

# Instructions



28:1/33:1 RATIO, WALL MOUNT

## Bulldog® Pumps

307932R

For ambient temperature spray applications.

**Part No. 245187, 33:1, Series B**

*3300 psi (22.8 MPa, 228 bar) Maximum Fluid Working Pressure  
100 psi (700 kPa, 7 bar) Maximum Air Input Pressure*

**Part No. 253697, 28:1, Series A**

*2800 psi (19.3 MPa, 193 bar) Maximum Fluid Working Pressure  
100 psi (700 kPa, 7 bar) Maximum Air Input Pressure*

**Part No. 245185, Series B (240 Volt Heater)**

**Part No. 245186, Series B (480 Volt Heater)**

For heated spray applications.

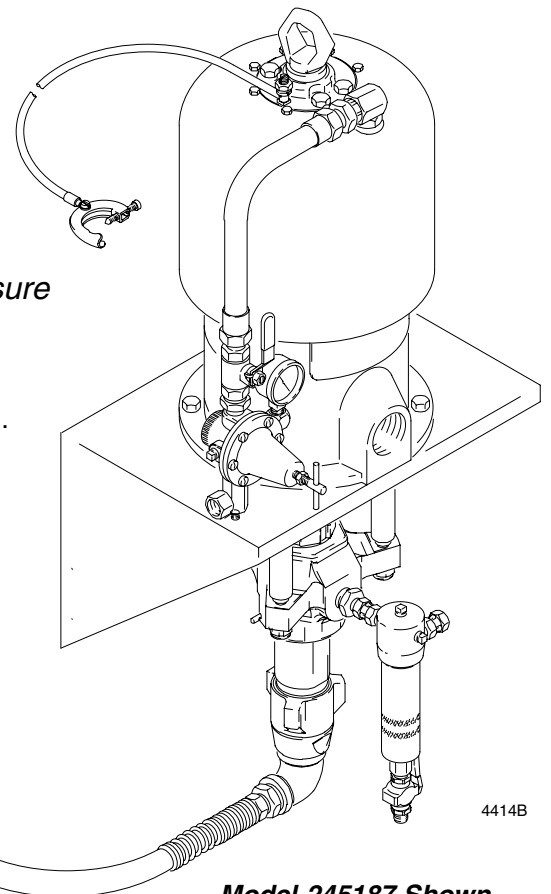
*3000 psi (20.7 MPa, 207 bar) Maximum Fluid Working Pressure  
90 psi (600 kPa, 6 bar) Maximum Air Input Pressure*



**Important Safety Instructions**

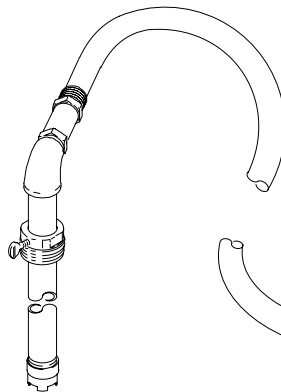
Read all warnings and instructions in this manual.  
Save these instructions.

See page 2 for Table of Contents.



4414B

**Model 245187 Shown**



PROVEN QUALITY. LEADING TECHNOLOGY.



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# Symbols

## Warning Symbol



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

## Caution Symbol



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

# WARNING



INSTRUCTIONS

## EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture or malfunction 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 not sure, call your Graco distributor.
- Do not alter or modify this equipment.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated system component. Refer to the **Technical Data** on page 21 for the maximum working pressure of this equipment.
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Do not use hoses to pull equipment.
- Route hoses away from 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).
- Wear hearing protection when operating this equipment.
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

# WARNING



## SKIN INJECTION HAZARD

Spray from the gun, 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 gun at anyone or at any part of the body.
- Do not put your hand or fingers over the spray tip.
- Do not stop or deflect leaks with your hand, body, glove or rag.
- Do not “blow back” fluid; this is not an air spray system.
- Always have the tip guard and the trigger guard on the gun when spraying.
- Check the gun diffuser operation weekly. Refer to the gun manual.
- Be sure the gun trigger safety operates before spraying.
- Lock the gun trigger safety when you stop spraying.
- Follow the **Pressure Relief Procedure** on page 14 if the spray tip clogs and before cleaning, checking or servicing the equipment.
- Tighten all fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.
- Use only Graco approved hoses. Do not remove the spring guard that is used to help protect the hose from rupture caused by kinks or bends near the couplings.



## MOVING PARTS HAZARD

Moving parts, such as the air motor piston, can pinch or amputate your fingers.

- Keep clear of all moving parts when starting or operating the pump.
- Before servicing the equipment, follow the **Pressure Relief Procedure** on page 14 to prevent the equipment from starting unexpectedly.

# WARNING



## FIRE AND EXPLOSION HAZARD

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



- Ground the equipment and the object being sprayed. Refer to **Grounding** on page 5.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop spraying immediately**. Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being sprayed.
- Keep the spray area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the spray area.
- Extinguish all open flames or pilot lights in the spray area.
- Do not smoke in the spray area.
- Do not turn on or off any light switch in the spray area while operating or if fumes are present.
- Do not operate a gasoline engine in the spray area.



## TOXIC FLUID HAZARD

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

- 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.

# Installation



## General Information

**NOTE:** Reference numbers and letters in parentheses in the text refer to the callouts in the figures and the parts drawing.

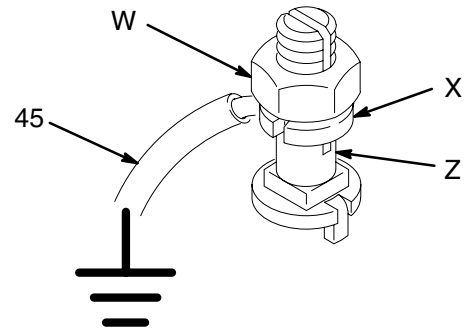
**NOTE:** Always use Genuine Graco Parts and Accessories, available from your Graco distributor. Refer to the Product Data Sheet for your pump, Form No. 305791. If you supply your own accessories, be sure they are adequately sized and pressure rated for your system.

**NOTE:** Fig. 2 is only a guide for selecting and installing system components and accessories. Contact your Graco distributor for assistance in designing a system to suit your particular needs.

## Grounding

 <b>WARNING</b>	
	<b>FIRE AND EXPLOSION HAZARD</b> Before operating the pump, ground the system as explained below. Also read the section <b>FIRE OR EXPLOSION HAZARD</b> on page 4.

1. *Pump:* use a ground wire and clamp (supplied). See Fig. 1. Loosen the grounding lug locknut (W) and washer (X). Insert one end of a 1.5 mm<sup>2</sup> (12 ga) minimum ground wire (45) into the slot in lug (Z) and tighten the locknut securely. Connect the other end of the wire to a true earth ground.



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**Fig. 1**

2. *Air and fluid hoses:* use only electrically conductive hoses.
3. *Heaters, if used:* refer to Viscon HP Heater manual, 309524.
4. *Air compressor:* follow manufacturer's recommendations.
5. *Spray gun:* ground through connection to a properly grounded fluid hose and pump.
6. *Fluid supply container:* follow your local code.
7. *Object being sprayed:* follow your local code.
8. *Solvent pails used when flushing:* follow your local code. Use only metal pails, which are conductive, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts the grounding continuity.
9. *To maintain grounding continuity when flushing or relieving pressure,* hold a metal part of the spray gun firmly to the side of a grounded *metal* pail, then trigger the gun.

# Installation

## Supplied Components

Refer to Fig. 2 for a typical installation of an airless system.

### **WARNING**

A red-handled bleed-type master air valve (14) and a fluid drain valve (7) are supplied in your system. These accessories help reduce the risk of serious injury, including fluid injection and splashing of fluid in the eyes or on the skin, and injury from moving parts if you are adjusting or repairing the pump.

The red-handled bleed-type master air valve relieves air trapped between this valve and the pump after the air is shut off. Trapped air can cause the pump to cycle unexpectedly. Locate the valve close to the pump.

The fluid drain valve assists in relieving fluid pressure in the displacement pump, hose, and gun. Triggering the gun to relieve pressure may not be sufficient.

- **The red-handled bleed-type master air valve (14)** is required in your system to relieve air trapped between it and the air motor when the valve is closed (see the **WARNING** above). Be sure the bleed valve is easily accessible from the pump, and is located **downstream** from the air regulator.
- **The air regulator (8)** controls pump speed and outlet pressure by adjusting the air pressure to the pump. Locate the regulator close to the pump, but **upstream** from the red-handled bleed-type master air valve (14).
- **The air manifold (15)** has a swivel air inlet. It mounts to the cart, and provides ports for connecting lines to air-powered accessories.
- **The fluid filter (4)** includes a 60 mesh (250 micron) stainless steel element to filter particles from the fluid as it leaves the pump.
- **The fluid drain valve (7)** is required in your system to relieve fluid pressure in the hose and gun (see the **WARNING** above).
- **The suction hose (24) and tube (25)** allow the pump to draw fluid from a 200 liter (55 gallon) drum.

## System Accessories

### Air and Fluid Hoses

Be sure all air hoses (A) and fluid hoses (G) are properly sized and pressure-rated for your system. Use only electrically conductive hoses.

1. Connect one end of the fluid line (G) to the filter outlet swivel. Connect a fluid hose to each gun (H). Install a fluid shutoff valve (J) at each gun drop. **Do not** install the spray tip in the gun yet.
2. Close the red-handled bleed valve (14) and air regulator (8). Connect the air hose (A) to the swivel inlet of the air manifold (15).

### Air Line Accessories

1. Install an **air line filter (B)** in the main air line, to remove harmful dirt and moisture from the compressed air supply.
2. Install a **second bleed valve (C)** in the main air line, to isolate the accessories for servicing.
3. Install a **drain valve (D)** at the bottom of each air line drop, to drain off moisture.
4. To provide automatic lubrication of the air motor, install an **air line lubricator (E)** downstream from the red-handled bleed-type master air valve (14).
5. Install a **pump runaway valve (F)**. The runaway valve will automatically shut off the air to the pump if the pump starts running too fast. A pump that runs too fast can be seriously damaged.

# Installation

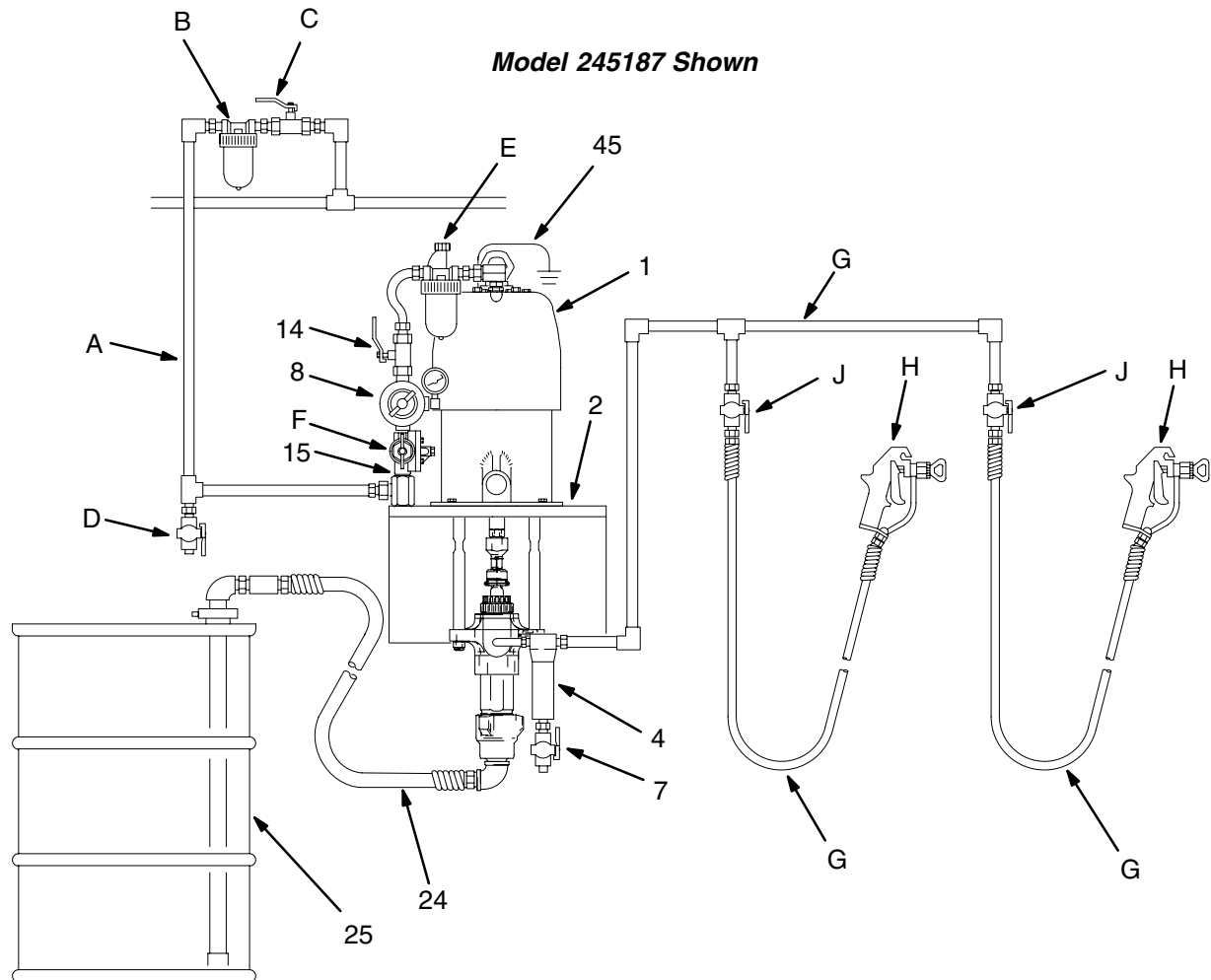
## KEY

### SUPPLIED COMPONENTS

- 1 Pump
- 2 Pump Wall Bracket
- 4 Fluid Filter
- 7 Fluid Drain Valve (required)
- 8 Pump Air Regulator
- 14 Red Handled Bleed-Type Master Air Valve (required, for pump)
- 15 Air Manifold
- 24 Suction Hose
- 25 Suction Tube
- 45 Ground Wire (required; see page 5 for installation instructions)

### ACCESSORIES YOU MUST SUPPLY

- A Electrically Conductive Air Hose
- B Air Line Filter
- C Bleed-Type Master Air Valve (for accessories)
- D Air Line Drain Valve
- E Air Line Lubricator
- F Pump Runaway Valve
- G Electrically Conductive Fluid Line
- H Airless Spray Gun
- J Fluid Shutoff Valve



**Fig. 2**

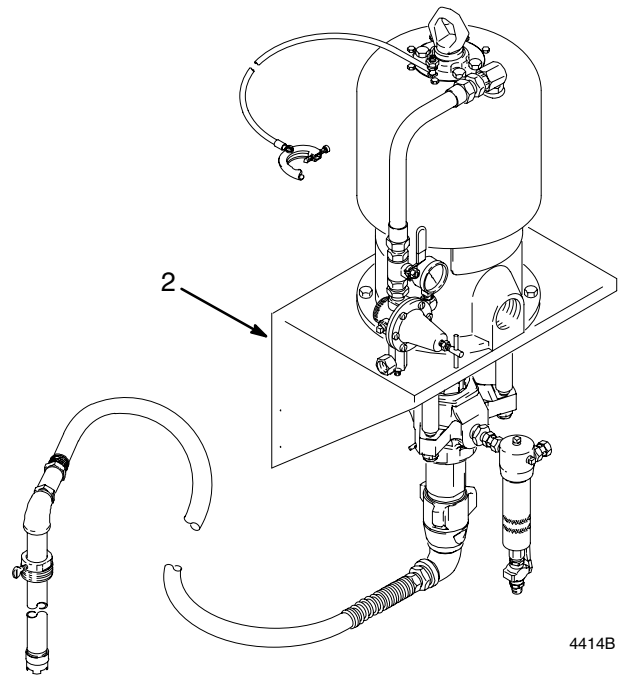
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# Installation

## Models 245187 and 253697 (for Ambient Temperature Spray Applications)

**NOTE:** Refer to page 10 to convert Pump Model 245187 or 253697 to a heated system.

1. Mount the pump wall bracket (2) 5 ft (1.5 m) above the floor. Be sure the wall is strong enough to support the weight of the pump and accessories, fluid, hoses, and stress caused during pump operation. Refer to **Mounting Hole Layout** on page 20.
2. Connect the air and fluid hoses and the spray gun as explained on page 6.



**Model 245187 Shown**

**Fig. 3**

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# Installation

## Models 245185 and 245186 (for Heated Temperature Spray Applications)

1. Be sure the wall is strong enough to support the weight of the pump and accessories, heaters, hoses, fluid, and stress caused during operation.
2. Mount the pump wall bracket (2) 5 ft (1.5 m) above the floor. Refer to the **Mounting Hole Layout** on page 20.
3. Locate the holes for the heater wall brackets (26\*) **exactly** as indicated on page 20. Use the heater wall brackets as templates to mark the wall.

**NOTE:** Refer to the **Mounting Hole Layout** on page 20. Note that one set of mounting holes is above and slightly to the left of the other. Install the heater (44) with the fluid filter (4) attached in that set of holes. Install the heater without the fluid filter (4) in the lower set of holes.

4. Use M8 or 5/16 in. bolts of the appropriate length and lockwashers (not supplied) to fasten the heater brackets to the wall.
5. Bring the hose (31a) from the inlet elbow (32a) of the lower heater (44a) and connect it securely to the swivel (50) coming from the pump outlet. See Fig. 4.
6. Route the hose (31b) from the inlet elbow (32b) of the upper heater (44b), behind the lower heater (44a), and connect it securely to the swivel (34a) at the outlet of the lower heater.
7. Bring the fluid supply hose (31) from the swivel (34b) at the fluid filter (4) outlet and connect it to the main fluid supply line to the guns.
8. Bring the fluid return hose (37) from the three-way ball valve (40) and connect it to the main fluid return line.
9. Connect the air and fluid hoses and the spray gun as explained on page 6.

- 1 Connect supply hose (31) to the main fluid supply line to the guns.  
2 Connect return hose (37) to the main fluid return line.

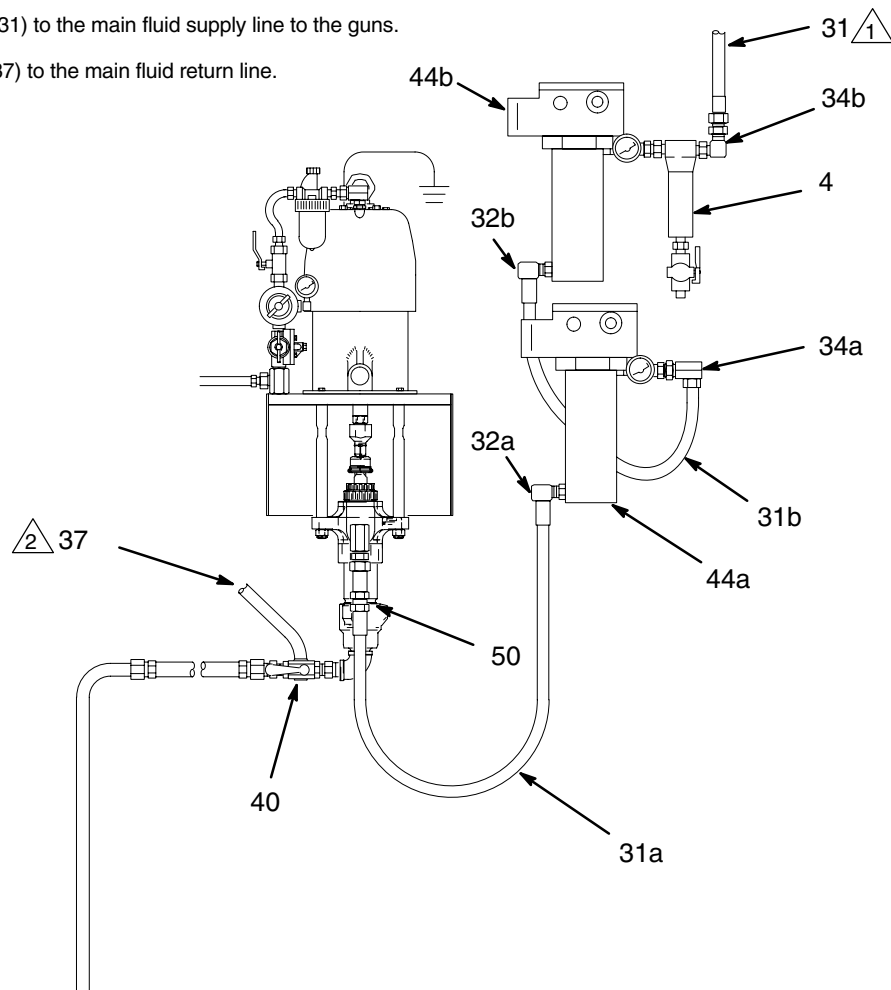


Fig. 4

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# Installation

## Converting to a Heated System

To convert Model 245187 or 253697 to a heated circulating system, order the following parts. The heaters are available in three voltages. Specify which voltage you desire.

- *Two* Viscon HP Fluid Heaters
  - Model 245848 (120 V, single-phase, 19.2 amp)
  - Model 245863 (240 V, single-phase, 16.7 amp)
  - Model 245864 (480 V, single-phase, 8.30 amp)
- Dual Heater Mounting Kit 222311
- Circulating Kit 222312
- Warning Label 290074

### WARNING

The Viscon HP Heaters must be installed by a qualified electrician in compliance with all state and local codes and regulations, to reduce the risk of electric shock or other serious injury during installation or operation.

The power supply must match the heaters' requirements (see above). Refer to the Viscon HP Heater Manual, 309524, for further information.

## Accessories for a Heated System

### Viscon HP Heater Cord 110160

12 gauge, rated at 105° C.

### WARNING

Do not use in hazardous areas containing flammable materials or fumes.

### Airless Insulated Hose Kit 222263

25 ft. (7.6 m) nylon fluid hose for use with airless heated systems. Includes an in-line fluid filter, circulating manifold, and 3 ft. (0.9 m) whip hose.

## Installing Dual Heater Mounting Kit 222311

### WARNING

Before installing the heaters, dual heater mounting kit and circulating kit, follow the **Pressure Relief Procedure** on page 14. Disconnect all hoses from the pump.

**NOTE:** Reference numbers marked with an asterisk (for example, 26\*) are included in kit 222311.

Apply pipe sealant (36\*) to all male threads except at swivel connections.


1. Be sure the wall is strong enough to support the weight of the heaters, hoses, fluid, and stress caused during operation. Locate the holes for the heater wall brackets (26\*) **exactly** as indicated on page 20. Note that one heater will be mounted above and slightly to the left of the other. Use the heater wall brackets as templates to mark the wall.
2. Attach a heater wall bracket to each heater's mounting posts with the M8 x 1.25 screws and lockwashers supplied with the heater (44).
3. Use M8 or 5/16 in. bolts of the appropriate length and lockwashers (not supplied) to fasten the heater brackets to the wall.
4. Remove the fluid filter (4) and attaching hardware (3, 9) from the pump fluid outlet. Keep the filter, but discard the attaching hardware. See Fig. 5.

# Installation

5. Screw the 3/4 npt street elbow (28\*) into the pump's fluid outlet. Assemble the nipple (27\*), check valve (29\*), coupling (30\*), and swivel (50\*) as shown in Fig. 6. The arrow on the check valve must point down, toward the coupling.
6. Screw an elbow (32\*) onto the lower heater's inlet. Screw the coupler (63) onto the elbow. Attach the heater hose (31\*) to the coupler. Connect the other end of the hose to the swivel (50\*) coming from the pump outlet.
7. Screw an elbow (32\*) onto the upper heater's inlet. Screw the coupler (63) onto the elbow. Attach the second heater hose (31\*) to the coupler. Run this hose to the left of and behind the lower heater. See Fig. 4.
8. Install the bushing (62) and a 3/8 npt nipple (33\*) in the lower heater's outlet. Screw the rigid end of the union (34\*) onto this nipple, and screw the swivel end of the union onto the free end of the second heater hose (31\*).
9. Screw the bushing (62) and a 3/8 npt nipple (33\*) into the upper heater's outlet. Screw the fluid filter (4) inlet onto this nipple. Unscrew the adapter (10) from the filter outlet. Screw the 1/4 x 3/8 npt nipple (35\*) into the filter outlet, and screw the union (34\*) onto the nipple. See Fig. 6.

**⚠ WARNING**

**COMPONENT RUPTURE HAZARD**  
To reduce the risk of overpressurizing your system, which could cause component rupture and serious injury, *never exceed 90 psi (6 bar, 600 kPa) incoming air pressure to the pump.*



10. Install the warning label (51) as shown in Fig. 6.

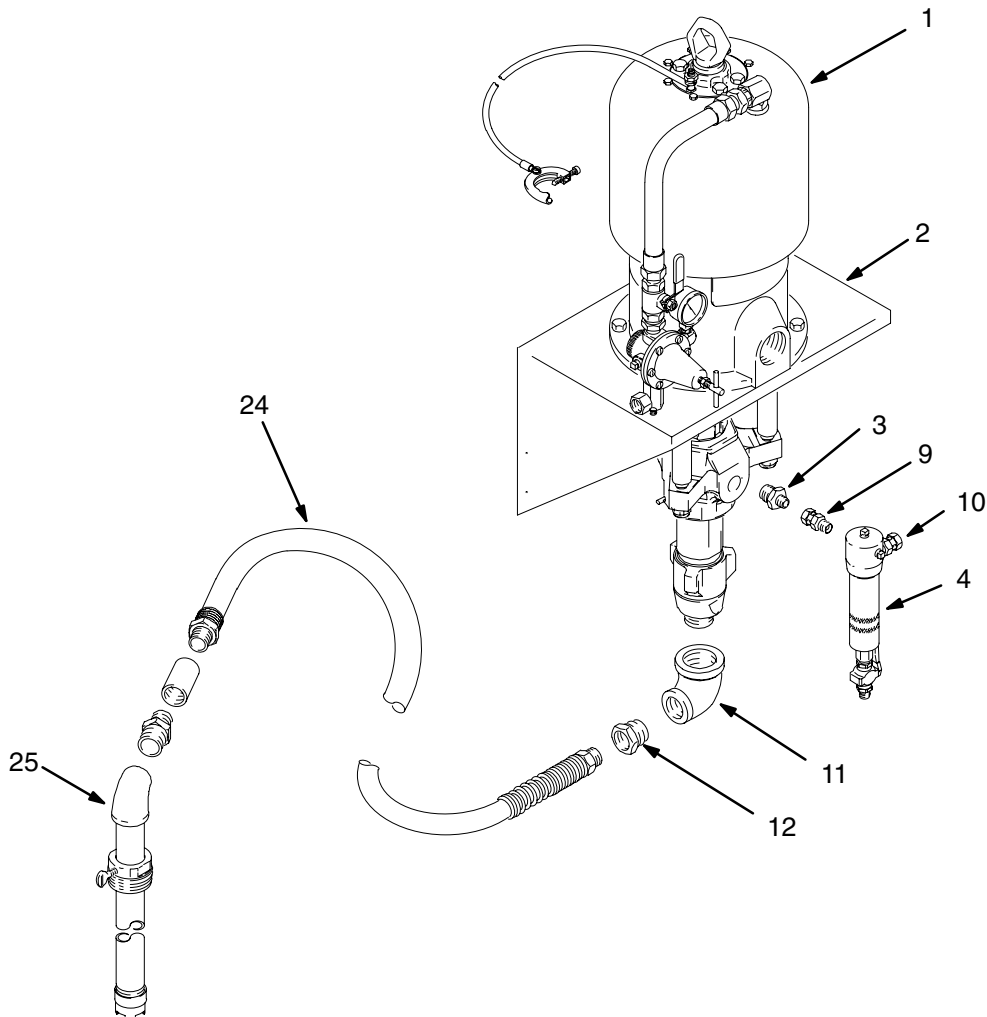


Fig. 5

# Installation

## Installing Circulating Kit 222312

### **WARNING**

Before installing the heaters, dual heater mounting kit and circulating kit, follow the **Pressure Relief Procedure** on page 14. Disconnect all hoses from the pump.

**NOTE:** Reference numbers marked with a symbol (for example, 37†) are included in kit 222312.

Apply pipe sealant (36†) to all male threads except at swivel connections.

1. Remove the suction tube (25), fittings (52 and 53), hose (24), and adapter (12). See Fig. 5. Keep these parts for use later.
2. Screw nipple (54) and then the tee (48†) into the elbow (11) at the pump fluid inlet. Screw the 1 x 3/4 npt bushing (55) and then the 3/4 npt x 1/4 npt bushing (49†) into the branch of the tee. See Fig. 6.
3. Reconnect the bushing (12), hose (24), fittings (52 and 53), and suction tube (25).

4. Install the CIRC end of the three-way ball valve (40†) in the bushing (49†). Screw a bushing (39†) onto the IN branch of the three-way valve. Connect the rigid end of the 45° union (38†) to this bushing. Screw the swivel end of the union (38†) onto the braided hose (37†). Connect this hose to the main fluid return line. See Fig. 6.
5. Screw another bushing (39†) onto the DRAIN end of the three-way valve (40†). Connect the nylon fluid hose (41†) to this bushing, and connect the return tube (42†) to the other end of the hose. Place the return tube in the fluid supply container.

### **WARNING**






#### **COMPONENT RUPTURE HAZARD**



To reduce the risk of overpressurizing your system, which could cause component rupture and serious injury, *never exceed 90 psi (6 bar, 600 kPa) incoming air pressure to the pump.*

6. Install the warning label (51) as shown in Fig. 6.
7. Connect the air and fluid hoses and the spray gun as explained on page 6.

# Installation

-  1 Specify desired heater voltage (see page 10).
-  2 Part of the heater (44).
-  3 Arrow must point down.
-  4 Connect to the main fluid supply line to the guns.
-  5 Connect to the main fluid return line.

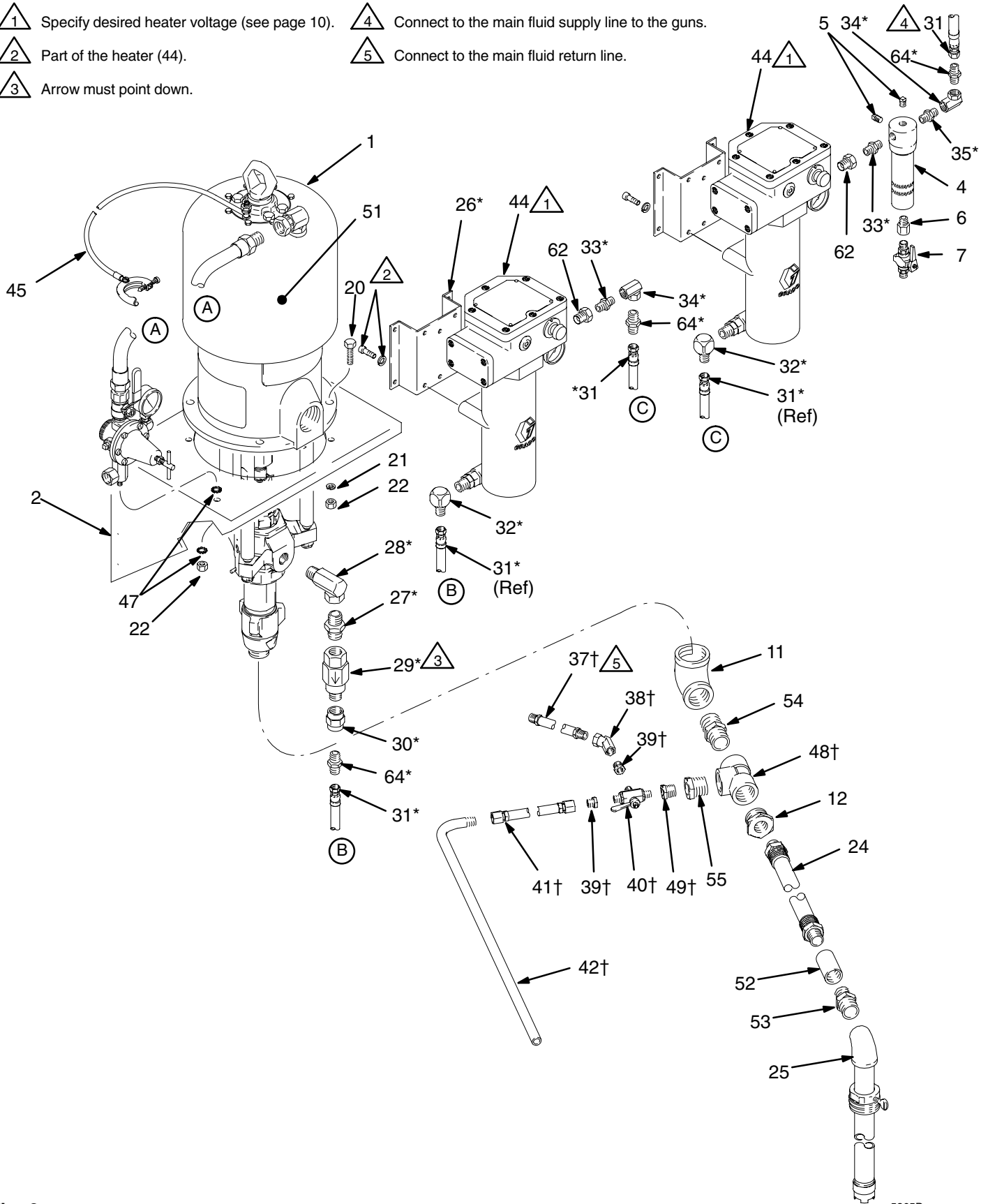


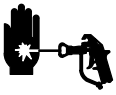
Fig. 6

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# Operation/Maintenance

## Pressure Relief Procedure

### **WARNING**



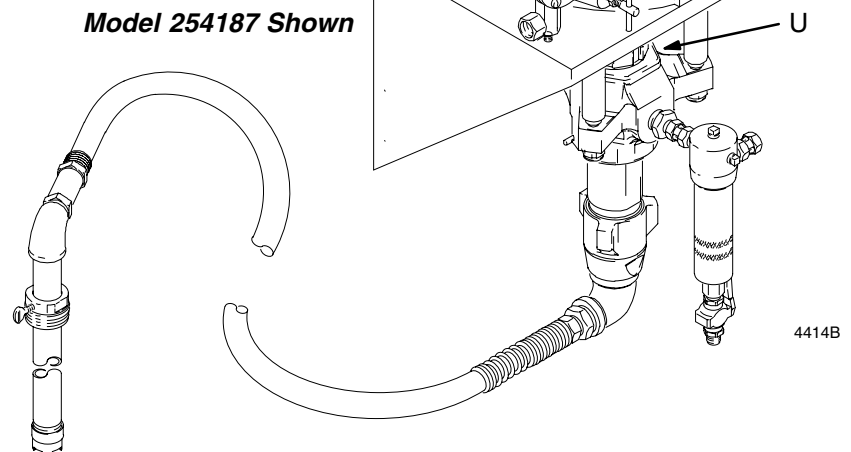
#### **SKIN INJECTION HAZARD**

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,
- check or service any of the system equipment,
- or install or clean the spray tips.

1. Lock the gun trigger safety.
2. Shut off the air supply to the pump.
3. Close the bleed-type master air valve (required in your system).
4. Unlock the gun trigger safety.
5. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
6. Lock the gun trigger safety.
7. Open the drain valve (required in your system), having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray again.

*If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, very slowly loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.*



## Packing Nut/Wet-Cup

Before starting, fill the packing nut (U) 1/3 full with Graco Throat Seal Liquid (TSL) or compatible solvent. See Fig. 7.

### **WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** at left.

The packing nut is torqued at the factory and is ready for operation. If it becomes loose and there is leaking from the throat packings, relieve pressure, then tighten the nut as specified in your separate pump manual. Do this whenever necessary. Do not overtighten the packing nut.

## Flush the Pump Before First Use

Pumps are tested with lightweight oil which is left in to protect the pump parts. To prevent contamination of the fluid, flush the pump with a compatible solvent before using it.

Fig. 7

# Operation/Maintenance

## Starting and Adjusting the Pump

1. Be sure the air regulator and bleed-type master air valve are closed.

**NOTE:** *Do not install the spray tip yet!*

2. Open the bleed-type master air valve.
3. Hold a metal part of the spray gun firmly to the side of a grounded metal pail and trigger the gun.
4. Slowly open the air regulator until the pump starts.
5. Allow the pump to cycle slowly until all the air is pushed out of the fluid lines.
6. Release the gun trigger and lock the trigger safety; the pump will stall against the pressure.
7. With the pump and lines primed, and with adequate air pressure and volume supplied, the pump will start and stop as the spray gun is triggered and released.

### **WARNING**

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

8. Relieve the pressure, then install the spray tip in the gun.

9. Use the air regulator to control the pump speed and fluid pressure. Always use the lowest pressure necessary to achieve the desired results. Higher pressures waste fluid and cause premature wear of the pump packings and spray tip.

### **CAUTION**

Do not allow the pump to run dry. It will quickly accelerate to a high speed, causing damage. If your pump is running too fast, stop it immediately and check the fluid supply. If the container is empty and air has been pumped into the lines, refill the container and prime the pump and the lines, or flush and leave it filled with a compatible solvent. Eliminate all air from the fluid system.

## Heated Circulating Systems

Operating instructions for a heated circulating system are provided in the Viscon HP Heater manual, 309524. Read and understand all warnings and instructions in the heater manual before operating a heated system.

1. The three-way ball valve (40) selects either fluid circulation or draining. To circulate fluid back to the pump, turn the handle toward the CIRC end of the valve.
2. To drain the fluid, turn the handle toward the DRAIN end.

# Operation/Maintenance

## Shutdown and Care of the Pump

### WARNING

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

For overnight shutdown, stop the pump at the bottom of its stroke to prevent fluid from drying on the exposed displacement rod and damaging the throat packings. Relieve the pressure.

Always flush the pump before the fluid dries on the displacement rod. See **Flushing** below.

## Flushing

### WARNING



#### **FIRE AND EXPLOSION HAZARD**

Before flushing, read the section **FIRE OR EXPLOSION HAZARD** on page 4.



Be sure the entire system and flushing pails are properly grounded. Refer to **Grounding** on page 5.

Flush with a fluid that is compatible with the fluid you are pumping and with the wetted parts in your system. Check with your fluid manufacturer or supplier for recommended flushing fluids and flushing frequency. Always flush the pump before fluid dries on the displacement rod.

### CAUTION

Never leave water or water-base fluid in the pump overnight. If you are pumping water-base fluid, flush with water first, then with a rust inhibitor such as mineral spirits. Relieve the pressure, but leave the rust inhibitor in the pump to protect the parts from corrosion.

### WARNING

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

1. Relieve the pressure.
2. Remove the spray tip from the gun.
3. Hold a metal part of the gun firmly to the side of a grounded *metal* pail.
4. Start the pump. Always use the lowest possible fluid pressure when flushing.
5. Trigger the gun.
6. Flush the system until clear solvent flows from the gun.
7. Relieve the pressure.



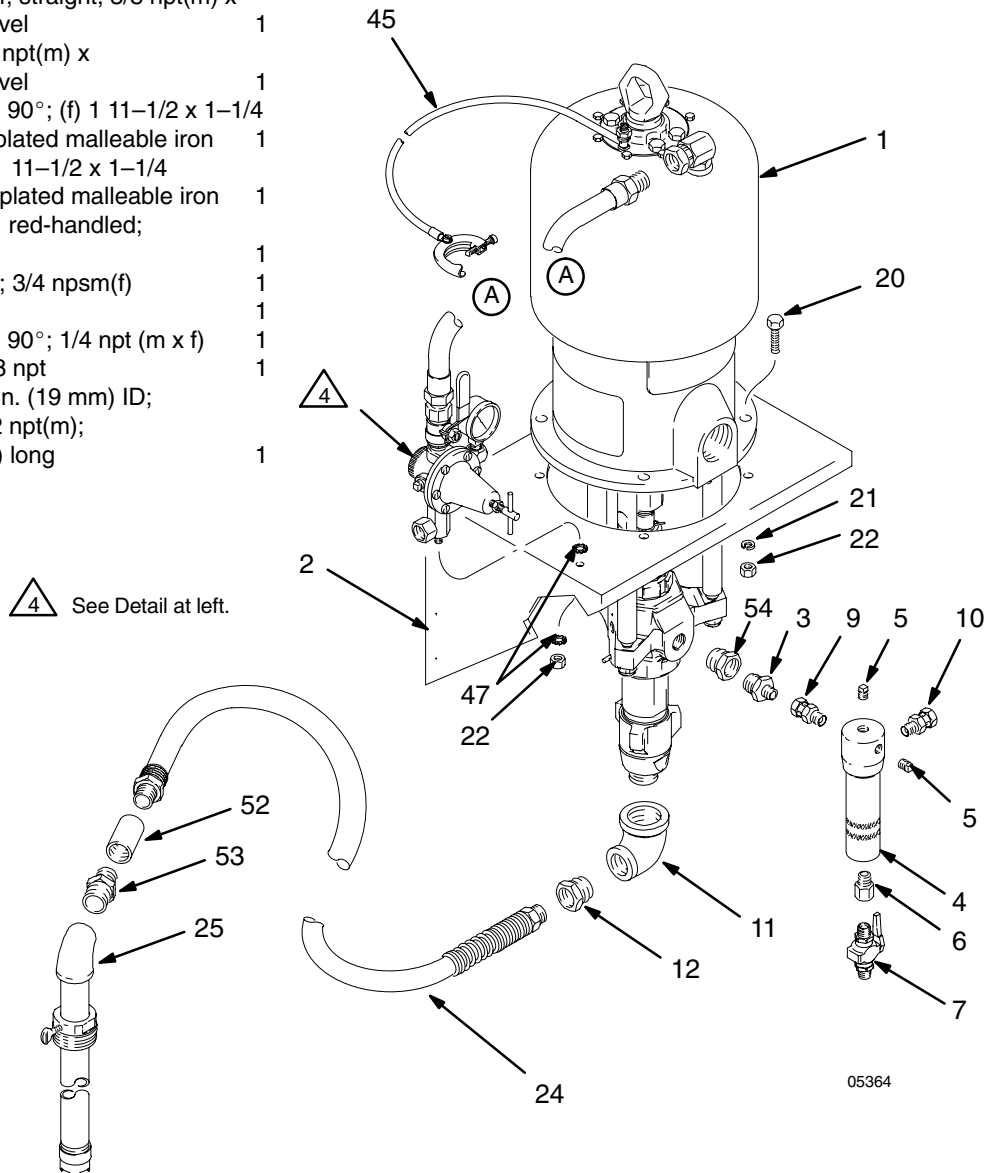
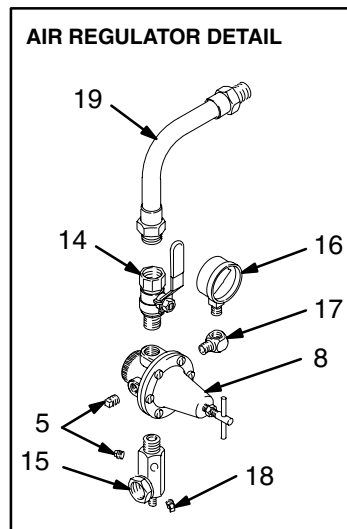
# Parts

## Model 245187, 33:1, Series B

## Model 253697, 28:1, Series A

Ref No.	Part No.	Description	Qty
1	245117	33:1 BULLDOG PUMP (245187 only) See 309340 for parts	1
	245167	28:1 BULLDOG PUMP (253697 only) See 309340 for parts	1
2	206294	BRACKET, wall, pump	1
3	161800	NIPPLE, reducing; 3/4 npt x 3/8 npsm	1
4	218029	FLUID FILTER See 307273 for parts	1
5	100509	PLUG, pipe, sq hd; 1/4 npt	4
6	150286	ADAPTER; 3/8 npt (m x f)	1
7	210658	DRAIN VALVE; 3/8 npt(mbe) See 306861 for parts	1
8	206197	AIR REGULATOR See 308168 for parts	1
9	155665	UNION, adapter, straight; 3/8 npt(m) x 3/8 npsm(f) swivel	1
10	157705	ADAPTER, 1/4 npt(m) x 3/8 npsm(f) swivel	1
11	116401	ELBOW, street, 90°; (f) 1 11-1/2 x 1-1/4 11-1/2(f); zinc-plated malleable iron	1
12	116402	ADAPTER; (f) 1 11-1/2 x 1-1/4 11-1/2(f); zinc-plated malleable iron	1
14	113269	BLEED VALVE, red-handled; 1/2 npt (m x f)	1
15	206205	MANIFOLD, air; 3/4 npsm(f)	1
16	100960	GAUGE, air	1
17	100840	ELBOW, street; 90°; 1/4 npt (m x f)	1
18	100403	PLUG, pipe; 1/8 npt	1
19	214952	HOSE, air; 3/4 in. (19 mm) ID; 3/4 npt(m) x 1/2 npt(m); 16 in. (406 mm) long	1

Ref No.	Part No.	Description	Qty
20	100101	SCREW, cap, hex hd; 3/8-16 x 1 in. (25 mm) long	4
21	100133	WASHER, spring lock; 3/8 in.	4
22	100131	NUT, hex; 3/8-16	5
24	244516	HOSE, siphon; nylon; 1 in. npt; 6 ft (1.8 m) long	1
25	206266	SUCTION TUBE; 3/4 npt(f)	1
43	206994	THROAT SEAL LIQUID 8 oz (0.5 liters); not shown	1
45	237569	GROUND WIRE	1
47	100322	WASHER, lock; 3/8 in.	2
52	100474	COUPLING, pipe	1
53	158555	NIPPLE, reducing; 1 npt x 3/4 npt	1
54	158586	BUSHING, 1 x 3/4	1



05364

# Parts

## Model 245185, Series A (240 Volt Heater)

## Model 245186, Series A (480 Volt Heater)

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	245117	33:1 BULLDOG PUMP See 309340 for parts	1	34*	159801	UNION, adapter, 90°; 3/8 npt(f) x 1/2 npsm(f) swivel	2
2	206294	BRACKET, wall, pump	1	35*	165198	NIPPLE, reducing; 1/4 npt(m) x 3/8 npt(m)	1
4	218029	FLUID FILTER See 307273 for parts	1	36*†	110110	SEALANT, pipe; sst; 6 ml (not shown)	1
5	100509	PLUG, pipe, sq hd; 1/4 npt	4	37†	207296	HOSE, fluid; PTFE tube w/braid cover; 13/32 in. ID; cpld 3/8 npt (mbe); 31 in. (0.8 m) long	1
6	150286	ADAPTER; 3/8 npt (m x f)	1	38†	207411	UNION, adapter, 45°; 3/8 npt(f) x 3/8 npsm(f) swivel	1
7	210658	DRAIN VALVE; 3/8 npt(mbe) See 306861 for parts	1	39†	100176	BUSHING, hex; 1/4 npt(f) x 3/8 npt(m)	2
8	206197	AIR REGULATOR See 308168 for parts	1	40†	214711	BALL VALVE, three-way; 1/4 npt(m); See 306861 for parts	1
11	116401	ELBOW, street, 90°; (f) 1 11-1/2 x 1-1/4 11-1/2(f); zinc-plated malleable iron	1	41†	205169	HOSE, fluid; nylon; 3/8 in. ID; 3/8 npsm (fbe); 3 ft (0.9 m) long	1
12	116402	ADAPTER; (f) 1 11-1/2 x 1-1/4 11-1/2(f); zinc-plated malleable iron	1	42†	167905	TUBE, return; 3/8 npt(m)	1
14	113269	BLEED VALVE, red-handled; 1/2 npt (m x f)	1	43	206994	THROAT SEAL LIQUID 8 oz (0.5 liters); not shown	1
15	206205	MANIFOLD, air; 3/4 npsm(f)	1	44	245863	VISCON HP HEATER, 240 Volt; used on Model 245185	2
16	100960	GAUGE, air	1		245864	VISCON HP HEATER, 480 Volt; used on Model 245186	2
17	100840	ELBOW, street; 90°; 1/4 npt (m x f)	1	45	237569	GROUNDING WIRE AND CLAMP	1
18	100403	PLUG, pipe; 1/8 npt	1	47	100322	WASHER, lock; 3/8 in.	2
19	214952	HOSE, air; 3/4 in. (19 mm) ID; 3/4 npt(m) x 1/2 npt(m); 16 in. (406 mm) long	1	48†	500566	TEE; 1 in. female	1
20	100101	SCREW, cap, hex hd; 3/8-16 x 1 in. (25 mm) long	4	49†	100615	BUSHING; 3/4 npt(m) x 1/4 npt(f)	1
21	100133	WASHER, spring lock; 3/8 in.	4	51▲	290074	LABEL, warning	1
22	100131	NUT, hex; 3/8-16	5	52	100474	COUPLING, pipe	1
24	244516	HOSE, siphon; nylon; 1 in. npt; 6 ft (1.8 m) long	1	53	158555	NIPPLE, reducing; 1 npt x 3/4 npt	1
25	206266	SUCTION TUBE; 3/4 npt(f)	1	54†	158585	FITTING, nipple	1
26*	183982	BRACKET, wall, heater	2	55†	158586	BUSHING; 1 npt(m) x 3/4 npt(f)	1
27*	175013	NIPPLE; 3/4 npt	1	62	502265	BUSHING, reducer, pipe	2
28*	166590	ELBOW, street, 3/4 npt(m x f)	1	64*	158491	NIPPLE, 1/2 npt	3
29*	235132	CHECK VALVE; 3/4 npt(m) x 3/4 npt(f); includes items 29a-29e	1				
29a	235133	. SEAT, valve	1				
29b	111691	. O-RING; fluoroelastomer	1				
29c	101190	. BALL	1				
29d	181492	. GUIDE, ball	3				
29e	187861	. HOUSING, valve	1				
30*	158556	COUPLING, hex pipe; 1/2 npt(f) x 3/4 npt(f)	1				
31*	H55003	HOSE, fluid; nylon; 1/2 in. (12.7 mm) ID; 1/2 npt (fbe); 3 ft (0.9 m) long	3				
32*	158683	ELBOW, 90°; 1/2 npt (m x f)	2				
33*	156849	NIPPLE; 3/8 npt	2				

\* Included in Dual Heater Mounting Kit 222311. Required to convert Model 245187 or 253697 Sprayers to a heated unit. The heaters are not included in this kit and must be ordered separately, by desired voltage (see page 10).

† Included in Circulating Kit 222312. Required to convert Model 245187 or 253697 Sprayers to a circulating unit.

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

# Parts

**Model 245185, Series A (240 Volt Heater)**  
**Model 245186, Series A (480 Volt Heater)**

- △1 Specify desired heater voltage (see page 10).
- △2 Part of the heater (44).
- △3 See Check Valve Detail.
- △4 See Air Regulator Detail.
- △5 Connect to the main fluid supply line to the guns.
- △6 Connect to the main fluid return line.

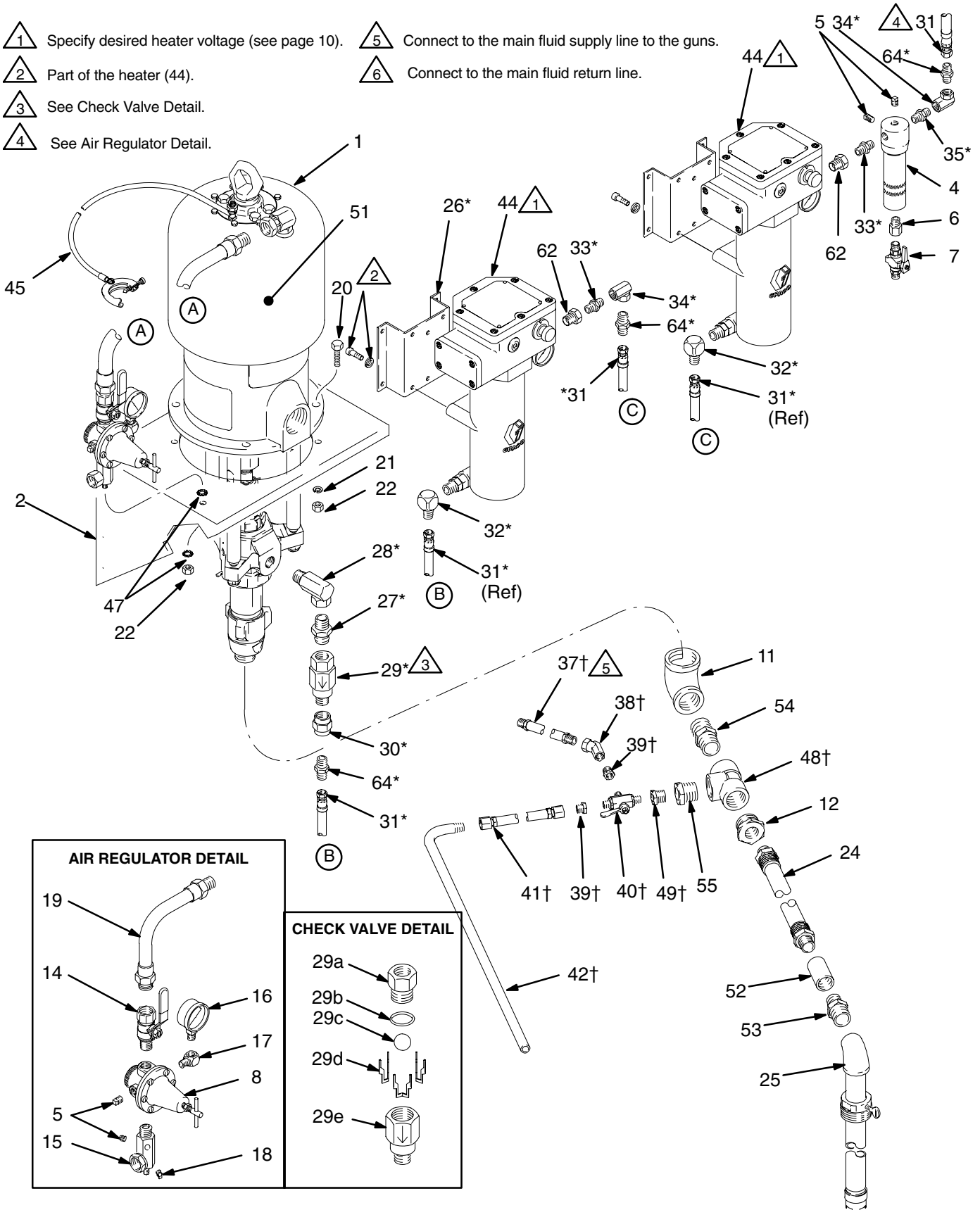
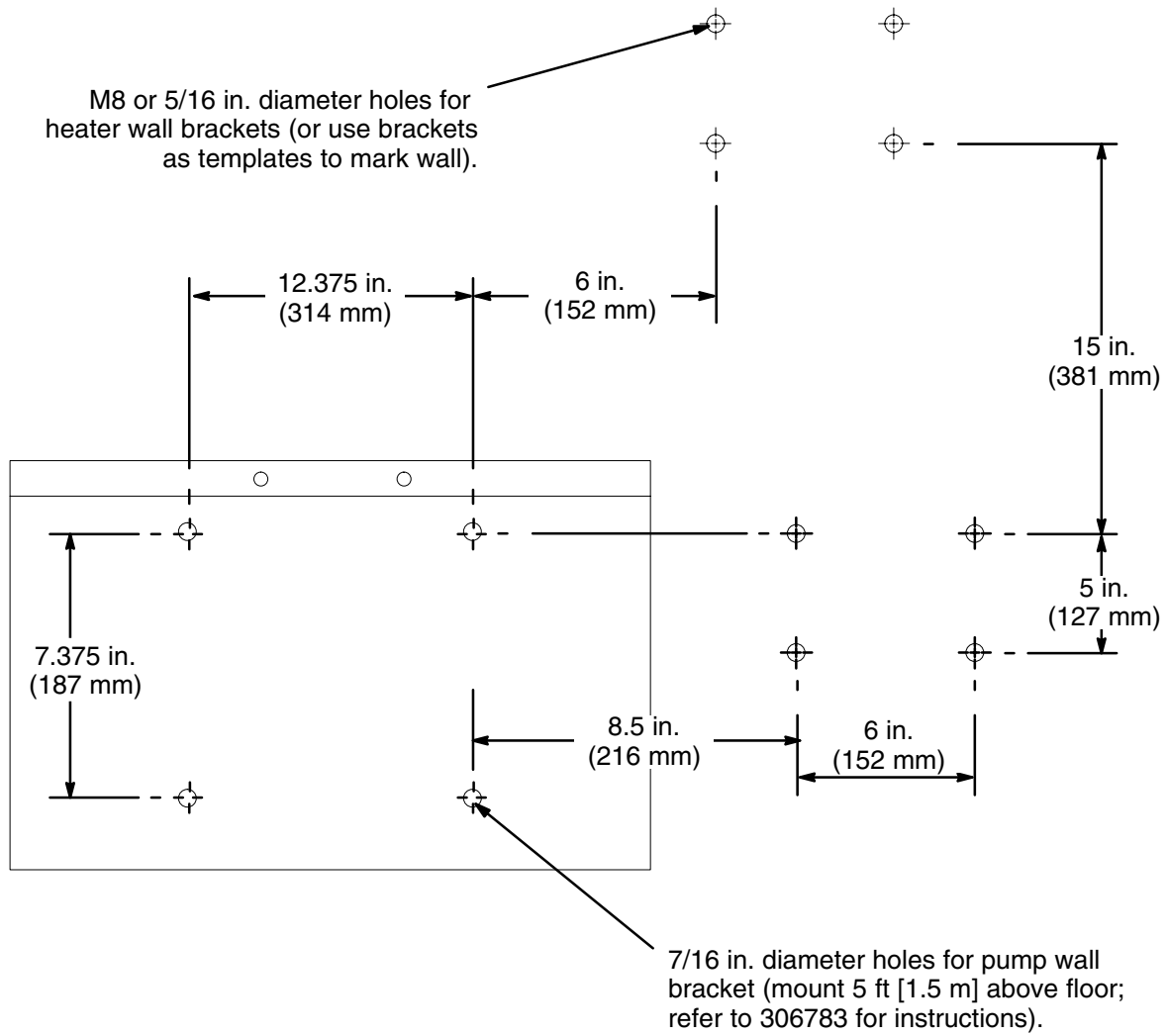


Fig. 8

5365D

# Mounting Hole Layout



# Technical Data

Category	Data
Maximum fluid working pressure	<i>Model 245187</i> : 3300 psi (228 bar, 22.8 MPa) <i>Models 245185, 245186</i> : 3000 psi (207 bar, 20.7 MPa) <i>Model 253697</i> : 2800 psi (193 bar, 19.3 MPa)
Maximum air input pressure	<i>Models 245187, 253697</i> : 100 psi (7 bar, 700 kPa) <i>Model 245185, 245186</i> : 90 psi (6 bar, 600 kPa)
Ratio	<i>Models 245185, 245186, 245187</i> : 33:1 <i>Model 253697</i> : 28:1
Pump performance data	See pump manual 309340
Air consumption data	See pump manual 309340
Maximum operating temperature	<i>Models 245187, 253697 (ambient temperature applications)</i> : 180°F (82°C) <i>Models 245185, 245186 (heated applications)</i> : 205°F (93°C)
Air inlet size	3/4 npsm(f)
Fluid outlet size (at fluid filter)	3/8 npsm(f)
Fluid inlet size	1–1/2 in. npt(f)
Weight	<i>Models 245187, 253697</i> : 135 lb (61 kg) <i>Models 245185, 245186</i> : 210 lb (95 kg)
Wetted parts	<i>Pump</i> : See pump manual 309340 <i>Fluid Filter</i> : See manual 307273 <i>Heater</i> : See manual 309524 <i>Suction Hose and Tube</i> : LDPE, Carbon Steel <i>Fluid Fittings</i> : Carbon Steel, Wrought Steel/Plated, Malleable Iron/Plated

## Sound Pressure Levels (tested at 1 meter from motor)

Air Motor	Input Air Pressures at 15 cycles per minute			
	40 psi (2.8 bar, 280 kPa)	70 psi (4.8 bar, 480 kPa)	90 psi (6 bar, 600 kPa)	100 psi (7 bar, 700 kPa)
Standard Bulldog	82.4 dB(A)	87.3 dB(A)	88.5 dB(A)	90.0 dB(A)

## Sound Power Levels (tested in accordance with ISO 9614)

Air Motor	Input Air Pressures at 15 cycles per minute			
	40 psi (2.8 bar, 280 kPa)	70 psi (4.8 bar, 480 kPa)	90 psi (6 bar, 600 kPa)	100 psi (7 bar, 700 kPa)
Standard Bulldog	91.6 dB(A)	95.9 dB(A)	97.4 dB(A)	98.1 dB(A)

# 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.

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**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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MM 307932

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307932 12/1988, Revised 06/2006