ROBERTS GORDON®

Revision: RG-DTH-IOM (09-25) 2000536-0

Supersedes: — (Original Version)

DOCKED TRAILER ELECTRIC HEATER INSTALLATION, OPERATION, AND MAINTENANCE

MODEL DTH

⚠ DANGER ⚠

- **Read all instructions before using the unit.**
- **Failure to follow safety warnings exactly could result in serious injury, death, or property damage.**
- **Improper installation, adjustment, alteration, service, or maintenance can cause serious injury, death, or property damage.**
- **Installation and service must be performed by a qualified technician.**
- **Be sure to read and understand the installation, operation, and service instructions in this manual.**
- **This unit has hot parts inside. Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**
- **This unit is hot when in use. To avoid burns, do not let bare skin touch hot surfaces.**
- **Do not operate any unit after it malfunctions. Disconnect power at the service panel and have the unit inspected by a reputable electrician before reusing.**
- **Do not use outdoors.**
- **Do not insert or allow foreign objects to enter any unit opening as this may cause electrical shock, fire, or damage to the unit.**
- **To prevent a possible fire, do not block air intakes or exhaust in any way whatsoever.**
- **Use this unit only as recommended by the manufacturer. Any other use may cause electrical shock, fire, or damage to the unit.**

IMPORTANT INSTRUCTIONS SAVE THESE INSTRUCTIONS

TABLE OF CONTENTS

GENERAL INFORMATION

- This unit has been tested for capacity and efficiency so as to provide many years of safe and dependable comfort providing it is properly installed and maintained. With regular maintenance, this unit will operate satisfactorily year after year. Abuse, improper use, and/or improper maintenance can shorten the life of the appliance and create unsafe hazards.
- To achieve optimum performance and minimize equipment failure, it is recommended that periodic maintenance be performed on this unit. The ability to properly perform maintenance on this equipment requires certain tools and mechanical skills.
- The unit is designed to be mounted in the top of a shipping dock doorway to provide comfort for personnel unloading shipping trailers.

Important Safety Information

Please read all information in this manual thoroughly and become familiar with the capabilities and use of your appliance before attempting to operate or maintain this unit. Pay attention to all dangers, warnings, cautions, and notes highlighted in this manual. Safety markings should not be ignored and are used frequently throughout to designate a degree or level of seriousness.

DANGER: A danger statement describes a potentially hazardous situation that if not avoided, will result in severe personal injury or death and/or property damage.

WARNING: A warning statement describes a potentially hazardous situation that if not avoided, can result in severe personal injury and/or property damage.

CAUTION: A caution statement describes a potentially hazardous situation that if not avoided, can result in minor or moderate personal injury and/or property damage.

NOTE: A note provides important information that should not be ignored.

⚠ DANGER ⚠

Read these instructions carefully before installation and operation of the unit. Failure to adhere to the instructions could result in fire, electric shock, serious personal injury, death, or property damage. Review frequently for continuing safe operation and instruction of future users, if necessary.

⚠ WARNING ⚠

- **Installation should be done by a qualified agency in accordance with these instructions. The qualified service agency installing this unit is responsible for the installation.**
- **This appliance is not intended for use by persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.**
- **Children should be supervised to ensure that they do not play with the appliance.**

⚠ CAUTION ⚠

- **This unit is not approved for use in corrosive atmospheres, wet or very humid locations such as marine green house, or chemical storage areas.**
- **To prevent damage to the unit or to its internal components, it is recommended that two wrenches be used when loosening or tightening nuts. Do not over tighten!**

Warranty

Refer to the limited warranty form in the literature bag provided with the unit. The warranty is void if:

- Wiring is not in accordance with the diagram furnished with the unit.
- The unit is installed without proper clearance to combustible materials.
- The air delivery system is modified.

Certification

This unit is listed by Intertek to UL 2021 and CSA C22.2 #46 for use in the US and Canada.

Installation Codes

This unit must be installed in accordance with local building codes. Local authorities having jurisdiction should be consulted before installation is made to verify local codes and installation procedure requirements.

Dimensions

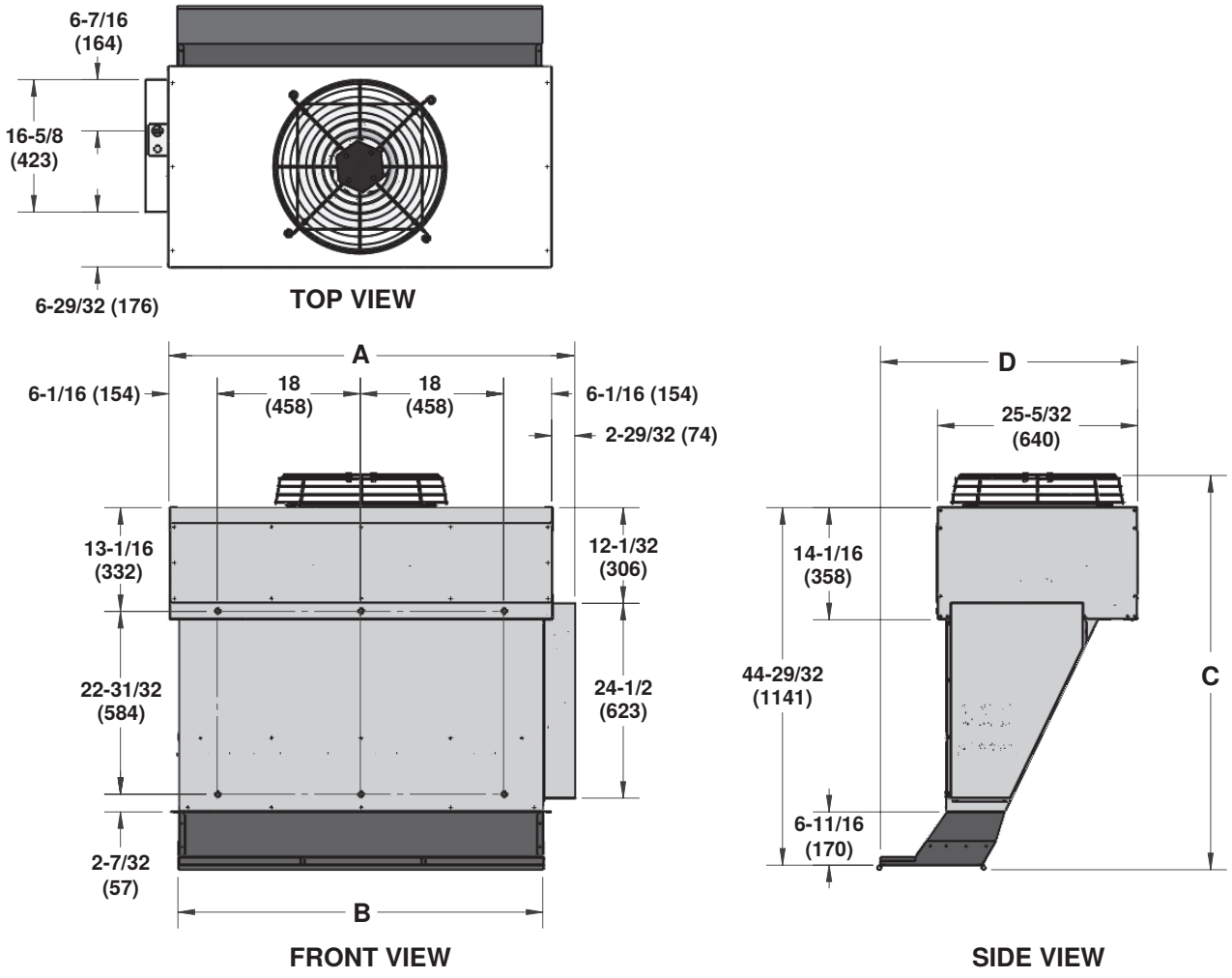


Figure 1. Dimensions (Refer to Table 1)

Table 1. Dimensions			
Dimension (See Figure 1)			
A	B	C	D
Inches (mm)			
51-1/32 (1297)	45-7/8 (1166)	49-9/16 (1259)	32-5/16 (821)

Weights

⚠ DANGER ⚠

Ensure that any lift or hoist used to lift the unit is adequate to support the weight of the unit with packaging (approximately 300 pounds (137 kg)). Ensure that the support structure for mounting the unit is adequate to support the weight of the unit without packaging (approximately 200 pounds (91 kg)). The transformer included with option AK8E adds an additional 75 pounds (34 kg) to both units with packaging and units without packaging.

Clearances

⚠ DANGER ⚠

Keep combustible materials at least 36 inches (915 mm) away from the front of the unit.

The unit must be located so that the clearances listed in **Table 2** are provided for with regards to inspection and service and for proper spacing from combustible construction. Clearance to combustibles is defined as the minimum distance from the unit to a surface or object for which it is necessary to ensure that a surface temperature of 117°F (65°C) above the surrounding ambient temperature is not exceeded. Refer to the dimensions listed in **Table 1** and shown in **Figure 1** when determining clearances to combustibles.

Table 2. Clearances to Combustibles

Unit Surface	Minimum Clearance (Inches (mm))
Top (from fan guard)	36 (915)
Sides	21 (533)
Back (non-discharge side)	
Front (discharge side)	1 (26)
Bottom	0 (0)

Unit Location

⚠ WARNING ⚠

While in operation, the unit is hot and may cause burns if touched.

⚠ CAUTION ⚠

Do not locate the unit where it may be exposed to water spray, rain, or dripping water.

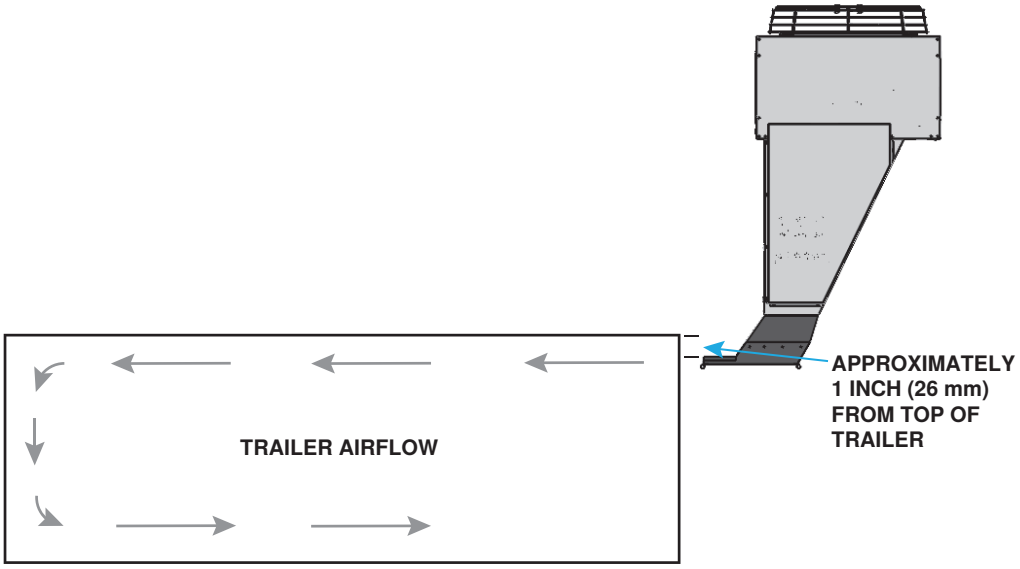


Figure 2. Unit Location

INSTALLATION

Unpacking and Inspection

The unit was test-operated and inspected at the factory prior to crating and was in operating condition. If, upon removing it from its crate, the unit has been found to have incurred any damage in shipment, document the damage with the transporting agency and contact an authorized Factory Distributor. If you are an authorized Distributor, follow the FOB freight policy procedures.

Pre-Installation Checklist

- ❑ Check the rating plate for the electrical characteristics of the unit to ensure that they are compatible with the electric supply at the installation site.
- ❑ Read this manual and become familiar with the installation requirements.
- ❑ If you do not have knowledge of local requirements, check with the local agencies who might have requirements concerning this installation.
- ❑ Before beginning, make preparations for necessary supplies, tools, and manpower.

Unit Mounting

⚠ DANGER ⚠

- **Before suspending the unit, check the supporting structure to be used to verify that it has sufficient load-carrying capacity to support the weight of the unit (refer to Weights section). DO NOT add additional weight to a suspended unit.**

NOTE: The unit is shipped secured to the shipping pallet. Keep the unit secured to the pallet until it is lifted and secured to its mounting location.

1. Remove screws that secure electrical compartment cover to unit and remove cover (see **Figure 3**).

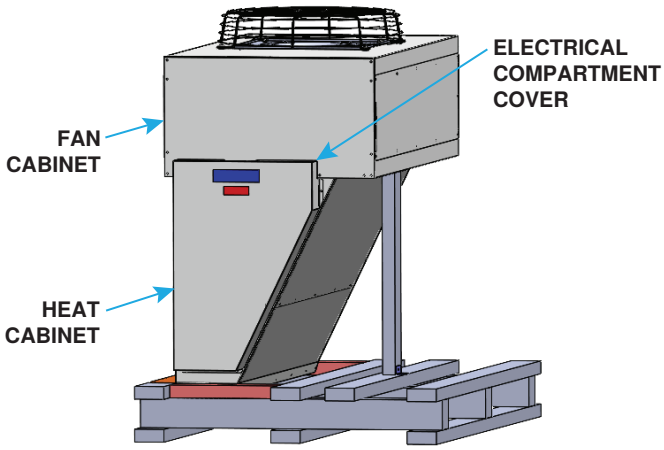


Figure 3. Shipping Pallet with Unit

NOTE: It is recommended that the unit be mounted using the mounting hardware provided, but it can be mounted using field-supplied hardware.

2. Install mounting rails with wall mounts on unit as shown in **Figure 4**. For optimum dispersion of heat in trailer, install rails so that unit is mounted as far left or right in door opening width as is possible. Secure rails to unit using provided hardware—3/8-inch flat washers and 3/8-16 × 3-inch bolts—in nutserts in unit's six rail mount holes as shown.

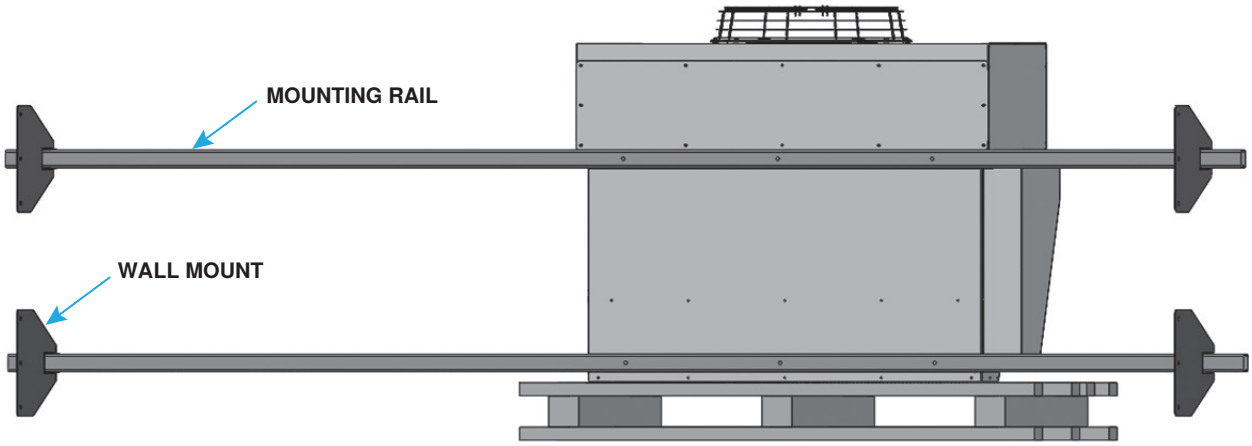


Figure 4. Mounting Rails and Wall Mounts

NOTE: Air dispersion is improved by mounting the unit as far left in the door opening width as is possible. Mounting rails are designed so that adjustment is possible left to right. Wall mounts are designed so that adjustment is possible front to back. The location of the wall mounts must be determined and the unit must be secured to the wall before the canvas discharge nozzle is installed on the unit.

3. Determine unit location so that top of canvas discharge nozzle will be approximately 1 inch (26 mm) below top of docked trailer door opening (see **Figure 2**). Refer to **Figure 5** for mounting hole dimensions.

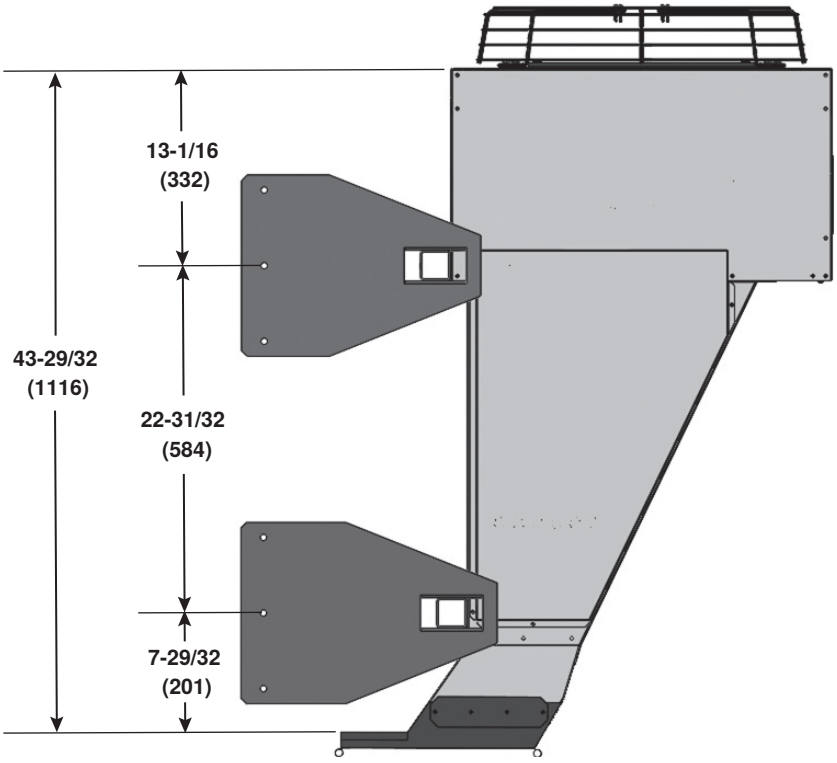


Figure 5. Determining Unit Location

Unit Mounting—Continued

NOTE: The wall mounts are secured to the inside angle brackets.

4. Using suitable lift or hoist, lift unit into position determined in step 3 and mark mounting hole locations for inside angle brackets and outside wall plates (see **Figure 6**). Drill holes through wall as necessary and secure angle brackets and wall plates using field-supplied 1/2-inch nuts, lockwashers, and bolts.

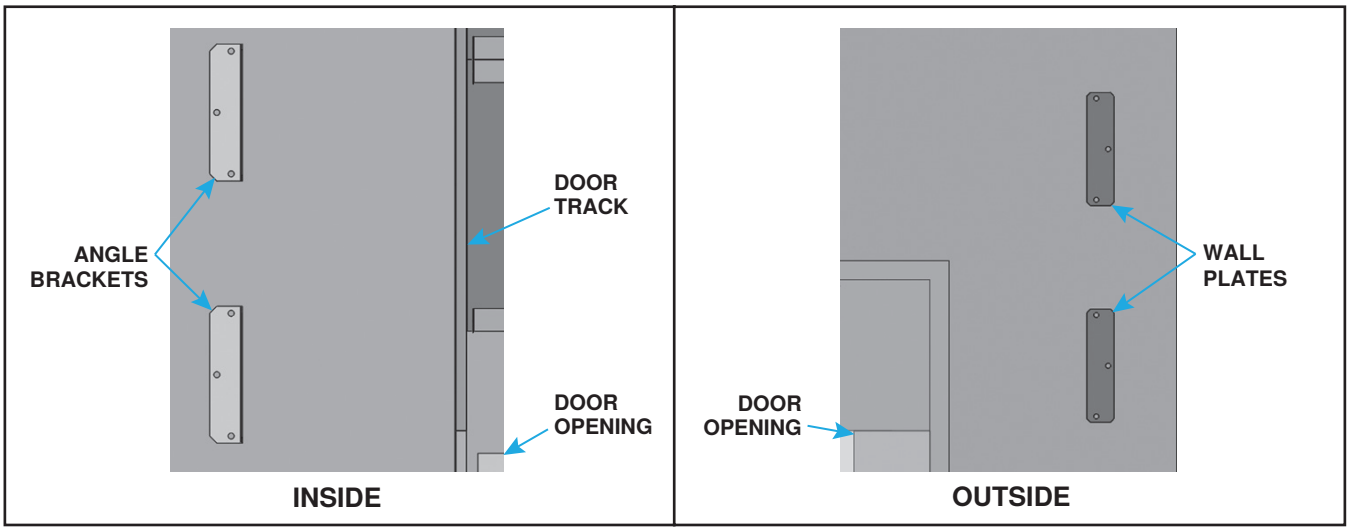


Figure 6. Inside Angle Brackets and Outside Wall Plates

5. Secure wall mounts to inside angle brackets using provided hardware: 3/8-inch nuts and lockwashers and 3/8-16 × 1-inch bolts.
6. Secure wall mounts to mounting rails using provided hardware: 3/8-inch nuts and lockwashers and 3/8-16 × 3-inch bolts.
7. Remove screws that secure shipping pallet and its vertical support to unit and remove pallet and vertical support. Re-install vertical support screw in unit.
8. Using #10 screws, install discharge duct to bottom of unit as follows (see **Figure 7**). Ensure that back panel of unit overlaps rear and side duct panels as shown.
   a. First, install front duct panel.
   b. Second, install rear duct panel.
   c. Third, install side duct panels.

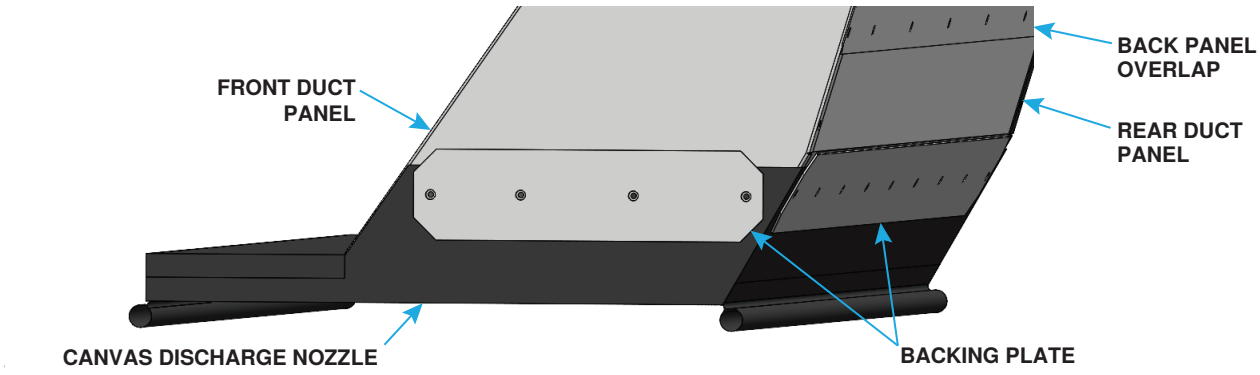


Figure 7. Discharge Duct and Canvas Discharge Nozzle

9. Install and secure canvas discharge nozzle (see **Figure 7**) to duct using backing plates and #10 screws.

Electrical Connections

⚠ CAUTION ⚠

- **Ensure that Ground Fault Overcurrent Protection (GFOC) and the Short Circuit Current Rating (SCCR) are adequate and provided for at the installation location.**
- **Ensure that all wiring is in accordance with the wiring diagram (refer to APPENDIX: WIRING DIAGRAMS) provided with the unit.**
- **All electrical wiring and connections, including electrical grounding MUST BE made in accordance with the *National Electric Code* (ANSI/NFPA No. 70, latest edition) or, in Canada, the *Canadian Electric Code* (Part 1, CSA C.22.1, latest edition). In addition, the installer should be aware of any local ordinances that might apply.**
- **All external wiring MUST BE within approved conduit and have a minimum temperature rise rating of 140°F (60°C). Conduit must be run so as not to interfere with the access panel.**

Refer to **Figure 8** or **Figure 9** and make connections in accordance with the wiring diagram provided with the unit as follows:

NOTE: Check the rating plate for supply voltage and current requirements. A dedicated line voltage supply with a disconnect switch (option CP3, CP21, CP23, CP41, or CP43 or field-supplied) should be run directly from the main electrical panel to the unit.

1. Route supply wiring through supply wiring entrance and connect to supply wiring terminal block.
2. Route wiring for HEAT ON/FAN ONLY control through control wiring entrance and connect to control wiring terminal block.
3. Close and secure electrical cover.
4. For 600V (18kW or 30kW) units, install factory-wired 600V transformer in accordance with **600V Transformer Installation** section.

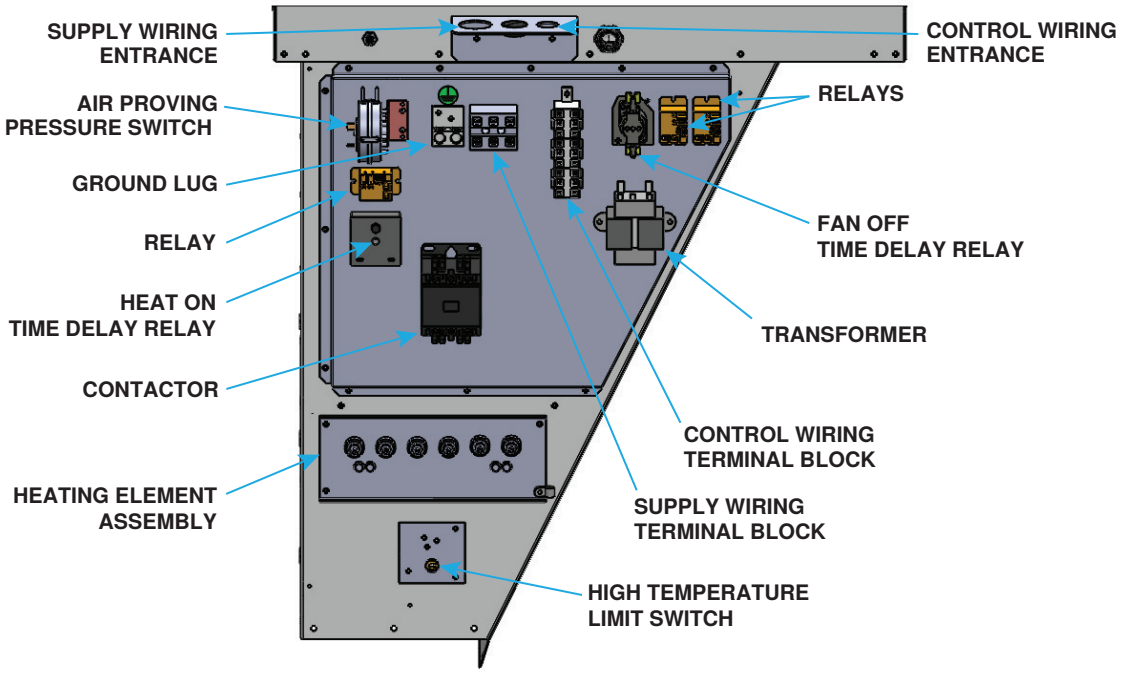


Figure 8. Electrical Compartment for 240V (18kW) and 600V (18kW) Units

Electrical Connections—Continued

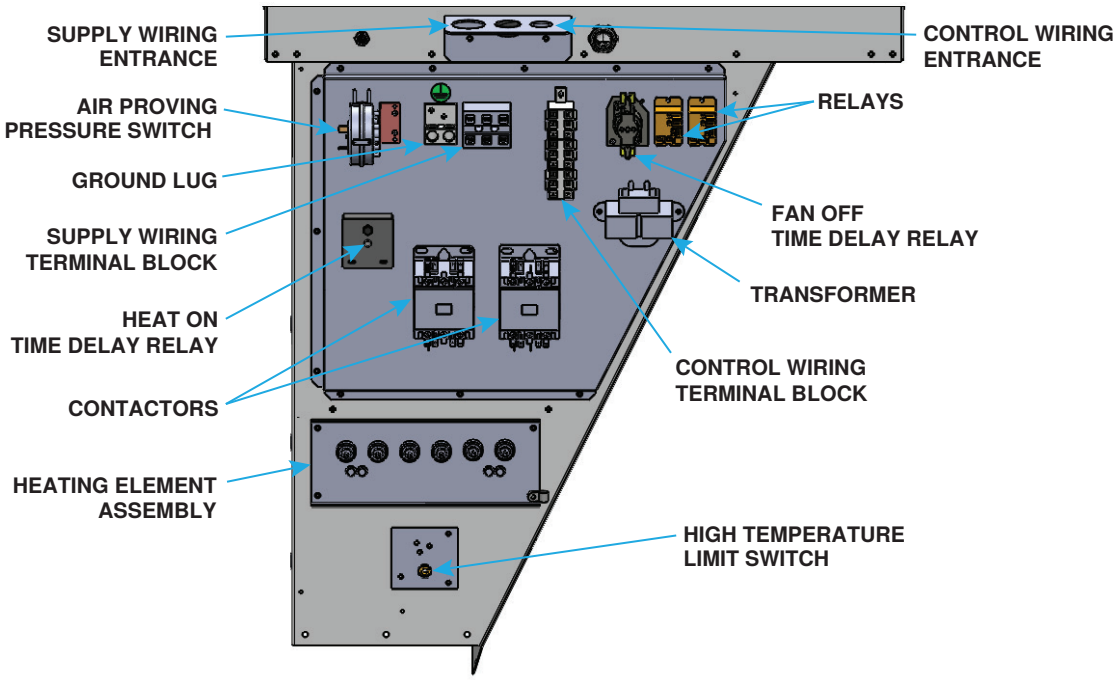


Figure 9. Electrical Compartment for 480V (18kW et 30kW) and 600V (30kW) Units

600V Transformer Installation

600V units are shipped with a factory-wired 600V transformer that requires field-mounting. Install the transformer as follows:

NOTE: The transformer is screwed to the pallet for shipping and is factory-wired with conduit running into the electrical compartment.

1. Remove transformer from shipping pallet and position on top fan cabinet panel as shown in **Figure 10**.
2. Align transformer mounting holes with nutserts in top fan cabinet panel.
3. Secure transformer to top fan cabinet panel using provided 1/4-20 × 3/4-inch bolts and 1/4-inch lockwashers.

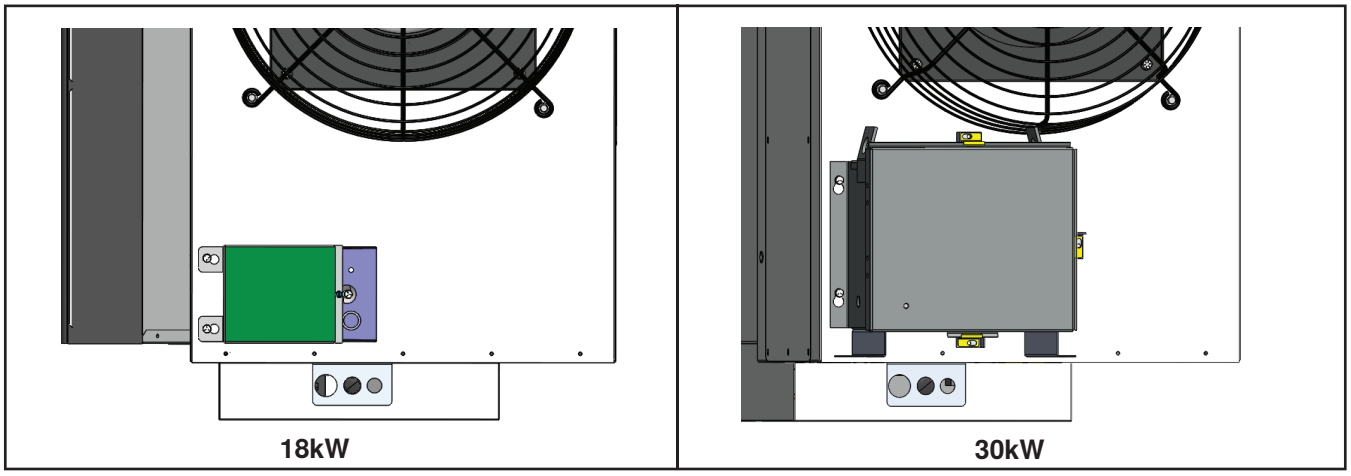


Figure 10. 600V Transformer Installation

Disconnect Switch (Options CP3, CP21, CP23, CP41, and CP43)

A disconnect switch is available as optional equipment or it may be field-supplied. Install the switch in accordance with the *National Electric Code* (ANSI/NFPA 70) or, in Canada, the *Canadian Electric Code* (Part 1, CSA C.22.1) and ensure that conduit and the switch housing are clear of all service doors.

Manual HEAT ON/FAN ONLY Control

A field-installed wall-mounted HEAT ON/FAN ONLY control assembly (see **Figure 11**) is provided with each unit. The control assembly has two green pushbuttons—HEAT ON and FAN ONLY.

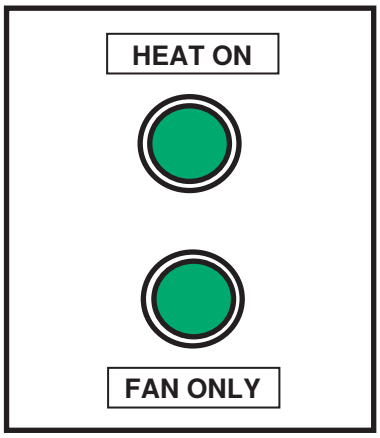


Figure 11. Manual HEAT ON/FAN ONLY Control

Air Proving Pressure Switch

⚠ WARNING ⚠

The automatic-reset air proving pressure switch will continue to shut down the unit until the cause is corrected. Never bypass this switch as hazardous conditions could result.

All units are equipped with a normally-open automatic-reset air proving pressure switch (see **Figure 8** or **Figure 9**) that senses air pressure provided by fan operation. The switch is factory-set and is non-adjustable. When the setpoint is satisfied, the switch allows electric supply to the heating elements. This safety device provides protection in the case of fan motor failure or lack of airflow due to a restriction at the inlet or outlet.

High Temperature Limit Switch

⚠ WARNING ⚠

The automatic-reset high temperature limit switch will continue to shut down the unit until the cause is corrected. Never bypass this switch as hazardous conditions could result.

All units are equipped with a normally-closed temperature-activated, automatic-reset high temperature limit switch (see **Figure 8** or **Figure 9**). The switch is factory-set and is non-adjustable. If the setpoint is reached, the switch interrupts the electric supply to the heating elements. This safety device provides protection in the case of fan motor failure or lack of airflow due to a restriction at the inlet or outlet.

Fan Motor

The fan motor is equipped with automatic-reset thermal overload protection. If the motor does not run, the cause may be due to improper voltage. Ensure that the correct voltage is available at the motor.

OPERATION

Pre-Startup Checklist

Check the following ***before*** startup:

- ❑ Check to ensure that all screws used to secure shipping brackets have been re-installed in cabinet.
- ❑ Check suspension—unit must be secure and level.
- ❑ Check to ensure that clearances from combustibles are in accordance with **Table 2**.
- ❑ Check electrical wiring—ensure that all wire gauges are as recommended—service disconnect switch should be used—verify that fusing or circuit breakers are adequate for load use.
- ❑ Check polarity—verify that line voltage exists between all power wires and earth ground.
- ❑ Place literature bag that contains limited warranty form, this manual, and any control or optional information in accessible location near unit.

Startup

Start up the unit as follows:

1. Turn ON electric power to unit—green status indicator light on rear bottom of fan cabinet is illuminated.
2. To heat cold trailer, run unit in heating and fan mode:
   a. Press HEAT ON pushbutton—green pushbutton is illuminated.
   b. Fan is energized, air proving pressure switch closes, and heating elements are energized when 6-second HEAT ON time delay relay is satisfied.
   c. Heating elements remain energized until HEAT ON pushbutton is pressed again.
   d. Fan remains energized to cool heating elements until 20-second FAN OFF time delay relay is satisfied.
3. To cool hot trailer, run unit in fan mode:
   a. Press FAN ONLY pushbutton—green pushbutton is illuminated.
   b. Fan is energized and remains energized until FAN ONLY pushbutton is pressed again.

MAINTENANCE

⚠ WARNING ⚠

- **Ensure that the disconnect switch is OFF before servicing the unit.**
- **Wait until the housing and heating elements cool before performing maintenance.**
- **Eye protection is recommended when cleaning unit.**

⚠ CAUTION ⚠

- **If any of the original wire supplied with the unit must be replaced, the wiring material must have a temperature rating of at least 220°F (105°C).**
- **Ensure that all wiring is in accordance with the wiring diagram provided with the unit.**

NOTE: To ensure long life and satisfactory performance, a unit that is operated under normal conditions should be inspected and cleaned at the start of each heating season. If the unit is operating in an area where an unusual amount of dust or soot or other impurities are present in the air, more frequent maintenance is recommended.

The unit is designed to operate with a minimum of maintenance. However, to ensure long life and satisfactory performance, routine service is recommended. When servicing, follow standard safety procedures and the specific instructions and warnings in this manual.

Service Checklist

The following section is designed to aid a qualified service person in maintaining and servicing this equipment. At a minimum, perform the following annually:

- ❑ Clean all dirt, lint, and grease from fan blade, fan guard, and motor.
- ❑ Replace any parts that do not appear sound.
- ❑ Check for any damaged wiring and replace as necessary.

Maintenance Procedures

⚠ CAUTION ⚠

- **When any service is completed, ensure that the unit is reassembled correctly so that no unsafe conditions are created.**
- **If replacement parts are required, use only factory-authorized parts.**

Electrical Component Replacement

Use a voltmeter to verify that there is 24V output from the transformer. If the transformer is not functioning, it must be replaced. If it is determined that an electrical component needs replacing, use only the factory-authorized replacement part that is designed for the unit.

Fan and Motor Assembly Maintenance

Inspect and clean the motor, fan guard, and blades. Remove any dirt and grease. Take care when cleaning the fan blades so as not to cause misalignment or imbalance. Check to ensure that there are no signs of damage or excessive wear to the fan and motor assembly. If necessary, replace the assembly as follows:

1. Turn OFF electric power to unit.
2. Remove and save screws that secure fan guard to top of fan cabinet (see **Figure 3**) and remove fan guard.
3. Remove fan access door from back of fan cabinet and disconnect existing fan motor wires and ground screw wire .
4. Remove and save screws that secure existing fan and motor assembly to top of fan cabinet and remove fan and motor assembly.
5. Install replacement fan and motor assembly in opening in top of fan cabinet and connect fan motor wires and ground screw wire in accordance with wiring diagram provided with unit.
6. Secure replacement fan and motor assembly to top of fan cabinet using screws removed in step 4.
7. Re-install fan access door removed in step 3.
8. Turn ON electric power to unit and check for proper operation.

Maintenance Procedures—Continued

Heating Element Assembly Maintenance

Inspect heating element assembly (see **Figure 8** or **Figure 9**) for signs of damage or excessive wear. If necessary, replace the assembly as follows:

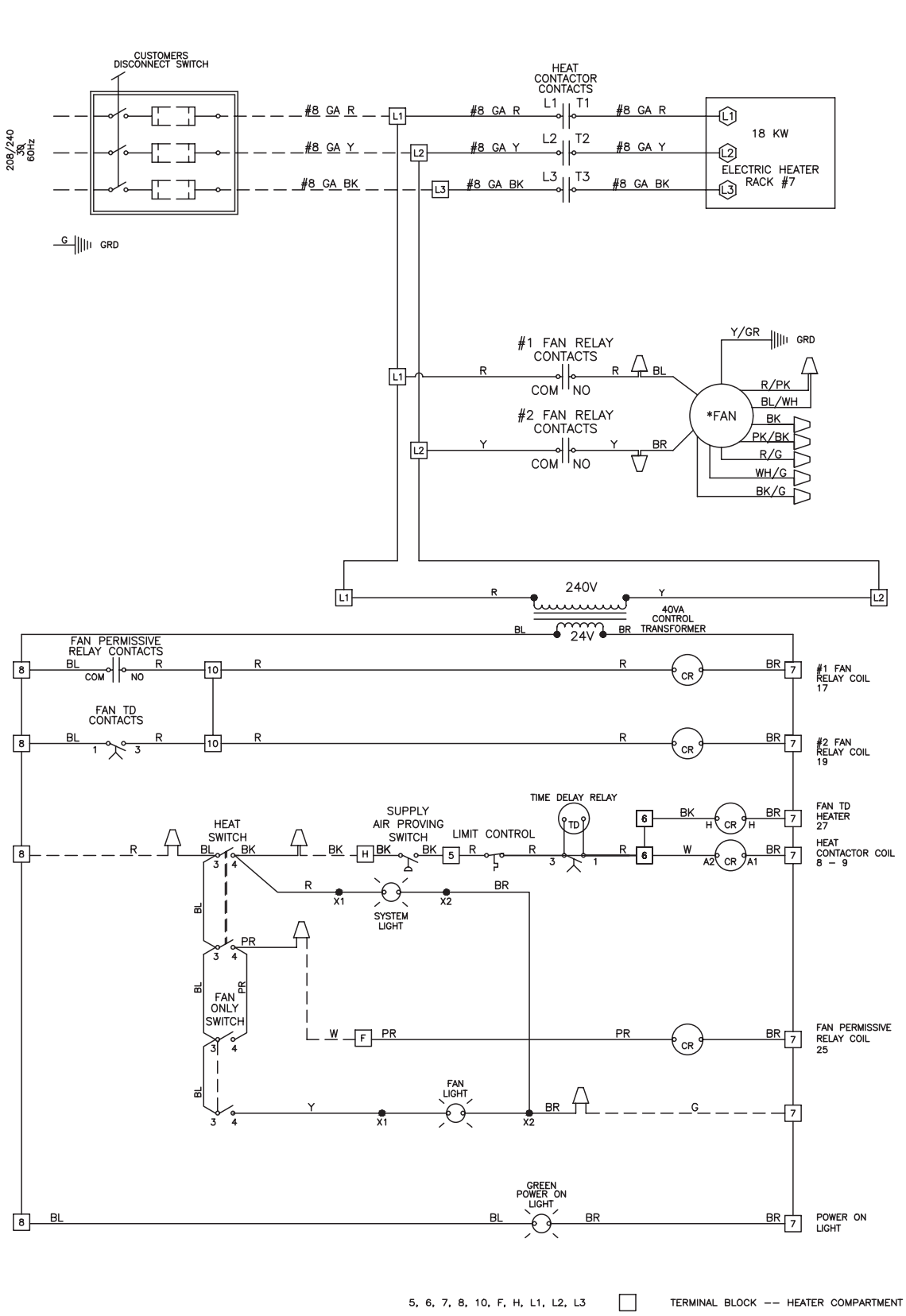
1. Turn OFF electric power to unit.
2. Remove and save screws that secure electrical compartment cover to side of heat cabinet (see **Figure 3**) and remove cover.
3. Mark and disconnect existing heating element wires.
4. Remove and save screws that secure existing heating element assembly to side of heat cabinet and remove heating element assembly.
5. Install replacement heating element assembly in opening in side of heat cabinet and secure replacement heating element assembly to side of heat cabinet using screws removed in step 4.
6. Reconnect heating element wires removed in step 3 in accordance with wiring diagram provided with unit.
7. Re-install electrical compartment cover removed in step 2.
8. Turn ON electric power to unit and check for proper operation.

TROUBLESHOOTING

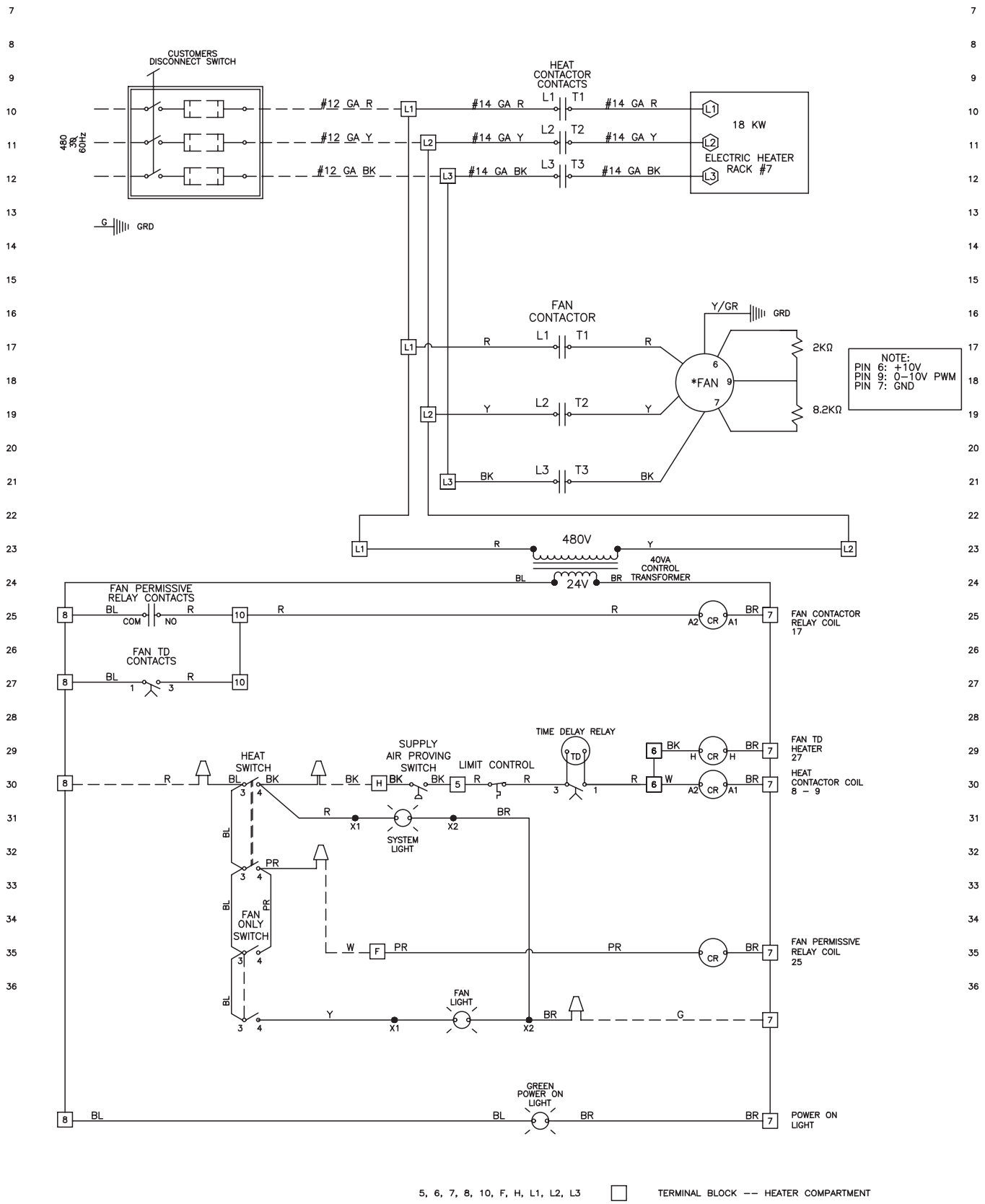
Table 3. Troubleshooting

Symptom	Probable Cause	Remedy
A. Unit will not start	1. No power to unit	Turn ON power and check supply fuses or circuit breaker
	2. No power to fan motor	Tighten connections at motor terminals
	3. No 24V power to manual HEAT ON/FAN ONLY control	Check control transformer output
		Replace transformer as necessary
	4. Defective fan motor	Replace fan and motor assembly
B. No heat (fan operating)	1. Poor airflow	Clean fan and motor assembly and fan guard
		Ensure that discharge nozzle is not blocked
	2. Defective electrical component (pressure switch, limit switch, relay, or contactor)	Replace electrical component(s) as necessary
	3. Defective heating element	Replace heating element
C. Fan motor will not run	1. Circuit open	Check wiring and connections
	2. Defective electrical component (pressure switch, limit switch, relay, or contactor)	Replace electrical component(s) as necessary
	3. Defective fan motor	Replace fan and motor assembly
D. Fan motor cuts out on overload	1. Poor airflow	Clean fan and motor assembly and fan guard
		Ensure that discharge nozzle is not blocked
	2. Low or high voltage supply	Correct electric supply
	3. Defective fan motor	Replace fan and motor assembly

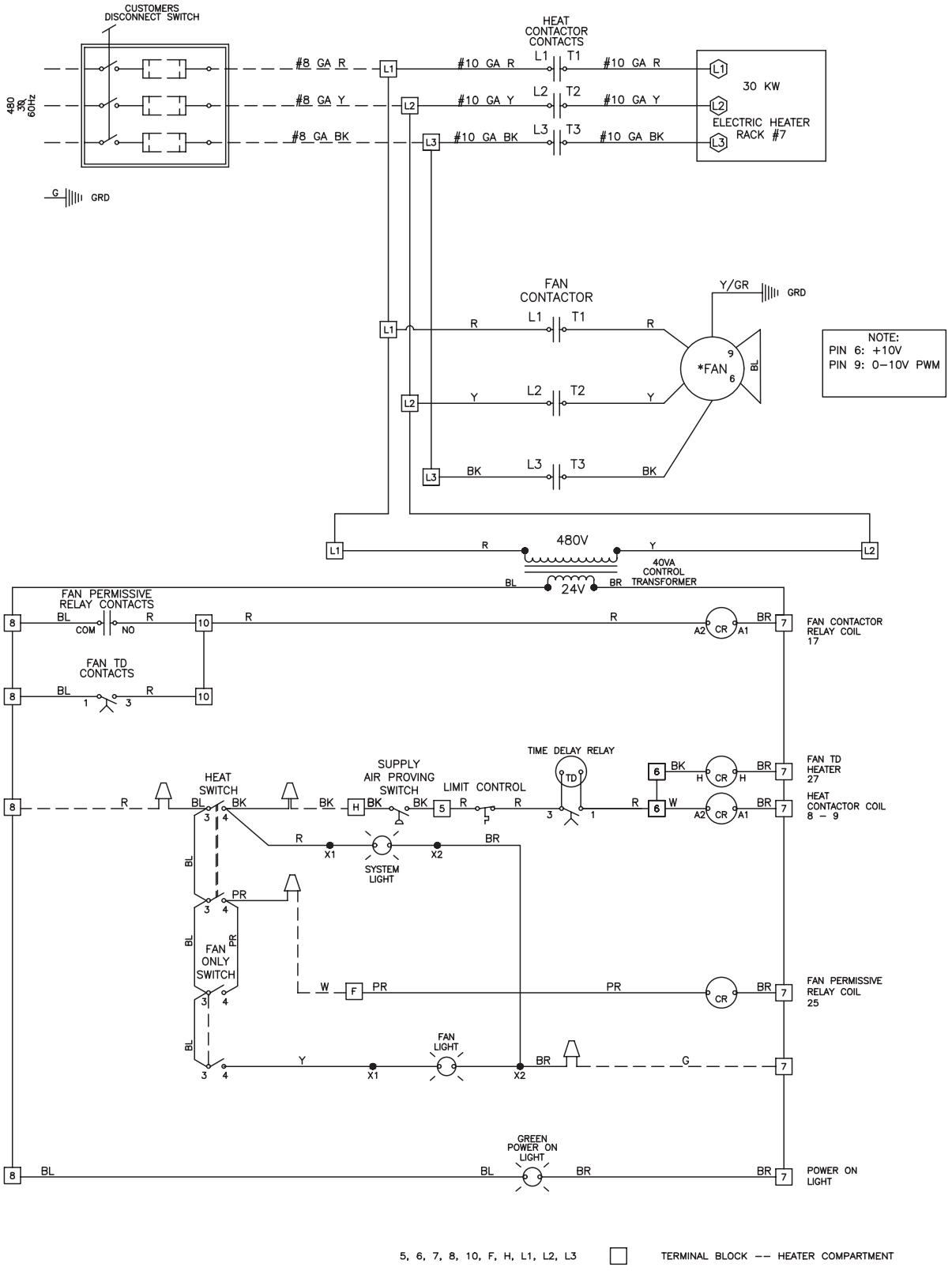
APPENDIX: WIRING DIAGRAMS



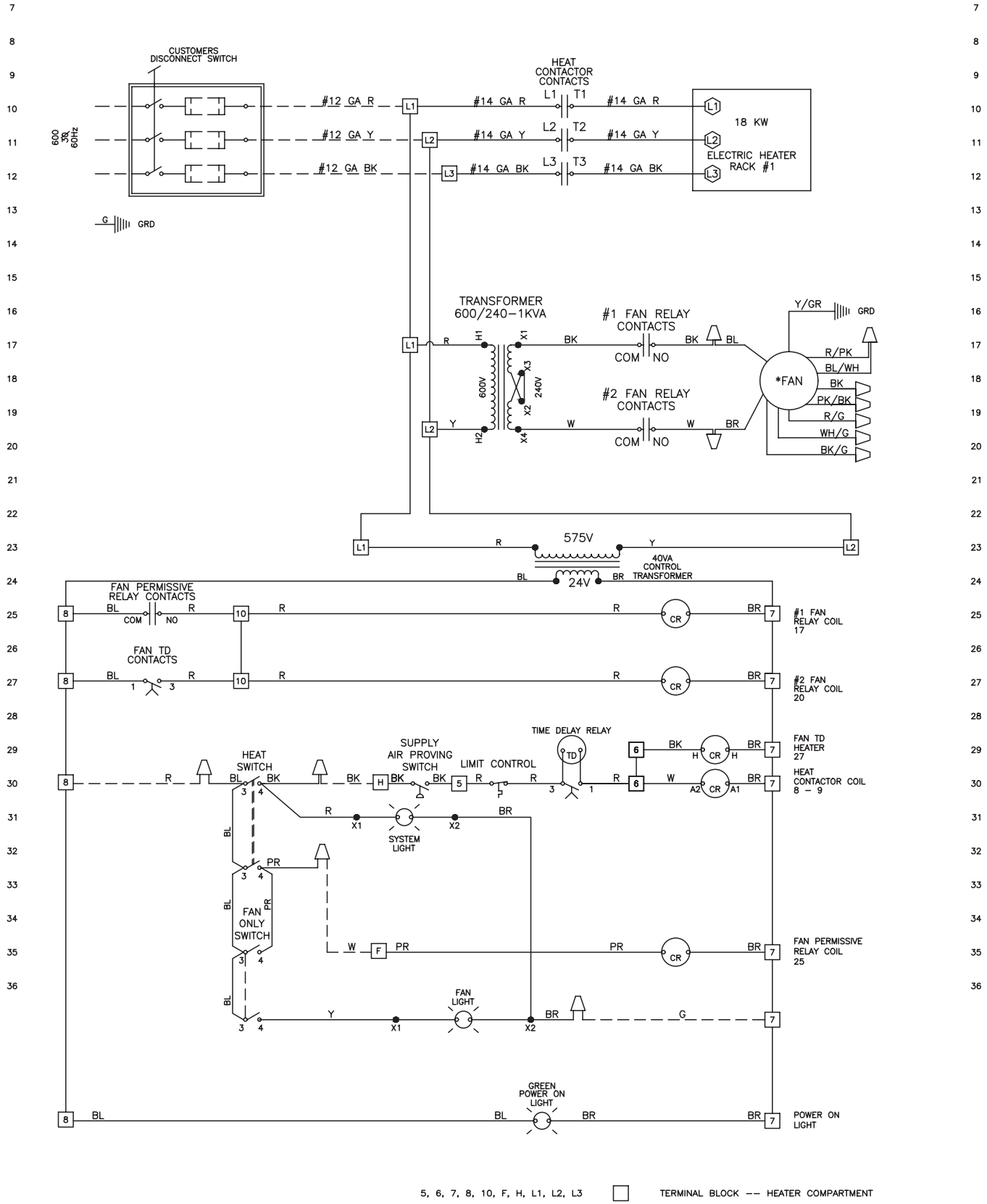
AK20 Wiring Diagram for 208V-240V 18kW Unit



AK7E Wiring Diagram for 480V 18kW Unit

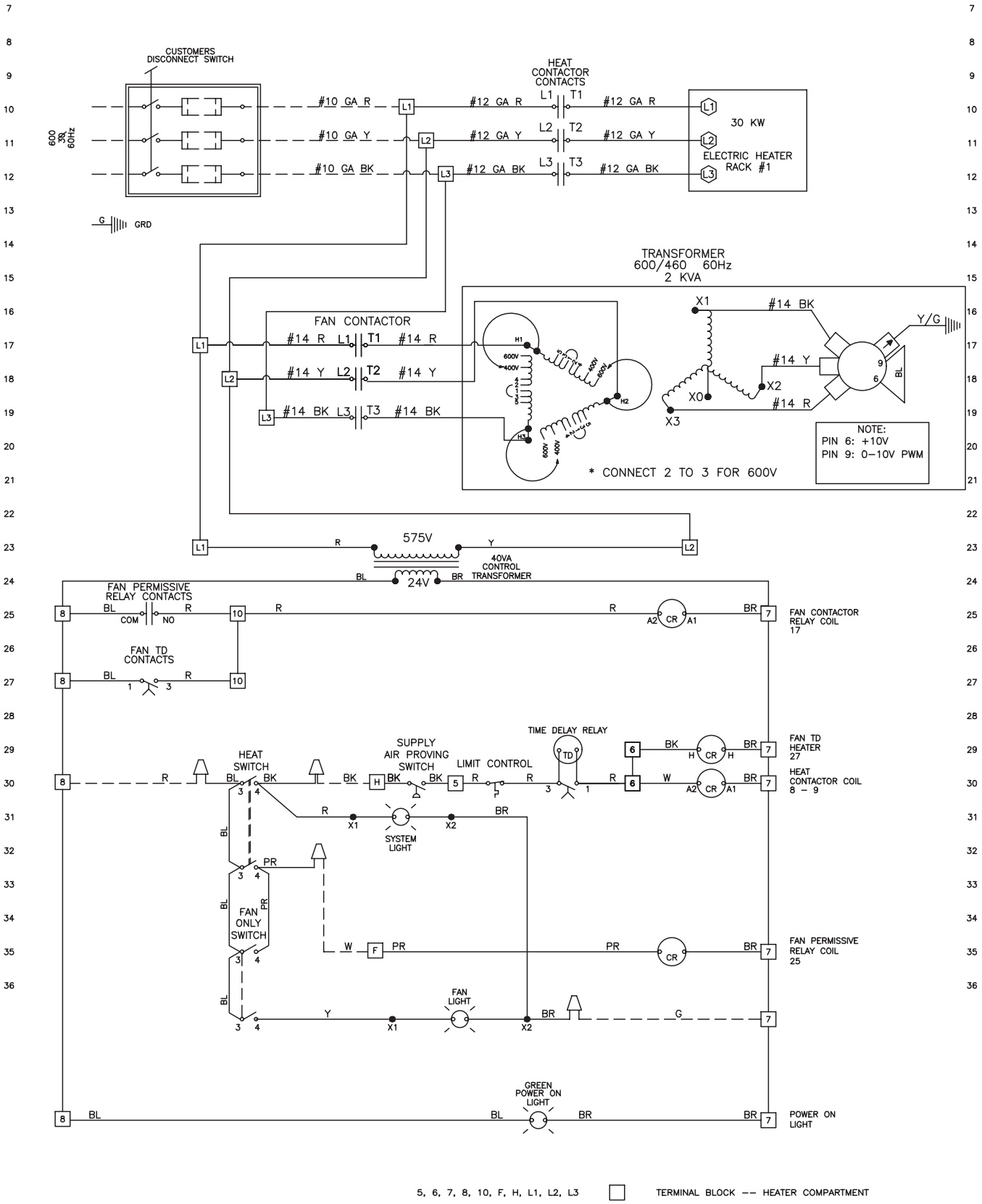


AK7E Wiring Diagram for 480V 30kW Unit



AK8E Wiring Diagram for 600V 18kW Unit

NOTE: The 600V 18kW unit is shipped with a factory-wired 600V transformer.



AK8E Wiring Diagram for 600V 30kW Unit

NOTE: The 600V 30kW unit is shipped with a factory-wired 600V transformer.

INSTALLATION RECORD (TO BE COMPLETED BY INSTALLER)

For service or repair, contact the Installer. For additional assistance, contact the Distributor. For more information, contact your Factory Representative.

Model	Serial No.	Date of Installation	Notes
	Installer	**Distributor**	
Name			
Company			
Address			
Phone No.			

Intertek

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