

## Vortex flow sensors // VVX for fluids



US version available

VVX20

**Note:** The US versions are separate products.  
The units are not converted, but pre-configured at the factory for the respective variants.



VVX20 QuickFasten

Poka  
Yoke

### 100 %

- Final water flow test by testing robot
- Adjustment of output signal and calibration at 3 test points  
→ Traceable measurement performance
- Recording of the test data  
→ Test protocols available for customers
- Traceability via serial number

### µController

- Customer-specific adaptation through approx. 60 software parameters
- Software filter (optional)  
→ exact flow measurement even with vibrations

### Final test by testing robot



### encapsulated piezoceramic sensor element



### Reliable

- Piezoceramic sensor element completely encapsulated  
→ no direct medium contact  
→ dirt-resistant and fail-safe
- CE Marking
- OEM product developed and produced in Germany

### Test reports for customers

- SIKA test labs - many qualification tests
  - Temperature shock
  - Contamination
  - and many other tests
- Test SIKA VVX in provided customer hydraulics
  - Optimization of the measurement performance in real installation situation
- Sample devices can be supplied with works test certificate

#### Test in provided customer hydraulics



### QuickFasten

- Quick and safe plug-in connection
  - Poka Yoke
- Toolless assembly
- Form-fit connection

#### QuickFasten





### Reliable partnership with SIKA

- More than 45 years of experience with flow sensors in heaters
- Leading heat pump manufacturers trust in SIKA Vortex flow sensors

### General information on the 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.

- Minimal flow obstruction → low pressure drop
- Independent of the conductivity of the medium
- High long-term stability / no zero drift

Type	VVX15	VVX20	VVX25
Nominal diameter	DN 15	DN 20	DN 25
Nominal pipe size	½"	¾"	1"
Process connection	G¾-ISO 228 male, incl. O-rings	QuickFasten or G1-ISO 228 male, incl. O-rings	G 1¼-ISO 228 male, incl. O-rings
Process connection	½" NPT	¾" NPT or QuickFasten	1" NPT
Inner diameter [mm]	Ø 13	Ø 19	Ø 25
Inner diameter [inch]	0.5	0.75	1
Medium	Water and aqueous solution		
Pressure rating	PN 10		
Pressure rating	Max. 145 psi		
Degree of protection EN 60529	IP65 and IP67 (each with attached cable socket)		
<b>Flow measuring</b>			
Flow range [l/min]	2...40*	5...80*	7...150*
Flow range [US gpm]	0.5...10*	1.3...21*	2...40*
Accuracy	±2 % of range*, deviations with media of higher viscosity		
Repeatability	±1 % at -20...5 °C Umgebungstemperatur ±0.5 % at 5...70 °C Umgebungstemperatur		
Repeatability	±1 % at -4...41 °F ambient temperature ±0.5 % at 41...158 °F ambient temperature		
<b>Temperature ranges</b>			
Medium	-20...90 °C (non-freezing)		
Medium	-4...194 °F (non-freezing)		
Ambient	-20...70 °C		
Ambient	-4...158 °F		
<b>Electrical data</b>			
Electrical connection	5-pin plug connector M12 x 1		
Power supply for output signal Push Pull (optional NPN) NPN 4...20 mA or 0...10 V	8...30 V DC 5 V DC 12...24 V DC		
Current consumption	< 15 mA		
<b>Approvals</b>			
	WRAS pending		
	 <ul style="list-style-type: none"> <li>• Conforms to ANSI UL Std.61010-1</li> <li>• Cert. to CAN/CSA C22.2 No.61010-1</li> </ul>	 <ul style="list-style-type: none"> <li>• Conforms to ANSI UL Std.61010-1</li> <li>• Cert. to CAN/CSA C22.2 No.61010-1</li> </ul>	
ETL only available for version with frequency output and version with analog output (0.5...3.5 V) and frequency output			

\* Test conditions:

- Test medium water
- Media temperature 20...30 °C / 68...86 °F
- Inlet pressure 7...10 bar / 102...145 psi
- Defined inlet and outlet pipes (see operating manual)

Three different versions available:

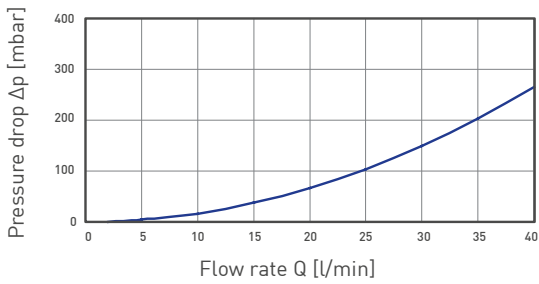
- Frequency output (1)
- Analogue 0.5...3.5 V and frequency output (1 and 2)
- Analogue 0...10 V or 4...20 mA and frequency output (1 and 3)

Frequency output 1	VVX15	VVX20	VVX25
<b>Output signal flow</b>	Frequency signal, square wave, pulse duty ratio 50:50, signal current max. 20 mA		
<b>Pulse rate [1/l]</b>	500 (optional 3...1000)	200 (optional 2...800 )	100 (optional 1...500)
<b>Pulse rate [pulses/gallon]</b>	2000 (optional 12...4000)	750 (optional 8...3000)	400 (optional 4...2000)
<b>Output signal temperature</b>	Pt1000 2 wire, class B or NTC 10.74k, B 0/100 3450 or none		

Analogue output 2	VVX15	VVX20	VVX25
<b>Output signal flow</b>	0.5...3.5 V		
<b>Scaling [l/min]</b>	2...40	5...80	7...150 l/min
<b>Scaling [US gpm]</b>	0.5...10	1.3...21	2...40 GPM
<b>Voltage rate</b> → 0.5...3.5 V	0.07895 V / l/min	0.04000 V / l/min	0.02098 V / l/min
<b>Voltage rate [V / US gpm]</b> → 0.5...3.5 V	0.31579	0.15228	0.07895
<b>Output signal temperature</b>	Voltage signal 0.5...3.5 V corresponds to 0...90 °C / 32...194 °F or none		

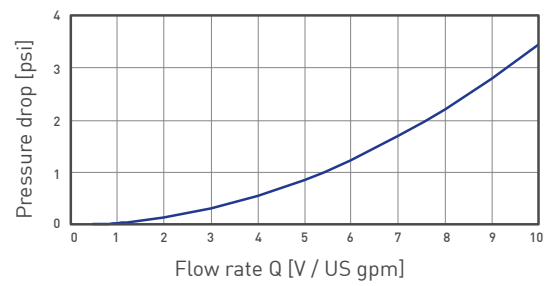
Analogue output 3	VVX15	VVX20	VVX25
<b>Output signal flow</b>	0...10 V or 4...20 mA		
<b>Scaling [l/min]</b>	0...40	0...80	0...150
<b>Scaling [US gpm]</b>	0...10	0...21	0...40
<b>Voltage rate [V / l/min]</b> → 0...10 V	0.25000	0.12500	0.06667
<b>Current rate [mA / l/min]</b> → 4...20 mA	0.40000	0.20000	0.10667
<b>Voltage rate [V / US gpm]</b> → 0...10 V	1.00000	0.47619	0.25000
<b>Current rate [mA / US gpm]</b> → 4...20 mA	1.60000	0.76190	0.40000
<b>Output signal temperature</b>	none		

Typical pressure drop VVX15

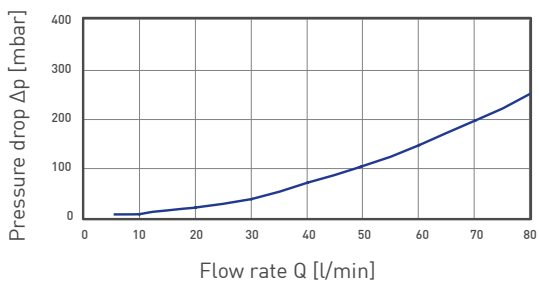


Typical pressure drop VVX15

US version

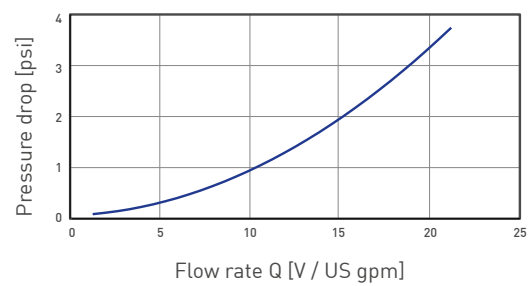


Typical pressure drop VVX20

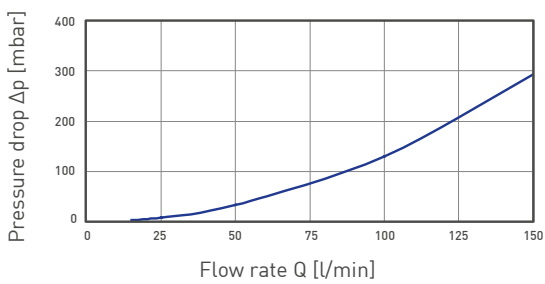


Typical pressure drop VVX20

US version

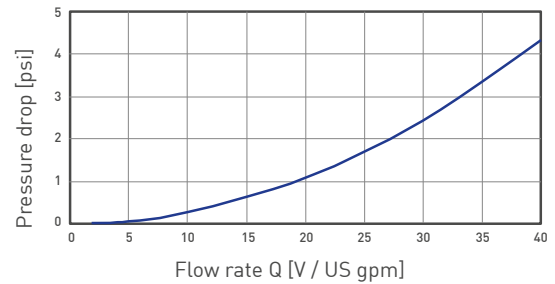


Typical pressure drop VVX25

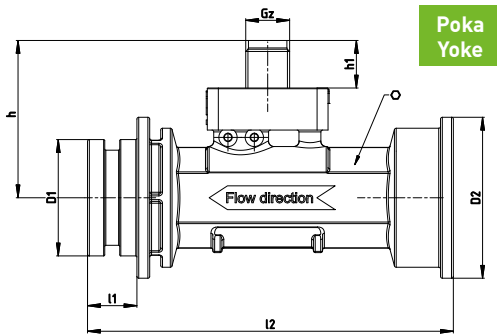


Typical pressure drop VVX25

US version

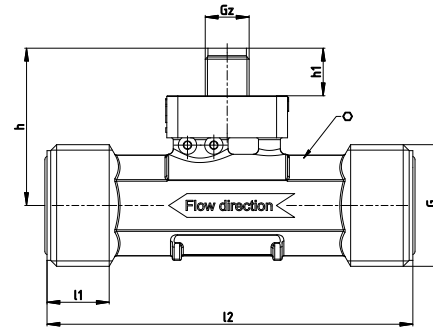


## VVX20 QuickFasten



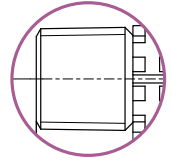
Flow direction

## VVX threaded versions



Flow direction

NPT version



Dimensions [mm]	h	h1	D1	D2	l1	l2	G	Gz	○ Width across flats
<b>Threaded version</b>									
VVX15	40	13			16.5	80	G 3/4	M12 x 1	19
VVX20	43	13			16.5	100	G 1	M12 x 1	24
VVX25	46	13			16.5	95	G 1 1/4	M12 x 1	30
<b>Quickfasten</b>									
VVX20	43	13	31.8	44	13.5	100		M12 x 1	24
<b>Dimensions [inch]</b>									
<b>Threaded version</b>									
VVX15	1.57	0.51			0.79	3.45	1/2 - 14 NPT	M12 x 1	7.48 and 15/16"
VVX20	1.69	0.51			0.81	3.94	3/4 - 14 NPT	M12 x 1	9.45 and 1 1/8"
VVX25	1.69	0.51			0.53	3.94	1 - 11.5 NPT	M12 x 1	11.81 and 1 1/2"
<b>Quickfasten</b>									
VVX20	1.81	0.51	1.25	1.73	0.94	3.94			

### Materials in contact with media

#### VVX15, VVX20, VVX25

Body /tube	PPS Fortron® 40 % glass fibre reinforced
Sensor	ETFE Tefzel®
O-rings	EPDM

## Version frequency output

Order code						
Nominal diameter						
DN 15 G $\frac{3}{4}$	VXA1S		A			514
DN 20 QuickFasten	WXC9S		B			52P
DN 20 G1	WXC9S		B			527
DN 25 G1 $\frac{1}{4}$	WXB2S		B			516
Power supply						
8...30 V DC		G			1	
5 V DC		N			2	
Output signal temperature						
Pt1000				RRRP		
NTC 10.74K				RRRN		
None				0000		
<b>Example order number</b>	<b>VXA1S</b>	<b>G</b>	<b>A</b>	<b>RRRP</b>	<b>1</b>	<b>514</b>

Order code						
Nominal pipe size						
1/2"	VXAAE		1			51C
3/4" QuickFasten	VXCCS		K			52P
3/4"	VXCCS		K			528
1"	WXBBE		2			51E
Power supply						
8...30 V DC		G			1	
5 V DC		N			2	
Output temperature sensor						
Pt1000				RRRP		
NTC 10.74K				RRRN		
None				0000		
<b>Example order number</b>	<b>VXAAE</b>	<b>N</b>	<b>1</b>	<b>RRRP</b>	<b>1</b>	<b>51C</b>

## Version analogue output (0.5...3.5 V) and frequency output

Order code					
Nominal diameter					
DN 15 G $\frac{3}{4}$	WXA1SNA	U1			514
DN 20 QuickFasten	WXC9SNB	UC			52P
DN 20 G1	WXC9SNB	UC			527
DN 25 G1 $\frac{1}{4}$	WXB2SNB	U2			516
Output signal temperature					
0.5...3.5 V			U1		
none			00		
Power supply					
8...30 V DC				1	
5 V DC				2	
<b>Example order number</b>	<b>VVXA1SNA</b>	<b>U1</b>	<b>U1</b>	<b>1</b>	<b>514</b>

Order code					
Nominal pipe size					
1/2"	WXAAEN1UA				51C
3/4" QuickFasten	WXCCSNKUE				52P
3/4"	WXCCSNKUH				528
1"	WXBEN2UB				51E
Output temperature sensor					
0.5...3.5 V			U1		
None			00		
Power supply					
8...30 V DC				1	
5 V DC				2	
<b>Example order number</b>	<b>VVXAAEN1UA</b>	<b>U1</b>	<b>U1</b>	<b>1</b>	<b>51C</b>













## Version analogue output (0...10 V or 4...20 mA) and frequency output

Order code		
<b>Nominal diameter</b>		
DN 15 G $\frac{3}{4}$	VXA1SGA	K003514
DN 20 QuickFasten	WXCS9SGB	N00352P
DN 20 G1	WXCS9SGB	N003527
DN 25 G1 $\frac{1}{4}$	VXB2SGB	L003516
<b>Output signal flow</b>		
0...10 V		V
4...20 mA		A
<b>Example order number</b>	<b>VVXA1SGA</b>	<b>V K003514</b>

Order code		
<b>Nominal pipe size</b>		
1/2"	VXAASN1	P00351C
3/4" QuickFasten	WXCCSNK	Q00352P
3/4"	WXCCSNK	Q003528
1"	VXBBSN2	S00351E
<b>Output signal flow</b>		
0...10 V		V
4...20 mA		A
<b>Example order number</b>	<b>VVXAASN1</b>	<b>V P00351C</b>

Order code	
<b>Service - Test in the test bench</b>	<b>Order number</b>
<b>Tests in provided customer hydraulics including a test report</b> Operation with SIKA test bench pump Operation with provided customer pump	WXTESTREPORT01 WXTESTREPORT02
<b>Works calibration certificate for sample devices</b>	VXWPS01

Order code					
Type	Accessories		Length [m]	Length [ft]	Order number
VVX15		Connection cable with 5 pin cable socket	1		XVXX040
VVX20		M12 x 1, angle type molded lead 5 x 0.34 mm <sup>2</sup> ,	2		XVXX051
VVX25		sheathing material PVC	3		XVXX039
		(Tmax = 80 °C / 176 °F)	5		XVXX041
		UL approval on request	10		XVXX042
		UL approval		10	XVXX017
	UL approval		16	XVXX018	
	UL approval		33	XVXX019	
		Connection cable with 5 pin cable socket	1.5	10	XVXX065
		M12 x 1, molded lead 5 x 0.34 mm <sup>2</sup> , sheathing material PVC, 4 pin Molex MicroBlade wire-to-board housing, (Tmax = 80 °C / 176 °F)			
Type	Accessories	Scope of delivery: 1 piece each	Order number		Order number
VVX15		Screw coupling G½, brass	BVXX1007		
		Soldering coupling Ø 15 mm, brass	BVXX1008		
VVX20		O-ring for QuickFasten, EPDM*	XVXX061		XVXX061
		Joint clip QuickFasten, stainless steel*	XVXX052		XVXX052
		Soldering coupling for QuickFasten, inlet side	BVXX1012		BVXX1012
		Soldering coupling for QuickFasten, outlet side	BVXX1011		BVXX1011
		Screw coupling G 1*, brass, compatibility type	BVXX1021		
VVX25		Screw coupling R1, brass	BVXX1003		
		Soldering coupling Ø 28 mm, brass	BVXX1004		
		Bonding coupling Ø 25 mm, PVC	BVXX1005		
		Screw coupling G 1, stainless steel 1.4571	BVXX1006		
		Screw coupling G 1¼*, brass, compatibility type	BVXX1022		

\* Two pieces are required for the assembly