

# REACTOR™

312408F

EN

## Air Powered, Heated, Plural Component Proportioner

*For spraying polyurethane foam and polyurea coatings.*

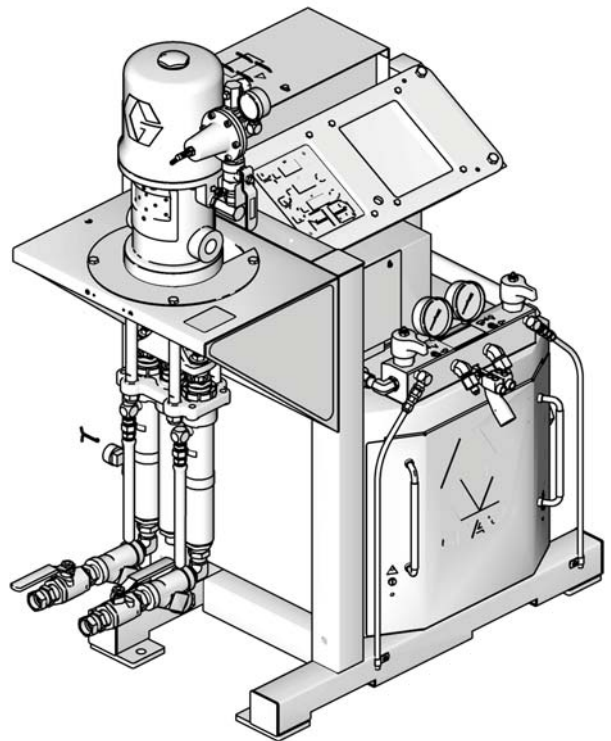
*Not for use in explosive atmospheres.*



### Important Safety Instructions

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

See page 3 for model information, including maximum working pressure and approvals.



Model 259060 Shown

For patent information, see  
[www.graco.com/patents](http://www.graco.com/patents).

TI11252a

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# Models

## Air Powered Reactors

### A-XP Series



All A-XP2 models are CE compliant.

Part, Series	Model	Voltage (phase)	Full Load Peak Amps	System Watts	Heater Watts (no hose)	Pressure Ratio	Flow gpm (lpm) at 78 cpm	Output per Cycle (A+B) gal. (liter)	Maximum Fluid Working Pressure psi (MPa, bar)
259060, A	A-XP2	230V (1)	62	14,540	10,200	25:1	1.5 (5.7)	0.0193 (0.73)	3000 (20.7, 207)
259061, A	A-XP2	230V (3)	40	14,540	10,200	25:1	1.5 (5.7)	0.0193 (0.73)	3000 (20.7, 207)
259062, A	A-XP2	400V (3)	22	14,540	10,200	25:1	1.5 (5.7)	0.0193 (0.73)	3000 (20.7, 207)

## Heat Packages (do not include proportioner)

### HT Series

Part, Series	Model	Voltage (phase)	Full Load Peak Amps	System Watts	Heater Watts (no hose)	Maximum Fluid Working Pressures psi (MPa, bar)
259070, B	HT-6.0	230V (1)	44	10,340	6,000	3500 (24.1, 241)
259071, B	HT-6.0	230V (3)	27	10,340	6,000	3500 (24.1, 241)
259072, B	HT-6.0	400V (3)	18	10,340	6,000	3500 (24.1, 241)
259073, B	HT-10.2	230V (1)	62	14,540	10,200	3500 (24.1, 241)
259074, B	HT-10.2	230V (3)	40	14,540	10,200	3500 (24.1, 241)
259075, B	HT-10.2	400V (3)	22	14,540	10,200	3500 (24.1, 241)
259076, B	HT-15.3	230V (1)	84	19,640	15,300	3500 (24.1, 241)
259077, B	HT-15.3	230V (3)	57	19,640	15,300	3500 (24.1, 241)
259078, B	HT-15.3	400V (3)	33	19,640	15,300	3500 (24.1, 241)

## Supplied Manuals

The following manuals are shipped with the Reactor™ Proportioner. Refer to these manuals for detailed equipment information.

Order Part 15M334 for a compact disk of Reactor manuals translated in several languages

Manuals are also available at [www.graco.com](http://www.graco.com).

Reactor Air Powered Proportioner	
Part	Description
312407	Reactor Air Powered Proportioner, Operation Manual (English)
Reactor Electrical Diagrams	
Part	Description
312409	Reactor Air Powered Proportioner, Electrical Diagrams (English)
Proportioning Pump	
Part	Description
308224	President® Pump (A-XP2), Repair-Parts Manual (English)
Motor	
Part	Description
306982	President® Air Motor (A-XP2), Repair-Parts Manual (English)
Displacement Pump	
Part	Description
307430	Displacement Pumps (A-XP2), Repair-Parts Manual (English)
Air Regulators	
Part	Description
308168	Instruction-Parts Manual (English)

## Related Manuals






The following manuals are for accessories used with the Reactor™.

Order Part 15M334 for a compact disk of Reactor manuals translated in several languages. Order Part 15B381 for a compact disk of Fusion manuals translated in several languages.

Feed Pump Kits	
Part	Description
309815	Instruction-Parts Manual (English)
Air Supply Kit	
Part	Description
309827	Instruction-Parts Manual (English) for Feed Pump Air Supply Kit
Circulation and Return Tube Kits	
Part	Description
309852	Instruction-Parts Manual (English)
Heated Hose	
Part	Description
309572	Instruction-Parts Manual (English)
Fusion Air Purge Spray Gun	
Part	Description
309550	Instruction-Parts Manual (English)
Fusion Mechanical Purge Spray Gun	
Part	Description
309856	Instruction-Parts Manual (English)
Circulation Kit	
Part	Description
309818	Instruction-Parts Manual (English)
Data Reporting Kit	
Part	Description
309814	Instruction-Parts Manual (English)

# Warnings

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

 <b>WARNING</b>	
	<p><b>ELECTRIC SHOCK HAZARD</b></p> <p>Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> <li>• Turn off and disconnect power cord before servicing equipment.</li> <li>• Use only grounded electrical outlets.</li> <li>• Use only 3-wire extension cords.</li> <li>• Ensure ground prongs are intact on sprayer and extension cords.</li> <li>• Do not expose to rain. Store indoors.</li> </ul>
	<p><b>TOXIC FLUID OR FUMES HAZARD</b></p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> <li>• Read MSDS's to know the specific hazards of the fluids you are using.</li> <li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li> <li>• Always wear impervious gloves when spraying or cleaning equipment.</li> </ul>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b></p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> <li>• Protective eyewear</li> <li>• Clothing and respirator as recommended by the fluid and solvent manufacturer</li> <li>• Gloves</li> <li>• Hearing protection</li> </ul>
	<p><b>SKIN INJECTION HAZARD</b></p> <p>High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. <b>Get immediate surgical treatment.</b></p> <ul style="list-style-type: none"> <li>• Do not point gun at anyone or at any part of the body.</li> <li>• Do not put your hand over the spray tip.</li> <li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li> <li>• Do not spray without tip guard and trigger guard installed.</li> <li>• Engage trigger lock when not spraying.</li> <li>• Follow <b>Pressure Relief Procedure</b> in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.</li> </ul>




## WARNING

	<p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> <li>• Use and clean equipment only in well ventilated area.</li> <li>• Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).</li> <li>• Keep work area free of debris, including solvent, rags and gasoline.</li> <li>• Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.</li> <li>• Ground equipment, personnel, object being sprayed, and conductive objects in work area. See <b>Grounding</b> instructions.</li> <li>• Use only Graco grounded hoses.</li> <li>• Check gun resistance daily.</li> <li>• If there is static sparking or you feel a shock, <b>stop operation immediately</b>. Do not use equipment until you identify and correct the problem.</li> <li>• Do not flush with gun electrostatics on. Do not turn on electrostatics until all solvent is removed from system.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul>
	<p><b>PRESSURIZED ALUMINUM PARTS HAZARD</b></p> <p>Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in pressurized aluminum equipment. Such use can cause serious chemical reaction and equipment rupture, and result in death, serious injury, and property damage.</p>
	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> <li>• This equipment is for professional use only.</li> <li>• Do not leave the work area while the equipment is energized or under pressure. Turn off all equipment and follow the <b>Pressure Relief Procedure</b> in this manual when the equipment is not in use.</li> <li>• Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li> <li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Data</b> in all equipment manuals.</li> <li>• Use fluids and solvents that are compatible with equipment wetted parts. See <b>Technical Data</b> in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.</li> <li>• Do not alter or modify equipment.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>• Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>• Keep children and animals away from work area.</li> <li>• Comply with all applicable safety regulations.</li> </ul>
	<p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> <li>• Keep clear of moving parts.</li> <li>• Do not operate equipment with protective guards or covers removed.</li> <li>• Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> in this manual. Disconnect power or air supply.</li> </ul>
	<p><b>BURN HAZARD</b></p> <p>Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns, do not touch hot fluid or equipment. Wait until equipment/fluid has cooled completely.</p>

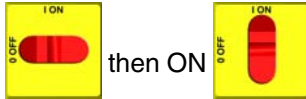
# Temperature Control Diagnostic Codes

Temperature control diagnostic codes appear on temperature display.

These alarms turn off heat. E99 clears automatically when communication is regained. Codes E03 through

E06 can be cleared by pressing . For other codes,

turn main power OFF then ON to clear.



Code	Code Name	Alarm Zone	Corrective Action page
01	High fluid temperature	Individual	7
02	High zone current	Individual	8
03	No zone current with hose heater on	Individual	8
04	FTS not connected	Individual	9
05	Board overtemperature	Individual	9
06	Communication cable unplugged from module	Individual	9
99	Loss of communication	A	9



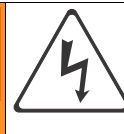
For hose zone only, if FTS is disconnected at startup, display will show hose current 0A.

## E01: High fluid temperature

### Causes of E01 Errors

- Thermocouple A or B (310) senses a fluid temperature above 230°F (110°C).
- Fluid temperature sensor (FTS) senses a fluid temperature above 230°F (110°C).
- Overtemperature switch A or B (308) senses a fluid temperature above 230°F (110°C) and opens. At 190°F (87°C) the switch closes again.
- Thermocouple A or B (310) fails, is damaged, is not touching the heater element (307), or has a poor connection to the temperature control board.
- Overtemperature switch A or B (308) fails in the open position.
- The temperature control board fails to turn off any heat zone.
- Zone power wires or thermocouples are switched from one zone to another.
- Failed heater element where thermocouple is installed.
- Loose wire
- On 6.0 and 10.2 kW heater models only: Jumper wire on J1 connector, between module (3) and display (4), is loose or incorrectly wired.

### Checks




Troubleshooting this equipment requires access to parts that may cause electric shock or other serious injury if work is not performed properly. Have a qualified electrician perform all electrical troubleshooting. Be sure to shut off all power to the equipment before repairing.

Check which zone is displaying the E01 error.

1. Check that connector B is firmly plugged into temperature control board (see FIG. 4, page 19).
2. Clean and re-plug connections.
3. Check connections between the temperature control board and overtemperature switches A and B (308), and between temperature control board and thermocouples A and B (310) or FTS (21) [depending on which zone is displaying E01]. See TABLE 3, page 19. Ensure that all wires are securely connected to connector B.

4. Remove connector B from temperature control module, and check continuity of overtemperature switches A and B, thermocouples A and B, or FTS by measuring resistance across the pins on the plug end; see TABLE 1.

 Before doing the following checks, note which zone (A, B, FTS, or all) has high fluid temperature.

**Table 1: Sensor Connector Continuity Checks**

Pins	Description	Reading
1 & 2	OT switch A	nearly 0 ohms
3 & 4	OT switch B	nearly 0 ohms
5 & 6	Thermocouple A	4-6 ohms
8 & 9	Thermocouple B	4-6 ohms
11 & 12	FTS	approximately 35 ohms per 50 ft (15.2 m) of hose, plus approximately 10 ohms for FTS
10 & 12	FTS	open

5. Verify fluid temperature, using an external temperature sensing device.
  - **If temperature is too high (sensor reading is 229°F [109°C] or above):**
6. Check if thermocouples A and B are damaged, or not contacting the heater element, page 22.
7. To test that temperature control module turns off when equipment reaches temperature setpoint:
  - a. Set temperature setpoints far below displayed temperature.
  - b. Turn zone on. If temperature rises steadily, power board is failing.
  - c. Verify by swapping with another power module. See **Replacing Temperature Control Assembly Modules**, page 20.
  - d. If the swapped module does not fix the problem, the power module is not the cause.

8. Verify continuity of heater elements with an ohmmeter, see page 21.

## E02: High zone current



1. Turn main power OFF.
2. Relieve pressure, page 15.



Disconnect whip hose.

3. Disconnect hose connector (D) at Reactor.
4. Using an ohmmeter, check between the two terminals of the connector (D). There should be no continuity.
5. Exchange zone module with another one. Turn zone on and check for error. If error disappears, replace faulty module.

*For hose zone:* If error still occurs, perform **Transformer Primary Check** and **Transformer Secondary Check** starting on page 25.



When there is a high current error, the LED on that zone's module will turn red while the error is displayed.

## E03: No zone current

1. Check for tripped circuit breaker inside electrical cabinet or at power source for that zone. Replace circuit breaker if it trips habitually.
2. Check for loose or broken connection at that zone.
3. Exchange zone module with another one. Turn zone on and check for error (see page 20). If error disappears, replace faulty module.
4. If E03 occurs for all zones, the contactor may not be closing. Verify wiring from heater control to contactor coil.
  - a. *Hose zone:* test hose continuity, page 23.



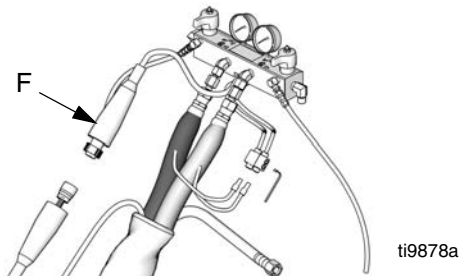
- b. Perform **Transformer Primary Check** and **Transformer Secondary Check**, starting on page 25.



When a no current error occurs, the LED on the specific zone's module turns red when the error is displayed.

## E04: Fluid Temperature Sensor (FTS) or thermocouple disconnected

1. Check temperature sensor connections to long green connector (B) on temperature control module, page 19. Unplug and re-plug sensor wires.
2. Test fluid temperature sensor continuity with ohm-meter, page 8.
3. If an error occurred for the hose zone, check FTS connections at each section of hose.
4. If an error occurred for the hose zone, test FTS by plugging directly into machine.



5. To verify heater control module is not causing the problem, use a wire to short-circuit the two pins corresponding to the FTS (red and yellow for A or B zone, red and purple for hose). The display will show the control heater module temperature.
6. If an error occurred for the hose zone, temporarily use the current control mode. Refer to Reactor Operation manual 312407.

## E05: Circuit board overheated



Each module has an on-board temperature sensor. Heat is turned off if module temperature exceeds 185°F (85°C) within the heater module.

1. Check that fan above electrical cabinet is operating.
2. Check that electrical cabinet door is properly installed.
3. Check for obstructions blocking cooling holes in bottom of electrical cabinet.
4. Clean heatsink fins behind heater control modules.
5. Ambient temperature may be too high. Allow Reactor to cool by moving to a cooler location.

## E06: Communication cable unplugged

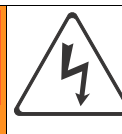
1. Unplug and re-plug cable that connects heater control module to heater module.
2. Replace communication cable if problem persists.

# Communication Diagnostic Code

## E99: Loss of communication

Communications between the display and the motor control board or the temperature control board has been lost. When communication is lost, the corresponding display will show E99.

1. Check all wiring between the display and the corresponding control board. Pay close attention to the wire crimping on plug J13 for each board.



Step 2 measures line voltage and should be done by a qualified electrician. If work is not performed properly it may cause electric shock or other serious injury.

2. Measure the incoming voltage to the board (it should be ~ 230Vac).
3. If it was only receiving 1 leg of the 230Vac the board may light up, and still not function properly. Correct the incoming voltage problem.

# Troubleshooting

## Reactor Electronics



Before performing any troubleshooting procedures:


1. Relieve pressure, page 15.

2. Turn main power OFF



3. Allow equipment to cool.

Try the recommended solutions in the order given for each problem, to avoid unnecessary repairs. Also, determine that all circuit breakers, switches, and controls are properly set and wiring is correct before assuming there is a problem.

PROBLEM	CAUSE	SOLUTION
Both sides of display do not illuminate.	No power.	Plug in power cord.
	Low voltage.	Turn disconnect ON 
	Loose wire.	Ensure input voltage is within specifications, page 26.
	Display disconnected.	Check connections, page 26.
Temperature display does not illuminate.	Display disconnected.	Check cable connections, page 26.
	Display cable damaged or corroded.	Check cable connections, page 26.
	Defective circuit board.	Clean connections; replace cable if is damaged.
Erratic display; display turns on and off.	Low voltage.	Swap display connection to motor control board with connection to heater control board. If temperature display illuminates, heater control board is causing problem. Otherwise, display cable or display is failing.
	Poor display connection.	Ensure input voltage is within specifications, page 26.
	Display cable damaged or corroded.	Check cable connections, page 26. Replace damaged cable.
	Display cable not grounded.	Clean connections; replace cable if is damaged.
	Display extension cable too long.	Ground cable, page 26.
Hose display reads OA at startup.	FTS disconnected or not installed.	Must not exceed 100 ft (30.5 m)
		Verify proper installation of FTS (see Operation manual 312407), or adjust FTS to desired current setting.

PROBLEM	CAUSE	SOLUTION
Display does not respond properly to button pushes.	Poor display connection.	Check cable connections, page 26. Replace damaged cable.
	Display cable damaged or corroded.	Clean connections; replace cable if is damaged.
	Ribbon cable on display circuit board disconnected or broken.	Connect cable (page 26) or replace.
	Broken display button.	Replace, page 26.
Red stop button does not work.	Broken button (fused contact).	Replace, page 26.
	Loose wire.	Check connections, page 26.
Fan not working.	Blown fuse.	Verify with ohmmeter; replace if necessary (page 26).
	Loose wire.	Check fan wire.
	Defective fan.	Replace, page 26.

## Primary Heaters (A and B)



Before performing any troubleshooting procedures:

1. Relieve pressure, page 15.

2. Turn main power OFF



3. Allow equipment to cool.

Try the recommended solutions in the order given for each problem, to avoid unnecessary repairs. Also, determine that all circuit breakers, switches, and controls are properly set and wiring is correct before assuming there is a problem.

PROBLEM	CAUSE	SOLUTION
Primary heater(s) does not heat.	Heat turned off.	Press <b>A</b> or <b>B</b> zone <b>I</b> keys.
	Temperature control alarm.	Check temperature display for diagnostic code, page 7.
	Signal failure from thermocouple.	See <b>E04: Fluid Temperature Sensor (FTS) or thermocouple disconnected</b> , page 9.
Control of primary heat is abnormal; high temperature overshoots or E01 error occurs intermittently.	Dirty thermocouple connections.	Examine connection of thermocouples to long green plug on heater control board. Unplug and re-plug thermocouple wires, cleaning off any debris. Unplug and re-plug long green connector.
	Thermocouple not contacting heater element.	Loosen ferrule nut (N), push in thermocouple (310) so tip (T) contacts heater element (307). Holding thermocouple tip (T) against heater element, tighten ferrule nut (N) 1/4 turn past tight. See page 22 for illustration.
	Failed heater element.	See Primary Heaters, page 21.
	Signal failure from thermocouple.	See <b>E04: Fluid Temperature Sensor (FTS) or thermocouple disconnected</b> , page 9.
	Thermocouple wired incorrectly.	See <b>E04: Fluid Temperature Sensor (FTS) or thermocouple disconnected</b> , page 9. Power up zones one at a time and verify that temperature for each zone rises.

# Hose Heat System



Before performing any troubleshooting procedures:

1. Relieve pressure, page 15.

2. Turn main power OFF



3. Allow equipment to cool.



## Problems

Try the recommended solutions in the order given for each problem, to avoid unnecessary repairs. Also, determine that all circuit breakers, switches, and controls are properly set and wiring is correct before assuming there is a problem.

PROBLEM	CAUSE	SOLUTION
Hose heats but heats slower than usual or it does not reach temperature.	Ambient temperature is too cold.	Use auxiliary hose heat system.
	FTS failed or not installed correctly.	Check FTS, page 9.
	Low supply voltage.	Verify line voltage. Low line voltage significantly reduces power available to hose heat system, affecting longer hose lengths.
Hose does not maintain temperature while spraying.	A and B setpoints too low.	Increase A and B setpoints. Hose is designed to maintain temperature, not to increase it.
	Ambient temperature is too cold.	Increase A and B setpoints to increase fluid temperature and keep it steady.
	Flow too high.	Use smaller mix chamber. Decrease pressure.
	Hose was not fully preheated.	Wait for hose to heat to correct temperature before spraying.
	Low supply voltage.	Verify line voltage. Low line voltage significantly reduces power available to hose heat system, affecting longer hose lengths.
Hose temperature exceeds setpoint.	A and/or B heaters are overheating material.	Check primary heaters for either a thermocouple problem or a failed element attached to thermocouple, page 9.
	Faulty thermocouple connections.	Verify that all FTS connections are snug and that pins of connectors are clean. Examine connection of thermocouples to long green plug on heater control board. Unplug and re-plug thermocouple wires, cleaning off any debris. Unplug and re-plug long green connector on heater control board.

PROBLEM	CAUSE	SOLUTION
Erratic hose temperature.	Faulty thermocouple connections.	Verify that all FTS connections are snug and that pins of connectors are clean. Examine connection of thermocouples to long green plug on heater control board. Unplug and re-plug thermocouple wires, cleaning off any debris. Unplug and re-plug long green connector.
	FTS not installed correctly.	FTS should be installed close to end of hose in same environment as gun. Verify FTS installation, page 24.
Hose does not heat.	FTS failed or is not contacting correctly.	Check FTS, page 24.
	FTS not installed correctly.	FTS should be installed close to end of hose in same environment as gun. Verify FTS installation, page 24.
	Temperature control alarm.	Check temperature display or diagnostic code, page 24.
Hoses near Reactor are warm, but hoses downstream are cold.	Shorted connection or failed hose heating element.	<p>With hose heat on and temperature setpoint above displayed hose zone temperature, verify voltage between connectors at each section of hose.</p> <p>Voltage should drop incrementally for each section of hose further from Reactor. Use safety precautions when hose heat is turned on.</p>

# Repair

				
<p>Repairing this equipment requires access to parts that may cause electric shock or other serious injury if work is not performed properly. Have a qualified electrician connect power and ground to main power switch terminals, see operation manual. Be sure to shut off all power to the equipment before repairing.</p>				

## Pressure Relief Procedure

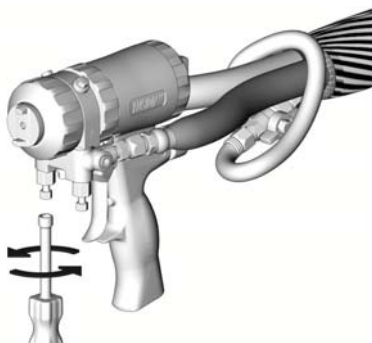
				
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1. Relieve pressure in gun and perform gun shutdown procedure. See gun manual.
2. Engage gun piston safety lock.




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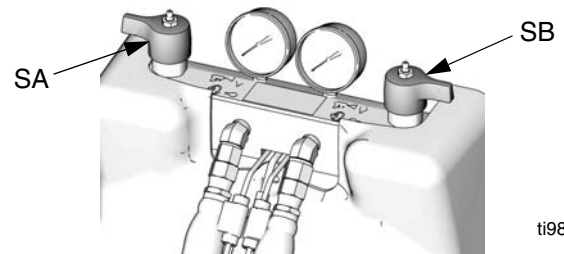
3. Close gun fluid manifold valves A and B.



ti2421a

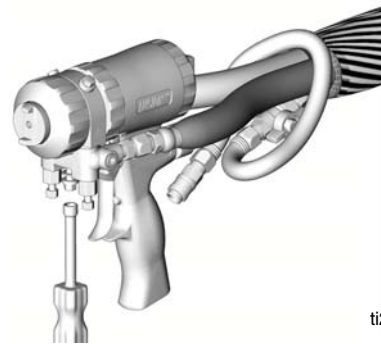
4. Shut off feed pumps and agitator, if used.

5. Turn PRESSURE RELIEF/SPRAY valves (SA, SB) to PRESSURE RELIEF/CIRCULATION . Route fluid to waste containers or supply tanks. Ensure gauges drop to 0.





ti9879a

6. Disconnect gun air line and remove gun fluid manifold.



ti2554a

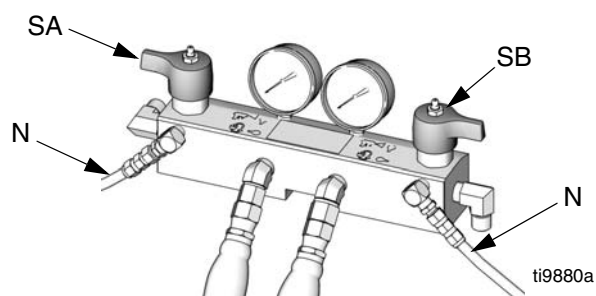
## Flushing

				
<p>Flush equipment only in a well-ventilated area. Do not spray flammable fluids. Do not turn on heaters while flushing with flammable solvents.</p>				

- Flush out old fluid with new fluid, or flush out old fluid with a compatible solvent before introducing new fluid.
- Use the lowest possible pressure when flushing.
- All fluid components are compatible with common solvents. Use only moisture-free solvents.

- To flush feed hoses, pumps, and heaters separately from heated hoses, set PRESSURE RELIEF/SPRAY valves (SA, SB) to PRESSURE

RELIEF/CIRCULATION  . Flush through bleed lines (N).



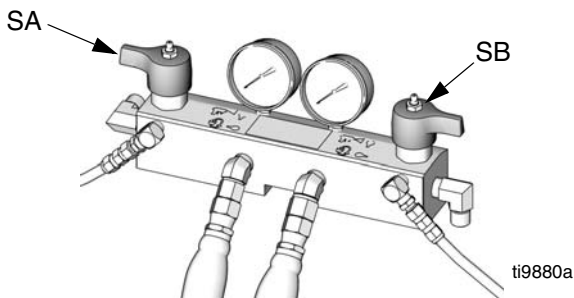
- To flush entire system, circulate through gun fluid manifold (with manifold removed from gun).
- To prevent moisture from reacting with isocyanate, always leave the system dry or filled with a moisture-free plasticizer or oil. Do not use water.




## Proportioning Pumps




1. Shut off **A** , **B** , and **C** heat zones.
2. Flush, page 16.
3. Relieve pressure, page 15.
4. Turn PRESSURE RELIEF/SPRAY valves (SA, SB) to PRESSURE RELIEF.

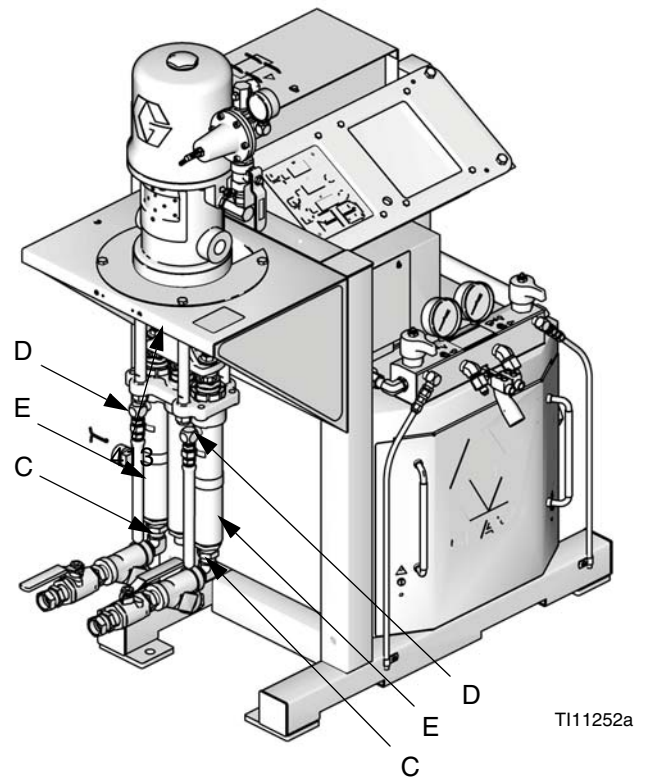


5. Turn main power OFF  . Disconnect power supply.
6. Disconnect hoses and fittings from fluid inlets (C) and outlets (D). See FIG. 1.

7. Remove pump. See applicable manuals, supplied.

 See applicable pump and motor repair-parts manuals. Displacement pump (E) may be removed without removing entire proportioning pump.

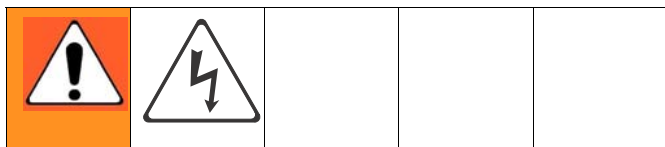
8. Reinstall in reverse order.



**FIG. 1. Pump Removal**

## Circuit Breaker Module

1. Turn main power OFF . Disconnect power supply. Turn circuit breakers on to test.

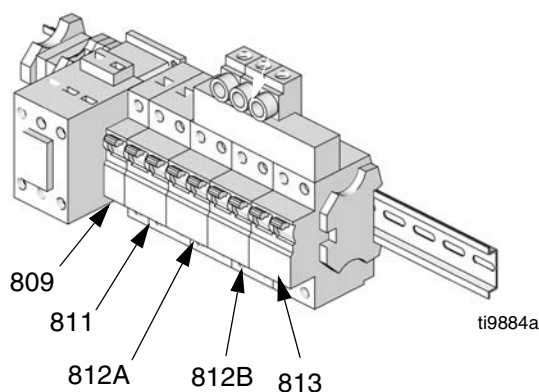


2. Relieve pressure, page 15.
3. Using an ohmmeter, check for continuity across circuit breaker (top to bottom). If no continuity, trip breaker, reset, and retest. If still no continuity, replace breaker as follows:
  - a. Refer to electrical diagrams and to TABLE 2. Disconnect wires and remove bad breaker.
  - b. Install new breaker and reconnect wires.

**Table 2: Circuit Breakers, see FIG. 2**

Ref.	Size	Component
809	50A	Hose/Transformer Secondary Side
811	40A	Transformer Primary
812A	25A, 40A*	Heater A
812B	25A, 40A*	Heater B
813	20A	Motor/Pumps

\* Depending on model.

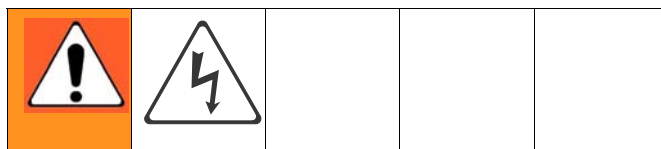


**NOTE:** To reference cables and connectors, see the electrical diagrams and the parts drawings on pages 40-41.

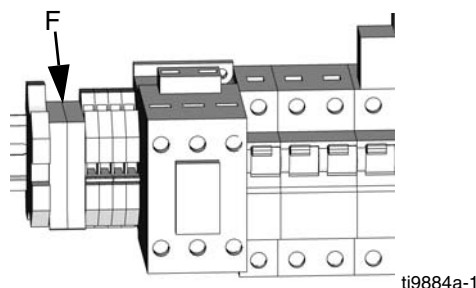
**FIG. 2. Circuit Breaker Module**

## Electric Fan

1. Turn main power OFF . Disconnect power supply.



2. Relieve pressure, page 15.
3. Check fuses (F) at left of breaker module, FIG. 3. Replace if blown. If good, continue with step 4.
4. Refer to electrical diagrams. Disconnect fan wires from fuses (F).
5. Remove fan.
6. Install fan in reverse order.



**FIG. 3. Fan Fuses**

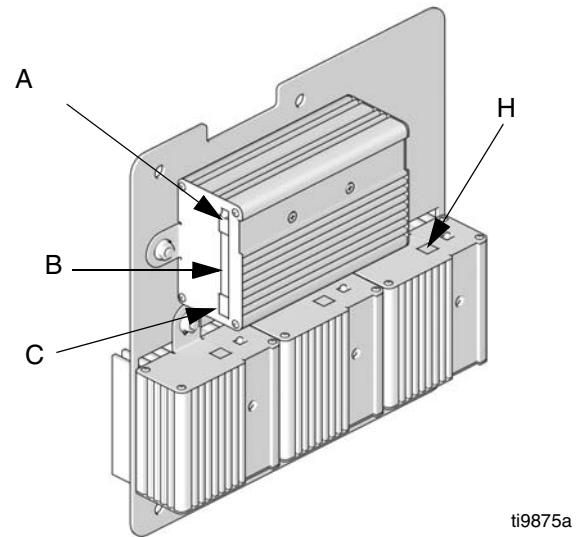
## Temperature Control Module

**Table 3: Temperature Control Module Connections**

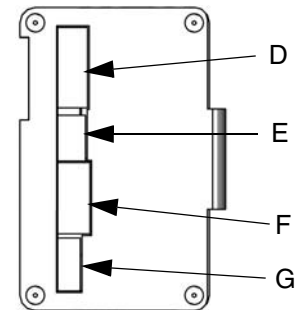
Connector		Description
DATA (A)		Data reporting
SENSOR (B)	PIN	
	12	HOSE T/C P; FTS (purple)
	11	HOSE T/C R; FTS (red)
	10	HOSE T/C S; FTS (silver (unshielded bare wire))
	9	HEATER T/C B, Y; Thermocouple (yellow)
	8	HEATER T/C B, R; Thermocouple (red)
	7	Not used
	6	HEATER T/C A, Y; Thermocouple (yellow)
	5	HEATER T/C A, R; Thermocouple (red)
	4, 3	OVERTEMPERATURE B; Overtemperature switch B
	2, 1	OVERTEMPERATURE A; Overtemperature switch A
DISPLAY (C)		Display
COMMUNICATION (D)		Communication to power boards
PROGRAM (E)		Software programming
BOOT (F)		Software bootloader
POWER/RELAY (G)		Circuit board power input and contactor control output

**Table 4: Temperature Power Module Connections**

Connector	Description
COMMUNICATION (H)	Communication to control board
POWER (J)	Power to heater

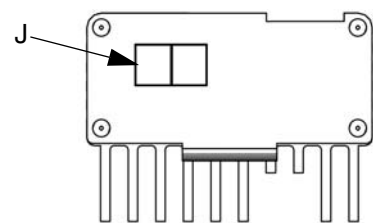


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**Right Side of Control Heater Module**



ti9843a4

**Bottom of Power Modules**

**FIG. 4: Temperature Control Module Connections**

## Test SCR Circuit



### 1. Test the SCR circuit in the on position:


- a. Make sure everything is connected, including the hose.

- b. Turn main power ON



- c. Adjust the hose heat setpoint **above** the ambient hose temperature.

- d. Turn on  heat zone by pressing .

- e. Hold down  to view electrical current.

Hose current should ramp up to 45A. If there is no hose current, see **E03: No zone current**, page 8. If hose current exceeds 45A, see **E02: High zone current**, page 8. If hose current stays several amps below 45A, hose is too long or voltage is too low.



### 2. Test the SCR circuit in the off position:

- a. Make sure everything is connected, including the hose.

- b. Turn main power ON



- c. Adjust the hose heat setpoint **below** the ambient hose temperature.

- d. Turn on  heat zone by pressing .

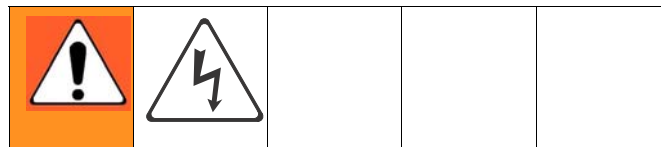
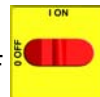
- e. Using a voltmeter, carefully measure the voltage at the hose connector. You should not get a voltage reading. If you do, the SCR on the temperature control board is bad. Replace the temperature control assembly.

## Replacing Temperature Control Assembly Modules

### CAUTION

Before handling assembly, put on a static conductive wrist strap to protect against static discharge which can damage assembly. Follow instructions provided with wrist strap.

1. Turn main power OFF  . Disconnect power supply.




2. Relieve pressure, page 15.
3. Refer to electrical diagrams; see Electrical Diagrams manual 312409. Temperature control assembly is on left side inside cabinet.
4. Remove bolts that secure transformer assembly and slide assembly to side in cabinet.
5. Put on static conductive wrist strap.
6. Disconnect all cables and connectors from assembly; see **Parts - Temperature Control**, page 38.
7. Remove nuts and take entire temperature control assembly to workbench.
8. Replace defective module.

# Primary Heaters

## Heater Element



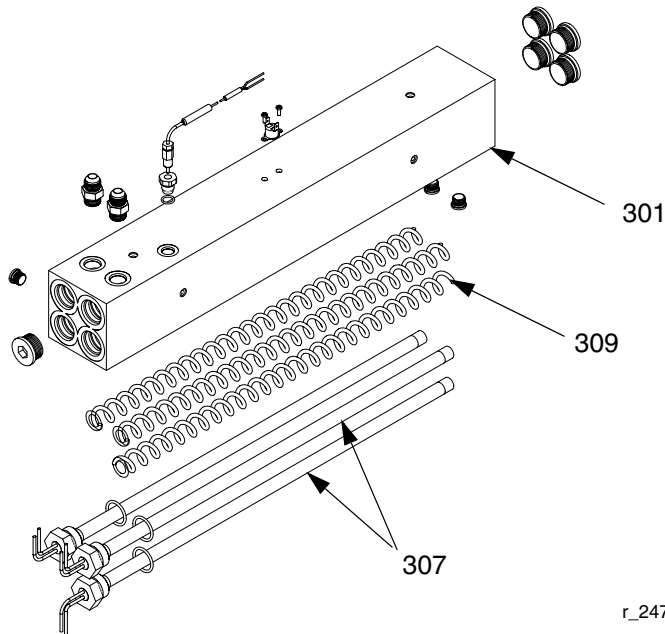
1. Turn main power OFF  . Disconnect power supply.
2. Relieve pressure, page 15.
3. Wait for heaters to cool.
4. Remove heater shroud.
5. See FIG. 9. Disconnect heater element wires from heater wire connector. Test with ohmmeter.

Total Heater Wattage	Element	Ohms
6,000	1500	30-35
7,650	2550	18-21
10,200	2550	18-21

6. To remove heater element, first remove thermocouple (310) to avoid damage, see step 7, page 22.
7. Remove heater element (307) from housing (301). Be careful not to spill any fluid left in housing. See FIG. 5.
8. Inspect element. It should be relatively smooth and shiny. If there is a crusted, burnt, ash-like material adhered to element or sheath shows pitting marks, replace element.
9. Install new heater element (307), holding mixer (309) so it does not block thermocouple port (P).
10. Reinstall thermocouple, page 22.
11. Reconnect heater element leadwires to heater wire connector.
12. Replace heater shroud.

## Line Voltage

The primary heaters output their rated wattage at 230 Vac. Low line voltage will reduce power available and the heaters will not perform at full capability.



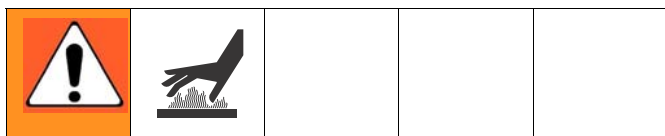
r\_247813\_312066

FIG. 5. Heater (7.5 kW Single Zone Heater Shown)

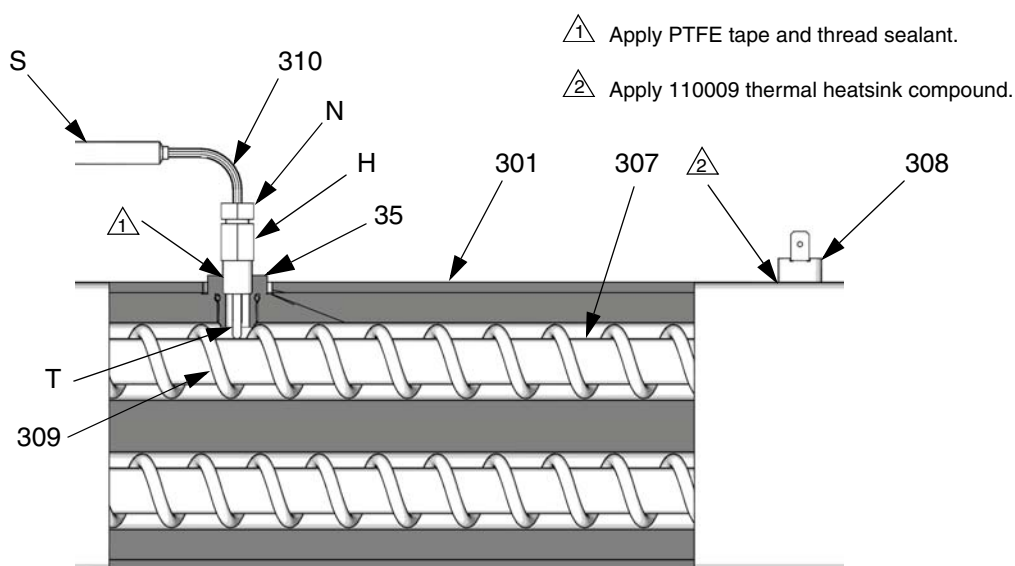
## Thermocouple

1. Turn main power OFF . Disconnect power supply.

2. Relieve pressure, page 15.




3. Wait for heaters to cool.
4. Remove heater shroud.
5. Disconnect thermocouple wires from B on temperature control module. See TABLE 3, page 19 and FIG. 4, page 19.
6. Feed thermocouple wires out of cabinet. Note path as wires must be replaced in the same way.
7. See FIG. 6. Loosen ferrule nut (N). Remove thermocouple (310) from heater housing (301), then remove thermocouple housing (H). Do not remove the thermocouple adapter (305) unless necessary. If adapter must be removed, ensure that mixer (309) is out of the way when replacing the adapter.
8. Replace thermocouple, FIG. 6.
  - a. Remove protective tape from thermocouple tip (T).
  - b. Apply PTFE tape and thread sealant to male threads and tighten thermocouple housing (H) into adapter (305).
  - c. Push in thermocouple (310) so tip (T) contacts heater element (307).
  - d. Holding thermocouple (T) against heater element, tighten ferrule nut (N) 1/4 turn past tight.
9. Route wires (S) into cabinet and thread into bundle as before. Reconnect wires to board.
10. Replace heater shroud.
11. Turn on heaters A and B simultaneously to test. Temperatures should rise at same rate. If one heater is low, loosen ferrule nut (N) and tighten thermocouple housing (H) to ensure thermocouple tip (T) contacts element (307).

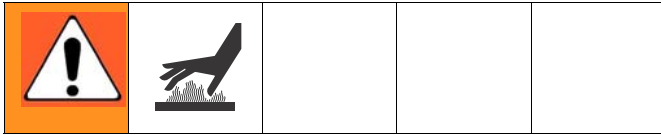


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**FIG. 6. Thermocouple**

## Overtemperature Switch

1. Turn main power OFF . Disconnect power supply.
2. Relieve pressure, page 15.



3. Wait for heaters to cool.
4. Remove heater shroud.
5. Disconnect one lead wire from overtemperature switch (308), FIG. 6. Test across switch with ohmmeter. Resistance must be approximately 0 ohms.
6. If switch fails test, remove wires and screws. Discard failed switch. Apply thermal compound 110009, install new switch in same location on housing (301), and secure with screws (311). Reconnect wires.




If wires need replacement, disconnect from temperature control board. See TABLE 3, page 19 and FIG. 4, page 19.

## Heated Hose



Refer to the heated hose manual 309572 for hose replacement parts.

### Check Hose Connectors


1. Turn main power OFF . Disconnect power supply.
2. Relieve pressure, page 15.

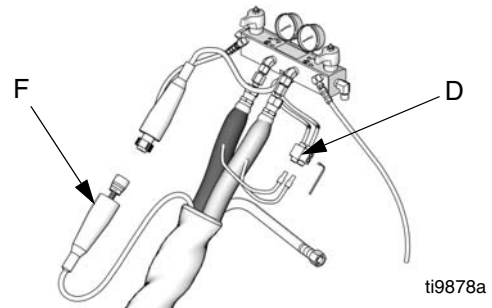


Whip hose must be connected.

3. Disconnect hose connector (D) at Reactor, FIG. 7.
4. Using an ohmmeter, check between the two terminals of the connector (D). There should be continuity.
5. If hose fails test, retest at each length of hose, including whip hose, until failure is isolated.

### Check FTS Cables

1. Turn main power OFF . Disconnect power supply.
2. Relieve pressure, page 15.
3. Disconnect FTS cable (F) at Reactor, FIG. 7.



**FIG. 7. Heated Hose**


4. Test with ohmmeter between pins of cable connector.

Pins	Result
1 to 2	approximately 35 ohms per 50 ft (15.2 m) of hose, plus approximately 10 ohms for FTS
1 to 3	infinity

5. If cable fails test, retest at FTS, page 24.

# Fluid Temperature Sensor (FTS)

## Test/Removal

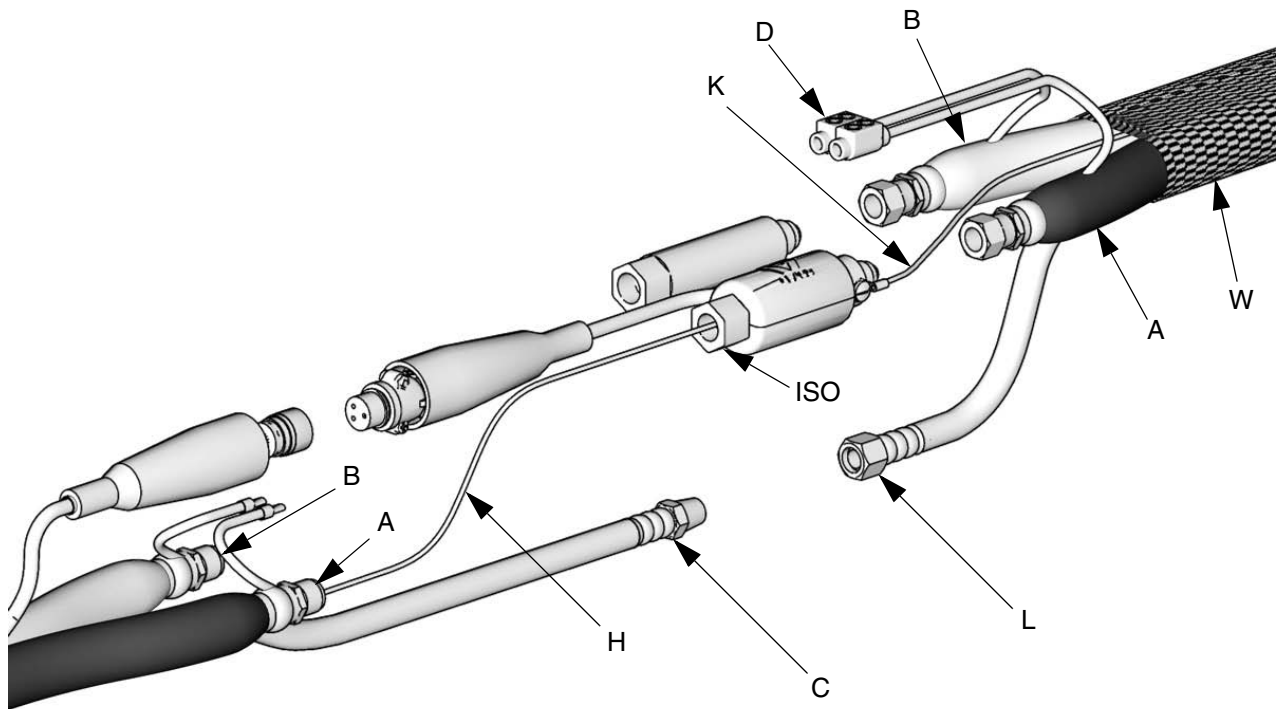
1. Turn main power OFF  . Disconnect power supply.
2. Relieve pressure, page 15.
3. Remove tape and protective covering from FTS (21), FIG. 7. Disconnect hose cable (F). Test with ohmmeter between pins of cable connector.

Pins	Result
1 to 2	approximately 10 ohms
1 to 3	infinity
3 to FTS groundscrew	0 ohms
1 to FTS component A fitting (ISO)	infinity

4. If FTS fails any test, replace FTS.
5. Disconnect air hoses (C, L), and electrical connectors (D).
6. Disconnect FTS from whip hose (W) and fluid hoses (A, B).
7. Remove ground wire (K) from ground screw on underside of FTS.
8. Remove FTS probe (H) from component A (ISO) side of hose.

## Installation

The Fluid Temperature Sensor (FTS) is supplied. Install FTS between main hose and whip hose. See Heated Hose manual 309572 for instructions.




ti9581c


FIG. 8: Fluid Temperature Sensor and Heated Hoses



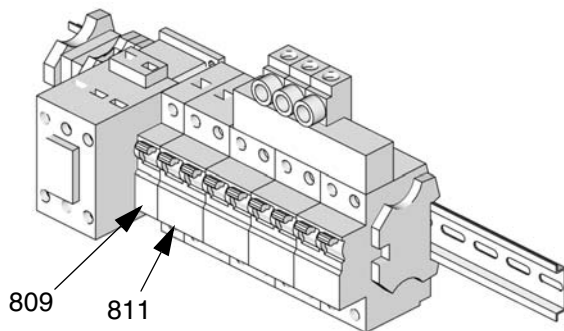
## Transformer Primary Check

1. Turn main power OFF .
2. Locate the two smaller (10 AWG) wires coming out of transformer. Trace these wires back to contactor and circuit breaker (811). Use an ohmmeter to test for continuity between two wires; there should be continuity.

## Transformer Secondary Check

1. Turn main power OFF .
2. Locate the two larger (6 AWG) wires coming out of transformer. Trace these wires back to large green connector under hose control module and circuit breaker (809). Use an ohmmeter to test for continuity between two wires; there should be continuity.

If you are not sure which wire in green plug under hose module connects to transformer, test both wires. One wire should have continuity with the other transformer wire in breaker (809) and the other wire should not.



**FIG. 9: Circuit Breaker Module**

3. To verify transformer voltage, turn on hose zone. Measure voltage from 18CB-2 to POD-HOSE-P15-2; see Reactor Electrical Diagrams manual 312409.

Model	Secondary Voltage
310 ft.	90 Vac*

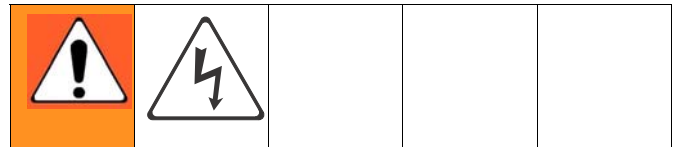
\* For 230 Vac line voltage.

## Replace Transformer



Use this procedure to replace transformer.

1. Turn main power OFF . Disconnect power supply.



2. Open Reactor cabinet.
3. Remove bolts holding transformer to cabinet floor. Slide transformer forward.
4. Disconnect the transformer wires; see Reactor Electrical Diagrams manual 312409.
5. Remove transformer from cabinet.
6. Install new transformer in reverse order.

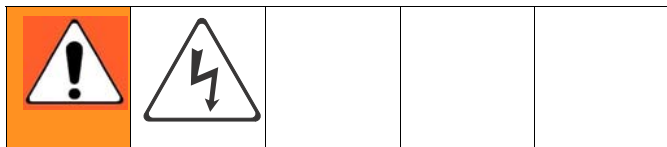
# Display Module

## Temperature and Pressure Displays


### CAUTION

Before handling board, put on a static conductive wrist strap to protect against static discharge which can damage board. Follow instructions provided with wrist strap.

1. Turn main power OFF . Disconnect power supply.



2. Relieve pressure, page 15.
3. Refer to electrical diagrams.
4. Put on static conductive wrist strap.
5. Disconnect main display cable (20) at lower left corner of display module; see FIG. 10.
6. Remove screws (509, 510) and cover (504); see FIG. 10.

 If replacing both displays, label temperature display cables TEMP and cycle counter display cables CYCLES before disconnecting.


7. Disconnect cable connectors J1 and J13 from back of temperature display (501) or pressure display (502); see FIG. 10.
8. Disconnect ribbon cable(s) (R) from back of display; see FIG. 10.

9. Remove nuts (508) and plate (505).
10. Disassemble display, see detail in FIG. 10.
11. Replace board (501a or 502a) or membrane switch (501b or 502b) as necessary.
12. Reassemble in reverse order, see FIG. 10. Apply medium strength thread sealant where shown. Be sure display cable ground wire (G) is secured between cable bushing and cover (504) with screws (512).

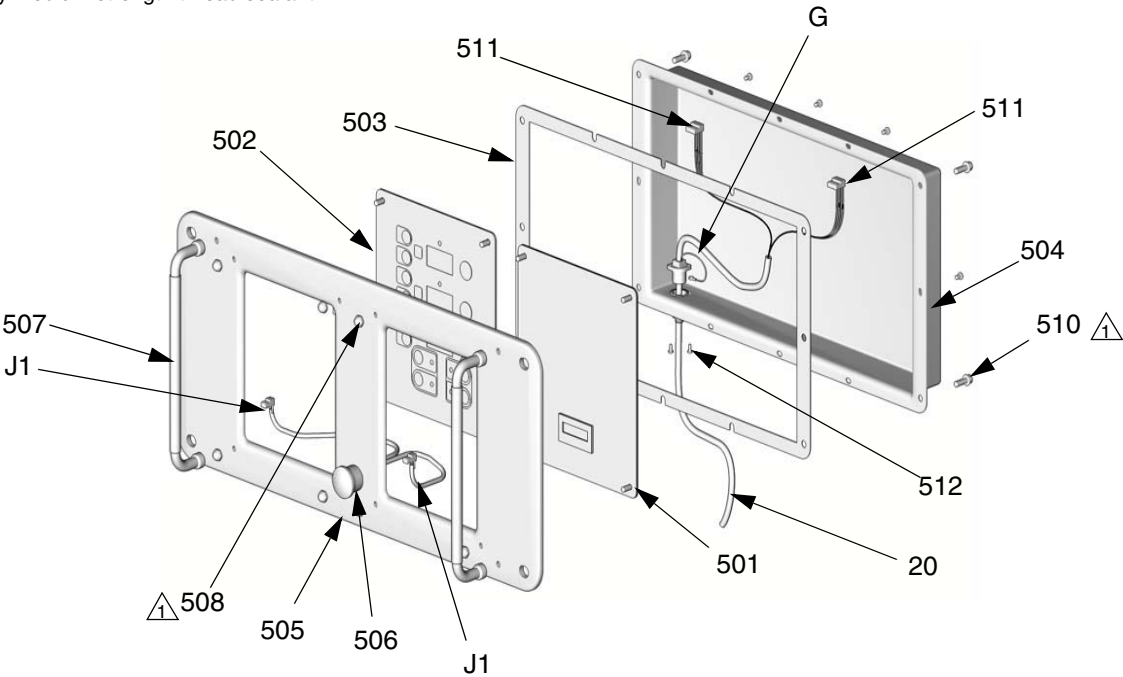
## Red Stop Button

### CAUTION

Before handling board, put on a static conductive wrist strap to protect against static discharge which can damage board. Follow instructions provided with wrist strap.

1. Turn main power OFF . Disconnect power supply.
2. Relieve pressure, page 15.
3. Refer to electrical diagrams.
4. Put on static conductive wrist strap.
5. Remove screws (509, 510) and cover (504), FIG. 10.
6. Disconnect button cable connectors (506) from back of temperature display (501) and pressure display (502).
7. Remove red stop button (506).
8. Reassemble in reverse order. Be sure display cable ground wire (G) is secured between cable bushing and cover (504) with screws (512).

⚠ Apply medium strength thread sealant.

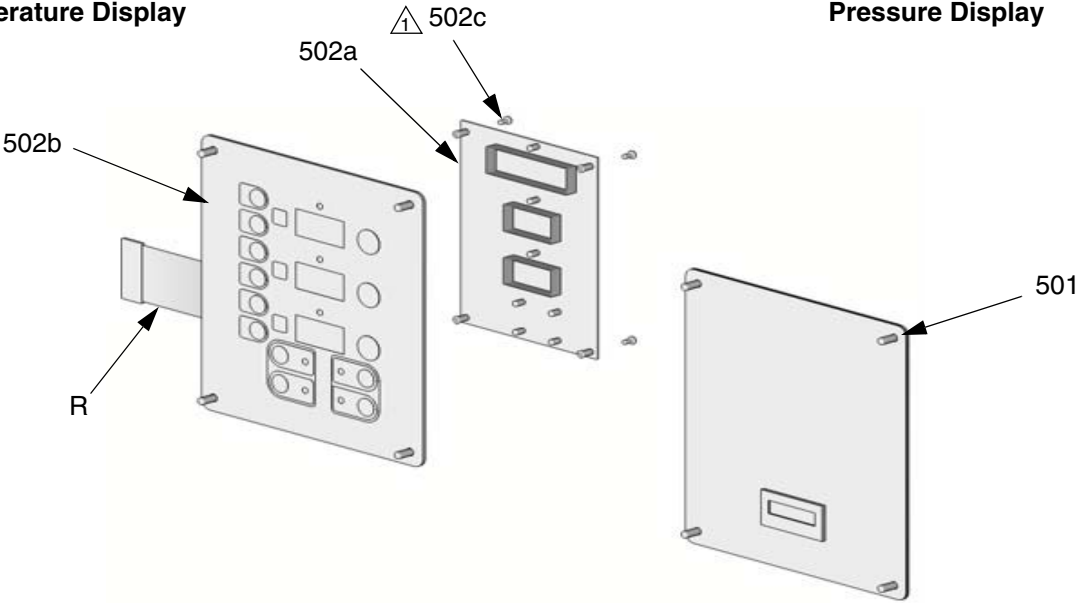


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**Detail of Membrane Switches and Display Boards**

**Temperature Display**

**Pressure Display**



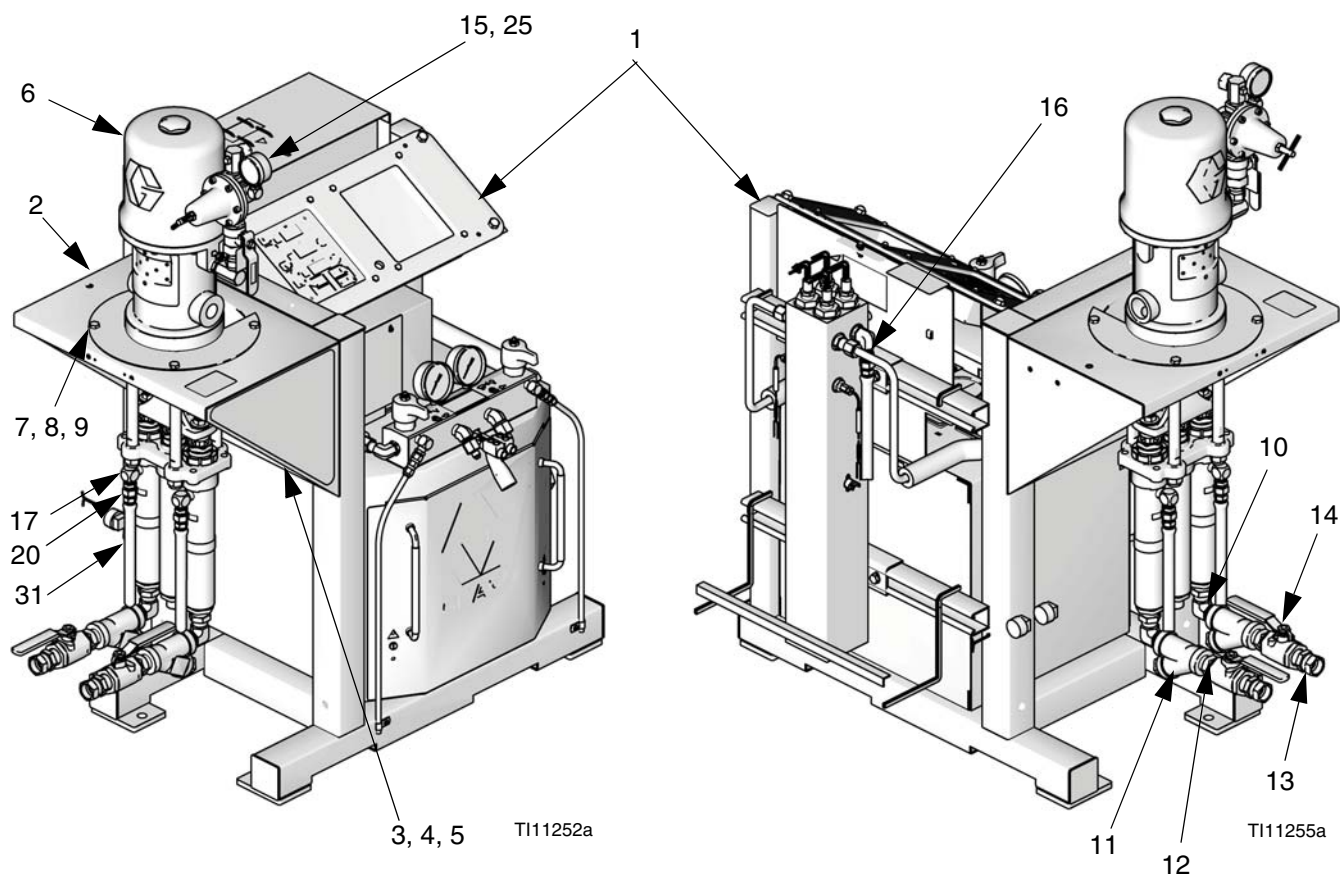
TI3702aa

**FIG. 10. Display Module**

# Parts

## Air Powered Reactors

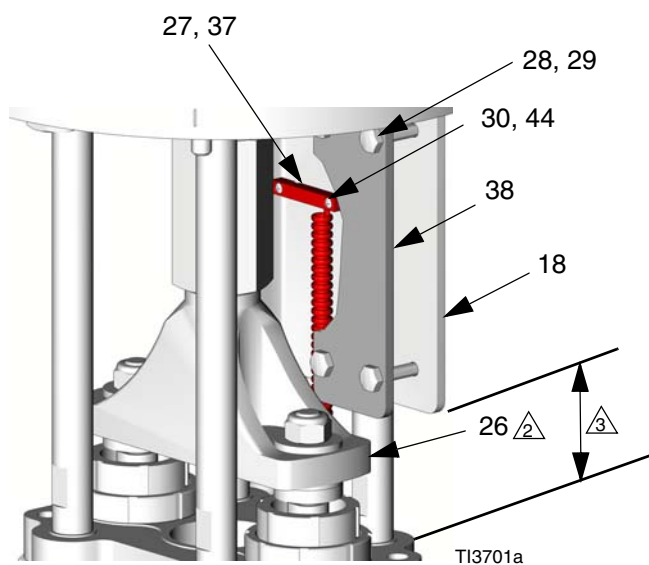
### Model A-XP2 Shown



### Detail of Cycle Counter Switch

△2 Ref. 26 magnet is on back side of yoke.

△3 Dimension from bottom of switch mounting plate (18) to top of tie plate must be 2 in. (51 mm) to maintain correct relationship between magnet (26) and switch (27).

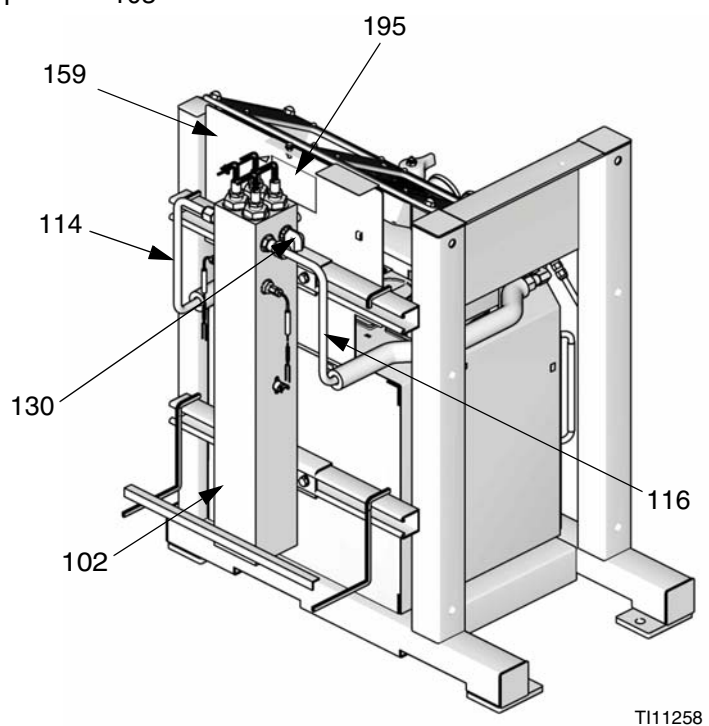
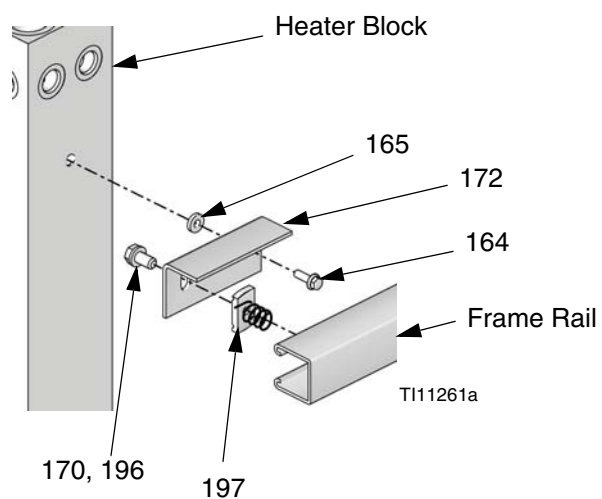
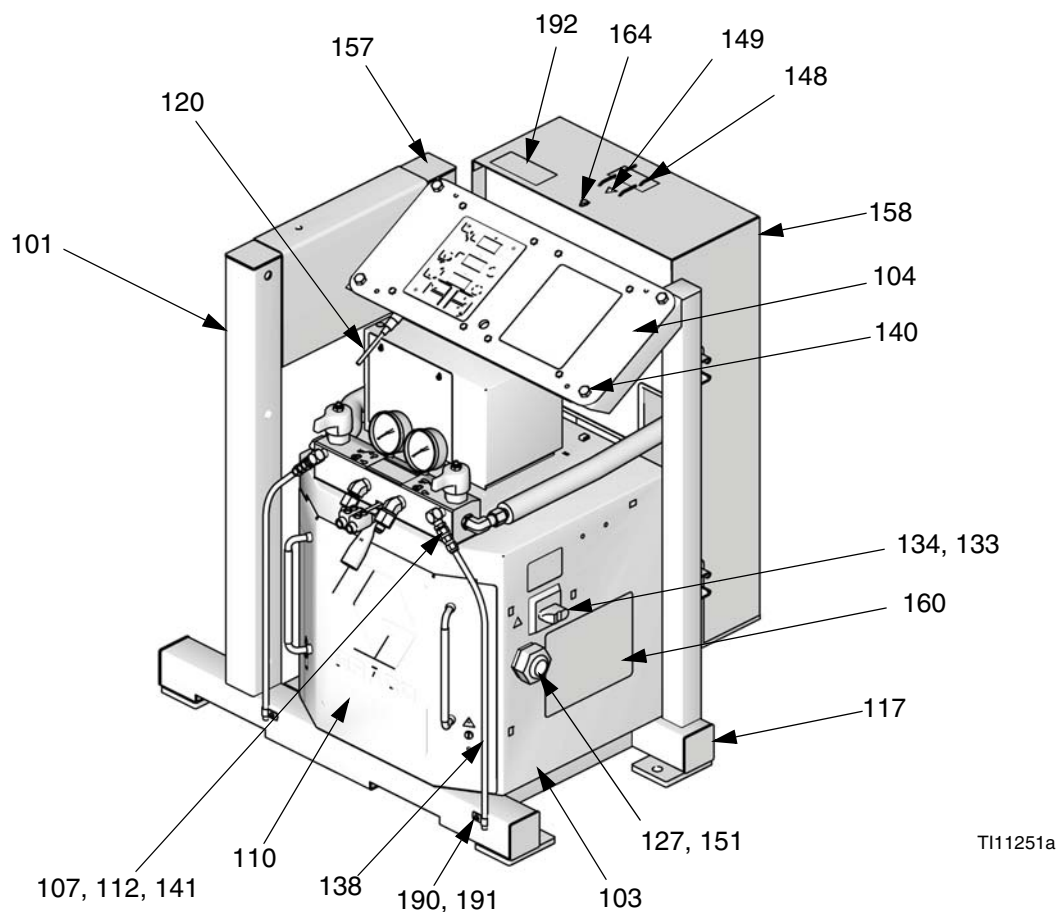


## Air Powered Reactors

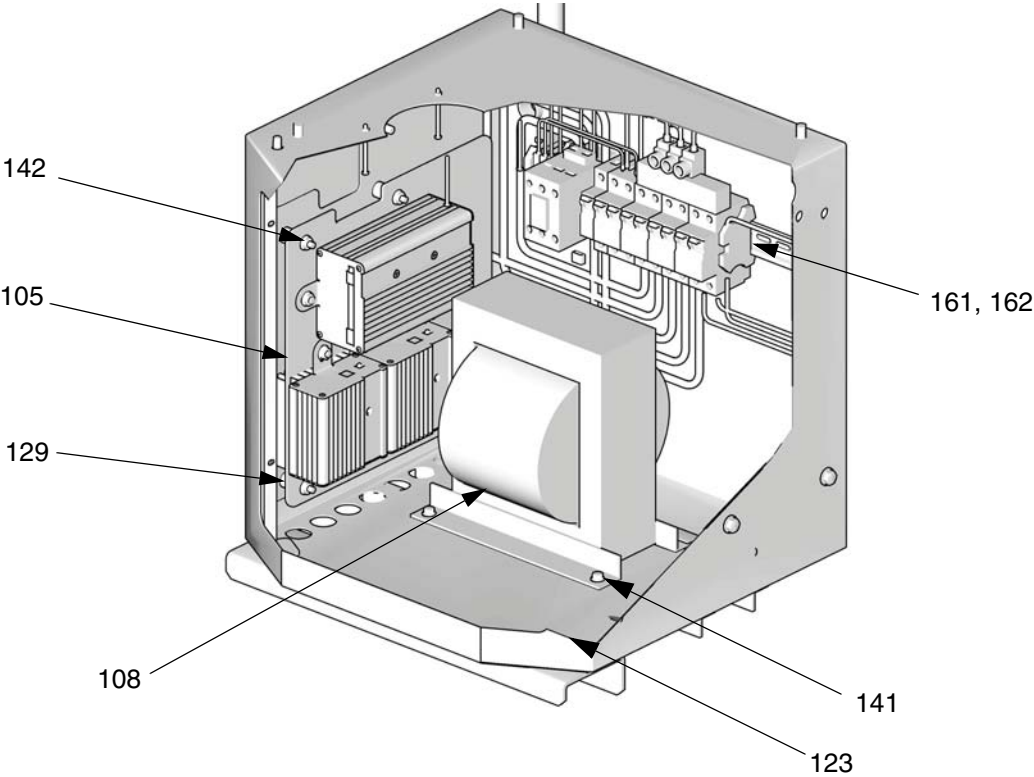
Use this chart to find parts by model. Find ref. of part in left column, and Reactor model in top row. Intersection is correct part number.

Ref.	Description	Air Powered Reactor Models			Qty
		259060, A-XP2	259061, A-XP2	259062, A-XP2	
1	PACKAGE, control, heat	259073	259074	259075	1
2	BRACKET, mounting	217298	217298	217298	1
3	SCREW, cap; 1/2-13 x 3-1/2 in. (89 mm)	100679	100679	100679	4
4	WASHER, lock; 1/2 in.	100018	100018	100018	4
5	NUT, hex; 1/2-13	100321	100321	100321	4
6	PUMP, proportioner; see 308224	231646	231646	231646	1
7	SCREW, cap; 3/8-16 x 1 in. (25 mm)	100101	100101	100101	4
8	WASHER, lock; 3/8 in.	100133	100133	100133	4
9	NUT, hex; 3/8-16	100131	100131	100131	4
10	ELBOW, swivel; 3/4 npt(m) x 3/4 npt(f)	160327	160327	160327	2
11	Y-STRAINER; includes 11a	101078	101078	101078	2
11a	.ELEMENT, 20 mesh; not shown	180199	180199	180199	1
12	NIPPLE; 3/4 npt	C20487	C20487	C20487	2
13	UNION, swivel; 3/4 npt(m) x 3/4 npt(f)	157785	157785	157785	2
14	VALVE, ball; 3/4 npt (fbe)	109077	109077	109077	2
15	KIT, air control; see 308168	241661	241661	241661	1
16	NIPPLE	156849	156849	156849	2
17	ELBOW, street; 3/8 npt (mxf)	155699	155699	155699	2
18	PLATE, mounting, switch	15C256	15C256	15C256	1
20	UNION, swivel; 3/8 npt(m) x 3/8 npsm(f)	155665	155665	155665	2
26	MAGNET	116618	116618	116618	1
27	SWITCH, reed, with cable	117770	117770	117770	1
28	NUT, hex flange; 1/4-20	115942	115942	115942	4
29	SCREW, cap, hex hd; 1/4-20 x 1-3/4 in. (44 mm)	106485	106485	106485	4
30	SCREW, machine; 5-40 x 7/8 in. (22 mm)	107438	107438	107438	2
31	HOSE, fluid; nylon; 3/8 npt (mbe); 3/8 in. (10 mm) ID; 5 ft (1.52 m)	215247	215247	215247	2
36	OIL, ISO pump; not shown	217374	217374	217374	1
37	CONNECTOR, 5 pin; 24 AWG	118115	118115	118115	1
38	BRACKET, mounting, switch	15C319	15C319	15C319	1
44	SPACER	116374	116374	116374	2

# Heat Control Packages

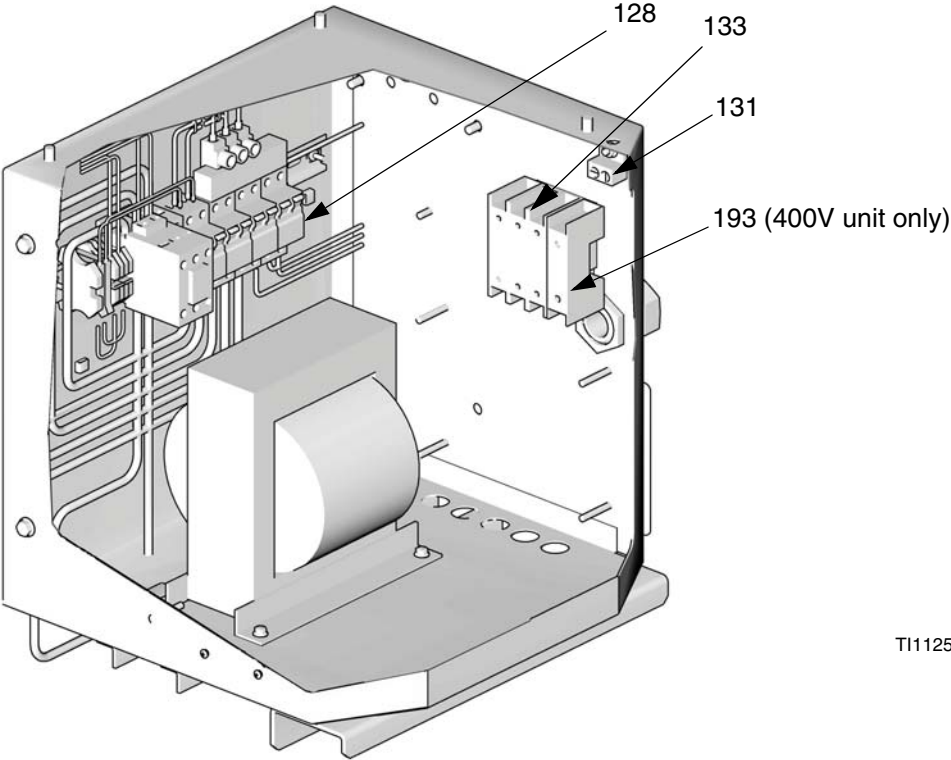


Left Side of Cabinet



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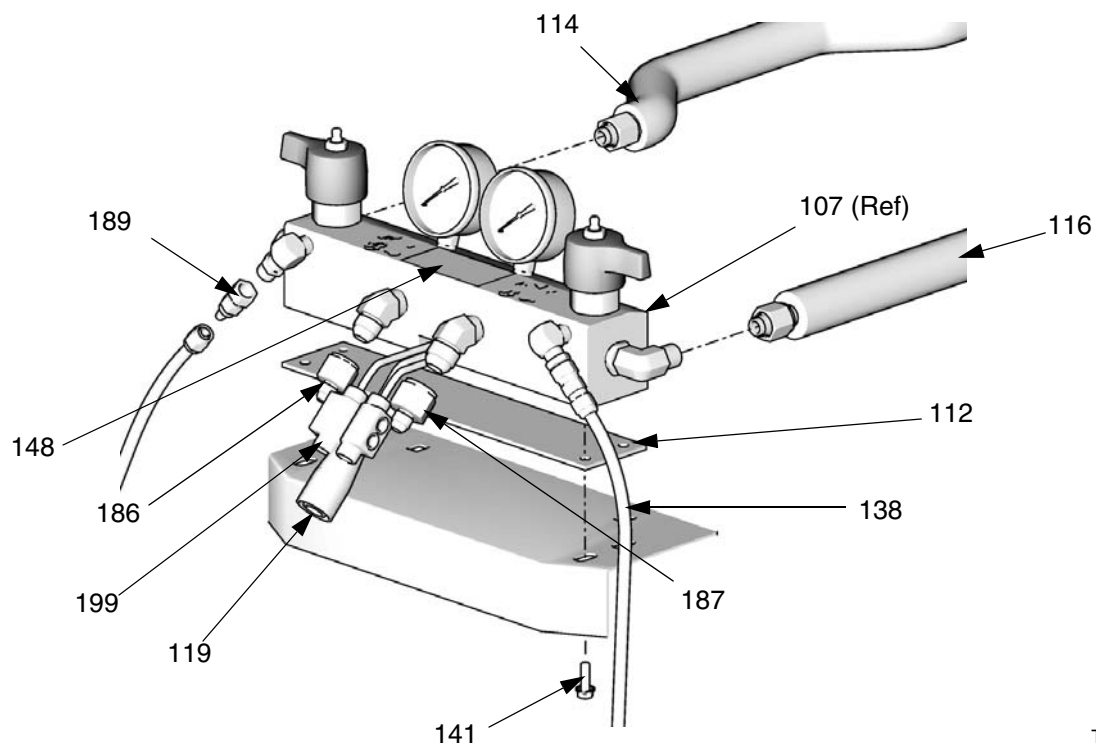
Right Side of Cabinet



TI11259a

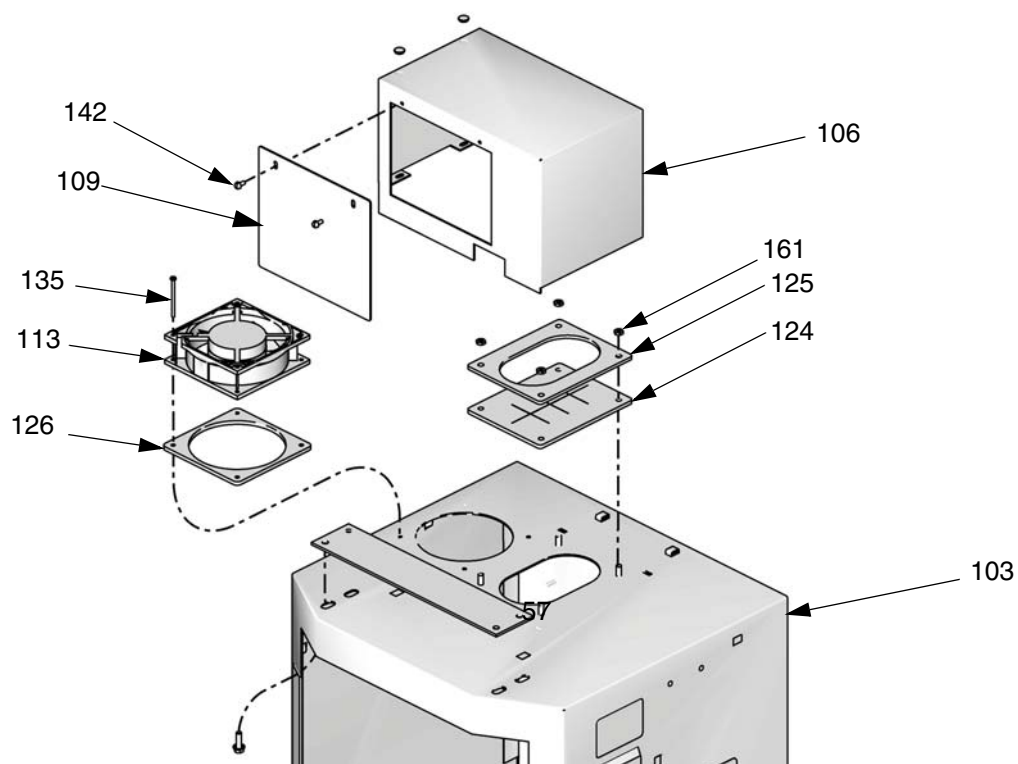


## Detail, Fluid Manifold Area



TI10962a

## Detail, Cabinet Area



TI11266a



## Heat Control Packages

The following parts are common for all heat control package models. See page 34 for parts that vary by model.

Ref.	Part	Description	Qty.				
101	245955	FRAME	1	151	255048	NUT, strain relief, M40 thread	1
102		HEATER; see page 34	1	153★	15B593	SHIELD, membrane switch; package of 10	1
103	259717	CABINET, electric	1	157★	15E965	CAP, tube, square	1
104	246043	DISPLAY	1	158	247524	COVER, heater, back; see page 34	1
105	247838	PANEL, control, heater	1	159	15B798	COVER, heater, front	1
106	15C223	COVER, fan	1	160▲	15G280	LABEL, warning	1
107	247556	MANIFOLD, inlet, fluid	1	161	113505	NUT, hex hd	6
108	247812	TRANSFORMER	1	162	112776	WASHER	2
109	15B775	COVER, wire access	1	164		BOLT; see page 34	-
110	246976	COVER, assembly (main cabinet)	1	165		INSULATOR; see page 34	-
111★	261669	KIT, fluid temp sensor, coupler	1	170		BOLT; see page 34	-
112	15B456	GASKET, manifold	1	172		BRACKET, heater; see page 34	-
113	115834	FAN, cooling	1	186	117502	FITTING; #5 x #8 JIC	1
114		TUBE, fluid, outlet, a; see page 34	1	187	117677	FITTING; #6 x #10 JIC	1
116		TUBE, fluid, heater, outlet, b; see page 34	1	189	205447	COUPLING, hose	2
117	168422	CAP, tube square	6	190	15C447	BRACKET, holding	2
118★	247787	CABLE, harness	1	191	100974	SCREW, mach pan hd	2
119	15B380	CABLE, hose, control	1	192	15C477	LABEL, diagnostics	1
120	15B383	CABLE, control to display	1	193		SWITCH, added pole; see page 34	1
123	112958	NUT, hex, flanged	4	195▲	171001	LABEL, warning	1
124	15B361	BOOT, wire feed through	1	196		WASHER, lock; 3/8 in.; see page 34	-
125	15B510	COVER, plate	1	197		NUT; 3/8-16; see page 34	-
126	15B360	GASKET, fan	1	199	261821	CONNECTOR, wire, 6AWG	1
127	255047	BUSHING, strain relief, M40 thread	1	▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.			
128		MODULE, breaker; see page 34	1	★ Not shown.			
129	247782	SPACER	1	✱ Required for all A-D series models. Included in Knob Repair Kit 258920 (purchase separately).			
130	255037	FITTING, elbow, sae x npt	2				
131	117666	TERMINAL, ground	1				
133✱	123969	SWITCH, disconnect	1				
134✱	123967	KNOB, operator disconnect	1				
135	117723	SCREW, mach, slotted, hd	4				
137★	247791	WIRE, hose, harness	1				
138	15M338	TUBE, plastic	1				

## Heat Control Packages (varying parts)

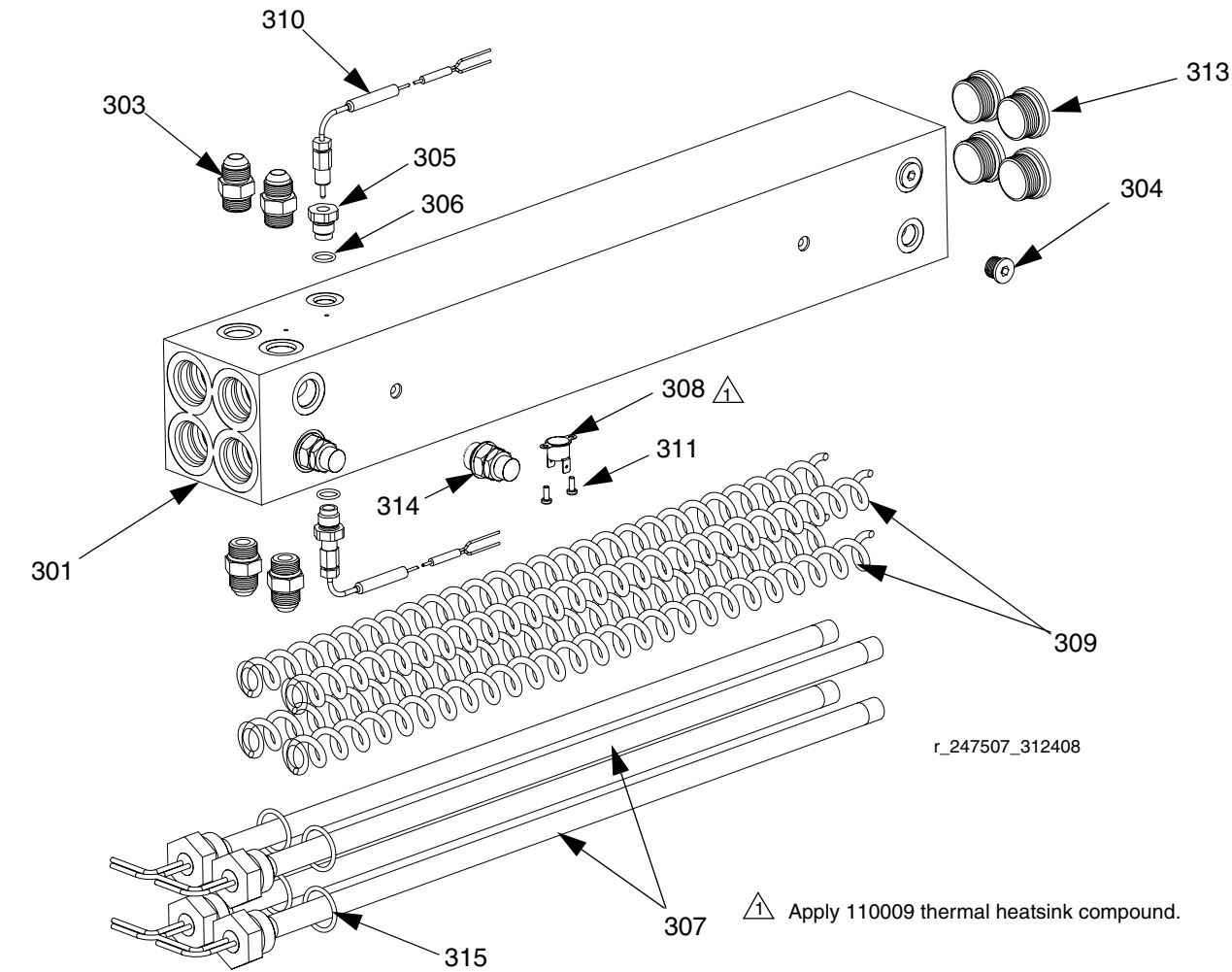
Use this chart to find parts by model. Find ref. of part in left column, and model in top row. Intersection is correct part number.

Ref.	Description	Heat Control Package Models									Qty
		259070	259071	259072	259073	259074	259075	259076	259077	259078	
102	HEATER	247506	247506	247506	247507	247507	247507				1
								247509	247509	247509	2
114	TUBE, fluid, outlet, a	247920	247920	247920	247920	247920	247920	247917	247917	247917	1
116	TUBE, fluid, heater, outlet, b	247918	247918	247918	247918	247918	247918	247915	247915	247915	1
128	BREAKER, module; see page 40	C	A	B	C	A	B	C	A	B	1
164	BOLT	113796	113796	113796	113796	113796	113796				2
								113796	113796	113796	4
165	INSULATOR	167002	167002	167002	167002	167002	167002				2
								167002	167002	167002	4
170	BOLT	100469	100469	100469	100469	100469	100469				2
								100469	100469	100469	4
172	BRACKET, heater	247523	247523	247523	247523	247523	247523				2
								247523	247523	247523	4
193	SWITCH, added pole; 400V			123968			123968			123968	1
196	WASHER, lock; 3/8 in.	100133	100133	100133	100133	100133	100133				2
								100133	100133	100133	4
197	NUT; 3/8-16	118446	118446	118446	118446	118446	118446				2
								118446	118446	118446	4

# 10.2 kW and 6.0 kW Heaters

(One Per Machine)

## Parts 247506 and 247507

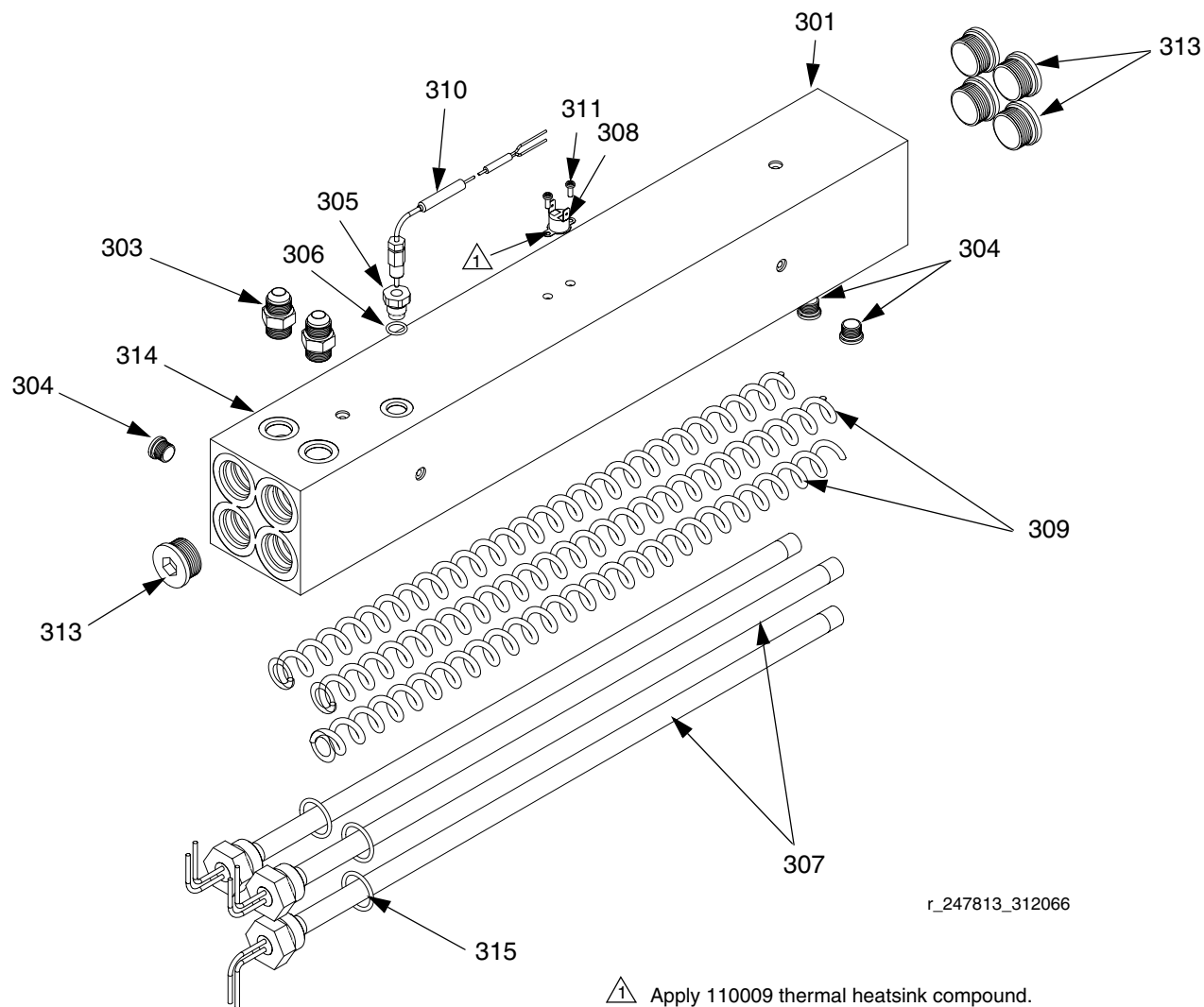


Ref.	Part	Description	Qty	Ref.	Part	Description	Qty
301		HOUSING, heater	1	308	15B137	SWITCH, overtemperature	1
303	121309	ADAPTER	4	309	15B135	MIXER, immersion heater	3
304	15H304	PLUG	2	310	117484	SENSOR	2
305	15H306	ADAPTER, thermocouple	2	311	100518	SCREW, machine, pan hd	2
306	120336	O-RING; fluoroelastomer	2	313	15H305	PLUG, hollow	5
307	16A110	HEATER, immersion; 2550 W, 10.2 kW (only 247507)	4	314	247520	DISC, rupture	2
	16A112	HEATER, immersion; 550 W, 6 kW (only 247506)		315	124312	O-RING	4

# 7.65 kW Single Zone Heater

(Two Per Machine)

## Part 247509



r\_247813\_312066

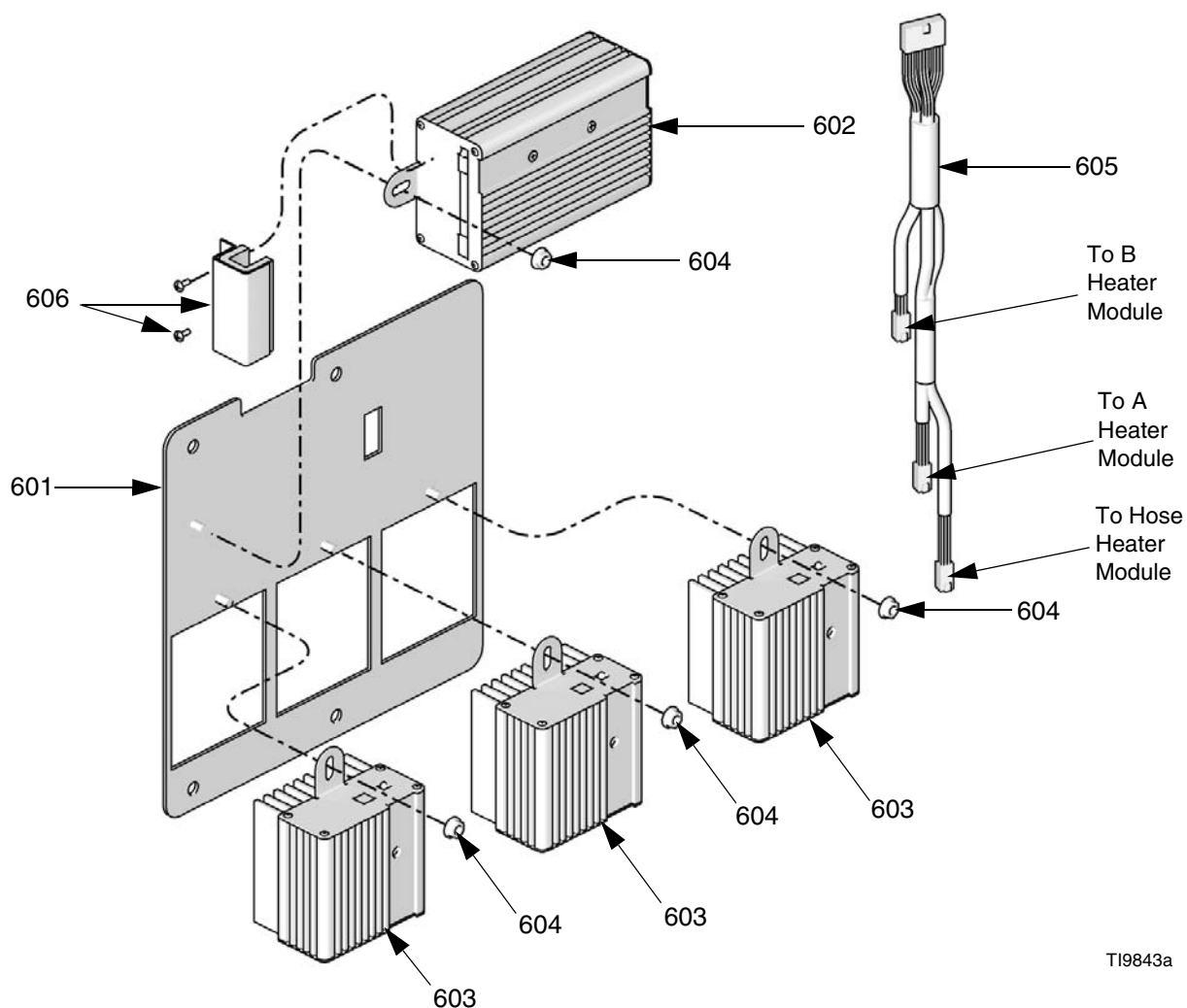
Ref.	Part	Description	Qty	Ref.	Part	Description	Qty
301		HOUSING, heater	1	309	15B135	MIXER, immersion heater	3
303	121309	ADAPTER	2	310	117484	SENSOR	1
304	15H304	PLUG	3	311	100518	SCREW, machine, pan hd	2
305	15H306	ADAPTER, thermocouple	1	313	15H305	PLUG, hollow	5
306	120336	O-RING; fluoroelastomer	1	314	247520	DISC, rupture; not shown	1
307	16A110	HEATER, immersion; 2550 W	3	315	124132	O-RING	3
308	15B137	SWITCH, overtemperature	1				

Exploded view diagram of a medical device assembly. The diagram shows the following components and their callouts:

- 401**: Main front panel with a handle and mounting holes.
- 402**: Internal component panel with various ports and connectors.
- 403**: Side panel or cover.
- 404**: Small rectangular component, possibly a filter or sensor.
- 405**: Small circular component, possibly a button or indicator.
- 406**: Small rectangular component, possibly a switch or connector.
- 407**: Small rectangular component, possibly a filter or sensor.
- 408**: Small circular component, possibly a button or indicator.
- 409**: Small rectangular component, possibly a filter or sensor.
- 410**: Small rectangular component, possibly a filter or sensor.
- 411**: Small rectangular component, possibly a filter or sensor.
- 412**: Small rectangular component, possibly a filter or sensor.
- 120**: A cable or tube connected to the main panel.
- 401a**: A small rectangular component on the main panel.
- 401b**: A small rectangular component on the main panel.
- 402a**: A small rectangular component on the internal panel.
- 402b**: A small rectangular component on the internal panel.
- 402c**: A small rectangular component on the internal panel.

312408F

## Temperature Control



Ref.	Part	Description	Qty.
601	247772	PANEL, module mounting	1
602	247827	HOUSING, control module	1
603	247828	HOUSING, heater module	3
604	115942	NUT, hex	4
605	247801	CABLE, communication	1
606	247825	KIT, cover, connector with screws	1

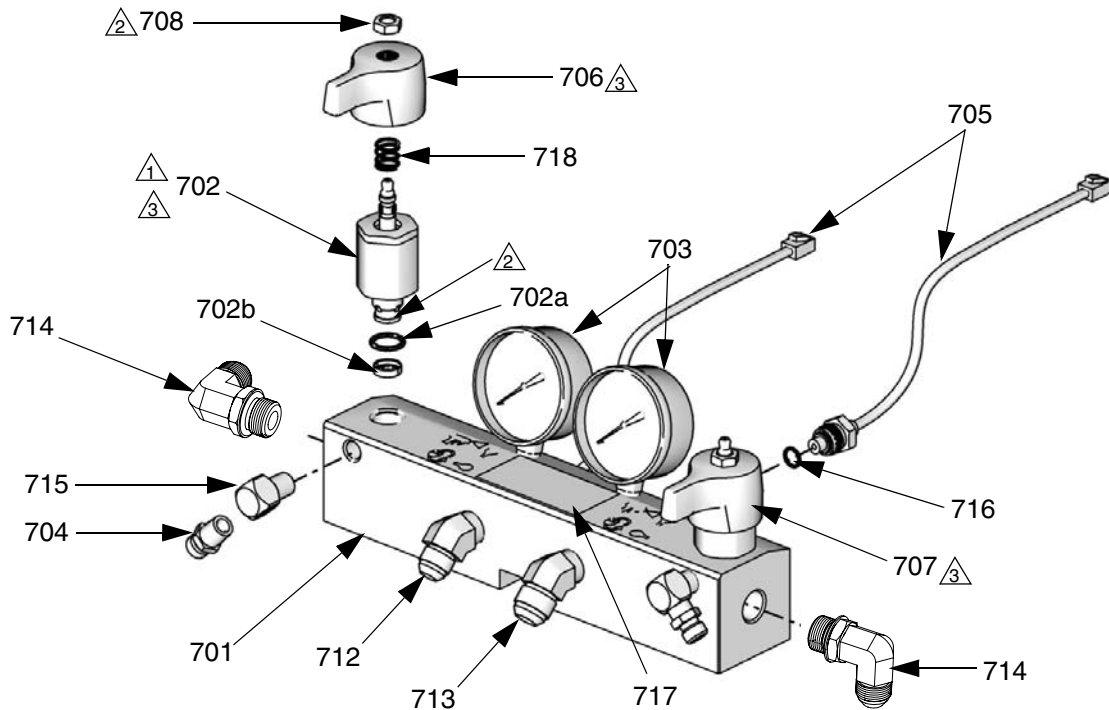
# Fluid Manifold

△1 Torque to 355-395 in-lb (40.1-44.6 N•m).

△2 Apply sealant (113500) to threads.

△3 Valve must be closed with handle position as shown on drawing.

\*\* Apply PTFE tape or thread sealant to tapered threads.




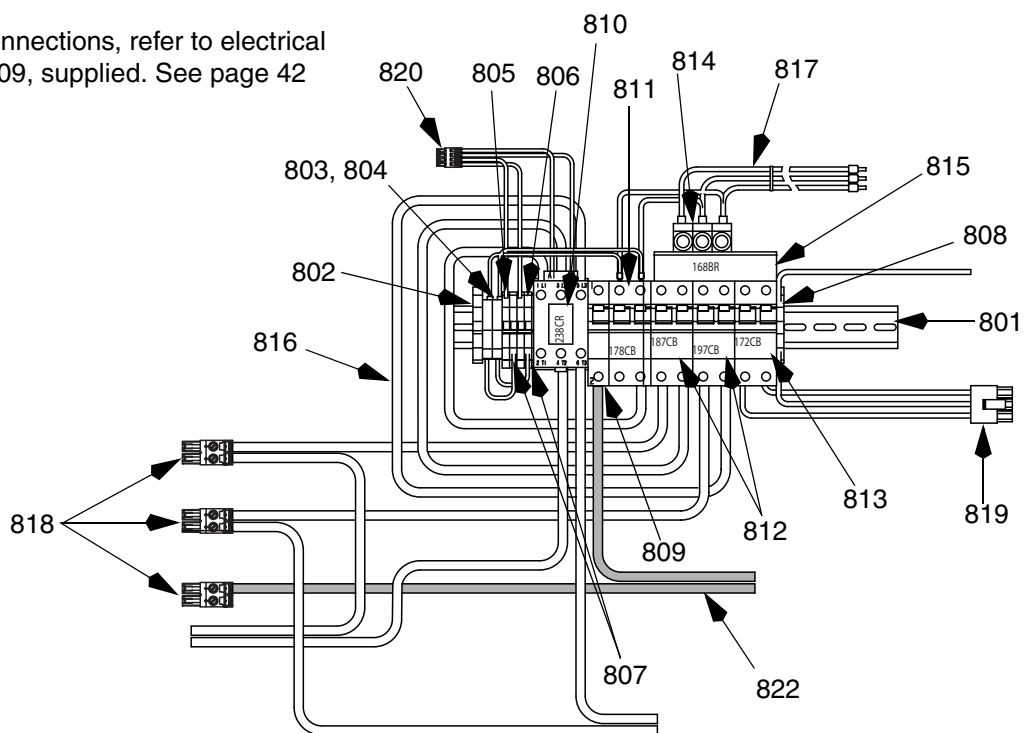
TI9839b

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
701	247837	MANIFOLD, fluid	1	714	121312	ELBOW, 90 degrees	2
702†	247824	VALVE, drain cartridge	2	715	100840	ELBOW, street; 1/4 npsm x 1/4 npt	2
702a†	158674	. O-RING	1	716	111457	O-RING, PTFE	2
702b†	247779	. SEAL, seat, valve	1	717▲	189285	LABEL, caution	1
703	102814	GAUGE, pressure, fluid	2	718†	150829	SPRING, compression	2
704	162453	FITTING, 1/4 npsm x 1/4 npt	2	▲ Replacement Warning labels, signs, tags, and cards are available at no cost.			
705	198241	PLUG, pressure, control	2				
706	247788	HANDLE, red	1				
707	247789	HANDLE, blue	1	† Included in the following complete valve kits*: ISO Valve Kit (left/red handle) 255149. Resin Valve Kit (right/blue handle) 255150. Valve Set Kit (both handles and grease gun) 255148.			
708†	112309	NUT, hex, jam	2				
712	117556	NIPPLE, #8 JIC x 1/2 npt	1				
713	117557	NIPPLE, #10 JIC x 1/2 npt	1	* Complete valve kits also include thread sealant. (Purchase kits separately).			


## Circuit Breaker Modules

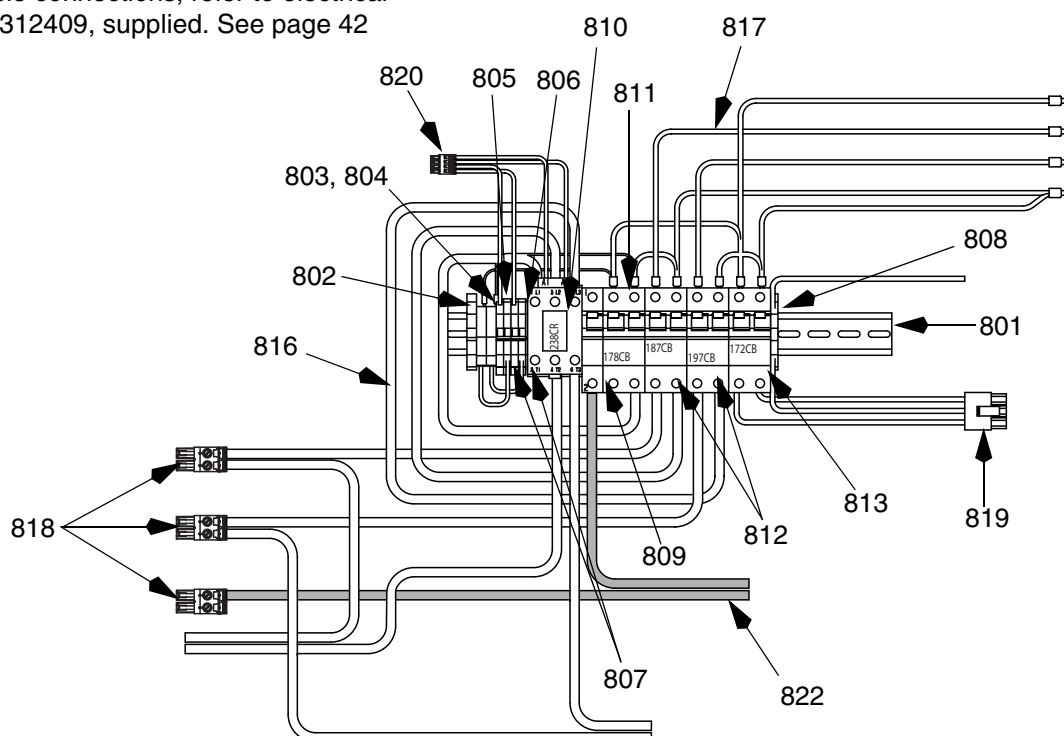
### A - 230V, 3 Phase Circuit Breaker Modules

 For wiring and cable connections, refer to electrical diagrams manual 312409, supplied. See page 42 for parts.



### B - 400V, 3 Phase Circuit Breaker Modules

 For wiring and cable connections, refer to electrical diagrams manual 312409, supplied. See page 42 for parts.

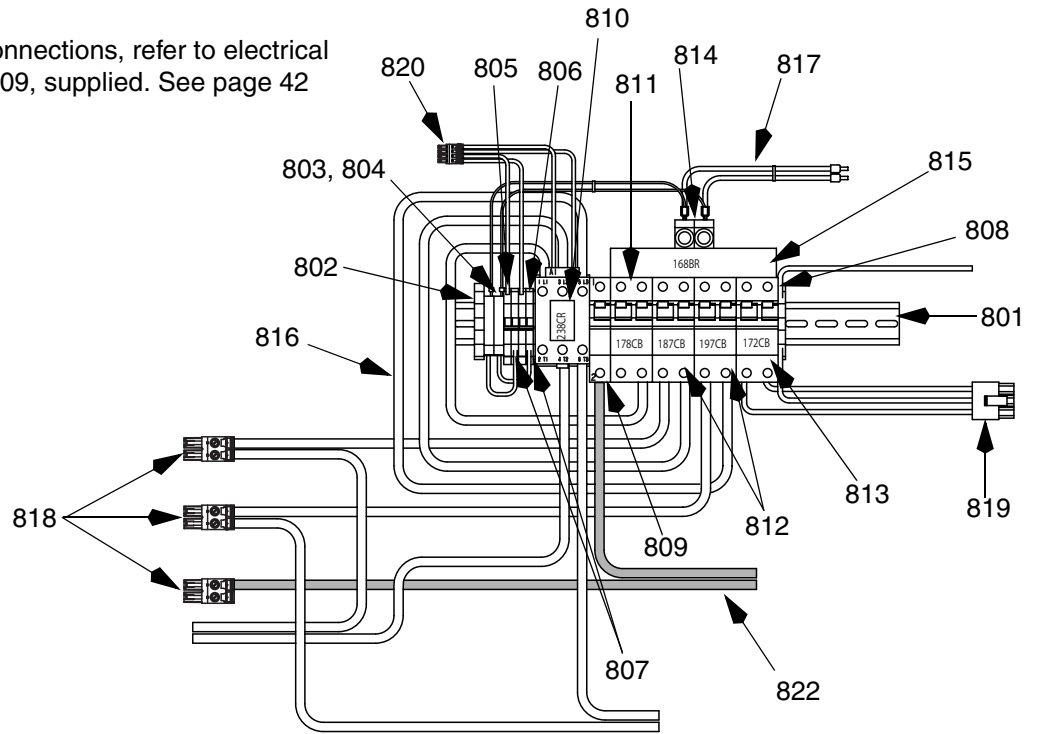




## C - 230V, 1 Phase Circuit Breaker Modules



For wiring and cable connections, refer to electrical diagrams manual 312409, supplied. See page 42 for parts.



## Circuit Breaker Modules Parts List

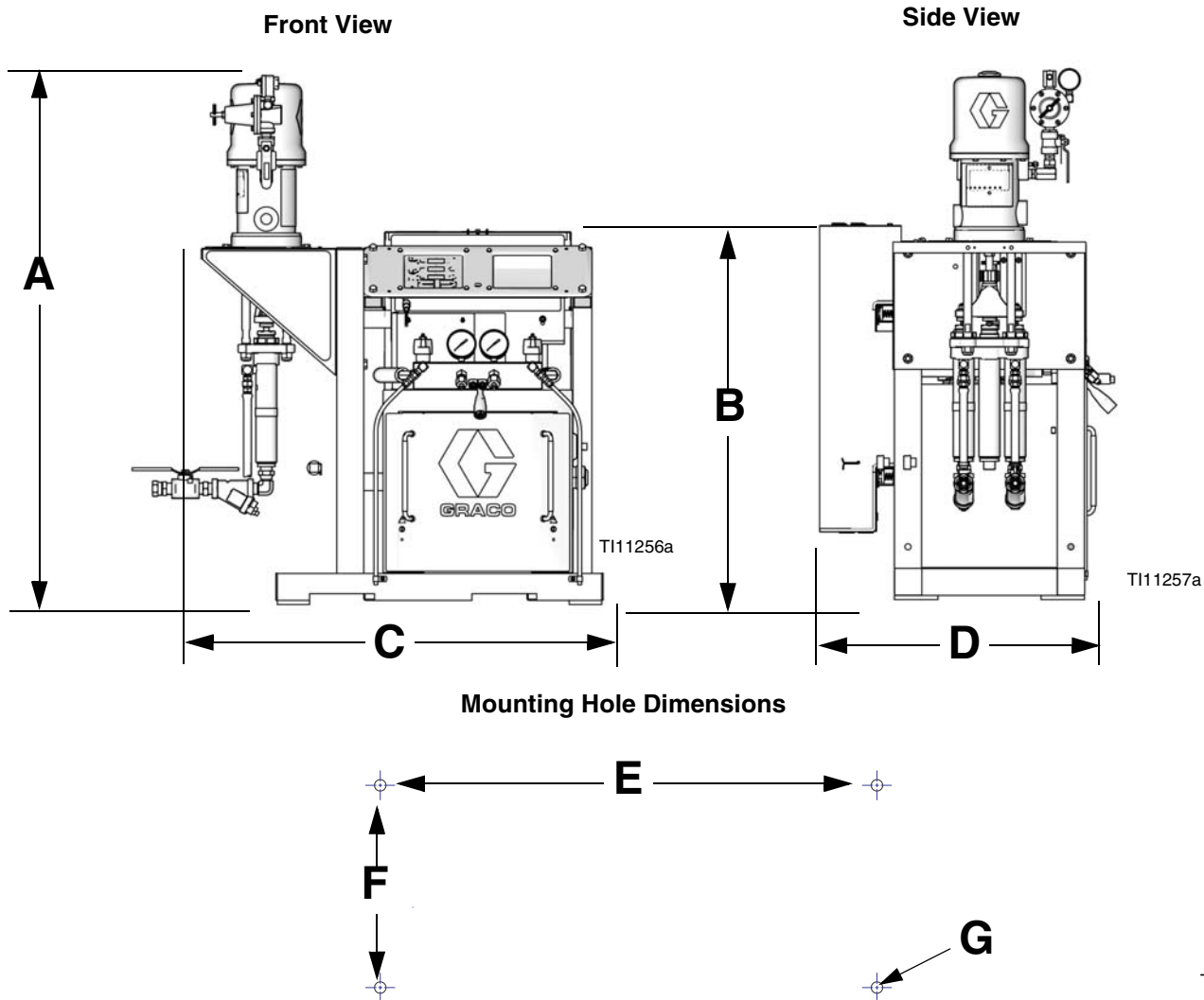
Ref.	Description	Breaker Modules			Qty
		A 230V, 3 phase	B 400V, 3 phase	C 230V, 1 phase	
801	RAIL, mounting	255028	255028	255028	1
802	CLAMP, block, end	255045	255045	255045	1
803	HOLDER, fuse terminal, block	255043	255043	255043	2
804	FUSE	255023	255023	255023	2
805	TERMINAL, block	255042	255042	255042	4
806	TERMINAL, end cover	120894	120894	120894	1
807	BRIDGE, plug in, jumper	255044	255044	255044	2
808	BLOCK, terminal ground	255046	255046	255046	1
809	BREAKER, 1 pole, 50A	255026	255026	255026	1
810	CONTACTOR, relay, 65A	255022	255022	255022	1
811	BREAKER, 2 phase, 40A	247768	247768	247768	1
812	BREAKER, 2 phase, 25A	255050	255050	255050	2
	BREAKER, 2 phase, 40A	247768	247768	247768	2
813	BREAKER, 2 phase, 20A	255049	255049	255049	1
814	CONNECTOR, power lug	117679			3
	CONNECTOR, power lug			117679	2
815	BAR, power buss, 3 phase	117805			1
	BAR, power buss, 1 phase			117678	1
816	CABLE, harness lower	247802	247802	247802	1
817	CABLE, harness upper	247805	247806	247804	1
818	CONNECTOR, 2 pin large	255027	255027	255027	3
819	CONNECTOR, 3 pin	120895	120895	120895	1
820	CONNECTOR, 4 pin	255031	255031	255031	1
822	CABLE, harness, hose wire	247791	247791	247791	1

[illegible]

# Dimensions

Dimension	Model	in. (mm)
A	A-XP2	49 (1245)
B	All	35 (889)
C	All	36.5 (927)
D	All	25 (635)
E	All	27 (686)

Dimension	Model	in. (mm)
F	All	11 (279)
G (hole diameter)	All	0.625 (16)
Weight	A-XP2	400 lb (180 kg)
	HT Series	333 lb (150 kg)



# Technical Data

Category	Data
Maximum Fluid Working Pressure	Model A-XP2: 3000 psi (20.7 MPa, 207 bar)
Maximum Input Pressure to Motor	Model A-XP2: 120 psi (0.82 MPa, 8.2 bar) air
Pressure Ratio Fluid:Air	Model A-XP2: 25:1
Air Inlet	Model A-XP2: 1/2 npsm(f)
Recommended Air Supply Hose Size	Model A-XP2: 1/2 in. (13 mm) ID minimum
Air Consumption	Model A-XP2: 40 scfm at 120 psi (0.82 MPa, 8.2 bar), 1.0 gpm (3.8 lpm)
Recommended Hydraulic Hose Size	Supply Hose: 3/4 in. (19 mm) ID minimum Return Hose: 1 in. (25 mm) ID minimum
Fluid Inlets	Model A-XP2: 3/4 npt(f) Model HT heat packages: 3/8 npt(f) on heater inlet blocks
Fluid Outlets	Component A (ISO): #8 JIC, with #5 JIC adapter Component B (RES): #10 JIC, with #6 JIC adapter
Fluid Circulation Ports	1/4 npsm(m), with plastic tubing, 250 psi (1.75 MPa, 17.5 bar) maximum
Maximum Fluid Temperature	190°F (88°C)
Maximum Output (10 weight oil at ambient temperature)	Model A-XP2: 1.5 gpm (5.7 liter/min) at 78 cycles/min
Output per Cycle (A and B)	Model A-XP2: 0.0193 gal. (.073 liter)
Line Voltage Requirement	230V 1 phase and 230V 3 phase units: 195-264 Vac, 50/60 Hz 380V 3 phase units: 338-457 Vac, 50/60 Hz
Amperage Requirement	See page 3.
Heater Power (A and B heaters, no hose)	Model HT-6.0: 6000 Watts Model A-XP2 and HT-10.2: 10200 Watts Model HT-15.3: 15300 Watts
Sound Power, per ISO 9614-2	Model A-XP2: 94.7 dB(A) at 2000 psi (14 MPa, 140 bar), 0.5 gpm (1.9 lpm), 15 cpm
Sound Pressure, 1 m from equipment	Model A-XP2: 81 dB(A) at 2000 psi (14 MPa, 140 bar), 0.5 gpm (1.9 lpm), 15 cpm
Weight	Model A-XP2: 400 lb (180 kg) Models HT-6.0, HT-10.2, and HT-15.3: 333 lb (150 kg)
Wetted Parts	Aluminum, stainless steel, zinc-plated carbon steel, brass, carbide, chrome, chemically resistant o-rings, PTFE, ultra-high molecular weight polyethylene

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