Huba Control

FOR FINE PRESSURE AND FLOW MEASUREMENT

OEM Flow sensor for liquid media type 235

Flow range
1.8 ... 240 l/min

Nominal diameters
DN 10 / 32

Temperature measurement
-40 ... +125 °C

The type 235 is based on the type 200 but incorporates a brass housing. The flow sensor type 235 is based on the Kármán vortex trail. 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.

- Low cost product with high levels of accuracy
- Temperature non-sensitive measuring principle
- Excellent media resistance (measuring element not in contact with the media)
- Wide application temperature range
- Marginal loss of pressure
- Measuring element not sensitive to debris
- Direct temperature measurement in the medium with PT1000 or NTC

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	< 100 ms < 5 ms

Temperature measurement

Measuring principle	Resistance			PT1000 NTC
PT1000	Measuring range			-40 ... +125 °C
	Accuracy	Class B DIN EN 60751	@ T = 0 °C @ T ≠ 0 °C	± 0.3 K ± 0.3 K ± 0.005 * T
NTC	Measuring range			-40 ... +125 °C
	Accuracy	NTC 10 kOhm @ 25 °C β = 4050	@ T = +25 °C @ T < +25 °C @ T > +25 °C	± 0.7 K ± 0.7 K ± 0.025 * T ± 0.7 K ± 0.050 * T
Temperature influences		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 Ambient Storage	< +125 °C -15 ... +85 °C -30 ... +85 °C
Max pressure and medium temperature		(for lifetime) (for lifetime) (for 600 hours) (for 2 hours) (max. test pressure)	12 bar at +40 °C 6 bar at +100 °C 4 bar at +125 °C 4 bar at +140 °C 18 bar at +40 °C
Cavitation	The following equation is valid to prevent cavitation:		$P_{abs\_oulet} / P_{difference} > 5.5$

Materials in contact with medium (FDA-conform)

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

Electrical overview

Power supply		U_{IN}	5 VDC ±5%
Output flow (Q)	Frequency Square pulse signal	$U_{OUT\_Q\_Frequency}$	< 0.1 ... > 4.75 V
Output temperature (T)	Resistant signal	$R_{OUT\ PT1000}$ $R_{OUT\ NTC}$	PT1000 class B DIN EN 60751 NTC 10 kOhm @ 25 °C; β = 4050
Electrical connection and protection class	Connector RAST 2.5 / 2.54 Connector M12x1		IP 20 IP 65
Load against GND or IN			> 10 kOhm / < 10 nF
Current consumption I_{IN} load free		Version OEM Version standard	< 6 mA < 10 mA

Weight

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

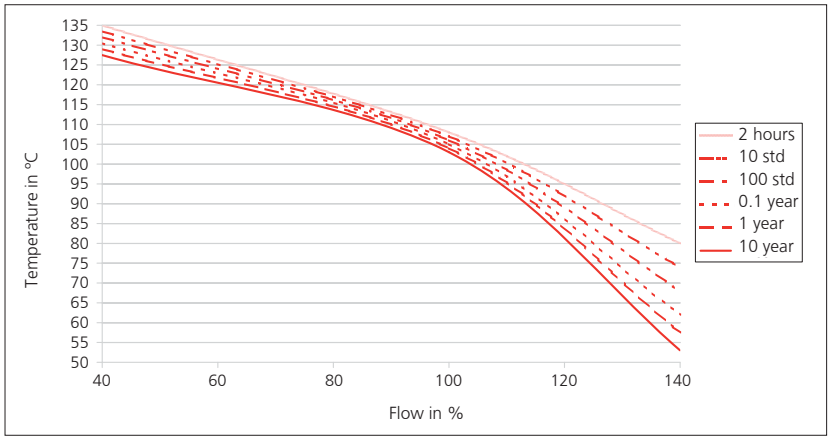
Test / Admissions

Electromagnetic compatibility	acc. to EN 61326-2-3 (no protection at surge)

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 puls @ 50% fs	Flow range	Characteristic line frequency output	Frequency range	Pressure drop [1), 2)]
DN 10	K	1.8 ... 32 l/min	1.416 ml	0.265 ... 4.716 m/s	0.0860 * f - 0.2	23 ... 374 Hz	22.50 * Q^2
DN 10	G	1.8 ... 32 l/min	1.386 ml	0.295 ... 5.895 m/s	0.0847 * f - 0.2	24 ... 380 Hz	22.50 * Q^2
DN 10	K	2.0 ... 40 l/min	1.419 ml	0.265 ... 4.716 m/s	0.0860 * f - 0.2	26 ... 467 Hz	22.50 * Q^2
DN 10	G	2.0 ... 40 l/min	1.386 ml	0.295 ... 5.895 m/s	0.0840 * f - 0.2	26 ... 479 Hz	22.50 * Q^2
DN 32	K	14 ... 240 l/min	27.513 ml	0.290 ... 4.974 m/s	1.6710 * f - 1.5	9 ... 145 Hz	0.25 * Q^2

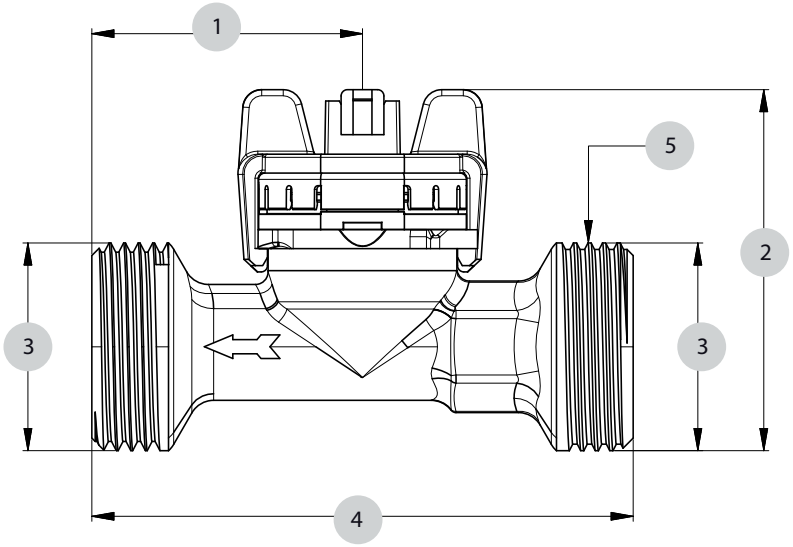
Order code selection table

					235.	X	X	X	X	X	X	X
Version	Flow					9						
	Flow and temperature (PT1000)					8			1			
	Flow and temperature (NTC)					7			1			
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 / power supply	Frequency output, 0 ... 5 VDC (Square pulse signal)			5 VDC	OEM	9			0			
	Frequency output, 0 ... 5 VDC (Square pulse signal)			5 VDC	Standard				1			
Electrical connection	3-pole connector	RAST 2.5				9				0		
	2x3-pole connector	RAST 2.5				7,8			1	1		
	3-pole connector	RAST 2.5	(condensation protection)			9				2		
	2x3-pole connector	RAST 2.5	(condensation protection)			7,8			1	3		
	3-pole circular connector	M12x1	(condensation protection)			9			1	4		
	5-pole circular connector	M12x1	(condensation protection)			7,8			1	5		
Sealing material	EPDM	Ethylene propylene rubber (peroxidically cross-linked)									1	
	FPM	Fluoro elastomer									2	
Tube connection	Brass with outside thread K (DN 10 - G ½ , DN32 - G 1 ½)											K
	Brass with outside thread G (DN 10 - G 1)											G

Accessories [3)]

				Order number
Connector RAST 2.5 with cable	3-pole	30 cm		111668
Connector RAST 2.5 with cable	3-pole	110 cm		101817
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
Connector RAST 2.5 with cable	2x3 pole	110 cm	(with temperature)	114629
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 1	86	19
DN32	50	74.9	G 1 ½	134	41

[1)] incl. 3xDi inlet and outlet side

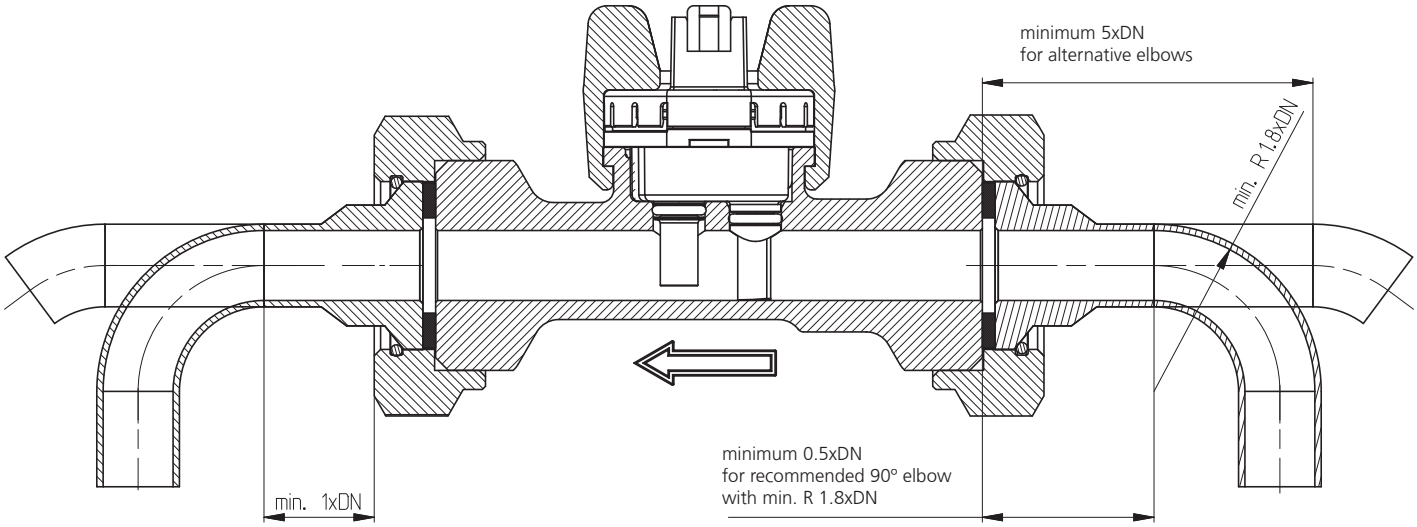
[2)] Pv in Pa; Q in l/min

[3)] Accessories supplied loose

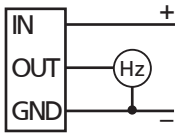
Tube mounting instructions

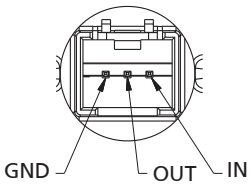
Consider the following to ensure the correct function of the sensor.

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

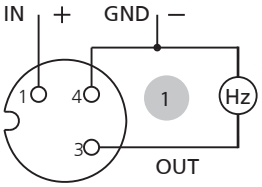


Electrical connections

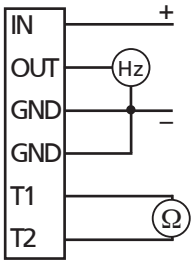


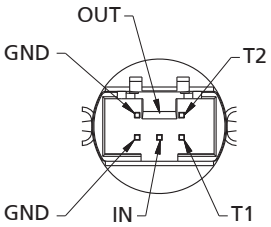


RAST 2.5 without temperature output

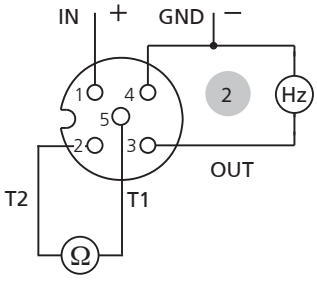


Connector M12x1 without temperature output





Connector 2x3-poles with temperature output



Connector M12x1 with temperature output

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

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