

Differential pressure flowmeter

- ✓ High accuracy of measurement
- ✓ Cost effective solution for flow measurement
- ✓ High reliability

Application

Measurement based on orifice plate with differential pressure transmitter is most widely used type of flow measurement. It can be used in flow measurement of steam, water, and gases.

The biggest advantages of this solution are:

- high accuracy in wide measuring ranges
- applicable to measure flow of neutral and aggressive mediums
- easy calibration

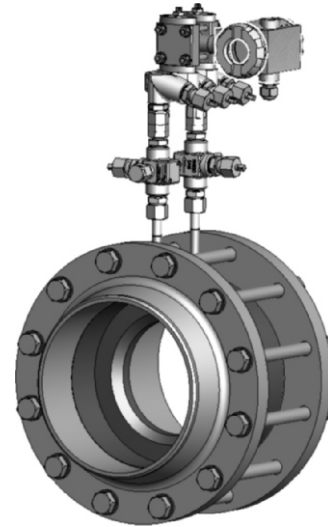


Fig. 1
Version with flanges with neck for welding

Principles of operation

An orifice plate installed in line creates a pressure drop. This difference of pressure is measured via impulse line by differential pressure transmitter. The relationship between the rate of flow and pressure drop is very well known and allows to easily convert measured pressure difference to flow value.

Flowmeters without correction are used for mediums with constant values of pressure and temperature.

For custody transfer measurement it's recommend to use differential pressure transmitters without SQRT characteristic and correction from changes of medium's pressure and temperature. This kind of measurement have to be calculated in dedicated flow counters.

For small diameters it's recommended to use micro orifice plates (Fig. 4).

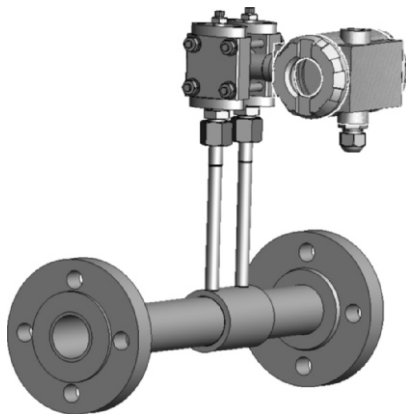


Fig. 2
Version with straight sections and flanges for screwing

Accuracy 0,5÷1,5% Factors which may have influence on measurement accuracy:

- uncertainty of density value
- accuracy of differential pressure transmitter
- length of straight section before orifice
- length of straight section after orifice
- actually percentage flow rate (recommended: 30÷100%, optimal: 75% of maximum flow rate)

Technical details

Nominal pressure:

- orifice PN6 ÷ PN100
- micro orifice PN6 ÷ PN40
- nozzle PN6 ÷ PN200

Nominal diameters:

- orifice DN25 ÷ DN1000
- micro orifice 1/2" ÷ 1"
- nozzle DN25 ÷ DN300

Materials:

- orifices and nozzles 1.4301 (SS304)
- flanges and casings 1.7335 (15HM)
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- other material on request

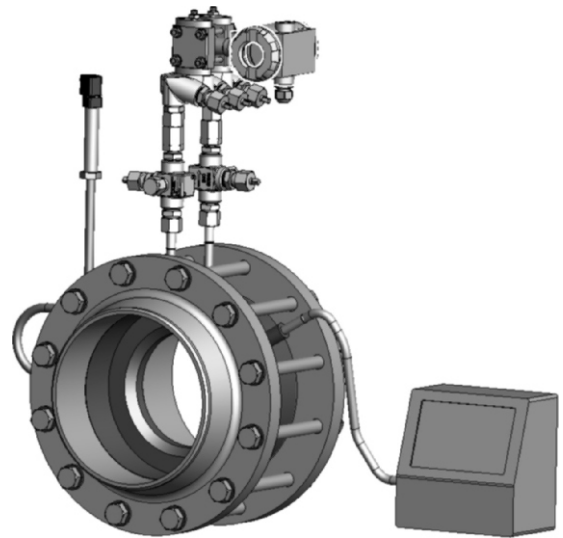


Fig. 3

Version with flanges with neck for welding and correction from pressure and temperature

Information needed for orifice calculation:

- flowmeter with or without correction from pressure and temperature
- line diameter DN
- material of pipe
- outside diameter of pipe or wall thickness
- nominal pressure
- nominal temperature
- maximum and minimum flow rate

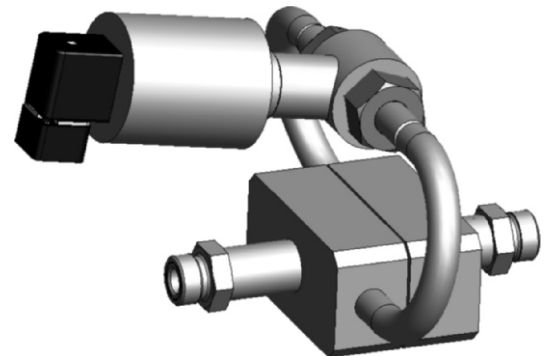


Fig. 4

Version with micro orifice for small diameters and flow rates



Fig. 5

Version with diaphragm seals (for medium teperature 120°÷ 300°C and ambient temperature -20°÷300°C)