perfect in sensors.

POSIWIRE®

Cable Extension Position Sensor

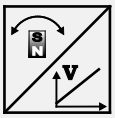
WS21 with internal magnetic encoder
Position Sensor

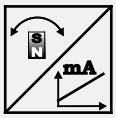
Datasheet

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

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

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

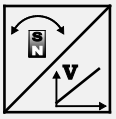
Accessories:

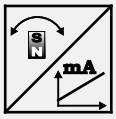
Connector cable (see page 29)

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

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
Resolution	<0.002% f.s.
Linearity	±0.10% f.s. (standard) ±0.05% f.s. (optional)
Sensing device	Magnetic absolute encoder
Housing material	Aluminium and plastic measuring cable: stainless steel
Protection class	IP67/IP69 (with mating connector only)
Connection	Connector M12, 5 pin
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Temperature range	-20 ... +85 °C
Weight	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
EMC	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

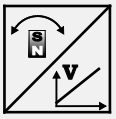
Accessories:

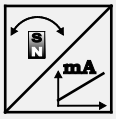
Connector cable (see page 30)

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

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

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

Output	**MCANOP** = CANopen **MCANJ1939** = CAN SAE J1939 **MCANOPR** = CANopen redundant **MCANJ1939R** = CAN SAE J1939 redundant
Resolution	setting via CAN Bus
Linearity	±0.10% f.s. (standard) ±0.05% f.s. (optional)
Sensing device	Magnetic absolute encoder
Housing material	Aluminium and plastic measuring cable: stainless steel
Protection class	IP67/IP69 (with mating connector only)
Connection	Connector M12, 5 pin
Temperature range	-20 ... +85 °C
Weight	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
EMC	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

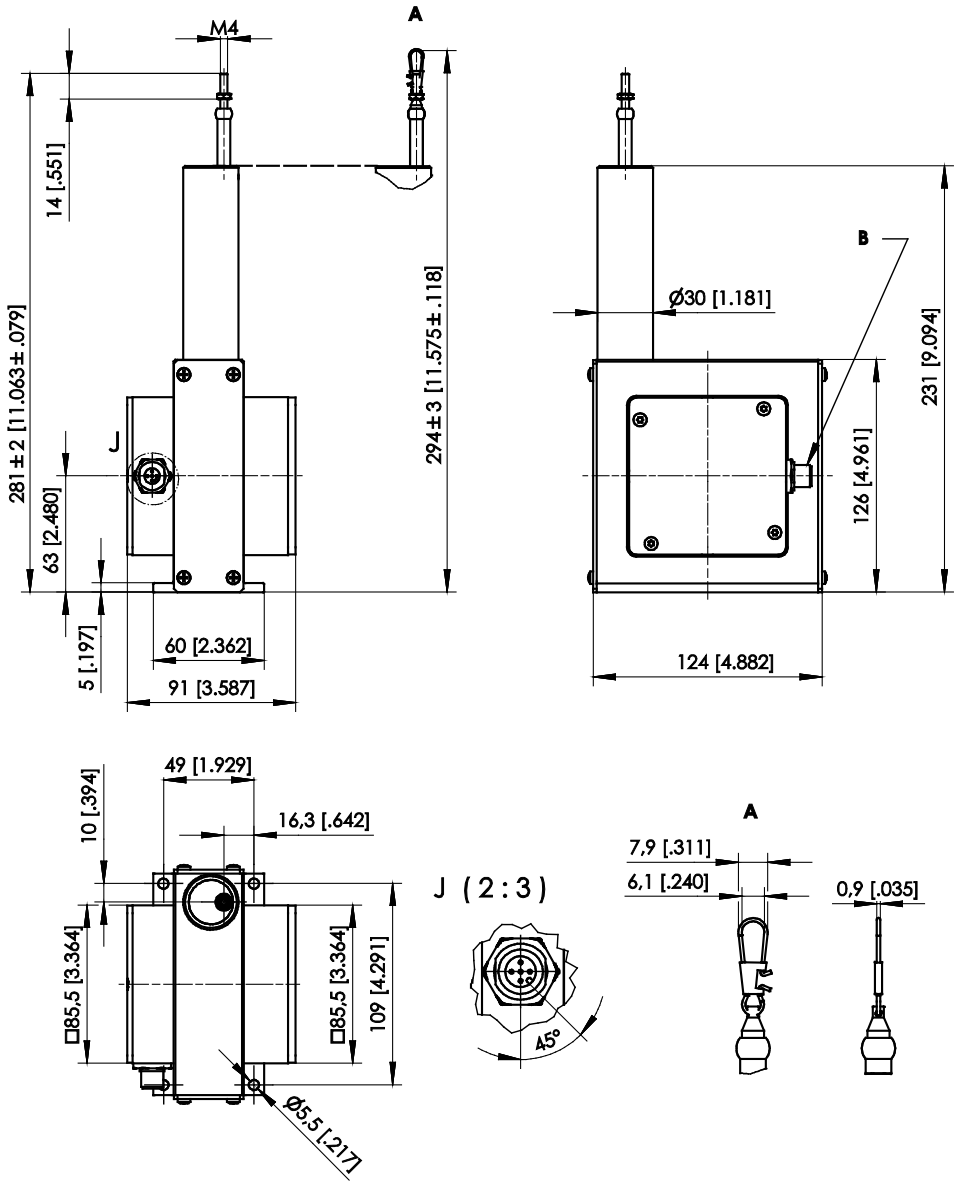
Accessories:

Connector cable (see page 32)

Cable forces typical at = 20 °C	Measurement range [mm]	Weight [kg]	Maximum pull-out force [N]	Minimum pull-in force [N]
	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

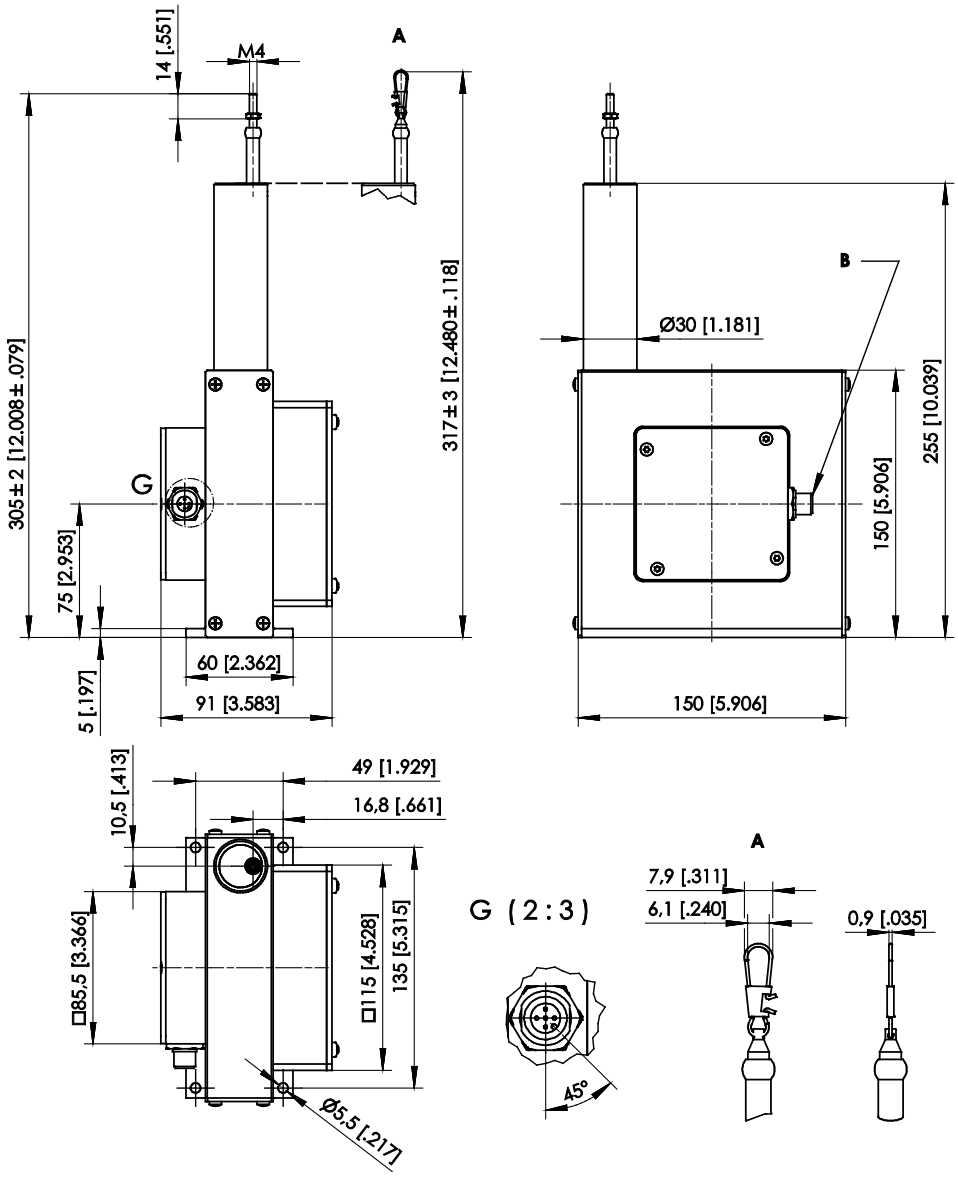
Measurement range 8000 … 10000 mm, magnetic encoder output



A – Option SB0
B – Connector M12

Dimensions in mm [inch]. Weight approx. 1.5 kg.
Dimensions informative only.
For guaranteed dimensions consult factory.

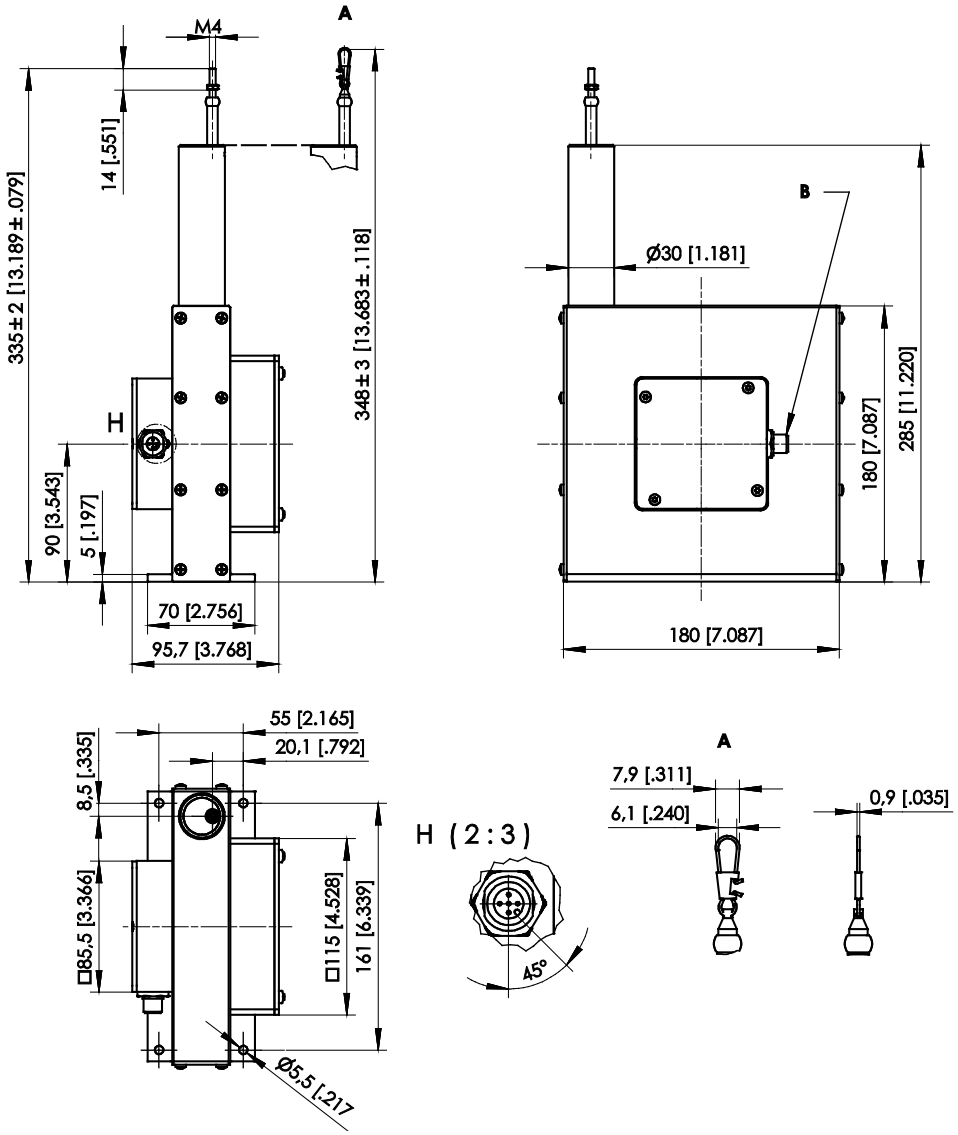
Measurement range 12500 mm, magnetic encoder output



A - Option SB0
B – Connector M12

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

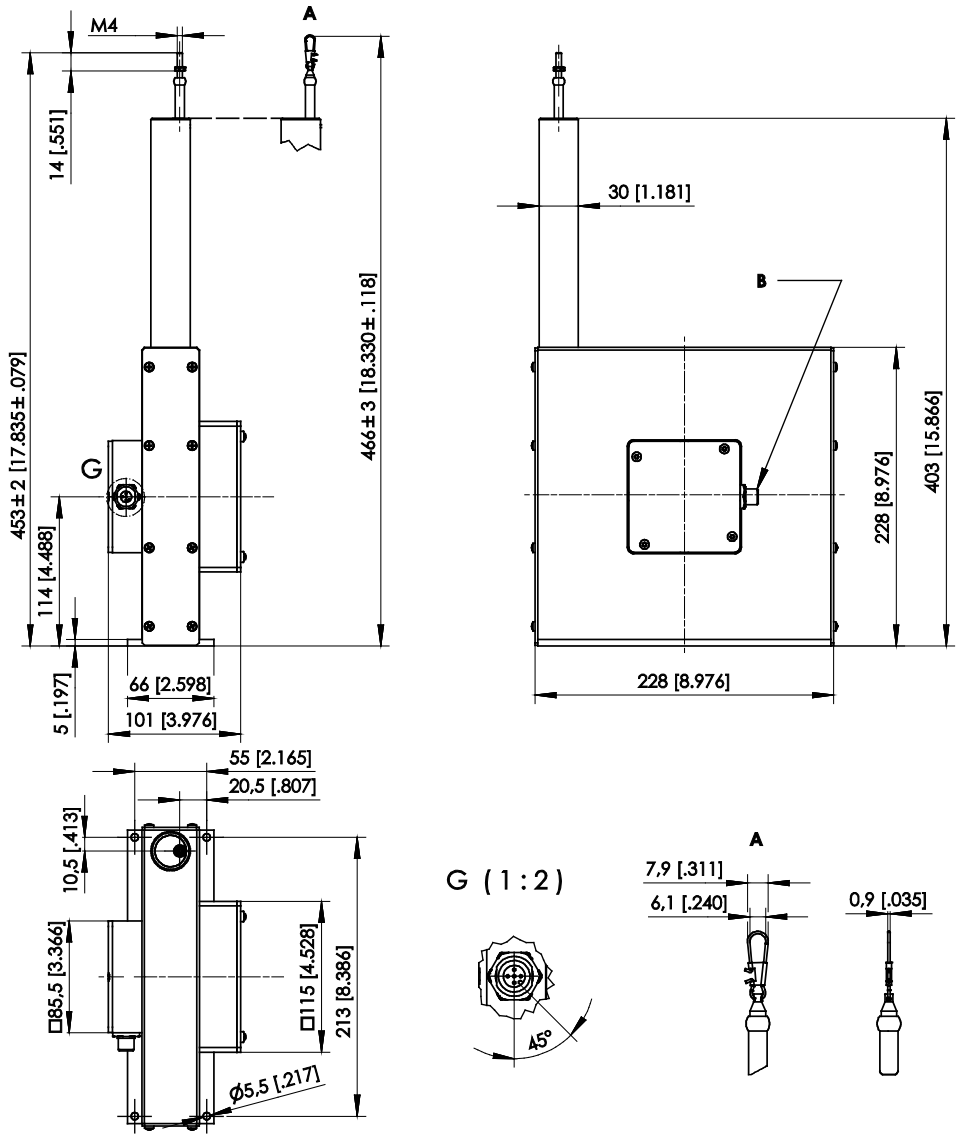
Measurement range 15000 mm, magnetic encoder output



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

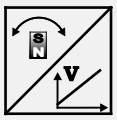


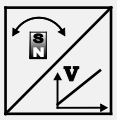
A – Option SB0
B – Connector M12

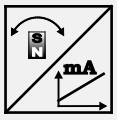
Dimensions in mm [inch]. Weight approx. 4.2 kg.
Dimensions informative only.
For guaranteed dimensions consult factory.

Output specification

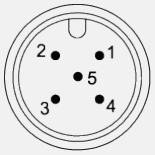
Analog output

U2 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)	±50 x 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

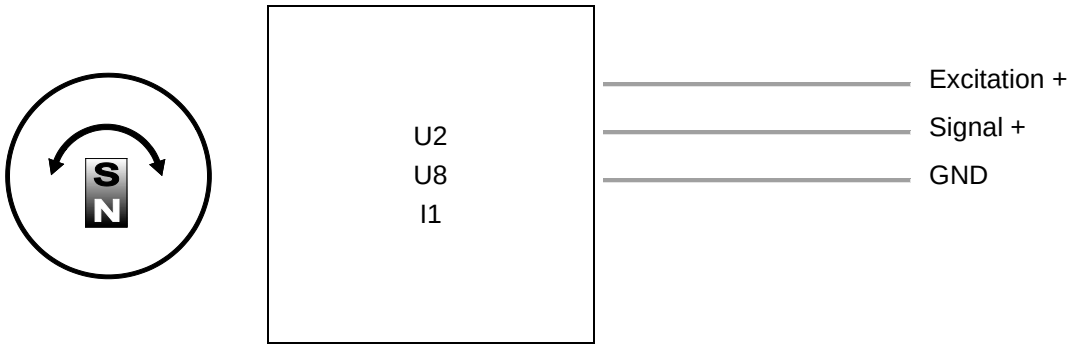
U8 Voltage output 0.5 … 4.5 V 	Excitation voltage	8 … 36 V DC
	Excitation current	17 mA typical at 24 V DC 32 mA typical at 12 V DC 50 mA max.
	Output voltage	0.5 … 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013

I1 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_L	500 Ω max.
	Output current	4 … 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 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

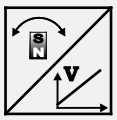
Signal wiring

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)	

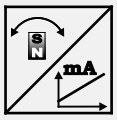
Signal diagram



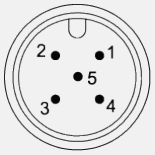
Analog output, programmable

U2/PMU 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)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	EN 61326-1:2013

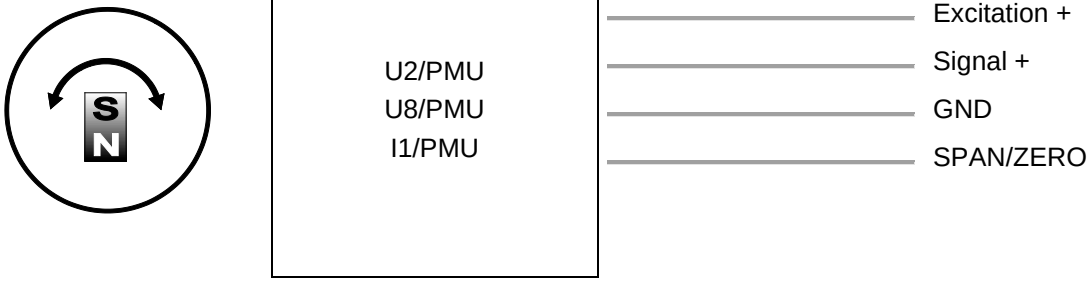
U8/PMU Voltage output 0.5 … 4.5 V 	Excitation voltage	8 … 36 V DC
	Excitation current	17 mA typical at 24 V DC 32 mA typical at 12 V DC max. 50 mA
	Output voltage	0.5 … 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stabilität (Temperatur)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013

I1/PMU 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 max. 120 mA
	Load R_L	500 Ω max.
	Output current	4 … 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 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 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



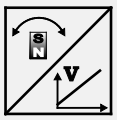
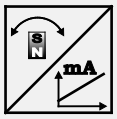
Option -PMU

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 teached 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.

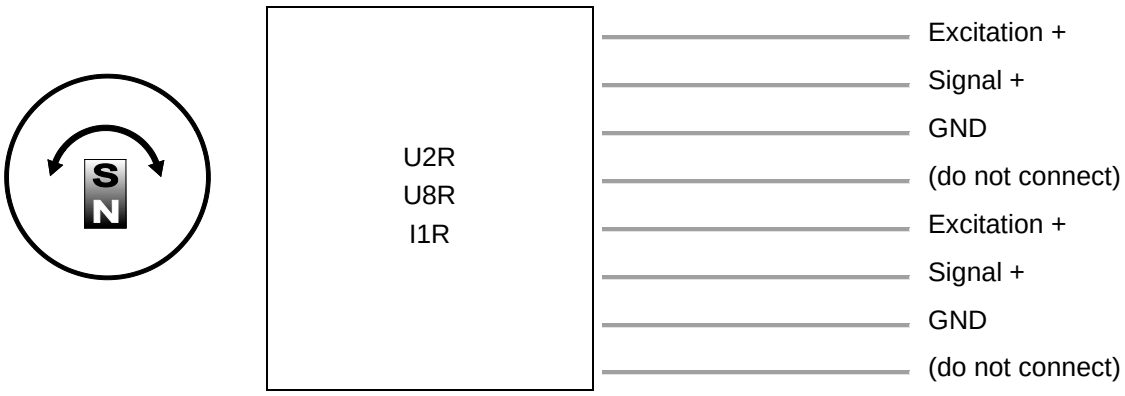
Analog output, redundant

U2R 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 per channel
	Output voltage	0.5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 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
U8R 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 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)	±50 x 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
I1R Current output 4 … 20 mA, 3 wires 	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 Ω max.
	Output current	4 … 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 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

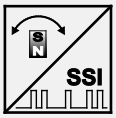
Signal wiring

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	

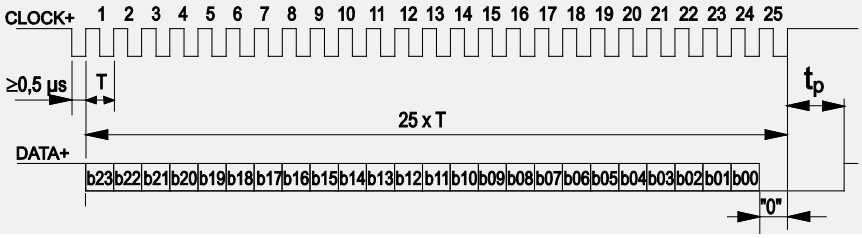
Signal diagram



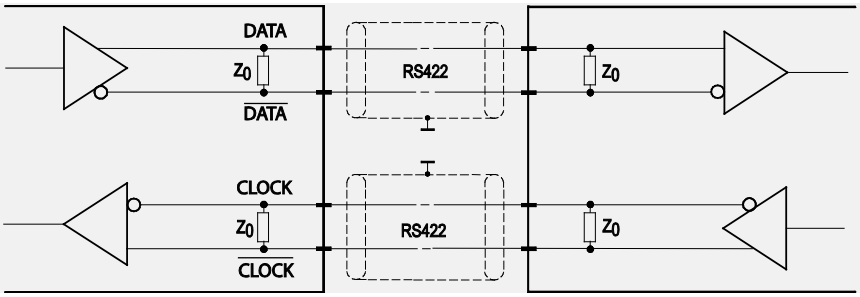
Digital output SSI

MSSI 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 µs min.
	Stability (temperature)	±50 x 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

Data format
(Train of 26 pulses)



Recommended processing circuit



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.

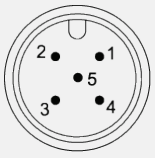
Signal wiring

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

MCANOP, CANOPR 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 conncector, 5 pin
	Integrated bus terminating resistor	120Ω adjustable by the customer
	Bus, galvanic isolated	no

Specifications	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^{-6}/°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	**Connector pin no.**	**View to the sensor connector**
Signal wiring	Shield	1	
	Excitation +	2	
	GND	3	
	CAN-H	4	
	CAN-L	5	

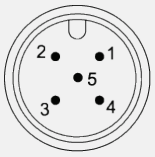
Digital output CAN SAE J1939

MCANJ1939/R 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

NAME Fields	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

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

Specifications	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^{-6}/°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	
	Excitiation +	2	
	GND	3	
	CAN-H	4	
	CAN-L	5	

Accessories

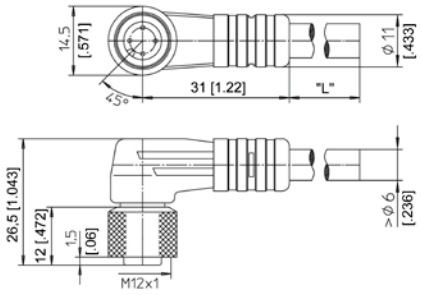
Connector cable M12, 4 pin

(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^2
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

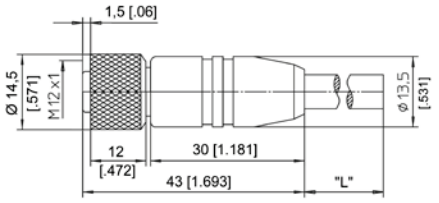
Connector cable M12, 4 pin

(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^2
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 M12, 4 pin	**Plug connection / cable color**			
	1	2	3	4
	brown	white	blue	black

Applicable for cable carriers

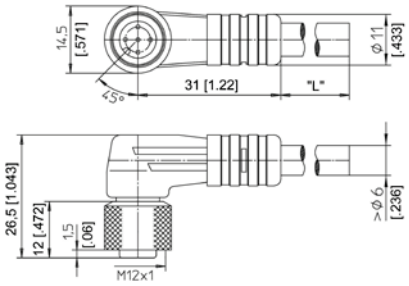
Maximum movement speed	3 m/s
Maximum acceleration	5 m/s^2
Minimum bending radius	10 x cable diameter

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^2
Cable diameter: 5.6 ±0.2mm



Order code

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

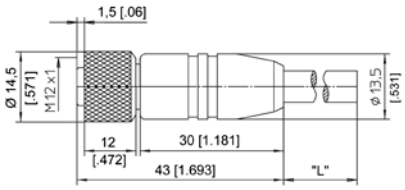
xM = length in m

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^2
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

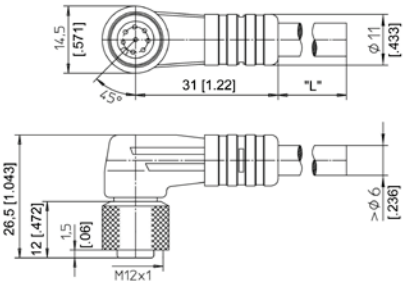
Applicable for cable carriers

Maximum movement speed	3 m/s
Maximum acceleration	5 m/s^2
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 0.25mm²
Cable diameter: 6.3 ±0.2mm



Order code

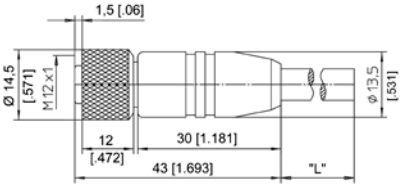
	KAB - xM - M12/8F/W - LITZE
IP69:	**KAB - xM - M12/8F/W/69K - LITZE**

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 0.25mm²
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

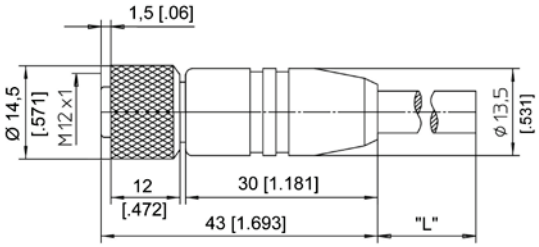
Signal wiring M12, 8 pin	**Plug connection / cable color**							
	1	2	3	4	5	6	7	8
	white	brown	green	yellow	grey	pink	blue	red

Applicable for cable carriers

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