Parts

INSTRUCTIONS-PARTS LIST

307805

Rev. K

This manual contains important warnings and information.
READ AND KEEP FOR REFERENCE.

INSTRUCTIONS

GRACO

First choice when quality counts.™

(VIScosity CONtrol) STAINLESS STEEL

Vis-con$^{2}_{TM}$ Fluid Heater

5000 psi (35 MPa, 350 bar) Maximum Fluid Working Pressure
NOTE: Earlier models (Series A through C) are rated at 4000 psi (27.6 MPa, 276 bar).

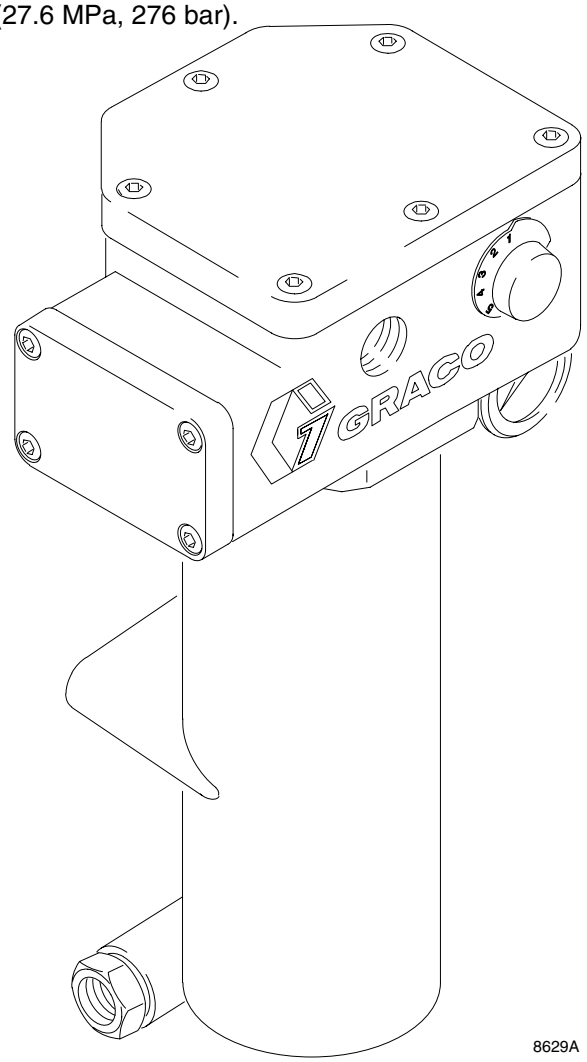
Model 220522, Series D 120 Volt
Model 220523, Series D 240 Volt
Model 220524, Series D 480 Volt

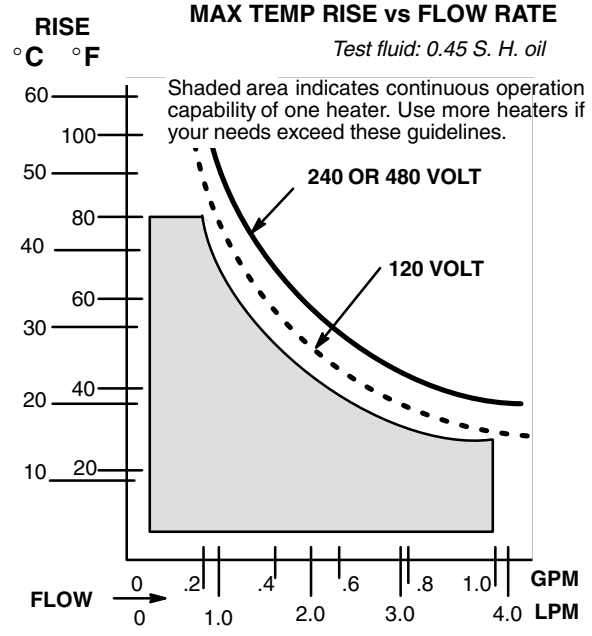
CE CSA® FM

APPROVED

CSA Certified and FM Approved* as explosion proof for Class I, Division 1, Group D, Hazardous Locations, Temp Code (identification number) T3. See the Technical Data on page 26 for additional information on this code.

* Series A Heaters are not FM approved.





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Graco Inc. is registered to I.S. EN ISO 9001

Table of Contents

Symbols

Warning Symbol

⚠ WARNING

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

Caution Symbol

⚠ CAUTION

This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the corresponding 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. Before pressurizing this equipment, verify the series letter of your heater. Series D Heaters have a **5000 psi (35 MPa, 350 bar) maximum working pressure.** Earlier models (Series A through C) have a **4000 psi (27.6 MPa, 276 bar) maximum working pressure.**
- 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 82°C (180°F) or below –40°C (–40°F).
- Do not touch the heater during operation; it is very hot.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

⚠ WARNING

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 medical attention.**
- 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.
- 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 12 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.
- Wear hearing protection when operating this equipment.

⚠ 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

Grounding

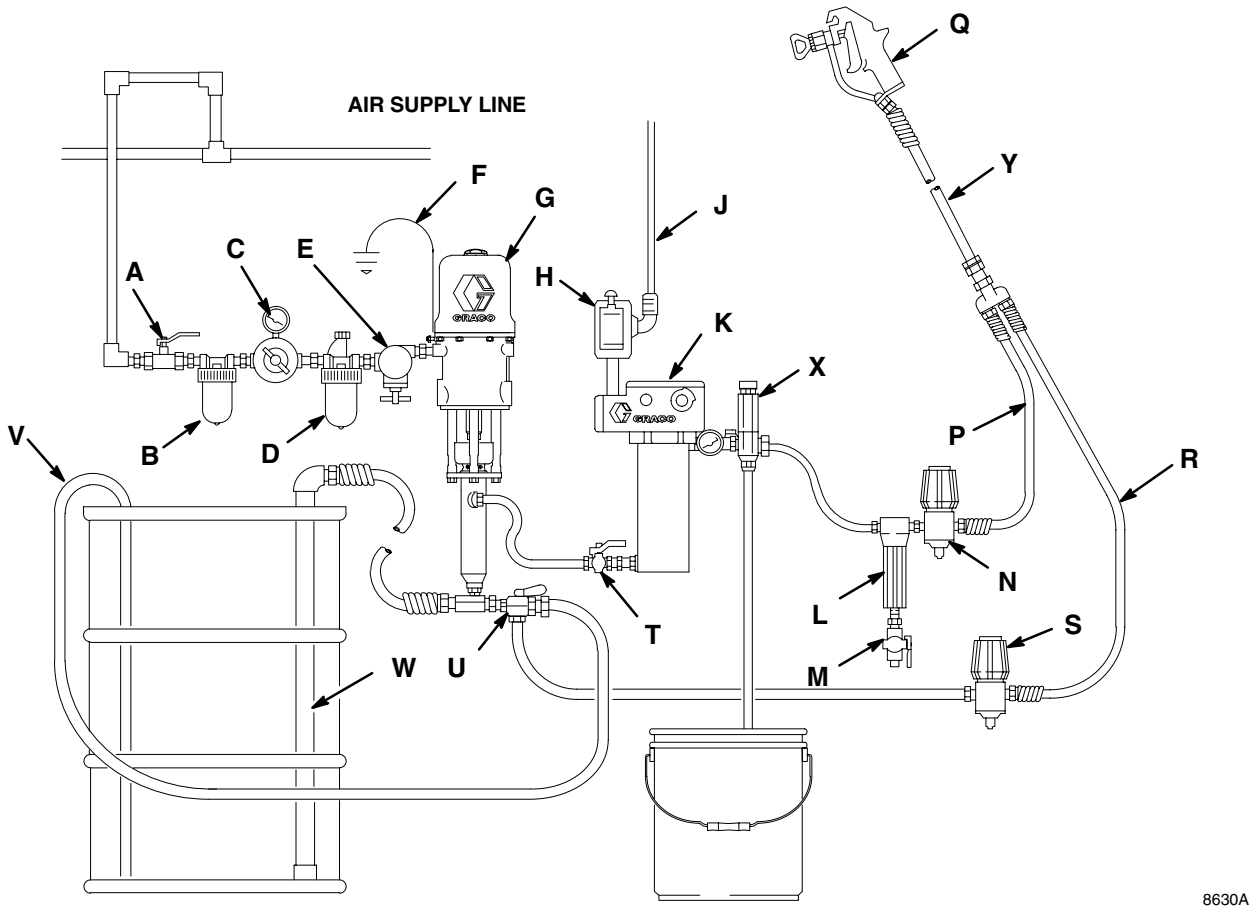
⚠ WARNING

FIRE AND EXPLOSION HAZARD
Before operating the pump, ground the system as explained below. Also read the section **FIRE AND EXPLOSION HAZARD** on page 4.

1. *Pump:* use a ground wire and clamp as shown in your separate pump manual.
2. *Air hoses:* use only electrically conductive air hoses.
3. *Fluid hoses:* use only electrically conductive fluid hoses.
4. *Heater:* by wiring to a properly grounded power supply through the electrical connections. In a mobile installation, be sure the truck or trailer is grounded to a true earth ground, also.
5. *Air compressor or hydraulic power supply:* follow manufacturer's recommendations.
6. *Spray gun:* grounding is obtained through connection to a properly grounded fluid hose and pump.
7. *Object being sprayed:* according to your local code.
8. *All solvent pails used when flushing,* according to 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,* always hold a metal part of the gun firmly to the side of a grounded metal pail, then trigger the gun.

Installation

HEATED CIRCULATING SYSTEM



KEY

A	Bleed-type Master Air Valve	**H**	Explosion Proof Power Switch	**R**	Fluid Return Line
B	Air Filter	**J**	Power Cable	**S**	Back Pressure Valve
C	Air Regulator and Gauge	**K**	Heater	**T**	Fluid Shutoff Valve
D	Air Line Lubricator	**L**	Fluid Filter	**U**	Director Valve
E	Pump Runaway Valve	**M**	Drain Valve	**V**	Drain Back Tube
F	Ground Wire	**N**	Fluid Pressure Regulator	**W**	Suction Tube
G	Pump	**P**	Fluid Supply Line	**X**	Pressure Relief Valve
		Q	Spray Gun	**Y**	Whip End Hose

Fig. 1

This **Typical Installation** is only a guide to setting up a heated, circulating spray system. For assistance in designing a system to suit your needs, contact your Graco distributor.

⚠ WARNING

When using a flexible power cord, the attached equipment is no longer explosion proof rated. To reduce the risk of serious injury from a fire or explosion, do not use the heater near flammable materials or vapors.

Locate the heater where operators will not come in contact with the hot metal surfaces.

Installation

Selecting Tubing for the Heated Section of the System

Fluid loses some of its heat through the tubing or hose between the heater and spray gun.

The chart in Fig. 2 shows a heat loss curve for three common types of tubing. Notice that the greater the flow rate, the less the heat loss.

Foam-insulated steel tubing and high pressure airless paint hose retain heat the best. When selecting tubing, keep in mind that the higher cost of insulated tubing or hose will probably be offset by lower operating costs.

Try to locate the heater close to the spray area to minimize heat loss through the plumbing.

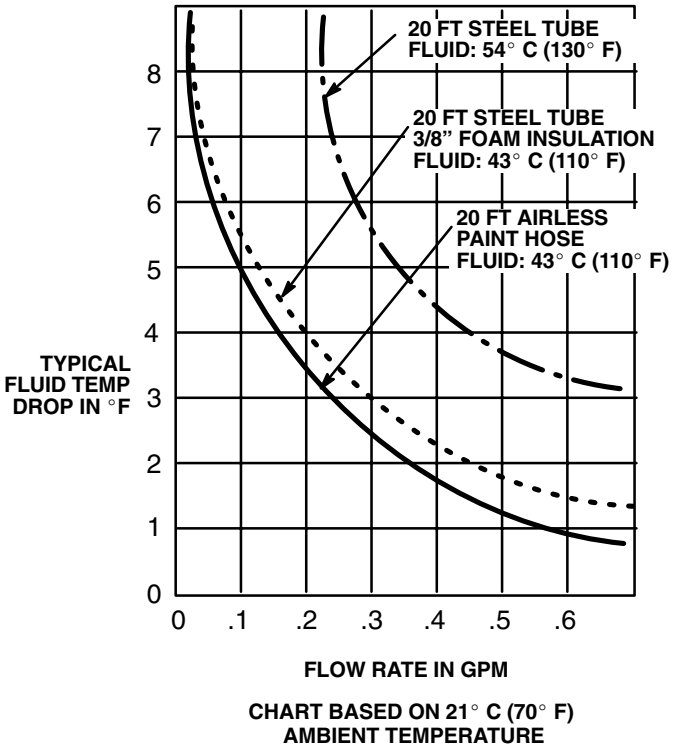


Fig. 2

Installation

Mounting the Heater

⚠ WARNING

To reduce the risk of serious injury from a fire or explosion, always locate the heater away from all flammable materials and debris, and where operators will not come in contact with the hot metal surfaces.

1. This heater has a surface temperature (identification code) of T3, indicating a maximum external (surface) temperature rating of 200° C (392° F) in accordance with Article 500 – Hazardous Locations – of NFPA 70 National Electrical Code and/or Section 18 – Hazardous Locations – of part 1 of the Canadian Electrical Code. See and comply with the requirements of these and similar codes as to the proper location of the heater.

2. Be sure the heater controls are easily accessible by the operator.

3. Be sure the mounting surface can support the weight of the heater and fluid, and any stress caused during operation.

4. Wall Mounting (See Fig. 3)

   a. Order wall bracket 183069 (FF). Use it as template to mark the wall. See **Accessories** on page 25.

   b. Use M8 x 1.25 bolts and lockwashers (AA), supplied, to mount the bracket to the heater's four mounting supports (BB).

   c. Use M8 or 5/16" bolts of the appropriate length and lockwashers (CC), not supplied, to mount the bracket to the wall.

5. Cart Mounting (See Fig. 4)

   a. Order two each of the cart mounting bar, 183485, and the clamp, 183484. See **Accessories** on page 25.

   b. Place the clamps (Y) around the vertical post (DD) of the cart and secure to the heater mounting bars (Z) with M8 x 1.25 bolts and lockwashers (EE), supplied, as shown.

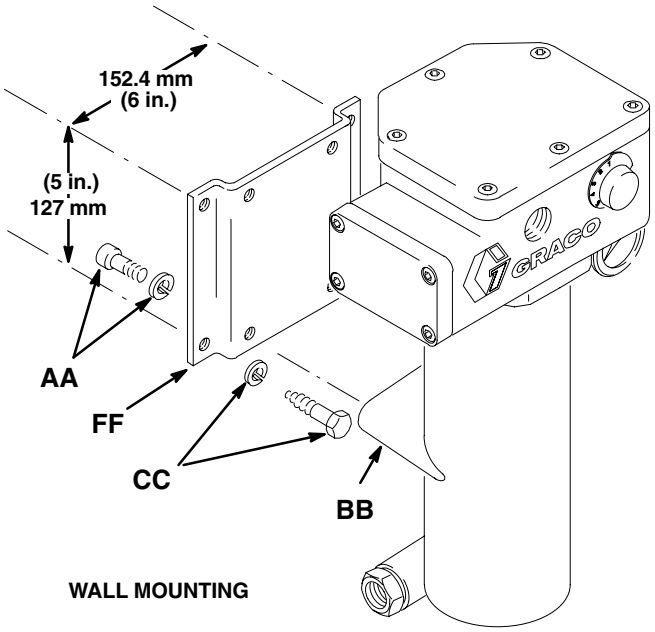


Fig. 3

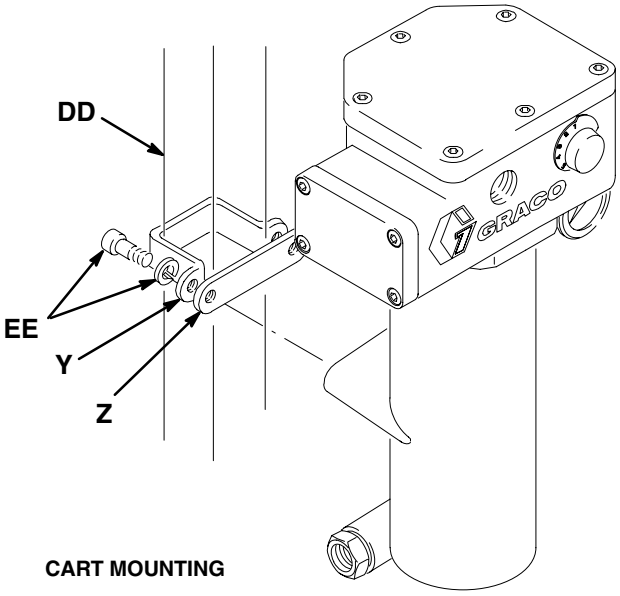


Fig. 4

Installation

Heater Fluid Connections (See Fig. 5)

1. Install a fluid shutoff valve (T) in the heater's 1/2–14 npt(f) fluid inlet. Then connect the fluid line.

⚠ CAUTION

Do not overtighten fittings going into the heater, to avoid damaging the heater.

2. Provide a means for adequately handling fluid expansion. See the **WARNING**, below.

⚠ WARNING

Heat causes fluid to expand. If fluid in the heated portion of your system is trapped with nowhere to expand, it can cause a system rupture. A system rupture can result in serious injury and property damage. Be sure your system has an adequate way to handle heat expansion.

- Use flexible hoses between the heater and gun.
- OR, install the heater in a circulating system
- OR, install a properly sized accumulator downstream from the heater
- OR, install a pressure relief valve (X), pre-set to relieve pressure when it exceeds the system's maximum working pressure. Contact your Graco distributor for the proper pressure relief valve for your system.
- And, never install any shutoff device between the heater and gun. If you are using a fluid regulator before the gun, never use it as a shutoff device.

3. Install a fluid filter (L), a drain valve (M) and a fluid pressure regulator (N) near the heater's 3/8–18 npt(f) fluid outlet. Then connect the fluid line.

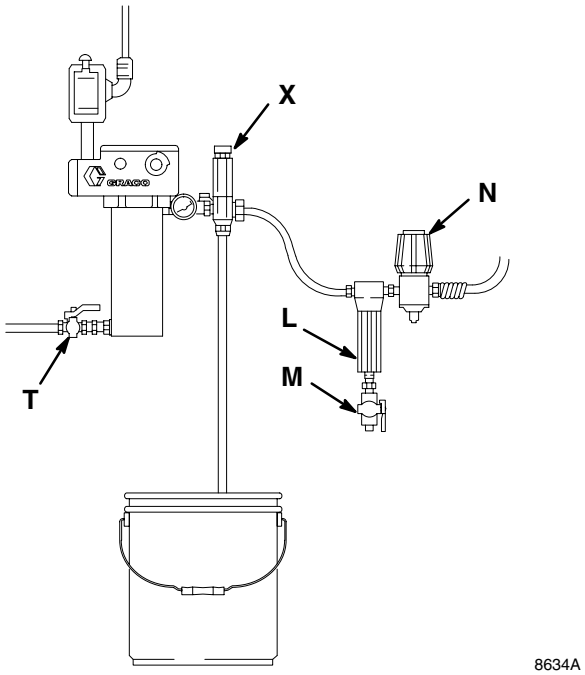


Fig. 5

Installation

Electrical Wiring (See Fig. 6)

⚠ WARNING

The Vis-con2 heater must be installed by a qualified electrician in compliance with all state and local codes and regulation, to reduce the risk of electric shock or other serious injury, during installation and operation. See the **Technical Data** on page 26 for further information.

The voltage supply must agree with the heater voltage:

- Model 220522, 120 Volt, 16.7 Amp draw
- Model 220523, 240 Volt, 9.6 Amp draw
- Model 220524, 480 Volt, 4.8 Amp draw

Mount an explosion-proof electric switch (H) near the heater. See **Accessories** for ordering a switch.

Remove the small electrical junction box cover (4) from the heater.

Refer to Fig. 6 for connecting the power leads to the proper terminals. Tighten all terminal nuts to 3.4 N.m (30 in-lb). Conductors used for the supply connection must be suitable for at least 105° C (221° F).

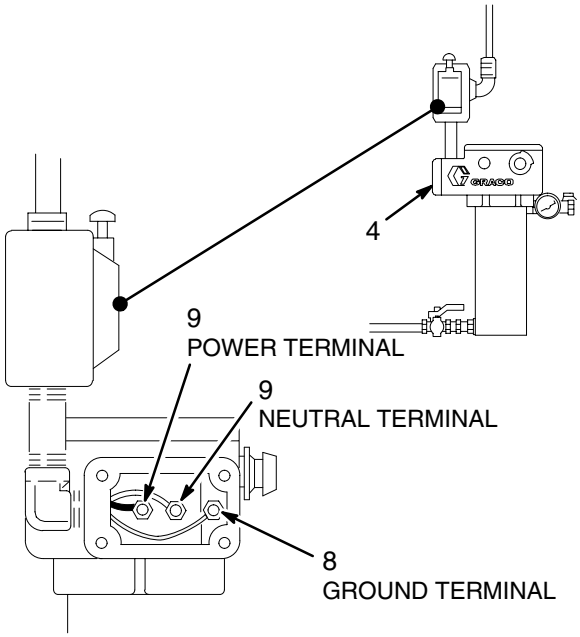


Fig. 6

Installation

Determining the Proper Fluid Temperature

⚠ CAUTION

Use the lowest temperature setting needed, for maximum heater life. Operating the heater at its highest setting – over 82° C (180° F) – for long periods of time decreases the heater life.

Higher than necessary temperatures also cause the fluid to dry out, resulting in a poor finish and clogging the heater.

The chart in Fig. 7 is used in determining the Under–Boil®) temperature. It also shows the effect of temperature on reducing viscosity. Notice that most of the viscosity reduction occurs by 55° C (130° F).

Under–Boil is the Graco method of hot, airless spraying in which the fluid is heated to a temperature just under the boiling point of its most volatile solvent.

To find the Under–Boil temperature of your fluid:

1. Pour a small sample into a heat–proof container.
2. Measure and record the temperature and viscosity of the fluid. Use a No. 2 Zahn cup.
3. Heat water in a large container to 93° C (200° F). Place the sample in the water.
4. At every 10° temperature rise, measure and record the viscosity and temperature. Do this until solvents start boiling off and the viscosity starts to level off – usually 71° to 77° C (160° to 170° F).
5. Subtract the lowest viscosity reading from the highest one. Multiply that result by 0.90. Subtract the new result from the highest viscosity reading. Find this number on your temperature and viscosity records. This is the temperature to use in your Under-Boil system.

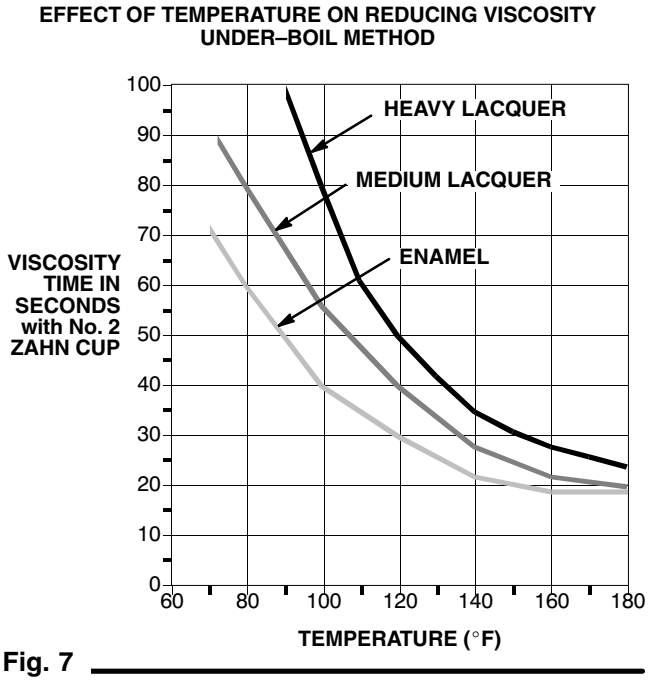


Fig. 7

The chart in Fig. 8 shows the effect of temperature in reducing two fluids to a sprayable viscosity – in the range of 20 to 34 seconds using a No. 2 Zahn cup.

Notice that temperature has more of an effect on high solid fluids than on thin enamels. That is, for the same 10° temperature rise, more viscosity reduction occurs in the high solid fluid than the enamel. This shows that high solid fluids are “temperature sensitive”, which needs to be taken into consideration when planning your system.

Also note that once the fluid is reduced to about 34 on the chart, viscosity reduction starts to level off. Therefore, high temperatures will not significantly improve sprayability, but will use more energy.

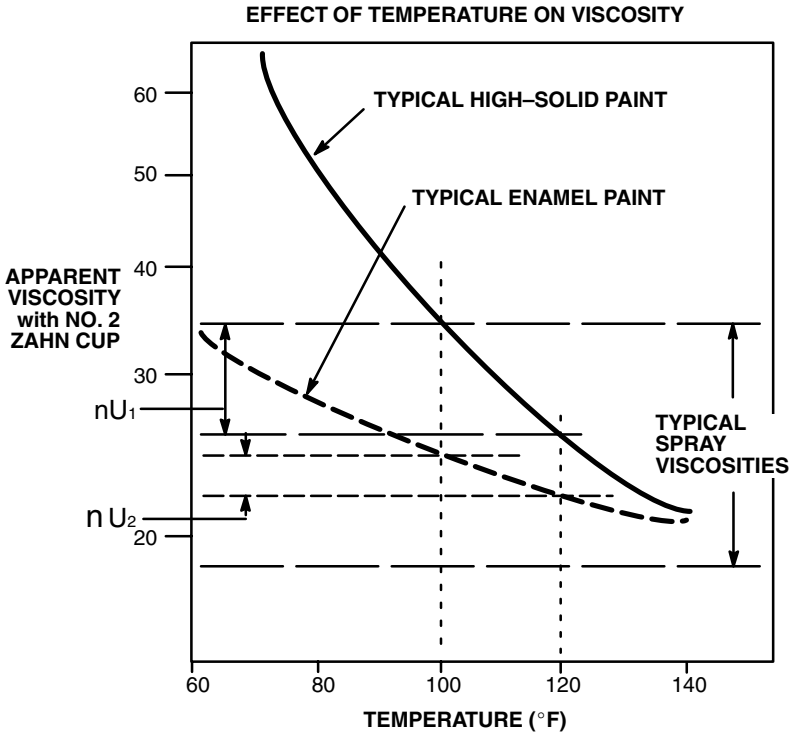


Fig. 8

Operation

Pressure Relief Procedure

⚠ WARNING

INJECTION HAZARD
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.

1. Lock the gun trigger safety.
2. Shut off the main power to the heater.
3. Circulate the fluid for at least 10 minutes to cool the heated fluid and heater.
4. Shut off all air and fluid supplies.
5. Unlock the gun trigger safety. Maintaining firm metal-to-metal contact between the gun and a grounded metal pail, trigger the gun to relieve pressure. Lock the gun trigger safety.
6. Open the fluid filter drain valve, having a container ready to catch the fluid.

Operation

Flush the Heater Before First Use

The heater was tested in lightweight oil. Without the heater turned on, flush the heater and system with a compatible solvent.

⚠ WARNING

To reduce the risk of serious injury when flushing:

1. Use the lowest possible pressure to reduce the risk of fluid injection and splashing solvent in the eyes or on the skin.
2. Maintain firm metal-to-metal contact between a metal part of the gun and a grounded metal pail to reduce the risk of static sparking which can cause a fire or explosion.

⚠ WARNING

To reduce the risk of serious injury from a fire or explosion, never operate the heater with its covers removed.

Priming the System (Refer to page 6)

1. Do not turn on the heater yet.
2. If you are using an airless spray gun, do not install a spray tip yet.
3. Start the pump according to the instructions supplied with it.
4. Turn the system director valve (T) to circulate and circulate the fluid for several minutes.
5. Open the spray gun (P) at the last outlet to prime the line. Repeat for all gun stations.
6. Lock the gun safety latch (airless spray guns only).
7. Shut off the power to the pump. Relieve pressure. Install the gun spray tip.

Set the Heater Control (See Fig. 9)

1. Set the heater control knob (33) to a trial setpoint of 4 or 5.
2. Start the pump and circulate fluid through the system at very low pressure – about 0.30 to 0.35 liter/min (10 to 12 oz/min).
3. After 10 minutes, read the temperature on the thermometer (2). If it does not correspond to the temperature you need, adjust the setpoint.

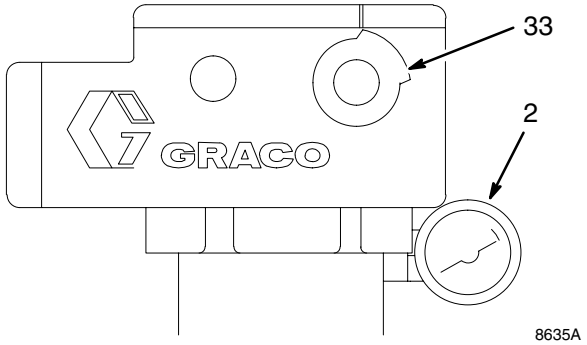


Fig. 9

Adjusting for Spraying

1. Adjust the pump pressure and the heater setpoint to the lowest settings needed for good fluid atomization.
2. Set all the system back pressure valves (L) to maintain even fluid pressure at all gun stations.

⚠ CAUTION

Use the lowest heater temperature setting possible for maximum heater life. Operating the heater at its highest temperature settings – over 82° C (180° F) – for long periods of time decreases the heater life.

Excessive temperatures also cause the fluid to dry out, resulting in a poor finish and clogging of the heater.

Maintenance

Flushing After Use

⚠ WARNING

Before flushing, always shut off the main power to the heater. Circulate the fluid through the system for at least 10 minutes to cool the fluid and heater. This reduces the risk of serious injury from burns.

⚠ CAUTION

Clogged fluid passages can be very difficult to clean. They also reduce heating efficiency, flow rate, and pressure. To prevent clogged passages, do not overheat or dry out the fluid, and flush frequently, including whenever the system or heater is not in use.

To Drain the Heater

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

1. Cool the system and **relieve the pressure**.
2. Remove the inlet and outlet fittings from the heater, having a container ready to catch the fluid. See Fig. 10.

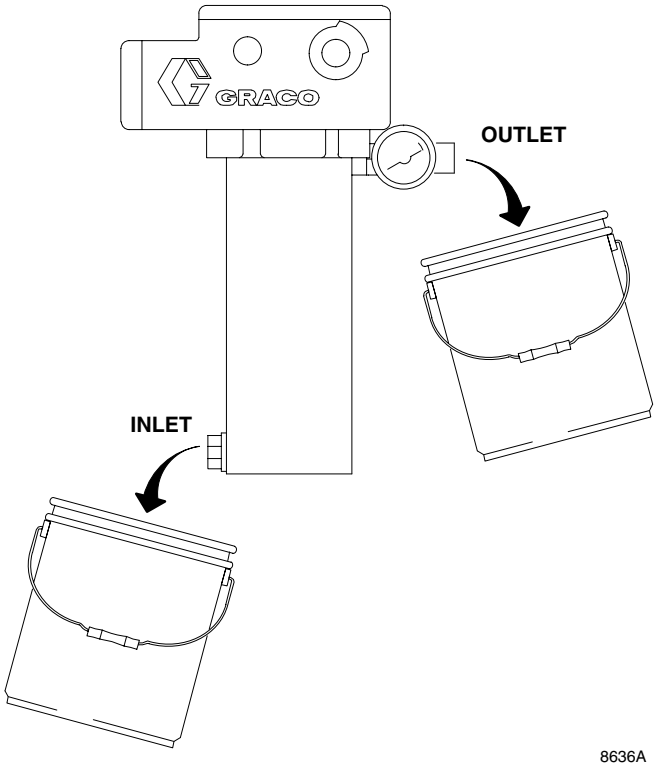


Fig. 10

To Unclog Fluid Passages (See Fig. 11)

1. Remove the heater block (3) from the heater housing. See **Heater Block**, page 21.
2. Pour a high strength, **compatible** solvent into the heater tube to soften the clog.
3. Flush out the clog.
4. Clean all passages thoroughly before reassembling the heater.

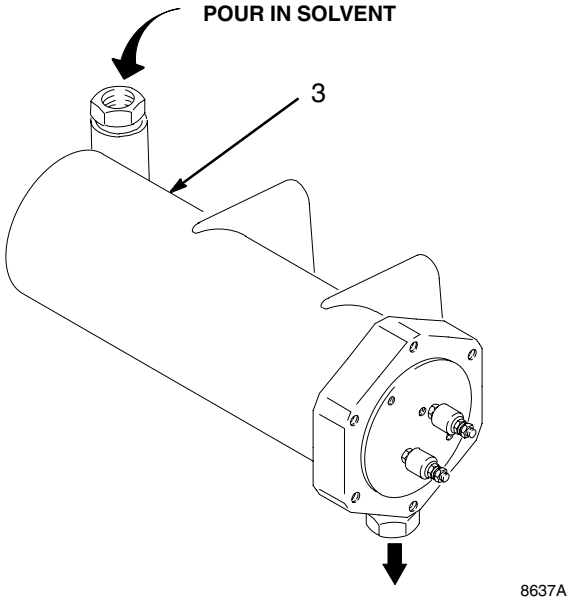


Fig. 11

Troubleshooting

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

Before servicing this equipment always make sure to **relieve the pressure**.

Check all possible problems and solutions before disassembling the pump.

PROBLEM	CAUSE	SOLUTION
Heater will not heat	1. No current.	1.a. Check circuit, fuses. 1.b. Check continuity of primary thermostat (24), backup thermostat (10) and heat limiter (15). 1.c. Check continuity of thermostat switch (10) and heater block (3) terminals. See page 16.
	2. Burned out heater block (3)	2. Replace block. See page 21.
	3. Blown heat limiter (15).	3. Check continuity of primary thermostat (24), and backup thermostat (10). Replace, if bad, when replacing heat limiter (15). See page 19.
Temperature too low	1. Fluid requires more warmup time.	1. Increase warmup time.
	2. Wrong temperature setting.	2. Adjust.
	3. Flow rate too high.	3. Reduce flow rate or use two heaters.
	4. Clogged fluid passages.	4. Flush regularly. See page 14.
Temperature too high	1. Wrong temperature setting.	1. Adjust.
	2. Bad thermostat (24).	2. Replace. See page 16.
High fluctuating temperatures, about 104° to 121° C (220° to 250°F) at 0.1 GPM	1. Sticking contacts on primary thermostat (24).	1. Replace thermostat (24). See page 16. Backup thermostat (10) keeps heater functioning only a short time.
Too much pressure drop OR Fluid will not flow	1. Flow rate too high.	1. Reduce flow rate or use two heaters.
	2. Clogged fluid passages.	2. Flush regularly. See page 14.
Leakage from heater fittings	1. Loose or damaged fittings.	1. Tighten fittings or replace heater block. See page 21.

Service

Thermostat Switch and Probe (See Fig. 12)

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

1. **Relieve the pressure**. Shut off the main power circuit breaker. Be sure the heater is cool to the touch.
2. Remove the housing cover (18).
3. Loosen the nut (27). Loosen the setscrew (26) in the switch shaft (28).
4. Remove the screw (16) and bracket (19) holding the probe (B).
5. Remove the wires from the terminals (A) of the thermostat switch (24).
6. Pull the thermostat probe (B) out of the heater block (3). Remove the thermostat from the housing.
7. Remove the bracket (35) from thermostat and secure it to the new thermostat.

⚠ CAUTION

To avoid damage to the capillary tube which can cause the heater to malfunction, do not kink or nick the tube.

To avoid shorting out the heater, be sure to loop the capillary tube as explained in step 8, to keep it from coming in contact with the block terminal (3A).

8. Liberally apply thermal lubricant (see **Accessories**) to the probe (B) of the new thermostat. Loop the capillary tube (C) several times as shown in Fig. 12. Insert the probe in the heater block.
9. Continue reassembling in the reverse order.
10. Refer to Fig. 13 to be sure the wiring is done properly.
11. Install the lockwashers (5) and screws (6) and torque to 10 N.m (89 in-lb).

Backup Thermostat (See Fig. 12)

1. **Relieve the pressure**. Shut off the main power circuit breaker. Be sure the heater is cool to the touch.
2. Remove the housing cover (18).
3. Loosen the screws (D) on the tabs of the thermostat (10) and remove the wires – one from the heat limiter (15) and one from the thermostat switch (24).
4. Remove the two screws (16) holding the thermostat (10) in place, and then remove the thermostat.
5. Liberally apply thermal lubricant (see **Accessories**) to the bottom of the thermostat and reinstall it in the reverse order of disassembly.
6. Refer to Fig. 13 to be sure the wiring is done properly.
7. Install the lockwashers (5) and screws (6) and torque to 10 N.m (89 in-lb).

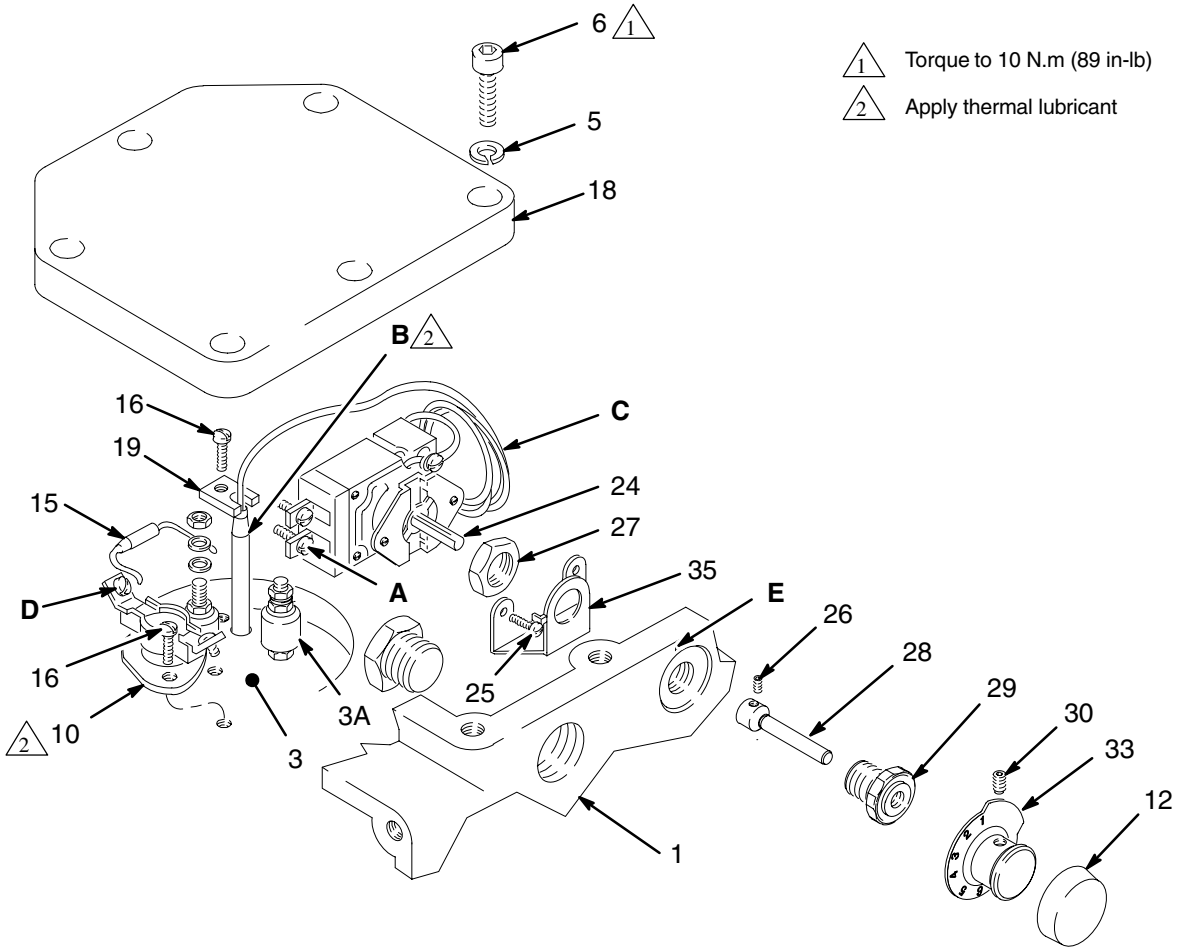

1 Torque to 10 N.m (89 in-lb)
2 Apply thermal lubricant
6 1
5
18
B 2
16
19
15
D
16
2 10
3
3A
A
C
24
27
35
25
E
26
28
29
30
33
12
1
8638A

Fig. 12

Notes

Service

Heater Limiter (See Figs. 12 and 13)

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

1. **Relieve the pressure**. Shut off the main power circuit breaker. Be sure the heater is cool to the touch.
2. Remove the housing cover (18).
3. Loosen the screw (D) and the nut (3B) holding the leads of the heater limiter (15) and remove the limiter.
4. Install a new limiter in the reverse order of disassembly.
5. See Fig. 13 to be sure the wiring is done properly.
6. Install the lockwashers (5) and screws (6) and torque to 10 N.m (89 in-lb).

Control Knob (See Fig. 14)

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

1. **Relieve the pressure**. Shut off the main power circuit breaker. Be sure the heater is cool to the touch.
2. Turn the knob (33) to **setpoint 1.**
3. Loosen the setscrew (30) in the control knob (33).
4. Pull the control knob off.
5. Remove the adjusting knob (12) from the control knob and press fit it onto the new control knob. Check the bushing (29) and replace it, if it is worn.
6. Position the new knob (33) so the **setpoint 1** aligns with the mark (E) on the housing and the knob is about 1 mm (1/16”) away from the housing. Tighten the setscrew (30).

CAUTION

Do not allow the capillary tube (A) to come in contact with the terminal (3A) of the heater block to avoid shorting out the heater.

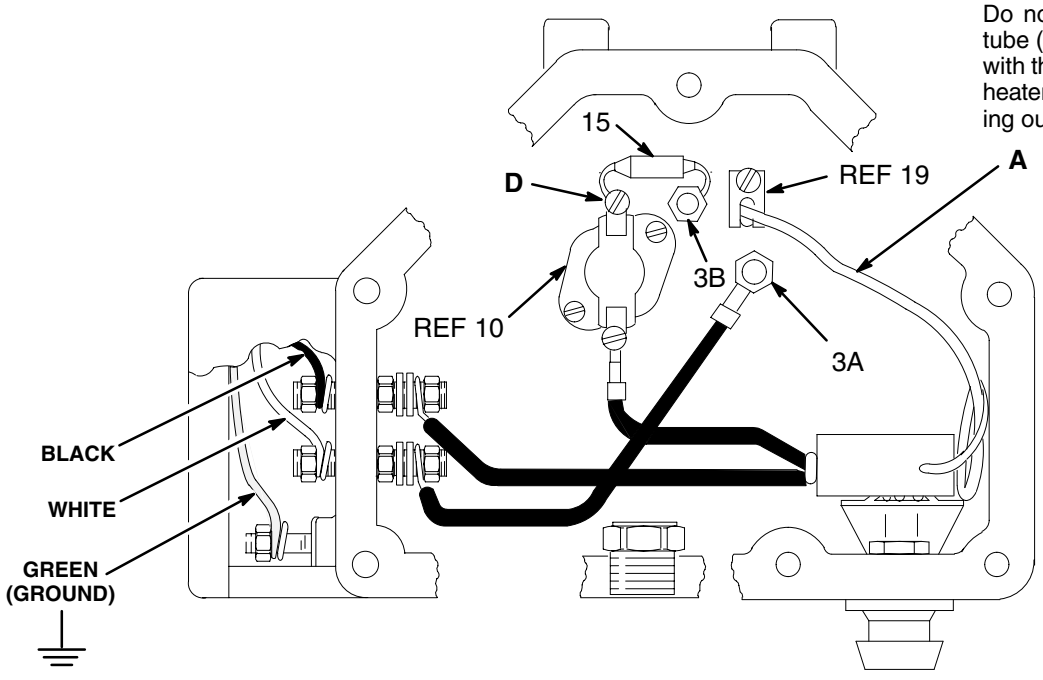


Fig. 13

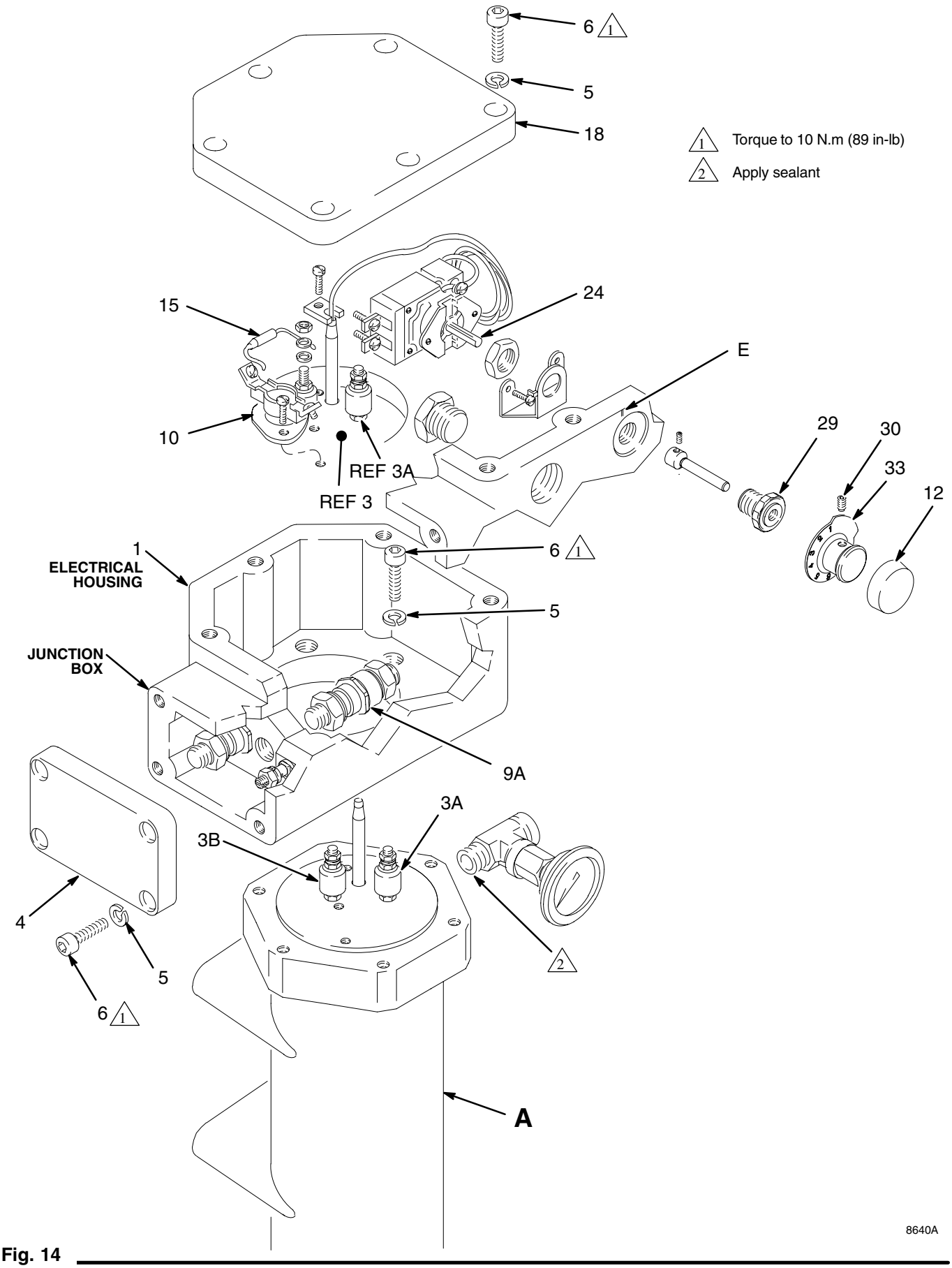

6 1
5
18
1 Torque to 10 N.m (89 in-lb)
2 Apply sealant
15
24
E
10
REF 3A
REF 3
29
30
33
12
1
ELECTRICAL HOUSING
6 1
5
JUNCTION BOX
9A
3A
3B
4
5
6 1
2
A
8640A

Fig. 14

Service

Heater Block (See Figs. 14 and 15)

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

1. **Relieve the pressure**. Shut off the main power circuit breaker. Be sure the heater is cool to the touch.

2. Remove the housing cover (18) and the electrical junction box cover (4).

3. Working in the junction box, disconnect the main power lead from the terminal of the post bushing (9A) on the right side of the box.

4. Working inside the electrical housing, use a wrench on the flats of the post bushing (9A) to unscrew it from the housing.

5. See the appropriate sections on page 16 to remove the thermostat and probe (24), the backup thermostat (10), the heat limiter (15) and the control knob (33).

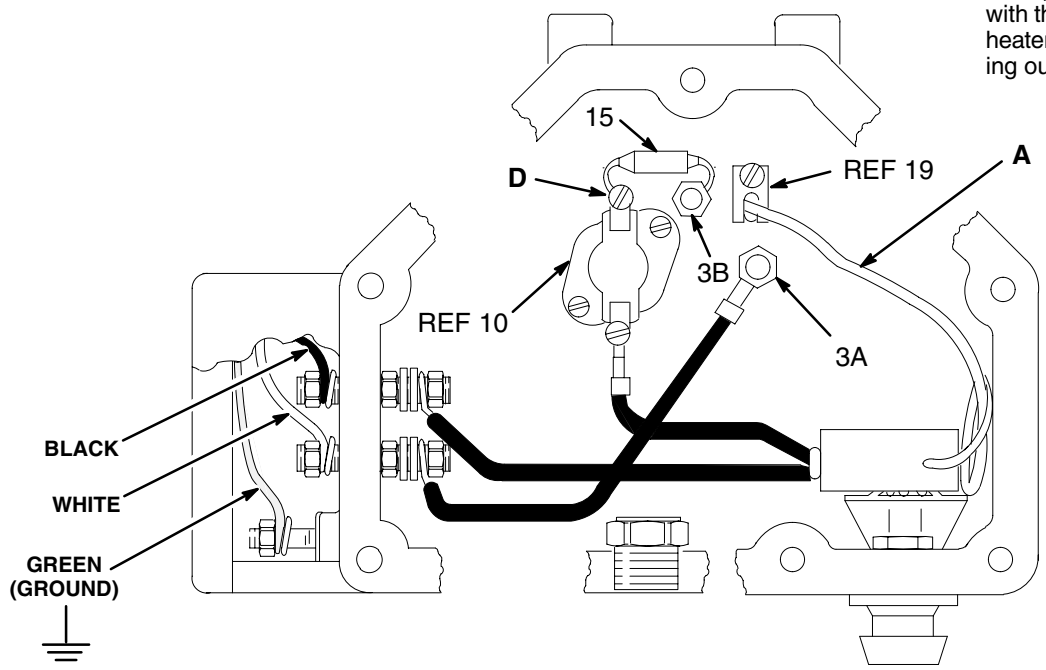
6. Remove the six screws (6) and lockwashers (5) holding the housing (1) to the heater block.

7. Reassemble the heater with the new block in the reverse order of disassembly.

8. Refer to Fig. 15, to be sure the wiring is done properly.

9. Install the lockwashers (5) and screws (6) and torque to 10 N.m (89 in-lb).

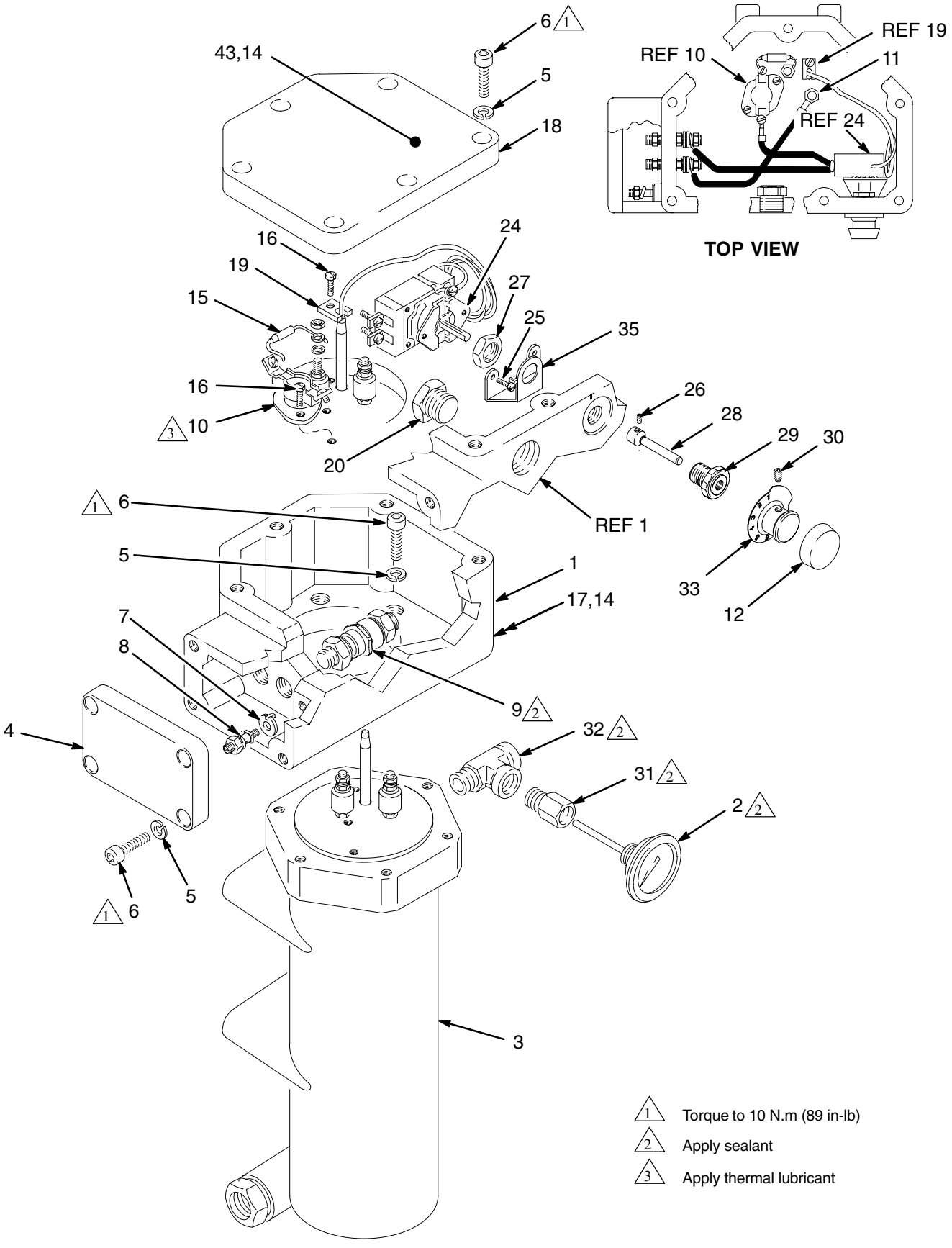
CAUTION
Do not allow the capillary tube (A) to come in contact with the terminal (3A) of the heater block to avoid shorting out the heater.



8639A

Fig. 15

Parts


6 1
43,14
5
18
16
19
15
16
3 10
20
24
27
25
35
26
28
29
30
REF 1
33
12
1
17,14
7
8
9 2
4
32 2
31 2
2 2
5
1 6
3
REF 19
REF 10
11
REF 24
TOP VIEW
1 Torque to 10 N.m (89 in-lb)
2 Apply sealant
3 Apply thermal lubricant
8644A

Parts

Model 220522, Series D

120 Volt Heater
Includes items 1 to 43

Model 220523, Series D

240 Volt Heater
Includes items 1 to 43

Model 220524, Series D

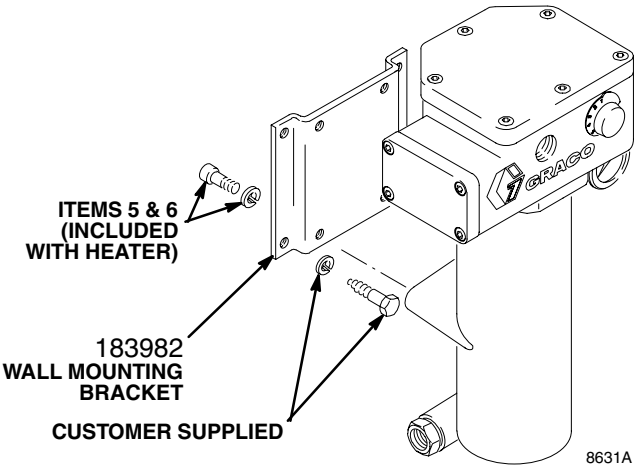
480 Volt Heater
Includes items 1 to 43

Ref No.	Part No.	Description	Qty
1	183074	HOUSING, control	1
2	102124	DIAL, thermometer	1
3	183061	BLOCK, heater, 120 V	
		Model 220522 only	1
	183060	BLOCK, heater, 240 V	
		Model 220523 only	1
	183059	BLOCK, heater, 480 V	
		Model 220524 only	1
4	183066	COVER	1
5	107542	LOCKWASHER, spring, Sz 8	20
6	109114	CAPSCREW, socket head; M8x1.25 mm	20
7	104582	WASHER, tab	1
8	104029	CLAMP, grounding	1
9	108675	BUSHING, post type; 1000 V max, 250 AMP max	2
10	108674	THERMOSTAT	1
11	101674	TERMINAL, *Model 220524*	4
		Models 220522 & 220523	6
12	177969	KNOB, adjusting	1
13	177922	TAG, warning	1
14	100055	SCREW, drive, type U, No. 6	12
15	105377	LIMITER, heat	1
16	105676	SCREW, mach, panhead; M4 x 0.7 x12 mm	3
18	183073	COVER, housing	1
19	183072	BRACKET, probe	1
20	108940	PLUG, pipe; 3/4–14 npsm	1
21	108664	TOOL, hex key wrench; 6 mm	1
22	105747	TOOL, hex key wrench; 2 mm	1
23	101369	TOOL, hex key wrench; 0.0927”	1
24	108676	SWITCH, thermostat	1
25	100032	SCREW, mach, slotted pnh; No. 6–32 unc–2a	2
26	105672	SETSCREW, socket head; M4 x 0.7 x 6 mm	1
27	183070	NUT, bushing, M15 x 1.5	1
28	183068	SHAFT, switch	1
29	183071	BUSHING, M14 x 1.5	1
30	101366	SETSCREW, sch, No. 10–24 x 0.312”	1
31	183050	BUSHING, hex, 3/8–18 npt(m) x 1/4–18 npt(f)	1
32	108673	TEE, street	1
33	177968	KNOB, control	1
35	183067	BRACKET, switch	1
36	183980	PLATE, warning	1
37	065245	WIRE, electrical, 14 AWG	18 in.
43	183981	PLATE, warning	1

Notes

Accessories

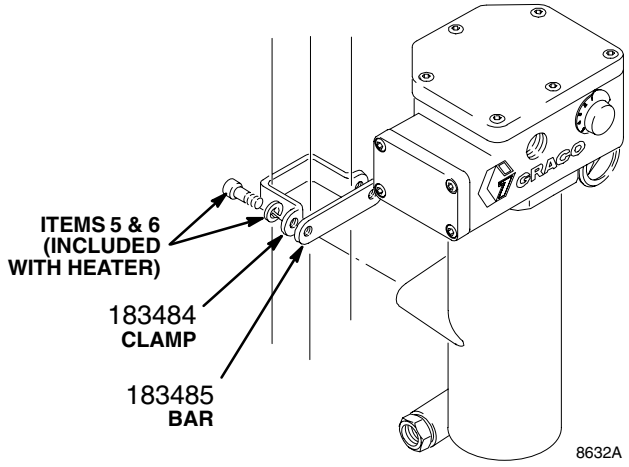
Wall Mounting Bracket 183982



Cart Bracket

Order two each of the following

183484	Clamp
183485	Bar



Fluid Pressure Regulator 206661

3000 psi (21.0 MPa, 210 bar) Maximum Working Pressure

1000–3000 psi (7.0–21.0 MPa, 70–210 bar) Regulated Fluid Pressure Range

3/8 npt Inlet, Two 1/4 npt Outlets

Light Kits

Explosion Proof Light Kits For Vis-con Heaters

222219 120 Volt
222220 240 Volt

Back Pressure Valve 206819

3000 psi (21 MPa, 210 bar) Maximum Inlet Pressure
1000–3000 psi (7.0–21.0 MPa, 70–210 bar) Regulated Pressure Range

1/4 npt Inlet & Outlet

Thermal Lubricant 110009

6.5 Gram Tube

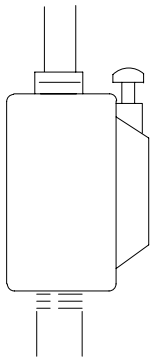
Hose 221102

3000 psi (21.0 MPa, 210 bar) Maximum Working Pressure

3 ft (0.9 m) x 1/2” ID; 1/2–14 npt (mbe)

Explosion–Proof Switch

Not available from Graco. Purchase at a local electrical supply house. Be sure it is classified as explosion-proof.



Power Cord Set 110160

600 Volt, 3 Wire, 12 Awg
Extra Hard Usage Type St
High Temperature (105°C) Rated

⚠ WARNING

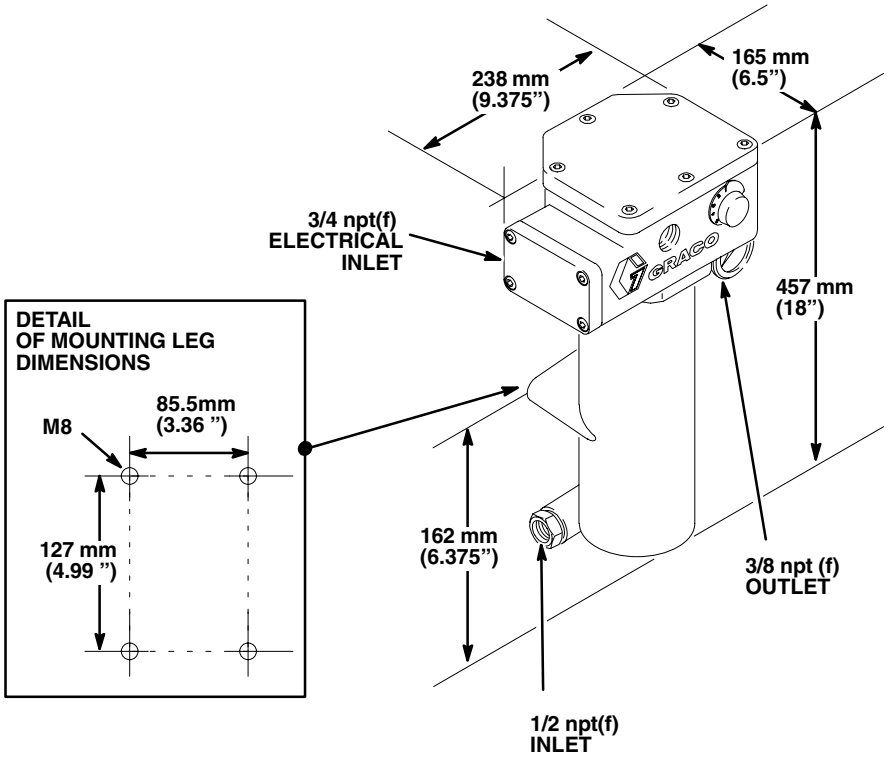
When using a flexible power cord, the attached equipment is no longer explosion proof rated. To reduce the risk of serious injury from a fire or explosion, do not use the heater near flammable materials or vapors.

Technical Data

Category	Data
Maximum working pressure	Series D heaters: 5000 psi (35 MPa, 350 bar) Series A through C are rated at 4000 psi (27.6 MPa, 276 bar).
Voltage: Model 220524	480 VAC, Single Phase, 4.8 Amp
Voltage: Model 220523	240 VAC, Single Phase, 9.6 Amp
Voltage: Model 220522	120 VAC, Single Phase, 16.7 Amp
Heating element wattage: Models 220524 & 220523	2300 Watts
Heating element wattage: Model 220522	2000 Watts
Fluid passage area	129,032 mm^2 (200 in^2)
Fluid passage diameter	9.7 mm (0.38 in.)
Fluid passage length	4166 mm (164 in.)
Thermometer range	–18 to 121° C (0–250° F)
Wetted parts	Stainless Steel
Temperature operating range*	29–104° C (85–220° F)
Surface temperature code	T3 (200° C [392° F])
Weight	17.6 kg (39 lb)
Canadian Registration Number (CRN) Ontario – 0E4872.5	*Models: 220522, 220523, and 220524*

* This heater has a surface temperature code (identification code) of T3, indicating a maximum external (surface) temperature rating of 200° C (392° F) in accordance with Article 500 – Hazardous Locations – of NFPA 70 National Electrical Code and/or Section 18 – Hazardous Locations – of Part 1 of the Canadian Electrical Code. See and comply with the requirements of these and similar codes as to the proper location of the heater.

Dimensions



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The 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 by an authorized Graco distributor to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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

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

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

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

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

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1–800–367–4023 Toll Free
612–623–6921
612–378–3505 Fax

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Sales Offices: Minneapolis, Detroit
International Offices: Belgium, Korea, Hong Kong, Japan

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