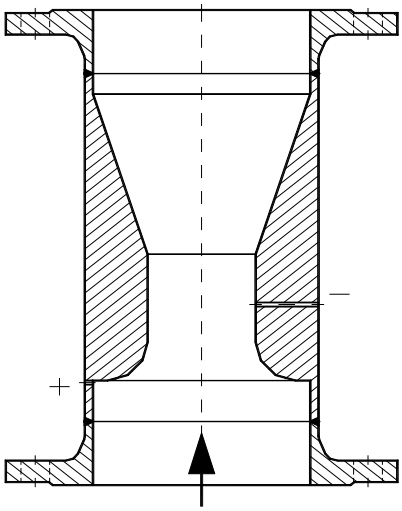
Venturi Nozzle DV 700

Application

Venturi nozzles are used as flow elements for flow measurement of aggressive and non-aggressive gases, steam and liquids.



Design

Venturi nozzles consist of a rounded inlet section, a cylindrical throat and an outlet cone. The upstream pressure tapping is typically manufactured as a single bore. The throat pressure tapping usually consists of four bore holes which lead to a ring chamber or annular ring. For some applications it is recommended to design the throat tapping as a single bore.

Advantages

Compared to orifice plates, nozzles are recommended for applications which require low pressure losses. At similar flow values, nozzles generate less differential pressure which results in lower permanent pressure loss. The rounded inlet profile is less susceptible to erosion in comparison to the sharp edge of an orifice plate. Hence, nozzles achieve higher service life times.

Measuring Uncertainty

Ranges from 1,2% - 1,8% of the discharge coefficient C, depending on the use case

Pressure Loss

The pressure loss depends on the diameter ratio β (d/D) and ranges from 5 - 20% of the differential pressure.

Nominal Diameter (ISO 5167)

DN 65 to DN 500 / 2,5“ to 20“ (if requested other sizes are available)

Pressure Rating

PN 6 to PN 400 / 150# to 2500# (ASME)

End Flanges

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

Techn. Stand 04-2021

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 „L“

The installation length depends on the diameter ratio β which needs to be calculated based on the respective process conditions. The following table presents an overview of typical installation lengths for an average diameter ratio.

Nominal Diameter DN	Installation length [mm] (*)
65	230
80	250
100	280
125	320
150	350
200	410
250	490
300	560
	(*) diameter ratio β=0,6 incl. flanges with pressure rating: PN 16 (EN 1092-1)

Bore Diameter "d"

The calculation of the bore 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

Pressure taps will be designed according to customer requirements. Typical tap designs are:

- plain ends for fittings
- butt weld ends
- threaded ends
- flanged ends

The typical tapping length is approx. 100 mm.

Marking

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

Materials

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

Venturi nozzle material	Description	DIN material no.	ASTM / UNS
non-alloy steels	P250 GH (C22.8)	1.0460	~ A105
	A105	~1.0432	A105
heat resistant/alloyed steels	16Mo3	1.5415	A182 Gr. F1
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
plastics	Polyvinylcloride	PVC	Polyvinylcloride
	Polyethylene	PE	Polyethylene
	PVDF (GRP 25%)	PVDF	PVDF

Dosch Messapparate GmbH · Kamenzer Damm 85 · 12249 Berlin
www.dosch-gmbh.de - Telefon: +49 (0)30 720153-0

Installation

Mounted 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, instrument valves, condensate pots, manifolds, mounting accessories can offered if requested.

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