

# FLOW 33

# FLOW 33 Ex

## INDUSTRIAL FLOW METER

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 C006 connector.

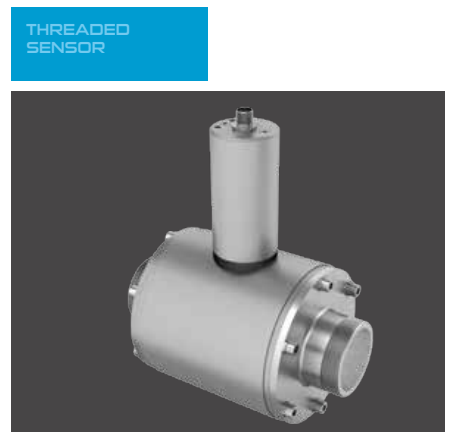
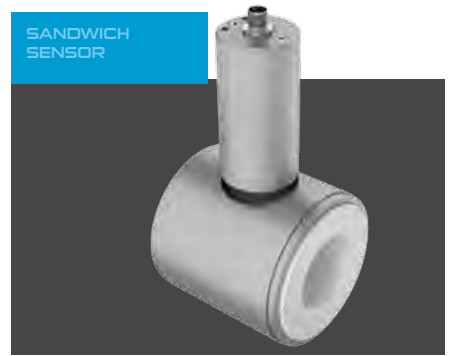


## MAIN MERITS

- 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 environment with
  - I M1 Ex ia I Ma
  - II 1G Ex ia IICT6 Ga
  - II 1D Ex ia IICT85°C Da

# 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 10÷400 (other DN upon agreement with the manufacturer)
Lining material (lining maximum temperature)	rubber (hard, soft, with potable water test certificate): DN 20÷DN 400 (T <sub>max</sub> 80 °C) PTFE: DN 10÷DN 400 (T <sub>max</sub> 150 °C for separate version) PFA, E-CTFE, 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 flanged DIN (EN1092) – carbon or stainless steel threaded (EN ISO 228-1) food grade (DIN 11851 fitting, clamp)
Pressure	PN10, PN16, PN25, PN40
Measured fluid min. conductivity	20 µS/cm (at a lower conductivity, upon agreement with the manufacturer)
Flow meter measuring range (Q <sub>min</sub> /Q <sub>max</sub> )	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 400)
Empty piping detection	DN 15÷DN 400
Display 2x LED	2x LED (meter's state is distinguished with 4 colours)
Setting	is done via Bluetooth (only for F33)
Outputs (passive)	pulse/flow switch (max. 1,6 kHz), 4÷20 mA
Max. ambient temperature	55 °C
Flow sensor degree of protection	IP65, IP67, IP68

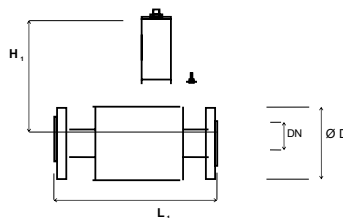


## FLOW RANGES

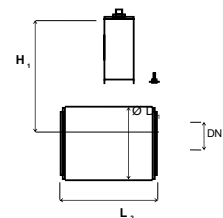
Instantaneous flow rate corresponding to flow velocity

Diameter nominal [mm]	Q <sub>min</sub> [m³/h] us Q <sub>min</sub> /Q <sub>max</sub>	Q <sub>max</sub> [m³/h]
	1/60 (0.2 m/s)	– (12 m/s)
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

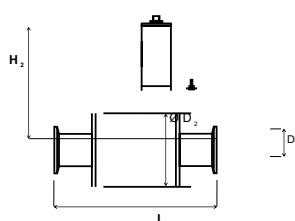
FLANGE  
(EN 1092)



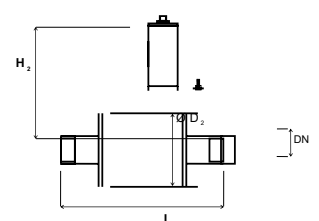
SANDWICH



CL AMP / FOOD THREAD  
(DIN 32676/ DIN 11851)

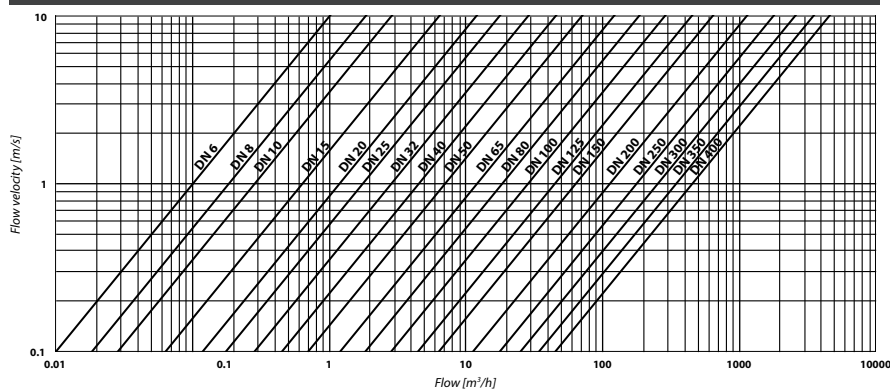


THREAD  
(EN ISO 228-1)



Constructional lengths can be modified upon agreement with the manufacturer.

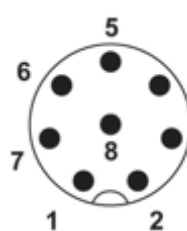
## VOLUMETRIC FLOW VERSUS INSTANTANEOUS FLOW RATE DIAGRAM



## 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

## 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	–



## DIMENSIONAL TABLE

Connection [mm]	Constructional length [mm]					Outside diameter [mm]			Total height of Compact design [mm]	
						Flange	Sensor body		Flanged	Threaded
	Flanged	Sandwich	Threaded	Sandwich						
			Food Thread		Food Thread		Food Thread			
DN	L1	L2	L3	L3	L3	D	D1	D2	H1	H2
10	–	90	–	–	–	–	51	–	146	–
15	200	90	133	133	161	95	51	70	146	150
20	200	90	141	139	161	105	61	80	146	155
25	200	90	147	149	169	115	71	90	151	160
32	200	90	155	155	169	135	82	100	156	165
40	200	110	175	177	189	145	92	116	161	173
50	200	110	–	181	193	160	107	136	169	183
65	200	130	–	211	229	180	127	151	179	191
80	200	130	–	221	229	195	142	177	186	204
100	250	200	–	–	–	215	168	–	199	–
125	250	200	–	–	–	245	194	–	212	–
150	300	200	–	–	–	280	224	–	227	–
200	350	200	–	–	–	335	284	–	257	–
250	450	–	–	–	–	405	–	–	300/–	–
300	500	–	–	–	–	440	–	–	325/–	–
350	550	–	–	–	–	500	–	–	355/–	–
400	600	–	–	–	–	565	–	–	385/–	–



## Additional construction for Ex version

Power	24 V DC ± 15 % (Pi 1,904 W)
Electrical connection	through Amphenol C006 (8 Pin) connector
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 M1 Ex ia I Ma II 1G Ex ia IIC T6 Ga II 1D Ex ia IIIC T85°C Da

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 mining 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.

FLOW 33	FL33/DNxxx	A1	Bx	Cx	Dx	Ex	Fx	Gx	H1	I1	Jx
<b>DN (diameter nominal)</b> DN... 10÷400											
<b>A (design)</b> A1... compact											
<b>B (connection)</b> B1... flanged B2... sandwich B3... threaded			B4... diary fitting B5... clamp B6... stainless steel flange								
<b>C (pressure)</b> C1... PN10 C2... PN16			C3... PN25 C4... PN40								
<b>D (lining)</b> D1... hard rubber D2... soft rubber D3... rubber with potable water test certificate			D4... PTFE D5... PFA D6... ceramics DN 15–80								
											<b>J (oposit connector M12, 8 pin)</b> J1... yes J2... no
											<b>I (measuring range Q<sub>min</sub>/Q<sub>max</sub>)</b> I1... 1/60
											<b>H (power)</b> H1... 24V DC ± 15 %
											<b>G (output)</b> G1... impulse G2... imp. + 4÷20 mA
											<b>F (sensor degree protection)</b> F1... IP65 F2... IP67 F3... IP68
											<b>E (electrodes)</b> E1... stainless steel 316 Ti E2... hastelloy C4 E3... titanium E4... tantalum
FLOW 33 Ex	FL33ex/DNxxx				Dx		Gx	H1	Jx	Kx	
<b>DN (diameter nominal)</b> DN... 15÷200											
<b>D (lining)</b> D1... hard rubber D2... soft rubber D3... rubber with potable water test certificate D4... PTFE											
											<b>K (Atex)</b> 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
											<b>J (oposit connector)</b> J1... yes J2... no
											<b>H (power)</b> H1... 24V DC ± 15 % (Pi 1,904W)
											<b>G (output)</b> 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

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 the manufacturer directly.