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# POSIWIRE®

Cable Extension Position Sensor

**WS21 with internal magnetic encoder  
Position Sensor**

Datasheet



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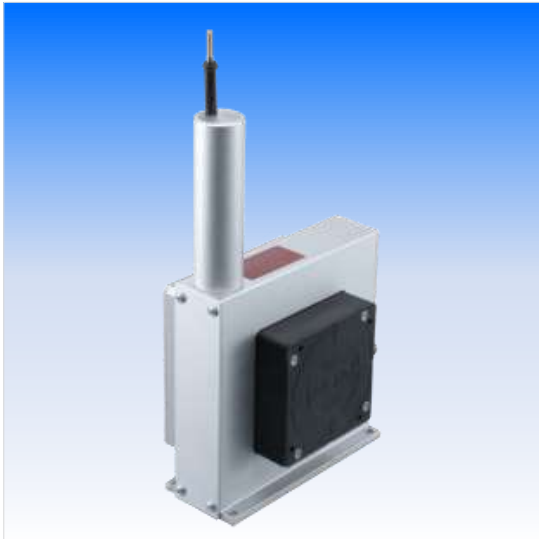
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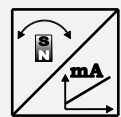
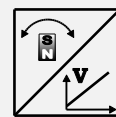
<b>Magnetic encoder, analog output .....</b>	<b>4</b>
Specifications .....	4
Order code .....	5
<b>Magnetic encoder, analog output, programmable .....</b>	<b>6</b>
Specifications .....	6
Order code .....	7
<b>Magnetic encoder, analog output, redundant.....</b>	<b>8</b>
Specifications .....	8
Order code .....	9
<b>Magnetic encoder, digital output SSI .....</b>	<b>10</b>
Specifications .....	10
Order code .....	11
<b>Magnetic encoder, digital output CAN Bus.....</b>	<b>12</b>
Specifications .....	12
Order code .....	13
<b>Dimensions .....</b>	<b>15</b>
Measurement range 8000 ... 10000 mm, magnetic encoder output .....	15
Measurement range 12500 mm, magnetic encoder output .....	16
Measurement range 15000 mm, magnetic encoder output .....	17
Measurement range 17500 ... 20000 mm, magnetic encoder output .....	18
<b>Output specification .....</b>	<b>19</b>
Analog output .....	19
Analog output, programmable.....	21
Analog output, redundant.....	23
Digital output SSI .....	25
Digital output CANopen.....	27
Digital output CAN SAE J1939 .....	28
<b>Accessories.....</b>	<b>29</b>
Connector cable M12, 4 pin .....	29
Connector cable M12, 5 pin .....	30
Connector cable M12, 8 pin .....	31
Connector/bus cable - M12, 5 pin CAN-Bus.....	32
T-piece for bus cable M12, 5 pin CAN-Bus.....	32
Terminating resistance M12, 5 pin CAN-Bus.....	32

## Magnetic encoder, analog output



### Sensor features

- With magnetic absolute encoder
- Measurement range up to 20000 mm
- Protection class IP67/IP69 (with mating connector only)
- Analog output
- Absolute measurement



### Specifications

<b>Output</b>	<b>U2</b> <b>U8</b> <b>I1</b>	= Voltage 0.5 ... 10 V = Voltage 0.5 ... 4.5 V = Current 4 ... 20 mA, 3 wire
<b>Resolution</b>	<0.002% f.s.	
<b>Linearity</b>	±0.10% f.s. (standard) ±0.05% f.s. (optional)	
<b>Sensing device</b>	Magnetic absolute encoder	
<b>Housing material</b>	Aluminium, plastic measuring cable: stainless steel	
<b>Protection class</b>	IP67/IP69 (with mating connector only)	
<b>Connection</b>	Connector M12, 5 pin	
<b>Shock</b>	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks	
<b>Vibration</b>	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles	
<b>Temperature range</b>	-20 ... +85 °C	
<b>Weight</b>	8000 mm:	1.5 kg
	10000 mm:	1.5 kg
	12500 mm:	2.5 kg
	15000 mm:	3.0 kg
	17500 mm:	4.2 kg
	20000 mm:	4.2 kg
<b>EMC</b>	DIN EN 61326-1:2013	

**Order code**

WS21 – 1 – 2 – 3 – 4 – 5 – 6

**1 Measurement range (in mm)**

8000 / 10000 / 12500 / 15000 / 17500 / 20000

**2 Output**

**U2** = Voltage 0.5 ... 10 V  
**U8** = Voltage 0.5 ... 4.5 V  
**I1** = Current 4 ... 20 mA, 3 wire

**3 Signal characteristics**

**A** = increasing signal (e.g. 4 ... 20 mA)  
**D** = decreasing signal (e.g. 20 ... 4 mA)

**4 Linearity**

**L10** = ±0.10% f.s. (standard)  
**L05** = ±0.05% f.s. (optional)

**5 Cable fixing**

**M4** = M4 cable fixing  
**SB0** = cable clip

**6 Connection**

**M12R5** = Connector M12, 5 pin

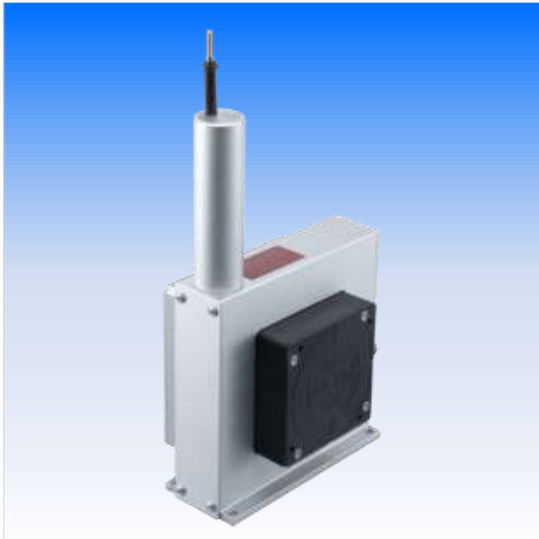
**Order example**

WS21 – 15000 – U2 – A – L10 – M4 – M12R5

**Accessories:**

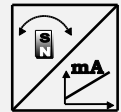
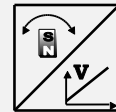
**Connector cable (see page 29)**

## Magnetic encoder, analog output, programmable



### Sensor features

- With magnetic absolute encoder
- Measurement range up to 20000 mm
- Protection class IP67/IP69 (with mating connector only)
- Analog output, programmable
- Absolute measurement



### Specifications

<b>Output</b>	<b>U2/PMU</b> = Voltage 0.5 ... 10 V, programmable <b>U8/PMU</b> = Voltage 0.5 ... 4.5 V, programmable <b>I1/PMU</b> = Current 4 ... 20 mA, 3 wire, programmable
<b>Resolution</b>	<0.002% f.s.
<b>Linearity</b>	±0.10% f.s. (standard) ±0.05% f.s. (optional)
<b>Sensing device</b>	Magnetic absolute encoder
<b>Housing material</b>	Aluminium, plastic measuring cable: stainless steel
<b>Protection class</b>	IP67/IP69 (with mating connector only)
<b>Connection</b>	Connector M12, 5 pin
<b>Shock</b>	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
<b>Vibration</b>	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
<b>Temperature range</b>	-20 ... +85 °C
<b>Weight</b>	8000 mm: 1.5 kg 10000 mm: 1.5 kg 12500 mm: 2.5 kg 15000 mm: 3.0 kg 17500 mm: 4.2 kg 20000 mm: 4.2 kg
<b>EMC</b>	DIN EN 61326-1:2013

**Order code**

WS21 – 1 – 2 – 3 – 4 – 5 – 6

**1 Measurement range (in mm)**

8000 / 10000 / 12500 / 15000 / 17500 / 20000

**2 Output**

**U2/PMU** = Voltage 0.5 ... 10 V, programmable  
**U8/PMU** = Voltage 0.5 ... 4.5 V, programmable  
**I1/PMU** = Current 4 ... 20 mA, 3 wire, programmable

**3 Signal characteristics**

**A** = increasing signal (e.g. 4 ... 20 mA)  
**D** = decreasing signal (e.g. 20 ... 4 mA)

**4 Linearity**

**L10** = ±0.10% f.s. (standard)  
**L05** = ±0.05% f.s. (optional)

**5 Cable fixing**

**M4** = M4 cable fixing  
**SB0** = cable clip

**6 Connection**

**M12R5** = Connector M12, 5 pin

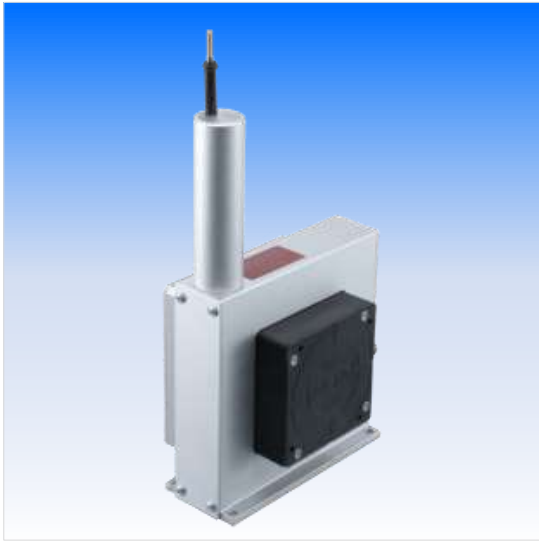
**Order example**

WS21 – 15000 – U2/PMU – A – L10 – M4 – M12R5

**Accessories:**

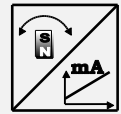
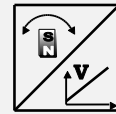
Connector cable (see page 30)

## Magnetic encoder, analog output, redundant



### Sensor features

- With magnetic absolute encoder
- Measurement range up to 20000 mm
- Protection class IP67/IP69 (with mating connector only)
- Analog output, redundant
- Absolute measurement



### Specifications

<b>Output</b>	<b>U2R</b> <b>U8R</b> <b>I1R</b>	= Voltage 0.5 ... 10 V, redundant = Voltage 0.5 ... 4.5 V, redundant = Current 4 ... 20 mA, 3 wire, redundant
<b>Resolution</b>	<0.002% f.s.	
<b>Linearity</b>	±0.10% f.s. (standard) ±0.05% f.s. (optional)	
<b>Sensing device</b>	Magnetic absolute encoder	
<b>Housing material</b>	Aluminium, plastic measuring cable: stainless steel	
<b>Protection class</b>	IP67/IP69 (with mating connector only)	
<b>Connection</b>	Connector M12, 8 pin	
<b>Shock</b>	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks	
<b>Vibration</b>	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles	
<b>Temperature range</b>	-20 ... +85 °C	
<b>Weight</b>	8000 mm:	1.5 kg
	10000 mm:	1.5 kg
	12500 mm:	2.5 kg
	15000 mm:	3.0 kg
	17500 mm:	4.2 kg
	20000 mm:	4.2 kg
<b>EMC</b>	DIN EN 61326-1:2013	



**Order code**

WS21 - 1 - 2 - 3 - 4 - 5 - 6

**1 Measurement range (in mm)**

8000 / 10000 / 12500 / 15000 / 17500 / 20000

**2 Output**

U2R = Voltage 0.5 ... 10 V, redundant  
 U8R = Voltage 0.5 ... 4.5 V, redundant  
 I1R = Current 4 ... 20 mA, 3 wire, redundant

**3 Signal characteristics**

A/A = Output 1 increasing, output 2 increasing  
 A/D = Output 1 increasing, output 2 decreasing  
 D/D = Output 1 decreasing, output 2 decreasing

**4 Linearity**

L10 = ±0.10% f.s. (standard)  
 L05 = ±0.05% f.s. (optional)

**5 Cable fixing**

M4 = M4 cable fixing  
 SB0 = cable clip

**6 Connection**

M12R8 = Connector M12, 8 pin

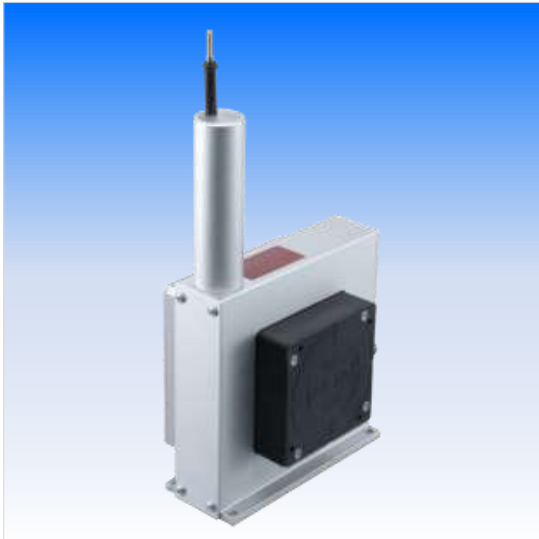
**Order example**

WS21 - 15000 - I1R - A/D - L10 - M4 - M12R8

**Accessories:**

**Connector cable (see page 31)**

## Magnetic encoder, digital output SSI



### Sensor features

- With magnetic absolute encoder
- Measurement range up to 20000 mm
- Protection class IP67/IP69 (with mating connector only)
- Digital output SSI
- Absolute measurement



### Specifications

<b>Output</b>	<b>MSSI</b> = SSI synchronous serial interface
<b>Resolution</b>	50 / 100
<b>Linearity</b>	±0.10% f.s. (standard) ±0.05% f.s. (optional)
<b>Sensing device</b>	Magnetic absolute encoder
<b>Housing material</b>	Aluminium, plastic measuring cable: stainless steel
<b>Protection class</b>	IP67/IP69 (with mating connector only)
<b>Connection</b>	Connector M12, 8 pin
<b>Shock</b>	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
<b>Vibration</b>	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
<b>Temperature range</b>	-40 ... +85 °C
<b>Weight</b>	8000 mm: 1.5 kg 10000 mm: 1.5 kg 12500 mm: 2.5 kg 15000 mm: 3.0 kg 17500 mm: 4.2 kg 20000 mm: 4.2 kg
<b>EMC</b>	DIN EN 61326-1:2013

**Order code**

**WS21** – 1 – 2 – 3 – 4 – 5 – 6

**1 Measurement range (in mm)**

8000 / 10000 / 12500 / 15000 / 17500 / 20000

**2 Resolution (in µm)**

50 / 100

**3 Output**

**MSSI** = SSI synchronous serial interface

**4 Linearity**

**L10** = ±0.10% f.s. (standard)  
**L05** = ±0.05% f.s. (optional)

**5 Cable fixing**

**M4** = M4 cable fixing  
**SB0** = cable clip

**6 Connection**

**M12R8** = Connector M12, 8 pin

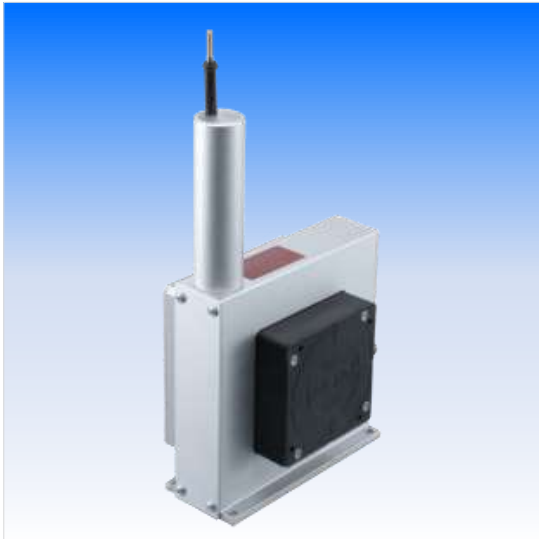
**Order example**

**WS21 – 15000 – 50 – MSSI – L10 – M4 – M12R8**

**Accessories:**

**Connector cable (see page 31)**

## Magnetic encoder, digital output CAN Bus



### Sensor features

- With magnetic absolute encoder
- Measurement range up to 20000 mm
- Protection class IP67/IP69 (with mating connector only)
- Digital output CAN Bus
- Absolute measurement
- Optional redundant CAN Bus



### Specifications

<b>Output</b>	<b>MCANOP</b> = CANopen <b>MCANJ1939</b> = CAN SAE J1939 <b>MCANOPR</b> = CANopen redundant <b>MCANJ1939R</b> = CAN SAE J1939 redundant
<b>Resolution</b>	setting via CAN Bus
<b>Linearity</b>	±0.10% f.s. (standard) ±0.05% f.s. (optional)
<b>Sensing device</b>	Magnetic absolute encoder
<b>Housing material</b>	Aluminium, plastic measuring cable: stainless steel
<b>Protection class</b>	IP67/IP69 (with mating connector only)
<b>Connection</b>	Connector M12, 5 pin
<b>Temperature range</b>	-20 ... +85 °C
<b>Weight</b>	8000 mm: 1.5 kg 10000 mm: 1.5 kg 12500 mm: 2.5 kg 15000 mm: 3.0 kg 17500 mm: 4.2 kg 20000 mm: 4.2 kg
<b>EMC</b>	DIN EN 61326-1:2013

**Order code**WS21 – 1 – 2 – 3 – 4 – 5**1 Measurement range (in mm)**

8000 / 10000 / 12500 / 15000 / 17500 / 20000

**2 Output**

**MCANOP** = CANopen  
**MCANJ1939** = CAN SAE J1939  
**MCANOPR** = CANopen redundant  
**MCANJ1939R** = CAN SAE J1939 redundant

**3 Linearity**

**L10** = ±0.10% f.s. (standard)  
**L05** = ±0.05% f.s. (optional)

**4 Cable fixing**

**M4** = M4 cable fixing  
**SB0** = cable clip

**5 Connection**

**M12/CAN** = Connector M12, 5 pin

**Order example**

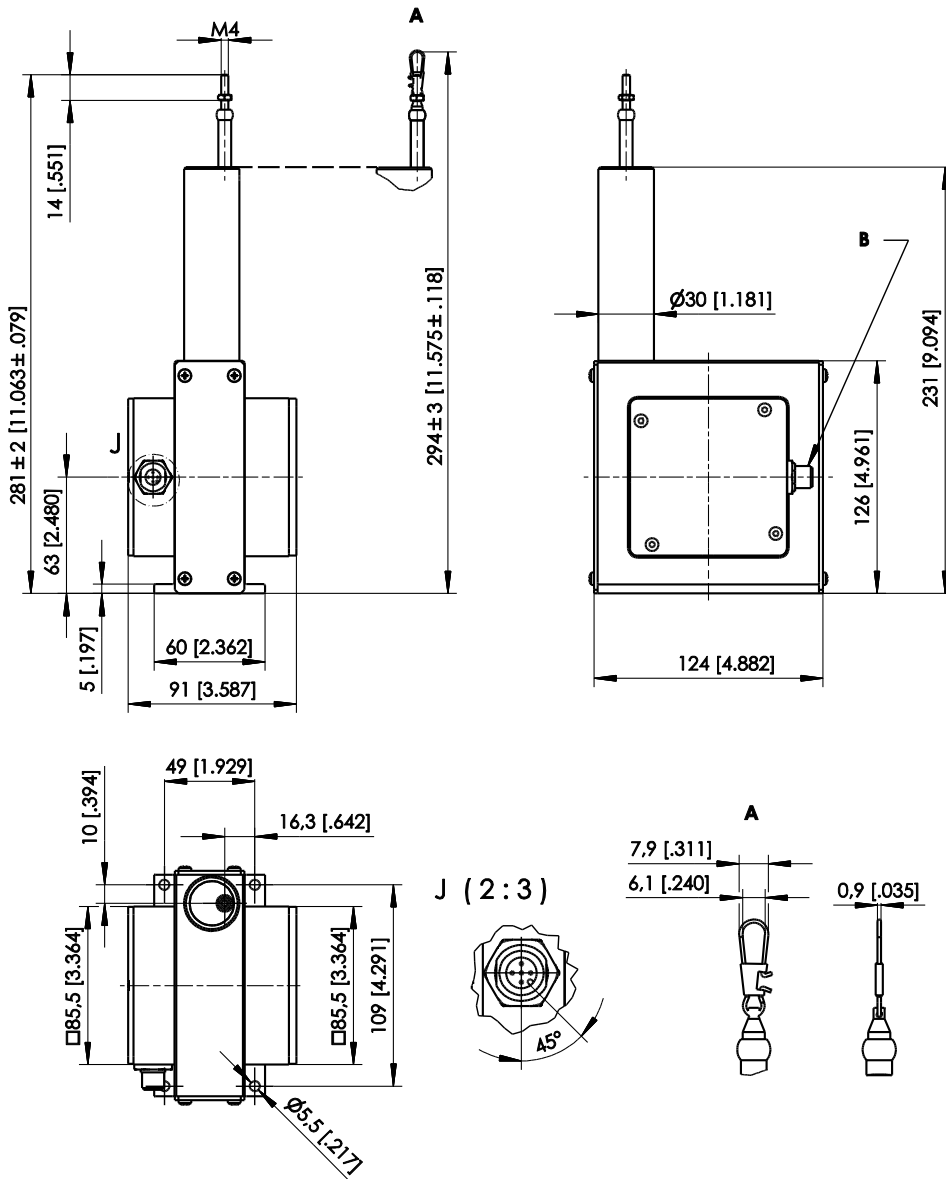
WS21 – 15000 – MCANOP – L10 – M4 – M12/CAN
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**Accessories:****Connector cable (see page 32)**

<b>Cable forces</b> typical at = 20 °C	<b>Measurement range [mm]</b>	<b>Weight [kg]</b>	<b>Maximum pull-out force [N]</b>	<b>Minimum pull-in force [N]</b>
	8000	1.5	4.3	2.9
	10000	1.5	4.3	2.9
	12500	2.5	11.3	7.9
	15000	3.0	8.8	4.4
	17500	4.2	6.8	4.5
	20000	4.2	6.8	4.5

## Dimensions

Measurement range 8000 ... 10000 mm, magnetic encoder output



A – Option SB0

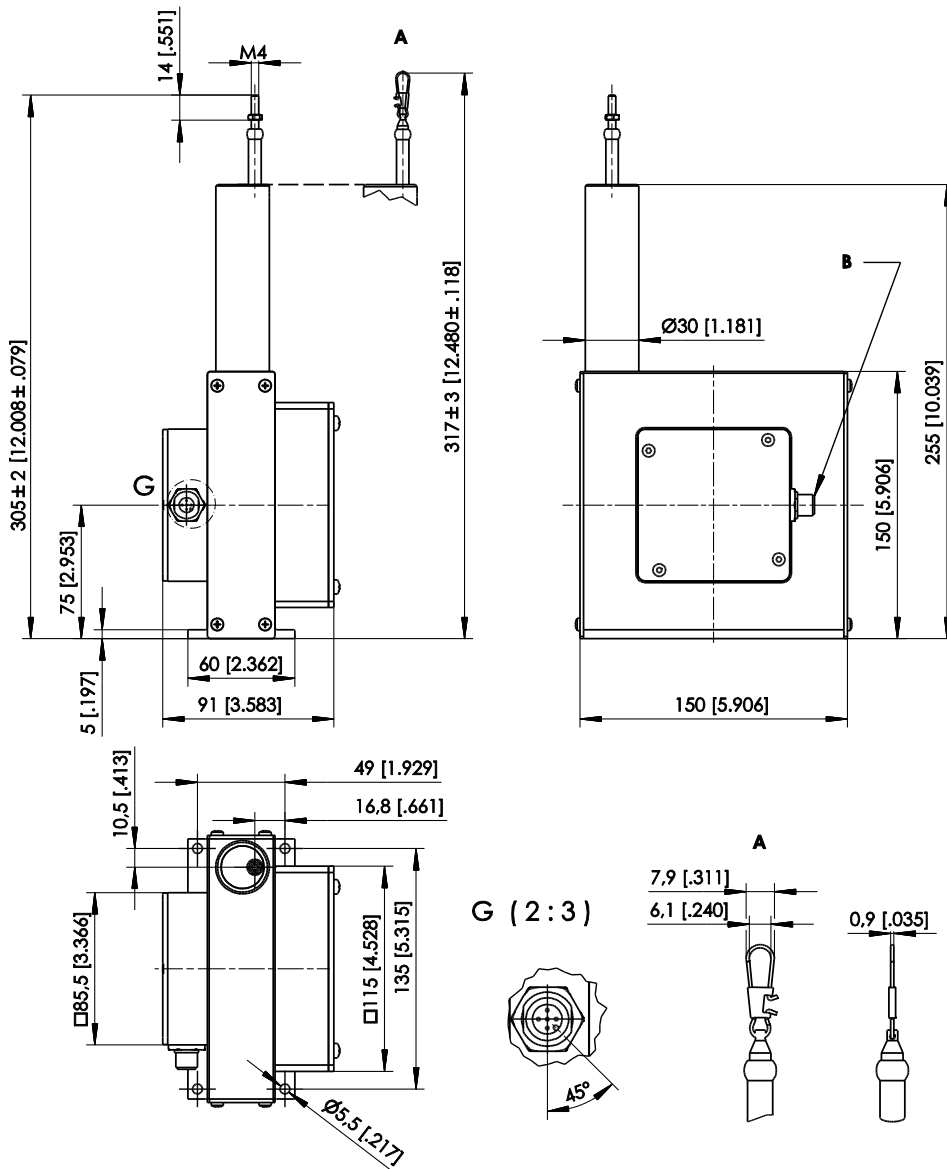
B – Connector M12

Dimensions in mm [inch]. Weight approx. 1.5 kg.

Dimensions informative only.

For guaranteed dimensions consult factory.

Measurement range 12500 mm, magnetic encoder output

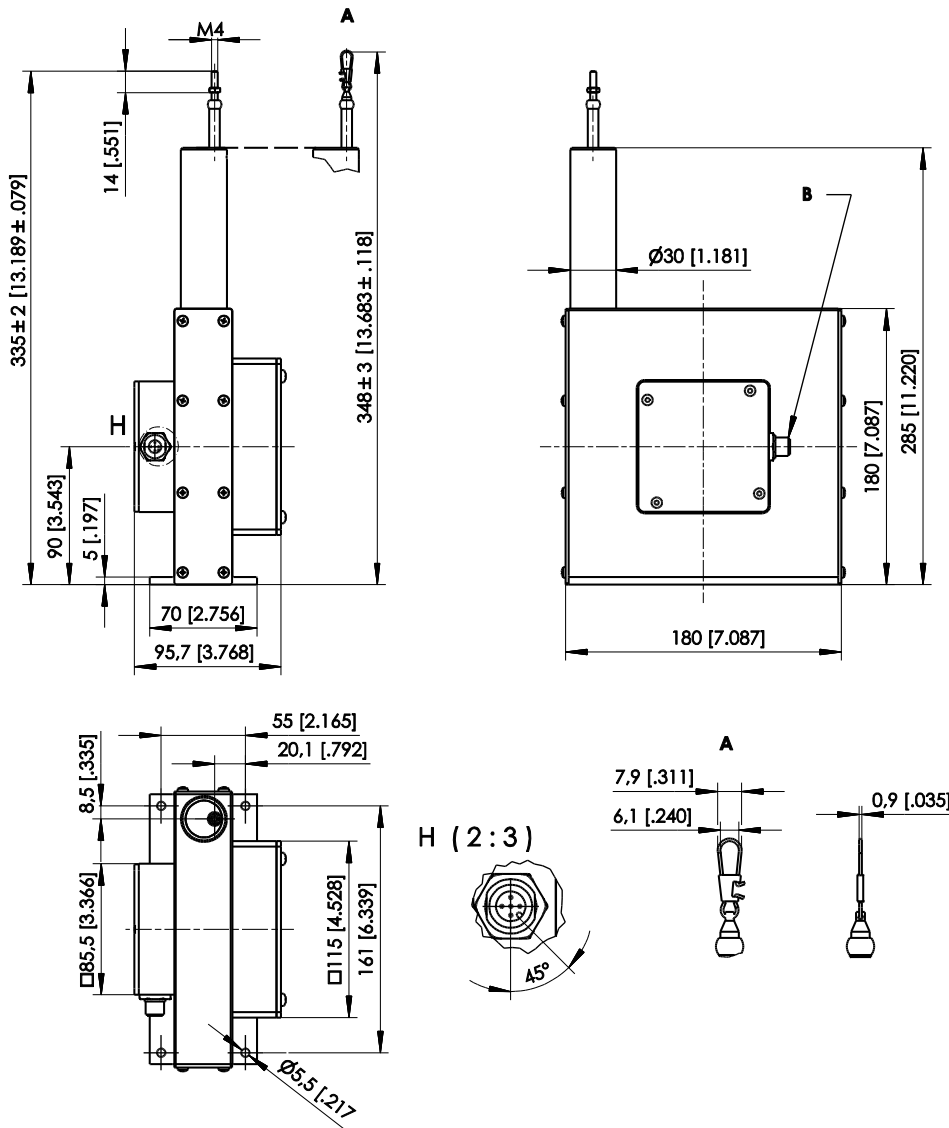


A - Option SB0  
 B - Connector M12

Dimensions in mm [inch]. Weight approx. 2.5 kg.  
 Dimensions informative only.  
 For guaranteed dimensions consult factory.



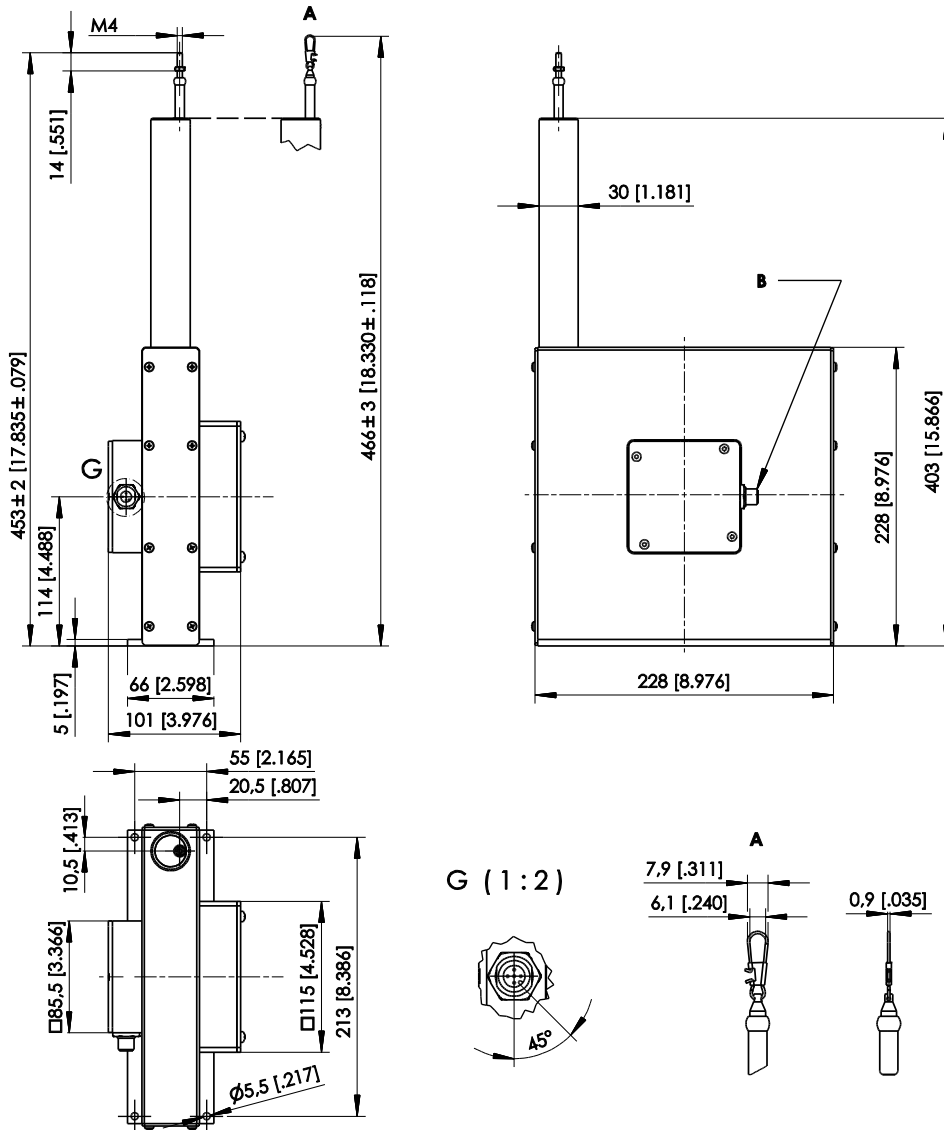
Measurement range 15000 mm, magnetic encoder output



A – Option SB0  
 B – Connector M12

Dimensions in mm [inch]. Weight approx. 3.0 kg.  
 Dimensions informative only.  
 For guaranteed dimensions consult factory.

Measurement range 17500 ... 20000 mm, magnetic encoder output

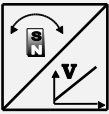
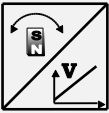
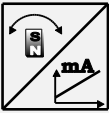


- A – Option SB0
- B – Connector M12


Dimensions in mm [inch]. Weight approx. 4.2 kg.  
 Dimensions informative only.  
 For guaranteed dimensions consult factory.

## Output specification

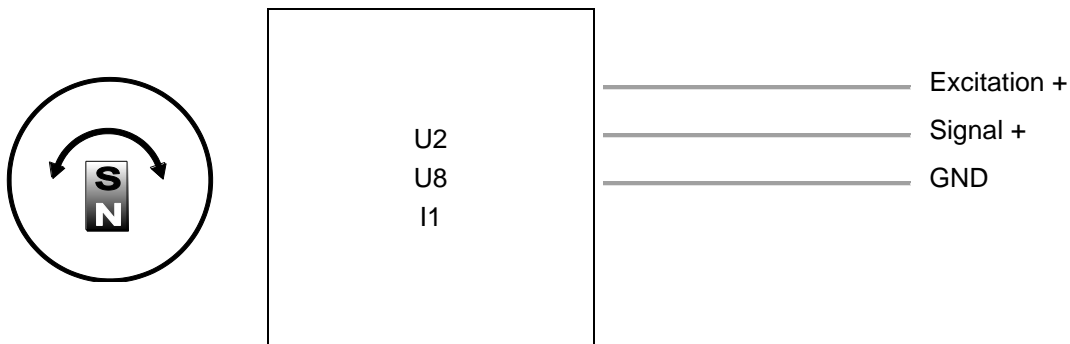
### Analog output

<b>U2</b> Voltage output 0.5 ... 10 V 	Excitation voltage	8 ... 36 V DC
	Excitation current	20 mA typical at 24 V DC 38 mA typical at 12 V DC max. 50 mA
	Output voltage	0.5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
<b>U8</b> Voltage output 0.5 ... 4.5 V 	Excitation voltage	8 ... 36 V DC
	Excitation current	17 mA typical at 24 V DC 32 mA typical at 12 V DC 50 mA max.
	Output voltage	0.5 ... 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
<b>I1</b> Current output 4 ... 20 mA, 3 wires 	Excitation voltage	8 ... 36 V DC
	Excitation current	typical 36 mA at 24 V DC typical 70 mA at 12 V DC 120 mA max.
	Load R <sub>L</sub>	500 Ω max.
	Output current	4 ... 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013

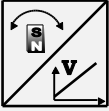
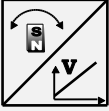
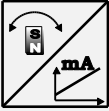
**Signal wiring**

Signal	Connector pin no.	Cable connection	View to the sensor connector
Excitation +	1	brown	
Signal	2	white	
GND	3	blue	
Do not connect!	4	black	
Do not connect!	5	(grey)	

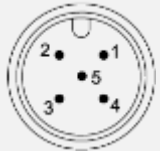
**Signal diagram**



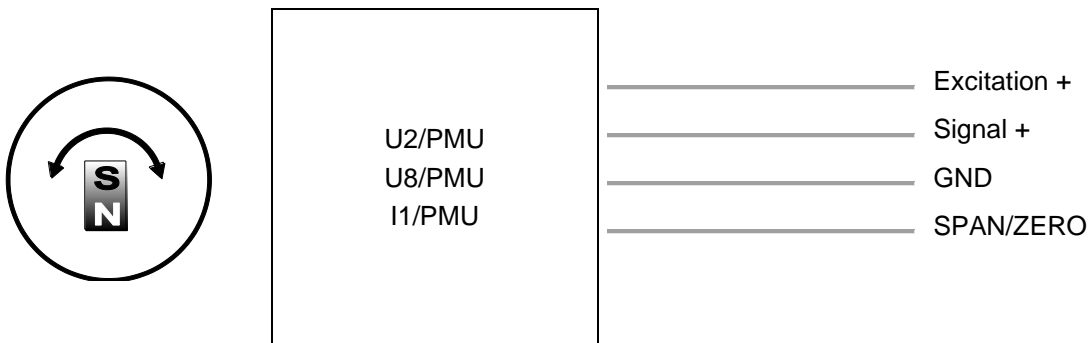
**Analog output, programmable**

<p><b>U2/PMU</b></p> <p>Voltage output 0.5 ... 10 V</p> 	Excitation voltage	8 ... 36 V DC
	Excitation current	20 mA typical at 24 V DC 38 mA typical at 12 V DC max. 50 mA
	Output voltage	0,5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	EN 61326-1:2013
	<p><b>U8/PMU</b></p> <p>Voltage output 0.5 ... 4.5 V</p> 	Excitation voltage
Excitation current		17 mA typical at 24 V DC 32 mA typical at 12 V DC max. 50 mA
Output voltage		0.5 ... 4.5 V DC
Output current		2 mA max.
Measuring rate		1 kHz standard
Stabilität (Temperatur)		$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical)
Protection		Reverse polarity, short circuit
Operating temperature		See specification of the respective sensor
EMC		DIN EN 61326-1:2013
<p><b>I1/PMU</b></p> <p>Current output 4 ... 20 mA, 3 wires</p> 		Excitation voltage
	Excitation current	typical 36 mA at 24 V DC typical 70 mA at 12 V DC max. 120 mA
	Load $R_L$	500 $\Omega$ max.
	Output current	4 ... 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013

**Signal wiring**

Signal	Connector pin no.	Cable color	View to sensor connector
Excitation +	1	brown	
Signal	2	white	
GND	3	blue	
Do not connect!	4	black	
SPAN/ZERO	5	grey	

**Signal diagram**



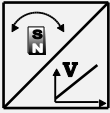
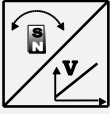
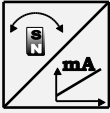
**Option -PMU**

**Programming of the start and end value by the customer**


Teach-In of start and end value for the options U2/PMU, I1/PMU, U8/PMU is provided by a binary signal SPAN/ZERO. At the start position connect signal SPAN/ZERO for a period of 2 ... 3 seconds to GND via push button. At the end position connect signal SPAN/ZERO for a period of 5 ... 6 seconds to GND via a push button. The scaling taught in that way will be stored non-volatile.

To reset the sensor to factory default signal ZERO/END must be connected to ground while powering up the sensor for 2 ... 3 seconds. For the option PMZ only teach-in of ZERO position is possible.

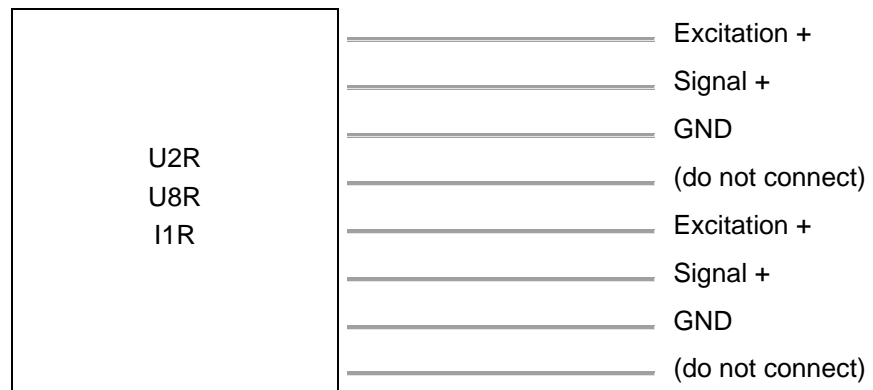
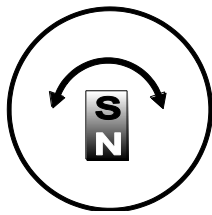
**Analog output, redundant**

<p><b>U2R</b></p> <p>Voltage output 0.5 ... 10 V</p> 	Excitation voltage	8 ... 36 V DC
	Excitation current	20 mA typical at 24 V DC 38 mA typical at 12 V DC max. 50 mA per channel
	Output voltage	0.5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
<p><b>U8R</b></p> <p>Voltage output 0.5 ... 4.5 V</p> 	Excitation voltage	8 ... 36 V DC
	Excitation current	17 mA typical at 24 V DC 32 mA typical at 12 V DC max. 50 mA per channel
	Output voltage	0.5 ... 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
<p><b>I1R</b></p> <p>Current output 4 ... 20 mA, 3 wires</p> 	Excitation voltage	8 ... 36 V DC
	Excitation current	36 mA typical at 24 V DC 76 mA typical at 12 V DC max. 120 mA per channel
	Load $R_L$	500 $\Omega$ max.
	Output current	4 ... 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013

**Signal wiring**

Channel	Signal	Connector pin no.	Cable color	View to the sensor connector
1	Excitation +	1	white	
1	Signal	2	brown	
1	GND	3	green	
1	Do not connect!	4	yellow	
2	Excitation +	5	grey	
2	Signal	6	pink	
2	GND	7	blue	
2	Do not connect!	8	red	

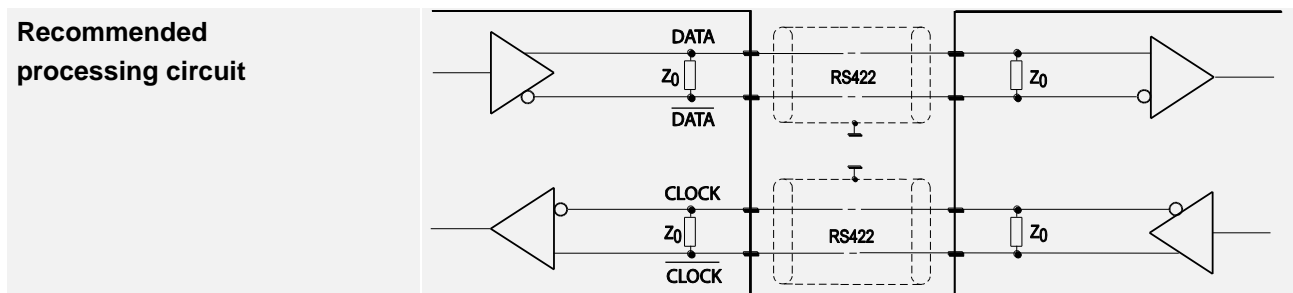
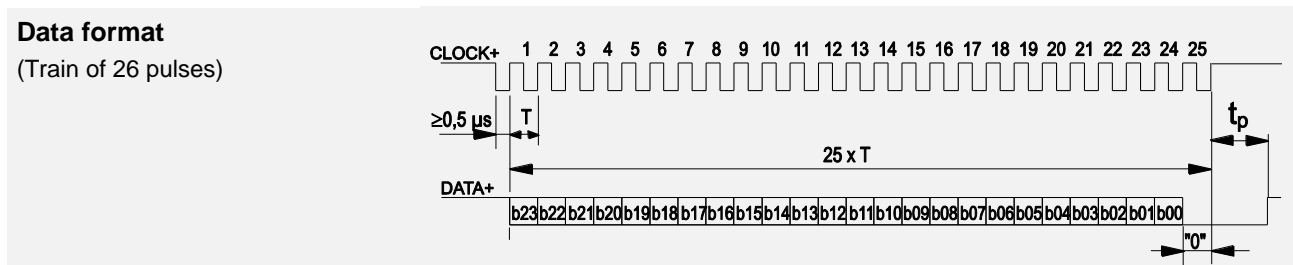
**Signal diagram**





### Digital output SSI


<b>MSSI</b> Synchronous serial SSI 	Interface	EIA RS-422
	Excitation voltage	8 ... 36 V DC
	Excitation current	19 mA typical at 24 V DC 35 mA typical at 12 V DC max. 80 mA
	Clock frequency	100 kHz ... 500 kHz
	Code	Gray-Code, continuous progression
	Delay between pulse trains ( $t_p$ )	30 $\mu$ s min.
	Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s. (typical)
	Operating temperature	See specification of the respective sensor
	Protection	Reverse polarity, short circuit
	EMC	DIN EN 61326-1:2013




Transmission rate	Cable length	Baud rate
	50 m	100-400 kHz
	100 m	100-300 kHz

**Note:**  
Extension of the cable length will reduce the maximum transmission rate.


**Signal wiring**

Signal	Connector pin no.	Cable color	View to sensor connector
Excitation +	1	white	
Excitation GND	2	brown	
CLOCK	3	green	
$\overline{\text{CLOCK}}$	4	yellow	
DATA	5	grey	
$\overline{\text{DATA}}$	6	pink	
-	7	blue	
-	8	red	


## Digital output CANopen

<b>MCANOP, CANOPR</b> CANopen 	CAN specification	ISO 11898, Basic and Full CAN 2.0 B
	Communication profile	CANopen CiA 301 V 4.02, Slave
	Encoder profile	Encoder CiA 406 V 3.2
	Error Control	Node Guarding, Heartbeat, Emergency Message
	Node ID	Adjustable via LSS, default: 127
	PDO	3 TxPDO, 0 RxPDO, no linking, static mapping
	PDO Modes	Event-/Time triggered, Remote-request, Sync cyclic/acyclic
	SDO	1 Server, 0 Client
	CAM	8 cams
	Certified	Yes
	Transmission rate	50 kBit bis 1 Mbit, adjustable via LSS, default: 125 kBit
	Bus connection	M12 connector, 5 pin
	Integrated bus terminating resistor	120Ω adjustable by the customer
	Bus, galvanic isolated	no

<b>Specifications</b>	Excitation voltage	8 ... 36 V DC
	Excitation current	20 mA typical at 24 V DC 40 mA typical at 12 V DC 80 mA max.
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	±50 x 10 <sup>-6</sup> /°C f.s. (typical)
	Repeatability	1 LSB
	Operating temperature	See specification of the respective sensor
	Protection	Reverse polarity, short circuit
	Dielectric strength	1 kV (V AC, 50 Hz, 1 min.)
	EMC	EN 61326-1:2013

Signal wiring	Signal	Connector pin no.	View to the sensor connector
	Shield	1	
	Excitation +	2	
	GND	3	
	CAN-H	4	
	CAN-L	5	


### Digital output CAN SAE J1939

<b>MCANJ1939/R</b> CAN SAE J1939 	CAN Specification	ISO 11898, Basic and Full CAN 2.0 B
	Transceiver	24V-compliant, not isolated
	Communication profile	SAE J1939
	Baud Rate	250 kbit/s
	Internal termination resistor	120 Ω adjustable by the customer
	Address	Default 247d, configurable

<b>NAME Fields</b>	Arbitrary address capable	1	Yes
	Industry group	0	Global
	Vehicle system	7Fh (127d)	Non specific
	Vehicle system instance	0	
	Function	FFh (255d)	Non specific
	Function instance	0	
	ECU instance	0	
	Manufacturer	145h (325d)	Manufacturer ID
	Identity number	0nnn	Serial number 21 bit

<b>Parameter Group Numbers (PGN)</b>	Configuration data	PGN EF00h	Proprietary-A (PDU1 peer-to-peer)
	Process data	PGN FFnnh	Proprietary-B (PDU2 broadcast); nn Group Extension (PS) configurable

<b>Specifications</b>	Excitation voltage	8 ... 36 V DC
	Excitation current	20 mA typical at 24 V DC 40 mA typical at 12 V DC, max. 80 mA
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	±50 x 10 <sup>-6</sup> /°C f.s. (typical)
	Repeatability	1 LSB
	Operating temperature	See specification of the respective sensor
	Protection	Reverse polarity, short circuit
	Dielectric strength	1 kV (V AC, 50 Hz, 1 min.)
EMV	EN 61326-1:2013	

Signal wiring	Signal	Connector pin no.	View to the sensor connector
	Shield	1	
	Excitation +	2	
	GND	3	
	CAN-H	4	
	CAN-L	5	

## Accessories

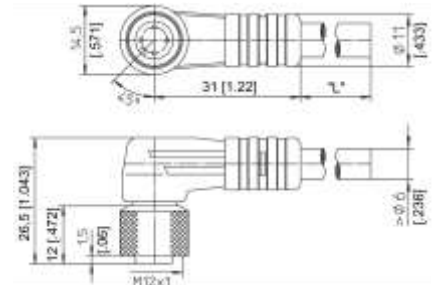
### Connector cable M12, 4 pin

#### (angular coupling)

shielded connector

Suitable for 5-pin sensor connectors

The 4-core screened cable is supplied with a mating 4-pin 90° M12 connector at one end and 4 wires at the other end. Available lengths are 2m, 5m and 10m. Wire: cross sectional area 0.34mm<sup>2</sup> Cable diameter: 5.6 ±0.2 mm



#### Order code

**KAB - xM - M12/4F/W - LITZE**

IP69: **KAB - xM - M12/4F/W/69K - LITZE**

xM = length in m

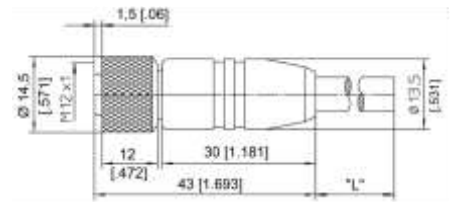
### Connector cable M12, 4 pin

#### (straight coupling)

shielded connector

Suitable for 5-pin sensor connectors

The 4-core screened cable is supplied with a mating 4-pin M12 connector at one end and 4 wires at the other end. Available lengths are 2m, 5m and 10m. Wire: cross sectional area 0.34mm<sup>2</sup> Cable diameter: 5.6 ±0.2 mm



#### Order code

**KAB - xM - M12/4F/G - LITZE**

IP69: **KAB - xM - M12/4F/G/69K - LITZE**

xM = length in m

Signal wiring	Plug connection / cable color			
	M12, 4 pin	1	2	3
	brown	white	blue	black

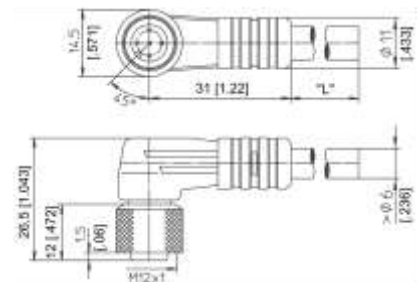
#### Applicable for cable carriers

Maximum movement speed	3 m/s
Maximum acceleration	5 m/s <sup>2</sup>
Minimum bending radius	10 x cable diameter

**Connector cable M12, 5 pin  
(angular coupling)**

shielded connector

The 5-core screened cable is supplied with a mating 5-pin 90° M12 connector at one end and 4 wires at the other end. Available lengths are 2m, 5m and 10m. Wire: cross sectional area 0.34mm<sup>2</sup> Cable diameter: 5.6 ±0.2mm



**Order code**

**KAB - xM - M12/5F/W - LITZE**

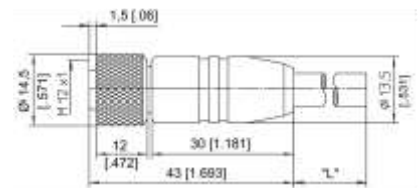
IP69: **KAB - xM - M12/5F/W/69K - LITZE**

xM = length in m

**Connector cable M12, 5 pin  
(straight coupling)**

shielded connector

The 5-core screened cable is supplied with a mating 5-pin M12 connector at one end and 4 wires at the other end. Available lengths are 2m, 5m and 10m. Wire: cross sectional area 0.34mm<sup>2</sup> Cable diameter: 5.6 ±0.2mm



**Order code**

**KAB - xM - M12/5F/G - LITZE**

IP69: **KAB - xM - M12/5F/G/69K - LITZE**

xM = length in m

Signal wiring M12, 5 pin	Plug connection / Cable color				
	1	2	3	4	5
	brown	white	blue	black	grey

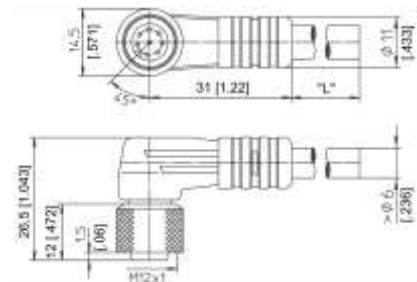
**Applicable for cable carriers**

Maximum movement speed	3 m/s
Maximum acceleration	5 m/s <sup>2</sup>
Minimum bending radius	10 x cable diameter

**Connector cable M12, 8 pin  
(angular coupling)**

shielded connector

The 8-lead shielded cable is supplied with a mating 8-pin 90° M12 connector at one end and 8 wires at the other end. Available lengths are 2m, 5m and 10m. Wire: cross sectional area 0.25mm<sup>2</sup> Cable diameter: 6.3 ±0.2mm



**Order code**

**KAB - xM - M12/8F/W - LITZE**

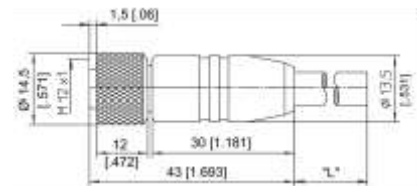
IP69: **KAB - xM - M12/8F/W/69K - LITZE**

xM = length in m

**Connector cable M12, 8 pin  
(straight coupling)**

shielded connector

The 8-lead shielded cable is supplied with a mating 8-pin M12 connector at one end and 8 wires at the other end. Available lengths are 2m, 5m and 10m. Wire: cross sectional area 0.25mm<sup>2</sup> Cable diameter: 6.3 ±0.2mm



**Order code**

**KAB - xM - M12/8F/G - LITZE**

IP69: **KAB - xM - M12/8F/G/69K - LITZE**

xM = length in m

Signal wiring	Plug connection / cable color							
	1	2	3	4	5	6	7	8
M12, 8 pin	white	brown	green	yellow	grey	pink	blue	red

**Applicable for cable carriers**

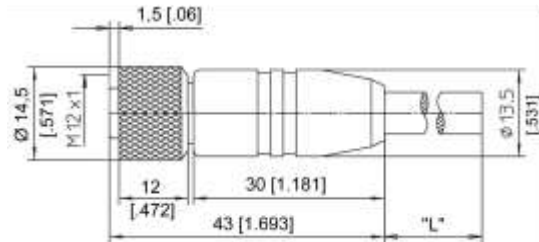
Maximum movement speed	3 m/s
Maximum acceleration	5 m/s <sup>2</sup>
Minimum bending radius	10 x cable diameter

**Connector/bus cable - M12, 5 pin CAN-Bus**

The 5-lead shielded cable is supplied with a female 5 pin M12 connector at one end and a male 5 pin M12 connector at the other end.

Available lengths are 0.3 m, 2 m, 5 and 10 m.

Cable diameter: 6.7 ±0.2 mm



Order code:

**KAB - xM - M12/5F/G - M12/5M/G - CAN**

IP69: **KAB - xM - M12/5F/G/69K - M12/5M/G/69K - CAN**

xM = length in m

**T-piece for bus cable M12, 5 pin CAN-Bus**

Order code:

**KAB - TCONN - M12/5M - 2M12/5F - CAN**



**Terminating resistance M12, 5 pin CAN-Bus**

Order code:

**KAB - RTERM - M12/5M/G - CAN**



**Applicable for cable carriers**

Maximum movement speed	3 m/s
Maximum acceleration	5 m/s <sup>2</sup>
Minimum bending radius	10 x cable diameter