

ELECTROMAGNETIC FLOWMETER



- FARADAY · NO OBSTRUCTION, NO PRESSURE LOSS, NO MOVING PARTS
- CONDUCTIVE LIQUIDS AND SLURRIES $\geq 25 \mu\text{S}/\text{CM}$ · 0.1 ... 15 M/S
- 4 ... 20 MA · PULSE · RS485 · HART · IP65 OR IP68

KEY DATA

Property	Value	Property	Value
Velocity	0.1 ... 15 m/s	Media	Conductive liquids and slurries $\geq 25 \mu\text{S}/\text{cm}$
Accuracy	$\pm 0.5 \%$ of reading	Protection grade	IP65 or IP68
Output	4 ... 20 mA · pulse · RS485 · RS232 · HART	Supply voltage	220 Vac or 24 Vdc
Ambient temperature	-25 ... +60 °C	Structure	One-piece or split

An electromagnetic meter: the conductive medium moving through a magnetic field induces a voltage across two electrodes. The tube is straight and empty — no obstruction, no pressure loss, no wear.



MEASUREMENT

Measuring principle	Faraday's law of induction · two electrodes in a magnetic field, no obstruction in the tube
Media	Conductive liquids and two-phase media · acids, alkalis, salt solutions, pulp and slurries
Conductivity	≥ 25 µS/cm (tap water is about 25 µS/cm)
Not suitable for	Media with ferromagnetic particles or a large number of bubbles
Velocity	0.1 ... 15 m/s, settable
Accuracy	± 0.5 % of the indicated value
Direction	Forward and reverse
Empty pipe	Empty-pipe detection with alarm output
Self-diagnosis	Self-diagnosis alarm output

MATERIALS AND PROCESS

Electrode	316L stainless steel · platinum-iridium · Hastelloy B or C · tantalum · titanium
Lining	Neoprene (CR) · PTFE · FEP · polyurethane rubber
Shell	Carbon steel as standard · stainless steel to order
Nominal pressure	4.0 MPa to DN50 · 1.6 MPa DN65 ... DN250 · 1.0 MPa DN300 ... DN1000 · 0.6 MPa DN1200 ... DN3000
Flange standard	GB/T 9119-2000 at 4.0 MPa · JB/T 81-94 at 1.6, 1.0 and 0.6 MPa
Ambient temperature	-25 ... +60 °C · humidity 5 ... 100 % RH
Structure	One-piece or split (remote converter)
Protection grade	IP65 or IP68 — the last field but one of the order code
Grounding	Grounding electrode or grounding ring, see the order code

ELECTRICAL PROPERTIES

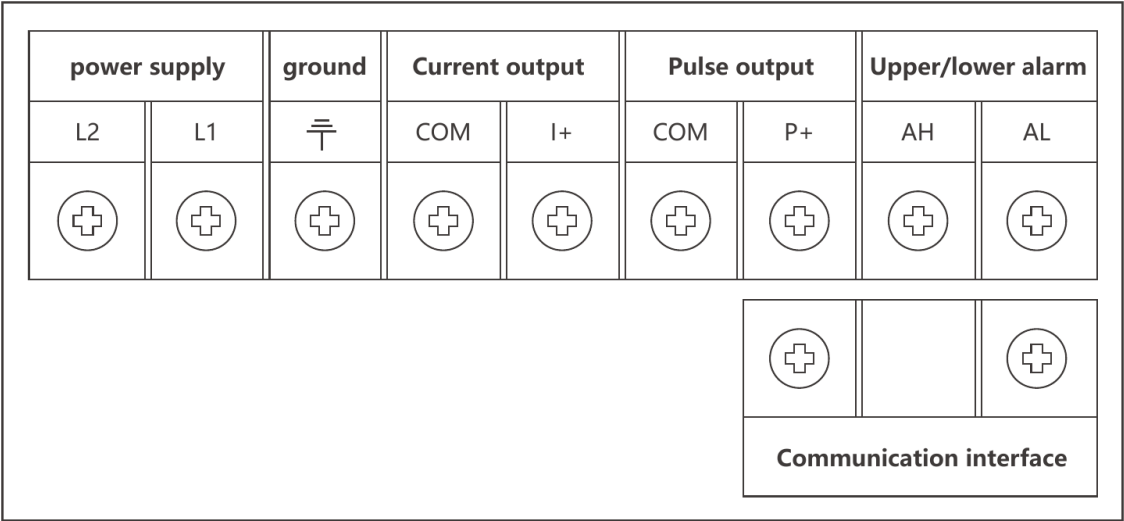
Supply voltage	220 Vac (terminals 21 and 22) or 24 Vdc (terminals 18 and 19)
Current output	4 ... 20 mA, terminal 4 · HART optional
Pulse output	Two-way flow pulse or frequency, terminals 5 and 6
Alarm outputs	Flow limit high on terminal 7, low on terminal 8
Communication	RS485 on terminals 1 and 3 · RS232 on terminal 2, optional
Field coil	Terminals 9 and 10
Electrode leads	Terminals 11 and 13 · ground wire on terminal 12
Display	LCD with backlight · volume flow in percent, velocity and totalized flow at the same time
Display rotation	Up to 90° on the one-piece version

DISPLAY

Reading	Percentage, actual flow rate and totalized flow
Backlight	Readable in direct sunlight and in a dark room



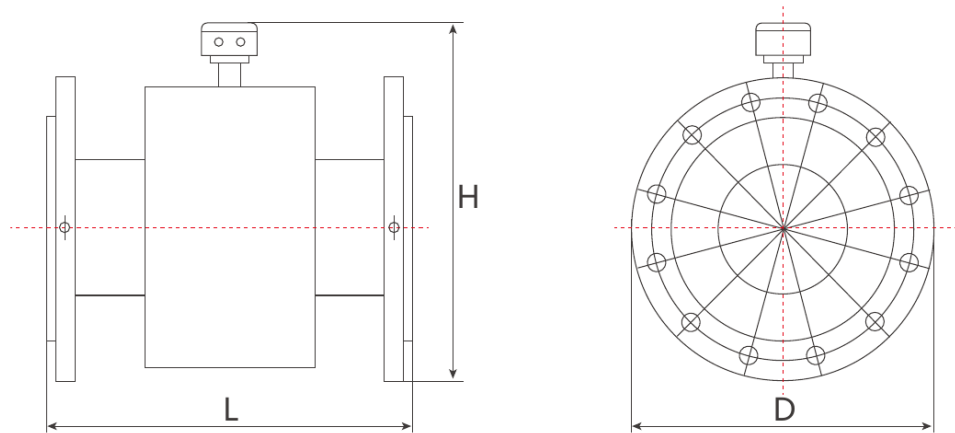
WIRING



The terminal strip. L2 and L1 carry the supply, the earth symbol the protective earth, COM and I+ the current output, COM and P+ the pulse output, AH and AL the two alarms; the three terminals at the bottom right are the communication interface.

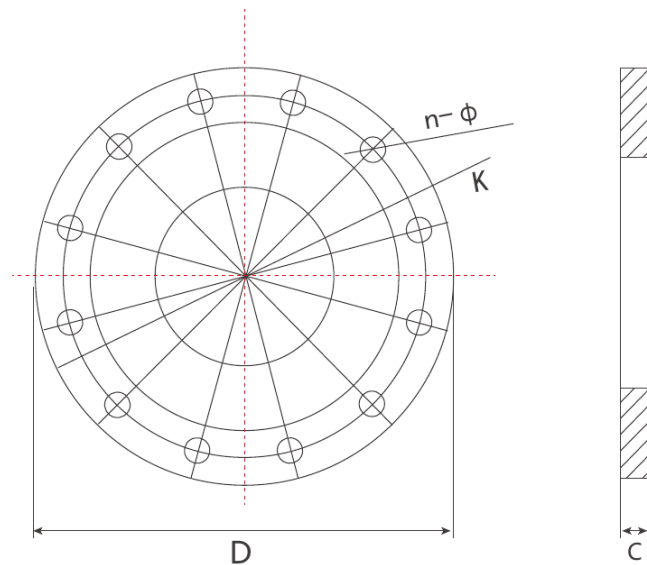


DIMENSIONS (mm)



DN150 - DN2000 Flanged sensor (flange diameter)

The flanged sensor: L is the face-to-face length, D the flange outer diameter and H the overall height.



The connection flange: D outer diameter, K bolt circle, n bolt holes of diameter $\emptyset$, C the flange thickness.



L is the face-to-face length and H the overall height with the converter on top. The pressure column follows the flange table below.

OVERALL DIMENSIONS (mm)

DN	PN (MPa)	Length L	H	Weight (kg)
6	4.0	200	220	6
10	4.0	200	220	6
15	4.0	200	220	8
20	4.0	200	220	10
25	4.0	200	223	12
32	4.0	200	240	13
40	4.0	200	250	14
50	4.0	200	263	15
65	1.6	250	283	18
80	1.6	250	290	20
100	1.6	250	318	25
125	1.6	250	350	28
150	1.6	300	380	30
200	1.6	350	430	50
250	1.6	450	495	70
300	1.0	500	547	95
350	1.0	550	602	120
400	1.0	600	665	140
450	1.0	600	720	160
500	1.0	600	783	200
600	1.0	600	897	280
700	1.0	700	982	350
800	1.0	800	1092	400
900	1.0	900	1192	480
1000	1.0	1000	1299	550
1200	0.6	1200	1488	660
1400	0.6	1400	1700	750
1600	0.6	1600	1924	850
1800	0.6	1800	2134	980
2000	0.6	2000	2344	1200
2200	0.6	2200	2549	1600
2400	0.6	2400	2754	2000
2600	0.6	2600	2964	2400
2800	0.6	2800	3169	2700
3000	0.6	3000	3369	2900



D is the flange outer diameter, K the bolt circle, Ø the bolt hole, n the number of bolts and C the flange thickness.

FLANGE DIMENSIONS (mm)

PN (MPa)	DN	D	K	Bolt Ø	n	C
4.0	6	90	60	14	4	14
4.0	10	90	60	14	4	14
4.0	15	95	65	14	4	16
4.0	20	105	75	14	4	16
4.0	25	115	85	14	4	16
4.0	32	135	100	18	4	18
4.0	40	145	110	18	4	18
4.0	50	160	125	18	4	20
1.6	65	180	145	18	4	24
1.6	80	195	160	18	8	24
1.6	100	215	180	18	8	26
1.6	125	245	210	18	8	28
1.6	150	280	240	23	8	28
1.6	200	335	295	23	12	30
1.6	250	405	355	25	12	32
1.0	300	440	400	23	12	28
1.0	350	500	460	23	16	28
1.0	400	565	515	25	16	30
1.0	450	615	565	25	20	30
1.0	500	670	620	25	20	32
1.0	600	780	725	30	20	36
1.0	700	895	840	30	24	36
1.0	800	1010	950	34	24	38
1.0	900	1110	1050	34	28	42
1.0	1000	1220	1160	34	28	44
0.6	1200	1400	1340	33	32	32
0.6	1400	1630	1560	36	36	32
0.6	1600	1830	1760	36	40	34
0.6	1800	2045	1970	39	44	36
0.6	2000	2265	2180	42	48	38
0.6	2200	2475	2390	42	52	42
0.6	2400	2685	2600	42	56	44
0.6	2600	2905	2810	48	60	46
0.6	2800	3115	3020	48	64	48
0.6	3000	3315	3220	48	68	50



The flow range in cubic metres per hour, one line per size.

FLOW RANGES (m³/h)

DN	Flow range (m ³ /h)	DN	Flow range (m ³ /h)	DN	Flow range (m ³ /h)
3	0.013 ... 0.127	100	14 ... 140	900	1145 ... 11450
6	0.051 ... 0.508	150	31 ... 310	1000	1413 ... 14130
8	0.09 ... 0.9	200	56 ... 560	1200	2035 ... 20350
10	0.14 ... 1.4	250	88 ... 880	1400	2770 ... 27700
15	0.31 ... 3.1	300	127 ... 1270	1600	3619 ... 36190
20	0.56 ... 5.6	350	173 ... 1730	1800	4580 ... 45800
25	0.88 ... 8.8	400	226 ... 2260	2000	5654 ... 56540
32	1.44 ... 14	450	286 ... 2860	2200	6842 ... 68420
40	2.2 ... 22	500	353 ... 3530	2400	8143 ... 81430
50	3.5 ... 35	600	508 ... 5080	2600	9556 ... 95560
65	5.9 ... 59	700	692 ... 6920	2800	11083 ... 110830
80	9.0 ... 90	800	904 ... 9040	3000	12723 ... 127230

The flow in cubic metres per hour at five velocities, DN10 to DN500.

FLOW AT FIVE VELOCITIES (m³/h)

DN	0.3 m/s	0.6 m/s	1 m/s	6 m/s	10 m/s
10	0.085	0.17	0.28	1.7	2.8
15	0.19	0.38	0.64	3.8	6.4
20	0.34	0.68	1.13	6.8	11.3
25	0.53	1.06	1.76	10.6	17.6
32	0.87	1.74	2.9	17.4	29
40	1.36	2.71	4.52	27.1	45.2
50	2.12	4.24	7.07	42.4	70.7
65	3.58	7.17	11.95	71.7	119.5
80	5.43	10.86	18.1	108.6	181
100	8.48	16.96	28.27	169.6	282.7
125	13.25	26.5	44.18	265	441.8
150	19.09	38.17	63.62	381.7	636.2
200	33.93	67.86	113.1	678.6	1131
250	53.01	106.03	176.71	1060.3	1767.1
300	76.34	152.68	254.47	1526.8	2544.7
350	103.9	207.82	346.36	2078.2	3463.6
400	135.72	271.43	452.39	2714.3	4523.9
450	171.77	343.53	572.56	3435.3	5725.6
500	212.06	424.12	706.86	4241.2	7068.6



COMPLIANCE AND CERTIFICATION

Protection grade	IP65 or IP68, chosen in the order code
Measuring principle	Electromagnetic induction
Accuracy	± 0.5 % of reading
Wetted materials	Five electrode materials and four linings are offered
Pressure rating	By size, see the flange table

Example: QMKA-050-S-CR-L-0-040-L-0-0-AC-5—.

ORDER CODE

Field	Code	Meaning
1 Series	QMKA	QMKA electromagnetic flowmeter
2 Size	003 ... 1000	Nominal size in mm, three or four digits
3 Electrode	S · HB · HC	Stainless steel · Hastelloy B · Hastelloy C
	Pt · Ti · Ta	Platinum · titanium · tantalum
4 Lining	CR · PU	Neoprene · polyurethane rubber
	PT · FE	PTFE · FEP
5 Shell	L · S	Carbon steel · stainless steel
6 Counter flange	0 · 1	Without · with
7 Pressure	040 · 016	4.0 MPa · 1.6 MPa
	010 · 006	1.0 MPa · 0.6 MPa
	0025	0.25 MPa
8 Temperature	L · H	≤ 70 °C · ≤ 120 °C
9 Ground ring	0 · 1	Without · standard ground ring
10 Communication	0 · 1	Without · RS485
11 Supply	AC · DC	220 Vac · 24 Vdc
12 Protection	5 · 8	IP65 · IP68
13 Converter	— · F	One-piece · split

