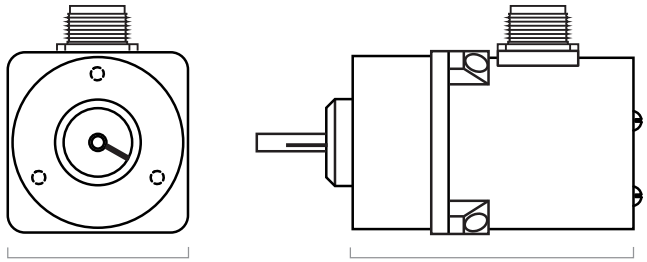
# RT8510

## 0–45° to 0–200 Turns • 0...5, 0...10 Vdc

**Industrial Grade Rotational Position Sensor**
**Absolute Rotary Position up to 200 turns**
**Aluminum or Stainless Steel Enclosure Options**
**IP68 / NEMA 6**

CE




### GENERAL

| | |
|---|---|
| Full Stroke Range Options | 0-0.125 to 0-200 turns |
| Output Signal Options | 0...5, 0...10 Vdc |
| Accuracy | see ordering information |
| Repeatability | ± 0.05% full stroke |
| Resolution | essentially infinite |
| Enclosure Material Options | powder-painted aluminum or stainless steel |
| Sensor | plastic-hybrid precision potentiometer |
| Potentiometer Cycle Life | see ordering information |
| Shaft Loading | up to 10 lbs. radial and 5 lbs. axial |
| Starting Torque (25°C) | 2.0 in-oz., max. |
| Weight, Aluminum (Stainless Steel) Enclosure | 3 lbs. (6 lbs.) max. |

### ELECTRICAL

| | |
|---|---|
| Input Voltage | 14.5-40 VDC (10.5-40 VDC for 0...5 volt output) |
| Input Current | 10 mA max. |
| Output Impedance | 1000 ohms |
| Maximum Load | 5000 ohms. |
| Zero Adjustment | from factory set zero to 50% of full stroke range |
| Span Adjustment | to 50% of factory set span |

### ENVIRONMENTAL

| | |
|---|---|
| Enclosure | NEMA 4/4X/6, IP 67/68 |
| Operating Temperature | -40° to 200°F (-40° to 90°C) |
| Vibration | up to 10 g to 2000 Hz maximum |

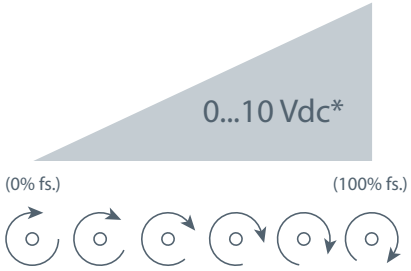
### EMC COMPLIENCE PER DIRECTIVE 89/336/EEC

| | |
|---|---|
| Emission/Immunity | EN50081-2/EN50082-2 |

The RT8510 can operate from an unregulated 14.5 to 40 VDC power supply while providing a regulated output signal over it's full range from 1/8 of a turn up to 200 turns. It provides a 0 - 10 VDC position feedback signal proportional to the rotational position of the shaft

As a member of Celesco's innovative family of NEMA-4/ IP67 rotational transducers, the RT8510 offers numerous benefits including a zero and span adjust and a potentiometric sensor which provides an "absolute" feedback signal that is unaffected by power loss.

Output Signal:




**Optional 0...5 Vdc output signal available.*

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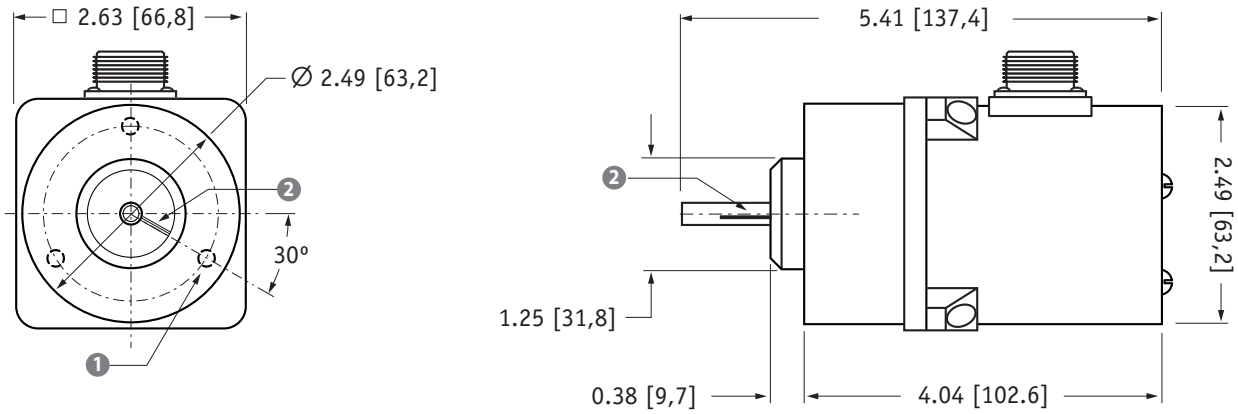
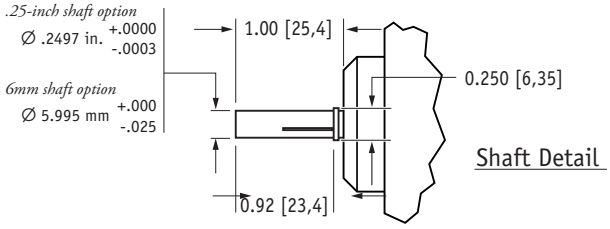
## Outline Drawing:




1 *mounting holes:*
*for .25 in. shaft option, mounting holes are threaded #10-32 x 0.375 deep 120° apart on a 2.00 inch dia. BC*

*for 6mm shaft option, mounting holes are threaded M6 x 9 mm deep 120° apart on a 50,8 mm dia. BC*

2 *reference mark:*
*full counter-clockwise position - align mark on shaft to mark on face for start of measurement range*




Shaft Detail

DIMENSIONS ARE IN INCHES [MM]
tolerances are ±0.02 in. [±0,5 mm] unless otherwise noted

## Ordering Information:

### Model Number:

**RT8510-** ____ Ⓡ **-** ___ Ⓐ Ⓑ Ⓒ **-** 1 Ⓓ Ⓔ Ⓕ 0 Ⓖ

*order code:*

Sample Model Number:

**RT8510 - 0005 - 111 - 1110**

| | | |
|---|---|---|
| Ⓡ | range: | 5 turns (clockwise shaft rotations) |
| Ⓐ | enclosure: | aluminum |
| Ⓑ | shaft diameter: | .25 inches |
| Ⓒ | mounting style: | face mount |
| Ⓔ | output signal: | 0...10 VDC signal increasing clockwise |
| Ⓕ | electrical connection: | 6-pin plastic connector |

### Full Stroke Range:

| Ⓡ *order code:* | R125 | 0R25 | 0R50 | 0001 | 0002 | 0003 | 0005 | 0010 | 0020 |
|---|---|---|---|---|---|---|---|---|---|
| clockwise shaft rotations, min: | 0.125 | 0.25 | 0.50 | 1 | 2 | 3 | 5 | 10 | 20 |
| accuracy (% of f.s.): | 1.25% | 1.25% | 0.5% | 0.5% | 0.5% | 0.2% | 0.2% | 0.15% | 0.15% |
| potentiometer cycle life*: | 2.5 x $10^6$ | 2.5 x $10^6$ | 2.5 x $10^6$ | 2.5 x $10^6$ | 2.5 x $10^6$ | 5 x $10^5$ | 5 x $10^5$ | 2.5 x $10^5$ | 2.5 x $10^5$ |

| Ⓡ *order code:* | 0030 | 0040 | 0050 | 0080 | 0100 | 0120 | 0140 | 0180 | 0200 |
|---|---|---|---|---|---|---|---|---|---|
| clockwise shaft rotations, min: | 30 | 40 | 50 | 80 | 100 | 120 | 140 | 180 | 200 |
| accuracy (% of f.s.): | 0.15% | 0.15% | 0.15% | 0.15% | 0.15% | 0.15% | 0.15% | 0.15% | 0.15% |
| potentiometer cycle life*: | 2.5 x $10^5$ | 2.5 x $10^5$ | 2.5 x $10^5$ | 2.5 x $10^5$ | 2.5 x $10^5$ | 2.5 x $10^5$ | 2.5 x $10^5$ | 2.5 x $10^5$ | 2.5 x $10^5$ |

**–number of times the sensor shaft can be cycled back and forth from beginning to end and back to the beginning before any measurable signal degradation may occur.*

### Enclosure Material:

Ⓐ *order code:*

| 1 | 2 |
|---|---|
| powder-painted aluminum | 303 stainless steel |

### Shaft Diameter:

Ⓑ *order code:*

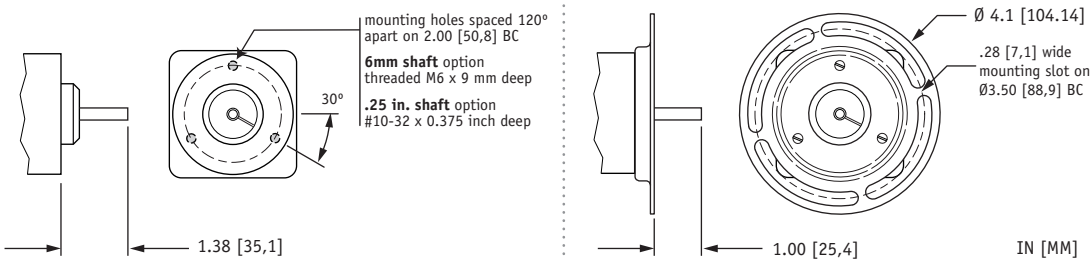
| 1 | 2 | 3 | 4 |
|---|---|---|---|
| 0.25-in. diameter | 6 mm diameter | 0.25-in. dia. w/flats | 6 mm dia. w/flats |

Ordering Information (cont.):

## Mounting Style:

**C** *order code:*

| 1 | 2 |
|---|---|
| face mount | flange mount |




## Output Signals:

**B** *order code:*

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| output signal options: | 0...10 VDC | 10...0 VDC | 0...5 VDC | 5...0 VDC |
| | 0 → 10 | 10 → 0 | 0 → 5 | 5 → 0 |
| | ccw ↺ cw | ccw ↺ cw | ccw ↺ cw | ccw ↺ cw |
| input voltage: | 14.5...40 VDC | | 10.5...40 VDC | |

*Example:*

ordercode = **1** = 0...10 VDC { max ccw ↺ = 0 VDC ; max cw ↻ = 10 VDC

## Electrical Connection:

**F** *order code:*

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| 6-pin plastic connector w/mating plug | 10-ft. [3 M] waterproof cable | 6-pin metal connector w/mating plug | 25-ft. [7.5 M] instrumentation cable |
| **IP 67, NEMA 4X**,6** | **IP 67, NEMA 4X**, 6** | **IP 65, NEMA 4** | **IP 67, NEMA 6** |
| 3.0 in. [78 mm] | | 2.4 in. [60 mm] | |
| 1/2 - 5/16" [14 - 8 mm] cable dia.<br>16 AWG max conductor size<br>connector: MS3102E-14S-6P<br>mating plug: MS3106E-14S-6S | 10 ft. x 0.4-in. dia.<br>[3 M x 10 mm dia.]<br>18 AWG, type SJTW | 3/8-in. [9 mm] max cable dia.<br>16 AWG max conductor size<br>connector: MS3102E-14S-6P<br>mating plug: MS3106E-14S-6S | 25 ft. x 0.2-in. dia.<br>[7,5 M x 5 mm dia.]<br>24 AWG, shielded |

**F** *order code:*

| 5 | 6 | 7 |
|---|---|---|
| 100-ft. [30 M] waterproof cable | 10-ft. [3 M] **pressure tested*** waterproof cable | 100-ft. [30 M] **pressure tested*** waterproof cable |
| **IP 67, NEMA 4X**,6** | **IP 68, NEMA 4X**, 6P** | **IP 68, NEMA 4X**, 6P** |
| 100 ft. x 0.4-in. dia.<br>[30 M x 10 mm dia.]<br>18 AWG, type SJTW | 10 ft. x 0.4-in. dia.<br>[3 M x 10 mm dia.]<br>18 AWG, type SJTW | 100 ft. x 0.4-in. dia.<br>[30 M x 10 mm dia.]<br>18 AWG, type SJTW |

**6-pin Mating Plug**

| pin | signal |
|---|---|
| A | input voltage |
| B | output signal |
| C | common |

*contact view*

**Waterproof Cable**

| color code | signal |
|---|---|
| WHITE | input voltage |
| GREEN | output signal |
| BLACK | common |

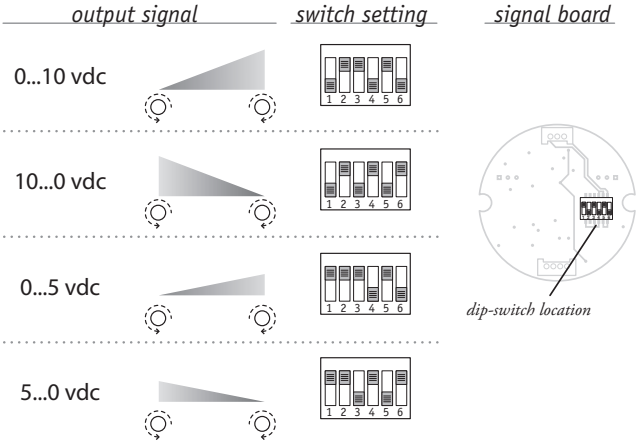
**Instrumentation Cable**

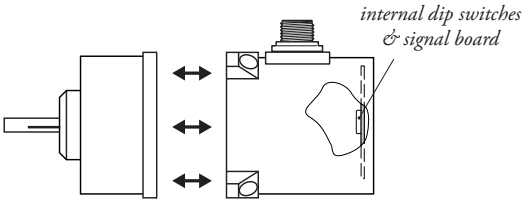
| color code | signal |
|---|---|
| RED | input voltage |
| GREEN | output signal |
| BLACK | common |

*Notes:* { * –*Test pressure: 100 feet [30 meters] $H_2O$ (40 PSID); Test Medium: Air; Duration: 2 hours.*
** –*NEMA 4X applies to stainless steel enclosure only.*

## Output Signal Selection:

The output signal direction can be reversed at any time by simply changing the dip-switch settings found on the internal signal board. After the settings have been changed, adjustment of the Zero and Span trimpots will be required to precisely match signal values to the beginning and end points of the stroke.




To gain access to the signal board, remove four Allen-Head Screws and seperate the two case halves.