

Solution Note

Enhance Temperature Measurement Reliability with Proper Electrical Grounding



Accurate and reliable temperature measurement is critical in several demanding industrial applications in process plants. A temperature transmitter converts a low level signal from a temperature sensor into a current signal capable of being transmitted over a long distance in a noisy industrial plant. Several applications necessitate locating temperature sensors in noisy environments.

Although temperature as a process variable has a long dead-time, some applications demand a faster response time, leading to the use of grounded thermocouples. When the ground potential is different at the measurement sensor, instrument and power supply points, the presence of high voltage spikes in the plant can cause significant interference in the measurement loop, leading to unreliable and inaccurate temperature measurements.

Even when ungrounded RTD sensors are used, it is possible to have measurement errors caused by condensation of contaminants in the transmitter terminals due to environmental conditions.

Solution

Honeywell STT 3000 Temperature Transmitters are a perfect fit for meeting the above challenges for the following reasons:

- Availability of **galvanic isolation** in all models, resulting in very good noise performance. Galvanic isolation between input and output in the measurement device is a simple and effective way to eliminate the issues caused by electrical noise and interference due to ground loops. In addition, proper grounding schemes have to be employed based on the application. It is recommended to always use shielded cables for signal as well as power in outdoor installations.



Shielding along the sensor as well as the analog output should be maintained at the same potential. STT250 units have a galvanic isolation of 500 VAC while STT350 units have a galvanic isolation of 1400 VAC between Input and output.

- STT 3000 – STT250/STT350 units are **immune to common mode noise** normally encountered with grounded TC sensors. Depending on the way the grounded sensor is wired to the transmitter, common mode voltage develops between the sensor and the transmitter ground, affecting transmitter performance. Hence the chosen transmitters in such applications should have good common mode rejection ratios.
- **Flexible mounting options** in the form of field, wall, head, and DIN rail mounting, making the devices flexible for different measurement locations.
- Availability of **internal and external surge protection** in all STT 3000 models, to protect against electrical transients and surges due to noisy plant environments or lightning.
- **EMC compliancy** in all STT 3000 units

Applications

Honeywell STT 3000 Temperature Transmitters are particularly suitable for applications in noisy environments. Typical applications include the following:

- Smelting processes in alumina industry
- Annealing processes in metal industries
- Material handling equipment in cement industries
- Gas/oil burners used in burner management processes in combustion equipment



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The Honeywell Advantage

Honeywell STT 3000 Temperature Transmitters are ideal for a variety of applications that involve high voltage environments and the potential for the creation of unreliable measurements due to ground loops formed by the use of grounded sensors.

For More Information

To learn more about Honeywell's Temperature Transmitters, visit our website www.honeywellprocess.com or contact your Honeywell distributor.

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