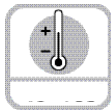


Linear Position Technology

Draw Wire Mechanics with Encoder or Analog Sensor

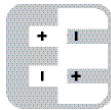
Draw Wire Encoder DW110



Wide temperature range



Shock/vibration resistant



Reverse polarity protection



Robust

- **Corrosion resistant:** Titanium-anodized aluminium housing.
- **High-strength stainless steel draw wire.**
- **Low friction design or wire exit free from wear.** Diamond-polished ceramic guide.
- **Wide temperature range of** -40 to +194 °F (-40 to +90 °C).

Fast

- **High traverse speed.**
- **High acceleration:** Dynamic spring traction by means of a constant force spring.

Versatile

- **Suitable for various sensors/encoders:** Absolute, fieldbus, incremental and analog.
- **Quick mounting:** Fastening by means of two screws.
- **Flexible connection options:** Cable, connector, radial, axial.
- **Linearity up to 0.05%.**

Mechanical Characteristics (Draw Wire Mechanics):

| Measuring range: | 1000 mm | 2000 mm | 3000 mm | |
|--------------------------------|--|------------------------------|------------------------------|-------|
| Extension force | Fmin: (6.9 N) 1.55 lbs | (6.4 N) 1.44 lbs | (6.9 N) 1.55 lbs | |
| | Fmax: (8.3 N) 1.87 lbs | (7.8 N) 1.75 lbs | (9.8 N) 2.20 lbs | |
| Max. speed: | 32.8 ft/s (10 m/s) | 32.8 ft/s (10 m/s) | 32.8 ft/s (10 m/s) | |
| Max. acceleration: | 14 g (140 m/s ²) | 14 g (140 m/s ²) | 14 g (140 m/s ²) | |
| Linearity (of measuring range) | | | | |
| | analog output: | 0.15% | 0.1% | 0.1% |
| | encoder: | 0.05% | 0.05% | 0.05% |
| Weight: | approx. 750 g (depending on the sensor/encoder used) | | | |
| Materials: | housing: titanium-anodized aluminium | | | |
| | wire: stainless steel Ø 0.5 mm | | | |
| Protection (encoder only): | IP65 | | | |

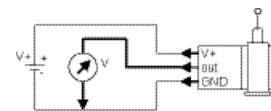
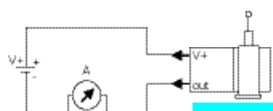
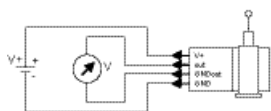
Electrical Characteristics (Digital Output):

The electrical characteristics of the draw wire encoder assembly may be found in the data sheets of the encoder selected.

Electrical Characteristics (Analog Output):

| Analog output [Key Code]: | 0-10 V [8C] | 4-20 mA [7E] | Potentiometer [PA] |
|------------------------------|--|-------------------------------|-------------------------------|
| Output: | 0-10 V galvanically isolated, 4 conductors | 4-20 mA, 2 conductors | 1 kOhm |
| Supply voltage: | 12-30 VDC | 12-30 VDC | max. 30 VDC |
| Recommended slider current: | - | - | < 1 µA |
| Max. current consumption: | 22.5 mA (no load) | 50 mA | - |
| Reverse polarity protection: | yes | yes | - |
| Operating temperature: | -4 to +140 °F (-20 to +60 °C) | -4 to +140 °F (-20 to +60 °C) | -4 to +185 °F (-20 to +85 °C) |

Connection diagrams:



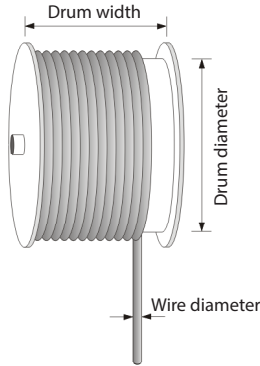
ROHS compliant according to: EU guideline 2011/65/EU

Linear Position Technology

Draw Wire Mechanics with Encoder or Analog Sensor

Draw Wire Encoder DW110

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.

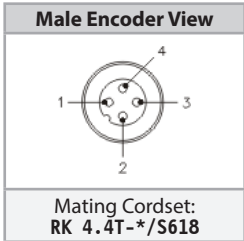
Note:

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

Standard Wiring:

| Pin | Color | 0-10 V | 4-20 mA | 10 kOhm |
|-----|-------|----------|---------|---------|
| 1 | BN | V+ | V+ | V+ |
| 2 | WH | Signal | N/C | Slider |
| 3 | BU | GND | Signal | GND |
| 4 | BK | GND Sig. | N/C | N/C |

Wiring Diagram:



* Length in meters.

Linear Position Technology

Draw Wire Mechanics with Encoder or Analog Sensor

Draw Wire Encoder DW110

Part Number Key: DW110 with Encoder

| A | B | | C | | D | | E | F | | G | | H |
|----|------|---|-----|---|----|---|----|------|---|-------|---|----------|
| DW | 1000 | - | 110 | - | 10 | - | 2B | 1024 | - | H1181 | / | Specials |

| A | Type |
|----|-----------|
| DW | Draw Wire |

| B | Measuring Range* |
|------|--------------------|
| 1000 | 1000 mm Steel Wire |
| 2000 | 2000 mm Steel Wire |
| 3000 | 3000 mm Steel Wire |

*Other Measuring Ranges Available on Request

| C | Housing |
|-----|---------|
| 110 | 80 mm |

| D | Encoder Type |
|----|-------------------------------|
| 10 | RI-10, Incremental |
| 28 | RM-28, SSI |
| 29 | RM-29, CANopen or PROFIBUS-DP |

| E | Voltage Supply and Output Type |
|---|--------------------------------|
| Dependant on Encoder Selected ¹⁾ | |

| F | Pulse Rate/Resolution |
|---|-----------------------|
| Dependant on Encoder Selected ¹⁾ | |

| G | Type of Connection |
|---|--------------------|
| Dependant on Encoder Selected ¹⁾ | |

| H | Specials |
|---|----------|
| Dependant on Encoder Selected ¹⁾ | |

¹⁾ Recommended encodes listed below

Standard resolutions for draw wire with incremental encoder RI-10, drum circumference 200 mm

| | | | |
|----------------------|---------|----------|---------|
| Encoder PPR | 200 | 2000 | 5000 |
| PQ* pulse/revolution | 800 | 8000 | 20,000 |
| Pulses/mm | 4 | 40 | 100 |
| Resolution | 0.25 mm | 0.025 mm | 0.01 mm |

*PQ = Post Quadrature

Standard resolutions for draw wire with absolute encoder RM-28 or RM-29, drum circumference 200 mm

| | | |
|-------------------|--------------|--|
| Absolute encoder | RM-28 | RM-29 |
| Pulses/revolution | 2048/11 bits | 4096, programmable via the bus/12 bits |
| Pulses/mm | 10.24 | 20.48 |
| Resolution | ~0.1 mm | ~0.05 mm |

Example part number key: Standard device with incremental encoder, RI-10

DW****-110-10-2B2000-H1481

The standard device is supplied mounted. The mounted encoder is the incremental **RI-10** encoder, connector axial 8-pin M12 Eurofast, push-pull with inverted signals, supply voltage 10-30 VDC (RI-10T10C-2B2000-H1481)

Example part number key: Standard device with absolute encoder, RM-28 or RM-29

DW****-110-28-3C23B-12M23

Absolute **RM-28** encoder with SSI interface (gray code), 2048 pulses/rev., set key, 10-30 VDC, radial 12-pin M23 Multifast connector (RM-28T10C-3C23B-12M23)

DW****-110-29-9D28B-R2M12

Absolute **RM-29** encoder with CANopen interface, 4096 pulses/rev. programmable via the bus, set key, 10-30 VDC, M12 Eurofast connector (RM-29T10C-9D28B-R2M12)

DW****-110-29-9A28B-R3M12

Absolute **RM-29** encoder with PROFIBUS connection, 4096 pulses/rev. programmable via the bus, set key, 10-30 VDC, M12 Eurofast connector (RM-29T10C-9A28B-R3M12)

Accessories:

- See page H1, Connectivity, for cables and connectors

Draw Wire Encoder DW110

Part Number Key: DW110 with Analog Sensor

| A | B | | C | | D | | E |
|----|------|---|-----|---|----|---|-------|
| DW | 1000 | - | 110 | - | 7E | - | H1441 |

| A | Type |
|----|-----------|
| DW | Draw Wire |

| B | Measuring Range* |
|------|--------------------|
| 1000 | 1000 mm Steel Wire |
| 2000 | 2000 mm Steel Wire |
| 3000 | 3000 mm Steel Wire |

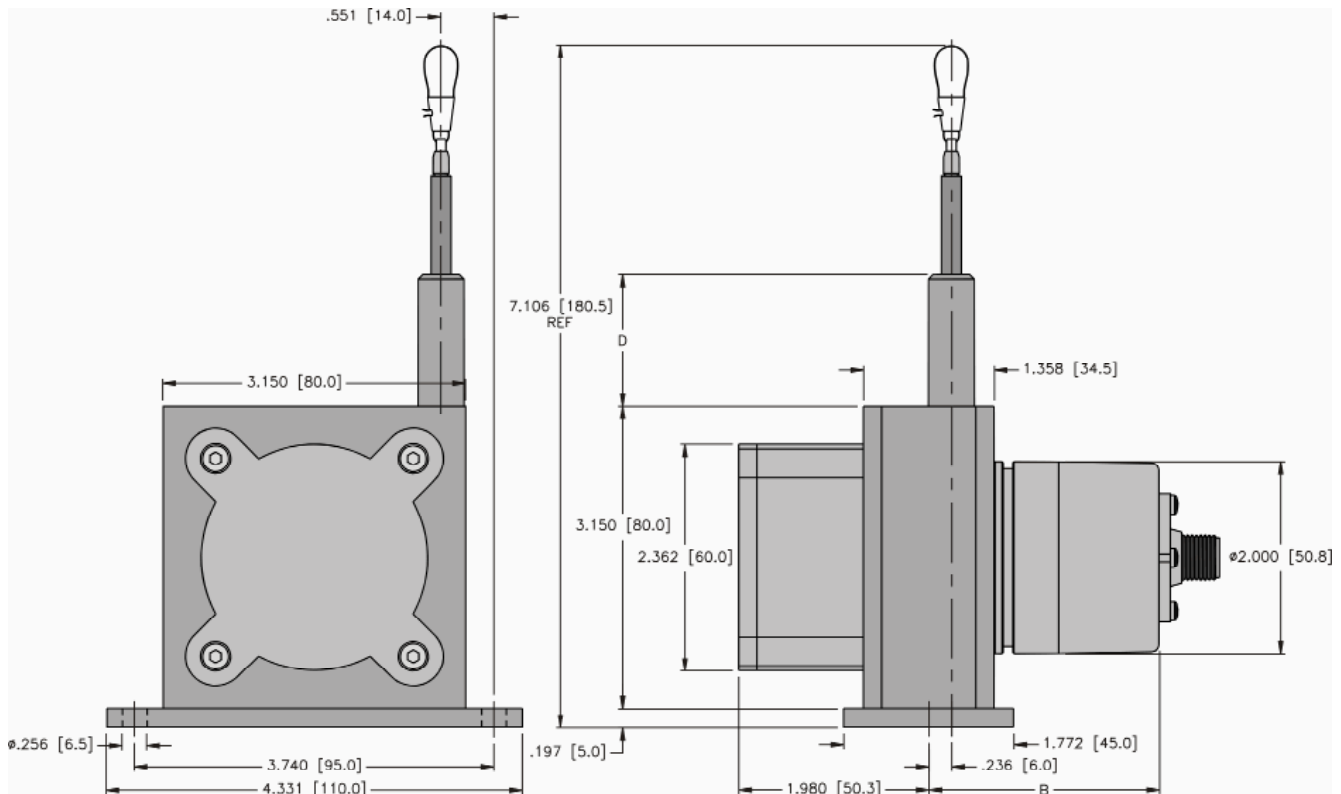
*Other Measuring Ranges Available on Request

| C | Housing |
|-----|---------|
| 110 | 80 mm |

| D | Voltage Supply and Output Type |
|----|---------------------------------|
| 7E | 12-30 VDC, 4-20 mA |
| 8C | 12-30 VDC, 0-10 V |
| PA | 30 VDC max, 1 kΩ, Potentiometer |

| E | Type of Connection |
|-------|------------------------------------|
| H1441 | Axial 4-pin M12 Eurofast Connector |
| CA | Axial Cable (2 m PVC) |

Dimensions: DW110 with Encoder



| Measuring Range | D in. [mm] |
|-----------------|------------|
| 1,000 mm | 0.827 [21] |
| 2,000 mm | 1.378 [35] |
| 3,000 mm | 1.378 [35] |

Dimension B depends on the encoder used

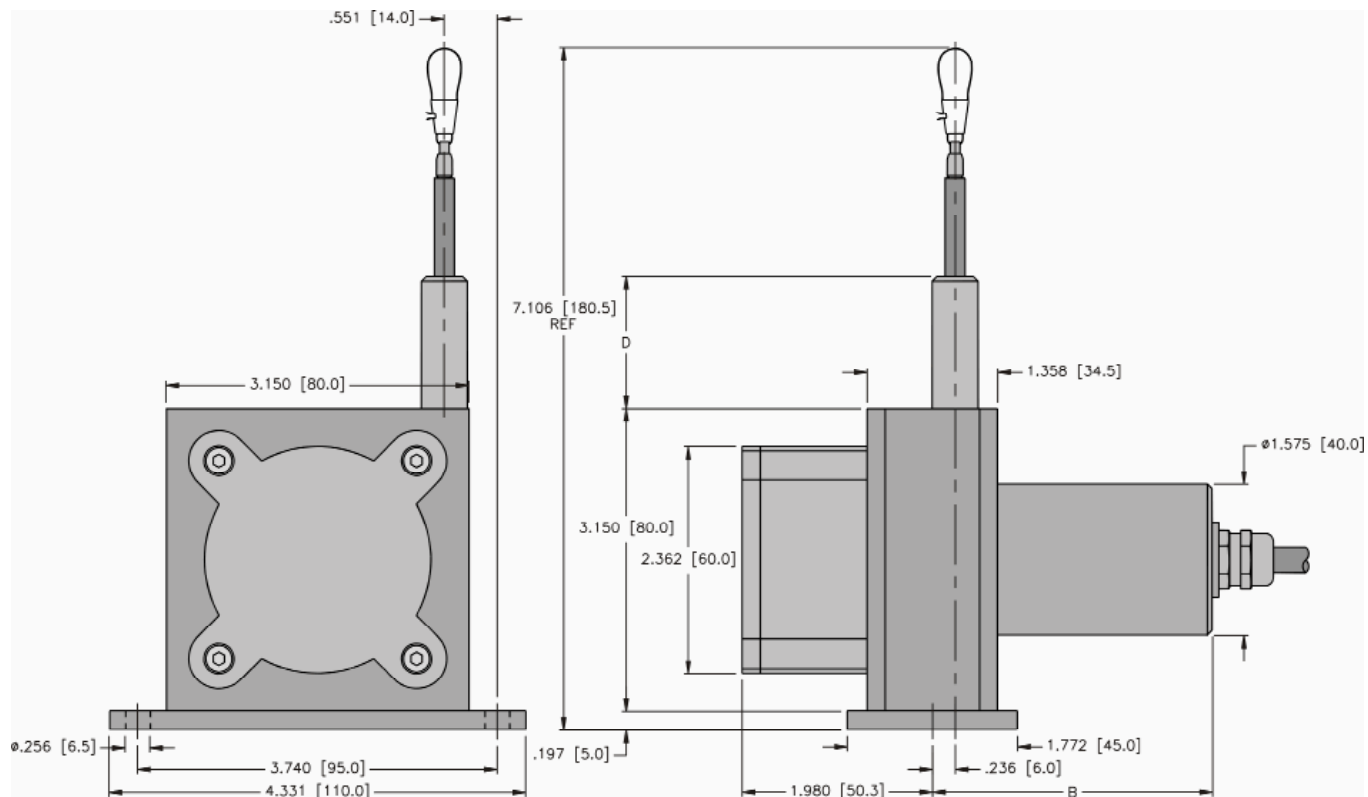
| Encoder | B in. [mm] |
|--|---------------|
| Incremental (RI-10) DW***-110-10-*****_**** | 2.136 [54.25] |
| Absolute (RM-28) DW***-110-28-*****_**** | 2.628 [66.75] |
| Absolute (RM-29) DW***-110-29-*****_**** | 3.671 [93.25] |

Linear Position Technology

Draw Wire Mechanics with Encoder or Analog Sensor

Draw Wire Encoder DW110

Dimensions: DW110 with Analog Sensor



| Sensor Type | Measuring Length | B in. [mm] | C in. [mm] |
|-------------------|------------------|----------------|---------------|
| Potentiometer | 1,000 mm | 2.913 [74] | 0.827 [21] |
| | 2,000 mm | 2.913 [74] | 0.827 [21] |
| | 3,000 mm | 4.026 [102.25] | 1.378 [35] |
| 0-10 V 4-20 mA | 1,000 mm | 3.445 [87.5] | 0.827 [21] |
| | 2,000 mm | 3.445 [87.5] | 0.827 [21] |
| | 3,000 mm | 4.026 [102.25] | 1.378 [35] |

Draw Wire Encoder Accessories

Part Number:
RA-DW-SEC-2M

Description:
2 m steel wire extension

Part Number:
RA-DW-SEC-5M

Description:
5 m steel wire extension

Part Number:
RA-DW-PEC-2M

Description:
2 m para wire extension

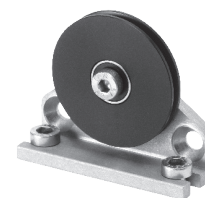
Part Number:
RA-DW-SEC-10M

Description:
10 m steel wire extension



Part Number:
RDR-1

Description:
Guide pulley



Accessories:

- See page H1, Connectivity, for cables and connectors