

Averaging Pitot Tubes

Application

Averaging pitot tubes are DP flow elements used for flow measurement of gases, liquids, and steam. In comparison to DP flow elements according to ISO 5167, they offer low pressure losses and flexible installation options.

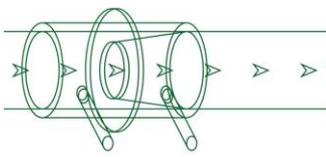


Design

Averaging pitot tubes work in a similar fashion to ISO 5167 flow elements. The diamond shaped sensor is inserted into the pipe and is divided into two pressure chambers (upstream and downstream), each designed with several pressure sensing holes. On the upstream side the stagnation pressure is measured and on the downstream side there is a negative pressure. The differential pressure between the sides is measured outside of the pipe and is proportional to the square root of the flow rate.

The pressure bore holes distributed along the flow profile lead to an averaged pressure signal. This reduces the requirements for a uniform flow profile, i.e. it reduces the required straight pipe length in front of the pitot tube.

For steam applications, the standard construction includes condensate pots in a compact design. Also for steam applications we standardly supply a complete solution with instrument valves or manifold welded to the outlet of the condensate pots.



Advantages

Averaging Pitot Tubes advantages include:

- low permanent pressure losses resulting energy cost savings in comparison to many other flow meters
- ease of installation, especially in large pipe sizes
- ability to install and retract from the pipe without shutting the flow
- integral temperature measurement allowing for single pipe penetration to measure mass flow
- bidirectional flow as standard with our symmetrical diamond sensor
- long term accuracy

Measuring Uncertainty

The measuring uncertainty is approximately 1% of the measuring signal.

Pressure Loss

The pressure loss depends on the probe diameter to pipe diameter ratio and amounts to approximately to 5% to 20% of the differential pressure signal. The exact value is provided on the calculation sheet.

Nominal Diameter

DN 25 to DN 6500/ 1" to 256" (21 feet) (other sizes are available upon request)

Pressure Rating

PN 10 to PN 400 / 150# to 2500# (ASME)

Pipe Mounting Styles

Pipe mounting styles include threaded compression fitting, flanged, or retractable version for installation and removal of probe without flow shutdown.

Pressure Taps

Pressure Taps are typically 1/2" NPT male, 1/2" socket weld, plain ends for fittings, or a flange plate according to IEC 61518 for direct mount of manifold and DP transmitter.

Marking

Tag number of flow element
Pressure rating "PN"
Maximum Pressure and Temperature
Pipe inner diameter "D"
Material
Direction of flow
Tagging of pressure connections with "+" and "-"

