Electric Heater

MODEL # VH- __ __ __ __ - __

Owner's Manual

MANUAL # PNEG-269

a division of

THE GSI GROUP

✓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_____

CE

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 Damage Warning And Disclaimer

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.

Heater Operation

Thank you for choosing a GSI product. It is designed to give excellent performance and service for many years.

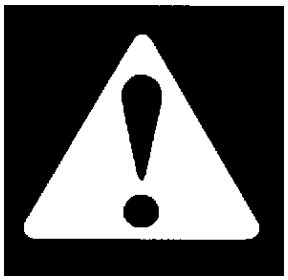
This manual describes the operation of the Electric Heater. Many models are available to accommodate low temperature grain conditioning.

The principal concern of the GSI Group, Inc. ("GSI") is your safety and the safety of others associated with grain handling equipment. This manual is written to help you understand safe operating procedures, and some of the problems that may be encountered by the operator or other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist, and to inform all personnel associated with the equipment, or who are in the heater area. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation, where serious injury or death may occur.

Safety Alert Symbol

The symbol shown is used to call your attention to instructions concerning your personal safety. Watch for this symbol; it points out important safety precautions. It means "ATTENTION", "WARNING", "CAUTION", and "DANGER". Read the message and be cautious to the possibility of personal injury or death.



WARNING! BE ALERT!

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

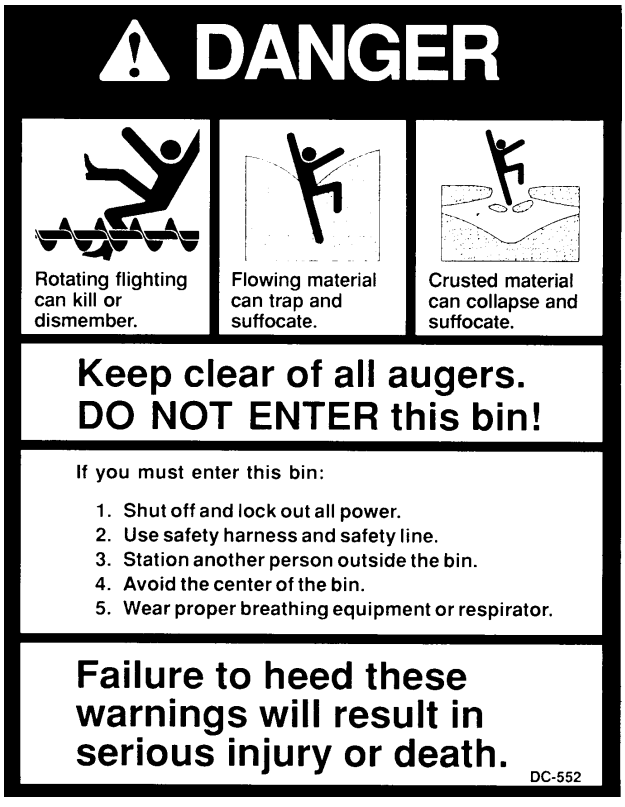
The GSI Group, Inc. recommends contacting your local power company, and having a representative survey your installation so the wiring is compatible with their system, and adequate power is supplied to your unit.

Safety decals should be read and understood by all people in the grain handling area. The bottom right decal should be present on the inside bin door cover of the two ring door, 24" porthole door cover and the roof manway cover.

If a decal is damaged or is missing contact:

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

A free replacement will be sent to you.



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 trans former 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 Fan Specifications on page 8 for the recommended slow blow fuse or breaker size to use when installing your particular fan.

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 11.

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.

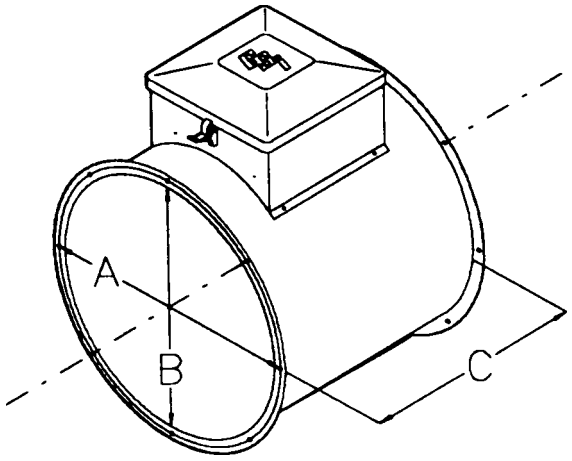
4. Check and retighten all electrical connections. They may have loosened in shipping.

5. Make all input power connections to heater as shown on pages 9 and 10.

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"			26"			28"		
Elements	1	2	3	1	2	3	1	2	3	1	2	3
Kilowatts	4	8	12	6	12	18	6	12	18	6	12	18
Volts	230	230	230	230	230	230	230	230	230	230	230	230
Full Load Amps	17	34	51	26	52	78	26	52	78	26	52	78
Minimum Wire Size	**Copper Wire**			**Copper Wire**			**Copper Wire**			**Copper Wire**		
50' Run	14	8	4	10	4	2	10	4	2	10	4	2
100' Run	14	8	4	10	4	2	10	4	2	10	4	2
200' Run	12	6	2	8	2	0	8	2	0	8	2	0
300' Run	10	6	2	8	2	0	8	2	0	8	2	0
Minimum Wire Size	**Aluminum Wire**			**Aluminum Wire**			**Aluminum Wire**			**Aluminum Wire**		
50' Run	12	6	2	8	2	0	8	2	0	8	2	0
100' Run	12	6	2	8	2	0	8	2	0	8	2	0
200' Run	10	4	0	6	0	00	6	0	00	6	0	00
300' Run	8	4	0	6	0	00	6	0	00	6	0	00
Fuse Size (Slow Blow)	20	40	60	30	60	100	30	60	100	30	60	100
Breaker Size	20	40	60	30	60	100	30	60	100	30	60	100



Fan	18" Diameter	24" Diameter	26" Diameter	28" Diameter
A (Bolt Circle)	19.1/2	25.3/4	27.11/16	29.5/8
B (Inside Diameter)	18.1/4	24.1/4	26.5/16	28.1/8
C (Length)	22	20	22.1/2	22.1/2

Note: All dimensions in inches.

Upwind Heater Electrical Installation (230v Fans)

These Instructions Are For Heater Installation On Fan Units With 230v Motors.

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

1. Secure wiring harness assembly as shown in Figure 1.
2. Make field connection of wires as shown in Figure 2.
3. Thermostat wires are tagged HI- LIMIT INTERLOCK in heater box.
4. Input power wires are tagged 220V POWER in heater box.

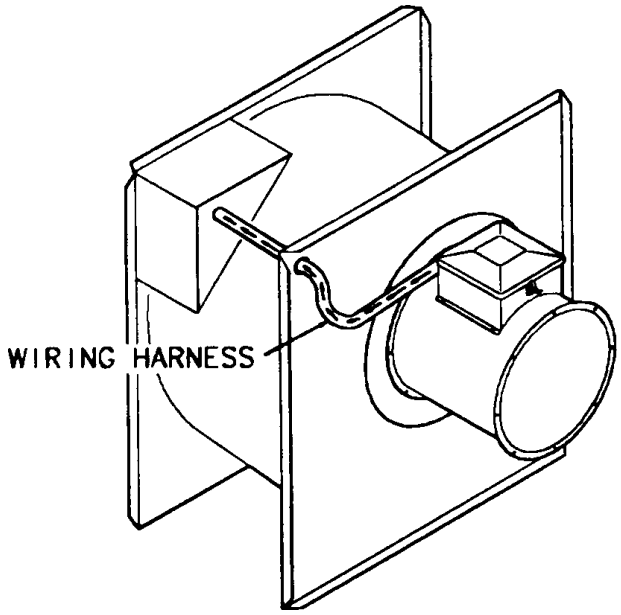


Figure 1: Illustration of electric heater wiring installation on a centrifugal fan unit.

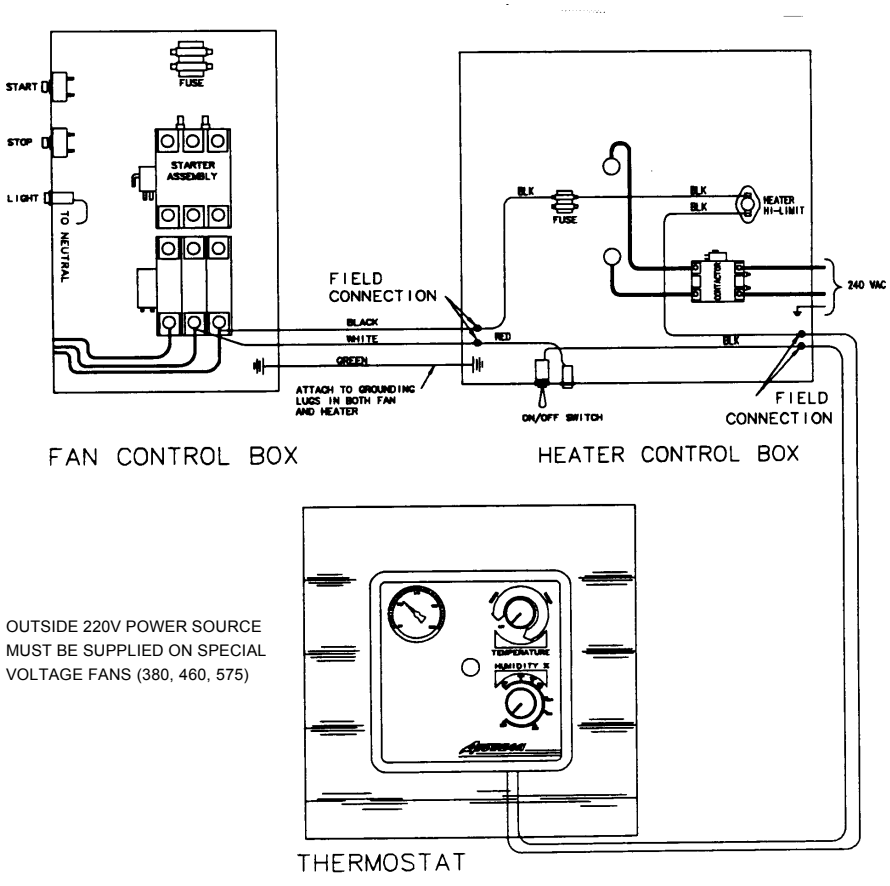


Figure 2: Electric heater wiring to fan unit.

Downwind Heater Electrical Installation (230v Fans)

These Instructions Are For Heater Installation On Fan Units With 230v Motors.

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

1. Secure wiring harness assembly as shown in Figure 3.
2. Make field connection of wires as shown in Figure 4.
3. Thermostat wires are tagged HI- LIMIT INTERLOCK in heater box.
4. Input power wires are tagged 220V POWER in heater box.

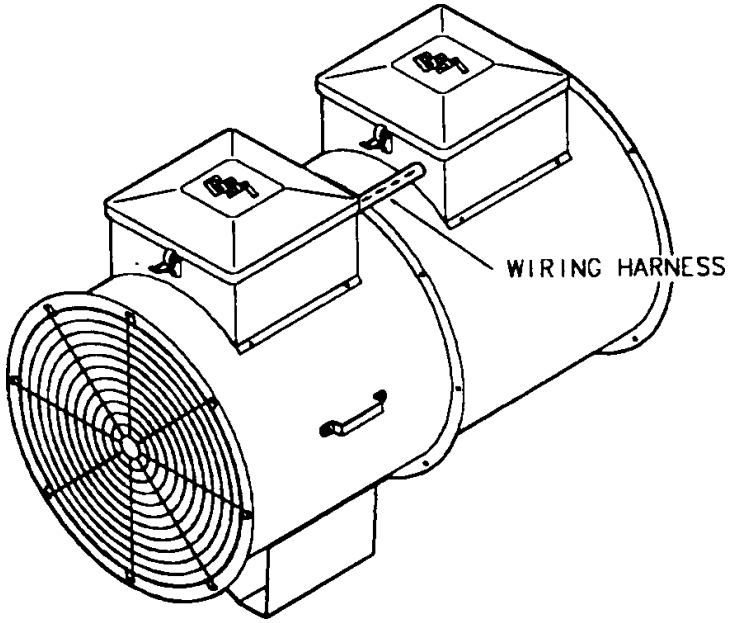
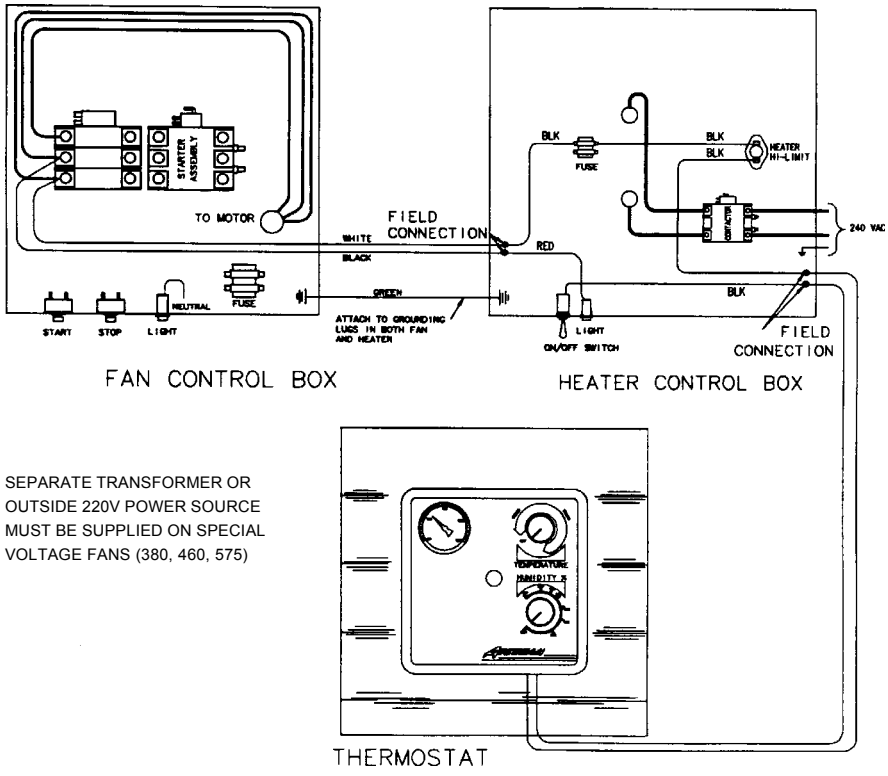


Figure 3: Illustration of electric heater wiring installation on a vane axial or inline fan unit.



SEPARATE TRANSFORMER OR OUTSIDE 220V POWER SOURCE MUST BE SUPPLIED ON SPECIAL VOLTAGE FANS (380, 460, 575)

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.

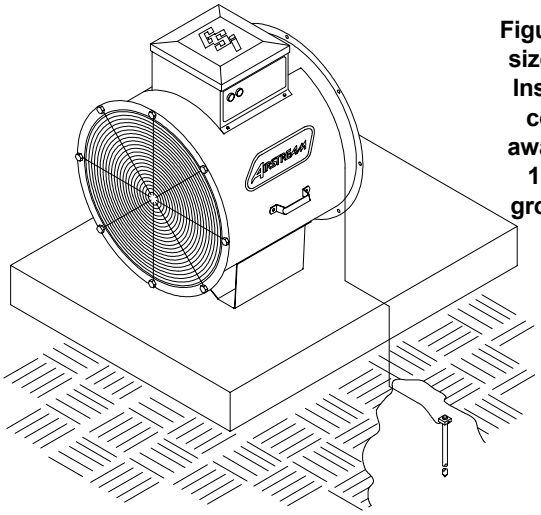


Figure 4: Use a #6 or approved size bare copper ground wire. Install a 5/8" diameter 8' long copper-clad ground rod, 2' away from the foundation and 1' below the surface of the ground or in accordance with local requirements.

Proper Installation Of Ground Rod

(Ground rods and wires are not supplied by Airstream). 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 jabing 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

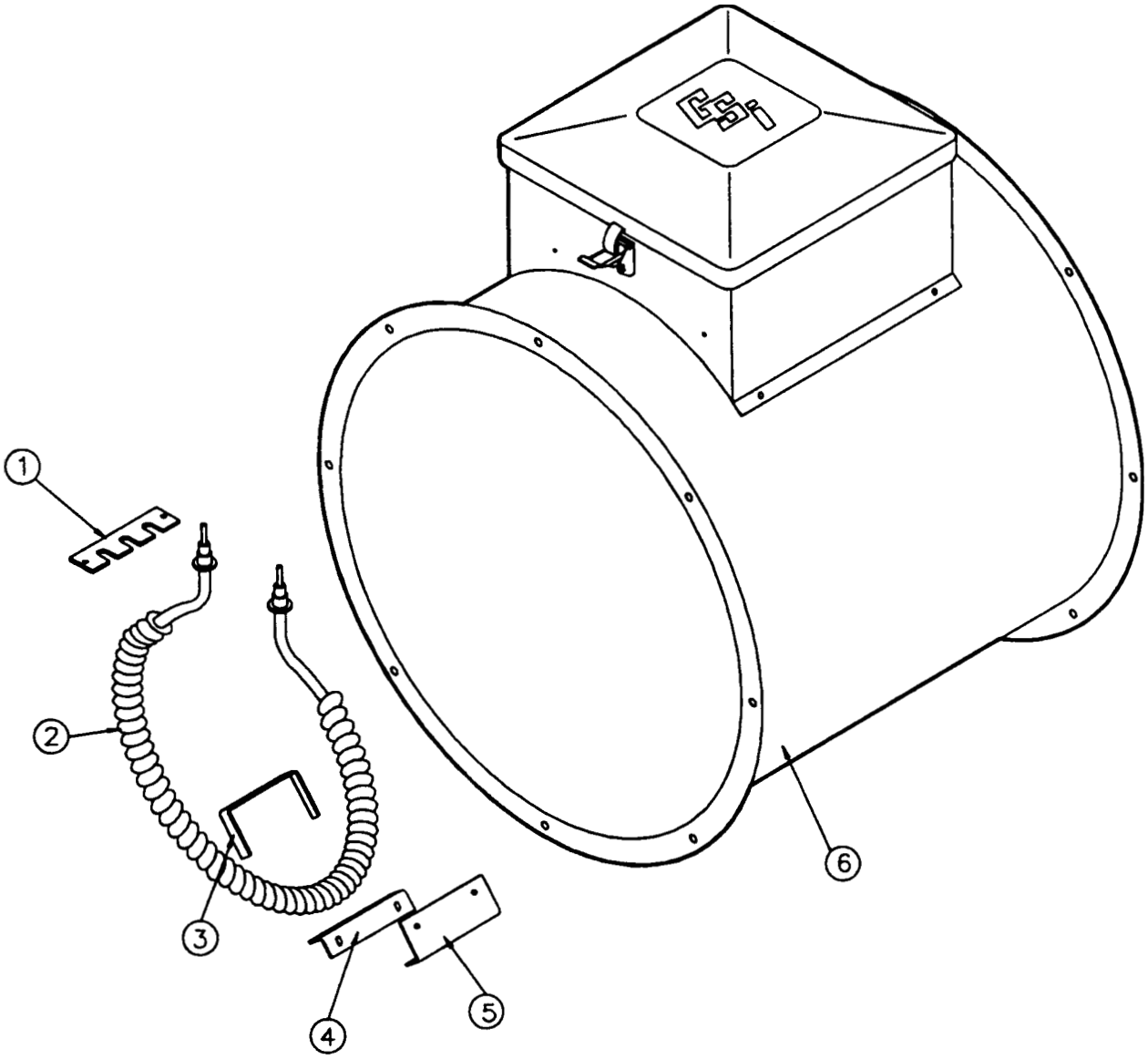
All GSI Electric Heater Units are designed and built to withstand use in the most severe environments. Take time out at least once a year to go over the whole unit and make sure everything is in working order. Preventive maintenance can save time and money if done on a regular basis.

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

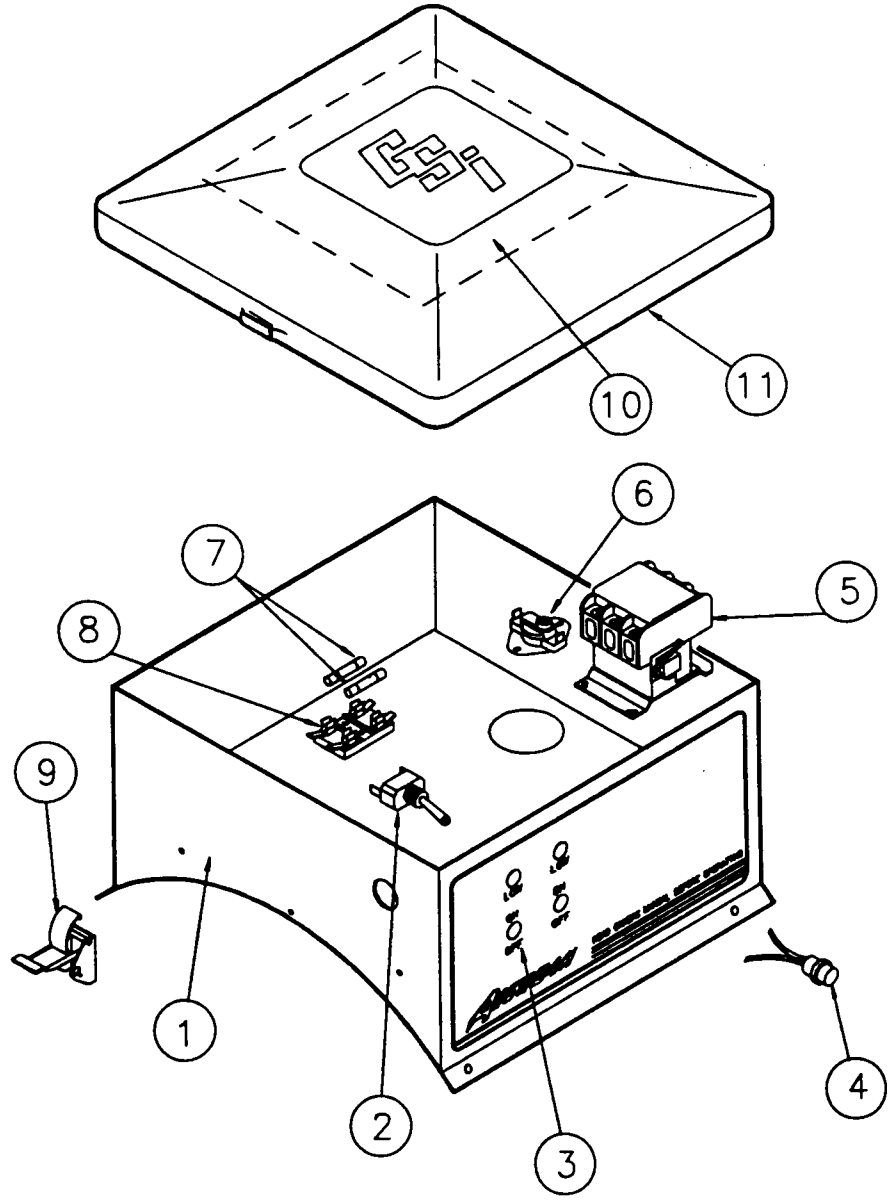
Symptom	Possible Cause	Remedy
Heater will not start.	Blown fuse or breaker in disconnect switch	Replace fuses or reset breakers.
	Blown fuse in fan control box	Replace fuse.
	Defective wiring or loose connection	Follow wiring diagram and tighten any loose connections.
	Incorrect wire size	See wire size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

18" Electric Heater



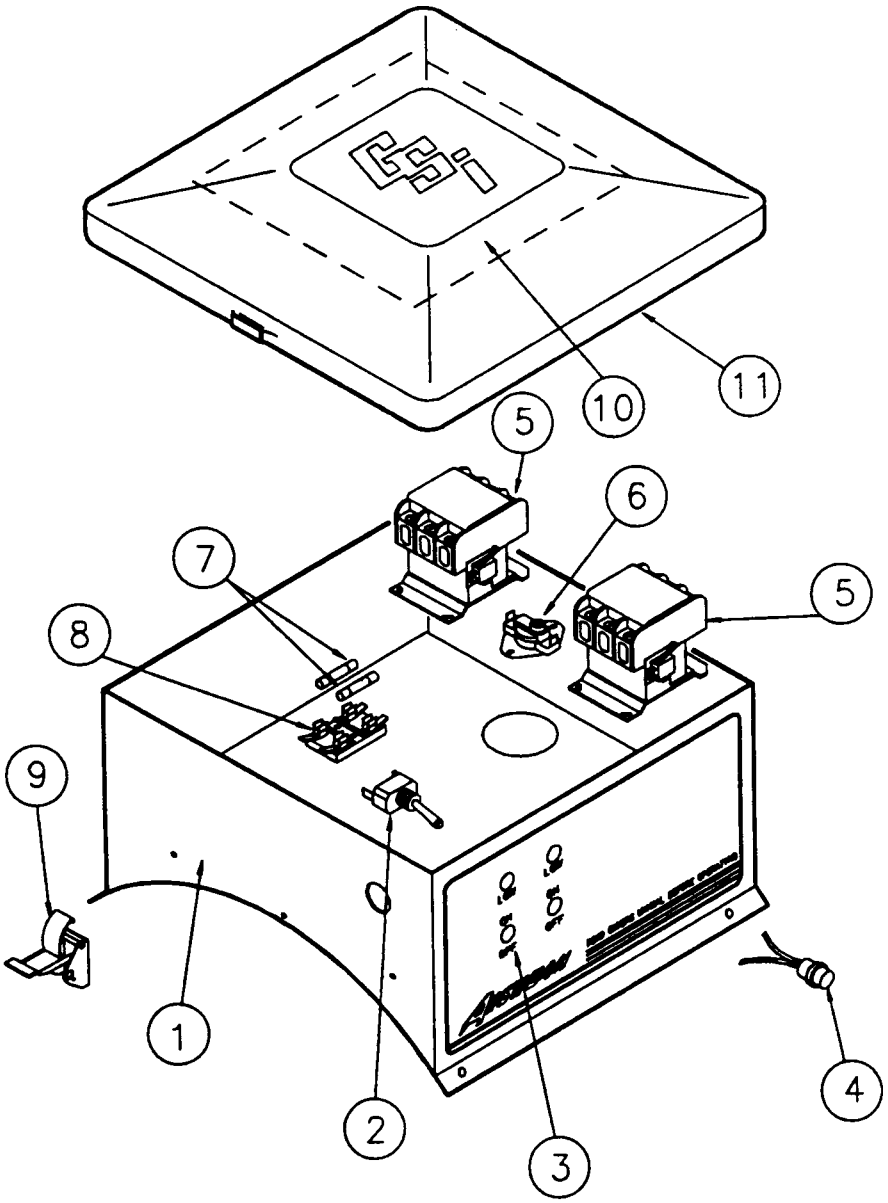
Key	Part Number	Description
1	HF-551	Element Cover Plate
2	HF-1164	220v 18" Heater Element
3	HF-548	Element Clamp Bracket
4	HF-547	Element Clamp Angle
5	HF-554	18" Element Mounting Bracket
6	HF-7044	18" Electric Heater Housing

18" Electric Heater Control Box (1 Element)



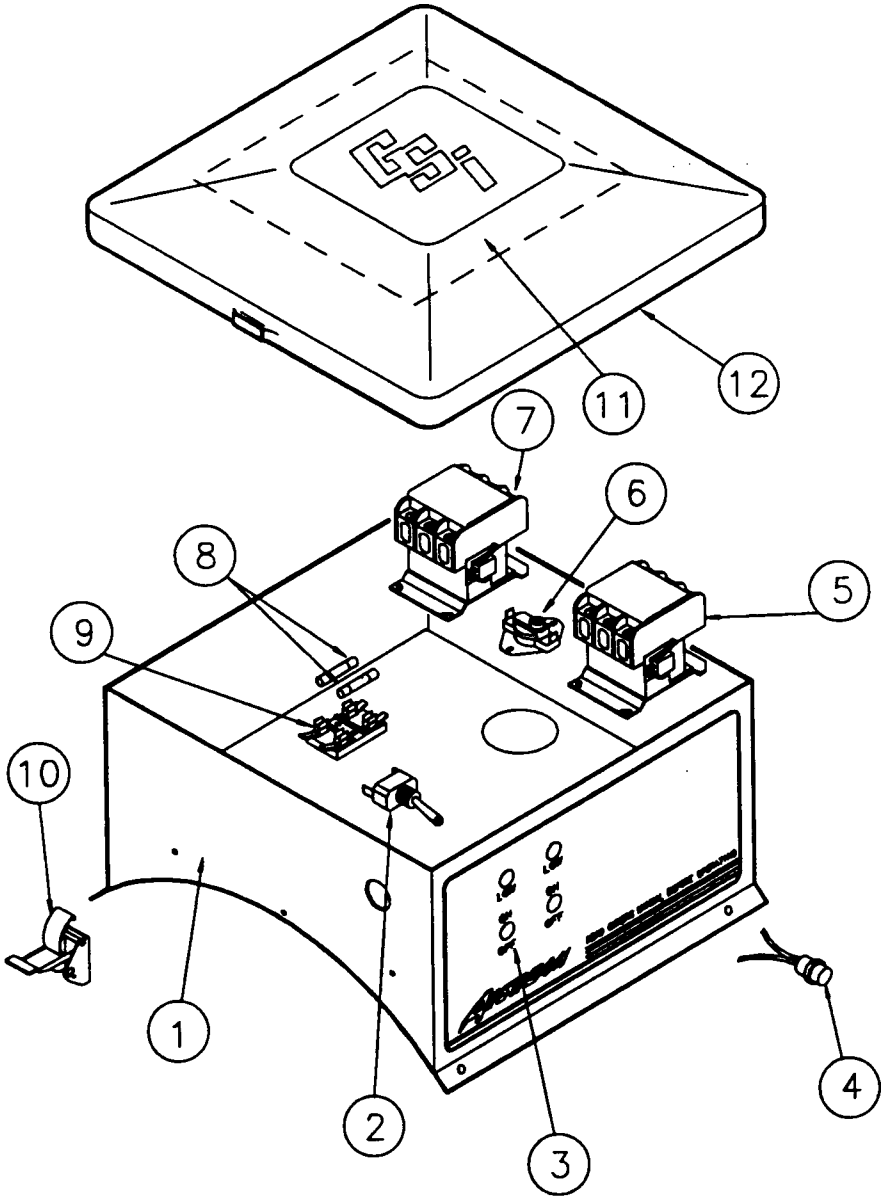
Key	Part Number	Description
1	HF-7112	18" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1039	30 Amp Contactor
6	HH-1166	120 Deg High-limit
7	FH-1059	5 Amp Fuse
8	FH-1058	Fuse Holder
9	FH-4429-1	Control Box Latch
10	DC-585	1 Element Wiring Diagram
11	F-942	Control Box Lid

18" Electric Heater Control Box (2 Element)



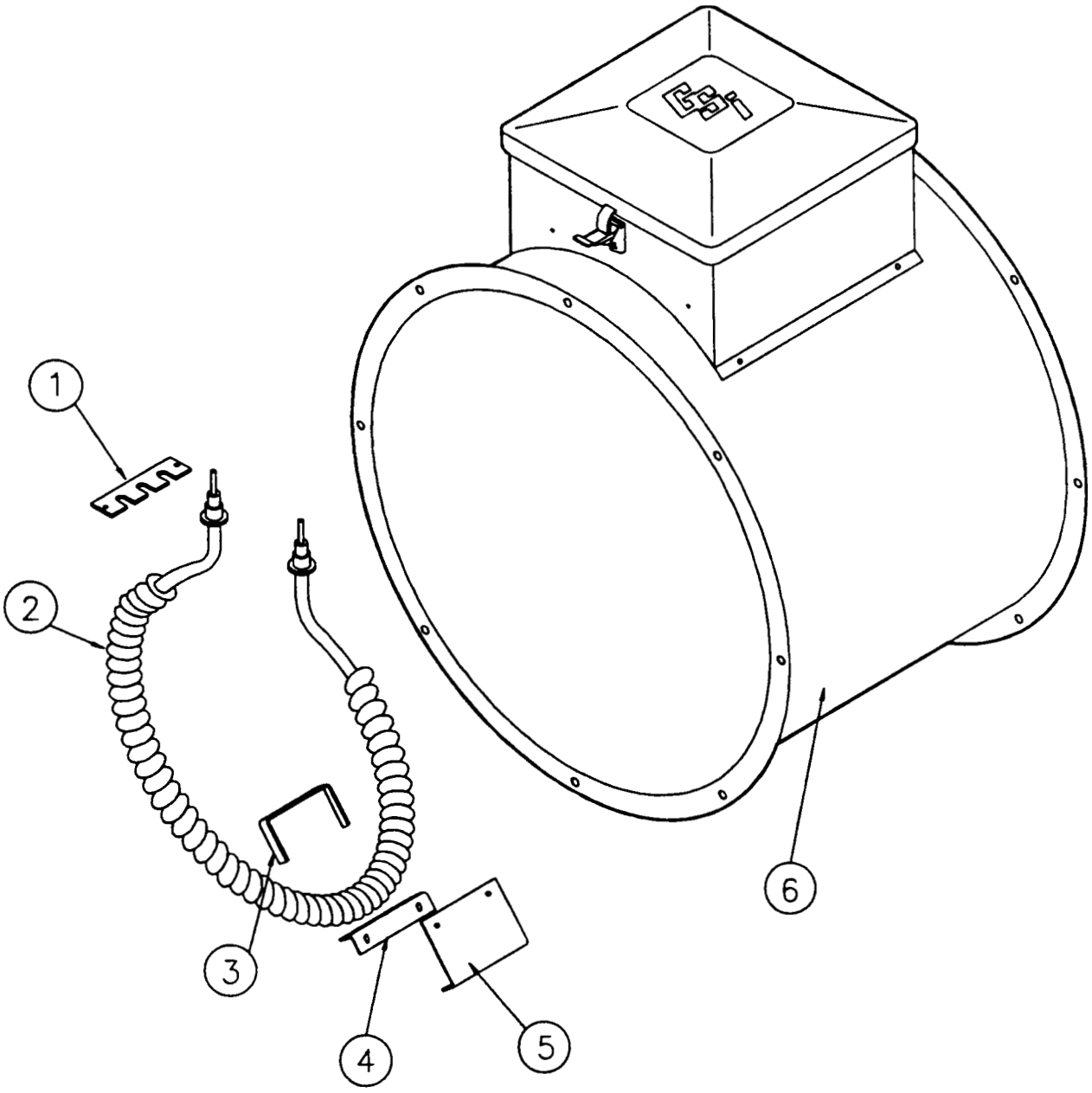
Key	Part Number	Description
1	HF-7112	18" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1039	30 Amp Contactor
6	HH-1166	120 Deg High-limit
7	FH-1059	5 Amp Fuse
8	FH-1058	Fuse Holder
9	FH-4429-1	Control Box Latch
10	DC-586	2 Element Wiring Diagram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

18" Electric Heater Control Box (3 Element)



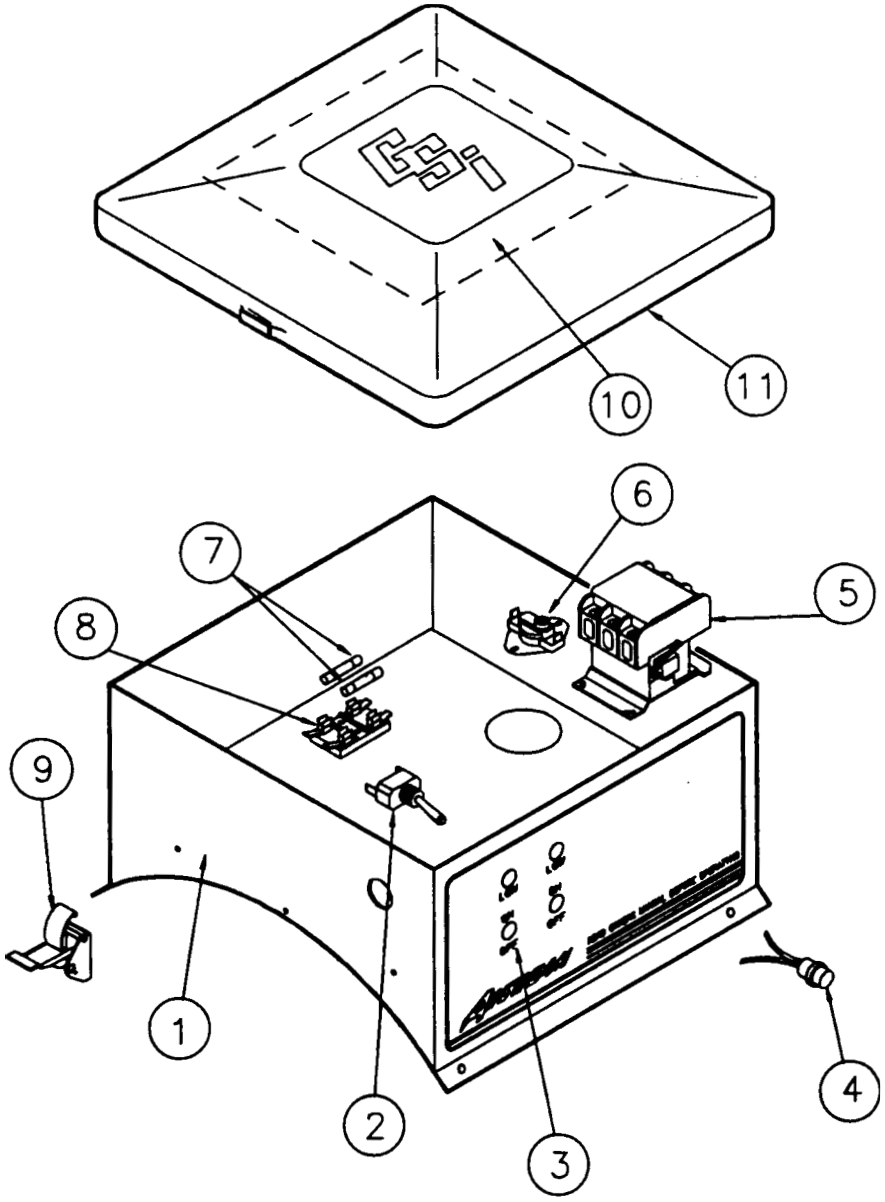
Key	Part Number	Description
1	HF-7112	18" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1037	40 Amp Contactor
6	HH-1166	120 Deg High-limit
7	CH-1039	30 Amp Contactor
8	FH-1059	5 Amp Fuse
9	FH-1058	Fuse Holder
10	FH-4429-1	Control Box Latch
11	DC-587	3 Element Wiring Diagram

24" Electric Heater



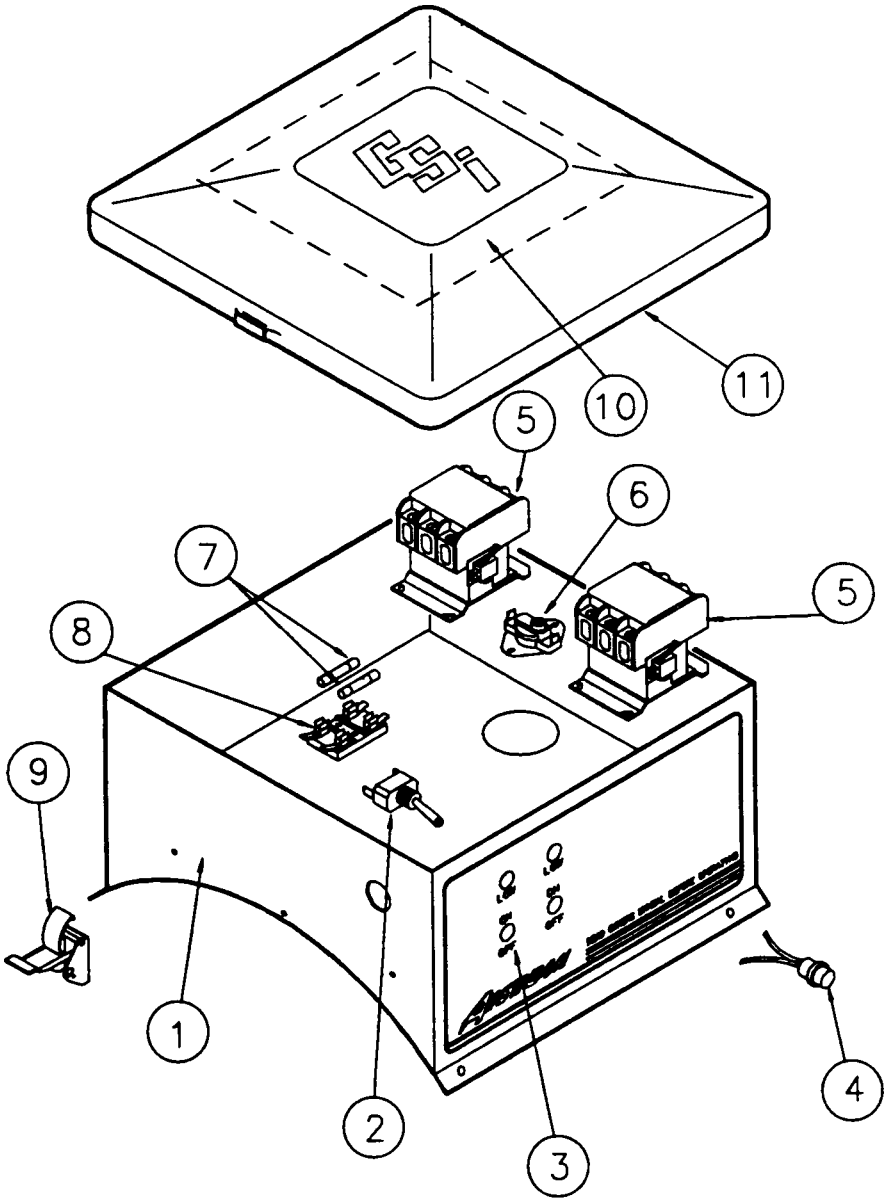
Key	Part Number	Description
1	HF-551	Element Cover Plate
2	HF-1170	220V 24-26-28" Heater Element
3	HF-548	Element Clamp Bracket
4	HF-547	Element Clamp Angle
5	HF-553	24" Element Mounting Bracket
6	HF-6784	24" Electric Heater Housing

24" Electric Heater Control Box (1 Element)



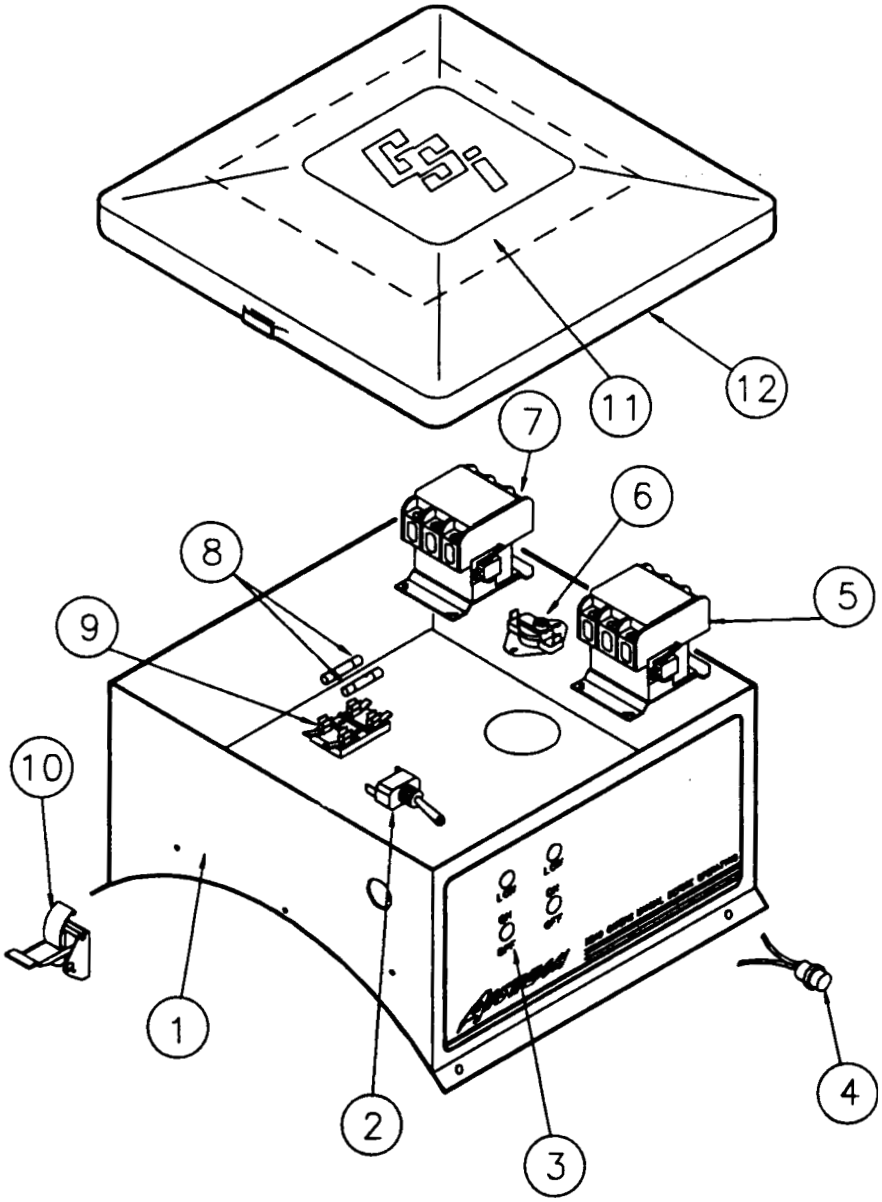
Key	Part Number	Description
1	HF-7113	24" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1039	30 Amp Contactor
6	HH-1166	120 Deg High-limit
7	FH-1059	5 Amp Fuse
8	FH-1058	Fuse Holder
9	FH-4429-1	Control Box Latch
10	DC-585	1 Element Wiring Diagram
11	F-942	Control Box Lid

24" Electric Heater Control Box (2 Element)



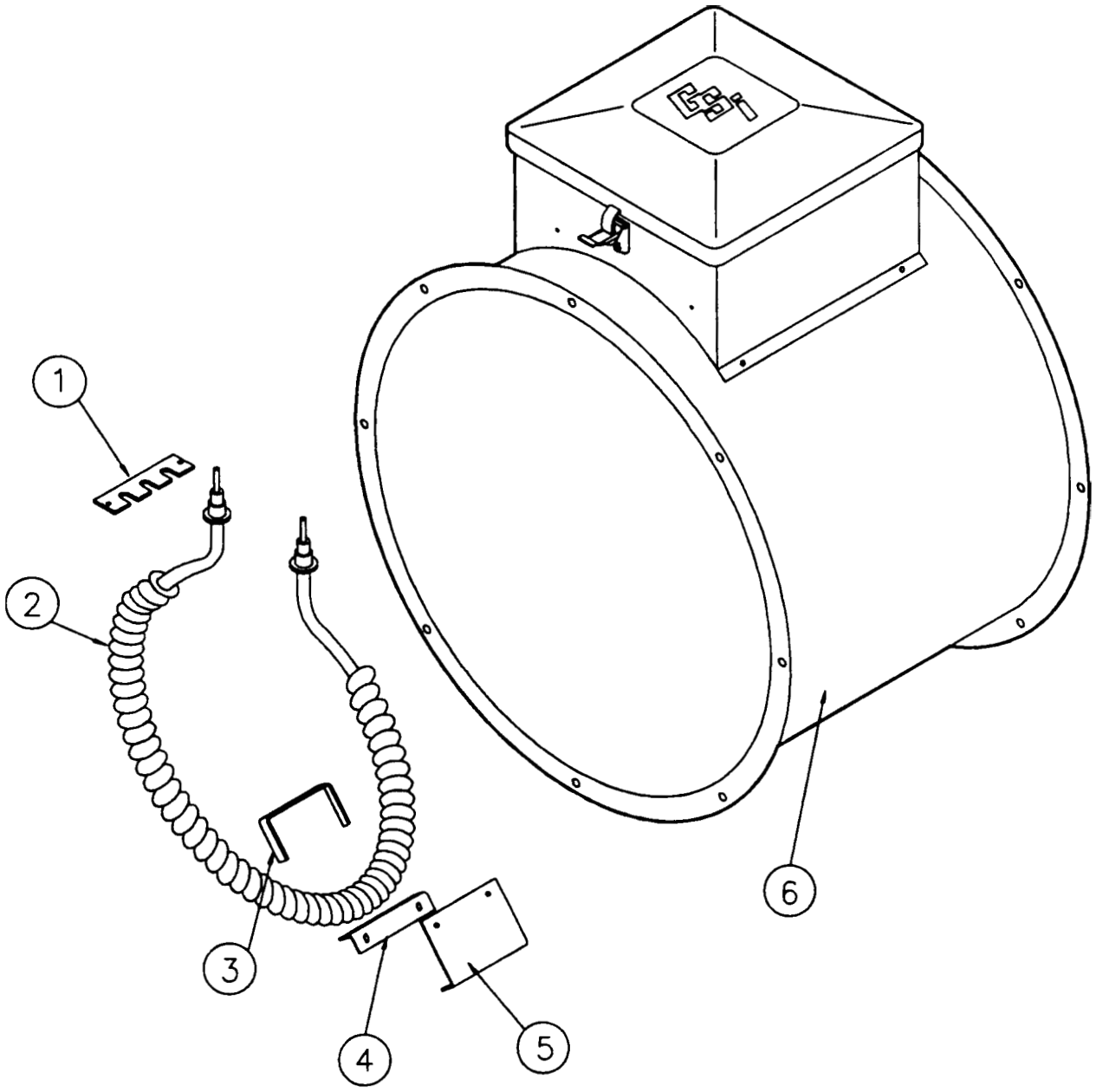
Key	Part Number	Description
1	HF-7113	24" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1039	30 Amp Contactor
6	HH-1166	120 Deg High-limit
7	FH-1059	5 Amp Fuse
8	FH-1058	Fuse Holder
9	FH-4429-1	Control Box Latch
10	DC-586	2 Element Wiring Diagram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

24" Electric Heater Control Box (3 Element)



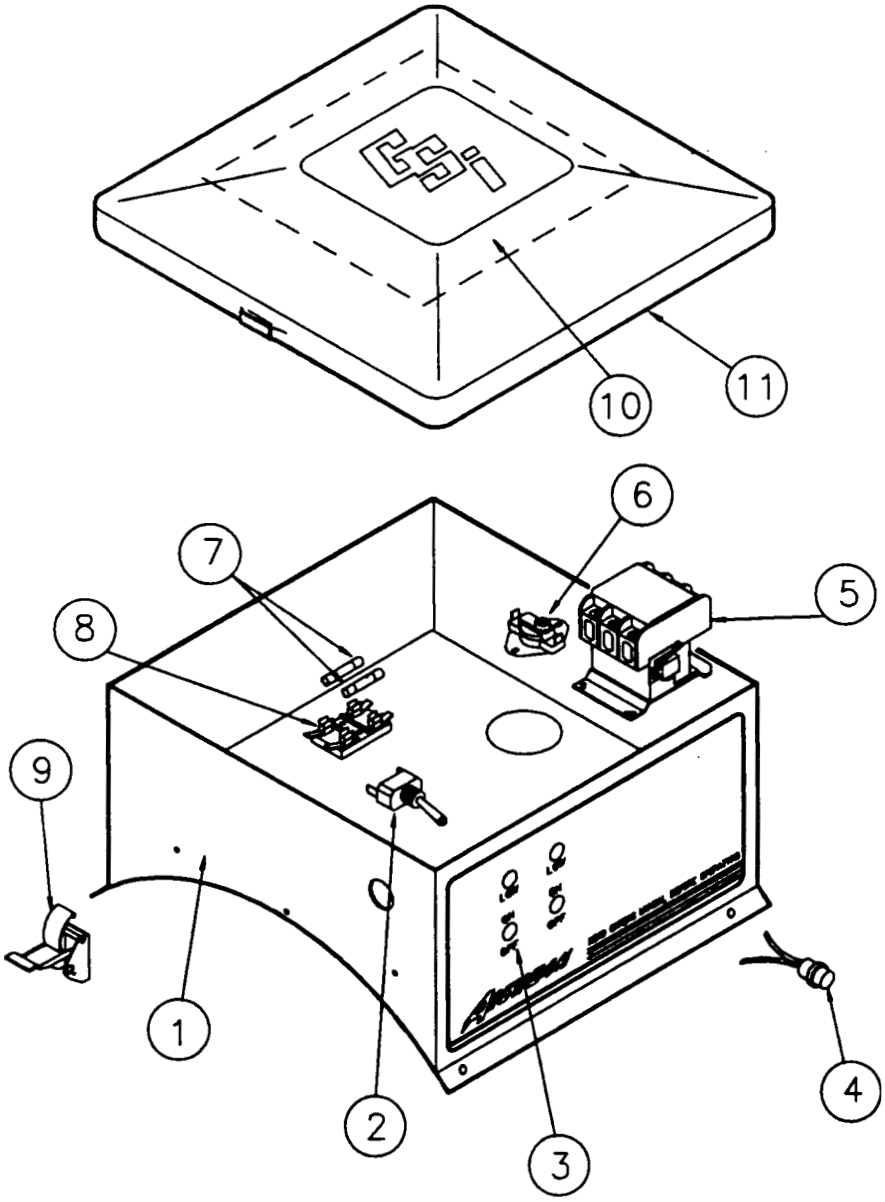
Key	Part Number	Description
1	HF-7113	24" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1038	60 Amp Contactor
6	HH-1166	120 Deg High-limit
7	CH-1039	30 Amp Contactor
8	FH-1059	5 Amp Fuse
9	FH-1058	Fuse Holder
10	FH-4429-1	Control Box Latch
11	DC-587	3 Element Wiring Diagram

26" Electric Heater



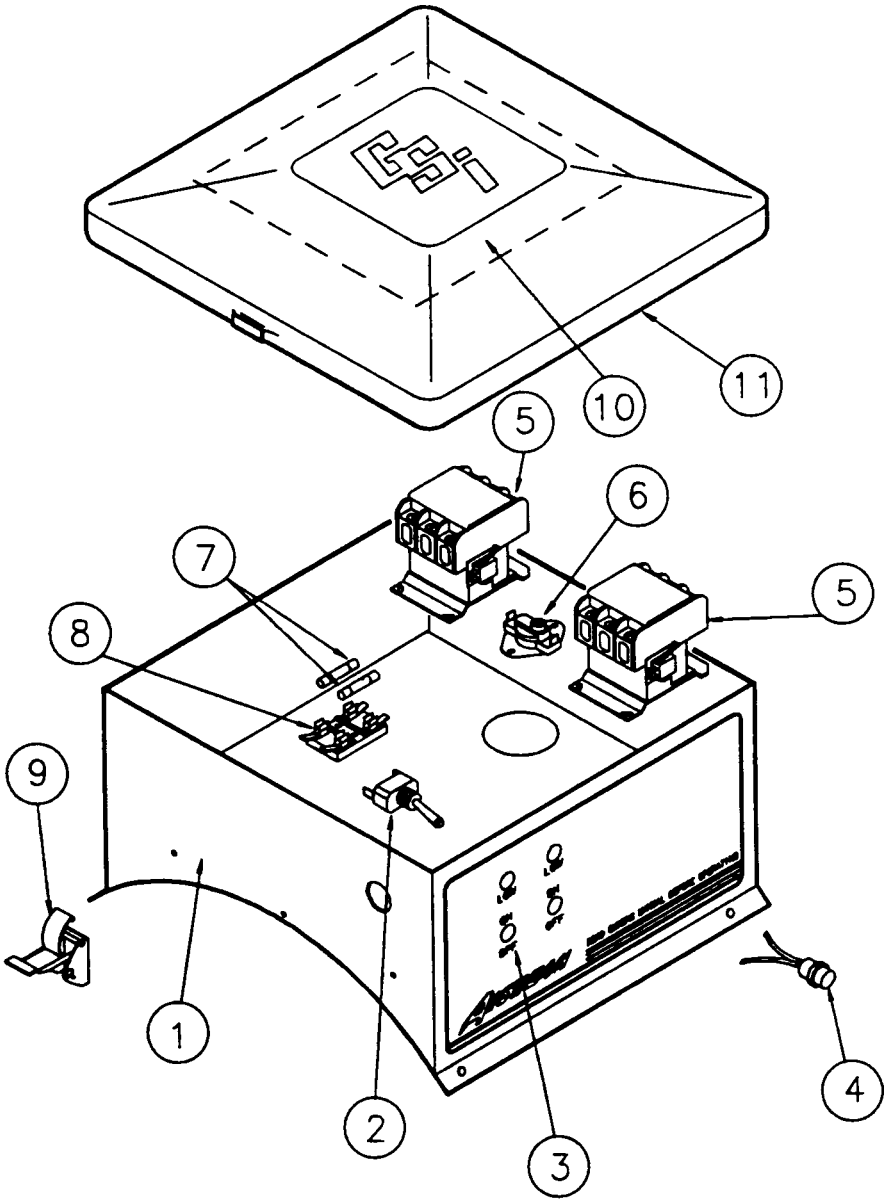
Key	Part Number	Description
1	HF-551	Element Cover Plate
2	HF-1170	220V 24-26-28" Heater Element
3	HF-548	Element Clamp Bracket
4	HF-547	Element Clamp Angle
5	HF-552	26" Element Mounting Bracket
6	HF-6783	26" Electric Heater Housing

26" Electric Heater Control Box (1 Element)



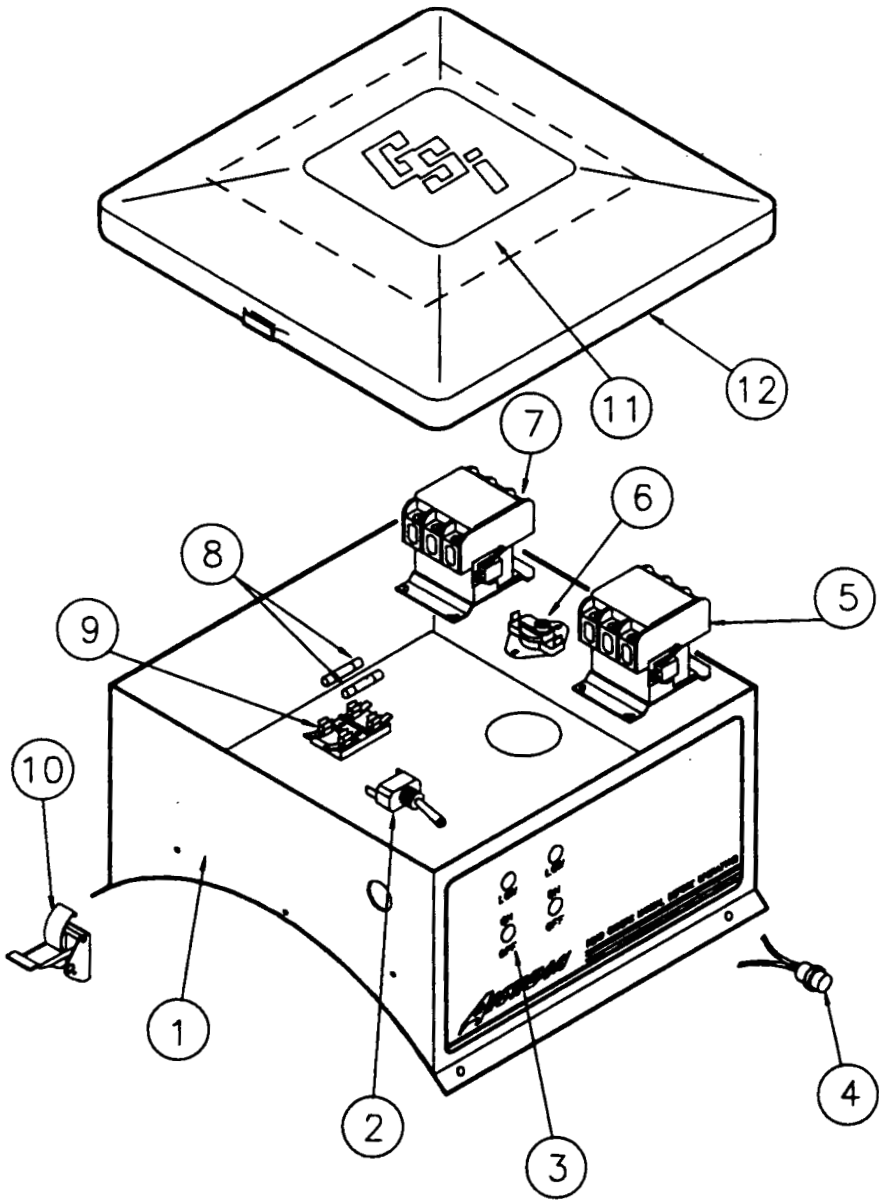
Key	Part Number	Description
1	HF-7114	26" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1039	30 Amp Contactor
6	HH-1166	120 Deg High-limit
7	FH-1059	5 Amp Fuse
8	FH-1058	Fuse Holder
9	FH-4429-1	Control Box Latch
10	DC-585	1 Element Wiring Diagram
11	F-942	Control Box Lid

26" Electric Heater Control Box (2 Element)



Key	Part Number	Description
1	HF-7114	26" 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

26" Electric Heater Control Box (3 Element)



Key	Part Number	Description
1	HF-7114	26" 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
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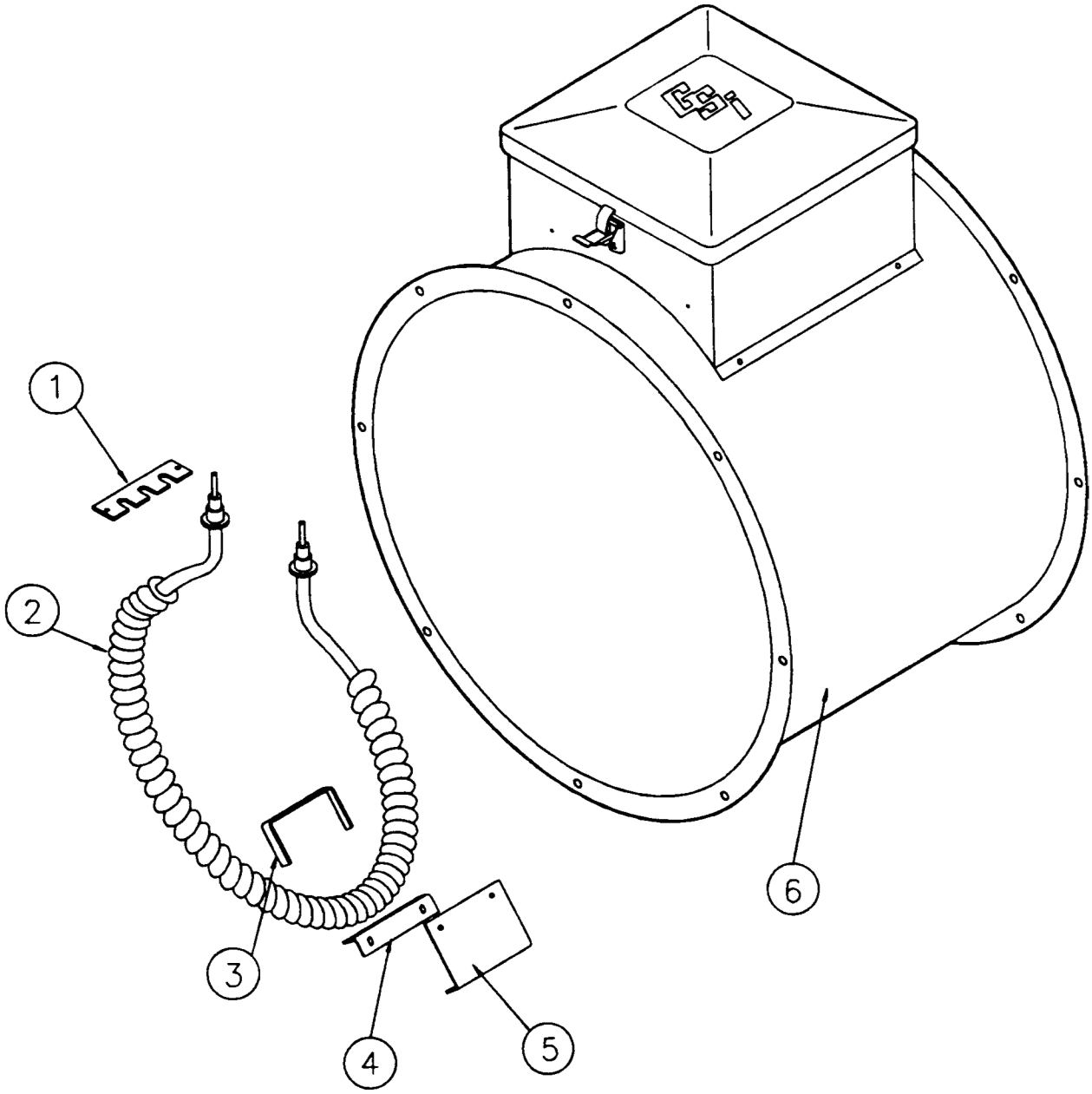
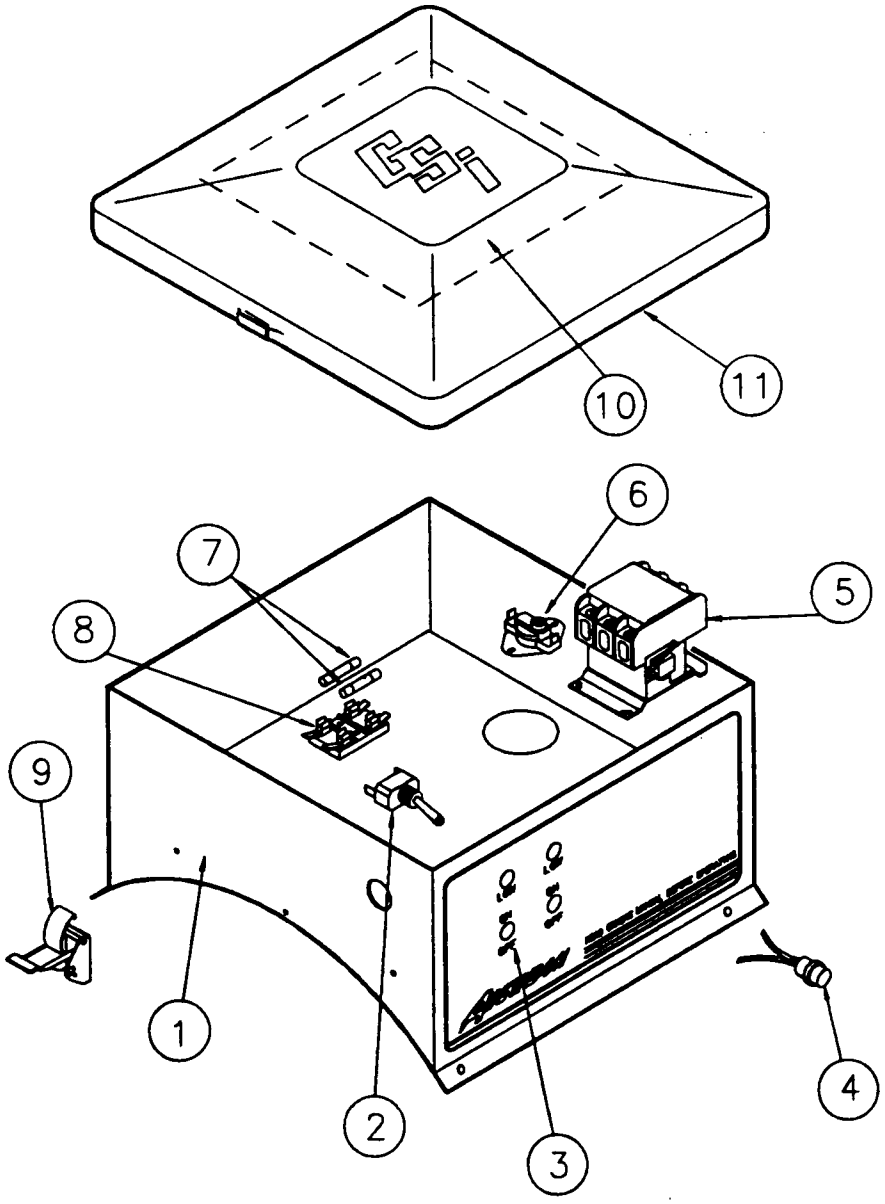
7	CH-1039	30 Amp Contactor
8	FH-1059	5 Amp Fuse
9	FH-1058	Fuse Holder
10	FH-4429-1	Control Box Latch
11	DC-587	3 Element Wiring Diagram

28" Electric Heater



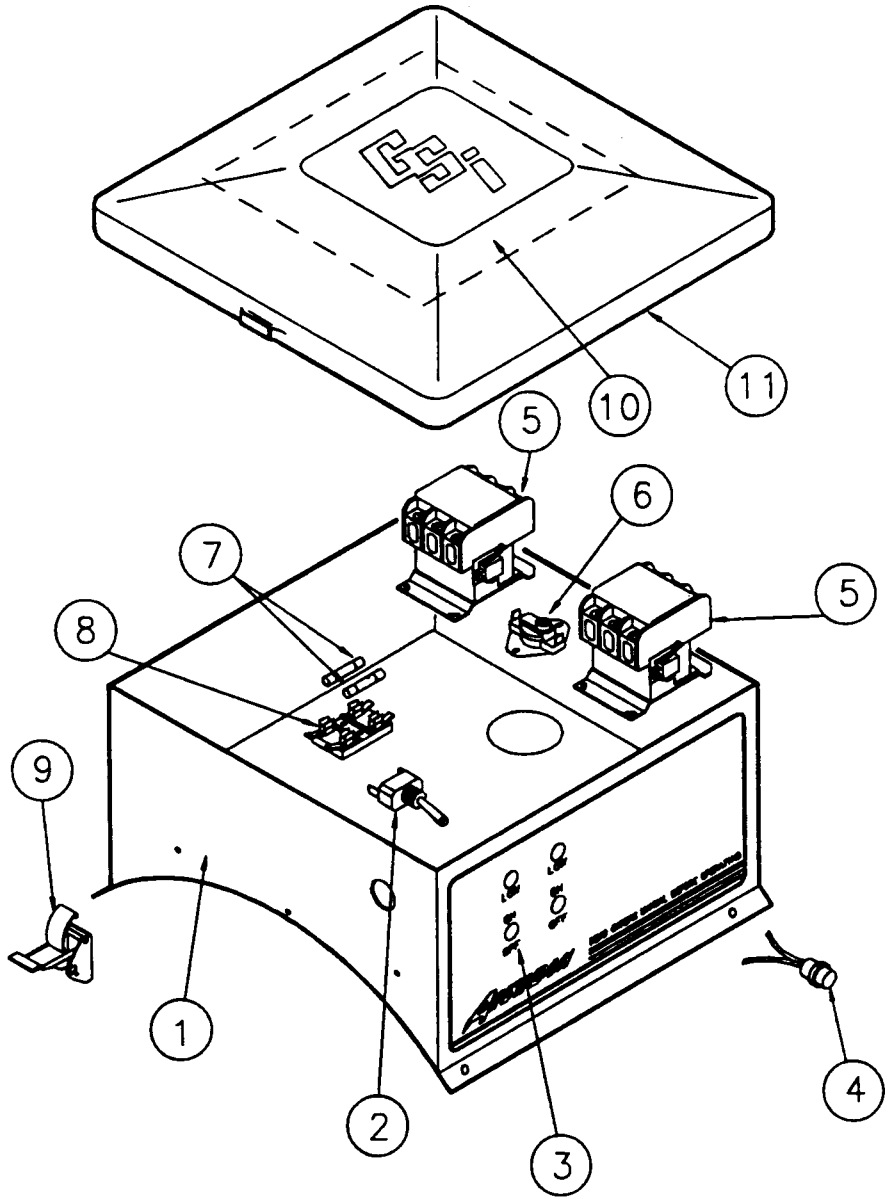
Key	Part Number	Description
1	HF-551	Element Cover Plate
2	HF-1170	220V 24-26-28" Heater Element
3	HF-548	Element Clamp Bracket
4	HF-547	Element Clamp Angle
5	HF-7128	28" Element Mounting Bracket
6	HF-7129	28" Electric Heater Housing

28" Electric Heater Control Box (1 Element)



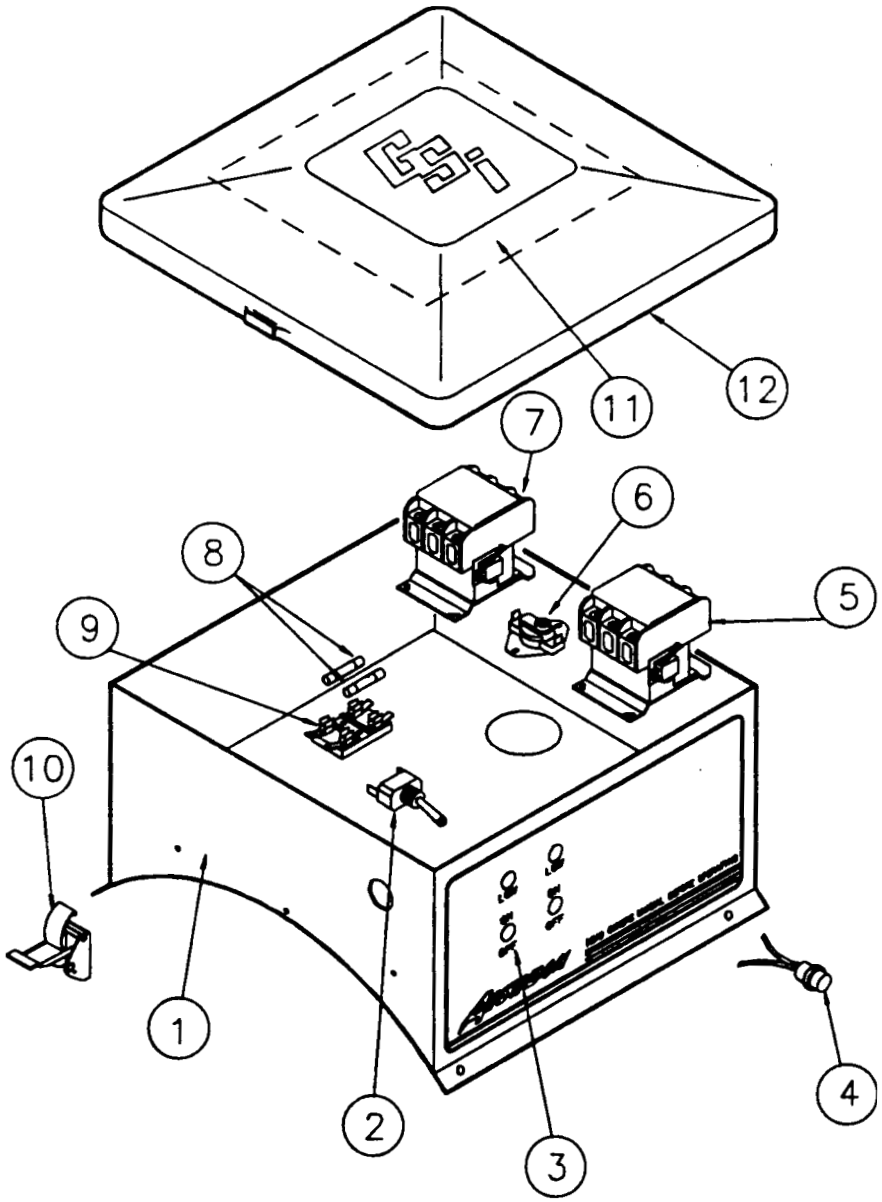
Key	Part Number	Description
1	HF-7130	28" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1039	30 Amp Contactor
6	HH-1166	120 Deg High-limit
7	FH-1059	5 Amp Fuse
8	FH-1058	Fuse Holder
9	FH-4429-1	Control Box Latch
10	DC-585	1 Element Wiring Diagram
11	F-942	Control Box Lid

28" Electric Heater Control Box (2 Element)



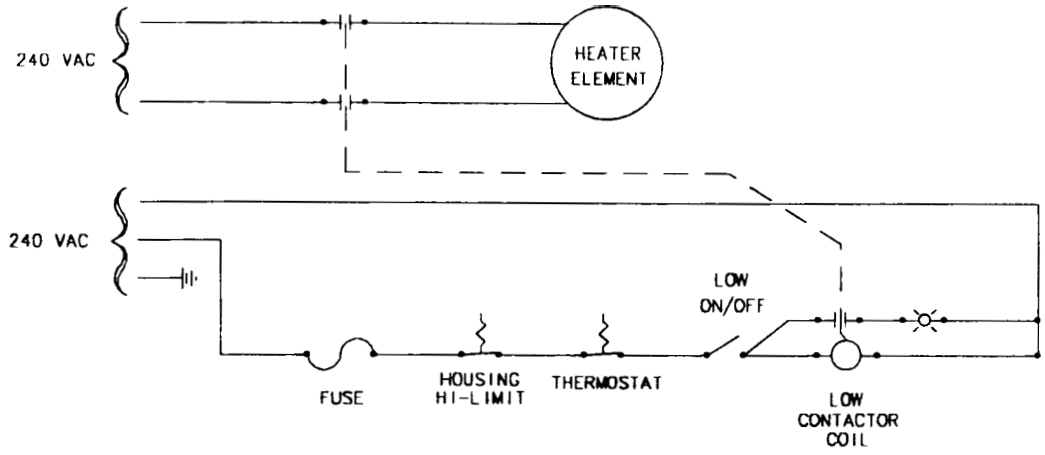
Key	Part Number	Description
1	HF-7130	28" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1039	30 Amp Contactor
6	HH-1166	120 Deg High-limit
7	FH-1059	5 Amp Fuse
8	FH-1058	Fuse Holder
9	FH-4429-1	Control Box Latch
10	DC-586	2 Element Wiring Diagram
11	F-942	Control Box Lid

28" Electric Heater Control Box (3 Element)

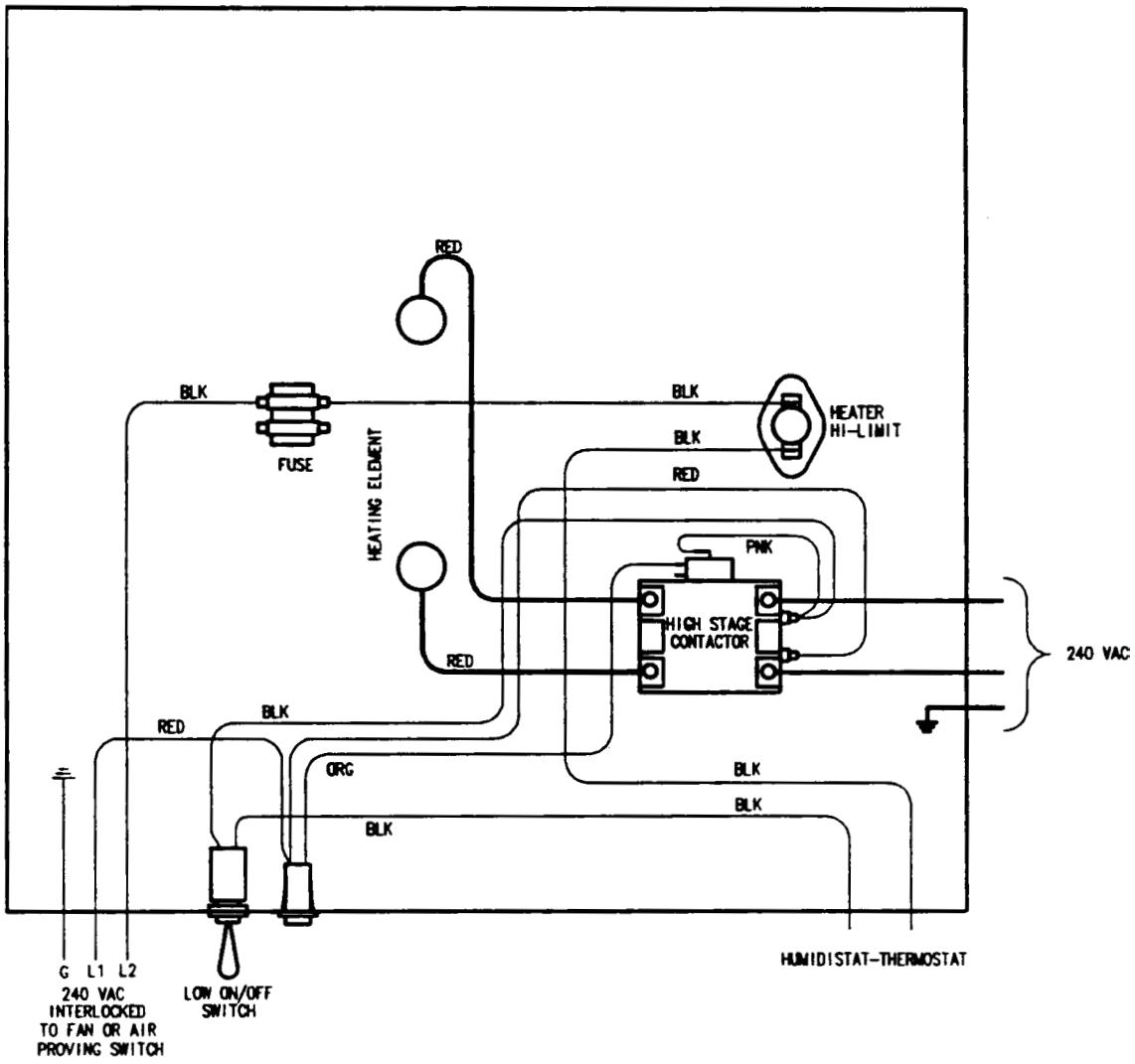


Key	Part Number	Description
1	HF-7130	28" Control Box Housing
2	HH-1442	Spst Toggle Switch
3	DC-161	Control Box Decal
4	07097476	220V Red Light
5	CH-1038	60 Amp Contactor
6	HH-1166	120 Deg High-limit
7	CH-1039	30 Amp Contactor
8	FH-1059	5 Amp Fuse
9	FH-1058	Fuse Holder
10	FH-4429-1	Control Box Latch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

240v 1 Phase 1 Element

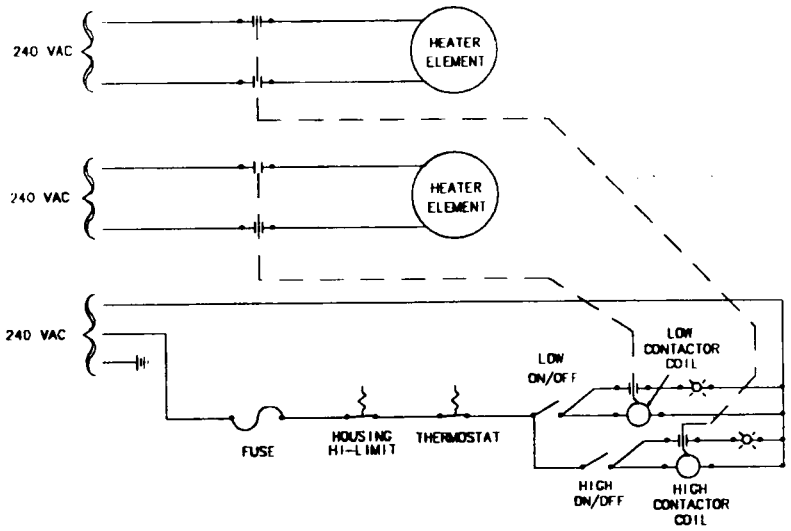


Schematic

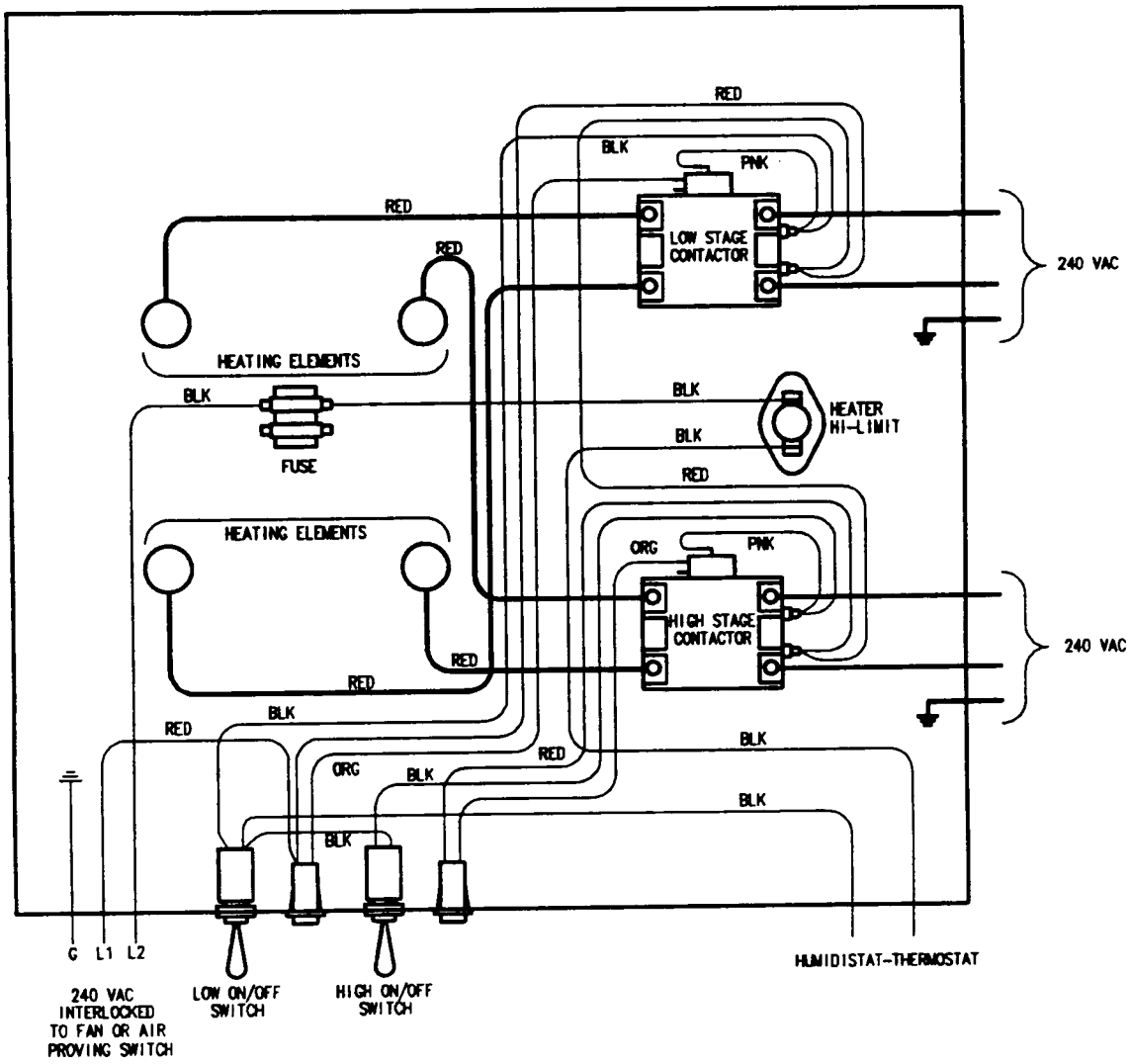


Wiring Diagram

240v 1 Phase 2 Element

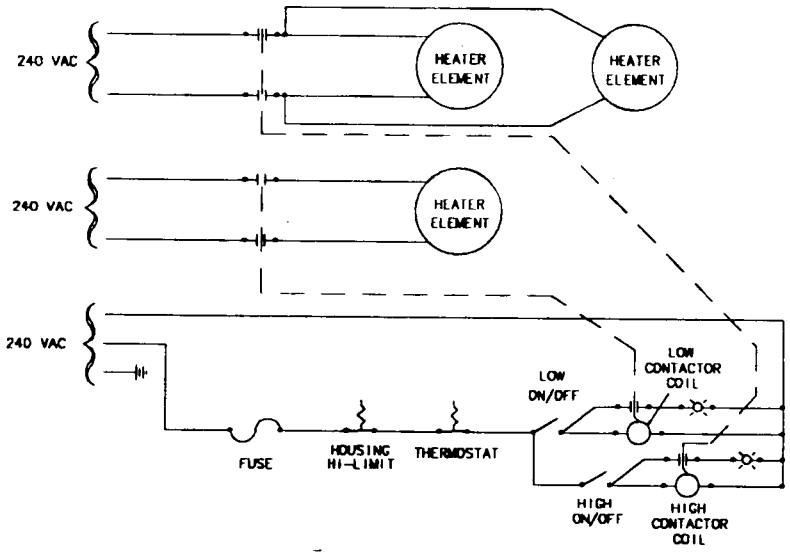


Schematic

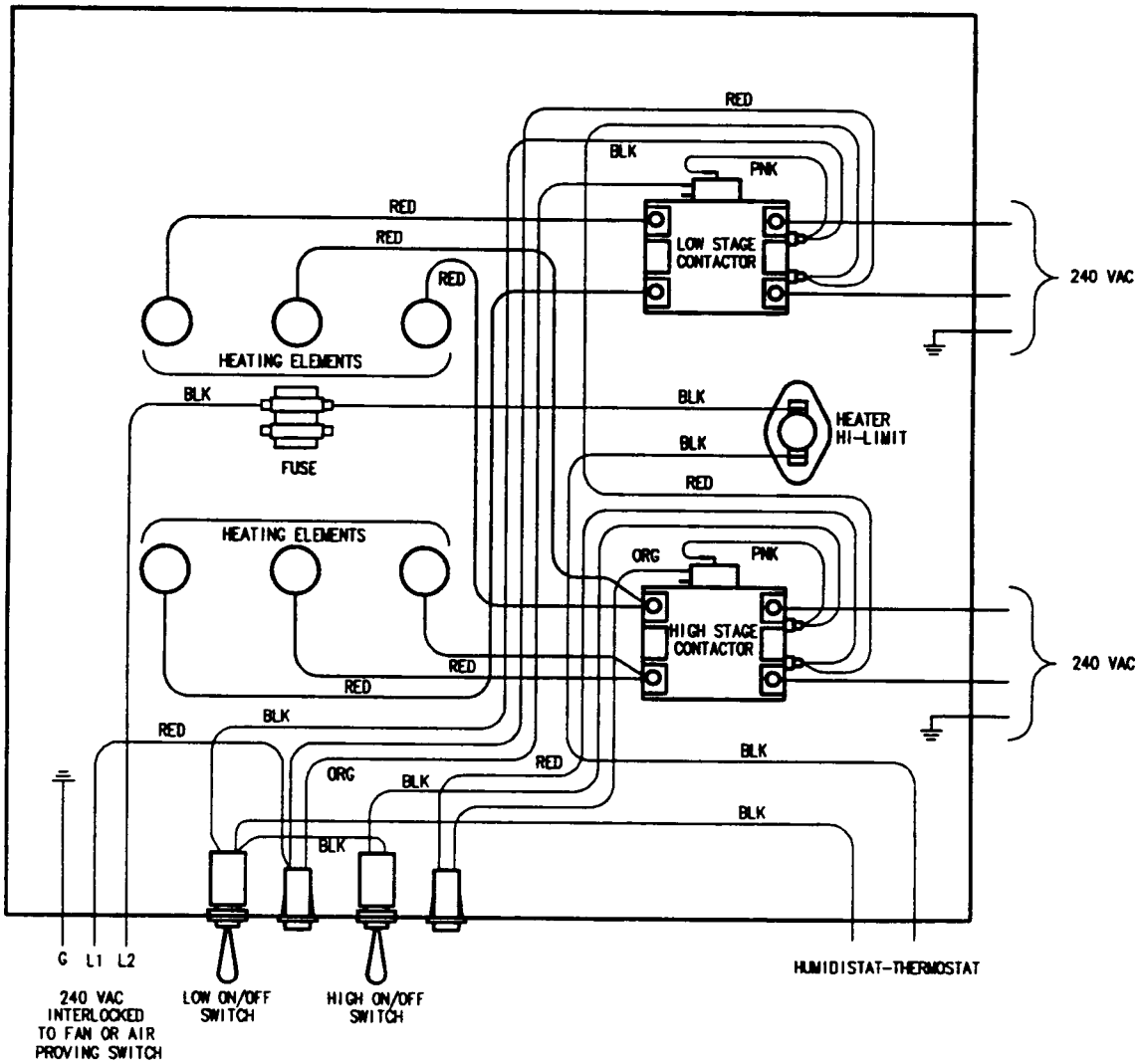


Wiring Diagram

240v 1 Phase 3 Element

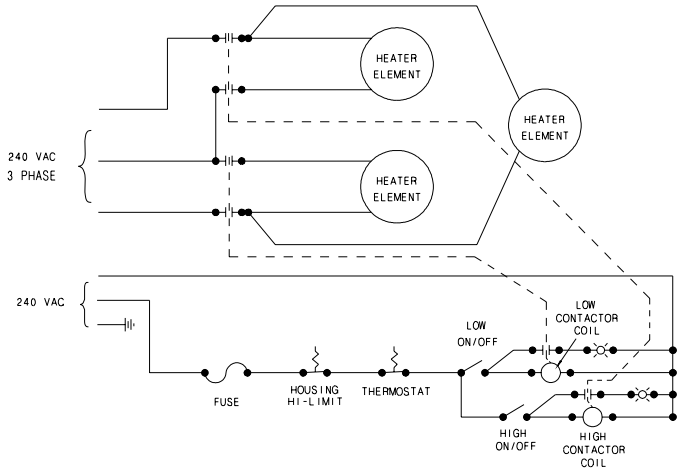


Schematic

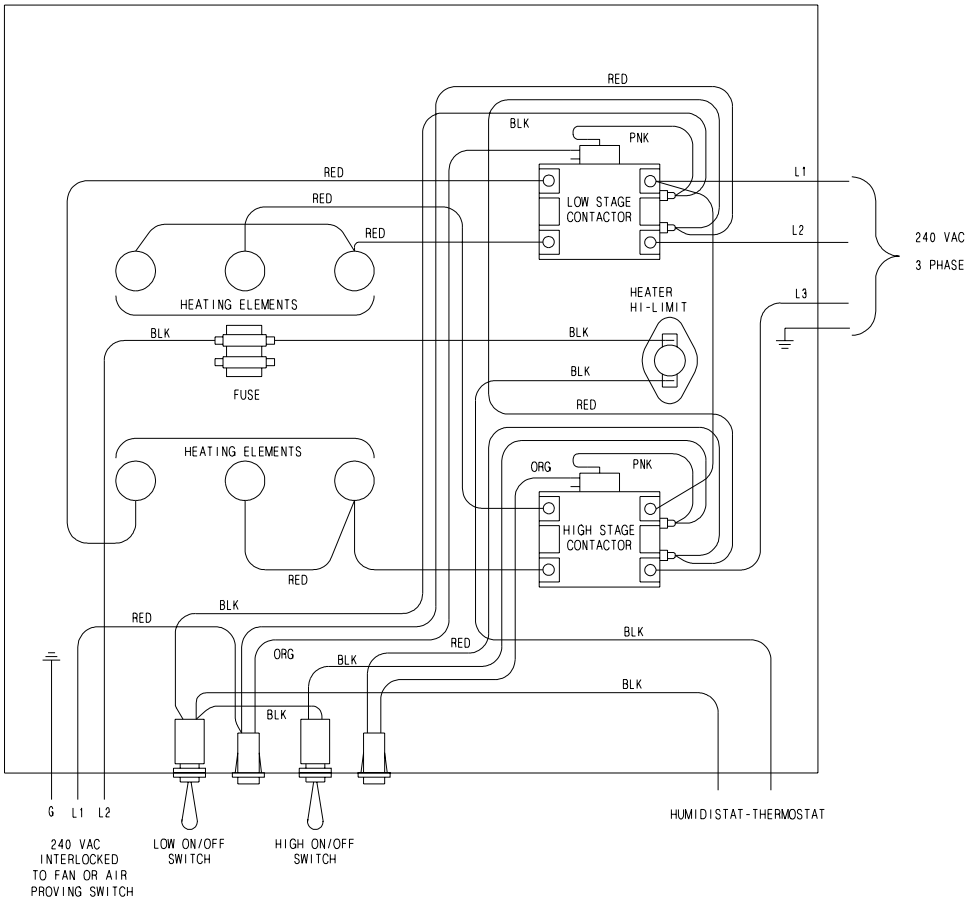


Wiring Diagram

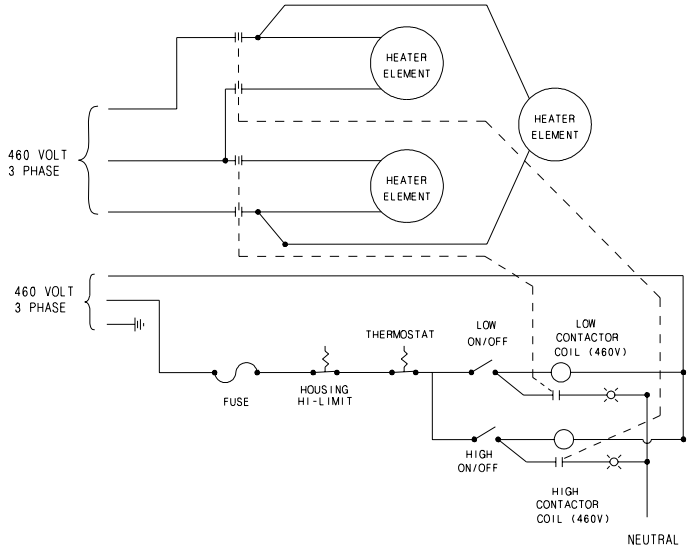
230v 3 Phase Schematic



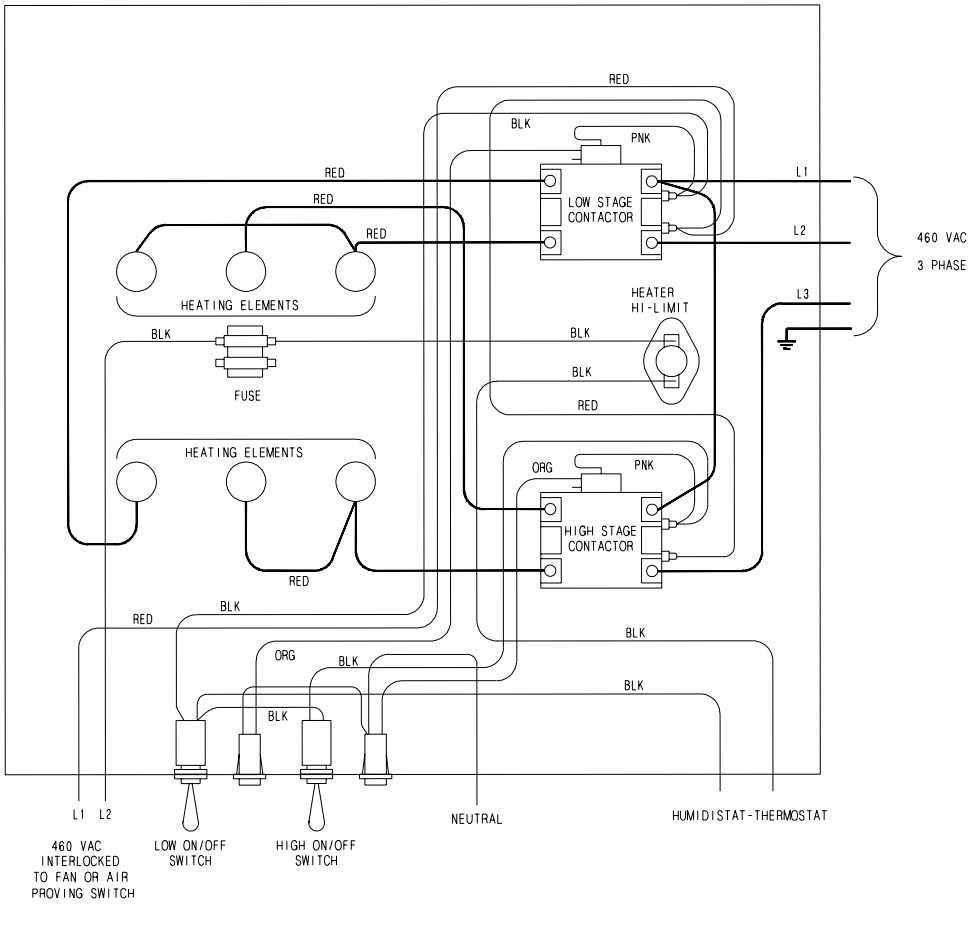
230v 3 Phase Wiring



460v 3 Phase Schematic



460v 3 Phase Wiring



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