

Electromagnetic flow meter

Model FLC-2300

WIKA data sheet FL 20.06

Applications

- Water meters
- Water and wastewater
- District metering
- Industrial process liquids, slurries and concrete

Special features

- No upstream or downstream runs required
- Approved for custody transfer (MID MI-001, OIML R49)
- Accurate low flow measurement
- Case from stainless steel with ebonite lining



Flow meter, model FLC-2300

Description

Electromagnetic flow meters are based on the Faraday principle, by which a conductor which traverses a magnetic field generates a potential oriented perpendicular to that field. The flow tube is enclosed by two flanges and also by two coils. The magnetic field which is generated by the electric current running through the coils induces a potential difference in the electrodes that is proportional to the flow being measured.

A WIKA signal converter, either attached directly to the instrument or separated from it (e.g. model FLC-608), generates the current to supply the magnetic coil, detects the potential difference between the electrodes, processes the signal to calculate the flow and manages communication with the external control systems.

Electromagnetic flow meters have no moving internal parts and thus have a very low pressure loss. OIML R-49 permits a maximum pressure loss of 630 mbar [9.14 psi] with a flow velocity of approx. 8 m/s.

The model FLC-2300 flow tube has a conical profile, through which the flow is accelerated and the signal to the electrodes is amplified. Due to this special feature, the model FLC-2300 flow meter has a pressure loss of less than 250 mbar [3.63 psi] at a velocity of 8 m/s.

For flow velocities of less than 1 m/s, the pressure loss is always less than 10 mbar [0.15 psi].

The conical profile of the flow tube enables a flexible operation in numerous areas of application, since no upstream or downstream runs are required. The maintenance-free measuring instrument is suitable for use in pits, for underground applications and also for permanent immersion under water.

Very small flow volumes can be measured precisely and repeatedly, even in difficult applications with solid components in the medium.

Specifications

Available pipe diameters

Diameter									
mm	50	65	80	100	125	150	200	250	300
in	2	2.5	3	4	5	6	8	10	12

Basic information	
Materials	
Flow tube	<ul style="list-style-type: none"> ■ SS304 (standard) ■ SS316
Flanges	<ul style="list-style-type: none"> ■ Carbon steel (S235JR - 1.0037) (standard) ■ SS304 ■ SS316
Electrodes	<ul style="list-style-type: none"> ■ SS316L (standard) ■ Hastelloy C® ■ Titanium ■ Tantalum ■ Platinum
Flow tube lining	Hard rubber (ebonite) ¹⁾
Painting of sensor housing and flange	Acrylic paint (painting for class C4 environments on request)
Pressure loss class	
DN ≤ 80	ΔP25 (< 0.25 bar [3,6 psi])
DN ≥ 80	ΔP40 (< 0.4 bar [5,8 psi])
Medium temperature	-40 ... +80 °C [-40 ... +176 °F]
Electrodes	<ul style="list-style-type: none"> ■ Three ■ Fourth electrode as an empty-pipe alarm, activation and deactivation via software
Available flange standards	EN 1092-1 (PN 16), ANSI 150, AS 2129 (table D - E - F), AS 4087 (PN 16, PN 21), KS 10K, others on request
Installation requirements	U0, D0
Ingress protection per EN 60529	IP68 (continuous immersion to 1.5 m [4,9 ft])
Compatible signal converters	<ul style="list-style-type: none"> ■ Model FLC-608A/B/R/P/I ■ Model FLC-406
Electrical connection	Cable gland M20 x 1.5, terminal block and sealing resin

1) Ebonite per standards WRAS, FDA and DM174.

Flow rates

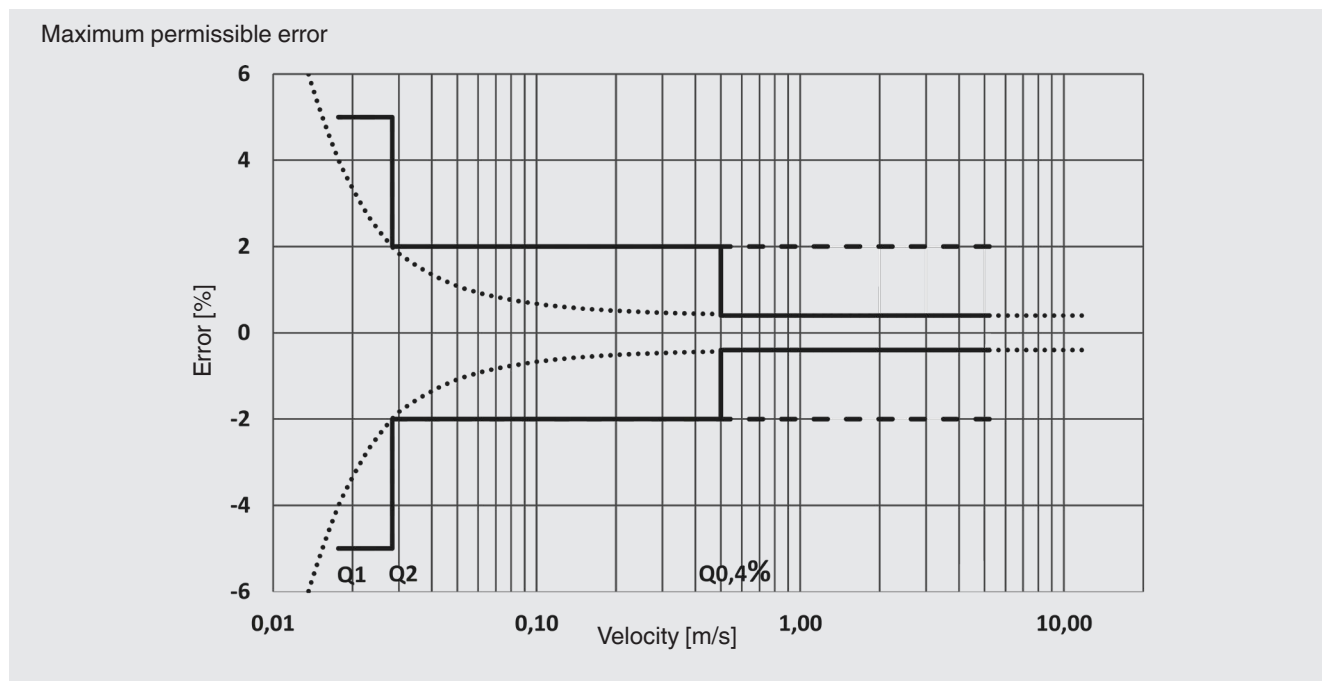
Sensor diameter	Flow rate [m ³ /h]					Ratio R Q3/Q1
	Minimum flow Q1	Transition flow Q2	Q 0.4 %	Permanent flow Q3	Overload flow Q4	
DN 50 [2"]	0.125	0.2	3.5	25	31.25	200
DN 65 [2.5"]	0.2	0.32	6	40	50	200
DN 80 [3"]	0.315	0.5	9	63	78.75	200
DN 100 [4"]	0.5	0.8	14	100	125	200
DN 125 [5"]	0.8	1.28	22	160	200	200
DN 150 [6"]	1.25	2	32	250	312.5	200
DN 200 [8"]	3.15	5.04	57	630	787.5	200
DN 250 [10"]	5	8	90	1,000	1,250	200
DN 300 [12"]	8	12.5	128	1,000	1,250	125

Calibration and maximum measuring deviation

The sensors of the model FLC-2300 belong to reference group B1 (per ISO 11631).

Each sensor is wet-calibrated on a hydraulic test bench which is fitted with a reference weighting system and is ACCREDIA-certified.

The measuring deviation of the calibration is 0.2 % ±2 mm/s. The repeatability is 0.1 %.



Integration of the flow meter

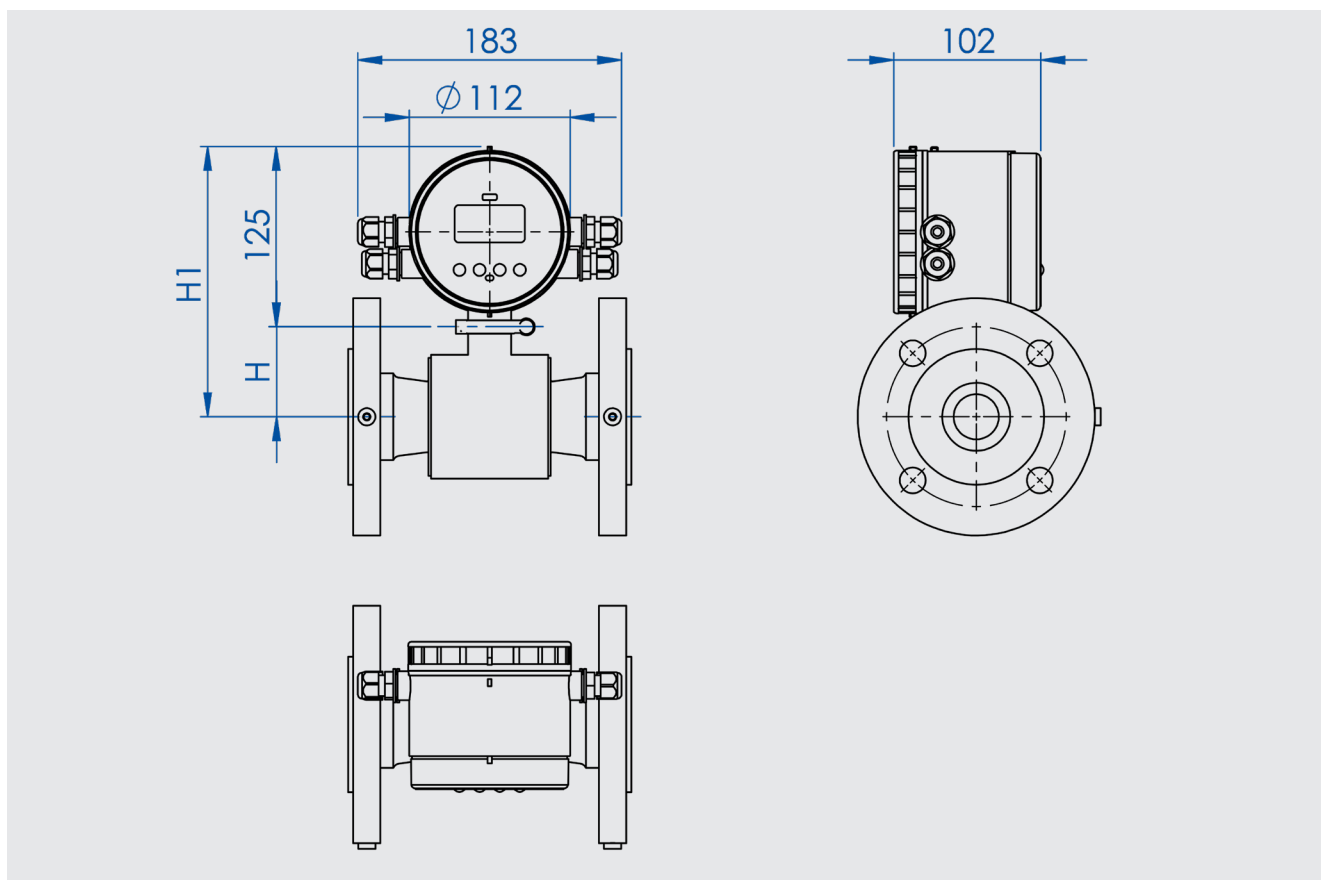
The model FLC-2300 sensors can be combined with all WIKA signal converters.

In the separated version, the sensor is connected with the signal converter via a cable, whose length depends on the electric conductivity of the liquid.

The maximum length of the cable is 100 m [328 ft] (30 m [98 ft] in combination with battery-powered electronics).

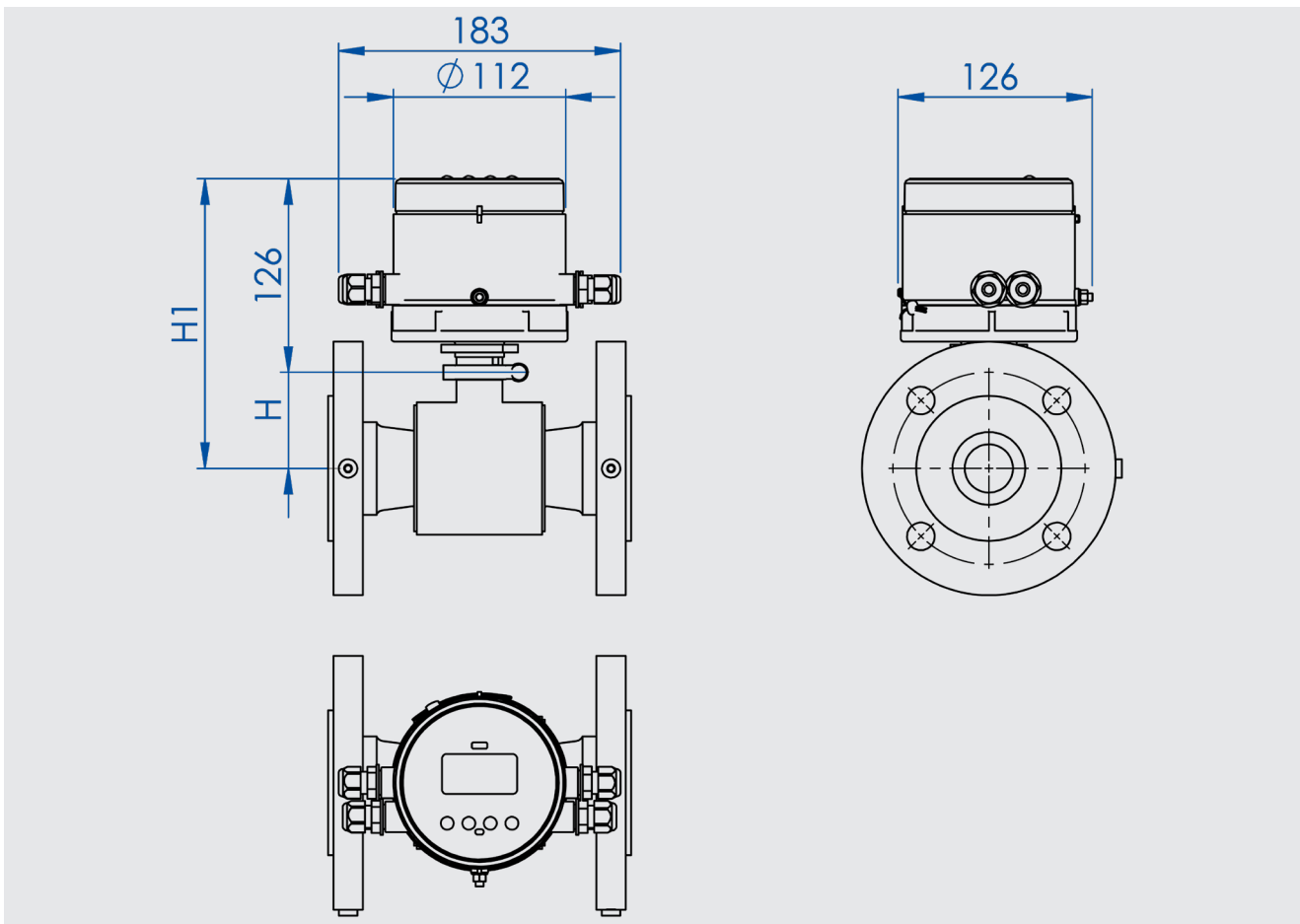
Dimensions in mm

Compact version: Model FLC-2300 in combination with signal converter, model FLC-406, radial mount



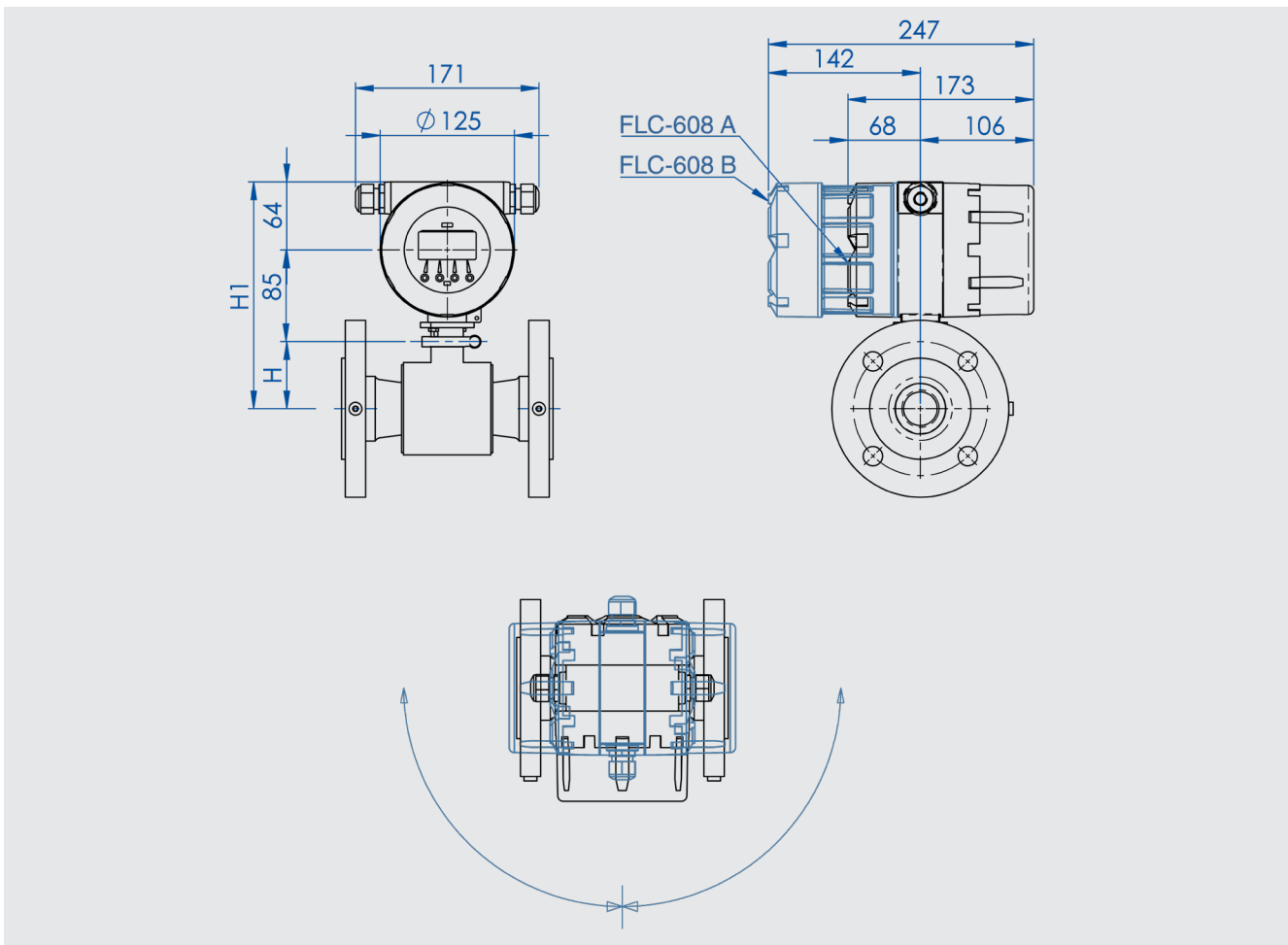
Model FLC-406, radial mount		
DN	H	H1
DN 50 [2"]	62	187
DN 65 [2.5"]	62	187
DN 80 [3"]	71	196
DN 100 [4"]	79	204
DN 125 [5"]	106	231
DN 150 [6"]	101	226
DN 200 [8"]	147	272
DN 250 [10"]	176	301
DN 300 [12"]	207	332

Compact version: Model FLC-2300 in combination with signal converter, model FLC-406, back mount



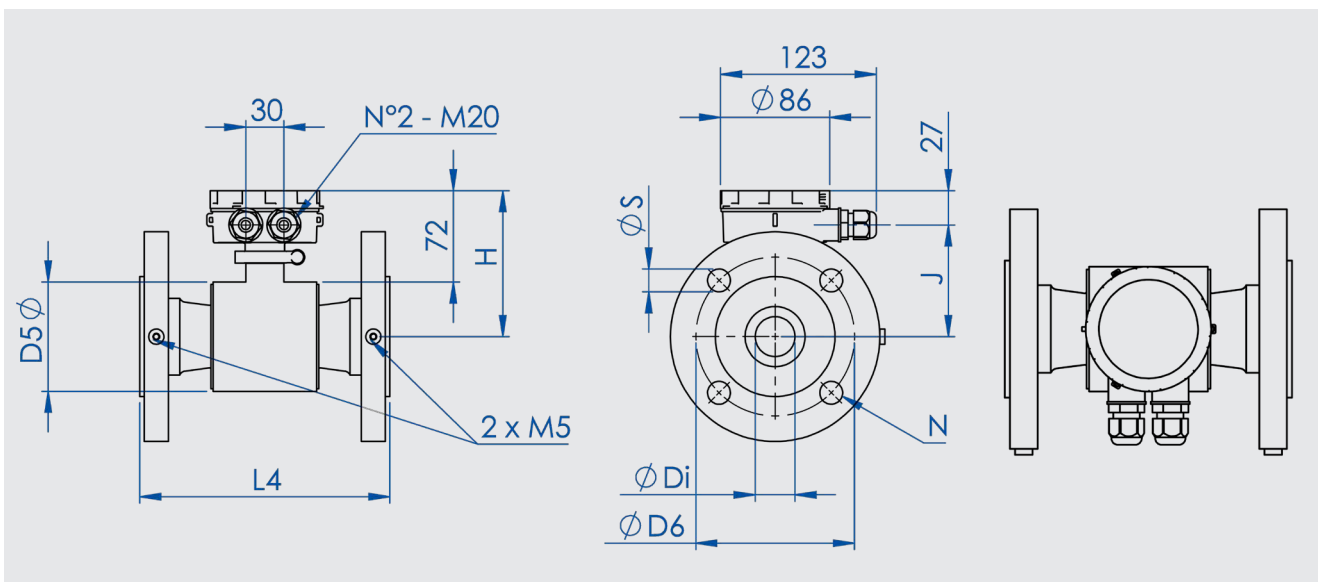
Model FLC-406, back mount		
DN	H	H1
DN 50 [2"]	62	188
DN 65 [2.5"]	62	188
DN 80 [3"]	71	197
DN 100 [4"]	79	205
DN 125 [5"]	106	232
DN 150 [6"]	101	227
DN 200 [8"]	147	273
DN 250 [10"]	176	302
DN 300 [12"]	207	333

Compact version: Model FLC-2300 in combination with signal converter, model FLC-608 A/B/R



Model FLC-608 A/B/R		
DN	H	H1
DN 50 [2"]	62	211
DN 65 [2.5"]	62	211
DN 80 [3"]	71	220
DN 100 [4"]	79	228
DN 125 [5"]	106	255
DN 150 [6"]	101	250
DN 200 [8"]	147	296
DN 250 [10"]	176	325
DN 300 [12"]	207	356

Separated version: Model FLC-2300



EN 1092 / PN 16								
DN	D5	L4	J	Di	D6	N	S	H
50	85	200 (+0/-3)	87.35	30.4	125	4	18	114.5
65	85	200 (+0/-3)	87.35	34.3	145	4	18	114.5
80	103	200 (+0/-3)	96.35	46.3	160	4	18	123.5
100	118	250 (+0/-3)	103.85	62.1	180	8	18	131
125	172	250 (+0/-3)	130.85	74.9	210	8	18	158
150	163	300 (+0/-3)	126.35	100	240	8	22	153.5
200	255	350 (+0/-3)	172.35	154.3	295	8	22	199.5
250	312	450 (+0/-5)	200.85	205	350	12	22	228
300	375	500 (+0/-5)	232.35	259	400	12	22	259.5




ANSI 150								
DN	D5	L4	J	Di	D6	N	S	H
DN 50 [2"]	85	200 (+0/-3)	87.35	30.4	120.65	4	19.05	114.5
DN 65 [2.5"]	85	200 (+0/-3)	87.35	34.3	139.7	4	19.05	114.5
DN 80 [3"]	103	200 (+0/-3)	96.35	46.3	152.4	4	19.05	123.5
DN 100 [4"]	118	250 (+0/-3)	103.85	62.1	190.5	8	19.05	131
DN 125 [5"]	172	250 (+0/-3)	130.85	74.9	215.9	8	22.352	158
DN 150 [6"]	163	300 (+0/-3)	126.35	100	241.3	8	22.352	153.5
DN 200 [8"]	255	350 (+0/-3)	172.35	154.3	298.45	8	22.352	199.5
DN 250 [10"]	312	450 (+0/-5)	200.85	205	361.95	12	25.4	228
DN 300 [12"]	375	500 (+0/-5)	232.35	259	431.8	12	25.4	259.5

AS 2129 table D								
DN	D5	L4	J	Di	D6	N	S	H
50	85	200 (+0/-3)	87.35	30.4	114	4	18	114.5
65	85	200 (+0/-3)	87.35	34.3	127	4	18	114.5
80	103	200 (+0/-3)	96.35	46.3	146	4	18	123.5
100	118	250 (+0/-3)	103.85	62.1	178	4	18	131
125	172	250 (+0/-3)	130.85	74.9	210	8	18	158
150	163	300 (+0/-3)	126.35	100	235	8	18	153.5
200	255	350 (+0/-3)	172.35	154.3	292	8	18	199.5
250	312	450 (+0/-5)	200.85	205	356	8	22	228
300	375	500 (+0/-5)	232.35	259	406	12	22	259.5

AS 2129 table E								
DN	D5	L4	J	Di	D6	N	S	H
50	85	200 (+0/-3)	87.35	30.4	114	4	18	114.5
65	85	200 (+0/-3)	87.35	34.3	127	4	18	114.5
80	103	200 (+0/-3)	96.35	46.3	146	8	18	123.5
100	118	250 (+0/-3)	103.85	62.1	178	8	18	131
125	172	250 (+0/-3)	130.85	74.9	210	8	18	158
150	163	300 (+0/-3)	126.35	100	235	8	22	153.5
200	255	350 (+0/-3)	172.35	154.3	292	8	22	199.5
250	312	450 (+0/-5)	200.85	205	356	12	22	228
300	375	500 (+0/-5)	232.35	259	406	12	26	259.5

AS 4087 / PN 16								
DN	D5	L4	J	Di	D6	N	S	H
50	85	200 (+0/-3)	87.35	30.4	114	4	18	114.5
65	85	200 (+0/-3)	87.35	34.3	127	4	18	114.5
80	103	200 (+0/-3)	96.35	46.3	146	8	18	123.5
100	118	250 (+0/-3)	103.85	62.1	178	4	18	131
125	172	250 (+0/-3)	130.85	74.9	210	8	18	158
150	163	300 (+0/-3)	126.35	100	235	8	18	153.5
200	255	350 (+0/-3)	172.35	154.3	292	8	18	199.5
250	312	450 (+0/-5)	200.85	205	356	8	22	228
300	375	500 (+0/-5)	232.35	259	406	12	22	259.5

Approvals

Logo	Description	Country
	EU declaration of conformity	European Union
	EMC directive EN 61326 emission (group 1, class B) and immunity (industrial application)	
	Low voltage directive	
	ATEX directive (option for separated version)	
	IECEx (option for separated version)	International
	Custody transfer	
-	International Organization for Legal Metrology (OIML)	International
-	Measuring instrument directive (MID)	European Union

Approvals and certificates, see website

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