

OWNERS MANUAL

ELECTRIC HEATER

VH - _ _ E _ - _

PNEG-269

✓OK

- _____ 1. All wire connections
- _____ 2. Fuse in place, extra fuse provided
- _____ 3. Indicator lights
- _____ 4. Unit cycles on to off with thermostat
- _____ 5. Hi-coil or coils
- _____ 6. Heat up
- _____ 7. Lo-coil heats up

Tester Signature _____

Date _____



This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

Roof Warning, Operation & Safety	4
Safety Alert Decal	5
Electric Heater Installation	6
Checklist Before Installing Electric Heater	6
Installation Instructions	6
Heater Specifications	7
Heater Electrical Installation (230V Fans)	8
Machine To Earth Grounding	9
Proper Installation Of Ground Rod	9
Electric Heater Operation	10
Start Up	10
Service	10
Troubleshooting Chart	10
Electric Heater Parts	11
18" Electric Heater	11
18" Electric Heater Control Box (2 Element)	12
24" Electric Heater	13
24" Electric Heater Control Box (2 Element)	14
28" Electric Heater	15
28" Electric Heater Control Box (3 Element)	16
Electric Heater Wiring	17
240V 1 Phase 2 Element	17
240V 1 Phase 3 Element	18
230V 3 Phase Schematic and Wiring	19
460V 3 Phase Schematic and Wiring	20
Notes	21
Warranty	22

SAFETY FIRST**General Safety Statements**

The GSI Group Inc's Principal concern is your safety and the safety of others associated with grain handling equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist and inform all personnel associated with, or in the area of the product. Safety precautions may be required from the personnel. This product is ideal for the conditioning of corn, soy beans or other select grains. Avoid any alteration to the equipment, such alterations may produce a very dangerous situation, where serious injury or death may occur.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION**

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

If a decal is damaged or missing contact:

The GSI Group Inc.
1004 E. Illinois St.
Assumption, IL 62510
217-226-4421

A free replacement will be sent to you.

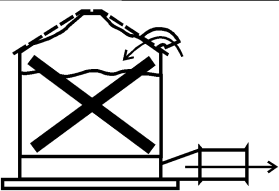
**BE ALERT!****Danger!**

Personnel operating or working around electrical equipment should read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

The GSI Group Inc. recommends that you contact your local power company and have a representative review your installation so your wiring will be compatible with their system and so that you will have adequate power supplied to your unit.

Roof Damage Warning And Disclaimer

⚠ CAUTION!



Excessive vacuum (or pressure) may damage roof. Use positive aeration system. Make sure all roof vents are open and unobstructed. Start roof fans when supply fans are started. Do not operate when conditions exist that may cause roof vent icing.

DC-969

GSI DOES NOT WARRANT ANY ROOF DAMAGE CAUSED BY EXCESSIVE VACUUM OR INTERNAL PRESSURE FROM FANS OR OTHER AIR MOVING SYSTEMS. ADEQUATE VENTILATION AND/OR "MAKEUP AIR" DEVICES SHOULD BE PROVIDED FOR ALL POWERED AIR HANDLING SYSTEMS. GSI DOES NOT RECOMMEND THE USE OF DOWNWARD FLOW SYSTEMS (SUCTION). SEVERE ROOF DAMAGE CAN RESULT FROM ANY BLOCKAGE OF AIR PASSAGES. RUNNING FANS DURING HIGH HUMIDITY/COLD WEATHER CONDITIONS CAN CAUSE AIR EXHAUST OR INTAKE PORTS TO FREEZE.



⚠ WARNING

Stay clear of rotating blade. Blade could start automatically. Can cause serious injury. Disconnect power before servicing.

DC-1225



⚠ WARNING

Flame and pressure beyond door. Do not operate with service door removed. Keep head and hands clear. Can cause serious injury.

DC-1227

⚠ DANGER!



High voltage. Will cause serious injury or death. Lockout power before servicing.

DC-1224

⚠ DANGER



Rotating flighting can kill or dismember.



Flowing material can trap and suffocate.



Crusted material can collapse and suffocate.

Keep clear of all augers. DO NOT ENTER this bin!

If you must enter this bin:

1. Shut off and lock out all power.
2. Use safety harness and safety line.
3. Station another person outside the bin.
4. Avoid the center of the bin.
5. Wear proper breathing equipment or respirator.

Failure to heed these warnings will result in serious injury or death.

DC-552

Checklist Before Installing Electric Heater

1. One of the most important factors for installation is providing adequate power to run the unit. Under sized wire can lead to voltage drop and can cause overheating of power leads and poor performance. Therefore, it is necessary to know the distance from the unit to an available transformer and the horsepower of your fan unit. These two factors will determine the size of wire needed for efficient operation. See Fan Specifications on the following page.
2. Each electric heater circuit should be wired through a fused or circuit breaker disconnect switch.
3. Refer to the Heater Specifications on page 7 for the recommended slow blow fuse or breaker size to use when installing your particular Heater.
4. Standard electrical safety practices and codes should be used. Refer to National Electric Code Standard Handbook by National Fire Protection Association.
5. A qualified electrician should make all electrical wiring installations.

Installation Instructions



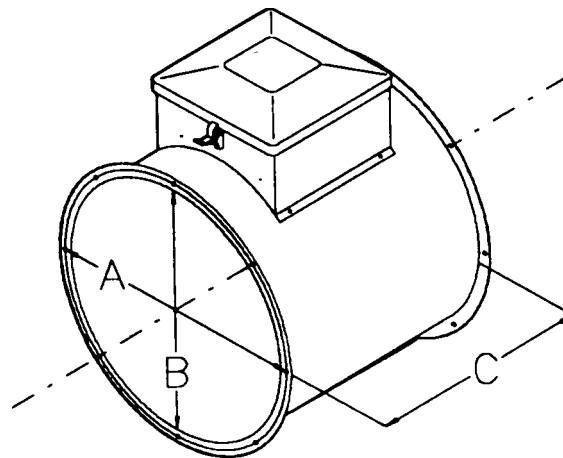
Be Sure Power Is Disconnected And Locked Out Before Installation! Failure To Do So May Cause Serious Injury Or Death.

1. Be sure that the disconnect and the fan are well grounded. See machine to earth ground page 9.
2. Check all fasteners on heater elements and other bolted items to make sure they are tight. If any are loose, check for proper clearance and retighten. They may have loosened in shipping.
3. Heater should be bolted solidly to fan and transition.
4. Check and retighten all electrical connections. They may have loosened in shipping.
5. Make all input power connections to heater as shown on page 8.

Important! Heater Must Be Interlocked To Fan Or Connected To An Air Proving Device. In Event Of Fan Failure Heater Must Be Shutdown.

Heater Specifications

Diameter	18"	24"	28"
Elements	2	2	3
Kilowatts	8	12	8
Volts	230	230	230
Amps	34	52	78
Minimum Wire Size	Copper	Copper	Copper
50' run	8	4	2
100' run	8	4	2
200' run	6	2	0
300' run	6	2	0
Minimum Wire Size	Alum	Alum	Alum
50' run	6	2	0
100' run	6	2	0
200' run	4	0	00
300' run	4	0	00
Fuse Size (Time Delay)	40	60	100
Breaker Size	40	60	100



Fan	18"	24"	28"
A (Bolt Circle)	19.1/2"	25.3/4"	29.5/8"
B (Inside Diameter)	18.1/4"	24.1/4"	28.1/8"
C (Length)	22"	20"	22.1/2"

Downwind Heater Electrical Installation



Be Sure Power Is Disconnected And Locked Out Before Installation! Failure To Do So May Cause Serious Injury Or Death.

1. Make field connection of heater power cord to 5 amp fuse block in fan as shown in Figure 4.
2. Make field connection of thermostat wires in heater control box. Thermostat wires are tagged HI-LIMIT INTER-LOCK in heater box.

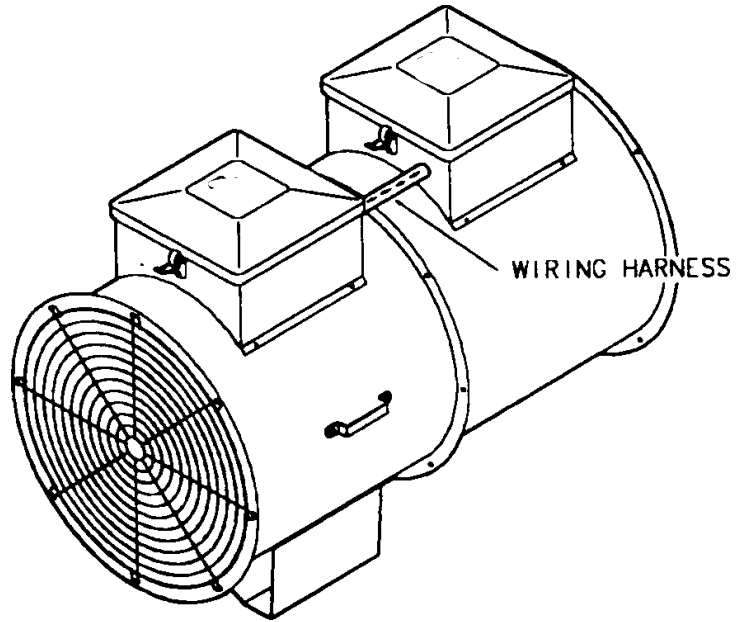


Figure 3: Illustration of electric heater wiring installation on a vane axial or inline fan unit.

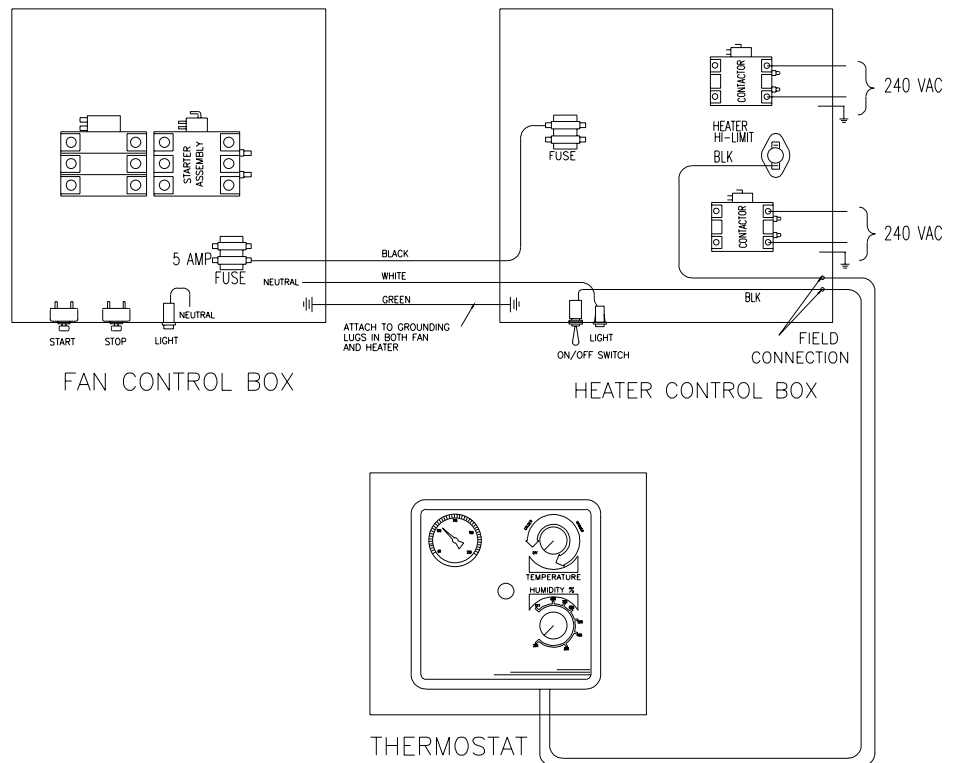


Figure 4: Electric heater wiring to fan unit.

Machine To Earth Grounding

It is very important that a *Machine To Earth Ground Rod* be installed at the fan. The ground rod needs to be as close to the fan as possible, but no more than 8 feet away. The ground rod should be connected to the fan control panel with at least a #6 solid, bare, copper ground wire. The grounding rod located at the power pole will not provide adequate grounding for the fan. The proper grounding will provide additional safety if there is a short and will ensure long life of all circuit boards used on control circuits, and the ignition system. The ground rod must be in accordance with local requirements.



Dig a hole large enough to hold 1 or 2 gallons of water. Work the ground rod into the earth until it is completely in the ground.

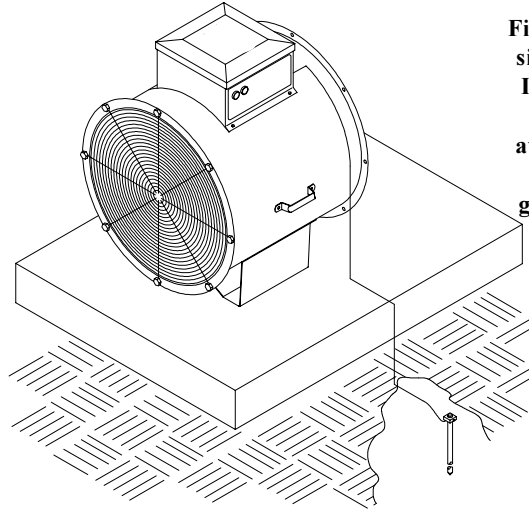


Figure 4: Use a #6 or approved size bare copper ground wire. Install a 5/8" diameter 8' long copper-clad ground rod, 2' away from the foundation and 1' below the surface of the ground or in accordance with local requirements.

Proper Installation Of Ground Rod

(Ground rods and wires are not supplied by Manufacturer). It is recommended that the rod not be driven into dry ground. Follow these instructions for proper installation.

1. Dig a hole large enough to hold 1 to 2 gallons of water.
2. Fill hole with water.
3. Insert rod through water and jab it into the ground.
4. Continue jabling the rod up and down. The water will work its way down the hole, making it possible to work the rod completely into the ground. This method of installation assures good contact with the surrounding soil, making a proper ground.
5. Connect the bare, copper ground wire to the rod with the proper ground rod clamp.
6. Connect the bare ground wire to control panel with a grounding lug.
7. Ground wire must not have any breaks or splices. Insulated wire is not recommended for grounding applications.

Previously Installed Units

It is recommended that previously installed units be checked to see that a machine to earth ground has been properly installed by an electrician.

Start Up

1. Turn thermostat knob to its warmest position.
2. Set heater switches to ON position. Red light should be lit.
3. Watch thermometer on thermostat housing. When temperature reaches desired level turn thermostat knob slowly to the left until heater lights go out.

Remember: Electric heaters normally give no more than 5-15 degrees temperature rise.

4. Observe the heater as it runs through a few cycles to make sure thermostat is set correctly.

Service

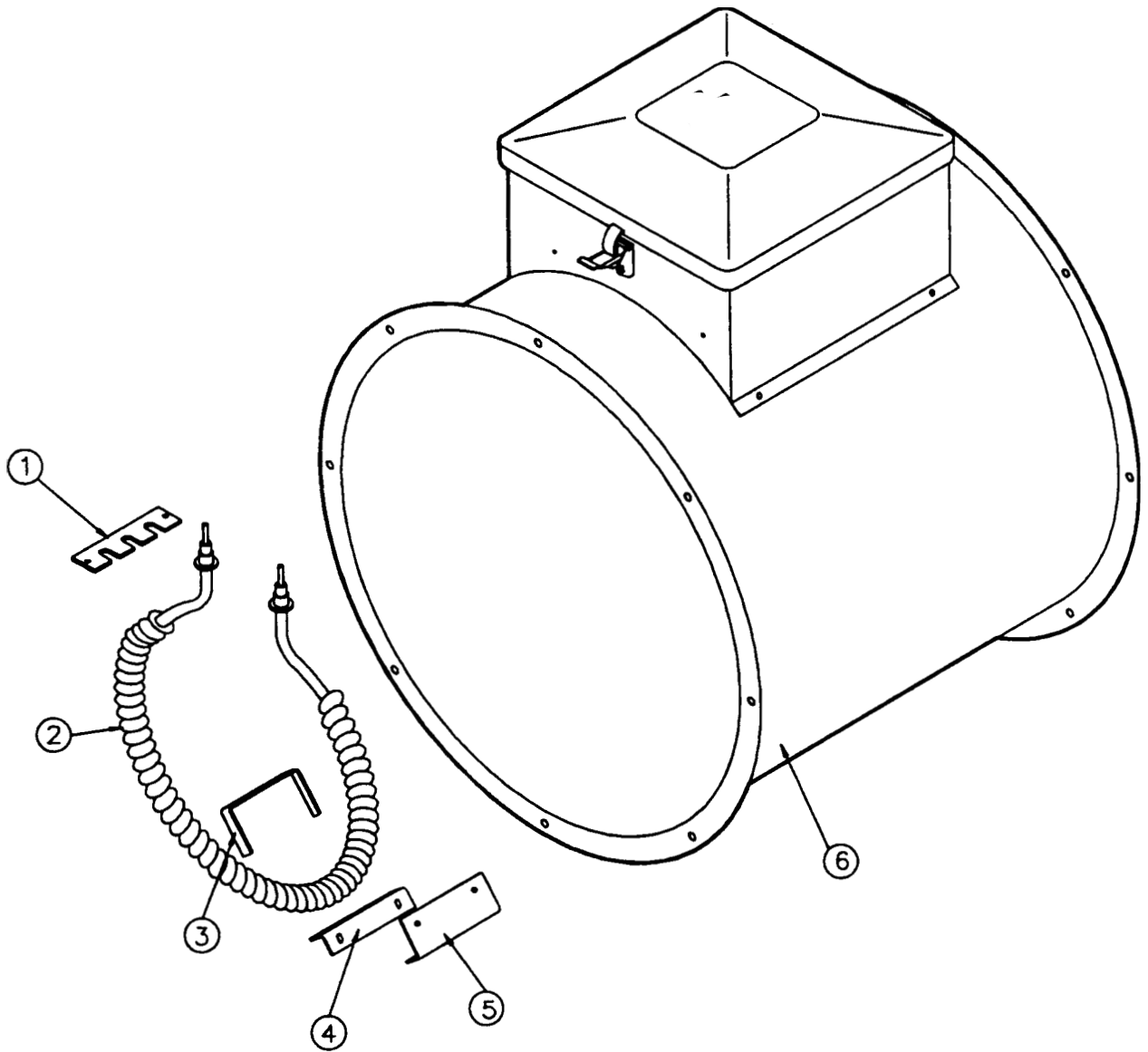
All Electric Heater Units are designed and built to withstand use in the most severe environments. Take time out at least once a year to go over the whole unit and make sure everything is in working order. Preventive maintenance can save time and money if done on a regular basis.

1. Always disconnect and lock out the power before working on or around fan motor and electrical components.
2. Malfunctioning electrical components should be checked by a qualified electrician.
3. Heater elements should be cleaned yearly to avoid excess dust and dirt build up. Excessive build up on heater may cause heater to perform poorly and reduce the life of the heater elements.

Troubleshooting Chart

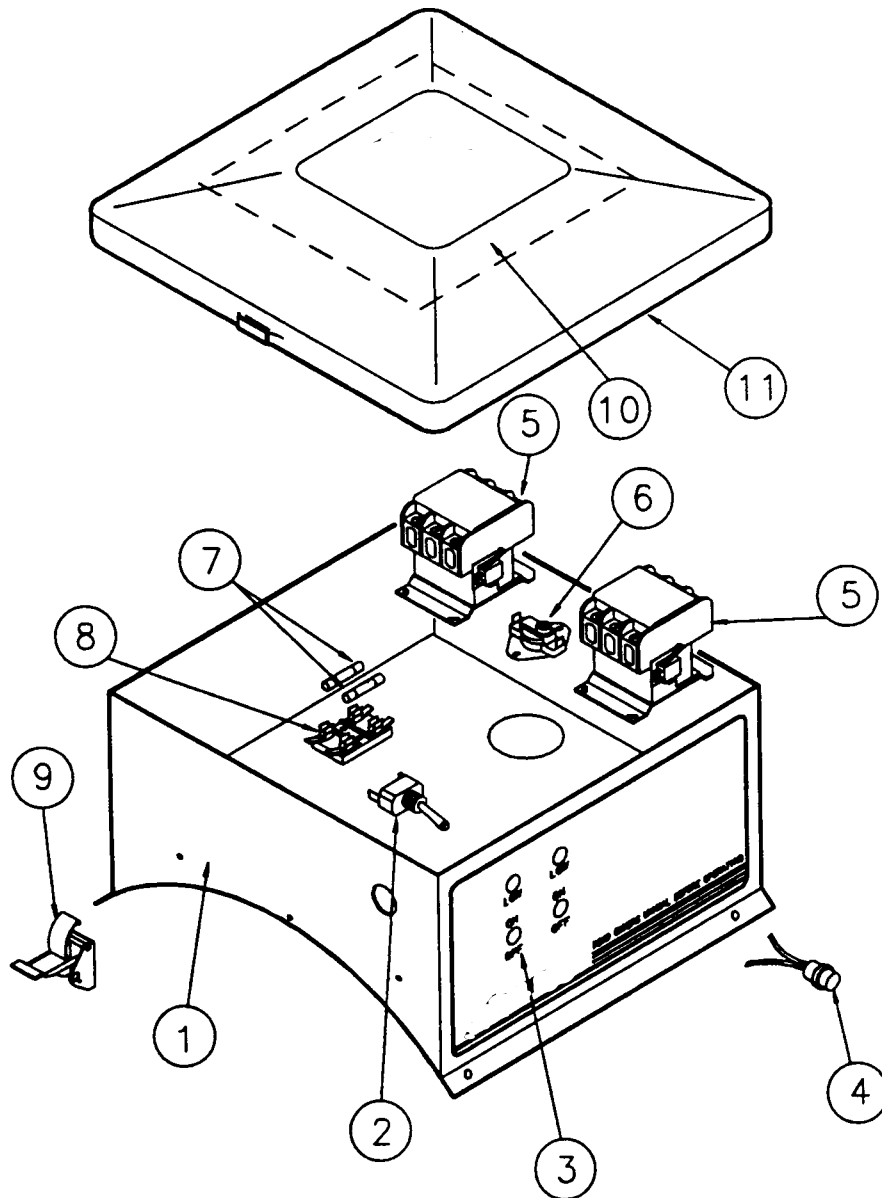
Symptom	Possible Cause	Remedy
Heater will not start.	Blown fuse or breaker in disconnect switch Blown fuse in fan control box Defective wiring or loose connection Incorrect wire size Heater high limit kicked out Defective thermostat Thermostat not adjusted	Replace fuses or reset breakers. Replace fuse. Follow wiring diagram and tighten any loose connections. See wire size charts for proper wire size and change if needed. Check manual reset. Push in to reset. Replace thermostat. Adjust thermostat settings.
Heater runs for short period of time and kicks out high limit switch.	Lack of airflow through heater Defective high limit switch	Check for problems with fan or obstructions that may be blocking airflow. Replace high limit switch.
Poor performance	Defective element Low line voltage at the installation. Power failure. Dirt build up on element Defective magnetic contactor	Replace element. Call power company after making sure wire size is correct. Clean element. Replace contactor.

18" Electric Heater



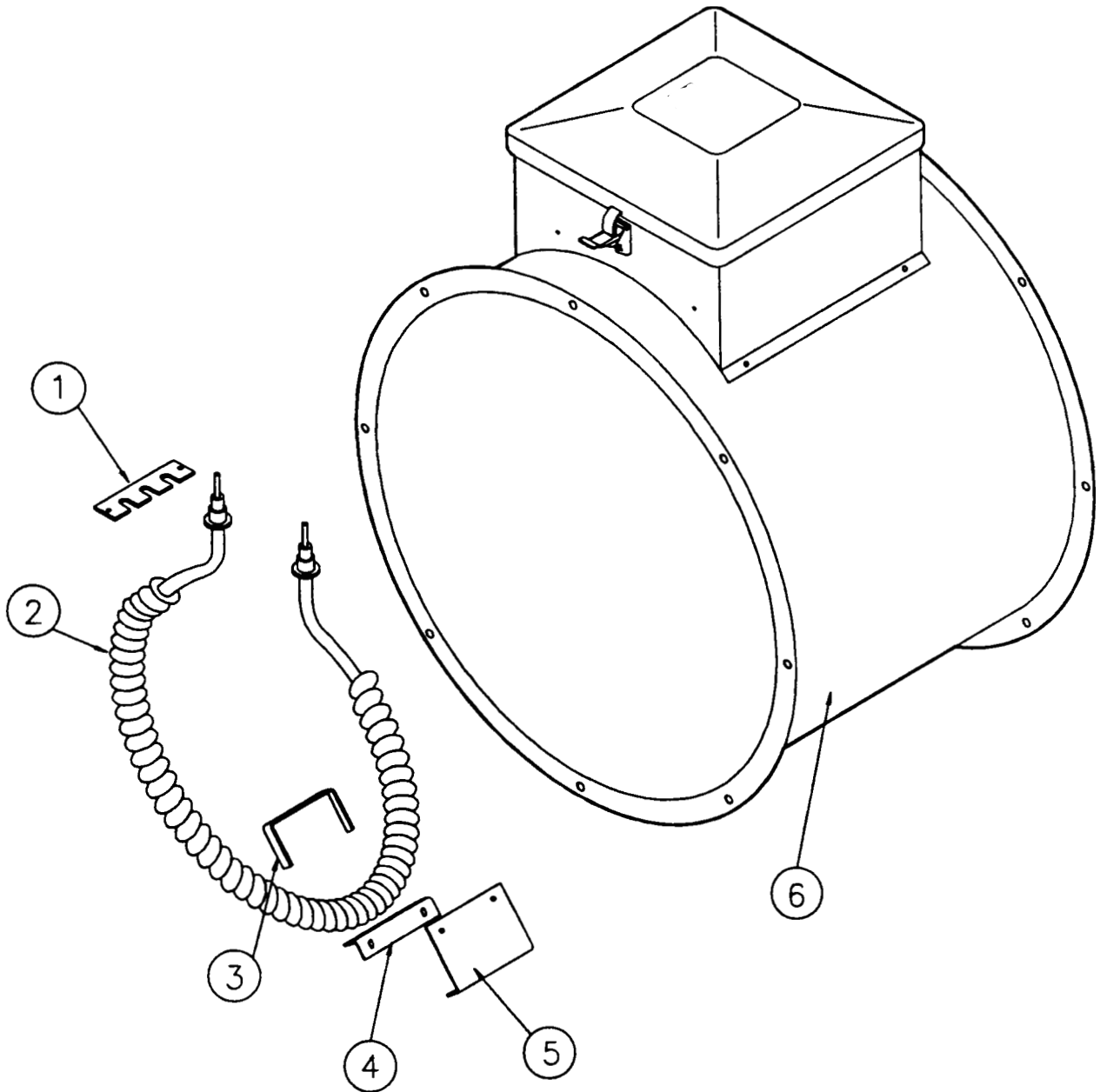
Key	Part Number	Description
1	HF-551	Element Cover Plate
2	HF-1164	220v 18" Heater Element
3	HF-548	Element Clamp Bracket
4	HF-547	Element Clamp Angle
5	HF-554	18" Element Mounting Bracket
6	HF-7044	18" Electric Heater Housing

18" Electric Heater Control Box (2 Element)



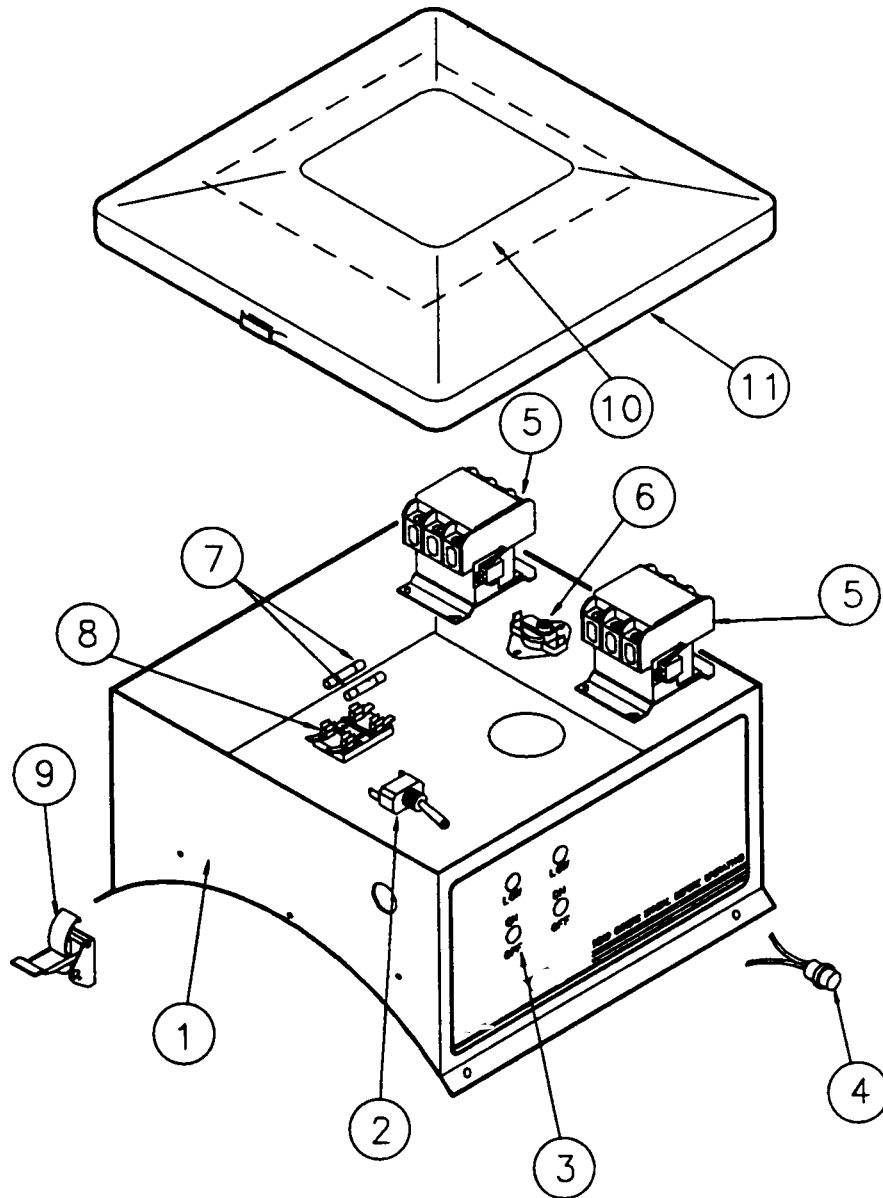
Key	Part Number	Description
1	HF-7112	18" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1039	30 Amp Contactor
6	HH-1166	120 Deg High-limit
7	FH-1059	5 Amp Fuse
8	FH-1058	Fuse Holder
9	FH-4429-1	Control Box Latch
10	DC-586	2 Element Wiring Diagram
11	F-942	Control Box Lid

24" Electric Heater



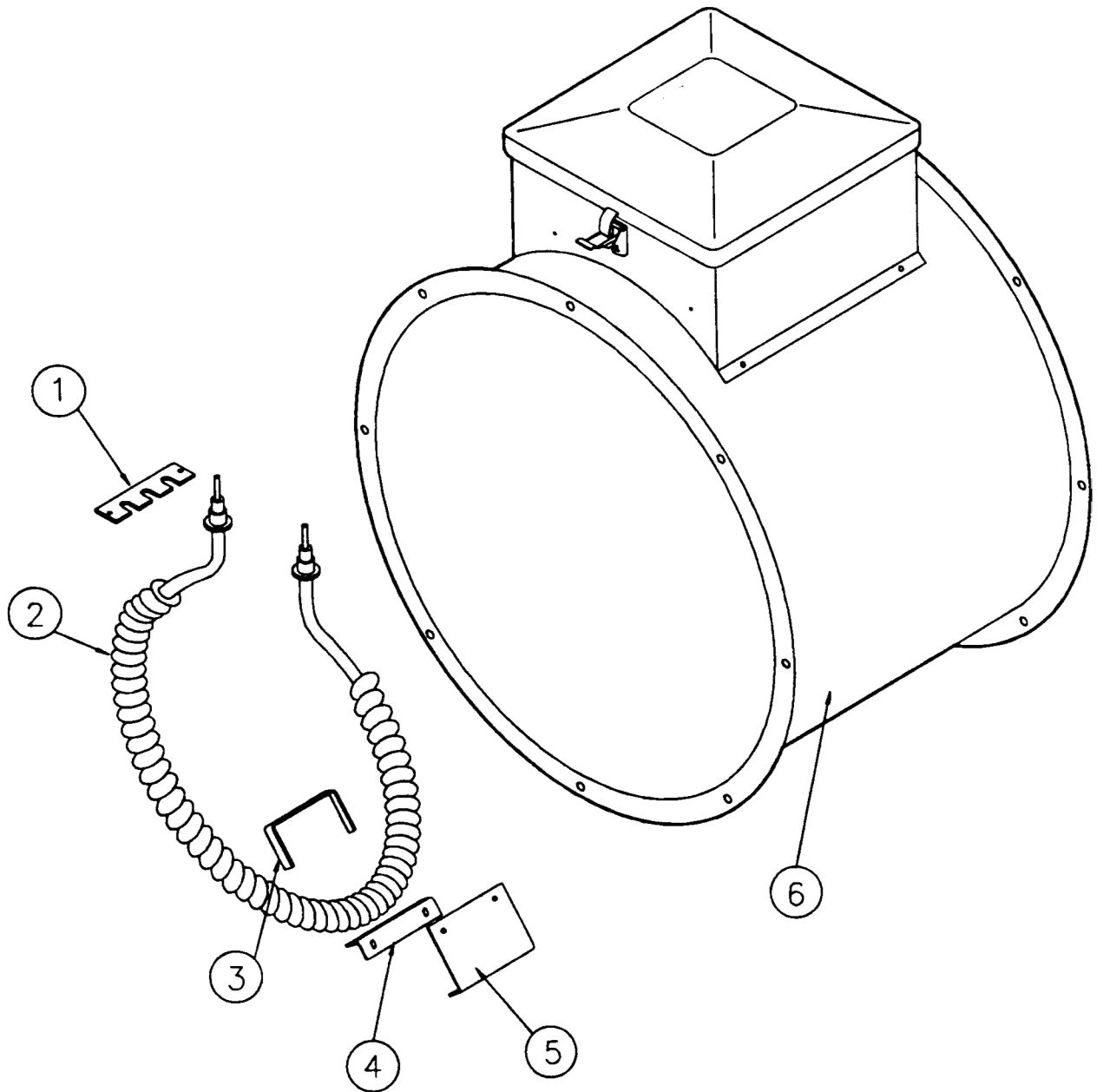
Key	Part Number	Description
1	HF-551	Element Cover Plate
2	HF-1170	220V 24-26-28" Heater Element
3	HF-548	Element Clamp Bracket
4	HF-547	Element Clamp Angle
5	HF-553	24" Element Mounting Bracket
6	HF-6784	24" Electric Heater Housing

24" Electric Heater Control Box (2 Element)



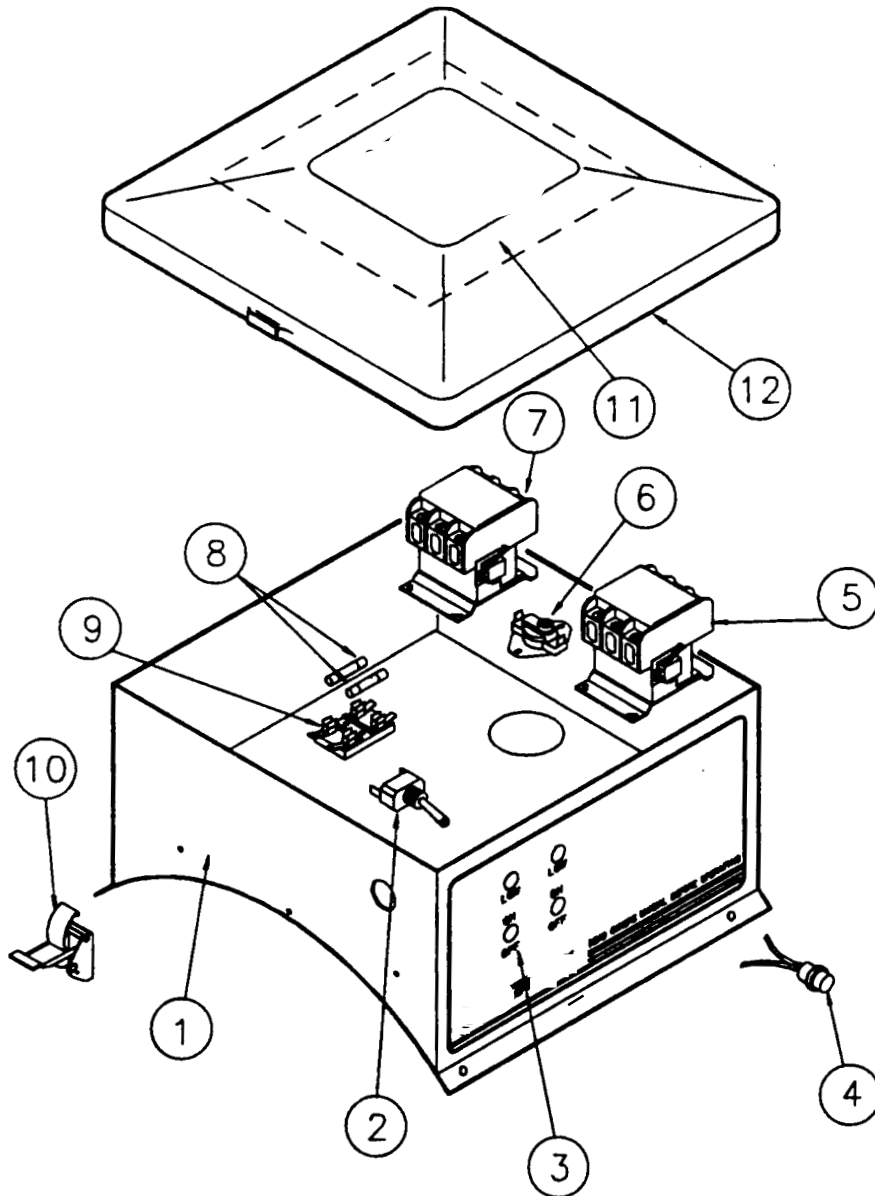
Key	Part Number	Description
1	HF-7113	24" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1039	30 Amp Contactor
6	HH-1166	120 Deg High-limit
7	FH-1059	5 Amp Fuse
8	FH-1058	Fuse Holder
9	FH-4429-1	Control Box Latch
10	DC-586	2 Element Wiring Diagram
11	F-942	Control Box Lid

28" Electric Heater



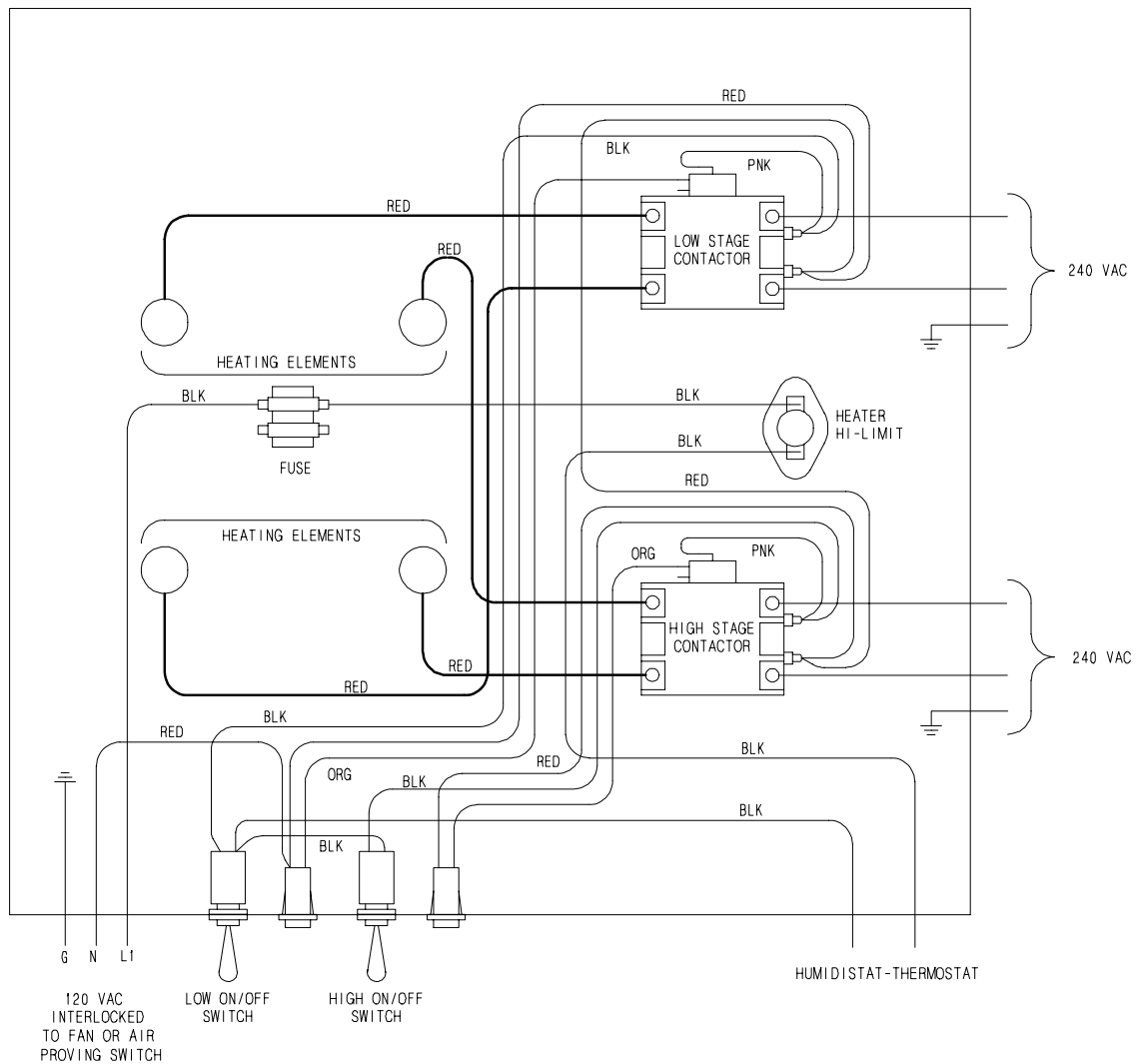
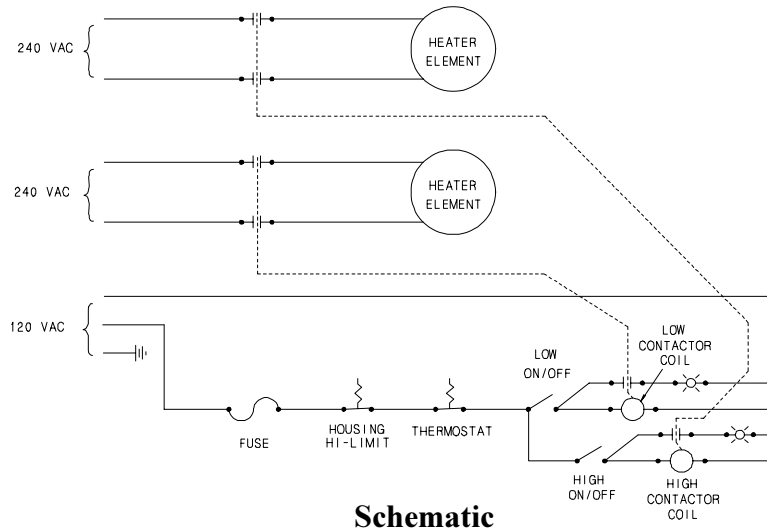
Key	Part Number	Description
1	HF-551	Element Cover Plate
2	HF-1170	220V 24-26-28" Heater Element
3	HF-548	Element Clamp Bracket
4	HF-547	Element Clamp Angle
5	HF-7128	28" Element Mounting Bracket
6	HF-7129	28" Electric Heater Housing

28" Electric Heater Control Box (3 Element)



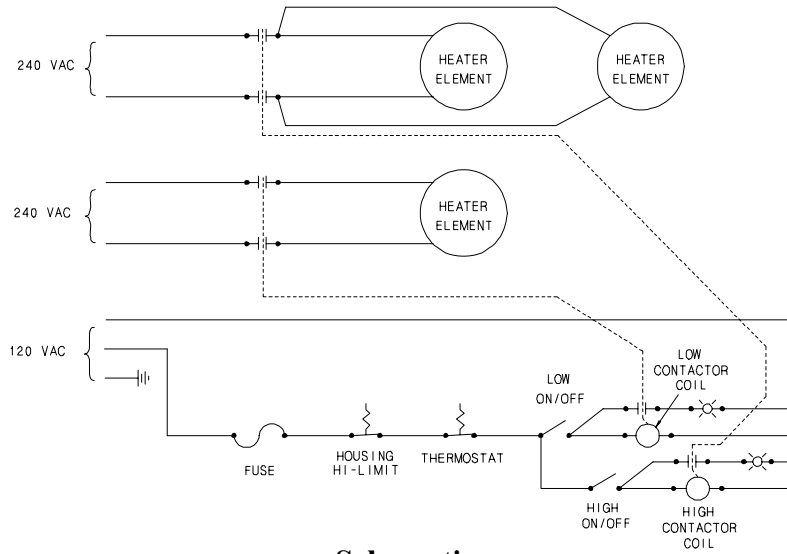
Key	Part Number	Description
1	HF-7130	28" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1038	60 Amp Contactor
6	HH-1166	120 Deg High-limit
7	CH-1039	30 Amp Contactor
8	FH-1059	5 Amp Fuse
9	FH-1058	Fuse Holder
10	FH-4429-1	Control Box Latch
11	DC-587	3 Element Wiring Diagram

240v 1 Phase 2 Element

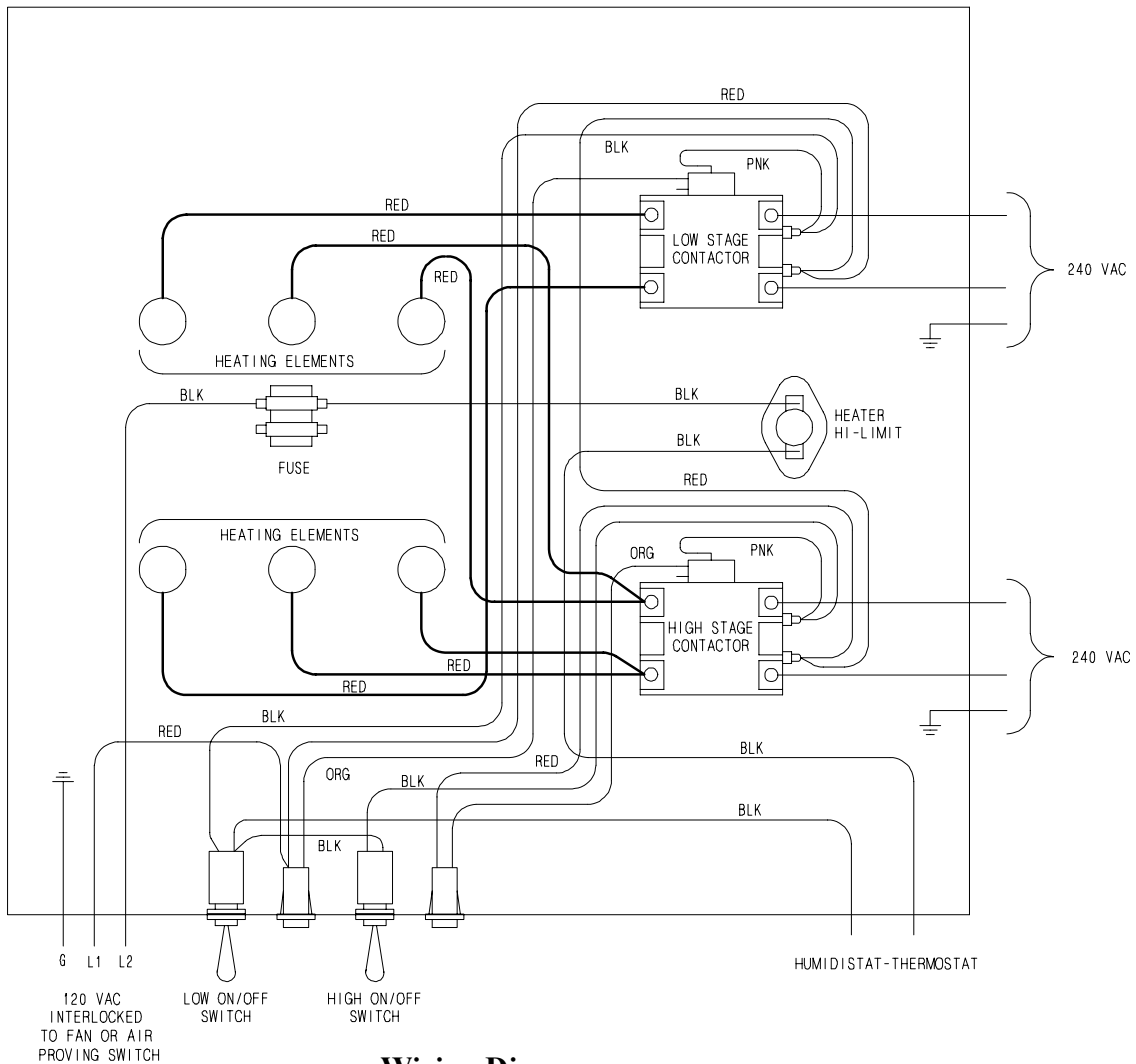


Wiring Diagram

240v 1 Phase 3 Element

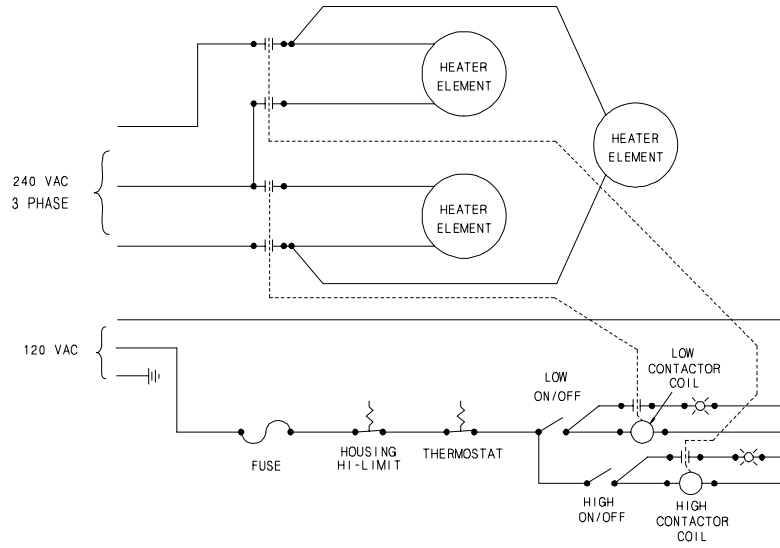


Schematic

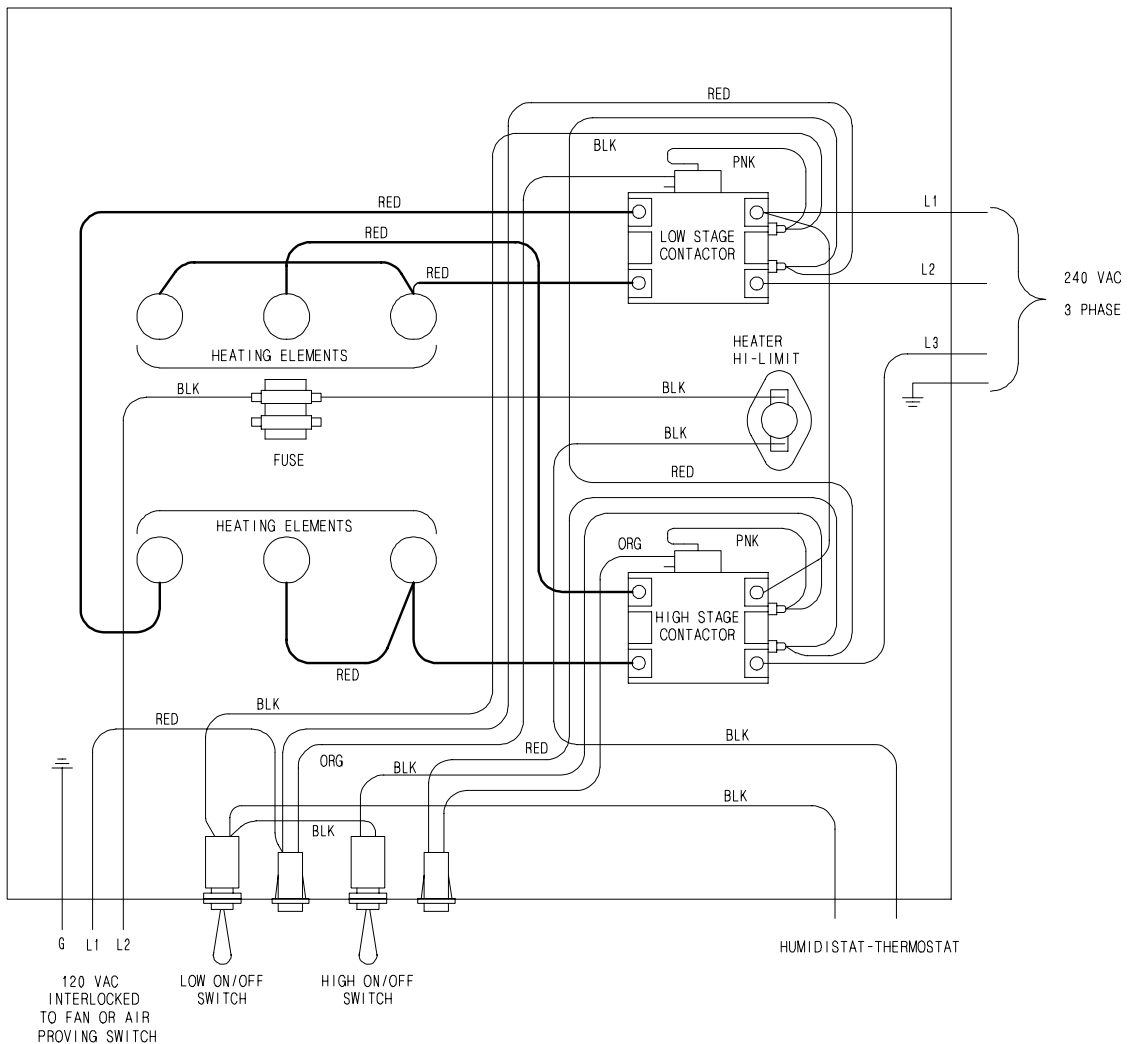


Wiring Diagram

230v 3 Phase Schematic

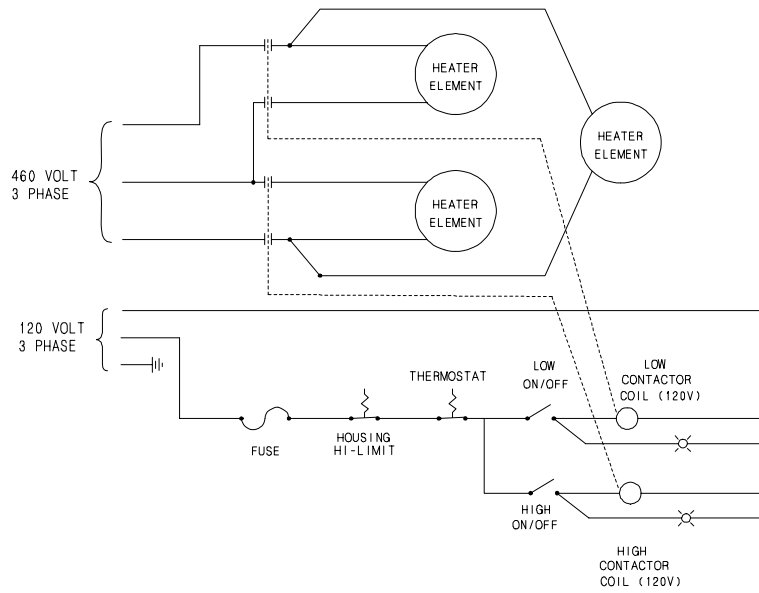


230v 3 Phase Wiring

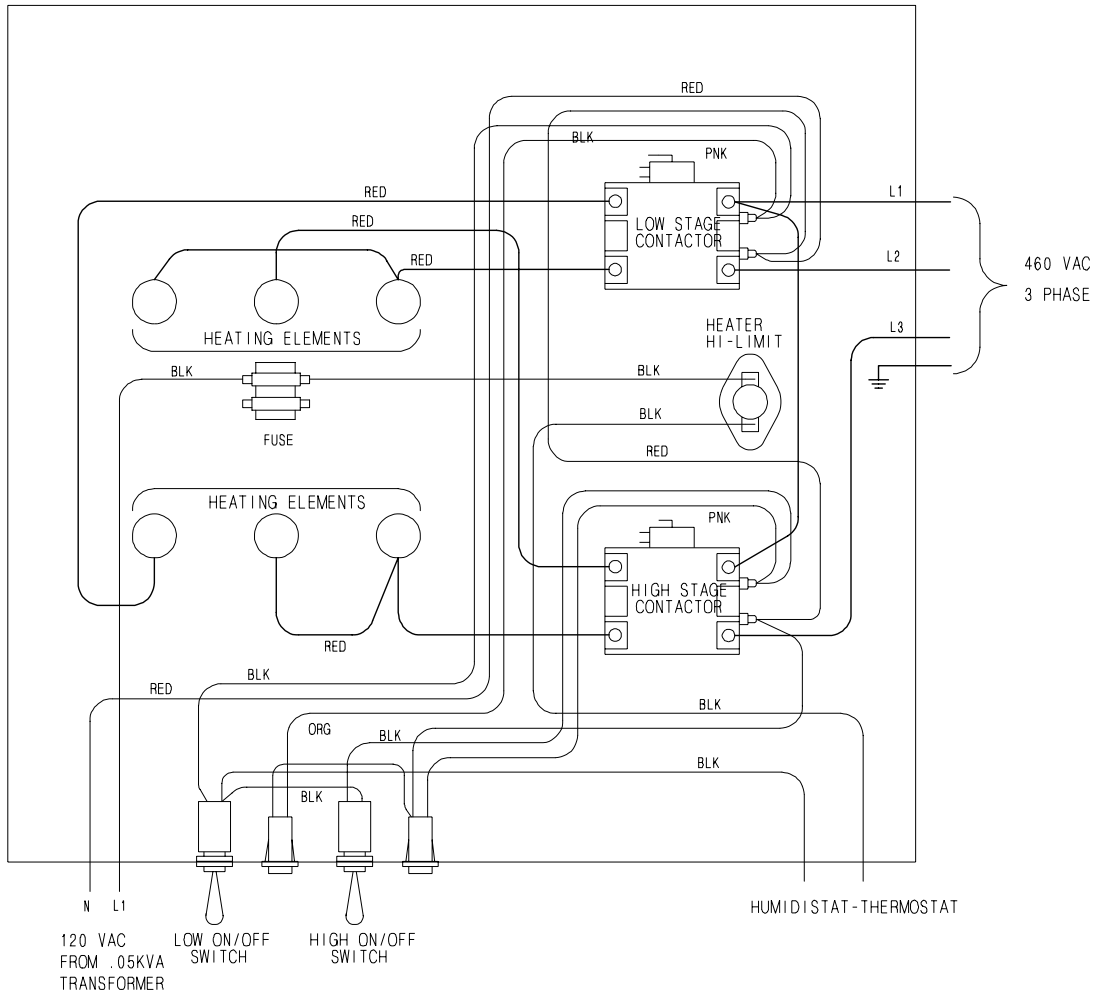


Wiring Diagram

460v 3 Phase Schematic



460v 3 Phase Wiring



Wiring Diagram

THE GSI GROUP WARRANTS ALL PRODUCTS MANUFACTURED BY THE GSI GROUP TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USAGE AND CONDITIONS FOR A PERIOD OF 12 MONTHS AFTER RETAIL SALE TO THE ORIGINAL END USER OF SUCH PRODUCTS. THE GSI GROUP'S ONLY OBLIGATION IS, AND PURCHASER'S SOLE REMEDY SHALL BE FOR THE GSI GROUP, TO REPAIR OR REPLACE, AT THE GSI GROUP'S OPTION AND EXPENSE, PRODUCTS THAT, IN THE GSI GROUP'S SOLE JUDGMENT, CONTAIN A MATERIAL DEFECT DUE TO MATERIALS OR WORKMANSHIP. ALL DELIVERY AND SHIPMENT CHARGES TO AND FROM THE GSI GROUP'S FACTORY WILL BE PURCHASER'S RESPONSIBILITY. EXPENSES INCURRED BY OR ON BEHALF OF THE PURCHASER WITHOUT PRIOR WRITTEN AUTHORIZATION FROM AN AUTHORIZED EMPLOYEE OF THE GSI GROUP SHALL BE THE SOLE RESPONSIBILITY OF THE PURCHASER.

EXCEPT FOR THE ABOVE STATED EXPRESS LIMITED WARRANTIES, THE GSI GROUP MAKES NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH (i) PRODUCT MANUFACTURED OR SOLD BY THE GSI GROUP OR (ii) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF DMC REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCT OR PRODUCTS.

IN NO EVENT SHALL THE GSI GROUP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOSS OF ANTICIPATED PROFITS OR BENEFITS. PURCHASER'S SOLE AND EXCLUSIVE REMEDY SHALL BE LIMITED TO THAT STATED ABOVE, WHICH SHALL NOT EXCEED THE AMOUNT PAID FOR THE PRODUCT PURCHASED. THIS WARRANTY IS NOT TRANSFERABLE AND APPLIES ONLY TO THE ORIGINAL PURCHASER. THE GSI GROUP SHALL HAVE NO OBLIGATION OR RESPONSIBILITY FOR ANY REPRESENTATIVE OR WARRANTIES MADE BY OR ON BEHALF OF ANY DEALER, AGENT OR DISTRIBUTOR OF THE GSI GROUP.

THE GSI GROUP ASSUMES NO RESPONSIBILITY FOR FIELD MODIFICATIONS OR ERECTION DEFECTS WHICH CREATE STRUCTURAL OR STORAGE QUALITY PROBLEMS. MODIFICATIONS TO THE PRODUCT NOT SPECIFICALLY COVERED BY THE CONTENTS OF THIS MANUAL WILL NULLIFY ANY PRODUCT WARRANTY THAT MIGHT HAVE BEEN OTHERWISE AVAILABLE.

THE FOREGOING WARRANTY SHALL NOT COVER PRODUCTS OR PARTS WHICH HAVE BEEN DAMAGED BY NEGLIGENT USE, MISUSE, ALTERATION OR ACCIDENT. THIS WARRANTY COVERS ONLY PRODUCTS MANUFACTURED BY THE GSI GROUP. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. THE GSI GROUP RESERVES THE RIGHT TO MAKE DESIGN OR SPECIFICATION CHANGES AT ANY TIME.

PRIOR TO INSTALLATION, PURCHASER HAS THE RESPONSIBILITY TO RESEARCH AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL CODES WHICH MAY APPLY TO THE LOCATION AND INSTALLATION.

