

# CALOR 38 MID

## Certified induction heat meter Calor 38 MID

is designed for invoicing measurement of water supplied heat. Commonly used in transfer stations, industrial or residential buildings, various technological processes and operations.

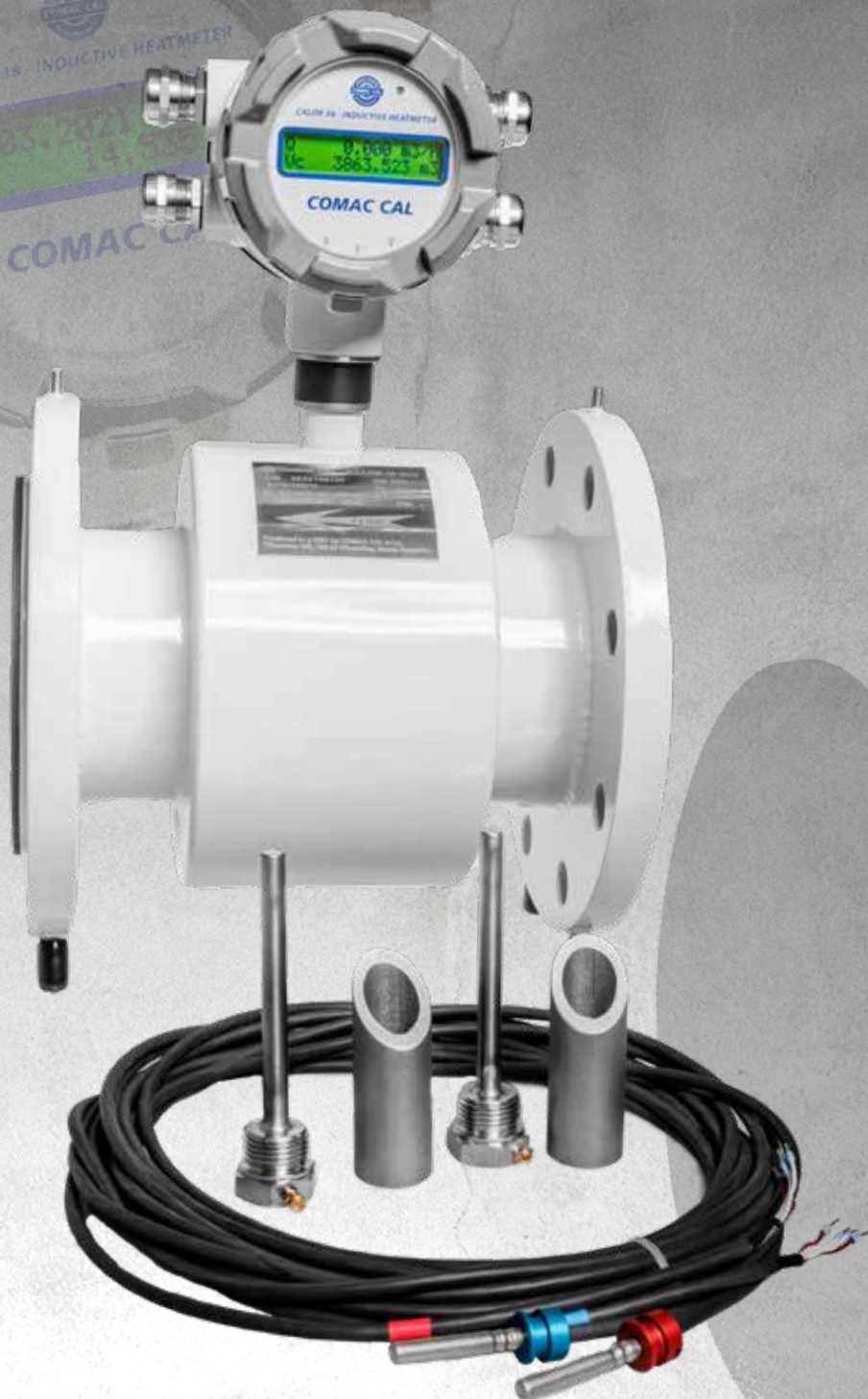
It stands out for its high accuracy and stability of metrological parameters.

The meter communicates via the RS485 interface with M-BUS and MODBUS protocols. Backlit display shows the supplied energy, real-time flow rate, thermal power and temperatures, flow volume, date, time and in case of failure its description.

Daily energy counter values are stored in the archive (up to 176 records), that is accessible through communication interface.

### MAIN BENEFITS

- Operating temperature up to **170 °C**
- Pressure rating up to **PN40**
- Guaranteed measurement accuracy over the entire range
- Certified for invoicing purposes
- Long-term stability of metrological parameters
- Remote or local reading
- No moving parts
- No pressure loss



**COMAC CAL**

## TECHNICAL DATA

Power	230V AC ( 50-60 HZ)
Input power	9,6 VA
Type of electronics	H – head
Design	compact ( $T_{max} = 90\text{ }^{\circ}\text{C}$ ), separated (standard cable length 3 m)
Diameter nominal	DN 10 až DN 400
Material výstelek (maximální teplota výstelky)	PTFE: DN 15 to DN 80 ( $T_{max} = 120\text{ }^{\circ}\text{C}$ for separated version) ETFE: DN 100 to DN 400 ( $T_{max} = 120\text{ }^{\circ}\text{C}$ ), PFA PFA: DN 10 to DN 300 ( $T_{max} = 170\text{ }^{\circ}\text{C}$ )
Electrode material	Steel 316 Ti, Hastelloy C4, Titan, Tantal
Frame	All-welded
Sensor material	Flanged– stainless steel and structural steel with polyurethane coating
Process connections	Flanged (EN1092)
Pressure	PN10 - PN40
Min. conductivity of the measured fluid	20 $\mu\text{S/cm}$ (at a lower conductivity, upon agreement with the manufacturer)
Accuracy	Accuracy class 2 (EN 1434)
Flow meter measuring range ( $q_i, q_p$ )	1/25, 1/50, 1/100
Repeatability	up to 0,2% (pro 0,1- 10 m/s)
Pressure loss	< 0,1 bar
Additional electrodes	Grounding and detection electrodes for empty piping (DN 10 až DN 400)
Empty piping detection	DN 10÷DN 400
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, (Impulse and current outputs are passive with a possibility of being powered from internal power supply of the meter)
	Interface RS485 (protocols M-BUS/MODBUS)
Max. ambient temperature	5 to 55 $^{\circ}\text{C}$
Flow sensor degree of protection	IP65

## DISPLAY UNIT OPERATION



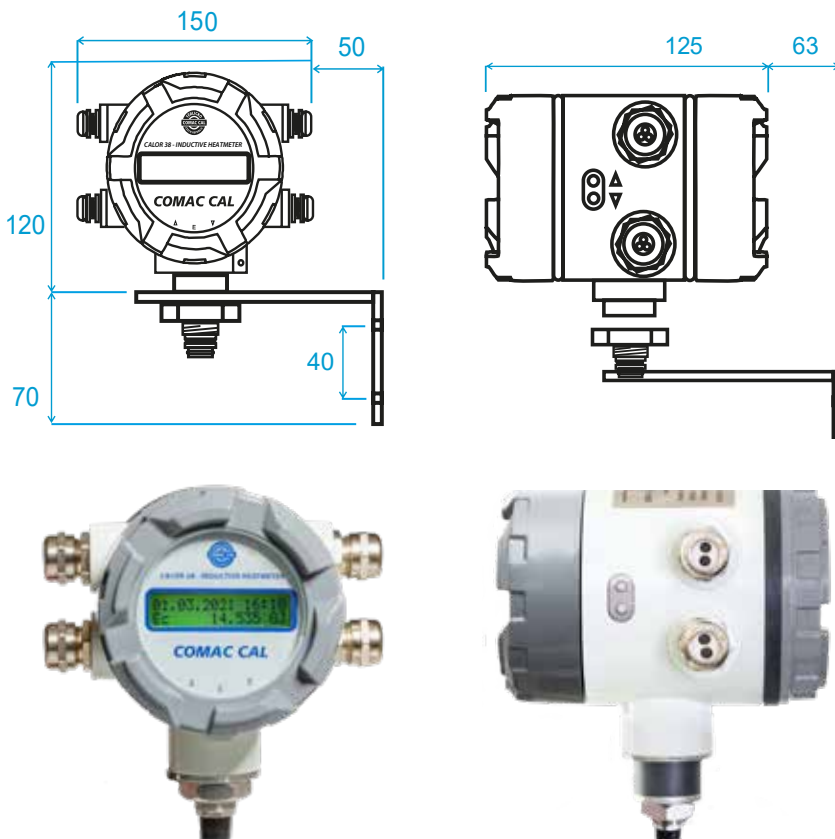
The device is equipped with two external buttons on the side of the electronics case, allowing to scroll through the individual screens and three internal buttons hidden under the front cover.

After removing the cover, these buttons can be used to change settings or the displayed parameters.

For more convenient reading the transmitter head can be rotated by 350  $^{\circ}$ .

## ELECTRONICS

### DISPLAY UNIT



## FLOW RANGES

Instantaneous flow rate corresponding to flow velocity

DN [mm]	$q_i$ [1/100] [m <sup>3</sup> /h] (18)	$q_i$ [1/50] [m <sup>3</sup> /h] (17)	$q_i$ [1/25] [m <sup>3</sup> /h] (16)	$q_p$ [m <sup>3</sup> /h]	$q_s$ [m <sup>3</sup> /h]
DN 10	0,017	0,034	0,068	1,70	3,40
DN 15	0,038	0,076	0,152	3,80	7,60
DN 20	0,071	0,142	0,284	7,10	14,20
DN 25	0,105	0,21	0,42	10,50	21
DN 32	0,17	0,34	0,68	17	34
DN 40	0,27	0,54	1,08	27	54
DN 50	0,42	0,84	1,68	42	84
DN 65	0,72	1,44	2,88	72	144
DN 80	1,10	2,20	4,40	110	220
DN 100	1,70	3,40	6,80	170	340
DN 125	2,67	5,34	10,68	267	534
DN 150	3,80	7,60	15,20	380	760
DN 200	6,75	13	27	675	1350
DN 250	-	20	40	1000	2000
DN 300	-	30	60	1500	2000
DN 350	-	-	60	1500	2000
DN 400	-	-	60	1500	2000

Note:  
 $q_i$  - minimal flow  
 $q_p$  - nominal flow  
 $q_s$  - maximal flow

# CALOR 38 MID

## POSSIBILITIES OF OUTPUT CONFIGURATIONS

### OUT1 (IMPULSE)

**E<sub>c</sub>** = Energy

**+V** - Volume pulses in the positive flow direction

**ΣV** - Volume pulses in both flow directions

**-V** - Volume pulses in the opposite flow direction

### OUT1 (STATUS)

**+Q** - Flow switch in the positive flow direction

**ΣQ** - Flow switch in both flow directions

**-Q** - Flow switch in the opposite flow direction

### OUT2 (IMPULSE)

**+V** - Volume pulses in the positive flow direction

**ΣV** - Volume pulses in both flow directions

**-V** - Volume pulses in the opposite flow direction

### OUT2 (STATUS)

**+Q** - Flow switch in the positive flow direction

**ΣQ** - Flow switch in both flow directions

**-Q** - Flow switch in the opposite flow direction

Error

### CURRENT OUTPUT (4-20MA)

**P** - Power

**±Q** - Both flow directions

**+Q** - Positive flow direction

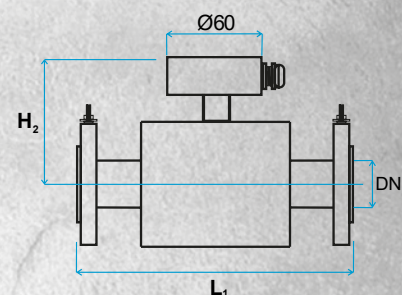
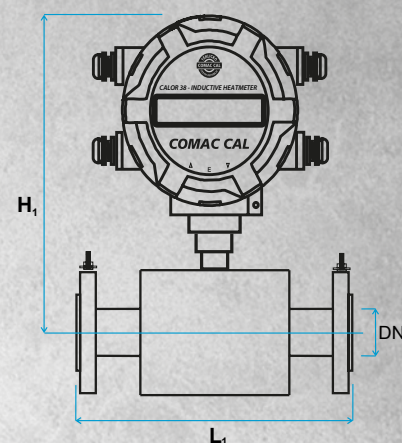
**ΣQ** - Both flow directions ( abs (Q) )

**-Q** - Opposite flow direction

## DIMENSIONAL TABLE

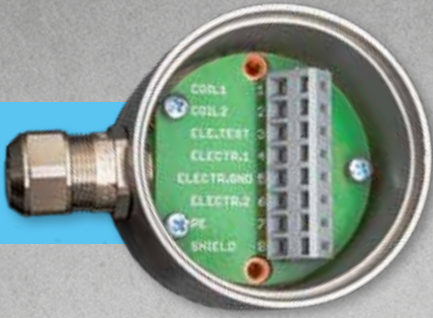
Connection	Constructional length [mm]	Total height of [mm]	
		Compact design	Separated design
	Flanged	Flanged	Flanged
DN	L1	H1	H2
10	200	173	86
15	200	173	86
20	200	173	86
25	200	178	91
32	200	183	96
40	200	188	101
50	200	196	109
65	200	206	119
80	200	213	126
100	250	226	139
125	250	239	152
150	300	254	167
200	350	284	197
250	450	327/-	240/-
300	500	352/-	265/-
350	550	382/-	295/-
400	600	412/-	325/-

FLANGED (EN 1092)



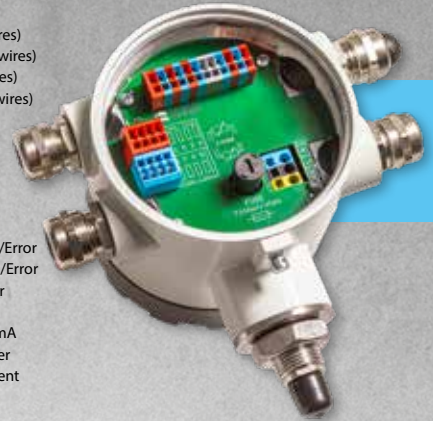
## FLOW SENSOR TERMINAL BOARD CONNECTION FOR SEPARATED VERSION

## EVALUATION UNIT TERMINAL BOARD ELECTRICAL CONNECTION



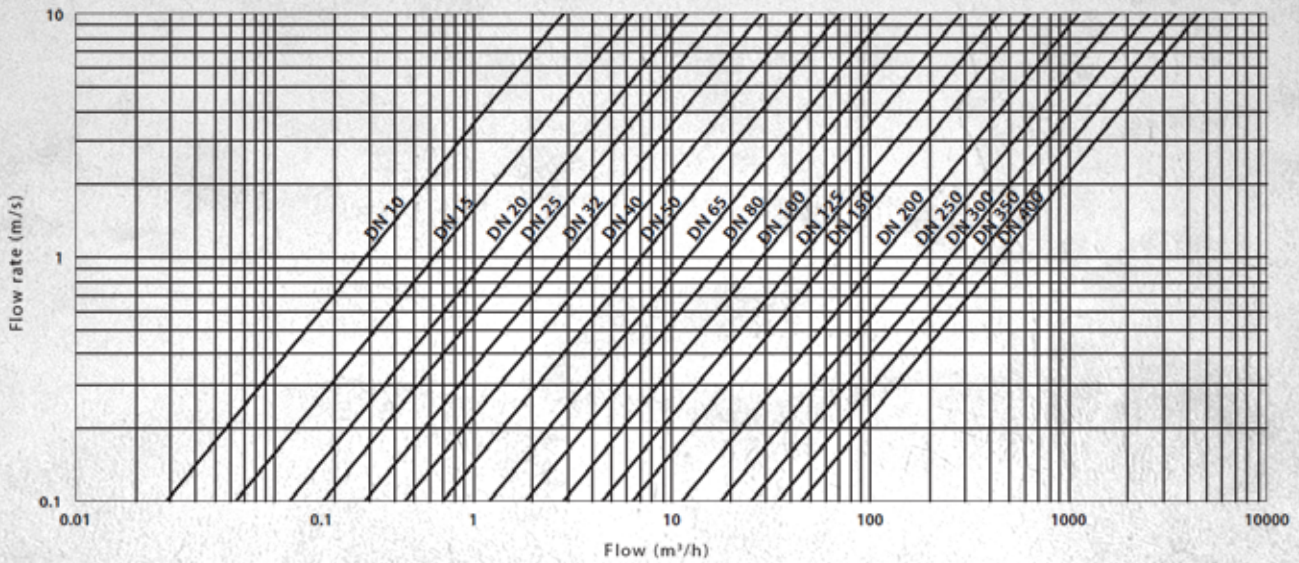
- Terminal 1 – coil 1 (black)
- Terminal 2 – coil 2 (white)
- Terminal 3 – shading (not connected)
- Terminal 4 – electrode 1 (red)
- Terminal 5 – electrode GDN (shading of violet)
- Terminal 6 – electrode 2 (blue)
- Terminal 7 – PE (shading red – blue – white and black)
- Terminal 8 – electrode TEST (violet)

- 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÷20 mA (+)
- Terminal No. 91 – current output 4÷20 mA (-)
- Terminal No. 50 – (C) Out1 - Imp/FlowSwitch
- Terminal No. 51 – (E) Out1 - Imp/FlowSwitch
- Terminal No. 20 – (A) RS485 communication
- Terminal No. 21 – (B) RS485 communication
- Terminals No. 52 – (E) Out2 - Imp/FlowSwitch/Status/Error
- Terminals No. 53 – (C) Out2 - Imp/FlowSwitch/Status/Error
- Terminal No. 54, 55 – external button - resetting the user energy register Enull
- Terminal No. 56 – GND for output voltage 16 V/100 mA
- Terminal No. 57 – output voltage 16 V/100 mA (power supply for changing to active current and impulse outputs)
- Terminals L, N, PE – supply voltage 230 VAC (Install as an independent supply circuit with its own protection 0.5÷1A)



*Note: Connection of terminal is always described on DPS.*

## VOLUMETRIC FLOW VERSUS INSTANTANEOUS FLOW RATE DIAGRAM



## PRODUCT ORDERING CODE



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### C38MID/DNxxx/Ax(dk)/Bx/Cx/Dx/Ex/Fx/Gx/Hx/Ix/Jx/Kx/Lx/Mx/Nx

**DN (diameter nominal)**  
 DN... 10÷400

**A (construction)**  
 A1... compact  
 A2... separated (cable length min. 3 m)

**B (connection)**  
 B1... flanged  
 B6... flanged SS304  
 B7... flanged SS316

**C (pressure)**  
 C1... PN10 (DIN) C3... PN25 (DIN)  
 C2... PN16 (DIN) C4... PN40 (DIN)

**D (lining)**

D4... PTFE

D5... PFA

D7... ETFE

**E (electrodes)**

E1... stainless steel 316 Ti

E3... titanium

E2... hastelloy C4

E4... tantalum

**F (IP code)**

F1... IP65

**G (outputs)**

G1... impulse/switch (monitor)

G3... imp./sw. + RS485

G2... imp./sw. + 4÷20 mA

G4... imp./sw. + 4÷20 mA + RS485

(RS485 optional protocols M-BUS/MOD-BUS RTU)

**N (location of meter)**

N1... return pipe

N2... supply pipe

**M (min. temperature diferencies)**

M1... dT=3°C, media temp. to 120°C

M2... dT=3°C, media temp. to 170 °C

**L (thermometer cable length Pt500)**

L1... 4m L4... 10m

L2... 6m L5... 12m

L3... 8m L6... 15m

**K (welded-on pieces)**

K1... NO K2... YES

**J (thermowells)**

J1... 36mm J4... 136mm

J2... 86mm J5... 176mm

J3... 100mm

**I (measuring range Q<sub>f</sub>/Q<sub>p</sub>)**

I6... 1/25

I7... 1/50

I8... 1/100

**H (power)**

H1... 110÷230 VAC