



Heater Control Upgrade Kit

312069 rev.B

For replacing heater control on E-20, E-30, and H-25 Reactors.



Important Safety Instructions

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



It is recommended that this kit be installed by an authorized Graco distributor.

Kit Includes:

Part	Description	Qty.
255100	PANEL, control, heater	1
15J885	SPACER	4
120711	RELAY, contactor, 65 amp, 3 phase	1
120790	CONNECTOR, 12 pin	1
103473	STRAP, tie, wire	10
255053	COVER, connector	1
114331	SCREW, pan hd	2
15M401	HARNESS, retrofit, heater board	1
120815	CONNECTOR, heater, female, 2 phase	2
120816	CONNECTOR, heater, male, 2 phase	2
261821	CONNECTOR, wire, 6 AWG	1
118575	SCREW DRIVER, flat, 1/8 in. blade	1

PROVEN QUALITY. LEADING TECHNOLOGY.



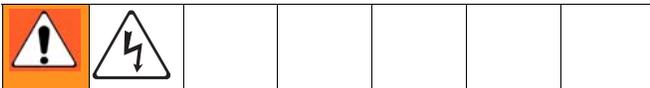
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Warnings

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.

 WARNING	
	<p>ELECTRIC SHOCK HAZARD</p> <p>Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power cord before servicing equipment. • Use only grounded electrical outlets. • Use only 3-wire extension cords. • Ensure ground prongs are intact on sprayer and extension cords. • Do not expose to rain. Store indoors.
	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • 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. For complete information about your material, request MSDS forms from distributor or retailer. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	<p>BURN HAZARD</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>



Upgrading 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; refer to Operation manual. Be sure to shut off all power to the equipment before performing upgrade procedures.

1. Turn off unit and disconnect power cord, or turn off breaker power to unit.



Wait 5 minutes for stored voltage to discharge.

2. Remove front access door of unit.
3. Remove two screws from front of transformer.

Red Wire

Screws

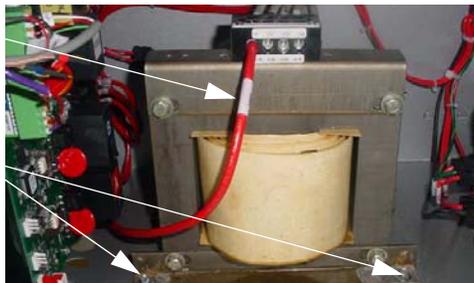


FIG. 1

4. Hold red wire on tap setting while loosening connector. Remove red wire from transformer.
5. Disconnect 2-pin black connector for primary transformer. Then remove black wire that runs to 50 amp circuit breaker.

Black Wire

2-Pin
Connector



FIG. 2

6. Pull transformer toward front of unit and remove it.
7. Disconnect all six connectors from temperature board.

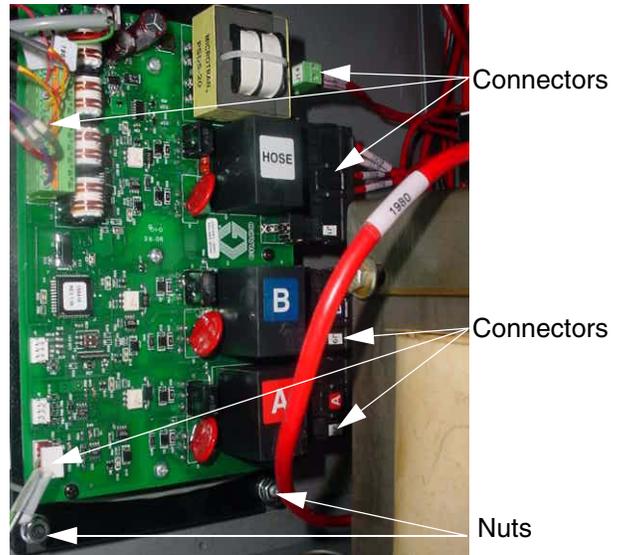


FIG. 3

8. Remove all four 7/16 in. nuts from temperature board. Remove temperature board.
9. Remove and discard all four spacers from under the board. Save the four flange nuts.
10. Use a 5/32 in. (4 mm) allen wrench to remove wires on bottom of power disconnect. There are two wires for 1-phase units, three wires for 3-phase units, and four wires for 400V 3-phase units. Also, use a slotted screw driver to remove ground (green) wire from grounding block.

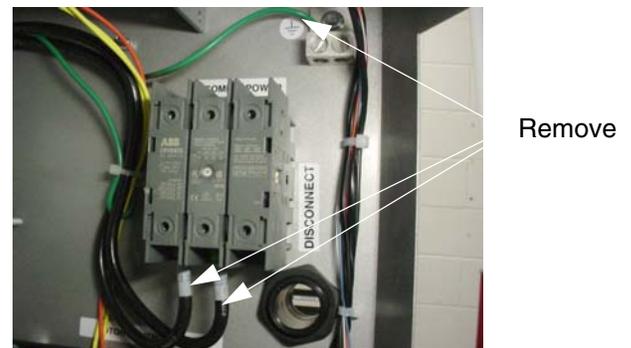


FIG. 4

Remove

Remove Circuit Breaker Assembly

1. Remove wires from GND and from bottom of circuit breaker assembly (1851, 1820, 1830, 1520, 1530, 1650, 1660, 1070, 1090).

 Wire numbers are for reference only.

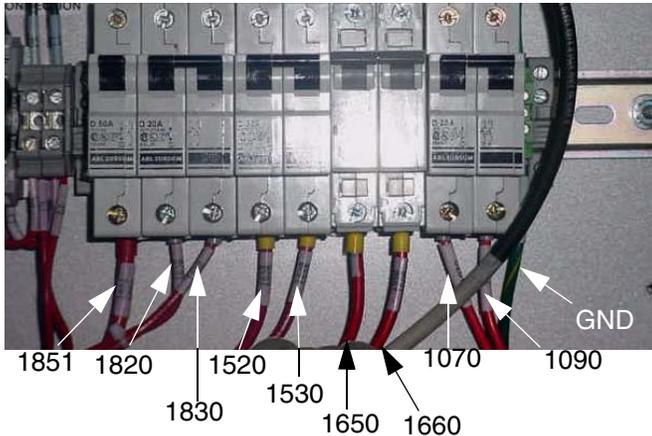


FIG. 5

2. Remove fuses from fuse holder. Do NOT discard fuses. They will be reinstalled later.
3. Use a flat blade screw driver to remove wires from top of fuse holders.

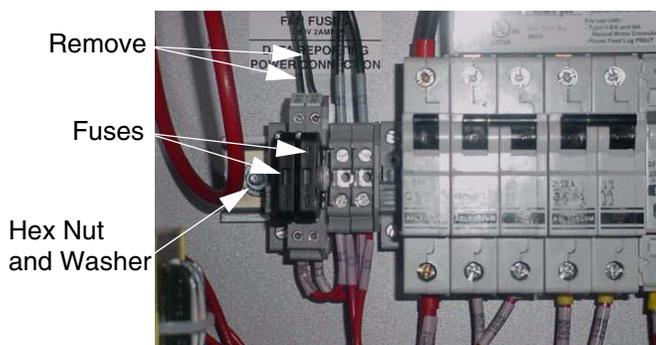


FIG. 6

4. Cut wire ties/cable ties/tie straps to circuit breaker harness.
5. Use a 3/8 in. socket wrench to remove hex nuts and washers from both ends of circuit breaker assembly. Remove circuit breaker assembly from unit.

Electric Units Only

6. Remove heater cover. Locate set of wires connected by wire nuts on each side of heater. Remove tape and wire nuts.
7. Remove side panel from middle of unit.



FIG. 7

8. Clip cable ties that hold heater wires in place. Pull the four heater wires through unit.

Remove Circuit Breaker Assembly

9. Locate black 6-pin connector (J1) and wire labeled 1872. Cut wire at connector. Strip wire 1/2 in. (13 mm) from end.

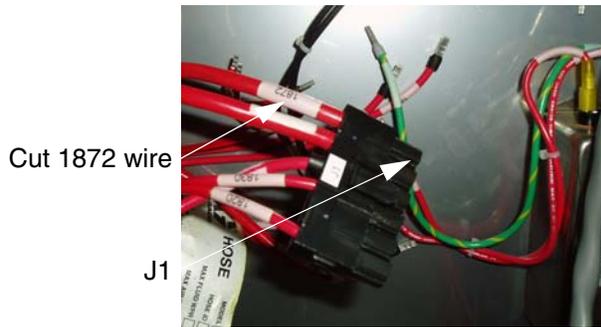


FIG. 8

10. Remove all loose wires and connectors from unit. Do not discard these wires; a few will be used again.
11. Remove current sensor.

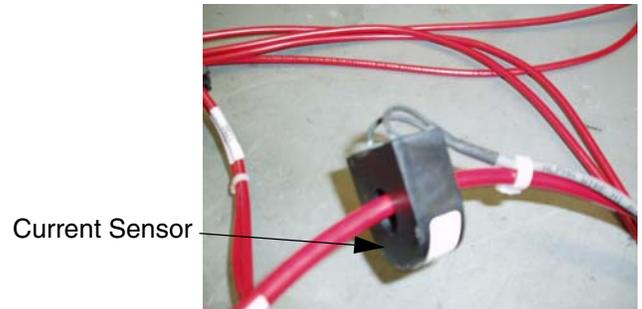


FIG. 9

Hydraulic Units Only

12. Use a 1/2 in. socket wrench to remove bolts from heater covers. Remove heater covers.
13. Locate set of wires connected by a blue wire nut on each side of heater. Remove tape and wire nuts.
14. Separate wires and pull the two red and two black wires through unit.

Install New Contactor C30 Assembly

1. Loosen screws on end stop on either side of circuit breaker assembly.
2. Loosen middle screw in green/yellow terminal block.
3. Slide end stop and green/yellow terminal block to right; 3/4 in. (19 mm) from end of din rail.
4. Tighten screws on end stop and green/yellow terminal block on circuit breaker (see FIG. 10).



Third End Stop Removed Green/Yellow Block
FIG. 10

5. Loosen screws on third end stop (between terminal blocks and hose circuit breaker), and remove end stop from din rail. See FIG. 10.
6. Slide all circuit breakers to right against green/yellow terminal block.

 If circuit breakers do not slide easily, put din rail on its end and push down on circuit breakers.

7. On opposite end of din rail, move end stop, fuse holder, and terminal blocks to end of rail.



FIG. 11

8. Install new C30 contactor assembly on din rail between fuse holders and circuit breaker. Place contactor on din rail so that top catch is on rail, and then press contactor toward din rail until it snaps on.

 If contactor does not snap on, use a small flat screwdriver to pull down white tab on bottom of contactor, and then press contactor toward din rail and release tab.

9. Slide fuse holders and terminal blocks on left side of din rail toward C30 contactor assembly. Tighten screws in end block.



C30 Contactor Assembly Installed

FIG. 12

Install New Wires

Install new circuit breaker wires. Tighten each wire after it is inserted. Refer to FIG. 13 for location reference.

1. Insert wire 197CB-2 in left connection of circuit breaker B.
2. Insert wire 187CB-2 in left connection of circuit breaker C.
3. Insert wire 197CB-4 in right connection of circuit breaker B.
4. Insert wire 187CB-4 in right connection of circuit breaker C.
5. Insert wire 178CB-4 in right connection of circuit breaker D.
6. Insert wire 178CB-2 in left connection of circuit breaker D.

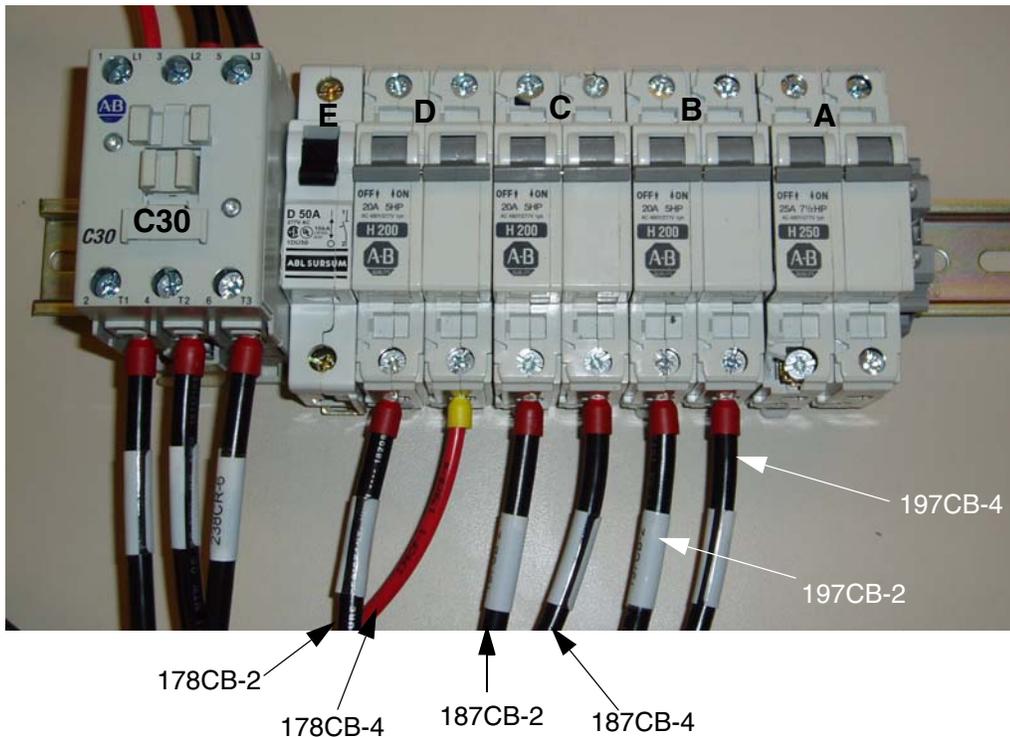


FIG. 13

Reinstall Circuit Breaker Assembly

1. Install din rail on studs and fasten to unit with flat washers and hex nuts.
2. Locate the two black fan wires and the two black data recorder kit wires (if unit includes). Insert wires in top of fuse holders labeled FU112 and FU113, and tighten screws. Pull on wires to ensure they are secure.

 Insert fan wires in rear ports.

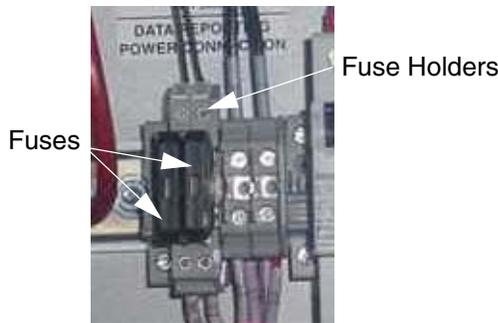


FIG. 14

3. Reinstall fuses removed in **Remove Circuit Breaker Assembly** section; page 4.
4. Locate 2-pin green connector labeled J14 (attached to terminal blocks) and remove wires labeled L1 and L2 from connector.
5. Insert wires from J14 connector in new 4-pin green connector included in wiring harness. Pull on wires to ensure they are secure.

 Wires can go in either opening of connector.



FIG. 15

6. Reconnect main power wires that were removed in step 10 on page 3. Insert wires L1, L2, L3, and N (depending on unit) in bottom connections of disconnect switch and ground.

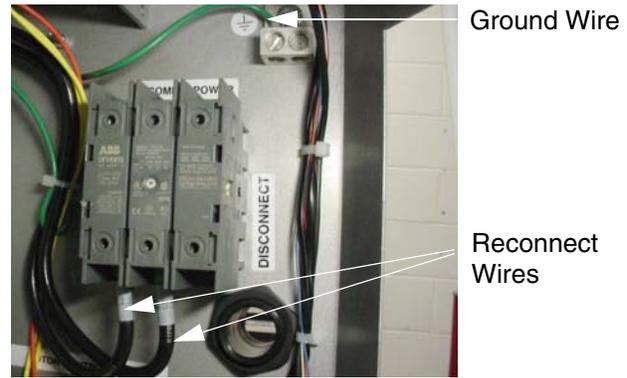


FIG. 16

7. Insert wire 1090 in right connection of circuit breaker A.
8. Insert wire 1070 in left connection of circuit breaker A.
9. Insert green/yellow wire (GND) in bottom connection of green/yellow terminal block.
10. Insert wire 1872 (removed from old wires in step 9; page 5) in circuit breaker E.

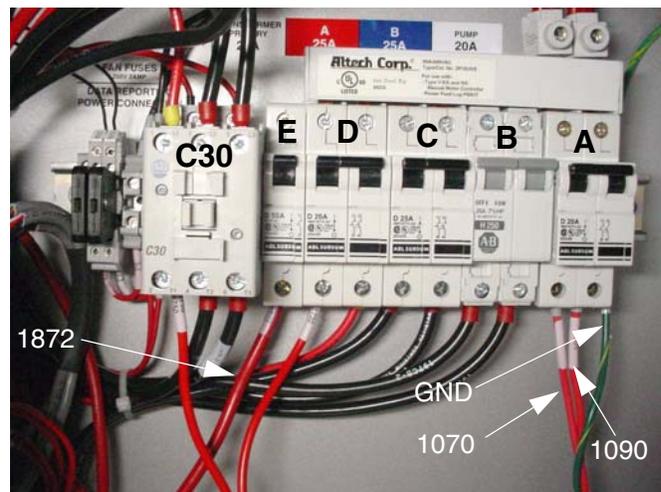


FIG. 17

Connect Heater Wires

Connect Electric Unit Heater Wires

1. Run wires labeled Heater A up through middle of unit and out of box to left side of unit. Ensure wires do not come in contact with fluid tubes.
2. Attach green connector (supplied with kit) to ends of heater wires.
3. Tighten wires and pull on them to ensure they are secure.
4. Insert red wires into green connector, and insert black wires into other side of green connector.
5. Tighten wires and pull on them to ensure they are secure.

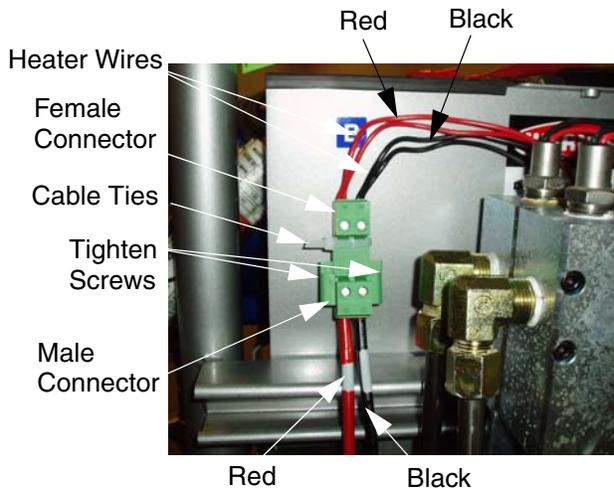


FIG. 18

6. Plug two green connectors together and secure with screws.
7. Use cable ties to keep wires in place.
8. Repeat steps 1-7 for B side of heater.
9. Replace panel on middle of unit. See FIG. 7.
10. Replace heater cover on back of unit.

Connect Hydraulic Unit Heater Wires

Single Heater (8 kW) Unit

1. Run wires labeled Heater A out of opening in right side of unit.
2. Attach green connector (supplied with kit) to ends of heater wires.
3. Tighten wires and pull on them to ensure they are secure.
4. Insert red wires into green connector, and insert black wires into other side of green connector.
5. Tighten wires and pull on them to ensure they are secure.

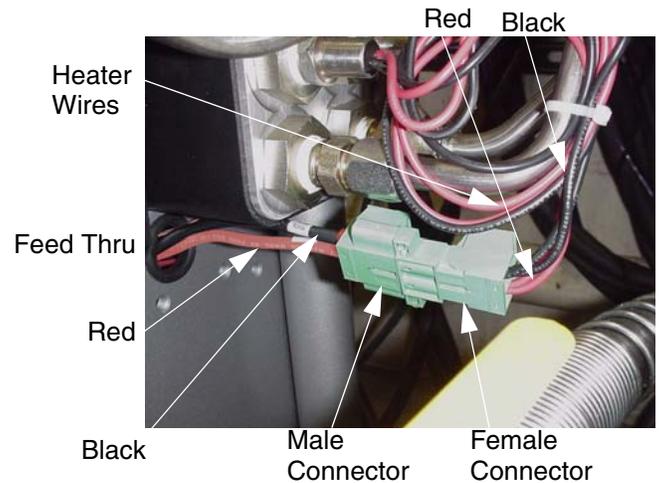


FIG. 19

6. Plug the two green connectors together and secure with screws.
7. Use cable ties to keep wires in place.
8. Repeat steps 1-7 for B side of heater.

 Wires will run out of opening in left side of unit for B heater connection.

9. Replace heater cover on unit after wiring is complete.

Double Heater (15 kW) Unit

1. Run wires labeled Heater A out of opening on left side of heater.
2. Attach green connector (supplied with kit) to ends of heater wires.
3. Tighten wires and pull on them to ensure they are secure.
4. Insert red wires into green connector, and insert black wires into other side of green connector.
5. Tighten wires and pull on them to ensure they are secure.

6. Plug two green connectors together and secure with screws.
7. Repeat steps 1-7 for B side of heater.

 Wires will run out of opening in right side of unit for B heater connection.

8. Replace heater covers on unit after wiring is complete.



FIG. 20

Install Heater Control Panel

1. Plug 4-pin green connector into heater control module. See FIG. 22
2. Plug A and B green connectors into bottom of corresponding heater modules on control panel. See FIG. 21.
3. Connect wire 1980 to hose connector and tighten screw. Pull on wire to ensure it is secure.
4. Plug hose connector into hose heater module on control panel.

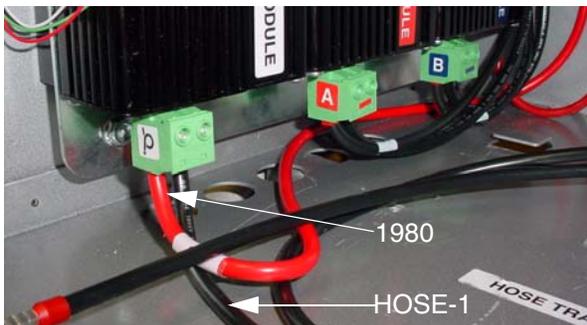


FIG. 21

5. Place control panel assembly on new spacers (supplied with kit) and tighten down with original nuts.
6. Plug new 12-pin green connector into the control heater module on the panel assembly.

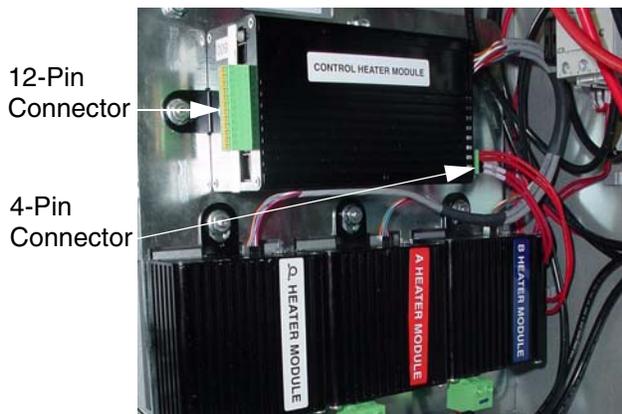


FIG. 22

7. Locate 14-pin green connector that was plugged into old temperature board.

8. Use a flat head screwdriver to remove wires from original 14-pin green connector.
9. Insert original wires into new 12-pin green connector in the following order starting at the top.

 Only 12 of the original 14 wires will be used. Use flat blade screw driver to push in tab when inserting wires.

- A Purple wire 1960
- B Red wire 1950
- C Black (bare) wire GND
- D Yellow wire } B Side
- E Red wire } B Side
- F Blank
- G Yellow wire } A Side
- H Red wire } A Side
- J Green wire 1840
- K Red wire 1831
- L White wire 1821
- M Black wire 1810

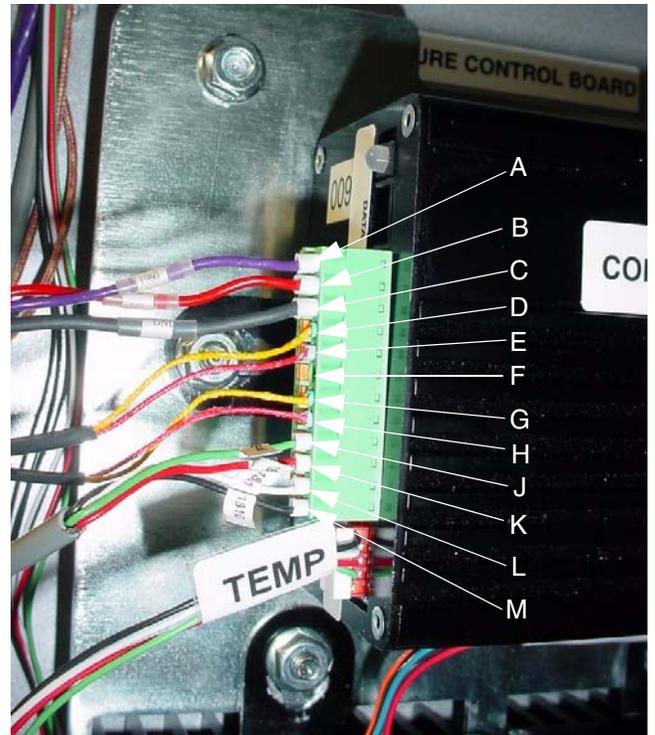


FIG. 23

10. Connect 5-pin connector (TEMP) below 12-pin connector. See FIG. 23.
11. Place cover over 12-pin connector and tighten screws.

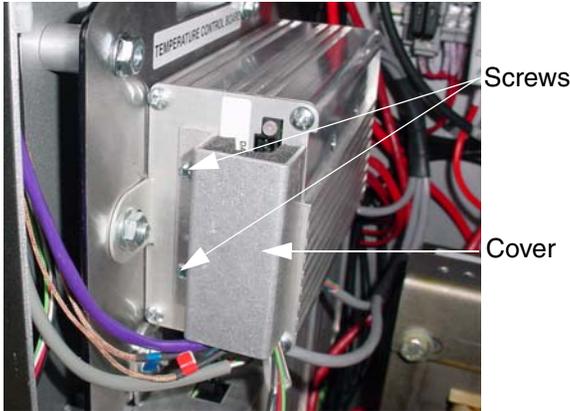


FIG. 24

12. Replace transformer in cabinet. Use original bolts to fasten down transformer.
13. Plug 2-pin transformer connector into 2-pin circuit breaker connector.
14. Connect wire HOSE-1 to transformer using highest tap setting. Depending on transformer unit, wire will be in either #7 or #9 connection. Tighten wire. See FIG. 25.

15. Insert large transformer wire (1818) into top connection of 50 amp circuit breaker. Tighten wire and pull on wire to ensure it is secure.

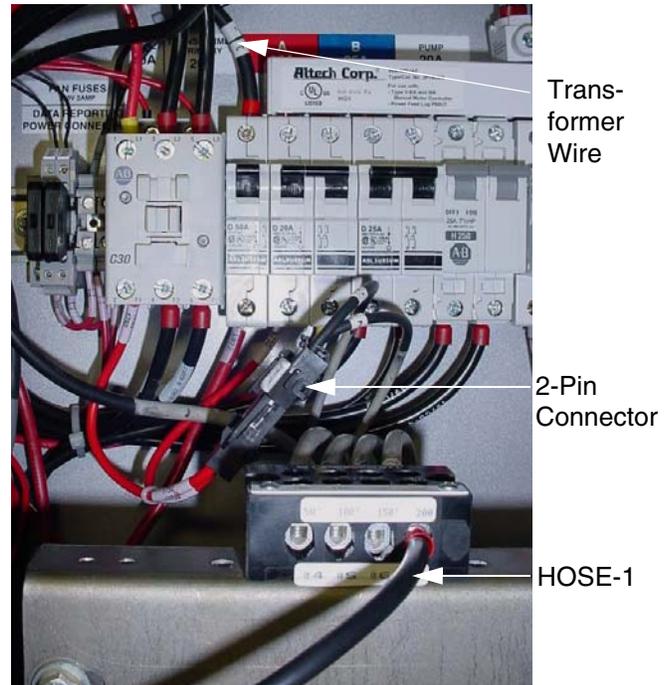


FIG. 25

16. Wrap all wires with cable ties.
17. Clean bottom of chassis. Remove any build up under unit and inside of unit. All openings on bottom of chassis must remain clear.

Verify Upgrade



Refer to the operation manual for complete operating instructions.

1. Turn on all circuit breakers. Plug in unit and turn on disconnect switch.
2. Ensure the display illuminates on both sides. If left side is not illuminated, recheck small 5-pin connector.
3. Ensure green LEDs are illuminated on each heater module. If heater modules are not operating correctly, the LED will be red.
4. Ensure A and B temperature indicators are operating correctly. If error code E4 is displayed, the yellow or red wires in connections D/E or G/H on 12-pin connector are not connected. Connect wires to resolve problem.
5. Ensure thermocouples for each zone are operating correctly. Start A temperature. Temperature should rise only for that zone. If not, switch yellow and red wires in connections D/E and G/H on 12-pin connector.
6. Start hose temperature setting and monitor display for a rising temperature; this could take one to two minutes. If there is not a rise in temperature, ensure green LED on hose heater module is illuminated. Also ensure the 50 amp circuit breaker is on. If it is not on, you will receive error code E3. If error code E4 is displayed, reconnect thermocouple cable.
7. When all temperature zones are operating correctly replace front access cover. The unit is now ready for operation.

Heater Control Upgrade Schematic

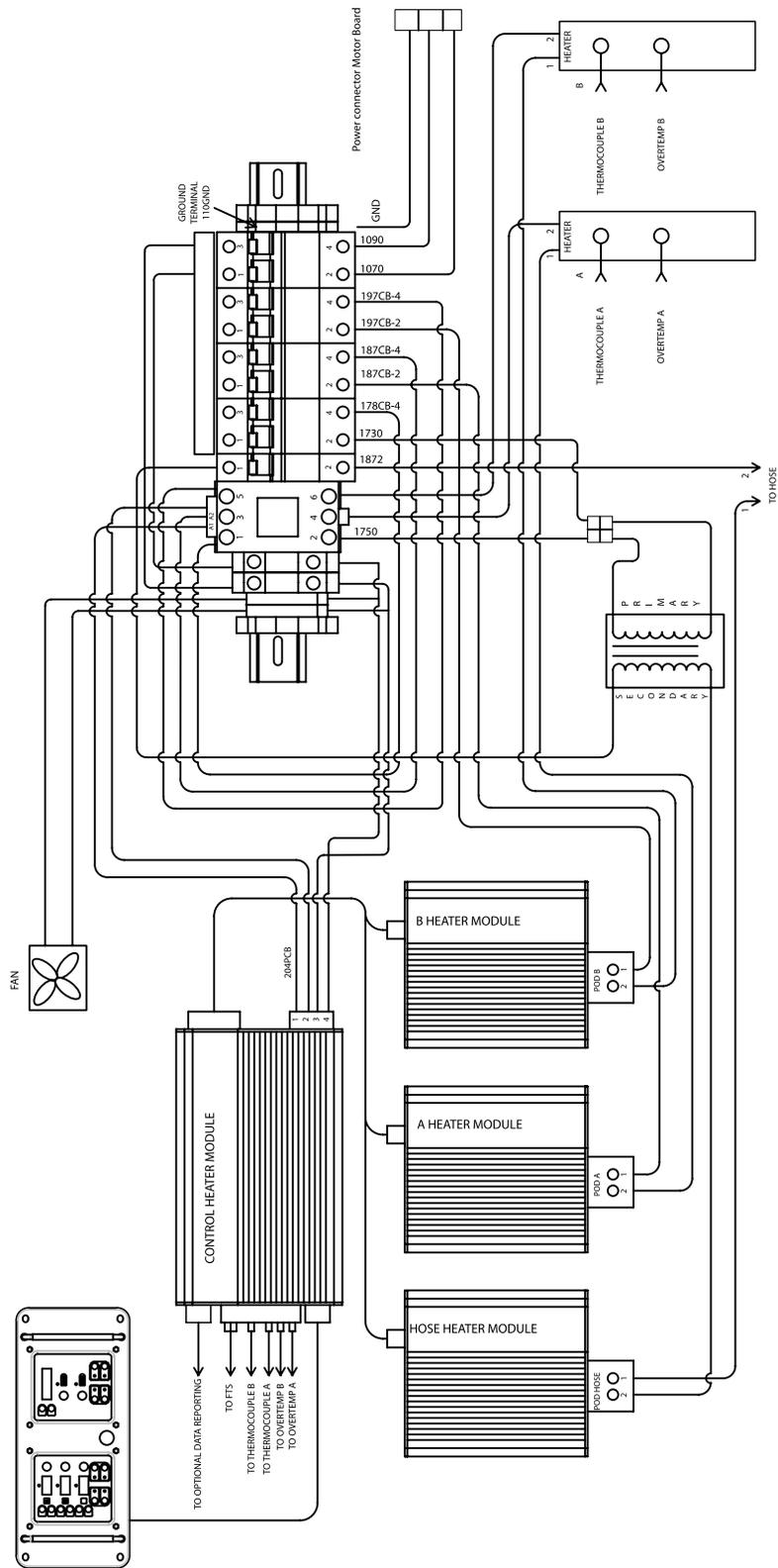


FIG. 26

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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

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

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

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In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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