

HYDRAMAG

Electromagnetic BTU Meter

Revolutionizing Flow



The Hydramag Electromagnetic BTU meters are solely suitable for measuring energy of electrically conductive liquids with a minimum conductivity of 20 $\mu\text{S}/\text{cm}$.

350° SWIVEL
DISPLAY



VARIOUS
COMMUNICATION
OPTIONS



IP68 PROTECTION



WIDE CHOICE OF
LINING &
ELECTRODES



FEATURES

TECHNICAL DATA

Power	230 VAC (50/60 Hz), 24 VAC/VDC with polarity reversal protection
Input power	9.6 VA
Type of electronics	Meter mount (H – standard), Remote mount (F)
Design	Compact (Tmax 90 °C), Separated (standard cable length 3 m)
Diameter nominal	DN 10...600 (other DN upon agreement with the manufacturer)
Lining material	Rubber (hard, soft, with potable water test certificate): DN 25...DN 400 (Tmin 0 °C , Tmax 70 °C) PTFE: DN 15...DN 80 (Tmin –25 °C , Tmax 150 °C for separate version) PFA: (upon agreement with the manufacturer) (Tmin –25 °C , Tmax 170 °C) ETFE: DN 100...DN 600 (Tmin –25 °C , Tmax 150 °C)
Electrode material	CrNi ocel DIN 1.4571, Hastelloy C4, Titanium, Tantal
Frame	All-welded
Sensor material	Flanged– stainless steel and structural steel with polyurethane coating Wayfair, Threaded, Food grade – stainless steel
Process connections	Flanged DIN (EN1092) Threaded (EN 10226-1) Clamp/Food Threaded (DIN 32676/DIN 11851)
Pressure	PN10– PN40
Min. conductivity of the measured fluid	20 µS/cm (at a lower conductivity, upon agreement with the manufacturer)
Flow meter measuring range (qi/q_s)	1/25, 1/50, 1/100
Flow meter accuracy	up to 0.5 % (pro 0.1...10m/s)
Repeatability	up to 0.2 % (pro 0.1...10m/s)
Pressure loss	Negligible
Additional electrodes	Grounding and detection electrodes for empty piping (DN 10...DN 600)
Empty piping detection	DN 10...DN 600
Display unit	LCD 2×16 characters, backlit
Controls	2× external button (viewing values) 3× internal button (viewing + parameter changing)
Outputs	2x Impulse/flow switch (max. 400 Hz), 4...20 mA, Interface RS485, M-Bus
Max. ambient temperature	5-55 °C
Flow sensor degree of protection	IP65, IP67, IP68
Electronics degree of protection	Meter mount (H – head) , Remote mount (F) -IP67

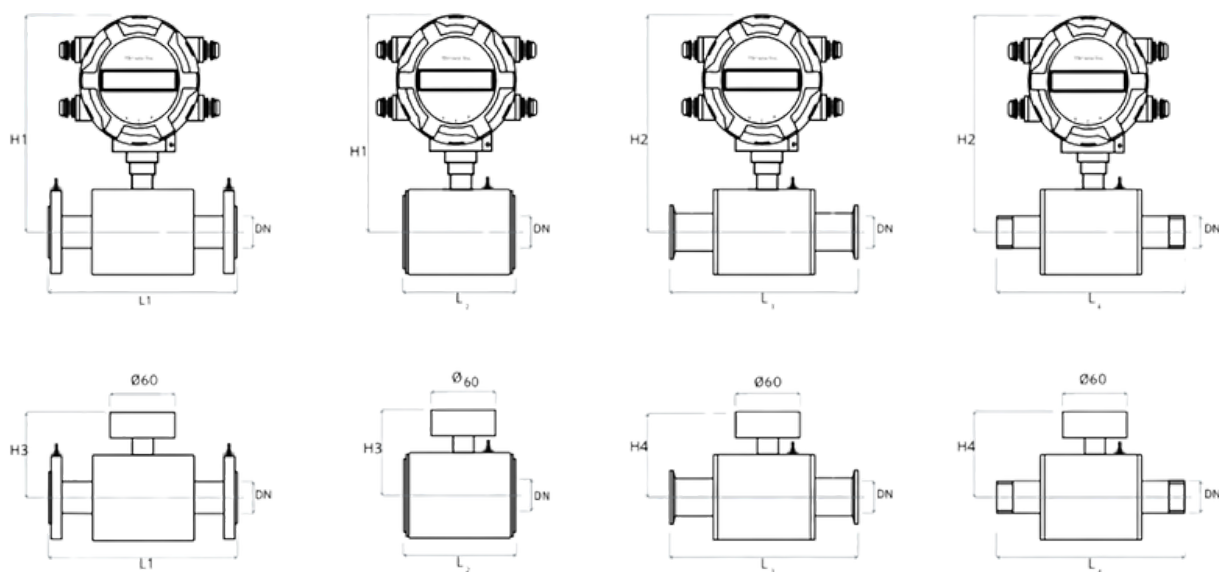
FLOW RANGES					
Diameter (DN) mm	1/60 (m3/h) L1	1/100 (m3/h) L2	1/200 (m3/h) L3	Qp (m3/h)	Qs (m3/h)
DN 10	0.06	0.034	-	1.7	3.4
DN 15	0.13	0.076	0.038	3.8	7.6
DN 20	0.24	0.142	0.071	7.1	14.2
DN 25	0.35	0.21	0.105	10.5	21
DN 32	0.6	0.34	0.17	17	34
DN 40	0.9	0.54	0.27	27	54
DN 50	1.4	0.84	0.42	42	84
DN 65	2.4	1.44	0.72	72	144
DN 80	3.6	2.2	1.1	110	220
DN 100	5.6	3.4	1.7	170	340
DN 125	8.9	5.34	2.67	267	534
DN 150	13	7.6	3.8	380	760
DN 200	23	13.5	6.75	675	1350
DN 250	35	21.1	-	1057.5	2115
DN 300	51	30	-	1525	3050
DN 350	70	41	-	2075	4150
DN 400	90	54	-	2713	5426
DN 500	141	-	-	4240	8480
DN 600	203	-	-	6100	12200

Note:
 qi –minimal flow
 qp –nominal flow
 qs –maximum flow

DIMENSIONS

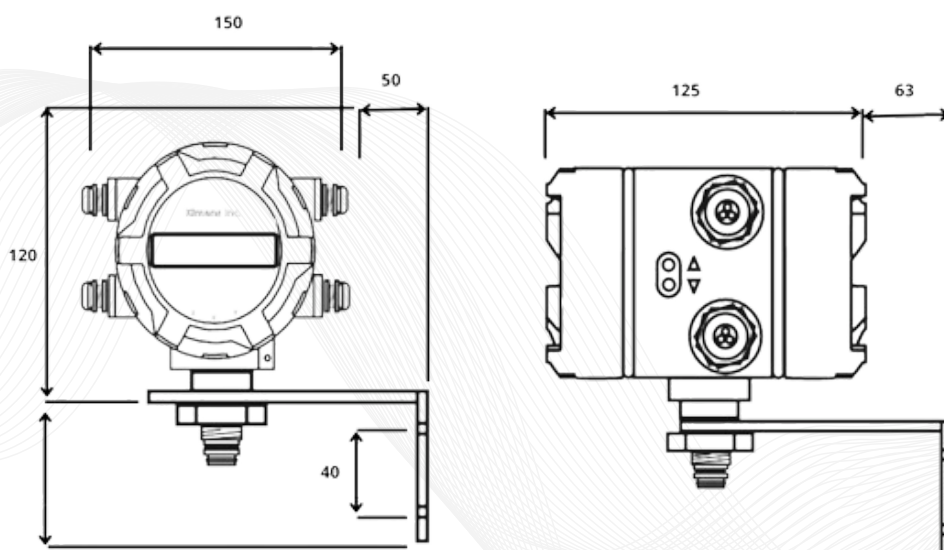
Connection (mm)	Constructional length (mm)				Total height in (mm)			
					Compact design		Separated design	
	Flanged	Wafer	Clamp Food thread	Threaded connection	Flanged	Threaded	Flanged	Threaded
DN	L1	L2	L3	L4	H1	H2	H3	H4
DN 10	200	90	180	190 (3/8")	173	177	86	90
DN 15	200	90	180	190 (1/2")	173	177	86	90
DN 20	200	90	180	200 (3/4")	173	182	86	95
DN 25	200	90	180	200 (1")	178	187	91	100
DN 32	200	90	190	230 (1 1/4")	183	192	96	105
DN 40	200	110	210	245 (1 1/2")	188	200	101	113
DN 50	200	110	230	254 (2")	196	210	109	123
DN 65	200	130	275	-	206	-	119	-
DN 80	200	130	285	-	213	-	126	-
DN 100	250	200	300	-	226	-	139	-
DN 125	250	200	-	-	239	-	152	-
DN 150	300	200	-	-	254	-	167	-
DN 200	350	200	-	-	284	-	197	-
DN 250	450	-	-	-	327	-	240	-
DN 300	500	-	-	-	352	-	265	-
DN 350	550	-	-	-	382	-	295	-
DN 400	600	-	-	-	412	-	325	-
DN 500	600	-	-	-	892	-	797	-
DN 600	600	-	-	-	1025	-	930	-

DIMENSIONS

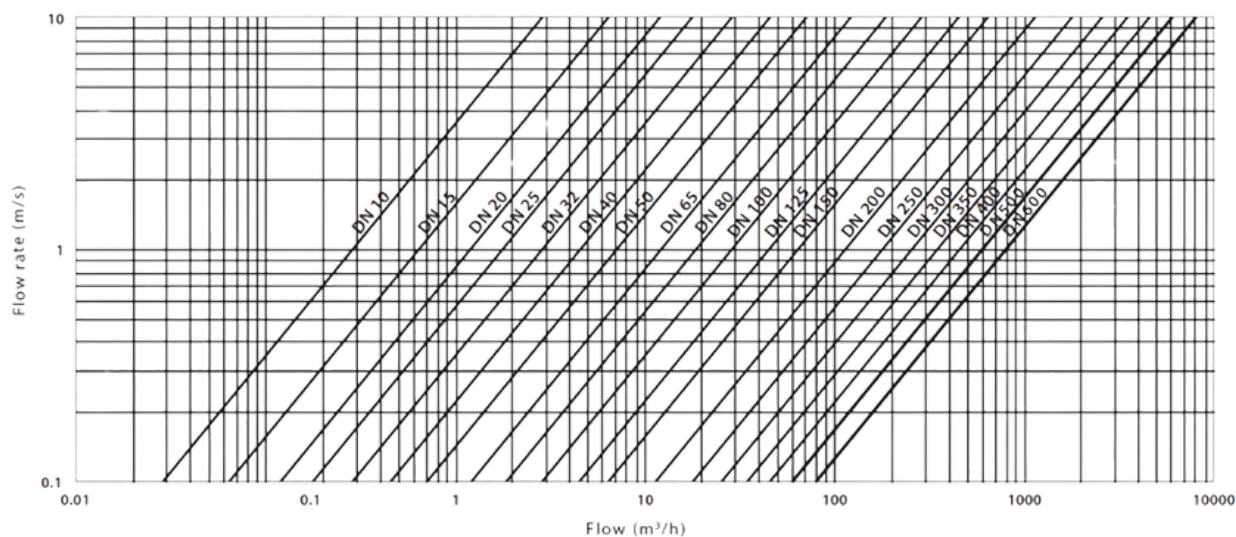


ELECTRONICS

METER/REMOTE MOUNT

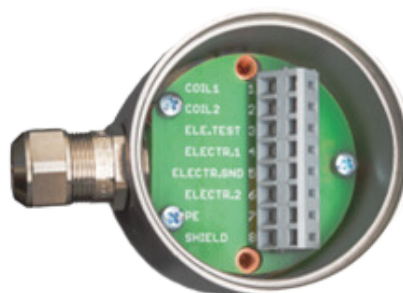


VOLUMETRIC FLOW vs INSTANTANEOUS FLOW RATE DIAGRAM



FLOW SENSOR TERMINAL BOARD CONNECTION FORM SEPARATED VERSION

- Terminal 1—Coil 1 (black)
- Terminal 2—Coil 2 (white)
- Terminal 3—Shading (not connected)
- Terminal 4—Electrode 1 (red)
- Terminal 5—Electrode GDN (shading of violet)
- Terminal 6—Electrode 2 (blue)
- Terminal 7—PE (shading red-blue-white and black)
- Terminal 8—Electrode TEST (violet)



EVALUATION UNIT TERMINAL BOARD ELECTRICAL CONNECTION

Terminal No. 1,5—temperature sensor THIGH (red wires)
Terminal No. 2,6—temperature sensor THIGH (white wires)
Terminal No. 3,7—temperature sensor TLOW (red wires)
Terminal No. 4,8—temperature sensor TLOW (white wires)
Terminal No. 90—current output 4-20mA (+)
Terminal No. 91—current output 4-20mA (-)
Terminal No. 50— (C) Out1— Imp/Flow Switch
Terminal No. 51— (E) Out1— Imp/Flow Switch
Terminal No. 20— (A) RS485 communication
Terminal No. 21— (B) RS485 communication
Terminal No. 52— (E) Out2— Imp/Flow Switch/Status/Error
Terminal No. 53— (C) Out2— Imp/Flow Switch/Status/Error
Terminal No. 54, 55— external button-resetting the user energy register Enull
Terminal No. 56— GND for output voltage 16v/100mA
Terminal No. 57— Output voltage 16v/100mA (power supply for changing to active current and impulse outputs)
Terminals L,N,PE—Supply voltage 230VAC (Install as an independent supply circuit with its own protection 0.5-1A)



HYDRAMAG / DN XXX / A X dk / B X / C X / D X / E X F X / G X / H X / I X / J X / K X / L X / M X / N X									
DN(Diameter nominal)									
10-600 DN									
A (construction)									
compact A1									
separated(cable length 3-30m, Tmax 150 °C) A2									
separated(cable length 3-30m, Tmax 80 °C) A3									
B (connection)									
Flanged B1 clamp B5									
Wafer B2 (Flanged SS304) B6									
Threaded B3 (Flanged SS316) B7									
Dairy Fittings B4									
C (Pressure)									
PN10(DIN) C1 PN64(DIN) C5 40K(JIS) C9									
PN16(DIN) C2 PN100(DIN) C6 150lb(ANSI) C10									
PN25(DIN) C3 10K(JIS) C7 300lb(ANSI) C11									
PN40(DIN) C4 20K(JIS) C8									
D (Lining)									
(hard rubber) D1 (PTFE) D4 (PVDF) D8									
rubber with D3 (PFA) D5 (RILSAN) D9									
certificate for drinking water (ceramic*) D6 (ETFE) D7									
E (electrodes)									
stainless steel 316 Ti E1 titian E3									
hastelloy C4 E2 tanta E4									
F (IP code)									
IP65 F1									
IP67 F2									
IP68 F3									
G (outputs)									
G1 Impulse/switch (monitor)									
G2 imp./sw. + 4-20mA									
G3 imp./sw.+RS485									
G4 imp./sw.+4-20mA, +RS485 optional M-Bus/MOD-BUS RTU									
H (power)									
H1 110-230VAC									
H2 24V AC/DC									
I (measuring range qi/qs)									
I1 1/60									
I2 1/100									
I3 1/200									
J (thermowells)									
J1 36mm J4 136mm									
J2 86mm J5 176mm									
J3 100mm									
K (welded on pieces)									
K1 NO K2 YES									
L (thermometer cable length PT500)									
L14m L4 10m									
L26m L5 12m									
L38m L6 15m									
M (min. temperature differences)									
M1 dT= 3°C									
M2 dT= 2°C									
N (location of meter)									
N1 return pipe									
N2 supply pipe									

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