

The RT8510 can operate from an unregulated 14.5 to 40 VDC power supply while providing a regulated output signal over its 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.

## 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**

### General

<b>Full Stroke Range</b>	0-0.125 to 0-200 turns
<b>Output Signal Options</b>	0...5, 0...10 Vdc
<b>Accuracy</b>	0.15% to 1.25%, see ordering information
<b>Repeatability</b>	± 0.05% full stroke
<b>Resolution</b>	essentially infinite
<b>Enclosure Material Options</b>	powder-painted aluminum or stainless steel
<b>Sensor</b>	plastic-hybrid precision potentiometer
<b>Potentiometer Cycle Life</b>	see ordering information
<b>Shaft Loading</b>	up to 10 lbs. radial and 5 lbs. axial
<b>Starting Torque (25°C)</b>	2.0 in.-oz., max.
<b>Weight, Aluminum (Stainless Steel) Enclosure</b>	3 lbs. (6 lbs.) max.

### Electrical

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

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

<b>Emission/Immunity</b>	EN50081-2/EN50082-2
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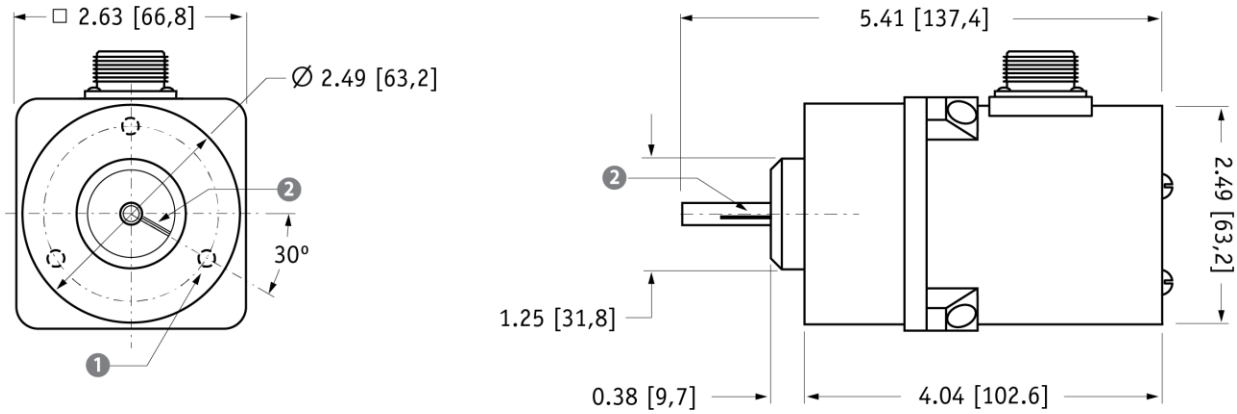
### Environmental

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

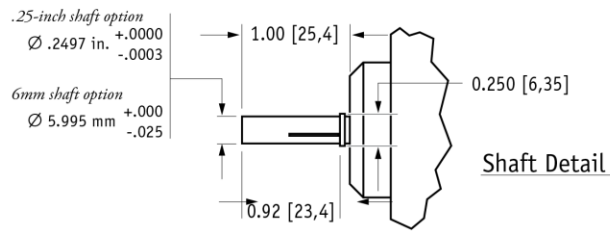
# RT8510

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

## 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



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:      R      A      B      C      D      E      F      G

### Sample Model Number:

**RT8510 - 0005 - 111 - 1110**

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

### Full Stroke Range:

R order code:	R125	OR25	OR50	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 <sup>6</sup>	2.5 x 10 <sup>6</sup>	2.5 x 10 <sup>6</sup>	2.5 x 10 <sup>6</sup>	2.5 x 10 <sup>6</sup>	5 x 10 <sup>5</sup>	5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>

R 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 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>	2.5 x 10 <sup>5</sup>

\*—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.

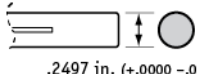
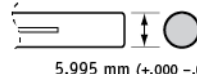


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0–45° to 0–200 Turns • 0...5, 0...10 Vdc

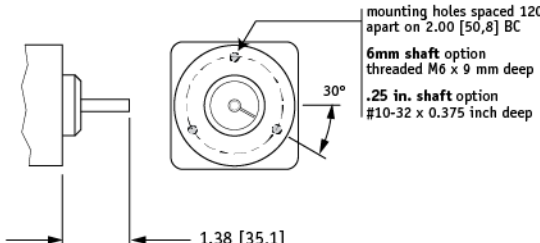
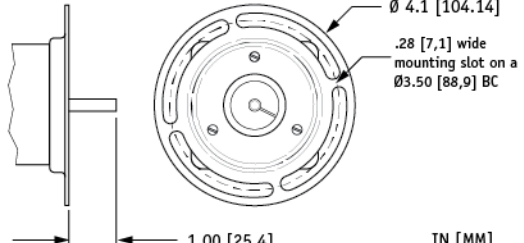
## Enclosure Material:

<b>A</b> order code:	<b>1</b>	<b>2</b>
	powder-painted aluminum	303 stainless steel

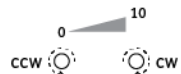
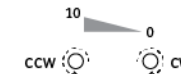
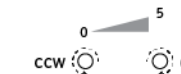
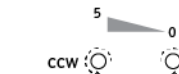
## Shaft Diameter:

<b>B</b> order code:	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
	0.25-in. diameter	6 mm diameter	0.25-in. dia. w/flats	6 mm dia. w/flats
				
	.2497 in. (+.0000 -0.0003)	5.995 mm (+.000 -0.025)	0.33 in. 0.025 in.	8.4 mm 0.64 mm

## Mounting Style:



<b>C</b> order code:	<b>1</b>	<b>2</b>
	face mount	flange mount
		
	1.38 [35,1]	1.00 [25,4]
	mounting holes spaced 120° apart on 2.00 [50,8] BC 6mm shaft option threaded M6 x 9 mm deep .25 in. shaft option #10-32 x 0.375 inch deep	Ø 4.1 [104.14] .28 [7,1] wide mounting slot on a Ø3.50 [88,9] BC
		IN [MM]

## Output Signals:

<b>D</b> order code:	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
output signal options:	0...10 VDC	10...0 VDC	0...5 VDC	5...0 VDC
				
input voltage:	14.5...40 VDC		10.5...40 VDC	

Example:

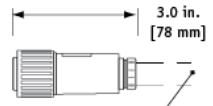
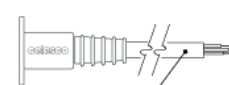
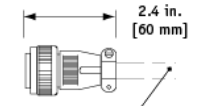

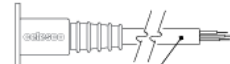
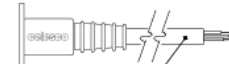
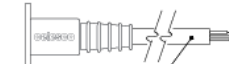

ordercode = **1** = 0...10 VDC

 = 0 VDC     
  = 10 VDC

# RT8510

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



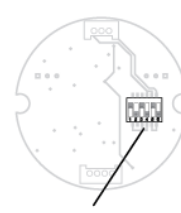






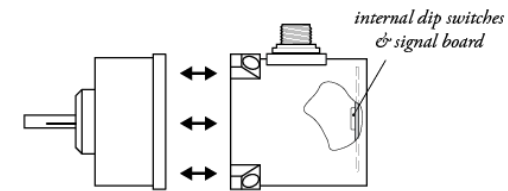
## Electrical Connection:

<p><b>1</b></p> <p><b>order code:</b></p> <p>6-pin plastic connector w/mating plug <b>IP 67, NEMA 4X**, 6</b></p>  <p>3.0 in. [78 mm]</p> <p>1/2 - 5/16" [14 - 8 mm] cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S</p>	<p><b>2</b></p> <p>10-ft. [3 M] waterproof cable <b>IP 67, NEMA 4X**, 6</b></p>  <p>10 ft. x 0.4-in. dia. [3 M x 10 mm dia.] 18 AWG, type SJTW</p>	<p><b>3</b></p> <p>6-pin metal connector w/mating plug <b>IP 65, NEMA 4</b></p>  <p>2.4 in. [60 mm]</p> <p>3/8-in. [9 mm] max cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S</p>	<p><b>4</b></p> <p>25-ft. [7.5 M] instrumentation cable <b>IP 67, NEMA 6</b></p>  <p>25 ft. x 0.2-in. dia. [7,5 M x 5 mm dia.] 24 AWG, shielded</p>																												
<p><b>5</b></p> <p><b>order code:</b></p> <p>100-ft. [30 M] waterproof cable <b>IP 67, NEMA 4X**, 6</b></p>  <p>100 ft. x 0.4-in. dia. [30 M x 10 mm dia.] 18 AWG, type SJTW</p>	<p><b>6</b></p> <p>10-ft. [3 M] <b>pressure tested*</b> waterproof cable <b>IP 68, NEMA 4X**, 6P</b></p>  <p>10 ft. x 0.4-in. dia. [3 M x 10 mm dia.] 18 AWG, type SJTW</p>	<p><b>7</b></p> <p>100-ft. [30 M] <b>pressure tested*</b> waterproof cable <b>IP 68, NEMA 4X**, 6P</b></p>  <p>100 ft. x 0.4-in. dia. [30 M x 10 mm dia.] 18 AWG, type SJTW</p>																													
<p><b>6-pin Mating Plug</b></p> <table border="0"> <tr> <td>pin</td> <td>signal</td> </tr> <tr> <td>A</td> <td>input voltage</td> </tr> <tr> <td>B</td> <td>output signal</td> </tr> <tr> <td>C</td> <td>common</td> </tr> </table>  <p>contact view</p>		pin	signal	A	input voltage	B	output signal	C	common	<table border="0"> <tr> <td colspan="2"><b>Waterproof Cable</b></td> <td colspan="2"><b>Instrumentation Cable</b></td> </tr> <tr> <td>color code</td> <td>signal</td> <td>color code</td> <td>signal</td> </tr> <tr> <td>WHITE</td> <td>input voltage</td> <td>RED</td> <td>input voltage</td> </tr> <tr> <td>GREEN</td> <td>output signal</td> <td>GREEN</td> <td>output signal</td> </tr> <tr> <td>BLACK</td> <td>common</td> <td>BLACK</td> <td>common</td> </tr> </table>		<b>Waterproof Cable</b>		<b>Instrumentation Cable</b>		color code	signal	color code	signal	WHITE	input voltage	RED	input voltage	GREEN	output signal	GREEN	output signal	BLACK	common	BLACK	common
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Notes: { \* -Test pressure: 100 feet [30 meters] H<sub>2</sub>O (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.

<u>output signal</u>	<u>switch setting</u>	<u>signal board</u>	
0...10 vdc			 <p>dip-switch location</p>
10...0 vdc			
0...5 vdc			
5...0 vdc			
			 <p>internal dip switches &amp; signal board</p> <p>To gain access to the signal board, remove four Allen-Head Screws and separate the two case halves.</p>

## RT8510

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

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