JUMO DELOS S02

Pressure transmitter with display

Bluetooth® IO-Link

Operating Manual

40505611T90Z001K000

V2.00/EN/30053013/2025-04-02

Further information and downloads

qr-405056-en.jumo.info

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1 About this documentation

1.1 Purpose

This documentation is part of the device and includes all information to ensure that it is used safely and as intended across all phases of the product lifecycle.

If you do not follow the documentation and safety information, this may result in risk to life and damage to property due to improper use.

- Read and follow the documentation and the safety information and warnings.
- Store the document in its entirety, in an easily accessible location, and so that it can be read in full at all times.
- Contact the manufacturer if you have any questions about the device and documentation.

1.2 Target group

This documentation is intended to be used by personnel for plant mechanical systems for sanitary, heating and air-conditioning technology, electrical engineering or mechanical and plant engineering.

1.3 Definition of terms

Use in the documentation	Definition
Device, product	Pressure transmitter
End device	Smartphone, tablet, laptop, PC etc.
Sensor	Pressure sensor, pressure measuring cell
Medium, measurement medium	Gases, vapors, liquids
Product lifecycle	Overall consideration of Product identification, acceptance of the goods, storage, mounting, connection, operation, troubleshooting, maintenance to disposal

1.4 Trademark information

All trademarks and trade and company names used are the property of their rightful owners or authors.

1.5 Symbols

NOTE!

This symbol is used in tables and indicates that further information is provided after the table.

REFERENCE!

This symbol refers to **further information** in other sections, chapters, or other manuals.

2.1 Intended use

The pressure transmitter with display measures the absolute or relative pressure of liquid, vaporous, and gaseous media.

The device is suitable for mounting in pipes and containers in various applications. It is mounted using individual process connections.

The documentation is part of the device. The device is only intended for use according to this documentation.

2.2 Qualification of personnel

The personnel deployed must meet the following requirements in all phases of the product lifecycle:

- Trained electrical, mechanical, and plant engineering personnel.
- Members of personnel are familiar with this documentation and the safety information and warnings it contains.

2.3 Hot surfaces

Hot device surfaces pose a risk of injury. Hot device surfaces can be caused by the use of hot media in applications.

- If required, install contact protection.

When working on the device:

- Allow the device and plant to cool down.
- Wear suitable protective equipment.

2.4 Hazardous materials

Using hazardous materials as a medium may result in abrasive and corrosive damage to components of the product that come into contact with the medium. The medium may leak and present a fire hazard and a risk to health.

Carry out a risk assessment taking into consideration the safety data sheet for the relevant hazardous substance for mounting, operation, maintenance, cleaning, and disposal:

- Comparison and systematic checking of the durability of the components of the product that come into contact with the medium and the admissible environmental influences.
- Assessment of the risk to people and the environment.
- Assessment of the fire hazard due to the product materials, the admissible environmental influences, and the voltage supply.

2.5 Mechanical loads

Mechanical load on the device and process connections can lead to leaks.

- Do not place the device and the process connections under mechanical strain.
- Systematically check that the process connections are leak-tight.

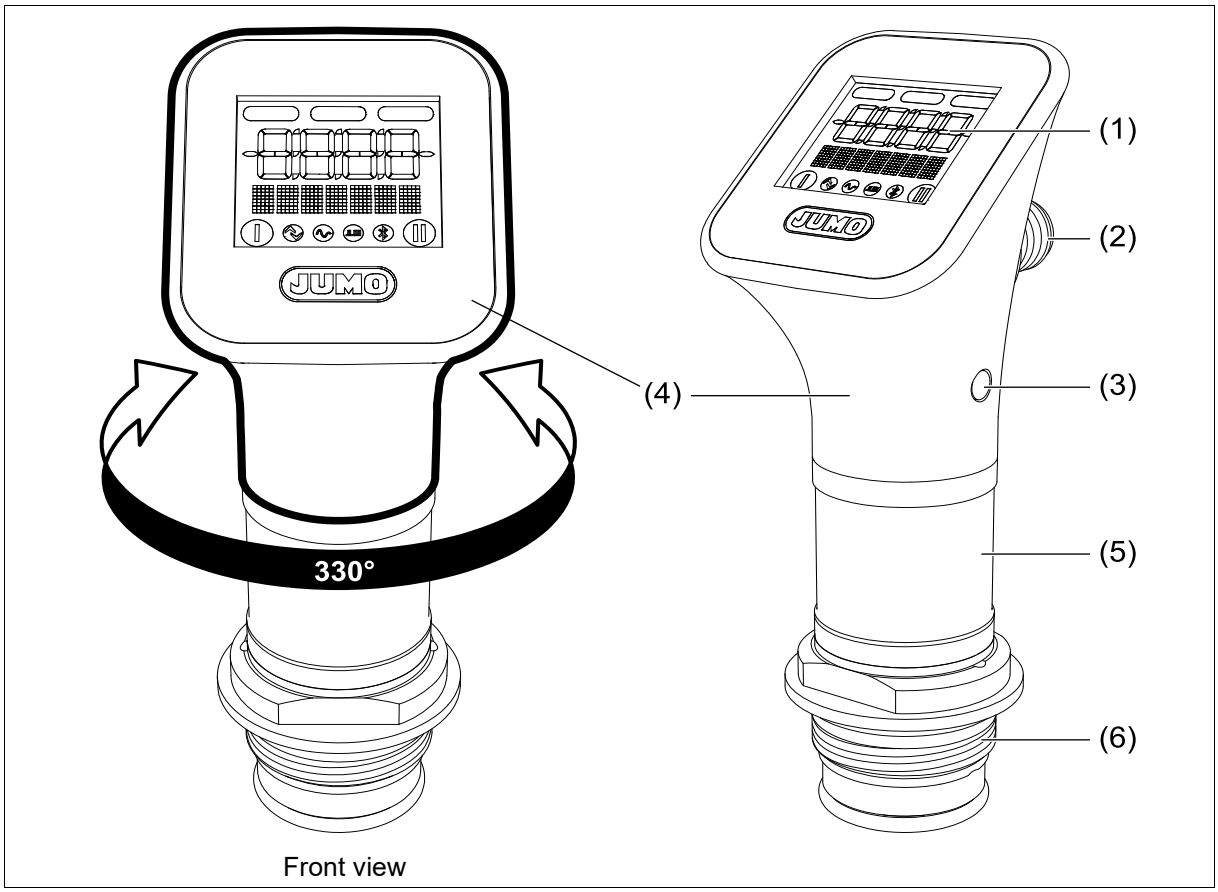
2.6 Transport and storage damage

The device can be damaged if it is insufficiently protected during transport and/or improperly stored.

- Transport the device protected from moisture and dirt in shockproof packaging.
- Protect all electrical and mechanical connections from damage.
- Observe the admissible storage temperature of the device.
- Store the device in a dry and dust-free environment.

3 Description

3.1 Structure



Front view

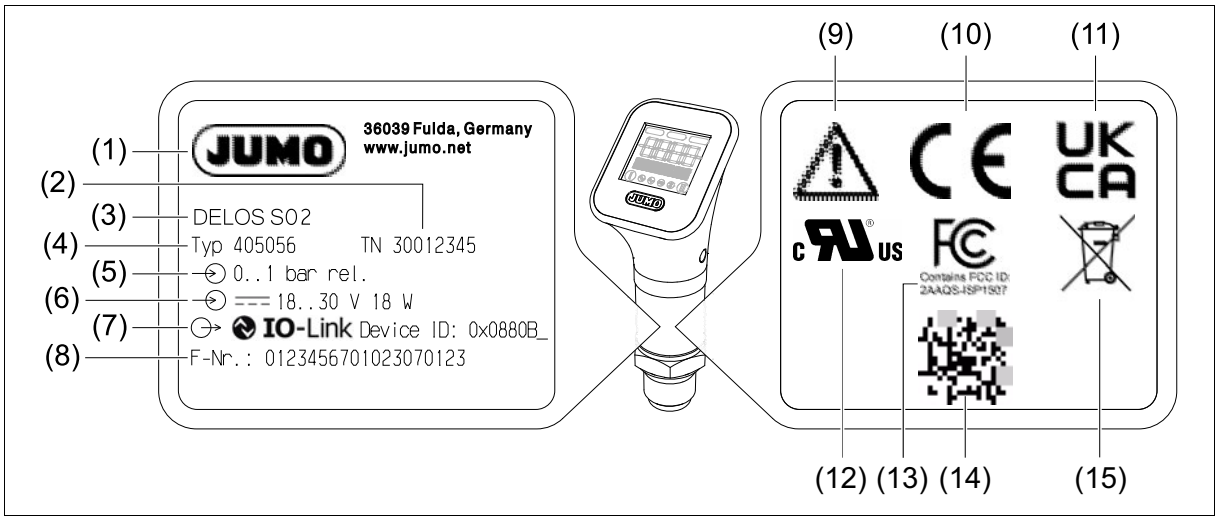
1	Display	4	Top section of the housing (rotating)
2	M12 plug connector	5	Case bottom section
3	Pressure compensation element (only in relative pressure sensor)	6	Process connection with sensor

3.2 Functions

The device measures the absolute or relative process pressure. In this process, the process pressure acts on a pressure measuring cell (sensor) via a membrane. The sensor sends an output signal to the transmitter. The transmitter converts the output signal into the process value. The process value can be read on the display and output to higher-level systems via the interfaces or outputs.

Measurand	**Measuring principle**
Absolute pressure	Piezoresistive pressure measurement
Relative pressure	

3.3 Nameplate



1	Manufacturer and address	9	Observe device documentation!
2	Part no.	10	CE identification marking
3	Device designation	11	UKCA identification marking
4	Order code	12	UL identification marking
5	Measuring range	13	FCC identification marking
6	Voltage supply (DC)	14	Data Matrix code
7	IO-Link device identifier (Device ID)	15	Disposal
8	Fabrication number		

3.4 Approval marks and certificates

Certificates for approved device versions are available for download on the manufacturer's website.

Submitted:

EHEDG conformity only in conjunction with EHEDG-approved process connections, ⇨ page 24.

Radio Equipment Directive (RED)

JUMO GmbH & Co. KG hereby states that the DELOS S02 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-405056-en.jumo.info.

3 Description

Radio Equipment Regulations 2017

JUMO GmbH & Co. KG hereby states that the DELOS S02 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-405056-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.

3.5 Device ID

The device ID is shown on the nameplate (⇨ Page 9) and identifies the device version. A device description file (IODD) is assigned to each device ID which is used for communication via the IO-Link interface, ⇨ Page 35.

Relative pressure

Device ID	Device version	IODD
0×088031	0 to 0.4 bar relative pressure	JUMO-088031-*.xml
0×0880B1	0 to 1 bar relative pressure	JUMO-0880B1-*.xml
0×088131	0 to 4 bar relative pressure	JUMO-088131-*.xml
0×0881B1	0 to 10 bar relative pressure	JUMO-0881B1-*.xml
0×088231	0 to 25 bar relative pressure	JUMO-088231-*.xml
0×0882B1	0 to 60 bar relative pressure	JUMO-0882B1-*.xml
0×088331	0 to 100 bar relative pressure	JUMO-088331-*.xml
0×0883B1	-0.1 to +0.1 bar relative pressure	JUMO-0883B1-*.xml
0×088431	-0.4 to +0.4 bar relative pressure	JUMO-088431-*.xml
0×0884B1	-1 to +1 bar relative pressure	JUMO-0884B1-*.xml
0×088531	-1 to +3 bar relative pressure	JUMO-088531-*.xml
0×0885B1	-1 to +9 bar relative pressure	JUMO-0885B1-*.xml
0×088631	-1 to +24 bar relative pressure	JUMO-088631-*.xml

Absolute pressure

Device ID	Device version	IODD
0×0886B1	0 to 0.4 bar absolute pressure	JUMO-0886B1-*.xml
0×088731	0 to 1 bar absolute pressure	JUMO-088731-*.xml
0×0887B1	0 to 4 bar absolute pressure	JUMO-0887B1-*.xml
0×088831	0 to 10 bar absolute pressure	JUMO-088831-*.xml
0×0888B1	0 to 25 bar absolute pressure	JUMO-0888B1-*.xml
0×088931	0 to 60 bar absolute pressure	JUMO-088931-*.xml

3.6 Scope of delivery

Device in the ordered version
Operating manual

4 Technical data

4.1 Electrical safety

Requirements	DIN EN 61010-1:2020 The device must be equipped with an electrical circuit that meets the requirements for "Limited-energy circuits".

4.2 Electrical data

Voltage supply	DC 18 to 30 V SELV, PELV
Current consumption	
IO-Link operation	≤ 100 mA
Operation with switching output	≤ 600 mA
Power consumption	
IO-Link operation	≤ 1.8 W
Operation with switching output	≤ 18 W
Overvoltage category	II
Protection rating	DIN EN 61140, Class III (protective low voltage)
Electrical connection	
Connection elements	
Device	M12 plug connector
Connecting cable	M12 plug connector
M12 plug connector	IEC 61076-2-101
Version	4-pole
Connecting cable	
Conductor cross section	
IO-Link operation	≥ AWG 22
Operation with switching output	≥ AWG 21
Version	4-core, copper
Line length	≤ 20 m
Temperature resistance	≥ 80 °C
For UL application	
Approved cables[a]	CYJV2/8, CYJV/7, PVVA2/8, PVVA/7

[a] The cables must be suitable for the voltage, current and temperature used.

4.3 Inputs

4.3.1 Measurands

Reference conditions

Basic principles	EN 61298-1, DIN 16086, DIN EN 60770
Installation position	Any
Calibration position	Device upright, process connection at the bottom

Relative pressure

Measuring range	**Linearity**[a]	**Accuracy with**		**Long-term stability**	**Overload capability**[b]	**Burst pressure**
		20 °C[c]	**-20 to +75 °C**[d]			
bar	% MSP[e]	% MSP	% MSP	% MSP per year	bar	bar
0 to 0.4[f]	0.15	0.40	1.00	≤ 0.15	10	20
0 to 1[f]	0.15	0.30	1.00	≤ 0.15	10	20
0 to 4	0.10	0.25	0.75	≤ 0.10	25	50
0 to 10	0.10	0.25	0.75	≤ 0.10	50	60
0 to 25	0.10	0.25	0.75	≤ 0.10	120	200
0 to 60	0.10	0.25	0.75	≤ 0.10	300	400
0 to 100	0.10	0.25	0.75	≤ 0.10	300	400
-0.1 to +0.1[f]	0.20	0.50	1.00	≤ 0.20	6	10
-0.4 to +0.4[f]	0.15	0.40	1.00	≤ 0.20	10	20
-1 to +1[f]	0.15	0.30	1.00	≤ 0.15	10	20
-1 to +3	0.10	0.25	0.75	≤ 0.10	25	50
-1 to +9	0.10	0.25	0.75	≤ 0.10	50	60
-1 to +24	0.10	0.25	0.75	≤ 0.10	120	200

[a] According to limit point setting.

[b] All pressure transmitters are vacuum proof.

[c] Includes: linearity, hysteresis, repeatability, deviation of measuring range start value and measuring range end value.

[d] Includes: linearity, hysteresis, repeatability, deviation of measuring range start value and measuring range end value, thermal effect on measuring range start and measuring span.

[e] MSP = measuring span.

[f] Not for increased medium temperature.

4 Technical data

Absolute pressure

Measuring range bar	**Linearity**[a] % MSP[e]	**Accuracy with** **20 °C**[c] % MSP	 **-20 to +75 °C**[d] % MSP	**Long-term stability** % MSP per year	**Overload capability**[b] bar	**Burst pressure** bar
0 to 0.4[f]	0.15	0.40	1.00	≤ 0.15	10	20
0 to 1[f]	0.15	0.30	1.00	≤ 0.15	10	20
0 to 4	0.10	0.25	0.75	≤ 0.10	25	50
0 to 10	0.10	0.25	0.75	≤ 0.10	50	60
0 to 25	0.10	0.25	0.75	≤ 0.10	120	200
0 to 60	0.10	0.25	0.75	≤ 0.10	200	300

[a] According to limit point setting.

[b] All pressure transmitters are vacuum proof.

[c] Includes: linearity, hysteresis, repeatability, deviation of measuring range start value and measuring range end value.

[d] Includes: linearity, hysteresis, repeatability, deviation of measuring range start value and measuring range end value, thermal effect on measuring range start and measuring span.

[e] MSP = measuring span.

[f] Not for increased medium temperature.

4.4 Outputs

Measuring range scaling (turn down)	1:4
Warm-up time	75 s
Step response time T_{90}	150 ms

4.4.1 Analog output

Current output	
Function	Output of the process value, output of a signal for error messaging
Signal range	4.0 to 20 mA
Signal limits	3.4 to 22 mA
Accuracy	±0.1 % of 16 mA
Temperature influence	75 ppm/K
Burden	≤ 500 Ω
Burden influence	±0.02 % per 100 Ω
Voltage output	
Function	Output of the process value, output of a signal for error messaging
Signal range	DC 0 to 10 V
Signal limits	DC 0 to 11 V
Accuracy	±0.1 % of 10 V
Temperature influence	75 ppm/K
Load	≥ 2000 Ω
Load influence	≤ 15 mV

4.4.2 Digital output

Type	Switching output
Protection	Against short circuiting and overload, protected against polarity reversal
Output signal	Push-pull, PNP, NPN
Ampacity	≤ 200 mA
Voltage drop	≤ 3.5 V
Switching output	
Function	Limit value monitoring function
Input signal	Pressure
Output signal	2 limit value monitoring functions, device error
Switch-on and switch-off delay	0 to 100 s
Limit value function	Hysteresis mode, window mode, two-point mode
Switching points	Configurable

4 Technical data

4.5 Interfaces

4.5.1 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

4.5.2 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

4.6 Display

Type	LCD
Display range	22.5 × 26.0 mm
Resolution	
Process value display	18-segment
Text line	5 × 8 Dot-Matrix
Brightness	11 levels (configurable)
Alignment	0°, 180°

4.7 Environmental influences

The product is UL-approved. The approval stipulates that the product may be used indoors only.

Admissible temperatures	DIN 60068-2-1, DIN 60068-2-2
Medium	
Standard	-25 to +100 °C (135 °C maximum 1 hour per day without function)
Increased	-25 to +200 °C
H2 ready	-40 to +120 °C
Ambient	-25 to +75 °C
Storage	-40 to +85 °C
Climatic conditions	DIN EN 60721-3-3
Climate class	3K6
Air temperature	-25 to +55 °C
Relative humidity	
Storage	≤ 90 %
Operation	≤ 100 % – condensation on device outer shell
Protection type	DIN EN 60529 IP65, IP67
Electromagnetic compatibility (EMC)	DIN EN 61326-2-3:2022
Interference emission	Class B[a]
Interference immunity	Industrial requirements
Oscillation	DIN EN 60068-2-6
Amplitude	1.5 mm at 10 to 2000 Hz
Acceleration	20 g at 10 to 2000 Hz
Shock	DIN EN 60068-2-27 50 g for 11 ms, 100 g for 1 ms
Site altitude	≤ 2000 m above sea level

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

4 Technical data

4.8 Mechanical features

4.8.1 Materials

Housing	
Top section of the housing	PBT-GF30
Case bottom section	1.4301 (304), PBT-GF30
Threaded sleeve M12 x 1	1.4301 (304)
Seal	EPDM
Display	PMMA
Sensor	Silicon
Membrane	1.4435 (316L)
Filling oil	Silicone oil, FDA-compliant oil
Process connection	
Without EHEDG certification	1.4571 (316Ti)
With EHEDG certification	1.4404 (316L)
Welding ring	1.4404 (316L)
O-ring, sealing ring	FPM, others available as an optional extra (e.g. EPDM, VMQ)

4.8.2 Surface finish

Wetted parts

Process connection	
Front-flush	
Taper socket with grooved union nut DN 25, DIN 11851	Ra ≤ 0,8 µm, Ra ≤ 0,4 µm on request
Taper socket with grooved union nut DN 40, DIN 11851	Ra ≤ 0,8 µm, Ra ≤ 0,4 µm on request
Clamping socket (clamp) DN 10/15/20, DIN 32676	Ra ≤ 0,8 µm, Ra ≤ 0,4 µm on request
Tank connection with grooved union nut DN 25 round thread 52 × 1/6 (dairy pipe fitting)	Ra ≤ 0,8 µm
Front-flush, with EHEDG certification	
Clamping socket (clamp) DN 25/32/40, DIN 32676	Ra ≤ 0,8 µm, Ra ≤ 0,4 µm on request
Clamping socket (clamp) DN 50, DIN 32676, 2" ISO 2852	Ra ≤ 0,8 µm, Ra ≤ 0,4 µm on request
JUMO PEKA Hygienic process connection	Ra ≤ 0,8 µm

4.8.3 Device

Weight[a]	
Process connection G 1/4	~ 155 g
Alignment	
Top section of the housing	Can be rotated by 330°

[a] Depends on version and DN.

4.8.4 Sensor

Measuring principle	Piezoresistive (absolute pressure sensor, relative pressure sensor)
Admissible load changes	> 10 million

4.8.5 Process connections

Specifications according to DIN standard in accordance with intended use. Temperature range depends on pressure range and sealing material.

Front-flush

Designation	Max. pressure	Temperature range
G 3/4 front-flush DIN EN ISO 228-1	25 bar	-10 to +150 °C
	40 bar	-10 to +100 °C
G 1/2 front-flush with double seal	25 bar	-10 to +150 °C
	40 bar	-10 to +100 °C
G 3/4 front-flush with double seal	25 bar	-10 to +150 °C
	40 bar	-10 to +100 °C
G 1 front-flush with double seal	40 bar	-10 to +100 °C
Taper socket with grooved union nut DN 25 DIN 11851	40 bar	-10 to +140 °C
Taper socket with grooved union nut DN 40 DIN 11851	40 bar	-10 to +140 °C
Clamping socket (clamp) DN 10/15/20 DIN 32676	25 bar	-10 to +140 °C
Tank connection with grooved union nut DN 25 round thread 52 × 1/6 (dairy pipe fitting)	25 bar	Up to 150 °C
	40 bar	Up to 100 °C

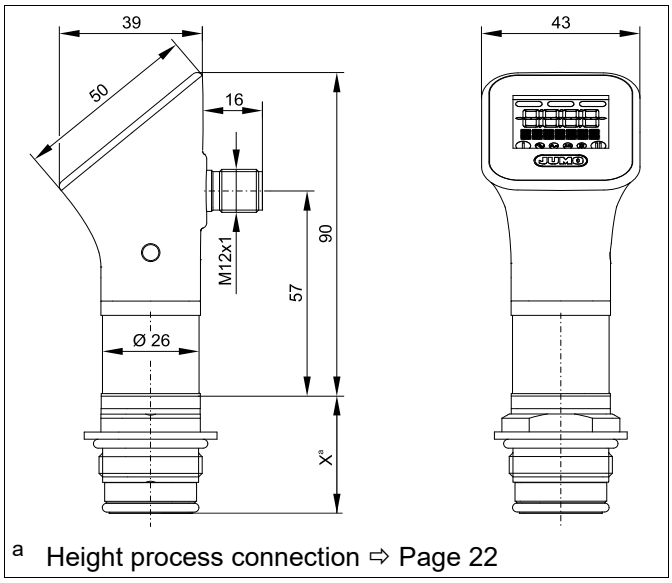
4 Technical data

Front-flush, with EHEDG certification

Designation	Max. pressure	Temperature range
Clamping socket (clamp) DN 25/32/40 DIN 32676	25 bar	-10 to +140 °C
Clamping socket (clamp) DN 50 DIN 32676, 2" ISO 2852	16 bar	-10 to +140 °C
JUMO PEKA Hygienic process connection	25 bar	-10 to +200 °C
	40 bar	-10 to +100 °C

4.9 Dimensions

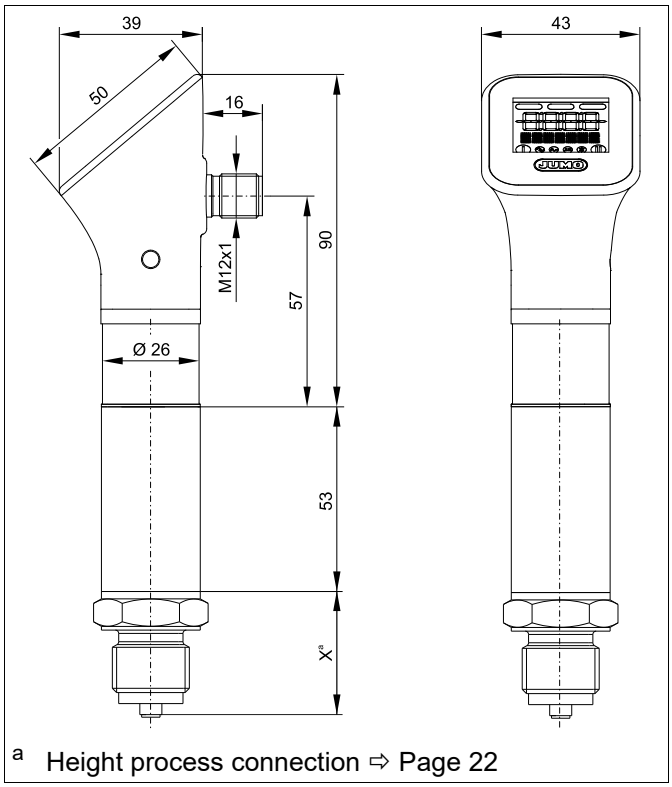
4.9.1 Device in standard version



[a] Height process connection ⇨ Page 22

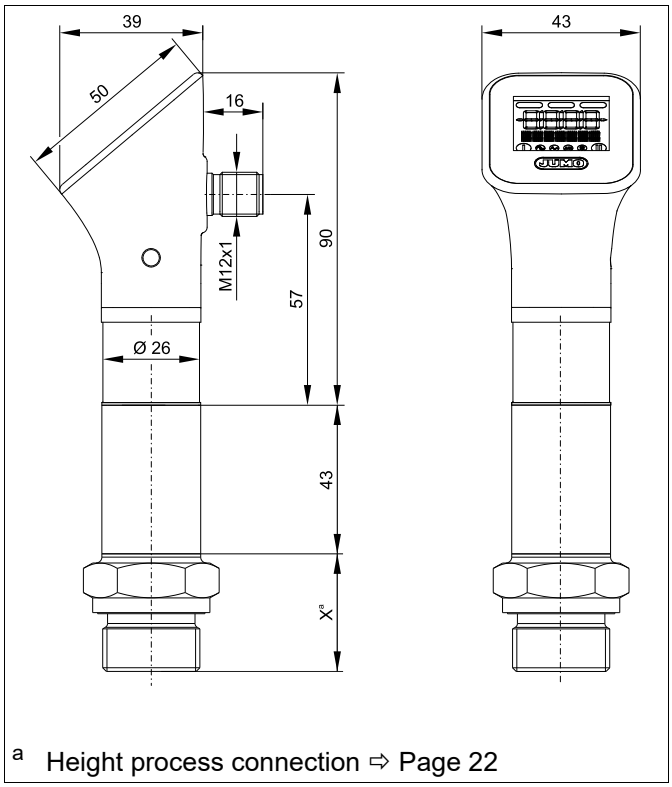
4.9.2 Device with increased medium temperature

Not front-flush



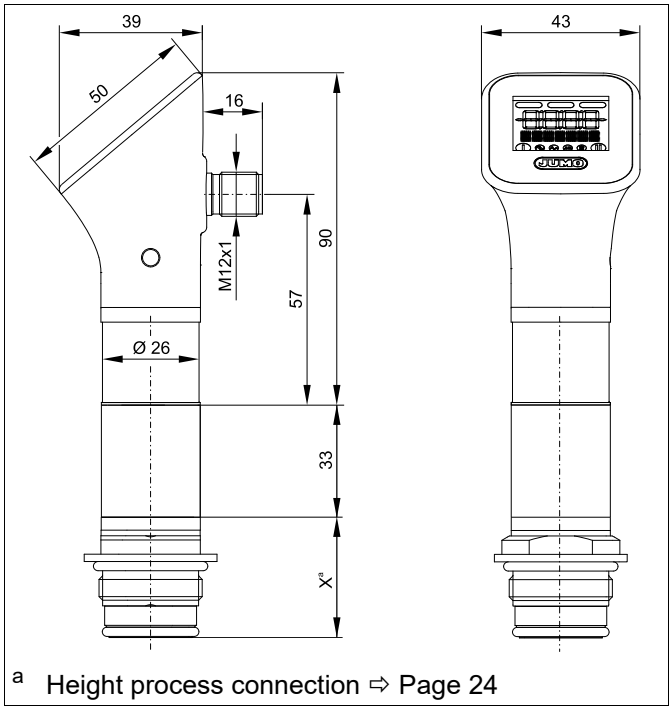
[a] Height process connection ⇨ Page 22

Front-flush



[a] Height process connection ⇨ Page 22

Front-flush, with EHEDG certification

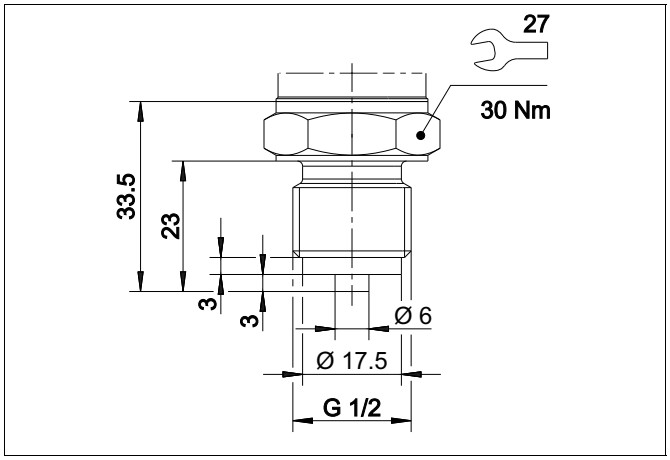


[a] Height process connection ⇨ Page 24

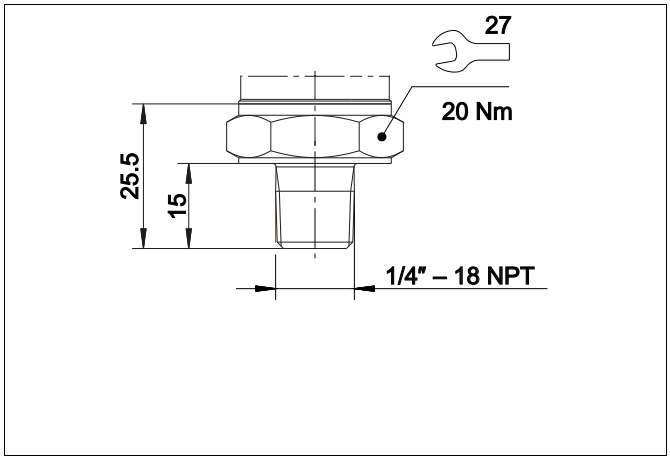
4.9.3 Process connections

Not front-flush

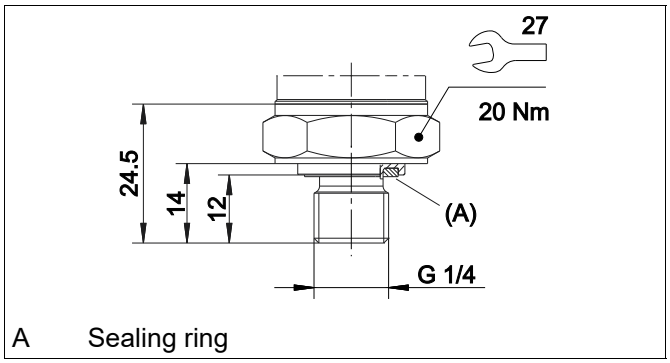
G 1/2 DIN EN 837



1/4" – 18 NPT DIN EN 837

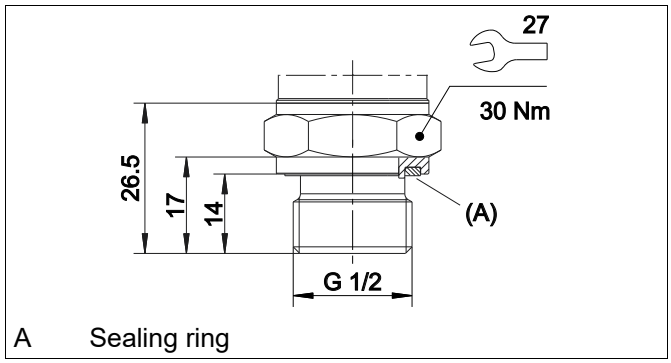


G 1/4 DIN EN 3852-11



A Sealing ring

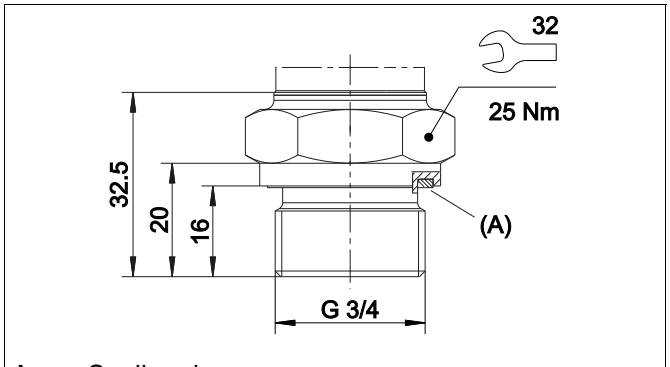
G 1/2 DIN EN 3852-11



A Sealing ring

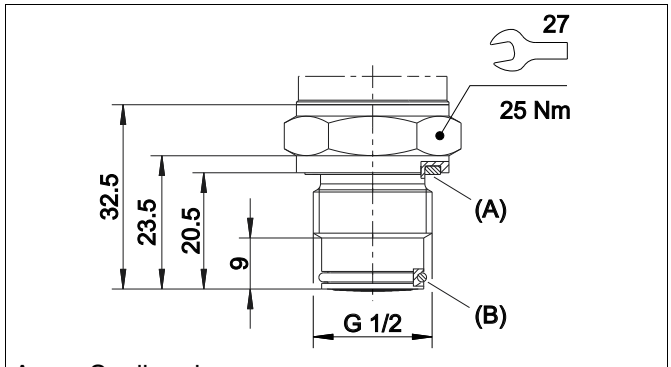
Front-flush

G 3/4 front-flush DIN EN ISO 228-1



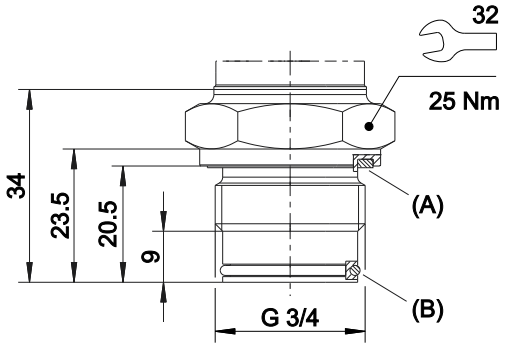
A Sealing ring

G 1/2 front-flush with double seal



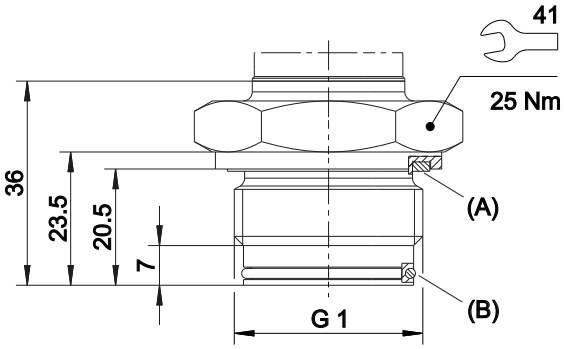
A Sealing ring
B O-ring 15.1 × 1.78

G 3/4 front-flush with double seal



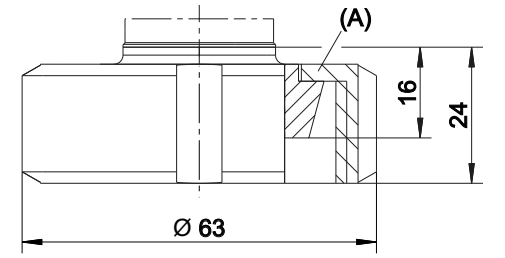
A Sealing ring
B O-ring 26.7 × 1.78

G 1 front-flush with double seal



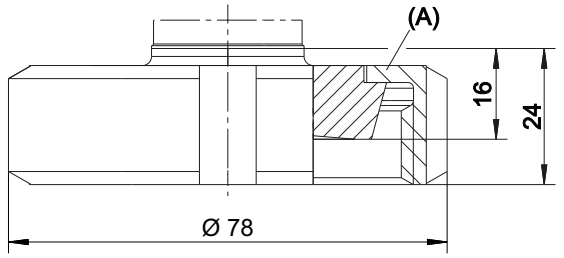
A Sealing ring
B O-ring 26.7 × 1.78

Taper socket with grooved union nut, DN 25
DIN 11851



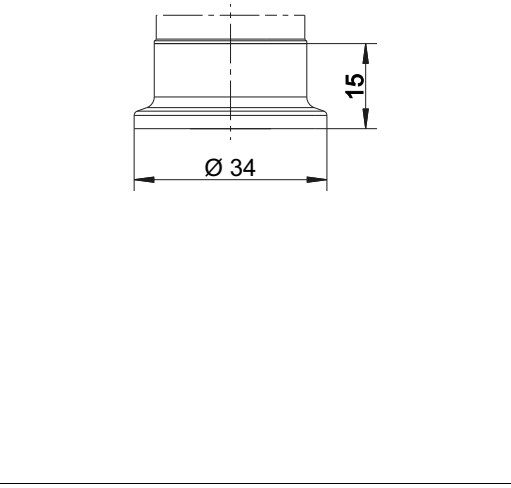
A Grooved union nut

Taper socket with grooved union nut, DN 40
DIN 11851

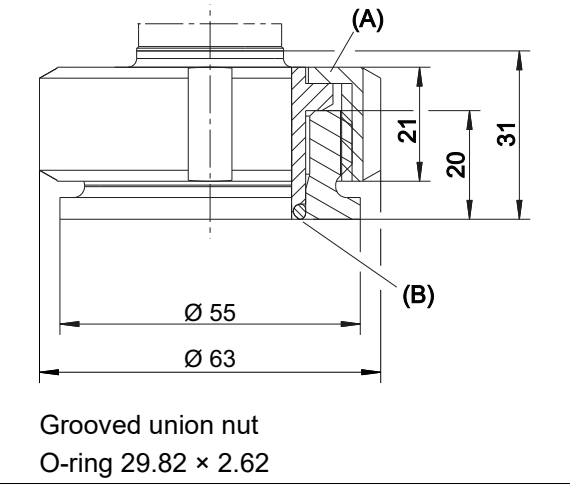


A Grooved union nut

Clamping socket (clamp) DN 10/15/20
DIN 32676



Tank connection with grooved union nut, DN 25
Round thread 52 × 1/6 (dairy pipe fitting)

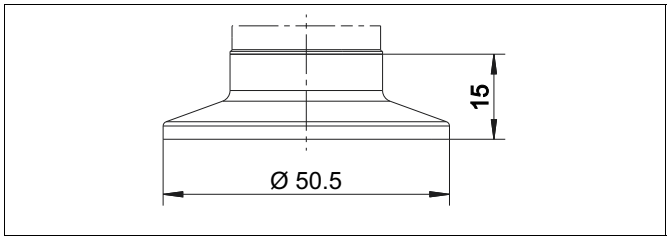


A Grooved union nut
B O-ring 29.82 × 2.62

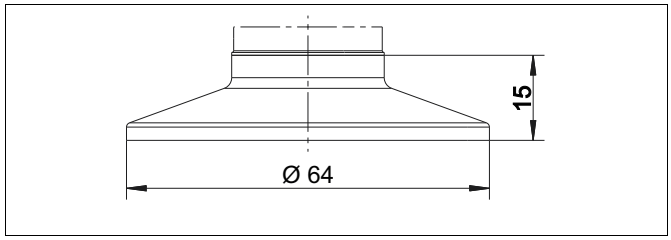
4 Technical data

Front-flush, with EHEDG certification

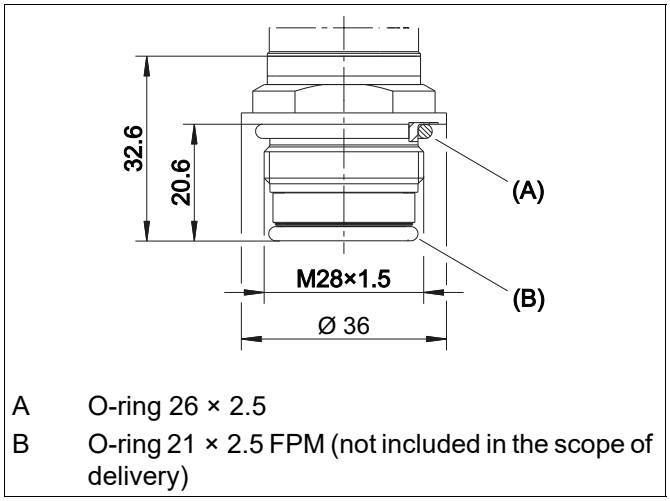
Clamping socket (clamp) DN 25/32/40
DIN 32676



Clamping socket (clamp) DN 50
DIN 32676, 2" ISO 2852



JUMO PEKA
Hygienic process connection
⇨Data sheet 409711



A	O-ring 26 × 2.5
B	O-ring 21 × 2.5 FPM (not included in the scope of delivery)

5.1 Preparing for installation

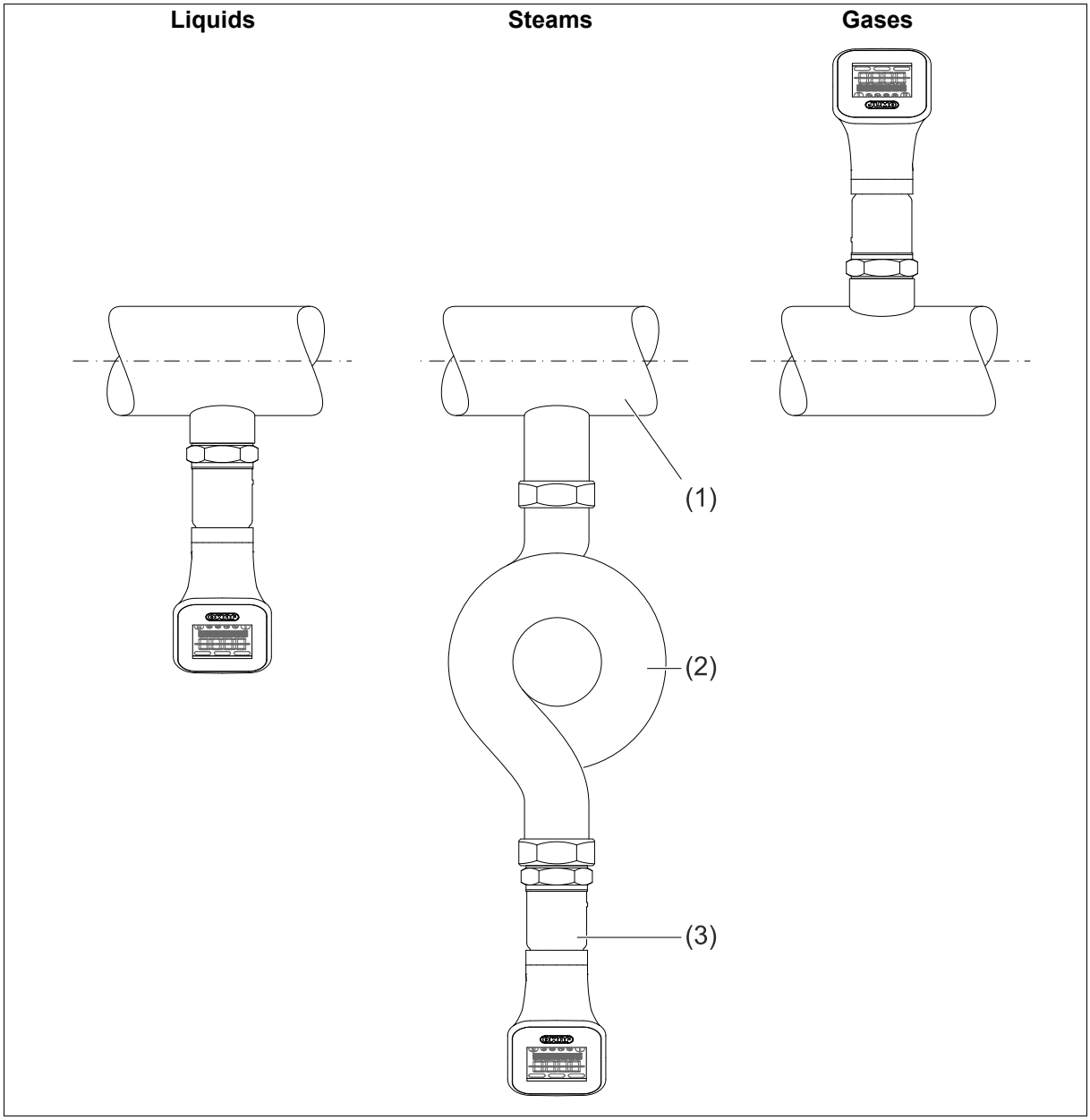
5.1.1 Installation site

Requirements:

- The device is protected from UV radiation and weather influences in outdoor applications through structural measures.
- Observe the admissible environmental influences, see ⇨ "Environmental influences ", Page 17.

5.1.2 Installation position

The device can be installed in any position within systems and solutions. Depending on the physical condition of the measurement medium, the following installation positions are recommended for pressure measurement:



1 Pipe
2 Siphon

3 Device

5.2 Important information for usage according to EHEDG

The device in combination with one of the following process connections is suitable for use in food production due to its EHEDG approval:

- Clamp connections DN 25, DN 32, DN 40, DN 50, DN 100 or 1“, 1 1/2“, 2 1/2“, 4“ with Tri-Clamp seal Combifit International B.V.
- JUMO PEKA with FKM O-ring
- VARINLINE® housing with process connection type N or type G with EPDM O-ring
- VARIVENT® process connections type B, type F, and type N with EPDM O-ring
- Aseptic screw connections DN 25 to DN 50, DIN 11864-1 and DIN 11864-3

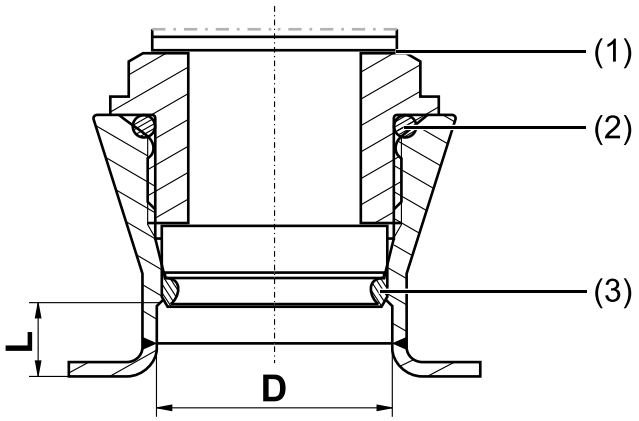
The device is suitable for CIP (Cleaning in Place) when installed accordingly.

Observe temperature and material resistance.

Observe EHEDG-compliant integration into the respective systems:

Prefer installation without cavity.
Ensure self-draining installation of the connection spigots.
Use only EHEDG approved process connections according to the current EHEDG position paper.
When used on tanks, the installation must be flush with the front. Cleaning by direct illumination must be ensured. It must be possible to detect cavity.
Install leakage opening in a clearly visible position. In the case of vertical lines, install pointing downwards.

The following drawing shows an installation example.
Observe dimensions to avoid cavity: **L < D**.



(1) Leakage opening
(2) Rear seal
(3) Front-flush seal

5.3 Installing the device

Example describes installation of the device version with a G 1/2 process connection DIN EN 837 in a pipe with port. Auxiliary equipment and tightening torques dependent on the selected process connection, ⇨ page 22.

Auxiliary equipment	Torque wrench with open-ended insert, wrench size 27

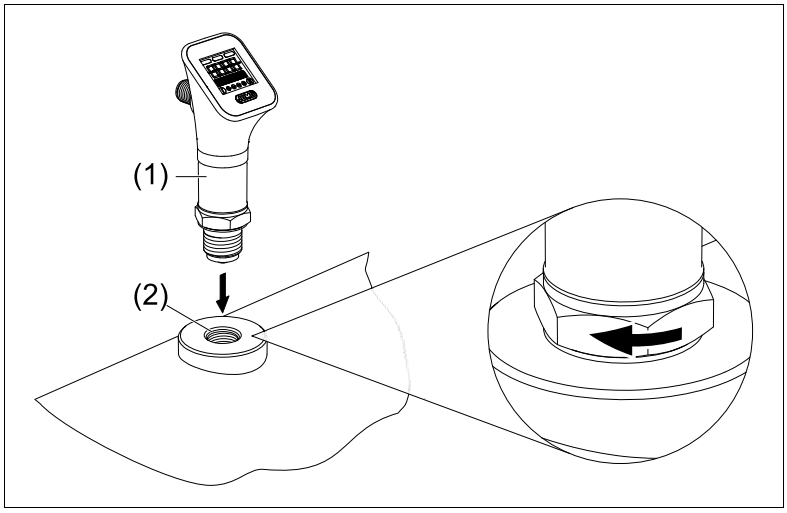
Requirements:

- The system has been de-energized and secured against being switched on again.
- The medium circulation of the plant is stopped.
- The pipe is drained and rinsed.
- Suitable protective equipment has been set up.
- The pipe is prepared for installation.

Procedure:

1. Manually (1) screw the device into the port (2) and tighten with suitable auxiliary equipment.

   Tightening torque: 30 Nm

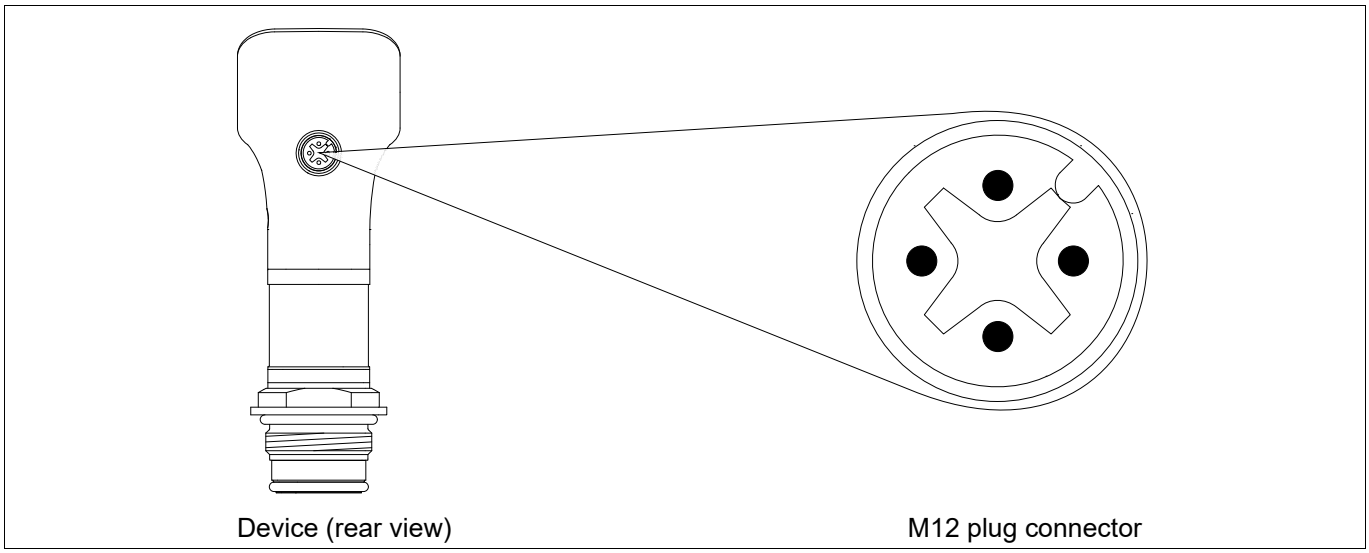


2. Switch on the plant, fill the pipe and check the tightness of the process connections under operating conditions.

The device is now installed in the pipe.

6 Electrical connection

6.1 Connection elements

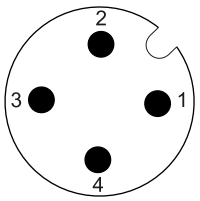


Device (rear view) M12 plug connector

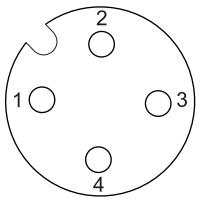
6.1.1 Terminal assignment

M12 plug connection

Designation	Description	Assignment
IO-Link	DC 24 V	1 BN (brown)
	I/O Pin 2 (DI/DQ)[a]	2 WH (white)
	GND	3 BU (blue)
	I/O Pin 1 (C/Q)[b]	4 BK (black)



Device



Connecting cable

[a] Configurable as: inactive, digital output, analog output.

[b] Configurable as: inactive, IO-Link, digital output.

6.2 Connection diagram

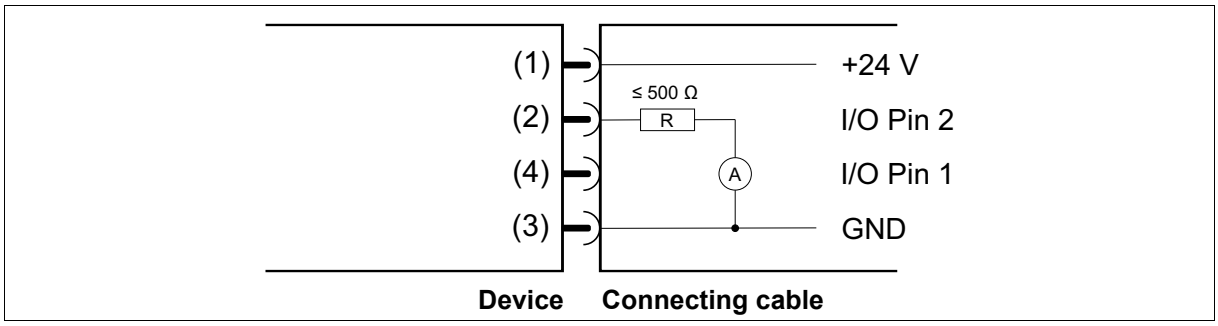
Requirements:

- An unused current output is connected to GND.
- An unused voltage output is open.

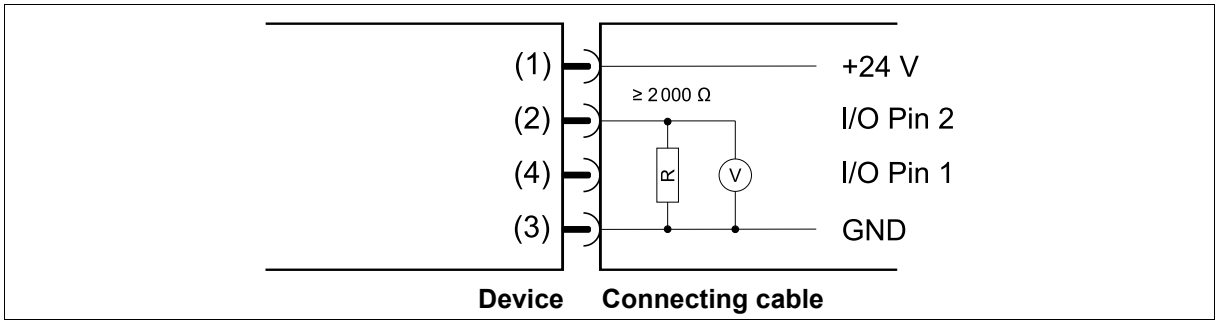
6.2.1 Analog outputs

I/O Pin 2 can be configured as analog output.

Current output – 4 to 20 mA



Voltage output – 0 to 10 V

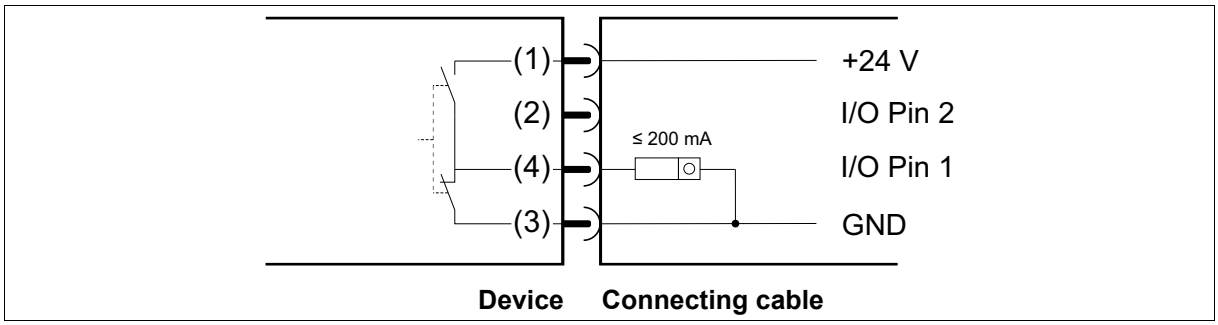


6.2.2 Digital outputs

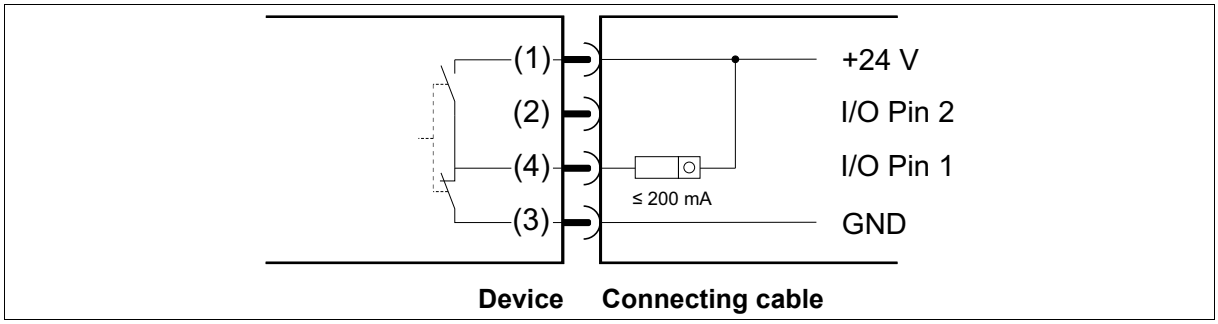
I/O pin 1 and/or I/O pin 2 can be configured as digital outputs with the switching output function.

The connection examples for I/O pin 1 also apply to I/O pin 2.

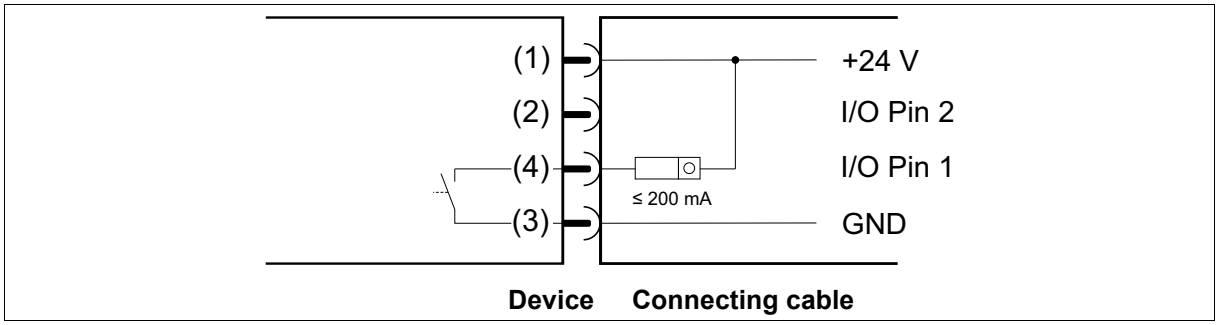
Digital output – push-pull (example 1)



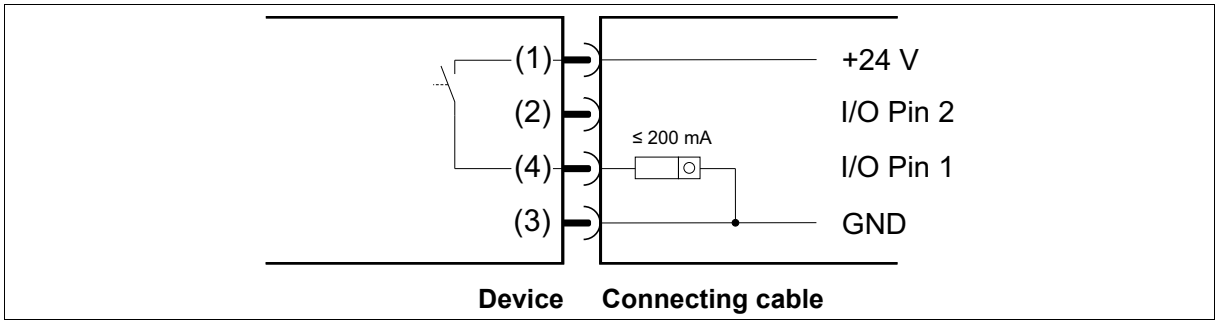
Digital output – push-pull (example 2)



Digital output – NPN (n-switching)



Digital output – PNP (p-switching)



6.3 Connecting the device

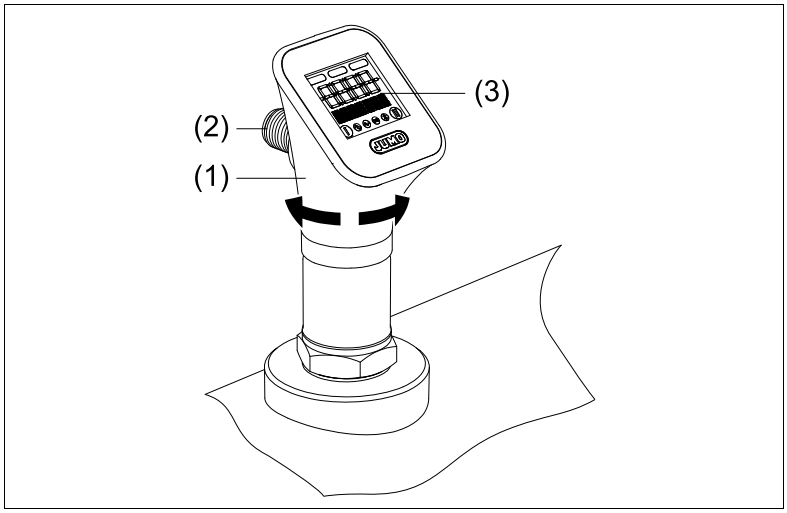
Auxiliary equipment	Torque wrench with socket wrench insert, wrench size 5
Material	Connecting cable for plug connector M12

Requirements:

- The system has been de-energized and secured against being switched on again.
- The connections for the voltage supply and signal processing have been correctly prepared.
- The process connection of the device is grounded.
- The connection cable is temperature resistant according to the process.
- The connection cable is installed at a minimum distance of 30 cm from high-voltage or high-frequency cables.

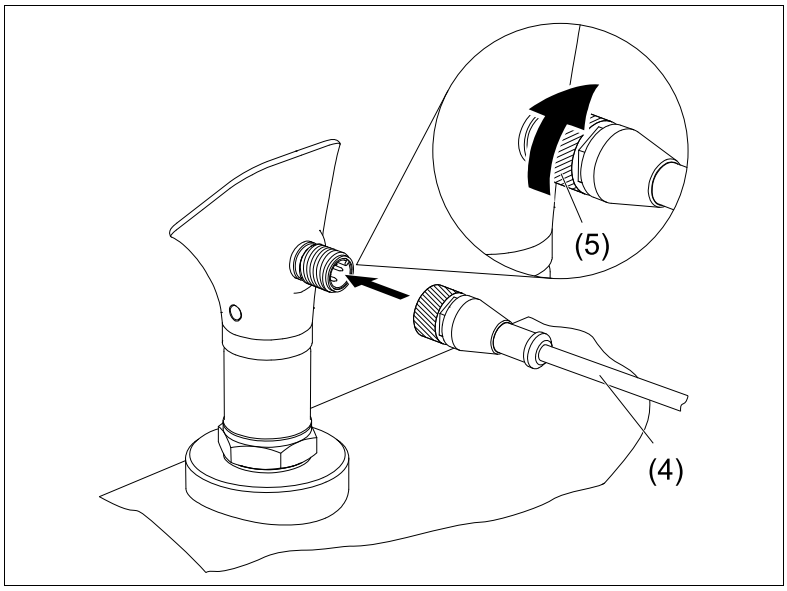
Procedure:

1. Position the top section of the device (1) so that the M12 plug connector (2) is easily accessible and the process display (3) is easy to read.



2. Insert the connecting cable (4) into the M12 plug connector and screw the connecting cable's union nut (5) to the M12 plug connector.

   Tightening torque: 0.4 Nm.



3. Connect the connecting cable to the device that is processing the signals and to the voltage supply.
4. Lay the connecting cable so that it is protected from mechanical load.

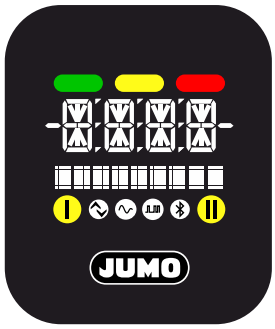
The device is ready for operation as soon as the voltage supply is established,
⇨ "Startup display ", Page 32.

7 Operation

7.1 Display elements

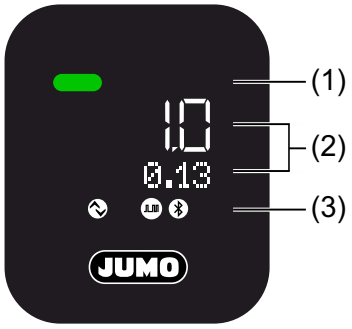
7.1.1 Startup display

The start-up display shows all of the display segments and switches to the device info display after a few milliseconds.

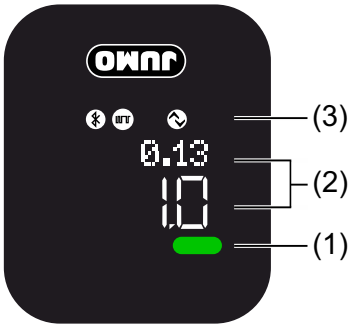


Orientation: 0°

7.1.2 Device info display



Orientation: 0°

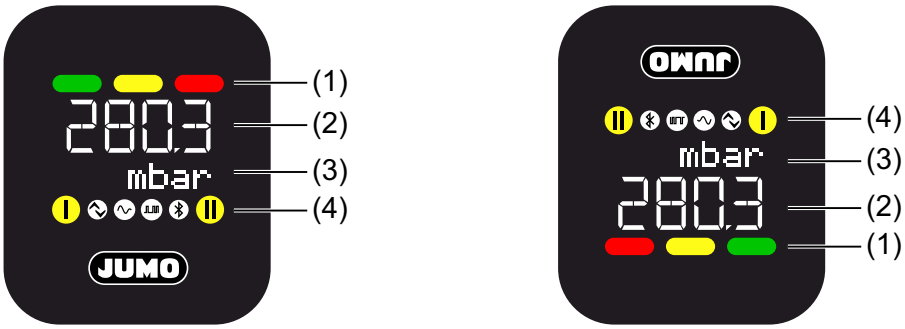


Orientation: 180°

Pos.	Designation	Description
1	**Device info display**	Shows the device status.
2		Shows the device software version.
3		Shows the configuration and status of the interfaces.

The device info display switches to the process display after approximately three seconds.

7.1.3 Process display



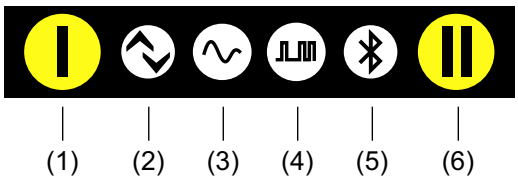
Orientation: 0° Orientation: 180°

Pos.	Designation	Description
1	**Device status** Multicolored	Indicates the device status based on the classification according to NAMUR NE 107: • Steady green = Normal operation • Flashing green = Maintenance required (M) • Steady yellow[a] = Outside the specification (S) • Steady red = Failure (F) • Flashing red = Functional check (C)
2	**Process value**	Shows: • The measured process value • Error messages ⇨ "Error messages ", Page 34
3	**Text line**	Shows: • The configured unit • Error messages and warnings as running text
4	**Toolbar**	Shows: • The configuration and status of I/O pin 1 and I/O pin 2 • The configuration and status of the interface connections

[a] Contrary to classification according to NAMUR NE 107, steady yellow instead of flashing red.

7 Operation

Toolbar



Pos.	Symbol, display	Description
1		Configuration: I/O pin 1 = Digital output (switching output) • Lights up when the output is active.
2		Interface connection: IO-Link • Lights up when an IO-Link connection is active via I/O pin 1 but no communication is taking place. • Lights up when an IO-Link connection is active via I/O pin 1 and communication is taking place.
3		Configuration: Analog output • Lights up when I/O pin 2 is configured as an analog output.
4		Configuration: Digital output (switching output) • Lights up when I/O pin 1 and/or I/O pin 2 is configured as a digital output.
5		Interface connection: Bluetooth® • Does not light up if NFC approval is needed for the connection or if Bluetooth® is permanently disabled. • Flashes when Bluetooth® is ready for a connection. • Lights up when a Bluetooth® connection has been established.
6		Configuration: I/O pin 2 = Digital output (switching output) • Lights up when the output is active.

7.2 Error messages

Error messages and warnings are specified as running text in the text line – alternately with the unit configured for the display. If there are several error messages, only the error message with the highest priority is displayed.

The illuminated fields that display the device status indicate the error category.

Further information, ⇨ "Troubleshooting ", Page 53.

7.3 Interfaces

7.3.1 Bluetooth

The JUMO smartCONNECT app allows the device to be configured and its parameters to be set using an end device. Configuration data and device information are transmitted via Bluetooth. The Bluetooth radio module of the device is permanently active during initial startup.

The app is available for free download from the manufacturer´s websites or alternatively using the QR code:

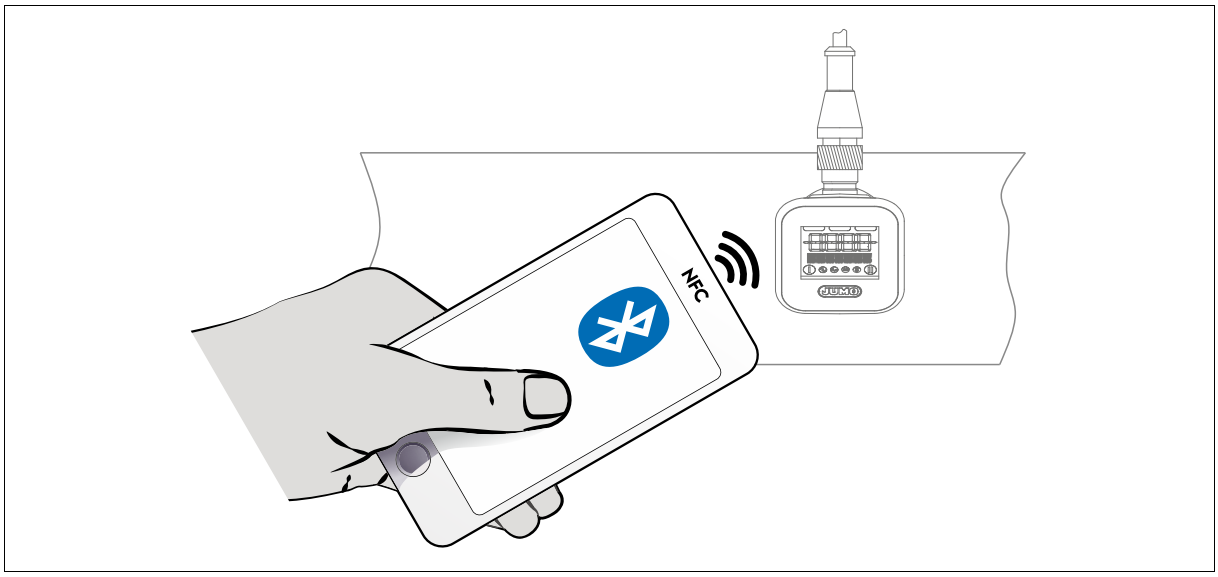
JETZT BEI Google Play

Laden im App Store

Active: The Bluetooth® radio module is permanently active. The device is detected by the smartCONNECT app as soon as it is within range of the Bluetooth® radio module.

Restricted (via NFC): The Bluetooth® radio module is inactive and can be temporarily activated via an NFC tag in the device. To establish a connection between the NFC tag and the end device, this device must be NFC-capable and held close to the device display.

Inactive: The Bluetooth® radio module can disabled and enabled via IO-Link.



7.3.2 IO-Link

IO-Link enables the device to be configured and parameterized using an end device. Process data, configuration data and device information are transmitted using a standard IO-Link master.

The user software of the IO-Link master requires a device description file (IODD) for this, which is assigned to the device ID, ⇨ Page 10.

The device IODD collection is available to download for free from the manufacturer website or alternatively directly via http://ioddfinder.io-link.com.

8 Functional descriptions

8.1 Limit value monitoring

Parameter	Value	Default setting	Description
Function	Inactive Single Point Mode Windows Mode Two Point Mode	Inactive	**Inactive:** Limit value monitoring function inactive **Single Point Mode:** Hysteresis mode ("Switching point SP1" and "Hysteresis") **Windows Mode:** Window mode ("Switching point SP1", "Release point SP2" and "Hysteresis") **Two Point Mode:** Two-point mode ("Switching point SP1" and "Release point SP2")
Logic	High-active Low-active	High-active	The limit value logic can be inverted. **High-active:** An active limit value monitoring function corresponds to the High signal (logic level 1). **Low-active:** An active limit value monitoring function corresponds to the Low signal (logic level 0).
Switching point SP1	-1 bar to +100 bar	0 bar	–
Switching point SP2	-1 bar to +100 bar	0 bar	Only when "Switching function" = "Windows Mode" and "Two Point Mode"
Hysteresis	0 bar to 100 bar	0 bar	Only when "Switching function" = "Single Point Mode" and "Windows Mode"
Switch-on delay	0 s to 100 s	0 s	State is not given to the limit value monitoring function output until after the time has elapsed.
Switch-off delay	0 s to 100 s	0 s	State is not given to the limit value monitoring function output until after the time has elapsed.
Error behavior	Inactive Active Frozen	Inactive	Behavior of the limit value monitoring function output signal when there is a process value error. **Inactive:** Inactive signal (logic level 0) **Active:** Active signal (logic level 1) **Frozen:** Last valid value

Two limit value monitoring functions are available for each measurand. All limit value monitoring functions can be configured independently of each other.

Different switching modes are selectable, all of which can be inverted. In addition, the limit value monitoring functions have a switching delay.

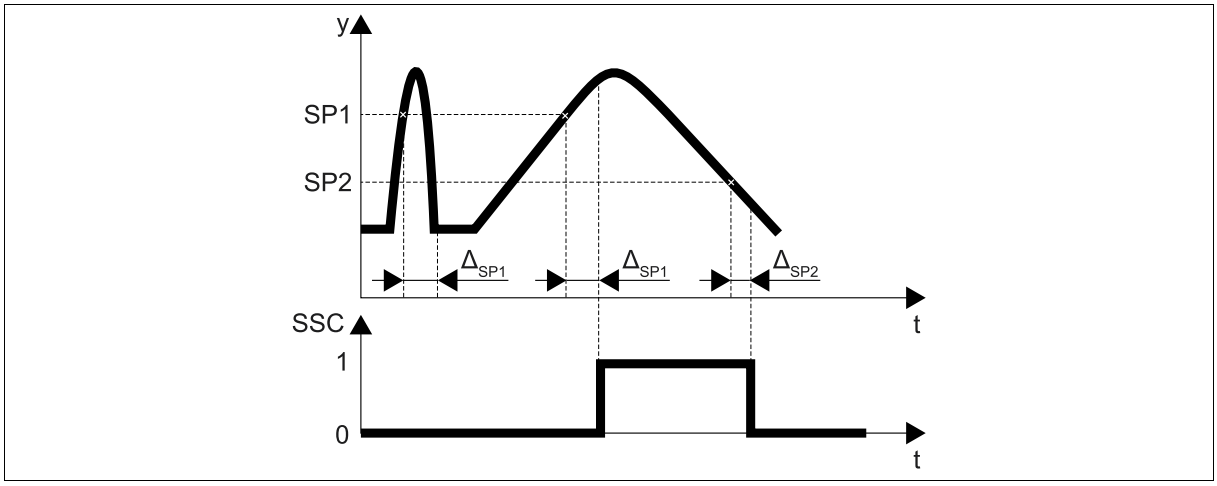
Switching delay

A switching delay for switching on and / or switching off can be configured.

If the switching condition is fulfilled, the set timer for the switch-on delay (Δ_{SP1}) starts to elapse. The state is only output after the time has elapsed. If the switching condition is no longer fulfilled before the time has elapsed, the timer is restarted.

The switch-off delay (Δ_{SP2}) works analogously.

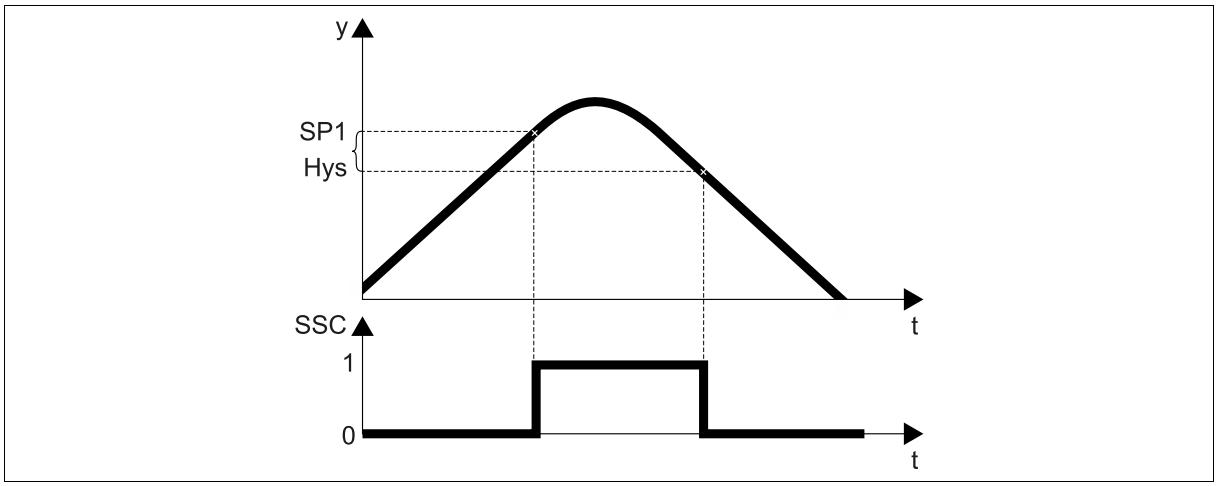
The delay times prevent the output from being switched by measured value peaks or by measured value dips.



(Δ_{SP1}) Switch-on delay
(Δ_{SP2}) Switch-off delay
(SSC) Limit value monitoring function output signal
(SP1) Switching point
(SP2) Release point
(t) Time
(y) Measured value

Hysteresis mode

If the process value exceeds the switching point SP1, the output of the limit value monitoring function becomes active. If the switching point SP1 reduced by the amount of the hysteresis is undershot again, the output of the limit value monitoring function becomes inactive again.

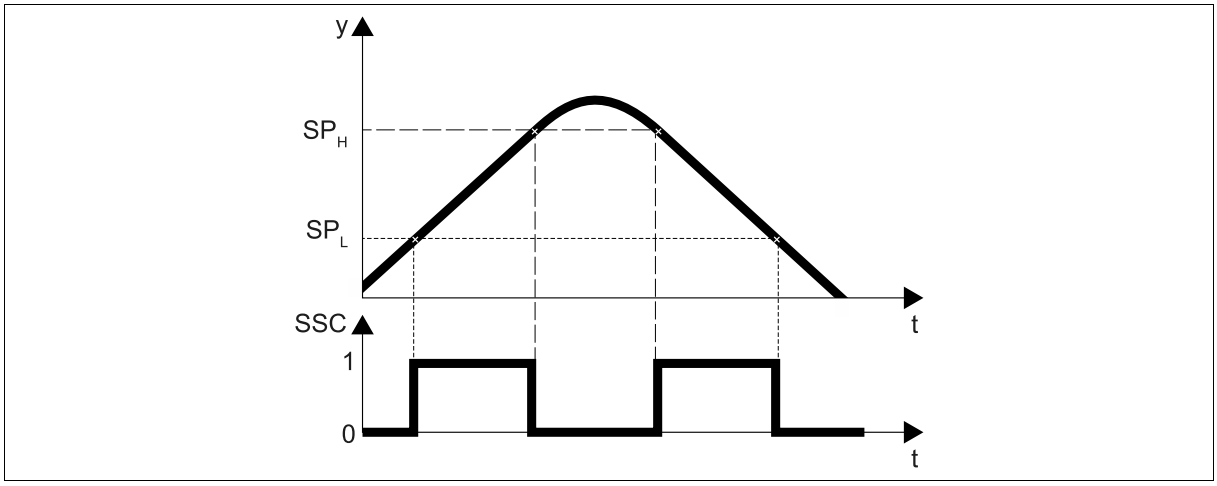


(SSC) Limit value monitoring function output signal
(Hys) Hysteresis
(SP1) Switching point
(t) Time
(y) Measured value

Window mode

Window mode checks whether the process value is within a certain range. SP_L is defined as the smaller value of switching points SP1 and SP2. SP_H is defined as the larger value of switching point SP1 and SP2.

The hysteresis of the switching points is adjustable.

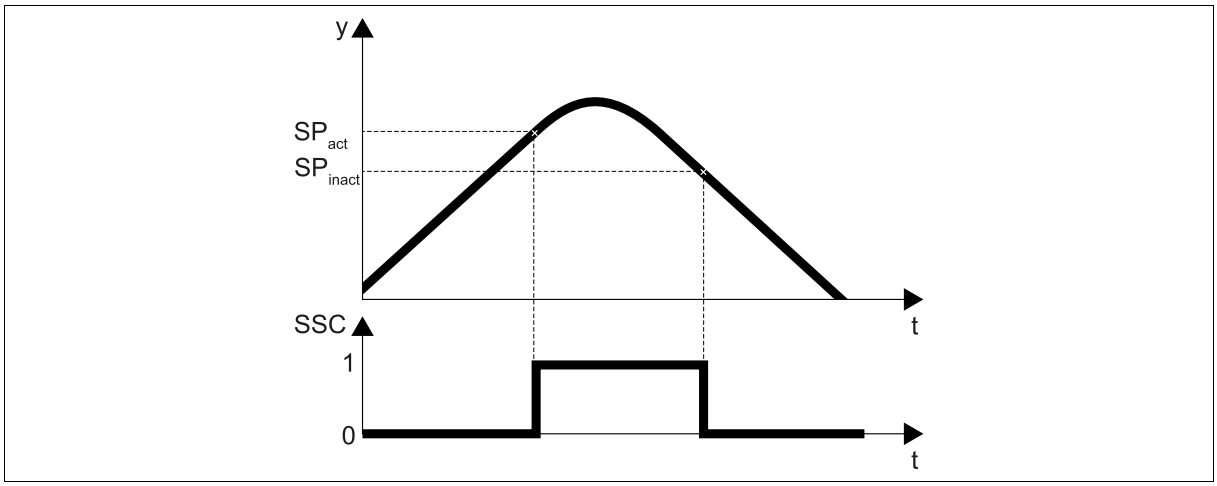


(SSC) Limit value monitoring function output signal
(t) Time
(SP_H) High switching point
(y) Measured value
(SP_L) Low switching point

Two-point mode

In two-point mode, two switching points are defined. If the process value exceeds the SP_{act} switching point, the limit value monitoring function output becomes active. If the process value falls below the SP_{inact} switching point, the output becomes inactive.

SP_{act} is defined as the larger value of switching points SP1 and SP2, SP_{inact} is correspondingly the smaller of the two values.



(SSC) Limit value monitoring function output signal
(t) Time
(SP_{act}) Active switching point
(y) Measured value
(SP_{inact}) Inactive switching point

The parameter lists are based on the JUMO smartCONNECT app operating menu. The table headings locate the respective parameters in the app operating menu..

The default settings are shown in **bold** in the following tables.

9.1 Device

System data

Parameter	Value	Description
Language	Deutsch, **English**, Français, Español	National language for the error messages of the process display.
Application-specific marking	**DELOS S02**	TAG designation (text entry with max. 19 characters possible).

System units

Parameter	Value	Description
Pressure	mbar, psi, **bar**, hPa, kPa, MPa	System unit for pressure.

9.2 Display

Appearance

Parameter	Value	Description
Brightness	0 to 10 (**5**)	Brightness of the display.
Orientation	**0°**, 180°	Alignment of the display.

Process value display > Value 1

Parameter	Value	Description
–	**No selection**	Process value is hidden.
Process values	**Pressure**	Display and configuration of the process value.

Process value display > Value 1 > Process values

Parameter	Value	Description
Measurands	**Pressure**	–
Input scaling as a percentage	**Pressure in percent**	

9.3 Bluetooth

Parameter	Value	Description
Function	Restricted (via NFC), **active**	Status of the Bluetooth® connection, ⇨ Page 35.

9 Configuration via Bluetooth®

9.4 Measurands

Pressure

Parameter	Value	Description
Offset	Input range: -999.00 to 999.00 (**0.00**) bar	Offset correction for zero point adjustment.

Pressure > Simulation

Parameter	Value	Description
Value	Input range: -1.11 to 110.00 (**0.00**) bar	Input value for the simulation.
Function	**Inactive**, active	Parameter function.

Pressure > Filter

Parameter	Value	Description
Time constant	Input range: **0.0** to 100.0 s	Optimization of measured value updating. The larger the filter time constant value, the slower the change in measured value at the output.

9.5 Limit value monitoring

Pressure (teach channel 1 (2))

Parameter	Value	Description
Switching point SP1	Input range: -1.00 to 100.00 (**0.00**) bar	Process value of the limit value monitoring function signal. Delivery condition: 40% of the nominal measuring range
Switching point SP2	Input range: -1.00 to 100.00 (**0.00**) bar	Process value of the limit value monitoring function signal. Delivery condition: 50% of the nominal measuring range
Logic	**High-active**, Low-active	Delivery condition: High-active
Function	**Inactive**, Single Point Mode, Window Mode, Two Point Mode	Delivery condition: Single Point Mode
Hysteresis	Input range: **0.000** to 100.000 bar	Delivery condition: 1% of the nominal measuring range
Error behavior 📖	**Inactive**, active, frozen	Behavior of the output signal in case of a malfunction.
Switch-on delay	Input range: **0.0** to 100.0 s	–
Switch-off delay	Input range: **0.0** to 100.0 s	

Error behavior

Inactive value: If the **function** parameter of digital output 1 is configured as a **switching output** value, a process value error sets the **switching output** value to **inactive**.

Frozen value: If the **function** parameter of digital output 1 is configured as a **switching output** value, a process value error does not have any influence on the configuration of the **switching output** value.

Teach

Parameter	Value	Description
Channel	Input range: 0 to 2 (**1**)	Selection of the channel that will be addressed by the teach functions. The teach functions are triggered by 2 buttons within the JUMO smartCONNECT app. With the teach functions, the current process value is adopted in the respective switching point (SP1, SP2).

9.6 Analog output

Analog output 1

Parameter	Value	Description
Output signal	0 to 10 V, **4 to 20 mA**	Parameter output signal.
Scale start	Input range: -99999999.00 to 99999999.00 (**0.00**) bar	Process value for the current output (4 mA) or the voltage output (0 V).
Scale end	Input range: -99999999.00 to 99999999.00 (**100.00**) bar	Process value for the current output (20 mA) or the voltage output (10 V).
Error behavior	**Replacement value**, low, high	Output signal in the event of a malfunction: Replacement value: Parameter input value for **replacement value.** Low: 3.4 mA or 0 V High: 22 mA or 11 V
Replacement value	Input range: **3,400** to 22,000	**Error behavior** parameter must be configured as a **replacement value**. Input range: 3.4 to 22 mA (current output) 0 to 11 V (voltage output)

9 Configuration via Bluetooth®

9.7 Digital output

Digital output 1 (2)

Parameter	Value	Description
Output signal		–
Inversion	**Off**, On	Inverts the output signal.
Output signal type	**Push-pull**, n-switching, p-switching	Parameter function.

Digital output 1 (2) > Output signal

Parameter	Value	Description
Process values		–

Digital output 1 (2) > Output signal > Process values

Parameter	Value	Description
Alarm overview		–
Limit value monitoring function		

Digital output 1 (2) > Output signal > Process values > Alarm overview

Parameter	Value	Description
Collective alarm	**Device failure**	–

Digital output 1 (2) > Output signal > Process values > Limit value monitoring function

Parameter	Value	Description
Pressure (teach channel 1)	**Output**	–
Pressure (teach channel 2)	**Output**	

9.8 IO-Link

I/O pin 1 (C/Q)

Parameter	Value	Description
Function	Inactive, **IO-Link**, digital output	Parameter function.

I/O pin 2 (DI/DQ)

Parameter	Value	Description
Function	Inactive, **digital output**, analog output	Parameter function.

Identification

Parameter	Value	Description
Plant identification code	***	TAG designation (text entry with max. 32 characters possible).
Location identification code	***	

The default settings are shown in **bold** in the following tables.

10.1 Device

System data

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Language	Deutsch, **English**, Français, Español	National language for the error messages of the process display.	500	1	Uint8	RW
Application-specific marking	**DELOS S02**	TAG designation (text entry with max. 19 characters possible).	24	0	String	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

System units

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Pressure	mbar, psi, **bar**, hPa, kPa, MPa	System unit for pressure.	500	2	Uint8	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

10.2 Display

Appearance

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Brightness	0 to 10 (**5**)	Brightness of the display.	540	1	Uint32	RW
Orientation	**0°**, 180°	Alignment of the display.	540	2	Uint8	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

Process value display > Value 1 > Process values

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
–	**No selection**	–	540	3	Uint8	RW
Measurands	**Pressure**					
Input scaling as a percentage	**Pressure in percent**					

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

10.3 Bluetooth

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Function	Restricted (via NFC), **active**	Status of the Bluetooth® connection, ⇨ Page 35.	560	0	Uint8	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

10.4 Measurands

Pressure

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Offset	Input range: -999.00 to 999.00 (**0.00**) bar	Offset correction for zero point adjustment.	100	1	Float	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

Pressure > Simulation

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Value	Input range: -1.11 to 110.00 (**0.00**) bar	Input value for the simulation.	100	3	Float	RW
Function	**Inactive**, active	Parameter function. After a device restart, the default setting is always active.	580	0	Uint8	WO

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

Pressure > Filter

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Time constant	Input range: **0.0** to 100.0 s	Optimization of measured value updating. The larger the filter time constant value, the slower the change in measured value at the output.	100	2	Float	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

10.5 Limit value monitoring

Pressure (teach channel 1)

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Switching point SP1	Input range: -1.00 to 100.00 (**0.00**) bar	Process value of the limit value monitoring function signal. Delivery condition: 40% of the nominal measuring range	60	1	Float	RW
Switching point SP2	Input range: -1.00 to 100.00 (**0.00**) bar	Process value of the limit value monitoring function signal. Delivery condition: 50% of the nominal measuring range	60	2	Float	RW
Logic	**High-active**, Low-active	Delivery condition: High-active	61	1	Uint8	RW
Function	**Inactive**, Single Point Mode, Window Mode, Two Point Mode	Delivery condition: Single Point Mode	61	2	Uint8	RW
Hysteresis	Input range: **0.000** to 100.000 bar	Delivery condition: 1% of the nominal measuring range	61	3	Float	RW
Error behavior 🕮	**Inactive**, active, frozen	Behavior of the output signal in case of a malfunction.	77	1	Uint8	RW
Switch-on delay	Input range: **0.0** to 100.0 s	–	77	2	Float	RW
Switch-off delay	Input range: **0.0** to 100.0 s		77	3	Float	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

Error behavior

Inactive value: If the **function** parameter of digital output 1 is configured as a **switching output** value, a process value error sets the **switching output** value to **inactive**.

Frozen value: If the **function** parameter of digital output 1 is configured as a **switching output** value, a process value error does not have any influence on the configuration of the **switching output** value.

Pressure (teach channel 2)

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Switching point SP1	Input range: -1.00 to 100.00 (**0.00**) bar	Process value of the limit value monitoring function signal. Delivery condition: 40% of the nominal measuring range	62	1	Float	RW
Switching point SP2	Input range: -1.00 to 100.00 (**0.00**) bar	Process value of the limit value monitoring function signal. Delivery condition: 50% of the nominal measuring range	62	2	Float	RW
Logic	**High-active**, Low-active	Delivery condition: High-active	63	1	Uint8	RW
Function	**Inactive**, Single Point Mode, Window Mode, Two Point Mode	Delivery condition: Single Point Mode	63	2	Uint8	RW
Hysteresis	Input range: **0.000** to 100.000 bar	Delivery condition: 1% of the nominal measuring range	63	3	Float	RW
Error behavior 🕮	**Inactive**, active, frozen	Behavior of the output signal in case of a malfunction.	79	1	Uint8	RW
Switch-on delay	Input range: **0.0** to 100.0 s	–	79	2	Float	RW
Switch-off delay	Input range: **0.0** to 100.0 s		79	3	Float	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

Error behavior

Inactive value: If the **function** parameter of digital output 1 is configured as a **switching output** value, a process value error sets the **switching output** value to **inactive**.

Frozen value: If the **function** parameter of digital output 1 is configured as a **switching output** value, a process value error does not have any influence on the configuration of the **switching output** value.

Teach

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Channel	Input range: 0 to 2 (**1**)	Selection of the channel that will be addressed by the teach functions. The teach functions are triggered by 2 buttons within the JUMO smartCONNECT app. With the teach functions, the current process value is adopted in the respective switching point (SP1, SP2).	58	0	Uint8	RW
System command	65	Teach SP1	2	0	Uint8	WO
	66	Teach SP2	2	0	Uint8	WO
Teach Result	0	Idle	59	0	Bool	RO
	1	Success Teach SP1				
	2	Success Teach SP2				
	5	Busy				
	7	Error				

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

10.6 Analog output

Analog output 1

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Output signal	0 to 10 V, **4 to 20 mA**	Parameter output signal.	260	1	Uint8	RW
Scale start	Input range: -99999999.00 to 99999999.00 (**0.00**) bar	Process value for the current output (4 mA) or the voltage output (0 V).	260	3	Float	RW
Scale end	Input range: -99999999.00 to 99999999.00 (**100.00**) bar	Process value for the current output (20 mA) or the voltage output (10 V).	260	4	Float	RW
Error behavior	**Replacement value**, low, high	Output signal in the event of a malfunction: Replacement value: Parameter input value for **replacement value.** Low: 3.4 mA or 0 V High: 22 mA or 11 V	260	5	Uint8	RW
Replacement value	Input range: **3,400** to 22,000	**Error behavior** parameter must be configured as a **replacement value**. Input range: 3.4 to 22 mA (current output) 0 to 11 V (voltage output)	260	6	Float	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

10.7 Digital output

Digital output 1

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Output signal	Collective alarm, **pressure (teach channel 1)**, pressure (teach channel 2)	–	200	1	Uint8	RW
Inversion	**Off**, On	Inverts the output signal.	200	2	Uint8	RW
Output signal type	**Push-pull**, n-switching, p-switching	Parameter function.	200	3	Uint8	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

Digital output 2

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Output signal	Collective alarm, pressure (teach channel 1), **pressure (teach channel 2)**	–	220	1	Uint8	RW
Inversion	**Off**, On	Inverts the output signal.	220	2	Uint8	RW
Output signal type	**Push-pull**, n-switching, p-switching	Parameter function.	220	3	Uint8	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

10.8 IO-Link

I/O pin 1 (C/Q)

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Function	Inactive, **IO-Link**, digital output	Parameter function.	520	0	Uint8	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

I/O pin 2 (DI/DQ)

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Function	Inactive, **digital output**, analog output	Parameter function.	521	0	Uint8	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

Identification

Parameter	Value	Description	Index	Sub-index	Data type	Access right[a]
Plant identification code	***	TAG designation (text entry with max. 32 characters possible).	25	0	String	RW
Location identification code	***		26	0	String	RW

[a] RW = Read and write access, RO = Read-only access, WO = Write-only access

The data is transferred in a cycle via the IO-Link interface to the IO-Link master (PDI = Process Data Input). The entire process data can be extracted via index 40 and subindex 0.

Bit offset	16	2	1	0
Data type	Float32T	Integer14T	Bool	Bool
Parameter	MDC[a] 1: Pressure	Bit offset 2: Invalid pressure Bit offset 3: Invalid configuration Bit offset 4: Invalid calibration data	SSC[b] 1.2	SSC[b] 1.1

[a] Measuring Data Channel: Function class for measured values with a fixed set of attributes that define the measurement and precise description of the values within the process data.

[b] Switching Signal Channel, ⇨ Page 36.

12.1 Process value error

Process value errors are displayed instead of the process value.

Appearance	Cause	Remedy
----	The input value is invalid. The sensor is defective or communication to the sensor is impaired.	Contact the manufacturer.
	There is an internal device error.	Contact the manufacturer.
<<<<	The measuring range was undershot.	Operate the device within the device specifications.
>>>>	The measuring range was exceeded.	Operate the device within the device specifications.

12.2 Error messages

Symbol	Classification according to NAMUR NE 107
 Steady red	**Error/failure**

Error message	Cause	Remedy	Bit offset for status in PDI	Event code	Event type
Configuration faulty	The checksum of the configuration data is faulty.	Transfer the configuration data to the device again.	3	0×6320	Error
Calibration data faulty	The checksum of the calibration data is faulty.	Contact the manufacturer.	4	0×5000	Error
Device not calibrated	There is no calibration data.	Contact the manufacturer.	4	0×5000	Error
Pressure faulty	The measuring range has been fallen below or exceeded or the pressure sensor has failed.	Operate the device within the device specifications.	2	0×8C20	Error

Symbol	Classification according to NAMUR NE 107
 Flashing red	**Functional check**

Error message	Cause	Remedy	Bit offset for status in PDI	Event code	Event type
Simulation active	Simulation mode is active.	Deactivate simulation mode. Alternatively: Restart device.	–	0×8C01	Warning

Symbol	Classification according to NAMUR NE 107
 Flashing green	**Maintenance required**

Error message	Cause	Remedy	Bit offset for status in PDI	Event code	Event type
Restart the device	The device must be restarted due to a configuration change.	Restart the device.	–	–	–

Symbol	Classification according to NAMUR NE 107
 Steady yellow[a]	**Outside the specification**

[a] Contrary to classification according to NAMUR NE 107, steady yellow instead of flashing red.

Error message	Cause	Remedy	Bit offset for status in PDI	Event code	Event type
Undervoltage	The voltage supply to the device is insufficient.	Check the voltage supply to the device.	–	0×5111	Warning
Device operating conditions	The device is being operated outside the device specifications.	Operate the device within the device specifications.	–	0×8C10	Warning
Analog output error	The burden at the analog output (current output) is too high.	Observe the specified values for the burden of the analog output.	–	–	–
Overload at C/Q or DO	There is a short circuit at the digital output.	Contact the manufacturer.	–	–	–

13 Maintenance and cleaning

13.1 Maintenance

The device is maintenance-free.

13.2 Cleaning device housing

The device housing can be cleaned when the device has been installed.

Clean the device with a cloth dampened with water.

13.3 Decontamination

Use:

- When the medium is changed in the plant.
- Before replacing sealing rings/O-rings.
- Before returning the device.
- Before disposing of the device.

Requirements:

- The device is uninstalled, ⇨ Page 57.
- If the medium is a hazardous substance: The information in the safety data sheet is taken into account.
- Suitable protective equipment has been set up.
- Ein geeignetes Reinigungsmittel ist einsatzbereit.
- Ein Reinigungsplatz zum Spülen und Neutralisieren aller mediumberührten Teile ist vorbereitet.

Procedure:

1. ***CAUTION!*** Do not damage the sealing ring grooves when removing the sealing rings/O-rings.

   Remove the sealing rings/O-rings from the sealing ring grooves.
2. ***CAUTION!*** Use only cleaning agents that are compatible with the materials used to make the device.

   Thoroughly flush and neutralize all parts that come into contact with the medium using a suitable cleaning agent.
3. When disposing the device: ⇨ Page 57.
4. When continuing to use the device: ⇨ Page 56.

13.4 Replacing sealing rings/O-rings

Requirements:

- All components in contact with the medium are decontaminated, ⇨ Page 56.

Proceeding:

1. Check the sealing rings/O-rings previously used for damage and replace them if necessary.
2. Install the device, ⇨ Page 27.

14.1 Uninstallation

Requirements:

- The plant has been de-pressurized, de-energized and secured against being switched on again.
- The medium circulation of the plant is stopped.
- The pipe is drained and rinsed.
- The device has cooled down.
- A clean and dry storage location has been prepared.

Procedure:

1. Manually loosen the union nut of the connecting cable from the M12 plug connection on the device.
2. Pull the connecting cable out of the M12 plug connection and remove from the working range.
3. Use suitable auxiliary equipment to detach the device.
4. ***CAUTION!*** Make sure that the seals remain in the sealing ring grooves of the process connections of the device.

   Carefully remove the device from the plant and put in a clean and dry place.

14.2 Returns

Requirements:

- Clean the device housing ⇨ Page 56.
- Clean the parts that come into contact with the medium ⇨ Page 56.

Procedure:

1. The supplementary sheet for product returns must first be completed correctly and signed. Then enclose it with the shipping documents and attach it to the packaging, ideally on the outside.
2. Use the original packaging or a suitably secure container for sending the device.

14.3 Disposal

Requirements:

- Clean the device housing ⇨ Page 56.
- Clean the parts that come into contact with the medium ⇨ Page 56.

- Do not dispose of the device or replaced parts in the trash after use.
- Delete programs and data stored on the device.
- Remove batteries, if any, if this can be done without damaging the device.
- Dispose of the device and the packaging material in a responsible and environmentally friendly manner.
- Observe the country-specific laws and regulations for waste treatment and disposal.

In accordance with Directive 2012/19/EU on Waste from Electrical and Electronic Equipment, manufacturers are obliged to offer the option of returning waste equipment. Request the return from the manufacturer.

15 Accessories

Without UL approval

Designation	Part no.
Connection line M8/voltage supply, length 2 m, IO-Link master, 4 channel	00767913
Connection line M8/Ethernet, length 2 m, IO-Link master, 4 channel	00767923
Connection line M12/voltage supply, length 2 m, IO-Link master, 8 channel	00767914
Connection line M12/Ethernet, length 2 m, IO-Link master, 8 channel	00767927
IO-Link master, 1-channel (TMG Device Tool), including mini USB cable for use with Windows® PC	00694070
T-piece with PEKA connection DN 25, EHEDG	00643555
T-piece with PEKA connection DN 32, EHEDG	00643574
T-piece with PEKA connection DN 40, EHEDG	00643576
T-piece with PEKA connection DN 50, EHEDG	00643579
T-piece with PEKA connection DN 65, EHEDG	00643580
T-piece with PEKA connection DN 80, EHEDG	00643581
T-piece with PEKA connection DN 100, EHEDG	00643582
Line socket, 4-pole, M12 × 1, straight, length 2 m	00404585
Line socket, 4-pole, M12 × 1, angled, length 2 m	00409334
Service deployment	00427970
Preconfiguration (Service)	00427968
JUMO smartCONNECT (App)	00770436

With UL approval

Designation	Part no.
IO-Link master, 4-channel – TURCK TBEN-S2-4IOL	00759867
IO-Link master, 8-channel – TURCK TBEN-LL-8IOL	00759875
Cable PUR, 4 × 0.34, black, length 2 m	00776248
Cable PUR, 4 × 0.34, black, length 5 m	00776250
Cable PUR, 4 × 0.34, black, length 10 m	00776252

16 Open-source software

The device software and/or device components were developed using open-source software.

Insofar as the respectively applicable license terms justify a claim on the provision of source code or other information, JUMO GmbH & Co. KG will provide the source code and the license texts on a conventional data carrier at the cost incurred for the provision of the data carrier.

This offer is valid for three years after the software is made available. This offer is valid beyond that time to the extent specified in the license terms.

For questions related to open-source software, please contact:

Address JUMO GmbH & Co. KG
License Compliance
Moritz-Juchheim-Straße 1
36039 Fulda, Germany

Email licensecompliance@jumo.net

16 Open-source software

JUMO GmbH & Co. KG
Street address:
Moritz-Juchheim-Straße 1
36039 Fulda, Germany
Delivery address:
Mackenrodtstraße 14
36039 Fulda, Germany
Postal address:
36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO UK LTD
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6724 Joy Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com