

# Instructions – Parts List



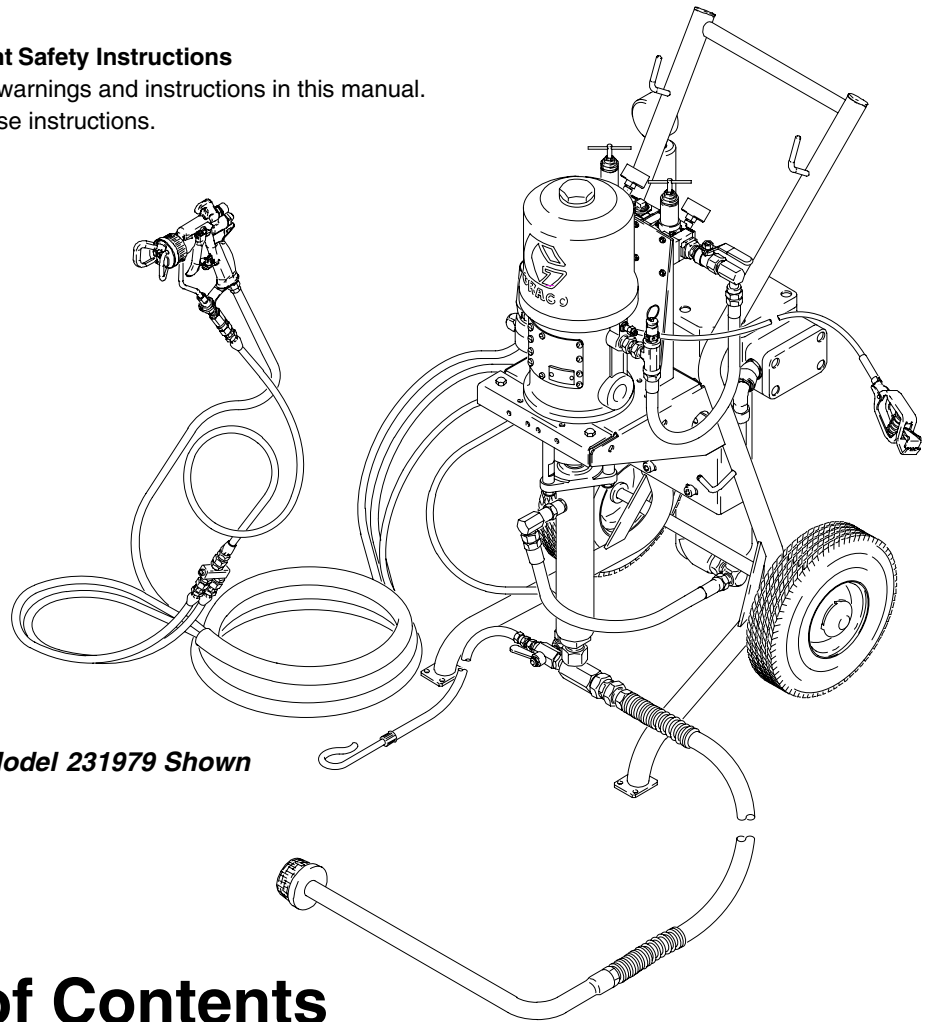
## Cart-Mounted, Heated Air-Assisted Package

308693 rev.K



### Important Safety Instructions

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



*Model 231979 Shown*

## Table of Contents

List of Models .....	2
Warnings .....	3
Setup .....	6
Operation .....	10
Parts .....	16
Dimensions .....	21
Technical Data .....	22
Graco Warranty .....	24
Graco Information .....	24

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# List of Models

Package Part No.	Series	Pump Model	Ratio	Maximum Fluid Working Pressure	Maximum Air Input Pressure	Voltage/ Amps
231979	D	President®, carbon steel	30:1	3000 psi (21 MPa, 210 bar)	100 psi (0.7 MPa, 7 bar)	120/19.2
231980	D	President®, carbon steel	30:1	3000 psi (21 MPa, 210 bar)	100 psi (0.7 MPa, 7 bar)	240/16.7
231982	C	President®, carbon steel	30:1	3000 psi (21 MPa, 210 bar)	100 psi (0.7 MPa, 7 bar)	240/16.7
232005	D	Monark®, stainless steel	15:1	1500 psi (10 MPa, 100 bar)	100 psi (0.7 MPa, 7 bar)	120/19.2
232006	D	Monark®, stainless steel	15:1	1500 psi (10 MPa, 100 bar)	100 psi (0.7 MPa, 7 bar)	240/16.7
232015	D	President®, carbon steel	15:1	1500 psi (10 MPa, 100 bar)	100 psi (0.7 MPa, 7 bar)	120/19.2
232016	D	President®, carbon steel	15:1	1500 psi (10 MPa, 100 bar)	100 psi (0.7 MPa, 7 bar)	240/16.7
232034	D	President®, stainless steel	30:1	3000 psi (21 MPa, 210 bar)	100 psi (0.7 MPa, 7 bar)	120/19.2
232049	D	Monark®, stainless steel	23:1	2300 psi (16 MPa, 160 bar)	100 psi (0.7 MPa, 7 bar)	120/19.2
232050	D	Monark®, stainless steel	23:1	2300 psi (16 MPa, 160 bar)	100 psi (0.7 MPa, 7 bar)	240/16.7
232059	D	Monark®, carbon steel	23:1	2300 psi (16 MPa, 160 bar)	100 psi (0.7 MPa, 7 bar)	120/19.2
232060	D	Monark®, carbon steel	23:1	2300 psi (16 MPa, 160 bar)	100 psi (0.7 MPa, 7 bar)	240/16.7
232062	D	Monark®, carbon steel	23:1	2300 psi (16 MPa, 160 bar)	100 psi (0.7 MPa, 7 bar)	240/16.7

# 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



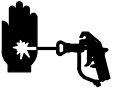
INSTRUCTIONS

### 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 uncertain about usage, call your Graco distributor.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- 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 22 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, 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 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 10 whenever you: are instructed to relieve pressure; stop spraying; clean, check, or service the equipment; and install or clean the spray tip.
- Tighten all 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.
- Use only Graco approved hoses. Do not remove any 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 10 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 7.
- 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.

# Setup

## 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 Product Data Sheet 305813. If you supply your own accessories, be sure they are adequately sized and pressure-rated for your system.

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.

## Prepare the Operator

All persons who operate the equipment must be trained in the safe, efficient operation of all system components as well as the proper handling of all fluids. All operators must thoroughly read all instruction manuals, tags, and labels before operating the equipment.

## Prepare the Site

**NOTE:** The compressed air supply to the gun must be clean and dry, to prevent damage to the finish. Use a coalescing air filter in the main air supply line.

Ensure that you have an adequate compressed air supply. Refer to the performance charts on page 23 to find the air consumption of your sprayer.

Refer to Fig. 2. Bring a compressed air supply line (A) from the air compressor to the pump location. Be sure all air hoses are properly sized and pressure-rated for your system. Use only electrically conductive hoses. The air hose should have a 3/8 npsm(m) thread.

Install a bleed-type shutoff valve (B) in the air line to isolate the air line components for servicing. Install an air line filter (J) and a moisture trap and drain valve (C) to help remove moisture and contaminants from the compressed air supply.


Keep the site clear of any obstacles or debris that could interfere with the operator's movement.

Have a grounded, metal pail available for use when flushing the system.

# Setup

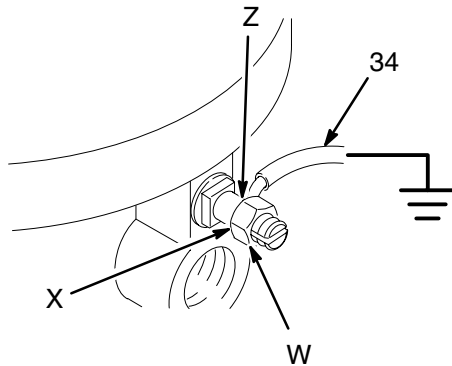
## Grounding

**⚠ WARNING**



**FIRE AND EXPLOSION HAZARD**  
Before operating the pump, ground the system as explained below. Also read the section **FIRE AND EXPLOSION HAZARD** on page 5.

1. *Pump:* use the ground wire and clamp (supplied). See Fig. 1. Loosen the grounding lug locknut (W) and washer (X). Insert one end of the ground wire (34) into the slot in lug (Z) and tighten the locknut securely. Connect the other end of the wire to a true earth ground.



0720

**Fig. 1**

2. *Air and fluid hoses:* use only electrically conductive hoses.
3. *Viscon HP Heater:* refer to the heater manual, supplied.
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.

## Supplied Components

Refer to Fig. 2.

**⚠ WARNING**

A red-handled bleed-type master air valve (E) and a fluid drain valve (D) are supplied. These components 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 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 (E)** 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 pump air regulator (F).
- **The pump air regulator (F)** controls pump speed and outlet pressure by adjusting the air pressure to the pump. Locate close to the pump, but **upstream** from the bleed-type master air valve (E).
- **The air relief valve (41)** opens automatically to prevent overpressurization of the pump.
- **The gun air filter/regulator (G)** adjusts the air pressure to the air-assisted spray gun (106).
- **The air manifold (H)** directs incoming air to the pump and to the gun. It includes an air inlet swivel fitting.

*Continued on page 8.*

# Setup

## Supplied Components (continued)

- **The fluid filter (16)** includes a 60 mesh (250 micron) stainless steel element to filter particles from the fluid as it leaves the pump. It also includes the **fluid drain valve (D)**, which is required in your system to relieve fluid pressure in the hose and gun (see the **WARNING** on page 7).
- **The gun filter/swivel (104)** provides a final filtering of fluid before it enters the gun, and allows greater gun maneuverability.
- **The suction hose (25) and tube (26)** allow the pump to draw fluid from a 5 gallon (19 liter) pail (K). The strainer at the end of the suction tube keeps large particles from entering the pump.
- **The back pressure regulator (40)** controls back pressure to the gun and maintains proper circulation pressure.
- **The 3-way valve (45)** allows you to circulate fluid back to the pump or return it to the fluid container.

## Fluid Heater

The **fluid heater (51)** heats the fluid as it passes through, to maintain the correct spraying viscosity.

Read and understand all instructions in the supplied heater manual 309524 before operating the heater.

### **WARNING**

#### **COMPONENT RUPTURE HAZARD**



Heat causes fluid to expand. If the heated fluid is trapped with nowhere to expand, it can cause component rupture.

**Be sure** to keep the heated fluid circulating (turn the 3-way valve to CIRC). **Do not** install a fluid shutoff device between the heater and the gun.

### **WARNING**



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

The Viscon HP Heater 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.

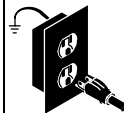


Refer to the **Technical Data** and to the supplied Viscon HP Heater manual 309524 for information on heater power supply requirements.

**Do not** plug in or unplug the power cord in any area containing flammable fluids or fumes, to avoid fire or explosion resulting in serious injury.

**Do not** put all flammable materials and debris on or near the heater. Keep the work area clean.

### **WARNING**



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

The heater electrical cord is rated for 105°C (221°F). Do not substitute a lower temperature rated, generally available cord.



# Setup

## KEY

### SUPPLIED WITH THE SPRAYER

- 1 Cart
- 13 Pump
- 16 Fluid Filter (includes fluid drain valve D)
- 25 Suction Hose
- 26 Suction Tube
- 34 Ground Wire (required; see page 7 for installation instructions)
- 40 Back Pressure Regulator
- 41 Air Relief Valve
- 45 3-Way Valve
- 51 Fluid Heater

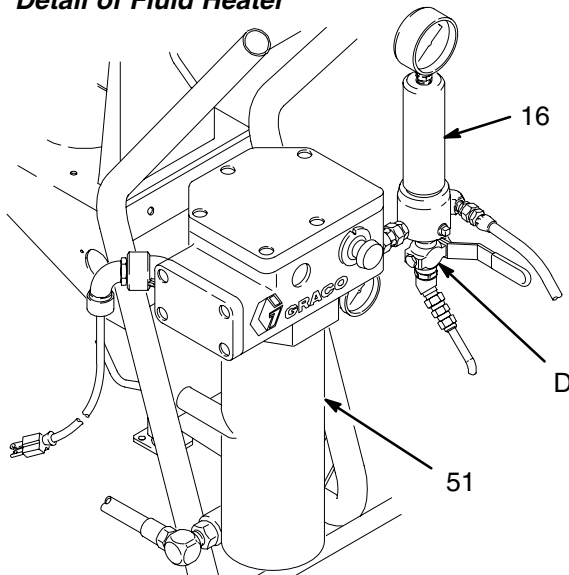
### SUPPLIED WITH THE SPRAYER

- 101 Electrically Conductive, Heated Air and Fluid Supply/Return Hose
- 103 Fluid Whip Hose
- 104 Gun Filter/Swivel
- 106 Air-Assisted Spray Gun
- D Fluid Drain Valve
- E\* Red-Handled Bleed-Type Master Air Valve (required, for pump)
- F\* Pump Air Regulator
- G\* Gun Air Filter/Regulator
- H\* Air Manifold
- \* Included in Air Regulation Kit (19).

### COMPONENTS YOU MUST SUPPLY

- A Electrically Conductive Air Supply Hose
- B Bleed-Type Master Air Valve (for accessories)
- C Air Line Moisture Trap and Drain Valve
- J Air Line Filter
- K Grounded 5 Gallon (19 Liter) Pail

### Detail of Fluid Heater



### Detail of Air Controls

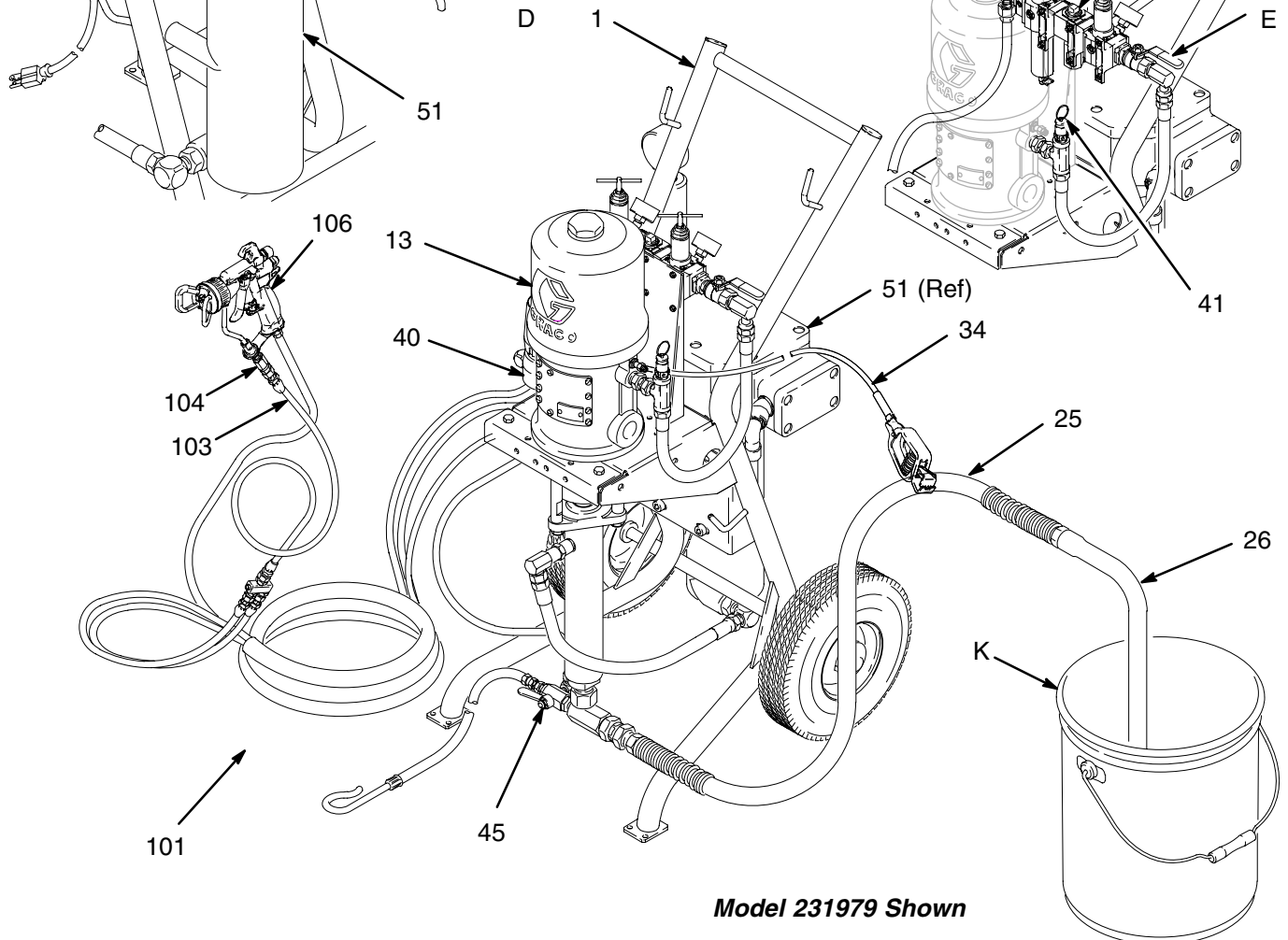
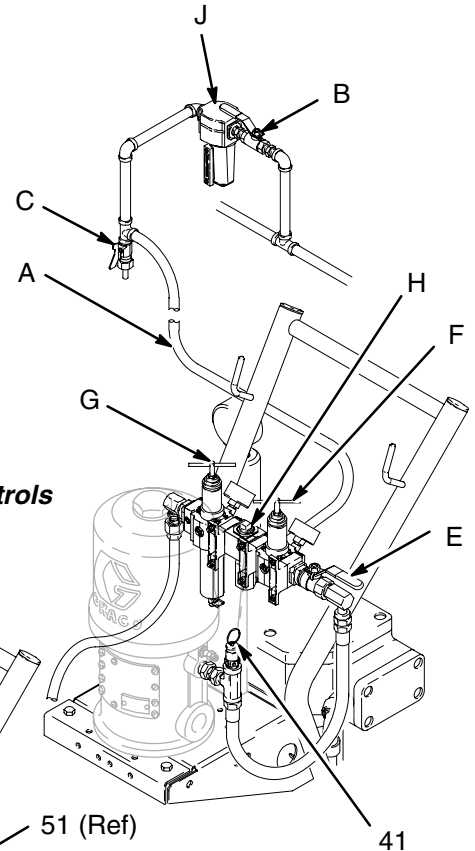


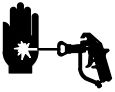
Fig. 2

06901B

# Operation

## 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 tip.

### WARNING



#### HOT SURFACE HAZARD

Do not touch the heater while it is operating. Allow the heater to cool for at least 10 minutes before flushing or servicing it.

### WARNING



#### FIRE AND EXPLOSION HAZARD

Do **not** plug in or unplug the power cord in any area containing flammable fluids or fumes, to avoid fire or explosion resulting in serious injury.

5. Turn the 3-way valve (45) to DRAIN. Hook the drain hose (46) onto a waste container.
6. Unlock the gun trigger safety.
7. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
8. Lock the gun trigger safety.
9. Open the drain valve (D, required in your system), having a container ready to catch the drainage.
10. 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

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

### 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 torque 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

The pump is tested with lightweight oil, which is left in to protect the pump parts. If the fluid you are using may be contaminated by the oil, flush it out with a compatible solvent. See **Flushing** on page 15.

1. Lock the gun trigger safety.
2. Unplug the heater power cord.
3. Circulate the fluid for at least 10 minutes to cool the heated fluid and the heater.
4. Close the red-handled bleed-type master air valve (E, required in your system). See Fig. 3.

# Operation

## CAUTION

To avoid tip-over, the cart must be on a flat and level surface. Failure to follow this caution could result in injury or equipment damage.

### Prime the Pump

## WARNING



### FIRE AND EXPLOSION HAZARD

**Do not** plug in or unplug the power cord in any area containing flammable fluids or fumes, to avoid fire or explosion resulting in serious injury.

1. See Fig. 3. Unplug the heater power cord before priming the pump.
  2. Remove the tip guard and spray tip from the gun (106). See the gun manual.
  3. Close the gun air filter/regulator (G), pump air regulator (F), and bleed-type air valves (B, E).
  4. Close the fluid drain valve (D).
  5. Connect the air line (A) to the swivel of the air manifold (H).
  6. Check that all fittings throughout the system are tightened securely.
  7. Turn the 3-way valve (45) to CIRC. Hook the drain hose (46) onto a waste container.
  8. Place the pump suction tube (26) into the fluid supply container.
  9. Open the back pressure regulator (40) (fully counterclockwise).
  10. Open the bleed-type air valves (B, E) and the gun air filter/regulator (G).
  11. Hold a metal part of the gun (106) firmly to the side of a grounded metal pail and hold the trigger open.
  12. Slowly open the pump air regulator (F) until the pump starts.
- NOTE:** To open the air regulator, turn the T-handle in (clockwise). To close the regulator, turn the handle counterclockwise. To lock the regulator setting, tighten the jam nut.
13. Cycle the pump slowly until all air is pushed out and the pump and hoses are fully primed.
  14. Release the gun trigger and lock the trigger safety. The pump will continue to cycle as long as air is supplied and the back pressure regulator is open.
  15. If the pump fails to prime properly, open the drain valve (D). Use the drain valve as a priming valve until the fluid flows from the valve. Close the valve.
- NOTE:** When changing fluid containers with the hose and gun already primed, open the drain valve (D) to help prime the pump and vent air before it enters the hose. Close the drain valve when all air is eliminated.

# Operation

## Install the Spray Tip

### WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

Relieve the pressure. Install the spray tip and tip guard as explained in your separate gun manual, supplied.

The fluid output and pattern width depend on the size of the spray tip, the fluid viscosity, and the fluid pressure. Use the **Spray Tip Selection Chart** in your gun instruction manual as a guide for selecting an appropriate spray tip for your application.

## Adjust the Spray Pattern

### WARNING



#### FIRE AND EXPLOSION HAZARD

**Do not** plug in or unplug the power cord in any area containing flammable fluids or fumes, to avoid fire or explosion resulting in serious injury.

1. Start the pump. Plug in the heater power cord. Turn the 3-way valve (45) to CIRC.
2. Set the heater control to a trial point (4 or 5).
3. Circulate fluid through the pump for at least 10 minutes, at very low pressure. Check the temperature on the heater thermometer.
4. Adjust the fluid pressure and temperature to the lowest settings necessary to get the desired results. Use the air regulator (F) to adjust the pump speed and fluid pressure until the spray is completely atomized. Refer to the back pressure valve and heater manuals (supplied) for adjustment procedures. Higher pressures and temperatures may not improve the spray pattern and will cause premature component wear.

### WARNING

#### COMPONENT RUPTURE HAZARD



To reduce the risk of overpressurizing your package, which could cause component rupture and serious injury, *never exceed 100 psi (0.7 MPa, 7 bar) air input pressure to the package. Never exceed 100 psi (0.7 MPa, 7 bar) air input pressure to the spray gun.* Also refer to the **Technical Data** on page 22 and to your separate component manuals.

Heat causes fluid to expand. If the heated fluid is trapped with nowhere to expand, it can cause component rupture. **Be sure** to keep the heated fluid circulating (turn the 3-way valve to CIRC). **Do not** install a fluid shutoff device between the heater and the gun.

5. When applying the fluid, keep the gun a consistent distance, about 8 to 12 inches (200 to 300 mm) from the surface of the object being sprayed. Always hold the gun at a right angle from the surface. Do not make an arc with the gun as it causes an uneven coat of fluid. Use a full-open, full-close triggering action. Practice to find the best length and speed of stroke.
6. To adjust the spray pattern, follow the instructions in your gun manual, supplied.
7. With the pump and lines primed, and with adequate volume supplied, the pump will continue to cycle as long as air is supplied and the back pressure regulator is open.


### 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.

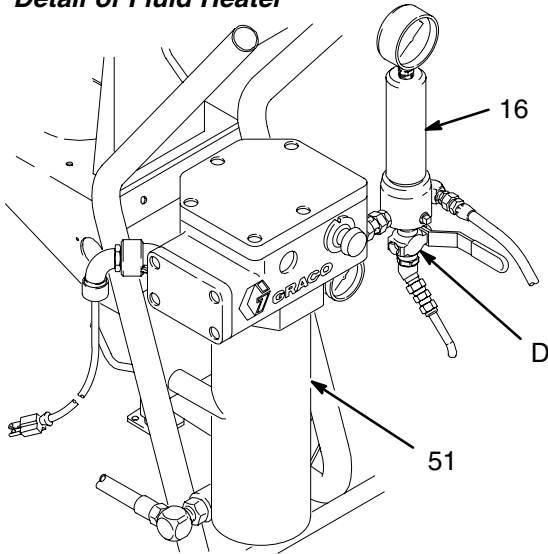
# Operation

## KEY

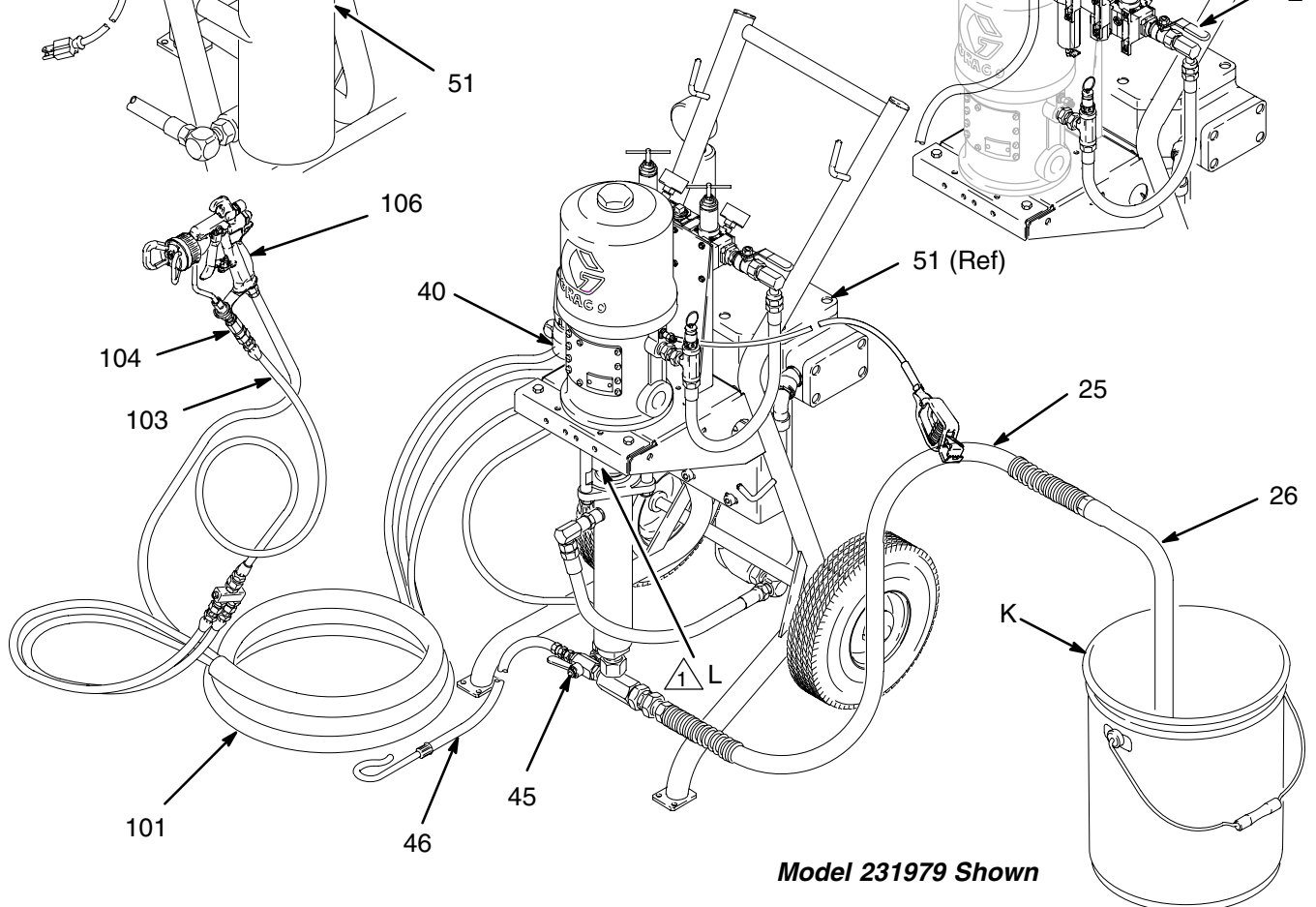
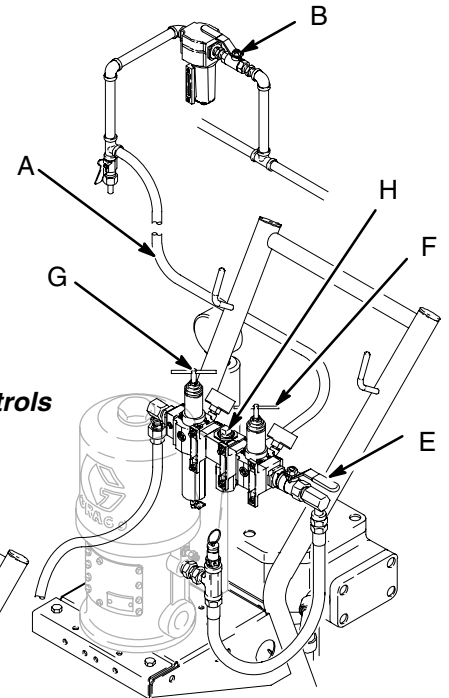
16	Fluid Filter (includes fluid drain valve D)	103	Fluid Whip Hose	E	Red-Handled Bleed-Type Master Air Valve (required, for pump)
25	Suction Hose	104	Gun Filter/Swivel	F	Pump Air Regulator
26	Suction Tube	106	Air-Assisted Spray Gun	G	Gun Air Filter/Regulator
40	Back Pressure Regulator	A	Electrically Conductive Air Supply Hose	H	Air Manifold
45	3-Way Valve	B	Bleed-Type Master Air Valve (for accessories)	K	Grounded 5 Gallon (19 Liter) Pail
46	Fluid Return Drain Hose	D	Fluid Drain Valve	L	Packing Nut/Wet-Cup (partially hidden)
51	Fluid Heater				
101	Electrically Conductive, Heated Air and Fluid Supply/Return Hose				

 Torque as specified in your separate pump manual.

### Detail of Fluid Heater



### Detail of Air Controls



**Model 231979 Shown**

06901B

**Fig. 3**

# Operation

## Clean the In-Line Filter/Swivel Element

The filter/swivel (104) includes a 100 mesh stainless steel filter element (105). Clean the element periodically with a compatible solvent, as follows.

### **WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

1. Relieve the pressure.
2. Disassemble the filter/swivel (104) and remove the filter element (105).
3. Clean or replace the element, as necessary.
4. Reassemble. Torque the two halves of the filter/swivel to 10–15 ft-lb (14–20 N•m).

## 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 10.


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** on page 15.

# Operation

## Flushing


**WARNING**

**FIRE AND EXPLOSION HAZARD**  
Before flushing, read the section **FIRE AND EXPLOSION HAZARD** on page 5. Be sure the entire system and flushing pails are properly grounded. Refer to **Grounding** on page 7.


Flush the pump:

- Before the first use
- When changing colors or fluids
- Before fluid can dry or settle out in a dormant pump (check the pot life of catalyzed fluids)
- Before storing the pump.


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.


**CAUTION**


If you have a carbon steel package, 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 10.

**WARNING**

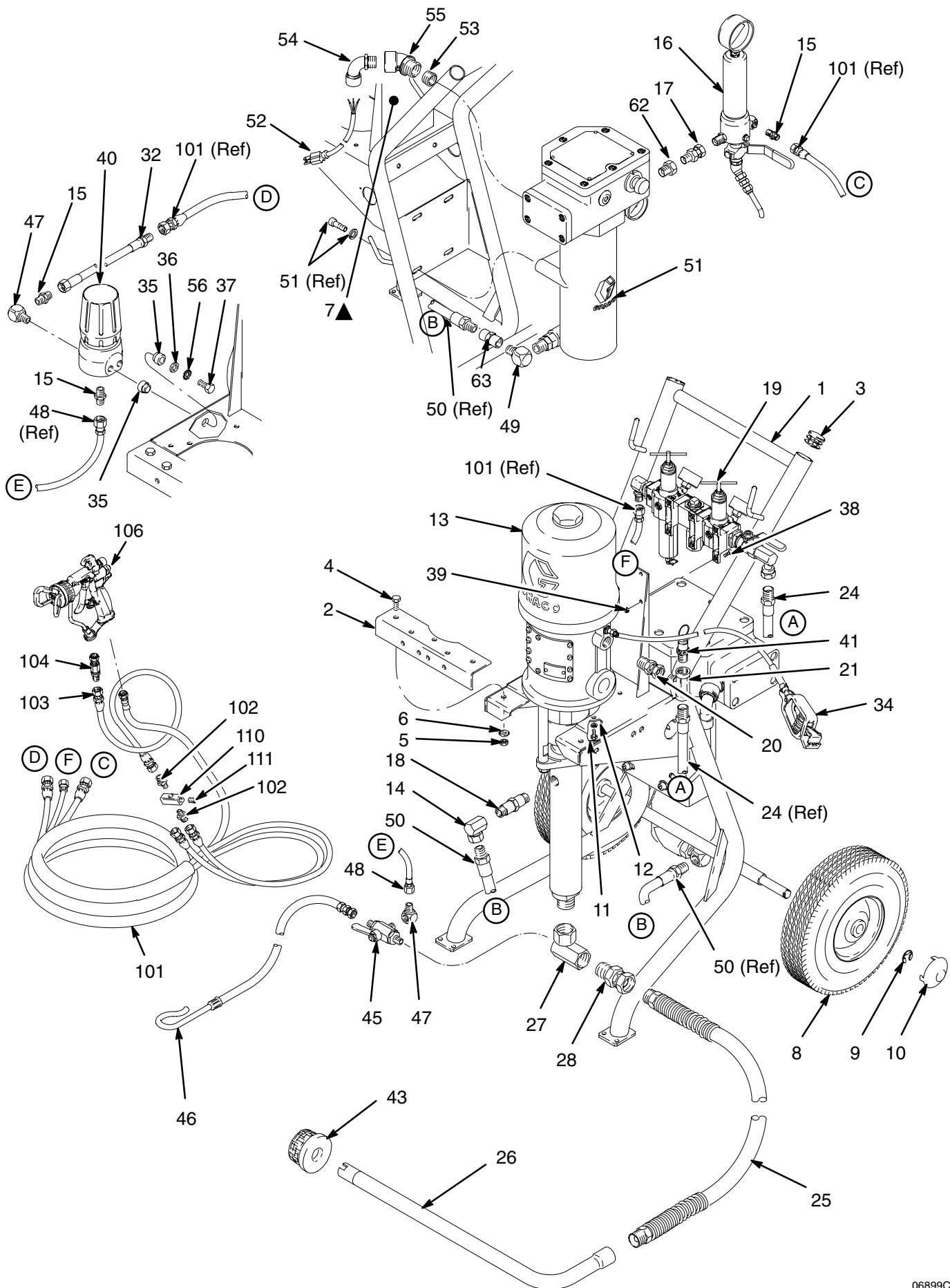
**HOT SURFACE HAZARD**  
Do not touch the heater while it is operating. Allow the heater to cool for at least 10 minutes before flushing or servicing it.

**WARNING**

**FIRE AND EXPLOSION HAZARD**  
**Do not** plug in or unplug the power cord in any area containing flammable fluids or fumes, to avoid fire or explosion resulting in serious injury.

1. Unplug the heater power cord and circulate the fluid for at least 10 minutes to cool the heated fluid and the heater.
2. Relieve the pressure.
3. Remove the tip guard and spray tip from the gun. See the gun manual.
4. Remove the filter element from the fluid filter (16). Reinstall the filter bowl.
5. Open the back pressure regulator (40). Set the 3-way valve (45) to CIRC.
6. Place the suction tube (26) in a container of solvent.
7. Hold a metal part of the gun firmly to the side of a grounded *metal* pail.
8. Start the pump. Always use the lowest possible fluid pressure when flushing.
9. Trigger the gun. Flush the system until clear solvent flows from the gun.
10. Release the gun trigger and lock the trigger safety. The pump will continue to cycle as long as air is supplied and the back pressure regulator is open.
11. Set the 3-way valve (45) to DRAIN. Hook the drain hose (46) onto a waste container and continue flushing until clear fluid comes from the hose.
12. Relieve the pressure.
13. Clean the tip guard, spray tip, and fluid filter element separately, then reinstall them.
14. Clean the inside and outside of the suction tube (26).

# Parts





# Parts

**NOTE:** Part numbers vary by package. To find the part number used in your package, read down the chart to find the desired ref. no., then read left to right to find the part number for your package.

Ref. No.	Description	Packages						Qty
		CST 231979, 231980, 231982	SST 232034	SST 232005, 232006	CST 232015, 232016	SST 232049, 232050,	CST 232059, 232060, 232062	
1	CART, portable; includes replaceable items 2–10	238938	238938	238938	238938	238938	238938	1
2	. BRACKET, front	191902	191902	191902	191902	191902	191902	1
3	. CAP	112853	112853	112853	112853	112853	112853	2
4	. CAPSCREW, hex hd; M8 x 1.25; 16 mm (5/8 in.)	108768	108768	108768	108768	108768	108768	2
5	. NUT, keps, hex; M8	113761	113761	113761	113761	113761	113761	2
6	. WASHER, flat; 8 mm	108788	108788	108788	108788	108788	108788	2
7▲	. LABEL, warning	290331	290331	290331	290331	290331	290331	1
8	. WHEEL	106062	106062	106062	106062	106062	106062	2
9	. RING, retaining	101242	101242	101242	101242	101242	101242	2
10	. HUBCAP	104811	104811	104811	104811	104811	104811	2
11	CAPSCREW, hex hd; 1/4–20 x 5/8 in. (16 mm)	100270	100270		100270			2
	CAPSCREW, hex hd; 1/4–20 x 3/4 in. (19 mm)			100022		100022	100022	2
12	LOCKWASHER, spring; 1/4 in.	100016	100016	100016	100016	100016	100016	2
13	PUMP, 30:1 President; cst; <i>see manual 306981</i>	223586						1
	PUMP, 30:1 President; sst; <i>see manual 308106</i>		223843					1
	PUMP, 15:1 Monark; sst; <i>see manual 308106</i>			223844				1
	PUMP, 15:1 President; cst; <i>see manual 306936</i>				217580			1
	PUMP, 23:1 Monark; sst; <i>see manual 307619</i>					237958		1
	PUMP, 23:1 Monark; cst; <i>see manual 307619</i>						223596	1
14	UNION, swivel, 90°; cst; 3/8 npt(f) x 1/2 npsm(f)	159801			159801		159801	1
	UNION, swivel, 90°; sst; 1/2 npt(fbe)		113934	113934		113934		1
15	NIPPLE; cst; 1/4 npt x 1/4 npsm	162453			162453		162453	3
	NIPPLE; sst; 1/4 npt x 1/4 npsm		166846	166846		166846		3
16	FLUID FILTER; cst; <i>see manual 307273</i>	239244			239244		239244	1
	FLUID FILTER; sst; <i>see manual 307273</i>		239300	239300		239300		1
17	UNION, swivel; cst; 3/8 npt(m) x 3/8 npsm(f)	155665			155665		155665	1
	UNION, swivel; sst; 3/8 npt(m) x 3/8 npsm(f)		235207	235207		235207		1
18	NIPPLE; cst; 3/8 npt	156850					156850	1
	NIPPLE; sst; 3/8 npt x 1/2 npt		112027	112027		112027		1
	NIPPLE; cst; 3/8 npt x 1/2 npt				188577			1

▲ Replacement Danger and Warning labels, tags and cards are available at no cost.  
 This label is also available in the following languages:  
 German (Part No. 290396)  
 French (Part No. 290397)  
 Spanish (Part No. 290398).

# Parts

**NOTE:** Part numbers vary by package. To find the part number used in your package, read down the chart to find the desired ref. no., then read left to right to find the part number for your package.

Ref. No.	Description	Packages						Qty
		CST 231979, 231980, 231982	SST 232034	SST 232005, 232006	CST 232015, 232016	SST 232049, 232050	CST 232059, 232060, 232062	
19	AIR REGULATOR KIT; <i>see manual 308686</i>	238939	238939	238939	238939	238939	238939	1
20	UNION, swivel; cst; 1/2 npt(m) x 3/8 npsm(f)	158256	158256		158256			1
	UNION, swivel; cst; 3/8 npt(m) x 3/8 npsm(f)			155665		155665	155665	1
21	TEE; 3/8 npt(f) run x 3/8 npt(m) branch	113777	113777	113777	113777	113777	113777	1
24	HOSE, air; 3/8 in. (10 mm) ID; 3/8 npt(mbe); 22 in. (559 mm) long	239061	239061	239061	239061	239061	239061	1
25	HOSE, suction; 3/4 in. (19 mm) ID; 3/4 npt (mbe) cst fittings; 3.5 ft (1 m) long	214960			214960		214960	1
	tHOSE, suction; 3/4 in. (19 mm) ID; 3/4 npt (mbe) sst fittings; 3.5 ft (1 m) long		236075	236075		236075		1
26	TUBE, suction; aluminum	192121			192121		192121	1
	TUBE, suction; sst		112191	112191		112191		1
27	MANIFOLD, inlet; cst; 1/4 npt(f) x 3/4 npt(f) x 3/4 npsm(f)	166998			166998		166998	1
	MANIFOLD, inlet; sst; 1/4 npt(f) x 3/4 npt(f) x 3/4 npsm(f)		113927	113927		113927		1
28	UNION, swivel; cst; 3/4 npt(m) x 3/4 npsm(f)	157785			157785		157785	1
	UNION, swivel; sst; 3/4 npt(m) x 3/4 npsm(f)		112268	112268		112268		1
32	HOSE, fluid; nylon; 1/4 in. (6 mm) ID; 1/4 npt(m) x 1/4 npsm(f); 10 in. (0.25 m) long; cst fittings	239368			239368		239368	1
	HOSE, fluid; nylon; 1/4 in. (6 mm) ID; 1/4 npt(m) x 1/4 npsm(f); 10 in. (0.25 m) long; sst fittings		239311	239311		239311		1
33	THROAT SEAL LIQUID; 1 pint (0.5 liter); not shown	206994	206994	206994	206994	206994	206994	1
34	GROUND WIRE AND CLAMP	238909	238909	238909	238909	238909	238909	1
35	INSULATOR, heat	167002	167002	167002	167002	167002	167002	4
36	WASHER; 1/4 in.	100527	100527	100527	100527	100527	100527	2
37	CAPSCREW, hex hd; 1/4–20 x 3/4 in. (19 mm)	100022	100022	100022	100022	100022	100022	2
38	SCREW, socket; M5 x 0.8; 16 mm (5/8 in.)	113768	113768	113768	113768	113768	113768	6
39	NUT, hex, self-locking; M5 x 0.8	105332	105332	105332	105332	105332	105332	6
40	REGULATOR, back pressure; cst; <i>see manual 306860</i>	206819			206819		206819	1
	REGULATOR, back pressure; sst; <i>see manual 306860</i>		238926	238926		238926		1
41	VALVE, relief; 125 psi (0.86 MPa, 8.6 bar)	113769	113769	113769	113769	113769	113769	1
43	STRAINER, suction tube; 1/2 npt(f); sst	181073			181073		181073	1
	STRAINER, suction tube; 3/4 npt(f); sst		183770	183770		183770		1
44	NUT, hex; 1/4–20; not shown			100015		100015	100015	2

# Parts

**NOTE:** Part numbers vary by package. To find the part number used in your package, read down the chart to find the desired ref. no., then read left to right to find the part number for your package.

Ref. No.	Description	Packages						Qty
		CST 231979, 231980, 231982	SST 232034	SST 232005, 232006	CST 232015, 232016	SST 232049, 232050	CST 232059, 232060, 232062	
45	VALVE, 3-way; 1/4 npt(m); cst	214711			214711		214711	1
	VALVE, 3-way; 1/4 npt(m); sst		113834	113834		113834		1
46	HOSE, drain; nylon; cst fittings; 1/4 in. (6 mm) ID; 1/4 npsm(f)	206965			206965		206965	1
	HOSE, drain; nylon; sst fittings; 1/4 in. (6 mm) ID; 1/4 npsm(f)		239062	239062		239062		1
47	ELBOW; 1/4 npt (m x f); cst	100840			100840		100840	2
	ELBOW; 1/4 npt (m x f); sst		166866	166866		166866		2
48	HOSE, fluid; nylon; cst fittings; 0.25 in. (6 mm) ID; 1/4 npsm (fbe); 3 ft (0.9 m) long	H42503					H42503	1
	HOSE, fluid; nylon; cst fittings; 0.25 in. (6 mm) ID; 1/4 npsm (fbe); 3 ft (0.9 m) long				H42503			1
	HOSE, fluid; nylon; sst fittings; 0.15 in. (4 mm) ID; 1/4 npsm (fbe); 14 in. (0.36 m) long		239109	239109		239109		1
49	ELBOW, 90°; cst; 1/2 npt (m x f)	158683			158683		158683	1
	ELBOW, 90°; sst; 1/2 npt (m x f)		166242	166242		166242		1
50	HOSE, fluid; nylon; cst fittings; 1/2 in. (13 mm) ID; 1/2 npt (mbe); 19.5 in. (0.5 m) long	239148			239148		239148	1
	HOSE, fluid; nylon; sst fittings; 1/2 in. (13 mm) ID; 1/2 npt (mbe); 19.5 in. (0.5 m) long		239153	239153		239153		1
56	LOCKWASHER, external tooth; 1/4 in.	100985	100985	100985	100985	100985	100985	2
62	BUSHING, reducer, pipe	502265	502265	502265	502265	502265	502265	1
63	FITTING, coupler	117627	117627	117627	117627	117627	117627	1

# Hose and Gun Parts

Ref. No.	Description	Packages						Qty
		CST 231979, 231980, 231982	SST 232034	SST 232005, 232006	CST 232015, 232016	SST 232049, 232050	CST 232059, 232060, 232062	
101	HOSE, air/fluid, triple; nylon; 1/4 in. (6 mm) ID; 1/4 npsm (fbe) cst fittings; 24.6 ft (7.5 m) long;	239346			239346		239346	1
	HOSE, air/fluid, triple; nylon; 1/4 in. (6 mm) ID; 1/4 npsm (fbe) sst fittings; 24.6 ft (7.5 m) long		239311	239311		239311		1
102	NIPPLE; 1/4 npsm x 1/8 npt; cst	191872			191872		191872	3
	NIPPLE; 1/4 npsm x 1/8 npt; sst		191929	191929		191929		3
103	HOSE, whip, fluid; nylon; 3/16 in. (5 mm) ID; 1/4 npsm (fbe) cst fittings; 23.6 in. (0.6 m) long	238708			238708		238708	1
	HOSE, whip, fluid; nylon; 3/16 in. (5 mm) ID; 1/4 npsm (fbe) sst fittings; 23.6 in. (0.6 m) long		239069	239069		239069		1
104	SWIVEL FILTER, in-line; includes replaceable item 105	239394	239394	239394	239394	239394	239394	1
105	. ELEMENT, filter; 100 mesh sst; not shown	205264	205264	205264	205264	205264	205264	1
106	AA SERIES SPRAY GUN; with AAM413 tip; <i>see manual 311001</i>	249242	249242	249242	249242	249242	249242	1
107	SPRAY TIP; customer's choice; not shown	AAMxxx	AAMxxx	AAMxxx	AAMxxx	AAMxxx	AAMxxx	1
110	MANIFOLD, hose; cst; 1/8 npt(f)	169795			169795		169795	1
	MANIFOLD, hose; sst; 1/8 npt(f)		191923	191923		191923		1
111	PLUG; cst; 1/8 npt	100139			100139		100139	1
	PLUG; sst; 1/8 npt		107570	107570		107570		1

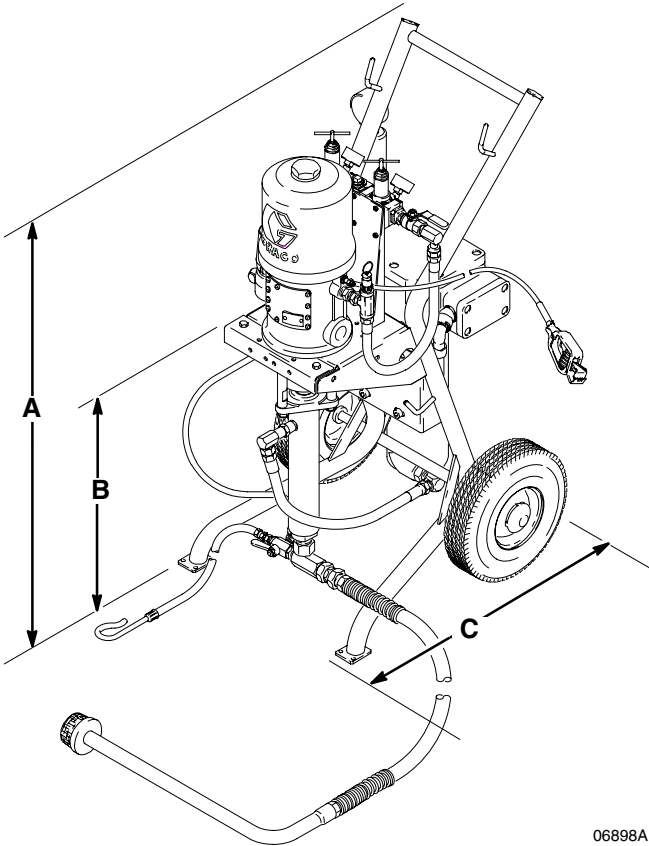
# Heater Parts

**NOTE:** This chart includes the heater and related parts which vary by package. The packages are grouped by heater voltage, so they are in different columns from the preceding charts. To find the part number used in your package, read down the chart to find the desired ref. no., then read left to right to find the correct part number.

Ref. No.	Description	Packages			Qty
		120V PACKAGES: 231979, 232005, 232015, 232034, 232049, 232059	240V PACKAGE: 231982	240V PACKAGES: 231980, 232006, 232016, 232050, 232060, 232062	
51	HEATER, fluid, 120V; <i>see manual 309524</i>	245848			1
	HEATER, fluid, 240V; <i>see manual 309524</i>		245863	245863	1
52	CORD, electrical; with plug; 12 AWG; 600V; 20 AMP; 221 °F (105°C); 6.5 ft (2 m) long	110160		110160	1
	CORD electrical; without plug; 12 AWG; 600V; 20 AMP; 221 °F (105°C); 6.5 ft (2 m) long		113922		1
53	BUSHING; 3/4 npt(m) x 1/2 npt(f)	107219		107219	1
54	STRAIN RELIEF, 90°	112408		112408	1
	STRAIN RELIEF, clamp		113162		1
55	ELBOW, conduit, 45°; 3/4 npt (m x f)	113778	113778	113778	1

# Dimensions

*Shown without hoses and gun*



06898A

## All Packages

A	B	C	Width Across Wheels	Weight
38.5 in. (978 mm)	22.5 in. (572 mm)	21 in. (534 mm)	20 in. (508 mm)	145 lb (66 kg)

# Technical Data

Category	Data
Maximum fluid working pressure	<i>Part Nos. 231979, 231980, 231982, 232034:</i> 3000 psi (21 MPa, 210 bar) <i>Part Nos. 232049, 232050, 232059, 232060, 232062:</i> 2300 psi (16 MPa, 160 bar) <i>Part Nos. 232015, 232016:</i> 1500 psi (10 MPa, 100 bar) <i>Part Nos. 232005, 232006:</i> 1500 psi (10 MPa, 100 bar)
Maximum air input pressure	100 psi (0.7 MPa, 7 bar)
Maximum gun air input pressure	100 psi (0.7 MPa, 7 bar)
Ratio	<i>Part Nos. 231979, 231980, 231982, 232034:</i> 30:1 <i>Part Nos. 232049, 232050, 232059, 232060, 232062:</i> 23:1 <i>Part Nos. 232015, 232016:</i> 15:1 <i>Part Nos. 232005, 232006:</i> 15:1
Maximum Heater	<i>Part Nos. 231979, 232005, 232015, 232034, 232049, 232059:</i> 120V, 19.2 Amp <i>Part Nos. 231980, 231982, 232006, 232016, 232050, 232060, 232062:</i> 240V, 16.7 Amp
Maximum operating temperature	120°F (50°C)
Wetted parts	<i>Pump:</i> See applicable pump manual <i>Spray Gun:</i> See gun manual 311001 <i>Fluid Filter:</i> See filter manual 307273 <i>Fluid Hoses:</i> Nylon

## Sound Pressure Levels (dBa)

(measured at 1 meter from unit)

Air Motor	Input Air Pressures at 15 cycles per minute		
	40 psi (0.28 MPa, 2.8 bar)	70 psi (0.48 MPa, 4.8 bar)	100 psi (0.7 MPa, 7 bar)
President	73.6 dB(A)	78.34 dB(A)	80.85 dB(A)
Monark	73.25 dB(A)	75.85 dB(A)	77.65 dB(A)

## Sound Power Levels (dBa)

(tested in accordance with ISO 9614–2)

Air Motor	Input Air Pressures at 15 cycles per minute		
	40 psi (0.28 MPa, 2.8 bar)	70 psi (0.48 MPa, 4.8 bar)	100 psi (0.7 MPa, 7 bar)
President	87.4 dB(A)	92.09 dB(A)	94.62 dB(A)
Monark	87.0 dB(A)	89.65 dB(A)	91.43 dB(A)

# Technical Data

## Performance Charts

**To find Fluid Outlet Pressure (psi/MPa/bar) at a specific fluid flow (lpm/gpm) and operating air pressure (psi/MPa/bar):**

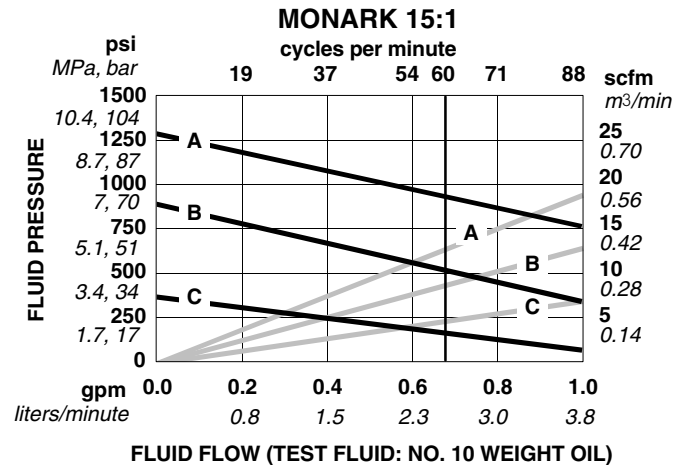
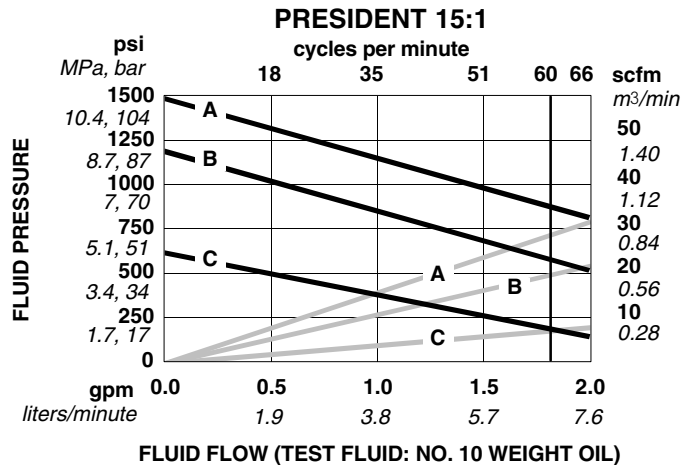
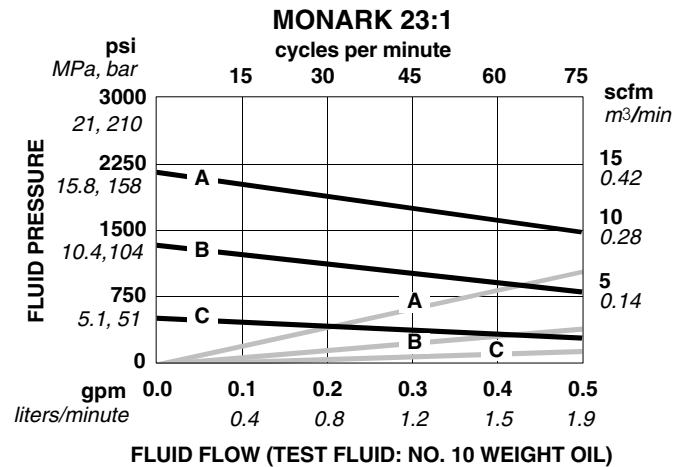
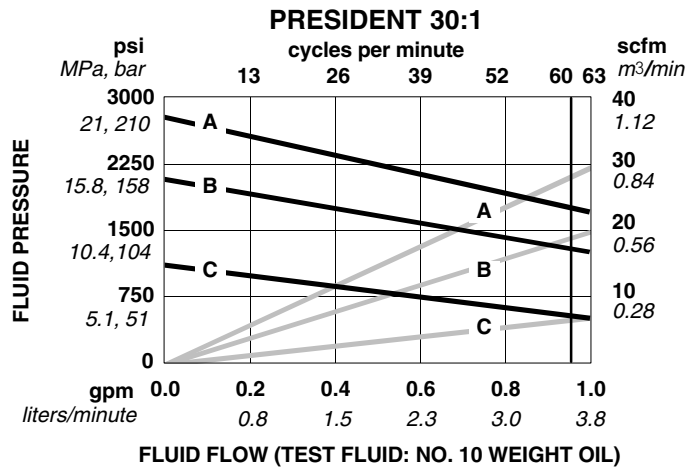
1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale to read fluid outlet pressure.

**KEY:** Fluid Outlet Pressure – Black Curves  
Air Consumption – Gray Curves

**To find Pump Air Consumption (m<sup>3</sup>/min or scfm) at a specific fluid flow (lpm/gpm) and air pressure (psi/MPa/bar):**

1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with selected air consumption curve (gray). Follow right to scale to read air consumption.

**A** 100 psi (0.7 MPa, 7 bar) air pressure  
**B** 70 psi (0.49 MPa, 4.9 bar) air pressure  
**C** 40 psi (0.28 MPa, 2.8 bar) air pressure



# Graco Warranty

Graco warrants all equipment listed in this manual 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.

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, gas engines, 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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# Graco Information

**TO PLACE AN ORDER**, contact your Graco distributor, or call this number to identify the distributor closest to you:

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

**612-623-6921**

**612-378-3505 Fax**

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