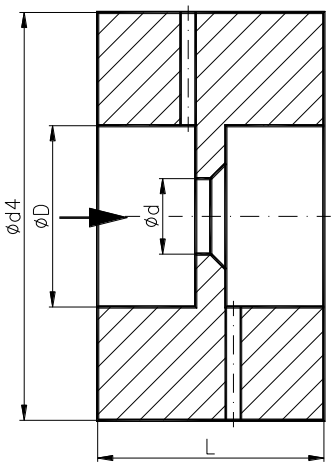
Orifice Plates with Single Bore Taps BLB 300

Application

Orifice plates with single bore pressure taps are used as flow elements for flow measurement of aggressive and non-aggressive gases, steam and liquids.



Design

These orifice plates include a carrier ring where the single bore pressure taps are located. The carrier ring and the orifice plate are manufactured in one piece. Depending on the process conditions, the plate type may be manufactured as

- square edge concentric
- quarter circle nozzle
- segmental
- plate with conical entrance
- double cone

according to the relevant standards (ISO 5167, ASME MFC-3M etc.). The plate type is chosen based on the specific process conditions. The orifice plate edge is typically manufactured from a wear-resistant material like stainless steel. The material of the carrier ring can be equivalent to the pipe material.
The compact design alternative (BLB 300 K) makes it possible to directly mount a manifold and the transmitter onto the orifice plate.

Advantages

- Compact and economical construction for use with small installation lengths.
- Clogged pressure taps can be cleaned easily.

Compact design (BLB 300 K):

- External influences can be avoided, e.g. temperature, vibration, different elevations of pressure taps.
- Installation costs are reduced because separate pressure tap piping are not needed.
- We can provide a complete ~~unit of the~~ orifice plate solution with integral manifold and transmitter mounted.

Measuring Uncertainty

Ranges from 0,5% - 1,2% of the discharge coefficient C, depending on the application.

Pressure Loss

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

Techn. Stand 04-2021

Nominal Diameter (ISO 5167)

DN 50 to DN 1000 / 2“ to 40“ (if requested other sizes are possible)

Pressure Rating

up to PN 400 / 2500# (ASME),
~~or other standards~~

Plate Sealing Surface

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.

Outer Diameter "d4"

The outer diameter of the plate is designed to fit between the respective flanges of the customer.

Installation Length ”L“

Standards: 65 mm, 40 mm, 25 mm; special lengths are possible

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.

Inner Diameter of the Carrier Ring „d1“

The inner diameter of the carrier ring is designed to be slightly larger than the pipe inner diameter. This prevents a sudden reduction of the diameter in the front and in the back of the orifice plate which would influence the measurement negatively.

The diameter is in compliance to the requirements of ISO 5167-2, paragraph 5.2.3.6.

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

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
- compact taps according to IEC 61518

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 orifice plates with taps. The material is chosen based on process medium, pressure and temperature. The pressure tap material is selected to be equivalent to the carrier ring material.

Carrier ring material	Description	DIN material no.	ASTM / UNS
non-alloy steels	P250GH (C22.8)	1.0460	~ A105
	P265GH (HII)	1.0425	-
	A105	~1.0432	A105
	A516 Gr.60	~1.0436	A516 Gr.60
heat resistant/alloyed steels	16Mo3	1.5415	-
stainless steels	X2CrNiMo17-12-2	1.4404	316L
	X6CrNiMoTi 17 12 2	1.4571	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
	Teflon (GRP 25%)	PTFE	PTFE
Orifice plate material			
stainless steels	X2CrNiMo17-12-2	1.4404	316L
	X6CrNiMoTi 17 12 2	1.4571	316Ti
high corrosion-resistant alloys	Hastelloy C276	2.4819	N 10276
	Monel 400	2.4360	N 04400

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

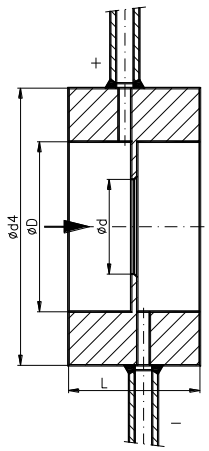
Manufacture and Test work is done according to the relevant codes and standards such as AD 2000, EN 13480, ASME Codes (without stamp) or customer specifications.
Inspection certificates according to EN 10204 3.1 and 3.2 are furnished if ordered. Special inspections are available upon request.

Accessories

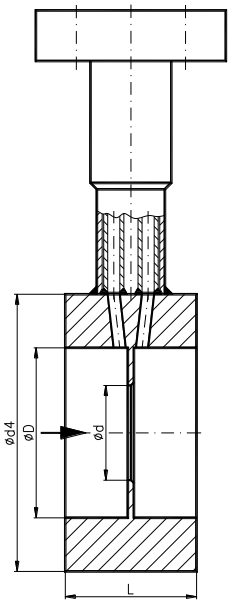
Pipe flanges, bolts/nuts, gaskets, instrument valves, condensate pots, manifolds, mounting accessories can be offered if requested.

Example drawings

BLB 300



BLB 300 K



Techn. Stand 04-2021