

Magnetic inductive flow sensors // IVMI induQ®



US version available

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

Highlights

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

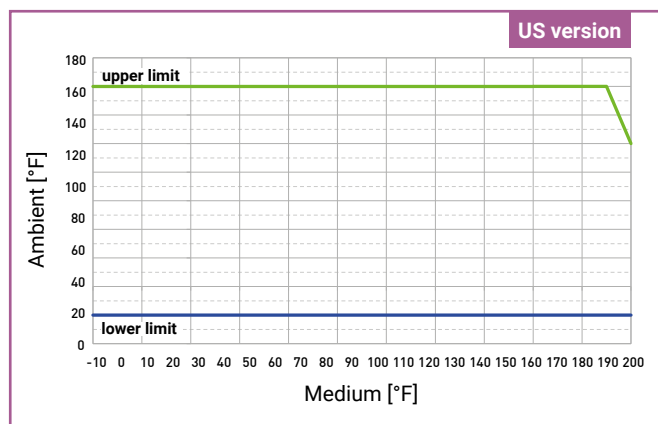
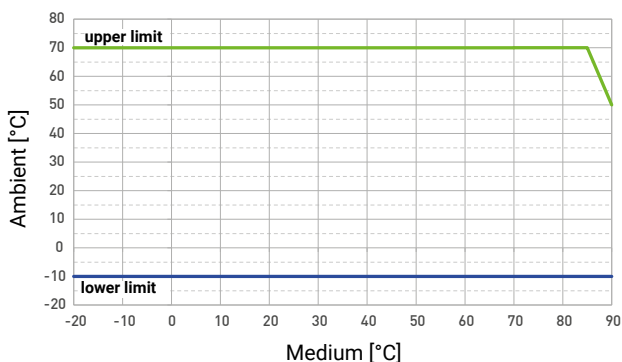
| Type | IVMI02 | IVMI07 | IVMI10 | IVMI20 |
|------------------------------------|--|---------------------------------------|--|--------------------------------------|
| Characteristics | | | | |
| Nominal diameter | DN 2 | DN 7 | DN 10 | DN 20 |
| Nominal pipe size | 1/8" | 1/4" | 3/8" | 3/4" |
| Process connection | G 1/4-ISO 228 male | G 1/2-ISO 228 male | G 1/2-ISO 228 male or G 3/4-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 | | | |

* Test conditions: Water 23 °C / 73 °F at 150 ±100 µS/cm; standard pulse rate

Technical data

| Type | IVMI02 | IVMI07 | IVMI10 | IVMI20 |
|-------------------------------|---|--------|--------|----------------|
| Characteristics | | | | |
| 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) | | | |
| Electrical data | | | | |
| Electrical connection | Plug connector M12 x 1 | | | |
| Power supply | 12...24 VDC (±10 %) | | | 24 VDC (±10 %) |
| Current consumption | ≤ 150 mA | | | |
| Approval | | | | |
| For VMI02/07/10 | EU RO Mutual Recognition Type Approval Certificate (covers: ABS, BV, CCS, CRS, DNV, IRS, KR, LR, ClassNK, PRS, RINA, RS) | | | |

Temperature limits



Output signals

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 | IVMI02 | IVMI07 | IVMI10 | IVMI20 |
|------------------------------------|---|------------------------------|-----------------------------|--------------------------|
| Pulse rate [pulses/l]* | 10,000 optional: 1...20,000 | 1,000 optional 1...2,000 | 500 optional 1...1,000 | 100 optional 1...200 |
| Pulse rate [pulses/gallon]* | 20,000 optional: 1...40,000 | 2,000 optional: 1...7,500 | 1,000 optional: 4...3700 | 250 optional: 4...750 |
| Resolution [ml/pulse]* | 0.1 | 1.0 | 2.0 | 10 |
| Resolution [gallons/pulse]* | 0.00005 | 0.0005 | 0.001 | 0.004 |
| Signal shape | Square wave signal, pulse duty ratio 50:50, Push-Pull | | | |
| Signal current | ≤ 100 mA, current limited | | | |

| Analogue output 4...20 mA 2 | IVMI02 | IVMI07 | IVMI10 | IVMI20 |
|-----------------------------|----------------------|--------|--------|--------------------|
| Scaling [l/min]** | 0...1 or 0...2 | 0...30 | 0...60 | 0...200 or 0...250 |
| Scaling [US gpm]** | 0...0.26 or 0...0.53 | 0...8 | 0...16 | 0...50 or 0...66 |
| Max. Load | 250 Ω against GND | | | |

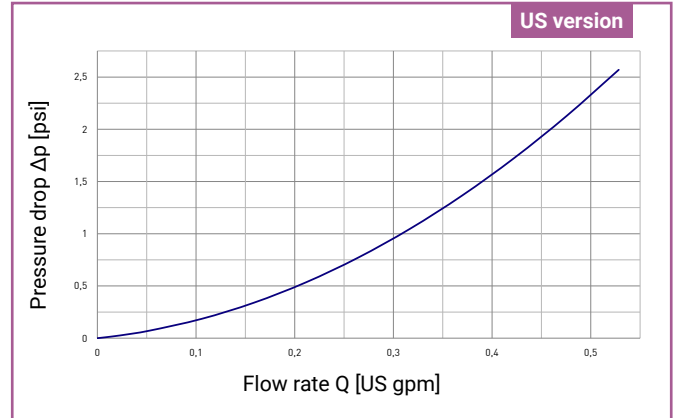
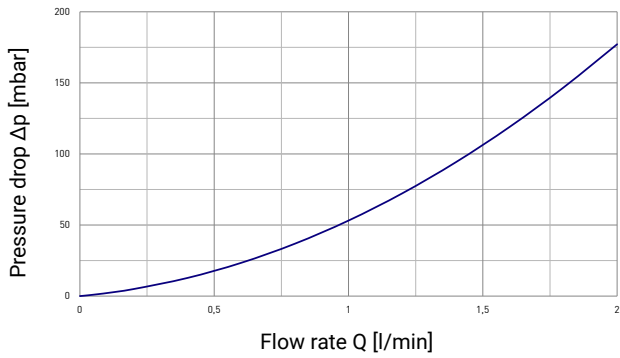
| Analogue output 0...10 V 3 | IVMI02 | IVMI07 | IVMI10 | IVMI20 |
|----------------------------|----------------------|--------|--------|--------------------|
| Scaling [l/min]** | 0...1 or 0...2 | 0...30 | 0...60 | 0...200 or 0...250 |
| Scaling [US gpm]** | 0...0.26 or 0...0.53 | 0...8 | 0...16 | 0...50 or 0...66 |

* Factory configurable

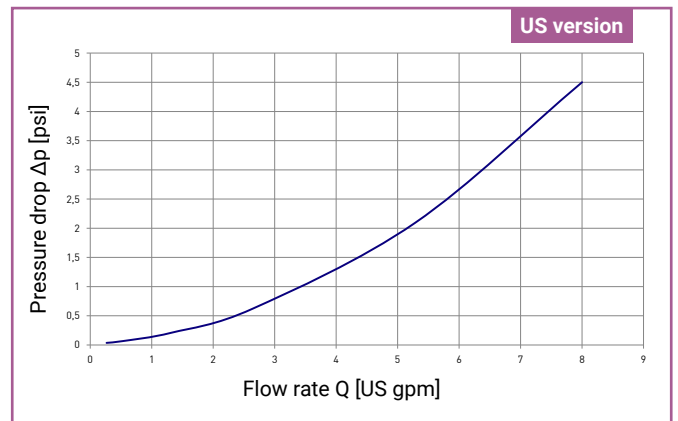
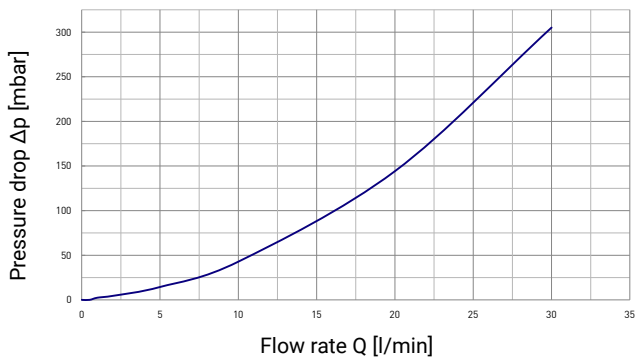
** Other ranges available on request

Typical pressure drop

Typical pressure drop IVMI02

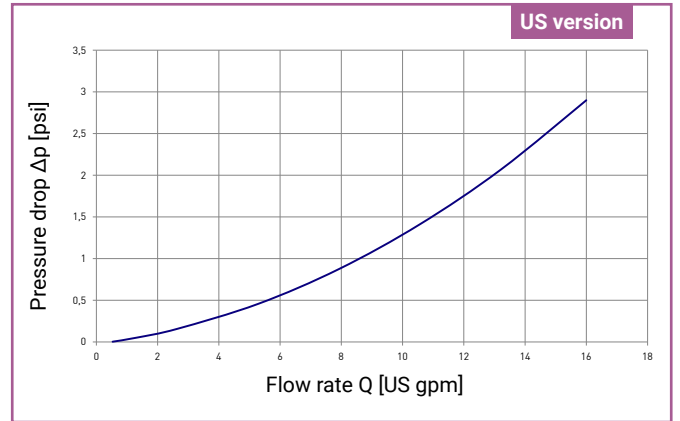
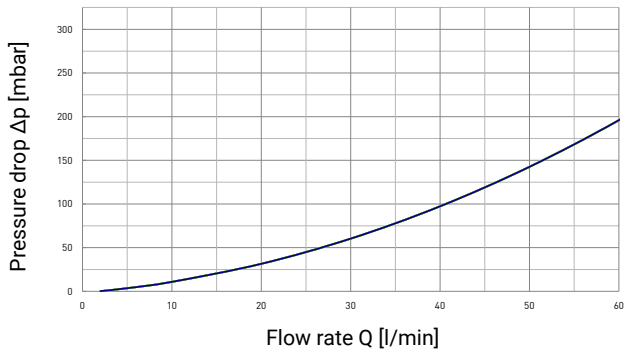


Typical pressure drop IVMI07

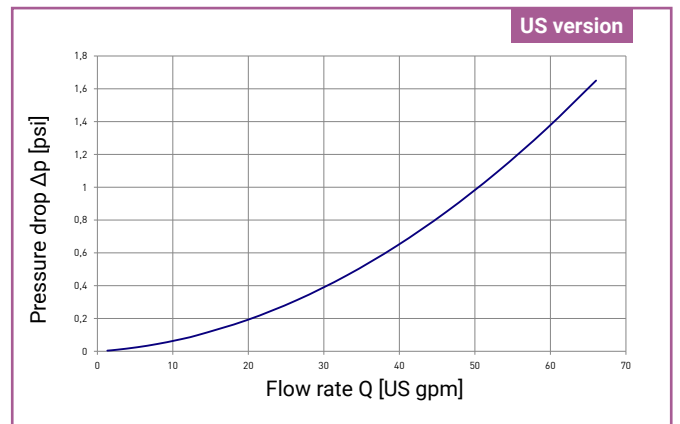
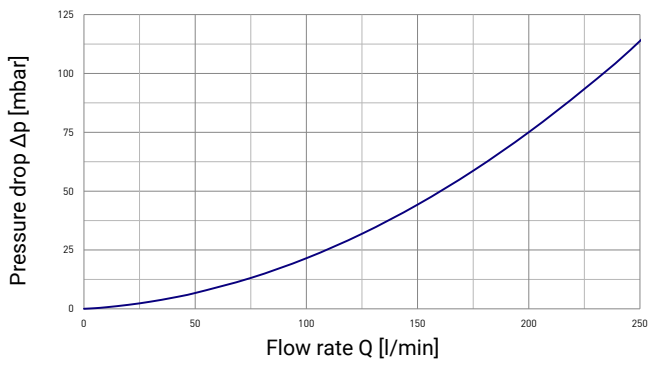


Typical pressure drop

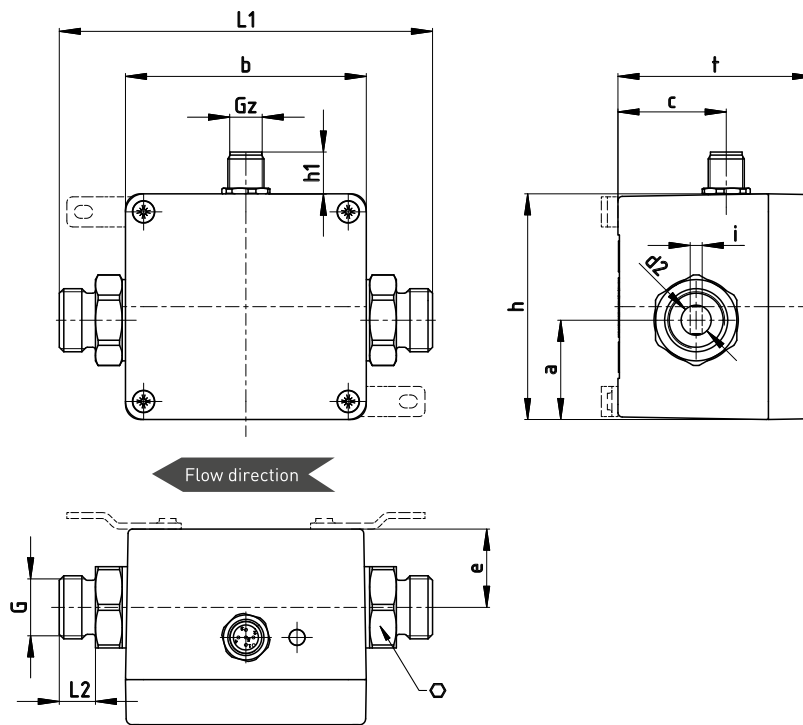
Typical pressure drop IVMI10



Typical pressure drop IVMI20



Technical drawings // Dimensions // Materials



Dimensions (mm)

| IVMI | 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)

| IVMI | 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

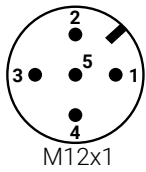
Measuring pipe PEEK-GF30

O-rings EPDM / FKM optional

Wirings

Pinout

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



Possible pinout:

Pin 1: $+U_B$

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

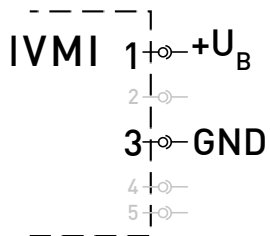
Pin 3: **GND**

Pin 4: Frequency

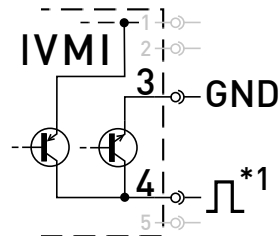
Pin 5: n. c. (not connected)

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

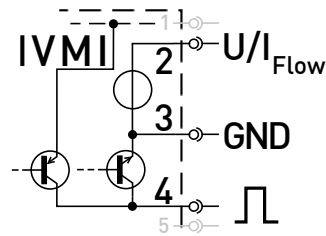
Supply voltage



IVMI 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.

Article numbers

| Order code | | | | | |
|--|------------------|---------------------------------|-----|---------|---------|
| Type | | | | | |
| IVMI | | IVMI | | | |
| Nominal diameter / Process connection | | | | | |
| DN 02 / G$\frac{1}{4}$ male thread | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 0.0083...1 l/min | 02A | | 0YGX100 | |
| | 0.05...2 l/min | 02A | | 0YGX101 | |
| Frequency signal and analogue signal 4...20 mA | 0...1 l/min | 02A | | 0YGI100 | |
| | 0...2 l/min | 02A | | 0YGI101 | |
| Frequency signal and analogue signal 0...10 V | 0...1 l/min | 02A | | 0YGU100 | |
| | 0...2 l/min | 02A | | 0YGU101 | |
| DN 07 / G$\frac{1}{2}$ male thread | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 0.1...30 l/min | 07A | | 0YGX100 | |
| Frequency signal and analogue signal 4...20 mA | 0...30 l/min | 07A | | 0YGI100 | |
| Frequency signal and analogue signal 0...10 V | 0...30 l/min | 07A | | 0YGU100 | |
| DN 10 / G$\frac{1}{2}$ male thread | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 0.2...60 l/min | 10A | | 0YGX100 | |
| Frequency signal and analogue signal 4...20 mA | 0...60 l/min | 10A | | 0YGI100 | |
| Frequency signal and analogue signal 0...10 V | 0...60 l/min | 10A | | 0YGU100 | |
| DN 10 / G$\frac{3}{4}$ male thread | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 0.2...60 l/min | 10E | | 0YGX100 | |
| Frequency signal and analogue signal 4...20 mA | 0...60 l/min | 10E | | 0YGI100 | |
| Frequency signal and analogue signal 0...10 V | 0...60 l/min | 10E | | 0YGU100 | |
| DN 20 / G1 male thread | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 5...250 l/min | 20A | | 0YGX000 | |
| Frequency signal and analogue signal 4...20 mA | 0...200 l/min | 20A | | 0YGI005 | |
| | 0...250 l/min | 20A | | 0YGI000 | |
| Frequency signal and analogue signal 0...10 V | 0...200 l/min | 20A | | 0YGU005 | |
| | 0...250 l/min | 20A | | 0YGU000 | |
| Mounting straps | | | | | |
| Without (standard) | | | SS | | |
| With mounting straps | | | LS | | |
| Material O-rings | | | | | |
| EPDM (Standard) | | | | 0 | |
| FKM (Option) | | | | 1 | |
| Example order number | | IVMI | 02A | SS | 0 |
| | | | | | 0YGX000 |

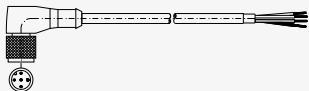

Article numbers

| Order code | | | | | |
|--|----------------------|---------------------------------|------------|-----------|----------------|
| Type | | | | | |
| IVMI | | IVMI | | | |
| Nominal diameter / Process connection | | | | | |
| DN 02 / ¼" NPT male | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 0.0022...0.26 US gpm | 02B | | 0YGX200 | |
| | 0.0133...0.53 US gpm | 02B | | 0YGX201 | |
| Frequency signal and analogue signal 4...20 mA | 0...0.26 US gpm | 02B | | 0YGI200 | |
| | 0...0.53 US gpm | 02B | | 0YGI201 | |
| Frequency signal and analogue signal 0...10 V | 0...0.26 US gpm | 02B | | 0YGU200 | |
| | 0...0.53 US gpm | 02B | | 0YGU201 | |
| DN 07 / ½" NPT male | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 0.027...8 US gpm | 07B | | 0YGX200 | |
| Frequency signal and analogue signal 4...20 mA | 0...8 US gpm | 07B | | 0YGI200 | |
| Frequency signal and analogue signal 0...10 V | 0...8 US gpm | 07B | | 0YGU200 | |
| DN 10 / ½" NPT male | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 0.053...16 US gpm | 10B | | 0YGX200 | |
| Frequency signal and analogue signal 4...20 mA | 0...16 US gpm | 10B | | 0YGI200 | |
| Frequency signal and analogue signal 0...10 V | 0...16 US gpm | 10B | | 0YGU200 | |
| DN 10 / ¾" NPT male | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 0.053...16 US gpm | 10F | | 0YGX200 | |
| Frequency signal and analogue signal 4...20 mA | 0...16 US gpm | 10F | | 0YGI200 | |
| Frequency signal and analogue signal 0...10 V | 0...16 US gpm | 10F | | 0YGU200 | |
| DN 20 / 1" NPT male | | | | | |
| Output signals | | corresponds to flow rate | | | |
| Frequency signal | 1.3...66 US gpm | 20B | | 0YGX002 | |
| Frequency signal and analogue signal 4...20 mA | 0...50 US gpm | 20B | | 0YGI007 | |
| | 0...66 US gpm | 20B | | 0YGI002 | |
| Frequency signal and analogue signal 0...10 V | 0...50 US gpm | 20B | | 0YGU007 | |
| | 0...66 US gpm | 20B | | 0YGU002 | |
| Mounting straps | | | | | |
| Without (standard) | | | | SS | |
| With mounting straps | | | | LS | |
| Material O-rings | | | | | |
| EPDM (Standard) | | | | 0 | |
| FKM (Option) | | | | 1 | |
| Example order number | | IVMI | 02B | SS | 0 |
| | | | | | 0YGX200 |

Accessories



Connection cable

| Order code | | | | |
|---|---|------------|-------------|--------------|
| Accessories | | Length [m] | Length [ft] | Order number |
|  | Connection cable with 5 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 |
|  | 5 pin cable socket M12 x 1 angle type, unassembled | | | VT1331 |