

Electromagnetic flow meter Model FLC-2200EL

WIKA data sheet FL 20.01



Applications

- Water meters
- Water and wastewater
- Process industry
- Industrial process liquids and slurries
- Mining and pumps

Special features

- Supplied empty-pipe electrode for diameter \geq DN 50
- With integrated pressure port available
- Internal wet calibration for diameter \leq DN 2000
- Approved for custody transfer (MID MI-001, OIML R49)

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.

The model FLC-2200EL corresponds to the latest state-of-the-art for water-cycle and process applications. The flow meter is the solution for a wide range of industrial applications. The model FLC-2200EL offers a high accuracy

For further approvals
see page 13



Model FLC-2200EL with model FLC-608 signal converter in compact version

and extensive bidirectional flow measuring ranges in a robust, fully welded and potted design.

If particular ambient conditions require it, the model FLC-2200EL can be supplied in stainless steel, with flange or with special painting for class C4 environments in accordance with UNI EN ISO 12944-2. The measuring instruments are manufactured in accordance with the OIML R49-1:2013 standard.

To be able to measure even very small potentials, the inside of the flow tube is electrically insulated so that the process liquid does not come into contact with the material of the flow tube or flanges.

The flange and the outer surface of the sensor are coated with acrylic paint. Thus the measuring instrument has an excellent resistance to water, even with permanent immersion.

Specifications

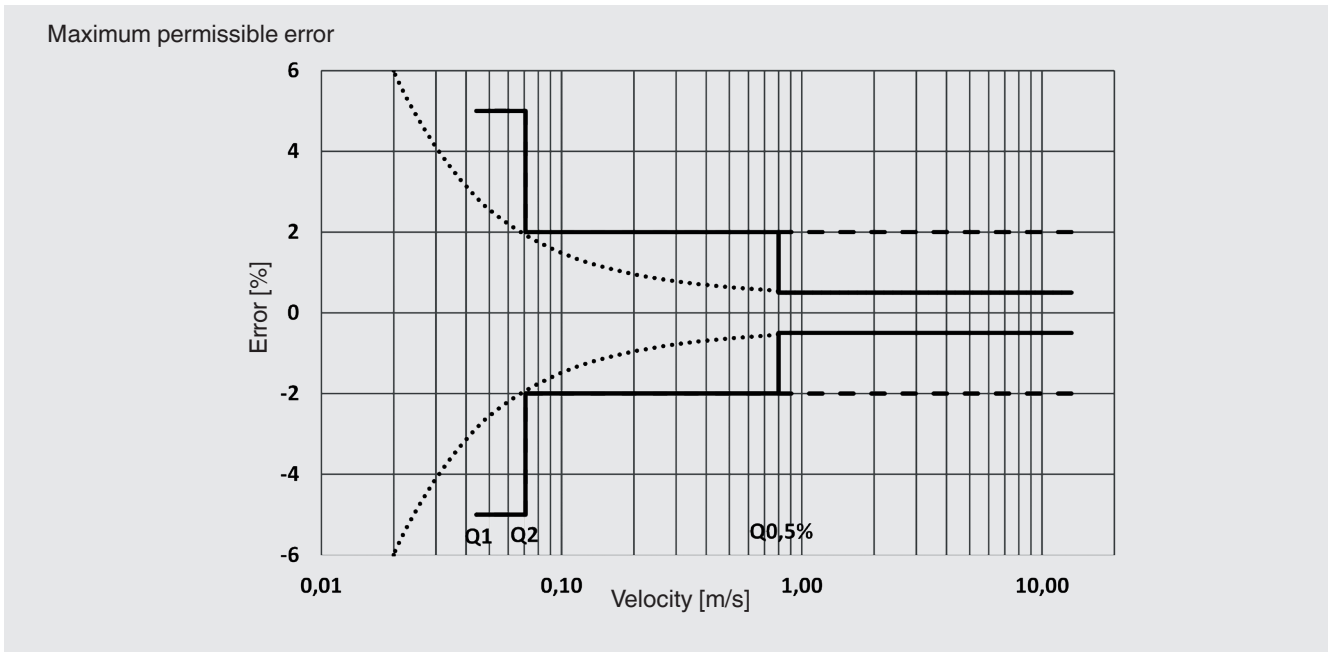
Available pipe diameters in mm							
15	20	25	32	40	50	65	80
100	125	150	200	250	300	350	400
450	500	600	700	800	900	1.000	1.200
1.300	1.400	1.500	1.600	1.700	1.800	2.000	-

Available pipe diameters in Inch							
0,5	0,75	1	1,25	1,5	2	2,5	3
4	5	6	8	10	12	14	16
18	20	24	28	32	36	40	48
52	56	60	64	68	72	80	-

Basic information					
Materials					
Flow tube	<ul style="list-style-type: none"> ■ Stainless steel 304 ■ Stainless steel 316 ■ Stainless steel 				
Flanges	<ul style="list-style-type: none"> ■ Carbon steel, painted ■ Stainless steel 304 ■ Stainless steel 316 				
Electrodes	<ul style="list-style-type: none"> ■ Hastelloy C® ■ Titanium ■ Tantalum ■ Platinum 				
Flow tube lining	<ul style="list-style-type: none"> ■ PTFE (for pipe diameters DN 15 ... DN 100), on request also for DN > 100 ■ Hard rubber (ebonite) (for diameter ≥ DN 125) <p>Approvals for use in drinking water applications: WRAS, FDA, DPR 777/82 and DM 174.</p>				
Painting of sensor housing and flange	Acrylic paint (painting for class C4 environments on request)				
Flow tube lining and medium temperature	<p>The maximum permissible medium temperature of the process liquid is limited by the lining material.</p> <table border="1"> <tbody> <tr> <td>PTFE</td> <td>-40 ... +130 °C [-40 ... +266 °F] (-40 ... +180 °C [-40 ... +356 °F] on request)</td> </tr> <tr> <td>Hard rubber (ebonite)</td> <td>-40 °C ... +80 °C [-40 ... +176 °F]</td> </tr> </tbody> </table>	PTFE	-40 ... +130 °C [-40 ... +266 °F] (-40 ... +180 °C [-40 ... +356 °F] on request)	Hard rubber (ebonite)	-40 °C ... +80 °C [-40 ... +176 °F]
PTFE	-40 ... +130 °C [-40 ... +266 °F] (-40 ... +180 °C [-40 ... +356 °F] on request)				
Hard rubber (ebonite)	-40 °C ... +80 °C [-40 ... +176 °F]				
Available flange standards	<ul style="list-style-type: none"> ■ EN 1092-1 ■ ANSI 150 ■ ANSI 300 ■ ANSI 600 ■ ANSI 900 ■ DIN 2501 ■ BS 4504 ■ AS 2129 (Tabelle D - E - F) ■ AS 4087 ■ ISO 7005-1 ■ KS 10K 				
Ingress protection per EN 60529	IP68				
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				

Calibration and maximum measuring deviation

The sensors of the model FLC-2200EL 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 SIT certified. The measuring deviation of the calibration is 0.2 % \pm 2 mm/s. The repeatability is 0.1 %.



Integration of the flow meter

The model FLC-2200EL 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-operated electronics).

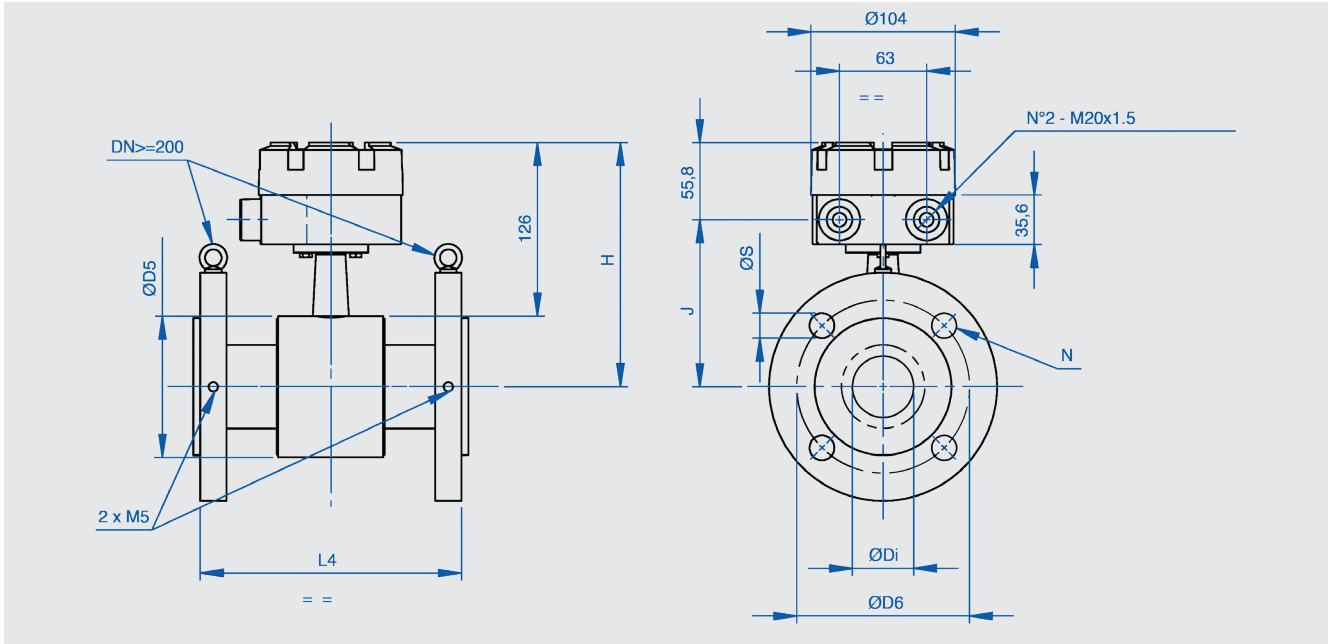
When installed into plastic or coated pipelines, the sensors may require the use of two grounding rings which are inserted between the flange and the mating face. With sensors larger than or equal to DN 50, an empty-pipe electrode (empty-pipe alarm) is supplied as standard.

Flow rates

Sensor diameter	Flow rate [m ³ /h]					Ratio R Q3/Q1
	Minimum flow Q1	Transition flow Q2	Q 0.5 %	Permanent flow Q3	Overload flow Q4	
DN 25 [1"]	0.08	0.128	1.4	10	12.5	125
DN 32 [1.25"]	0.08	0.128	2.3	10	12.5	125
DN 40 [1.5"]	0.128	0.205	3.6	16	20	125
DN 50 [2"]	0.2	0.32	5.65	25	31.25	125
DN 65 [2.5"]	0.32	0.512	9.55	40	50	125
DN 80 [3"]	0.504	0.806	14.5	63	78.75	125
DN 100 [4"]	0.8	1.28	22.6	100	125	125
DN 125 [5"]	1.28	2.048	35.3	160	200	125
DN 150 [6"]	2	3.2	51	250	312.5	125
DN 200 [8"]	3.2	5.12	90.5	400	500	125
DN 250 [10"]	5.04	8.064	140	630	787.5	125
DN 300 [12"]	8	12.8	200	1,000	1,250	125
DN 350 [14"]	12.8	20.48	280	1,600	2,000	125
DN 400 [16"]	12.8	20.48	360	1,600	2,000	125
DN 450 [18"]	25	40	460	2,500	3,125	100
DN 500 [20"]	25	40	570	2,500	3,125	100
DN 600 [24"]	50	80	820	4,000	5,000	80
DN 700 [28"]	50	80	1,100	4,000	5,000	80
DN 800 [32"]	100	160	1,450	6,300	7,875	63
DN 900 [36"]	100	160	1,840	6,300	7,875	63
DN 1,000 [40"]	200	320	2,270	10,000	12,500	50
DN 1,200 [48"]	320	512	3,270	16,000	20,000	50
DN 1,400 [56"]	500	800	4,440	25,000	31,250	50
DN 1,500 [60"]	800	1,280	5,100	40,000	50,000	50
DN 1,600 [64"]	1,260	2,016	5,800	63,000	78,750	50
DN 1,800 [72"]	2,000	3,200	7,350	100,000	125,000	50
DN 2,000 [80"]	3,200	5,120	9,100	160,000	200,000	50

Dimensions in mm

Separated version



PN 10 EN 1092-1								
DN	D5	L4	J	Di	D6	N	S	H
15	84	200 (+0/-3)	112.2	11.3	65	4	14	168
20	84	200 (+0/-3)	112.2	16.9	75	4	14	168
25	74	200 (+0/-3)	107.2	23.7	85	4	14	163
32	83	200 (+0/-3)	111.7	31.8	100	4	18	167.5
40	88	200 (+0/-3)	114.2	37.3	110	4	18	170
50	102	200 (+0/-3)	121.2	47.3	125	4	18	177
65	114	200 (+0/-3)	127.2	63.1	145	4	18	183
80	127	200 (+0/-3)	133.7	74.9	160	4	18	189.5
100	161	250 (+0/-3)	150.7	97	180	8	18	206.5
125	187	250 (+0/-3)	163.7	122	210	8	18	219.5
150	210	300 (+0/-3)	175.2	148	240	8	22	231
200	261	350 (+0/-3)	200.7	195	295	8	22	256.5
250	319	450 (+0/-5)	229.7	245	350	12	22	285.5
300	371	500 (+0/-5)	255.7	296	400	12	22	311.5
350	404	550 (+0/-5)	272.2	325.6	460	16	22	328
400	455	600 (+0/-5)	297.7	374.4	515	16	25	353.5
450	519	450 (+0/-7)	329.7	441	565	20	26	385.5
500	570	500 (+0/-7)	355.2	492	620	20	26	411
600	684	600 (+0/-7)	412.2	594	725	20	30	468
700	783	700 (+0/-7)	461.7	695	840	24	30	517.5
800	885	800 (+0/-7)	512.7	795	950	24	33	568.5
900	996	900 (+0/-15)	568.2	894	1,050	28	33	624
1,000	1,098	1,000 (+0/-15)	619.2	996	1,160	28	36	675
1,200	1,312	1,200 (+0/-15)	726.2	1,200	1,380	32	39	782
1,400	1,512	1,400 (+0/-15)	826.2	1,398	1,590	36	42	882

PN 10 EN 1092-1								
DN	D5	L4	J	D _i	D6	N	S	H
1,500	1,612	1,500 (+0/-15)	876.2	1,500	-	-	-	932
1,600	1,712	1,600 (+0/-15)	926.2	1,596	1,820	40	48	982
1,800	1,922	1,800 (+0/-15)	1,031.2	1,694	2,020	44	48	1,087
2,000	2,122	2,000 (+0/-15)	1,131.2	1,992	2,230	48	48	1,187

PN 16 EN 1092-1								
DN	D5	L4	J	D _i	D6	N	S	H
15	84	200 (+0/-3)	112.2	11.3	65	4	14	168
20	84	200 (+0/-3)	112.2	16.9	75	4	14	168
25	74	200 (+0/-3)	107.2	23.7	85	4	14	163
32	83	200 (+0/-3)	111.7	31.8	100	4	18	167.5
40	88	200 (+0/-3)	114.2	37.3	110	4	18	170
50	102	200 (+0/-3)	121.2	47.3	125	4	18	177
65	114	200 (+0/-3)	127.2	63.1	145	4	18	183
80	127	200 (+0/-3)	133.7	74.9	160	8	18	189.5
100	161	250 (+0/-3)	150.7	97	180	8	18	206.5
125	187	250 (+0/-3)	163.7	122	210	8	18	219.5
150	210	300 (+0/-3)	175.2	148	240	8	22	231
200	261	350 (+0/-3)	200.7	195	295	12	22	256.5
250	319	450 (+0/-5)	229.7	245	350	12	25	285.5
300	371	500 (+0/-5)	255.7	308	400	12	25	311.5
350	404	550 (+0/-5)	272.2	339.6	470	16	25	328
400	455	600 (+0/-5)	297.7	390.4	525	16	30	353.5
450	519	450 (+0/-7)	329.7	439	585	20	30	385.5
500	570	500 (+0/-7)	355.2	490	650	20	33	411
600	684	600 (+0/-7)	412.2	590	770	20	36	468
700	783	700 (+0/-7)	461.7	691	840	24	36	517.5
800	885	800 (+0/-7)	512.7	791	950	24	39	568.5
900	996	900 (+0/-15)	568.2	888	1,050	28	39	624
1,000	1,098	1,000 (+0/-15)	619.2	992	1,170	28	42	675
1,200	1,312	1,200 (+0/-15)	726.2	1,192	1,390	32	48	782
1,400	1,512	1,400 (+0/-15)	826.2	1,390	1,590	36	48	882
1,500	1,612	1,500 (+0/-15)	876.2	1,492	-	-	-	932
1,600	1,712	1,600 (+0/-15)	926.2	1,588	1,820	40	56	982
1,800	1,922	1,800 (+0/-15)	1,031.2	1,686	2,020	44	56	1,087
2,000	2,122	2,000 (+0/-15)	1,131.2	1,982	2,230	48	62	1,187

PN 25 EN 1092-1								
DN	D5	L4	J	D _i	D6	N	S	H
15	84	200 (+0/-3)	112.2	11.3	65	4	14	168
20	84	200 (+0/-3)	112.2	16.9	75	4	14	168
25	74	200 (+0/-3)	107.2	23.7	85	4	14	163
32	83	200 (+0/-3)	111.7	31.8	100	4	18	167.5
40	88	200 (+0/-3)	114.2	37.3	110	4	18	170

PN 25 EN 1092-1								
DN	D5	L4	J	D _i	D6	N	S	H
50	102	200 (+0/-3)	121.2	47.3	125	4	18	177
65	114	200 (+0/-3)	127.2	63.1	145	8	18	183
80	127	200 (+0/-3)	133.7	74.9	160	8	18	189.5
100	161	250 (+0/-3)	150.7	97	190	8	22	206.5
125	187	250 (+0/-3)	163.7	122	220	8	25	219.5
150	210	300 (+0/-3)	175.2	148	250	8	25	231
200	261	350 (+0/-3)	200.7	201	310	12	25	256.5
250	319	450 (+0/-5)	229.7	255	370	12	30	285.5
300	371	500 (+0/-5)	255.7	306	430	16	30	311.5
350	404	550 (+0/-5)	272.2	337.6	490	16	33	328
400	455	600 (+0/-5)	297.7	386.4	550	16	36	353.5
450	519	450 (+0/-7)	329.7	437	600	20	36	385.5
500	570	500 (+0/-7)	355.2	486	660	20	36	411
600	684	600 (+0/-7)	412.2	586	770	20	39	468
700	783	700 (+0/-7)	461.7	685	875	24	42	517.5
800	885	800 (+0/-7)	512.7	785	990	24	48	568.5
900	996	900 (+0/-15)	568.2	882	1,090	28	48	624
1,000	1,098	1,000 (+0/-15)	619.2	984	1,210	28	56	675
1,200	1,312	1,200 (+0/-15)	726.2	1,182	-	-	-	782
1,400	1,512	1,400 (+0/-15)	826.2	1,380	-	-	-	882
1,500	1,612	1,500 (+0/-15)	876.2	1,482	-	-	-	932
1,600	1,712	1,600 (+0/-15)	926.2	1,574	-	-	-	982
1,800	1,922	1,800 (+0/-15)	1,031.2	1,674	-	-	-	1,087
2,000	2,122	2,000 (+0/-15)	1,131.2	1,966	-	-	-	1,187

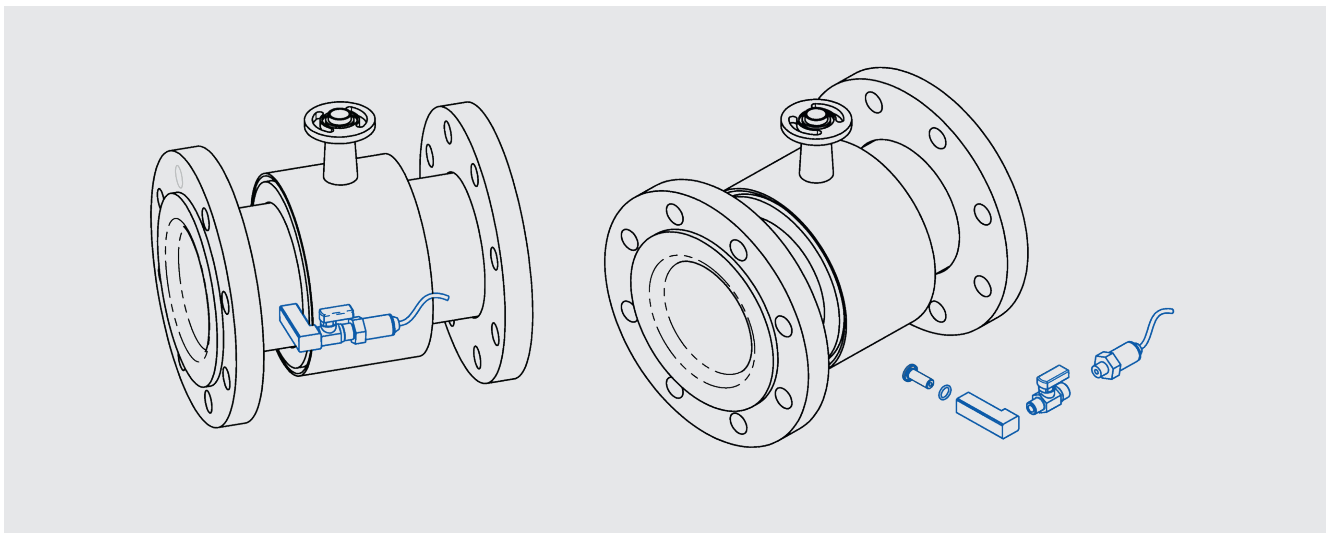
PN 40 EN 1092-1								
DN	D5	L4	J	D _i	D6	N	S	H
15	84	200 (+0/-3)	112.2	11.3	65	4	14	168
20	84	200 (+0/-3)	112.2	16.9	75	4	14	168
25	74	200 (+0/-3)	107.2	23.7	85	4	14	163
32	83	200 (+0/-3)	111.7	31.8	100	4	18	167.5
40	88	200 (+0/-3)	114.2	37.3	110	4	18	170
50	102	200 (+0/-3)	121.2	47.3	125	4	18	177
65	114	200 (+0/-3)	127.2	63.1	145	8	18	183
80	127	200 (+0/-3)	133.7	74.9	160	8	18	189.5
100	161	250 (+0/-3)	150.7	99	190	8	22	206.5
125	187	250 (+0/-3)	163.7	124	220	8	25	219.5
150	210	300 (+0/-3)	175.2	152	250	8	25	231
200	261	350 (+0/-3)	200.7	199	320	12	30	256.5
250	319	450 (+0/-5)	229.7	251	385	12	33	285.5
300	371	500 (+0/-5)	255.7	302	450	16	33	311.5
350	404	550 (+0/-5)	272.2	333.6	510	16	36	328
400	455	600 (+0/-5)	297.7	382.4	585	16	39	353.5
450	519	450 (+0/-7)	329.7	431	610	20	39	385.5
500	570	500 (+0/-7)	355.2	480	670	20	42	411
600	684	600 (+0/-7)	412.2	578	795	20	48	468

PN 40 EN 1092-1								
DN	D5	L4	J	D _i	D6	N	S	H
700	783	700 (+0/-7)	461.7	677	900	24	48	517.5
800	885	800 (+0/-7)	512.7	775	-	-	-	568.5
900	996	900 (+0/-15)	568.2	870	-	-	-	624
1,000	1,098	1,000 (+0/-15)	619.2	970	-	-	-	675
1,200	1,312	1,200 (+0/-15)	726.2	1,166	-	-	-	782
1,400	1,512	1,400 (+0/-15)	826.2	1,362	-	-	-	882
1,500	1,612	1,500 (+0/-15)	876.2	1,462	-	-	-	932
1,600	1,712	1,600 (+0/-15)	926.2	1,554	-	-	-	982
1,800	1,922	1,800 (+0/-15)	1,031.2	1,650	-	-	-	1,087
2,000	2,122	2,000 (+0/-15)	1,131.2	1,942	-	-	-	1,187

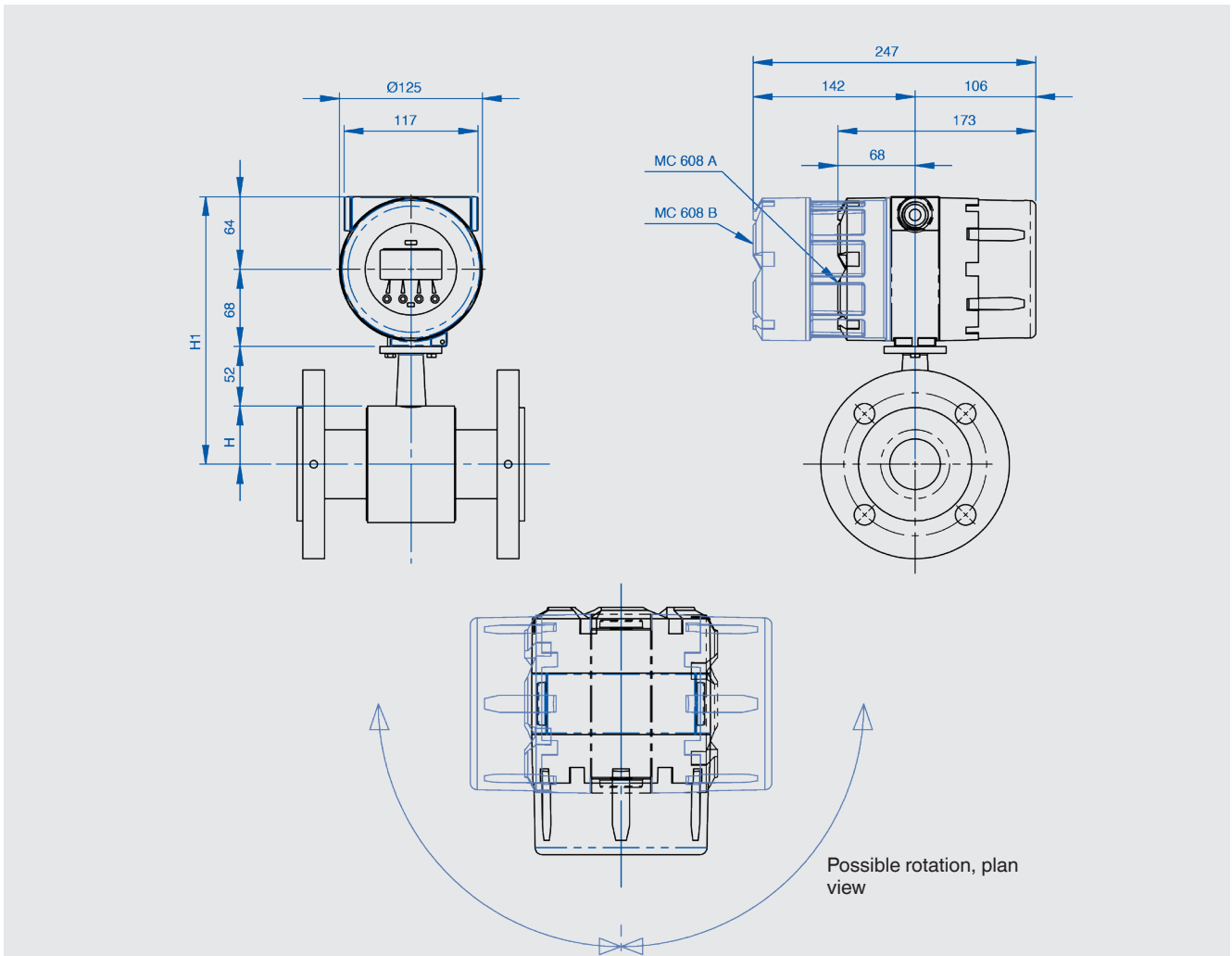
ANSI 150								
DN	D5	L4	J	D _i	D6	N	S	H
0.5"	84	200 (+0/-3)	112.2	11.3	60.3	4	16	168
0.75"	84	200 (+0/-3)	112.2	16.9	69.8	4	16	168
1"	74	200 (+0/-3)	107.2	23.7	79.4	4	15.9	163
1.25"	83	200 (+0/-3)	111.7	31.8	88.9	4	15.9	167.5
1.5"	88	200 (+0/-3)	114.2	37.3	98.4	4	15.9	170
2"	102	200 (+0/-3)	121.2	47.3	120.6	4	19	177
2.5"	114	200 (+0/-3)	127.2	63.1	139.7	4	19	183
3"	127	200 (+0/-3)	133.7	74.9	152.4	4	19	189.5
4"	161	250 (+0/-3)	150.7	97	190.5	8	19	206.5
5"	187	250 (+0/-3)	163.7	122	215.9	8	22.2	219.5
6"	210	300 (+0/-3)	175.2	148	241.3	8	22.2	231
8"	261	350 (+0/-3)	200.7	195	298.4	8	22.2	256.5
10"	319	450 (+0/-5)	229.7	245	361.9	12	25.4	285.5
12"	371	500 (+0/-5)	255.7	308	431.8	12	25.5	311.5
14"	404	550 (+0/-5)	272.2	337.6	476.2	12	28.6	328
16"	455	600 (+0/-5)	297.7	388.4	539.7	16	28.6	353.5
18"	519	450 (+0/-7)	329.7	437	577.6	16	31.7	385.5
20"	570	500 (+0/-7)	355.2	488	635	20	31.7	411
24"	684	600 (+0/-7)	412.2	588	749.3	20	34.9	468
28"	783	700 (+0/-7)	461.7	687	863.6	28	35	517.5
32"	885	800 (+0/-7)	512.7	787	977.9	28	41	568.5
36"	996	900 (+0/-15)	568.2	886	1,085.9	32	41	624
40"	1,098	1,000 (+0/-15)	619.2	988	1,200	36	41	675
48"	1,312	1,200 (+0/-15)	726.2	1,188	1,422.4	44	41	782
56"	1,512	1,400 (+0/-15)	826.2	1,384	1,651	48	47.8	882
60"	1,612	1,500 (+0/-15)	876.2	1,484	1,760	52	47.8	932
64"	1,712	1,600 (+0/-15)	926.2	1,580	-	-	-	982
72"	1,922	1,800 (+0/-15)	1,031.2	1,678	-	-	-	1,087
80"	2,122	2,000 (+0/-15)	1,131.2	1,974	-	-	-	1,187

ANSI 300								
DN	D5	L4	J	D _i	D6	N	S	H
0.5"	84	200 (+0/-3)	112.2	11.3	66.7	4	16	168
0.75"	84	200 (+0/-3)	112.2	16.9	82.5	4	19	168
1"	74	200 (+0/-3)	107.2	23.7	88.9	4	19	163
1.25"	83	200 (+0/-3)	111.7	31.8	98.4	4	19	167.5
1.5"	88	200 (+0/-3)	114.2	37.3	114.3	4	22.2	170
2"	102	200 (+0/-3)	121.2	47.3	127	8	19	177
2.5"	114	200 (+0/-3)	127.2	63.1	149.2	8	22.2	183
3"	127	200 (+0/-3)	133.7	74.9	168.3	8	22.2	189.5
4"	161	250 (+0/-3)	150.7	105	200	8	22.2	206.5
5"	187	250 (+0/-3)	163.7	122	234.9	8	22.2	219.5
6"	210	300 (+0/-3)	175.2	150	269.9	12	22.2	231
8"	261	350 (+0/-3)	200.7	197	330.2	12	25.4	256.5
10"	319	450 (+0/-5)	229.7	249	387.3	16	28.6	285.5
12"	371	500 (+0/-5)	255.7	300	450.8	16	31.7	311.5
14"	404	550 (+0/-5)	272.2	329.6	514.3	20	31.7	328
16"	455	600 (+0/-5)	297.7	378.4	571.5	20	34.9	353.5
18"	519	450 (+0/-7)	329.7	427	628.6	24	34.9	385.5
20"	570	500 (+0/-7)	355.2	476	685.8	24	34.9	411
24"	684	600 (+0/-7)	412.2	572	812.8	24	41.3	468
28"	783	700 (+0/-7)	461.7	671	939.8	28	44.5	517.5
32"	885	800 (+0/-7)	512.7	767	1,054.1	28	50.8	568.5
36"	996	900 (+0/-15)	568.2	862	1,168.4	32	53.8	624
40"	1,098	1,000 (+0/-15)	619.2	962	1,155.7	32	44.5	675
48"	1,312	1,200 (+0/-15)	726.2	1,160	1,371.6	32	50.8	782
56"	1,512	1,400 (+0/-15)	826.2	1,350	1,600.2	28	60.5	882
60"	1,612	1,500 (+0/-15)	876.2	1,450	1,701.8	32	60.5	932
64"	1,712	1,600 (+0/-15)	926.2	1,542	-	-	-	982
72"	1,922	1,800 (+0/-15)	1,031.2	1,638	-	-	-	1,087
80"	2,122	2,000 (+0/-15)	1,131.2	1,926	-	-	-	1,187

Integrated pressure port



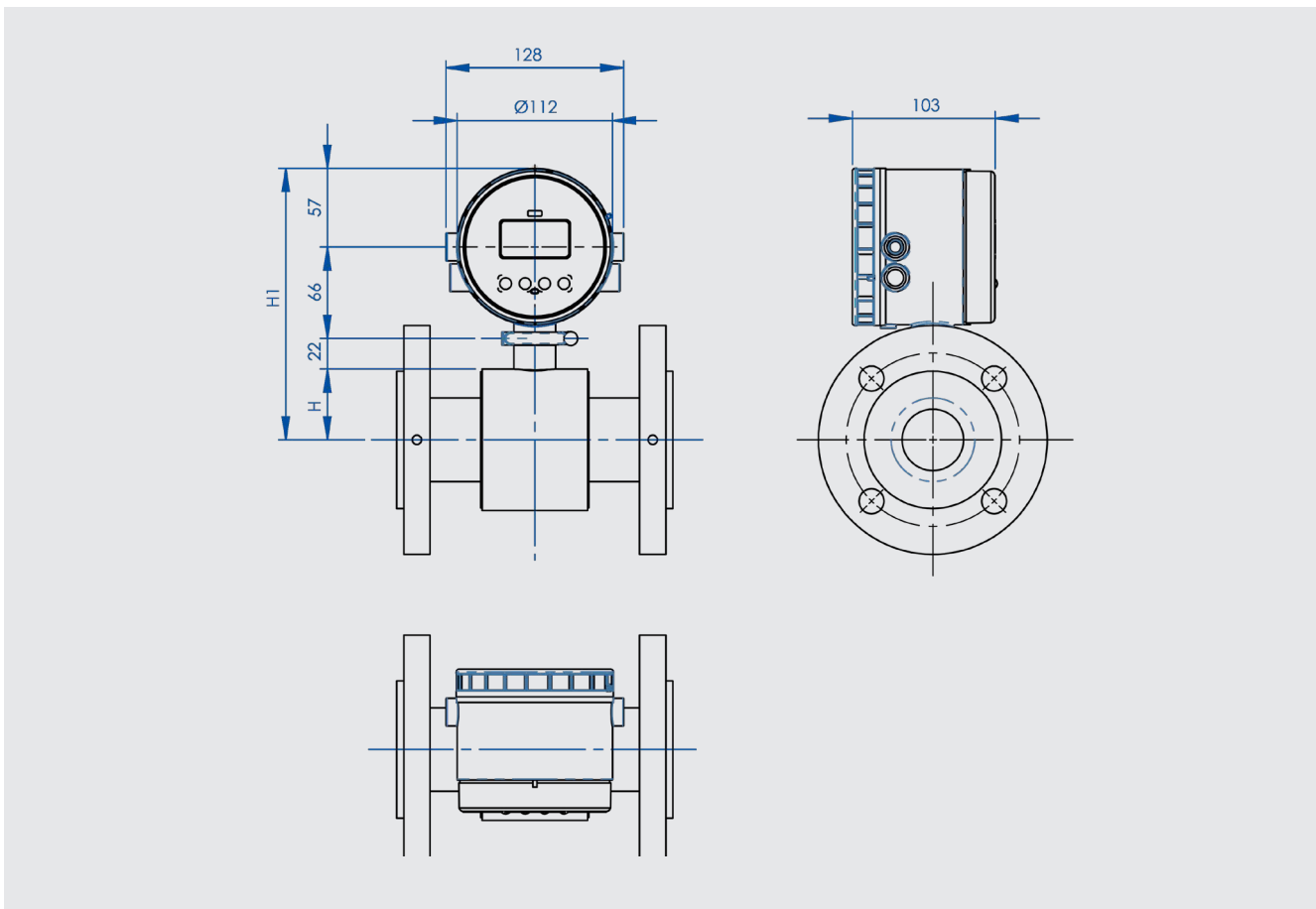
Compact version: Model FLC-2200EL in combination with signal converter, model FLC-608 A/B/R (B/R max. DN 600)



Model FLC-608 A/B/R		
DN	H	H1
25	37	220
32	42	225
40	44	227
50	51	234
65	57	240
80	64	247
100	81	264
125	94	277
150	105	288
200	131	314
250	160	343
300	186	369
350	202	385

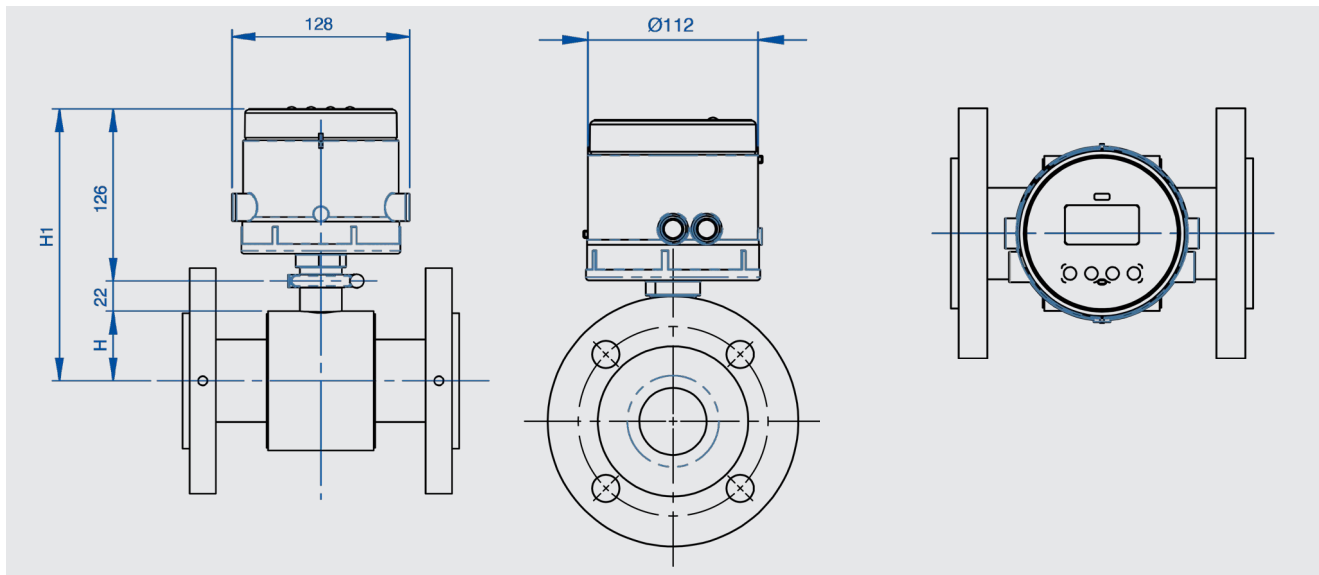
Model FLC-608 A/B/R		
DN	H	H1
450	260	443
500	285	468
600	342	525
700	392	575
750	417	600
800	443	626
900	498	681
1,000	549	732
1,200	656	839
1,400	756	939
1,500	806	989
1,600	856	1,039
1,800	961	1,144

Compact version: Model FLC-2200EL in combination with signal converter, model FLC-406, radial mount (max. DN 600)






Model FLC-406, radial mount		
DN	H	H1
25	37	182
32	42	186
40	44	189
50	51	196
65	57	202
80	64	208
100	81	225
125	94	238
150	105	250
200	131	275
250	160	304
300	186	330
350	202	347
400	228	372
450	260	404
500	285	430
600	342	487

Compact version: Model FLC-2200EL in combination with signal converter, model FLC-406, back mount (max. DN 600)



Model FLC-406, back mount		
DN	H	H1
25	37	185
32	42	190
40	44	192
50	51	199
65	57	205
80	64	212
100	81	229
125	94	242
150	105	253
200	131	279
250	160	308
300	186	334
350	202	350
400	228	376
450	260	408
500	285	433
600	342	490

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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