

Linear measuring technology

Draw wire mechanics with encoder or analogue sensor

Draw wire encoder D135

**Measuring length max. 42.5 m
Traverse speed max. 5 m/s**



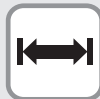
These draw wire mechanics D135 can be used up to a measuring length of 42.5 metres.

This draw wire mechanics may be combined with the proven Kübler Sendix encoders with incremental or absolute interface, as well as with analogue sensors.

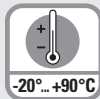
With its compact construction, the D135 suits perfectly all measuring tasks from 8 up to 42.5 metres.



Max.
acceleration



Long service
life



Temperature



High protection
level



Reverse polarity
protection

Robust

- The titanium-anodised aluminium housing and the stainless steel wires allow for using the mechanics even in harsh conditions.
- Wear-free wire exit thanks to special plain bearing guide.

Versatile

- High traverse speed and high acceleration.
- Flexible mounting thanks to fastening tabs or fastening grooves.
- Various connection possibilities available.

Order code with encoder

D8.4D1 . XXXX . XXXX . XXXX
Type a b c d e

a Measuring range

0800 = 8 000 mm	3000 = 30 000 mm
1000 = 10 000 mm	3500 = 35 000 mm
1200 = 12 000 mm	4000 = 40 000 mm
1500 = 15 000 mm	4250 = 42 500 mm
2000 = 20 000 mm	
2500 = 25 000 mm	

b Encoder used

00 = Sendix incremental 5000
F3 = Sendix absolute F5863
63 = Sendix absolute 5863
F8 = Sendix absolute F5868
68 = Sendix absolute 5868

c Output circuit

depends on the encoder used

d Type of connection

depends on the encoder used

e Resolution / Protocol / Options

depends on the encoder used

Optional on request

- Other measuring ranges
- Cable diameter 1 mm
- Ring eye instead of cable clip
- Modified cable and/or connector orientation
- Modified cable outlet direction
- Sensor protection level IP67

Standard resolutions for draw wire with incremental encoder Sendix 5000, drum circumference 333.33 mm (357.14 mm for the 8 000 mm measuring range)

	500	2000
Pulses / revolution		
Pulses / mm	1.5 (1.4)	6 (5.6)
Resolution (mm)	~ 0.66 (0.71)	~ 0.17 (0.18)

Standard res. for draw wire with absolute encoder Sendix F5863 or F5868 – 5863 or 5868, drum circumference 333.33 mm (357.14 mm for the 8 000 mm measuring range)

	F5863 / 5863	F5868 / 5868
Absolute encoder		
Pulses / revolution	2048 / 11 bit	4096, programmable via the bus / 12 bit
Pulses / mm	6.14 (5.73)	12.28 (11.47)
Resolution (mm)	~ 0.16 (0.17)	~ 0.08 (0.09)

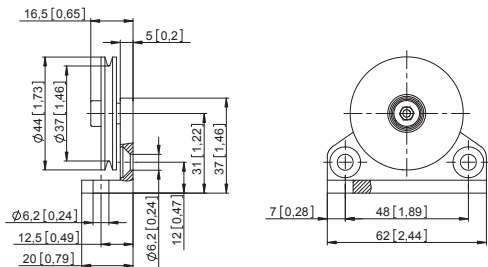
Recommended standard devices

Order no. draw wire encoder	Mounted encoder	Interface	Power supply	Type of connection	Resolution / Protocol	Options
D8.4D1.XXXX.0054.2000	Sendix 5000 (8.5000.8354.2000)	PushPull with inv. signal	10 ... 30 V DC	1 radial M12 connector	2000 ppr	no option
D8.4D1.XXXX.F324.G123	Sendix F5863 (8.F5863.1224.G123)	SSI	10 ... 30 V DC	1 radial M23 connector	SSI-Gray-Code	Set button + Status LED
D8.4D1.XXXX.6324.G123	Sendix 5863 (8.5863.1224.G123)	SSI	10 ... 30 V DC	1 radial M23 connector	SSI-Gray-Code	Set button + Status LED
D8.4D1.XXXX.F82E.2123	Sendix F5868 (8.F5868.122E.2123)	CANopen	10 ... 30 V DC	1 radial M12 connector	CANopen encoder profile DS406 V3.2	Set button
D8.4D1.XXXX.6822.2123	Sendix 5868 (8.5868.1222.2123)	CANopen	10 ... 30 V DC	2 radial M12 connector	CANopen encoder profile DS406 V3.2	Set button
D8.4D1.XXXX.6832.3113	Sendix 5868 (8.5868.1232.3113)	Profibus	10 ... 30 V DC	3 radial M12 connector	PROFIBUS DP V0 encoder profile Class 2	Set button
D8.4D1.XXXX.68B2.B212	Sendix 5868 (8.5868.12B2.B212)	EtherCAT	10 ... 30 V DC	3 radial M12 connector	EtherCAT with CoE 3.2.10	no option
D8.4D1.XXXX.68C2.C212	Sendix 5868 (8.5868.12C2.C212)	Profinet	10 ... 30 V DC	3 radial M12 connector	PROFINET encoder profile version 4.1	no option

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Order code with analogue sensor	D8.3D1 . XXXX . XXX X . 0000 Type a b c	
a <i>Measuring range</i> 0800 = 8 000 mm 3000 = 30 000 mm 1000 = 10 000 mm 3500 = 35 000 mm 1500 = 15 000 mm 4000 = 40 000 mm 2000 = 20 000 mm 2500 = 25 000 mm	b <i>Analogue sensor output / power supply</i> A11 = 4 ... 20 mA / 12 ... 30 V DC A22 = 0 ... 10 V / 12 ... 30 V DC A33 = potentiometer 1 kΩ / max. 30 V DC	<i>Optional on request</i> - Other measuring ranges - Cable diameter 1 mm - Ring eye instead of cable clip - Modified cable and/or connector orientation - Modified cable outlet direction - Sensor protection level IP67 - Increased linearity
	c <i>Type of connection</i> 1 = axial cable, 2 m [6.56'] PVC 3 = M12 connector, 4-pin	

Guide pulley for draw wire encoder	Order no.
  Order code for the set: - Guide pulley (anodised aluminium) - 2 x countersunk screws for lateral fixing - 2 x hexagonal screws for fixing on a flat surface	8.0000.7000.0045

Connection technology for analogue sensor	Order no.
Connector, self-assembly (straight)	M12 female connector with coupling nut 8.0000.5116.0000
Cordset, pre-assembled	M12 female connector with coupling nut, 2 m [6.56'] PVC cable 05.00.6081.2211.002M

Technical data						
Mechanical characteristics (draw wire mechanics)						
Measuring range		8000 mm	10000 mm 12000 mm 15000 mm	20000 mm	25000 mm 30000 mm	35000 mm 40000 mm 42500 mm
Extension force		F _{min}	7.2 N	8.7 N	7.0 N	7.3 N
		F _{max}	16.0 N	16.9 N	12.4 N	15.7 N
Max. speed		10 m/s	6 m/s	5 m/s	5 m/s	5 m/s
Max. acceleration		140 m/s ²	80 m/s ²	60 m/s ²	60 m/s ²	60 m/s ²
Linearity	analogue output encoder	±0.1 % (of the measuring range) ±0.05 % (of the measuring range)				
Weight		depending on the measuring and the sensor/encoder used				
Material	housing wire	titanium-anodised aluminium stainless steel ø 0.5 mm (ø 1 mm can be supplied as a special up to measuring range 20000 mm)				
Protection acc. to EN 60529		IP65 (sensor)				

Electrical characteristics (digital output)
The electrical characteristics of the draw wire mechanics with digital output can be found in the data sheets of the encoders.

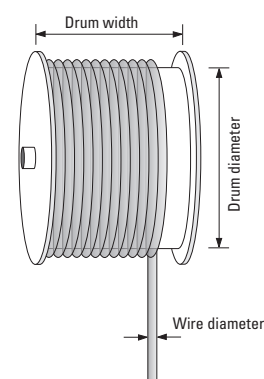
Operating principle

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.



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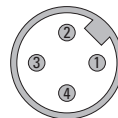
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Electrical characteristics (analogue output)			
Analogue output	0 ... 10 V	4 ... 20 mA	Potentiometer
Output	0 ... 10 V / galv. isolated, 4 conductors	4 ... 20 mA / 2 conductors	1 kΩ
Power supply	12 ... 30 V DC	12 ... 30 V DC	max. 30 V DC
Recommended slider current	—	—	< 1 μA
Max. current consumption	22.5 mA (no load)	50 mA	—
Reverse polarity protection	yes	yes	—
Working temperature	-20°C ... +60°C [-4°F ... +140°F]	-20°C ... +60°C [-4°F ... +140°F]	-20°C ... +85°C [-4°F ... +185°F]
Connection diagrams			
CE compliant acc. to	EMC guideline 2004/108/EC RoHS guideline 2011/65/EU		

Terminal assignment (analogue output)

Pin	1	2	3	4
Cable colour	BN	WH	BU	BK
0 ... 10 V	+V	Signal	0 V	0 V Sig.
4 ... 20 mA	+V	n. c.	Signal	n. c.
1 kΩ	+V	Slider	0 V	n. c.

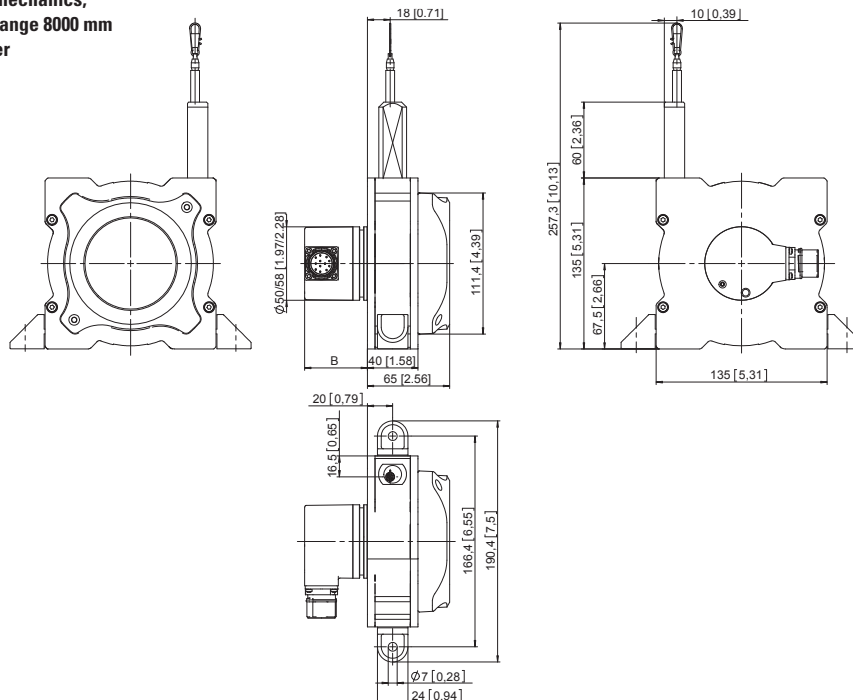
Connector (analogue output)



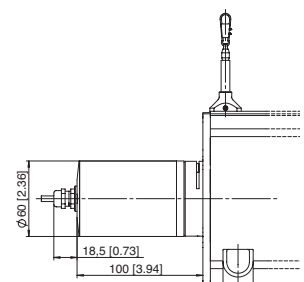
Dimensions

Dimensions in mm [inch]

Draw wire mechanics, measuring range 8000 mm with encoder



with analogue output



Dimension B depends on the encoder used	
Encoder	B
Sendix incremental (5000) D8.4D1.XXXX.00XX.XXXX	37.00 [1.46]
Sendix absolute (5863) D8.4D1.XXXX.63XX.XXXX	49.50 [1.95]
Sendix absolute (5868) D8.4D1.XXXX.68XX.XXXX	76.00 [2.99]

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**Draw wire mechanics
with encoder or analogue sensor**

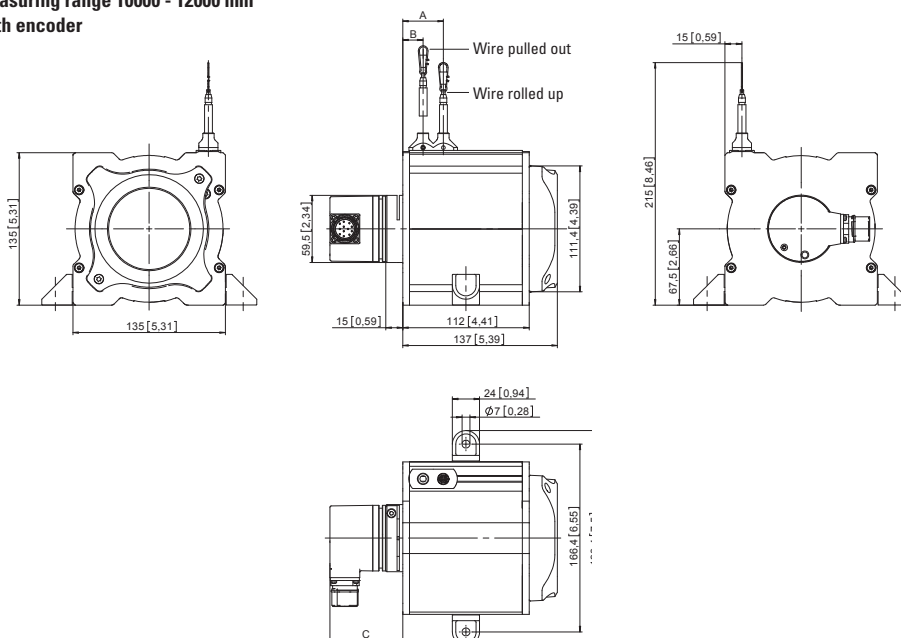
Draw wire encoder D135

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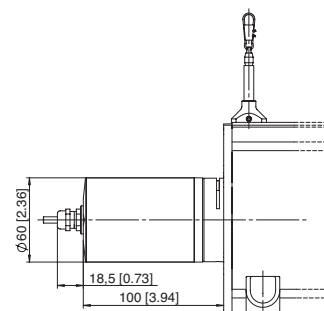
Dimensions

Dimensions in mm [inch]

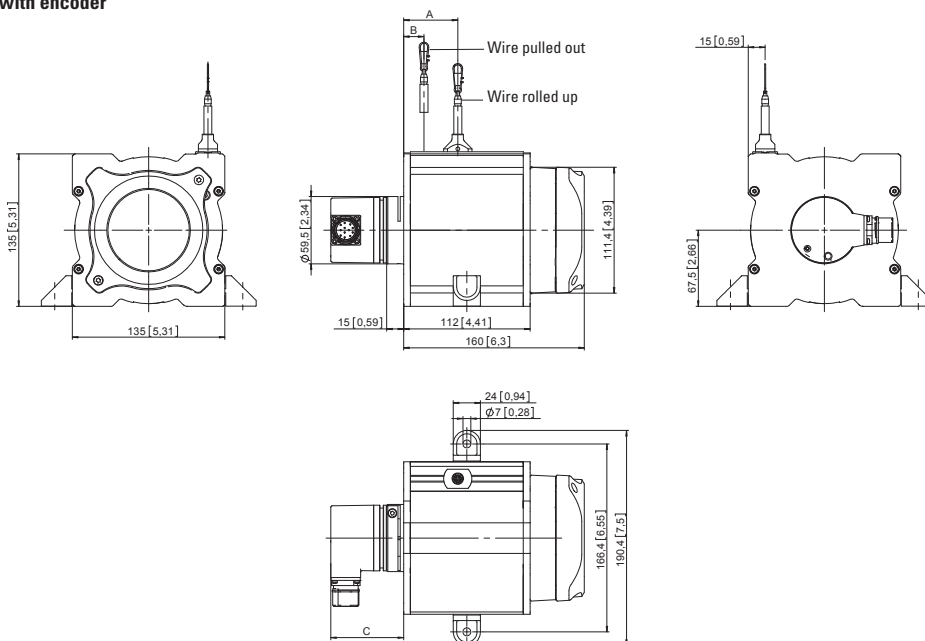
**Draw wire mechanics,
measuring range 10000 - 12000 mm
with encoder**



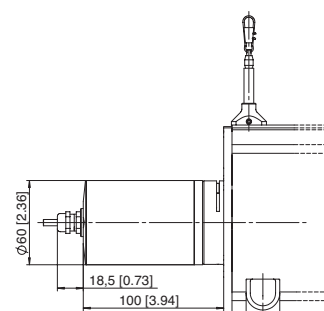
with analogue output



**Draw wire mechanics,
measuring range 15000 - 20000 mm
with encoder**



with analogue output



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technology

Dimension C depends on the encoder used	
Encoder	C
Sendix incremental (5000) D8.4D1.XXXX.00XX.XXXX	37.00 [1.46]
Sendix absolute (5863) D8.4D1.XXXX.63XX.XXXX	49.50 [1.95]
Sendix absolute (5868) D8.4D1.XXXX.68XX.XXXX	76.00 [2.99]

Measuring range	A - Wire rolled up	B - Wire pulled out
10000 mm	33 [1.30]	18 [0.71]
12000 mm	36 [1.42]	18 [0.71]
15000 mm	41 [1.61]	18 [0.71]
20000 mm	48 [1.89]	18 [0.71]

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Draw wire mechanics with encoder or analogue sensor

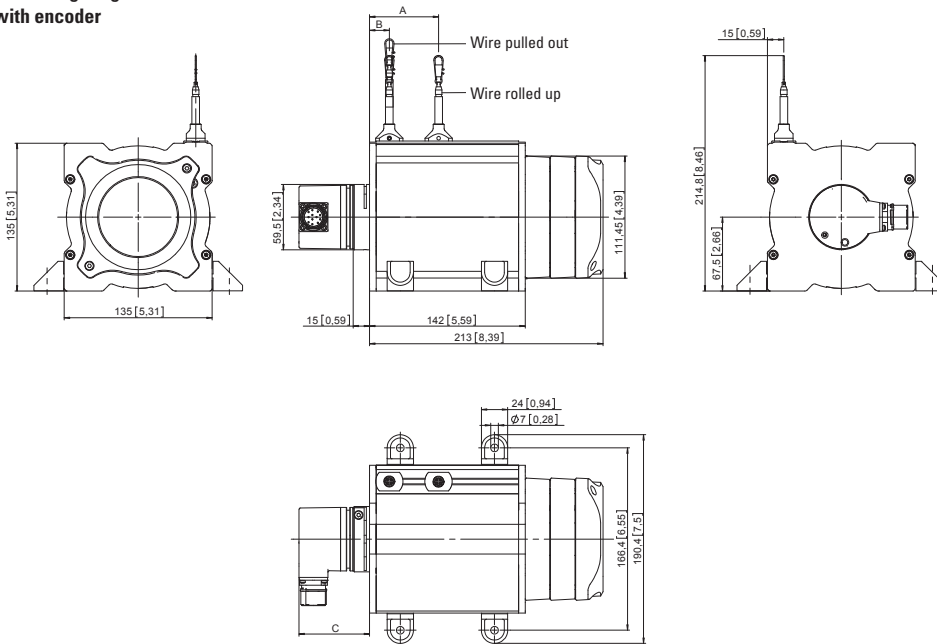
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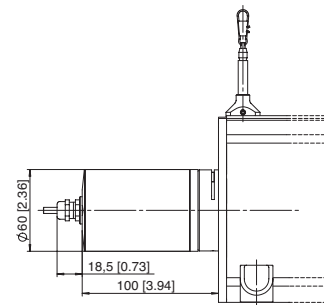
Dimensions

Dimensions in mm [inch]

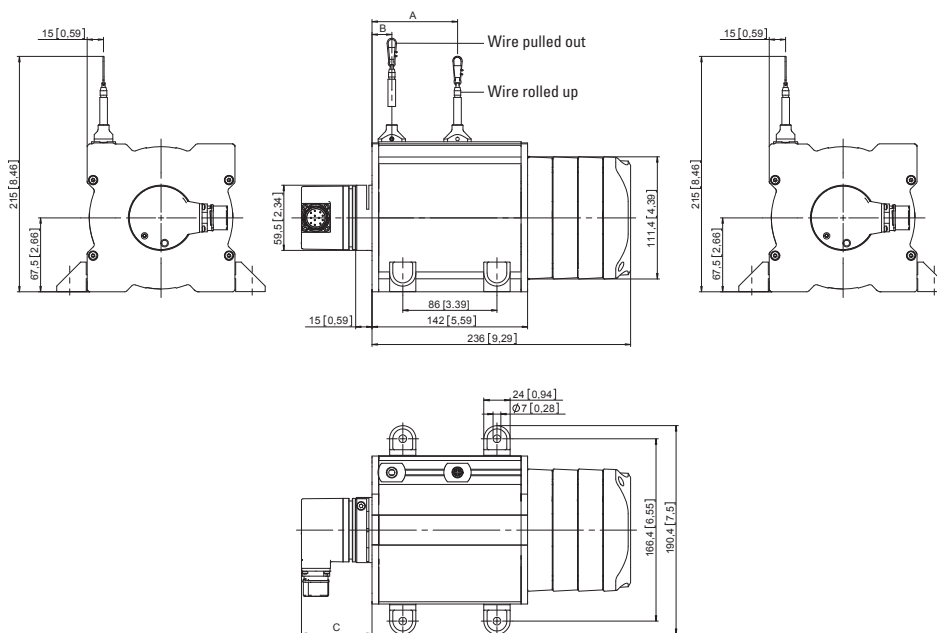
Draw wire mechanics,
measuring range 25000 - 30000 mm
with encoder



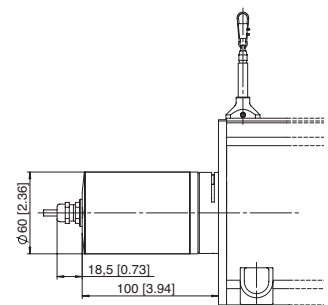
with analogue output



Draw wire mechanics,
measuring range 35000 - 42500 mm
with encoder



with analogue output



Dimension C depends on the encoder used	
Encoder	C
Sendix incremental (5000) D8.4D1.XXXX.00XX.XXXX	37.00 [1.46]
Sendix absolute (5863) D8.4D1.XXXX.63XX.XXXX	49.50 [1.95]
Sendix absolute (5868) D8.4D1.XXXX.68XX.XXXX	76.00 [2.99]

Measuring range	A - Wire rolled up	B - Wire pulled out
25000 mm	56 [2.20]	18 [0.71]
30000 mm	63 [2.48]	18 [0.71]
35000 mm	71 [2.80]	18 [0.71]
40000 mm	78 [3.07]	18 [0.71]
42500 mm	82 [3.23]	18 [0.71]