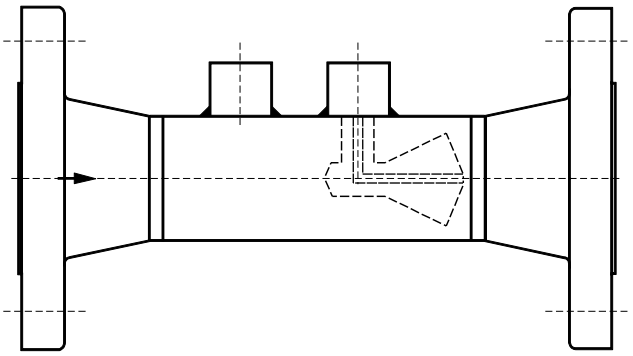
Cone Meters

Application

Cone meters are used for flow measurement of aggressive and non-aggressive gases, steam and liquids.



Design

A cone meter according to ISO 5167-5 consists of a pipe section in which a cone is positioned concentrically and which acts as a throttle element. The upstream pressure tap is located at a specific distance from the downstream pressure tap. The downstream pressure tap bore runs from the outside tapping connection through the support strut of the cone to the downstream face of the cone element. Generally, we provide cone meters with end flanges for easy mounting.

Advantages

A cone meter – in contrast to all other flow elements – diverts the flow from the center axis to the pipe inner surface. The consequent mixing of the main flow with the low velocity boundary layer flow leads to a flattened flow profile. This results in considerably lower inlet/outlet straight length requirements as for the classical differential pressure flow elements.

Measuring Uncertainty

+/- 5% of the discharge coefficient C (a calibration can improve the uncertainty)

Pressure Loss

The pressure loss depends on the diameter ratio β and amounts to approx. 50 - 70% of the differential pressure.

Nominal Diameter (ISO 5167)

DN 50 to DN 500 / 2“ to 20“

Pressure Rating

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

End Flanges

according to EN 1092-1 / ASME B16.5 / JIS- BS- or DIN-standards

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Flange Facing

according to EN 1092-1:

- flat (form B1 and B2)
- groove (form D)
- female (form E)

according to ASME B16.5:

- flat (RF and SF)
- groove (small/large)
- female (small/large)
- RTJ female

or according to other flange standards specified by the customer.

Installation Length

Cone meters are manufactured with end flanges for easy mounting. Depending on line size, the total length are as follows:

DN	50 (2“)	80 (3“)	100 (4“)	150 (6“)	200 (8“)	250 (10“)	300 (12“)	350 (14“)	400 (16“)	450 (18“)	500 (20“)
length (mm)	350	450	500	600	750	850	1000	1150	1250	1400	1500

These values are only estimations. The exact lengths have to be assessed for individual process conditions. Special Lengths are available upon request.

Diameter of the Cone „d“

The calculation of the diameter is based on the supplied process data. All relevant standards and regulations will be considered. The calculation is part of the scope of supply.

Pressure Taps

Generally, pressure tappings are provided with thread ends G 1/2" or 1/2" NPT-f. For gases, the taps face upwards, and for liquids, they face downwards. Other requirements can also be considered.

Marking

Tag no. of flow element
Pressure rating "PN"
Pipe inner diameter "D"
Diameter of cone "d"
Material, direction of flow and tagging
of pressure tappings with "+" and "–"

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Materials

The following table shows a selection of typical materials. The material is chosen based on process medium, pressure and temperature.

Cone material	Description	DIN material no.	ASTM / UNS
non-alloy steels	P250 GH (C22.8)	1.0460	~ A105
	P265 GH	1.0425	-
	A105	~1.0432	A105
	A516 Gr.60	~1.0426	A516 Gr.60
	A516 Gr.70	~1.0473	A516 Gr.70
stainless steels	X2CrNiMo17-12-2	1.4404	A182 Gr. 316L
	X6CrNiMoTi 17 12 2	1.4571	A182 Gr. 316Ti
high corrosion-resistant alloys	Hastelloy C276	2.4819	N 10276
	Monel 400	2.4360	N 04400

Installation

For mounting between flanges according to EN 1092-1 / ASME B 16.5 or other standard such as DIN, JIS or BS. The pipe may be positioned horizontally, vertically or sloped.

Quality Control

Manufacture and Test work is done according to the relevant codes and standards such as AD 2000, EN 13480, ASME Codes (without stamp) or customer specifications.
Inspection certificates according to EN 10204 3.1 and 3.2 are furnished if ordered. Special inspections are available upon request.

Accessories

Pipe flanges, bolts/nuts, gaskets for installation, instrument valves, condensate pots, manifolds, mounting accessories can be included for additional charges.

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