

Surface Mount Sensor for Outdoor Use

APPLICATION

A gas manufacturer wants to measure the temperature of a liquid nitrogen pipeline. They want to make the measurement without tapping into the line. They would like a sensor to mount to the exterior of the pipe which is located outdoors.

CHALLENGE

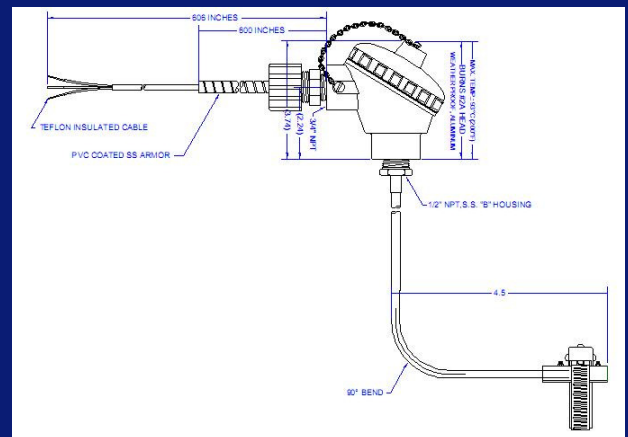
Since the measurement is outdoors, this eliminates the use of traditional surface mount sensors. The packaging of many surface sensors is not waterproof and the cabling is not protected from the elements.

In addition, measuring the temperature of liquid nitrogen requires the sensor to be able to operate reliably from -196°C to 50°C and not be influenced by the ambient air temperature outside.

SOLUTION

In order to meet the weatherproof requirement and temperature range requirement, a Series 200 probe was selected. The operational range of the Series 200 is -196°C to 500°C and the construction is suitable for outdoor use. The probe, however, must be able to mount to the surface and make accurate pipeline temperature measurements. A Series 200 'B' style probe was modified for the application.

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▶ Series 200 'B' Style Surface Mount PRT

- A 90 degree bend was put in the probe to offset the connection head from the pipeline.
- A stainless steel block was attached to the tip and radiused to match the outside diameter of the pipe allowing the probe to simply be hose clamped into place.
- The connection head allowed the use of weatherproof PVC-coated armored cable for the signal back to the control panel.

Appropriate insulation was still required over the sensor and pipe to isolate the temperature measurement from the ambient air.