

POSITAPE®

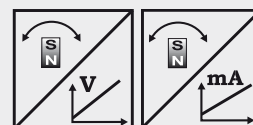
WB21

Analog Output



Position sensor with measuring tape

- Measurement range up to 20,000 mm
- Protection class IP67/IP69K
- Stainless steel measuring tape
- Analog output



Specifications

Outputs	U2	Voltage 0.5 ... 10 V
	U8	Voltage 0.5 ... 4.5 V
	I1	Current 4 ... 20 mA, 3 wire
Resolution		<0,05 mm
Linearity		±0.10 % f. s.; optional ±0.05 %
Sensing device		Magnetic absolute encoder
Material		Aluminium, plastic and stainless steel; Tape: stainless steel, 10 mm wide, 0.08 mm thick
Protection class		IP67/IP69K (with mating connector)
Connection		Connector M12, 5 pin
Shock		EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration		EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
EMC, temperature		Refer to output specification

Order code WB21

WB21 - [] - [] - [] - [] - [] - BAB1

Model name

Measurement range (in mm)

8000 / 10000 / 12500 / 15000 / 17500 / 20000

Output

U2 = 0.5 ... 10 V signal conditioner
U8 = 0.5 ... 4.5 V signal conditioner
I1 = 4 ... 20 mA signal conditioner

Signal characteristics

A = increasing (eg. 4 ... 20 mA)
D = decreasing (eg. 20 ... 4 mA)

Linearity

L10 = ±0.10 % (standard)
L05 = ±0.05 % (optional)

Connection

M12R5 = Connector M12, 5 pin

Dust wiper

BAB1

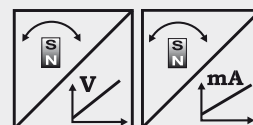
Order code connector cable see page 17

Order example: WB21 - 8000 - I1 - A - L10 - M12R5 - BAB1



Position sensor with measuring tape

- Measurement range up to 20,000 mm
- Protection class IP67/IP69K
- Stainless steel measuring tape
- Analog output, programmable



Specifications

Output	U2/PMU U8/PMU I1/PMU	Voltage 0.5 ... 10 V, programmable Voltage 0.5 ... 4.5 V, programmable Current 4 ... 20 mA, 3 wire, programmable
Resolution		<0,05 mm
Linearity		±0.10 % f. s.; optional ±0.05 %
Sensing device		Magnetic absolute encoder
Material		Aluminium, plastic and stainless steel; Tape: stainless steel, 10 mm wide, 0.08 mm thick
Protection class		IP67/IP69K (with mating connector)
Connection		Connector M12, 5 pin
Shock		EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration		EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
EMC, temperature		Refer to output specification

Order code WB21

WB21 - [] - [] - [] - [] - [] - BAB1

Model name

Measurement range (in mm)

8000 / 10000 / 12500 / 15000 / 17500 / 20000

Output

U2/PMU = 0.5 ... 10 V signal conditioner, programmable

U8/PMU = 0.5 ... 4.5 V signal conditioner, programmable

I1/PMU = 4 ... 20 mA signal conditioner, programmable

Signal characteristics

A = increasing (eg. 4 ... 20 mA)

D = decreasing (eg. 20 ... 4 mA)

Linearity

L10 = ±0.10 % (standard)

L05 = ±0.05 % (optional)

Connection

M12R5 = Connector M12, 5 pin

Dust wiper

BAB1

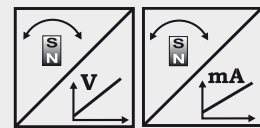
Order code connector cable see page 18

Order example: WB21 - 8000 - U2/PMU - A - L10 - M12R5 - BAB1



Position sensor with measuring tape

- Measurement range up to 20,000 mm
- Protection class IP67/IP69K
- Stainless steel measuring tape
- Analog output, redundant



Specifications

Output	U2R U8R I1R	Voltage 0.5 ... 10 V, redundant Voltage 0.5 ... 4.5 V, redundant Current 4 ... 20 mA, 3 wire, redundant
Resolution		<0,05 mm
Linearity		±0.10 % f. s.; optional ±0.05 %
Sensing device		Magnetic absolute encoder
Material		Aluminium, plastic and stainless steel; Tape: stainless steel, 10 mm wide, 0.08 mm thick
Protection class		IP67/IP69K (with mating connector)
Connection		Connector M12, 8 pin
Shock		EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration		EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
EMC, temperature		Refer to output specification

Order code WB21

WB21 - [] - [] - [] - [] - [] - [] - BAB1

Model name

Measurement range (in mm)

8000 / 10000 / 12500 / 15000 / 17500 / 20000

Output

U2R = 0.5 ... 10 V signal conditioner, redundant

U8R = 0.5 ... 4.5 V signal conditioner, redundant

I1R = 4 ... 20 mA signal conditioner, redundant

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

Linearity

L10 = ±0.10 % (standard)

L05 = ±0.05 % (optional)

Connection

M12R8 = Connector M12, 8 pin

Dust wiper

BAB1

Order code connector cable see page 19

Order example: WB21 - 8000 - I1R - A/D - L10 - M12R8 - BAB1



Position sensor with measuring tape

- Measurement range up to 20,000 mm
- Protection class IP67/IP69K
- Stainless steel measuring tape
- Digital output SSI



Specifications

Output	Synchronous serial interface (SSI)
Resolution	0.05 mm
Linearity	±0.10 % f.s; optional ±0.05 %
Sensing device	Magnetic absolute encoder
Material	Aluminium, plastic and stainless steel; Tape: stainless steel, 10 mm wide, 0.08 mm thick
Protection class	IP67/IP69K (with mating connector)
Connection	Connector M12, 8 pin
Shock	EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
EMC, temperature	Refer to output specification

Order code WB21

	WB21	-		-		-		-		-		-	BAB1
Model name													
Measurement range (in mm)													
8000 / 10000 / 12500 / 15000 / 20000													
Resolution (in µm)													
50 (other resolutions on demand)													
Output													
MSSI = SSI synchronous serial interface													
Linearity													
L10 = ±0.10% (standard)													
L05 = ±0.05% (optional)													
Connection													
M12R8 = Connector M12, 8 pin													
Dust wiper													
BAB1													

Order code connector cable see page 19

Order example: WB21 - 8000 - 50 - MSSI - L10 - M12R8 - BAB1



Position sensor with measuring tape

- Measurement range up to 20,000 mm
- Protection class IP67/IP69K
- Stainless steel measuring tape
- Digital output CANopen or CAN SAE J1939
- Optional redundant CAN Bus (on demand)



Specifications

Output	CANopen or CAN SAE J1939
Resolution	setting via CAN Bus
Linearity	±0.10 % f.s.; optional ±0.05 %
Sensing device	Magnetic absolute encoder
Material	Aluminium, plastic and stainless steel; Tape: stainless steel, 10 mm wide, 0.08 mm thick
Protection class	IP67/IP69K (with mating connector)
Connection	Connector M12, 5 pin
Shock	EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
EMC, temperature	Refer to output specification

Bestellcode WB21

WB21 - [] - [] - [] - [] - BAB1

Model name

Measurement range (in mm)

8000 / 10000 / 12500 / 15000 / 20000

Output

MCANOP = CANopen

MCANJ1939 = CAN SAE J1939

Linearity

L10 = 0.10% (standard)

L05 = 0.05% (optional)

Connection

M12/CAN = Connector M12, 5 pin

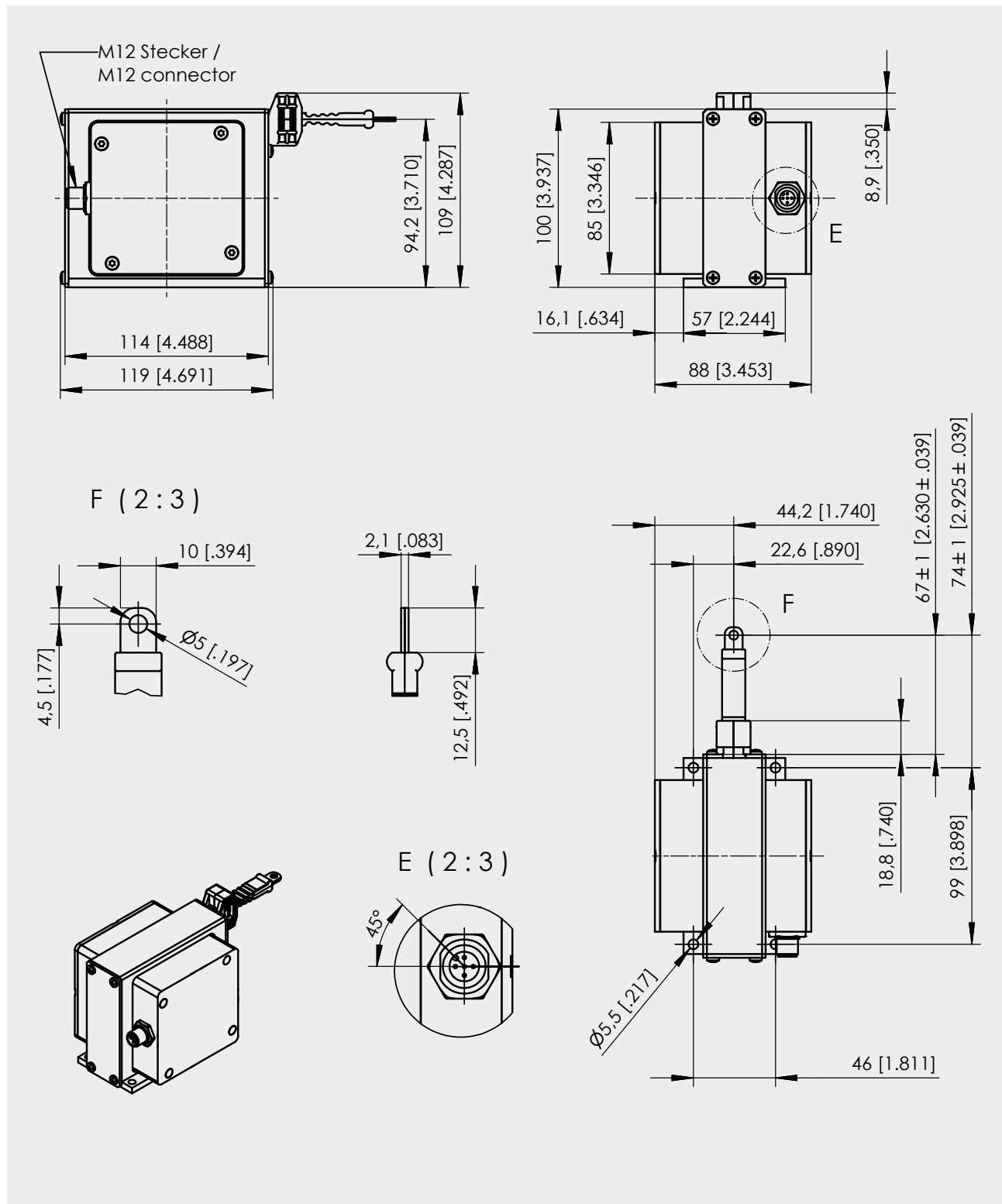
Dust wiper

BAB1

Order code connector cable see page 20

Order example: WB21 - 8000 - MCANOP - L10 - M12/CAN - BAB1

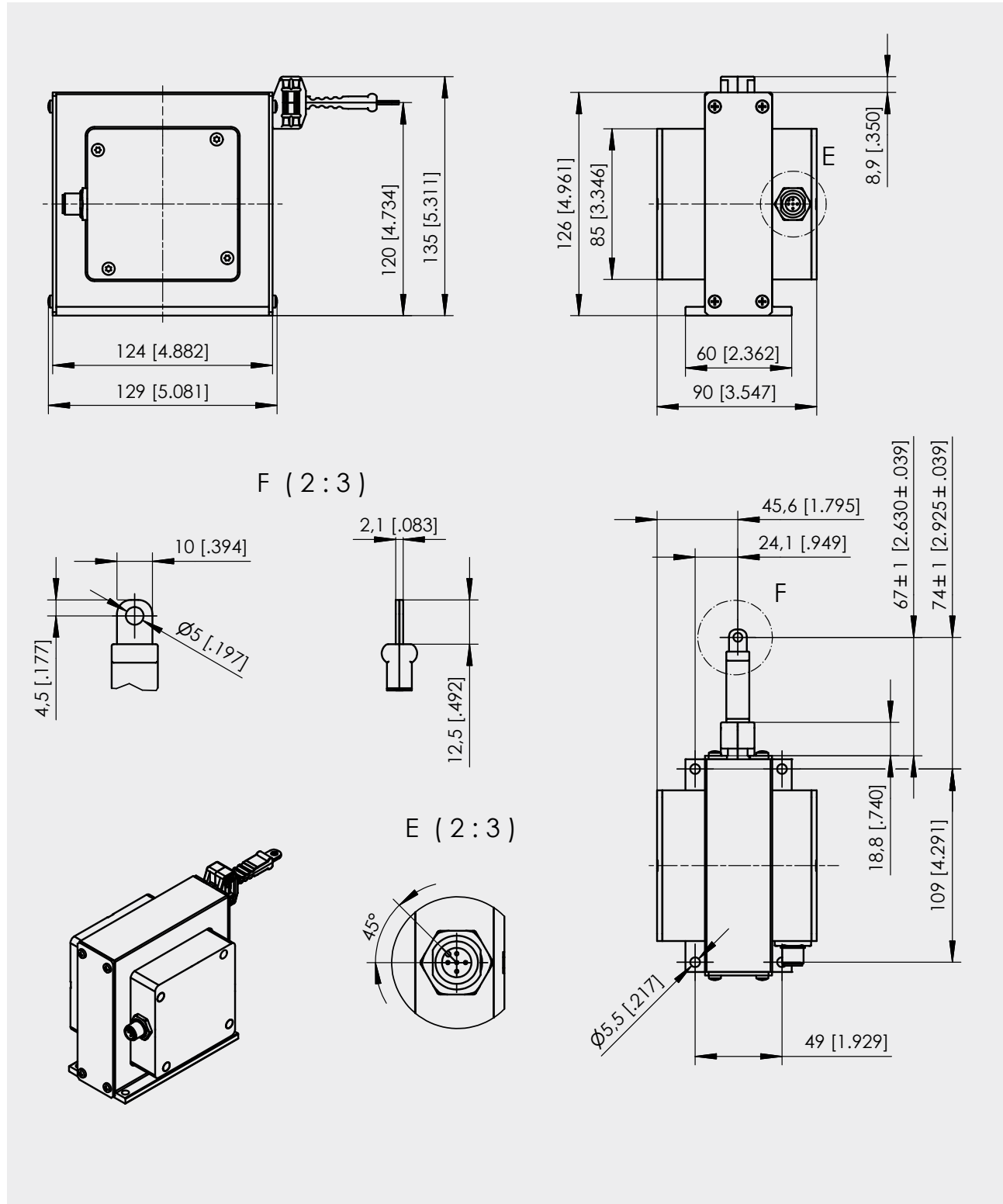
Dimensions WB21-8000



Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.

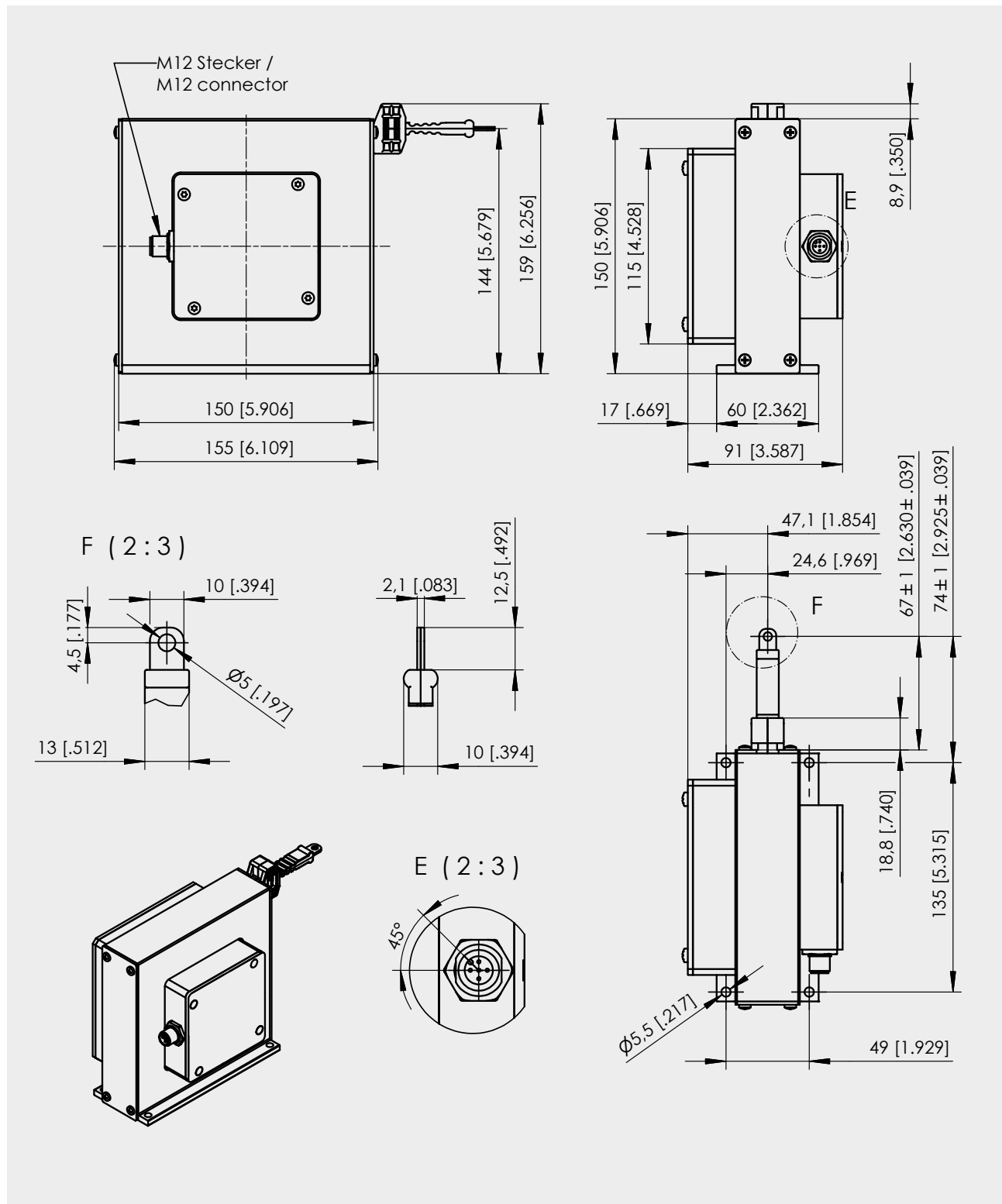
Dimensions WB21-10000



Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.

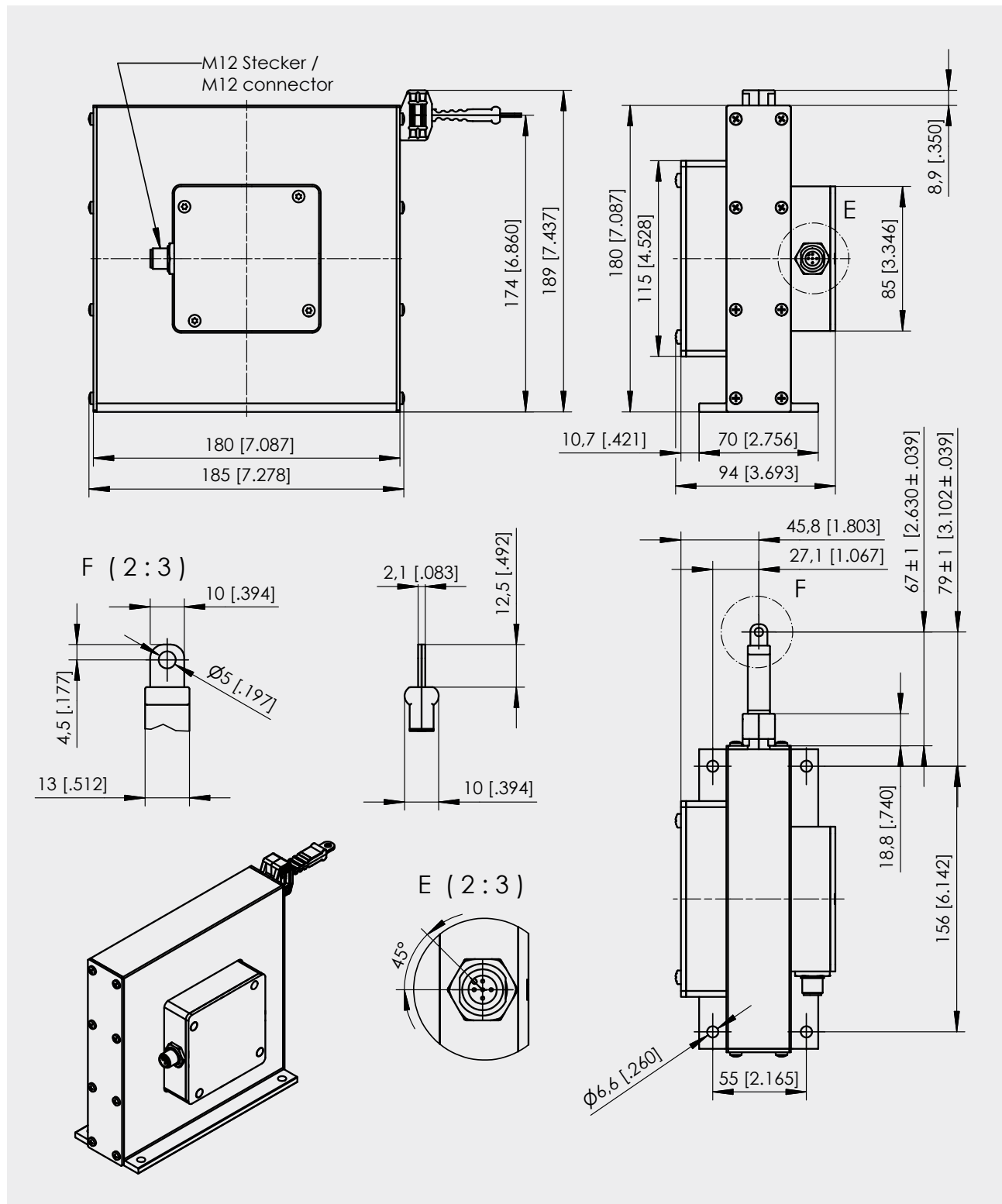
Dimensions WB21-12500



Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.

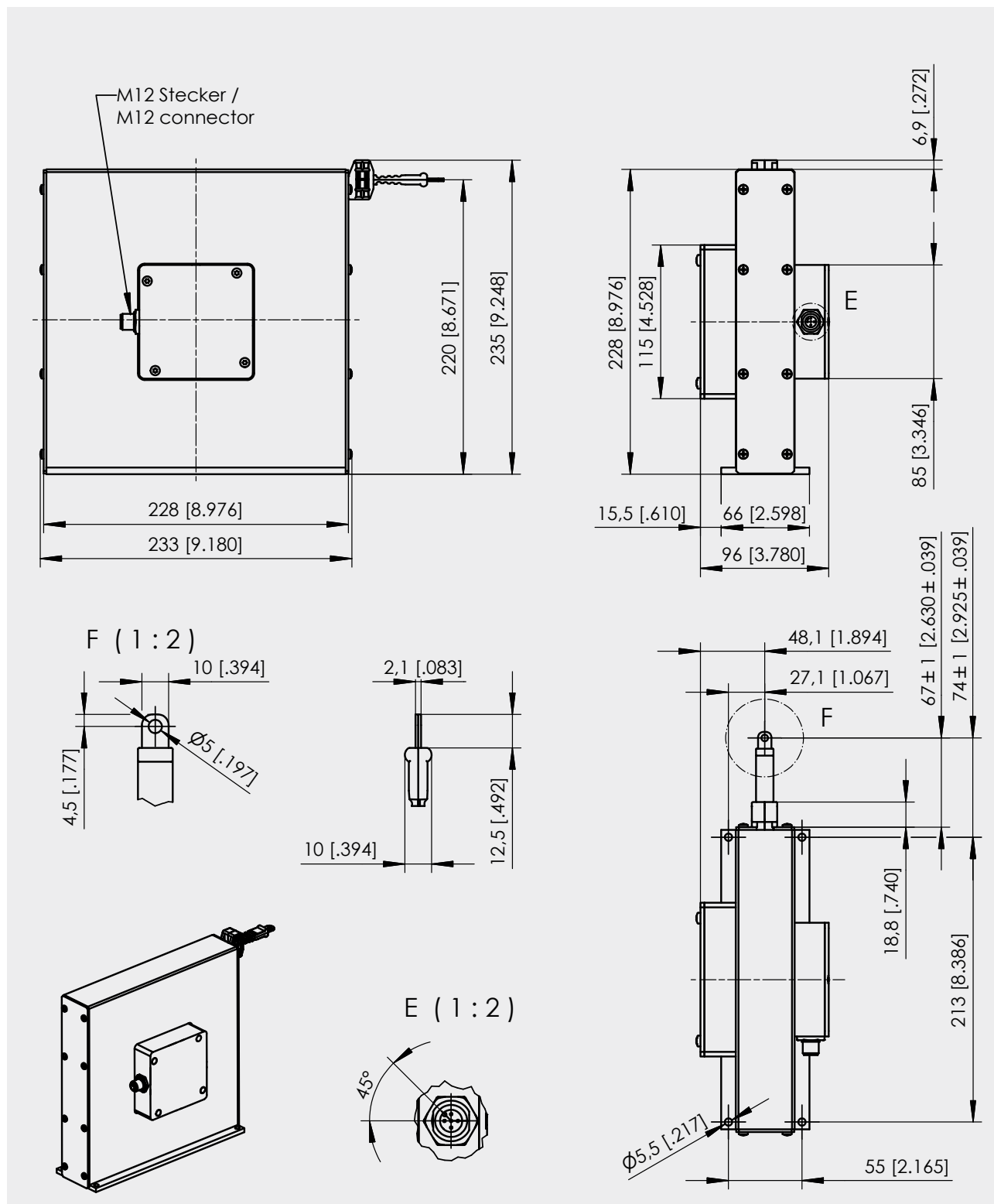
Dimensions WB21-15000



Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.

Dimensions WB21-17500, WB21-20000



Dimensions in mm [inch]

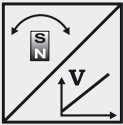
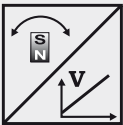
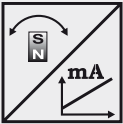
Dimensions informative only.
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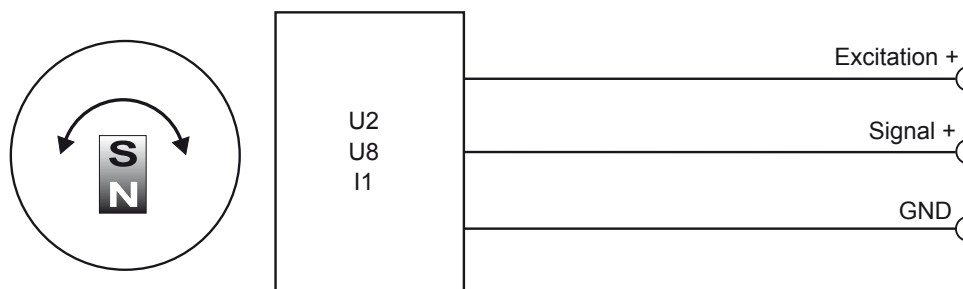
U2, U8 and I1

Analog output



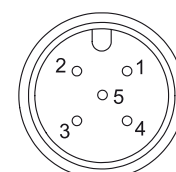
U2 Voltage output 0.5 ... 10 V 	Excitation voltage	10 ... 36 V DC
	Excitation current	typ. 20 mA at 24 V DC typ. 20 mA at 24 V DC max. 60 mA
	Output voltage	0,5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}/^{\circ}\text{C}$ f.s. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
	EMC	EN 61326-1:2013
U8 Voltage output 0.5 ... 4.5 V 	Excitation voltage	10 ... 36 V DC
	Excitation current	typ. 17 mA at 24 V DC typ. 32mA at 12 V DC max. 60 mA
	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. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
	EMC	EN 61326-1:2013
I1 Current output 4 ... 20 mA, 3 wire 	Excitation voltage	10 ... 36 V DC
	Excitation current	typ. 36 mA at 24 V DC typ. 70 mA at 12 V DC max. 100 mA
	Load R_L	500 Ω max.
	Output current	4 ... 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}/^{\circ}\text{C}$ f.s. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
	EMC	EN 61326-1:2013

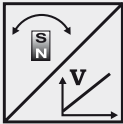
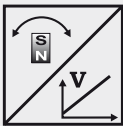
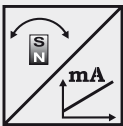
Output signals



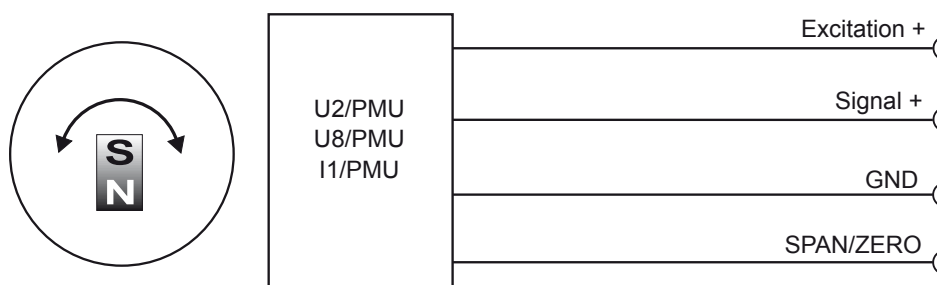
Signal wiring/ connection	Output signal	Connector pin	Cable wire color
	Excitation +	1	brown
	Signal	2	white
	GND	3	blue
	Do not connect!	4	black
	Do not connect!	5	(grey)

View to sensor
connector



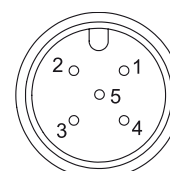
U2/PMU Voltage output 0.5 ... 10 V 	Excitation voltage	10 ... 36 V DC
	Excitation current	typ. 20 mA at 24 V DC, typ. 38 mA at 12 V DC max. 60 mA
	Output voltage	0,5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}/^{\circ}\text{C}$ f.s. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
U8/PMU Voltage output 0.5 ... 4.5 V 	Excitation voltage	10 ... 36 V DC
	Excitation current	typ. 17 mA at 24 V DC, typ. 32 mA at 12 V DC max. 60 mA
	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. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
I1/PMU Current output 4 ... 20 mA, 3 wire 	Excitation voltage	10 ... 36 V DC
	Excitation current	typ. 36 mA at 24 V DC, typ. 70 mA at 12 V DC max. 100 mA
	Load R_L	500 Ω max.
	Output current	4 ... 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}/^{\circ}\text{C}$ f.s. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
EMC		EN 61326-1:2013

Output signals



Signal wiring/ connection	Signal	Connector pin	Cable wire color
	Excitation +	1	brown
	Signal	2	white
	GND	3	blue
	Do not connect!	4	black
	SPAN/ZERO	5	grey

View to sensor
connector

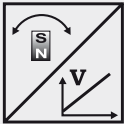
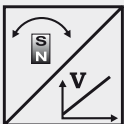
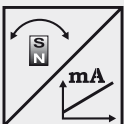


Option -PMU

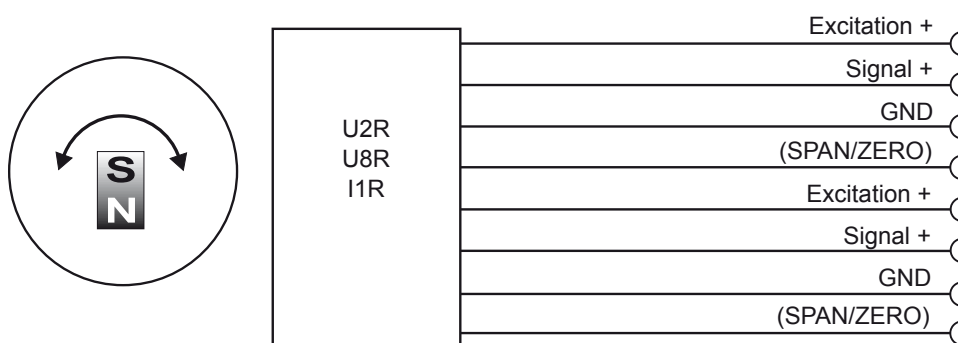
Programming of the start and end value by the customer

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 taught positions 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.

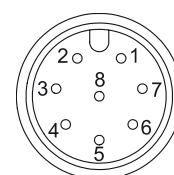
U2R Voltage output 0.5 ... 10 V 	Excitation voltage	10 ... 36 V DC
	Excitation current	typ. 22 mA at 24 V DC typ. 43 mA at 12 V DC max. 60 mA per channel
	Output voltage	0.5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}/^{\circ}\text{C}$ f.s. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
EMC		EN 61326-1:2013
U8R Voltage output 0.5 ... 4.5 V 	Excitation voltage	10 ... 36 V DC
	Excitation current	typ. 20 mA at 24 V DC typ. 38 mA at 12 V DC max. 60 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. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
EMC		EN 61326-1:2013
I1R Current output 4 ... 20 mA, 3 wire 	Excitation voltage	10 ... 36 V DC
	Excitation current	typ. 39 mA at 24 V DC typ. 76 mA at 12 V DC max. 100 mA per channel
	Load R_L	500 Ω max.
	Output current	4 ... 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}/^{\circ}\text{C}$ f.s. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
EMC		EN 61326-1:2013

Output signals



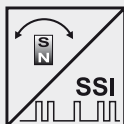
Signal wiring/ connection	Channel	Signal	Connector Pin	Cable wire color
	1	Excitation +	1	white
	1	Signal	2	brown
	1	GND	3	green
	1	Do not connect!	4	yellow
	2	Excitation +	5	grey
	2	Signal	6	pink
	2	GND	7	blue
	2	Do not connect!	8	red

View to sensor
connector



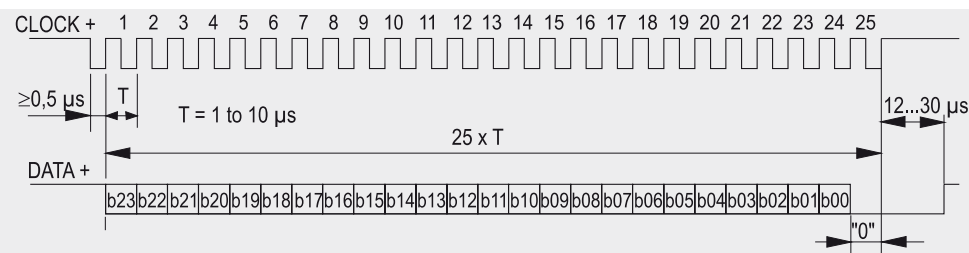
MSSI

Synchronous serial SSI

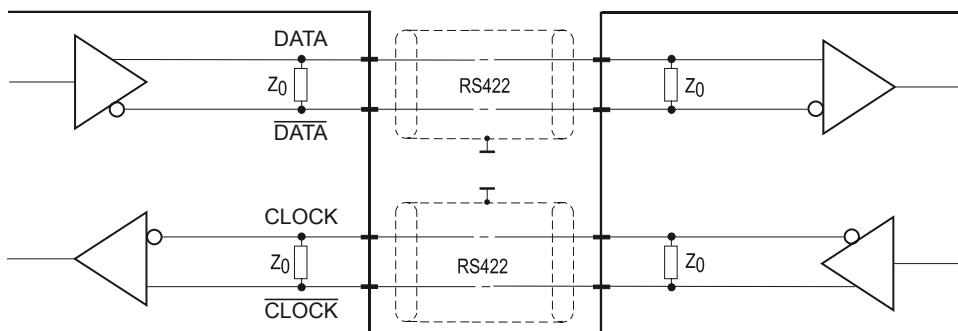


Interface	EIA RS-422
Excitation voltage	8 ... 36 V DC
Excitation current	typ. 19 mA at 24 V DC typ. 35 mA at 12 V DC max. 80 mA
Clock frequency	100 kHz ... 500 kHz
Code	Gray-Code, continuous progression
Delay between pulse trains	20 µs min.
Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typ.)
Operating temperature	-40 ... +85 °C
Protection	Short circuit
EMC	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

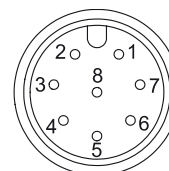
Note:

Extension of the cable length will reduce the maximum transmission rate.

Signal wiring/ Connection

Signal	Connector Pin	Cable wire color
Excitation +	1	white
Excitation GND	2	brown
CLOCK	3	green
CLOCK	4	yellow
DATA	5	grey
DATA	6	pink
—	7	blu
—	8	red

View to sensor
connector



POSITAPE®

MCANOP

Digital output CANopen



MCANOP CANopen



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	2 cams
Certified	Yes
Transmission rates	50 kbit to 1 Mbit, adjustable via LSS; default: 125 kbit
Bus connection	M12 connector, 5 pins
Integrated bus terminating resistor	120Ω, adjustable by the customer
Bus, galvanic isolated	No

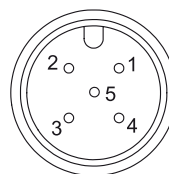
Specifications

Excitation voltage	8 ... 36 V DC
Excitation current	typ. 20 mA at 24 V DC typ. 40 mA at 12 V DC max. 80 mA
Measuring rate	1 kHz (asynchronous)
Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s.
Repeatability	1 LSB
Operating temperature	-40 ... +85 °C
Protection	Reverse polarity, short circuit
Dielectric strength	1 kV (V AC, 50 Hz, 1 min.)
EMC	EN 61326-1:2013

Signal wiring / connection

Signal	Connector pin
Shield	1
Excitation +	2
GND	3
CAN-H	4
CAN-L	5

View to sensor
connector



MCANJ1939 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

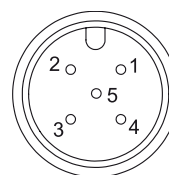
NAME Fields	Arbitrary address capable	1	Yes
	Industry group	0	Global
	Vehicle system	7Fh (127d)	Non specific
	Vehicle system instance	0	
	Function	FFh (255d)	Non specific
	Function instance	0	
	ECU instance	0	
	Manufacturer	145h (325d)	Manufacturer ID
	Identity number	0nnn	Serial number 21 bit

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	Typ. 20/40 mA for 24/12 V, max. 80 mA
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
	Repeatability	1 LSB
	Operating temperature	-40 ... +85 °C
	Protection	Reverse polarity, short circuit
	Dielectric strength	1 kV (V AC, 50 Hz, 1 min.)
	EMC	EN 61326-1:2013

Signal wiring / connection	Signal name	Connector pin no.
	Shield	1
	Excitation +	2
	GND	3
	CAN-H	4
	CAN-L	5

View to sensor connector



Connector cable
M12, 4 pin

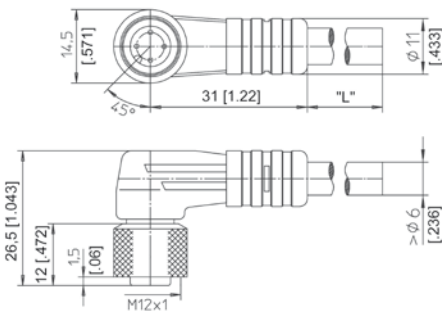
Suitable for 5-pin
sensor connectors

The 4-lead shielded cable is supplied with a mating 4-pin 90° M12 connector at one end and 4 wires at the other end. Available lengths are 2, 5 and 10 m. Wire: cross sectional area 0.34 mm².
Order code:

KAB - XM - M12/4F/W - LITZE

IP69K: KAB - XM - M12/4F/W/69K - LITZE

Length in m



Connector cable
M12, 4 pin

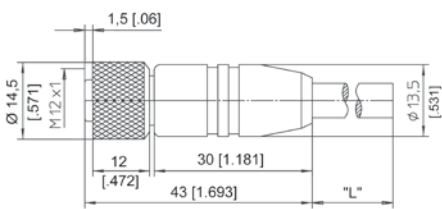
Suitable for 5-pin
sensor connectors

The 4-lead shielded cable is supplied with a mating 4-pin M12 connector at one end and 4 wires at the other end. Available lengths are 2, 5 and 10 m. Wire: cross sectional area 0.34 mm².
Order code:

KAB - XM - M12/4F/G - LITZE

IP69K: KAB - XM - M12/4F/G/69K - LITZE

Length in m



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

Connector cable

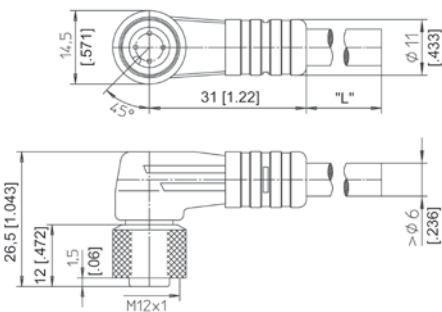
M12, 5 pin

The 5-lead shielded cable is supplied with a mating 5-pin 90° M12 connector at one end and 5 wires at the other end. Available lengths are 2, 5 and 10 m. Wire: cross sectional area 0.34 mm².
Order code:

KAB - XM - M12/5F/W - LITZE

IP69K: KAB - XM - M12/5F/W/69K - LITZE

Length in m



Connector cable

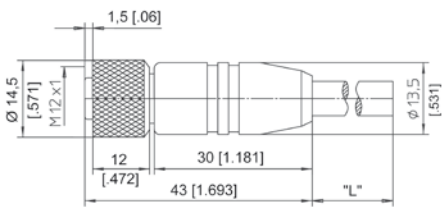
M12, 5 pin

The 5-lead shielded cable is supplied with a mating 5-pin M12 connector at one end and 5 wires at the other end. Available lengths are 2, 5 and 10 m. Wire: cross sectional area 0.34 mm².
Order code:

KAB - XM - M12/5F/G - LITZE

IP69K: KAB - XM - M12/5F/G/69K - LITZE

Length in m



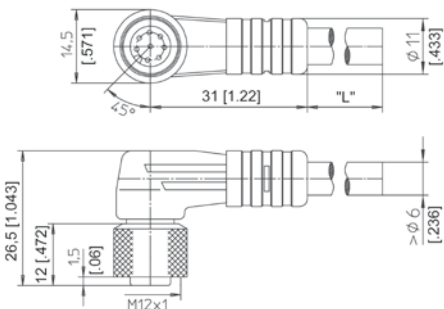
Signal wiring M12, 5 pin	Connector pin / cable color				
	1	2	3	4	5
	brown	white	blue	black	grey

Connector cable

M12, 8 pin

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 2, 5 and 10 m. Wire: cross sectional area 0.25 mm².
Order code:

KAB - XM - M12/8F/W - LITZE
IP69K: **KAB - XM - M12/8F/W/69K - LITZE**
Length in m

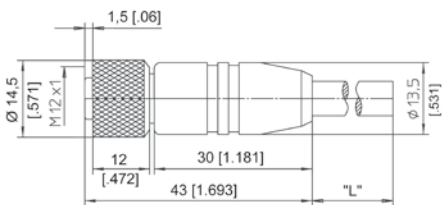


Connector cable

M12, 8 pin

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 2, 5 and 10 m. Wire: cross sectional area 0.25 mm².
Order code:

KAB - XM - M12/8F/G - LITZE
IP69K: **KAB - XM - M12/8F/G/69K - LITZE**
Length in m

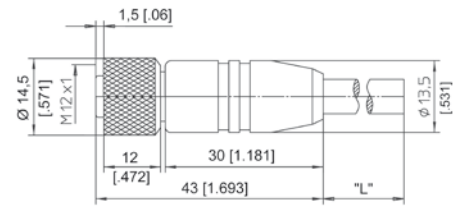


Signal wiring M12, 8 pin	Connector pin / cable color							
	1	2	3	4	5	6	7	8
	white	brown	green	yellow	grey	pink	blue	red

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, 2, 5 and 10 m.



Order code:

KAB - XM - M12/5F/G - M12/5M/G - CAN

IP69K: **KAB - XM - M12/5F/G/69K - M12/5M/G/69K - CAN**

Length in m

T-piece for bus cable

M12, 5 pin
 CAN bus

Order code:

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



Terminating resistance

5 pin M12
 CAN bus

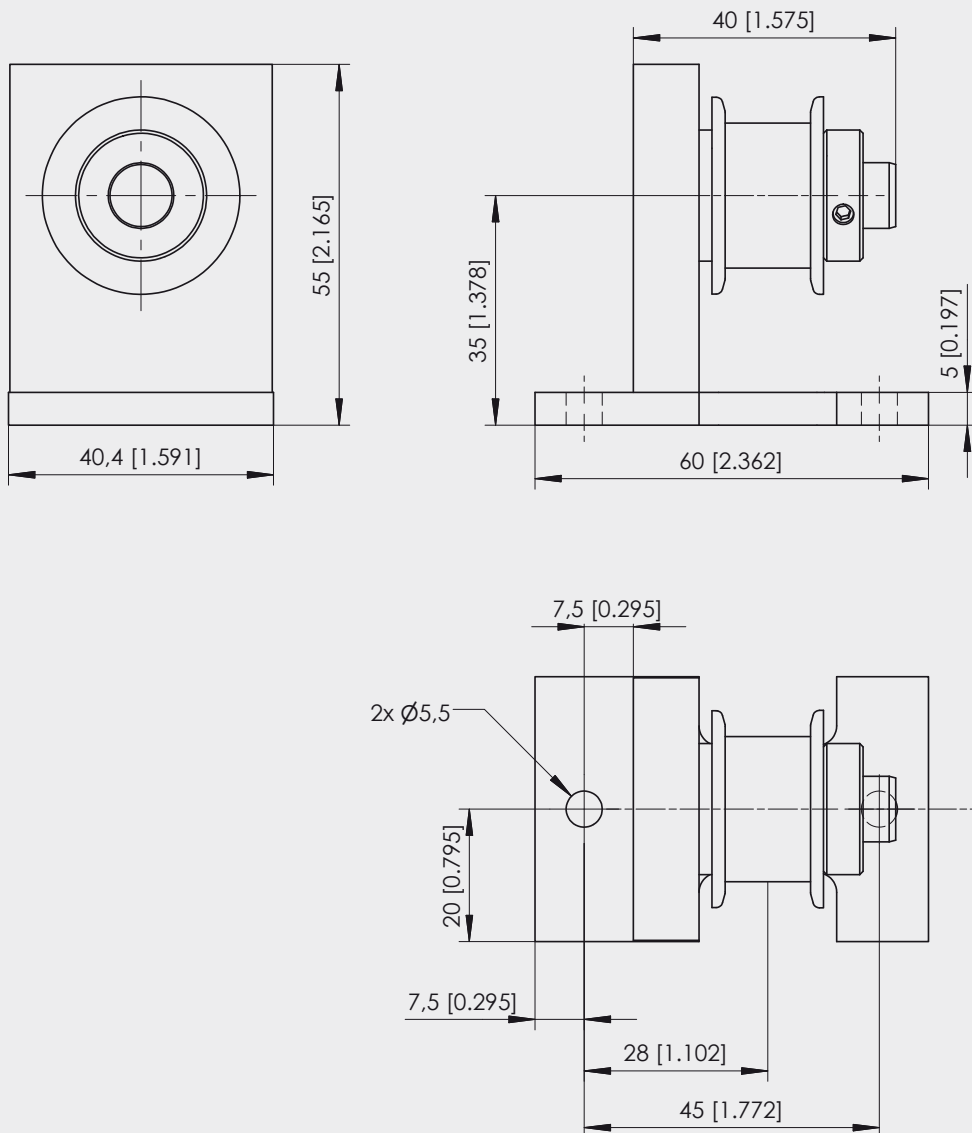
Order code:

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



Tape pulley WBR1

Order code: **WBR1**



Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.