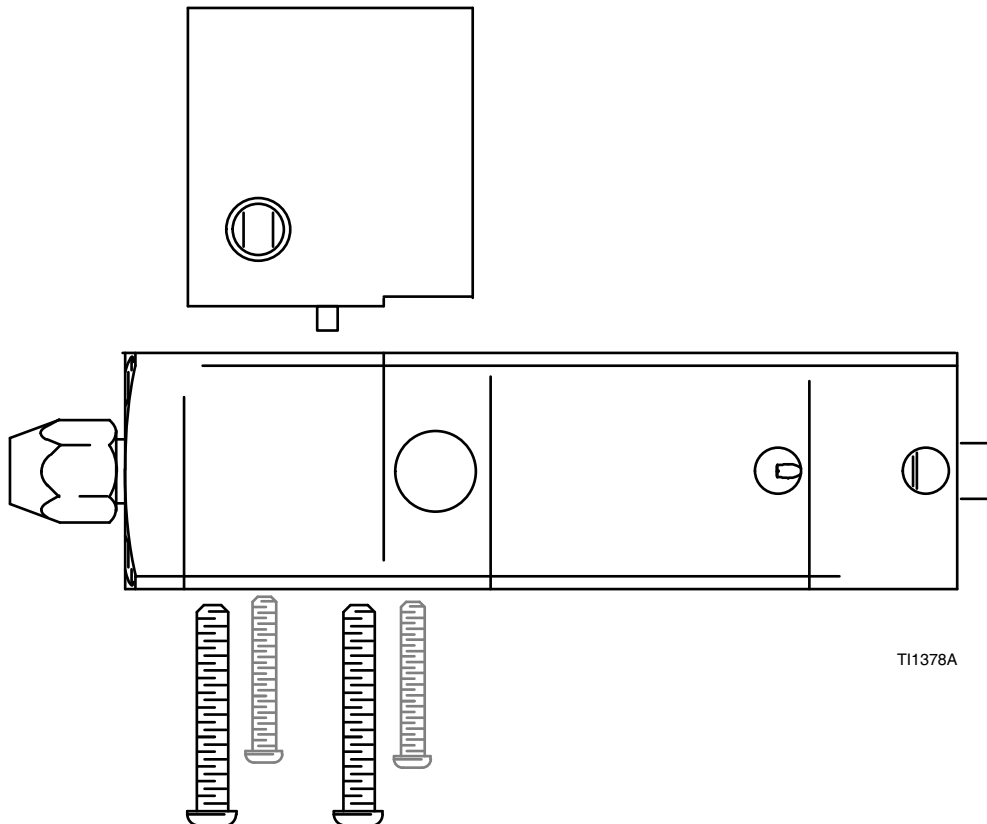


Fig. 8



# Service

## Valve models 244535, 244907, and 244937

**NOTE:** See parts drawing on page 20 for parts referenced in parentheses ( ).

### Disassemble Automatic Dispense Valve

**NOTE:** The fluid section and the air section can be serviced independently.

#### Fluid Section

1. Remove 4 screws (22) and pull the nose piece (6) straight off.
2. Insert a 3/32 punch or an allen wrench through the hole in the head of the needle (7) and unscrew from shaft (8). Another punch can be used through the hole in shaft (8) to keep it from turning.
3. Remove seat (13) and gasket (12).

4. Pull fluid housing (5) and grease bearing housing (4) from the shaft.

#### Air Section

1. Remove 4 screws (22) from top of valve. Pull top air cylinder housing (1) straight off.
2. Remove the first retaining ring (10), piston (9), and second retaining ring (10).

**NOTE:** Use only the new retaining rings provided in repair kit when reassembling air section of valve.

3. Pull lower air cylinder housing (2) straight away from housing (3)
4. Remove shaft (8) if fluid section has been disassembled.

# Service

## Assembly of Automatic Dispense Valve Models 244535, 244907, and 244937

**NOTE:** See parts drawing on page 20 for parts referenced in parentheses ( ). See service drawing on page 19 for references to steps in this procedure [x].

### Air Section

1. Lubricate all seals and sliding parts with a high temperature, moisture free grease such as #115982 grease cartridge (ordered separately).
2. Assemble o-rings (17), (19), and (21) into or onto their respective parts as shown. Install o-ring (18) only to housing (3).
3. Insert shaft (8), (small end first) into housing (3).

**NOTE:**

- Do not overextend retaining ring (10) during installation and repair.
- Make sure to assemble retaining ring longitudinally down the shaft diameter.
- Do not stretch the ring around the diameter.
- Use only the new retaining rings provided in repair kit when reassembling air section of valve.

4. Assemble the lowest retaining ring (10) on the shaft. Add o-ring (18) onto the shaft, then add spring (24), a piston (9), and the next retaining ring (10).
5. Slide housing (3) straight down over shaft (8) with pieces aligned as shown.
6. Add next retaining ring (10), o-ring (18), piston (9), and last retaining ring (10).
7. Insert button (33) into housing (1) and push assembly down over the piston and shaft.
8. Align the open/close air ports as shown.
9. Insert four screws (22) and torque evenly to 40-50 lb-in.

### Fluid Section

10. Lubricate all seals and sliding parts with a high temperature, moisture free grease such as #115982 grease cartridge (ordered separately).
11. Carefully insert “U” cup (15) into bearing (11) with the open end of the seal facing into the bearing. Install the two o-rings (21) on the outside grooves of the bearing.
12. Insert the bearing, “U” cup end first, into the grease housing (4). Push this assembly onto shaft (8) while holding bearing (11) into housing (4).
13. Carefully insert “U” cup (16), lips first, into the appropriate end of housing (5). Push this assembly onto shaft (8), up against housings (3) and (4).
14. Place the valve in a vice such that it is pushing button (33) to compress the spring.
15. Place the clear plastic gasket (12) and seat (13) into their groove on housing (5). The seat is reversible and can go in either way.
16. Insert needle (7) through seat (13). While holding shaft (8), screw the needle (7) into shaft (8) using Loctite blue thread locker. Tighten with a 3/32 pin or punch to approximately 15-20 lb-in.
17. Place snuff-back ring (14) in nose piece (6) and white o-ring (26) in its groove on housing (5). Align nose piece (6) and push straight into place. If higher flow and less snuff-back is desired, do not use the snuff-back ring (14).
18. Insert four screws (22) with Loctite blue thread locker and tighten evenly, compressing bearing (11) to 40-45 lb-in.
19. Cycle valve 25 times at full air pressure to set hardened needles to carbide seat.
20. Install one fitting (23). Pump grease (27) across bearing (11) and out other side. Install second fitting (23) and apply another shot of grease.
21. Use pipe thread sealant on plugs (36 and 35).

# Service

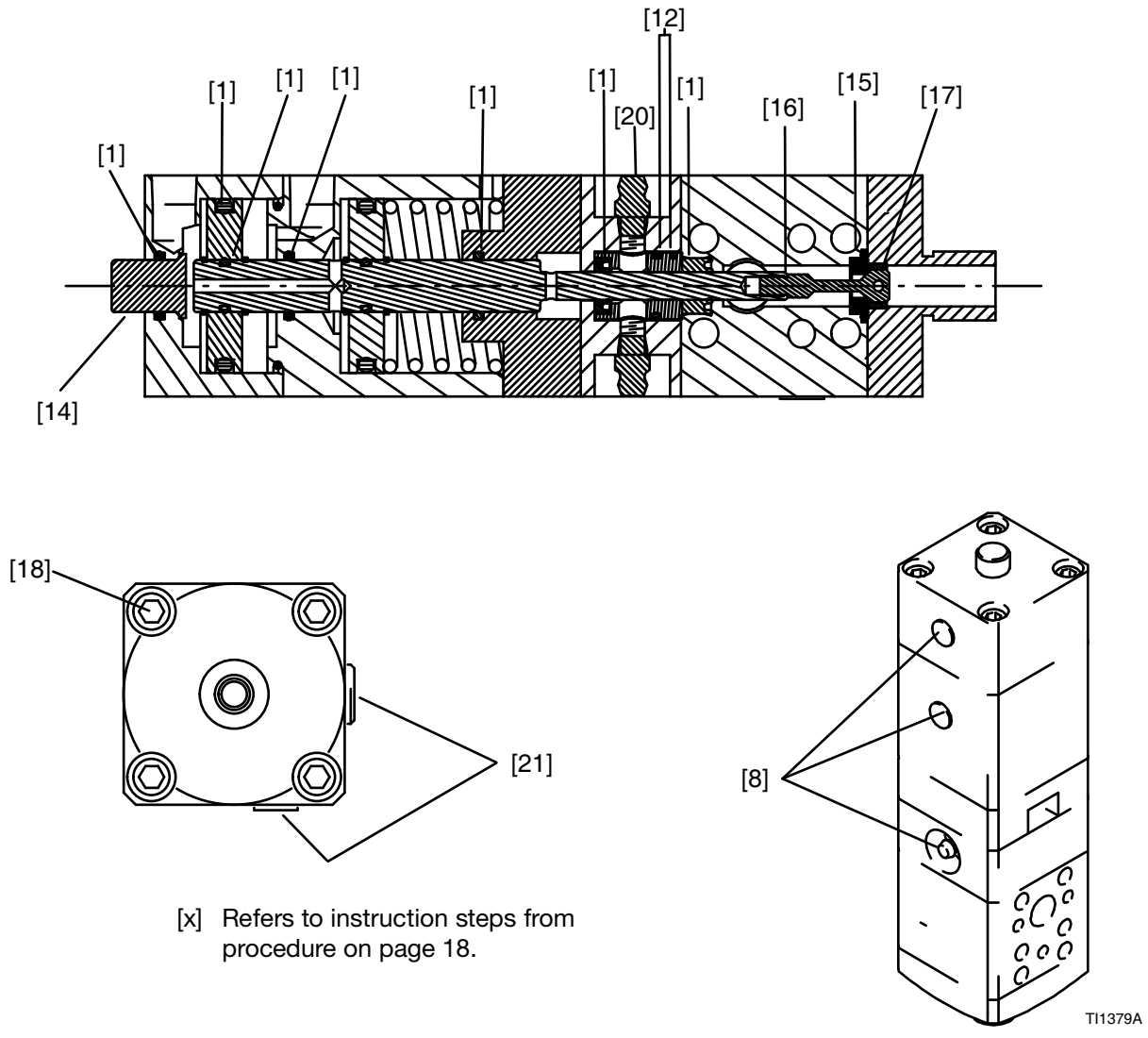
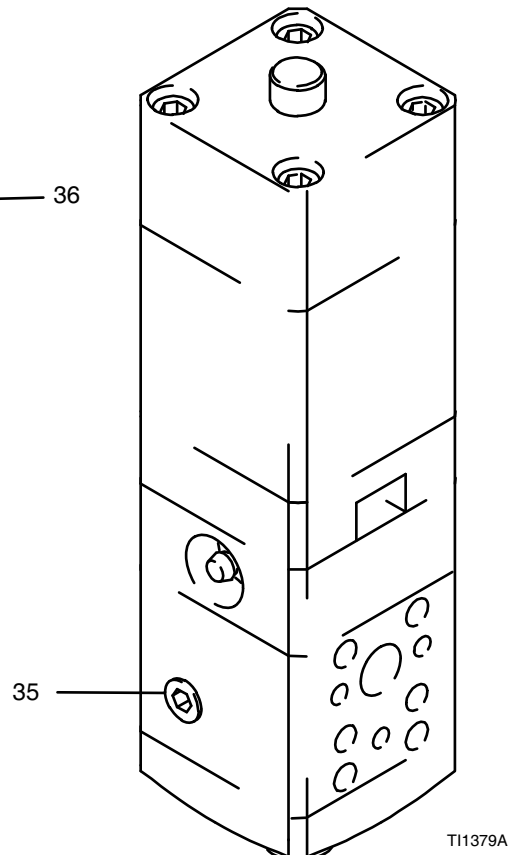
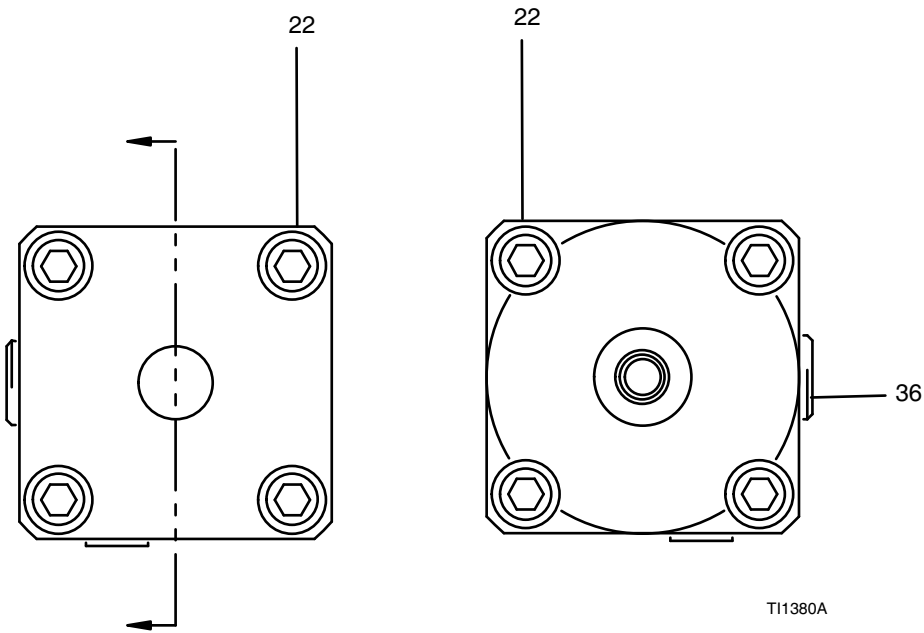
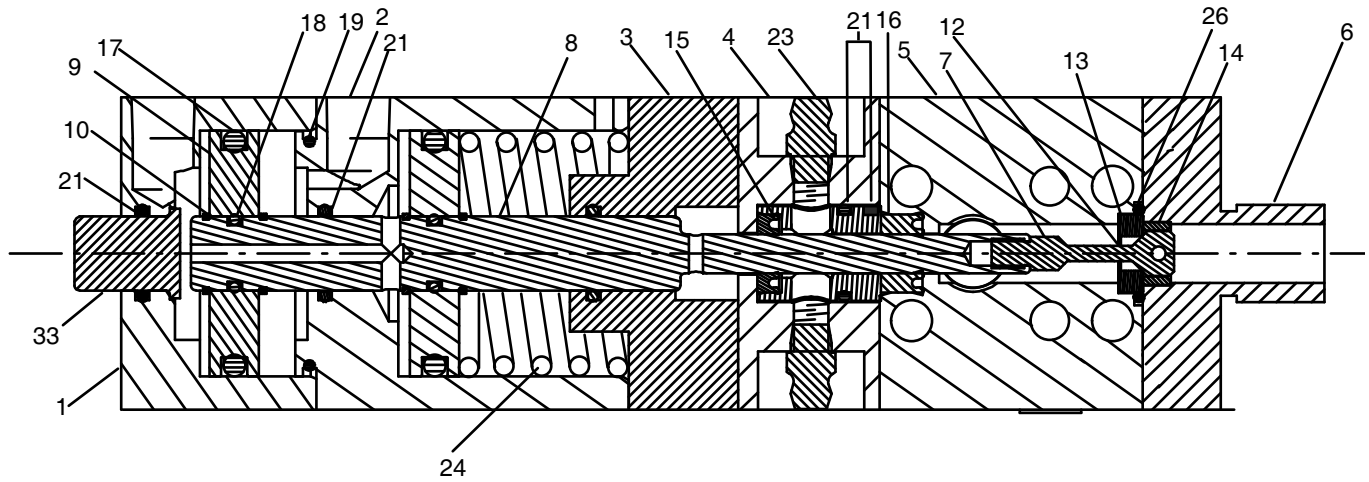


Fig. 9

# Parts

Model numbers 244535, 244907, and 244937



# Parts

## Model numbers 244535, 244907, and 244937

| Ref. | Part      | Description   | Qty. | Ref. | Part   | Description   | Qty. |
|------|-----------|---|------|------|--------|---|------|
| 1    | 24X841    | KIT, cylinder, valve  | 1    | 16** | 551190 | SEAL, u-cup polymt 1/4, 1/2, 1/4 (model 244535)           | 1    |
| 2    | 24X842    | KIT, cylinder, air, top                                     | 1    | 16** | 551193 | SEAL, u-cup PTFE 1/4, 1/2, 1/4 (models 244907 and 244937) | 1    |
| 3    | 197508PKG | HOUSING, cylinder, air                                      | 1    | 17** | 116978 | PACKING, o-ring, fluoroelastomer                          | 2    |
| 4    | 197503    | HOUSING, lubrication  | 1    | 18** | 106555 | PACKING, o-ring, fluoroelastomer                          | 2    |
| 5    | 197505    | HOUSING, material   | 1    | 19** | 102895 | PACKING, o-ring, cylinder, fluoroelastomer                | 1    |
| 6    | 198280    | FLANGE, nose piece (models 244535 and 244907)               | 1    | 21** | 103610 | PACKING, o-ring, fluoroelastomer                          | 5    |
| 6    | 198443    | FLANGE, nose piece (model 244937)                           | 1    | 22   | 111112 | SCREW, cap, socket head                                   | 8    |
| 7**  | 626062    | NEEDLE, sst hardened  | 1    | 23** | 100846 | FITTING, lubtn, st  | 2    |
| 8    | 15E014    | SHAFT, valve  | 1    | 24   | 111092 | SPRING, valve   | 1    |
| 9    | 111094    | PISTON  | 2    | 26** | 104319 | PACKING, o-ring   | 1    |
| 10** | 15E017    | RING, retaining, external                                   | 4    | 27*  | 115982 | LUBRICANT, synthetic, grease                              | 1    |
| 11** | 19B987    | BEARING, lube   | 1    | 33   | 198234 | BUTTON, valve   | 1    |
| 12** | 171860    | GASKET, seat  | 1    | 35   | 101970 | PLUG, pipe, headless                                      | 1    |
| 13** | 185467    | SEAT, valve   | 1    | 36   | 110208 | PLUG, pipe, headless                                      | 1    |
| 14** | 626060    | INSERT, snuff-back  | 1    |      |        |   |      |
| 15** | 551191    | PACKING, u-cup Fluoroelastomer 1/4, 1/2, 1/8 (model 244535) | 1    |      |        |   |      |
| 15** | 617491    | PACKING, u-cup urt 1/4, 1/2, 1/8 (models 244907 and 244937) | 1    |      |        |   |      |

\* Not shown or included. Order separately.  
 \*\* Included in repair kits. Kits also include manifold o-rings for all models.

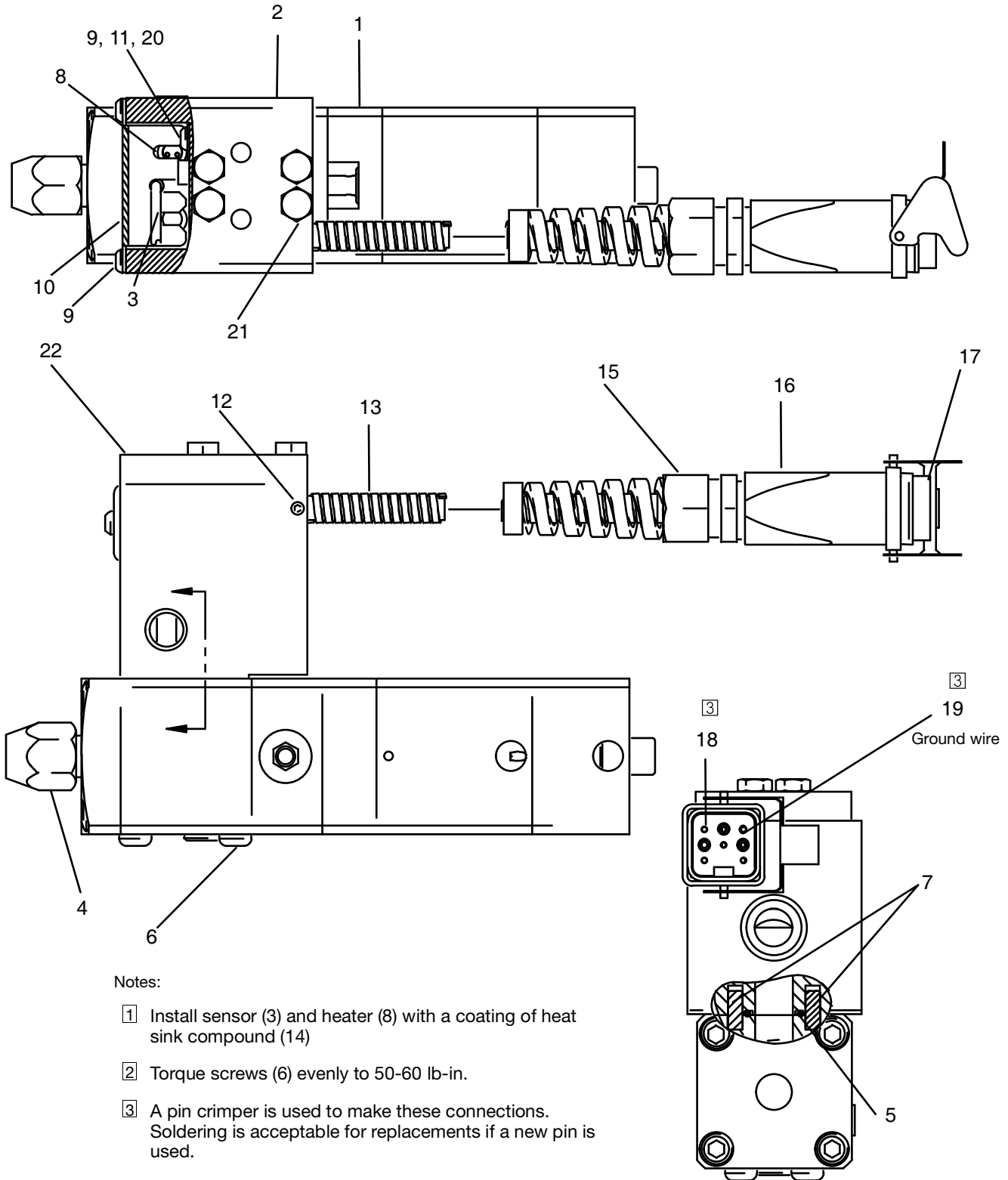
**NOTE:** Do not overextend retaining rings (10) during installation and repair.

### Repair Kits

| Part No. | Description            |
|----------|------------------------|
| 15E012   | Standard seals         |
| 15E011   | High temperature seals |

# Parts

Models 244962, 244909, and 244951 (240 V. Models)



Notes:

- ① Install sensor (3) and heater (8) with a coating of heat sink compound (14)
- ② Torque screws (6) evenly to 50-60 lb-in.
- ③ A pin crimper is used to make these connections. Soldering is acceptable for replacements if a new pin is used.

T11382A

# Parts

## Models 244962, 244909, and 244951 (240 V Models)

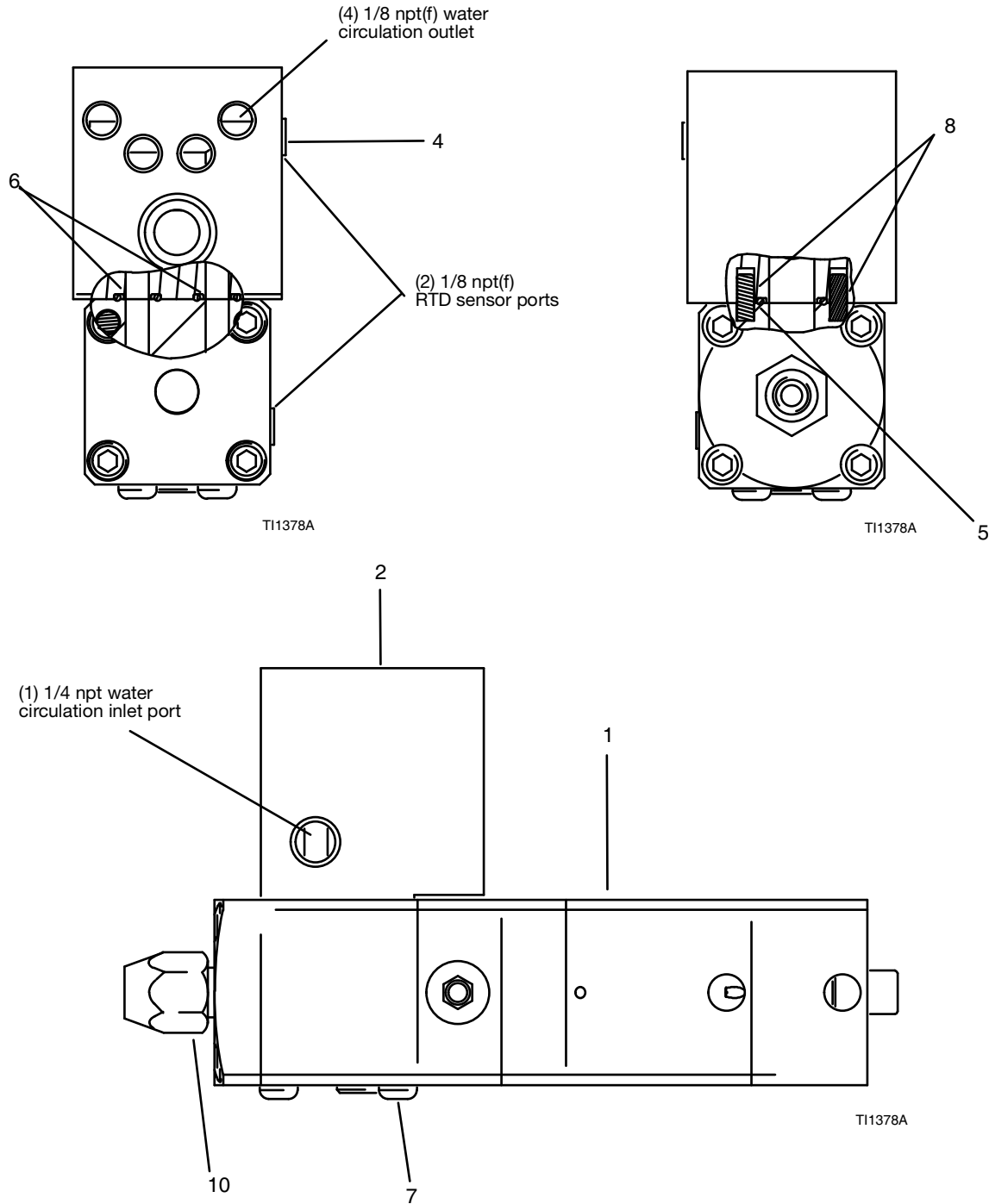
| Ref. | Part   | Description  | Qty. | Ref. | Part  | Description                          | Qty.  |
|------|--------|--|------|------|---|--------------------------------------|-------|
| 1    | 244535 | VALVE, ext, dispense, 200 deg. F<br>(model 244962) | 1    | 11   | 101674  | TERMINAL, ring, ground               | 1     |
| 1    | 244907 | VALVE, ext, dispense, 400 deg. F<br>(model 244909) | 1    | 12   | 105672  | SCREW, set, sch.                     | 1     |
| 1    | 244937 | VALVE, (model 244951)                              | 1    | 13   | 116675  | CORD, flex,                          | 1     |
| 2    | 198236 | MANIFOLD, electrical                               | 1    | 14*  | 073019  | LUBRICANT, thermal                   | 1     |
| 3    | C32255 | SENSOR, temperature                                | 1    | 15   | 116673  | BUSHING, strain relief               | 1     |
| 4    | C32089 | RETAINER, nozzle                                   | 1    | 16   | 116637  | CONNECTOR, cable coupler hood        | 1     |
| 5**  | 109576 | PACKING, o-ring, fluoroelastomer                   | 1    | 17   | 115860  | INSERT, male                         | 1     |
| 6    | 116412 | SCREW, cap, button head, M6 x 60                   | 4    | 18   | 116640  | CONTACT, connector                   | 4     |
| 7    | 114618 | PIN, dowel, dia. 3/16 x 1/2 lg                     | 2    | 19   | 115862  | CONNECTOR, male, crimp               | 1     |
| 8    | 116614 | HEATER, cartridge, 240 V                           | 1    | 20   | 065345  | WIRE, copper, electrical<br>(16 AWG) | 2 ft. |
| 9    | 114185 | SCREW, cap, button head                            | 3    | 21   | 513035  | SCREW, cap, shcs                     | 4     |
| 10   | 198232 | GUARD, manifold,                                   | 1    | 22   | 197843  | Block, mounting                      | 1     |
|      |        |  |      | *    | not shown   |                                      |       |
|      |        |  |      | **   | Included in repair kits. Kits also include manifold o-rings for all models. |                                      |       |

## Repair Kits

| Part   | Description            |
|--------|------------------------|
| 15E012 | Standard seals         |
| 15E011 | High temperature seals |

# Parts

## Model 244910 (ambient or temperature conditioned)





# Parts

## Model 244910 (ambient or temperature conditioned)

| Ref. | Part   | Description                      | Qty. | Ref. | Part   | Description   | Qty. |
|------|--------|----------------------------------|------|------|--------|---|------|
| 1    | 244535 | VALVE, ext, dispense, 200 deg. F | 1    | 7    | 116412 | SCREW, cap, button head   | 4    |
| 2    | 198235 | MANIFOLD, water                  | 1    | 8    | 114618 | PIN, dowel dia 3/16 x 1/2 lg  | 2    |
| 3*   | 070408 | SEALANT, pipe, sst               | 1    | 9    | 513035 | SCREW, cap, shcs  | 4    |
| 4    | 110208 | PLUG, pipe, headless             | 5    | 10   | C32089 | RETAINER, seat  | 1    |
| 5**  | 109576 | PACKING, o-ring, fluoroelastomer | 1    | *    |        | not shown   |      |
| 6**  | 106555 | PACKING, o-ring                  | 2    | **   |        | Included in repair kits. Kits also include manifold o-rings for all models. |      |

## Repair Kits

| Part   | Description            |
|--------|------------------------|
| 15E012 | Standard seals         |
| 15E011 | High temperature seals |

# Accessories

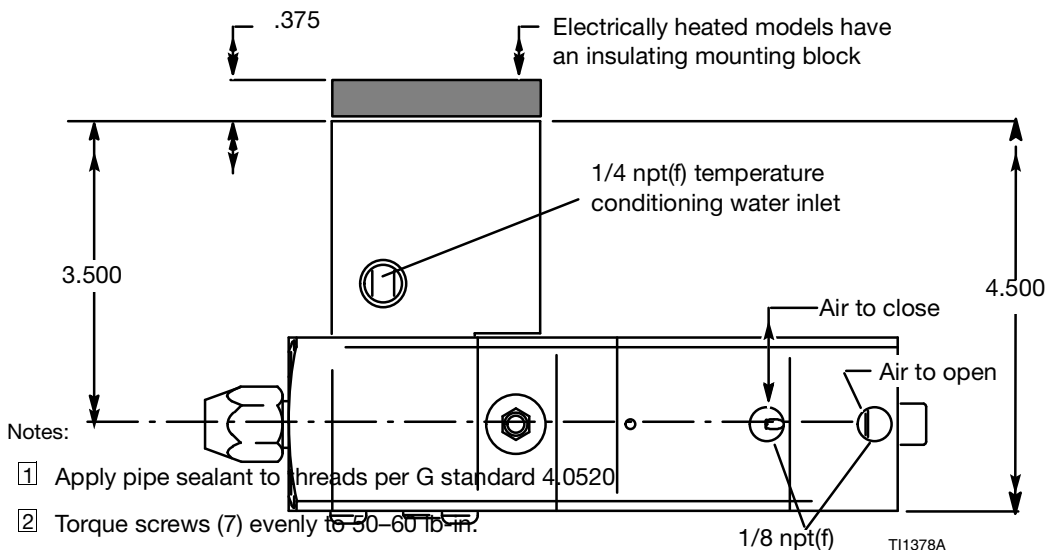
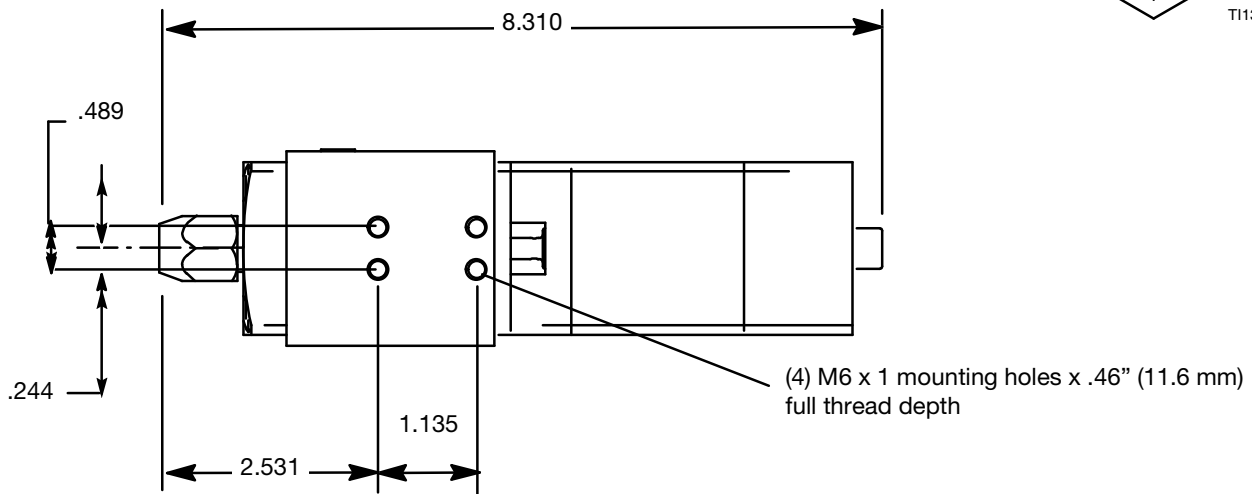
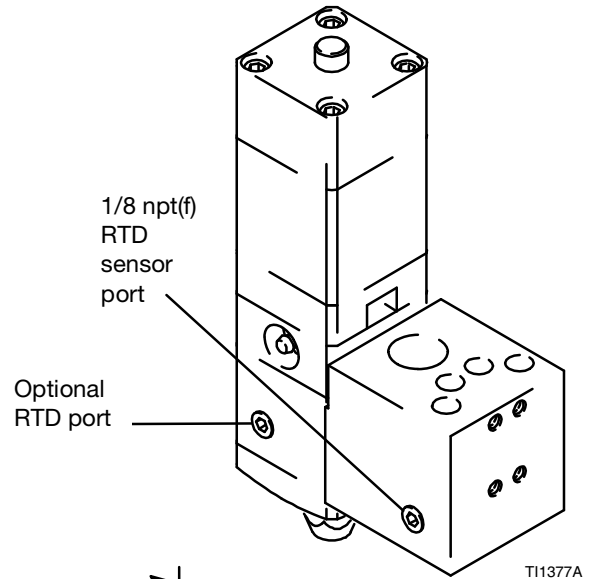
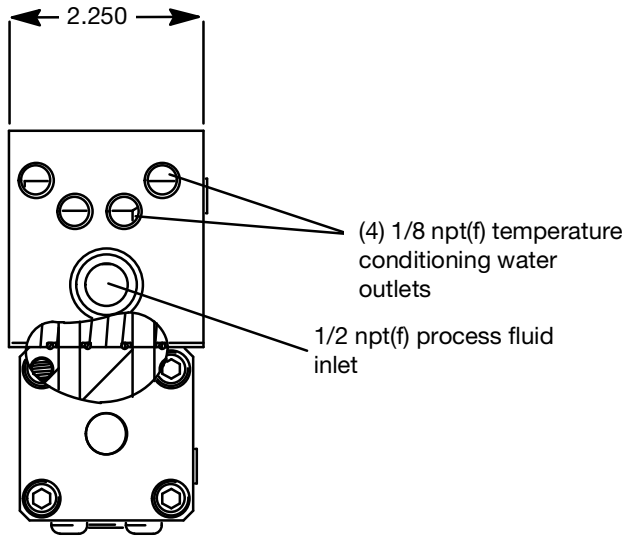
*Use Only Genuine Graco Parts and Accessories*

| <b>Description</b>  |               |                              | <b>Part</b>   |
|---|---------------|------------------------------|---------------|
| <b>Tube Fittings for Air or Water</b>   |               |                              |               |
| Suggested air fittings for automatic dispense valve air inlet ports. Do not use fittings with temperature ratings that are lower than the operating temperature of your system. Contact your Graco Service Representative for more information. These fittings are rated for at least 150 psi at 140°F. |               |                              |               |
|   | <b>NPT</b>    | <b>Tube</b>                  |               |
| 90° elbow, push-in tube   | 1/8" male     | 1/4" O.D.                    | <b>597151</b> |
| 90° elbow, push-in tube   | 1/8" male     | 5/32" (4mm)                  | <b>198171</b> |
| Straight push-in tube   | 1/8" male     | 1/4" O.D.                    | <b>104172</b> |
| Straight push-in tube   | 1/8" male     | 5/32" (4mm)                  | <b>114263</b> |
| For heated hoses reference 309160.  |               |                              |               |
| <b>Solenoid Valve Kits for High Temperature Valves</b>  |               |                              |               |
| For heated double acting air actuated valves. Includes solenoid, 24" high temperature air tubes, air fittings, and muffler.   |               |                              |               |
|   |               | <b>Coil Voltage</b>          | <b>C58942</b> |
|   |               | 120 Volt AC                  | <b>243703</b> |
|   |               | 230 Volt AC                  | <b>C59038</b> |
|   |               | 24 Volt DC                   |               |
| <b>Hose and Cable Kit</b>   |               |                              |               |
| 8 pin square female connector and 10 ft. of cable to mate with 240 VAC valves   |               |                              | <b>244021</b> |
| <b>Quick Exhaust Valve</b>  |               |                              |               |
| 1/8 npt(f)  |               |                              | <b>104661</b> |
| <b>Temperature Conditioning Accessories (Water Circulation)</b>   |               |                              |               |
| RTD Sensor. 1/8 npt(m) x .81" (21mm) insertion length   |               |                              | <b>198457</b> |
| 3 pin Picofast connector fits the cable below   |               |                              |               |
| Sensor cable. 6 ft. (1.8 m)   |               |                              | <b>198458</b> |
| 3-pin Picofast 90° connector for RTD above (198457)   |               |                              |               |
| 3-pin Omega connector on control end. Fits St. Clair temperature conditioning cable.  |               |                              |               |
| <b>NOTE: The following accessories are not applicable to Model 297261.</b>  |               |                              |               |
| <b>Swirl Orbiter Adapters</b>   |               |                              |               |
| Alternate nosepiece for valve outlet. 3/4-16 JIC(m). Fits inlet swivel on orbiter   |               |                              | <b>197504</b> |
| 45° orbiter mount uses the following parts:   |               |                              |               |
| 45° Nosepiece   |               |                              | <b>197842</b> |
| Alternate orbiter nut   |               |                              | <b>198323</b> |
| Fitting nosepiece to orbiter  |               |                              | <b>198324</b> |
| <b>Streaming Adapter</b>  |               |                              |               |
| Alternate outlet nut to retain 270xxx streaming tips or 182xxx fan tips (See Manual 308813)   |               |                              | <b>617585</b> |
| <b>Steel Dispense Nozzles</b>   |               |                              |               |
| 1/8 npt (m)   |               |                              |               |
|   | <b>Length</b> | <b>Orifice Size</b>          |               |
|   | 2"            | .125                         | <b>607665</b> |
|   | 2"            | .094                         | <b>161505</b> |
|   | 2.12"         | .055                         | <b>164799</b> |
|   | 1.22"         | .125                         | <b>C17009</b> |
|   | 2.43"         | .09 x.37 ribbon hardened tip | <b>C01025</b> |
| <b>Repair Kits</b>  |               |                              |               |
| Standard seals  |               |                              | <b>15E012</b> |
| High temperature seals  |               |                              | <b>15E011</b> |

# Accessories

| Description   | Part          |
|---|---------------|
| <b>Cable Wrap</b>   |               |
| 10" x 10" nylon fabric pad with Velcro strip. Used to secure the valve cable connector to the heated hose. Protects the electrical connectors in applications where the valve is being moved. | <b>198422</b> |
| <b>Velcro Straps</b>  |               |
| 1" x 12" strap used to secure ends of wrap 198422 above.  | <b>198442</b> |
| <b>Fluid Inlet Adapters</b>   |               |
| 1/2" NPT(m) x No. 8 JIC(m) (3/4 -16 with 37° flare)   | <b>C20700</b> |
| 1/2" NPT(m) x No. 10 JIC(m) (7/8 -14 with 37° flare)  | <b>C20703</b> |
| 1/2" NPT(m) x No. 12 JIC(m) (1-1/16 -12 with 37° flare)   | <b>C20642</b> |
| <b>Grease Gun</b>   |               |
| 3 oz. cartridge   | <b>551189</b> |

# Dimensions



# Technical Specifications

|   |   |
|---|---|
| Maximum working fluid pressure  | 24.1 MPa (241 bar, 3500psi)   |
| Maximum static fluid pressure   | 34.5 MPa (345 bar, 5000 psi)  |
| Maximum working dry air pressure  | .83 MPa (8.3 bar, 120 psi)  |
| Maximum working temperature   |   |
| Standard seals in models 244535, 244910, 244961, 244962                         | 95°C (200°)   |
| High temperature seals in models 244907, 244908, 244909, 244937, 244951, 245184 | 204°C (400°)  |
| Material Inlet on inlet manifold (all models)                                   | 1/2" npt(f)   |
| Air Inlets (open and close)   | 1/8" npt  |
| 120 Volt Heater   | 150w @ 120 VAC, 96 ohms +/-10 pins C and F  |
| 240 Volt Heater   | 200w @ 240 VAC, 288 ohms +30/-40 pins 1 and 2   |
| RTD Sensor  | (120 Volt models - pins A and B)      100 Ohm platinum RTD, 0.00385 ohm/ohm/deg C<br>(240 Volt models - pins 3 and 4)      (108.2 ohms @ 21° C (70° F)) |

Weight (automatic dispense valve + manifold) approx. 1.8 kg (4 lbs)

Model 244910 can be temperature conditioned with circulating water. The valve/manifold is equipped with:

- (1) 1/4 npt(f) water inlet
- (4) 1/8 npt(f) water outlets
- (2) 1/8 npt(f) ports that can be used for a temperature sensor (see page 26).

## WETTED PARTS (all valves)

Aluminum, Stainless Steel, chrome, carbide, acetal plastic, PTFE, fluoroelastomer

## PRIMARY SEAL MATERIALS

Model 244535 - Polymyte® (orange) standard temperature

Models 244907 and 244937 - graphite fiber reinforced PTFE (black) high temperature

| Material Outlet         |                    |
|-------------------------|--------------------|
| 244951                  | 1/2 npt(m)         |
| 244910, 244962, 244908, | 5/8-18 with nut to |

Polymyte is a trademark of Parker Seal.

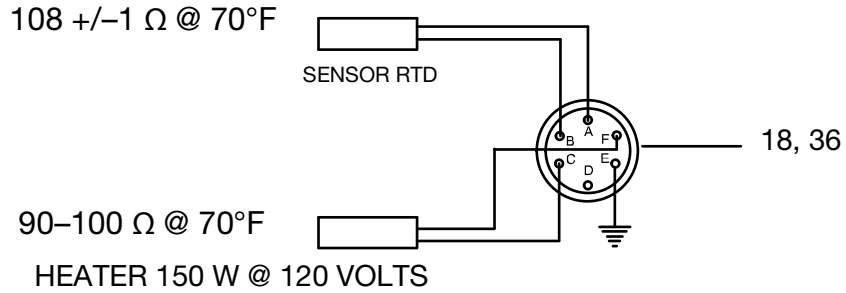
## California Proposition 65

### CALIFORNIA RESIDENTS

 **WARNING:** Cancer and reproductive harm – [www.P65warnings.ca.gov](http://www.P65warnings.ca.gov).

# Wiring Diagram

## 120 Volt Models

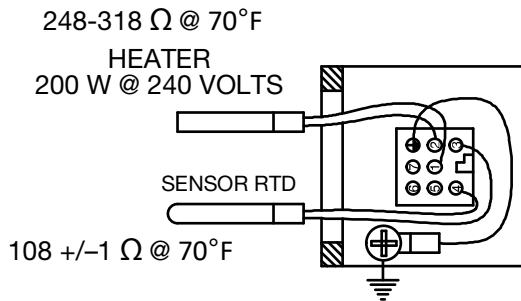


NOTE: ALLOW SUFFICIENT LEAD LENGTH TO BE ABLE TO ROTATE CONNECTOR BRACKET  $\pm$  180.

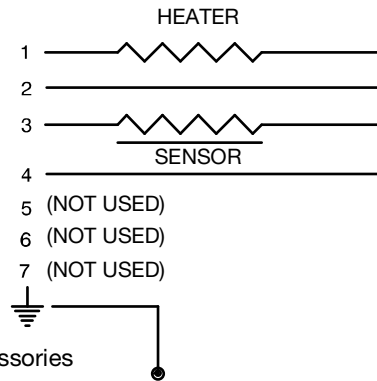
Past Therm-O-Flow™ accessories

## 240 Volt Models

WIRING DIAGRAM



SCHEMATIC DIAGRAM



# Graco Standard Warranty

Graco warrants all equipment referenced in this document which is 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.

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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.

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**Phone:** 612-623-6921 **or Toll Free:** 1-800-328-0211, **Fax:** 612-378-3505

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Original instructions. This manual contains English. MM 309376

**Graco Headquarters:** Minneapolis

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Revision R, August 2022