

JUMO GmbH & Co. KG
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JUMO Process Control, Inc.
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JUMO MIDAS S21 Ex

Pressure transmitter for use in Ex-areas

Areas of application

- Oil, fuel, natural gas
- Painting plants/painting robots
- Process engineering and process technology
- Plant engineering
- Testing and laboratory technology
- Chemical industry

These recommendations are based on many years of experience; however, in individual cases they may not be fully applicable. We would be happy to provide further information, including regarding additional applications.

Description

The JUMO MIDAS S21 Ex pressure transmitter measures the pressure of gases, vapors, and liquids. The device operates according to the piezoresistive measuring principle. The output signal is a load-independent direct current which is linearly proportional to the input pressure.

The pressure transmitter type 404710 meets the requirements:

- Off device group II in the potentially explosive area of zones 1 and 2
- Of device group III in the potentially explosive area of zones 21 und 22

The EC-type examination certificate of the pressure transmitter reads: SEV 09 ATEX 0101 X.



Type 404710

Customer benefits

- **Cost saving**
Type pressure transmitter is based on the already well-proven sensor technology of the JUMO MIDAS pressure transmitter series. A high level of automation on the production line ensures consistently high quality and low production costs.
- **Process reliability**
The measuring device was designed and certified according to ATEX directives. Set quality standards ensure a full final inspection within the fully automated measuring and calibration system. High burst pressures up to 400 bar (10 times the measuring span) ensure that the process will operate safely even in the event of damage.
- **Versatility**
A broad spectrum of measuring ranges and a multitude of process connections ensure many variants, which can be specifically adapted to any application.

Special features

- Measuring ranges of 0.25 to 100 bar relative and absolute pressure rating
- ATEX approval
- Welded system
- Compact design type
- Static and dynamic measurements

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Approval marks and certificates

	Designation Testing agency Certificate no. Inspection basis Valid for	ATEX Eurofins Electrosuisse Product Testing AG SEV 09 ATEX 0101 X EN 60079-0, EN 60079-11 Type 404710
	Designation Testing agency Certificate no. Inspection basis Valid for	UKEX Bureau Veritas EPS 22 UKEX 1 088 X EN IEC 60079-0, EN 60079-11 Type 404710 with extra code 085
	Designation Testing agency Certificate no. Inspection basis Valid for	EAC Ex ПрофиТест / ProfiTest RU C-DE.HB07.B.00659/22 TP TC 012/2011 Type 404710 with extra code 240
	Designation Testing agency Certificate no. Inspection basis Valid for	PESO Government of India, Ministry of Commerce & Industry P471636 IEC 60079-0 Type 404710
	Designation Testing agency Certificate no. Inspection basis Valid for	DNV DNV TAA0000211 DNV-CG-0339 Type 404710 with electrica connection 36 or 61 and extra code 062
	Designation Testing agency Certificate no. Inspection basis Valid for	H2 ready – Mobile hydrogen application KIWA P000415366HGV19 CSA ANSI HGV 3.1:2022 Type 404710 with extra code 1160

Observe "Special conditions for safe use" in hazardous areas.

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

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Technical data

General Information

Reference conditions	According to DIN EN 60770-1 and DIN IEC 61298-1
Sensor	
Material	Silicon sensor with stainless steel membrane
Pressure transfer medium	Synthetic oil
Admissible load changes	> 10 million
Mounting position	Any
Calibration position	Device upright, process connection at the bottom

Input

Measuring range and accuracy

Measuring range bar	Linearity ^a % MSP ^f	Accuracy at		Long-term stability ^b % MSP per year	Overload capacity ^c bar	Burst pressure bar
		20 °C ^d % MSP	-20 °C to +85 °C ^e % MSP			
0 to 0.6 bar relative/absolute pressure	0.3	0.5	1.2	< 0,2	2.4	6
0 to 1 bar relative/absolute pressure	0.3	0.5	1.2		4	10
0 to 1.6 bar relative/absolute pressure	0.3	0.4	1.0		6.4	16
0 to 2.5 bar relative/absolute pressure	0.3	0.4	1.0		10	25
0 to 4 bar relative/absolute pressure	0.3	0.4	1.0		16	40
0 to 6 bar relative/absolute pressure	0.3	0.4	1.0		24	60
0 to 10 bar relative/absolute pressure	0.3	0.4	1.0		40	100
0 to 16 bar relative/absolute pressure	0.3	0.4	1.0		64	160
0 to 25 bar relative/absolute pressure	0.3	0.4	1.0		100	250
0 to 30 bar relative/absolute pressure	0.3	0.4	1.0		100	250
0 to 0.25 bar relative pressure	0.3	0.5	1.2		1	2.5
0 to 0.4 bar relative pressure	0.3	0.5	1.2		1.6	4
0 to 40 bar relative pressure	0.3	0.4	1.0		300	400
0 to 60 bar relative pressure	0.3	0.4	1.0		300	400
0 to 100 bar relative pressure	0.3	0.4	1.0		300	400
-0.25 to 0 bar relative pressure	0.3	0.5	1.2		1	2.5
-0.4 to 0 bar relative pressure	0.3	0.5	1.2		1.6	4
-0.6 to 0 bar relative pressure	0.3	0.5	1.2		2.4	6
-1 to 0 bar relative pressure	0.3	0.5	1.2		4	10
-1 to +0.6 bar relative pressure	0.3	0.4	1.0		6.4	16
-1 to +1.5 bar relative pressure	0.3	0.4	1.0		10	25
-1 to +3 bar relative pressure	0.3	0.4	1.0		16	40
-1 to +5 bar relative pressure	0.3	0.4	1.0		24	60
-1 to +9 bar relative pressure	0.3	0.4	1.0		40	100
-1 to +15 bar relative pressure	0.3	0.4	1.0		64	160
-1 to +24 bar relative pressure	0.3	0.4	1.0		100	250

^a Linearity according to limit point setting

^b Reference conditions EN 61298-1

^c All pressure transmitters are vacuum proof.

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

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

^f MSP = Measuring span

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Output

Output signal	
Current	4 to 20 mA, two-wire
Step response T_{90}	≤ 2 ms
Burden	
4 to 20 mA, two-wire	$R_B \leq (U_B - 16 \text{ V}) \div 0.022 \text{ A } (\Omega)$
Burden influence	$\leq 0.004 \text{ \% per } 100 \Omega$

Mechanical features

Material	
Process connection	316 Ti
According to customer specification	316 L
Membrane	316 L
Housing	304
Connecting cable	Silicone
Loose stranded wires	Silicone
Round plug M12 × 1	PA, nickel-plated zinc diecast
Line socket	
Without DNV approval	PA 66 GF, PA6-GF30, EPDM
With DNV approval	PBT-GF30, PA, EPDM
Electrical connection	
Special version	PUR
Weight	170 g with process connection G 1/2

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Environmental influences

Admissible temperatures	
Medium temperature	-40 bis +85 °C
Ambient temperature	
Equipment Protection Level Gb	
Temperature class	
T4	-40 to +85 °C
T5	-40 to +70 °C
T6	-40 to +55 °C
Equipment Protection Level Db	
Max. surface temperature	
T100 °C	-40 to +85 °C
T85 °C	-40 to +70 °C
T70 °C	-40 to +55 °C
Storage temperature	-40 to +100 °C
Protection type ^a	DIN EN 60529 IP65
Electromagnetic compatibility (EC)	DIN EN 61326-2-3:2022
Interference emission	Class B ^b
Interference immunity	Industrial requirement
Mechanical load	DIN EN 60068-2-27, DIN EN 60068-2-6
Shock resistance	100 g/1 ms
Vibration resistance	20 g at 15 to 2000 Hz

^a The protection type is only achieved with a suitable mounted counter piece. The connecting cable diameter for line socket is minimum 4.5 mm, maximum 7 mm.

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

For the special conditions for use, observe the examination certificate.

Electrical data

Voltage supply U_B ^a	
Nominal voltage	DC 24 V
4 to 20 mA	
Without DNV approval	DC 16 to 28 V
With DNV approval	DC 21 to 24 V
Current consumption	≤ 23 mA
Electrical circuit	Intrinsically safe
Electrical connection	
Connection elements	Attached cable, loose stranded wires, round plug M12 ^b , line socket ^b

^a Residual ripple: the voltage peaks must not exceed or fall below the specified voltage supply values!

^b With DNV approval.

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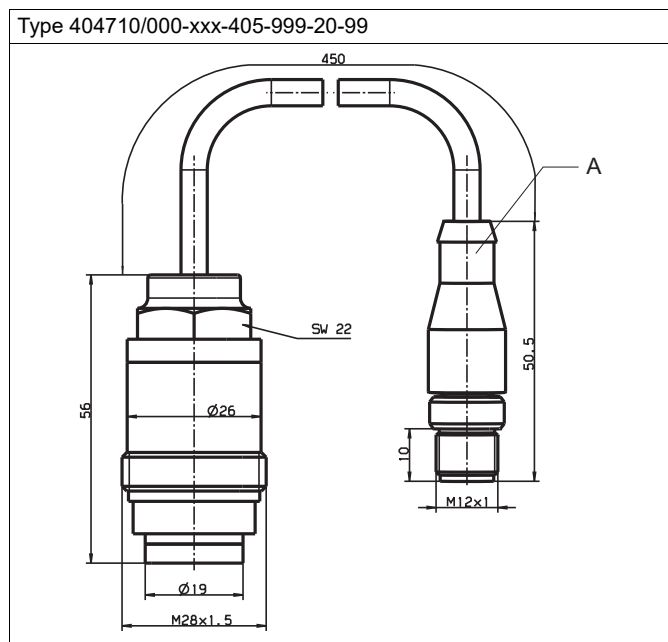
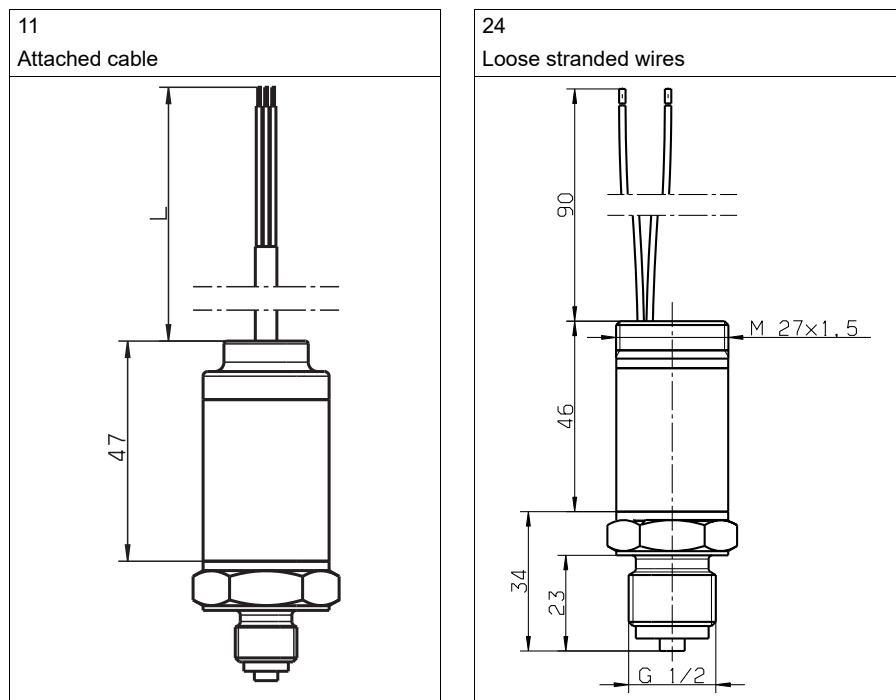
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Dimensions

Electrical connection



A Cable connector 4 × 0.34, 4-pin

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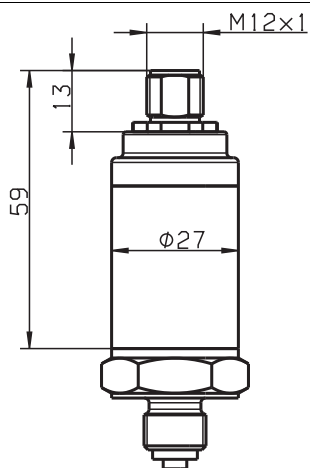
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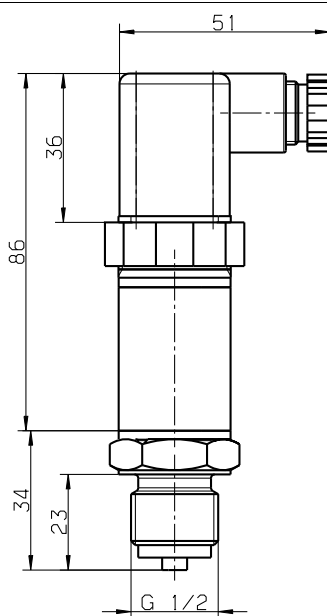
36

Round plug M12 × 1



61

Line socket



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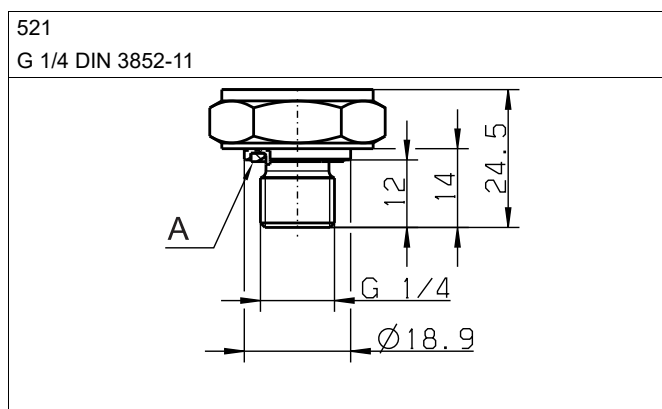
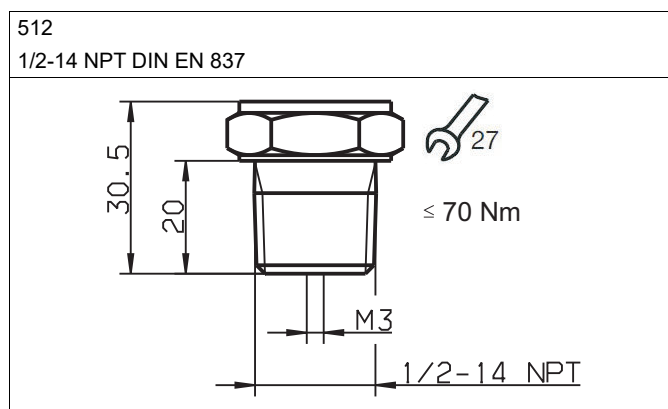
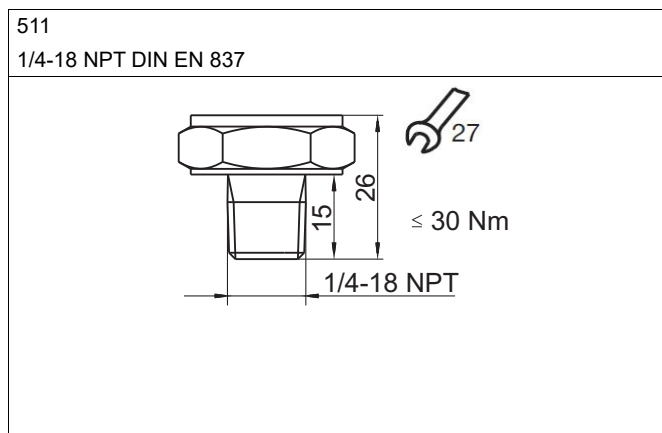
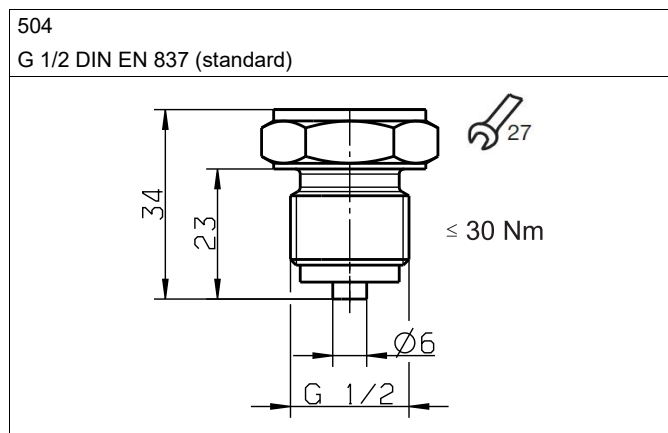
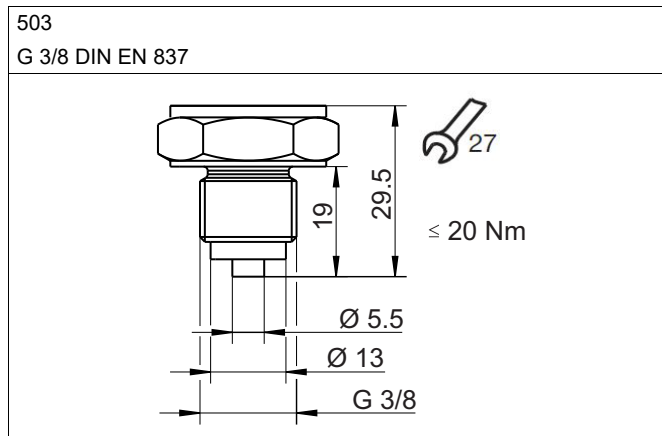
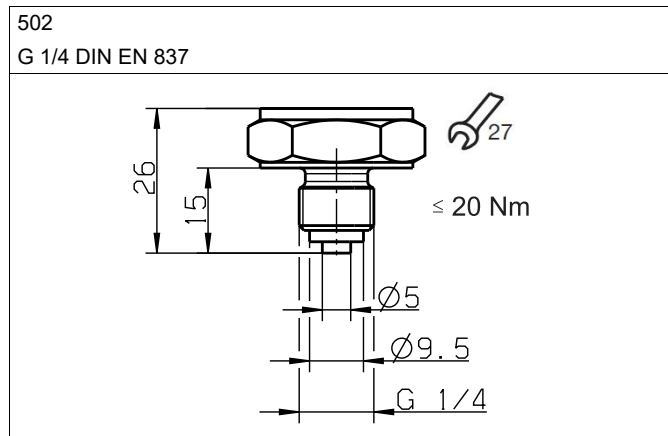
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**Process connections****Not front-flush**

A Profile seal G 1/4

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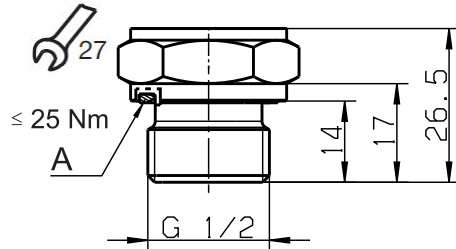
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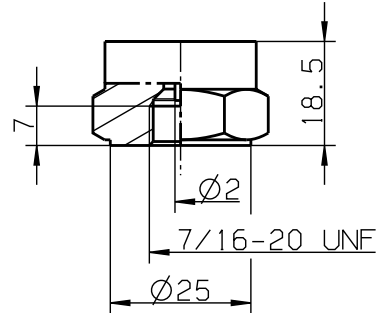
G 1/2 DIN 3852-11



A Profile seal G 1/2

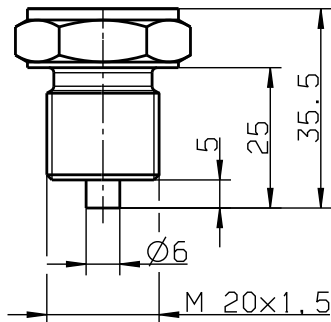
563

7/16-20 UNF interior with valve core handle



583

M20 × 1.5 with pin



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Connection diagram

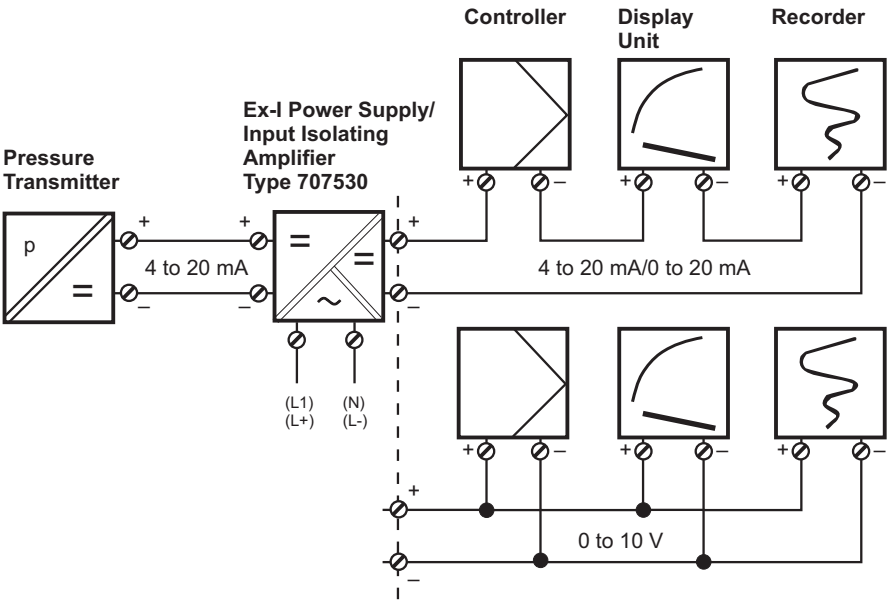
The connection diagram in the data sheet provides information on product selection.
For the electrical connection, only use the installation instructions or the operating manual.

Connection		Terminal assignment (Figure: connection to the pressure transmitter)			
		11 Attached cable	24 Loose stranded wires	36 Round plug M12 x 1	61 Cable socket
4 to 20 mA, two-wire (output 405)					
Voltage supply DC 16 to 28 V	U _B /S+ 0 V/S-	BU BK	BU BK	1 BN 3 BU	1 2
Functional bonding conductor FB ^a		-	-	-	-

^a The pressure transmitter has to be connected to the potential equalization system of the plant via the process connection.

Color coding: connecting cable round plug M12 x 1		1 BN	Brown
		2 WH	White
		3 BU	Blue
		4 BK	Black
The color coding is only valid for A-coded standard cables!			

Connection examples



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Order details

	(1) Basic type
404710	JUMO MIDAS S21 Ex – Pressure transmitter for use in Ex-areas
	(2) Basic type extension
000	None
	(3) Input – nominal measuring range
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 to 16 bar relative pressure
461	0 to 25 bar relative pressure
432	0 to 30 bar relative pressure
462	0 to 40 bar relative pressure
463	0 to 60 bar relative pressure
464	0 to 100 bar relative pressure
475	-0.25 to 0 bar relative pressure
476	-0.4 to 0 bar relative pressure
477	-0.6 to 0 bar relative pressure
478	-1 to 0 bar relative pressure
479	-1 to +0.6 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
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
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
998	Special measuring range for absolute pressure
999	Special measuring range for relative pressure
	(4) Output
405	4 to 20 mA, 2-wire
	(5) Process connection
502	G 1/4 DIN EN 837
503	G 3/8 DIN EN 837
504	G 1/2 DIN EN 837 (standard)
511	1/4"– 18 NPT DIN EN 837

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512	1/2"– 14 NPT DIN EN 837
521	G 1/4 DIN 3852-11
523	G 1/2 DIN 3852 T11
563	7/16" – 20 UNF interior with valve core handle
583	M20 × 1.5 with pin
999	According to customer specifications
(6)	Process connection material
20	CrNi (stainless steel)
(7)	Electrical connection
11	Connecting cable
24	Loose stranded wires
36	M12 plug connector
61	Line socket DIN EN 175301-803 Form A ^a
99	Special electrical connection
(8)	Extra code
062	DNV approval ^b
085	UKEX approval
240	EAC Ex approval
462	Inverted output signal
591	Restrictor in pressure channel
624	Free from oil and grease
630	Enlarged pressure duct
1160	H2 ready – Mobile hydrogen application ^c

^a Only certified for gas application.

^b Only in conjunction with M12 plug connector or line socket available.

^c Only available with process connections 502, 503, 504, 511 or 512.

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)
Order code		/		-		-		-		-		-		/	
Order example	404710	/	000	-	459	-	405	-	504	-	20	-	11	/	000

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Accessories

The accessories are not checked according to DNV requirements.

Description	Description	Part no.
Ex-i repeater power supply / input isolating amplifier 	The Ex-i repeater power supply / input isolating amplifier is designed for operating intrinsically safe transmitters (Ex-i) and mA current sources installed in potentially explosive (Ex) areas. Two-wire transmitters are supplied with energy and analog 0/4 to 20 mA measured values are transmitted from the Ex-area to the non-Ex-area. The output of the module can be operated actively or passively. Further technical data and the relevant safety requirements are available in the operating manual B 707530.0.	00577948
Cable box, straight 	The PVC connecting cable is 2 m long and has a 4-pin, straight M12 × 1 connector with gold-plated contacts on the device side.	00404585
Cable box, angled 	The PVC connecting cable is 2 m long and has a 4-pin, angled M12 × 1 connector with gold-plated contacts on the device side.	00409334