

# Linear measuring technology

<b>Draw-wire encoder D125</b>	<b>Base-Line</b>	<b>Measuring length max. 10 m</b>
-------------------------------	------------------	-----------------------------------



The draw wire system D125 is more than a sensor for determining length-related position data. Variants with integrated inclinometer and redundant interfaces offer versatile application possibilities. The contactless magnetic position scanning, a high IP67 protection level and the wider temperature range round off the product.



Analog output



Wide temperature range



High protection level



Shock / vibration resistant



Redundancy

## Characteristics

- Measuring length 6 ... 10 m.
- Integrated inclinometer.
- Redundant sensors.
- Different types of sensors (analog, CANopen).
- Linearity up to  $\pm 0.5\%$  of the measuring range.
- High protection level IP67 and wide temperature range from  $-40\text{ °C}$  ...  $+85\text{ °C}$ .

## Advantages

- The suitable measuring length for every application.
- Cost, space and installation work saving.
- For even higher plant availability.
- Simple selection and fast installation.
- High accuracy at economic prices.
- Reliability and long service life for outdoor applications.

## Order code with analog sensor

D8 . D125 . XXXX . XXX1 . 1 000

### a Measuring length

0600 = 6 m  
0700 = 7 m  
0800 = 8 m  
0900 = 9 m  
1000 = 10 m

### b Single sensor

A11 = 4 ... 20 mA  
A22 = 0 ... 10 V  
A44 = 0.5 ... 4.5 V

### Redundat sensor

R11 = 2 x 4 ... 20 mA  
R22 = 2 x 0 ... 10 V  
R44 = 2 x 0,5 ... 4,5 V

### Crossed signals

R1C = 4 ... 20 mA / 20 ... 4 mA  
R2C = 0 ... 10 V / 10 ... 0 V  
R4C = 0,5 ... 4,5 V / 4,5 ... 0,5 V

### c Type of connection

1 = M12 male connector, 5-pin

## Order code with CANopen and inclinometer

D8 . D125 . XXXX . XXX1 . 1 X 00

### a Measuring length

0600 = 6 m  
0700 = 7 m  
0800 = 8 m  
0900 = 9 m  
1000 = 10 m

### b Sensor type

RC1 = CANopen redundant  
RCT = CANopen redundant, with termination resistor 120  $\Omega$

### c Type of connection

1 = M12 male connector, 5-pin

### d Inclinometers

0 = none  
1 = 1 inclinometer  
2 = 2 inclinometers

### Stock types

D8.D125.1000.RC11.1000

# Linear measuring technology

Draw-wire encoder D125	Base-Line	Measuring length max. 10 m
<b>Cables and connectors</b>		Order no.
<b>Preassembled cables</b>	M12 female connector with coupling nut, 5-pin, A coded, straight single ended 2 m [6.56'] PVC cable	<b>05.00.6081.2211.002M</b>
<b>Connectors</b>	M12 female connector with coupling nut, 5-pin, A coded, straight (metal)	<b>8.0000.5116.0000</b>
	M12 female connector with coupling nut, 5-pin, A coded, straight (metal/plastic)	<b>05.B-8151-0/9</b>
	M12 female connector with coupling nut, 5-pin, A coded, right-angle (plastic)	<b>05.B-8251-0/9</b>

Further Kübler cables and connectors can be found at: [kuebler.com/connection-technology](http://kuebler.com/connection-technology)

## Technical data

Mechanical characteristics (draw-wire mechanics)		
<b>Measuring range</b>		6.0 ... 10.0 m
<b>Measuring wire</b>	material	AISI304 steel wire Nylon coated
	diameter	ø 0.9 mm
<b>Wire fastening</b>	eyelet	
	internal diameter	ø 8 mm
	outer diameter	ø 15 mm
	height	2 mm
<b>Speed max.</b>		1 m/s
<b>Acceleration max.</b>		10 m/s <sup>2</sup>
<b>Linearity</b>	analog	±1.0 %
(whole measuring range)	CANopen	±0.8 %
<b>Repetition accuracy</b>	analog	±0.5 %
(whole measuring range)	CANopen	±0.4 %
<b>Pull-back force</b>		typ. 4.5 N <sup>1)</sup>
<b>Pull-out force</b>		typ. 9 N
<b>Type of connection</b>		M12 connector, 5-pin
<b>Housing</b>		polycarbonate reinforced with glass fibers
<b>Protection</b>		IP67
<b>Temperature range</b>		-40 °C ... +85 °C [-40 °F ... +185 °F]
<b>Weight</b>		approx. 0.97 kg [34.2 oz]
<b>Shock resistance</b> acc. to EN 60068-2-27		300 m/s <sup>2</sup> , 11 ms
<b>Vibration resistance</b> acc. to EN 60068-2-6		100 m/s <sup>2</sup> , 10 ... 500 Hz

Electrical characteristics		
<b>Supply voltage</b>		
Sensor type:		
A11, A22, R11, R22, R1C, R2C		12 ... 30 V DC
A44, R44, R4C		9 ... 30 V DC
RC1, RCT		9 ... 30 V DC

Analog sensor	
<b>Output signal</b>	analog
<b>Resolution</b>	12 bit

CANopen	
<b>Output signal</b>	CANopen (DS301)
<b>Resolution</b>	14 bit
<b>Resolution inclinometer</b>	0.1°
<b>Accuracy inclinometer</b>	±0.6°
<b>Temperature drift inclinometer</b>	±0.01 % / °C

Approvals		
<b>Electromagnetic compatibility</b>		acc. to EN 61326-1, EN 61326-3-1
<b>CE compliant</b> in accordance with		
	EMC Directive	2014/30/EU
	RoHS Directive	2011/65/EU
<b>UKCA compliant</b> in accordance with		
	EMC Regulations	S.I. 2016/1091
	RoHS Regulations	S.I. 2012/3032

1) May be lower at low temperatures.

# Linear measuring technology

<b>Draw-wire encoder D125</b>	<b>Base-Line</b>	<b>Measuring length max. 10 m</b>
-------------------------------	------------------	-----------------------------------

## Terminal assignment

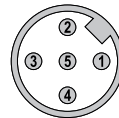
Sensor type	Interface	Type of connection	M12 connector, 5-pin					
analog sensor <b>A11, R11, R1C</b>	(2x) 4 ... 20 mA	1	Signal:	+V	0 V	I <sub>out 1</sub>	I <sub>out 2</sub> <sup>1)</sup>	n.c.
			Pin:	1	2	3	4	5

Sensor type	Interface	Type of connection	M12 connector, 5-pin					
analog sensor <b>A22, R22, R2C</b> <b>A44, R44, R4C</b>	(2x) 0 ... 10 V (2x) 0.5 ... 4.5 V	1	Signal:	+V	0 V	U <sub>out 1</sub>	U <sub>out 2</sub> <sup>1)</sup>	n.c.
			Pin:	1	2	3	4	5

Sensor type	Interface	Type of connection	M12 connector, 5-pin					
<b>RC1, RCT</b>	CANopen	1	Signal:	+V	0 V	CAN-GND	CAN-H	CAN-L
			Pin:	2	3	1	4	5

- +V : Supply voltage +V DC
- 0 V : Supply voltage GND (0V)
- I<sub>out 1</sub> : Current output 1
- I<sub>out 2</sub> : Current output 2
- U<sub>out 1</sub> : Voltage output 1
- U<sub>out 2</sub> : Voltage output 2
- n.c. : not connected

Top view of mating side, male contact base



M12 connector, 5-pin

1) Only in case of redundant ordering option sensor type R11, R1C, R22, R2C, R44, R4C (otherwise n.c.).

# Linear measuring technology

**Draw-wire encoder D125**

**Base-Line**

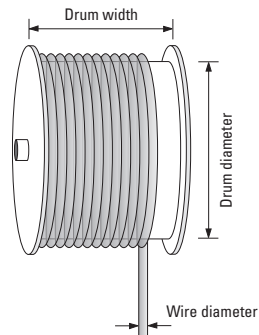
**Measuring length max. 10 m**

## Technology in detail

### Operating principle

#### Construction

The core of a draw-wire device is a drum mounted on bearings, onto which a wire is wound. Winding takes place via a spring-loaded device.

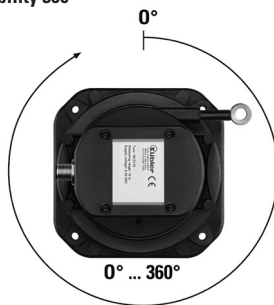


#### Note

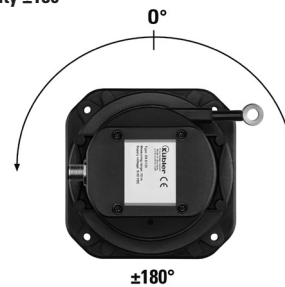
Exceeding the maximum extension length of the draw-wire will lead to damage to the wire and the mechanics.

### Inclinometer with option RC1

Setting possibility 360°



Setting possibility ±180°



Redundant signals possible.

#### Setting possibilities:

- Switching between setting possibilities 180° and 360°.
- Switching between synchronous and asynchronous output.
- Change of direction of rotation (cw/ccw).
- Setting and resetting an offset.

