

Static Pressure Measurement with Honeywell Smart Multivariable Transmitters



Problem: Static pressure measurement.

A customer wanted to measure the static pressure in a process line containing high levels of solids with temperature reported as a separate process variable. In this application, the customer did not need to measure a differential pressure or flow.

The Smart Multivariable Transmitter (SMV3000) is designed for flow measurement applications in which the process variables are differential pressure across a primary flow element such as an orifice plate, a process static pressure, a process temperature and a flow calculated based on the first three process variables.

In the static pressure and temperature measurements the Smart Multivariable SMG 170 was chosen based on its static pressure range of 0 to 3000 psig. In the customer application described above, the SMV 3000 with a single remote seal was used to measure static pressure with the low pressure side of the transmitter open to atmosphere. The remote seal prevents solids from building up inside the Smart Multivariable Transmitter.

This method of static pressure measurement is only effective for static pressures up to 30 psig, but cannot be used for higher static pressures. The reason for this is that the SMG 170 is designed for flow measurement based on differential pressure measurement. If static pressure is applied to the high side of the transmitter with only atmospheric pressure on the low side, the high side pressure measurement diaphragm will bottom out onto the seal support making higher pressure measurements unobtainable.

Solution: The SMV3000 with two remote seals.

Even though a differential pressure is not needed for flow calculation, the SMG170 equipped with two identical remote seals is needed for the static pressure measurement. The balance of pressure from the two remote seals balances out the tendency of the diaphragm to bottom out in the seal making static pressure measurement up to 3000 psig feasible.

Having both the high and the low sides of the transmitter open to the process pressure is required for excessive static pressure measurement even if open tubes rather than remote seals are used in the application.

Benefits

Installation of the SMG 170 for static pressure measurement include:

- Rapid, and effective configuration of the SMA110 using the SCT.
- Significant dollar savings through the use of a single transmitter to provide several process variable measurements.
- Digital integration to the Honeywell TPS provides the security of digital integration plus a wide range of diagnostic and configuration capabilities.

Other SMV3000 Applications

The SMV3000 can be used to measure the flow of virtually any liquid, gas or slurry for which a primary flow element exists to provide differential pressure measurement. Examples for the chemical industry include gas flows (nitrogen, hydrogen, steam and natural gas), liquid flows (acids, bases, solvents, monomers, polymers) and slurries (chemical suspensions).

More Information

For more information on Smart Multivariable Transmitters, visit www.honeywellprocess.com, or contact your Honeywell account manager.

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