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Dekoron Unitherm LL C
CAPE CORAL, FLORIDA

TECHNICAL UPDATE - TU-4011

SUBJECT: Verification of Heater Operation

Both constant power density (CPD) and self-regulating (SR) heating cables are constructed as parallel circuits. Parallel construction includes two bus wires that provide nearly a constant voltage along the entire length. A break, or discontinuity, in either bus wire will disable heater operation from the break point to the fleet end of the heater.

Continuity Verification:
Electrical continuity can be verified by sensing the voltage at the ends of the bus wires or by checking the bus wire resistance. A Dekoron Unitherm Model1556 Monitor light can be used to continuously verify the circuit continuity during normal operation by sensing the bus wire voltage. An ohmmeter can be used to simply test the heater continuity.

To use a monitor lamp, and electric traced bundle must be designed with a "monitor" wire in the bundle. A monitor lamp is connected to the monitor wires as shown in Figure 1. One or both heater wires may be monitored for continuity. Monitoring both bus wires provides the most reassurance that the heater circuit is unbroken.
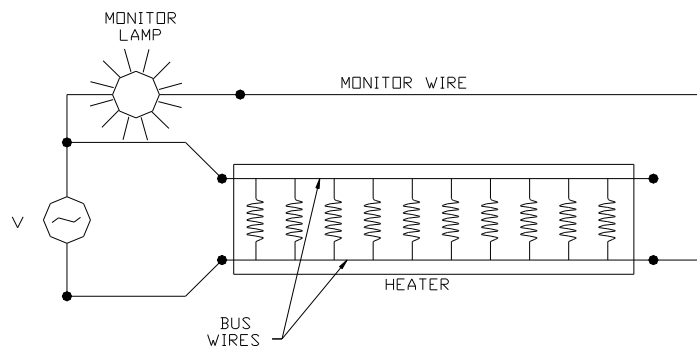

Figure 1 - Heater with one external monitor wire
To check for heater continuity using an ohmmeter, the heater should be disconnected from all power sources. Temporarily twist the two bus wires together at one end of the heater. Then connect the ohmmeter to each of the two bus wires on the opposite end. Typical bus wire resistance should be less than 10 Ohms. A high resistance will indicate a broken bus wire within the heater.

Power Output Calculation:
The power output of CPD heaters can be determined by measuring the resistance across the bus wires and the voltage of the power source. (The end of the heater must be properly terminated by insulating the bus wire ends from one another and the metallic braid). The total power output in Watts may be calculated using Equation 1. Divide the total power output by the length of the heater to determine the power output per foot (meter) of heater.

P = V/R (Equation 1)

where   P = power (Watts)
        V = voltage (Volts)
        R = resistance (Ohms)

Due to the variable resistance of SR heaters, the power
output can not be accurately determined in this manner