INDUSTRIAL FLOW METER

FLOW 38



Industrial inductive flow meter with display unit

The flow meter is designed for a wide range of fluid measurements in various industries. Various process connections such as flange, sandwich (wafle), threaded and dairy fittings (DIN 11851) or clamp types are available.

The evaluation unit is made in three versions. It includes the standard design (head) and the unit is also made in front and panel designs. It is advantageous in the compact front version that the evaluation unit (display unit) is placed from the front part of the sensor and in case of the separated version, the display unit can be mounted in DIN rail. The panel mounted electronics offers the installation of the display unit in the electric box door.

The flow meter offers a wide range of outputs and the communication for connection to various control systems.

MAIN MERITS

- Extensive variability of process connection
- Possibility of the constructional length made to customer needs
- Possibility of the sensor made in full stainless steel design
- Big dynamic measuring range
- High measurement accuracy and repeatability
- Wide choice of lining, electrodes and outputs
- Very simple and intuitive operation
- Possibility of flow monitoring function (flow switch)
- 350° swivel display for comfortable reading

TĚRLICKO COMAC CAL CZECH REPUBLIC

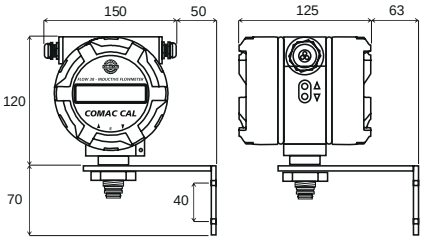
COMAC CAL

TECHNICAL DATA

Power	110...230 VAC (50/60 Hz), 24 VAC/VDC with polarity reversal protection
Input power	4.6 VA
Type of electronics	Head (H – standard), front (F), panel (P) versions
Design	Compact (T_{max} 90 °C), separated (standard cable length 3 m)
Diameter nominal	DN 4...600 (other DN upon agreement with the manufacturer)
Lining material	Rubber (hard, soft, with potable water test certificate): DN 25...DN 600 (T_{max} 70 °C)
	PTFE: DN 10...DN 80 (T_{max} 150 °C for separate version), PVDF: DN 4...DN 20
	Rilsan: DN 25...DN 600 (T_{max} 70 °C for separate version)
	ETFE: DN 100...DN 600 (T_{max} 150 °C), PFA, Ceramics (upon agreement with the manufacturer)
Electrode material	CrNi steel DIN 1.4571, Hastelloy C4, Titanium, Tantalum
Frame	All-welded
Sensor material	Flanged– stainless steel and structural steel with polyurethane coating
	Sandwich, threaded, food grade – stainless steel
Process connections	Sandwich (PN25 only)
	Flanged DIN (EN1092) – carbon or stainless steel
	Threaded (EN 10226-1)
	Food grade (DIN 11851 fitting, clamp)
Pressure	PN10 (DIN), PN16 (DIN), PN25 (DIN), PN40 (DIN), PN64 (DIN), PN100 (DIN)
	10K (JIS), 20K (JIS), 40K (JIS)
	150lb (ANSI), 300lb (ANSI)
Min. conductivity of the measured fluid	20 µS/cm (at a lower conductivity, upon agreement with the manufacturer)
Flow meter measuring range (Q_{min}/Q_{max})	bi-directional for 0.2 to 12 m/s (1/60); 0.12 to 12 m/s (1/100); 0.06 to 12 m/s (1/200)
Flow meter accuracy	Accuracy up to 0.5 %, repeatability up to 0.2 %
Pressure loss	Negligible
Additional electrodes	Grounding and detection electrodes for empty piping (DN 15...DN 600)
Empty piping detection	DN 10...DN 600
Display unit	LCD 2×16 characters
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 (protocols M-BUS/Mod-Bus)
	(Impulse and current outputs are passive with a possibility of being powered from internal power supply of the meter)
Max. ambient temperature	55 °C
Flow sensor degree of protection	IP65, IP67, IP68
Electronics degree of protection	Standard unit (H – head) – IP65, IP67, front unit (F) and panel unit (P) – IP54

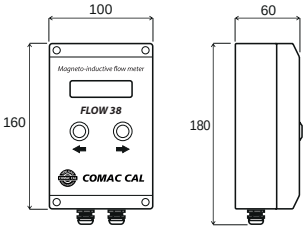
ELECTRONICS

STANDARD UNIT (HEAD)



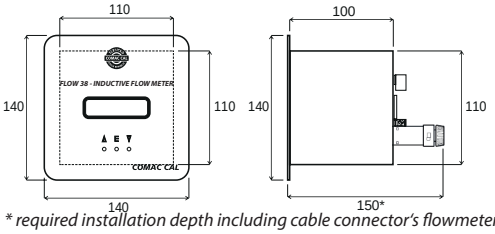


FRONT UNIT





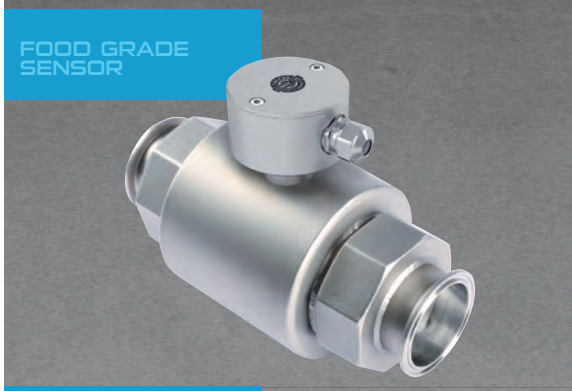
PANEL UNIT

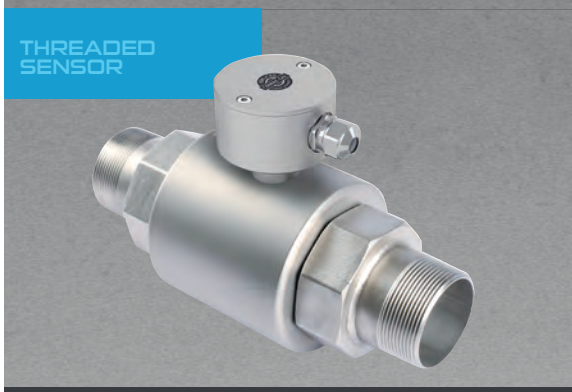




** required installation depth including cable connector's flowmeter sensor is 200 mm*







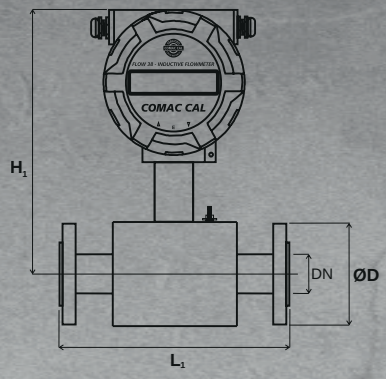
FLOW RANGES

Instantaneous flow rate corresponding to flow velocity

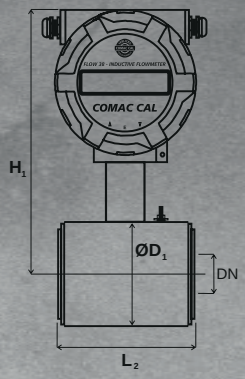
Diameter nominal [mm]	Q_{min} [m³/h] dle Q_{min}/Q_{max}			Q_{max} [m³/h]
	1/60 (0,2 m/s)	1/100 (0,12 m/s)	1/200 (0,06 m/s)	– (12 m/s)
DN 4	0,01	–	–	0,6
DN 6	0,02	–	–	1,2
DN 8	0,04	–	–	2,2
DN 10	0,06	0,034	–	3,4
DN 15	0,13	0,076	0,038	7,6
DN 20	0,24	0,142	0,071	14,2
DN 25	0,35	0,21	0,105	21
DN 32	0,6	0,34	0,17	34
DN 40	0,9	0,54	0,27	54
DN 50	1,4	0,84	0,42	84
DN 65	2,4	1,44	0,72	144
DN 80	3,6	2,2	1,1	220
DN 100	5,6	3,4	1,7	340
DN 125	8,9	5,34	2,67	534
DN 150	13	7,6	3,8	760
DN 200	23	13,5	6,75	1350
DN 250	35	21,1	–	2115
DN 300	51	30	–	3050
DN 350	70	41	–	4150
DN 400	90	54	–	5426
DN 500	141	–	–	8480
DN 600	203	–	–	12200

FLOW 38

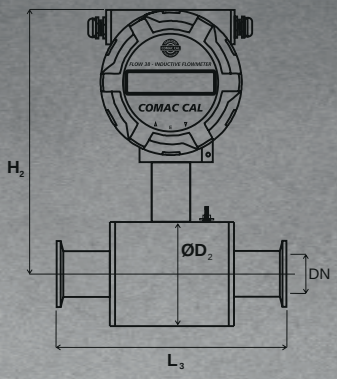
FLANGE
(EN 1092)



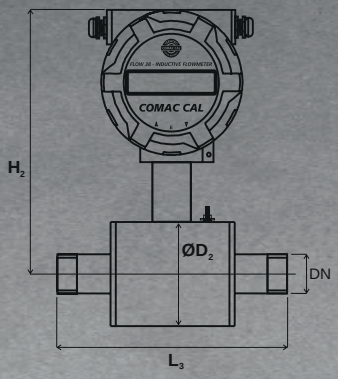
SANDWICH

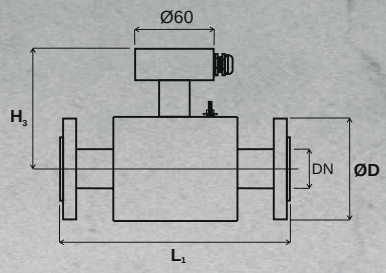


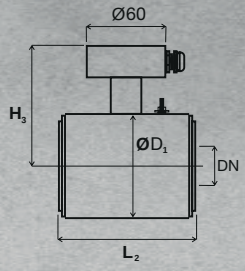
CLAMP/FOOD THREAD
(DIN32676/DIN11851)

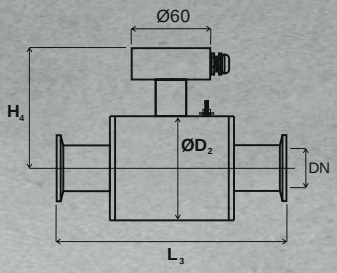


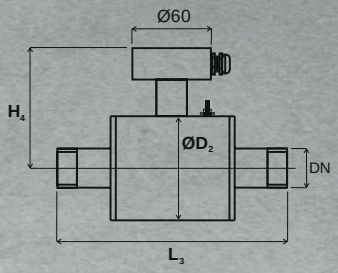
THREAD
(EN 10226-1)











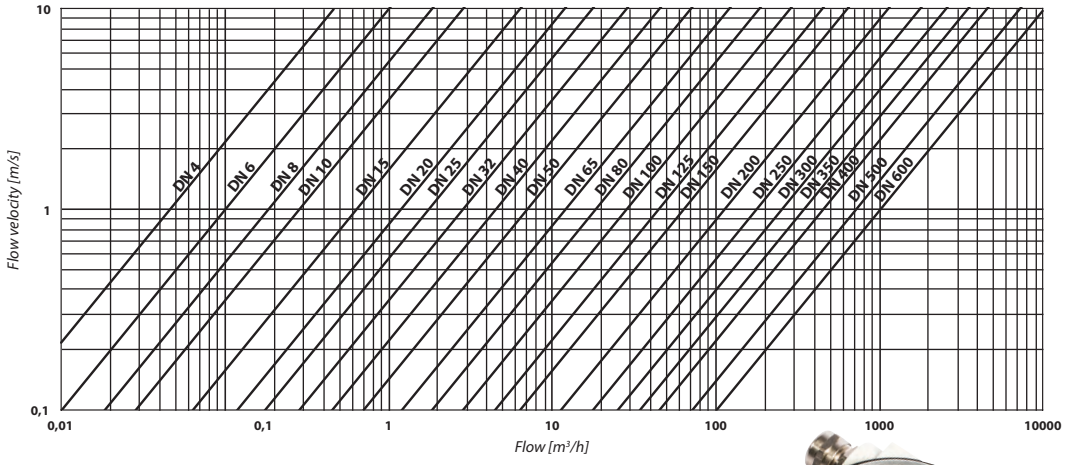
Constructional lengths can be modified upon agreement with the manufacturer.

DIMENSIONAL TABLE

Connection [mm]	Constructional length [mm]					Outside diameter [mm]		Total height of [mm]			
						Sensor body		Compact design		Separated design	
	Flanged	Sandwich (PN25)	Threaded (connection)	Food Thread	Food Clamp	Sandwich (PN25)	Threaded Food Thread Food Clamp	Flanged Sandwich (PN25)	Threaded Food Thread Food Clamp	Flanged Sandwich (PN25)	Threaded Food Thread Food Clamp
DN	L1	L2	L3	L3	L3	D1	D2	H1	H2	H3	H4
4	–	–	157 (1/2")	–	–	–	70/–/–	–/182	182/–/–	–/92	92/–/–
6	–	–	157 (1/2")	–	–	–	70/–/–	–/182	182/–/–	–/92	92/–/–
8	–	–	157 (1/2")	–	–	–	70/–/–	–/182	182/–/–	–/92	92/–/–
10	200	90	186 (3/8")	173	180	51	70	173	177	86	90
15	200	90	190 (1/2")	165	175	51	70	173	177	86	90
20	200	90	200 (3/4")	170	175	61	80	173	182	86	95
25	200	90	200 (1")	180	175	71	90	178	187	91	100
32	200	90	228 (1 1/4")	192	175	82	100	183	192	96	105
40	200	110	248 (1 1/2")	215	203	92	116	188	200	101	113
50	200	110	258 (2")	228	211	107	136	196	210	109	123
65	200	130	upon agreement	upon agreement	upon agreement	127	151	206	218	119	131
80	200	130	upon agreement	upon agreement	upon agreement	142	177	213	231	126	144
100	250	200	–	–	–	168	–	226	–	139	–
125	250	200	–	–	–	194	–	239	–	152	–
150	300	200	–	–	–	224	–	254	–	167	–
200	350	200	–	–	–	284	–	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.

VOLUMETRIC FLOW VERSUS INSTANTANEOUS FLOW VELOCITY DIAGRAM





DISPLAY UNIT OPERATION

The meter is equipped with two external buttons on the electronics housing side and three internal buttons accessible after removing the front cover with glass. Using the external buttons, it is possible to scro-ll individual quantities and settings. After removing the cover, it is possible to change settings as well.

The unit can be swivelled within 350° for more comfortable reading of values on the display both in compact and separated designs.

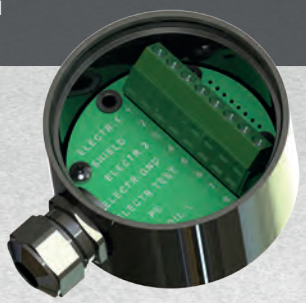
EVALUATION UNIT TERMINAL BOARD ELECTRICAL CONNECTION



Standard connection:

Terminals 1, 2 – current output 4...20 mA
Terminals 3, 4 – Out1(Imp/FlowSwitch)
Terminals 5, 6 – RS485 communication
Terminals 7, 8 – Out2 (Imp/FlowSwitch/Status)
Terminals 9, 10 – reset Total V register (resettable counter) by external button
Terminals 11, 12 – output voltage 16 V/100 mA (power supply for changing to active current and impulse outputs)
Terminals L, N, PE – mains voltage 230 VAC (standard), available also in 24 VAC/VDC version (Install as an independent supply circuit with its own protection 0.5...1 A)

FLOW SENSOR TERMINAL BOARD CONNECTION FOR 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)

Note: *Connection of terminale is always describing on DPS.*

PRODUCT ORDERING CODE

FLOW 38 **FL38x/DNxxx/Ax(cl)/Bx/Cx/Dx/Ex/Fx/Gx/Hx/Ix**

FLOW38 (type)
H… head
P… panel
F… front

DN (diameter nominal)
DN… 4...600**

A (design)
A1… compact
A2… separated (cabel length 3...30 m, T_{max} 150 °C)
A3… separated (cabel length 3...30 m, T_{max} 80 °C)

B (connection)
B1… flanged
B2… sandwich
B3… threaded
B4… diary fitting
B5… clamp
B6… stainless steel flange SS304
B7… stainless steel flange SS316

C (pressure)
C1… PN10 (DIN)
C2… PN16 (DIN)
C3… PN25 (DIN)
C4… PN40 (DIN)
C5… PN64 (DIN)
C6… PN100 (DIN)
C7… 10K (JIS)
C8… 20K (JIS)
C9… 40K (JIS)
C10… 150lb (ANSI)
C11… 300lb (ANSI)

D (lining)
D1… hard rubber
D2… soft rubber
D3… rubber with potable water test certificate
D4… PTFE
D5… PFA
D6… ceramics*
D7… ETFE
D8… PVDF
D9… RILSAN

E (electrodes)
E1… stainless steel 316 Ti
E2… hastelloy C4
E3… titanum
E4… tantalum

F (sensor degree protection)
F1… IP65
F2… IP67
F3… IP68

G (output)
G1… impulse/flow switch
G2… imp./sw. + 4...20 mA
G3… imp./sw. + RS485
G4… imp./sw. + 4...20 mA + RS485
G5… imp./sw. + 4...20 mA + HART
G6… imp./sw. + 4...20 mA + HART + RS485
(RS485, protocol M-BUS/MOD-BUS RTU)

H (power)
H1… 110...230 VAC
H2… 24 VAC/VDC

I (measuring range Q_{min}/Q_{max})
I1… 1/60
I2… 1/100
I3… 1/200

Standard set include installation manual and calibration certificate. For other requirements, please contact the manufacturer directly.
*Upon agreement with the manufacturer. **DN 4, 6, 8 PVDF only, accuracy 1%, flow range 1/60
Note: within additional accessories belong plug-in module with M-Bus, micro SD card and their combination.

09_2019

COMAC CAL s.r.o.
Czech Republic, 735 42 Těrlicko
tel.: +420 556 205 322
e-mail: export@comaccal.com
WWW.COMACCAL.COM

Exclusive partner:

Errata and technical changes reserved. The figures and photographs shown are only for illustration purposes.