

CALOR 38

Heat and cold consumption meter Calor 38

The Calor 38 inductive meter is a reliable tool for any operational measurement of transferred heat or cold. It stands out for the stability of metrological parameters and its high accuracy.

The sensor unit can be modified to suit customer requirements to be used in a variety of operating conditions. It is designed to measure the heat transferred by a transfer medium. Commonly used in transfer stations, industrial or residential buildings and in various technological processes and operations.

The device is equipped with several configurable outputs (pulse, status, analog current loop 4-20mA and RS485). The 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

- high measurement accuracy over the entire range
- it measures from the temperature difference $0,5^{\circ}\text{C}$
- possibility of measuring cold, e.g. for glycol mixtures
- long-term stability of metrological parameters
- suitable to use with aggressive liquids
- remote and local reading
- no moving parts and pressure loss

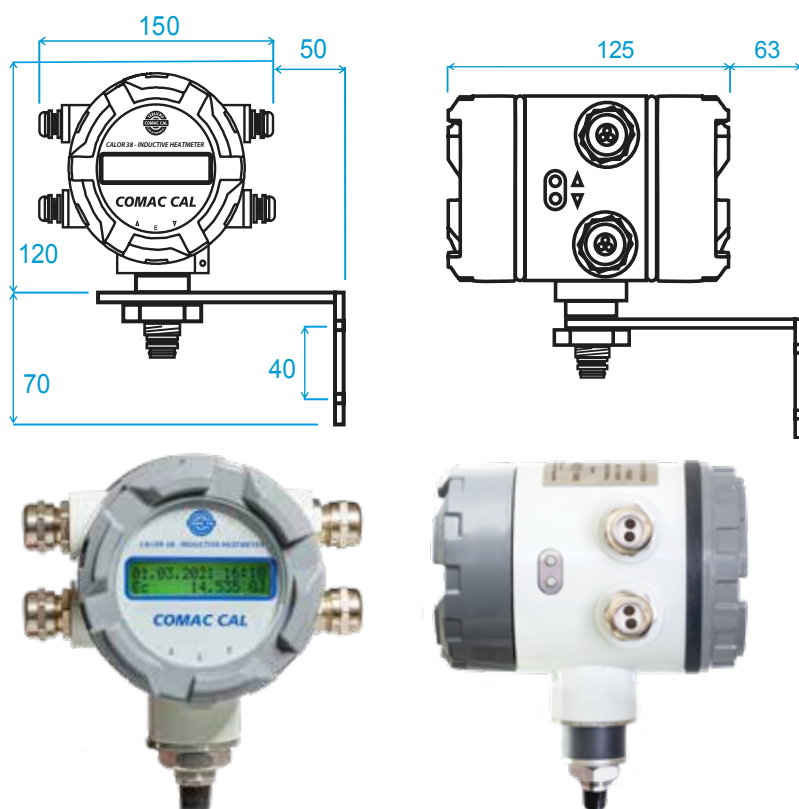
**COMAC CAL**

TECHNICAL DATA

Power	230 V AC (+10; -20%), 50÷60 Hz(standard) 24 V AC/DC with polarity reversal protection
Input power	9,6 VA
Type of electronics	H – head (standart), P – panel
Design	compact ($T_{max} = 90^{\circ}\text{C}$), separated (standard cable length 3 m)
Diameter nominal	DN 10÷600 (other DN upon agreement with the manufacturer)
Lining material (maximal temperature of lining material)	Rubber (hard, soft, with potable water test certificate): : DN25÷DN400 ($T_{min} = 0^{\circ}\text{C}$, $T_{max} = 70^{\circ}\text{C}$) Rilsan: DN25÷DN600 ($T_{min} = -10^{\circ}\text{C}$, $T_{max} = 70^{\circ}\text{C}$) PTFE: DN15÷DN80 ($T_{min} = -25^{\circ}\text{C}$, $T_{max} = 120^{\circ}\text{C}$ for separated version) ETFE: DN100÷DN 600 ($T_{min} = -25^{\circ}\text{C}$, $T_{max} = 150^{\circ}\text{C}$) PFA: (upon agreement with producer) ($T_{min} = -25^{\circ}\text{C}$, $T_{max} = 170^{\circ}\text{C}$)
Electrode material	CrNi ocel DIN 1.4571, Hastelloy C4, Titan, Tantal
Frame	All-welded
Sensor material	Flanged– stainless steel and structural steel with polyurethane coating Sandwich, threaded, food grade – stainless steel
Process connections	Flanged (EN1092) Threaded (EN 10226-1) Clamp/Food Threaded (DIN 32676/DIN11851)
Pressure	PN10 - PN40
Min. conductivity of the measured fluid	20 $\mu\text{S}/\text{cm}$ (at a lower conductivity, upon agreement with the manufacturer)
Flow meter measuring range (q_1, q_2)	1/25, 1/50, 1/100
Flow meter accuracy	up to 0,5% (pro 0,1÷10 m/s)
Repeatability	up to 0,2% (pro 0,1÷10 m/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 impulsni/flow switch (max. 400 Hz), 4÷20 mA, Interface RS485 (protocols M-BUS/MODBUS)
Max. ambient temperature	÷55 $^{\circ}\text{C}$
Flow sensor degree of protection	IP65, IP67, IP68
Electronics degree of protection	Standard unit (H – head) – IP65, panel unit (P) – IP54

ELECTRONICS

STANDART DEVICE (HEAD)



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. Upon cover removal, these buttons can be used to change settings or the displayed parameters.

For more convenient reading the transmitter head can be rotated by 350° and the display unit can rotate by increments of 90° in both directions.

FLOW RANGES

Instantaneous flow rate corresponding to flow velocity

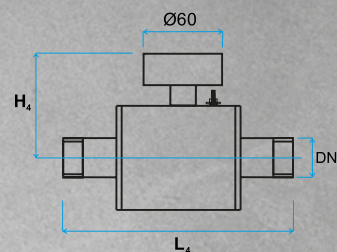
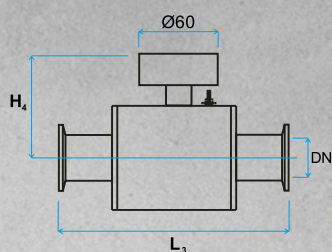
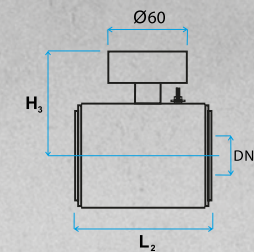
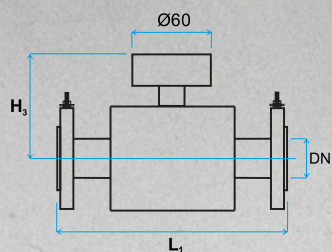
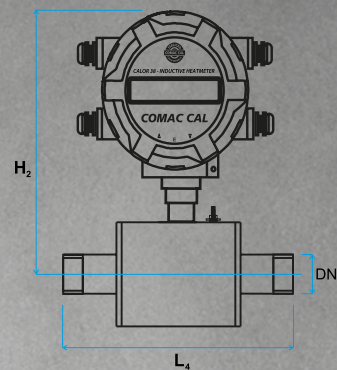
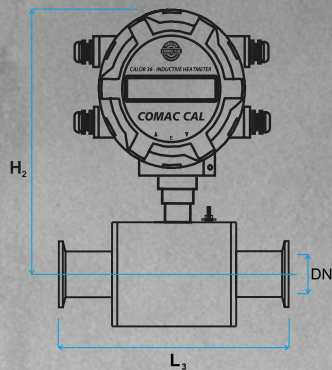
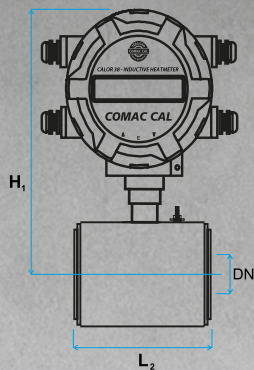
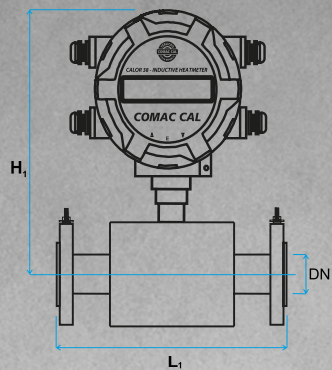
DN [mm]	q_1 [1/200] [m³/h] (I3)	q_1 [1/100] [m³/h] (I2)	q_1 [1/60] [m³/h] (I1)	q_p [m³/h]	q_2 [m³/h]
DN 10	-	0,034	0,06	1,7	3,4
DN 15	0,038	0,076	0,13	3,8	7,6
DN 20	0,071	0,142	0,24	7,1	14,2
DN 25	0,105	0,21	0,35	10,5	21
DN 32	0,17	0,34	0,6	17	34
DN 40	0,27	0,54	0,9	27	54
DN 50	0,42	0,84	1,4	42	84
DN 65	0,72	1,44	2,4	72	144
DN 80	1,1	2,2	3,6	110	220
DN 100	1,7	3,4	5,6	170	340
DN 125	2,67	5,34	8,9	267	534
DN 150	3,8	7,6	13	380	760
DN 200	6,75	13,5	23	675	1350
DN 250	-	21,1	35	1057,5	2115
DN 300	-	30	51	1525	3050
DN 350	-	41	70	2075	4150
DN 400	-	54	90	2713	5426
DN 500	-	-	141	4240	8480
DN 600	-	-	203	6100	12200

Note: q_1 - minimal flow
 q_p - nominal flow
 q_2 - maximal flow

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FLANGE (EN 1092)

SANDWICH

CLAMP/FOOD THREAD
(DIN32676/DIN11851)THREAD
(EN 10226-1)

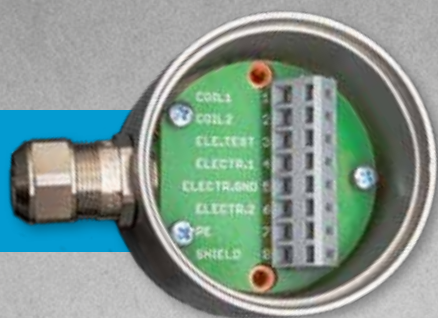
DIMENSIONAL TABLE

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

Note: D - The outside diameter corresponds to the required pressure class and standards.

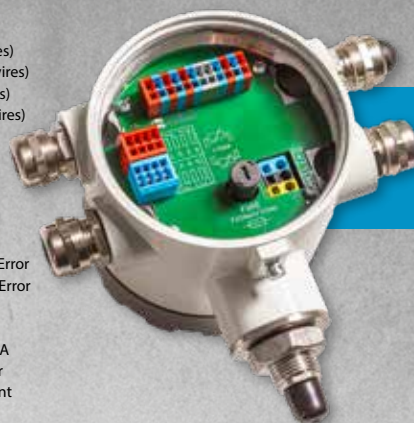
FLOW SENSOR TERMINAL BOARD CONNECTION FOR SEPARATED VERSION

EVALUATION UNIT TERMINAL BOARD ELECTRICAL CONNECTION



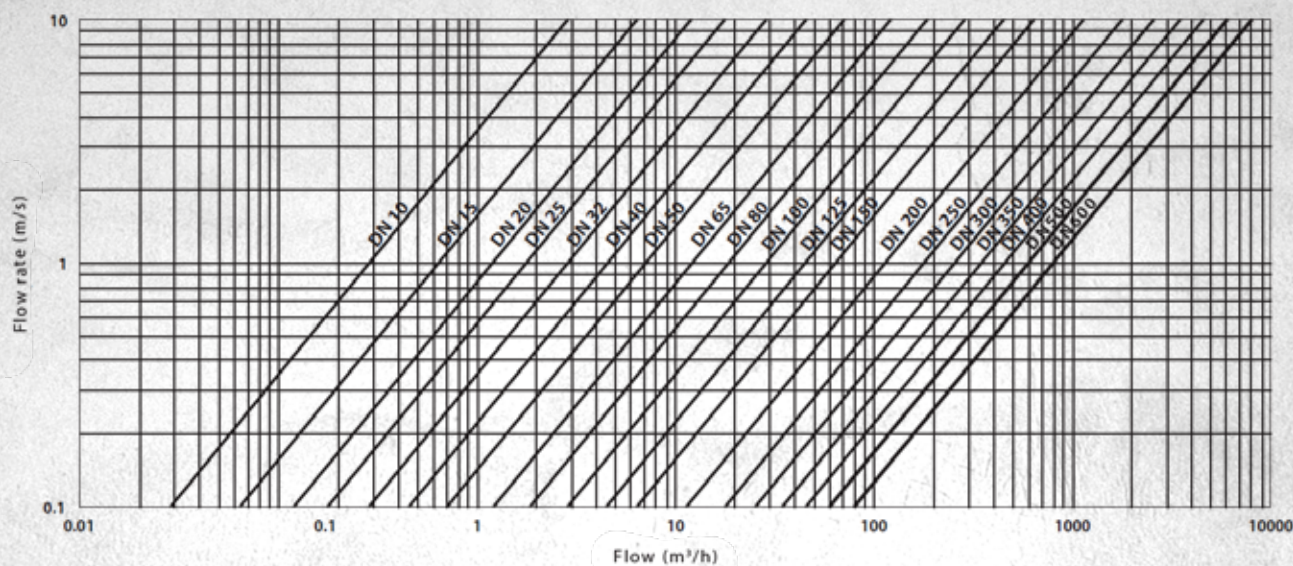
- Terminal 1 – coil 1 (black)
- Terminal 2 – coil 2 (white)
- Terminal 3 – shading (not connected)
- Terminal 4 – electrode 1 (red)
- Terminal 5 – electrode GDN (shading of violet)
- Terminal 6 – electrode 2 (blue)
- Terminal 7 – PE (shading red – blue – white and black)
- Terminal 8 – electrode TEST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



Note: Connection of terminal is always described on PCB.

VOLUMETRIC FLOW VERSUS INSTANTANEOUS FLOW RATE DIAGRAM



PRODUCT ORDERING CODE



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Exclusive partner:

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C38/DNxxx/Ax(dk)/Bx/Cx/Dx/Ex/Fx/Gx/Hx/Ix/Jx/Kx/Lx/Mx/Nx									
CALOR 38									
DN (diameter nominal) DN... 10÷600									
A (construction) A1... compact A2... separated (cable length 3÷30 m, T _{max} 150 °C) A3... separated (cable length 3÷30 m, T _{max} 80 °C)									
B (connection) B1... flanged B5... clamp B2... sandwich B6... flanged SS304 B3... threaded B7... flanged SS316 B4... dairy fittings									
C (pressure) C1... PN10 (DIN) C5... PN64 (DIN) C9... 40K (JIS) C2... PN16 (DIN) C6... PN100 (DIN) C10... 150lb (ANSI) C3... PN25 (DIN) C7... 10K (JIS) C11... 300lb (ANSI) C4... PN40 (DIN) C8... 20K (JIS)									
D (lining) D1... hard rubber D4... PTFE D8... PVDF D2... soft rubber D5... PFA D9... RILSAN D3... rubber with certificate for drinking water D7... ETFE									
E (electrodes) E1... stainless steel 316Ti E3... titan E2... hastelloy C4 E4... tanta									
F (IP code) F1... IP65 F2... IP67 F3... IP68									
N (location of meter) N1... return pipe N2... supply pipe									
M (min. temperature differences) M2... dT=31° 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_v/q_m) I1... 1/60 I2... 1/100 I3... 1/200									
H (power) H1... 110 - 230 VAC H2... 24V AC/DC									
G (outputs) G1... impulse/switch (monitor) G2... imp./sw. + 4÷20 mA G3... imp./sw. + RS485 G4... imp./sw. + 4÷20 mA + RS485 (RS485 optional protocols M-BUS/MOD-BUS RTU)									