

BRASCH INSTRUCTIONS FOR FIELD REPLACEMENT OF RESISTANCE OPEN COIL ELEMENTS IN BRASCH DUCT HEATERS

1. Replacement elements are shipped with the following:
 - A. Terminals and hardware on each end of the elements.
 - B. The necessary terminal insulators.
2. Before removing the old elements from the heater, make an accurate sketch of the terminal box and terminal box wiring. Also make a sketch of the heater elements in the frame and the number of passes each element makes throughout the face area of the heater. Replacement elements must be positioned in the heater frame and terminals and busses connected exactly as shown in the two sketches just completed.
3. It may be necessary to remove the back pan (opposite end of the heater frame to the terminal box) of the heater if there is insufficient space to install the element. The pan may be removed by drilling out the spotwelds that attach it to the frame. Later, the pan can be reattached by using sheet metal screws. It also may be necessary to remove the terminal box if there is insufficient space to make the element return bends.
4. The replacement element must be stretched to the proper length before installation. The proper stretched length is determined by the width ("W" dimension) of the heater and by the number of passes which the element makes through the heater, and is found by the formula: $\text{Stretched Length} = \text{number of passes} \times (W - 1")$. It is important that the element not be over-stretched.
5. Use extreme caution to avoid damaging the supporting insulator bushings when removing or installing an element. To install the element, proceed as follows:
 - A. Determine the mid-point of the element.
 - B. Pass both ends of the element through the heater frame simultaneously. The sketch made in Paragraph 2 must be carefully examined to insure that these passes are made through the correct location, and in the direction that will place the center of the return bend at the proper end of the heater. For example, if the element is to make four passes the mid-point of the element must be across the front bracket (i.e. at terminal end).
6. The male half of the phenolic terminal insulator bushing must be placed in the terminal pan from the side internal to the duct, before the element terminal is passed through the terminal pan. (If the terminal pan has been removed, all of the elements should be strung before this phase of the job is attempted.) Care must be taken that the terminal is completely seated into this section of the insulator bushing, so that the terminal is prevented from rotating when its hardware is installed.

(Terminal pans which have been removed may be re-assembled to the heater and attached with sheet metal screws after all terminals have been inserted through their insulator bushings.)

The terminals are fastened into their insulator bushings by a nut tightened down against a washer on top of the female section of the bushing. It is essential to assure that the terminal is completely seated into the bushing so that it is prevented from turning. Extreme caution should be observed when tightening bushings as they may be easily cracked by over-tightening.

NOTE: all #10-32 element terminals should be torqued to 20 in-lbs in order to ensure proper tightness and prevent failure due to loose connections.

7. The buss pieces previously removed when removing the old elements, must be placed exactly as shown in the terminal box sketch made in Paragraph 2. All supply connections to the resistance element terminals or their busses must be reconnected exactly as shown in this sketch made in Paragraph 2.

After the installation of new elements has been completed, make a thorough visual inspection of the heater insuring that all electrical connections are tight, the washers installed in the proper locations, all bus bars and supply connections match the sketch made in Paragraph 2 and that all foreign materials such as old terminal hardware, old elements, etc., are removed from the terminal box. A resistance check of each stage should be made insuring that each has equal continuity and that there are no shorts to ground. If available, a hypot tester should be used applying 2000 volts to ground at each supply connection. If any electrical arcing or breakdown occurs, the heater must be carefully examined and the fault determined and corrected before energizing the heater.

NOTE: BRASCH assumes no liability for workmanship or cost incurred by field repair of heaters.