

Flow sensor type 236 for liquid media

Flow range

1.8 ... 240 l/min

Nominal diameters

DN 10 / 32

Temperature measurement

-40 ... +125 °C



The type 236 is based on the type 210 but incorporates a brass housing. The Vortex Sensor type 236 has a rugged construction of brass connection. This flow sensor is available with a larger variety concerning power supply and outputs.

You can choose between various versions as integrated temperature measurement. With no moving parts the flow sensor is not sensitive to debris, has marginal pressure loss and high accuracy.

- Flow measuring with voltage, current or frequency output
- Temperature non-sensitive measuring principle
- Excellent media resistance (measuring element not in contact with the media)
- CE conformity
- Wide application temperature range
- Marginal loss of pressure
- Measuring element not sensitive to debris
- Direct temperature measurement in the medium
- Drinking water approval KTW, W270, WRAS, ACS

Technical Overview

Flow measurement

Measuring principle	Vortex	Piezoelectric sensor element
Measuring range		1.8 ... 240 l/min
Nominal diameters		DN 10 / 25
Accuracy at < 50% fs (water)	< 1% fs	
Accuracy at > 50% fs (water)	< 2% measuring value	
Response time	Immediately Therefore suitable for spigot use.	Signal delay Response time
	Frequency output	< 100 ms < 5 ms
Analogue output		Signal delay Response time
		< 2 s < 500 ms

Temperature measurement

Measuring principle	Resistance	PT1000
Measuring range		-40 ... +125 °C
PT1000	Accuracy	class B DIN EN 60751
		@ T = 0 °C @ T ≠ 0 °C
0 ... 10 V	Measuring range	± 0.3 K ± 0.3 K ± 0.005 * ΔT
	Accuracy	-25 ... +125 °C ± 0.5 K ± 0.005 * ΔT
Temperature influences	Calculation temperature	T (°C) = ±150 °C / 10 V * U _{OUT,T} - 25 °C
	Self-heating at temperature sensor Conduction resistance to connector	1 K/mW 0.8 Ohm

Operating conditions

Medium	Suitable for heating circuit water with the usual additives Drinking water	Other medium on request
temperature	Media	≤ +125 °C
	Ambient Storage	-15 ... +85 °C -30 ... +85 °C
Max. pressure and medium temperature	(for lifetime)	12 bar at +40 °C
	(for lifetime)	6 bar at +100 °C
	(for 600 hours)	4 bar at +125 °C
	(for 2 hours)	4 bar at +140 °C
Cavitation	The following equation is valid to prevent cavitation: $P_{abs\ outer} / P_{difference} > 5.5$	(max. test pressure)
		18 bar at +40 °C

Materials in contact with medium (FDA-conform)

Sensor paddle	ETFE
Case with damming body	Brass (CuZn40PbZ), PA6T/6I (40% GF)
Sealing material	EPDM (perox.) (for drinking water)
	FPM

Electrical overview

		U _{IN}	Frequency output	Voltage output	Current output
Power supply		4.75 ... 33 VDC	11.5 ... 33 VDC	8 ... 33 VDC	
Output	Frequency square pulse signal	U _{OUT,Q_frequency}	< 0.5 ... > U _{IN} - 0.5 V	-	-
Flow (Q)	Analogue signal	U _{OUT,Q} or I _{OUT}	-	0 ... 10 V	4 ... 20 mA
Output	Resistant signal	R _{OUT PT1000}		PT1000 class B DIN EN 60751	
temperature (T)	Voltage signal	U _{OUT,T}		0 ... 10 V	-
Electrical connection and protection class			M12x1 (IP 65)	M12x1 (IP 65)	M12x1 (IP 65)
Load against GND or IN			< 1 mA / < 100 nF	< 6 mA / < 100 nF ¹⁾	< (U _{IN} - 8 V) / 20 mA
Current consumption load free (I _{IN})			< 2mA	< 5 mA	-
Electrical reliability	Short circuit, reverse voltage and external voltage protected within the admissible supply voltage.				

Weight

DN 10 with thread K	~ 170 g
DN 10 with thread G	~ 250 g
DN 32	~ 650 g

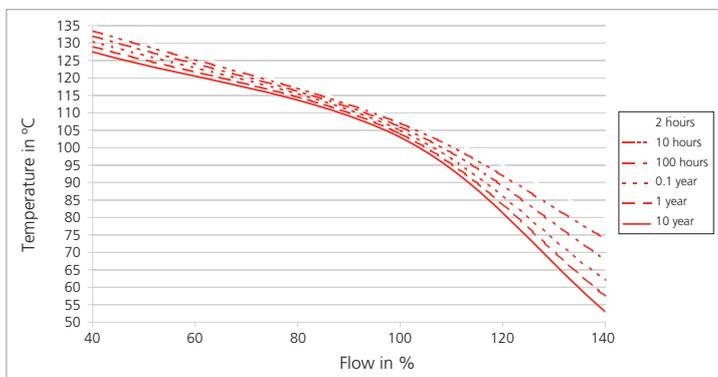
Test / Admissions

Electromagnetic compatibility	CE conformity acc. to EN 61326-2-3
Drinking water approval	WRAS, ACS
	Plastic parts with KTW and W270 approval

Packaging

Single packaging	
Multiple packaging	

Minimum life span on high flow rate and high temperature



Nominal diameters dependent variables

Nominal diameters	Tube connection	Measuring range	Quantity per pulse @ 50% fs	Flow range	Frequency range	Q ₀	K _f	K _v	K _i	Pressure drop ^{1), 2)}
DN 10	K	1.8 ... 32 l/min	1.416 ml	0.265 ... 4.716 m/s	23 ... 374 Hz	-0.2	0.0860	3.2	2.000	22.50 * Q ²
DN 10	G	1.8 ... 32 l/min	1.386 ml		24 ... 380 Hz		0.0847			22.50 * Q ²
DN 10	K	2.0 ... 40 l/min	1.419 ml	0.295 ... 5.895 m/s	26 ... 467 Hz	-0.2	0.0860	4.0	2.500	22.50 * Q ²
DN 10	G	2.0 ... 40 l/min	1.386 ml		26 ... 479 Hz		0.0840			22.50 * Q ²
DN 32	K	14 ... 240 l/min	27.513 ml	0.290 ... 4.974 m/s	9 ... 145 Hz	-1.47	1.64710	24	15.000	0.25 * Q ²

Characteristic line formula frequency output
 $Q_v = K_f * f + Q_0$

Characteristic line formula voltage output
 $Q_v = K_u * U_{OUT}$

Legend

Q _v	Volume flow rate	[l/min]
Q ₀	Axis intercept	[l/min]
K _f	Coefficient frequency output	[(l/min) / f]
K _v	Coefficient voltage output	[(l/min) / V]
K _i	Coefficient current output	[(l/min) / f]
f	Frequency	[Hz]
U _{OUT}	Voltage	[V]
I _{OUT}	Current	[mA]
quantity pulse	Quantity per pulse	litres pulse

Characteristic line formula current output
 $Q_v = K_i * (I_{OUT} - 4 \text{ mA})$

Formula quantity per pulse [litres/pulse]
 $\text{quantity pulse} = \frac{Q_v * K_f}{60 * (Q_v - Q_0)}$

Order code selection table

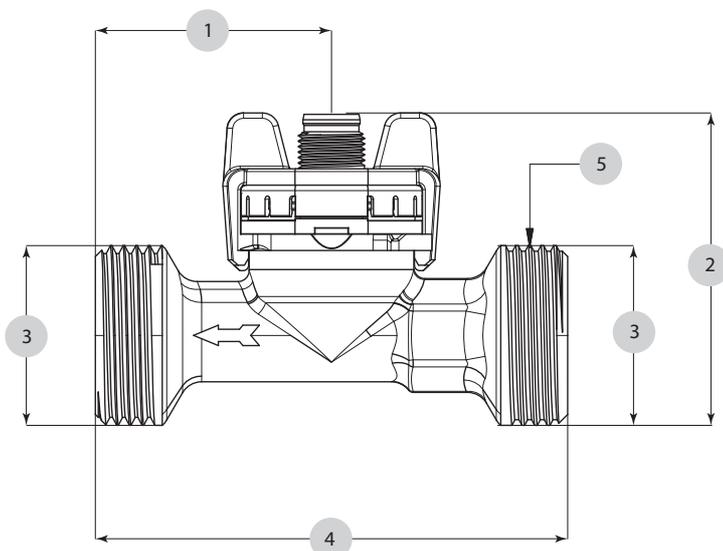
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		1	2	3	4	5	6	7
Version	Flow	9				4		
	Flow and temperature (PT1000)	8				5		
	Flow and temperature (0 ... 10 V)	6			3	5		
Nominal diameters and flow range	DN 10 1.8 ... 32 l/min.		1	0				
	DN 10 2.0 ... 40 l/min.		1	1				
	DN 32 14.0 ... 240 l/min.		3	2				K
Output and power supply	Frequency output (Square pulse signal)	8,9			2			
	Analogue signal				3			
Electrical connection	2- or 3-pole (condensation protection)	9			4			
	4- or 5-pole (condensation protection)	8,6			5			
Sealing material	EPDM Ethylene propylene rubber (peroxidically cross-linked)						1	
	FPM ³⁾ Fluoro elastomer						2	
Tube connection	K (DN 10 - G ½, DN32 - G 1 ½)							K
	G (DN 10 - G 1)							G

Accessories ⁴⁾

				Order number
Straight-wire box for connector M12x1 with cable	3-pole	200 cm		114605
Corner-wire box for connector M12x1 with cable	3-pole	200 cm		114604
Straight-wire box for connector M12x1 with cable	5-pole	200 cm	(with temperature)	114564
Corner-wire box for connector M12x1 with cable	5-pole	200 cm	(with temperature)	114563
Straight-wire box for connector M12x1 screwing terminal	5-pole			115024

Dimension diagram DN 10, 32



	1	2	3	4	5
DN10	43	57.3	G ½ / G 1	86	19
DN32	50	74.9	G 1 ½	134	41

¹⁾ incl. 3xDi inlet and outlet side

²⁾ Pv in Pa; Q in l/min

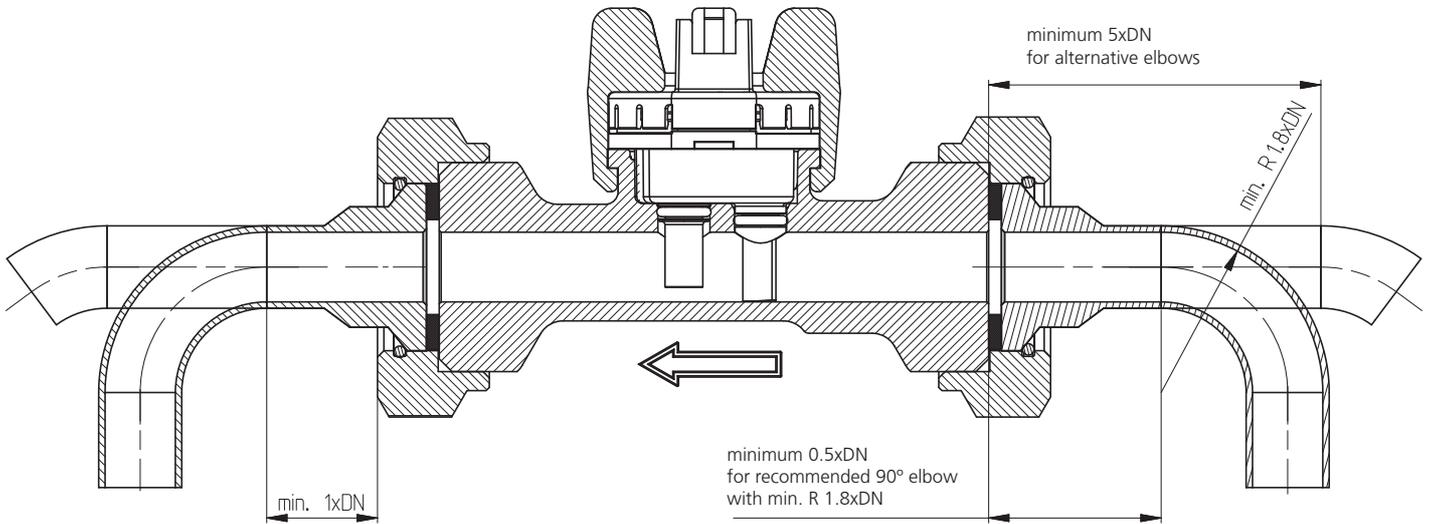
³⁾ No drinking water approval

⁴⁾ Accessories supplied loose

Tube mounting instructions

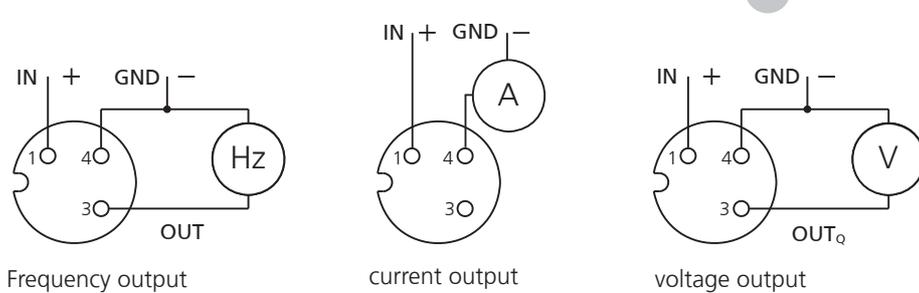
Consider the following to ensure the correct function of the sensor.

- Only diameter changes from large to small are allowed.
- Avoid repeated elbows in the same level at entryside



Electrical connection

Connector M12x1 without temperature measurement



Pin	Colour
1	brown
3	blue
4	black
1	brown
2	white
3	blue
4	black
5	gray

Connector M12x1 with temperature measurement

