MBL500

Technical Datasheet



Short Description

Orifice measuring section with a two-part carrier ring and an exchangeable measuring insert, for flow rate measurement of aggressive and non-aggressive gases and vapours in small pipelines. Inlet and outlet pipe form *one* unit with the carrier rings and run up to the orifice plate without a step – in small nominal diameters the largest source of error. The pipe inside diameter D is therefore part of the supplied section and is marked on the primary device. The measuring insert is exchangeable: a different measuring range, the same section.

Identification

Product name	MBL500
Type	Orifice measuring section with ring chamber tapping
Carrier ring	two-part, with ring chamber
Design basis	DIN EN ISO 5167-2 and -3
Versions	MBL 500 F and MBL 500 S
Document status	12.11.2026

Design Data and Measuring Range

Nominal pressure	PN 6 to PN 100
Nominal diameter	DN 10 to DN 400, larger on request
Diameter ratio	$\beta = d/D$
Flow range	approx. 0.1 L/min up to approx. 10,000 m^3/h, individual design possible
Differential pressure range	standard approx. 1 to 20 mbar, individual design possible
Permanent pressure loss	30 to 80 % of the differential pressure, depending on the diameter ratio

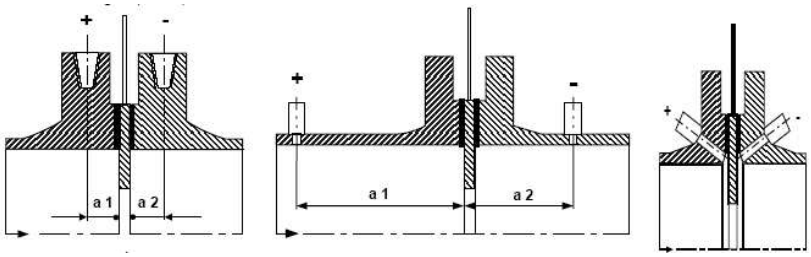
The bore diameter d is calculated from the specified operating data in accordance with the applicable standards and regulations and is documented in the calculation data sheet – which also states the pressure loss of the individual design. Where lower pressure losses are required, a Venturi tube (H800) or a Venturi nozzle (DV700) is the appropriate element. The accuracy of an individual measuring point follows from design and calibration – we state it in the factory or DAkkS calibration certificate.

Structure and Measuring Insert

Type	primary device with ring chamber tapping and its own inlet and outlet section
Carrier ring	two-part, with ring chamber and an exchangeable measuring insert
Measuring insert	standard orifice plate according to DIN EN ISO 5167-2, quarter-circle nozzle or double-cone orifice – depending on the operating conditions. In special cases also standard Venturi nozzles
Sealing	carrier rings and measuring insert with a flat gasket
Delivery condition	fully assembled and ready for installation, either for flanging in or for welding in
Identification	tag number, PN, D, d, flow direction, and + and – on the tapping sockets
Tapping sockets	12 mm socket with G1/8" female thread or according to customer specification

Differential Pressure Tapping

The standard version is the **ring chamber orifice plate**: the two-part carrier ring forms a ring chamber upstream and downstream of the orifice plate, each averaging the pressure over the full circumference – corner tapping according to DIN EN ISO 5167-2 in its standard-compliant form. Where single tapping holes are required instead, the differential pressure is taken at the distances a_1 and a_2 from the orifice plate; three arrangements are possible:

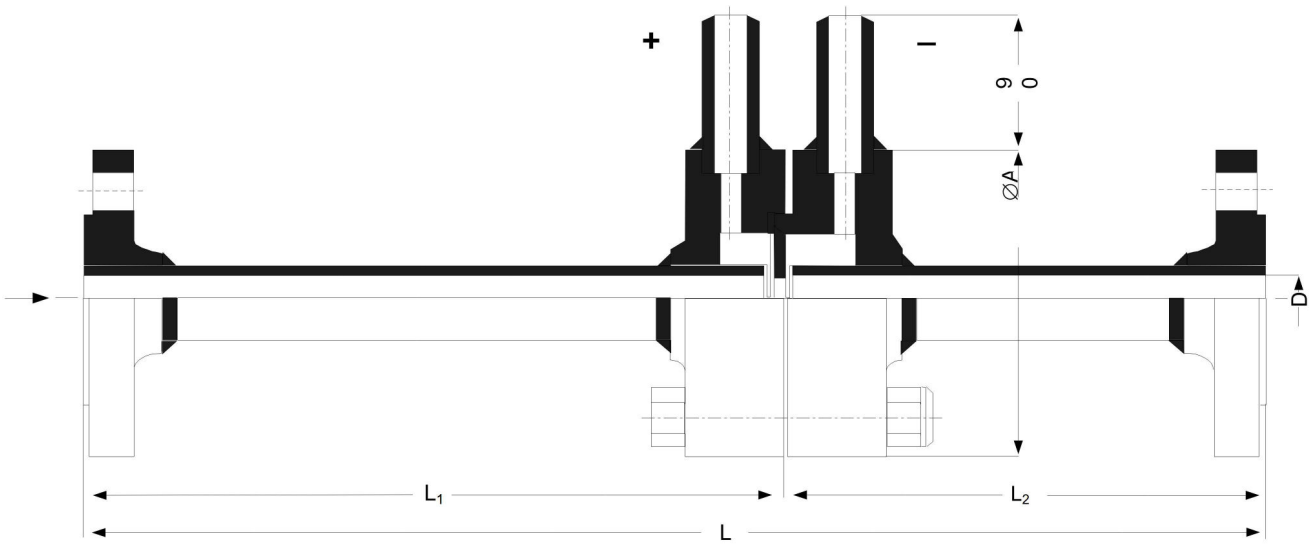


From left: flange tapping according to DIN 19214 · D and D/2 tapping in the pipe, where $a_1 = D$ and $a_2 = D/2$ · corner tapping in the flange, similar to the standard, for special cases.

Installation

FEATURE	DATA
MBL 500 F	between flanges in horizontal, vertical or inclined pipelines
MBL 500 S	for welding into the pipeline. Dimensions as for MBL 500 F
Sealing face types	smooth, recess according to DIN 2513 or groove according to DIN 2512
Straight inlet length	minimum $28 \times D$
Straight outlet length	minimum $7 \times D$
Not in scope of delivery	counter flanges, bolts and gaskets. For the gaskets, the regulations regarding medium and operating conditions must be observed

Dimensional Drawing MBL 500 F/S



L = total length of the measuring section · L_1 = inlet section · L_2 = outlet section. The drawing shows the welded-in ring chamber. Dimensions in millimetres, drawing not to scale; binding dimensions are provided once the design has been completed.

Typical Installation Lengths

DN	INCH	L	L_1	L_2
10	0.25"	400	230	170
15	0.5"	550	380	170
20	0.75"	700	500	200
25	1"	900	650	250
32	1.25"	1100	800	300
40	1.5"	1300	1000	300
50	2"	1500	1200	300

DN	INCH	L	L_1	L_2
65	2.5"	1600	1250	350
80	3"	1800	1400	400
100	4"	2200	1700	500
125	5"	2700	2000	700
150	6"	3200	2400	800
200	8"	4000	3000	1000

Nominal diameter DN in millimetres, all dimensions in millimetres. $L = L_1 + L_2$ in all thirteen sizes.

Materials

Materials selected to suit the medium, the temperature and the installation conditions. Carrier rings, measuring inserts and tapping sockets are specified separately; the selection is documented in the quotation.

Standards and Regulations

Design basis	DIN EN ISO 5167-2 (orifice plate) and -3 (nozzles)
Calculation rules	VDI/VDE 2041
Pressure tapping	DIN 19214 (flange tapping)
Sealing faces	DIN 2512 (groove), DIN 2513 (recess)
Manufacturing and testing	according to, or in line with, the relevant pressure equipment codes (AD 2000-Merkblatt, EN 13480) as well as customer specifications. The applicable scope is stated in the quotation
Material certificates	EN 10204 3.1 and 3.2

Accessories

- Counter flanges, bolts and gaskets for installation (at extra charge)
- Shut-off valves, condensate pots, impulse line vessels and valve manifolds

Ordering Information

Every measuring section is calculated for the individual measuring task. For design and quotation we require:

- Flow range(s)
- Gas type(s)
- Pipe nominal diameter(s)
- Material
- Operating conditions (pressure and temperature)
- Permissible pressure drop
- Measurement accuracy
- Ambient conditions

DESIGN AND ADVICE

For the design of your measuring point please contact us at **+49 7157 5387-0** or **info@tetratec.de**.