JUMO TAROS S47 P

Pressure Transmitter

Applications

- Test equipment construction
- Calibration technology
- Plant construction and mechanical engineering
- Laboratories

Brief description

The pressure transmitter is used to acquire relative and absolute pressures in liquid and gaseous media.

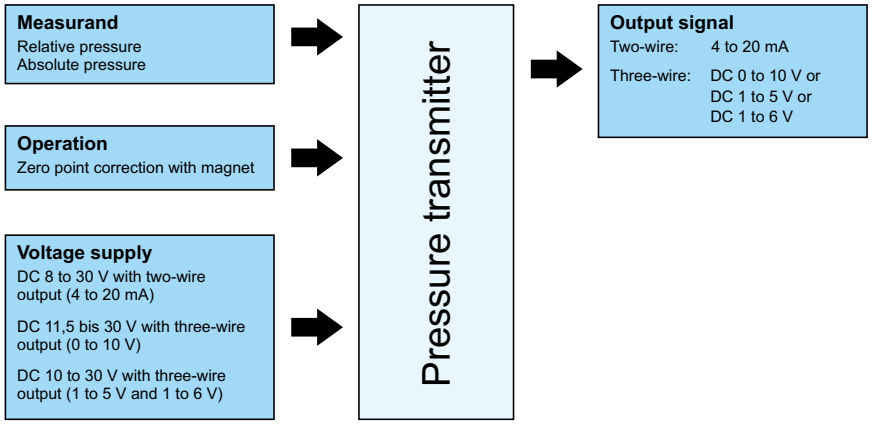
The JUMO TAROS S47 P with an analog output signal has a pressure measuring cell with a piezoresistive silicon sensor. The pressure is converted into an electrical current or voltage signal and output via various electrical connections.

A built-in magnetoresistive switch (MRS) enables the user to adjust the zero point of the device externally using a magnet.

UL and EAC approvals for the pressure transmitter are currently being prepared.

Type 402072

Block diagram



Special features

- High degree of accuracy
- A large selection of process connections and electrical connections
- Zero point adjustment using a magnet
- Active temperature compensation
- Compact dimensions

Technical data

Mechanical features

Materials of parts coming into contact with the pressurized medium	
Membrane	Stainless steel 1.4435 (316L)
O-ring/sealing ring	FPM, others available as an optional extra (e.g. EPDM, VMQ)
Process connection	Stainless steel 1.4571 (316Ti)
Welding ring	Stainless steel 1.4404 (316L)
Materials of other parts	
Housing	Stainless steel 1.4301 (304)
Electrical connection	
Attached cable	Cable fitting made from stainless steel 1.4301 (304); PUR cable with and without pressure compensation
Round plug M12 × 1	Threaded bushing made from stainless steel 1.4301 (304)
Line socket	Holding ring/connector fastener made from high-quality plastic, comparable with PBT GF30 V0
Terminal head	Stainless steel 1.4301 (304); cable fitting: stainless steel
Rated position	Upright, with downward process connection
Operating position	Any, but there may be a zero offset relative to the rated position

Measuring range and accuracy

Measuring range	Linearity[a]	Accuracy at			Long-term stability[b]	Overload capability[c]	Burst pressure
		20 °C[d]	-20 to +80 °C[e]	-20 to +100 °C			
	% MSP[f]	% MSP	% MSP	% MSP	% MSP per year	bar	bar
-1 to 0 bar relative pressure	0.15	0.3	1	1.2	≤ 0.15	10	20
-1 to +0.6 bar relative pressure	0.15	0.3	1	1.2	≤ 0.15	10	20
-1 bar to +1 bar relative pressure	0.15	0.3	1	1.2	≤ 0.15	10	20
-1 to +1.5 bar relative pressure	0.15	0.3	1	1.2	≤ 0.15	20	40
-1 to +3 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	25	50
-1 to +5 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	50	60
-1 to +9 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	50	60
-1 to +15 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	120	200
-1 to +24 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	120	200
-0.4 to +0.4 bar relative pressure	0.15	0.4	1	1.2	≤ 0.2	10	20
-0.1 to +0.1 bar relative pressure	0.2	0.5	1	1.2	≤ 0.2	6	10
0 to 0.1 bar relative pressure	0.25	0.75	1.2	1.5	≤ 0.2	1.5	3
0 to 0.16 bar relative pressure	0.25	0.75	1.2	1.5	≤ 0.2	6	10
0 to 0.25 bar relative pressure	0.25	0.5	1	1.2	≤ 0.2	6	10
0 to 0.4 bar relative pressure	0.15	0.4	1	1.2	≤ 0.15	10	20
0 to 0.6 bar relative pressure	0.15	0.4	1	1.2	≤ 0.15	10	20
0 to 1 bar relative pressure	0.15	0.3	1	1.2	≤ 0.15	10	20
0 to 1.6 bar relative pressure	0.15	0.3	1	1.2	≤ 0.15	20	40
0 to 2.5 bar relative pressure	0.15	0.3	1	1.2	≤ 0.1	20	40
0 to 4 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	25	50
0 to 6 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	50	60
0 to 10 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	50	60
0 bar to 16 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	120	200
0 bar to 25 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	120	200
0 bar to 40 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	300	400
0 bar to 60 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	300	400
0 bar to 100 bar relative pressure	0.1	0.25	0.75	0.8	≤ 0.1	300	400
0 to 0.6 bar absolute pressure	0.15	0.4	1	1.2	≤ 0.15	10	20
0 to 1 bar absolute pressure	0.15	0.3	1	1.2	≤ 0.15	10	20
0 to 1.6 bar absolute pressure	0.15	0.3	1	1.2	≤ 0.15	20	40
0 to 2.5 bar absolute pressure	0.15	0.3	1	1.2	≤ 0.1	20	40
0 to 4 bar absolute pressure	0.1	0.25	0.75	0.8	≤ 0.1	25	50
0 to 5 bar absolute pressure	0.1	0.25	0.75	0.8	≤ 0.1	25	50
0 to 6 bar absolute pressure	0.1	0.25	0.75	0.8	≤ 0.1	50	60
0 to 10 bar absolute pressure	0.1	0.25	0.75	0.8	≤ 0.1	50	60
0 to 16 bar absolute pressure	0.1	0.25	0.75	0.8	≤ 0.1	120	200
0 to 25 bar absolute pressure	0.1	0.25	0.75	0.8	≤ 0.1	120	200
0 to 40 bar absolute pressure	0.1	0.25	0.75	0.8	≤ 0.1	200	300

[a] Linearity according to limit point setting

[b] Reference conditions EN 61298-1

[c] All measuring ranges are vacuum proof.

[d] Includes: linearity, hysteresis, repeatability, deviation of measuring range start value (offset) and measuring range end value

[e] Includes: linearity, hysteresis, repeatability, deviation of measuring range start value (offset) and measuring range end value, thermal effect on measuring range start (offset) and measuring span

[f] MSP = measuring span

Electrical data

Voltage supply[a]	
Two-wire	
4 to 20 mA	DC 8 to 30 V, nominal voltage DC 24 V[b]
Three-wire	
DC 0 to 10 V	DC 11.5 V to 30 V, nominal voltage DC 24 V
DC 1 to 5 V	DC 10 V to 30 V, nominal voltage DC 24 V
DC 1 to 6 V	DC 10 V to 30 V, nominal voltage DC 24 V

[a] The auxiliary energy of the pressure transmitter 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] Maximum current consumption ≤ 30 mA.

Burden/load[a]	
Two-wire	
4 to 20 mA	$R_L \leq (U_B - 8\ V) \div 0.02\ A\ (\Omega)$
Three-wire	
DC 0 to 10 V	$R_L \geq 10\ k\Omega$
DC 1 to 5 V	$R_L \geq 10\ k\Omega$
DC 1 to 6 V	$R_L \geq 10\ k\Omega$

[a] Maximum effect < 0.5 %.

Behavior if measured value is out of range	Error signal in the case of	NAMUR exceedance, linear
Two-wire		
4 to 20 mA	≤ 3.6 mA and ≥ 21.5 mA	3.8 to 20.5 mA
Three-wire		
DC 0 to 10 V	10.7 V	0 to 10.5 V
DC 1 to 5 V	5.7 V	0.8 to 5.5 V
DC 1 to 6 V	6.7 V	0.8 to 6.5 V

Behavior after power on	Ready for operation after < 120 ms
Voltage supply influence	≤ 0.02 %/V
Reverse voltage protection	U_B to 0 V (all output variants)
Short-circuit resistance	S+ to 0 V (only voltage variants)
Overvoltage protection	The operating voltage must be restricted to max. 33 V
Step response of 90 % (according to DIN 16068 Point 3.3.8)	< 5 ms

Insulation resistance	> 100 MΩ at DC 500 V
Insulation voltage	AC 500 V

Environmental influences

Admissible temperatures	Ambient temperature	Medium temperature	Storage temperature
with MSP[a] ≤ 0.4 bar	-20 to +85 °C	-20 °C to +125 °C	-20 to +100 °C
with MSP > 0.4 bar	-40 to +85 °C	-40 to +125 °C	-40 to +100 °C

[a] MSP = measuring span

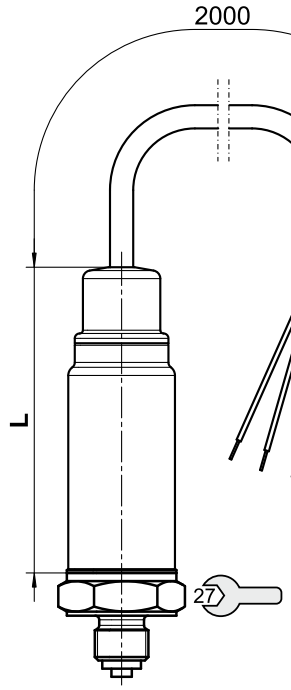
Resistance to climatic conditions	100 % relative humidity including condensation on the device's outer case; 90 % relative humidity without condensation
Protection type	According to DIN EN 60529
Types with attached cable	IP68[a] (IP66/IP68)
Types with round plug M12 × 1	IP67 (IP66/IP67)
Types with line socket	IP65
Types with terminal head	IP69 (IP66/IP69)
Admissible mechanical load	
Vibration resistance	20 g at 10 to 2000 Hz, 10 cycles per axis, device in X, Y, Z axis, industrial requirement according to IEC 60068-2-6
Shock resistance	50 g for 11 ms and 100 g for 1 ms, industrial requirement according to IEC 60068-2-27
Electromagnetic compatibility (EMC)	According to DIN EN 61326-2-3
Interference emission	Class A – only for industrial use –
Interference immunity	Industrial requirement
Process media	Liquid and gaseous media which are compatible with the materials of the parts coming into contact with the pressurized medium

[a] For 1 h at a depth of 2 m.

Dimensions

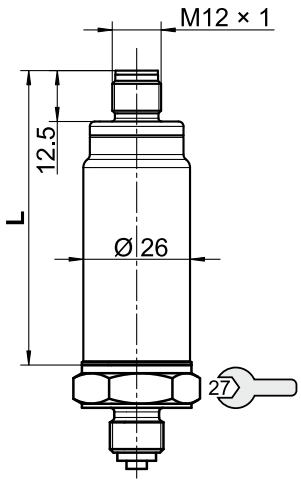
Transmitter with electrical connections

12
Attached cable, length of 2 m (standard)



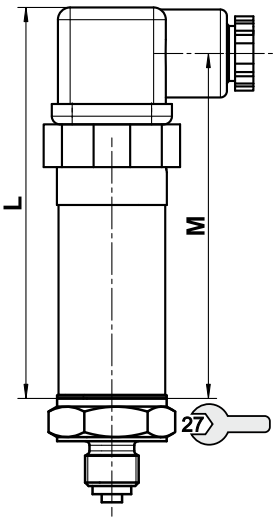
PA	L (mm)
502, 504, 511, 512, 562, 574	75
571, 575, 576	50

36
Round plug M12 × 1



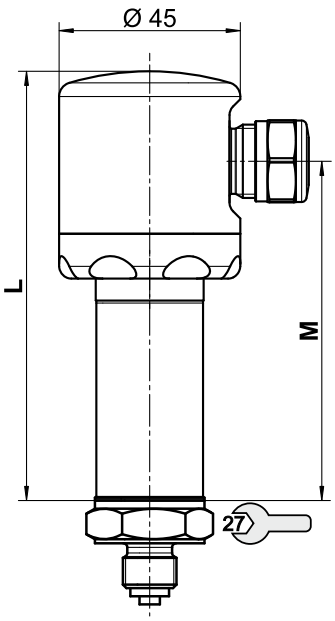
PA	L (mm)
502, 504, 511, 512, 562, 574	73
571, 575, 576	48

61
Line socket DIN EN 175301-803, form A



PA	L (mm)	M (mm)
502, 504, 511, 512, 562, 574	96	85
571, 575, 576	71	60

75
Terminal head

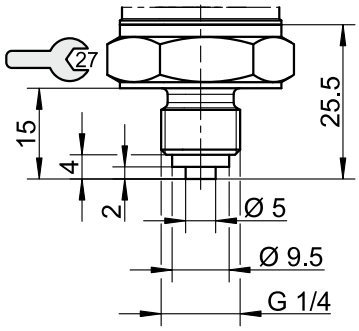


PA	L (mm)	M (mm)
502, 505, 511, 512, 562, 574	105	84
571, 575 576	81	61

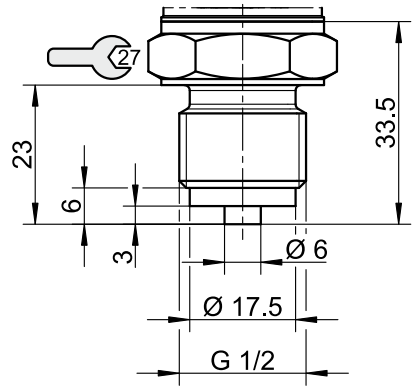
PA = process connection

Process connections, not front-flush

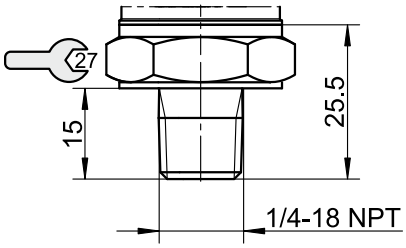
502
G 1/4 DIN EN 837



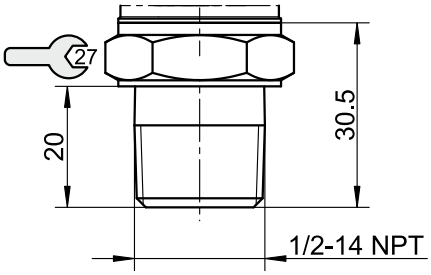
504
G 1/2 DIN EN 837



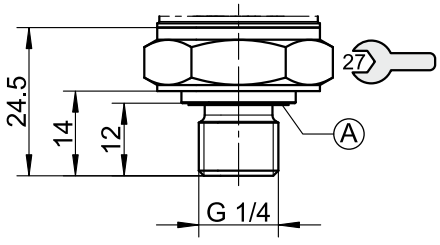
511
1/4-18 NPT DIN EN 837



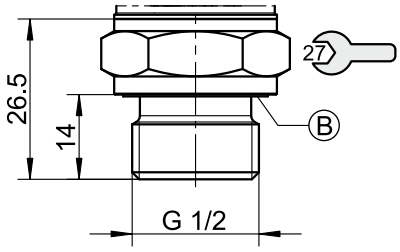
512
1/2-14 NPT DIN EN 837



521
G 1/4 DIN 3852-11



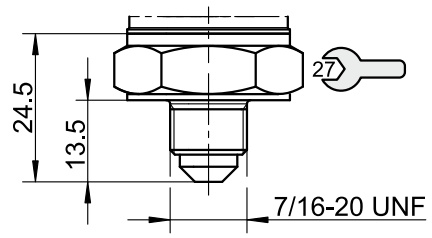
523
G 1/2 DIN 3852-11



Ⓐ Profile sealing ring G 1/4

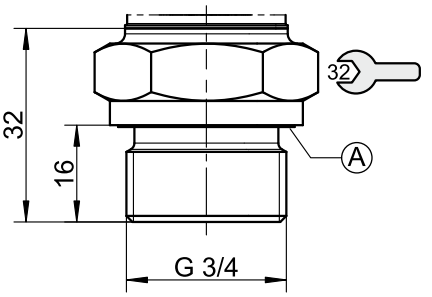
Ⓑ Profile sealing ring G 1/2

562
7/16-20 UNF

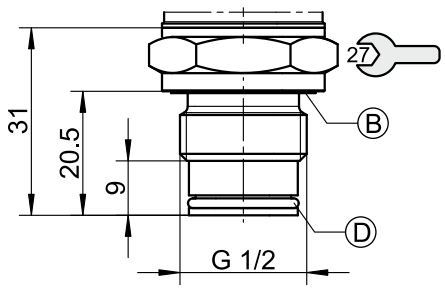


Process connections, front-flush

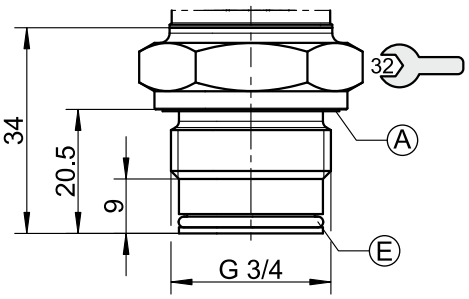
571
G 3/4 DIN EN ISO 228-1



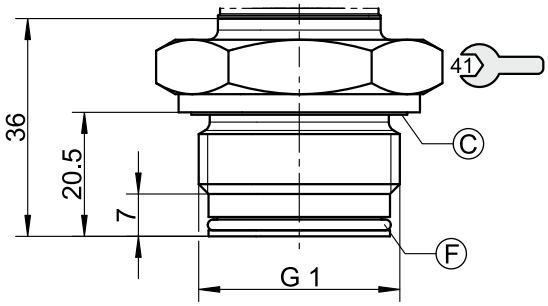
574
G 1/2 with double seal



575
G 3/4 with double seal



576
G 1 with double seal

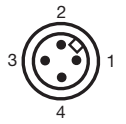
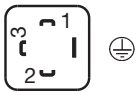
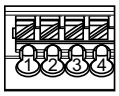


Ⓐ Profile sealing ring G 3/4
Ⓑ Profile sealing ring G 1/2
Ⓒ Profile sealing ring G 1
Ⓓ O-ring 15.1 × 1.6
Ⓔ O-ring 20.35 × 1.78
Ⓕ O-ring 26.7 × 1.78

Connection diagram

Transmitter

The connection diagram in the data sheet provides preliminary information about the connection options. For the electrical connection, only use the installation instructions or the operating manual. The knowledge and the correct technical compliance with the safety information and warnings contained in these documents are mandatory for mounting, electrical connection, and startup as well as for safety during operation.

Connection		**Terminal assignment**[a]			
					
		12 Attached cable	36 Round plug M12 × 1	61 Cable socket	75 Terminal head
4 to 20 mA, 2-wire (output 405)					
Voltage supply DC 8 to 30 V	U_B/S+	White	1	1	1
	0 V/S-	Black	3	2	2
DC 0 to 10 V, 3-wire (output 415)					
Voltage supply DC 11.5 V to 30 V	U_B	White	1	1	1
	0 V/S-	Black	2	2	2
	S+	Yellow	3	3	3
DC 1 to 5 V, three-wire (output 418) **DC 1 to 6 V, three-wire (output 420)**					
Voltage supply DC 10 to 30 V	U_B	White	1	1	1
	0 V/S-	Black	2	2	2
	S+	Yellow	3	3	3
Functional bonding conductor FB[b] (all output variants)		Shield/green	4		4

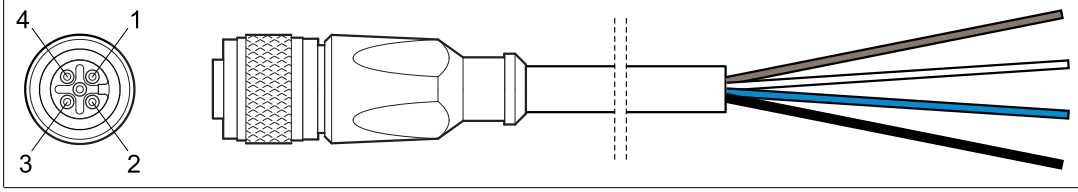
[a] Figure: Connection to the pressure transmitter

[b] As a basic principle, the device is grounded via the process connection. Alternatively, the device can also be grounded via the electrical connection on all variants. However, grounding via both the process connection **and** the electrical connection is not admissible.

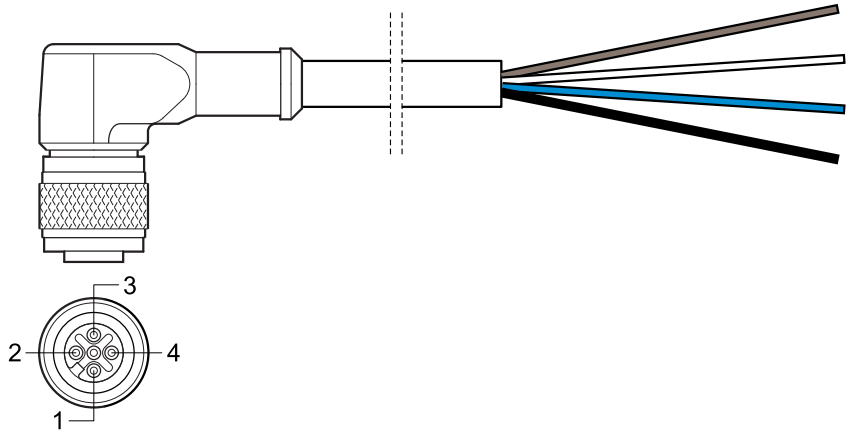
Admissible effect on the "attached cable" variant	
Smallest bending radius (fixed)	40 mm
Max. tensile force on the cable	20 N

Accessories

Line socket, 4-pole, M12 × 1, without pressure compensation, straight (part no. 00404585)

Figure	Pin	Color
	1	Brown
	2	White
	3	Blue
	4	Black

Line socket, 4-pole, M12 × 1, without pressure compensation, angled (part no. 00409334)

Figure	Pin	Color
	1	Brown
	2	White
	3	Blue
	4	Black

Order details

	(1)	**Basic type**
402072		JUMO TAROS S47 P – pressure transmitter
	(2)	**Basic type extension**
000		None
051		Relative-pressure version without zero point adjustment
999		Special version
	(3)	**Input**
478		-1 to 0 bar relative pressure
479		-1 to +0.6 bar relative pressure
449		-1 to +1 bar relative pressure
480		-1 to +1.5 bar relative pressure
481		-1 to +3 bar relative pressure
482		-1 to +5 bar relative pressure
483		-1 to +9 bar relative pressure
484		-1 to +15 bar relative pressure
485		-1 to +24 bar relative pressure
428		-0.4 to +0.4 bar relative pressure
427		-0.1 to +0.1 bar relative pressure
425		0 to 0.1 bar relative pressure
426		0 to 0.16 bar relative pressure
451		0 to 0.25 bar relative pressure
452		0 to 0.4 bar relative pressure
453		0 to 0.6 bar relative pressure
454		0 to 1 bar relative pressure
455		0 to 1.6 bar relative pressure
456		0 to 2.5 bar relative pressure
457		0 to 4 bar relative pressure
458		0 to 6 bar relative pressure
459		0 to 10 bar relative pressure
460		0 bar to 16 bar relative pressure
461		0 bar to 25 bar relative pressure
462		0 bar to 40 bar relative pressure
463		0 bar to 60 bar relative pressure
464		0 bar to 100 bar relative pressure
487		0 to 0.6 bar absolute pressure
488		0 to 1 bar absolute pressure
489		0 to 1.6 bar absolute pressure
490		0 to 2.5 bar absolute pressure
491		0 to 4 bar absolute pressure
500		0 to 5 bar absolute pressure
492		0 to 6 bar absolute pressure
493		0 to 10 bar absolute pressure
494		0 to 16 bar absolute pressure
495		0 to 25 bar absolute pressure
505		0 to 40 bar absolute pressure
998		Special measuring range for absolute pressure
999		Special measuring range for relative pressure
	(4)	**Output**
405		4 to 20 mA, two-wire

415		DC 0 to 10 V, three-wire
418		DC 1 to 5 V, three-wire
420		DC 1 to 6 V, three-wire
	(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
512		1/2-14 NPT DIN EN 837
521		G 1/4 DIN 3852-11
523		G 1/2 DIN 3852-11
562		7/16-20 UNF
571		G 3/4 front-flush DIN EN ISO 228-1
574		G 1/2 front-flush with double seal
575		G 3/4 front-flush with double seal
576		G 1 front-flush with double seal
	(6)	**Process connection material**
20		Stainless steel
	(7)	**Electrical connection**
12		Attached cable, shielded
36		Round plug M12 × 1
61		Line socket DIN EN 175301-803, form A
75		Terminal head
	(8)	**Measuring system, filling medium**
01		Silicone oil
	(9)	**Extra codes**
000		None
374		Inspection certificate 3.1 EN 10204 – material
462		Inverted output signal
624		Oil and grease free
769		Calibration certificate

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)
Order code		/		-		-		-		-		-		-		/	
Order example	402072	/	000	-	491	-	405	-	504	-	20	-	61	-	01	/	000

Accessories

Item	Part no.
Line socket, 4-pole, M12 × 1, straight, with 2-m PVC cable, without pressure compensation	00404585
Line socket, 4-pole, M12 × 1, angled, with 2-m PVC cable, without pressure compensation	00409334
Magnetic pin for simple adjustment of zero point	00736330