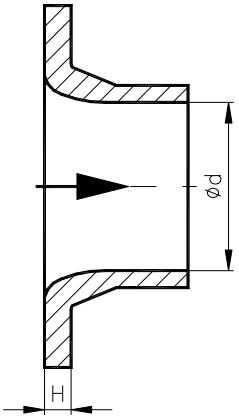
Long Radius Nozzle DU 600 LR

Application

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



Design

Long radius nozzles consist of a rounded inlet section and a cylindrical throat. The rounded inlet section has the shape of a quarter ellipse. The pressure tappings are situated in the pipe at 1D in front of and 0,5D behind the nozzle (D=pipe inner diameter). Usually, they are manufactured on site. This long radius nozzle type is designed to be mountable between flanges.

Advantages

Compared to orifice plates, nozzles are recommended for appliances which require low pressure losses. At similar flow values nozzles need less differential pressure which results in less 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

Approx. 2% of the discharge coefficient C, depending on the application

Pressure Loss

The pressure loss depends on the diameter ratio β (d/D) and ranges 30 - 80% of the differential pressure.

Nominal Diameter (ISO 5167)

DN 50 to DN 630 / 2“ to 26“ (if requested other sizes are available)

Pressure Rating

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

Sealing Surface of the Nozzle

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

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or according to other flange standards specified by the customer.

Thickness „H“

The thickness depends on the pipe inner diameter D and should be chosen within the range of 3 mm and 0,15D. It needs to be high enough to avoid any kind of mechanical distortion during manufacture, installation and operation.

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

Generally, the pressure taps are manufactured on site by the customer. However, if necessary we can provide spool pieces which include the pressure taps. We also offer different nozzle designs which already incorporate the pressure tappings, e.g. see brochure E96L.

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 "–"

Material

The following table shows a selection of typical materials utilized for nozzles. The material is chosen based on process medium, pressure and temperature. Normally, long radius nozzles are manufactured from the equivalent pipe material or from stainless steel.

Nozzle Material	Description	DIN material no.	ASTM / UNS
non-alloy steels	P250GH (C22.8)	1.0460	~A105
	A105	~1.0432	A105
heat resistant/alloyed steels	16Mo3	1.5415	A182 Gr. F1
	13CrMo44	1.7335	A182 Gr. F11
	10CrMo910	1.7380	A182 Gr. F22
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

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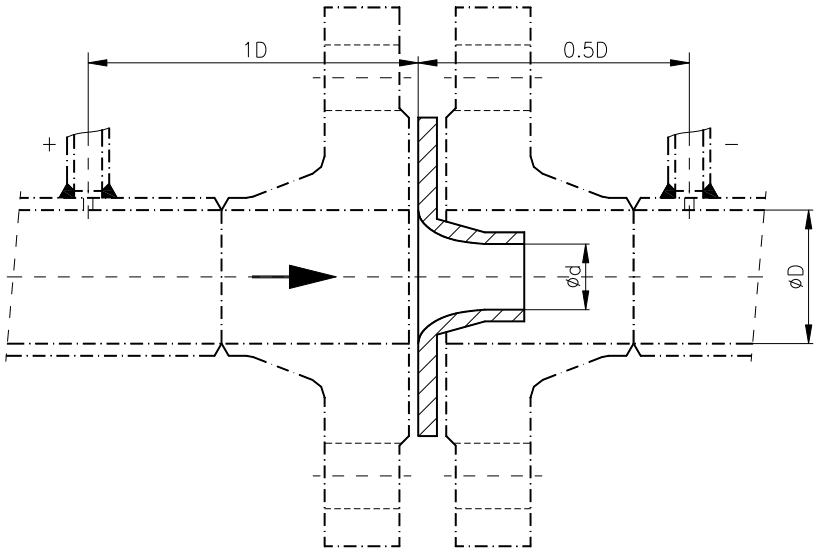
Example Drawing

For mounting between flanges, pressure taps provided on site



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, spool pieces, instrument valves, condensate pots, manifolds, mounting accessories can be offered if requested.