FLOW 33
FLOW 33 Ex

Industrial induction flow meter in compact design without the display unit

The flow meter can be in full stainless design where the evaluation unit is located right on the flow meter sensor. The advantage: the possibility of using the meter in various technologies where the customer needs pulse or current signals from the meter for process management. Its applications can be found in all sorts of industries.

It can be selected from two types of meter, according to environmental classification. Application in standard environment and in potentially explosive atmospheres (EX design).

The flow meter is equipped with two information LEDs, indicating the state of the meter. Electrical connection is ensured through standard M12 connector, whereas in Ex design, by means of Amphenol C016 or Sealcon M23 connector.

MAIN MERITS

- Setting via Bluetooth
- Optional compact design with full stainless construction
- Very rigid construction
- Extensive variability of mechanical connection
- Wide choice of materials for liners and electrodes
- Status signalling with LEDs
- Maintenance-free operation
- Meter constructed into Ex environment with
  - I M2 Ex mb I
  - I M1 Ex ia I Ma
  - II 1G Ex ia IIC T6 Ga
  - II 1D Ex ia IIIC T85°C Da

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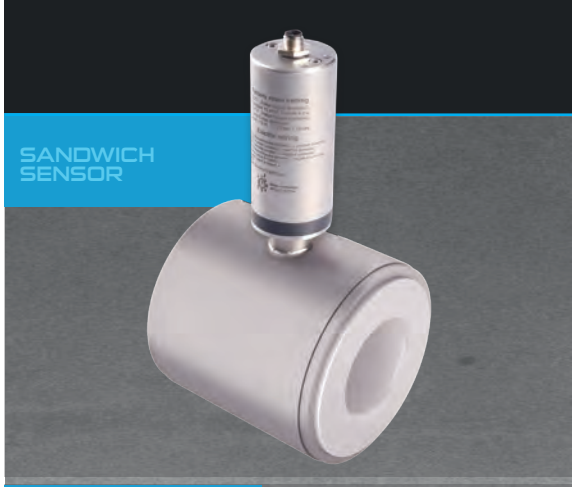
TECHNICAL DATA

Power	24V DC±15 % power with polarity reversal protection
Input power	4.2 VA
Electrical connection	through M12 (8-pin) connector
Design	compact
Maximum fluid temperature	90 °C (according to lining), for higher temperatures upon agreement with the manufacturer
Diameter Nominal	DN 4÷600 (other DN upon agreement with the manufacturer)
Lining material (lining maximum temperature)	Rubber (hard, soft, with potable water test certificate): DN 25÷DN 600 (T_{max} 80 °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} 90 °C for separate version)
	ETFE: DN100÷DN 600 (T_{max} 150 °C), PFA, Ceramics (upon agreement with the manufacturer)
Electrode material	CrNi steel DIN 1.4571, Hastelloy C4, Titan, Tantalum
Frame	all-welded
Sensor material	flanged – stainless steel and structural steel with polyurethane coating
	sandwich, threaded, food grade – stainless steel
Process connection	sandwich (PN25 only)
	flanged DIN (EN1092) – carbon or stainless steel
	threaded (EN ISO 228-1)
	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)
Measured fluid min. conductivity	20 µS/cm (at a lower conductivity, upon agreement with the manufacturer)
Flow meter measuring range (Q_{min}/Q_{max})	unidirectional/bidirectional for 0.2÷12 m/s (1/60)
Flow meter 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 2x LED	2× LED (meter's state is distinguished with 4 colours)
Setting	is done via Bluetooth (only for F33)
Outputs (passive)	OUT1 - impulse (max. 1,6 kHz, selectable constant)
	OUT2 - impulse (imp. constant as per OUT1)/status/flow-switch
	Analogue 4÷20 mA, adjustable range
Max. ambient temperature	55 °C
Flow sensor degree of protection	IP65, IP67, IP68

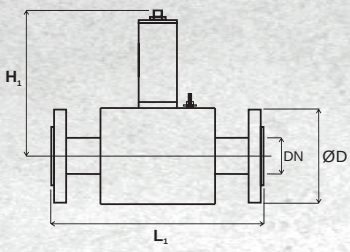


FLOW RANGES

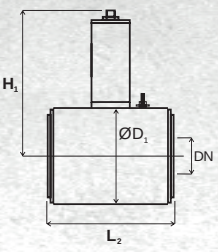
Instantaneous flow rate corresponding to flow velocity

Diameter nominal [mm]	Q_{min} [m³/h] dle Q_{min}/Q_{max} 1/60 (0,2 m/s)	Q_{max} [m³/h] – (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 80	3,6	220
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

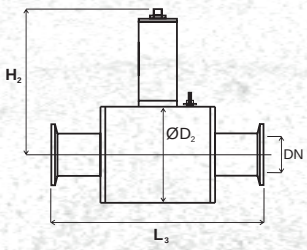
FLANGE (EN 1092)



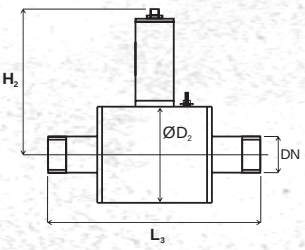
SANDWICH



CLAMP/FOOD THREAD (DIN32676/DIN11851)

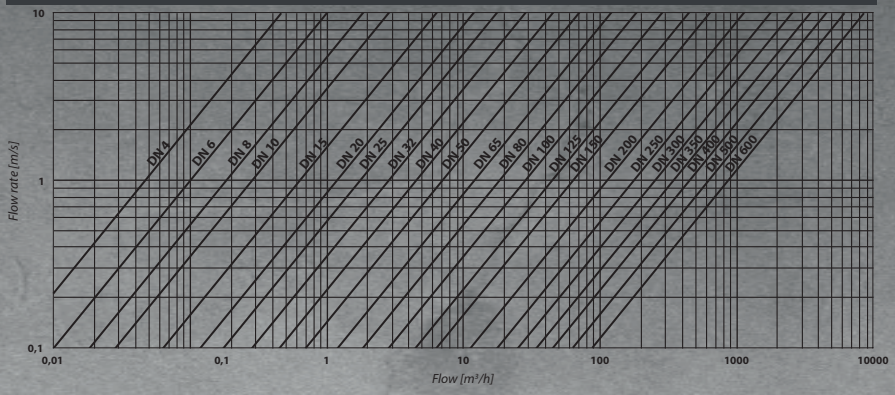


THREAD (EN ISO 228-1)



Constructional lengths can be modified upon agreement with the manufacturer.

VOLUMETRIC FLOW VERSUS INSTANTANEOUS FLOW RATE DIAGRAM



METER STATES DISPLAYED

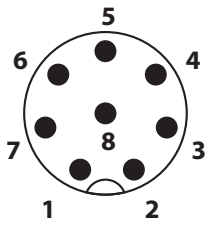
The state of the meter is continuously indicated by two LED indicators located in the cover plate of the evaluation unit (next to M12 connector).

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

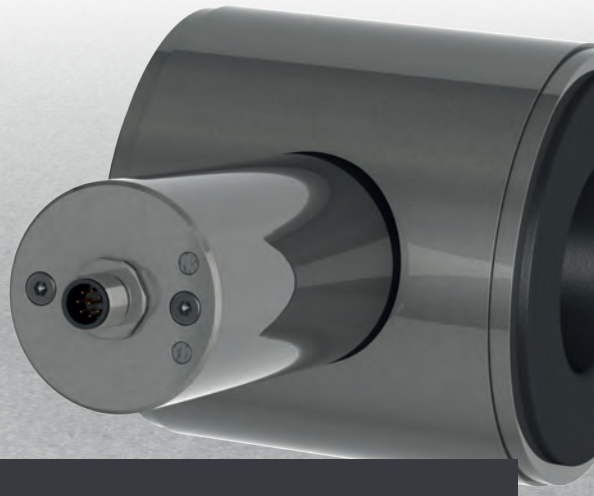
LED 1	LED 2	Description	Current output
green	–	The meter is in order and the flow is zero or negative (for single-direction measurement)	4 mA
green	flickering blue	The meter is in order and the flow is positive whereas the blue LED indicates the transmission of volumetric pulses	4÷20 mA
green	yellow	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:
8-pin M12 connector for 24 V DC±15 % power, pulse output and current loop



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



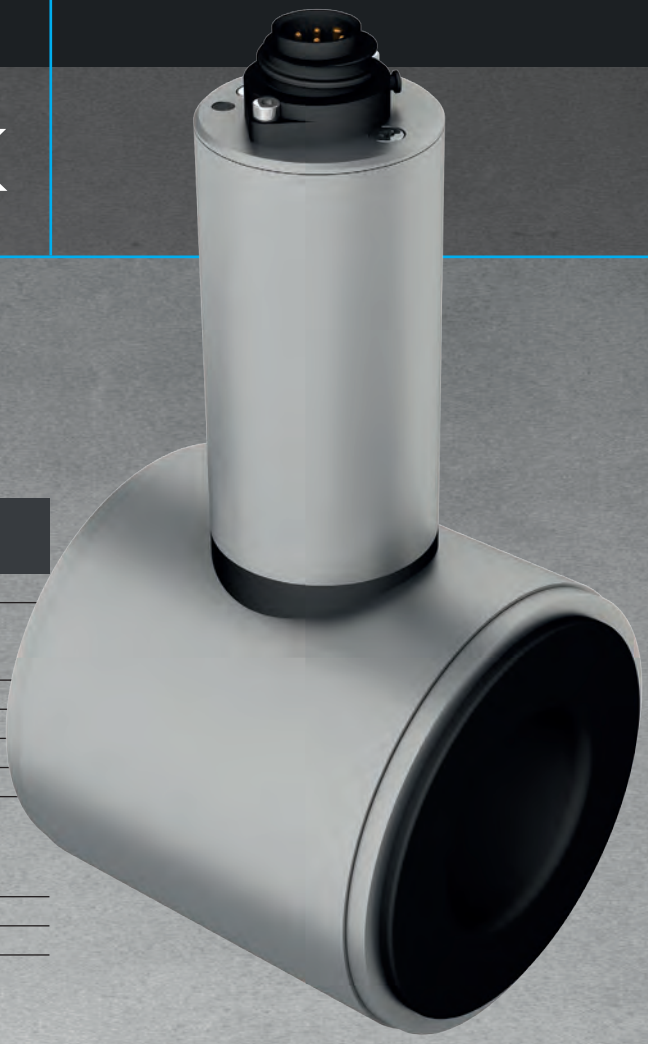
DIMENSIONAL TABLE

Connection [mm]	Constructional length [mm]					Outside diameter [mm] Sensor body		Total height of Compact design [mm]	
	Flanged	Sandwich (PN25)	Threaded (connection)	Food Thread	Clamp	Sandwich (PN25)	Threaded Food Thread Clamp	Flanged Sandwich (PN25)	Threaded Food Thread Clamp
DN	L1	L2	L3	L3	L3	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	193 (3/8")	179	189	51	70/–/–	146	150
15	200	90	196 (1/2")	172	182	51	70	146	150
20	200	90	206 (3/4")	176	182	61	80	146	155
25	200	90	206 (1")	186	182	71	90	151	160
32	200	90	233 (1 1/4")	197	189	82	100	156	165
40	200	110	256 (1 1/2")	220	210	92	116	161	173
50	200	110	261 (2")	231	217	107	136	169	183
65	200	130	–	upon agreement	upon agreement	127	151	179	191
80	200	130	–	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	–	–	–	–	–	–	–	–
600	600	–	–	–	–	–	–	–	–

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

INDUSTRIAL FLOW METER

FLOW 33 Ex



Additional construction for Ex version

Power	*24 V DC±15 % (Pi 1,904 W)*
Electrical connection	*throught Amphenol C016 (7 Pin) connector for I M2 Ex Mb I and I M1 Ex ia I ma* *throught Sealcon M23 (7 Pin) connector for II 1G Ex ia IIC T6 Ga* *and II 1D Ex ia IIIC T85 °C Da*
Diameter nominal	*DN 15÷200*
Lining material	*rubber (hard, soft, with potable water test certificate)* *PTFE*
Outputs	*pulse or frequency 5÷15 Hz, current loop 4÷20 mA or 0,2÷1 mA*
Classification	*I M2 Ex mb I* *I M1 Ex ia I Ma* *II 1G Ex ia IIC T6 Ga* *II 1D Ex ia IIIC T85°C Da*
Max. temperature of medium	*40 °C*
Max. ambient temperature	*55 °C*

The other parameters are consistent with technical data for FLOW 33.

It is an induction flow meter with optional full stainless steel construction designed for technological processes in industry where there are demanding requirements related to explosion hazard.

Due to its unique stainless steel construction, it is ideal for use where long service life is required also in extreme conditions. The meter is in compact design.

The meter is equipped with the pulse output with a variable impulse number or 5÷15 Hz output and 4÷20 mA or 0,2÷1 mA current loops.

PRODUCT ORDERING CODE

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

DN (diameter nominal)
DN… 4÷600**

A (design)
A1… compact

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

H (power)
H1… 24V DC±15 %

I (measuring range Q_{min}/Q_{max})
I1… 1/60

J (oposit connector M12, 8 pin)
J1… yes
J2… no

*Upon agreement with the manufacturer. **DN 4, 6, 8 PVDF only, accuracy 1%, flow range 1/60

FLOW 33 Ex

FL33Ex/DNxxx/A1/Bx/Cx/Dx/Ex/Fx/Gx/H1/I1/Jx/Kx

DN (diameter nominal)
DN… 15÷200

D (lining)
D1… hard rubber
D2… soft rubber
D3… rubber with potable water test certificate
D4… PTFE

G (output)
G1… pulses
G2… puls + 4÷20 mA
G3… puls + 0,2÷1 mA
G4… 5÷15 Hz
G5… 5÷15 Hz + 4÷20 mA
G6… 5÷15 Hz + 0,2÷1 mA

H (power)
H1… 24V DC±15 % (Pi 1,904W)

J (oposit connector)
J1… yes
J2… no

K (Atex)
K1… I M2 Ex mb I
K2… I M1 Ex ia I Ma
K3… II 1G Ex ia IIC T6 Ga
K4… II 1D Ex ia IIIC T85°C Da

The other points of order code are consistent with order code of FLOW 33.
Standard set include installation manual and calibration certificate.
For other requirements, please contact Kompauto directly.

Distributor:

KOMPAUTO™ INDUSTRIAL SOLUTIONS

Sweden:
Kompauto Nordic AB
Box 265, 771 26 LUDVIKA
Phone +46 10 130 10 00
E-mail: info@kompauto.se

Norway:
Kompauto Norway AS
Postboks 30, 5854 BERGEN
Phone: +47 55 55 86 99
E-mail: info@kompauto.no

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