JUMO flowTRANS US W01

Ultrasonic flowmeter for liquids

Applications

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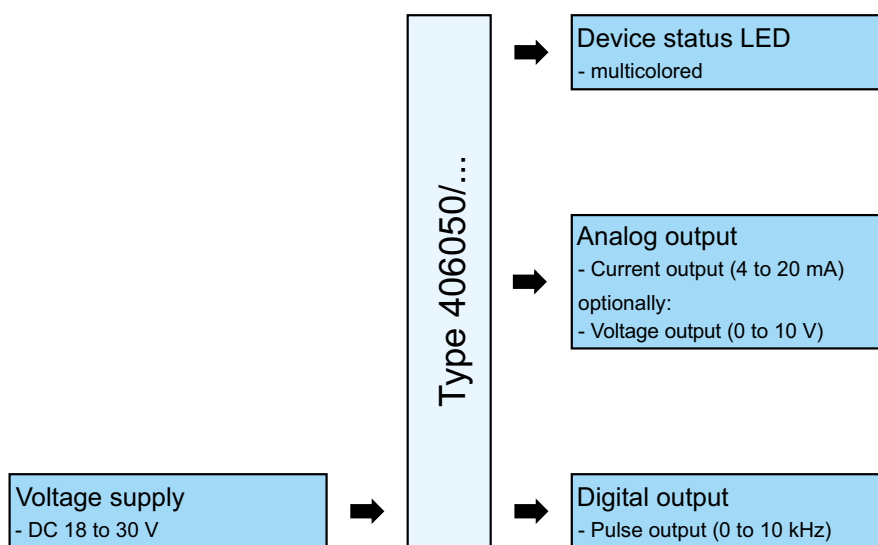- Cooling towers

Brief description

The ultrasonic flow meter measures the volume flow of conductive and non-conductive media. The volume flows can be output in analogue as a current signal (4 to 20 mA) and digitally as a pulse signal (0 to 10 kHz).

The inline 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 installation accessories. Another mounting set enables the flow-optimized transition of the nominal width DN 15 to DN 10 (low-flow calibration).

Type 406050/...

Block diagram

Type 406050/...

Device status LED
- multicolored

Analog output
- Current output (4 to 20 mA)
optionally:
- Voltage output (0 to 10 V)

Voltage supply
- DC 18 to 30 V

Digital output
- Pulse output (0 to 10 kHz)

Special features

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

Technical data
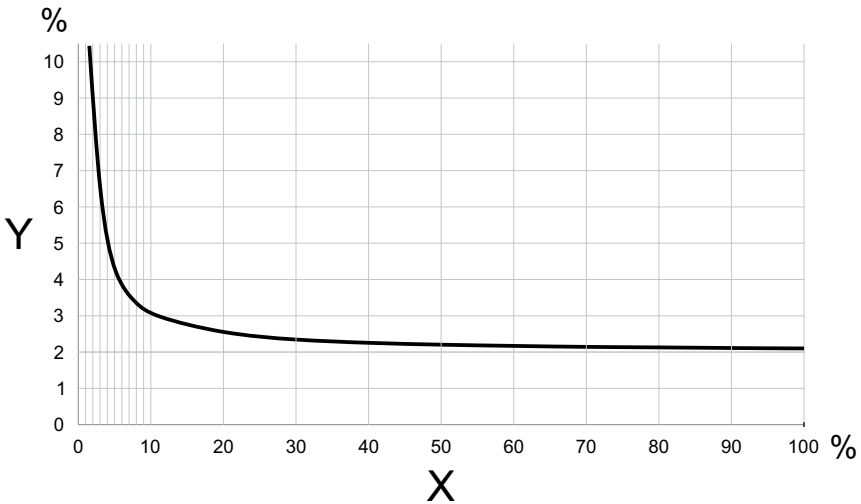
Input

Measuring range and accuracy

Nominal width	Default settings for analog output[a, b]	Flow$_{max}$[a]
DN 15 (Low-flow calibration)	0 to 30 l/min	60 l/min
DN 15	0 to 62.5 l/min	80 l/min
DN 20	0 to 105 l/min	210 l/min
DN 25	0 to 160 l/min	320 l/min
DN 32	0 to 260 l/min	520 l/min

[a] Low flow cut off: 0.05 % of flow$_{max}$.
[b] Optionally expandable up to flow$_{max}$.

X = Flow$_{max}$ (%) Y = Measuring deviation from the measured value ± (%)	
Measuring deviation[a]	
Pulse output	≤ ±2.0 % of measured value ±0.1 % of flow$_{max}$
Current output	Like pulse output, additionally ≤ ±0.1 % of 20 mA
Voltage output	Like pulse output, additionally ≤ ±0.1 % of 10 V
Reproducibility	≤ ±0.5 % of measured value[a] ±0.03 % of flow$_{max}$
Temperature drift	≤ ±0.15% of measured value[a] per 10 K temperature change (at -20 to +80° C)
Response time t$_{90}$	≤ 2 s

[a] Under reference conditions.

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
Meter run	Horizontal installation, compliance with the required inlet and outlet sections

Output

Analog output

Type	Current output
Function	Output of the current flow rate, output of a signal for error messages, display via device status LED
Signal range	4 to 20 mA
Signal limits	3.8 to 20.5 mA
Error message	3.4 or 22 mA (default settings: 3.4 mA)
Temperature influence	75 ppm/K
Burden	≤ 500 Ω
Burden influence	≤ ±0.02 % per 100 Ω

Type	Voltage output (optionally)
Function	Output of the current flow rate, output of a signal for error messages, display via device status LED
Signal range	DC 0 to 10 V
Signal limits	DC 0 to 10.3 V
Error message	DC 0 or 11 V (default settings: 0 V)
Temperature influence	75 ppm/K
Burden	≥ 700 Ω
Burden influence	≤ ±0.02 % per 100 Ω

Digital output

Type	Transistor output	
Function	Pulse output	
Switching output	Push-Pull, PNP/NPN (optionally)	
Ampacity	≤ 200 mA	
Voltage drop	≤ 2 V	
Protection	Against polarity reversal, short circuiting and overload	
Pulse frequency	0 to 10 kHz	
Duty cycle	50 %	
Output value at nominal width	Pulses per Liter (l)	
DN 15 (Low-flow calibration)	10000	
DN 15	4800	
DN 20	2850	
DN 25	1875	
DN 32	1150	

Electrical data

Voltage supply	DC 18 to 30 V SELV, PELV, Class 2
Current consumption	50 mA, with digital output 300 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".

Mechanical features

Materials

Housing	PA66-GF25
Components in contact with the medium	
Meter run	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

Pressure loss diagram

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

X = Flow rate$_{max}$ (%)
Y = Pressure loss (mbar)
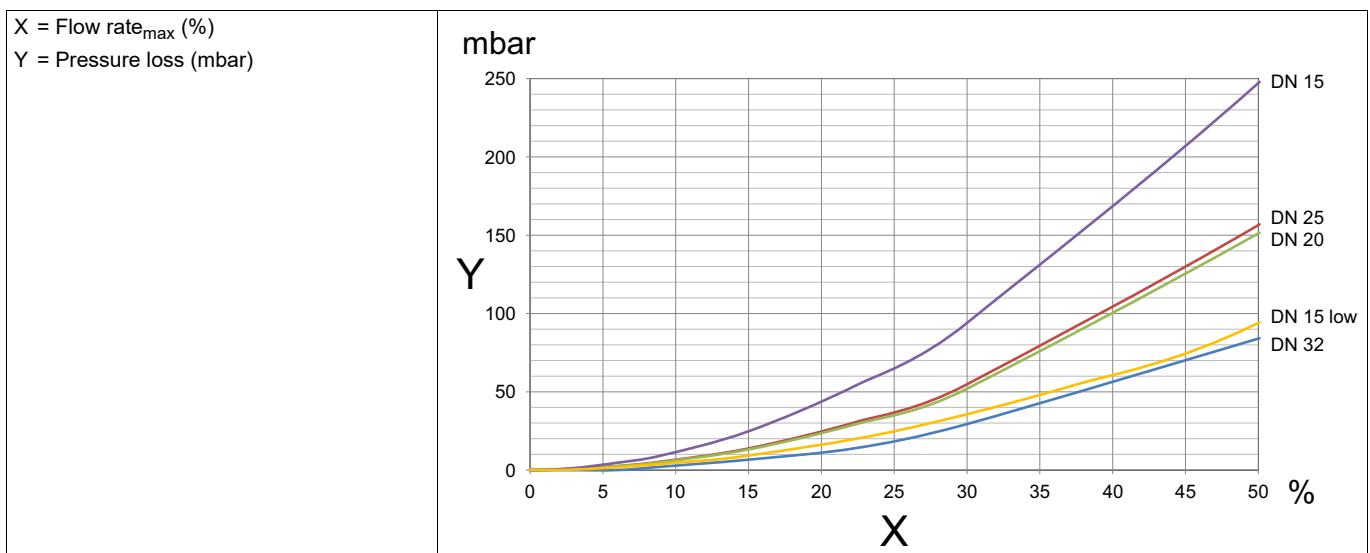
Measurement media

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.

Environmental influences

Admissible ambient temperature	DIN 60068-2-1, DIN 60068-2-2
at a medium temperature of ≤ 80 °C	-20 to +70 °C
at a medium temperature of > 80 °C	-20 to +45 °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.

Dimensions

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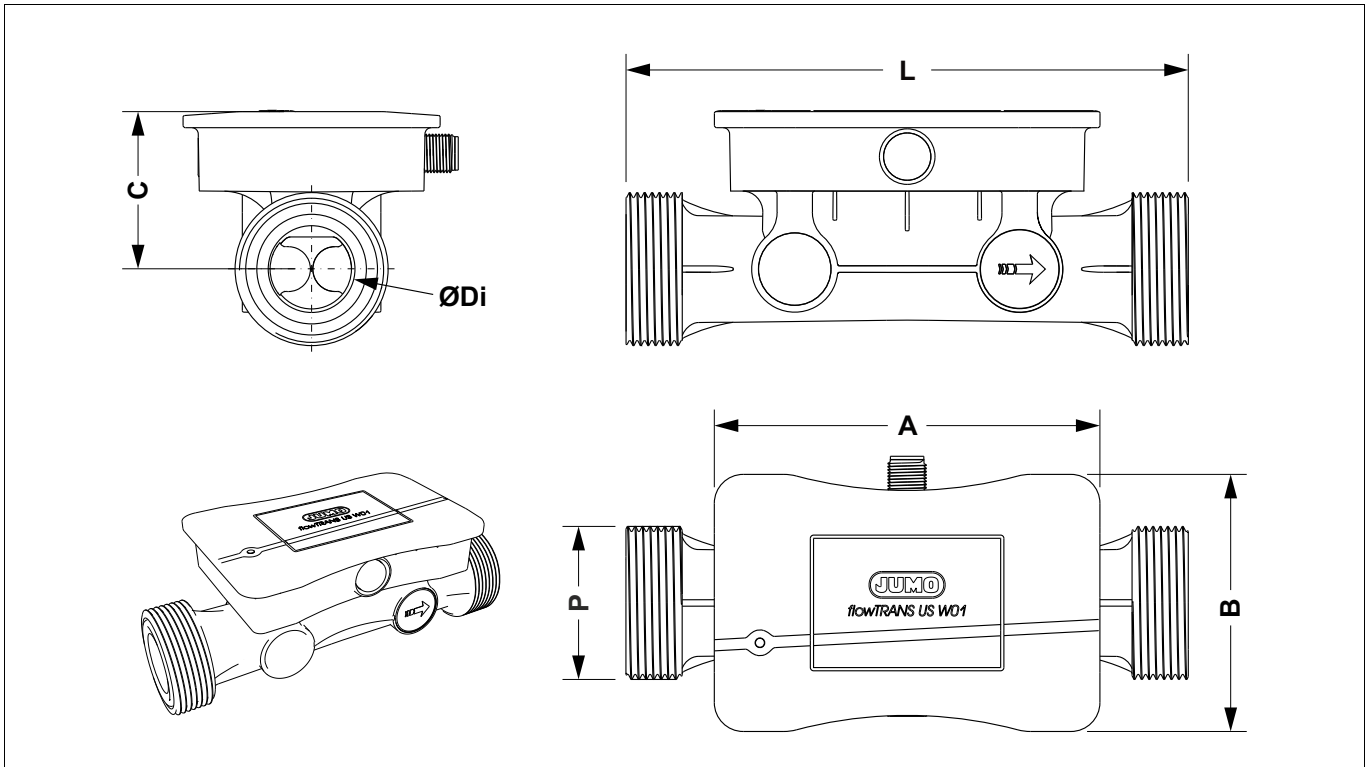
Nominal width	ØDi [mm]	P	A [mm]	B [mm]	C [mm]	L [mm]
DN 15	16.5	G 1″			43.5	160
DN 20	21.5	G 1 1/4″	120	80	46	165
DN 25	27	G 1 1/2″			49	175
DN 32	34	G 2″			52.5	185

Installation accessories

Mounting sets – DN 15 to DN 32

Device (1) with mounting set – consisting of union ends (2) and union nuts (3)	**Overall installation length (L1) of device and mounting set – installed in the pipe (4)**

Union end PVC	**Union end stainless steel**	**Union end PP butt-welding**	**Union end PP socket welding**
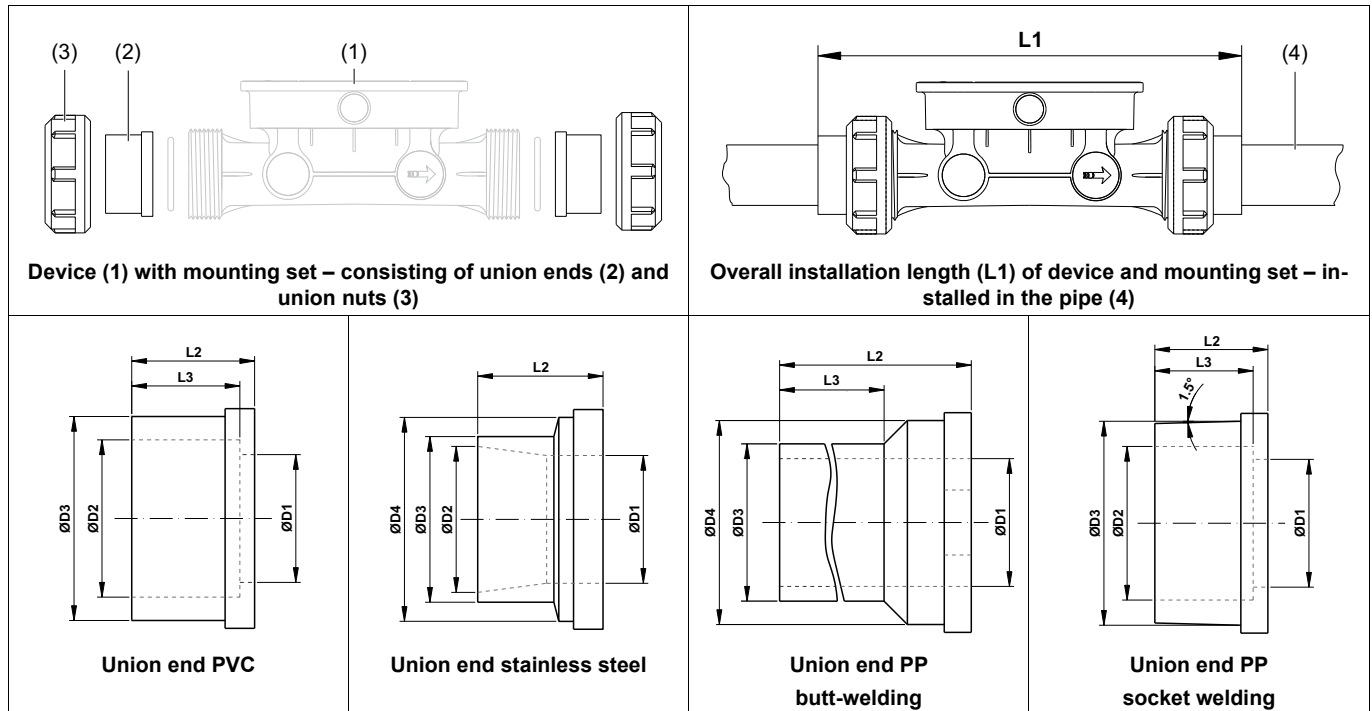
Nominal width	ØD1 [mm]	ØD2 [mm]	ØD3 [mm]	ØD4 [mm]	L1 [mm]	L2 [mm]	L3 [mm]
Union end PVC							
DN 15 to DN 10	10.5	16	23.5	27.5	203	24	16
DN 15	15	20	27.5	-	198	19	16
DN 20	22	25	36	-	209	22	19
DN 25	26	32	41.5	-	225	25	22
DN 32	33	40	53	-	243	29	26
Union end stainless steel							
DN 15 to DN 10	10.5	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

Installation notes

The installation notes in the data sheet provide information on product selection.

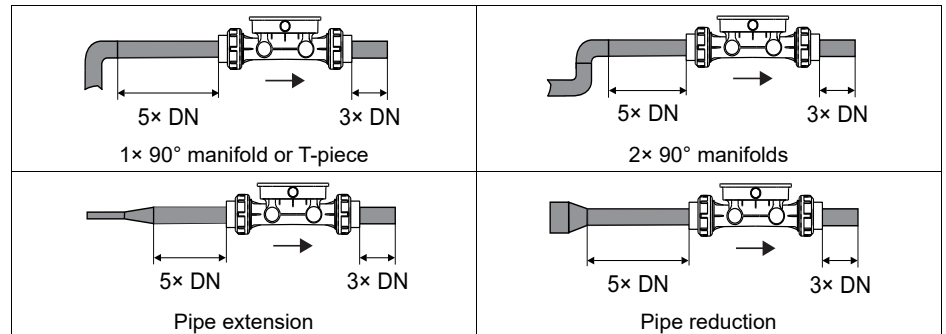**For the mechanical connection, only use the installation instructions or the operating manual.**

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

| 5× DN 3× DN	5× DN 3× DN
1× 90° manifold or T-piece	2× 90° manifolds
5× DN 3× DN	5× DN 3× DN
Pipe extension	Pipe reduction

Installation position

Mount the device in either the horizontal or vertical pipe.

Requirements:

- The pipe around the transducers must be filled.
- The flow direction (⟶) must run upward when mounting vertically.
- Avoid the formation of air bubbles in the pipe and right at the device.

Correct	**Incorrect**
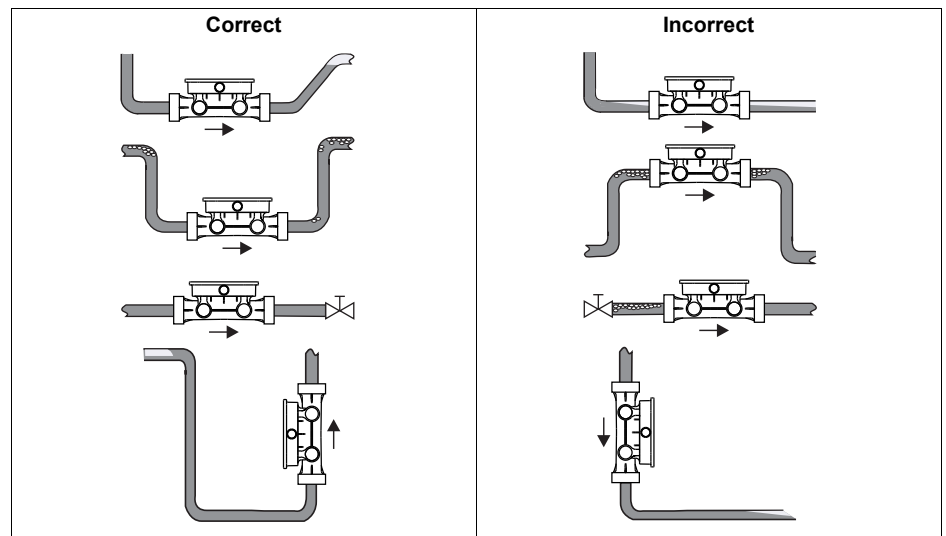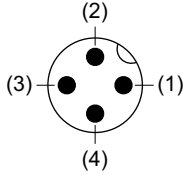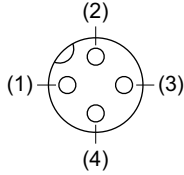
Connection elements

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]
	M12	M12
Pin assignment and color coding[b]		
Figure	(2) (3) (1) (4)	(2) (1) (3) (4)
Voltage supply V+ (DC 24 V)	(1)	(1) – BN (brown)
Analog output	(2)	(2) – WH (white)
GND	(3)	(3) – BU (blue)
Digital output	(4)	(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 11.

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

Order details

	(1)	Basic type
406050		JUMO flowTRANS US W01
	(2)	Basic type extension
000		None
	(3)	Nominal width
0012		DN 15 (1/2″) with Low-flow-calibration
0015		DN 15 (1/2″)
0020		DN 20 (3/4″)
0025		DN 25 (1″)
0032		DN 32 (1 1/4″)
	(4)	Material sensor
121		PPSU
	(5)	Process connection
32		External thread ISO 228
	(6)	Mat. seals sensor
58		EPDM
	(7)	Signal inputs and outputs
12		Pulse, 4 to 20 mA
	(8)	Extra codes
000		None
100		Customer-specific configuration (specifications in plain text)

	(1)		(2)	(3)	(4)	(5)	(6)	(7)		(8)	
Order code		/		-	-	-	-	-	/		...[a]
Order example	406050	/	000	- 0015	- 121	- 32	- 58	- 12	/	000	

[a]   List extra codes in sequence and separate using commas.

Scope of delivery

1× JUMO flowTRANS US W01 – Device in the ordered version, including test certificate
2× O-ring (seal for the process connection) in the ordered version
1× JUMO flowTRANS US W01 operating manual

Stock versions

Order code	Part no.
406050/000-0012-121-32-58-12/000	00749926
406050/000-0015-121-32-58-12/000	00744920
406050/000-0020-121-32-58-12/000	00744932
406050/000-0025-121-32-58-12/000	00744899
406050/000-0032-121-32-58-12/000	00744941

Spare parts and accessories

Product name	Part no.
Installation accessories	
Mounting set PVC DN 15 with PP-Nut	00750871
Mounting set PVC DN 20 with PP-Nut	00750872
Mounting set PVC DN 25 with PP-Nut	00750874
Mounting set PVC DN 32 with PP-Nut	00750876
Mounting set PP socket-welding DN 15	00750888
Mounting set PP socket-welding DN 20	00750890
Mounting set PP socket-welding DN 25	00750927
Mounting set PP socket-welding DN 32	00750926
Mounting set PP butt-welding DN 15	00750878
Mounting set PP butt-welding DN 20	00750881
Mounting set PP butt-welding DN 25	00750884
Mounting set PP butt-welding DN 32	00750887
Mounting set stainless steel DN 15 with PP-Nut	00750923
Mounting set stainless steel DN 20 with PP-Nut	00750920
Mounting set stainless steel DN 25 with PP-Nut	00750919
Mounting set stainless steel DN 32 with PP-Nut	00750918
Mounting set PVC DN 10 with PP-Nut	00750869
Mounting set 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

Further information on this chapter:

Installation accessories	⇨ "Installation accessories", Page 7
Connecting cable for plug connector M12	⇨ "Pin assignment of the M12 connector", Page 9

Further information and downloads

qr-406050-en.jumo.info