

# INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS

## GENERAL

This heater is supplied with an airflow switch suitable for either positive or negative pressure systems. Refer to Figure 1 to determine if switch is factory arranged for positive or negative pressure. Airflow switches connected to sense positive pressure will have sensing tube connected to positive port; negative sensing tube would be connected to negative sensing port if switch is connected for negative pressure system. Install heater in duct in accordance with instruction below.

## INSTALLATION

1. Install in a location where the minimum combined velocity and static pressure will be at least  $.05 \pm .02$ " WC when the fan is running. Heaters with positive pressure arrangement must be installed on pressure side of the fan. Negative pressure arrangement must be installed on the suction side of the fan. Avoid locations closer than two feet from room outlet or register where low static pressure may exist.
2. Mount heater in a location relatively free of vibration. Follow installation instructions furnished with the heater.

**NOTE: Heaters with airflow switches are not designed to operate in locations such as pressurized ceiling plenums where there may be no difference in static pressure between the duct and the heater terminal box.**

### DIRECTION OF AIRFLOW

The heater may be installed for either horizontal or vertical airflow. Airflow direction can be left or right, up or down.

Exception: Heaters with positive sensitive devices such as SCR controllers or mercury contractors may be mounted according to the caution label.

### POSITION OF THE SENSING TUBE

1. Positive Pressure

To insure proper operation, the curved end of the sensing probe should be turned to face upstream (toward the fan) to increase the pressure sensed by the airflow switch. The sensing probe has arrow indicating airflow direction. If necessary, to rotate sensing probe, proceed as follows:

- A. Remove flexible hose from probe.
- B. Remove two (2) probe mounting screws.
- C. Rotate probe 180 degrees
- D. Replace probe and reconnect flexible hose.

2. Negative Pressure

For negative pressure applications, the switch does not require a curved sensing probe. Field adjustment of probe position is not required.

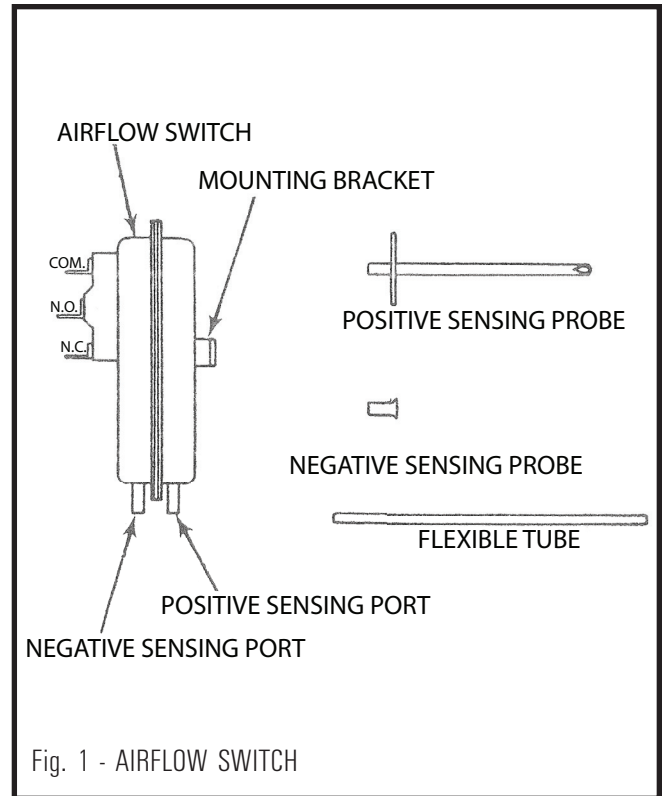


Fig. 1 - AIRFLOW SWITCH

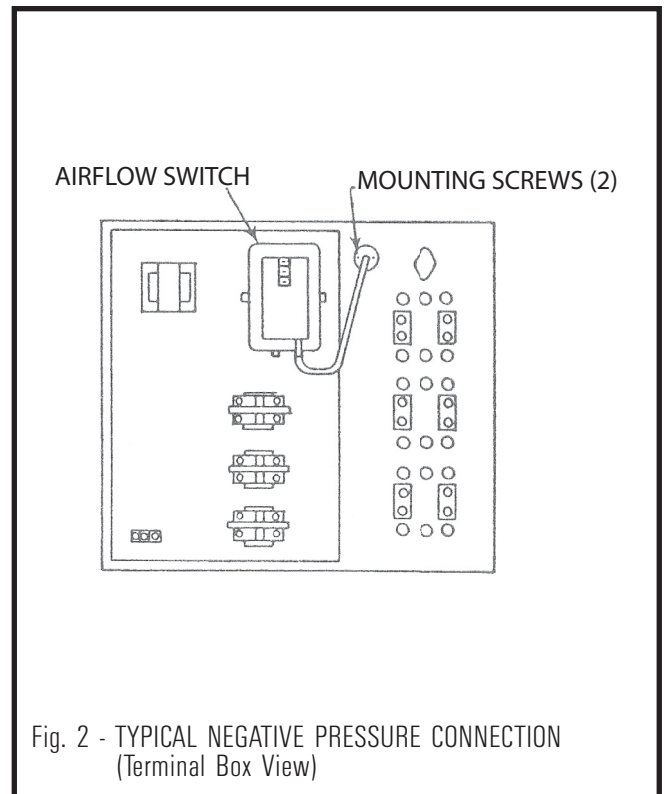


Fig. 2 - TYPICAL NEGATIVE PRESSURE CONNECTION  
 (Terminal Box View)

(Continued on Reverse Side)

## OPERATION

The airflow switch has been factory set to close at pressure of .05+/-0.02" WC. After the air distribution system has been properly balanced and before applying power to heater, test for sufficient airflow as follows:

- A. Insure that all power sources and main power to heater are off.
- B. WITH FAN ON, Check for continuity between terminals on airflow switch marked "NORM, OPEN". The correct readings are indication of zero resistance on an ohmmeter or short on a test light.

C. WITH FAN OFF, check continuity as in Step 2, above. Switch should now be open, with no continuity indicated.

**NOTE: If the switch does not close when fan is on or causes contactor to chatter when in operation, there is insufficient air pressure in the duct to operate the heater. Do not attempt to alter or short out the airflow switch.**

## MAINTENANCE

After initial installation and check out, field maintenance is not normally required. If heater does not operate properly and other protective devices function properly (See Bulletin I-17), the following suggestions may be of assistance.

<b>LOCATING TROUBLE</b>	
<b>PROBLEM</b>	<b>POSSIBLE SOLUTION</b>
<p><b>1</b></p> <p style="text-align: center;">AIRFLOW SWITCH WILL NOT OPERATE</p>	<ul style="list-style-type: none"> <li>A. Fan may be off or not delivering enough air. Check for sufficient CFM capacity. Sampling tube may be attached to incorrect port on airflow switch. Refer to Figure 1 for proper port connection for positive and negative applications.</li> <li>B. Airflow switch will not close unless the total pressure in the duct at the airflow switch is at least .05+/-0.02" WC pressure. If switch is located too close to the end of the duct (within two feet of register) or in other locations where airflow is very low or irregular (near bends or transitions) it may not close or may chatter. If positive pressure application, insure sampling probe faces into airflow for maximum sensing of velocity pressure. If switch does not close, relocate heater closer to fan.</li> <li>C. Airflow switch will not work if mounted in a plenum or false ceiling where there is no difference in static.</li> </ul>
<p><b>2</b></p> <p style="text-align: center;">AIRFLOW SWITCH CHATTERS (WILL NOT STAY ON)</p>	<ul style="list-style-type: none"> <li>A. Insufficient total pressure in duct may cause the airflow switch to chatter. At least .05+/-0.02" WC static pressure is required to operating the switch. See Item 1-B above.</li> <li>B. Check for loose wire connection in control unit.</li> </ul>
<p><b>3</b></p> <p style="text-align: center;">AIRFLOW SWITCH STOPS WORKING (AFTER A PERIOD OF NORMAL OPERATION)</p>	<ul style="list-style-type: none"> <li>A. Sampling tube may have been clogged. Remove sensing probe and tubing from heater; clean and reinstall.</li> <li>B. Airflow may have been stopped or diminished. Check for dirty filters, closed fire doors or balancing dampers, loose or broken fan belt, etc..</li> <li>C. Check for continuity in control circuit wiring. Some other safety device may have been opened.</li> <li>D. To be sure the airflow switch itself is at fault, perform the operational test under OPERATION, above.</li> </ul>

## SPECIFICATIONS

**Model DFS-221-112**

**Range**

**Electrical Ratings**

Factory adjusted to close at .05+/-0.02" WC static pressure. Maximum allowable pressure is 13.8" WC (1/2 psi.)

Resistive Loads, 15 Amps to 277 V

**UL Listed**

for installation in Brasch ELECTRODUCT heaters under File No. E 39836