

REACTOR™

309813H

Air Powered, Heated, Plural Component Proportioners

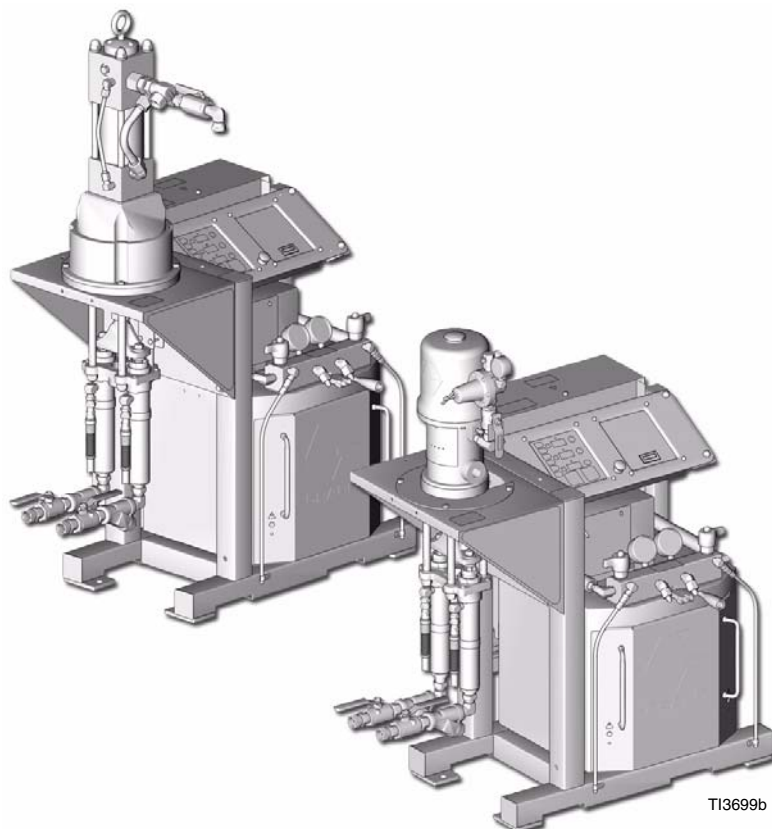
*For spraying polyurethane foam and polyurea coatings.
Not for use in explosive atmospheres.*



Important Safety Instructions

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

For model information, see page 3.






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Manual Conventions

Warning

**WARNING**



A warning alerts you to possible serious injury or death if you do not follow instructions.


Symbols, such as fluid injection (shown), alert you to a specific hazard and direct you to read the indicated hazard warnings on pages 6-7.

Caution

CAUTION

A caution alerts you to possible equipment damage or destruction if you do not follow instructions.

Note

 A note indicates additional helpful information.

Models

Air Powered Reactors

A-XP SERIES

| Part No., Series | Model | Voltage (phase) | Full Load Peak Amps* | System Watts** | Heater Watts (no hose) | Flow gpm (lpm) at 78 cpm | Output per Cycle (A + B) gal. (liter) | Maximum Fluid Working Pressure psi (MPa, bar) |
|------------------|-------|-----------------|----------------------|----------------|------------------------|--------------------------|---------------------------------------|---|
| 246639, B | A-XP2 | 230V (1) | 62 | 14,540 | 10,200 | 1 (3.8) | .0193 (.073) | 3000 (20.7, 207) |
| 246752, B | A-XP2 | 230V (3) | 40 | 14,540 | 10,200 | 1 (3.8) | .0193 (.073) | 3000 (20.7, 207) |
| 246753, B | A-XP2 | 380V (3) | 22 | 14,540 | 10,200 | 1 (3.8) | .0193 (.073) | 3000 (20.7, 207) |

Heat Packages (do not include proportioner)

| Part No., Series | Model | Voltage (phase) | Full Load Peak Amps* | System Watts** | Heater Watts (no hose) | Maximum Fluid Working Pressures psi (MPa, bar) |
|------------------|---------|-----------------|----------------------|----------------|------------------------|--|
| 246365, B | HT-6.0 | 230V (1) | 44 | 10,340 | 6,000 | 3500 (24.1, 241) |
| 246760, B | HT-6.0 | 230V (3) | 27 | 10,340 | 6,000 | 3500 (24.1, 241) |
| 246761, B | HT-6.0 | 380V (3) | 18 | 10,340 | 6,000 | 3500 (24.1, 241) |
| 246607, B | HT-10.2 | 230V (1) | 62 | 14,540 | 10,200 | 3500 (24.1, 241) |
| 246762, B | HT-10.2 | 230V (3) | 40 | 14,540 | 10,200 | 3500 (24.1, 241) |
| 246763, B | HT-10.2 | 380V (3) | 22 | 14,540 | 10,200 | 3500 (24.1, 241) |
| 246364, B | HT-15.3 | 230V (1) | 84 | 19,640 | 15,300 | 3500 (24.1, 241) |
| 246764, B | HT-15.3 | 230V (3) | 57 | 19,640 | 15,300 | 3500 (24.1, 241) |
| 246765, B | HT-15.3 | 380V (3) | 33 | 19,640 | 15,300 | 3500 (24.1, 241) |

* Full load amps with all devices operating at maximum capabilities. Fuse requirements at various flow rates and mix chamber sizes may be less.

**Total system watts for all units, using 310 ft (94.6 m) hose.

Supplied Manuals

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

Order Part No. 15B535 for a compact disk of Reactor manuals translated in several languages.

| Air and Hydraulic Reactors | |
|---|--|
| Part No. | Description |
| 309812 | Air and Hydraulic Reactors, Operation Manual (English) |
| Proportioning Pumps | |
| Part No. | Description |
| 308224 | President® Pump Repair-Parts Manual (English) |
| Motors | |
| Part No. | Description |
| 306982 | President® Air Motor Repair-Parts Manual (English) |
| Displacement Pumps | |
| Part No. | Description |
| 307430 | Displacement Pumps Repair-Parts Manual (English) |
| Reactor Electrical Diagrams (one of following included) | |
| Part No. | Description |
| 309854 | Electrical Diagrams, 230V 1 phase |
| 309855 | Electrical Diagrams, 230V 3 phase |
| 309576 | Electrical Diagrams, 380V 3 phase |
| Air Regulators (air powered units only) | |
| Part No. | Description |
| 308168 | Instruction-Parts Manual (English) |

Related Manuals

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

Order Part No. 15B535 for a compact disk of Reactor manuals translated in several languages.

Order Part No. 15B381 for a compact disk of Fusion manual translated in several languages.

| Hydraulic Power Supply | |
|-----------------------------------|---|
| Part No. | Description |
| 307550 | Instruction-Parts Manual (English) |
| Feed Pump Kits | |
| Part No. | Description |
| 309815 | Instruction-Parts Manual (English) |
| Air Supply Kit | |
| Part No. | Description |
| 309827 | Instruction-Parts Manual (English) for Feed Pump Air Supply Kit |
| Circulation and Return Tube Kits | |
| Part No. | Description |
| 309852 | Instruction-Parts Manual (English) |
| Heated Hose | |
| Part No. | Description |
| 309572 | Instruction-Parts Manual (English) |
| Fusion Air Purge Spray Gun | |
| Part No. | Description |
| 309550 | Instruction-Parts Manual (English) |
| Fusion Mechanical Purge Spray Gun | |
| Part No. | Description |
| 309856 | Instruction-Parts Manual (English) |
| Circulation Kit | |
| Part No. | Description |
| 309818 | Instruction-Parts Manual (English) |
| Data Reporting Kit | |
| Part No. | Description |
| 309814 | Instruction-Parts Manual (English) |



WARNING



SKIN INJECTION HAZARD

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. **Get immediate surgical treatment.**








- Do not point the gun at anyone or at any part of the body.
- Do not put your hand or fingers over the gun fluid nozzle.
- 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.
- Follow **Pressure Relief Procedure**, page 9, when you stop spraying and before cleaning, checking, or servicing equipment.
- Use lowest possible pressure when flushing, priming, or troubleshooting.
- Engage spray gun piston safety lock when not spraying.
- Tighten all fluid connections before operating the equipment.
- Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. High pressure hose cannot be recoupled; replace the entire hose.





FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Solvent and fumes in work area can ignite or explode. High voltage components can cause electric shock. To help prevent fire, explosion, and electric shock:


- Shut off main power switch and wait 5 minutes before opening Reactor cabinet door.
- All electrical wiring must be done by trained and qualified personnel and comply with all local codes.
- Ground equipment and conductive objects. See **Grounding** in the Operation manual.
- Use equipment only in well ventilated area.
- Eliminate all ignition sources, such as pilot lights, cigarettes and plastic drop cloths (potential static arc).
- Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.
- Keep the work area free of debris, including solvent, rags, and gasoline.
- Hold gun firmly to side of grounded pail when triggering into pail.
- Use only grounded hoses.
- If there is static sparking or you feel a shock, **stop operation immediately**. Do not use equipment until you identify and correct the problem.
- To avoid chemical reaction and explosion, do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in pressurized aluminum equipment.

|  WARNING | |
|--|--|
|  | <p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause serious injury or death.</p> <ul style="list-style-type: none"> • For professional use only. • Use equipment only for its intended purpose. Call your Graco distributor for information. • Read manuals, warnings, tags, and labels before operating equipment. Follow instructions. • Check equipment daily. Repair or replace worn or damaged parts immediately. • Do not alter or modify equipment. Use only Graco parts and accessories. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not use hoses to pull equipment. • Comply with all applicable safety regulations. |
|  | <p>BURN HAZARD</p> <p>This equipment is used with heated fluid, which can cause equipment surfaces to become very hot. To avoid severe burns:</p> <ul style="list-style-type: none"> • Do not touch hot fluid or equipment. • Allow equipment to cool completely before touching it. • Wear gloves if fluid temperature exceeds 110°F (43°C). |
|  | <p>TOXIC FLUID OR FUMES HAZARD</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"> • Read Material Safety Data Sheet (MSDS) to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines. |
|  | <p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>You must wear proper 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; and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear. • Gloves, clothing, and respirator as recommended by the fluid and solvent manufacturer. • Hearing protection. |




Before Beginning Repair

**WARNING**


Repairing this equipment requires access to parts which 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 the Operation manual. Be sure to shut off all power to the equipment before repairing.

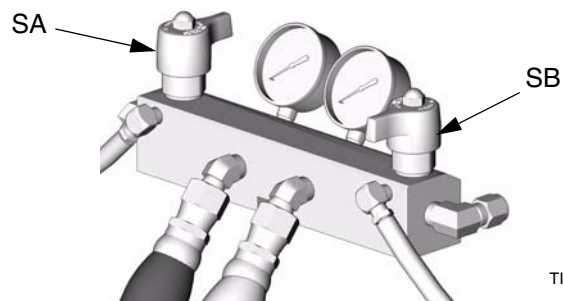
1. Flush if necessary, see right.
2. Trigger gun to park pumps at bottom of stroke.
3. Fill wet-cups. See operation manual.
4. Turn main power OFF .
5. Close red-handled valve to shut off power to motor.
6. Relieve pressure, page 9.

Flushing

**WARNING**


Read warnings, page 6. Flush equipment only in a well-ventilated area. Do not spray flammable fluids. Do not turn on heaters while flushing with flammable solvents.

- 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.

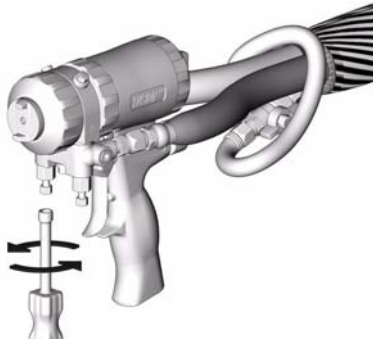


- To flush entire system, circulate through gun fluid manifold (with manifold removed from gun).
- Always leave some type of fluid in system. Do not use water.

Pressure Relief Procedure

1. Relieve pressure in gun and perform gun shutdown procedure. See gun manual.

2. Verify gun fluid manifold valves A and B are closed.

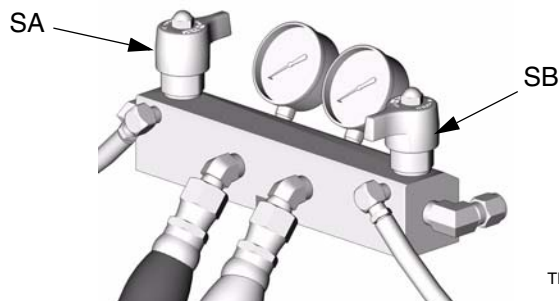


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3. Shut off feed pumps and agitator, if used.

4. Check that red-handled valve is closed, to shut off power to motor.

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



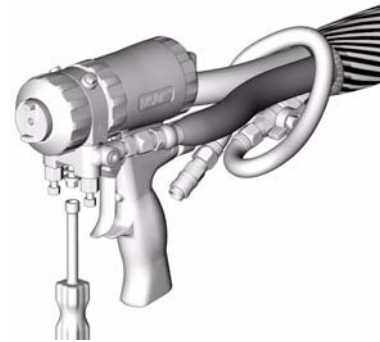
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6. Engage gun piston safety lock.




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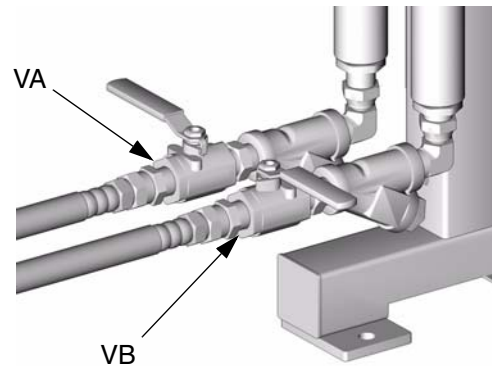
7. Disconnect gun air line and remove gun fluid manifold.



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 Pump throat seals work best under pressure. Close fluid inlet valves (VA, VB) when Reactor is depressurized, to prevent drum head pressure from leaking past pump piston seals.

8. Close fluid inlet valves (VA, VB).



TI3698b

Temperature Control Diagnostic Codes

Temperature control diagnostic codes E01 through E05 appear on temperature display.

These alarms turn off heat. Turn main power OFF



then ON



to clear.

| Code No. | Code Name | Alarm Zone | Corrective Action page |
|----------|-------------------------------------|------------|------------------------|
| 01 | High fluid temperature | Individual | 10 |
| 02 | High hose current | Hose only | 10 |
| 03 | No hose current with hose heater on | Hose only | 11 |
| 04 | FTS or thermocouple not connected | Individual | 11 |
| 05 | Board overtemperature | All | 11 |



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

E01: High fluid temperature

- Check connections between temperature control board and heater overtemperature switches, page 22.
- Check temperature sensors, page 21.
- Check temperature sensor is contacting heater element, page 21.

E02: High hose current

- Check tap connection at transformer, see operation manual.
- Check hose connections for electrical short, page 22.
- Move to lower hose length on transformer.
- Replace temperature control board, page 18.

E03: No hose current

Do steps in order. Do not skip any step.

- a. Check hose connectors for broken electrical connection, page 22.
- b. Test hose continuity, page 25.
- c. Test transformer wire harness continuity, page 25.
- d. Check 50A (806) and 20A (817A) circuit breakers, page 16.
- e. Test current sensor continuity, page 25.
- f. Do **In-Rush Current Limiter Check** (380V only), page 27
- g. Do **Transformer Primary Check**, page 27.
- h. Do **Transformer Secondary Check**, page 27.

E04: FTS or thermocouple not connected


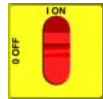
- a. Check FTS operation by connecting directly to Reactor.
- b. Check cable connections between all hose lengths.
- c. Check temperature sensor connection at J1 on temperature control board, page 18.
- d. Check thermocouple with ohmmeter, page 23.





- e. Use manual current control mode; see operation manual.



E05: Board overtemperature

- a. Check fan operation.
- b. Check electrical cabinet door is properly installed.
- c. Check for obstructions blocking cooling holes in bottom of Reactor.
- d. Ambient temperature too high. Reduce gun mix chamber size, or move Reactor to a cooler location.

Troubleshooting

| PROBLEM | CAUSE | SOLUTION |
|--------------------------------------|---|---|
| Reactor does not operate. | No power. | Plug in power cord. |
| | | Turn main power ON  |
| | | Turn circuit breakers ON, page 16. |
| | No air or hydraulic power. | Open red-handled valve. |
| | Red stop button circuit open. | Check button connections. See page 29 and electrical diagrams. |
| Fan not working. | Blown fuse. | Replace, page 17. |
| | Loose wire. | Check. |
| | Defective fan. | Replace, page 17. |
| Pump output low. | Obstructed fluid hose or gun; fluid hose ID too small. | Open, clear; use hose with larger ID. |
| | Worn piston valve or intake valve in displacement pump. | See pump manual. |
| Fluid leak in pump packing nut area. | Worn throat seals. | Replace. See pump manual. |
| No display. | Main power OFF. | Turn main power ON  |
| | Loose display cable. | Check cable connections, page 29. |
| | Display board failed. | Check board, replace; page 29. |
| No temperature display. | Loose display cable. | Check cable connections, page 29. |
| | Failed temperature control board. | Open cabinet. Check if board LED is blinking. If not, check power wiring connections to ensure board has power. If board has power and LED is not blinking, replace board, page 18. |
| | Inadequate power to temperature board. | Check that power supply meets requirements. |
| | Loose power cable (internal to display). | Check cable connections, page 29. |
| | Defective display board. | Replace, page 29. |
| No cycle counter display. | Loose display cable. | Check cable connections, page 29. |
| | Defective counter. | Replace, page 29. |
| Does not count. | Magnet (26) missing from pump yoke. | Replace. |
| | Defective reed switch (27). | Replace. |


| PROBLEM | CAUSE | SOLUTION |
|---|---|---|
| Hose display reads 0A on startup. | FTS not installed and  zone off. | Install FTS (see operation manual), or adjust current to desired setting. |
| Erratic display; display turns on and off. | Cable not grounded. | Ground cable, page 29. |
| | Extension cable too long. | Must not exceed 100 ft (30.5 m). |
| Display buttons do not work properly; cannot get out of an operation. | Broken membrane switch. | Replace, page 29. |
| | Ribbon cable disconnected or broken. | Connect cable, or replace. |
| Red stop button does not work. | Broken button (fused contact). | Replace, page 29. |
| | Loose wire. | Check connections, page 29. |
| No heat in any zone. | Red stop button circuit open. | Check button connections. See page 29 and electrical diagrams. |
| No heat in A or B zones. | Circuit breaker(s) tripped. | Reset breaker CB3 or CB4, page 16. |
| | Heat turned off. | Press  or  zone  keys. |
| | Temperature control alarm. | Check temperature displays for diagnostic code, page 10. |
| | Defective heater. | Replace, page 20. Check resistance. |
| | Loose connectors or wire nuts. | Check connections. |
| | Failed temperature control board. | Open cabinet. Check if board LED is blinking. If not, check power wiring connections to ensure board has power. If board has power and LED is not blinking, replace board, page 18. |
| | | |
| Low heat in A or B zones. | A and B temperature setpoints too low. | Check setpoint. Increase if necessary. |
| | Flow too high. | Use smaller mix chamber. Decrease pressure. |
| | Defective heater. | Replace, page 20. Check resistance. |
| | Loose connectors or wire nuts. | Check connections. |
| | Low voltage. | Check that power supply meets requirements. |
| | Overheated temperature control board. | Check fan operation. |
| | | Check if door is open; close. |
| | | Check that cooling holes are not clogged or obstructed. |
| | Fluid too cold. | Preheat fluid. |

| PROBLEM | CAUSE | SOLUTION |
|----------------|--|---|
| No hose heat. | 380V units only - In-rush current limiter contactor not closing when hose heat is turned on. | Check to be sure contactor in 288359 is closing when hose heat is turned on. If not, check fuse (198). If fuse is not blown, perform transformer checks. |
| | Loose hose electrical connections. | Check connections. Repair as necessary. |
| | Circuit breakers tripped. | Reset breakers (CB1 or CB2), page 16. |
| | Hose zone not turned on. | Press  zone  key. |
| | A and B temperature setpoints too low. | Check. Increase if necessary. |
| | Failed temperature control board. | Open cabinet. Check if board LED is blinking. If not, check power wiring connections to ensure board has power. If board has power and LED is not blinking, replace board, page 18. |
| Low hose heat. | A and B temperature setpoints too low. | Increase A and B setpoints. Hose designed to maintain temperature, not increase temperature. |
| | Hose temperature setpoint too low. | Check. Increase if necessary to maintain heat. |
| | Flow too high. | Use smaller mix chamber. Decrease pressure. |
| | Low current; FTS not installed. | Install FTS, see operation manual. |
| | Hose heat zone not turned on long enough. | Allow hose to heat up, or preheat fluid. |
| | Loose hose electrical connections. | Check connections. Repair as necessary. |

Repair

Proportioning Pump

Removal

1. Shut off **A** , **B** , and  heat zones.
2. Flush pump, page 8.
3. Relieve pressure, page 9.
4. Turn PRESSURE RELIEF/SPRAY valves (SA, SB) to PRESSURE RELIEF.

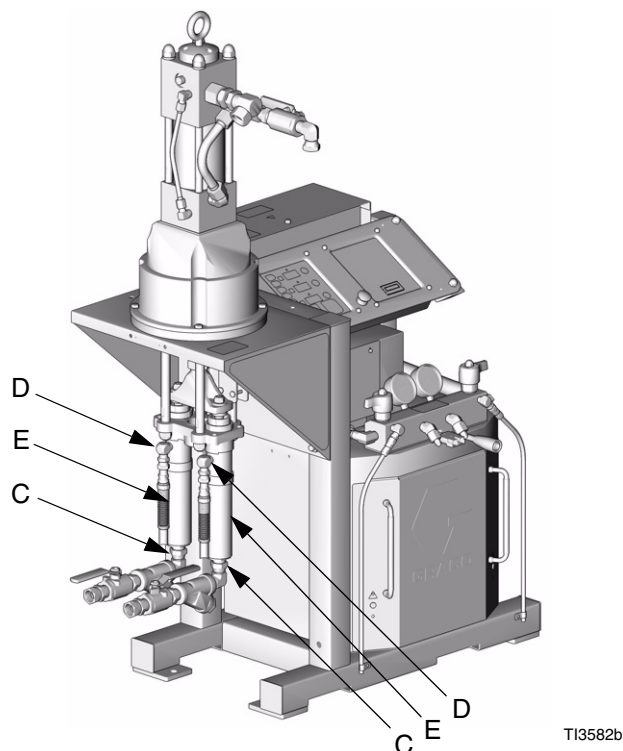
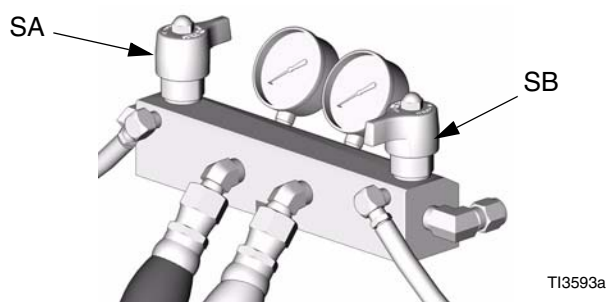



FIG. 1. Pump Removal

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 page 4 for applicable pump and motor repair-parts manuals. Displacement pumps (E) may be removed without removing entire proportioning pump.

8. Reinstall in reverse order.

Circuit Breaker Module

- 1. Turn main power OFF  . Disconnect power supply.

**WARNING**

Read warnings, page 6.

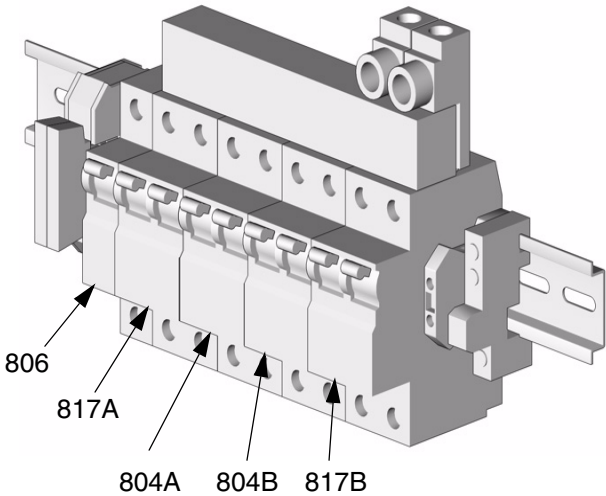
- 2. Relieve pressure, page 9.

- 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 1. Disconnect wires and remove bad breaker.
 - b. Install new breaker and reconnect wires.

Table 1: Circuit Breakers, see FIG. 2

| Ref. No. | Size | Component |
|----------|-------------|---------------------------------|
| 806 | 50 A | Hose/Transformer Secondary Side |
| 817A | 20 A | Transformer Primary |
| 804A | 25 or 40 A* | Heater A |
| 804B | 25 or 40 A* | Heater B |
| 817B | 20 A | Not Used |

* Depending on model.



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NOTE: To reference cables and connectors, see the electrical diagrams and the parts drawings on pages 45-47.

FIG. 2. Circuit Breaker Module

Fan

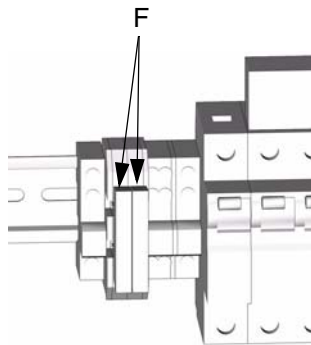
1. Turn main power OFF . Disconnect power supply.

WARNING



Read warnings, page 6.

2. Relieve pressure, page 9.
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). Thread wires through top of cabinet.
5. Remove fan.
6. Install fan in reverse order.



TI2514A-1

FIG. 3. Fan Fuses

Temperature Control Board



Temperature control board has seven green LEDs. Power must be on to check. See FIG. 4 for location.

Table 2: Temperature Control Board LEDs

| LED | Status | Function |
|-----|-------------------|---|
| D26 | blinks | Board powered |
| D14 | on | Zone A turned on |
| D13 | cycles on and off | Zone A powered, LED cycles as temperature cycles |
| D18 | on | Zone B turned on |
| D19 | cycles on and off | Zone B powered, LED cycles as temperature cycles |
| D27 | on | Hose zone turned on |
| D15 | cycles on and off | Hose zone powered, LED cycles as temperature cycles |

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.

- Remove screws and take board off heatsink.
- Install new board in reverse order. Apply thermal heatsink compound to mating surfaces of board and heatsink.



Order Part No. 110009 Thermal Compound.

Table 3: Temperature Control Board Connectors

| Connector | Pin | Description |
|-----------|------|------------------------------|
| J1 | 1, 2 | Overtemperature switch A |
| | 3, 4 | Overtemperature switch B |
| | 5, 6 | Current sensor |
| | 7 | Temperature sensor A, red |
| | 8 | Temperature sensor A, yellow |
| | 9 | Not used |
| | 10 | Temperature sensor B, red |
| | 11 | Temperature sensor B, yellow |
| | 12 | Thermocouple, silver |
| | 13 | Thermocouple, red |
| | 14 | Thermocouple, purple |
| J2 | n/a | To A heaters |
| J5 | n/a | To display board |
| J8 | n/a | Data reporting |
| J9 | n/a | To B heaters |
| J13 | n/a | To heated hose |

- Turn main power OFF . Disconnect power supply.




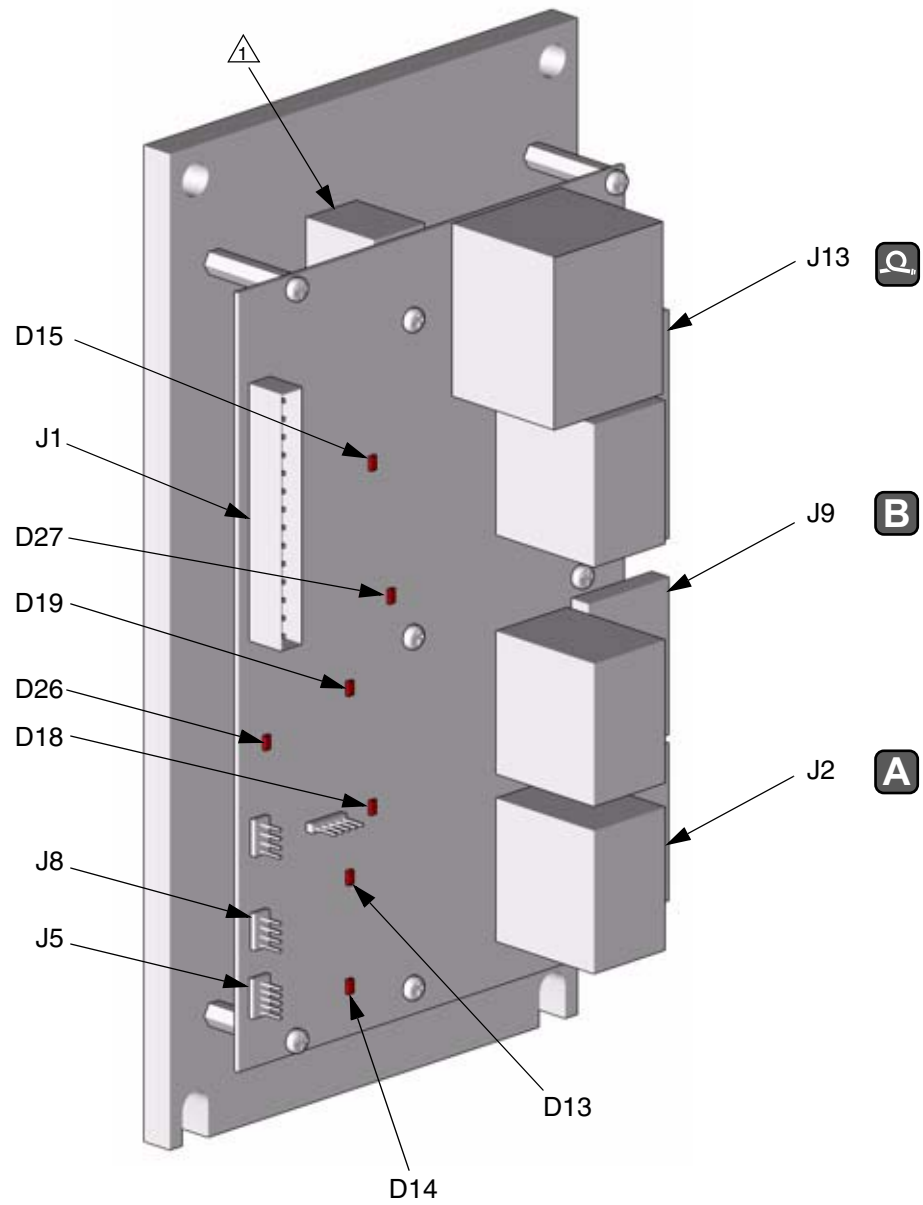
WARNING



Read warnings, page 6.

- Relieve pressure, page 9.
- Refer to electrical diagrams. Temperature control board is on left side inside cabinet.
- Put on static conductive wrist strap.
- Disconnect all cables and connectors from board, FIG. 4.
- Remove nuts and take entire temperature control assembly to workbench.

 Apply 110009 thermal heatsink compound to mating surfaces.



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FIG. 4. Temperature Control Board


Heater

Heater Element

1. Turn main power OFF  . Disconnect power supply.

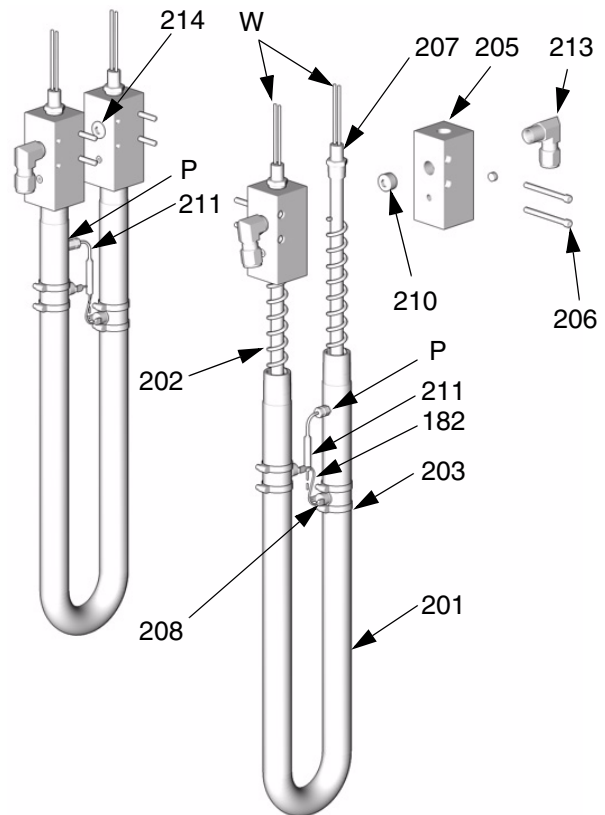
2. Relieve pressure, page 9.

⚠ WARNING



Read warnings, page 7. Wait for heaters to cool before repairing.

3. Wait for heaters to cool.
4. See FIG. 5. Remove tape and wire connector (63, not shown), and disconnect heater element wires (W) from heater wire harness. Test with ohmmeter. Resistance must be 21-25 ohms for 2550W element, and 30-34 ohms for 1500W element.
5. If heater fails test, remove temperature sensor (211) to avoid damage.
6. Remove heater element (207) from tube (201). Be careful not to spill any fluid left in tube.
7. Install new heater element (207), holding mixer (202) so it does not interfere with sensor port (P).
8. Reinstall temperature sensor, page 21.
9. Reconnect wires and secure with connector (63) and electrical tape.



TI2512b

FIG. 5. Heater (Model 245962 Shown)

Temperature Sensor

1. Turn main power OFF . Disconnect power supply.

2. Relieve pressure, page 9.



WARNING



Read warnings, page 7. Wait for heaters to cool before repairing.

3. Wait for heaters to cool.
4. Disconnect temperature sensor wires from J1 on temperature control board. See TABLE 3, page 18 and FIG. 4, page 19.
5. See FIG. 6. Test with ohmmeter. Between wires (S), resistance must be approximately 6 ohms. Between tip (T) and wires, resistance must be infinity (∞).
6. If sensor fails test, feed wires out of cabinet. Note path as cable must be replaced in the same way.
7. Loosen ferrule nut (N). Remove temperature sensor (211) from heater tube (201), then remove sensor housing (H).
8. Replace sensor, FIG. 6.
 - a. Remove protective tape from sensor tip (T).
 - b. To ensure mixer (202) is out of the way, insert 1/4 in. drill bit into heater tube (201) to a minimum depth of 0.81 in. (20.6 mm). If minimum is not achieved, mixer must be moved before proceeding.
 - c. Apply PTFE tape and thread sealant to male threads and tighten sensor housing (H) into tube (201).
 - d. Push in sensor (211) so tip (T) contacts heater element (207), avoiding mixer (202).
 - e. Tighten ferrule nut (N), holding sensor (T) against heater element.

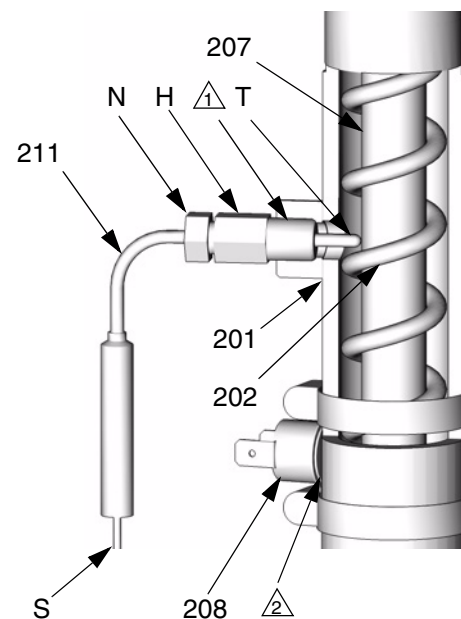
9. Route wires into cabinet and thread into bundle as before. Reconnect wires to board.
10. Turn on heaters A and B simultaneously to test. Temperatures should rise at same rate (30°F, +/- 4°). If one heater is low, loosen ferrule nut (N) and tighten sensor housing (H) to ensure sensor tip (T) contacts element (207).



Apply PTFE tape and thread sealant.



Apply 110009 thermal heatsink compound.



TI3249a


Fig. 6. Temperature Sensor

Overtemperature Switch

1. Turn main power OFF . Disconnect power supply.


2. Relieve pressure, page 9.

⚠ WARNING




Read warnings, page 7. Wait for heaters to cool before repairing.

3. Wait for heaters to cool.
4. Disconnect one leadwire from overtemperature switch (208), FIG. 6. Test across switch with ohmmeter. Resistance must be approximately 0 ohms.
5. If switch fails test, cut off clamps with wire clippers. Remove switch. Install new switch in same location on tube (201) and secure with hose clamps (203). Reconnect wires.

 If wires need replacement, disconnect from temperature control board. See TABLE 3, page 18 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 9.

 Whip hose must be connected.

3. Disconnect hose electrical connector (D) at Reactor, FIG. 7.
4. Using an ohmmeter, check between the two terminals of hose 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.

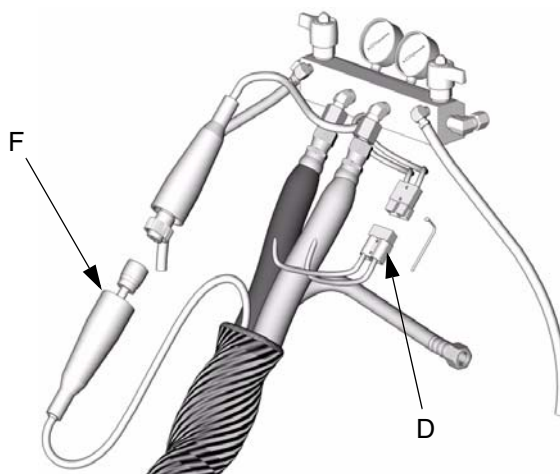
2. Relieve pressure, page 9.

3. Disconnect FTS cable (F) at Reactor, FIG. 7.

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 23.




TI2726a

FIG. 7. Heated Hose

Fluid Temperature Sensor (FTS)

Test/Removal

1. Turn main power OFF  . Disconnect power supply.
2. Relieve pressure, page 9.
3. Remove tape and protective covering from FTS (J), FIG. 8. 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 (∞) |

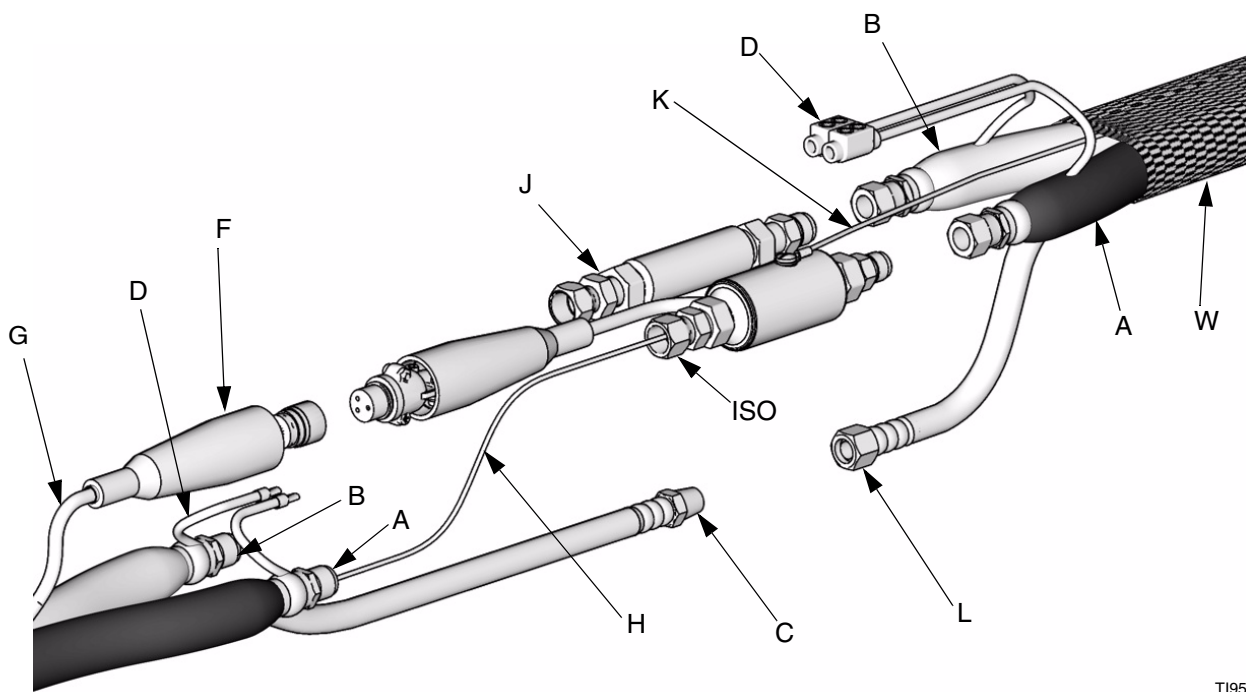
4. If FTS fails test, replace FTS.
5. Disconnect air hoses (C, L), and electrical connectors (D).
6. Disconnect FTS from whip hose (W) and fluid hoses (A, B).
7. Remove ground wire (K) from ground screw on underside of FTS.
8. Remove FTS probe from component A (ISO) side of hose.

Installation

| CAUTION |
|--|
| To prevent damage to probe, do not kink or excessively bend whip hose. Do not coil hose tighter than the minimum bend radius of 3 ft (0.9 m). Do not subject hose to excessive weight, impact, or other abuse. |

1. Carefully extend FTS probe (H). Do not bend or kink probe. Insert in component A (ISO) side of main hose.

2. Connect whip hose ground wire (K) to ground screw on underside of FTS.
3. Install FTS in reverse order of removal. Leave slack in cables (G) as stress relief, to prevent cable failure.
4. Secure hose and cable connections with tape and install protective covering.




TI9581B

FIG. 8. Fluid Temperature Sensor and Heated Hoses


Transformer

Test Hose Continuity


1. Turn main power OFF  . Disconnect power supply. Leave hose plugged in.
2. See FIG. 9. Disconnect 6-pin transformer connector (P) from J13 at temperature control board. Remove red wire from transformer hose length tap you are using (R).
3. Using an ohmmeter, check between pin 6 (P6) of connector (not board) and red wire. There should be continuity.
4. If test fails, trace wires until failure is located.

3. Using an ohmmeter, test for continuity across pins 5 and 6 of connector (not board). Reading should be 20-25 ohms. If not, replace current sensor (32). See FIG. 9.

Test Transformer Wire Harness Continuity

1. Turn main power OFF  . Disconnect power supply. Leave hose plugged in.
2. See FIG. 9. Disconnect 6-pin transformer connector (P) from J13 at temperature control board.
3. Check for continuity between:
 - a. Connector pin 1 (P1) and T1 on 20A hose circuit breaker (817A).
 - b. Connector pin 3 (P3) and T2 on 20A hose circuit breaker (817A).
 - c. Connector pin 5 (P5) and T3 on 50A hose circuit breaker (806).

Test Current Sensor Continuity

1. Turn main power OFF  . Disconnect power supply.
2. Disconnect 14-pin connector from J1 on temperature control board, page 18.

Detail B: Circuit Breaker Module and Hose Heat Wire Harness

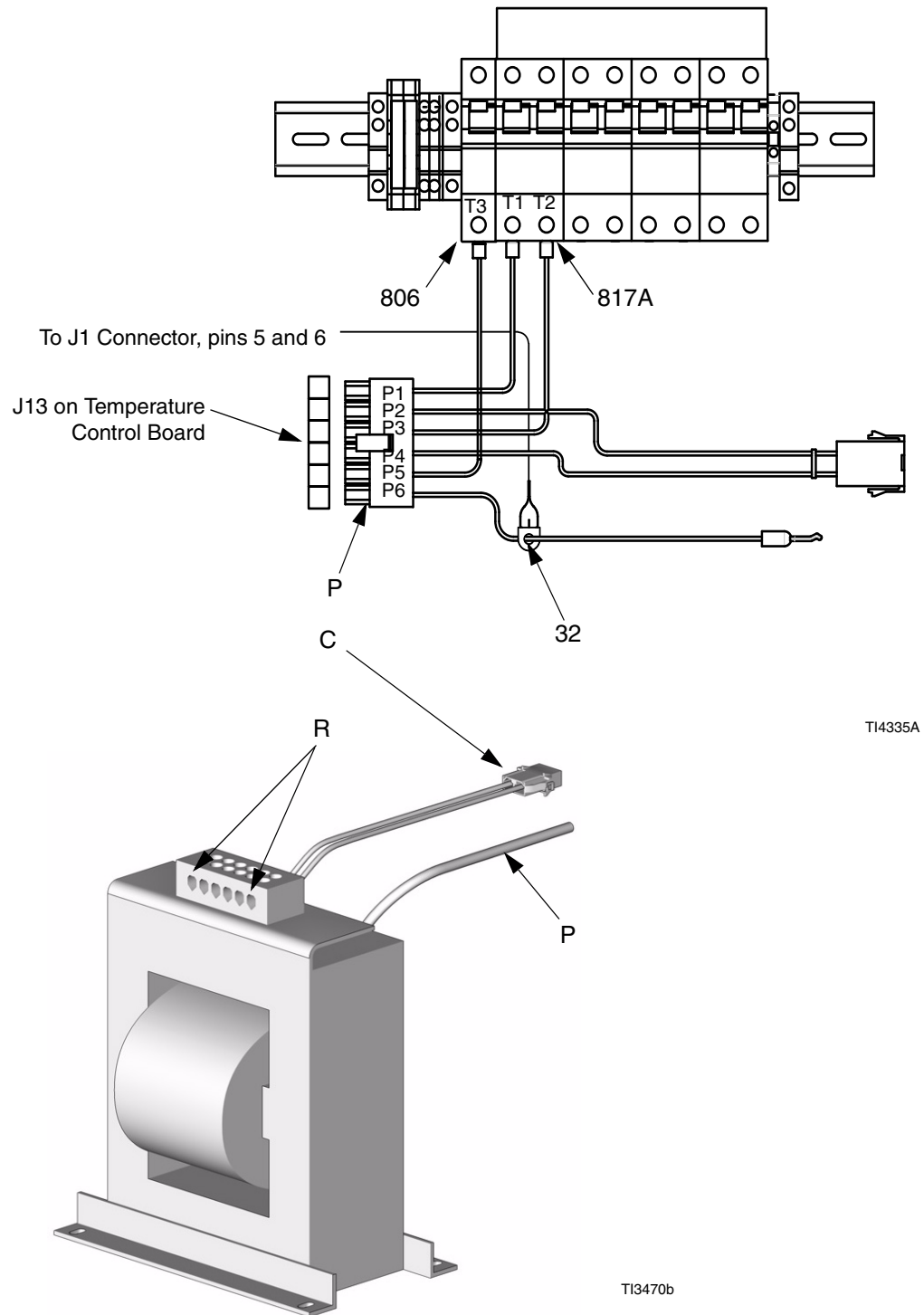


FIG. 9. Transformer Continuity Tests

In-Rush Current Limiter Check

(380V only)

1. Ensure that all harnesses, cables, and connectors are properly connected. Connect hose
2. Connect power supply. Turn main power ON



3. Turn on hose heat by pressing hose heat button





4. Contactor on front of transformer should close.
5. If contactor does not close, turn off main power and check inline fuse (198) on side of contactor. Replace fuse if blown.
6. If contactor does not close when hose heat is turned on with a new fuse, begin Transformer Checks.
7. If fuse (198) continually blows, replace In-Rush Current Limiter (288359).

Transformer Primary Check

1. Ensure that all harnesses, cables, and connectors are properly connected. Connect hose.
2. Connect power supply. Turn main power ON



3. Set hose heat target temperature below current hose temperature.

4. Turn on  heat zone by pressing .

WARNING



Read warnings, page 6. Step 5 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.

5. See FIG. 9, Detail B. Measure voltage across P2 and P4 on six-pin connector on temperature control board. Measurement should be line voltage. If not, replace temperature control board, page 18.



Transformer Secondary Check

1. Ensure that all harnesses, cables, and connectors are properly connected. Connect hose.

2. Connect power supply. Turn main power ON



3. Set hose heat target temperature below current hose temperature.

4. Turn on  heat zone by pressing .



WARNING




Read warnings, page 6. Step 5 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.

5. See FIG. 10, Detail B. Measure voltage across transformer hose tap (R) you are using and top terminal (T4) on 50A hose circuit breaker (806). See TABLE 4 for readings. If reading is correct, replace temperature control board, page 18. If reading is wrong, replace transformer, page 28.

Table 4: Transformer Voltage Readings

| Transformer Tap | Reading (VAC) |
|-----------------|---------------|
| 50' | 20 |
| 100' | 34 |
| 150' | 48 |
| 200' | 62 |
| 250' | 76 |
| 300' | 90 |

Replace Transformer

 Use this procedure to replace transformer. To replace terminal block (B) and wire harness (C) only, order Part No. 248113 Transformer Repair Kit. See manual 309930.

1. Turn main power OFF  . Disconnect power supply.

WARNING



Read warnings, page 6. Wait 5 min for stored voltage to discharge (E-30 and E-XP2 models only).

2. Open Reactor cabinet.
3. Remove bolts holding transformer to cabinet floor. Slide transformer forward.
4. Unplug 2-pin wire harness connector (C) from wire harness coming from temperature control board.
5. Disconnect the transformers secondary common wire (P) from T4 at 50 amp circuit breaker (806).
6. Remove transformer from cabinet.
7. Install new transformer in reverse order.

Detail B: Circuit Breaker Module

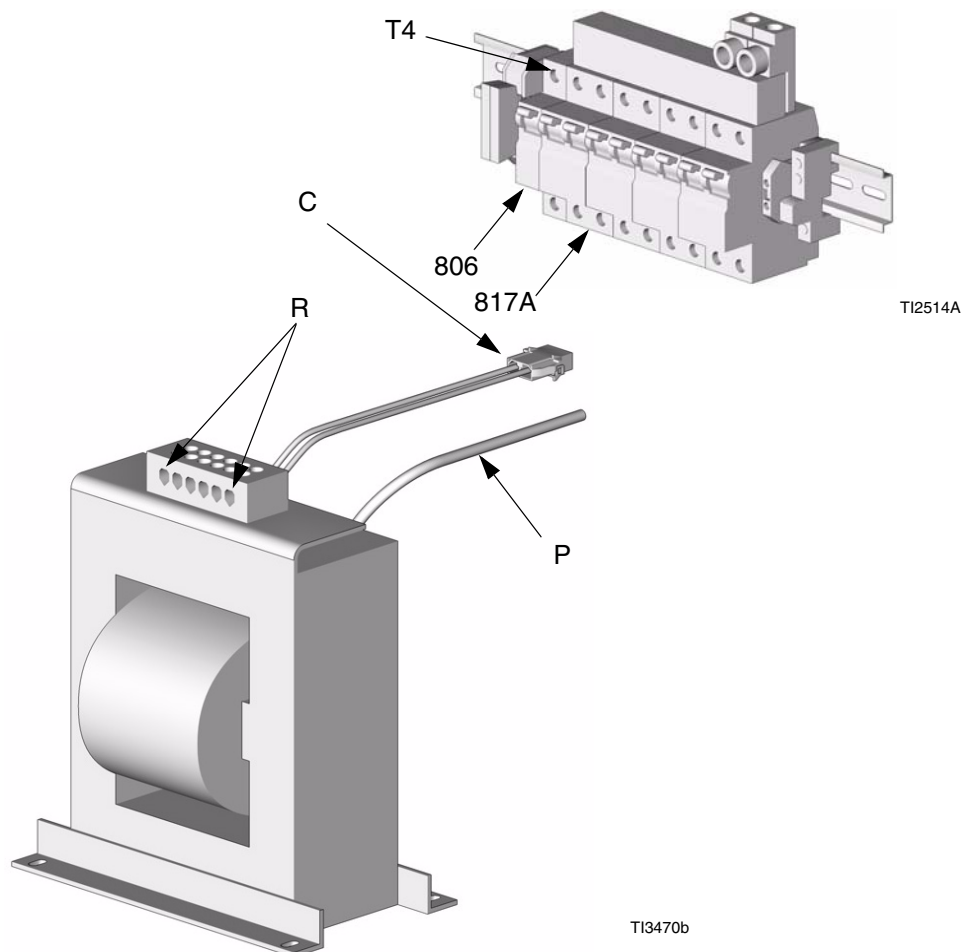


FIG. 10. Transformer

Display Module

Temperature and Cycle Counter 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.

WARNING



Read warnings, page 6.

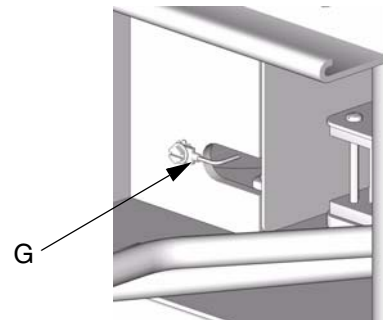
2. Relieve pressure, page 9.
3. Refer to electrical diagrams.
4. Put on static conductive wrist strap.
5. Disconnect main display cable (120) at lower left corner of display module, FIG. 11.
6. Remove screws (409, 410) and cover (404).



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

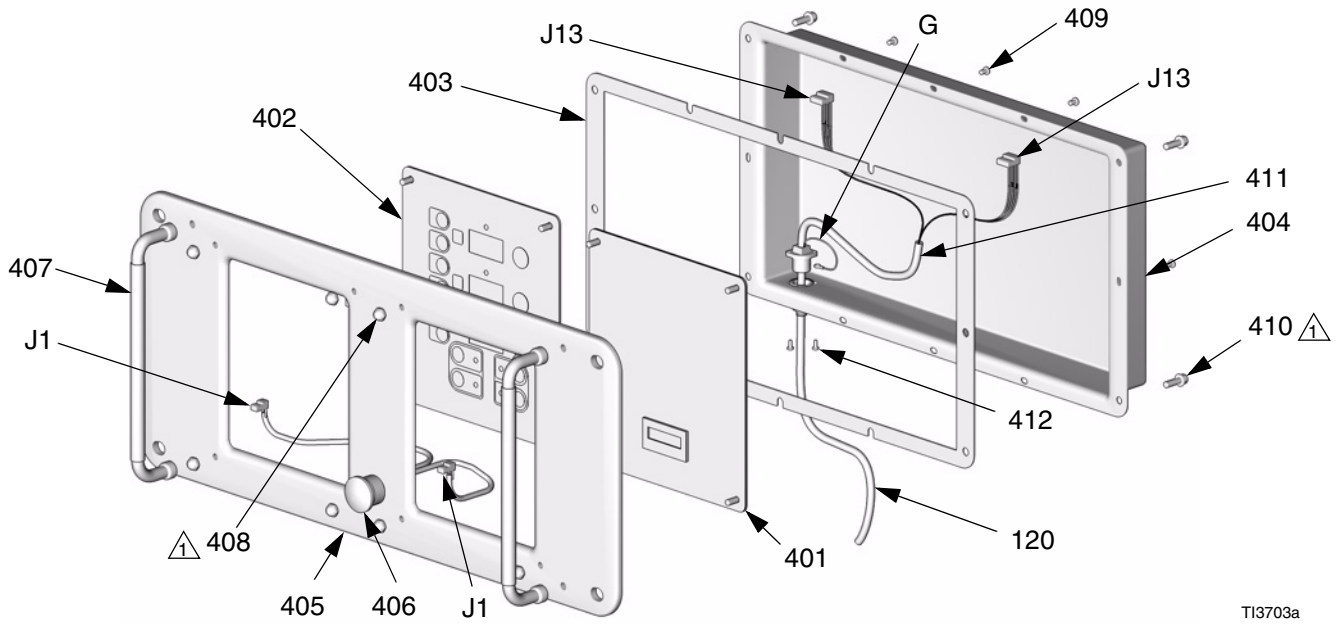
7. Disconnect cable connectors J1 and J13 from back of temperature display (402) or cycle counter display (401).
8. Disconnect ribbon cable (R) from back of display.
9. Remove nuts (408) and plate (405).
10. Disassemble display, see detail in FIG. 11.
11. Replace board (401 or 402a) or membrane switch (402b) as necessary.
12. Reassemble in reverse order, see FIG. 11. Apply medium strength thread sealant where shown. Be sure display cable ground wire (G) is secured between cable bushing and cover (404) with screws

(412), FIG. 11. Also check ground connection at rear of Reactor, see below.



TI2603a-2

⚠ Apply medium strength thread sealant.

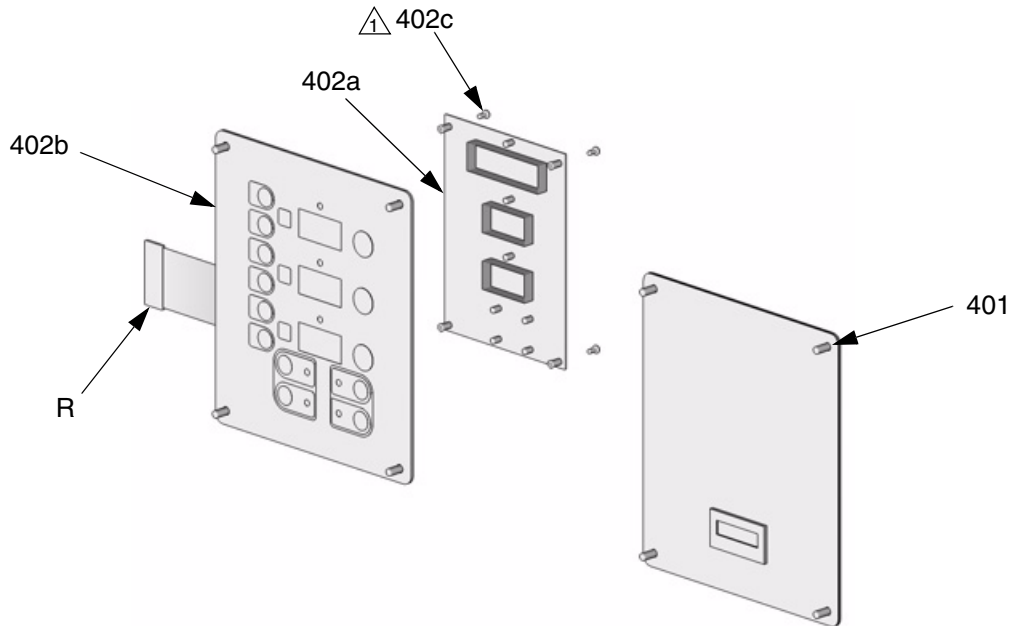


TI3703a

Detail of Membrane Switches and Display Boards

Temperature Display

Cycle Counter Display



TI3702a

FIG. 11. Display Module

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.



WARNING

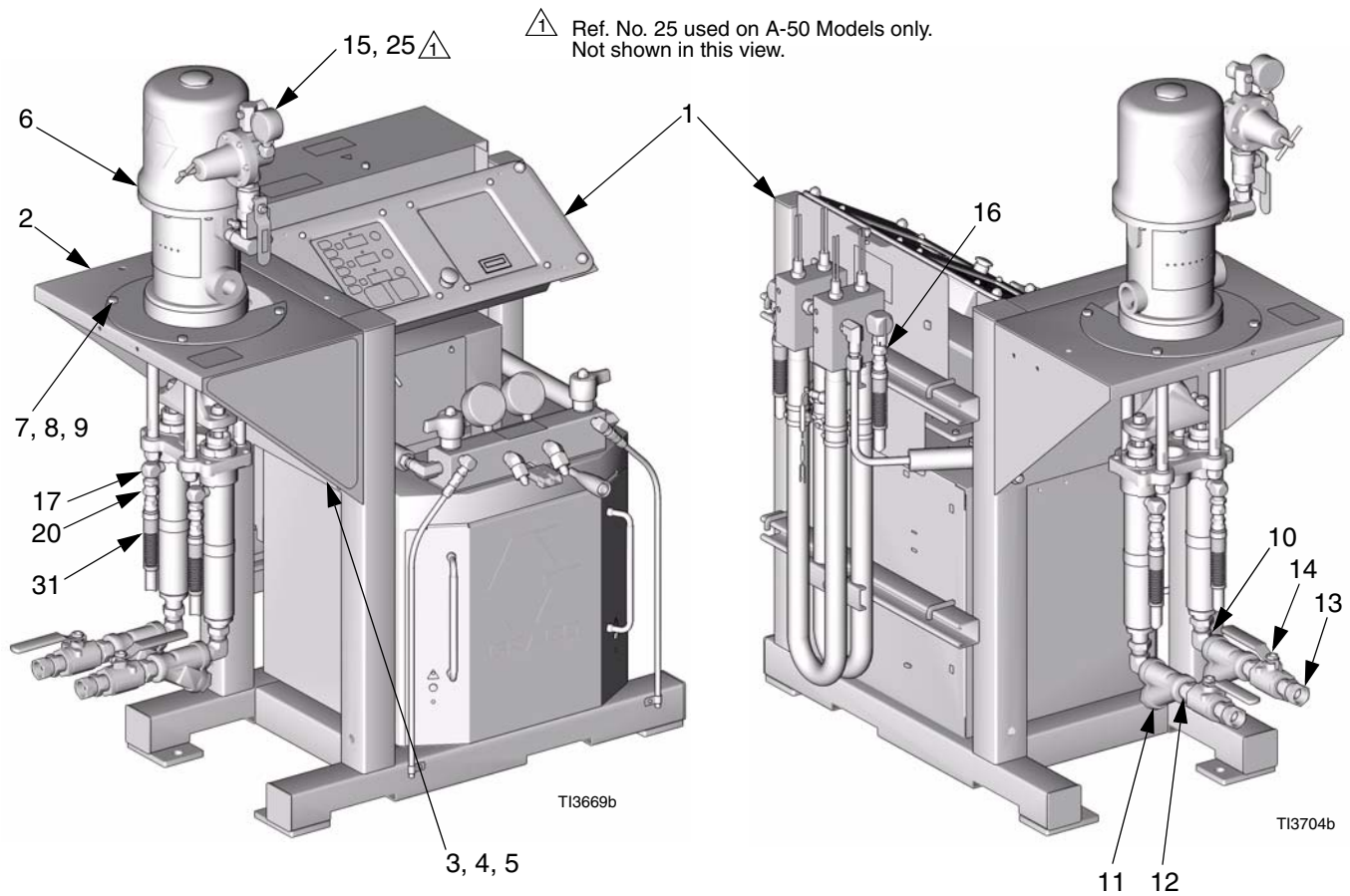


Read warnings, page 6.

2. Relieve pressure, page 9.
3. Refer to electrical diagrams.
4. Put on static conductive wrist strap.
5. Remove screws (409, 410) and cover (404), FIG. 11.
6. Disconnect button cable connectors J1 from back of temperature display (401) and cycle counter display (402).
7. Remove red stop button (406).
8. Reassemble in reverse order. Be sure display cable ground wire (G) is secured between cable bushing and cover (404) with screws (412).

Parts

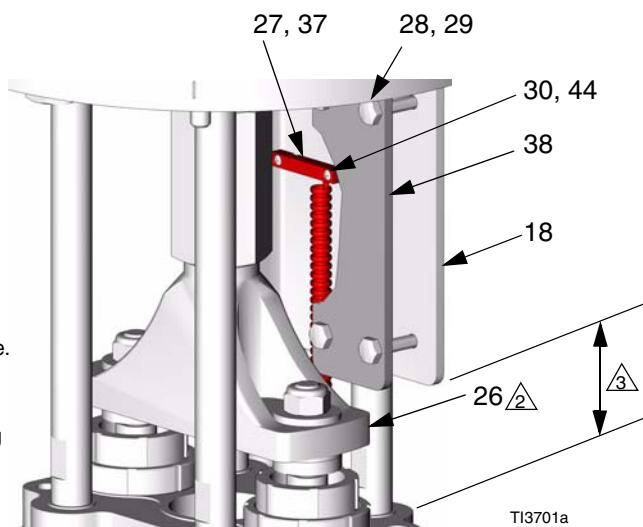
Air Powered Reactors (Model A-XP2 Shown)



Detail of Cycle Counter Switch

Ref. No. 26 Magnet is on back side of yoke.

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).



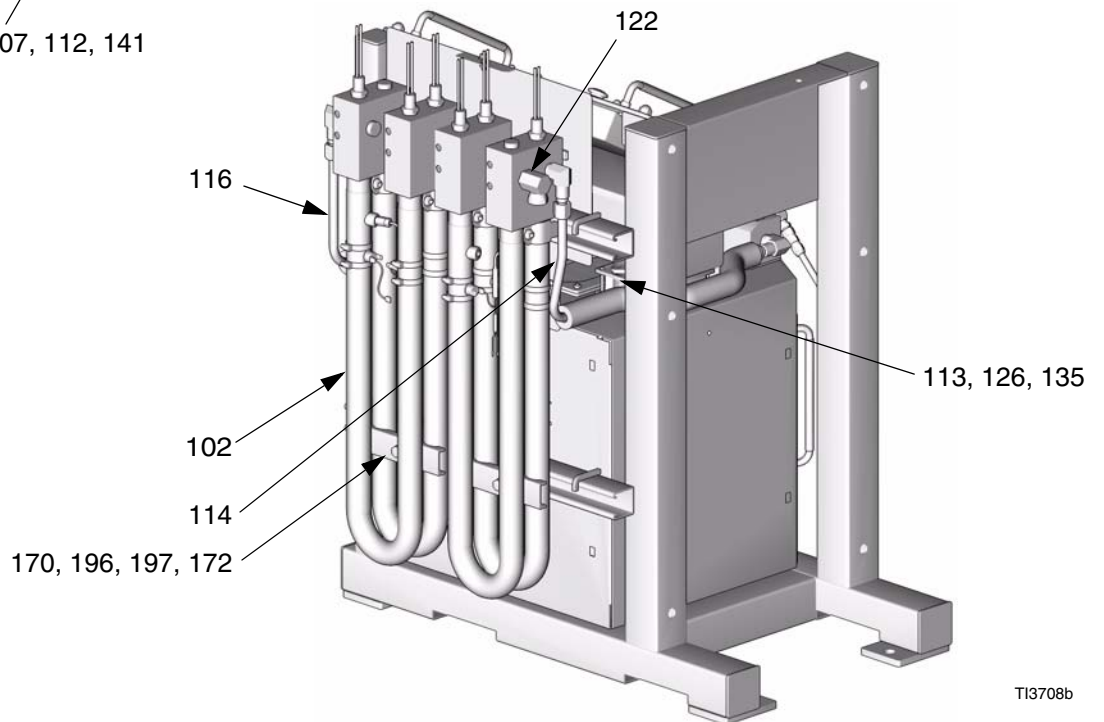
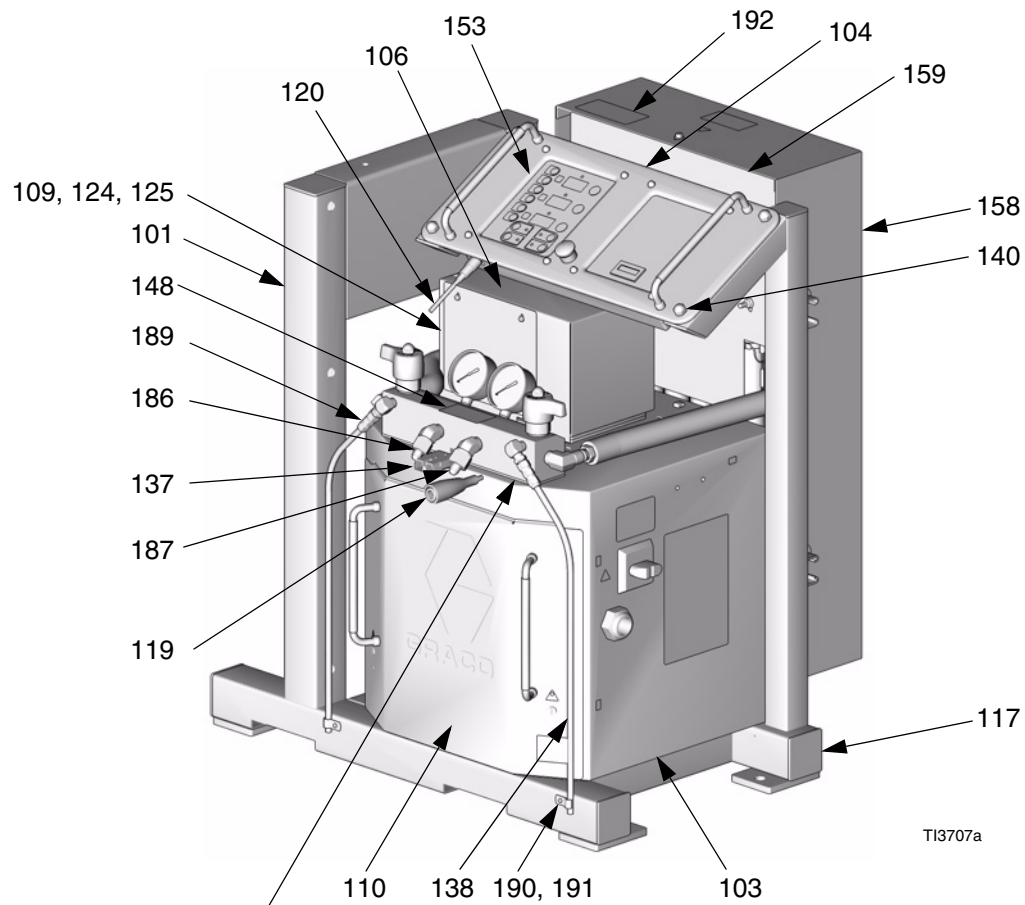
Air Powered Reactors

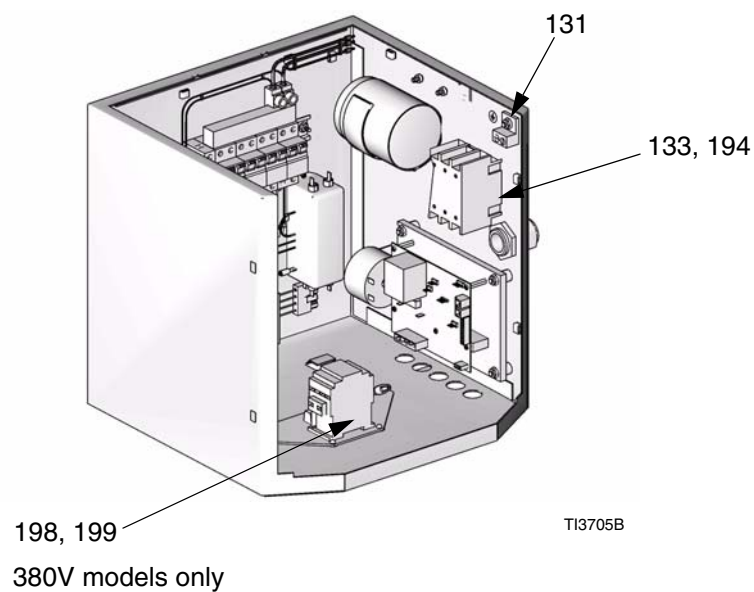
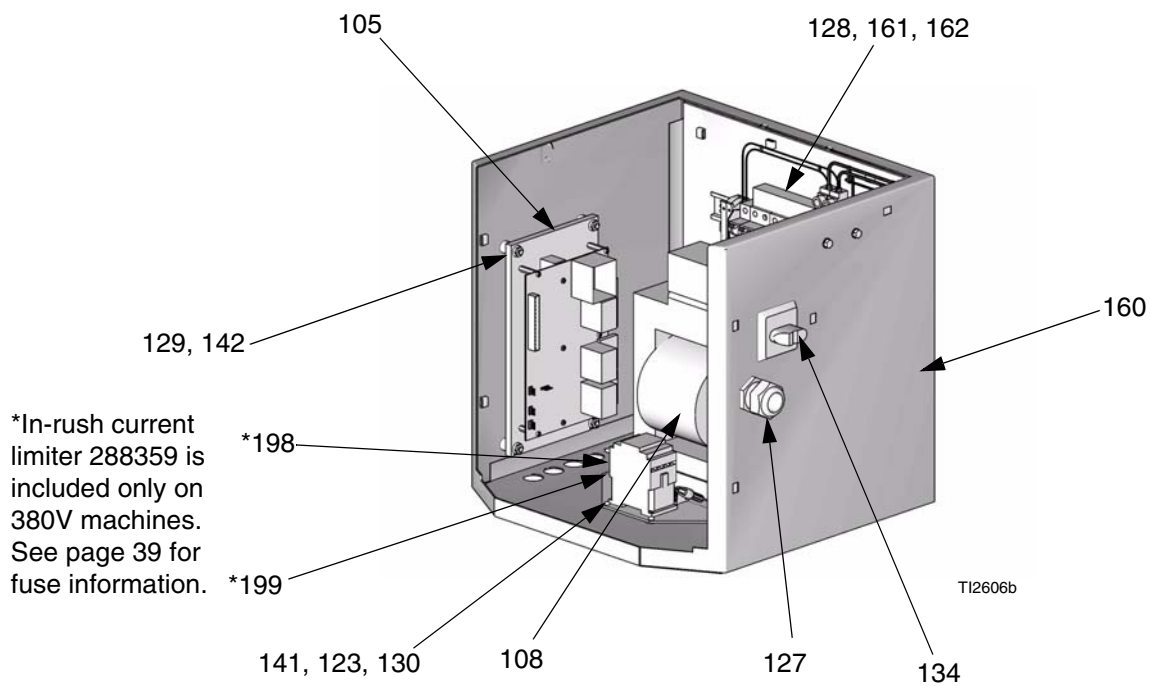
Use this chart to find parts by model. Find ref. no. of part in left column, and Reactor model in top row. Intersection is correct part no.

| Ref. No. | Description | Air Powered Reactor Models | | | Qty |
|----------|---|----------------------------|-----------------|-----------------|-----|
| | | 246639 A-XP2 | 246752 A-XP2 | 246753 A-XP2 | |
| 1 | PACKAGE, control, heat; page 35 | 246607 | 246762 | 246763 | 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 |
| | PUMP, proportioner; see 307547 | | | | 1 |
| 7 | SCREW, cap; 3/8-16 x 1 in. (25 mm) | 100101 | 100101 | 100101 | 4 |
| | SCREW, cap; 3/8-16 x 2 in. (51 mm) | | | | 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 |
| | ELBOW, swivel; 1 in. npt(m) x 1 in. npsm(f) | | | | 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 |
| | NIPPLE; 1 in. npt | | | | 2 |
| 13 | UNION, swivel; 3/4 npt(m) x 3/4 npt(f) | 157785 | 157785 | 157785 | 2 |
| | UNION, swivel; 1 in. npt(m) x 1 in. npsm(f) | | | | 2 |
| 14 | VALVE, ball; 3/4 npt (fbe) | 109077 | 109077 | 109077 | 2 |
| | VALVE, ball; 1 in. npt (fbe) | | | | 2 |
| 15 | KIT, air control; see 308168 | 241661 | 241661 | 241661 | 1 |
| | KIT, air control; see 308168 | | | | 1 |
| 16 | SWIVEL; 1/2 npt(m) x 3/8 npsm(f) | 158256 | 158256 | 158256 | 2 |
| | NIPPLE; 1/2 npt | | | | 2 |
| 17 | ELBOW, street; 3/8 npt (mx f) | 155699 | 155699 | 155699 | 2 |
| | ELBOW, street; 1/2 npt (mx f) | | | | 2 |

| Ref. No. | Description | Air Powered Reactor Models | | | Qty |
|----------|---|----------------------------|--------------|--------------|-----|
| | | 246639 A-XP2 | 246752 A-XP2 | 246753 A-XP2 | |
| 18 | PLATE, mounting, switch | 15C256 | 15C256 | 15C256 | 1 |
| 20 | UNION, swivel; 3/8 npt(m) x 3/8 npsm(f) | 155665 | 155665 | 155665 | 2 |
| 25 | VALVE, air relief; 75 psi (0.5 MPa, 5 bar) | | | | 1 |
| 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 |
| | SCREW, cap, hex hd; 1/4-20 x 2 in. (51 mm) | | | | 4 |
| 30 | SCREW, machine; 5-40 x 7/8 in. (22 mm) | 107438 | 107438 | 107438 | 2 |
| | SCREW, machine; 5-40 x 1/2 in. (13 mm) | | | | 2 |
| 31 | HOSE, fluid; nylon; 3/8 npt (mbe); 3/8 in. (10 mm) ID; 5 ft (1.52 m) | 215247 | 215247 | 215247 | 2 |
| | HOSE, fluid; nylon; 1/2 npsm (fbe); 3/8 in. (10 mm) ID; 5 ft (1.52 m) | | | | 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 Package





Heat Control Package

Use the following chart to find parts that vary by package. Find the ref. no. of part in left column, and package in top row. Intersection is correct part no.

| Ref. No. | Description | Heat Control Package | | | | | | | | | Qty |
|----------|---|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------|
| | | 246364 | 246365 | 246607 | 246760 | 246761 | 246762 | 246763 | 246764 | 246765 | |
| 101 | FRAME | 245955 | 245955 | 245955 | 245955 | 245955 | 245955 | 245955 | 245955 | 245955 | 1 |
| 102 | HEATER; pages 40, 41 | 245963 (qty: 2) | 245975 (qty: 1) | 245962 (qty: 1) | 245975 (qty: 1) | 245975 (qty: 1) | 245962 (qty: 1) | 245962 (qty: 1) | 245963 (qty: 2) | 245963 (qty: 2) | 1 or 2 |
| 103 | ENCLOSURE, electronics | 15C220 | 15C220 | 15C220 | 15C220 | 15C220 | 15C220 | 15C220 | 15C220 | 15C220 | 1 |
| 104 | DISPLAY; page 42 | 246043 | 246043 | 246043 | 246043 | 246043 | 246043 | 246043 | 246043 | 246043 | 1 |
| 105 | CONTROL, temperature; page 43 | 245979 | 245979 | 245979 | 245979 | 245979 | 245979 | 245979 | 245979 | 245979 | 1 |
| 106 | COVER, fan | 15C223 | 15C223 | 15C223 | 15C223 | 15C223 | 15C223 | 15C223 | 15C223 | 15C223 | 1 |
| 107 | MANIFOLD, fluid; page 44 | 246042 | 246042 | 246042 | 246042 | 246042 | 246042 | 246042 | 246042 | 246042 | 1 |
| 108 | TRANSFORMER; see page 48 | 15B352 | 15B352 | 15B352 | 15B352 | 15B352 | 15B352 | 15B352 | 15B352 | 15B352 | 1 |
| 109 | COVER, wire access | 15B775 | 15B775 | 15B775 | 15B775 | 15B775 | 15B775 | 15B775 | 15B775 | 15B775 | 1 |
| 110 | DOOR, cabinet | 246976 | 246976 | 246976 | 246976 | 246976 | 246976 | 246976 | 246976 | 246976 | 1 |
| 111 | SENSOR, fluid temperature | 261669 | 261669 | 261669 | 261669 | 261669 | 261669 | 261669 | 261669 | 261669 | 1 |
| 112 | GASKET, manifold | 15B456 | 15B456 | 15B456 | 15B456 | 15B456 | 15B456 | 15B456 | 15B456 | 15B456 | 1 |
| 113 | FAN | 115834 | 115834 | 115834 | 115834 | 115834 | 115834 | 115834 | 115834 | 115834 | 1 |
| 114 | TUBE, heater, component A | 15B685 | 15B481 | 15B481 | 15B481 | 15B481 | 15B481 | 15B481 | 15B685 | 15B685 | 1 |
| 115 | SCREW, machine; 8-32 x 0.345 in. (9 mm) | 115492 | 115492 | 115492 | 115492 | 115492 | 115492 | 115492 | 115492 | 115492 | 2 |
| 116 | TUBE, heater, component B | 15B687 | 15B483 | 15B483 | 15B483 | 15B483 | 15B483 | 15B483 | 15B687 | 15B687 | 1 |
| 117 | CAP, square | 168422 | 168422 | 168422 | 168422 | 168422 | 168422 | 168422 | 168422 | 168422 | 6 |
| 118 | CABLE, overtemperature; not shown, see electrical diagrams | 15B374 | 15B374 | 15B374 | 15B374 | 15B374 | 15B374 | 15B374 | 15B374 | 15B374 | 1 |
| 119 | CABLE, hose control | 15B380 | 15B380 | 15B380 | 15B380 | 15B380 | 15B380 | 15B380 | 15B380 | 15B380 | 1 |
| 120 | CABLE, display | 15B383 | 15B383 | 15B383 | 15B383 | 15B383 | 15B383 | 15B383 | 15B383 | 15B383 | 1 |

| Ref. No. | Description | Heat Control Package | | | | | | | | | Qty |
|-------------|---|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|
| | | 246364 | 246365 | 246607 | 246760 | 246761 | 246762 | 246763 | 246764 | 246765 | |
| 122 | ELBOW, street; 1/2 npt (mx) | 158683 | 158683 | 158683 | 158683 | 158683 | 158683 | 158683 | 158683 | 158683 | 2 |
| 123 | NUT, hex flange; 3/8-16 | 112958 | 112958 | 112958 | 112958 | 112958 | 112958 | 112958 | 112958 | 112958 | 4 |
| 124 | BOOT, wire feed through | 15B361 | 15B361 | 15B361 | 15B361 | 15B361 | 15B361 | 15B361 | 15B361 | 15B361 | 1 |
| 125 | PLATE, cover, wire | 15B510 | 15B510 | 15B510 | 15B510 | 15B510 | 15B510 | 15B510 | 15B510 | 15B510 | 1 |
| 126 | GASKET, fan | 15B360 | 15B360 | 15B360 | 15B360 | 15B360 | 15B360 | 15B360 | 15B360 | 15B360 | 1 |
| 127 | STRAIN RELIEF | 117682 | 117682 | 117682 | 117682 | 117682 | 117682 | 117682 | 117682 | 117682 | 1 |
| 128 | MODULE, breaker; page 45 | 246092 | 246090 | 246090 | 246087 | 246096 | 246087 | 246096 | 246089 | 246098 | 1 |
| 129 | SPACER | 116149 | 116149 | 116149 | 116149 | 116149 | 116149 | 116149 | 116149 | 116149 | 4 |
| 130 | SCREW, cap; 3/8-16 x 5/8 in. (16 mm) | 100575 | 100575 | 100575 | 100575 | 100575 | 100575 | 100575 | 100575 | 100575 | 4 |
| 131 | TERMINAL, ground | 117666 | 117666 | 117666 | 117666 | 117666 | 117666 | 117666 | 117666 | 117666 | 1 |
| 132 | SENSOR, current, hose; not shown, see electrical diagrams | 15B388 | 15B388 | 15B388 | 15B388 | 15B388 | 15B388 | 15B388 | 15B388 | 15B388 | 1 |
| 133 | SWITCH, disconnect | 117564 | 117564 | 117564 | 117564 | 117564 | 117564 | 117564 | 117564 | 117564 | 1 |
| 134 | SWITCH, main power | 117545 | 117545 | 117545 | 117545 | 117545 | 117545 | 117545 | 117545 | 117545 | 1 |
| 135 | SCREW, machine; 6-32 x 2 in. (51 mm) | 117723 | 117723 | 117723 | 117723 | 117723 | 117723 | 117723 | 117723 | 117723 | 4 |
| 137 | WIRE, hose | 15B396 | 15B396 | 15B396 | 15B396 | 15B396 | 15B396 | 15B396 | 15B396 | 15B396 | 1 |
| 138 | TUBE; 1/4 in. (6 mm) ID; 3/8 in. (16 mm) OD; 2 ft (1.2 m); PTFE | buy locally | buy locally | buy locally | buy locally | buy locally | buy locally | buy locally | buy locally | buy locally | 1 |
| 140 | NUT, cap; 3/8-16 | 117623 | 117623 | 117623 | 117623 | 117623 | 117623 | 117623 | 117623 | 117623 | 4 |
| 141 | SCREW, cap; 1/4-20 x 3/4 in. (19 mm) | 113796 | 113796 | 113796 | 113796 | 113796 | 113796 | 113796 | 113796 | 113796 | 7 |
| 142 | NUT, hex flange; 1/4-20 | 115942 | 115942 | 115942 | 115942 | 115942 | 115942 | 115942 | 115942 | 115942 | 7 |
| ▲ 148 | LABEL, caution | 189285 | 189285 | 189285 | 189285 | 189285 | 189285 | 189285 | 189285 | 189285 | 3 |
| 153 | SHIELD, membrane switch; pack of 10 | 15B593 | 15B593 | 15B593 | 15B593 | 15B593 | 15B593 | 15B593 | 15B593 | 15B593 | 1 |
| 158 | COVER, heater, back | 15B797 | 15B797 | 15B797 | 15B797 | 15B797 | 15B797 | 15B797 | 15B797 | 15B797 | 1 |
| 159 | COVER, heater, front | 15B798 | 15B798 | 15B798 | 15B798 | 15B798 | 15B798 | 15B798 | 15B798 | 15B798 | 1 |
| ▲ 160 | LABEL, warning | 15B679 | 15B679 | 15B679 | 15B679 | 15B679 | 15B679 | 15B679 | 15B679 | 15B679 | 1 |

| Ref. No. | Description | Heat Control Package | | | | | | | | | Qty |
|----------|---|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------|
| | | 246364 | 246365 | 246607 | 246760 | 246761 | 246762 | 246763 | 246764 | 246765 | |
| 161 | NUT, hex, keps; 10-24 | 113505 | 113505 | 113505 | 113505 | 113505 | 113505 | 113505 | 113505 | 113505 | 6 |
| 162 | WASHER, plain; no. 10 | 112776 | 112776 | 112776 | 112776 | 112776 | 112776 | 112776 | 112776 | 112776 | 2 |
| 163 | CONNECTOR, wire; not shown, see electrical diagrams | 117722 | 117722 | 117722 | 117722 | 117722 | 117722 | 117722 | 117722 | 117722 | 4 |
| 170 | BOLT; 3/8-16 | 516595 (qty: 4) | 516595 (qty: 2) | 516595 (qty: 2) | 516595 (qty: 2) | 516595 (qty: 2) | 516595 (qty: 2) | 516595 (qty: 2) | 516595 (qty: 4) | 516595 (qty: 4) | 2 or 4 |
| 172 | CLAMP, pipe, heater | 15C733 (qty: 4) | 15C733 (qty: 2) | 15C733 (qty: 2) | 15C733 (qty: 2) | 15C733 (qty: 2) | 15C733 (qty: 2) | 15C733 (qty: 2) | 15C733 (qty: 4) | 15C733 (qty: 4) | 2 or 4 |
| 179 | FERRULE | 112512 | 112512 | 112512 | 112512 | 112512 | 112512 | 112512 | 112512 | 112512 | 2 |
| 180 | ELBOW; 1/2 npt x 1/2 in. (13 mm) OD tube | 117532 | 117532 | 117532 | 117532 | 117532 | 117532 | 117532 | 117532 | 117532 | 2 |
| 182 | CABLE, overtemperature, jumper | 15B769 (qty: 4) | 15B769 (qty: 2) | 15B769 (qty: 2) | 15B769 (qty: 2) | 15B769 (qty: 2) | 15B769 (qty: 2) | 15B769 (qty: 2) | 15B769 (qty: 4) | 15B769 (qty: 4) | 2 or 4 |
| 183 | WASHER, lock; 1/4 | 100016 | 100016 | 100016 | 100016 | 100016 | 100016 | 100016 | 100016 | 100016 | 15 |
| 184 | WASHER, plain; 3/16 | 100086 | 100086 | 100086 | 100086 | 100086 | 100086 | 100086 | 100086 | 100086 | 8 |
| 186 | REDUCER; #5 x #8 JIC | 117502 | 117502 | 117502 | 117502 | 117502 | 117502 | 117502 | 117502 | 117502 | 1 |
| 187 | REDUCER; #6 x #10 JIC | 117677 | 117677 | 117677 | 117677 | 117677 | 117677 | 117677 | 117677 | 117677 | 1 |
| 189 | COUPLING, hose; 1/4 npsm(f) | 205447 | 205447 | 205447 | 205447 | 205447 | 205447 | 205447 | 205447 | 205447 | 2 |
| 190 | BRACKET, holding | 15C447 | 15C447 | 15C447 | 15C447 | 15C447 | 15C447 | 15C447 | 15C447 | 15C447 | 2 |
| 191 | SCREW, machine; 5-40 x 1/2 in. (13 mm) | 100974 | 100974 | 100974 | 100974 | 100974 | 100974 | 100974 | 100974 | 100974 | 2 |
| 192 | LABEL, diagnostic codes | 15C477 | 15C477 | 15C477 | 15C477 | 15C477 | 15C477 | 15C477 | 15C477 | 15C477 | 1 |
| 194 | SWITCH, added pole; 380V | | | | | 117553 | | 117553 | | 117553 | 1 |
| 195 ▲ | LABEL, warning; | 171001 | 171001 | 171001 | 171001 | 171001 | 171001 | 171001 | 171001 | 171001 | 1 |
| 196 | WASHER, lock; 3/8 in. | 100133 (qty: 4) | 100133 (qty: 2) | 100133 (qty: 2) | 100133 (qty: 2) | 100133 (qty: 2) | 100133 (qty: 2) | 100133 (qty: 2) | 100133 (qty: 4) | 100133 (qty: 4) | 2 or 4 |
| 197 | NUT; 3/8-16 | 118446 (qty: 4) | 118446 (qty: 2) | 118446 (qty: 2) | 118446 (qty: 2) | 118446 (qty: 2) | 118446 (qty: 2) | 118446 (qty: 2) | 118446 (qty: 4) | 118446 (qty: 4) | 2 or 4 |
| 198* | FUSE, 1.6A, Slo-Blow | | | | | 120614 | | 120614 | | 120614 | 1 |
| 199 | IN-RUSH CURRENT LIMITER | | | | | 288359 | | 288359 | | 288359 | 1 |

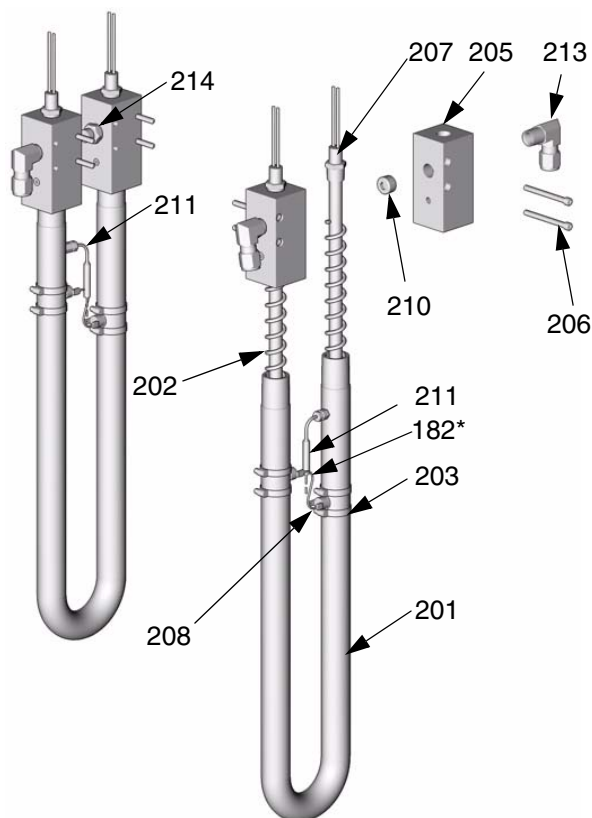
▲ Replacement Warning labels, signs, tags, and cards are available at no cost.

*Replacement fuse 120614 (198) must be Slo-Blow for in-rush current limiter to work correctly.

Fluid Heater

245962 10.2 kW Heater, for A-XP2 Reactors, and HT-10.2 Heat Packages

* Ref. No. 182 not included with heater.
Order separately, see page 39.

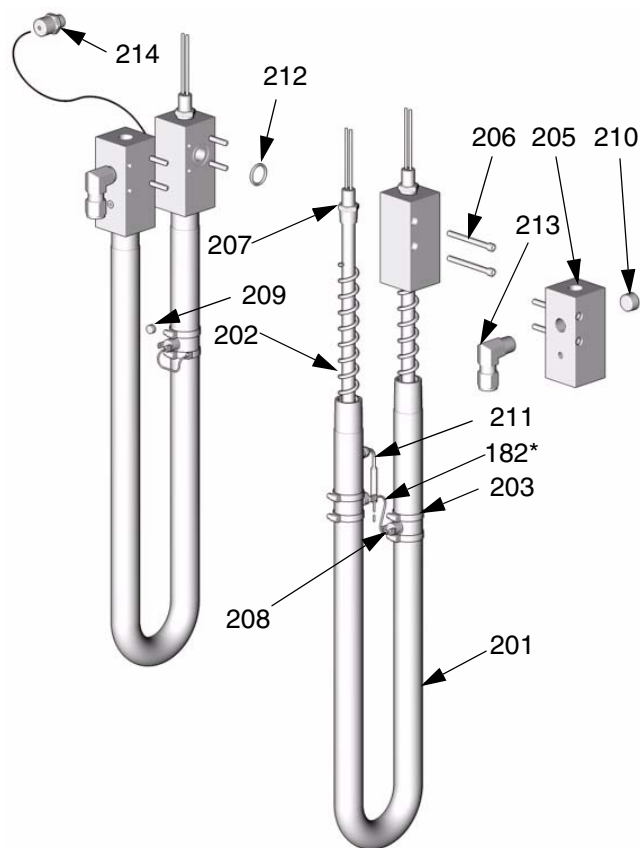


TI2512b

| Ref. No. | Part No. | Description | Qty |
|----------|----------|--|-----|
| 201 | 15B134 | HOUSING | 2 |
| 202 | 15B135 | MIXER | 4 |
| 203 | 118426 | CLAMP | 8 |
| 205 | 15B132 | MANIFOLD | 4 |
| 206 | 107218 | SCREW | 8 |
| 207 | 15B138 | HEATER, immersion; 2550 W; 230v | 4 |
| 208 | 15B137 | SWITCH, overtemperature | 4 |
| 210 | 100361 | PLUG | 4 |
| 211 | 117484 | SENSOR, temperature | 2 |
| 213 | 117532 | ELBOW; 1/2 npt x 1/2 in. (13 mm) OD tube | 4 |
| 214 | 248187 | RUPTURE DISK KIT; see 309969 | 2 |
| 213 | 117532 | ELBOW; 1/2 npt x 1/2 in. (13 mm) OD tube | 2 |
| 214 | 248187 | RUPTURE DISK KIT; see 309969 | 1 |

245963 7.65 kW Heater, for HT-15.3 Heat Packages (2 required)

* Ref. No. 182 not included with heater.
Order separately, see page 39.

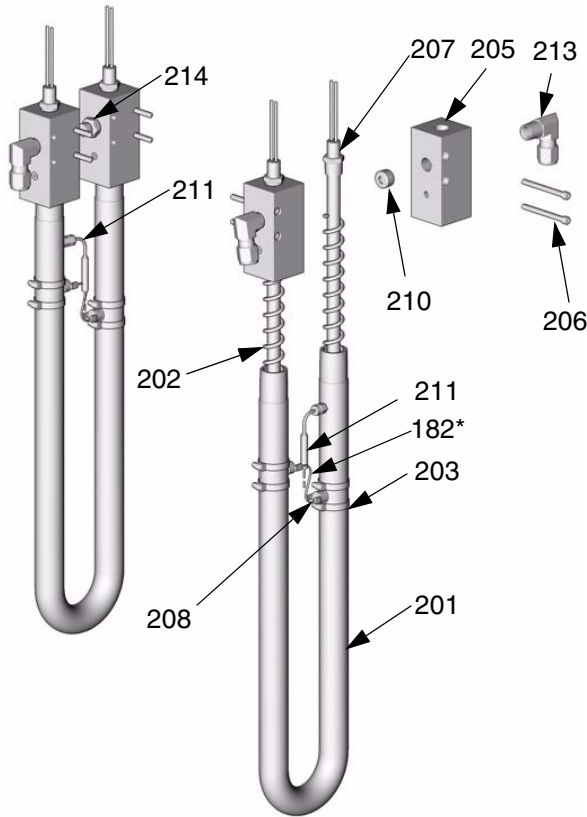


TI2578b

| Ref. No. | Part No. | Description | Qty |
|----------|----------|--|-----|
| 201 | 15B134 | HOUSING | 2 |
| 202 | 15B135 | MIXER | 3 |
| 203 | 118426 | CLAMP | 6 |
| 204 | 15B133 | CROSSOVER | 2 |
| 205 | 15B132 | MANIFOLD | 2 |
| 206 | 107218 | SCREW | 8 |
| 207 | 15B138 | HEATER, immersion; 2550 W; 230v | 3 |
| 208 | 15B137 | SWITCH, overtemperature | 3 |
| 209 | 100139 | PLUG | 1 |
| 210 | 100361 | PLUG | 2 |
| 211 | 117484 | SENSOR, temperature | 1 |
| 212 | 117466 | O-RING | 1 |
| 213 | 117532 | ELBOW; 1/2 npt x 1/2 in. (13 mm) OD tube | 2 |
| 214 | 248187 | RUPTURE DISK KIT; see 309969 | 1 |

245975 6 kW Heater, for HT-6.0 Heat Packages

* Ref. No. 182 not included with heater.
Order separately, see page 39.

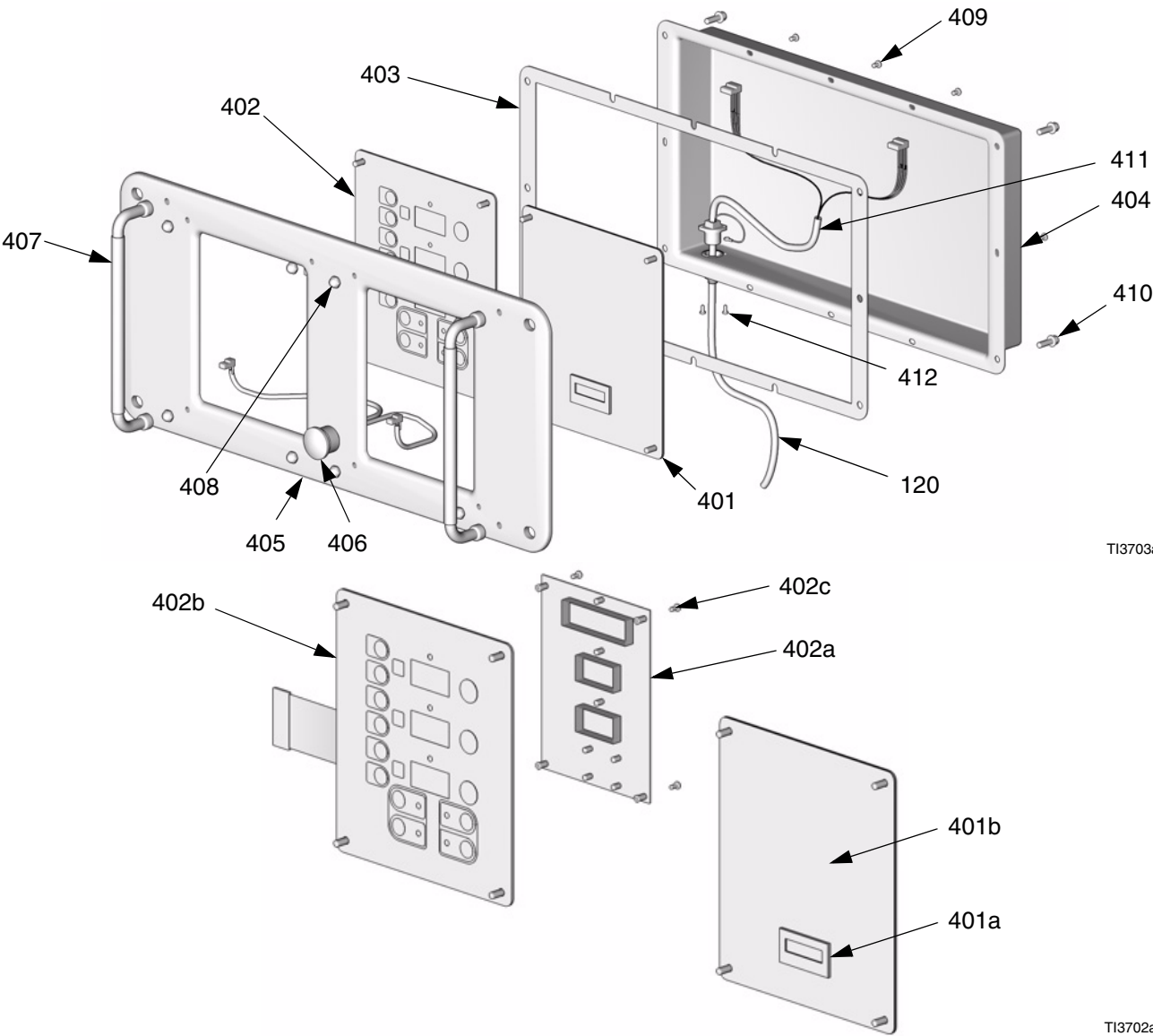


TI2512b

| Ref. No. | Part No. | Description | Qty |
|----------|----------|--|-----|
| 201 | 15B134 | HOUSING | 2 |
| 202 | 15B135 | MIXER | 4 |
| 203 | 118426 | CLAMP | 8 |
| 205 | 15B132 | MANIFOLD | 4 |
| 206 | 107218 | SCREW | 8 |
| 207 | 15B140 | HEATER, immersion; 1500 W; 230v | 4 |
| 208 | 15B137 | SWITCH, overtemperature | 4 |
| 210 | 100361 | PLUG | 2 |
| 211 | 117484 | SENSOR, temperature | 2 |
| 213 | 117532 | ELBOW; 1/2 npt x 1/2 in. (13 mm) OD tube | 4 |
| 214 | 248187 | RUPTURE DISK KIT; see 309969 | 2 |

Display

246043 Display



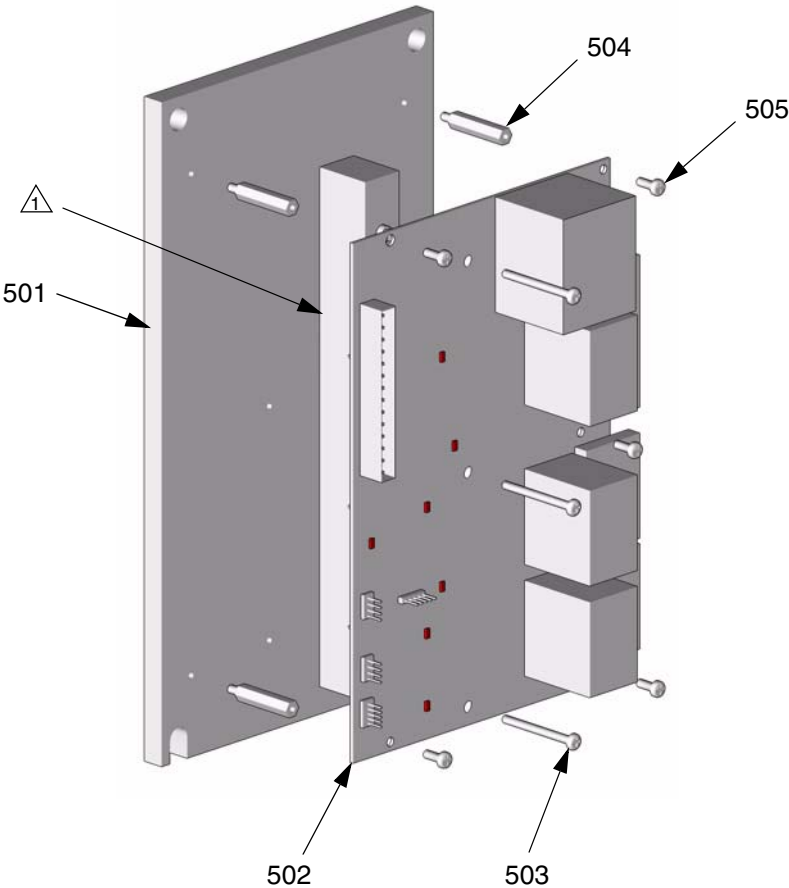
| Ref. No. | Part No. | Description | Qty |
|----------|----------|--|-----|
| 401 | 246044 | DISPLAY, counter; includes 401a-401b | 1 |
| 401a | 117830 | . COUNTER, digital | 1 |
| 401b | 15B365 | . LABEL | 1 |
| 402 | 245977 | DISPLAY, temperature; includes 402a-402c | 1 |
| 402a | 246130 | . BOARD, circuit | 1 |
| 402b | 246479 | . SWITCH, membrane | 1 |
| 402c | 112324 | . SCREW | 4 |
| 403 | 15B293 | GASKET | 1 |
| 404 | 15B292 | COVER | 1 |
| 405 | 15B291 | PLATE | 1 |
| 406 | 246287 | HARNESS, wire, red stop button | 1 |
| 407 | 117499 | HANDLE | 2 |

| Ref. No. | Part No. | Description | Qty |
|----------|----------|---|-----|
| 408 | 117523 | NUT, cap; 10-24 | 8 |
| 409 | 111008 | SCREW, tapping, 6-32; 1/4 in. (6 mm) | 8 |
| 410 | 111393 | SCREW, machine, pan-hd; M5 x 0.8; 16 mm | 4 |
| 411 | 15B386 | CABLE, display | 1 |
| 412 | 195853 | SCREW, machine; M2.5 x 6 | 2 |
| 414 | 118115 | CONNECTOR, cable; 5-pin; 24 AWG | 1 |

Temperature Control

245979 Temperature Control

 Apply 110009 thermal heatsink compound to mating surfaces.



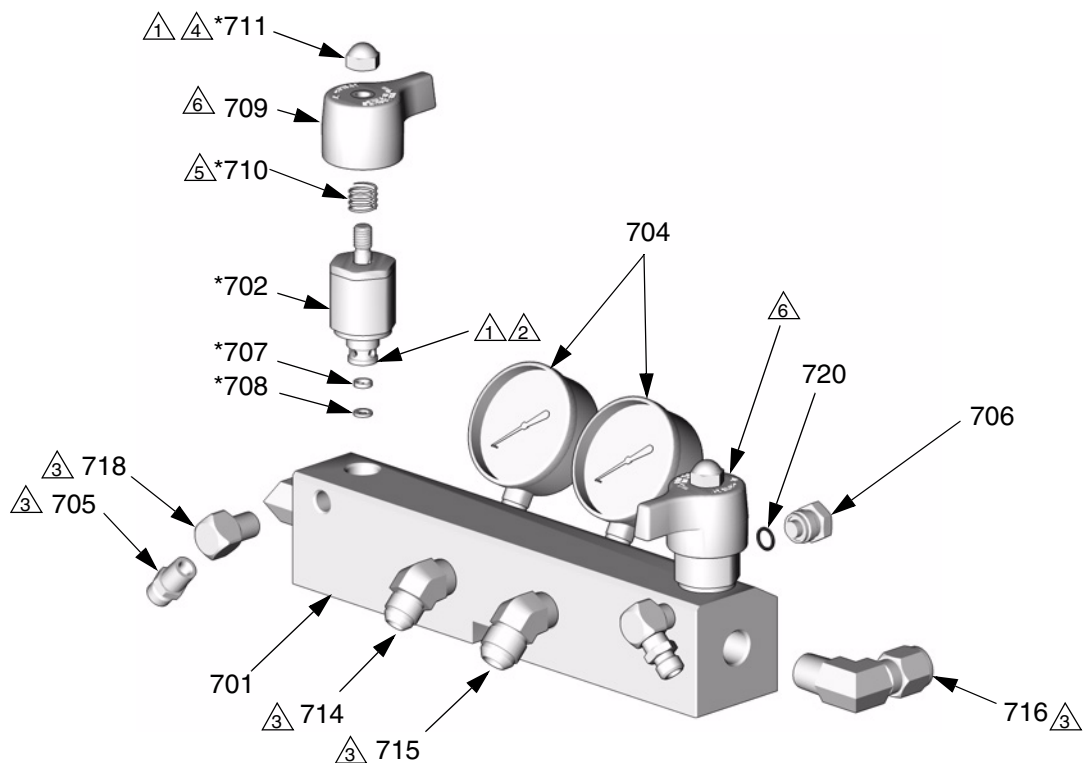
TI2575A-1

| Ref. No. | Part No. | Description | Qty |
|----------|----------|--|-----|
| 501 | 15B779 | HEAT SINK | 1 |
| 502 | 246194 | BOARD, temperature control | 1 |
| 503 | 117683 | SCREW, 6-32 x 1-1/2 in. (38 mm) | 2 |
| 504 | 117526 | SPACER | 5 |
| 505 | 104590 | SCREW, machine; 6-32 x 3/8 in. (10 mm) | 5 |

Fluid Manifold

246042 Fluid Manifold

- △1 Apply 113500 thread lock (blue).
- △2 Torque to 355-395 in-lb (40.1-44.6 N•m).
- △3 Apply PTFE tape or thread sealant to tapered threads.
- △4 Torque to 175-195 in-lb (19.8-22.0 N•m).
- △5 Lubricate ends of spring when assembling.
- △6 Assemble valves (702) and handles (709) with handles facing away from each other.



TI3706b


| Ref. No. | Part No. | Description | Qty |
|----------|----------|-----------------------------------|-----|
| 701 | 15B332 | MANIFOLD; aluminum | 1 |
| 702* | 246161 | VALVE, pressure relief/spray | 2 |
| 704 | 102814 | GAUGE; 5000 psi (35 MPa, 350 bar) | 2 |
| 705 | 162453 | NIPPLE; 1/4 npt x 1/4 npsm | 2 |
| 706 | 198241 | PLUG, pressure; 11/16-24 unef | 2 |
| 707* | 193709 | SEAT, valve; carbide | 2 |
| 708* | 193710 | SEAL, seat; nylon | 2 |
| 709* | 15B287 | HANDLE, valve | 2 |
| 710* | 114708 | SPRING | 2 |
| 711* | 117623 | NUT, cap; 3/8-16 | 2 |

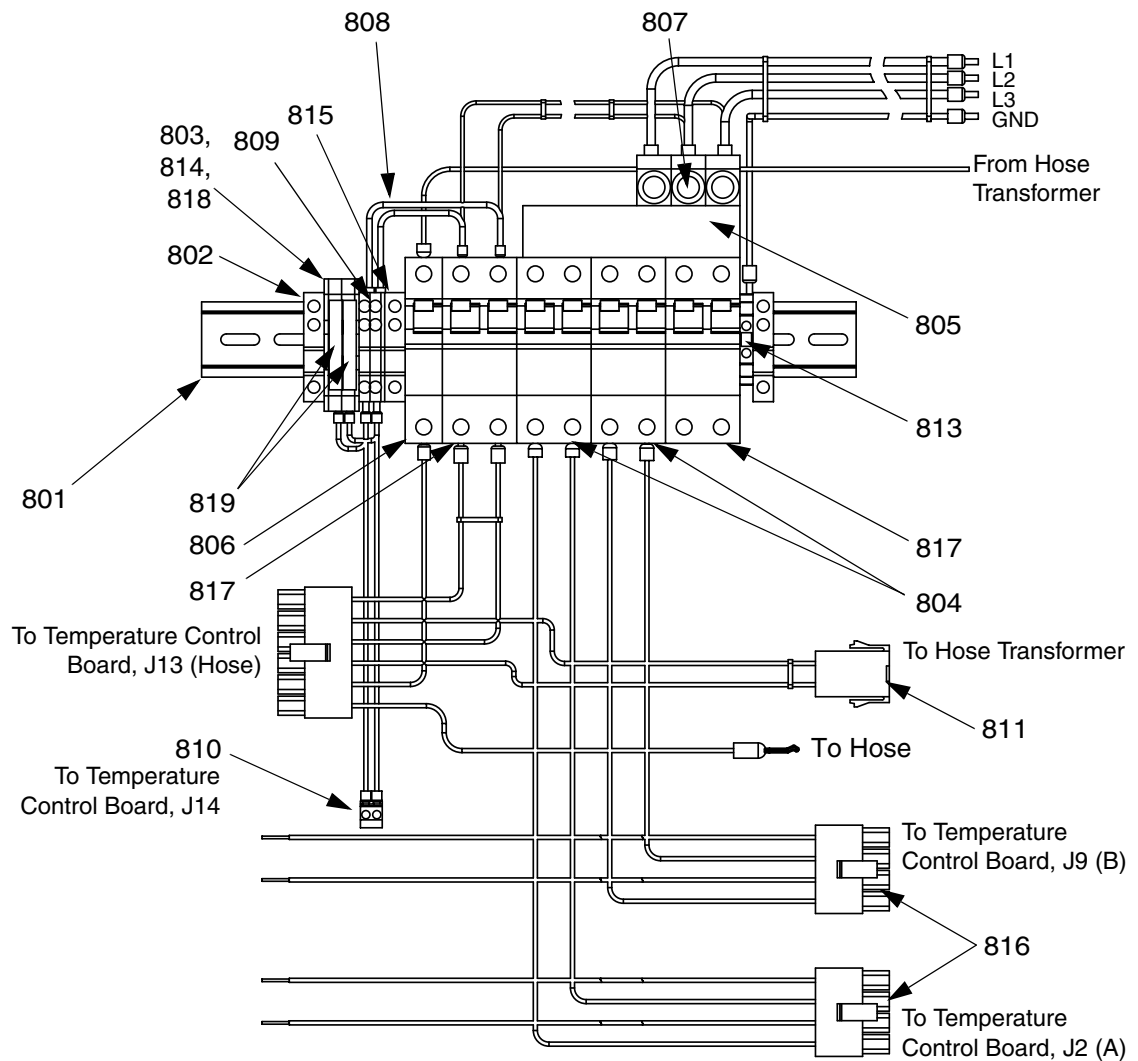
| Ref. No. | Part No. | Description | Qty |
|----------|----------|---|-----|
| 714 | 117556 | ELBOW, 45°; #8 JIC x 1/2 npt | 1 |
| 715 | 117557 | ELBOW, 45°; #10 JIC x 1/2 npt | 1 |
| 716 | 117532 | ELBOW; 1/2 npt(m) x 1/2 in. (13 mm) OD tube | 2 |
| 718 | 100840 | ELBOW, street; 1/4 npsm x 1/4 npt | 2 |
| 720 | 111457 | O-RING; PTFE | 2 |

* Included in Repair Kit 245103 (purchase separately).

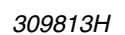
Circuit Breaker Modules

230V, 3 Phase Circuit Breaker Modules


 For wiring and cable connections, refer to electrical diagrams supplied. See page 48 for parts list.

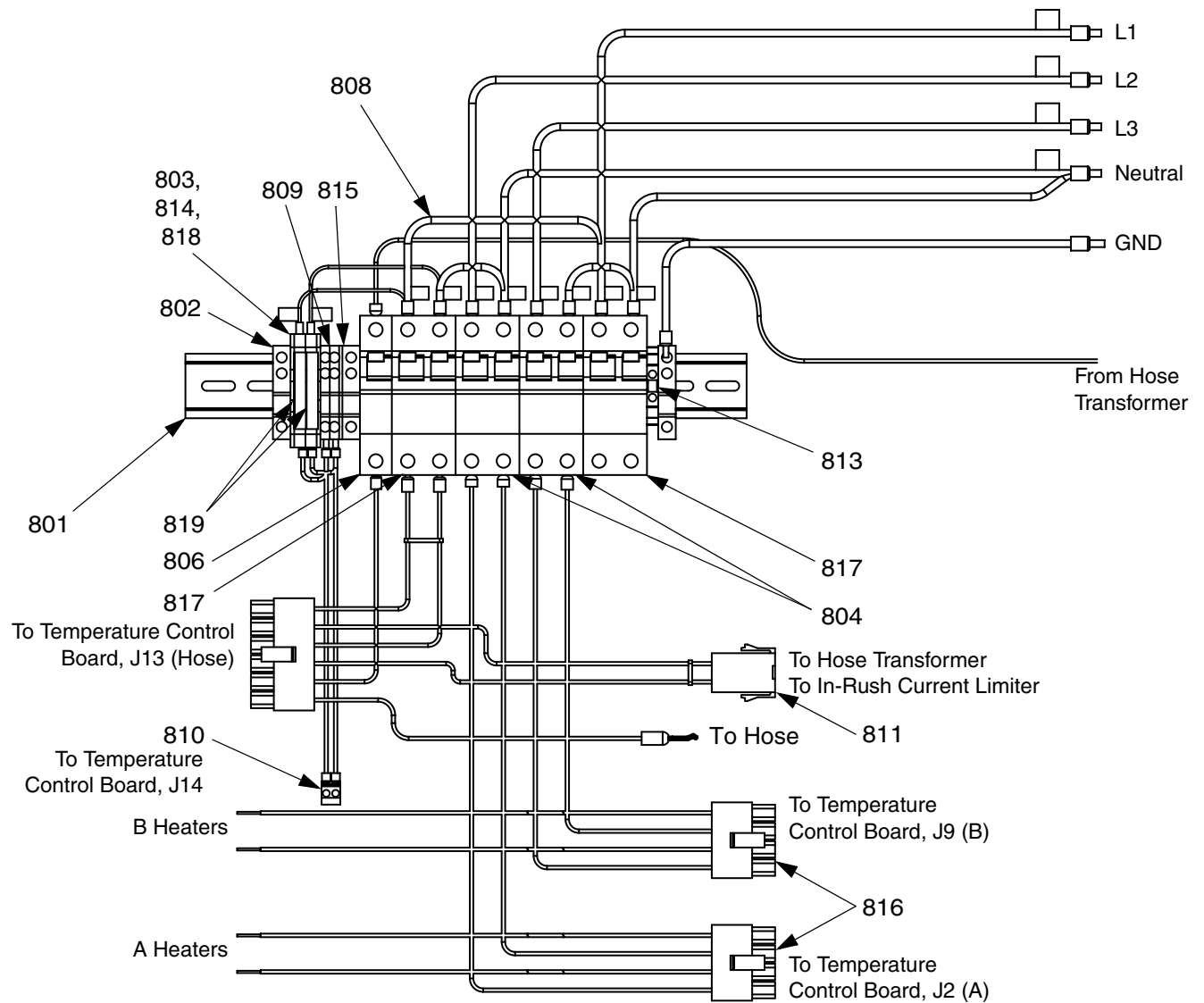
Part No. 246087 (A-XP2)

Part No. 246090 (A-XP2)



380V, 3 Phase Circuit Breaker Modules

 For wiring and cable connections, refer to electrical diagrams supplied. See page 48 for parts list.

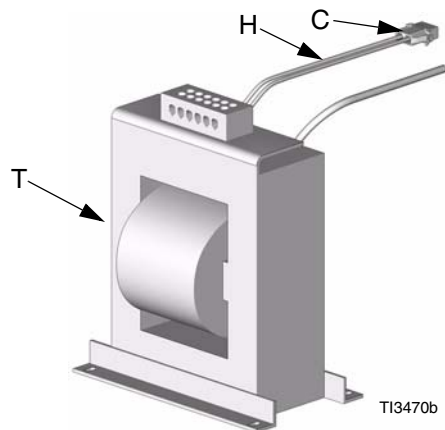
Part No. 246096 (A-XP2)

Circuit Breaker Modules Parts List

| Ref. No. | Description | Breaker Modules | | | | | | Qty |
|----------|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----|
| | | 246087 230V, 3 Ø | 246089 230V, 3 Ø | 246090 230V, 1 Ø | 246092 230V, 1 Ø | 246096 380V, 3 Ø | 246098 380V, 3 Ø | |
| 801 | RAIL, mounting | buy locally | buy locally | buy locally | buy locally | buy locally | buy locally | 1 |
| 802 | CLAMP, end | 112446 | 112446 | 112446 | 112446 | 112446 | 112446 | 3 |
| 803 | TERMINAL, base, fuse plug | 117798 | 117798 | 117798 | 117798 | 117798 | 117798 | 2 |
| 804 | BREAKER, dual; 25A | 117591 | | 117591 | | 117591 | | 2 |
| | BREAKER, dual; 40A | | 117505 | | 117505 | | 117505 | 2 |
| 805 | BAR, power buss, 3 phase | 117805 | 117805 | | | | | 1 |
| | BAR, power buss, 1 phase | | | 117678 | 117678 | | | 1 |
| 806 | BREAKER, single; 50A | 117503 | 117503 | 117503 | 117503 | 117503 | 117503 | 1 |
| 807 | CONNECTOR, power lug | 117679 | 117679 | | | | | 3 |
| | CONNECTOR, power lug | | | 117679 | 117679 | | | 2 |
| 808 | CABLE, harness; 230V, 3 phase | 15B387 | 15B387 | | | | | 1 |
| | CABLE, harness; 230V, 1 phase | | | 117674 | 117674 | | | 1 |
| | CABLE, harness; 380V, 3 phase | | | | | 15B377 | 15B377 | 1 |
| 809 | TERMINAL, block | 117796 | 117796 | 117796 | 117796 | 117796 | 117796 | 2 |
| 810 | CABLE, harness, power temp | 15B375 | 15B375 | 15B375 | 15B375 | 15B375 | 15B375 | 1 |
| 811 | CABLE, hose, heat | 15B378 | 15B378 | 15B378 | 15B378 | 15B378 | 15B378 | 1 |
| 813 | BLOCK, terminal ground | 112443 | 112443 | 112443 | 112443 | 112443 | 112443 | 1 |
| 814 | FUSE, fan; 5 x 20 mm Bussman GDA-2A or equivalent | 115216 | 115216 | 115216 | 115216 | 115216 | 115216 | 2 |
| 815 | TERMINAL, end cover | 117807 | 117807 | 117807 | 117807 | 117807 | 117807 | 1 |
| 816 | CABLE, harness, heat A/B | 15B376 | 15B376 | 15B376 | 15B376 | 15B376 | 15B376 | 2 |
| 817 | BREAKER, dual; 20A | 117711 | 117711 | 117711 | 117711 | 117711 | 117711 | 2 |
| 818 | TERMINAL, end cover | 117797 | 117797 | 117797 | 117797 | 117797 | 117797 | 1 |
| 819 | FUSE, plug | 117799 | 117799 | 117799 | 117799 | 117799 | 117799 | 2 |

Transformer

Part No. 15B352 Transformer



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: 1/2 npt(f) on heater inlet blocks |
| Fluid Outlets | Component A (ISO): #8 JIC (3/4-16 unf), with #5 JIC adapter Component B (RES): #10 JIC (7/8-14 unf), 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 gpm (3.8 liter/min) at 60 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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