BURNS ENGINEERING

Application Note

A130521

Old School Electronics Solves Long Lead-wire Dilemma

APPLICATION

As part of a ground source heat pump system several temperature measurements were required to control and monitor the fluid in the system and the ground temperature at underground points. A typical ground source heat pump system consists of a deep well or coils of tubing buried underground as a means of cooling or heating a fluid used by the heat exchanger. This design takes advantage of the moderate temperatures in the ground to boost efficiency and reduce the operational costs of heating and cooling systems. Several of the measurement points required a long cable run of up to 500 feet to get above ground and over to a central control room.

A waterproof RTD (Burns Series A) was chosen as the sensor for accuracy, long term stability, and durability.

TL

Two wire temperature transmitter

CHALLENGE

Long cable runs have high resistance and are not compatible with many of the new smart transmitters. Locating the transmitter closer to the RTD was not an option because the measurement points were underground.

SOLUTION

As it turns out the solution to the transmitter lead resistance problem lay in some old-school technology. The Burns Model TL transmitter was designed over 25 years ago and still finds numerous applications where stability, adjustability, and capability to handle high lead wire input resistance is required. The metal foil potentiometers provide a very stable zero and span adjustability with a turn of the screw providing several degrees of adjustability. This allows for matching the RTD sensor to the transmitter output for improved accuracy. Input lead resistance is calculated with the following equation: Max Load Resistance (ohms) = (Vpower supply -10)/.035 amps

For additional information on all the Burns transmitter offerings visit:

http://www.burnsengineering.com/document/catalogs/connection_head_supplement.pdf

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