

JUMO flowTRANS MAG H20

Electromagnetic flowmeter for liquids

Areas of application

- Food and beverage industry
- Auxiliary facilities for additional industries (including cooling water, process water)

Special features

- Compact design
- Precise measurement of extremely small volumes
- Single Pair Ethernet interface (SPE)
- Also with Tri-Clamp connection (securely welded)
- Configurable analog outputs for IO-Link variant
- Connection to JUMO Cloud for SPE variant
- Configuration via JUMO smartCONNECT app

Description

The electromagnetic flowmeter measures the flow and temperature of conductive liquid media. It is mounted in pipes made from plastic or metal.



Type 406065/...



Approval marks and certificates

Radio Equipment Directive (RED)

JUMO GmbH & Co. KG hereby states that the flowTRANS MAG H20 device complies with the Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following web address: qr-406065-en.jumo.info.

Radio equipment regulations 2017

JUMO GmbH & Co. KG hereby states that the flowTRANS MAG H20 device complies with the radio equipment regulations UK S.I. 2017 No. 1206. The full text of the UK Declaration of Conformity is available at the following web address: qr-406065-en.jumo.info.

Federal Communications Commission (FCC)

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions.

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Caution: Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Technical data

Electrical safety

Requirements	DIN EN 61010-1 The device must be equipped with an electrical circuit that meets the requirements for "Limited-energy circuits".
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Electrical data

Device with IO-Link

Voltage supply	DC 18 to 30 V PELV
Current consumption	
IO-Link operation	≤ 100 mA
Operation with switching output	≤ 600 mA
Power consumption	
IO-Link operation	≤ 3 W
Operation with switching output	≤ 18 W
Protection rating	DIN EN 61140, Class III (protective low voltage)
Electrical connection	
Connection elements	
Device	M12 plug connector, grounding terminal M4
Connecting cable	M12 plug connector
Grounding cable	Ring cable lug M4
Connecting cable	
Line length	≤ 20 m, unshielded
Temperature resistance	≥ 80 °C

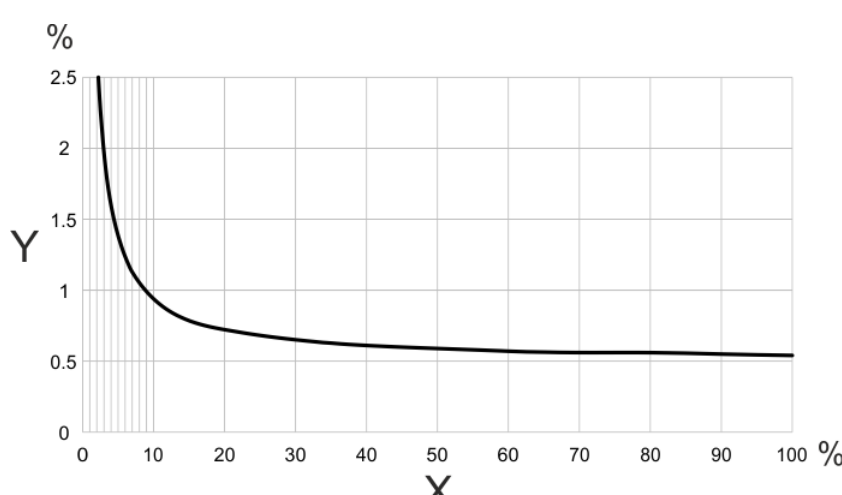
Device with SPE

Voltage supply	DC 18 to 30 V, PELV
Current consumption	$\leq 100 \text{ mA}$
Power consumption	$\leq 1.8 \text{ W}$
Overvoltage category	II
Pollution degree	2
Protection rating	DIN EN 61140, Class III (protective low voltage)
PoDL class	Class 11, IEEE 802.3cg
PoDL classification	SCCP or Forced Mode
Electrical connection	
Connection element	M12 plug connection
M12 plug connector	IEC 63171-5
Version	2-pole
Connecting cable	IEC 61156-13, IEC 61156-14
Version	2-core, shielded
Bandwidth	$\geq 20 \text{ MHz}$
Line length	$\leq 500 \text{ m}$ ($\geq \text{AWG } 22$ at $\geq \text{DC } 24 \text{ V}$ supply voltage into the cable)
DC loop resistance	$< 59 \text{ } \Omega$
Temperature resistance	$\geq 80 \text{ } ^\circ\text{C}$

Inputs

Measurands

Flow

$Flow_{max}$ DN 06 DN 15 DN 20 DN 25	0.005 to 5 l/min 0.05 to 35 l/min 0.1 to 75 l/min 0.2 to 150 l/min
Reference conditions Measurement medium Medium temperature Ambient temperature Medium pressure Measuring pipe Accuracy Response time t_{90}	Water 23 °C (73 °F) ± 5 °C 23 °C (73 °F) ± 5 °C 1 to 4 bar Horizontal installation 0.5 % of the measured value ± 1.5 mm/s ≤ 250 ms
Application conditions Accuracy Repeatability	0.8 % of the measured value ± 1.5 mm/s +0.2 % of the measured value ± 1 mm/s
X = Flow (%) in relation to $flow_{max}$ Y = Deviation (%) from measured value	

Temperature

Measuring range	-20 to +90 °C
Accuracy	$\pm 2,5$ K

Digital inputs

Function	Reset totalizer, start/stop batch, measured value suppression
Type	Logic input (external voltage supply)
Switching voltage V_{DI}	DC $-30\text{ V} \leq V_{DI} \leq +30\text{ V}$
Protection	Against polarity and voltage peaks
Internal resistance	$> 100\text{ k}\Omega$
Switching thresholds	PLC level: logic level "0" $< 7\text{ V}$, logic level "1" $> 15\text{ V}$

Outputs

Analog outputs

Current output	
Function	Output of the flow process values and temperature; output of a signal for error messaging
Signal range	4 to 20 mA
Signal limits	3.8 to 22 mA
Error message	3.4 or 22 mA or replacement value
Temperature influence	75 ppm/K
Burden	$\leq 500 \Omega$
Burden influence	$\leq \pm 0.02 \% \text{ per } 100 \Omega$
Voltage output	
Function	Output of the flow process values and temperature; output of a signal for error messaging
Signal range	DC 0 to 10 V
Signal limits	DC 0 to 11 V
Error message	DC 0 or 11 V or replacement value
Temperature influence	75 ppm/K
Load	$\geq 2000 \Omega$
Load influence	$\leq \pm 15 \text{ mV}$

Digital outputs

Type	Transistor output as switching output or pulse output (I/O pin 1 only)
Protection	Against polarity reversal, short circuiting and overload
Output signal	Push-pull, PNP, NPN
Ampacity	$\leq 100 \text{ mA}$
Voltage drop	$\leq 3 \text{ V}$
Switching output	
Function	Limit value monitoring function
Input signal	Flow, temperature
Output signal	Limit value monitoring function, batch active, batch error, device error
Switch-on and switch-off delay	0 to 100 s
Limit value function	Hysteresis (NO contact/NC contact), window (NO contact/NC contact), switch-on and switch-off delay
Switching point	Configurable
Pulse output	
Function	Output of the flow process value
Pulse frequency	0 to 10 kHz
Duty cycle	50 %
Output value at nominal width ^a	Pulses per liter (l)
DN 06	120000
DN 15	17100
DN 20	8000
DN 25	4000

^a Default setting (configurable).

Interfaces

Bluetooth

Function	Transfer of configuration data and device information, display of process values
Communication	Via end device with JUMO smartCONNECT app
Authentication	Via Bluetooth® radio module and NFC tag
Connection status (configurable)	
Permanently	Active
Temporarily	Restricted (via NFC)
Range	10 m under reference conditions
Radio frequency	
Bluetooth® radio module	2.4 GHz
NFC tag	13.56 MHz
Max. transmission power	
Bluetooth® radio module	0 dBm
NFC tag	–
JUMO smartCONNECT app	
System requirements	
iOS device	iPhone 7 or later (recommended) with iOS 13
Android device	Android 8.0 or later

SPE

Function	Transfer of process data, configuration data and device information
SPE protocol	Modbus TCP, integrated JUMO Cloud Connector
Data transfer rate (10BASE-T1L)	10 Mbit/s
PoDL class	Class 11, IEEE 802.3cg

IO-Link

Function	Transfer of process data, configuration data and device information, displaying of process values
Communication	Via end device with IO-Link master and device description file (IODD)
Communication interface	IO-Link device V 1.1
Data transfer rate (baud rate)	COM 3 (230.4 kBaud)
Cycle time	≥ 5 ms
Profile	Common Profile, Smart Sensor Profile

Display

Type	TFT display
Size	
Display range	35.04 × 28.03 mm
Screen size (diagonal)	1.77"
Resolution	128 × 160 RGB
Brightness	10 levels active + 1 level inactive (configurable)
Rotation	0°, 90°, 180°, 270° (configurable)

Environmental influences

Admissible ambient temperature	DIN 60068-2-1, DIN 60068-2-2
At a medium temperature ≤ 80 °C	-20 to +55 °C
At medium temperature of > 80 °C	-20 to +45 °C
Admissible storage temperature	-20 to +60 °C
Climatic conditions	DIN EN 60721-3-3
Climate class	3K6
Air temperature	-20 to +55 °C
Relative humidity	≤ 100 % – condensation on device outer shell
Protection type	DIN EN 60529, EN 50102
	IP65, IP67
Pollution degree	2
Electromagnetic compatibility (EMC)	DIN EN 61326-1:2022, DIN EN 61326-2-3:2022
Interference emission	Class B ^a
Interference immunity	Industrial requirements
Oscillation	DIN EN 60068-2-6
Amplitude	0.35 mm at 10 to 2000 Hz
Acceleration	50 m/s ² at 10 to 2000 Hz
Shock	DIN EN 60068-2-27
Peak acceleration	200 m/s ²
Shock duration	11 ms
Pressure Equipment Directive	2014/68/EU
Group 1 fluids - DN ≤ 25	Sound engineering practice according to Art. 4 (3) in conjunction with Art. 4 (1c.i)
Site altitude	≤ 2000 m above sea level

^a The product is suitable for industrial use as well as for households and small businesses.

Mechanical features

Materials

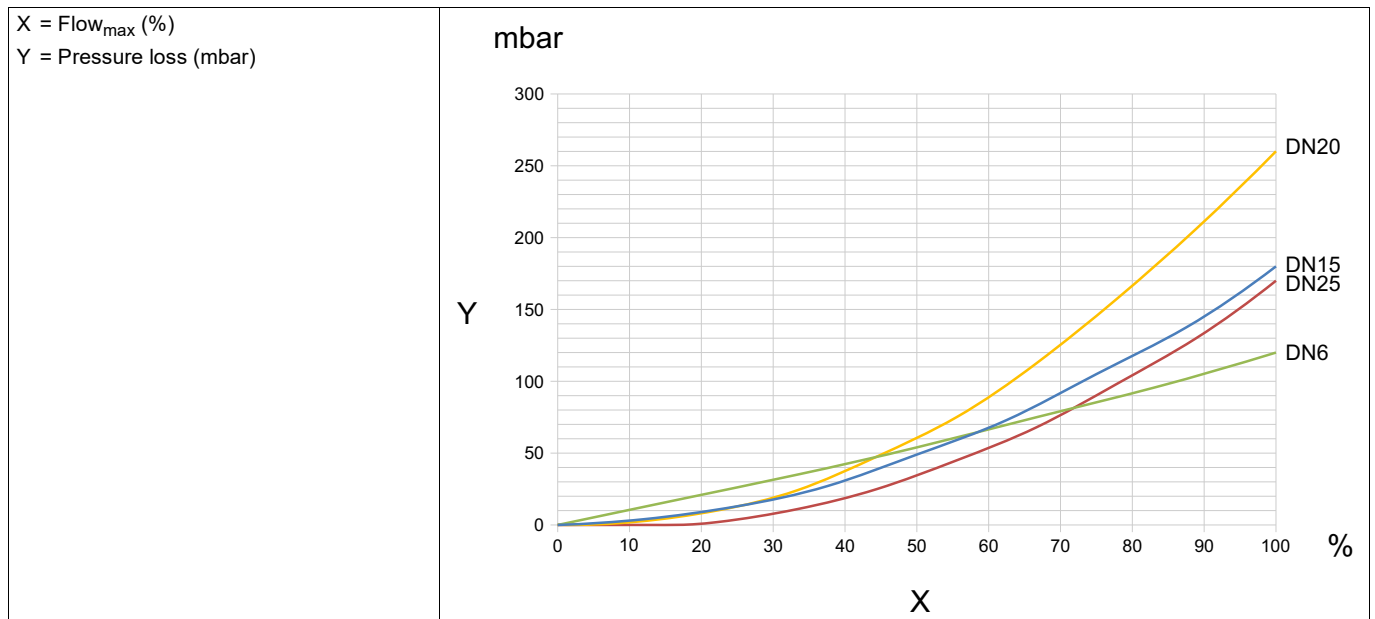
Housing	
Top section of the housing	PA-GF25 (glass fiber reinforced)
Case bottom section	Stainless steel 304
Threaded sleeve M12 × 1	Stainless steel 304
Display	PMMA
Components in contact with the medium	Drinking-water-certified materials (when using EPDM seals)
Process connection	1.4404 (stainless steel 316L)
O-ring, sealing ring	EPDM, FKM (optional)
Measuring pipe	PEEK
Electrodes	Carbon fiber

Nominal pressure

Nominal pressure level	PN 16
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Pressure loss diagram

Created under reference conditions ⇒ page 4.

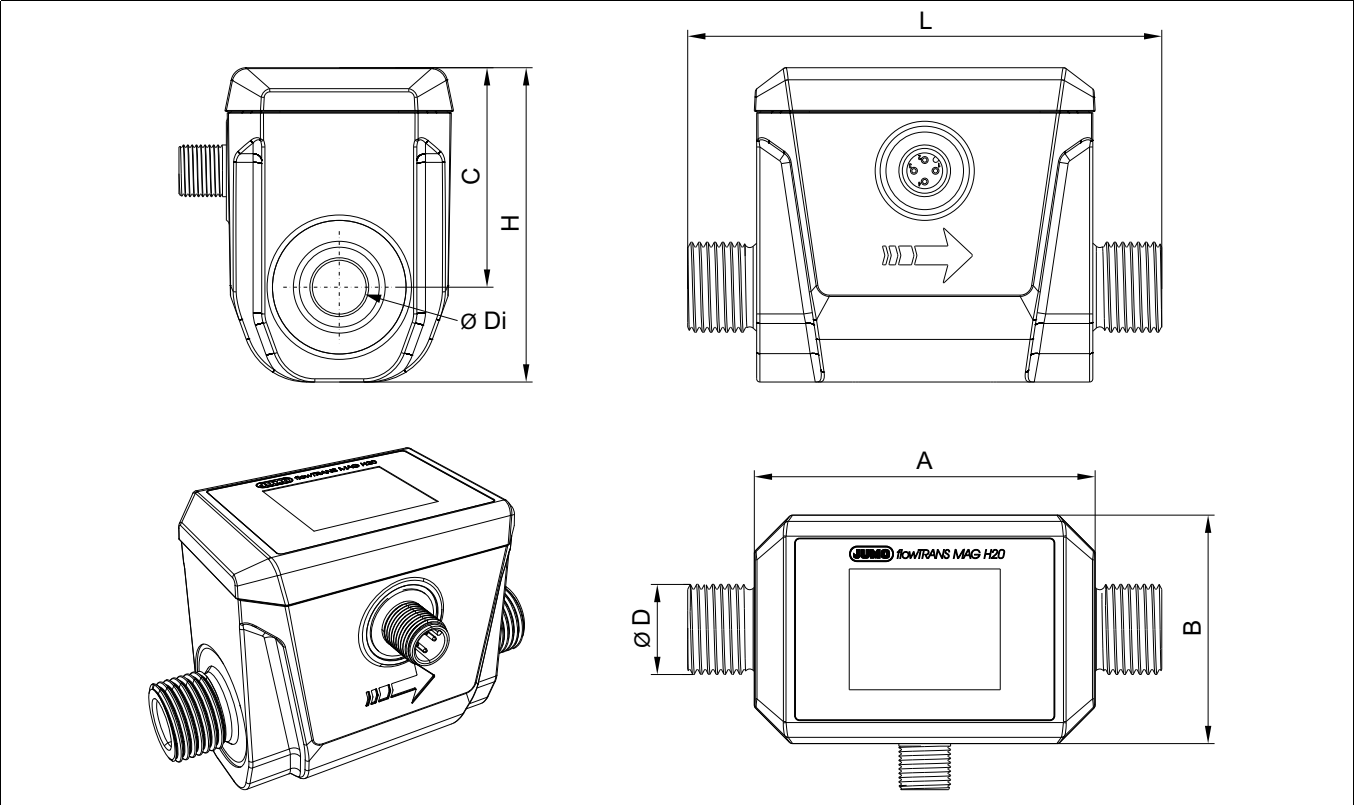


Measurement media

Medium type	Conductive liquids
Conductivity	≥ 20 μS/cm
Viscosity	≤ 70 mPa·s
Temperature range	-20 °C to +90 °C

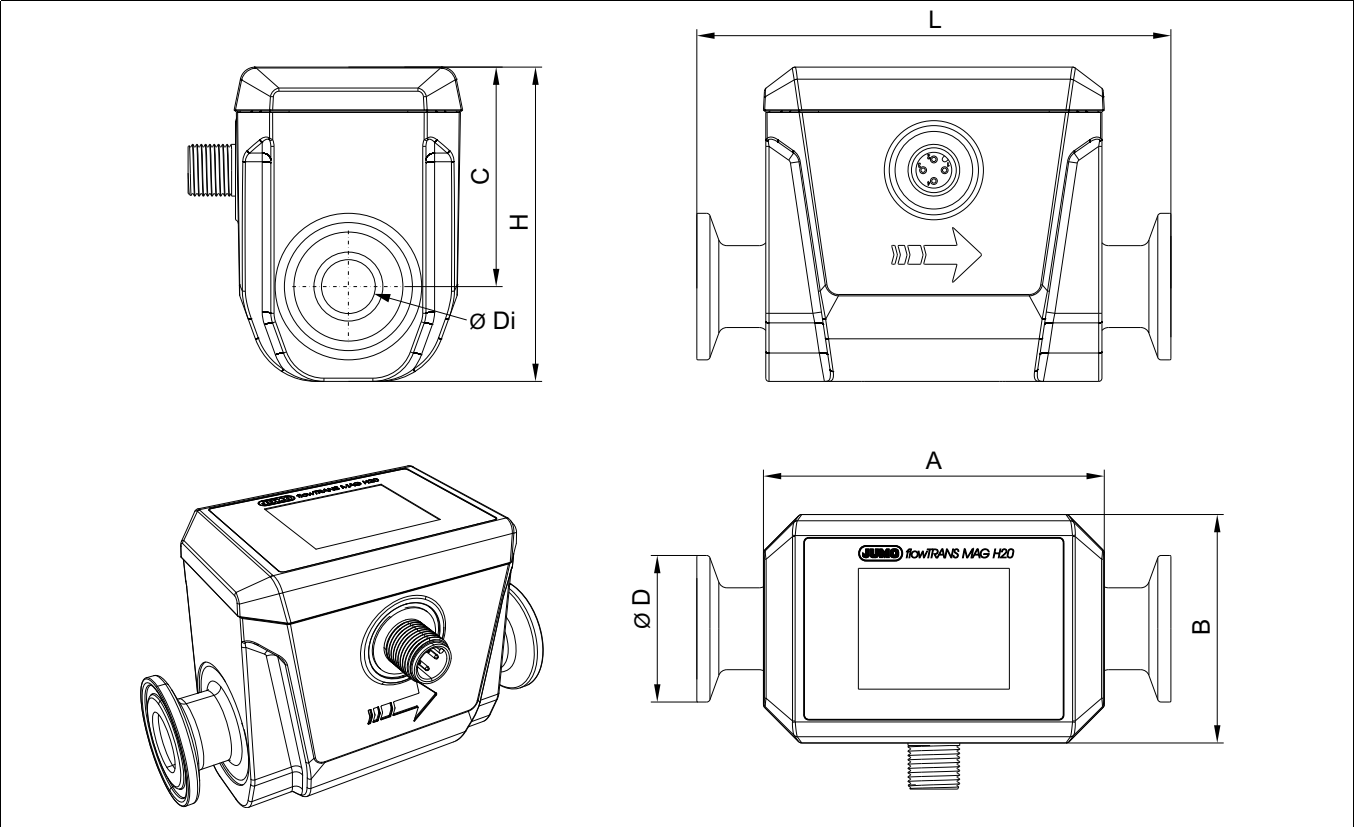
Dimensions

Threaded connector according to DIN EN ISO 228-1



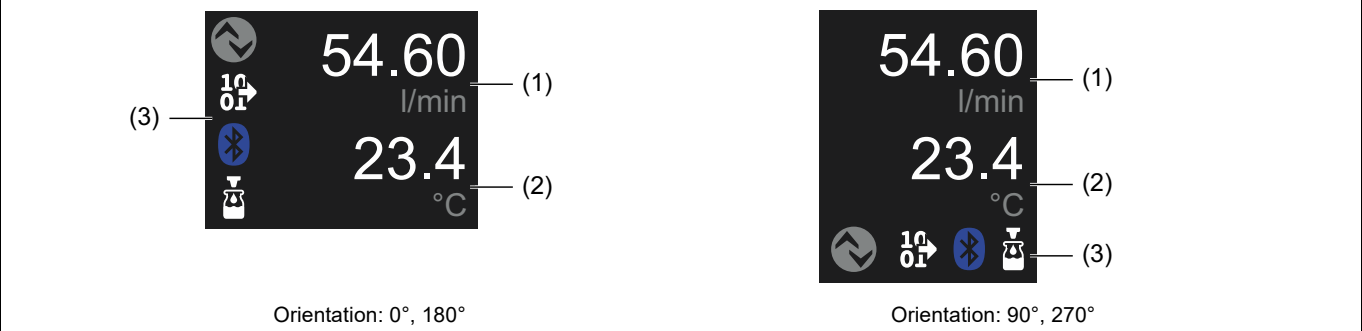
Nominal width	Ø Di [mm]	Ø D ["]	A [mm]	B [mm]	C [mm]	L [mm]	H [mm]
DN 6	6	1/4	79	53	51	110	73
DN 15	12.5	1/2					
DN 20	15	3/4					
DN 25	21	1					

Tri-Clamp connection according to DIN 32676, Series A



Nominal width	Ø Di [mm]	Ø D [mm]	A [mm]	B [mm]	C [mm]	L [mm]	H [mm]
DN 6	6	25	79	53	51	110	73
DN 15	12.5	34					
DN 20	15	34					
DN 25	26	50				130	

Display elements



Pos.	Designation	Description
1, 2	Process value 1, Process value 2	Show the following values and messages: <ul style="list-style-type: none">Both configured process values (actual values).The process value system units.The totalizer for the totalizer function.The fill volume or remaining volume for the batch function.Error messages
3	Toolbar	Shows: <ul style="list-style-type: none">The configuration and status of I/O pin 1 and I/O pin 2.The configuration and status of the interface connections.

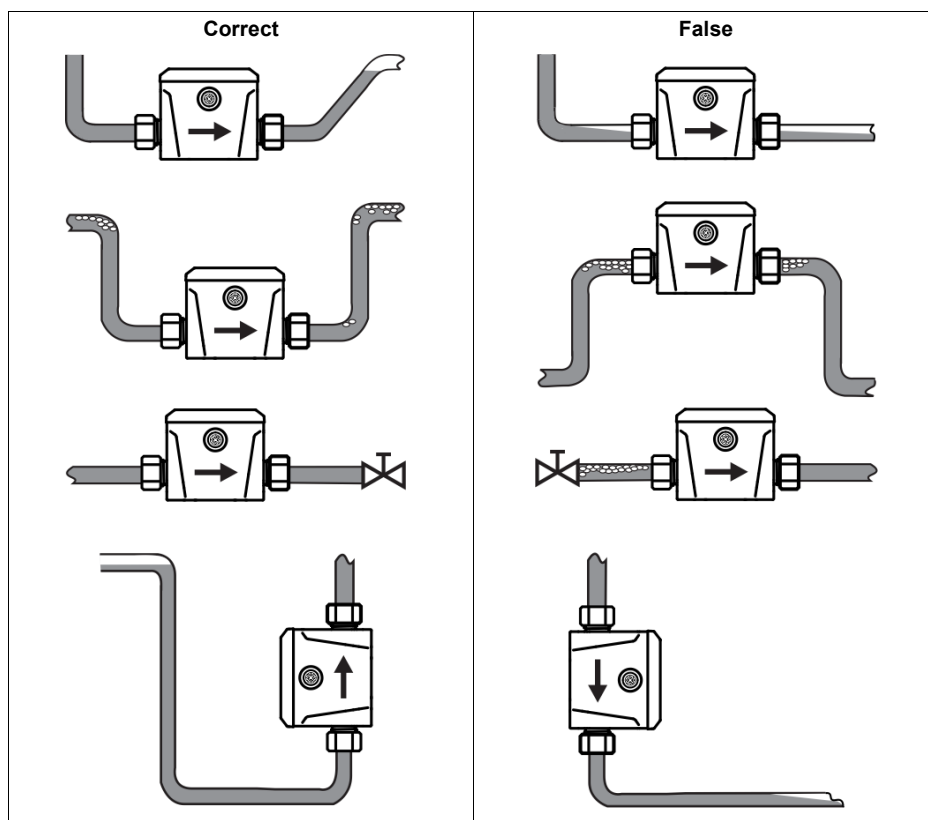
Installation notes

The installation instructions in the data sheet provide preliminary information on installing the device.

For the mechanical connection, only use the installation instructions or the operating manual.

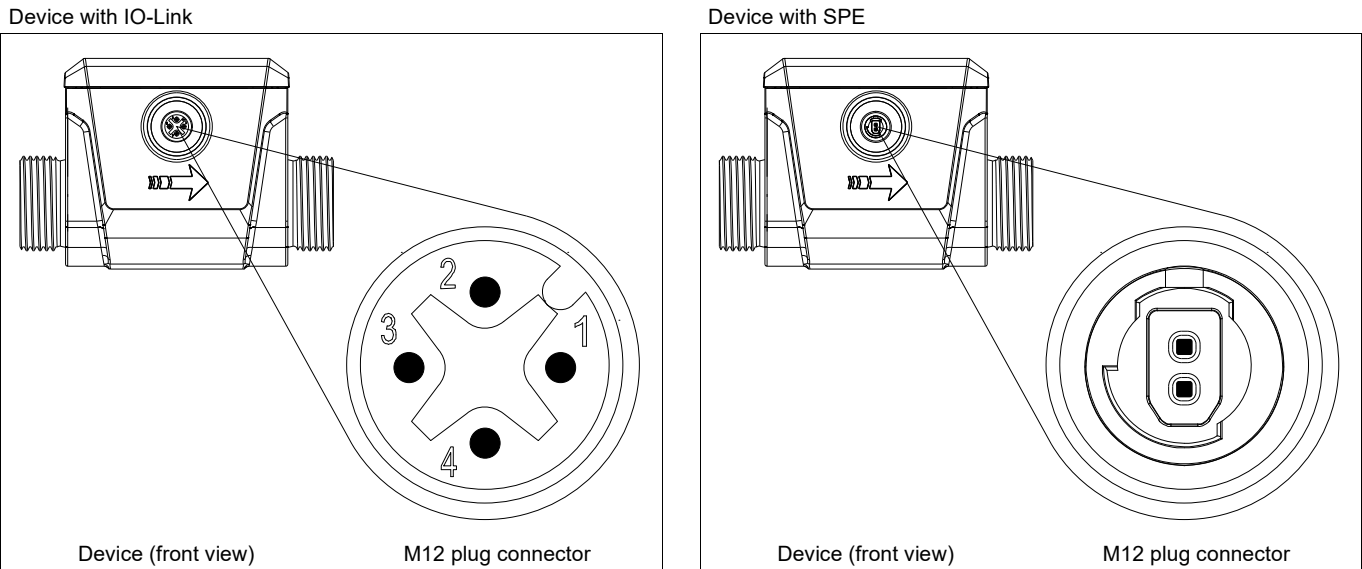
Installation position

→ = Flow direction



Connection elements

The connection elements in the data sheet provide information on product selection.
For the electrical connection, only use the installation instructions or the operating manual.



Terminal assignment

M12 plug connection

Designation	Description	Assignment		
IO-Link	DC 24 V	1 BN (Brown)	<p>Device</p>	<p>Connecting cable</p>
	I/O-Pin 2 ^a	2 WH (White)		
	GND	3 BU (Blue)		
	IO-Link, I/O-Pin 1 ^b	4 BK (Black)		
^a Configurable as: Digital input, digital output, analog output.				
^b Configurable as: IO-Link, digital output, analog output.				
Designation	Description	Assignment		
SPE	RxTx+/PoDL+	1 WH (white)	<p>Device</p>	<p>Connecting cable</p>
	RxTx-/PoDL-	2 BU (blue)		

^a Configurable as: Digital input, digital output, analog output.
^b Configurable as: IO-Link, digital output, analog output.

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