

→ Thread connections

→ QuickFasten



VORTEX FLOW SENSORS



Contains products with:



DS_Vortex_Flow_Sensors 01/2016



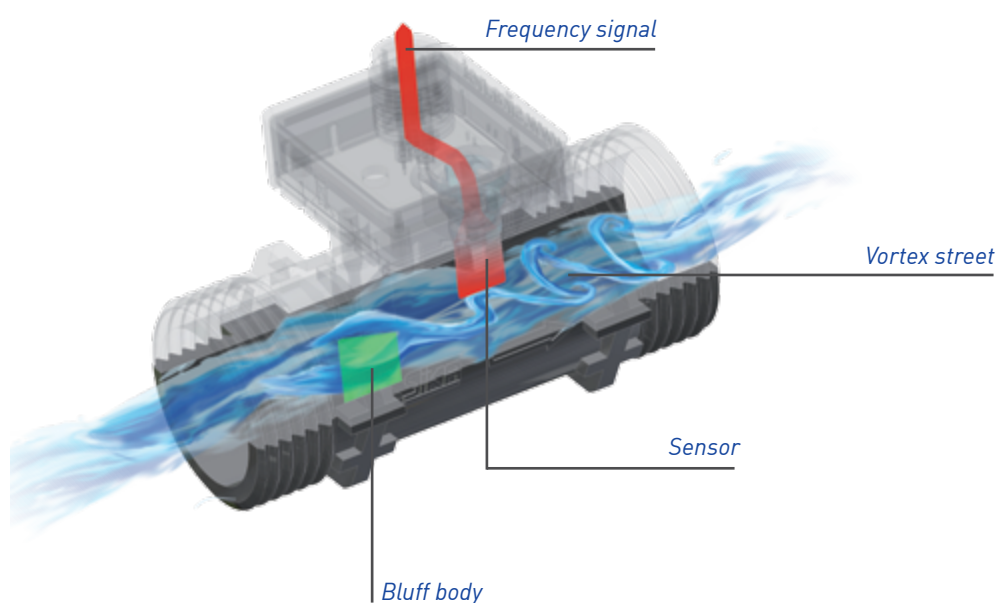
Vortex flow sensors

Principle of operation

Alternate vortices rotating in opposite directions are generated behind a bluff body immersed in a flow. The vortices detach from the edges of the bluff body and form a Kármán vortex street in the fluid stream. The distance between the single vortices is constant. The frequency of the vortices flowing past a sensor depends on the flow rate and is proportional to the flow. The sensor detects these vortices which are then converted to an electrical frequency signal.

Some of the advantages of this measuring principle

- Minimal flow obstruction → low pressure drop
- Wide range of applications in terms of pressure, temperature and density
- Independent of the conductivity of the medium
- High long-term stability / no zero drift



Advantages

- Solid state flow sensor for liquids with no moving parts
→ no mechanical wear
- Rugged glass fibre reinforced plastic ensures highest strength and performance
- Completely encapsulated piezoceramic sensor to detect the vortices
→ thus no direct contact with the medium
- Wide measuring span (1:20)
- Temperature sensor integrated
- Output signals: an analogue voltage signal and / or frequency signal is available for the flow, and a resistance or analogue signal is available for the temperature.
- High interference resistance
- Wetted parts metal-free
- 100 % final test with six test points (flow rates)
- Traceability by serial number
- Thread connection or QuickFasten



Vortex flow sensors

Series VVX

Encapsulated piezoceramic sensor



Type VVX15

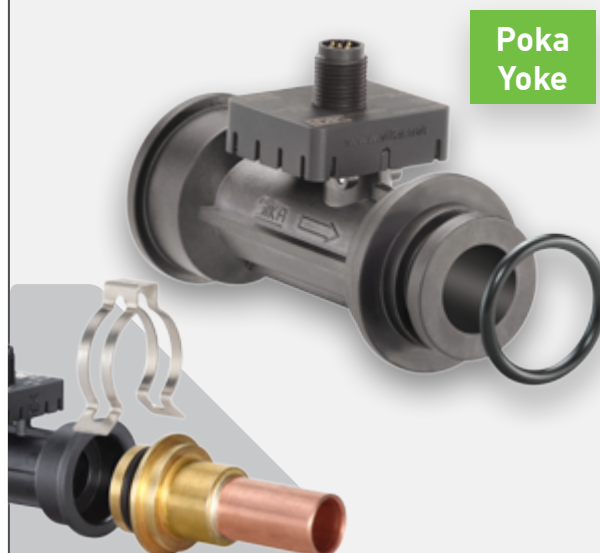


Technical data	VVX15	VVX20	VVX25
Nominal diameter	DN 15	DN 20	DN 25
Process connection	G¾-ISO 228 male, incl. O-rings optional G½	QuickFasten	G 1¼-ISO 228 male, incl. O-rings optional G 1
Inner diameter	Ø 13 mm	Ø 19 mm	Ø 25 mm
Flow range	2...40 l/min	5...80 l/min	7...150 l/min
Accuracy	±2 % of range*		
Repeatability	±0,5 % or ±1 %, see temperature ranges ambient		
Medium	Water and aqueous lotion, deviations with high viscous media		
Pressure rating	PN10		
Temperature ranges			
Medium	5...90 °C, -20...90 °C**		
Ambient	5...70 °C → Repeatability ±0,5 %, -20...70 °C → Repeatability ±1 %		
Degree of protection EN 60529	5-pin plug M12 x 1 → IP65*** 5-pin RAST 2.5 → IP20***		
Electrical data			
Electrical connection	5-pin plug connector M12 x 1 or 5-pin RAST 2.5		
Power supply	8...30 V DC or 5 V DC (±5 %)		
Current consumption	< 15 mA		
Approvals			
			
Option			
	Recognized component ETL according to UL und CSA Standards		Recognized component ETL according to UL und CSA Standards

Type VVX25



Type VVX20



Two different versions available:

- Frequency output
- Analogue and frequency output

Frequency output	VVX15	VVX20	VVX25
Output signal flow	Frequency signal, square wave, pulse duty ratio 50:50, signal current max. 20 mA		
Pulse rate	500 1/l [optional 3...1000 1/l]	200 1/l [optional 2...800 1/l]	100 1/l [optional 1...500 1/l]
Output signal temperature	Pt1000 2 wire, class B or NTC 10,74k, B 0/100 3450 or none		

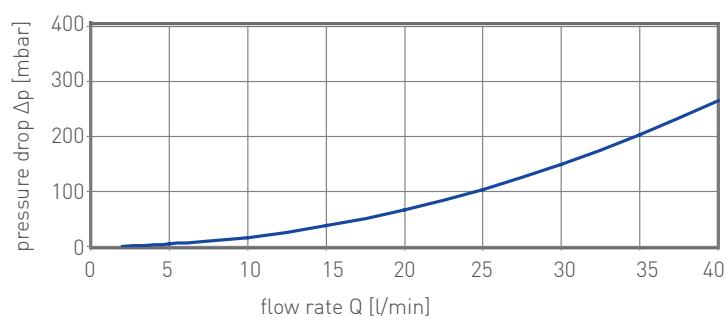
Analogue output	VVX15	VVX20	VVX25
Output signal flow	Voltage signal 0,5...3,5 V		
Scaling	2...40 l/min	5...80 l/min	7...150 l/min
Voltage rate	0.07895 V / l/min	0.04000 V / l/min	0.02098 V / l/min
Output signal temperature	Voltage signal 0,5...3,5 V corresponds to 0...90 °C or Pt1000 2 wire, class B or NTC 10.74k, B 0/100 3450 or none		

* Test conditions:
 → Test medium water
 → Media temperature 20...30 °C
 → Inlet pressure 7...10 bar
 → Defined inlet and outlet pipes (see operating manual)

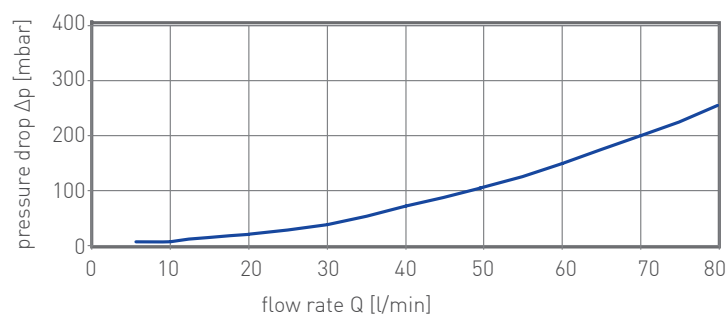
*** With attached cable socket

** Temperature cycle test: -20 °C / 70 °C, 0 % rH, cycle time 1.5 h, temperature gradient approx. 2.5 K/min, hold time at -20 °C and 70 °C 10 min each, 90 cycles: no failures

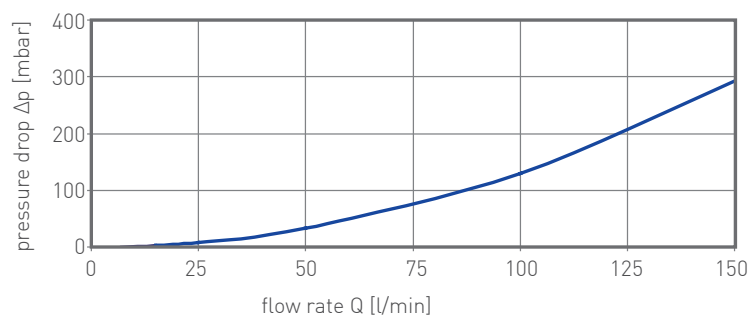
Typical pressure drop VVX15



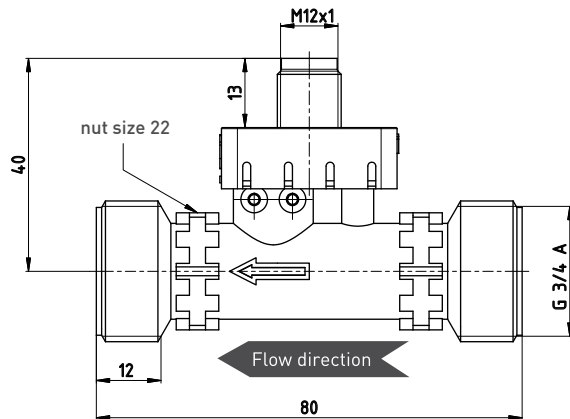
Typical pressure drop VVX20



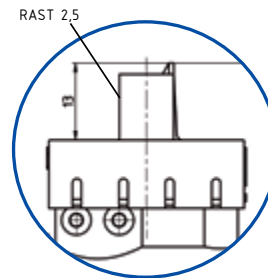
Typical pressure drop VVX25



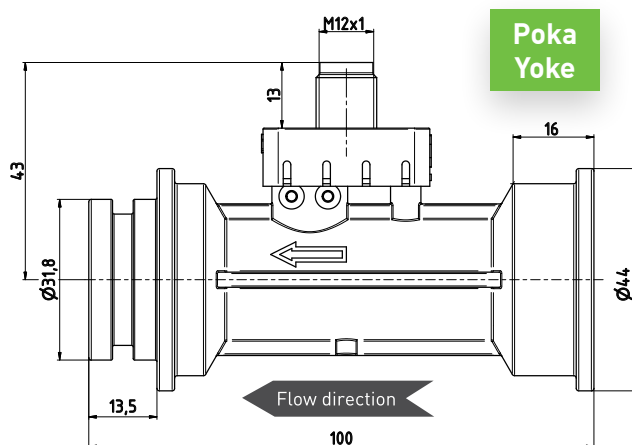
VVX15



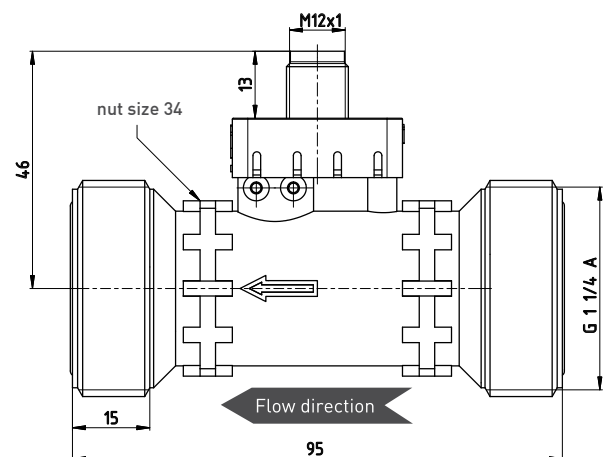
Alternative electrical connection



VVX20



VVX25



Materials in contact with media

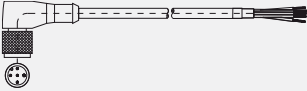
Body /tube	PPS Fortron® 40 % GF
Sensor	ETFE Tefzel®
O-rings	EPDM

Version frequency output

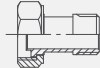
Order code	Example → VVXA1S						
	G	A	RRRP	1	5	14	
Nominal diameter							
DN 15	VXA1S	A					14
DN 20	VXC9S	B					2P
DN 25	VXB2S	B					16
Power supply							
8...30 V DC	G			1			
5 V DC	P			2			
Output signal temperature							
Pt1000			RRRP				
NTC 10.74K			RRRN				
none			0000				
Electrical connection							
5 pin plug M12 x 1						5	
RAST 2.5 plug						2	

Version analogue output and frequency output

Order code	Example → VVXA1SNAU1						
	RP	1	5	14			
Nominal diameter							
DN 15	VXA1SNAU1						14
DN 20	VXC9SNBUC						2P
DN 25	VXB2SNBU2						16
Output signal temperature							
0.5...3.5 V	U1						
Pt1000	RP						
NTC 10.74K	RN						
none	00						
Power supply							
8...30 V DC			1				
5 V DC			2				
Electrical connection							
5 pin plug M12 x 1						5	
RAST 2.5 plug						2	

Accessories	Length	Order code	
Connection cable with 5 pin cable socket M12 x 1, angle type molded lead 5 x 0.34 mm ² , sheathing material PVC (T _{max} = 80 °C)*	1 m	XV VX040	
	2 m	XV VX051	
	3 m	XV VX039	
	5 m	XV VX041	
	10 m	XV VX042	
Connection cable with 5 pin cable socket M12 x 1, molded lead 5 x 0.34 mm ² , sheathing material PVC, 4 pin Molex MicroBlade wire-to-board housing, (T _{max} = 80 °C)	1.5 m	XV VX065	
PVC-Ribbon cable 5 x AWG24 with RAST 2.5 duomodul	1 m	XV VX031	
	2 m	XV VX021	

* Connection cable with UL approval on request

Accessories VVX15	Order code**	
Screw coupling G½, brass	BV VX1007	
Soldering coupling Ø 15 mm, brass	BV VX1008	

Accessories VVX20	Order code**	
O-ring for QuickFasten, EPDM	XV VX061	
Joint clip QuickFasten, stainless steel	XV VX052	

Accessories VVX25	Order code**	
Screw coupling R1, brass	BV VX1003	
Soldering coupling Ø 28 mm, brass	BV VX1004	
Bonding coupling Ø 25 mm, PVC	BV VX1005	
Screw coupling G 1, stainless steel 1.4571	BV VX1006	

** Supplied piecewise

