

# Flow sensors VMI induQ®



US version available

VMI02



US version available

VMI20

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

## Your advantages

- Robust metal housing for high temperature and pressure
- Maintenance-free - no moving parts
- Frequency or analogue and frequency output
- Delivery including works calibration certificate

Type	VMI02	VMI07	VMI10	VMI20
<b>Characteristics</b>				
Nominal diameter	DN 2	DN 7	DN 10	DN 20
Nominal pipe size	1/8"	1/4"	3/8"	3/4"
Process connection	G1/4-ISO 228 male	G1/2-ISO 228 male	G1/2-ISO 228 male or G3/4-ISO 228 male	G 1-ISO 228 male
Process connection	1/4" NPT male	1/2" NPT male	1/2" NPT male or 3/4" NPT male	1" NPT male
Inner diameter [mm]	2	4 x 10	10	20
Inner diameter [inch]	0.08	0.4 x 0.16	0.4	0.79
Flow range [l/min]	0.0083...1 or 0.05...2	0.1...30	0.2...60	5...250
Flow range [US gpm]	0.0022...0.26 or 0.0133...0.53	0.027...8	0.053...16	1.3...66
Accuracy*	0...50 % of range: ±1 % of range 50...100 % of range: ±2 % of range	± (0.7 % of reading + 0.3 % of range)		±(1.5 % of reading + 0.3 % of range)
Repeatability*	1 %			
Response time	<500 ms			
Medium	Water and other conductive liquids			
min. conductivity of medium	50 µS/cm			
Medium temperature	-20...90 °C			
Medium temperature	-4...194 °F			
Ambient temperature	Min. -10 °C, max. see figure temperature limits			
Ambient temperature	Min. 14 °F, max. see figure temperature limits			

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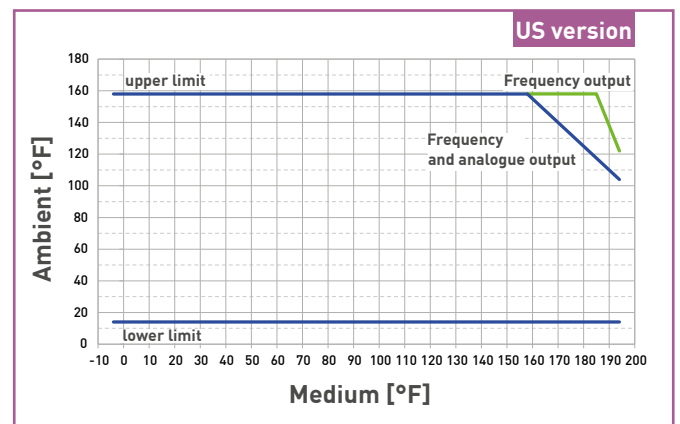
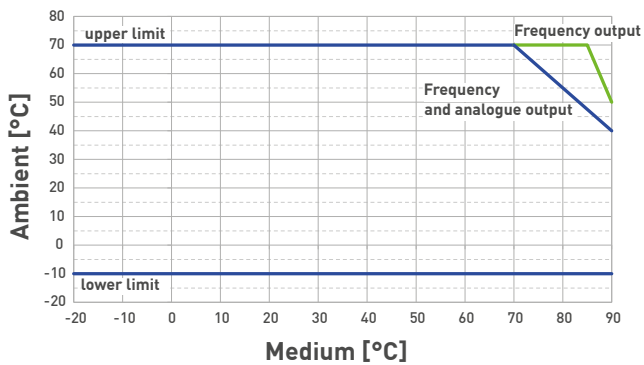
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Type	VMI02	VMI07	VMI10	VMI20
<b>Characteristics</b>				
Pressure rating	PN 16			
Pressure rating	Max. 232 psi			
Flow indication	LED green, flow proportional flashing			
Degree of protection EN 60529	IP65 and IP67 (with attached cable socket)			
<b>Electrical data</b>				
Electrical connection	Plug connector M12 x 1			
Power supply	12...24 VDC ( $\pm 10\%$ )			24 VDC ( $\pm 10\%$ )
Current consumption	$\leq 150$ mA			
<b>Approval</b>				
	Pending for VMI02/07/10: EU RO Mutual Recognition Type Approval Certificate (covers: ABS, BV, CCS, CRS, DNV GL, IRS, KR, LR, ClassNK, PRS, RINA, RS)			

### Temperature limits



Three different versions available:

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

Frequency output (1)	VMI02	VMI07	VMI10	VMI20
<b>Pulse rate [pulses/l]*</b>	10,000 optional: 1...20,000	1,000 optional 1...2,000	500 optional 1...1,000	100 optional 1...200
<b>Pulse rate [pulses/gallon]*</b>	20,000 optional: 1...40,000	2,000 optional: 1...7,500	1,000 optional: 4...3700	250 optional: 4...750
<b>Resolution [ml/pulse]*</b>	0.1	1.0	2.0	10
<b>Resolution [gallons/pulse]*</b>	0.00005	0.0005	0.001	0.004
<b>Signal shape</b>	Square wave signal, pulse duty ratio 50:50, Push-Pull			
<b>Signal current</b>	≤ 100 mA, current limited			

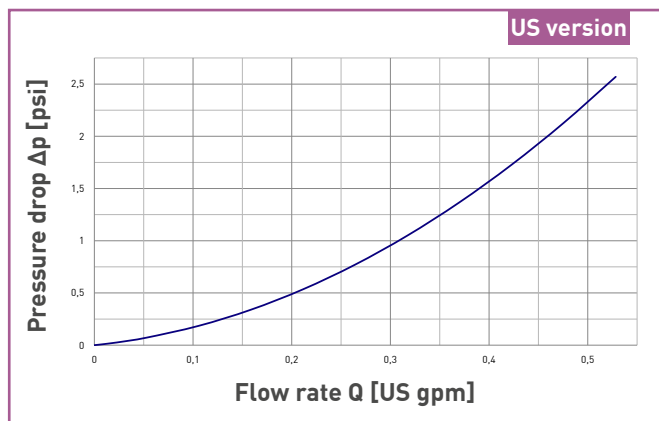
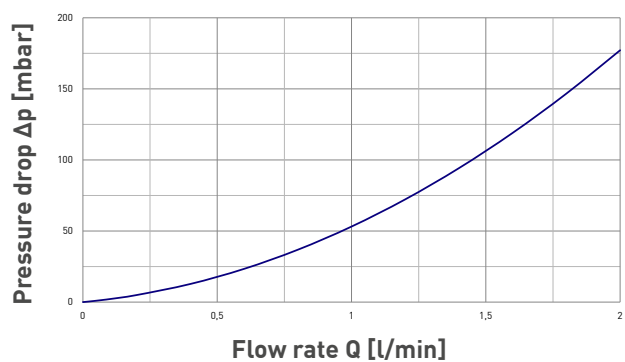
Analogue output 4...20 mA (2)	VMI02	VMI07	VMI10	VMI20
<b>Scaling [l/min]**</b>	0...1 or 0...2	0...30	0...60	0...200 or 0...250
<b>Scaling [US gpm]**</b>	0...0.26 or 0...0.53	0...8	0...16	0...50 or 0...66
<b>Max. Burden</b>	250 Ω against GND			

Analogue output 0...10 V (3)	VMI02	VMI07	VMI10	VMI20
<b>Scaling [l/min]**</b>	0...1 or 0...2	0...30	0...60	0...200 or 0...250
<b>Scaling [US gpm]**</b>	0...0.26 or 0...0.53	0...8	0...16	0...50 or 0...66

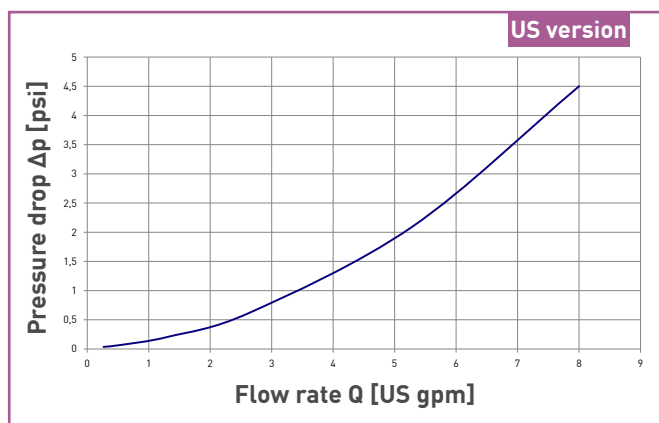
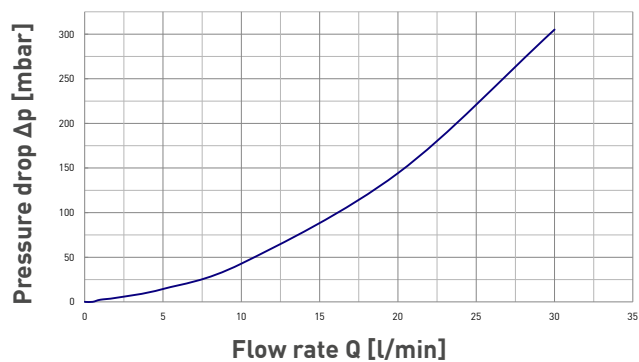
\* Factory configurable

\*\* Other ranges available on request

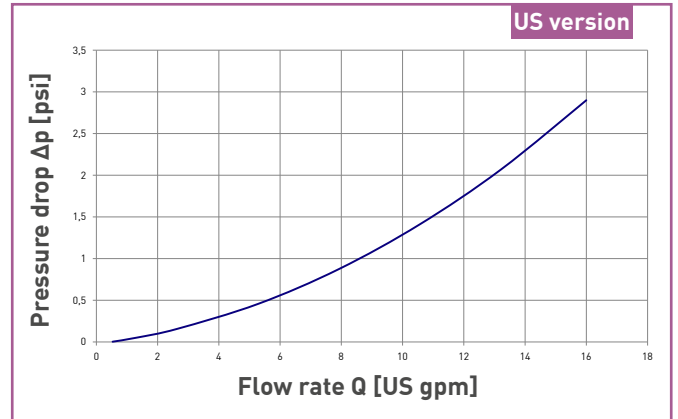
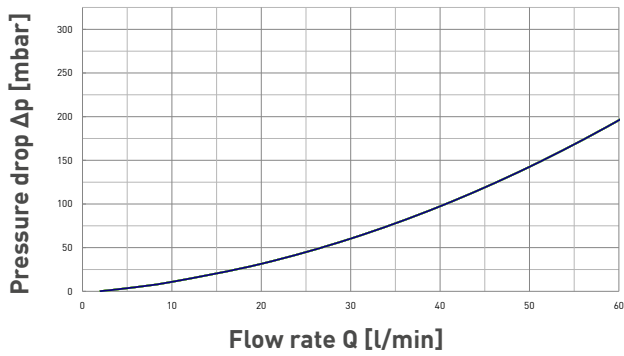
### Typical pressure drop VMI02



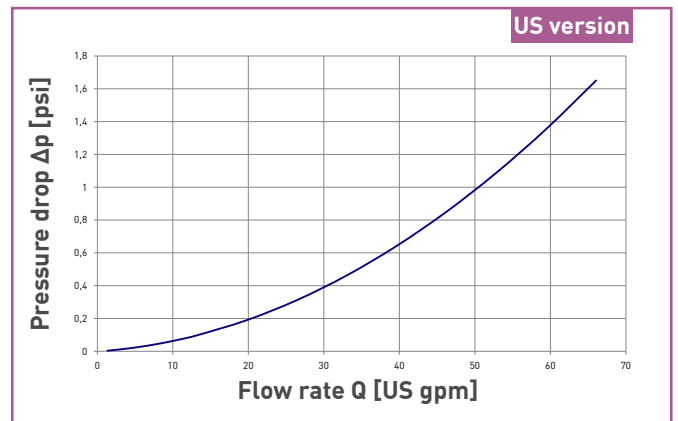
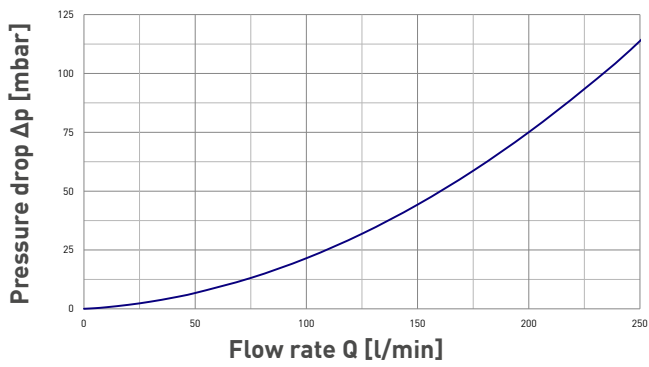
### Typical pressure drop VMI07



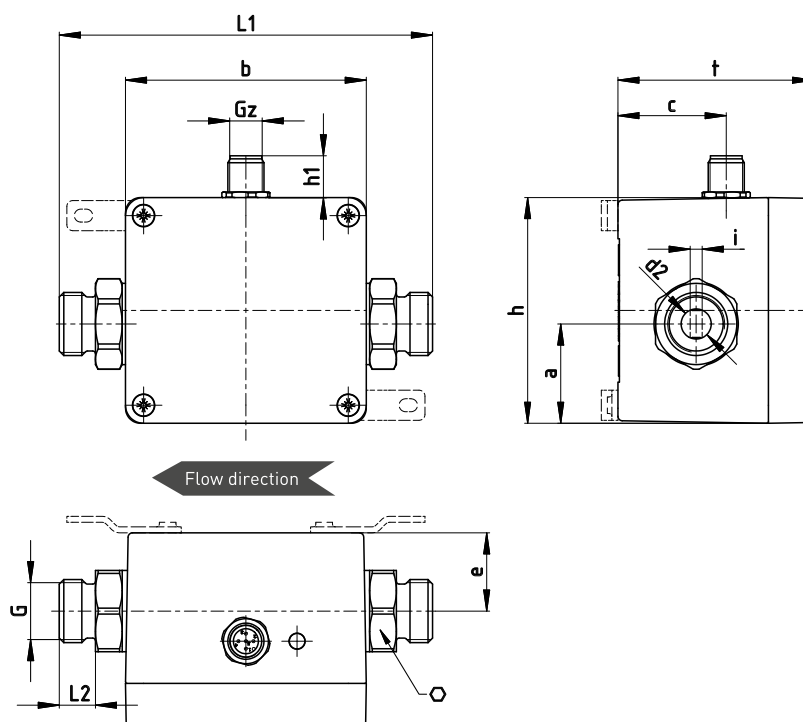
### Typical pressure drop VMI10



### Typical pressure drop VMI20



## Dimensions (mm)



### Dimensions (mm)

VMI	L1 ±0.5	L2 ±0.5	G	⊙	d2	i	b	h	t	a	c	e	Gz	h1
02	120	12	G ¼ A	17	∅ 3	1.9	80	75	65	34	36	26	M12x1	14
07	124	12	G ½ A	27	∅ 10	4	80	75	65	33	36	26	M12x1	14
10	124	12	G ½ A	27	∅ 10	—	80	75	65	33	36	26	M12x1	14
10	124	12	G ¾ A	27	∅ 10	—	80	75	65	33	36	26	M12x1	14
20	140	18	G 1 A	36	∅ 20	—	80	75	65	35.5	36	29	M12x1	14

### Dimensions (inch)

VMI	L1 ±0.5	L2 ±0.5	G	⊙	d2	i	b	h	t	a	c	e	Gz	h1
02	5	0.61	¼ - 14 NPT	—	∅ 0.12	0.07	3.15	2.95	2.56	1.3	1.42	1.02	M12x1	0.55
07	5.04	0.55	½ - 14 NPT	—	∅ 0.4	0.16	3.15	2.95	2.56	1.3	1.42	1.02	M12x1	0.55
10	5.04	0.55	½ - 14 NPT	—	∅ 0.4	—	3.15	2.95	2.56	1.3	1.42	1.02	M12x1	0.55
10	5.04	0.55	¾ - 14 NPT	—	∅ 0.4	—	3.15	2.95	2.56	1.3	1.42	1.02	M12x1	0.55
20	6.10	0.98	1 - 11.5 NPT	—	∅ 0.79	—	3.15	2.95	2.56	1.4	1.42	1.14	M12x1	0.55

### Materials

#### Not in contact with fluid

**Housing** Casted aluminium

#### In contact with fluid

**Electrodes** Stainless steel 1.4571

**Process connections** Stainless steel 1.4571

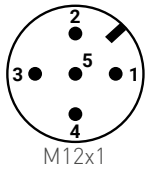
**Measuring pipe** PEEK-GF30

**O-rings** EPDM / FKM optional

## Wirings

### Pinout

The pinout differs according to the chosen configuration of the device.



Possible pinout:

Pin 1: +UB

Pin 2: d. n. c. (do not connect) / Analogue U/I

Pin 3: GND

Pin 4: Frequency

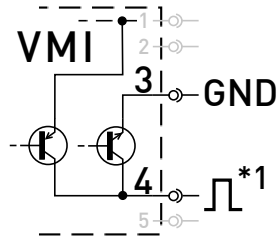
Pin 5: n. c. (not connected)

Connect the connecting cable according to your version and the pinout on the type plate.

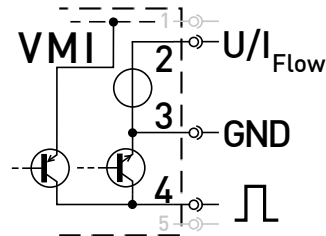
### Supply voltage



### VMI with frequency output Push-Pull



### Use of frequency and analogue output Push-Pull



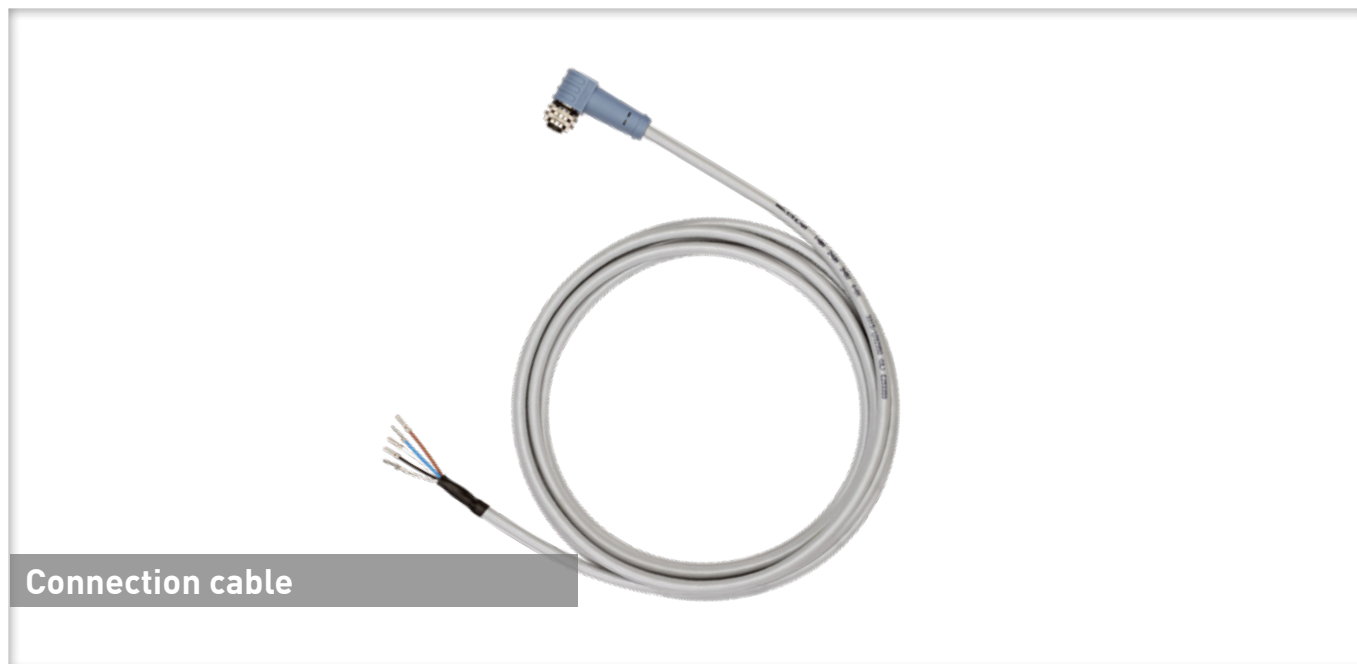
\*1: Push-Pull switching outputs of several VMI may not be connected in parallel.

Order code					
Type					
VMI		VMI			
Nominal diameter / Process connection					
<b>DN 02 / G<math>\frac{1}{4}</math> male thread</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		0.0083...1 l/min	02A		OYGX000
		0.05...2 l/min	02A		OYGX001
Frequency signal and analogue signal 4...20 mA		0...1 l/min	02A		OYGI000
		0...2 l/min	02A		OYGI001
Frequency signal and analogue signal 0...10 V		0...1 l/min	02A		OYGU000
		0...2 l/min	02A		OYGU001
<b>DN 07 / G<math>\frac{1}{2}</math> male thread</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		0.1...30 l/min	07A		OYGX100
Frequency signal and analogue signal 4...20 mA		0...30 l/min	07A		OYGI100
Frequency signal and analogue signal 0...10 V		0...30 l/min	07A		OYGU100
<b>DN 10 / G<math>\frac{1}{2}</math> male thread</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		0.2...60 l/min	10A		OYGX100
Frequency signal and analogue signal 4...20 mA		0...60 l/min	10A		OYGI100
Frequency signal and analogue signal 0...10 V		0...60 l/min	10A		OYGU100
<b>DN 10 / G<math>\frac{3}{4}</math> male thread</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		0.2...60 l/min	10E		OYGX100
Frequency signal and analogue signal 4...20 mA		0...60 l/min	10E		OYGI100
Frequency signal and analogue signal 0...10 V		0...60 l/min	10E		OYGU100
<b>DN 20 / G1 male thread</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		5...250 l/min	20A		OYGX000
Frequency signal and analogue signal 4...20 mA		0...200 l/min	20A		OYGI005
		0...250 l/min	20A		OYGI000
Frequency signal and analogue signal 0...10 V		0...200 l/min	20A		OYGU005
		0...250 l/min	20A		OYGU000
Mounting straps					
Without (standard)				SS	
With mounting straps				LS	
Material O-rings					
EPDM (Standard)					0
FKM (Option)					1
<b>Example order number</b>	<b>VMI</b>	<b>02A</b>	<b>SS</b>	<b>0</b>	<b>OYGX000</b>





Order code					
Type					
VMI		VMI			
Nominal diameter / Process connection					
<b>DN 02 / 1/4" NPT male</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		0.0022...0.26 US gpm	02B		OYGX200
		0.0133...0.53 US gpm	02B		OYGX201
Frequency signal and analogue signal 4...20 mA		0...0.26 US gpm	02B		OYGI200
		0...0.53 US gpm	02B		OYGI201
Frequency signal and analogue signal 0...10 V		0...0.26 US gpm	02B		OYGU200
		0...0.53 US gpm	02B		OYGU201
<b>DN 07 / 1/2" NPT male</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		0.027...8 US gpm	07B		OYGX200
Frequency signal and analogue signal 4...20 mA		0...8 US gpm	07B		OYGI200
Frequency signal and analogue signal 0...10 V		0...8 US gpm	07B		OYGU200
<b>DN 10 / 1/2" NPT male</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		0.053...16 US gpm	10B		OYGX200
Frequency signal and analogue signal 4...20 mA		0...16 US gpm	10B		OYGI200
Frequency signal and analogue signal 0...10 V		0...16 US gpm	10B		OYGU200
<b>DN 10 / 3/4" NPT male</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		0.053...16 US gpm	10F		OYGX200
Frequency signal and analogue signal 4...20 mA		0...16 US gpm	10F		OYGI200
Frequency signal and analogue signal 0...10 V		0...16 US gpm	10F		OYGU200
<b>DN 20 / 1" NPT male</b>					
<b>Output signals</b>		<b>corresponds to flow rate</b>			
Frequency signal		1.3...66 US gpm	20B		OYGX002
Frequency signal and analogue signal 4...20 mA		0...50 US gpm	20B		OYGI007
		0...66 US gpm	20B		OYGI002
Frequency signal and analogue signal 0...10 V		0...50 US gpm	20B		OYGU007
		0...66 US gpm	20B		OYGU002
Mounting straps					
Without (standard)				SS	
With mounting straps				LS	
Material O-rings					
EPDM (Standard)					0
FKM (Option)					1
<b>Example order number</b>		<b>VMI</b>	<b>02B</b>	<b>SS</b>	<b>0</b>
					<b>OYGX200</b>

## Accessories



Connection cable

Order code				
Accessories		Length [m]	Length [ft]	Order number
	Connection cable with 4-pin cable socket M12 x 1, angle type moulded lead, sheathing material PUR, shielded, (Tmax = 80 °C / 176 °F), UL-approval	3 m	10	XVT2053
		5 m	16	XVT2009
		10 m	33	XVT2070
	4 pin cable socket M12 x 1 angle type, unassembled			VT1331

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