

Low Pressure Steam Mass Flow Measurement on 48" pipe with MV82 Insertion Vortex flowmeter

Our PanaFlow MV82 VTP – a perfect fit, cost-effective solution

Summary

A very large non-associated gas production facility in the Middle East had to replace a Venturi flow meter as it was experiencing erratic steam flow measurements due to clogging in the differential pressure impulse lines. The customer also reported that readings were not matching their mass calculations leading to challenges in plant balance and data reconciliation.

Application

Pipe:	48" 150# (DN1200)
Flow Rate:	125000 lb/h to 1750000 lb/h (~57 t/h to 794 t/h)
Temperature:	400 Deg F (~204°C)
Pressure:	106 – 109 psig (7.3 to 7.5 barg)
Density:	0.26 lb/ft ³ (4.16 kg/m ³)

Challenge

The customer couldn't rely on the current steam flow measurement and was looking at more reliable alternatives. The Panametrics team proposed an insertion type multivariable vortex flow meter that is fit for purpose while staying within the customer's budget.

Benefits:

- Easy to install on large pipe
- Cost effective for large pipes with good accuracy and turn down
- No periodic calibration
- No down time for critical process flow measurement
- Mass Flow Measurement with MV82-VTP Multivariable sensors

MV82-VTP-SL-R(50)-DD-AC-1AM-ST-P3-C150

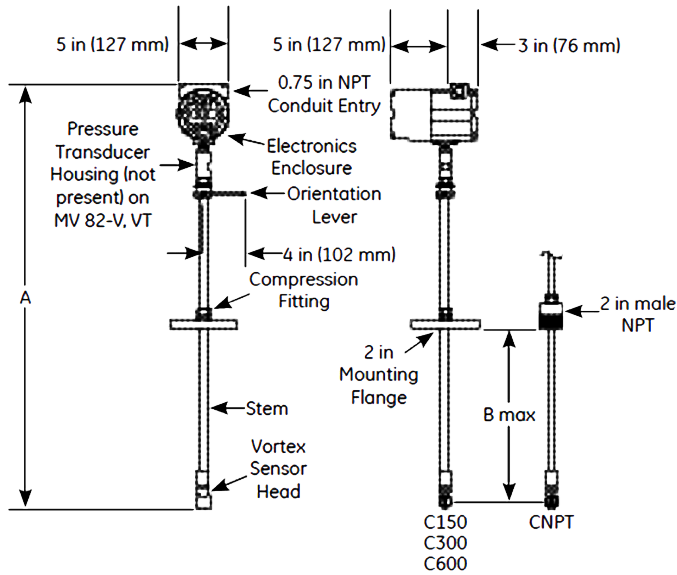


Fig. 1: Single depth measurement



Fig. 2: Former Venturi Flow meter

Solution

Following the application review with the client and after sizing calculation using Panametrics' Panaflo vortex software, the team confirmed meter suitability based on process parameters, available straight runs and accuracy expectations of $\pm 2\%$ of reading. The installation consisted of a 2" nozzle with pressure and temperature compensation for mass flow calculation. Thanks to the unique MV82-VTP Multivariable design, the customer was able to install the flow meter using a single tap point avoiding much longer process downtime. In addition, the customer eliminated the periodic differential pressure device calibration and maintenance burden and avoided replacing the existing meter with a flowcell based flow meter, which would have incurred significant cost.



Fig. 3: Insulated steam line