

JUMO GmbH & Co. KG

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JUMO Process Control, Inc.

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JUMO dTRANS p35

Pressure Sensor with IO-Link

Application

- Process automation
- Machines for the food and beverage industry
- General mechanical and apparatus engineering

Brief description

The pressure sensor serves to measure relative and absolute pressure and monitor it in liquids and gases. The effect of the pressure on the pressure sensor generates a signal, which is amplified, digitalized, and processed.

The pressure sensor is equipped with an IO-Link interface according to specification 1.1. IO-Link supports bidirectional communication and is used to exchange process data, parameters, diagnostic information, and status messages. The two green LEDs are permanently lit as soon as voltage is supplied to the device. Once an IO-Link connection is established, the LEDs flash.

The switching behavior and the switching thresholds of the switching outputs (max. 2 pieces; p or n switching) can be individually configured - along with many other parameters. Any IO-Link master can be used for the configuration.

The pressure sensor is therefore suitable for use in plant and mechanical engineering in connections to automation systems. A variety of pressure connections and measuring ranges are available to the user.



Type 402058

Customer benefits

- IO-Link
 - Multi-vendor point-to-point connection
 - Open standard with maximum transparency to the field level (IEC 61131-9)
 - Inexpensive, pre-fabricated connecting cable (no wiring errors)
 - Simple and uniform wiring and startup thanks to standardized interface
- Industry 4.0: pervasive communication from the control to the sensors
 - Retrieval of process data and diagnostic information
 - Dynamic parameter changes
- More safety during sensor replacement
 - Automatic parameterization possible
 - Replacement with sensors of same type, but with different properties, can be detected
- Optimization of the production process through communication down to the lowest field level
- Reduction of mounting and startup times
- Reduction of maintenance and service costs with simultaneous increase in plant availability

Special features

- Small, compact, robust
- Stainless steel, fully welded
- Various process connections
- Hygienic connections
- Simple startup
- Easy sensor replacement
- Proven accuracy
- Connection via IO-Link master
- LED status display
- Also available as a temperature sensor with IO-Link; see data sheet 902915

Approvals



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Approvals

	Designation	UL
	Testing agency	-
	Certificate no.	2022-07-27-E201387
	Inspection basis	UL 61010-1, 3 Ed. Mai 2012 revised 19. Juli 2019 und CAN/CSA-C22.2 No. 61010-1 (2012-05). 3. Ed. with revision through 2018-11
	Valid for	Type 402058

Technical data

Input

Measuring range and accuracy

Measuring range (MB)	Linearity ^a	Accuracy at		Long-term stability ^b	Overload capacity ^c	Burst pressure	Response of	
		20 °C ^d	-20 to +80 °C ^e				MB under-range	MB over-range
Bar	% MSP ^f	% MSP	% MSP	% MSP per year	Bar	Bar		
-400 to +400 mbar relative pressure	0.3	0.7	2.0	≤0.3	1	1.5	linear up to -1.5 % MSP	linear up to 5 % MSP
-1 bar to +1 bar relative pressure	0.3	0.6	1.8	≤0.2	4	8	Error value: 1·10 ³⁷	Error value: 2·10 ³⁷
-1 bar to +2.5 bar relative pressure	0.3	0.5	1.3		16	24		
-1 bar to +5 bar relative pressure	0.3	0.5	1.2		40	60		
-1 bar to +12 bar relative pressure	0.25	0.5	1.0		100	150		
-1 bar to +30 bar relative pressure	0.2	0.5	1.0		100	150		
-1 bar to +100 bar relative pressure	0.2	0.5	1.0		300	400		
-1 bar to +250 bar relative pressure	0.5	0.7	1.2		500	2000		
-1 bar to +400 bar relative pressure	0.5	0.7	1.2		800	2000		
-1 bar to +600 bar relative pressure	0.5	0.7	1.2		1200	2500		

^a Linearity according to limit point setting.

^b Reference conditions EN 61298-1.

^c All pressure sensors are vacuum proof.

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

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

^f MSP = measuring span

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Measuring range (MB) Bar	Linearity ^a % MSP ^f	Accuracy at		Long-term stability ^b % MSP per year	Overload capacity ^c Bar	Burst pressure Bar	Response of	
		20 °C ^d % MSP	-20 to +80 °C ^e % MSP				MB under-range	MB over-range
0 bar to 1 bar absolute pressure	0.3	0.5	1.3	≤0.2	4	6	No detection	linear up to 5 % MSP Error value: 2·10 ³⁷
0 bar to 2.5 bar absolute pressure	0.25	0.5	1.2		16	24		
0 bar to 5 bar absolute pressure	0.25	0.5	1.2		40	60		
0 bar to 12 bar absolute pressure	0.25	0.5	1.0		100	150		
0 bar to 30 bar absolute pressure	0.2	0.5	1.0		100	150		
0 bar to 100 bar absolute pressure	0.2	0.5	1.0		400	400		

^a Linearity according to limit point setting.

^b Reference conditions EN 61298-1.

^c All pressure sensors are vacuum proof.

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

^f MSP = measuring span

Signal processing

Input filter	Digital filter, 2nd order; filter time constant can be set
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Measuring circuit monitoring

Process data invalid	IO-Link event configurable; appears in the process value as an error value
Measuring range overflow	
Measuring range underflow	
Device hardware fault	

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Output

Number	1 output in IO-Link operation (output signal according to IO-Link communication standard version 1.1; see section "Interface", Page 4) 2 outputs for switch operation (SIO mode; SIO = standard IO)
Switching functions configurable	Hysteresis function or window function N/C or N/O contact Output p switching (PNP) or n switching (NPN) Switch-on/switch-off delay
Switching current	≤100 mA per output
Voltage drop at switching transistor	≤2 V
Short-circuit proof	Yes (clocked)
Reverse polarity protected	Yes
Current limiting	Yes
Hysteresis	
For hysteresis function	Configurable
For window function	Fixed setting (symmetrical; ±0.25 % of the measuring range)
Switch-on, switch-off delay	0 to 100 s
Response time	
Switching output	≤7 ms
IO-Link	≤7 ms + IO-Link cycle time

Interface

Communication interface	IO-Link device V 1.1, downward compatible to V 1.0
Data transfer rate (baud rate)	COM 3 (230.4 kBaud)
Max. cable length	20 m, unshielded
Min. cycle time	2 ms
IO Device Description (IODD)	Depending on the ordered input range; available on the manufacturer's website www.jumo.de or at http://ioddfinder.io-link.com

Electrical data

Voltage supply	
In IO-Link operation	DC 18 to 32 V
In switch operation	DC 9.6 to 32 V
Nominal voltage	DC 24 V
Current consumption	
In idle mode	≤10 mA
In IO-Link operation	≤12 mA
In switch operation	≤250 mA (with 2 switching outputs)
Electrical safety	Protection rating III according to DIN EN 61140
Intended use	Pressure measurement in industrial plants

The auxiliary energy of the pressure sensor must meet SELV requirements. Furthermore, the device must be equipped with an electrical circuit that meets the requirements of EN 61010-1 with regard to "Limited-energy circuits".

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Mechanical features

Materials	
Sensor	Stainless steel (membrane: 1.4435, welding ring: 1.4404)
High-pressure sensor	Stainless steel 1.4548 (for pressure ranges > 100 bar)
Process connection	Stainless steel 316L (1.4404 or 1.4571)
Housing	Stainless steel 304 (1.4301)
Installation position	Any
Calibration position	Device upright, process connection at the bottom
Weight	Approx. 160 g

Environmental influences

Admissible temperatures	
Medium	-40 °C to +125 °C
Ambient temperature	-40 to +85 °C (Ambient temperature range of the head)
Storage	-40 to +85 °C
Resistance to climatic conditions	
During operation	≤100 % relative humidity without condensation on the outer skin of the device
During storage	≤90 % relative humidity without condensation
Climate class	3K7 according to DIN EN 60721-3-3
Admissible mechanical load	
Vibration resistance	10 g, at 10 to 2000 Hz according to DIN EN 60068-2-6
Shock resistance	20 g for 11 ms according to DIN EN 60068-2-27 50 g for 1 ms according to DIN EN 60068-2-27
Process media	Liquid and gaseous media
Protection type	According to DIN EN 60529
With absolute pressure version	IP65/IP67
With relative pressure version	IP65
Electromagnetic compatibility	According to DIN EN 61326-2-3
Interference emission	Class B ^a
Interference immunity	Industrial requirement

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

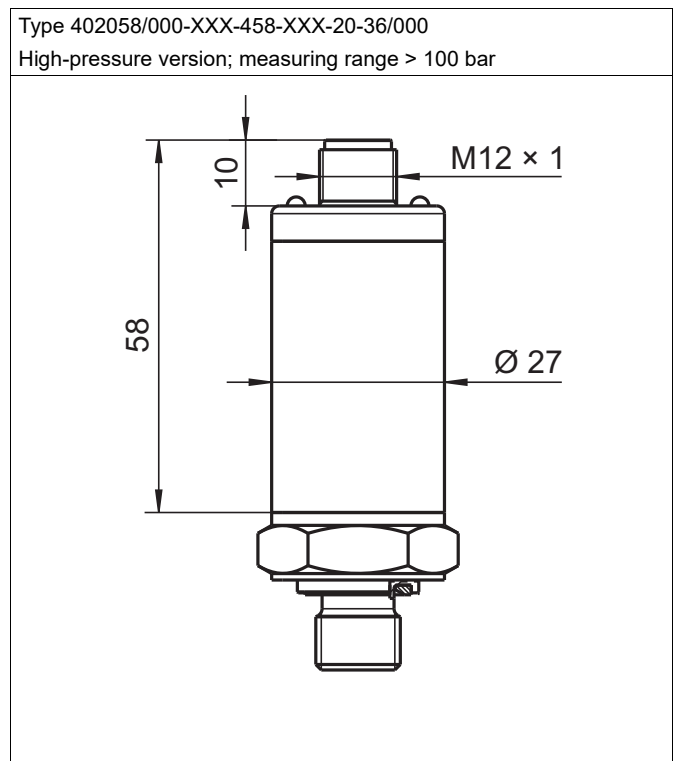
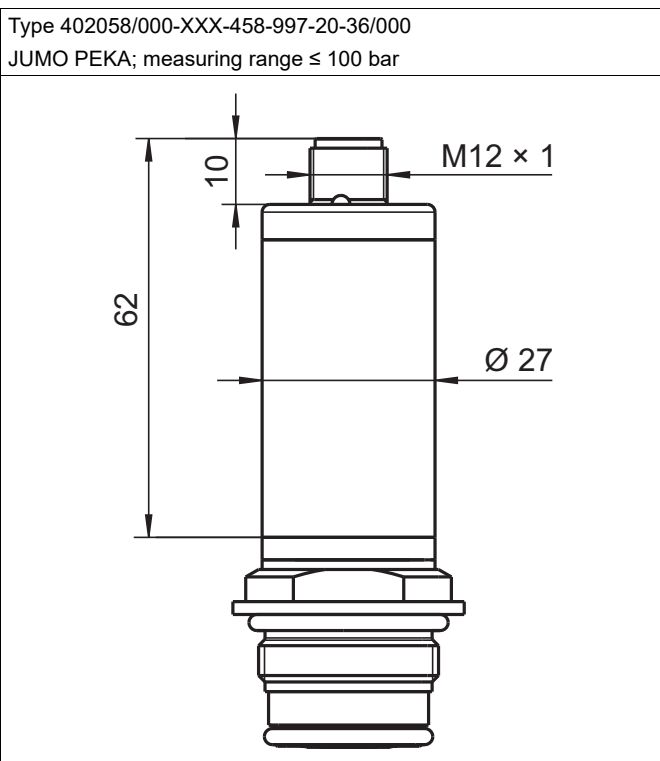
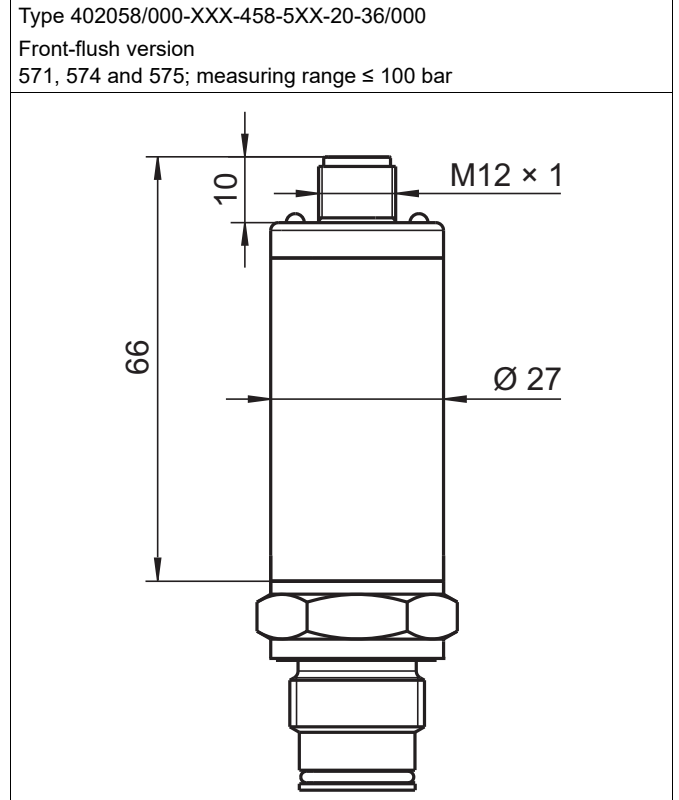
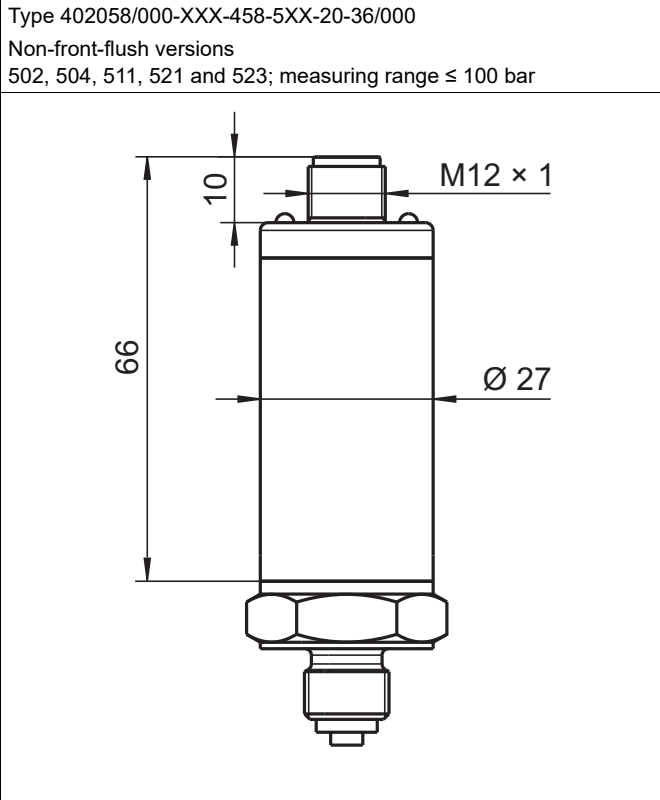
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Dimensions



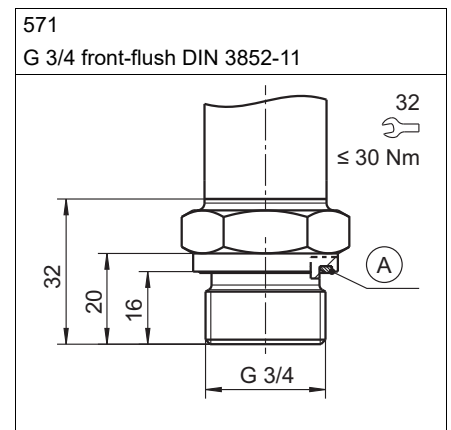
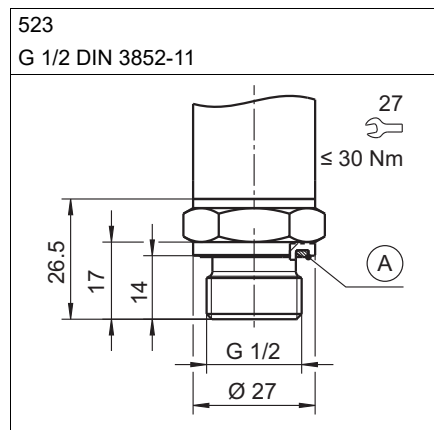
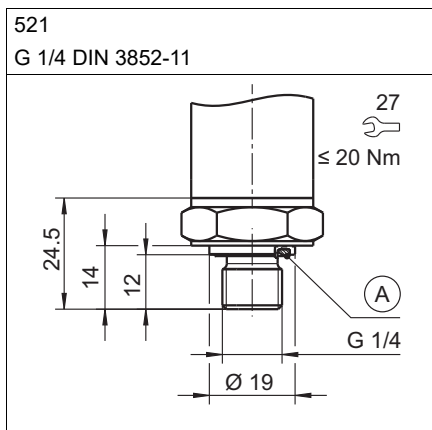
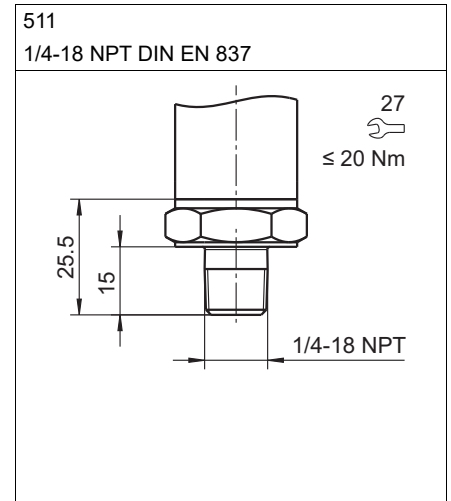
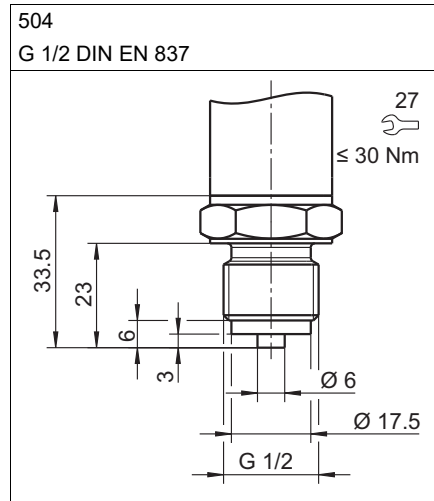
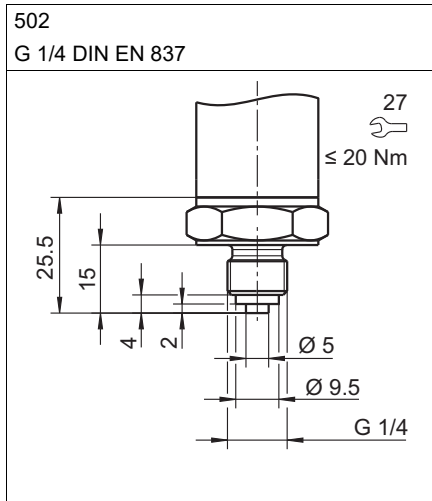
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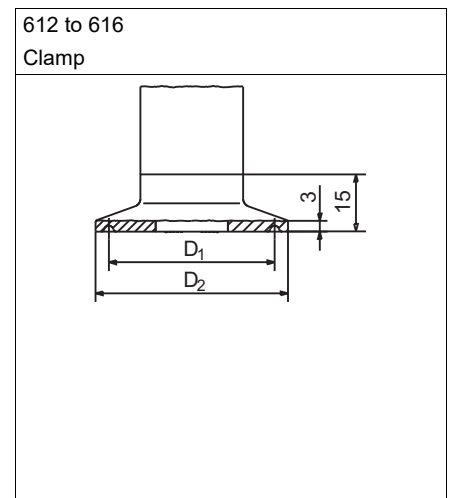
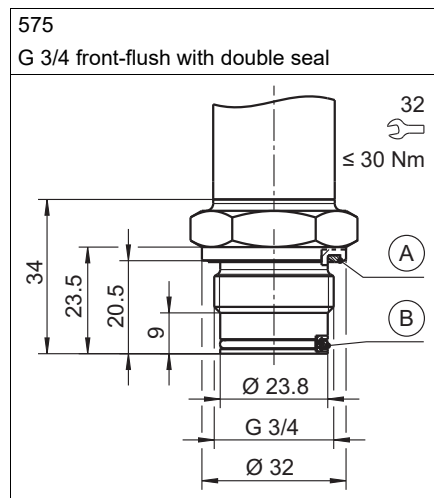
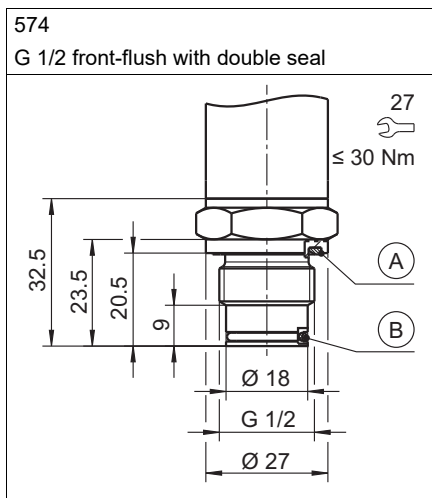
Process connections



A Profile seal G 1/4

A Profile seal G 1/2

A Profile seal G 3/4



A Profile seal G 1/2
W O-ring 15.1 × 1.6

A Profile seal G 3/4
W O-ring 20.35 × 1.78

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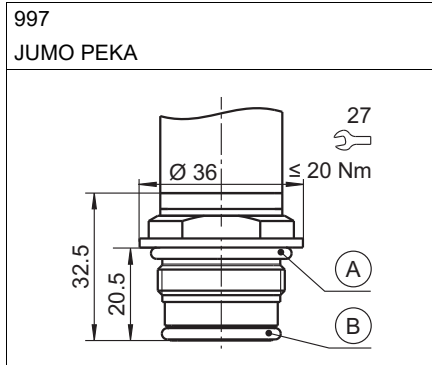
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A O-ring 26 × 2.5

W O-ring 21 × 2.5

Hygienic process connection for adapter system JUMO PEKA (data sheet 409711)

Process connection	DN DIN 32676	DN (Zoll)	Nominal size ISO 2852	Ø D ₁	Ø D ₂
612	10 15 20		12 12.7 17.2 21.3	27.5	34
613	25 32 40	1" 1.5"	25 33.7 38	43.5	50.5
616	50	2"	40 51	56.5	64

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Connection diagram

The connection diagram in the data sheet provides information on product selection.

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

Connection	Terminal assignment	
	M12 x 1 round plug (A-coded, non-rotating)	
Switch operation		
Voltage supply ^a DC 9.6 to 32 V	1 BN (brown) ^b 3 BU (blue)	L+ L-
Switching output 1	4 BK (black)	C/Q = OUT1
Switching output 2	2 WH (white)	I/Q = OUT2
IO-Link operation		
Voltage supply ^a DC 18 to 32 V	1 BN (brown) 3 BU (blue)	L+ L-
IO-Link	4 BK (black)	C/Q = IO-Link
Switching output 2	2 WH (white)	I/Q = OUT2
Potential equalization		
Functional bonding conductor FB ^c		

^a The auxiliary energy of the pressure sensor must meet SELV requirements. Furthermore, the device must be equipped with an electrical circuit that meets the requirements of EN 61010-1 with regard to "Limited-energy circuits".

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

^c The pressure sensor must be connected to the plant's potential equalization system via the process connection.

NOTE!

When using the device with UL approval, the user must make sure that the accessory he uses is also approved for a UL application (e. g. cable with UL approval AVL2/8 and/or cable with UL approval CYJV/7 or CYJV/8 or PVVA/7 or PVVA/8, in each case approved for ambient temperatures > 90 °C).

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Connection examples

IO-Link operation with 1 switching output	Switch operation with 2 switching outputs
<p>p switching (PNP)</p>	<p>p switching (PNP)</p>
<p>n switching (NPN)</p>	<p>n switching (NPN)</p>

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Order details

	(1) Basic type
402058	JUMO dTRANS p35 – pressure sensor with IO-Link
	(2) Basic type extension
000	None
999	Special version
	(3) Input
447	-400 to +400 mbar relative pressure
449	-1 bar to +1 bar relative pressure
473	-1 bar to +2.5 bar relative pressure
482	-1 bar to +5 bar relative pressure
526	-1 bar to +12 bar relative pressure
527	-1 bar to +30 bar relative pressure
515	-1 bar to +100 bar relative pressure
508	-1 bar to +250 bar relative pressure
509	-1 bar to +400 bar relative pressure
516	-1 bar to +600 bar relative pressure
488	0 bar to 1 bar absolute pressure
490	0 bar to 2.5 bar absolute pressure
500	0 bar to 5 bar absolute pressure
501	0 bar to 12 bar absolute pressure
503	0 bar to 30 bar absolute pressure
507	0 bar to 100 bar absolute pressure
	(4) Output
458	IO-Link measured value transmission, including digital output
	(5) Process connection
502	G 1/4 DIN EN 837
504	G 1/2 DIN EN 837
511	1/4-18 NPT DIN EN 837
521	G 1/4 DIN 3852-11
523	G 1/2 DIN 3852-11
571	G 3/4 front-flush DIN EN ISO 228-1 ^a
574	G 1/2 front-flush with double seal ^a
575	G 3/4 front-flush with double seal ^a
612	Clamp DN 10/15/20 according to DIN 32676 ^b
613	Clamp DN 25/32/40 according to DIN 32676 ^b
616	Clamp DN 50 (2") according to DIN 32676 ^b
997	JUMO PEKA hygienic process connection ^a
999	Other process connections upon request
	(6) Process connection material
20	Stainless steel 316L
	(7) Electrical connection
36	Round plug M12 × 1
	(8) Extra code
061	With UL approval
100	Customer-specific configuration (specifications in plain text)
591	Restrictor in the pressure channel ^c
631	Improved moisture and vibration protection

^a The process connection can only be supplied for inputs (measuring range) up to 100 bar.

^b The process connections 612, 613 and 616 are only available for measuring span up to 25 bar.

^c Restrictor only for non-front-flush process connections.

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	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)
Order code		/		-		-		-		-		-		/	
Order example	402058	/	000	-	526	-	458	-	504	-	20	-	36	/	061

Scope of delivery

Designation
1 pressure sensor in the ordered version
1 installation instructions

Accessories

Designation
IO-Link master upon request
Device data (IODD) on www.jumo.de or on http://ioddfinder.io-link.com