

Wedge flow meter

For slurries and highly viscous media

Model FLC-WG

WIKA data sheet FL 10.08

Applications

- Mining and basic materials industry
- Petrochemical industry
- Oil, gas and refineries
- Chemical and process industries
- Pulp and paper industry

Special features

- Low maintenance through robust design
- For highly viscous and particle-laden media
- Low unrecovered pressure loss
- For very high and very low Reynolds numbers
- Bi-directional measurement possible



Wedge flow meter, model FLC-WG

Description

For very high and very low Reynolds numbers

The model FLC-WG wedge flow meter consists of a pipe inside which a v-shaped wedge is fitted. Through this constriction, a differential pressure is generated which is dependent upon the volume flow.

Due to its design, the wedge flow meter is suitable for nearly all types of flow, especially for media with a very low Reynolds number of 300 up to very high Reynolds numbers of several million.

As a result, the wedge flow meter is very well suited for the measurement of slurries and highly viscous media (e.g. wastewater, sewage sludge, tar sand, cement ...) as well as gases and vapours.

Low maintenance through robust design

The design of the wedge flow meter is extremely robust against particle-laden, erosive and abrasive media.

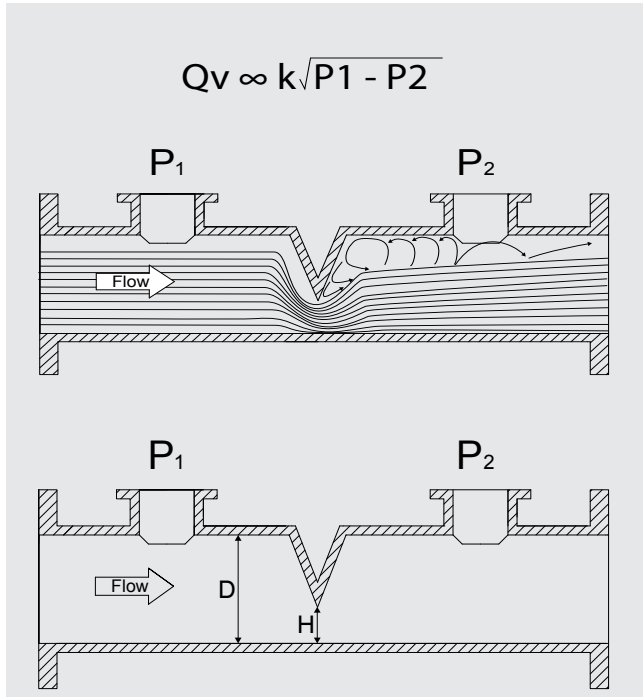
Bi-directional measurement for a variety of flow rates

The constructional design of the wedge flow meter enables bi-directional measurement, which differentiates it from other flow meters.

As standard, there are four different H/D ratios to select in order to cover a multitude of flow rates.

Operating principle

The functional principle of this measuring instrument is based upon the Bernoulli principle (continuity and energy balance equations). Via an engineered wedge, a differential pressure is generated which can be equated with the mass or volume flow. The flow range is determined through the H/D ratio.



$$Qv \propto k \sqrt{P_1 - P_2}$$

Specifications

Nominal size

1/2 ... 24"

H/D ratios

0.2 / 0.3 / 0.4 / 0.5

Accuracy (% of flow rate)

| Nominal size | Wet calibrated | Uncalibrated |
|--------------|----------------|--------------|
| 1/2" | ±0.75 % | ±5.0 % |
| 1 ... 24" | ±0.50 % | ±3.0 % |

Repeatability

±0.2 %

Max. operating pressure

The max. operating pressure of the wedge flow meter depends upon the pipe class and is limited through the maximum permissible operating pressure of the flange or the end connection.

There are deviations due to the material and temperature characteristics of the respective flange design.

Materials

- Carbon steel
- Low-temperature carbon steel
- Stainless steel
- Special materials on request (e.g. Hastelloy, ...)

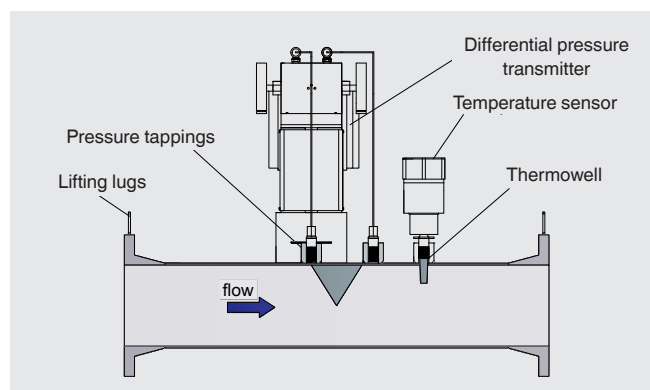
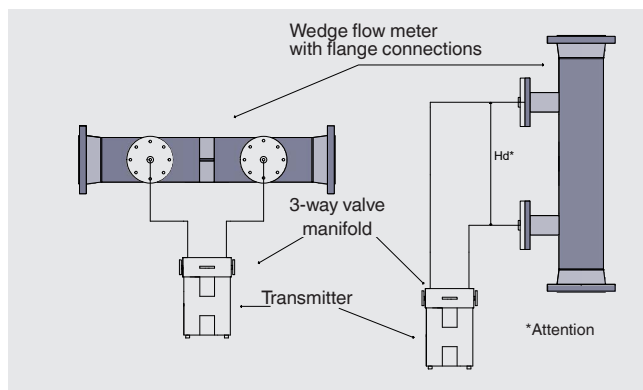
Mounting instructions

Alignment

The wedge flow meter can be installed vertically or horizontally. For the best measuring results, the wedge flow meter should be installed at a 90° angle to the pipe axis.

Mounting

When mounting the instrument, ensure that the flow direction of the medium corresponds to the arrows on the flow meter. In order to achieve the best results, the minimum lengths for the upstream and downstream pipes must be observed.



Length rules for upstream and downstream pipes

The values of the lengths are multipliers in relation to the pipe nominal diameters (e.g. 7 x pipe nominal diameter)

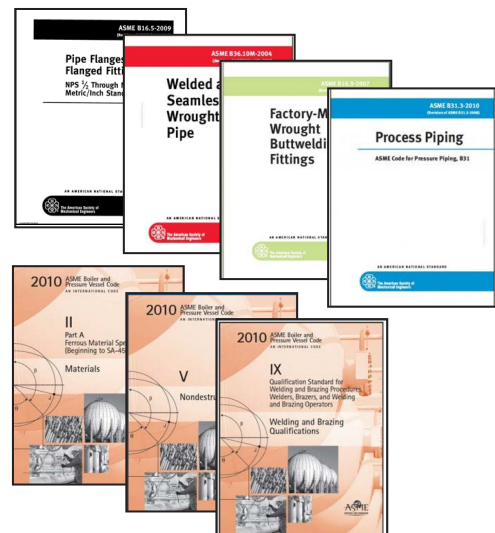
| Mounting situation | Upstream and downstream length | H/D ratio | | | |
|---------------------------------------|--------------------------------|-----------|-----|-----|-----|
| | | 0.2 | 0.3 | 0.4 | 0.5 |
| Single elbow | Upstream pipe | 7 | 9 | 10 | 12 |
| | Downstream pipe | 4 | 4 | 4 | 4 |
| Two elbows in the same plane | Upstream pipe | 10 | 12 | 14 | 16 |
| | Downstream pipe | 4 | 4 | 4 | 4 |
| Two elbows in different planes | Upstream pipe | 20 | 22 | 24 | 30 |
| | Downstream pipe | 4 | 4 | 4 | 4 |
| Reduction | Upstream pipe | 9 | 11 | 14 | 16 |
| | Downstream pipe | 4 | 4 | 4 | 4 |
| Expansion | Upstream pipe | 9 | 10 | 12 | 14 |
| | Downstream pipe | 5 | 5 | 5 | 5 |
| T connection with different diameters | Upstream pipe | 7 | 9 | 10 | 12 |
| | Downstream pipe | 4 | 4 | 4 | 4 |
| Shut-off valve (completely opened) | Upstream pipe | 10 | 12 | 14 | 16 |
| | Downstream pipe | 4 | 4 | 4 | 4 |
| Slide valve (completely opened) | Upstream pipe | 7 | 7 | 9 | 10 |
| | Downstream pipe | 4 | 4 | 4 | 4 |

Notes

- If a lower accuracy of additionally 1 % can be accepted, only half the upstream and downstream pipes are needed.
- All flow rectifiers should be mounted at the upstream pipe.

Body codes/Materials

- Design per ASME B31.3 or EN standard
- Welding operations per ASME section IX and ASME B31.3
- Pipe per ASME B36.10/19
- Flanges per ASME B16.5
- Fittings per B16.9 / 16.11
- Seamless pipes per ASME B36.10



Ordering information

Model / Nominal size / Nominal pressure / H/D ratio / Accuracy / Material

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