

Thermal Power Plant Reduces Installation Costs with Rosemount™ Conditioning Orifice Flow Meter

RESULTS

- Reduced potential leak points by 70 percent or greater
- Reduced installation time
- Reduced commissioning time and costs



Rosemount Conditioning Orifice Flow Meter significantly reduces straight pipe requirements in DP flow measurements.

APPLICATION

Caustic solution flow on the water treatment plant

CUSTOMER

Thermal power plant

CHALLENGE

Engineers at a thermal power station in New Zealand needed to measure caustic solution flow on their water treatment plant. DP flow metering technology was the preferred choice of the engineers, due to the critical requirements of handling caustic solutions.

The accuracy in supplying the correct amount of caustic solution is critical to assure adequate treatment in the water treatment plant. Because of the limited straight lengths of pipe available, the requirements of conventional orifice plate standards were not met.

In order to achieve an accurate measurement specified in ISO 5167 (the international standard commonly used to calculate orifice plate outputs), the pipeline immediately upstream of the primary element must be straight and of constant internal diameter for a distance not less than that indicated in the standard. For example, ISO standards require 16 diameters upstream of an orifice plate (0.4 beta ratio) installation after a 90-degree single elbow in the pipe. In addition, six diameters are required downstream, resulting in a total length of pipe straight-run of 22 diameters. The location of where the measurement was needed did not have the required adequate pipe straight run, which ultimately was the challenge for accurate flow measurement.

SOLUTION

The engineer at the power station was not only concerned with having the required straight lengths of pipe for accurate measurement, but also the costs required for the installation. Emerson™ was able to provide a solution with the Rosemount Conditioning Orifice Flow Meter.

WATER & WASTEWATER

The Rosemount Conditioning Orifice Flow Meter is a fully integrated flow meter. It combines the Rosemount 3051S Differential Pressure Transmitter with the conditioning plate version of the Rosemount 405 Compact Orifice Series resulting in a flow meter that is robust, inexpensive, and easy-to-install with an accuracy of ± 0.85 percent of volumetric flow in liquids.

The direct-mount flow meter was designed so it can be installed with only two diameters up and two diameters down from most upstream flow disturbances and still achieve an accurate and reliable measurement. This flow meter solved the power plant's problem, installing in the limited space available, while providing an accurate and consistent output.

In addition, the compact orifice flow meter is designed to lower the total overall installation costs and, when compared to the installation costs of a traditional orifice, the time and cost savings are substantial. Based on an innovative wafer design that facilitates direct mounting to coplanar transmitters, these systems can be installed between existing flanges. Also, with the direct-mount integral three-valve manifold incorporated into the flow meter, the long and troublesome impulse lines are now eliminated and reduce the potential leak points by 70 percent or greater. These features are important when dealing with caustic solutions.

With the familiarity of the DP Flow technology along with not having to substantially increase the installation project scope, the engineer at the power station is looking for other applications in the plant that could benefit from the Rosemount Conditioning Orifice Flow Meter.

RESOURCES

Emerson Water & Wastewater Industry

[Emerson.com/Industries/Water-Wastewater](https://www.emerson.com/Industries/Water-Wastewater)

Rosemount Compact Orifice Flowmeter Series

[Emerson.com/Rosemount/Rosemount-3051SFC-Orifice-Plate-Flow-Meter](https://www.emerson.com/Rosemount/Rosemount-3051SFC-Orifice-Plate-Flow-Meter)

Compact orifice flow meters are designed to lower the installed cost of traditional orifice installations. Based on an innovative wafer design that facilitates direct mounting to coplanar transmitters, these systems can be installed between existing flanges.



Rosemount Conditioning Orifice Flow Meter

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Global Headquarters

Emerson Automation Solutions

6021 Innovation Blvd.

Shakopee, MN 55379, USA

+1 800 999 9307 or +1 952 906 8888
 +1 952 949 7001
 RFQ.RMD-RCC@Emerson.com

Europe Region

Emerson Automation Solutions Europe GmbH

Neuhofstrasse 19a P.O. Box 1046
CH 6340 Baar, Switzerland

+41 (0) 41 768 6111
 +41 (0) 41 768 6300
 RFQ.RMD-RCC@Emerson.com

Middle East and Africa Region

Emerson Automation Solutions

Emerson FZE P.O. Box 17033,
Jebel Ali Free Zone - South 2
Dubai, United Arab Emirates

+971 4 8118100
 +971 4 8865465
 RFQ.RMTMEA@Emerson.com

Asia Pacific Region

Emerson Automation Solutions

1 Pandan Crescent
Singapore 128461

+65 6777 8211
 +65 6777 0947
 Enquiries@AP.Emerson.com

00830-0700-4810, Rev DA