CASE STUDY • POWER GENERATION

HIGH PRECISION ORIFICE FLOW METER IMPROVES FLOW RATIO ACCURACY OF COMBUSTION FURNACE

Customer

Glass Manufacturing Plant in Zhejiang, China

Background

The rapid development of electric vehicles, photovoltaic and wind power in recent years, have brought more opportunities for the glass and glass fiber industry.

Glass and glass fiber are typical industries with high energy consumption and high emission, where production process is required to mix a variety of raw materials in a certain ratio proportion and then heat up in the furnace with high temperature, to make into different products.

Application

The melting furnace is fueled by natural gas with strict control of the proportion ratio of natural gas and combustion air. This is also the key to reducing emissions, improving combustion efficiency, and saving costs.

Challenge

The traditional way of measurement is to use three transmitters to measure differential pressure, static pressure, and temperature respectively.
The values are sent to the controller system to calculate the flow.
Using this method often results in error due to a shortage in dynamic compensation of flow coefficient. Natural gas is a multi-component mixed gas; the relative density compression factor and other parameters are variable. Accurate measurement of natural gas flow is always a significant challenge especially with small pipe size.

Results

- Accuracy in measuring natural gas with high stability
- Improved combustion efficiency, maximize cost savings and reduce emission
- Reduced installation complexity
- Compact meter installation with only 2D upstream & 2D downstream piping ensures capital expenditures saving

Rosemount 3051 SFP Integral Orifice Flow Meter

EMERSON

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Solution

Emerson supplied Rosemount™ 3051SFP Integral Orifice Flow Meter solution to measure the small pipe size whereas Rosemount 3051SFC compact Orifice Flow Meter solution is used to measure 2” and above pipe size. Both solutions are combined with Rosemount 3051S MultiVariable™ Transmitter which are engineered with built-in flow calculations for fully compensated mass flow measurements. It is ideal for natural gas flow measurement and the integrated flow meter design makes field installation very simple, reducing potential leakage points and ensuring the safety of field production.

Rosemount Integral 3051SFP is suitable for small pipe application as low as 1/2” which is pre-installed in a meter tube with single-bore orifice plate, positioned and aligned between custom cast housings to ensure high stability of flow measurement.

Rosemount Integral 3051SFC Compact Orifice Flow Meter is able to ensure high accuracy of flow rate measurement even in locations without straight pipe run.

“Integral 3051SFC Compact Orifice Flow meter could ensure high accuracy of flow rate measurement, even in the location which wasn’t having enough straight pipe run.”

-Operations Manager,
Glass Manufacturing Plant
Zhejiang, China

For more information, visit
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