

FOR FINE PRESSURE AND FLOW MEASUREMENT

OEM Flow sensor type 235 for liquid media

Flow range 1.8 ... 240 l/min

Nominal diameters DN 10 / 32

Temperature measurement -40 ... +125 °C

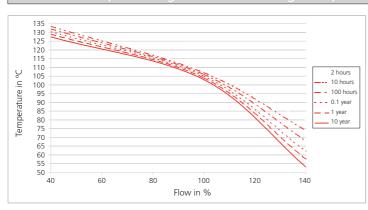


The type 235 is based on the type 200 but incorporates a brass housing. The flow sensor type 235 is based on the Kármán vortex trail. You can choose between various versions as integrated temperature measurement. With no moving parts the flow sensor is not sensitive to debris, has marginal pressure loss 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
- Drinking water approval KTW, W270, WRAS, ACS

Measuring principle Vortex Pezoelectric sensor. Measuring range 1.8., 240 Pmin Nominal diameters 2.1% fs. Accuracy at > 50% fs (water) < 2.9% measuring value Response time Immediately Signal delay < 100 ms Response time PT1000 NTC NTC Measuring principle Resistance PT1000 NTC PT1000 Accuracy Class B DIN EN 60751 © T = 0.7°C ± 0.3 K Measuring range 40 +125.7°C ± 0.3 K ± 0.3 K ± 0.3 K ± 0.7 K ± 0.05.7 K ± 0.					Flow measurement
18. 240 ymn	Piezoelectric sensor element	Vortex			
DN 10 / 25 Couracy at 50% fs (water)					
CCURROY at 5-50% ts (sweter)					
Course of all 5 50% fs (water) Immediately Signal delay Cl0 0ms Response time Immediately Signal delay Cl0 0ms Response time C 5 ms Response time					
Immediately Signal delay Cl00 ms					
Therefore suitable for spigot use. Response time C S ms		Signal dolay	1	lmn	accuracy at > 50 % 13 (water)
Measuring principle Resistance P11000 NTC NTC					Response time
Resistance Resistance Resistance Resistance Resistance Resistance A. D +125 °C 4.0.3 K 2.0.05 ° Δ 2.0.3 K 2.0.05 ° Δ					emperature measurement
Measuring range				Resistance	Measuring principle
Accuracy Class B DIN EN 60751 ② T = 0°C				Massuring range	
Accuracy Class B DIN EN 60/51 @ T = 0°C ± 0.3 (x ± 0.005 * Δ Accuracy Measuring range 40		@ T 0.0C		ivieasuring range	
Measuring range			ass B DIN EN 60751	Accuracy	11000
NTC 10 kOhm @ 25 °C		@ I ≠ 0 °C		*	
Accuracy β = doS0		0.7.05.00		Measuring range	
Accuracy β = 4050 Ø1 < ±2.5°C ± 0.7 K ± 0.025° X ± 0.7 K ± 0.050° X of T > ±2.5°C ± 0.7 K ± 0.050° X of T > ±0.5°C ± 0.7 K ± 0.050° X of T > ±0.5°C ± 0.7 K ± 0.050° X of T > ±0.5°C ± 0.7 K ± 0.050° X of T > ±0.5°C ± 0.7 K ± 0.050° X of T > ±0.5°C ± 0.7 K ± 0.050° X of T > ±0.7 K ± 0.050° X of T			°C 10 kOhm @ 25 °C		ITC
Self-heating at temperature sensor Conduction resistance to connector 0.8 Ohm Departing conditions Medium Sutable for heating circuit water with the usual additives Other medium on reperature Storage 7.0 Ohm of the medium of the properature of the properatur				Accuracy	IIC .
Conduction resistance to connector 0.8 Ohm		@ T > +25 °C			
Deerating conditions Medium Suitable for heating circuit water with the usual additives Prinking water Medium Anabient -15+85 °C Ambient -15					iomporature influences
Addition Suitable for heating circuit water with the usual additives Drinking water Media < +125 °C Ambient -15 +85 °C Storage -30 +85 °C Storage -30 +85 °C (for lifetime) 12 bar at +40 °C (for lifetime) 6 bar at +100 °C (for 600 hours) 4 bar at +125 °C (for 600 hours) 5 have at 140 °C (for 600 hours) 5 have at 140 °C (for 600 hours) 6 bar at +100 °C (for 600 hours) 7 have at 140 °C (for 600 hours) 8 bar at +40 °C (for 600 hours) 1 bar at +40 °C (for 600 hours) 2 have at 140 °C (for 600 hours) 3 have at 140 °C (for 600 hours) 4 bar at +125 °C (for 600 hours) 4 bar at +125 °C (for 600 hours) 5 have at 140 °C (for 600 hours) 4 bar at +100 °C (for 600 hours) 5 have at 140 °C (for 600 hours) 6 bar at 1400 °C (for 600 hours) 1 bar at +40 °C (for 600 hours) 1 bar at +40 °C (for 600 hours) 1 bar at +100 °C (for 600	0.8 Ohm		onduction resistance to connector		emperature iniliaetices
Prinking water Media 4-125 °C Ambient -15 +85 °C Storage -30 +85 °C Storag					perating conditions
Media	Other medium on request				Лedium
Storage -30 +85 °C -30 °C -30 +85 °C -30 °C		Media			
Storage 30 +85 °C 150 rigitime 12 bar at +40 °C 16 rigitime 12 bar at +40 °C 16 rigitime 16 bar at +100 °C 16 rigitime 16 bar at +100 °C 16 rigitime 16 bar at +100 °C 16 rigitime 16 bar at +125 °C 16 rigitime 16 bar at +140 °C 16 rigitime	-15 +85 °C	Ambient			emperature
(for lifetime) 1.2 bar at +40 °C (for lifetime) 6 bar at +100 °C (for filetime) 6 bar at +100 °C (for floor hours) 4 bar at +1125 °C (for 2 hours) 4 bar at +125 °C (for 2 hours) 18 bar at +40 °C (for 2 hours) 18 bar at +40 °C (max test pressure) 18 bar at +40 °C (max te	-30 +85 °C	Storage			,
Abar pressure and needium temperature (for 600 hours) 4 bar at +125 °C (for 2 hours) 4 bar at +140 °C (max. test pressure) 18 bar at +40 °C (max. test pressure) 18 bar at +40 °C (max. test pressure) 18 bar at +40 °C					
Abar pressure and seedium temperature (for 600 hours) 4 bar at +125 °C (for 2 hours) 4 bar at +140 °C (max. test pressure) 18 bar at +40 °C (max. test pressure) 18 bar at +40 °C (max. test pressure) 18 bar at +40 °C					
Indedium temperature					
The following equation is valid to prevent cavitation: Rabar at +40 °C					nedium temperature
Asterials in contact with medium (FDA-conform) ensor paddle ase with damming body ealing material ETFE					
Atterials in contact with medium (FDA-conform) ensor paddle ase with damming body ealing material ETFE Brass (CuZn40PbZ), for or o			- fallenting contains to half a grant garden		
ensor paddle lase with damming body ealing material STFE	Pabs_oulet / Pdifference > 5.5	. Cavitation:	e rollowing equation is valid to prevent	(FDA - () ()	
EPDM (perox.) (for defermination of EPDM) (perox.) (perox	ETFE			n (FDA-contorm)	
Electrical overview State	Brass (CuZn40PbZ), PA6T/6I (40% G				Case with damming body
Electrical overview State	EPDM (perox.) (for drinking water)				
Version OEM Version Standard Version Standar					iealing material
Dutput flow (Q) Frequency Square pulse signal Dutput temperature (T) Resistant signal Resistant signal Resistant signal ROUT PT1000 ROUT PT1000 ROUT PT1000 ROUT PT1000 ROUT PT1000 ROUT RAST 2.5 / 2.54 IP 20 Connector RAST 2.5 / 2.54 IP 20 Connector M12x1 IP 65 Connector M12x1 IP 65 Soad against GND or IN Current consumption I _N load free Version OEM < 6 mA Version standard < 10 mA Version thread K NO 10 with thread K NO 10 with thread G NO 10 with thread G NO 32 ROUT PT1000 PT1000 class B DIN I ROUT PT1000 PT1000 class B DIN I NOT 10 kOhm @ 25 Connector RAST 2.5 / 2.54 IP 20 Connector M12x1 IP 65 Version OEM < 6 mA Version standard < 10 mA					Electrical overview
Resistant signal Rout PT1000 class B DIN 1 Rout NTC 10 kOhm @ 25 Identical connection Rout NTC 10 kOhm @ 25 Connector RAST 2.5 / 2.54 P 20 Connector M12x1 IP 65 Connector M12x1 IP 65 > 10 kOhm / < 10 n Version OEM < 6 mA Version standard < 10 mA Version thread K N 10 with thread K N 10 with thread G N 32 ~ 650 g		U _{IN}			
Resistant signal Resistant signal ROUT NTC	< 0.1 > 4.75 V	U _{OUT_Q_Frequency}	equency Square pulse signal		utput flow (Q)
lectrical connection Independent of the connection of the connecti	PT1000 class B DIN EN 60751	R _{OUT PT1000}			(7)
lectrical connection nd protection class oad against GND or IN current consumption I _N load free Version OEM Version standard Version Standa	NTC 10 kOhm @ 25 °C; β = 4050		sistant signal		output temperature (1)
Indiprotection class India class					lectrical connection
250 g 250					
urrent consumption I _N load free Version OEM < 6 mA Version standard < 10 mA Veight N 10 with thread K N 10 with thread G N 32 Version OEM < 6 mA Version standard < 10 mA × 170 g ~ 250 g ~ 650 g		CONNECTOR INTEXT			
urrent consumption I _№ load free Version standard < 10 mA Veight N 10 with thread K N 10 with thread G N 32 Version standard < 10 mA ~ 170 g ~ 250 g ~ 650 g		Version OEM			Dad against divid of th
Veight ~ 170 g N 10 with thread K ~ 170 g N 10 with thread G ~ 250 g N 32 ~ 650 g					urrent consumption I _{IN} load free
N 10 with thread K ~ 170 g N 10 with thread G ~ 250 g N 32 ~ 650 g					Veight
N 10 with thread G ~ 250 g N 32 ~ 650 g	~ 170 g				
N 32 ~ 650 g					
est / Admissions					
					est / Admissions
ectromagnetic compatibility acc. to EN 61326-2-3 (no protection at surge)	protection at surge)				
wras, acs		WRAS, ACS			
Drinking water approval Plastic parts with KTW and W270 approval	W270 approval	Plastic parts with KTW and			minking water approval

Minimum life span on high flow rate and high temperature



Packaging
Single packaging
Multiple packaging

Nominal diameters	Tube connection	Measuring range	Quantity per pulse @ 50% fs	Flow rate	Frequency range	Q ₀	K _f	Pressure drop 1), 2)	
DN 10	K	1.8 32 l/min	1.416 ml	0.365 4.716	23 374 Hz	0.3	0.0860	22.50 * Q ²	
DN 10	G	1 1.8 32 I/MIN					0.0847	22.50 ^ Q*	
DN 10	К	2.0 40.16	1.419 ml	0.205	26 467 Hz	0.3	0.0860	22.50 * Q ²	
DN 10	G	2.0 40 l/min	1.386 ml	0.295 5.895 m/s	26 479 Hz	-0.2	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	1.671	0.25 * Q ²	

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

Formula quantity per pulse [litres/pulse]

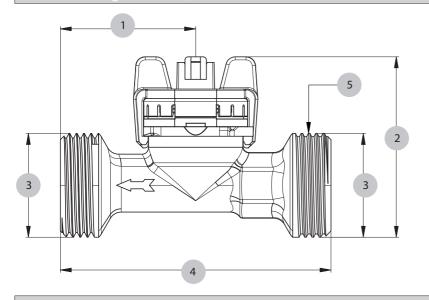
 $\frac{\text{quantity}}{\text{pulse}} = \frac{Q_{\text{v}} * K_{\text{f}}}{60 * (Q_{\text{v}} - Q_{\text{o}})}$

Lea	end

Q_V	Volume flow rate	[l/min]
Q_0	Axis intercept	[l/min]
K _f	Coefficient frequency output	[(l/min) / f]
f	Frequency	[Hz]
quantity pulse	Quantity per pulse	litres pulse

					1	2	3	4	5	6	7
Order code selection	on table			235.	Χ	Χ	Χ	Χ	Χ	X	Χ
	Flow				9						
Version	Flow and temperature (PT10	000)			8			1			
	Flow and temperature (NTC)			7			1			
Nominal diameters and	DN 10 1.8 32 l/m	in.				1	0				
flow range	DN 10 2.0 40 l/m	in.				1	1				
now range	DN 32 14.0 240 l/m	in.				3	2				Κ
Output / power supply	Frequency output, 0 5 VI	DC (Square pulse signal)	5 VDC	OEM	9			0			
Output / power supply	Frequency output, 0 5 VI	OC (Square pulse signal)	5 VDC	Standard				1			
	3-pole connector	RAST 2.5			9				0		
	2x3-pole connector	RAST 2.5			7,8			1	1		
Electrical connection	3-pole connector	RAST 2.5	(condensation protection)		9				2		
Electrical conflection	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		ene rubber (peroxidically cro	ss-linked)							1	
	FPM ³⁾ Fluoro elastome	er								2	
Tube connection	Brass with outside thread	K (DN 10 - G ½ , DN32 - G	1 ½)								Κ
Tube connection	brass with outside tillead	G (DN 10 - G 1)									G

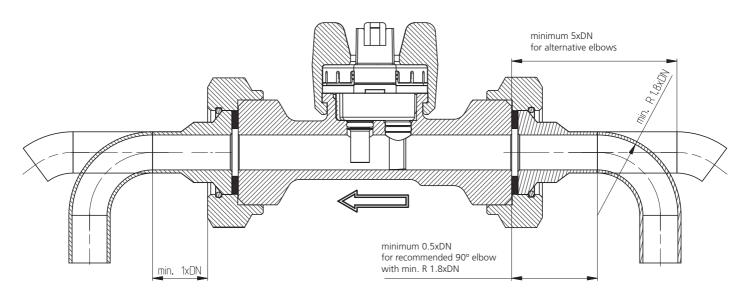
				Order number
Connector RAST 2.5 with cable	3-pole	30 cm		111668
Connector RAST 2.5 with cable	3-pole	110 cm		101817
Straight-wire box for connector M12x1 with cable	3-pole	200 cm		114605
Corner-wire box for connector M12x1 with cable	3-pole	200 cm		114604
Connector RAST 2.5 with cable	2x3 pole	110 cm	(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



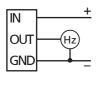
	1	2	3	4	5
DN10	43	57.3	G ½/G1	86	1 9
DN32	50	74.9	G 1 ½	134	4 3 41

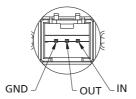
Consider the following to ensure the correct function of the sensor.

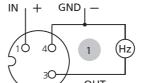
- Only diameter changes from large to small are allowed.
- Avoid repeated elbows in the same level at entryside

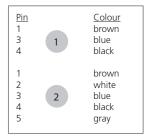


RAST 2.5 without temperature output

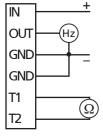


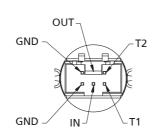




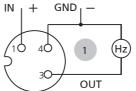


Connector 2x3-poles with temperature





Connector M12x1 without temperature output



Connector M12x1 with temperature output