

JUMO flowTRANS US W02

Ultrasonic flowmeter for liquids

Applications

- Reverse osmosis
- Desalination of seawater
- Wash water recovery
- Waste water (galvanic, surface treatment)
- Cooling towers

Brief description

The ultrasonic flowmeter measures the flow, temperature and optionally the pressure of conductive and non-conductive liquid media.

The process values are mapped via the process display, and issued to a higher-level system via the outputs.

The device can be configured via Bluetooth with the JUMO smartCONNECT app or via an IO-Link interface.

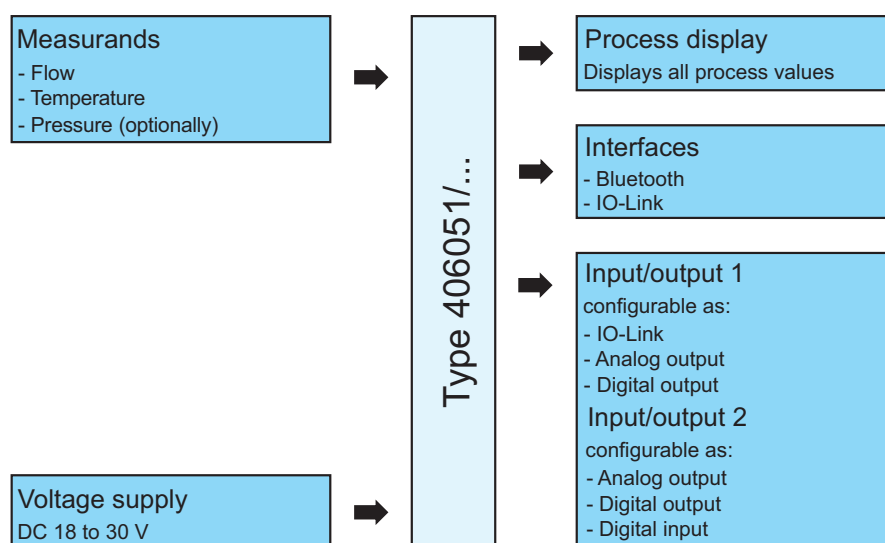
The device is available in nominal widths DN 15 to DN 32 and can be installed horizontally or vertically in existing plastic or metal pipes using various mounting sets. A special mounting set enables the flow-optimized transition of the nominal width DN 15 to DN 10 (low-flow calibration).



Type 406051/...



Block diagram



Special features

- Easy installation
- Corrosion-resistant
- Low-wear
- Easy to clean

Technical data

Electrical data

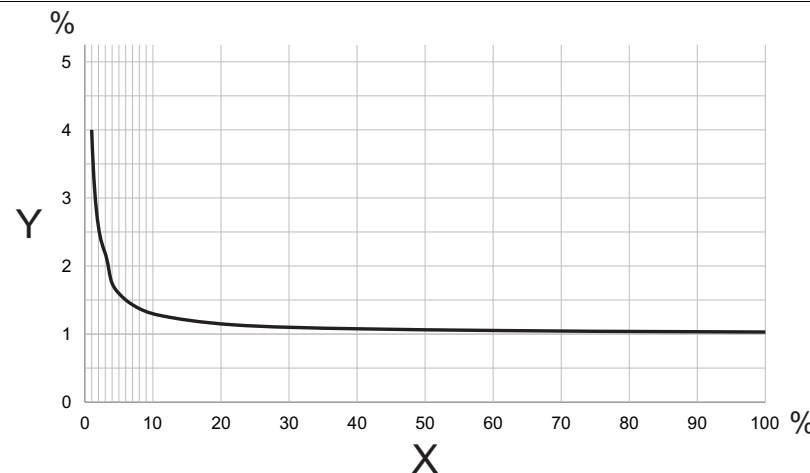
Voltage supply	DC 18 to 30 V SELV, PELV, Class 2
Current consumption	≤ 100 mA, with switching outputs ≤ 600 mA
Power consumption	≤ 10 W
Protection rating	DIN EN 61140, Class III (protective low voltage)
Electrical safety	The device must be equipped with an electrical circuit that meets the requirements of DIN EN 61010-1 with regard to "Limited-energy circuits".

Inputs

Reference conditions

Measurement medium	Water
Medium temperature	23 °C (73 °F) ±5 K
Ambient temperature	23 °C (73 °F) ±5 K
Medium pressure	1 to 4 bar
Measuring tube	Horizontal installation, compliance with the required inlet and outlet sections

Flow

Measuring range $_{max}$	
DN 15 with Low-flow calibration	60 l/min
DN 15	80 l/min
DN 20	210 l/min
DN 25	320 l/min
DN 32	520 l/min
Accuracy ^a	
Pulse output	≤ ±1.0% of the measuring range ±0.03% of the measuring range $_{max}$
Current output	Like pulse output, additionally ≤ ±0.1% of 16 mA
Voltage output	Like pulse output, additionally ≤ ±0.1% of 10 V
Reproducibility	≤ ±0.5% of measured value ^a ±0.03% of the measuring range $_{max}$
Temperature drift	≤ ±0.05% of measured value ^a per 10 K temperature change (at -20 to +80 °C)
Response time t_{90}	≤ 2 s
X = measuring range $_{max}$ (%) Y = deviation from measured value ± (%)	

^a Under reference conditions.

Temperature input

Measuring range	-40 to +125 °C
Accuracy	±2 K

Pressure input (optional)

Measuring range	up to 16 bar relative
Accuracy	
At 20 °C ^a	±0.4% MSP ^b
At -20 to +100 °C ^c	±1% MSP

^a Includes: linearity, hysteresis, repeatability, deviation of measuring range initial value, and measuring range end value.

^b MSP = measuring span.

^c Includes: linearity, hysteresis, repeatability, deviation of measuring range initial value, and measuring range end value, thermal effect on measuring range start and measuring span.

Digital input

Type	Logic input (external voltage supply)
Function	Reset totalizer, start/stop batch, measured value suppression
Switching voltage V_{DI}	DC $-30\text{ V} \leq V_{DI} \leq +60\text{ V}$
Protection	Against polarity and voltage peaks
Internal resistance	> 100 kΩ
Switching thresholds	PLC level: logic level "0" < 7 V, logic level "1" > 15 V

Outputs

Analog output

Current output

Function	Output of the flow process values, temperature or pressure (optional), output of a signal for error message
Signal range	4 to 20 mA
Signal limits	3.8 to 20.5 mA
Error message	3.4 or 22 mA
Temperature influence	75 ppm/K
Burden	≤ 500 Ω
Burden influence	≤ ±0.02% per 100 Ω

Voltage output

Function	Output of the flow process values, temperature or pressure (optional), output of a signal for error message
Signal range	DC 0 to 10 V
Signal limits	DC 0 to 10.3 V
Error message	DC 0 or 11 V
Temperature influence	75 ppm/K
Burden	≥ 2000 Ω
Burden influence	≤ ±15 mV

Digital output

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	≤ 200 mA
Voltage drop	≤ 3 V

Switching output

Function	
Output signal	Limit value switch, batch active, batch error, device error
Limit value monitoring function	
Input signals	Flow, temperature or pressure (optional)
Configuration	Hysteresis (NO contact/NC contact), window (NO contact/NC contact), switch-on and switch-off delay
Switching points	
For hysteresis function	Configurable
For window function	Configurable
Switch-on and switch-off delay	0 to 100 s

Pulse output

Function	Output of the flow process value
Pulse frequency	0 to 10 kHz
Duty cycle	50%
Output value at nominal width	Pulses per unit (configurable)
DN 15 (Low-flow calibration)	10000
DN 15	4800
DN 20	2850
DN 25	1875
DN 32	1150

Interfaces

Bluetooth

Communication	Via (mobile) 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	2.45 GHz
NFC tag	13.56 MHz
Max. transmission power	
Bluetooth radio module	0 dBm
NFC tag	-
smartCONNECT app	
Function	Transfer of configuration data and device information
System requirements	
iOS device	iPhone 7 or later (recommended) with iOS 13
Android device	Android 8.0 or later



IO-Link

Communication	Via end device with IO-Link master and device description file (IODD)
Communication interface	IO-Link device V 1.1.2, downward compatible with V 1.0
Data transfer rate (baud rate)	COM 3 (230.4 kBaud)
Max. cable length	20 m, unshielded
Min. cycle time	5 ms
Function	Transfer of process data, configuration data and device information

Display

Type	TFT display
Size	
Display area	35.04 × 28.03 mm
Screen size (diagonal)	1.77"
Resolution	128 × 160 RGB
Brightness	16 levels (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 +60 °C
At medium temperature of > 80 °C	-20 to +45 °C
Admissible storage temperature	-20 to +60 °C
Climatic conditions	DIN EN 60721-3-1, DIN EN 60721-3-3, DIN EN 60068-2-78
Climate class	3K6
Temperature range	-20 to +55 °C
Relative humidity	≤ 100 % – Condensation on device outer shell
Protection type	DIN EN 60529, EN 50102 IP65, IP67
Electromagnetic compatibility (EMC)	DIN EN 61326-1, DIN EN 61326-2-3
Interference emission	Class B ^a
Interference immunity	Industrial requirements
Vibration resistance	DIN EN 60068-2-6, DIN EN 60068-2-27
Vibration resistance	5 g at 10 to 2000 Hz
Shock resistance	20 g over 11 ms
Pressure Equipment Directive	2014/68/EU
Group 1 fluids - DN ≤ 25	Sound engineering practice acc. to Art. 4, para. 3 i. c. w. Art. 4 para. 1c.i
Group 2 fluids - DN ≤ 32	Sound engineering practice acc. to Art. 4, para. 3 i. c. w. Art. 4 para. 1c.i
Group 1 fluids	Sound engineering practice acc. to Art. 4, para. 3 i. c. w. Art. 4 para. 1c.ii

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

Mechanical features

Materials

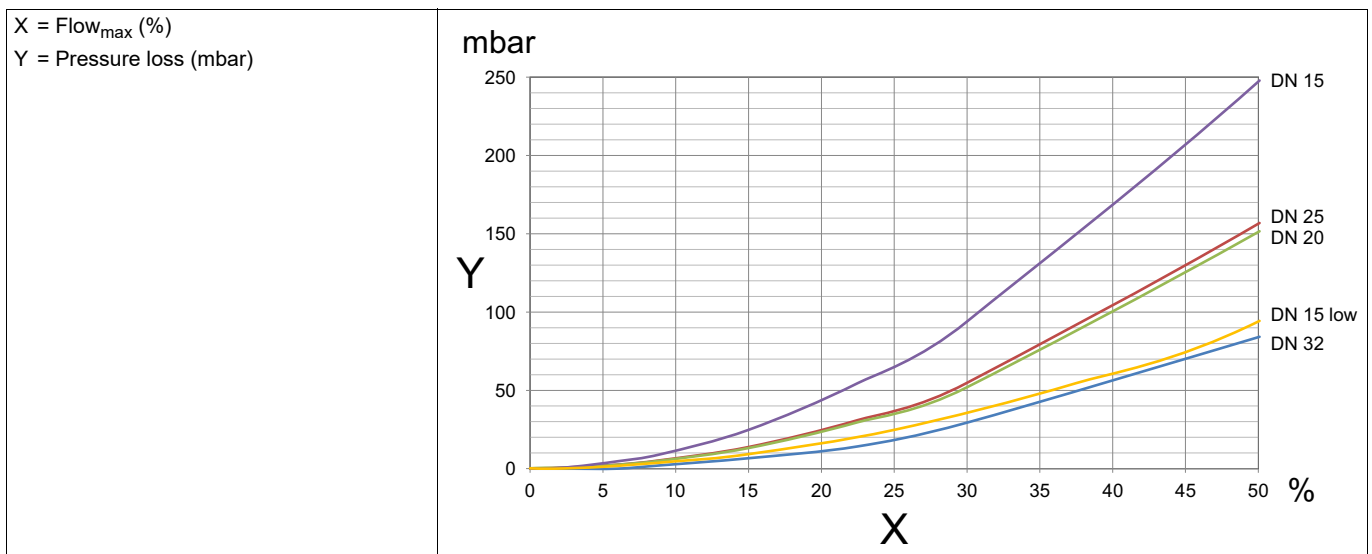
Housing	PA66-GF25
Display cover	PMMA
Components in contact with the medium	
Measuring tube	PPSU
Transducer	PEEK
Seals	
Process connection, transducer	EPDM or FKM (optionally)
Approvals	
Components in contact with the medium	Drinking water certified materials (when using EPDM seals)

Nominal pressure

Nominal pressure levels	PN 16
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Pressure loss diagram

Created under reference conditions ⇒ "Reference conditions", Page 2.



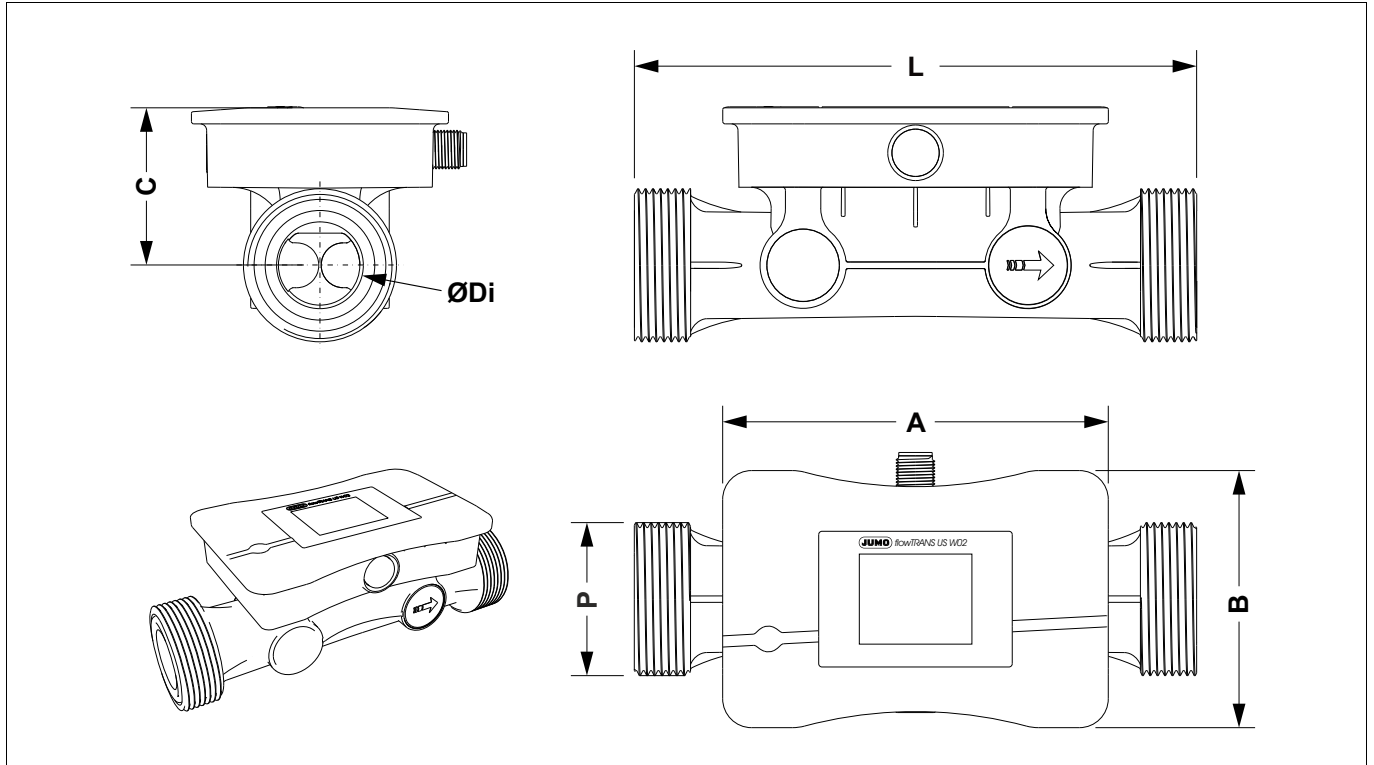
Measurement media

Medium type	Conductive or non-conductive liquids
Viscosity	≤ 100 mPas
Foreign matter content	
Solids	≤ 5 % vol
Gases	≤ 1 % vol
Medium temperature	
Temperature range	-20 to +95 °C
Within the accuracy specifications	-20 to +80 °C
Outside of the accuracy specifications ^a	> 80 to 95 °C

^a Return to the accuracy specifications after cooling down.

Dimensions

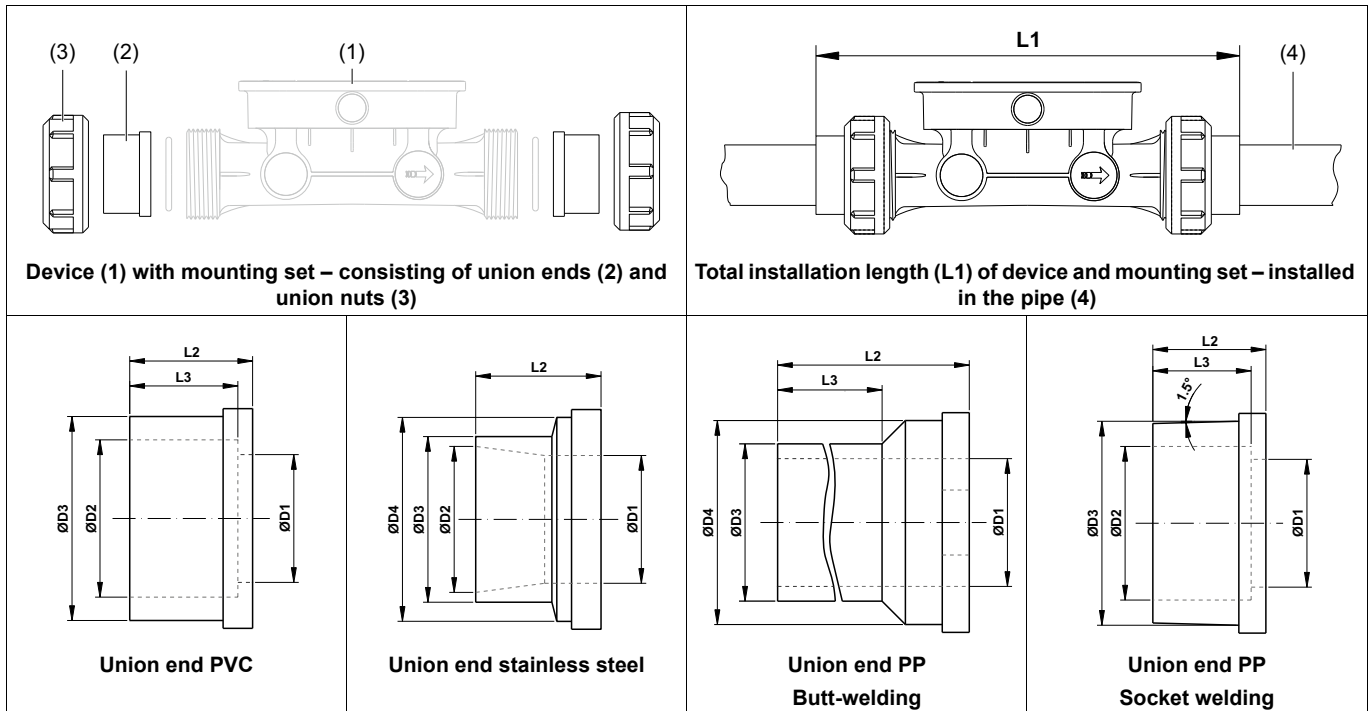
Device



Nominal width	ØDi [mm]	P	A [mm]	B [mm]	C [mm]	L [mm]
DN 15	16.5	G 1"	120	80	43.5	160
DN 20	21.5	G 1 1/4"			46	165
DN 25	27	G 1 1/2"			49	175
DN 32	34	G 2"			52.5	185

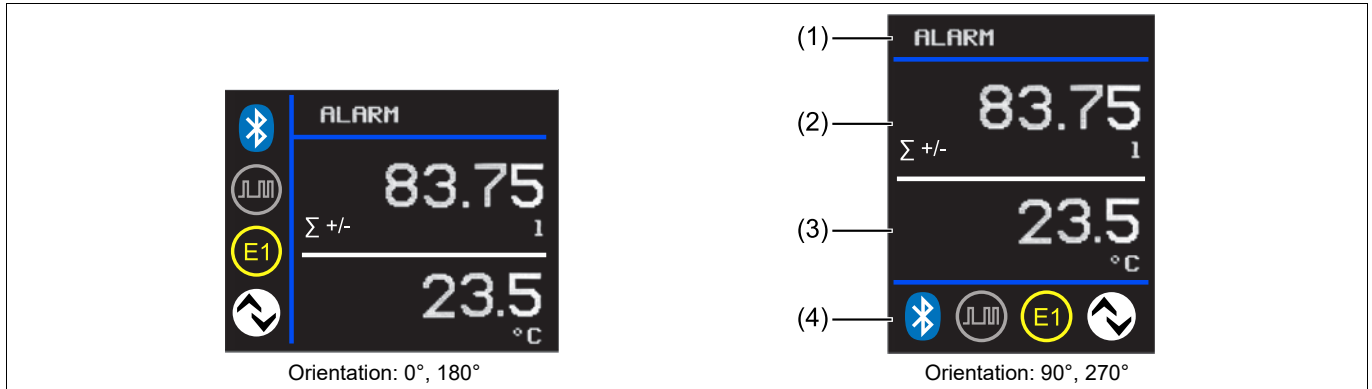
Accessories

Mounting sets



Nominal width	ØD1 [mm]	ØD2 [mm]	ØD3 [mm]	ØD4 [mm]	L1 [mm]	L2 [mm]	L3 [mm]
Union end PVC							
DN 15 to DN 10	10.5	16	23.5	27.5	203	24	16
DN 15	15	20	27.5	-	198	19	16
DN 20	22	25	36	-	209	22	19
DN 25	26	32	41.5	-	225	25	22
DN 32	33	40	53	-	243	29	26
Union end stainless steel							
DN 15 to DN 10	10.5	16	23.5	27.5	203	24	16
DN 15	15	17.3	21.3	27.5	203	21.5	-
DN 20	22	22.9	26.9	36	210	22.5	-
DN 25	26	29.7	33.7	41.5	226	25.5	-
DN 32	33	38.4	42.4	53	236	25.5	-
Union end PP butt-welding							
DN 15	15/16.2	-	20	27.5	266	53	37.75
DN 20	19.8	-	25	36	277.8	56.4	38.6
DN 25	26	-	32	41.5	293	59	41.25
DN 32	32.6	-	40	53	310.6	62.8	41.8
Union end PP socket-welding							
DN 15	17	19.35	27.5	-	198	19	16
DN 20	21	24.3	36	-	207	21	18
DN 25	26	31.25	41.5	-	221	23	20
DN 32	33	39.2	53	-	235	25	22

Display elements



Pos.	Designation	Description
1	Status bar	Shows information about the device status.
2, 3	Process value display 1, Process value display 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 residual volume for the batch function Error messages
4	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

Die Installationshinweise im Typenblatt liefern Informationen zur Produktauswahl.

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

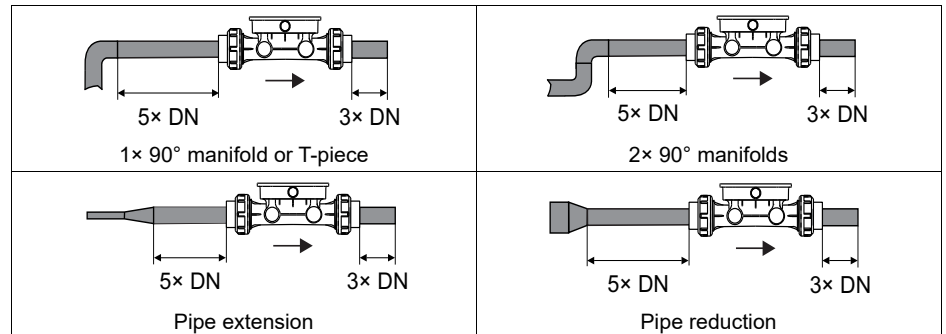
Inlet and outlet sections

To calm the flow in the pipeline, the specified inlet and outlet sections are required at the very least.

For increased accuracy, the inlet and outlet sections can be made longer.

DN = Nominal pipe width

→ = Flow direction



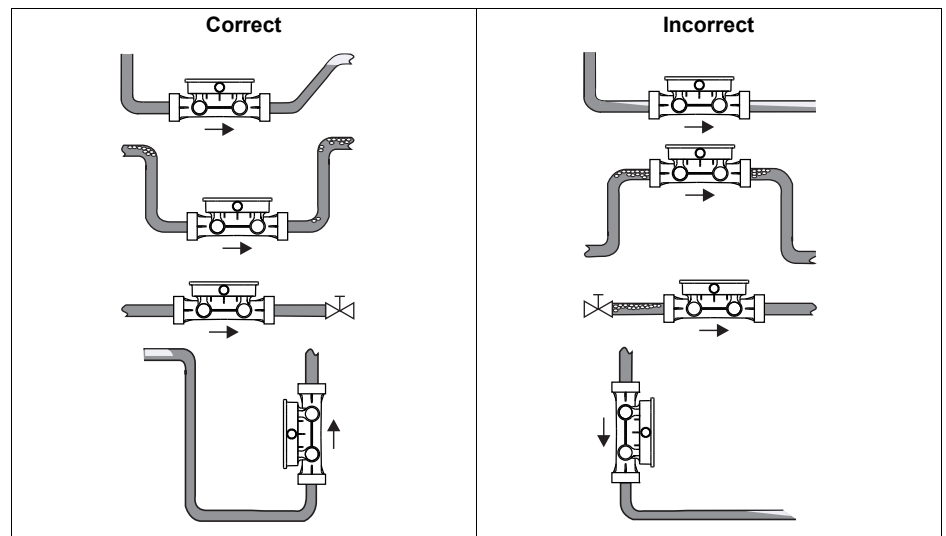
Installation position

Mount the device in either the horizontal or vertical pipe.

Requirements:

- The pipe around the transducers must be filled.
- The flow direction should be upwards for vertical mounting.
- Avoid the formation of air bubbles in the pipe and right at the device.

→ = Flow direction

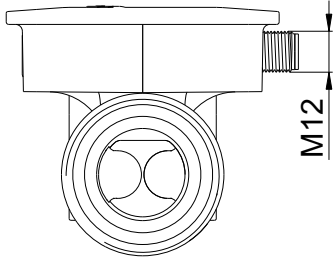
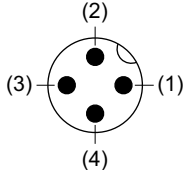
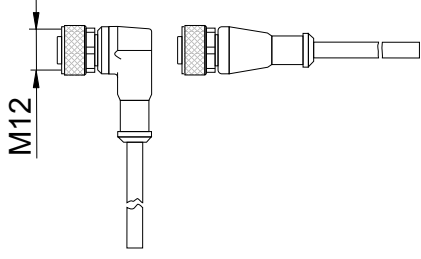
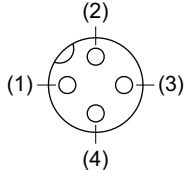


Connection elements

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.

Pin assignment of the M12 connector

Connection	Device	Connecting cable ^a
Pin assignment and color coding ^b Figure Voltage supply V+ (DC 24 V) I/O Pin 2 ^c GND IO-Link, I/O Pin 1 ^d	  (1) (2) (3) (4)	  (1) – BN (brown) (2) – WH (white) (3) – BU (blue) (4) – BK (black)
Connection type	Plug connector M12	Plug connector M12 with screw locking

^a Connecting cable for plug connector M12⇒ "Spare parts and accessories", Page 13.

^b The color coding is only valid for A-coded standard cables!

^c Configurable as: Digital input, digital output, analog output.

^d Configurable as: IO-Link, digital output, analog output.



Order details

	(1) Basic type
406051	JUMO flowTRANS US W02
	(2) Basic type extension
000	None
999	Special version
	(3) Nominal width
0015	DN 15 (1/2")
0020	DN 20 (3/4")
0025	DN 25 (1")
0032	DN 32 (1 1/4")
	(4) Material measuring tube
121	PPSU
	(5) Process connection
32	External thread ISO 228
	(6) Material seals measuring tube
58	EPDM
	(7) Calibration
01	Standard
02	Low flow
	(8) Material housing
85	Plastic
	(9) Display/Operation
01	Display and Bluetooth
	(10) Signal inputs and outputs
10	digiLine (in preparation)
11	IO-Link (conf. I/O)
	(11) Additional sensor
000	None
456	Pressure sensor 0 to 2.5 bar rel.
545	Pressure sensor -1 to +6 bar rel.
472	Pressure sensor -1 to +10 bar rel.
434	Pressure sensor -1 to +16 bar rel.

Order code (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)
Order example 406051 / 000 - 0015 - 121 - 32 - 58 - 01 - 85 - 01 - 11 - 000

Scope of delivery

1× JUMO flowTRANS US W02 – Device in the ordered version, including calibration certificate
2× O-ring (seal for the process connection) in the ordered version
1× JUMO flowTRANS US W02 operating manual

Spare parts and accessories

Designation	Part no.
Mounting set	
PVC DN 15 with PP nut	00750871
PVC DN 20 with PP nut	00750872
PVC DN 25 with PP nut	00750874
PVC DN 32 with PP nut	00750876
PP socket welding DN 15	00750888
PP socket welding DN 20	00750890
PP socket welding DN 25	00750927
PP socket welding DN 32	00750926
PP butt welding DN 15	00750878
PP butt welding DN 20	00750881
PP butt welding DN 25	00750884
PP butt welding DN 32	00750887
Stainless steel DN 15 with PP nut	00750923
Stainless steel DN 20 with PP nut	00750920
Stainless steel DN 25 with PP nut	00750919
Stainless steel DN 32 with PP nut	00750918
PVC DN 10 with PP nut	00750869
Stainless steel DN 10 with PP nut	00750924
Connecting cable for plug connector M12	
Cable socket, straight, 4-pole, M12 × 1, 2m	00404585
Cable socket, angled, 4-pole, M12 × 1, 2m	00409334
TMG IO-Link Device Tool	00694070

Further information and downloads



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