

Linear Measuring Technology

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|--|-------------------------------|---|
| Draw wire mechanics with encoder or analogue sensor | Draw wire encoder D135 | Measuring length max. 42.5 m Traverse speed max. 5 m/s |
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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.



| | | | | |
|---|--------------------------|-----------------------------------|------------------------------------|------------------------------------|
| 140 m/s² Max. acceleration | Long service life | -20°..+90°C Temperature | IP 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

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| | |
|--------------------------------|---|
| Order code with encoder | D8.4D1 . XXXX . XX XX . 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 | other measuring ranges on request |
| 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

| 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) | | |
|--|---------------|---------------|
| Pulses / revolution | 500 | 2000 |
| 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) | | |
|---|---------------|---|
| Absolute encoder | F5863 / 5863 | F5868 / 5868 |
| 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) |


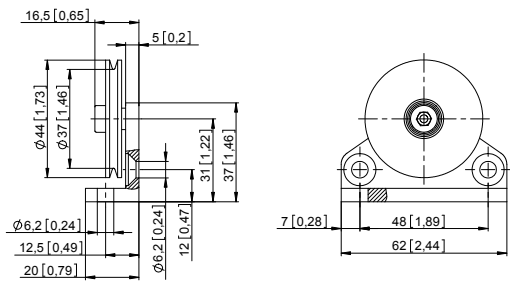
Appareils standard préconisés

| 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 M12 connector radial | 2000 ppr | no option |
| D8.4D1.XXXX.F324.G123 | Sendix F5863 (8.F5863.1224.G123) | SSI | 10...30 V DC | 1 M23 connector radial | SSI-Gray-Code | Set button + Status LED |
| D8.4D1.XXXX.6324.G123 | Sendix 5863 (8.5863.1224.G123) | SSI | 10...30 V DC | 1 M23 connector radial | SSI-Gray-Code | Set button + Status LED |
| D8.4D1.XXXX.F82E.2123 | Sendix F5868 (8.F5868.122E.2123) | CANopen | 10...30 V DC | 1 M12 connector radial | 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 M12 connector radial | 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 M12 connector radial | 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 M12 connector radial | 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 M12 connector radial | PROFINET encoder profile version 4.1 | no option |

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|--|-------------------------------|---|

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|--|---|
| Order code with analogue sensor | D8.3D1 . XXXX . XXX X . 0000 |
| <p>a Measuring range</p> <p>0800 = 8 000 mm 1000 = 10 000 mm 1500 = 15 000 mm 2000 = 20 000 mm 2500 = 25 000 mm</p> <p>3000 = 30 000 mm 3500 = 35 000 mm 4000 = 40 000 mm other measuring ranges on request</p> | <p>b Analogue sensor output / Power supply</p> <p>A11 = 4 ... 20 mA / 12 ... 30 V DC A22 = 0 ... 10 V / 12 ... 30 V DC A33 = Potentiometer 1 kΩ / max. 30 V DC</p> |
| <p>c Type of connection</p> <p>1 = cable axial, 2 m [6.56'] PVC cable 3 = M12 connector, 4-pin</p> | |

| | |
|---|--|
| Guide pulley for draw wire encoder | Order No. |
|   | <p style="text-align: right;">8.0000.7000.0045</p> <p>Order code for the set:</p> <ul style="list-style-type: none"> - Guide pulley (anodised aluminium) - 2 x countersunk screws for lateral fixing - 2 x hexagonal screws for fixing on a flat surface |

| | | |
|--|---|-----------------------------|
| Connection technology for analogue sensor | | |
| 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 | 20000 mm | 25000 mm | 35000 mm | |
| | | 12000 mm | | 30000 mm | 40000 mm | |
| | | 15000 mm | | | 42500 mm | |
| Extension force | F_{min} 7.2 N | 8.7 N | 7.0 N | 7.3 N | 7.0 N | |
| | F_{max} 16.0 N | 16.9 N | 12.4 N | 15.7 N | 14.1 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 | ± 0.1 % (of the measuring range) | | | | |
| | encoder | ± 0.05 % (of the measuring range) | | | | |
| Weight | depending on the measuring and the sensor/encoder used | | | | | |
| Material | housing | titanium-anodised aluminium | | | | |
| | wire | stainless steel ø 0.5 mm (ø 1 mm can be supplied as a special up to measuring range 20000 mm) | | | | |
| Protection (sensor) | IP65 (IP67 on request for encoders) | | | | | |

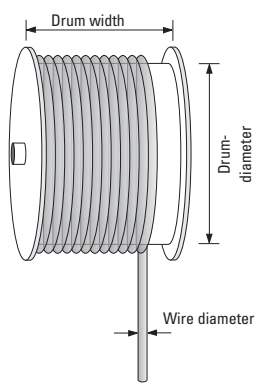
Electrical characteristics (digital output)

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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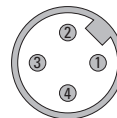
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|--|-------------------------------|---|
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|--|-------------------------------|---|

| 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 compliant acc. to | 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. |

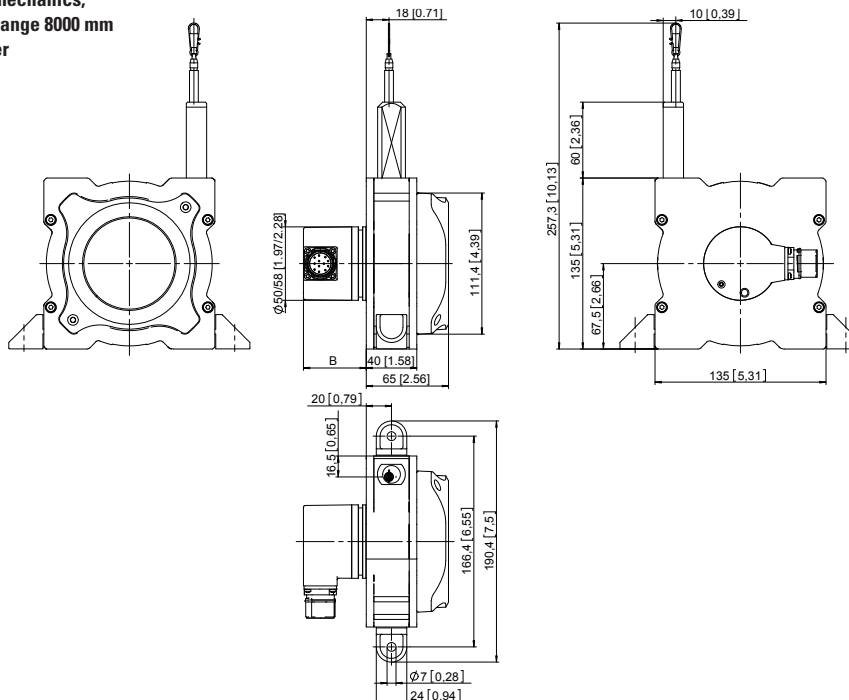
Connector (analogue output)



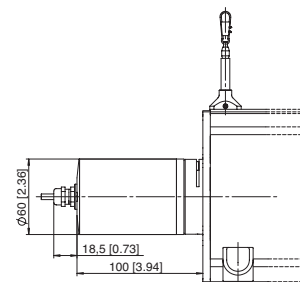
Dimensions

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**

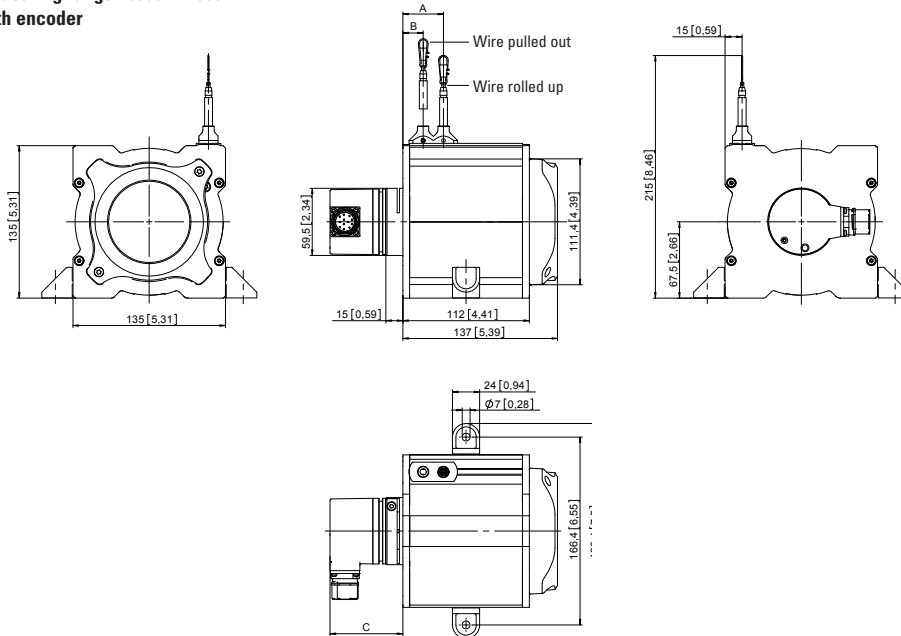
Draw wire encoder D135

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

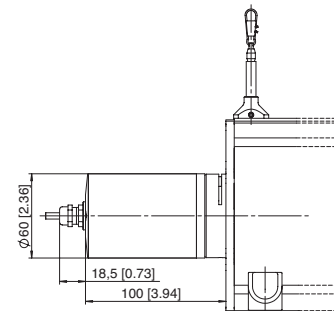
Dimensions

Dimensions in mm [inch]

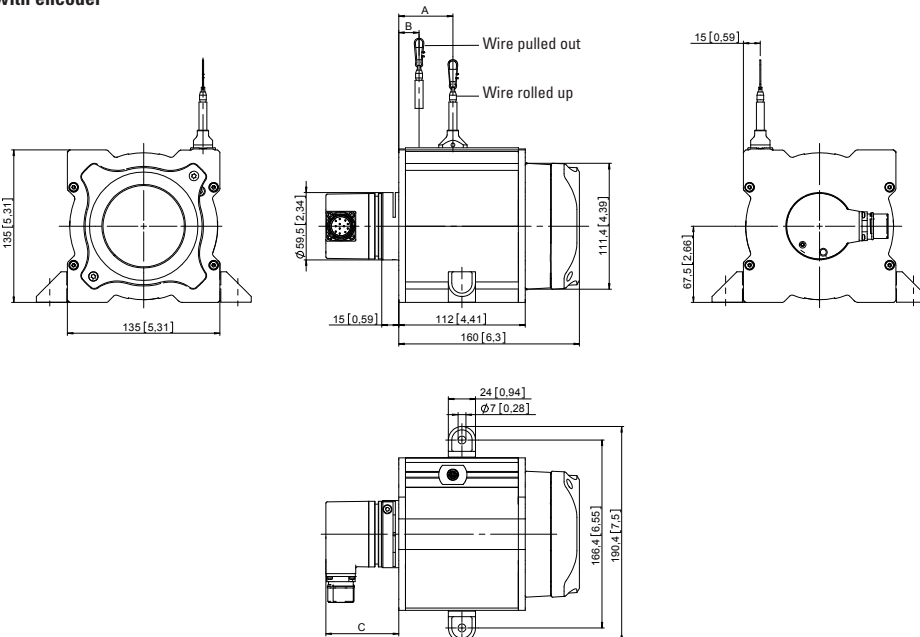
**Draw wire mechanics,
Measuring range 10000 - 12000 mm
with encoder**



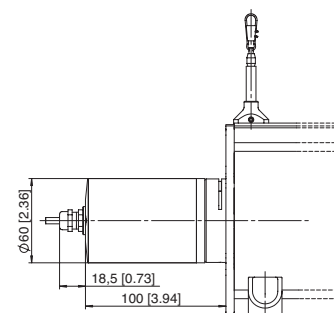
with analogue output



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



with analogue output



| 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] |

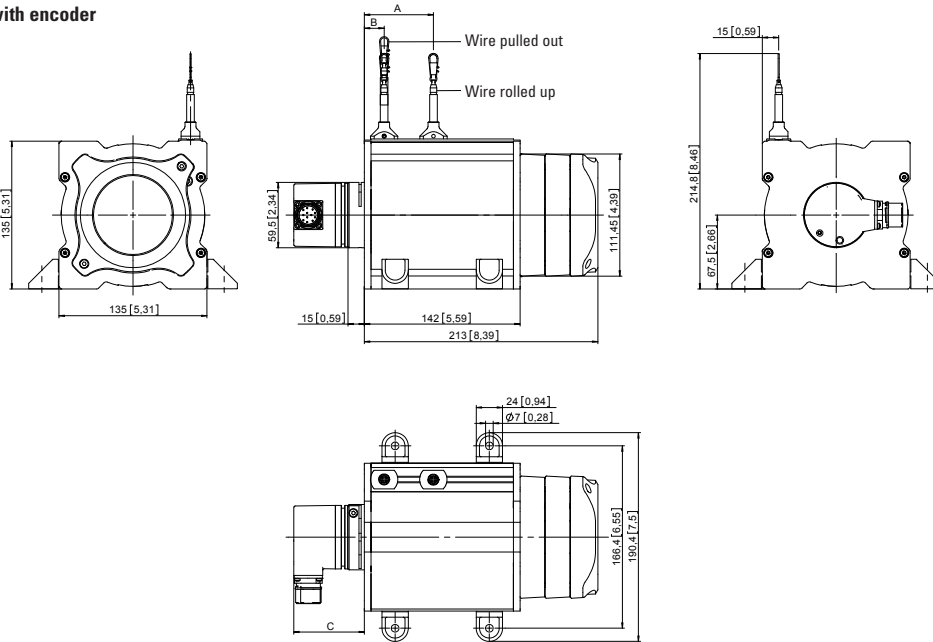
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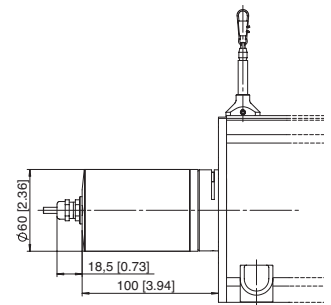
Dimensions

Dimensions in mm [inch]

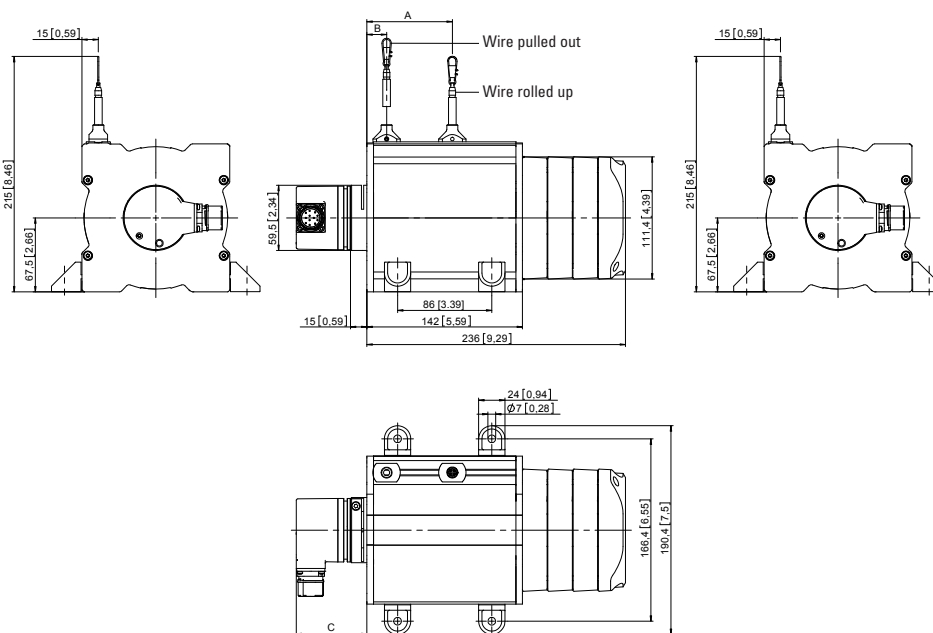
**Draw wire mechanics,
Measuring range 25000 - 30000 mm
with encoder**



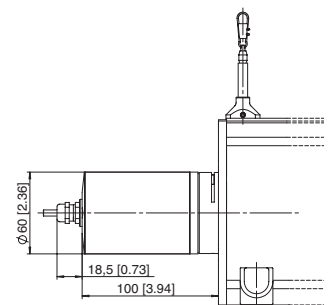
with analogue output



**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] |