

# FLOW 33



WIRELESS  
BLUETOOTH  
CONNECTION


## Industrial inductive flow meter in compact design without display unit

The flow meter can be fully manufactured in stainless-steel design, where the evaluation unit is mounted directly on the flow sensor. The advantage is the possibility of using the meter in various technologies where the customer requires a pulse or current signal for process control. It is suitable for many industrial applications.

For connection to a superior control system, three configurable outputs are available, and the electrical connection is provided via an M12x1, 8-pin connector.

The flow meter is equipped with two status LEDs that indicate the meter condition. The device also features BluetoothLE, used for configuration and diagnostics.

## MAIN BENEFITS

- Configuration via  **Bluetooth** (Android / iOS)
- Option to display the actual flow value
- High measurement accuracy across the full flow range
- Long-term stability of metrological parameters
- Option of a fully stainless-steel compact design
- Very robust construction
- High variability of mechanical connections
- Wide selection of lining and electrode materials
- LED status indication
- Empty pipe detection
- Maintenance-free operation



**COMAC CAL**

# TECHNICAL DATA

Power Supply	24 V DC $\pm$ 15 % with reverse polarity protection
Power Consumption	4,2 VA
Electrical Connection	via M12 connector (8-pin)
Design Options	Compact
Max. Media Temperature	90 °C (depending on lining); for higher temp. upon agreement with the manufacturer
Nominal Diameter	DN 4 ... DN 600 (other DN upon agreement)
Lining Material (Minimum and maximum temperatures)	Rubber (hard, soft, for drinking water): DN 32 to DN 600 ( $T_{min} = 0$ °C, $T_{max} = 70$ °C) Ceramic (upon request) Rilsan: DN 25 ... DN 600 ( $T_{min} = -20$ °C, $T_{max} = 70$ °C) PVDF: DN 4 ... DN 8 ( $T_{min} = -40$ °C, $T_{max} = 90$ °C) PFA: DN 10 ... DN 250 ( $T_{min} = -40$ °C, $T_{max} = 90$ °C) PTFE: DN 15 ... DN 80 ( $T_{min} = -40$ °C, $T_{max} = 90$ °C) ETFE: DN 100 ... DN 600 ( $T_{min} = -40$ °C, $T_{max} = 90$ °C)
Electrode Material	Stainless Steel 316 Ti, Hastelloy C4, Titanium, Tantalum
Construction	All-welded design
Sensor Body Materials	Flanged: stainless steel or carbon steel with polyurethane coating Sandwich, threaded, sanitary – stainless steel
Process Connection	Sandwich (PN25 only) Flanged DIN (EN1092) – stainless steel or carbon steel Threaded (EN 10226-1) Sanitary (fitting DIN 11851, clamp)
Pressure Rating	PN10 (DIN), PN16 (DIN), PN25 (DIN), PN40 (DIN), PN64 (DIN), PN100 (DIN) 10K (JIS), 20K (JIS), 40K (JIS) Class 150 (ANSI), Class 300 (ANSI)
Min. Conductivity of Medium	5 $\mu$ S/cm
Measuring Range ( $Q_{min}/Q_{max}$ )	1/60
Flowmeter Accuracy	up to 0,5 %, repeatability up to 0,2 %
Pressure Loss	Negligible
Additional Electrodes	grounding and empty-pipe detection (DN 10 ... DN 600)
Empty-pipe Detection	DN 10 ... DN 600
Display	2x LED (4 colour-coded meter states)
Configuration	BluetoothLE
Outputs (passive)	OUT1 – pulse (max. 1.6 kHz, selectable constant) OUT2 – pulse (same constant as OUT1) /status/flowswitch Live conductor 4 ... 20 mA (range configurable)
Max. Ambient Temperature	55 °C
Ingress Protection	IP65, IP67, IP68

SANDWICH SENSOR DESIGN



SANITARY SENSOR DESIGN



THREADED SENSOR DESIGN



## FACTORY SETTINGS

Nominal Diameter [mm]	Impulse output		4-20mA (in $Q_{min}/Q_{max}$ 1/100 range)	
	Vout [imp/l]	Vout pulse width [ms]	Q[l/h] for 4 mA	Q[l/h] for 20 mA
DN 4	100	4	0	540
DN 6	100	4	0	1 200
DN 8	10	4	0	2 200
DN 10	10	4	0	3 400
DN 15	10	4	0	7 600
DN 20	10	4	0	14 200
DN 25	10	4	0	21 000
DN 32	1	4	0	34 000
DN 40	1	4	0	54 000
DN 50	1	4	0	84 000
DN 65	1	4	0	144 000
DN 80	1	4	0	220 000
DN 100	0,1	4	0	340 000
DN 125	0,1	4	0	534 000
DN 150	0,1	4	0	760 000
DN 200	0,1	4	0	1 350 000
DN 300	0,1	4	0	3 052 000
DN 400	0,01	4	0	5 400 000
DN 500	0,01	4	0	8 400 000
DN 600	0,01	4	0	12 000 000

## FLOW RANGES

Instantaneous flow corresponding to the flow velocity

DN [mm]	$Q_{min}$ [m <sup>3</sup> /h] for $Q_{min}/Q_{max}$	$Q_{max}$ [m <sup>3</sup> /h]
	1/60 (0,2 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	3,4
DN 15	0,13	7,6
DN 20	0,24	14,2
DN 25	0,35	21
DN 32	0,6	34
DN 40	0,9	54
DN 50	1,4	84
DN 65	2,4	144
DN 100	5,6	340
DN 125	8,9	534
DN 150	13	760
DN 200	23	1350
DN 250	35	2115
DN 300	51	3050
DN 350	70	4150
DN 400	90	5426
DN 500	141	8480
DN 600	203	12200

METER STATES DISPLAYED

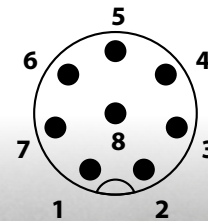
The state of the meter is continuously indicated by two LED indicators located in the cover plate of the evaluation unit (next to M12 connector).

The status of the meter indicated by LED indicators may be as follows:

LED 1	LED 2	Description	Current output
● green	-	The meter is in order and the flow is zero or negative (for single-direction measurement)	4 mA
● green	● flickering blue	The meter is in order and the flow is positive whereas the blue LED indicates the transmission of volumetric pulses	4...20 mA
● green	● yellow	Empty measuring tube	<4 mA
● red	-	Meter is out of order, servicing needed	<4 mA
● red	● yellow	Meter is temporarily out of parameters	<4 mA
-	-	Supply voltage error	-

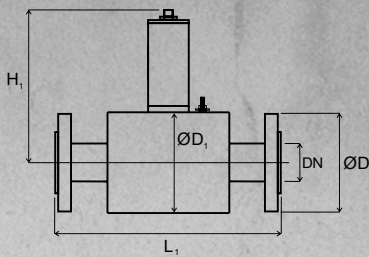
M12 CONNECTOR PINOUT

Standard M12 male connector on meter's body pinout:

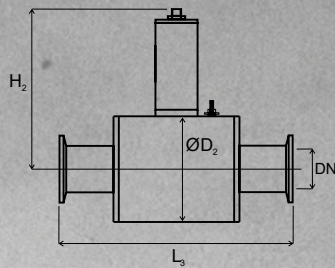


- PIN1 OUTPUT 2 Status/Puls (collector – positive potential)
- PIN2 OUTPUT 1 Puls (collector – positive potential)
- PIN3 OUTPUT 1 Puls (emitter – negative potential)
- PIN4 OUTPUT 2 Status/Puls (emitter – negative potential)
- PIN5 4...20mA -
- PIN6 4...20mA +
- PIN7 GND
- PIN8 +Vdd

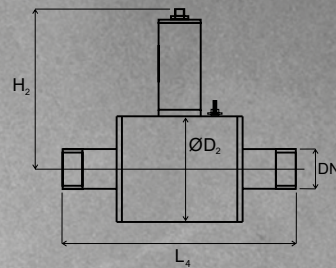
FLANGE (EN 1092)



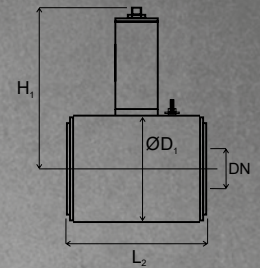
CLAMP/SANITARY FITTING (DIN32676/DIN11851)



THREAD (EN 10226-1)



SANDWICH



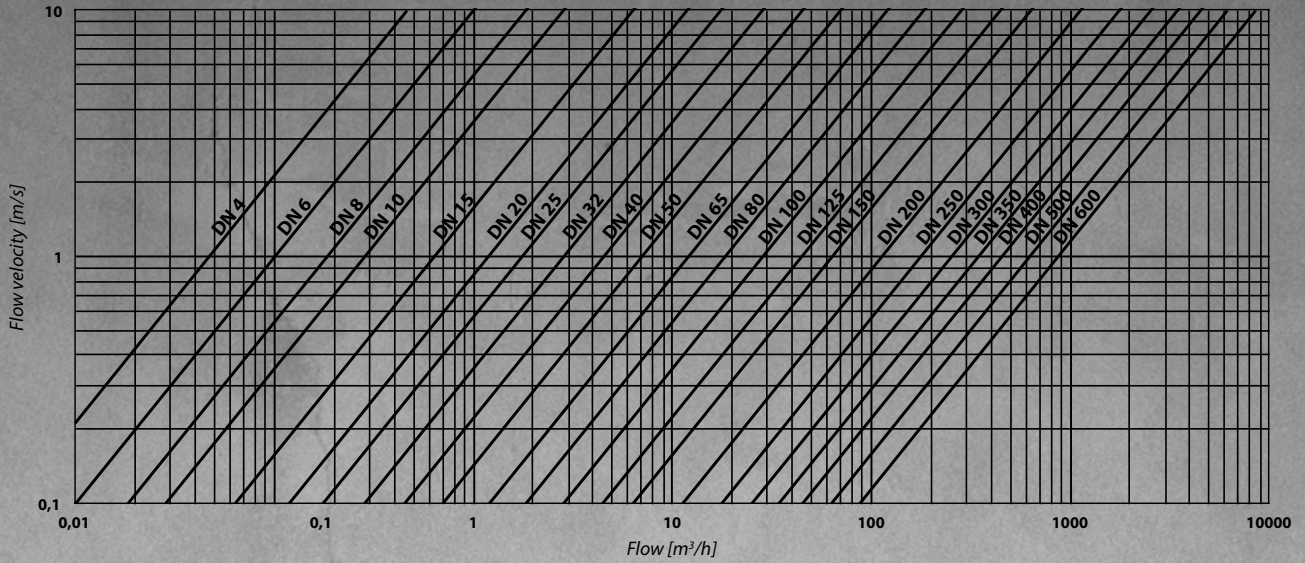
Installation lengths can be adjusted upon agreement with the manufacturer

DIMENSIONAL TABLE

Connection [mm]	Constructional length [mm]					Outside diameter [mm]		Total height of Compact design [mm]	
						Sensor body		Flanged	Threaded
	Flanged	Sandwich (PN25)	Sanitary fitting	Sanitary CLAMP	Threaded	Sandwich (PN25)	Sanitary		
								Flanged	Threaded
DN	L1	L2	L3	L3	L4	D1	D2	H1	H2
4	-	-	-	-	157 (1/2")	-	70/-/-	-/146	150
6	-	-	-	-	157 (1/2")	-	70/-/-	-/146	150
8	-	-	-	-	157 (1/2")	-	70/-/-	-/146	150
10	200	90	173	180	186 (3/8")	51	70/-/-	146	150
15	200	90	165	175	190 (1/2")	51	70	146	150
20	200	90	170	175	200 (3/4")	61	80	146	155
25	200	90	180	175	200 (1")	71	90	151	160
32	200	90	192	175	228 (1 1/4")	82	100	156	165
40	200	110	215	203	248 (1 1/2")	92	116	161	173
50	200	110	228	211	258 (2")	107	136	169	183
65	200	130	upon agreement	upon agreement	upon agreement	127	151	179	191
80	200	130	upon agreement	upon agreement	upon agreement	142	177	186	204
100	250	200	-	-	-	168	-	199	-
125	250	200	-	-	-	194	-	212	-
150	300	200	-	-	-	224	-	227	-
200	350	200	-	-	-	284	-	257	-
250	450	-	-	-	-	-	-	300/-	-
300	500	-	-	-	-	-	-	325/-	-
350	550	-	-	-	-	-	-	355/-	-
400	600	-	-	-	-	-	-	385/-	-
500	600	-	-	-	-	-	-	upon agreement	-
600	600	-	-	-	-	-	-	upon agreement	-

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

## VOLUMETRIC FLOW VERSUS INSTANTENEOUS FLOW RATE DIAGRAM



## PRODUCT ORDERING CODE

**FL33/DNxxx/A1/Bx/Cx/Dx/Ex/Fx/Gx/H1/I1/Jx**

### DN (nominal diameter)

DN... 4 ... 600\*\*

### A (design)

A1... compact

### B (connection)

B1... flanged	B5... clamp
B2... sandwich	B6... flanged SS304
B3... threaded	B7... flanged SS316
B4... dairy fitting	

### C (pressure rating)

C1... PN10 (DIN)	C5... PN63 (DIN)	C9... 40K (JIS)
C2... PN16 (DIN)	C6... PN100 (DIN)	C10... Class 150 (ANSI)
C3... PN25 (DIN)	C7... 10K (JIS)	C11... Class 300 (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 potable water certificate	D6... ceramic*	
	D7... ETFE	

### J (mating-connector M12, 8 pin)

J1... YES  
J2... NO

### I (measuring range $Q_{min}/Q_{max}$ )

I1... 1/60

### H (power supply)

H3... 24V DC±15 %

### G (output)

G1... pulse/switch (flowswitch)  
G2... imp./sw. + 4 ... 20 mA

### F (protection rating)

F1... IP65  
F2... IP67  
F3... IP68

### E (electrodes)

E1... stainless steel 316 Ti  
E2... hastelloy C4  
E3... titanium  
E4... tantalum

\* on request

\*\* DN 4, 6, 8 only available in PVDF, accuracy 1%, range 1/60

BLUETOOTH CONNECTION VIA APP CC FLOW



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