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Meeting the Challenges of Natural gas

How a New Moisture Transmitter Can Thrive in Gas Pipelines

The combination of moisture and Natural gas means trouble. Moisture causes corrosion in gas transmission pipelines as well as hydrate formation. This can disturb the gas supply for end users. If the gas is too moist it degrades the heating value of the gas. Normally there are local regulations that define allowable regional moisture levels. Until now the measurement technologies available for Natural gas moisture measurement have not truly fulfilled customer requirements.

This is the reason why Vaisala has introduced The Vaisala HUMICAP® Dewpoint and Temperature Transmitter HMT360N, which has been optimized for natural gas moisture measurement. This transmitter utilizes the company's HUMICAP® technology that has a long track record in industrial applications.

Natural gas from drilling wells is typically very moist. In most cases, drying is carried out with glycol. Then the gas is either compressed for delivery via the pipeline or liquified in a tank for delivery by other transportation methods. In pipeline transmission, the gas must be dry to avoid pipeline corrosion and formation of hydrates, as well icing of valves, for example. Corrosion is a serious problem because the length of the transmission pipelines are thousands of kilometres and they are made of steel. Cold ambient temperature can make the moisture in the gas to condense, or be high enough for corrosion to start (>60%RH). Serious and even fa-

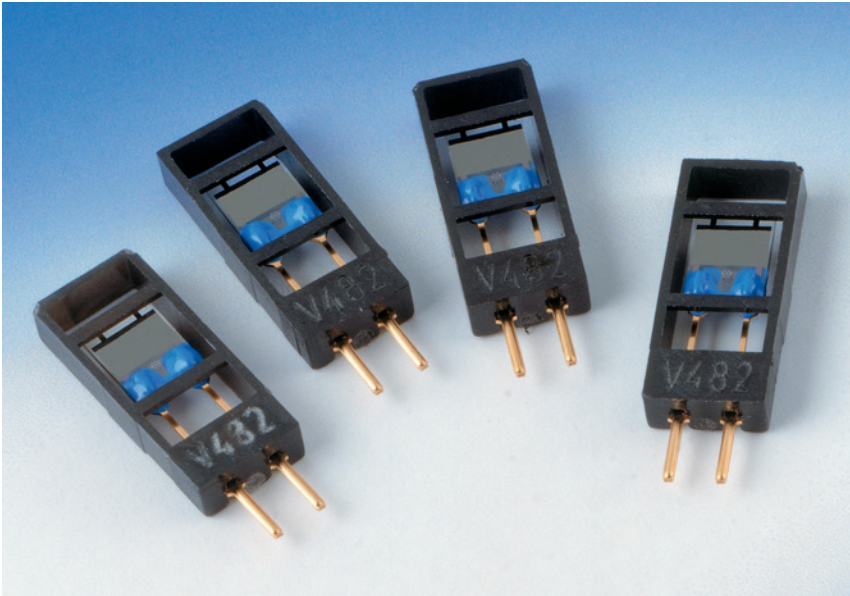
tal accidents have occurred where the pipeline has broken. Hydrate formation is a combination of high moisture and high hydrocarbon concentration which, together, will form solid aggregation that can slowly decrease the diameter of the pipeline reducing the gas supply capacity or blocking valves, for example. The icing problem is also the result excessively high gas moisture. The icing can occur in cold climates as well as at higher temperatures due to a fast changing pressure such as in a valve, where the pressure drop causes the natural gas to cool down. Cooling can make the moisture condense and even freeze, resulting in disruptions to the Natural gas supply.

Optimized solution for natural gas moisture measurement

The Vaisala HUMICAP® Dewpoint and Temperature Transmitter HMT360N series is a new version of the standard HMT360 series – this is an intrinsically safe (Exi) humidi- ➤



The Vaisala HUMICAP® Dewpoint and Temperature Transmitter HMT360N for Natural gas moisture measurement has low drift and is designed to work in the harsh environment often found in gas pipelines.



Vaisala HUMICAP® 180M Sensors

ty and temperature transmitter that already has a wide range of international approvals. The sensor in the HMT360N for natural gas moisture measurement is a new version. It is sensitive to low humidity levels and is also very durable, chemically. Both these features are required for Natural gas applications. Three pressure tight sensor heads offer a variety of installation methods, either directly to the gas pipeline or to a sampling cell, if gas sampling is preferred. Installation is also possible through a ball valve, which allows the probe to be installed directly into a pressurized gas pipeline.

The transmitter housing is rugged and durable for demanding outdoor applications and is equipped with a LCD display. The entire transmitter can be installed in those areas classified as having a constant risk of explosion.

Vaisala HUMICAP® performance

The performance of Vaisala HUMICAP® dewpoint transmitters is achieved through polymer sensor technology. The sensor is resistant to chemical attack and harsh environments that are typ-

ical in the Natural gas applications. The technology is optimized for the typical moisture range found in Natural gas transmission, and can also tolerate water spikes, so matching performance to actual measurement needs. This means that keeping the moisture range focused the sensor stability is superior. Over the longer term, this means less maintenance requirements and longer sensor lifetime than current technologies used for this application.

Recovers fully after getting wet

Vaisala HUMICAP® sensor technology is designed to work in water environments and recovers fully after getting wet. The transmitter performs well in locations that occasionally experience water spikes such as pipeline condensation that can occur during a system start-up or failure. Though Humidity or Dewpoint sensors should obviously be durable for high humidity levels and even for water immersion, not all are. The majority of sensors need recalibration, or even replacement, after high humidity peak in the particular process. The HMT360N

is different and can even be cleaned by immersing the sensor in water, if needed.

Additional features and options

The Vaisala HUMICAP® Dewpoint and Temperature Transmitter HMT360N offers a variety of features and has an LCD display as standard feature. The three probes available have different installation options, three different cable lengths, plus the rain shield for outdoor installation.

Additionally, the probes of HMT360 series are interchangeable so that maintenance is easy when probes are recalibrated. Typically, the recalibration interval is once per year and the transmitter can be sent to Vaisala Service for this work to be carried out. Because of the low drift in the company's dewpoint transmitters, it is hoped that the user will avoid unnecessary factory recalibrations.

Overall, the new sensor should bring improved levels of reliability and stability in measurements for Natural gas applications, with an impressive performance and low maintenance requirements. ●