

Glass Plant Reduces Engineering Costs and Gains Better Furnace Control with Multivariable Transmitter

RESULTS

- Improved furnace & burner control
- Reduced hardware, installation, and maintenance costs
- Reduced engineering setup time from 40 hours to 2 hours



APPLICATION

Oxygen and Natural Gas flow measurement in glass production furnace

CUSTOMER

Glass Manufacturing Plant

CHALLENGE

The glass manufacturing process requires tight control of natural gas and Oxygen flow to fuel the production furnaces. Finding a cost-effective, yet accurate way to control these furnaces was proving to be a challenge for a glass manufacturing facility.

The plant had previously been using three separate transmitters to measure differential pressure, static pressure and temperature. These values were then being sent to a single loop controller to calculate flow and perform furnace burner control. While this did work to a certain degree, there were numerous issues that left room for improvement.

The single loop controller did not compensate for the effects of discharge coefficient, velocity of approach, gas expansion, density and bore of the primary element. Even though they were getting a mass flow measurement, there was a lot of error and uncertainty with the calculation. This ultimately made it difficult to have a repeatable measurement for consistent furnace control.

The Rosemount 3051SMV combines three transmitters in a single package, eliminating the need for individual differential pressure, static pressure, and temperature transmitters.

SOLUTION

To help improve the measurement accuracy and repeatability, the glass manufacturing plant chose to use a Rosemount 3051SFA Annubar® Flowmeter. This combined the 3051S MultiVariable™ transmitter with the 485 Annubar® primary element, to provide all-in-one integrated assembly.

The Rosemount 3051SMV combines three transmitters in a single package, eliminating the need for individual differential pressure, static pressure, and temperature transmitters. The 3051SMV then uses these three measurements to calculate dynamically-compensated mass flow in real-time. All sources of error are corrected, including discharge coefficient, velocity of approach, gas expansion, bore expansion, and density. The result is a repeatable and accurate mass flow measurement from a single device. A project engineer from the glass facility credits the Rosemount 3051SMV for helping reduce gas and oxygen fluctuation due to quicker and more accurate flow measurement.

Additionally, the 3051SMV can be easily configured for any flow application through the use of the Engineering Assistant software package. Engineering Assistant provides a single means for quick and easy configuration, calibration, and troubleshooting. As a result, the required engineering setup time was reduced from 40 hours to only two hours per installation.

The 485 Annubar primary element also added additional measures of accuracy to each measurement while minimizing permanent pressure loss. The integrated thermowell and pressure taps enable three process measurements for fully-compensated mass flow, all with only one pipe penetration. This helps keep engineering costs down while greatly simplifying the installation process.

By using the Rosemount 3051SFA Annubar Flowmeter, the glass manufacturing plant was able to improve the accuracy and repeatability of their measurement which led to better process control. Natural gas and oxygen consumption was drastically decreased, and the installation and setup time was reduced by 95%. Ultimately, the 3051SFA Annubar Flowmeter is the most advanced DP flowmeter available, delivering real-time mass flow measurement through a single pipe penetration. This reduces engineering, hardware, and installation costs while improving process reliability and quality.



Rosemount 3051S MultiVariable™
Mass Flow Transmitter

RESOURCES

Emerson Process Management Chemical Industry

<http://www2.emersonprocess.com/en-US/industries/Chemical/Pages/index.aspx>

Rosemount Annubar Flowmeter Series

<http://www2.emersonprocess.com/en-US/brands/rosemount/Flow/DP-Flow-Products/Annubar-Flowmeters/Pages/index.aspx>

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