



**EUROMAG**  
INTERNATIONAL

*Measure > Sense > Innovate*

# SENSOR **MUT2200EL**

Electromagnetic flowmeter



*The electromagnetic flowmeter for all applications*



DS100-6-ENG



# Sensor MUT2200EL

MUT2200EL sensors represent the state of the art of Euromag International production for water cycle and process applications. The new structure for the generation of the magnetic field and the innovative route of the signal generated by the electrodes, provide a sensor with an extremely wide measurement range:

EL= Extended Linearity

This new sensors series follows the successful tradition of the MUT2200EL, introducing a measurement range of more than 1:1000 without linearization software. These kinds of performances allow very accurate measures on a wide flowrate range and to count lower flow rates that, before, would have been reset because of the effect of the converters cut off.

This flanged sensors series bases its operation on the Faraday Principle, by which a conductor crossing a magnetic field generates a potential perpendicularly orientated to the same field.

In this case the flow tube made in stainless steel AISI 304 is equipped with carbon steel or stainless steel flanges, two coils are installed on the top and inferior part; the magnetic field, generated by the electric current crossing the coil, induces in the electrodes a difference in the potential proportional to the flow rate.

With the aim of measuring such potential of very low values, the interior of the flow tube is electrically insulated, thus the process liquid is no longer in contact neither with the material of the flow tube nor with that of the flange.

The converter used generates the current supplying the coil, acquires the electrodes difference of potential, process the signal to calculate the flowrate and administers the communication with the exterior.

The entire sensor, when installed in the separate version, has a degree of protection IP68 suitable for a permanent immersion in water up to a depth of 1.5m thanks to a welded plate structure containing the coil and the electrodes.



## Body and flanges

The flange and the sensor external surface are acrylic painted. This treatment gives the sensor an excellent resistance to water, even in permanent immersion. When special ambient conditions require it, the MUT2200EL may be supplied in stainless steel, flange included or special painting for C4 class environments.

## Internal lining

The standard internal insulating lining is in PTFE for diameters from DN15 to DN100, in hard rubber (Ebonite) for diameters equal or bigger than DN125. On request, sensors may be supplied coated with PTFE with diameters bigger than DN100. The suitable temperature is limited by the type of internal lining used.

## Electrodes

Standard electrodes in Hastelloy C guarantee a wide compatibility with different kind of liquids; if required, they may be supplied in Hastelloy B, Titanium, Tantalum or Platinum.

## Coupling and sensor connection

MUT2200EL sensors may be coupled with any Euromag converters. In the separate version the sensor is connected to the converter by means of cables whose length depends on the liquid conductivity; the maximum length shall not exceed 100 metres (30 meters in combination with battery operated electronics).

When installed in plastic or coated pipe lines, sensors may require the use of two grounding rings, which are inserted between the flange and the counter flange. On sensors greater or equal than DN50 an empty pipe electrode is supplied as a standard (empty pipe alarm).

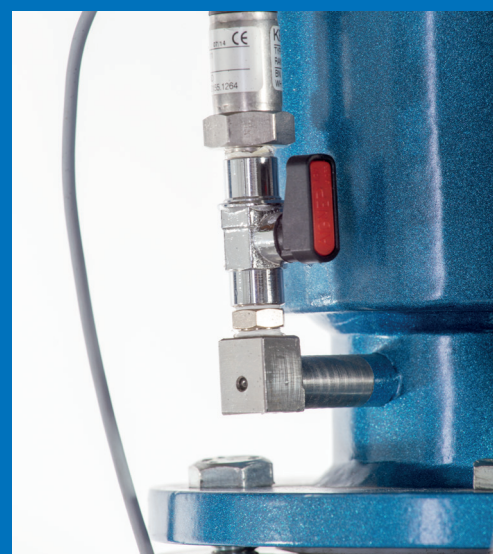
## Reference standards

The Euromag magnetic meters are marked CE and are manufactured according to the following standards:

- 2014/35/EU - EN 61010-1:2013 (LVD)
- 2014/30/EU - EN 61326-1:2013 (EMC)
- OIML R49-1:2013
- European directive 2014/32/EU (MID)
- 2014/34/UE - IEC 60079 - 0, IEC 60079 - 18 (ATEX - IECEx) Separate version
- EN ISO 15609-1 and EN ISO 15614-1
- UNI EN ISO 12944-2, painting for C4 class environments (on request)
- PTFE conform to the norms WRAS, FDA, DPR 777/82 e DM 21/09/773
- Ebonite conform to the norms WRAS, FDA e DM174



MUT2200EL - MC608A



Integrated pressure sensor



MUT2200EL - MC608B - GSM - Pressure

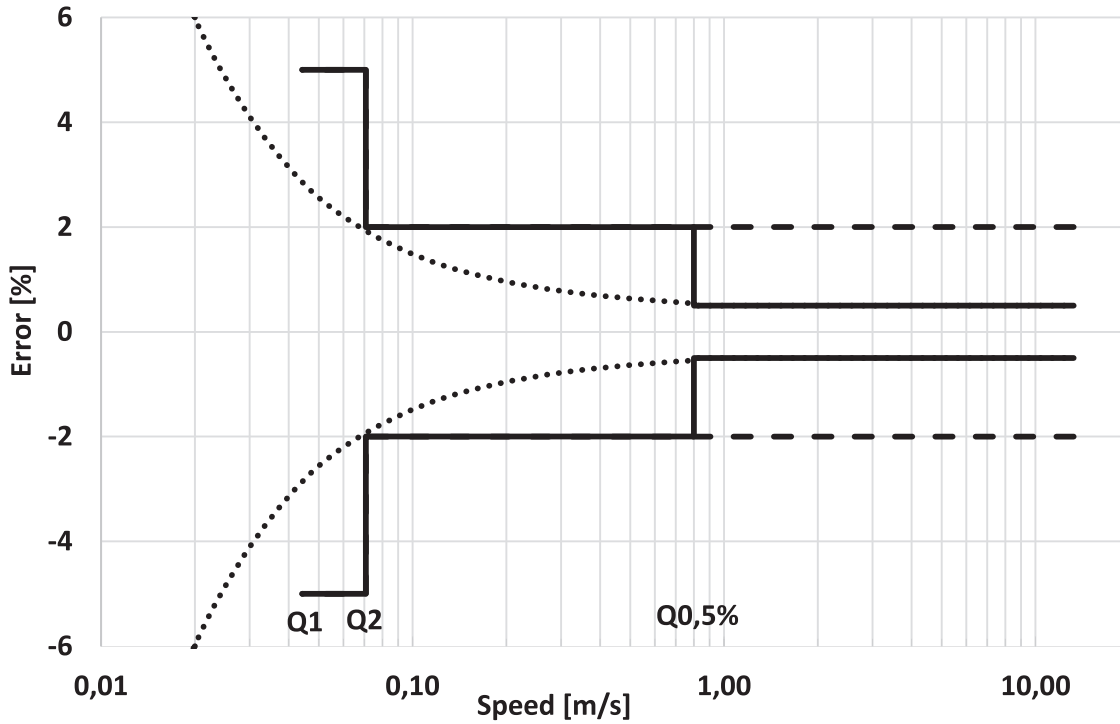


MUT2200EL - PTFE liner

# Calibration and maximum error

MUT2200EL sensors belong to the reference Group B1 (ISO 11631). Each sensor is calibrated on a hydraulic bench equipped with a reference weighting system and SIT certified. The uncertainty of the calibration is equal to 0.2% +/- 2 mm/s. The repeatability is in the order of 0.1%.

Maximum Permissible Error is within the limits indicated in the following graph:



## Flow rates chart

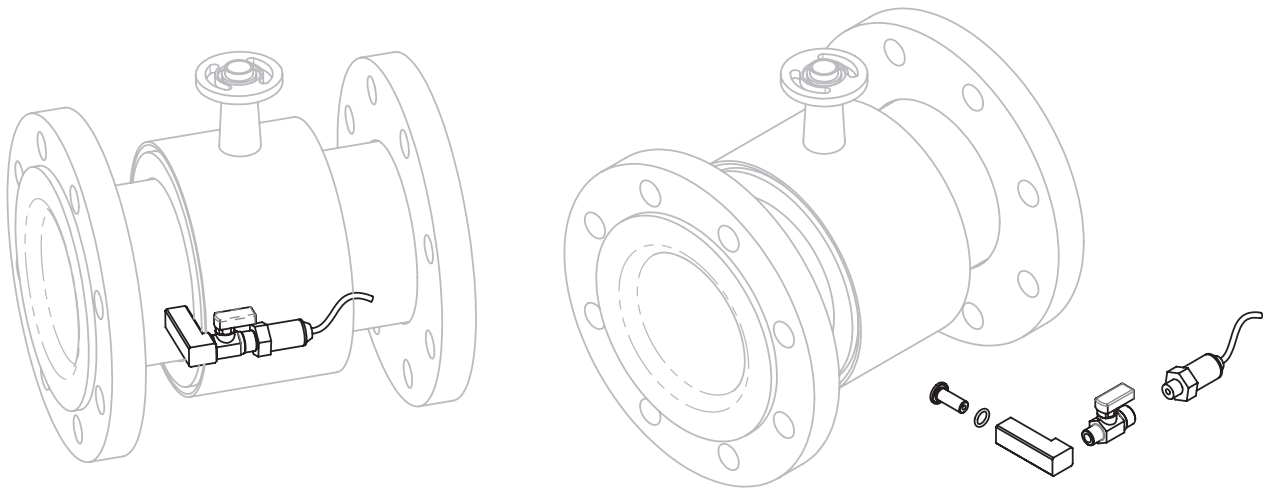
Sensor diameter	Flow rate [m³/h]					Ratio Q3/Q1
	Min. Q1	Trans. Q2	Q0,5%	Perm. Q3	Overl. Q4	
DN25 - 1"	0,080	0,128	1,40	10,00	12,50	125
DN32 - 1 1/4"	0,080	0,128	2,30	10,00	12,50	125
DN40 - 1 1/2"	0,128	0,205	3,60	16,00	20,00	125
DN 50 - 2"	0,200	0,320	5,65	25,00	31,25	125
DN 65 - 2 1/2"	0,320	0,512	9,55	40,00	50,00	125
DN 80 - 3"	0,504	0,806	14,50	63,00	78,75	125
DN 100 - 4"	0,800	1,280	22,60	100,00	125,00	125
DN 125 - 5"	1,280	2,048	35,30	160,00	200,00	125
DN 150 - 6"	2,000	3,200	51,00	250,00	312,50	125
DN 200 - 8"	3,200	5,120	90,50	400,00	500,00	125
DN 250 - 10"	5,040	8,064	140,00	630,00	787,50	125
DN 300 - 12"	8,000	12,800	200,00	1.000,00	1.250,00	125
DN 350 - 14"	12,800	20,480	280,00	1.600,00	2.000,00	125
DN 400 - 16"	12,800	20,480	360,00	1.600,00	2.000,00	125

Sensor diameter	Flow rate [m³/h]					Ratio Q3/Q1
	Min. Q1	Trans. Q2	Q0,5%	Perm. Q3	Overl. Q4	
DN450 - 18"	25	40	460	2.500	3.125	100
DN500 - 20"	25	40	570	2.500	3.125	100
DN600 - 24"	50	80	820	4.000	5.000	80
DN700 - 28"	50	80	1.100	4.000	5.000	80
DN800 - 32"	100	160	1.450	6.300	7.875	63
DN900 - 36"	100	160	1.840	6.300	7.875	63
DN1000 - 40"	200	320	2.270	10.000	12.500	50
DN1200 - 48"	320	512	3.270	16.000	20.000	50
DN1400 - 56"	500	800	4.440	25.000	31.250	50
DN1500 - 60"	800	1.280	5.100	40.000	50.000	50
DN1600 - 64"	1260	2.016	5.800	63.000	78.750	50
DN1800 - 72"	2.000	3.200	7.350	100.000	125.000	50
DN2000 - 80"	3.200	5.120	9.100	160.000	200.000	50

# MUT2200EL general features

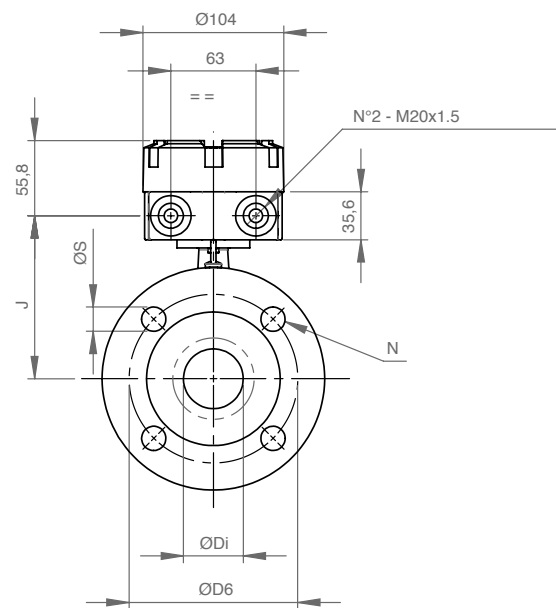
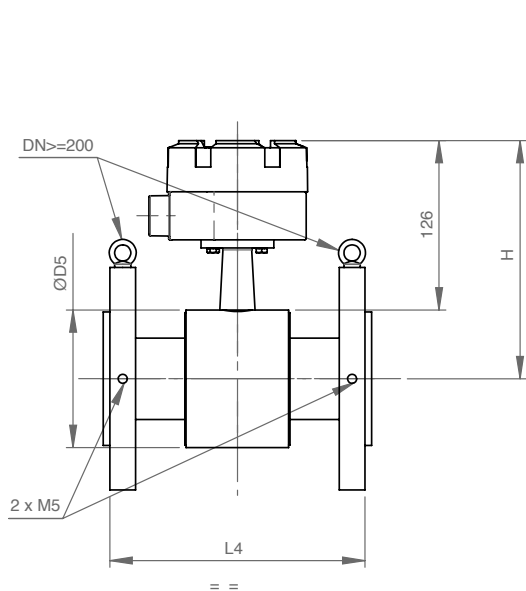
<b>Flow tube material</b>		AISI 304 (std), AISI 316															
<b>Flanges material</b>		Carbon steel painted (std), AISI 304, AISI 316															
<b>Electrodes material</b>		Hastelloy C (std), Hastelloy B, Titanium, Tantalio, Platinum															
<b>Internal lining and liquid temperature</b>		<b>Internal lining</b>								<b>Liquid temperature</b>							
		PTFE								Standard -40 /+130°C (up to +180° on request)							
		Ebonite								-40°C / +80°C							
<b>Available sizes</b>	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
	pollici	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	2.1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"
	mm	450	500	600	700	800	900	1000	1200	1300	1400	1500	1600	1700	1800	2000	
	pollici	18"	20"	24"	28"	32"	36"	40"	48"	52"	56"	60"	64"	68"	72"	80"	
<b>Flange standards available</b>		EN1092-1, ANSI 150, ANSI 300, ANSI 600, ANSI 900, DIN 2501, BS 4504, AS 2129 (TABLE D - E - F), AS 4087, ISO 7005-1, KS 10K															
<b>Protection Degree</b>		IP68 1,5 m continuous immersion (EN 60529)															
<b>Compatible converters</b>		MC608 A/B/R/P/I, MC406															
<b>Electrical connections</b>		Cable glands M20 x 1.5 + terminal block + sealing resin															

## Pressure port integrated



## Applications

MUT2200EL sensors are suitable for any on-line application. These sensors are typically used in the measure of potable or not potable water, industrial waste water, industrial process liquids, muds and concretes.



MUT2200EL 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	1050	28	33	624
1000	1098	1000(+0/-15)	619,2	996	1160	28	36	675
1200	1312	1200(+0/-15)	726,2	1200	1380	32	39	782
1400	1512	1400(+0/-15)	826,2	1398	1590	36	42	882
1500	1612	1500(+0/-15)	876,2	1500	-	-	-	932
1600	1712	1600(+0/-15)	926,2	1596	1820	40	48	982
1800	1922	1800(+0/-15)	1031,2	1694	2020	44	48	1087
2000	2122	2000(+0/-15)	1131,2	1992	2230	48	48	1187

MUT2200EL PN 16 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	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	1050	28	39	624
1000	1098	1000(+0/-15)	619,2	992	1170	28	42	675
1200	1312	1200(+0/-15)	726,2	1192	1390	32	48	782
1400	1512	1400(+0/-15)	826,2	1390	1590	36	48	882
1500	1612	1500(+0/-15)	876,2	1492	-	-	-	932
1600	1712	1600(+0/-15)	926,2	1588	1820	40	56	982
1800	1922	1800(+0/-15)	1031,2	1686	2020	44	56	1087
2000	2122	2000(+0/-15)	1131,2	1982	2230	48	62	1187

## MUT2200EL PN 25 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	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	1090	28	48	624
1000	1098	1000(+0/-15)	619,2	984	1210	28	56	675
1200	1312	1200(+0/-15)	726,2	1182	-	-	-	782
1400	1512	1400(+0/-15)	826,2	1380	-	-	-	882
1500	1612	1500(+0/-15)	876,2	1482	-	-	-	932
1600	1712	1600(+0/-15)	926,2	1574	-	-	-	982
1800	1922	1800(+0/-15)	1031,2	1674	-	-	-	1087
2000	2122	2000(+0/-15)	1131,2	1966	-	-	-	1187

## MUT2200EL PN 40 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	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
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
1000	1098	1000(+0/-15)	619,2	970	-	-	-	675
1200	1312	1200(+0/-15)	726,2	1166	-	-	-	782
1400	1512	1400(+0/-15)	826,2	1362	-	-	-	882
1500	1612	1500(+0/-15)	876,2	1462	-	-	-	932
1600	1712	1600(+0/-15)	926,2	1554	-	-	-	982
1800	1922	1800(+0/-15)	1031,2	1650	-	-	-	1087
2000	2122	2000(+0/-15)	1131,2	1942	-	-	-	1187

MUT2200EL ANSI 150

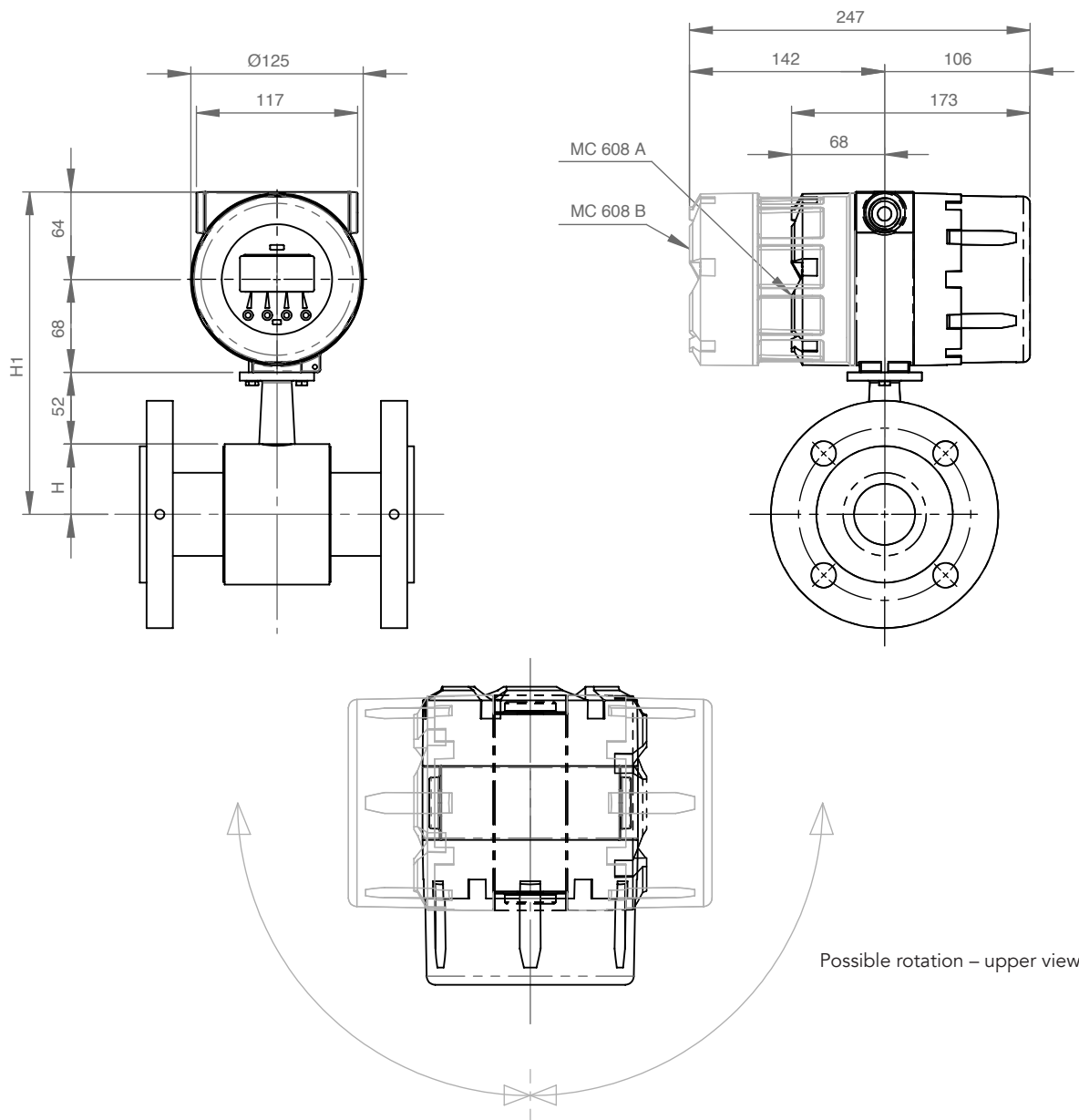
DN	D5	L4	J	Di	D6	N	S	H
1/2"	84	200(+0/-3)	112,2	11,3	60,3	4	16	168
3/4"	84	200(+0/-3)	112,2	16,9	69,8	4	16	168
1"	74	200(+0/-3)	107,2	23,7	79,4	4	15,9	163
1 1/4"	83	200(+0/-3)	111,7	31,8	88,9	4	15,9	167,5
1 1/2"	88	200(+0/-3)	114,2	37,3	98,4	4	15,9	170
2"	102	200(+0/-3)	121,2	47,3	120,6	4	19	177
2 1/2"	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	1085,9	32	41	624
40"	1098	1000(+0/-15)	619,2	988	1200	36	41	675
48"	1312	1200(+0/-15)	726,2	1188	1422,4	44	41	782
56"	1512	1400(+0/-15)	826,2	1384	1651	48	47,8	882
60"	1612	1500(+0/-15)	876,2	1484	1760	52	47,8	932
64"	1712	1600(+0/-15)	926,2	1580	-	-	-	982
72"	1922	1800(+0/-15)	1031,2	1678	-	-	-	1087
80"	2122	2000(+0/-15)	1131,2	1974	-	-	-	1187

MUT2200EL ANSI 300

DN	D5	L4	J	Di	D6	N	S	H
1/2"	84	200(+0/-3)	112,2	11,3	66,7	4	16	168
3/4"	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 1/4"	83	200(+0/-3)	111,7	31,8	98,4	4	19	167,5
1 1/2"	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 1/2"	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	1054,1	28	50,8	568,5
36"	996	900(+0/-15)	568,2	862	1168,4	32	53,8	624
40"	1098	1000(+0/-15)	619,2	962	1155,7	32	44,5	675
48"	1312	1200(+0/-15)	726,2	1160	1371,6	32	50,8	782
56"	1512	1400(+0/-15)	826,2	1350	1600,2	28	60,5	882
60"	1612	1500(+0/-15)	876,2	1450	1701,8	32	60,5	932
64"	1712	1600(+0/-15)	926,2	1542	-	-	-	982
72"	1922	1800(+0/-15)	1031,2	1638	-	-	-	1087
80"	2122	2000(+0/-15)	1131,2	1926	-	-	-	1187



# MUT2200EL - MC608 A/B/R\*

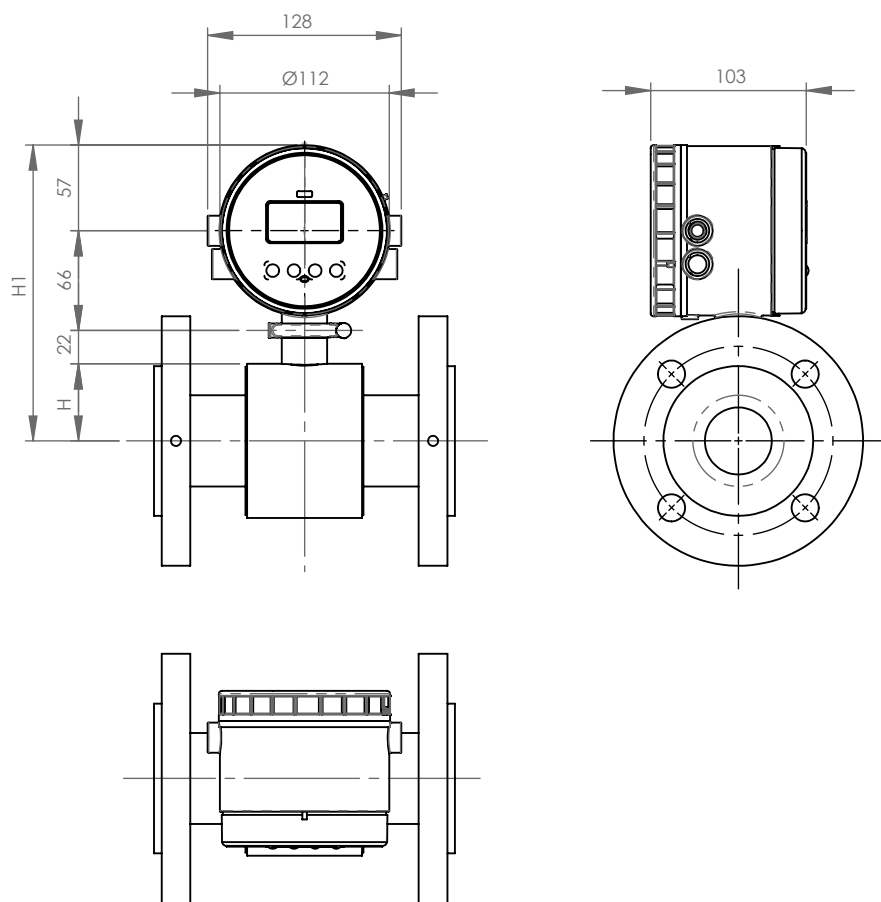


MC608 A/B/R*		
DN	H	H1
25	37	220
32	42	225
40	44	227
50	51	234
65	57	240
80	64	247
100	81	264
125	94	277
150	105	288
200	131	314
250	160	343
300	186	369
350	202	385

MC608 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
1000	549	732
1200	656	839
1400	756	939
1500	806	989
1600	856	1039
1800	961	1144

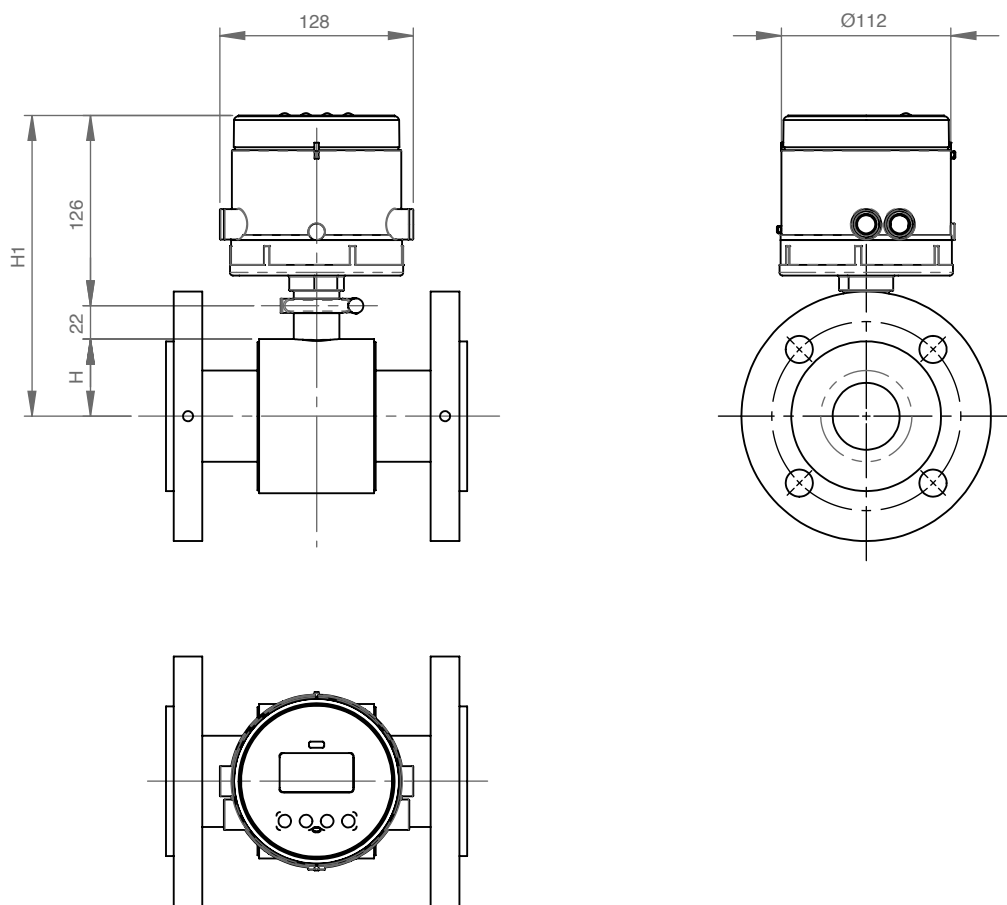
\* B/R max DN 600

# MUT2200EL - MC406 HORIZONTAL - max DN 600



MC406 HORIZONTAL		
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

# MUT2200EL - MC406 VERTICAL - max DN 600



MC406 VERTICAL		
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

# Measure > Sense > Innovate

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