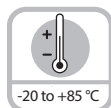


Linear Position Technology

Draw Wire Mechanics with Encoder or Analog Sensor

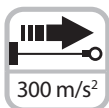
Draw Wire Encoder DW70



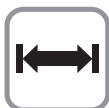
-20 to +85 °C
Wide temperature range



Reverse polarity protection



Maximum acceleration



Long service life



High protection level

Robust

- **Corrosion resistant:** Titanium-anodized aluminium housing.
- **High-strength stainless steel draw wire.**
- **Low friction design.** Diamond-polished ceramic guide.
- **Wide temperature range.**



Analog output

CANopen

SAE J1939

Versatile

- **Suitable for various sensors/encoders:** Absolute encoders with fieldbus interfaces, incremental, and analog.
- **Quick mounting:** Fastening by means of two screws.
- **Flexible connection options:** Cable, M12 connector, radial, axial.
- **Linearity up to 0.02%.**

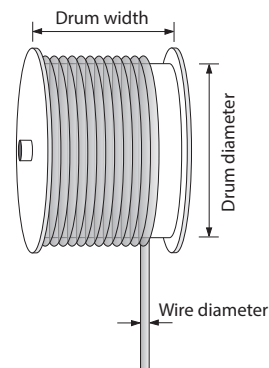
Fast

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

Mechanical Characteristics (Draw Wire Mechanics):

| | | | | |
|---------------------------------|--|--|--|------------------|
| Measuring range: | 250 mm | 500 mm | 1250 mm | |
| Extension force: | Fmin | 1.53 lbs (6.8 N) | 0.76 lbs (3.4 N) | 0.92 lbs (4.1 N) |
| | Fmax | 1.78 lbs (7.9 N) | 0.90 lbs (4.0 N) | 1.21 lbs (5.4 N) |
| Max. speed: | 26.2 ft/s (8 m/s) | 26.2 ft/s (8 m/s) | 32.8 ft/s (10 m/s) | |
| Max. acceleration: | 656.16 ft/s ² (200 m/s ²) | 656.16 ft/s ² (200 m/s ²) | 984.25 ft/s ² (300 m/s ²) | |
| Linearity (of measuring range): | analog sensor | ±0.15% | ±0.15% | ±0.1% |
| | encoder | ±0.05% | ±0.05% | ±0.02% |
| Weight: | approx. 0.72 lbs(330 g) (depending on the sensor/encoder used) | | | |
| Materials: | housing: titanium-anodized aluminium | | | |
| | wire: stainless steel Ø 0.5 mm | | | |
| Protection (encoder only): | IP65 | | | |

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:

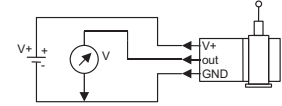
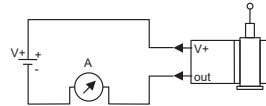
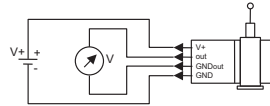
Exceeding the maximum extension length of the draw wire will lead to damage to the wire and the mechanics.

Draw Wire Encoder DW70

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 μ A |
| Max. current consumption: | 22.5 mA (no load) | 50 mA | - |
| Reverse polarity protection: | yes | yes | - |
| Operating temperature: | -4 to +185 °F (-20 to +85 °C) | -4 to +185 °F (-20 to +85 °C) | -4 to +185 °F (-20 to +85 °C) |

Connection diagrams:



ROHS compliant according to EU guideline 2011/65/EU

Electrical Characteristics (Digital Output):

The electrical characteristics of the draw wire encoder assembly may be found in the catalog pages of the encoder selected.

Accessories:

- See page H1, Connectivity, for cables and connectors

Linear Position Technology

Draw Wire Mechanics with Encoder or Analog Sensor

Draw Wire Encoder DW70

Part Number Key: DW70 with Encoder

| A | B | | C | | D | | E | F | | G | | H |
|----|-----|---|----|---|----|---|----|------|---|-------|---|----------|
| DW | 250 | - | 70 | - | 04 | - | 2H | 1250 | - | H1181 | / | Specials |

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

| B | Measuring Range |
|------|--------------------|
| 250 | 250 mm Steel Wire |
| 500 | 500 mm Steel Wire |
| 1250 | 1250 mm Steel Wire |

| C | Housing |
|----|---------|
| 70 | 50 mm |

| D | Encoder Type |
|-----|--------------------------------------|
| 04 | RI-04, Incremental |
| 46 | RM-46, Absolute, SSI |
| 47 | RM-47, Absolute, CANopen |
| 99 | RM-99, Absolute, SSI |
| 101 | RM-101, Absolute, CANopen, SAE J1939 |

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

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

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

¹⁾Recommended encoders listed below

Standard resolutions for draw wire with incremental encoder RI-04

| | | | |
|-------------------------|-----|------|------|
| Drum circumference (mm) | 125 | 125 | 125 |
| Pulses/revolution (ppr) | 125 | 1250 | 2500 |
| Pulses/mm | 1 | 10 | 20 |
| Resolution (mm) | 1 | 0.1 | 0.05 |

Standard resolutions for draw wire with absolute encoder RM-46, RM-47, RM-99 or RM-101, (12-bit ST, programmable via bus)

| | |
|-------------------------|------|
| Drum circumference (mm) | 125 |
| Pulses/revolution (ppr) | 4096 |
| Pulses/mm | 32.8 |
| Resolution (mm) | 0.03 |

Recommended standard variants (with incremental, absolute encoder)

| Draw wire assembly | Mounted encoder | Interface | Power supply | Type of connection | Resolution / Protocol | Option |
|-----------------------------|-------------------------|--------------------------------|--------------|--------------------------|---|--------|
| DWxxxx-70-04-2H1250-C | RI-04Q6S-2H1250-C | Push-pull with inverted signal | 8-30 VDC | Radial cable 2 M | 1250 ppr | - |
| DWxxxx-70-99-3C12S12M-H1181 | RM-99T6S-3C12S12M-H1181 | SSI | 10-30 VDC | Radial M12 connector | 4096 ppr / SSI-Gray-Code | - |
| DWxxxx-70-101-9D38B-H1151 | RM-101T6S-9D38B-H1151 | CANopen | 10-30 VDC | Radial M12 connector | CANopen encoder profile DS406 V4.0 | - |
| DWxxxx-70-101-9F43B-H1151 | RM-101T6S-9F43B-H1151 | SAE J1939 | 10-30 VDC | 1 x radial M12 connector | CAN high-speed acc. to ISO 11898, CAN specification 2.0 B | - |

Other variants (with absolute encoder)

| Draw wire assembly | Mounted encoder | Interface | Power supply | Type of connection | Resolution / Protocol | Option |
|----------------------------|------------------------|-----------|--------------|----------------------|------------------------------------|--------|
| DWxxxx-70-46-3C12S12M-CT1M | RM-46T6S-3C12S12M-CT1M | SSI | 10-30 VDC | Tangential cable 1 M | 4096 ppr / SSI-Gray-Code | - |
| DWxxxx-70-47-9D32B-CT1M | RM-47T6S-9D32B-CT1M | CANopen | 10-30 VDC | Tangential cable 1 M | CANopen encoder profile DS406 V3.2 | - |

Linear Position Technology

Draw Wire Mechanics with Encoder or Analog Sensor

Draw Wire Encoder DW70

Part Number Key: DW70 with Encoder(analog, scalable with limit switch function)

| | | | | | | | | | | | | |
|----|-----|---|----|---|----|---|----|-------|---|-------|---|----------|
| A | B | | C | | D | | E | F | | G | | H |
| DW | 250 | - | 70 | - | 97 | - | 7A | SALNS | - | H1151 | / | Specials |

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

| D | Encoder Type |
|----|-------------------------|
| 97 | RM-97, Absolute, Analog |

| B | Measuring Range |
|------|--------------------|
| 250 | 250 mm Steel Wire |
| 500 | 500 mm Steel Wire |
| 1250 | 1250 mm Steel Wire |

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

| C | Housing |
|----|---------|
| 70 | 50 mm |

| F | Measuring Range |
|---|-----------------|
| Dependent on Encoder Selected ¹⁾ | |

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

¹⁾Recommended encoders listed below

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

| Draw wire assembly | Mounted encoder | Interface | Power supply | Type of connection | Resolution / Protocol | Option |
|----------------------------|------------------------|-----------------|--------------|----------------------|-----------------------|--|
| DWxxxx-70-97-7ASALNS-H1151 | RM-97T6S-7ASALNS-H1151 | Analog, 4-20 mA | 10-30 VDC | Radial M12 connector | 12 Bit / 4-20 mA | scalable without limit switch function ¹⁾ |
| DWxxxx-70-97-8BSALNS-H1151 | RM-97T6S-8BSALNS-H1151 | Analog, 0-10 V | 15-30 VDC | Radial M12 connector | 12 Bit / 0-10 V | scalable without limit switch function ¹⁾ |
| DWxxxx-70-97-7ASALWL-H1151 | RM-97T6S-7ASALWL-H1151 | Analog, 4-20 mA | 10-30 VDC | Radial M12 connector | 12 Bit / 4-20 mA | scalable with limit switch function ²⁾ |
| DWxxxx-70-97-8BSALWL-H1151 | RM-97T6S-8BSALWL-H1151 | Analog, 0-10 V | 15-30 VDC | Radial M12 connector | 12 Bit / 0-10 V | scalable with limit switch function ²⁾ |

¹⁾Sealed to measuring range
²⁾Unsealed

Part Number Key: DW70 with Analog Sensor

| | | | | | | | |
|----|-----|---|----|---|----|---|-------|
| A | B | | C | | D | | E |
| DW | 250 | - | 70 | - | 7E | - | H1441 |

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

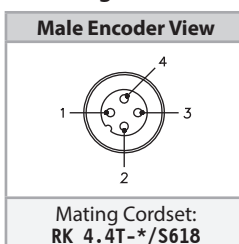
| D | Voltage Supply and Output Type |
|----|---------------------------------|
| 7E | 12-30 VDC, 4-20 mA |
| 8C | 12-30 VDC, 0-10 V |
| PA | 30 VDC max, 1 kΩ, Potentiometer |

| B | Measuring Range |
|------|--------------------|
| 250 | 250 mm Steel Wire |
| 500 | 500 mm Steel Wire |
| 1250 | 1250 mm Steel Wire |

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

| C | Housing |
|----|---------|
| 70 | 50 mm |

Wiring Diagram (Analog Sensor):



Standard Wiring (Analog Sensor):

| Pin | Color | 0-10 V | 4-20 mA | 1 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 |

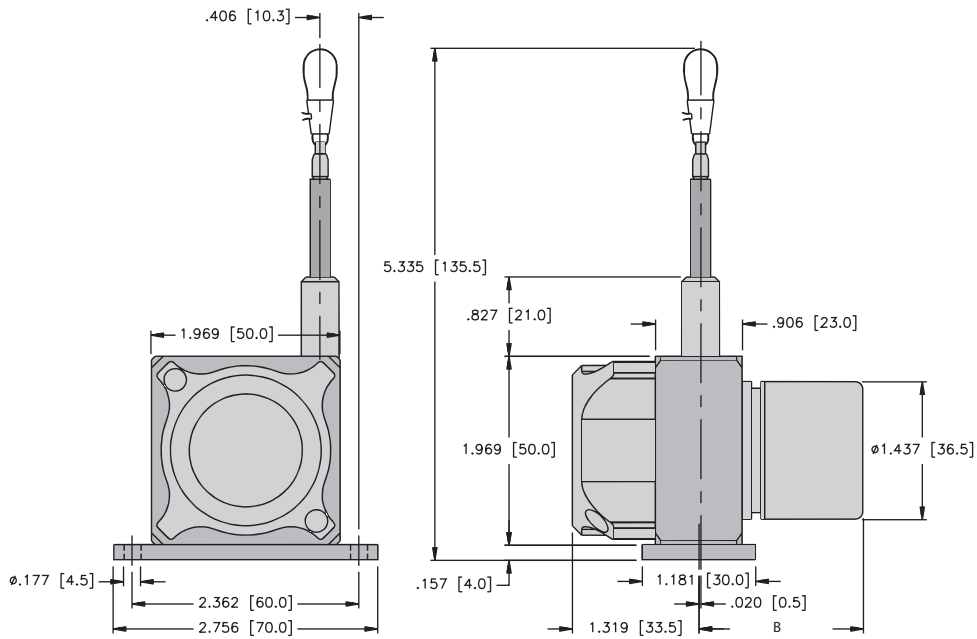
* Length in meters.

Linear Position Technology

Draw Wire Mechanics with Encoder or Analog Sensor

Draw Wire Encoder DW70

Dimensions: DW70 with Encoder

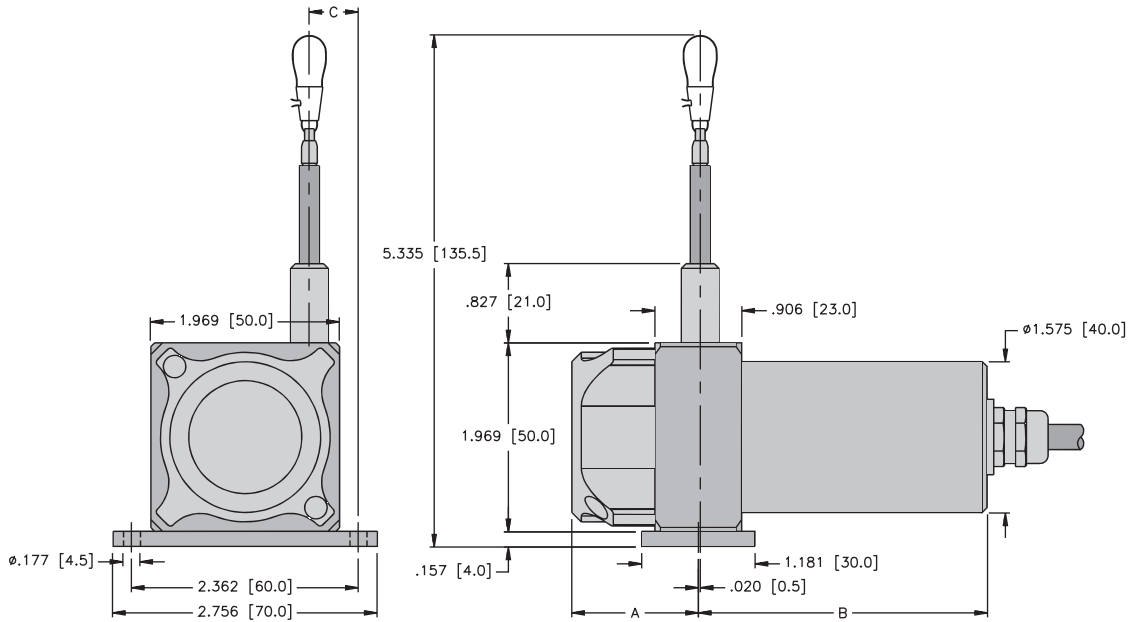


Dimension B depends on the encoder used

| Encoder | Draw wire assembly | B in. [mm] |
|---------------------|----------------------------|--------------|
| Incremental (RI-04) | DW*****-70-09-*****-***** | 1.69 [43.0] |
| Absolute (RM-97) | DW*****-70-97-*****-***** | 2.46 [62.45] |
| Absolute (RM-99) | DW*****-70-99-*****-***** | 2.46 [62.45] |
| Absolute (RM-101) | DW*****-70-101-*****-***** | 2.46 [62.45] |
| Absolute (RM-46) | DW*****-70-46-*****-***** | 2.02 [51.2] |
| Absolute (RM-47) | DW*****-70-47-*****-***** | 2.02 [51.2] |

Draw Wire Encoder DW70

Dimensions: DW70 with Analog Sensor



Linear Position Technology

| Sensor Type | Measuring Length | A in. [mm] | B in. [mm] | C in. [mm] |
|-------------------|------------------|---------------|---------------|---------------|
| Potentiometer | 250 mm | 1.043 [26.5] | 2.559 [65] | 0.840 [21.3] |
| | 500 mm | 1.043 [26.5] | 2.559 [65] | 0.50 [12.75] |
| | 1,250 mm | 1.319 [33.5] | 2.559 [65] | 0.406 [10.3] |
| 0-10 V 4-20 mA | 250 mm | 1.043 [26.5] | 3.091 [78.5] | 0.840 [21.3] |
| | 500 mm | 1.043 [26.5] | 3.091 [78.5] | 0.50 [12.75] |
| | 1,250 mm | 1.319 [33.5] | 3.091 [78.5] | 0.406 [10.3] |