



# INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS FOR INDEECO 220 SERIES ELECTRIC DUCT HEATERS USED IN HAZARDOUS LOCATIONS

## GENERAL

1. **CAUTION:** These installation instructions are for use by qualified personnel only.
2. **CAUTION:** Explosionproof duct heaters are designed for use in a specific hazardous location. Do not install the heater in an atmosphere where gases whose ignition temperatures are lower than the maximum operating temperature of the heater as shown on the nameplate are present, or in any location other than that shown on the nameplate.
3. **CAUTION:** Never install the explosionproof duct heater in a location where the minimum airflow is less than the value listed on the heater nameplate.
4. Always take care not to scratch or nick the mating surface between the terminal box cover and the terminal box. This surface must be smooth and fit tightly together to be able to contain a fire in the terminal box.

## MECHANICAL INSTALLATION

1. The heater must be installed in the correct orientation as indicated by the arrows inside the terminal box.
2. The air duct must be installed in accordance with the standards of the National Fire Protection Association for installation of air conditioning and ventilating systems of other than residence type (Pamphlet No. 90A) and residence type warm air heating and air conditioning systems (Pamphlet No. 90B).
3. For proper installation of heaters equipped with a built-in airflow switch, see the air flow switch manufacturer's instructions.
4. **CAUTION:** Due to the weight of the heater terminal box, care must be taken to provide adequate support.
5. Allow clearance to the heater for the terminal box cover to swing open.

## FLANGED CONSTRUCTION:

- A. Provide flanges on the duct to match the heater flanges on both the entering and leaving air sides.
- B. Supply gasket between mounting and mating flanges.
- C. Attach the duct flanges to the heater with a sufficient number of bolts or studs to support the heater and seal the duct.

## SLIP-IN CONSTRUCTION: (NOT RECOMMENDED BY FACTORY)

- A. All slip-in type heaters are suitable for installation in ducts with up to 1" of interior insulation as long as they have been sized for the dimensions inside the insulation. The heaters are not suitable for

insulation depths of greater than 1" unless special construction has been ordered.

- B. Cut a hole in the side of the duct to accommodate the heater frame. This hole should be 1/8" larger than the heater frame.
- C. Contact factory for installation instructions on your specific application.

## ELECTRICAL INSTALLATION

1. Follow the wiring diagram on the inside of the terminal box.
2. All supply connections must be made according to the latest NEC requirements for Class I and Class II locations. All the conduits entering the terminal box enclosure must be provided with conduit seals at the enclosure.
3. Supply connections must be made with copper wiring rated for 75°C minimum.
4. If supply connections are for 250 volts or greater, all wiring must be insulated for 600 volts.
5. Supply conductors for heaters rated less than 50 KW must be sized at 125% of rated load. On heaters rated 50 KW and more, the supply conductors may be sized at 100% of rated load if indicated on the wiring diagram. The line current for either a single or three phase load is calculated as follows:

Single Phase Line Current = (KW x 1000)/voltage

Three Phase Line Current = (KW x 1000)/voltage x 1.73

6. The following table shows the maximum current for 75°C copper wire with not more than three conductors in a raceway. It is based on the 1990 National Electric Code Table 310-16. The amperages shown are for 125% and 100% wire sizing. If there are more than three conductors in a raceway, derate these amperages per note 8 to Table 310-16.

AMPS		WIRE SIZE	AMPS		WIRE SIZE	AMPS		WIRE SIZE
125%	100%	AWG/ MCM	125%	100%	AWG/ MCM	125%	100%	AWG/ MCM
12		14	80	100	3	184	230	4/0
16		12	92	115	2	204	255	250
24		10	104	130	1	228	285	300
40		8	120	150	0	248	310	400
52	65	6	140	175	2/0	268	335	400
68	85	4	160	200	3/0	304	380	500

7. When connecting heaters with more than one stage, wire stage No. 1 so that it is the first stage on and the

last stage off (high limit overtemperature thermocouples are located on stage 1 elements). Heaters with built-in PE switches must follow this rule also. The stage number will be indicated on the front of each PE switch.

8. The heater must be wired so that it cannot operate unless air is flowing over it. This can be accomplished by using a built-in or remote airflow switch, a built-in fan relay, or any of several other methods. See the accompanying wiring diagram for the method used with this heater and provide appropriate interlock wiring as shown.
9. NEC requires the heater manufacturer to supply: (1) overcurrent protection where heater total current exceeds 48 amperes and (2) any contactors required for proper functioning of temperature limiting controls. Where these devices are not included in the heater terminal box, they are supplied in a remote panelboard shown on the wiring diagram. Do not install the panel in any location other than that shown on the nameplate of the panel. The wiring between the panel and the heater must be done in accordance with the NEC.
10. Install a line disconnect switch or main circuit breaker in accordance with NEC Article 424-19. Depending upon the heater's location and accessibility, a built-in disconnect switch may meet this requirement.
11. All electrical connections in the heater, including both field and factory made connections, should be checked for tightness before operating the heater. In addition, after a short period of operation, all connections should again be checked for tightness.
12. If the heater is wired to a heating/cooling thermostat, use a thermostat with isolating circuits to prevent possible interconnection of Class II outputs.
13. Verify that all unused conduit holes are plugged with factory supplied plugs.

## MAINTENANCE AND TROUBLESHOOTING

1. **CAUTION:** Maintenance and troubleshooting should be performed by qualified personnel only.
2. **CAUTION: ALL SOURCES OF SUPPLY MUST BE DISCONNECTED BEFORE WORKING ON THIS EQUIPMENT.**

### Routine:

3. Check all electric connections, including field and factory made connections, for tightness at least once each year or operating season. In addition, any filters in the airstream must be kept clean so that adequate airflow is maintained.

### Non-Routine:

4. Periodically inspect duct and heating elements for blockage or dirt build-up. The heater may be cleaned using compressed air. Do not wash down the heater.
5. Periodically inspect heating elements for signs of corrosion. Consult factory immediately if corrosion exists.
6. During normal operation, the limit controls are not supposed to cycle the heater ON and OFF. If frequent tripping of the limit controls occur, check to see if the inlet or the outlet of the heater is blocked in some way. If no obstruction is visible and airflow is greater than the minimum listed on the nameplate, consult the factory to determine the cause of the nuisance tripping.
7. Heating elements and control components are not field repairable. In the event that you require repairs or replacement components, obtain a Return Goods Number from the factory and return the heater to the factory for evaluation of the problem.

**FIELD REPAIRS ARE NOT AUTHORIZED.**

## INSTALLATION DRAWINGS

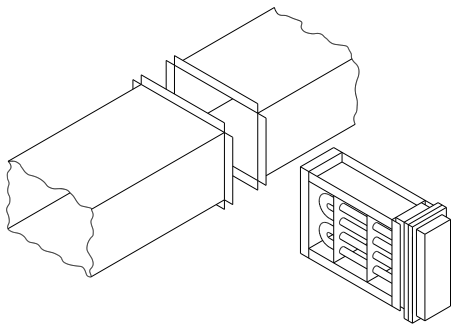


Fig. 1 – Installation drawing of flanged heater.

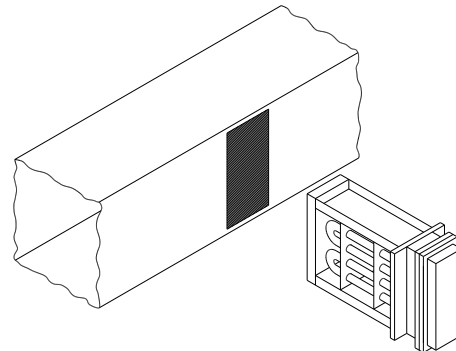


Fig. 2 – Installation drawing of slip-in heater.

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