



# Installation, Operation and Maintenance Instructions for High Temperature Air Duct Heaters

## Special Notes



CAUTION

**CAUTION.** This document presents the minimum requirement pertaining to the installation operation, and maintenance of the respective equipment as required by the manufacturer only. Any additional considerations, including but not limited to, any design consideration, in-service inspection, and fitness-for-service assessment to meet any safety principles and local jurisdictional regulatory requirements, shall be the responsibility of the user.



CAUTION

**ELECTRIC SHOCK HAZARD.** All electric heating equipment installations must be performed by qualified personnel in accordance with all electrical codes and standards and must be effectively grounded to eliminate shock hazard.



WARNING

**FIRE/EXPLOSION HAZARD FOR HEATERS.** This heater shall be used with protection controls as follows:

Air Heating Applications

- a. An air flow switch or differential pressure switch to ensure that the heating elements are only energized when adequate airflow is provided to prevent overheating of the equipment; or
- b. Heating elements sheath temperature controls to limit to the maximum allowable sheath design temperature



WARNING

**FIRE/EXPLOSION HAZARD.** Do not operate the heater in the presence of combustible materials including, but not limited to, gases, vapors, dusts or fibers unless the heater is specifically marked for the hazardous location. Operate the heater only under conditions in which the heater operating temperature will not exceed the temperature code rating. Note: Corrosion of the sheath can result in a ground fault which, depending upon the fluid being heated, can cause a fire or an explosion.



WARNING

**FIRE HAZARD.** If a thermostat is provided, it is designed for temperature control service only. Since the thermostat is not fail safe, it should not be used for temperature limiting duty. Wiring to this device is the users' responsibility.

Heaters are capable of developing high temperatures, therefore extreme care should be taken to:

- a. Use explosion-proof terminal enclosures in hazardous locations.
- b. Maintain minimum safe distance between the heater and combustible materials.



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## A. DESCRIPTION

1. The Instruction Manual **MUST** reviewed prior to installation or operation of this equipment. Failure to do so may result in property damage, personal injury or death.
2. This equipment is designed and manufactured with the intent to be suitable for industrial use **ONLY**.
3. Only qualified personnel should install and operate this equipment.
4. This equipment shall be operated only within the designed process conditions (flow rate, process fluid, supply voltage).
5. High temperature air duct heaters are designed for operation only while adequate airflow is provided. Never allow the heating elements to be energized when adequate airflow is not provided or the equipment can overheat and cause a hazardous situation including property damage, personal injury or death.
6. This equipment must have a separately installed over-temperature cutoff. Failure to do so may result in the heater overheating.
7. This equipment must be operated be in an area free of flammable substances, including but not limited to dust, dirt, and flammable gases.
8. The electrical terminals for this equipment must be protected at all times from moisture in the form of vapor drippings, condensation, fumes, spray, or any other substance. In outdoor locations, moisture resistant housings are required. It is recommended to use a drip loop to prevent moisture from entering the terminal box via the wire.
9. Appropriate protection against ground faults, ground faults, such as a ground-fault circuit interrupter or GFCI, is required for this equipment, as well as compliance with all applicable electrical codes and standards. Failure to provide protection against electrical grounding or bonding during the use of this equipment can result in property damage, personal injury, or death.

## B. INSTALLATION WARNINGS



WARNING

**WARNING** DO NOT insulate over the mounting flange, stilted area and terminal enclosure.



CAUTION

**CAUTION** Heaters with overtemperature devices require specific installation orientation.



CAUTION

**ELECTRIC SHOCK HAZARD** Disconnect all power before installing or servicing the heater. Failure to do so could result in personal injury, property damage or death. All maintenance and installation should be done by qualified personnel in compliance with all electrical codes and standards.



WARNING

**FIRE OR SHOCK HAZARD** Moisture accumulation on the dielectric material of the elements, sheath corrosion or overtemperature of the heaters could cause a fault generating arcing and molten metal. Install proper ground fault protections to prevent personal injury, property damage or death.



WARNING

**WARNING** Users of this equipment are responsible for the proper integration to the electrical systems, including protections, backups, and controls.



CAUTION

**CAUTION** Use supply wire suitable for 90°C min.



CAUTION

**CAUTION** Use copper conductors only with sufficient current carrying capacity for the heater circuit load. Check the heater nameplate. Temperature deration factors must be applied for heaters operating above 30°C (86°F).



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## C. INSTALLATION INSTRUCTIONS

1. Unpack and check heater for any damage that may have been caused during shipping.
2. Remove any desiccant material in the electrical box.
3. Check that all terminal connections are tight.
4. Check supply voltage for compliance with heater nameplate voltage. DO NOT connect the heater to a voltage source other than as listed on the heater nameplate.
5. A temperature controller or pilot duty thermostat should be used to control the heater. The pilot duty thermostat must be used with a contactor and (if required) a transformer.

4. Energize the heater and check for signs of hotspots in the electrical connections or vessel.
5. Retorque all electrical connections after 10 cycles.

## E. MAINTENANCE



**WARNING**

**WARNING** Disconnect all power before servicing the heater or heated equipment. Failure to do so could result in personal injury, property damage or death. All maintenance and installation should be done by qualified personnel in compliance with all electrical codes and standards.

## D. OPERATION



**CAUTION**

**RISK OF FIRE OR EXPLOSION** Do not operate heater at voltages higher than the rating specified on the nameplate. Failure to do this will cause elevated temperatures.



**WARNING**

**WARNING** Prior to operation an insulation resistance check must be performed. Heater with values less than 0.5 MΩ should follow a drying process. Please contact factory for details on procedure if heater is under 0.5 MΩ.



**WARNING**

**WARNING** Low megohm on heating elements with epoxy or hermetic seals cannot be serviced in the field. Typical resistance values when sealed are 1000 MΩ or greater.

1. Heaters stored for prolonged periods may absorb moisture. Using a 500V DC megger (insulation resistance tester) check the value of the insulation resistance to ground for each circuit. Initial readings of over 500,000 ohms to ground are normally acceptable. Should lower readings be observed, check factory for instructions.
2. Periodically check electrical connections for tightness and check wire insulation for any damage and replace if necessary.
3. Inspect the immersion heater periodically for corrosion and dust build-up. Do not continue to use a heater showing visible signs of corrosion.

1. Check that all connections are tight.
2. Verify temperature controller or thermostat is operating properly by cycling it and verifying cutout.
3. Perform an IR test prior to energization and verify that levels are acceptable (500,000 ohms min).