

ELECTROMAGNETIC FLOWMETER DN10 ... DN1200



- FARADAY · COMPACT OR REMOTE CONVERTER · 0 ... 10 M/S
- SIX ELECTRODE MATERIALS · 1.0 ... 4.0 MPa
- 4 ... 20 MA · PULSE · RS485 · MODBUS · HART · IP65 OR IP68

KEY DATA

Property	Value	Property	Value
Nominal size	DN10 ... DN1200	Media	Conductive liquids > 30 $\mu\text{S/cm}$ in practice
Velocity	0 ... 10 m/s	Accuracy	$\pm 0.5 \% \text{ R} \cdot \pm 1 \% \text{ R}$ below DN20
Nominal pressure	1.0 · 1.6 · 2.5 · 4.0 MPa	Protection grade	IP65 compact · IP65 or IP68 remote
Medium temperature	$\leq 250 \text{ }^{\circ}\text{C}$, by lining	Ambient temperature	-10 ... +55 $^{\circ}\text{C}$ · -30 ... +55 $^{\circ}\text{C}$ with OLED
Output	4 ... 20 mA · pulse to 5 kHz · RS485 · HART	Supply voltage	100 ... 240 Vac 50/60 Hz or 24 Vdc $\pm 10 \%$

An electromagnetic meter to JB/T 9248-2015. The converter sits either on the sensor (compact) or up to 300 m away (remote).



MEASUREMENT

Standard	JB/T 9248-2015
Measuring principle	Faraday's law of induction
Nominal size	DN10 ... DN1200
Velocity	0 ... 10 m/s
Accuracy	± 0.5 % of reading · ± 1 % of reading below DN20
Conductivity	25 µS/cm in theory, more than 30 µS/cm in practice
Nominal pressure	1.0 · 1.6 · 2.5 · 4.0 MPa
Electrodes	Standard or plug-in · three or four, by size
Straight pipe	5 D before and 3 D after the sensor · 10 D before a valve

MATERIALS AND PROCESS

Electrode	316L · Hastelloy C · Hastelloy B · titanium · tantalum · platinum
Lining	Neoprene 0 ... 80 °C · PTFE 0 ... 120 °C · FEP 0 ... 120 °C
	PFA -10 ... 180 °C · silicone fluoro rubber 70 ... 250 °C · PU -20 ... 60 °C
Shell and flange	Carbon steel as standard · stainless steel to order · flange to GB 9119
Ground ring	Stainless steel · 1Cr18Ni9Ti (SUS321) for DN15 ... DN450

ELECTRICAL PROPERTIES

Supply voltage	110/220 Vac (100 ... 240 Vac), 50/60 Hz · 24 Vdc ± 10 %
Consumption	≤ 15 VA
Output	4 ... 20 mA · pulse or frequency 2 kHz by default, 5 kHz maximum
Communication	RS485 with Modbus RTU · HART · GPRS
Display	LCD as standard · OLED to order
Keys	Mechanical as standard · infrared touch keys on the compact version
Ambient temperature	-10 ... +55 °C with LCD · -30 ... +55 °C with OLED
Cable entry	M20 × 1.5 · nylon gland standard, metal gland optional
Protection grade	Compact IP65 · remote IP65 or IP68

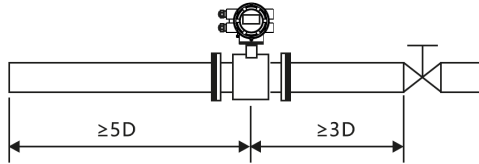
CONVERTER

Converter, compact	Sits on the sensor
Converter, remote	Two versions, wall mounted
Cable	10 m standard, 15, 20, 25 or 30 m in the order code, up to 300 m on request

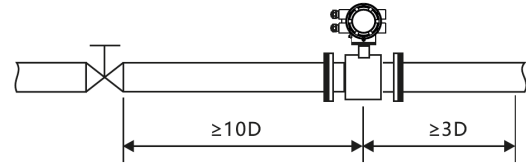


INSTALLATION

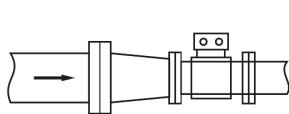
Straight pipe length requirements



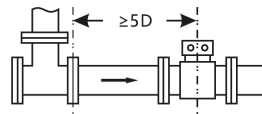
Valve is installed downstream of the sensor



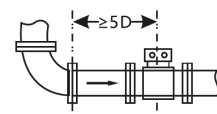
Valve is installed upstream of the sensor



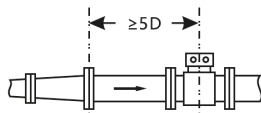
A tapered tube can be considered a straight tube



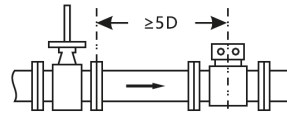
Tee joint



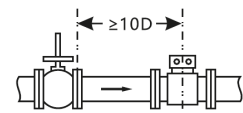
90°elbow



Expansion tube



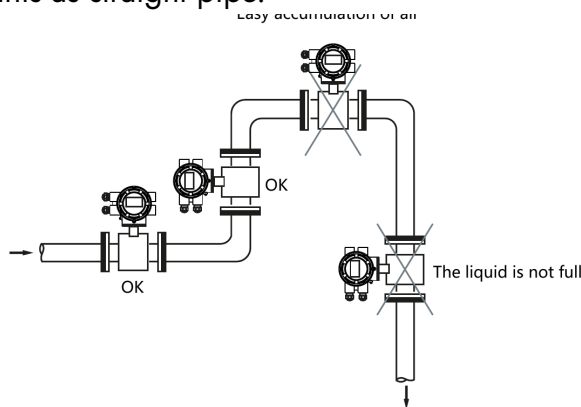
Full open gate valve



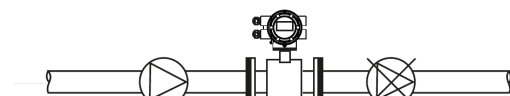
Various Kinds of Valves

Recommended installation location

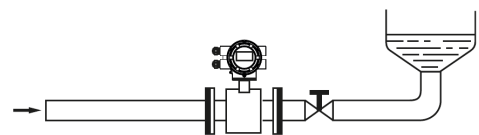
Straight pipe: five diameters before and three after the sensor, ten before if a valve sits upstream.
A cone counts as straight pipe.



The sensor is lower than the installation of the pipe

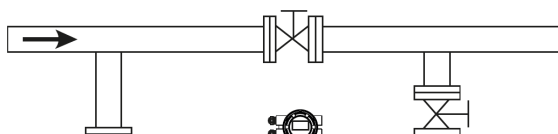


No electromagnetic flowmeter can be installed on the suction side of the pump to prevent negative pressure generated by vacuum



Downstream of the sensor there is back pressure installation

Easy to clean pipe connections



If the pipeline to be cleaned cannot be stopped, the side channel must be installed. To keep the system running while the equipment is being cleaned.

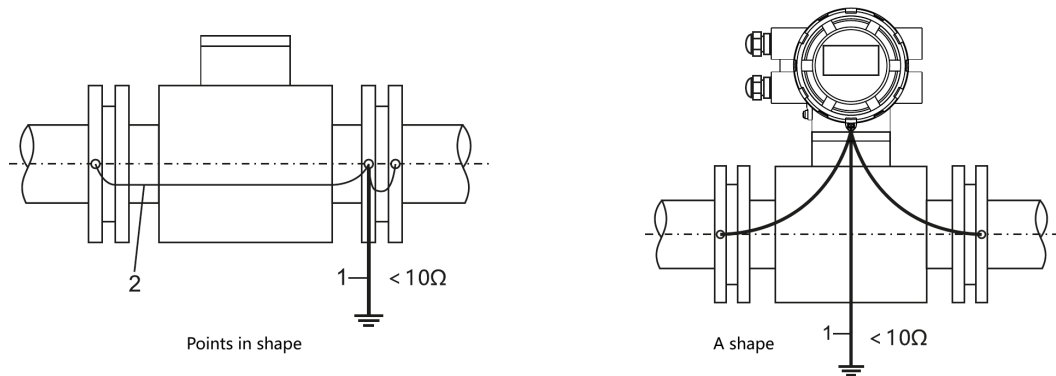
Where the sensor may sit. The tube has to run full: never at a high point where air collects, never on the suction side of a pump, and with back pressure downstream where the line discharges freely.



GROUNDING AND DIMENSIONS

The sensor of electromagnetic flowmeter should be well connected and the measuring accuracy of the flowmeter depends on the grounding effect of the sensor to a considerable extent. The grounding of the sensor under different installation conditions

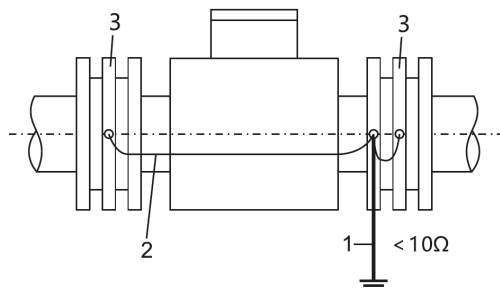
1. The sensor is grounded on the metal pipe



Grounding on a metal pipe, compact and remote version. 2.5 mm² copper wire.

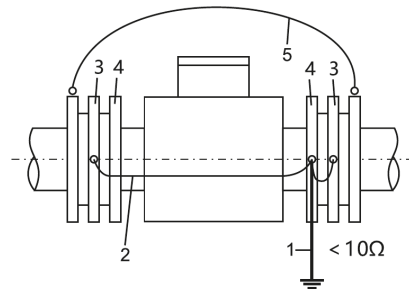
1- measure grounding, 2- ground conductor
Note: 2.5mm copper wire is used for connection

2. Grounding of sensor mounted on insulated pipe



1- measure grounding; 2- ground conductor 3-Ground loop
Note: 2.5mm² copper wire is used for connection

3. Grounding of the sensor installed on the cathodic protection



1- measure grounding; 2- ground conductor 3-Ground loop
4- bolts (insulated); 5 - cable
Note: 2.5mm² copper wire is used for connection

4. The sensor is installed in the place where the stray current in the pipeline is very strong

Grounding on an insulated pipe, on a pipe with cathodic protection and in a place with strong stray currents. The last case needs 16 mm² copper wire and an insulating section on both sides.



L is the face-to-face length, W the width over the flanges and H the overall height. The compact version carries the converter on the sensor and is therefore taller; the remote version has it on the wall.

OVERALL DIMENSIONS (mm)

DN	L	W	H compact	kg compact	H remote	kg remote
10	200	90	290	6	195	5.5
15	200	95	315	6	220	5.5
20	200	105	315	6.5	220	6
25	200	115	315	6.8	220	6.3
32	200	140	315	7.1	220	6.6
40	200	150	315	7.6	220	7.1
50	200	165	320	9.9	225	9.4
65	200	185	350	10.6	255	10.1
80	200	200	365	12.3	275	11.8
100	250	220	380	14.7	285	14.2
125	250	250	410	17.9	315	17.4
150	300	285	440	24.6	345	24.1
200	350	340	495	32.7	400	32.2
250	450	395	560	43.5	465	43
300	500	445	600	58	505	58
350	550	505	670	78	575	78
400	600	565	720	97	625	97
450	600	615	765	110	670	112
500	600	670	820	122	725	122
600	600	780	930	161	835	161
700	700	860	1010	241	915	241
800	800	975	1110	420	1015	420
900	900	1075	1210	541	1115	541
1000	1000	1175	1310	668	1215	668
1200	1200	1405	1540	858	1445	858

Q100 % in cubic metres per hour at four velocities: 0.3 m/s is the minimum, 1 and 3 m/s the commonly used range, 7 m/s the maximum. Conversion: $v = 354 \times q_v / D^2$ with q_v in m³/h, v in m/s and D in mm.

FLOW AT FOUR VELOCITIES (m³/h)

DN	0.3 m/s (minimum)	1 m/s (common)	3 m/s	7 m/s (maximum)
10	0.08	0.28	0.85	1.96
20	0.34	1.13	3.39	7.91
25	0.53	1.77	5.3	12.39
32	0.87	2.9	8.69	20.27
40	1.36	4.52	13.57	31.67
50	2.12	7.07	21.21	49.48
65	3.58	11.95	35.84	83.62



FLOW AT FOUR VELOCITIES (m³/h) · CONTINUED

DN	0.3 m/s (minimum)	1 m/s (common)	3 m/s	7 m/s (maximum)
80	5.43	18.1	54.29	126.67
100	8.48	28.27	84.82	197.92
125	13.25	44.18	132.54	309.25
150	19.09	63.62	190.85	445.32
200	33.93	113.1	339.3	791.7
250	53.01	176.71	530.13	1236.97
300	76.34	254.47	763.41	1781.29
350	103.91	346.36	1039.08	2424.52
400	135.72	452.39	1357.17	3166.73
500	212.06	706.86	2120.58	4948.02
600	305.37	1017.9	3053.7	7125.3
700	415.62	1385.4	4156.2	9697.8
800	542.88	1809.6	5428.8	12667.2
900	687.06	2290.2	6870.6	16031.4
1000	848.22	2827.4	8482.2	19791.8

The same 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

Standard	JB/T 9248-2015
Protection grade	IP65 on the compact version, IP65 or IP68 on the remote one
Measuring principle	Electromagnetic induction
Accuracy	± 0.5 % of reading, ± 1 % below DN20
Wetted materials	Six electrode materials and six linings
Pressure rating	1.0 ... 4.0 MPa

Example: QMKB-010-F-50-S-F1-A1-C-P0-----.

ORDER CODE

Field	Code	Meaning
1 Series	QMKB	QMKB electromagnetic flowmeter
2 Pressure	010 · 016	1.0 MPa · 1.6 MPa
	025 · 040	2.5 MPa · 4.0 MPa
3 Mounting	F	Flange to GB/T 9119-2000, carbon steel
4 Size	10 ... 1200	Nominal size in mm, see the flow tables
5 Electrode	S · HC · HB	316L · Hastelloy C · Hastelloy B
	Ti · Ta · Pt	Titanium · tantalum · platinum
6 Lining	F1 · F2	Neoprene (CR) · silicone fluoro rubber (FVMQ)
	F3 · F4	FEP F46
	F5 · F6	Steel-mesh reinforced PFA · PTFE F4
7 Temperature	A1 · A2 · A3	≤ 80 °C · ≤ 120 °C · ≤ 250 °C
8 Structure	C	Compact
	S10 ... S30	Remote, cable 10, 15, 20, 25 or 30 m
9 Supply	P0 · P1	110/220 Vac · 24 Vdc
10 Output	— · A	None · 4 ... 20 mA
	AH · RS	4 ... 20 mA with HART · RS485
	F1 · KB1 · KD1	Pulse or frequency · infrared touch keys · OLED display
11 Ex	— · E	No explosion protection · explosion-proof

The electromagnetic heat meter uses the same sensor and the same two converters as the flowmeter above and adds two Pt1000 sensors for the flow and the return temperature. It measures heat, not flow, and has its own order code and its own accuracy class.

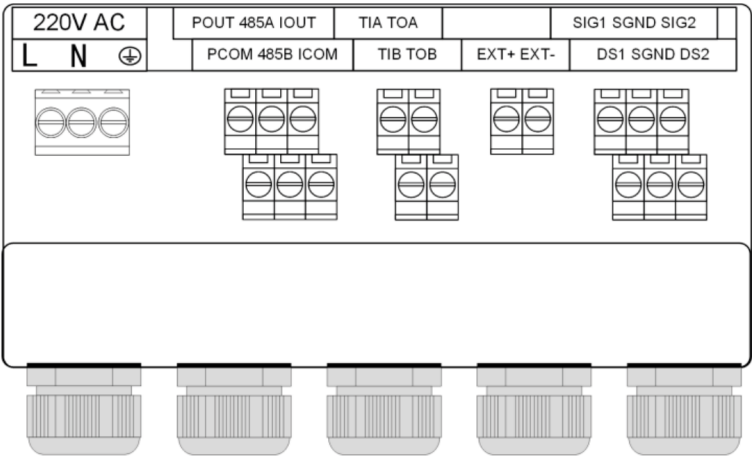
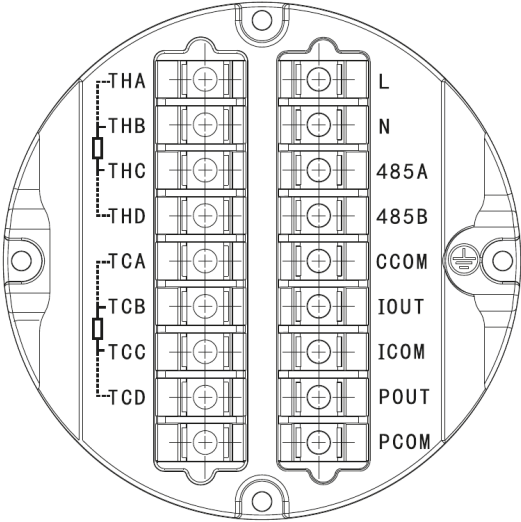
HEAT METER

Property	Value
Product	Electromagnetic heat meter for heating and cooling energy metering
Supply voltage	220 Vac / 24 Vdc
Communication	RS485 · Modbus RTU and BACnet · up to 400 m



HEAT METER · CONTINUED

Property	Value
Accuracy class	Class 2
Temperature sensor	Pt1000, two of them — flow and return
Temperature accuracy	± 0.1 °C
Medium temperature	2 ... 180 °C
Temperature difference	2 K ... 80 K
Data storage	18 months of history
Mounting	Flow or return pipe, both possible
Ambient temperature	-10 ... +55 °C
Protection grade	IP65
Accessories	Pt1000 sensor, pocket and welding base
Order code	Size, converter form (compact or remote), 220 Vac or 24 Vdc, and one of 4 ... 20 mA, RS485, pulse or infrared touch keys



The terminals of the heat meter, remote version above and compact below, with the two Pt1000 pairs for flow and return temperature.

