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Troubleshooting Guide for Heatrex Duct Heaters

Before servicing the heaters, check that the heater has been installed in accordance with Heatrex's installation, operating and maintenance instruction furnished with the heater. If you require a copy of these instructions, contact Heatrex.

Caution

Troubleshooting and repair of electric equipment should only be performed by qualified service people. ALL power must be disconnected to the equipment before starting any service. Locate, tag and lock out all power sources. High voltages are dangerous and may cause electrocution if all safety measures are not observed.

Problem	Cause	Remedy
No Heat	1. Main power off	1
	2. Fan not activated	2
	3. Manual thermal cutout tripped	3
	4. Automatic thermal cutout tripped	3
	5. Airflow switch open	11
	6. Fuses blown	3
Low Output	1. Heating element burned out	4
	2. Low line voltage	5
	3. Cycling on automatic thermal cutout	3
	4. Airflow switch cycling	11
	5. Fuses blown	3
Overheating	1. Control system	2
	2. Not enough airflow	3
	3. Uneven or partially blocked airflow	3
	4. High line voltage	5
Terminals Overheating	1. Loose connections	6
	2. Improperly sized wire	7
	3. High voltage	5
Contactor Hum or Chatter	1. Low control voltage	8, 5
	2. Dirt on armature of holding coil	9
	3. Defective contactor	10
	4. Airflow switch cycling	11

Remedies

All sources of supply must be disconnected before working on this equipment.

1. Turn main power disconnect switch on. If heater has a built-in disconnect switch, the door must be closed and the switch turned "on" before the heater will operate.
2. Check to see if fan unit is on and if auxiliary contact on fan motor starter is closed. Check all field wiring for continuity or possible short circuits. Check wiring diagram on inside of cover of heater or panelboards for interlocks and remote control equipment to make sure it is all working.
3. If the fan and heater are interlocked with a fan relay, the fan must be on before the heater will operate. If an airflow switch is used, air pressure in the duct must be sufficient (at least 0.07" WC) to close the switch before the heater will operate.

Check for obstructions to airflow through the heater. Check that the heater is installed properly and has at least the minimum amount of airflow. See installation instruction sheet furnished with the heater for minimum airflow requirements. Airflow must be even across the entire face area of the heater.

Check all manual thermal cutout(s) reset button(s) – reset as required.

Check all fuses – replace as required.

4. Check for burned out elements by disconnecting power wiring to the elements and connecting a reliable ohmmeter to the element terminals. Element resistance (R) should be equal to:

$$R = \frac{E^2}{1.06 \times W} \pm 5\%$$

Where E is the voltage across the element and

$$W = \frac{\text{Nameplate KW} \times 1000}{\text{Number of Elements}}$$

Generally, the element is either bad or good. Replace if open or shorted to ground.

5. Check nameplate voltage and line voltage. They should agree. With Watts* $+E^2/R$ any change in voltage will product a significant change in wattage. If heater output is unsatisfactory and nameplate voltage is not the same as line voltage, the heater should be replaced with a heater designed for the actual line voltage.

$$*\text{Water} = \text{KW} \times 1,000$$

6. Check for obvious signs of terminal and wiring overheating. Tighten and repair as required.
All terminals should be checked and tightened once a year or at the start of every heating season.
7. All incoming wiring should be sized in accordance with NEC Article 424-3(b).
8. Check control voltage, it should not be less than 90% of the contactor coil voltage. Low control voltage can be caused by low line voltage as the control voltage is from a transformer.
9. Clean contactor armature with low air pressure and a stiff brush.
10. Replace contactor.
11. Air pressure in the duct must be at least 0.07" WC to close the switch before the heater will operate. Be sure the airflow pickup tube has been turned into the air stream. Be sure the airflow switch reference port (opposite to the sensing port) is open to the atmosphere. Be sure that the positive port has been connected when the heater is on the discharge side of the fan and that the negative port has been connected when the heater is located on the suction side of the fan.

If airflow is not sufficient to keep the switch fully on, contactor may chatter.