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# JUMO MIDAS S21 Ex

## Pressure transmitter for use in Ex-areas

 II 2G Ex ib IIC T6 ... T4 Gb  
II 2D Ex ib IIIC T70 °C ... T100 °C Db

### Applications<sup>1</sup>

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

### Brief 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:

- of 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.

### Customer benefits

- **Cost saving**  
Type 404710 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.



Type 404710

### 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

<sup>1</sup> 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.

### Approvals/approval marks (see "Technical data")



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## Technical data

### General information

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

### Measuring range and Accuracy

Measuring range bar	Linearity <sup>a</sup>	Accuracy at		Long-term stability <sup>b</sup> % MSP per year	Overload capability <sup>c</sup> bar	Burst pressure bar
	% MSP <sup>f</sup>	20 °C <sup>d</sup> % MSP	-20 to +85 °C <sup>e</sup> % MSP			
0 to 0.6 bar relative and absolut pressure	0.3	0.5	1.2	≤ 0.2	2.4	6
0 to 1 bar relative and absolut pressure	0.3	0.5	1.2		4	10
0 to 1.6 bar relative and absolut pressure	0.3	0.4	1.0		6.4	16
0 to 2.5 bar relative and absolut pressure	0.3	0.4	1.0		10	25
0 to 4 bar relative and absolut pressure	0.3	0.4	1.0		16	40
0 to 6 bar relative and absolut pressure	0.3	0.4	1.0		24	60
0 to 10 bar relative and absolut pressure	0.3	0.4	1.0		40	100
0 to 16 bar relative and absolut pressure	0.3	0.4	1.0		64	160
0 to 25 bar relative and absolut 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	

<sup>a</sup> Linearity according to limit point setting

<sup>b</sup> Reference conditions EN 61298-1

<sup>c</sup> All pressure transmitters are vacuum-proof.

<sup>d</sup> Includes: linearity, hysteresis, repeatability, deviation of measuring range initial value (offset) and measuring range end value

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

<sup>f</sup> MSP = measuring span

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## Output

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

## Mechanical features

Material	
Process connection	316 Ti Exception: 316 L (process connection 999: to customer specifications)
Membrane	316 L
Case	304
Electrical connection	PA, nickel-plated diecast (electrical connection 36: round plug M12 × 1) Silicone (electrical connection 11: attached cable) PUR (electrical connection 99: special version)
Weight	170 g (pressure transmitter with process connection 504: G 1/2)
Explosion protection	II 2G Ex ib IIC T6 ... T4 Gb II 2D Ex ib IIIC T70°C ... T100°C Db

## Environmental conditions

Admissible temperatures	
Ambient	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 maximum surface temperature T100 °C: -40 to +85 °C T85 °C: -40 to +70 °C T70 °C: -40 to +55 °C
Medium temperature	-40 to +85 °C
Storage temperature	-40 to +100 °C
Protection type	IP65 according to DIN EN 60529
Electromagnetic compatibility <sup>a</sup>	
Interference emission	Class B <sup>b</sup>
Interference immunity	Industrial requirement
Mechanical load	
Shock resistance <sup>c</sup>	100 g/1 ms
Vibration resistance <sup>d</sup>	20 g at 15 to 2000 Hz

<sup>a</sup> EN 61326

<sup>b</sup> The product is suitable for industrial use as well as for households and small businesses.

<sup>c</sup> DIN EN 60068-2-27

<sup>d</sup> DIN EN 60068-2-6

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## Auxiliary energy

Voltage supply $U_B^a$ 4 to 20 mA, two-wire	DC 16 to 28 V
Current consumption	$\leq 23$ mA
Electrical circuit	Intrinsically safe

<sup>a</sup> Residual ripple: The voltage peaks must not exceed or fall below the specified voltage supply values.

## Approvals/approval marks

Approval mark	Testing agency	Certificate/certification number	Inspection basis	Valid for
ATEX	electrosuisse	SEV 09 ATEX 0101 X	DIN EN 60079-0:12 + A11:13 DIN EN 60079-11:12	Type 404710

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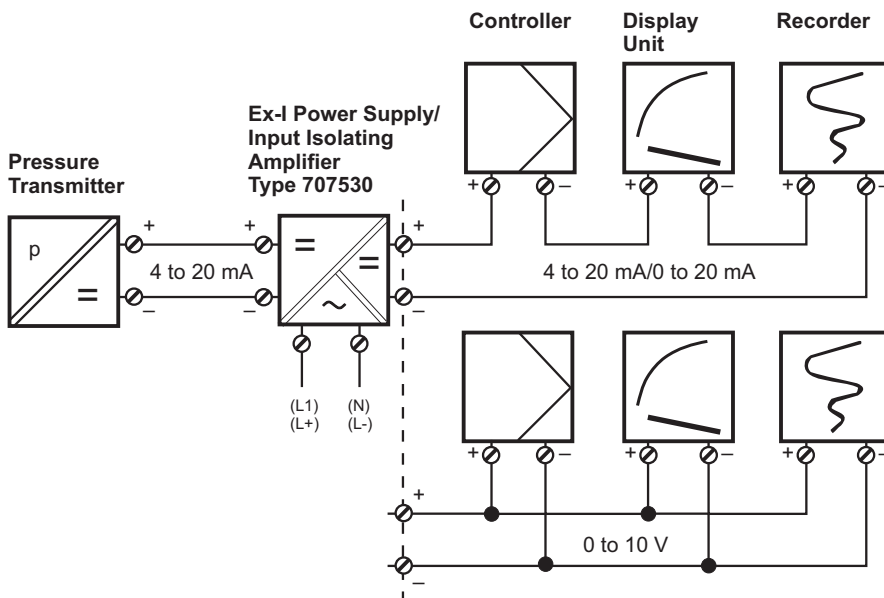
## Connection diagram

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	
		11 Attached cable	36 Round plug M12 x 1
<b>4 to 20 mA, two-wire (output 405)</b>			
Voltage supply DC 16 to 28 V	U <sub>B</sub> /S+ 0 V/S-	BU BK	1 BN 3 BU

<b>Colour coding: Round plug M12 x 1</b>	1 BN Brown
	2 WH White
	3 BU Blue
	4 BK Black
The colour coding is <b>only</b> valid for A-coded standard cables!	

## Connection example



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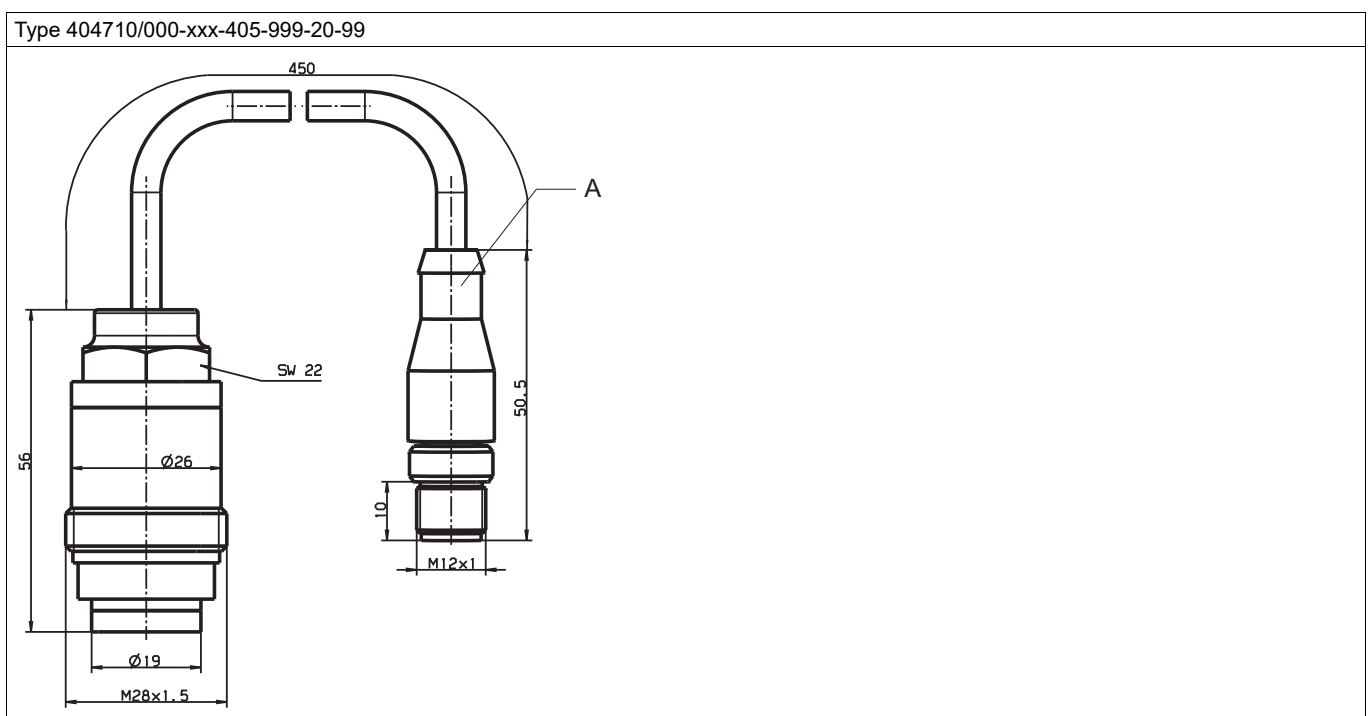
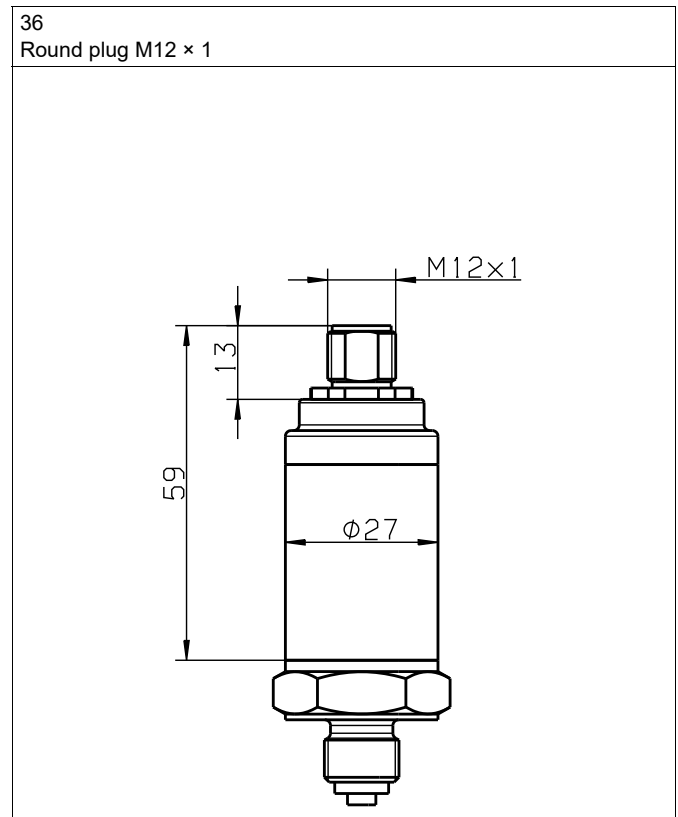
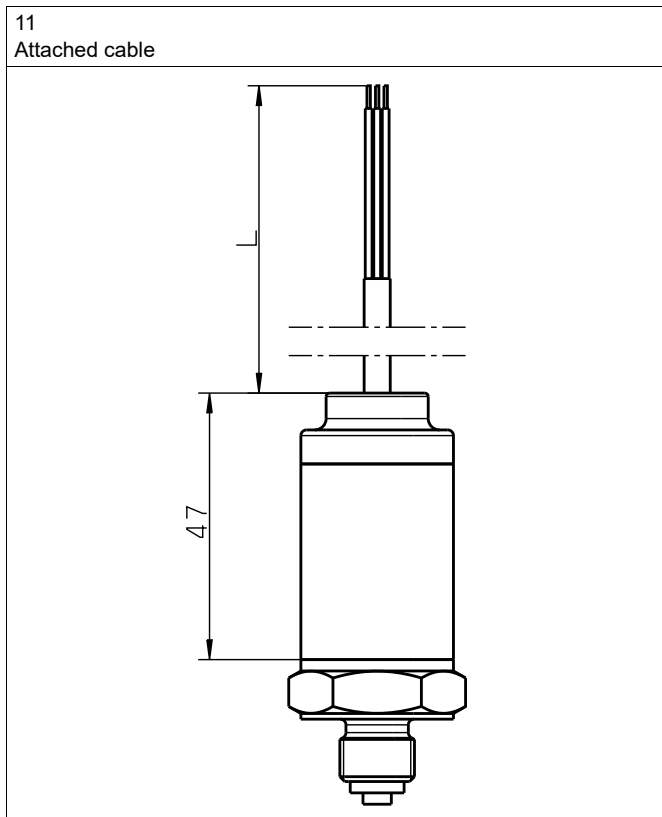
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# Dimensions

## Electrical connection



(A) Cable connector 4 x 0.34, 4 pole

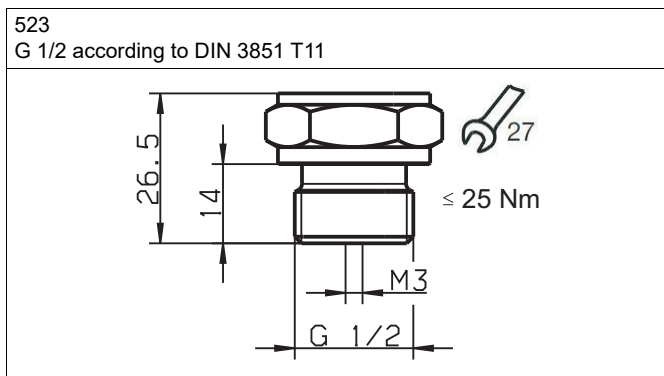
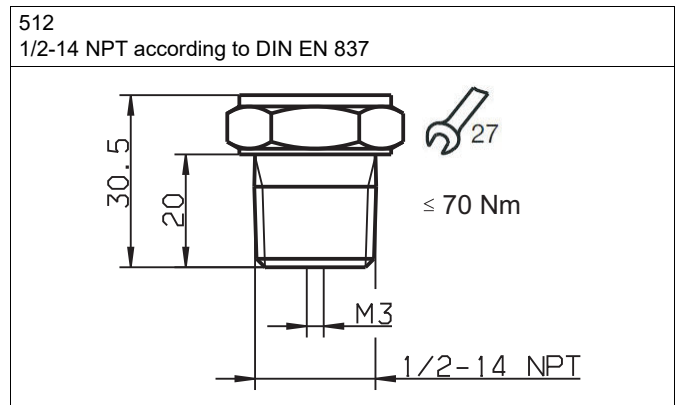
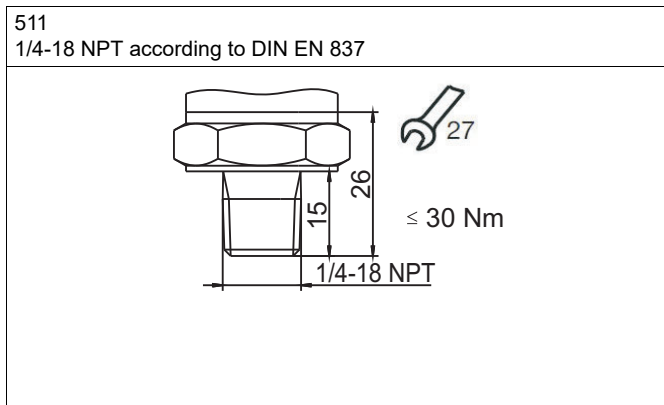
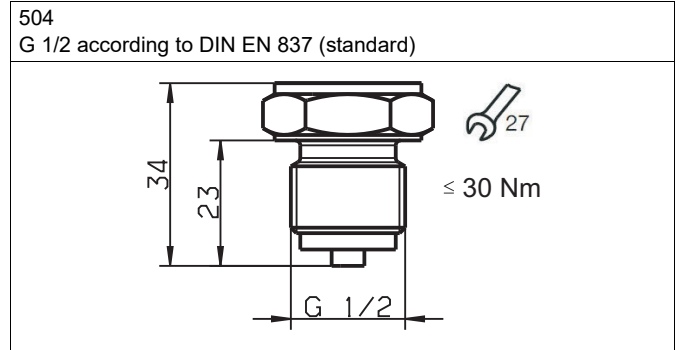
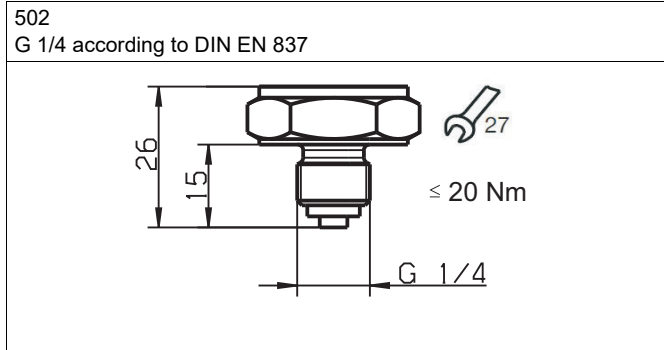
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**Process connection, not front-flush**



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## Order details

	<b>(1) Basic type</b>
404710/000	JUMO MIDAS S21 Ex – Pressure transmitter for use in Ex-areas
	<b>(2) Input – nominal measuring range</b>
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
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
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
	<b>(3) Output</b>
405	4 to 20 mA, two-wire
	<b>(4) Process connection</b>
502	G 1/4 according to DIN EN 837
504	G 1/2 according to DIN EN 837 (standard connection)
511	1/4-18 NPT according to DIN EN 837
512	1/2-14 NPT according to DIN EN 837
523	G 1/2 according to DIN 3852 T11
999	According to customer specifications
	<b>(5) Process connection material</b>
20	CrNi (stainless steel)



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<b>(6) Electrical connection</b>	
11	With attached cable (cable length 2 m)
36	Round plug M12 × 1
99	Special electrical connection
<b>(7) Extra code</b>	
000	None
462	Inverted output signal
591	Throttle in pressure duct
624	Free from oil and grease
630	Enlarged pressure duct

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

**Accessories**

Item	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 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 in length 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 in length and has a 4-pin, angled M12 × 1 connector with gold-plated contacts on the device side.	00409334