

Linear measuring technology

Draw wire mechanics with encoder or analog sensor	Draw wire encoder C120	Measuring length max. 6 m Traverse speed max. 10 m/s
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These draw wire mechanics C120 can be used up to a measuring length of 6 meters.

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



Max. acceleration 140 m/s ²	Long service life	Wide temperature range	High protection level IP	Reverse polarity protection

Robust

- The titanium-anodized aluminum 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.
- Various wire types and wire fastenings.

Versatile

- High traverse speed, up to 10 m/s.
- High acceleration, up to 140 m/s².
- Quick fastening by means of 2 screws.
- Various connection possibilities available.
- Interchangeable encoders (interchangeable installation).

Order code with encoder (incremental, absolute)

D8.XC1.0600.XX.XX.XXXX

Standard variants are represented **bold underlined>**

- | | | | |
|---|--|--|--|
| <p>a <i>Mechanics</i>
2 = interchangeable installation ¹⁾
4 = fixed installation ²⁾</p> <p>b <i>Measuring range</i>
0600 = 6000 mm</p> | <p>c <i>Encoder used</i>
00 = <u>Sendix 5000, incremental</u>
M3 = <u>Sendix M5863, absolute</u>
F3 = Sendix F5863, absolute
63 = Sendix 5863, absolute
M8 = <u>Sendix M5868, absolute</u>
F8 = Sendix F5868 absolute
68 = Sendix 5868, absolute</p> | <p>d <i>Output circuit</i>
depends on the encoder used</p> <p>e <i>Type of connection</i>
depends on the encoder used</p> <p>f <i>Resolution / Protocol / Options</i>
depends on the encoder used</p> | <p><i>Optional on request</i></p> <ul style="list-style-type: none"> - Other measuring ranges - Cable diameter 1 mm - Eyelet or M4 wire fastening instead of wire clip - Modified cable and/or connector orientation - Modified cable outlet direction - Sensor protection level IP67 - Improved linearity (0.02 %) |
|---|--|--|--|

Standard resolutions for draw wire with incremental encoder Sendix 5000			
Drum circumference [mm]	317.68	317.68	317.68
Pulses / revolution [ppr]	1000	2000	4000
Pulses / mm	3.1	6.3	12.6
Resolution [mm]	0.32	0.16	0.08

Standard resolutions for draw wire with absolute encoder Sendix M5863 (12 bit ST) or M5868 (12 bit ST, programmable via bus)	
Drum circumference [mm]	317.68
Pulses / revolution [ppr]	4096
Pulses / mm	12.9
Resolution [mm]	0.08

1) Draw wire mechanics with standard flange. The encoder can be replaced by the customer.
2) The encoder can only be replaced at the factory.

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

Draw wire encoder C120

**Measuring length max. 6 m
Traverse speed max. 10 m/s**

Recommended standard variants (with incremental, absolute encoder)

Order no. draw wire encoder	Mounted encoder	Interface	Power supply	Type of connection	Resolution / Protocol	Option
D8.xC1.0600.0054.2000	Sendix 5000 (8.5000.8354.2000)	Push-pull with inverted signal	10 ... 30 V DC	1 x radial M12 connector	2000 ppr	-
D8.xC1.0600.M324.G222	Sendix M5863 (8.M5863.3524.G222)	SSI	10 ... 30 V DC	radial M12 connector	4096 ppr / SSI-Gray-Code	-
D8.xC1.0600.M824.2122	Sendix M5868 (8.M5868.3524.2122)	CANopen	10 ... 30 V DC	radial M12 connector	CANopen encoderprofil DS406 V4.0	-

Other variants (with absolute encoder)

Order no. draw wire encoder	Mounted encoder	Interface	Power supply	Type of connection	Resolution / Protocol	Option
D8.xC1.0600.F324.G223	Sendix F5863 (8.F5863.1226.G223)	SSI	10 ... 30 V DC	1 x radial M12 connector	4096 ppr / SSI-Gray-Code	SET button + status LED
D8.xC1.0600.6324.G223	Sendix 5863 (8.5863.1226.G223)	SSI	10 ... 30 V DC	1 x radial M12 connector	4096 ppr / SSI-Gray-Code	SET button + status LED
D8.xC1.0600.F82E.2123	Sendix F5868 (8.F5868.122E.2123)	CANopen	10 ... 30 V DC	1 x radial M12 connector	CANopen encoder profile DS406 V3.2	SET button
D8.xC1.0600.6822.2123	Sendix 5868 (8.5868.1222.2123)	CANopen	10 ... 30 V DC	2 x radial M12 connector	CANopen encoder profile DS406 V3.2	SET button
D8.xC1.0600.6832.3113	Sendix 5868 (8.5868.1232.3113)	PROFIBUS	10 ... 30 V DC	3 x radial M12 connector	Profibus-DP V0 encoder profile Class 2	SET button
D8.xC1.0600.68B2.B212	Sendix 5868 (8.5868.12B2.B212)	EtherCAT	10 ... 30 V DC	3 x radial M12 connector	EtherCAT with CoE 3.2.10	-
D8.xC1.0600.68C2.C212	Sendix 5868 (8.5868.12C2.C212)	PROFINET IO	10 ... 30 V DC	3 x radial M12 connector	PROFINET encoder profile version 4.1	-
D8.xC1.0600.F8AN.A222	Sendix F5868 (8.F5868.12AN.A222)	EtherNet/IP	10 ... 30 V DC	3 x axial M12 connector	EtherNet/IP	-

**Order code with encoder
(analog, scalable with limit switch function)**

D8.XC1.0600.M1XX.XXXX

Standard variants are represented **bold underlined**

a *Mechanics*
2 = interchangeable installation ¹⁾
4 = **fixed installation** ²⁾

b *Measuring range*
0600 = 6000 mm

c *Encoder used*
M1 = Sendix M5861, absolute

d *Output circuit*
depends on the encoder used

e *Type of connection*
depends on the encoder used

f *Resolution / Protocol / Options*
depends on the encoder used

Optional on request

- Other measuring ranges
- Cable diameter 1 mm
- Eyelet or M4 wire fastening instead of wire clip
- Modified cable and/or connector orientation
- Modified cable outlet direction
- Sensor protection level IP67

Recommended standard variants (with encoder analog, scalable with limit switch function)

Order no. draw wire encoder	Mounted encoder	Interface	Power supply	Type of connection	Resolution / Protocol	Option
D8.xC1.0600.M134.3312	Sendix M5861 (8.M5861.3534.3312)	Analog, 4 ... 20 mA	10 ... 30 V DC	radial M12 connector	12 Bit / 4 ... 20 mA	scalable with limit switch function ³⁾
D8.xC1.0600.M144.4312	Sendix M5861 (8.M5861.3544.4312)	Analog, 0 ... 10 V	15 ... 30 V DC	radial M12 connector	12 Bit / 0 ... 10 V	scalable with limit switch function ³⁾
D8.xC1.0600.M134.3412	Sendix M5861 (8.M5861.3534.3412)	Analog, 4 ... 20 mA	10 ... 30 V DC	radial M12 connector	12 Bit / 4 ... 20 mA	scalable without limit switch function ³⁾
D8.xC1.0600.M144.4412	Sendix M5861 (8.M5861.3544.4412)	Analog, 0 ... 10 V	15 ... 30 V DC	radial M12 connector	12 Bit / 0 ... 10 V	scalable without limit switch function ³⁾

**Order code with analog sensor
(scaled to measuring range)**

D8.3C1.0600.XXX.X.0000

a *Measuring range*
0600 = 6000 mm

b *Analog sensor output / power supply*
A11 = 4 ... 20 mA / 12 ... 30 V DC
A22 = 0 ... 10 V / 12 ... 30 V DC
A33 = potentiometer 1 kΩ / max. 30 V DC

c *Type of connection*
1 = axial cable, 2 m PVC
3 = axial M12 connector, 4-pin

Optional on request


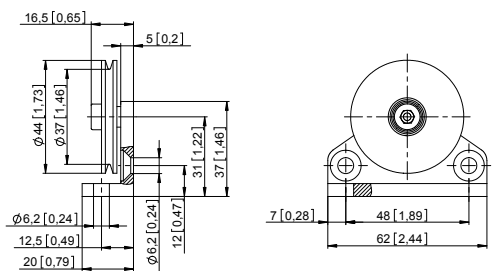
- Other measuring ranges
- Cable diameter 1 mm
- Eyelet or M4 wire fastening instead of wire clip
- Modified cable and/or connector orientation
- Modified cable outlet direction
- Sensor protection level IP67
- Improved linearity (0.02 %)
- Increased temperature range -40°C ... +85°C and -20°C ... +120°C

1) Draw wire mechanics with standard flange. The encoder can be replaced by the customer.
2) The encoder can only be replaced at the factory.

3) Delivery condition: scaled to measuring range.
Description for scaling and limit switch function see data sheet M5861.

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

Connection technology for analog sensor	Order no.
Cordset, pre-assembled	M12 female connector with coupling nut, 5-pin 2 m [6.56'] PVC cable 05.00.6081.2211.002M
Connector, self-assembly (straight)	M12 female connector with coupling nut, 5-pin 8.0000.5116.0000

Technical data

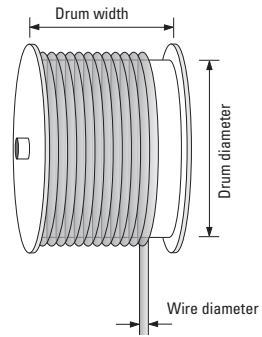
Mechanical characteristics (draw wire mechanics)	
Measuring range	6000 mm
Extension force	F_{min} 8.8 N F_{max} 12.3 N
Max. speed.	10 m/s
Max. acceleration	140 m/s ²
Linearity (of the measuring range)	with analog sensor ±0.10 % with encoder ±0.05 % ±0.02 % ¹⁾
Weight	approx. 1600 g [56.44 oz] (depending on the sensor/encoder used)
Material	housing: titanium-anodized aluminum wire: stainless steel ø 0.5 mm ø 1 mm can be supplied as a special up to measuring range 3000 mm (other wire types on request)
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.



Linear measuring technology

Electrical characteristics (analog sensor, scaled to measuring range)			
Version	A22	A11	A33
Analog 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] -40°C ... +85°C [-40°F ... +185°F] ¹⁾	-20°C ... +60°C [-4°F ... +140°F] -40°C ... +85°C [-40°F ... +185°F] ¹⁾	-20°C ... +85°C [-4°F ... +140°F] -40°C ... +85°C [-40°F ... +185°F] ¹⁾ -20°C ... +120°C [-4°F ... +248°F] ¹⁾
Connection diagrams			

CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU
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¹⁾ On request for encoder version: **00, F3, 63, F8, 68** (see order code).

Linear measuring technology

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

Draw wire encoder C120

**Measuring length max. 6 m
Traverse speed max. 10 m/s**

Technology in detail

Various wire types and wire fastenings

Wire types:

- 0.5 mm (V2A) ¹⁾
- 0.51 mm (V4A)
- 1.0 mm plastic-coated
(V4A = 0.81 mm,
plastic 0.19 mm)
- 0.6 mm (Coramid)

Wire fastenings:

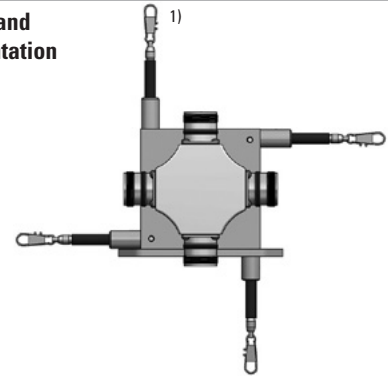
Clip ¹⁾

M4 thread

Eyelet



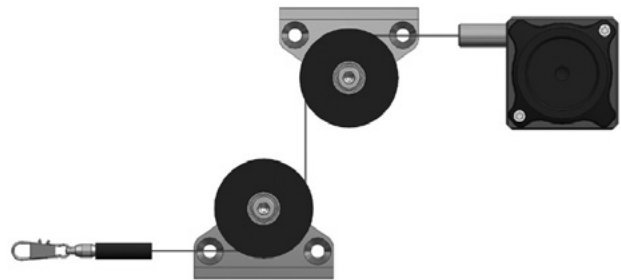
Individual wire outlet and cable / connector orientation



Extension wire



Application-specific installation possibilities



1) Standard.

Linear measuring technology

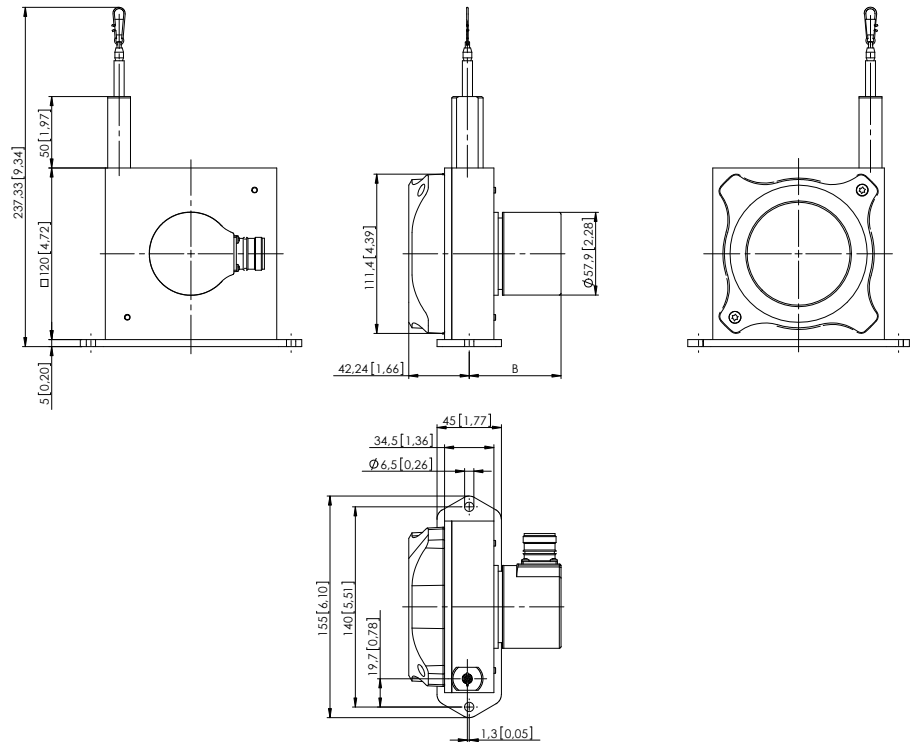
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Dimensions

Dimensions in mm [inch]

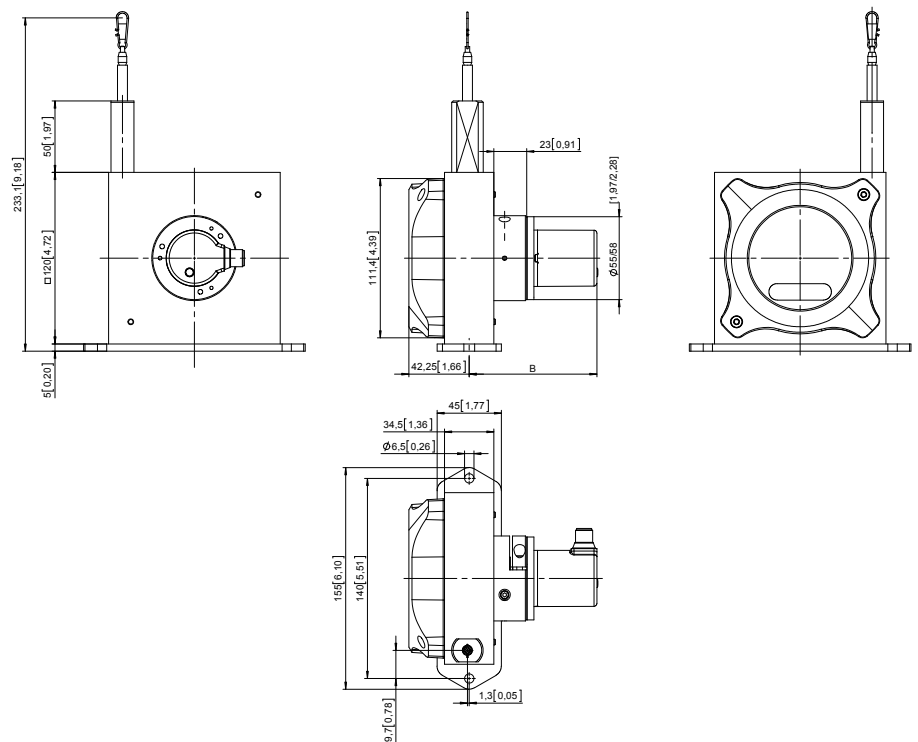
Draw wire mechanics with encoder Fixed installation

Dimension B depends on the encoder used	
Encoder	B
Sendix incremental (5000) D8.4C1.0600.00xx.xxxx	54.25 [2.14]
Sendix absolute (F5863) D8.4C1.0600.F3xx.xxxx	66.75 [2.63]
Sendix absolute (5863) D8.4C1.0600.63xx.xxxx	66.75 [2.63]
Sendix absolute (F5868, CANopen) D8.4C1.0600.F8xx.21xx	88.25 [3.47]
Sendix absolute (F5868, EtherNet/IP) D8.4C1.0600.F8xx.A2xx	76.75 [3.02]
Sendix absolute (5868) D8.4C1.0600.68xx.xxxx	67.35 [2.65]
Sendix absolute (M586x) D8.4C1.0600.Mxxx.xxxx	67.05 [2.64]



Draw wire mechanics with encoder Interchangeable installation, clamping flange

Dimension B depends on the encoder used	
Encoder	B
Sendix incremental (5000) D8.2C1.0600.00xx.xxxx	77.25 [3.04]
Sendix absolute (F5863) D8.2C1.0600.F3xx.xxxx	89.75 [3.53]
Sendix absolute (5863) D8.2C1.0600.63xx.xxxx	89.75 [3.53]
Sendix absolute (F5868, CANopen) D8.2C1.0600.F8xx.21xx	111.25 [4.38]
Sendix absolute (F5868, EtherNet/IP) D8.2C1.0600.F8xx.A2xx	99.75 [1.69]
Sendix absolute (5868) D8.2C1.0600.68xx.xxxx	90.35 [3.93]
Sendix absolute (M586x) D8.2C1.0600.Mxxx.xxxx	90.05 [3.54]



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Draw wire mechanics with encoder or analog sensor

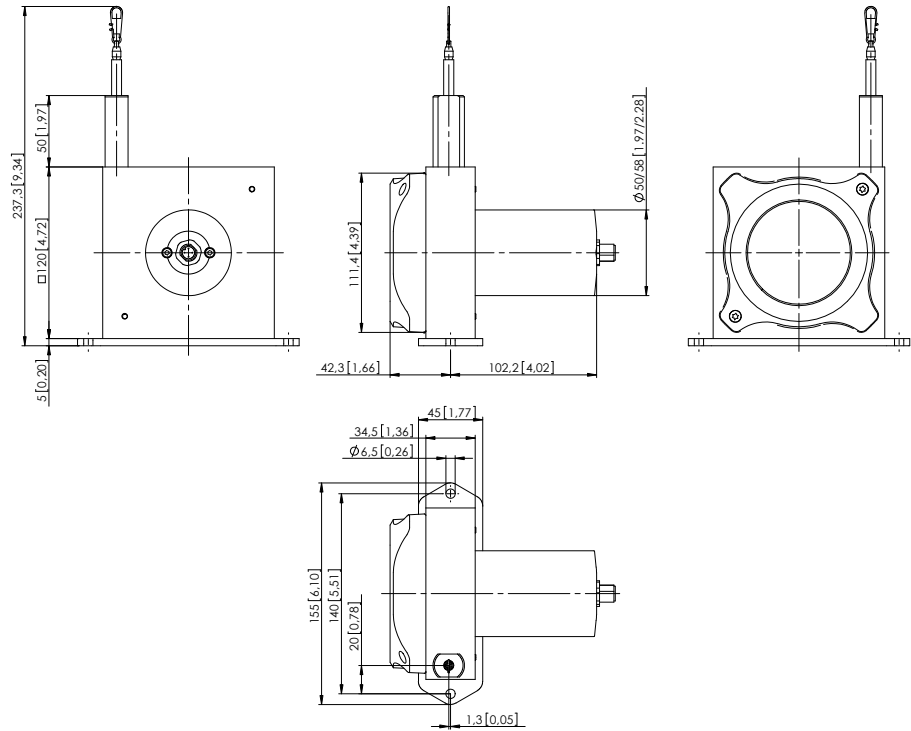
Draw wire encoder C120

**Measuring length max. 6 m
Traverse speed max. 10 m/s**

Dimensions

Dimensions in mm [inch]

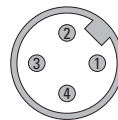
**Draw wire mechanics with analog sensor
(scaled on measuring range)**



Terminal assignment (analog sensor A11, A22, A33)

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

Top view of mating side, male contact base



M12 connector, 4-pin