Honeywell
THE POWER OF CONNECTED | Connected Industrial

Total Energy Measurement Helps Optimize Gas Custody Transfer

Solution Note

Honeywell's Total Energy Measurement solution measures not only the flow and quality of natural gas, but also provides a holistic solution to maintain long-term asset performance. This approach leverages our comprehensive "single source" product portfolio, extensive integration capabilities and gas industry domain expertise.

During custody transfer of natural gas, the potential cost of mis-measurement is very high. Fiscal metering has to meet recognized accuracy standards, and performance outside accepted boundaries can lead in contractual disputes between buyers and sellers. Imprecise readings over an extended period of time may only be detected when flow meters undergo re-calibration.

Honeywell takes a comprehensive approach to fiscal metering. Our Total Energy Measurement solution offers a sound concept and infrastructure for continuous, online gas measurement validation. It employs advanced digital technology and best-in-class products to improve performance and reliability, while at the same time reducing points of calibration aimed to reduce the overall metering uncertainty.

Part of Honeywell's Elster® Precision Solutions, Total Energy Measurement encompasses volume-measuring equipment such as turbine and ultrasonic meters, as well as devices for calculating the quantity of gas via the measured values of pressure, temperature and density. In combination, these devices provide all the data needed for accurate and reliable billing.

FEATURES & BENEFITS

- Single source supplier to meet all automation requirements
- Unmatched gas industry domain expertise
- Extensive gas metering integration capabilities
- Broad portfolio of precision metering and control products
- Industry-leading ultrasonic and turbine flow meter technologies
- Advanced, HART-based pressure and temperature transmitters
- Reliable flow computers and gas chromatographs
- Support for diverse digital communication protocols
- Enables continuous online diagnostics
- Robust tools for verification and validation
- Meascon tool supports condition-based maintenance
- Software solution helps keep measurement uncertainty as low as possible

Solution

Today's natural gas industry seeks to reduce operational expenses, minimize risks, improve regulatory compliance and maximize return on investment (ROI). Operators require increased confidence in the accuracy, reliability and availability of their gas metering stations. In this environment, however, companies must consider the overall costs associated with installing and operating a metering system:

- Initial investment
- Maintenance costs
- Costs for mis-measurement due to incorrect calibration or other factors

Honeywell delivers a comprehensive Total Energy Measurement solution, which measures not only the flow and quality of gas, but also provides a holistic solution to maintain long-term asset performance. This approach leverages our comprehensive "single source" product portfolio, extensive integration capabilities and gas industry domain expertise to help customers realize significant operational and business value. Our solution combines a breadth of advanced tools and products to:

- Reduce measurement uncertainty
- Improve system reliability
- Lower the risk of mis-measurement over extended periods of time

Wherever possible, our Total Energy Measurement solution utilizes digital technology to eliminate the errors commonly associated with analog inputs. For instance, there is digital communication between flow meters and flow computers, and for gas chromatographs. HART communication is also employed for pressure and temperature devices. This approach eliminates calibration of 4-20 mA loops and ensures no loss of numerical accuracy.

The Total Energy Measurement solution either employs our proven turbine flow meter, industry-leading ultrasonic flow meter, or both technologies in series to provide redundant measurements and verification. The Honeywell Elster Q.Sonic^{plus} Ultrasonic Flow Meter measures the velocity of flowing gas, and uses that velocity to calculate flow rate. It offers high accuracy and repeatability, and includes features for self-diagnostics. The meter can be removed from service and sent to a calibration facility as needed, and is approved for custody transfer around the world.

Honeywell also provides HART-based pressure and temperature transmitters. These instruments can be paired with flow computers to perform volume conversion of pipeline pressure and temperature back to standard conditions. The system is completed by a gas chromatograph to determine gas composition, as well as a PC-based supervisory system to handle control, calculations and reporting for continuous validation.

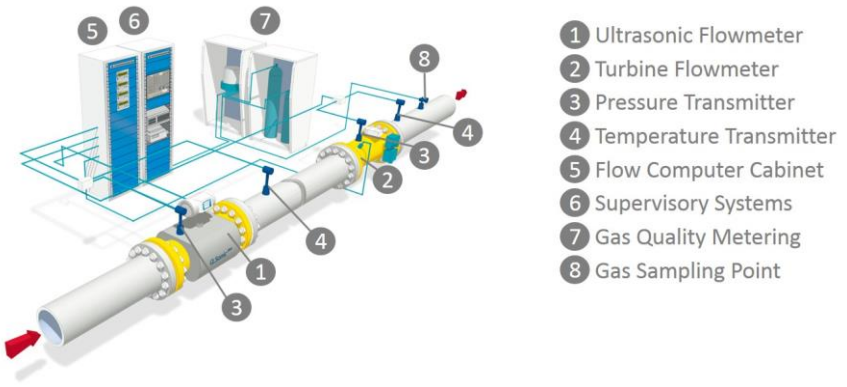

Fig. 1. Honeywell's Total Energy Measurement system architecture

Honeywell's robust diagnostics help to eliminate metering discrepancies and ensure the traceability of fiscal measurements. Gas operators can also monitor the performance of crucial assets over their lifetime. For example, users of our ultrasonic flow meter can perform velocity of sound validation, which continuously compares measured and calculated results to identify deviations in gas composition, pressure and temperature readings, measured flow, etc. In addition, historical mean deviation checks signal sudden changes in deviations. Truth tables combine several checks to pinpoint source of measurement error.

In addition, users can apply our Meascon® tool to implement smart monitoring supporting condition-based maintenance strategies to reduce operating expenses (OPEX). The software is designed to keep uncertainty as low as possible; an intuitive diagnostic dashboard offers a real-time overall view of gas metering stations. Users can continuously validate metering systems and compare meter performance to a pre-defined/stored reference. The software also provides evidence to support extended periods between calibrations.

Finally, Honeywell's Total Energy Measurement solutions are compatible with our ISS^{plus} Elster-Instromet Supervisory Suite. ISS^{plus} is specifically intended for gas/liquid metering applications where accurate calculations, data processing, reporting and advanced communications capabilities are of utmost importance. In cases where an Experion PKS DCS system is available there is no need for this dedicated supervisory system. In these cases even further integration and cost savings are possible by using Honeywell's MeterSuite, a DCS integrated metering solution that complies with all relevant industry standards.

Applications

Custody transfer occurs when fluids or gases are exchanged between parties. Payment is usually made as a function of the amount of fluid or gas transferred, so accuracy is paramount as even a small error in measurement can add up fast, leading to financial exposure in custody transfer transactions. In the gas industry, fiscal metering systems perform a variety of important functions, including (but not limited to):

- Flow computer communication
- Computation of totals and average values
- Providing the main operator interface
- Flow scheduling between individual metering lines
- Printing reports
- Provide data for billing purposes

In these demanding applications, it is essential for metering engineers to choose a good energy measurement set-up in the conceptual design phase:

- Select accurate meters and instruments
- Reduce the number of calibration points
- Provide tools for verification and validation
- Monitor performance/accuracy
- Make information available

With Honeywell's Total Energy Measurement solution, customers gain greater peace of mind. Our combination of customized engineering capabilities, reliable products, and best-in-class consulting and project management with industry expertise and lifecycle services provides innovative, integrated custody transfer measurement systems. All our products are produced to global product and fiscal metering standards.

Honeywell's Integrated Solution

In today's demanding environment, gas industry organizations benefit from partnering with an automation supplier that can combine a comprehensive, pre-integrated portfolio of products and solutions with appropriate application expertise.

Honeywell has spent decades developing products and services for projects in the oil & gas industry. We provide a full range of solutions from a single, dependable source. Our products are backed by a comprehensive warranty, global support with a strong local presence, and a Technical Assistance Center staffed by personnel with solid product knowledge.

Gas industry organizations can eliminate worries, and save time and money with Honeywell's high-quality equipment and integrated solutions. As a single source for every part of your installation, we provide a total energy-measuring concept to meet customers' unique requirements. Our continuous monitoring and validation capabilities help gas operators keep track of critical assets on a 24/7/365 basis – ensuring confidence and allowing you to focus on your core business.

For More Information

Learn more about the Total Energy Measurement solution at our website www.honeywellprocess.com or contact your Honeywell account manager.

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