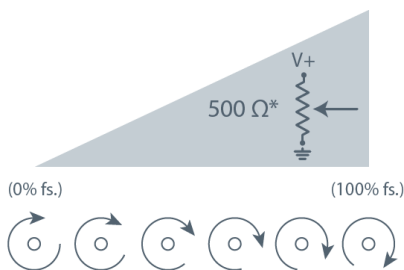


Celesco's model RT8101 provides a voltage feedback signal for rotational position. The sensing element of this device is a precision plastic-hybrid potentiometer which provides superb linearity and resolution.

The RT8101 provides extended rotational position feedback from as little as 1/8 of a turn f.s. all the way up to 200 turns f.s. Because the sensor is potentiometric, the RT8101 is absolute and will maintain position information even after a loss of power.

### Output Signal



\*—1K, 5K, 10K-ohm and bridge circuit also available. see ordering info.

## RT8101

0–45° to 0–200 Turns • Voltage Divider

**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>                        | voltage divider (potentiometer)            |
| <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 Resistance Options</b>                    | see ordering information         |
| <b>Power Rating, Watt</b>                          | 2.0 at 70°F derated to 0 at 250° |
| <b>Recommended Maximum Input Voltage</b>           | 30 V (AC/DC)                     |
| <b>Output Signal Change Over Full Stroke Range</b> | 94% ±4% of input voltage         |

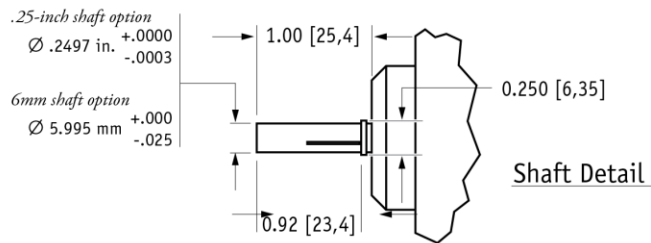
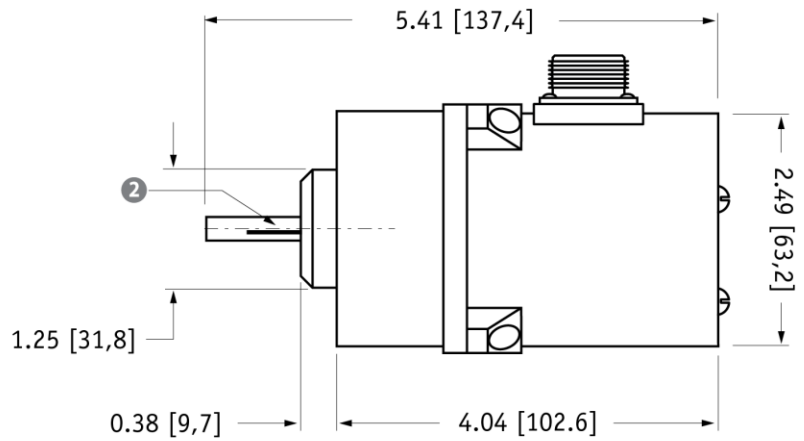
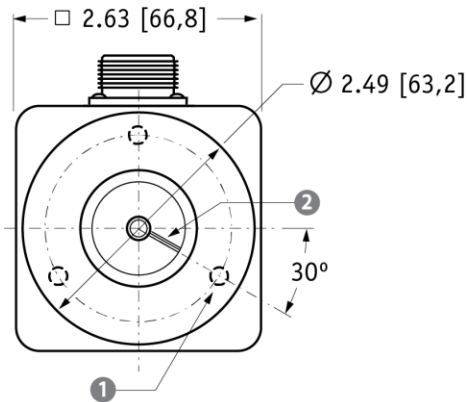
### Environmental

|                              |                               |
|------------------------------|-------------------------------|
| <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 |

# RT8101

0–45° to 0–200 Turns • Voltage Divider

## Outline Drawing



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

- 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

## Ordering Information

### Model Number:

**RT8101-** \_\_\_\_\_ **1** **0**  
order code:      **R**      **A**      **B**      **C**      **D**      **E**      **F**      **G**

### Sample Model Number:

**RT8101 - 0005 - 111 - 1110**

- R** range: 5 turns (clockwise shaft rotations)
- A** enclosure: aluminum
- B** shaft diameter: .25 inches
- C** mounting style: face mount
- D** output signal: 500 ohm potentiometer
- F** electrical connection: 6-pin plastic connector

### Full Stroke Range:

| <b>R</b> order code:            | <b>R125</b>           | <b>0R25</b>           | <b>0R50</b>           | <b>0001</b>           | <b>0002</b>           | <b>0003</b>         | <b>0005</b>         | <b>0010</b>           | <b>0020</b>           |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------|---------------------|-----------------------|-----------------------|
| 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> |

| <b>R</b> order code:            | <b>0030</b>           | <b>0040</b>           | <b>0050</b>           | <b>0080</b>           | <b>0100</b>           | <b>0120</b>           | <b>0140</b>           | <b>0180</b>           | <b>0200</b>           |
|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 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.





# RT8101

0–45° to 0–200 Turns • Voltage Divider

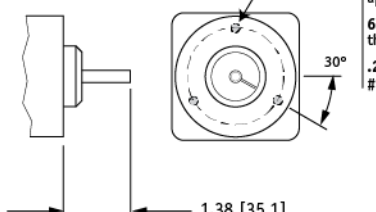
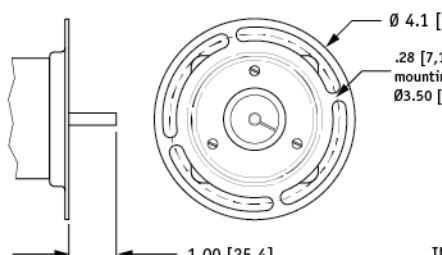
## Enclosure Material:

|                      |                         |                     |
|----------------------|-------------------------|---------------------|
| <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  |

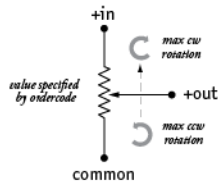
## Mounting Style:

|                      |   |   |
|----------------------|---|---|
| <b>C</b> order code: | <b>1</b>  | <b>2</b>  |
|                      | face mount  | flange mount  |
|                      |   |  |
|                      | 1.38 [35,1]   | 1.00 [25,4]   |
|                      | <p>mounting holes spaced 120° apart on 2.00 [50,8] BC</p> <p>6mm shaft option threaded M6 x 9 mm deep</p> <p>.25 in. shaft option #10-32 x 0.375 inch deep</p> <p>30°</p> | <p>Ø 4.1 [104.14]</p> <p>.28 [7,1] wide mounting slot on a Ø3.50 [88,9] BC</p>      |
|                      |   | IN [MM]   |

## Output Signals:

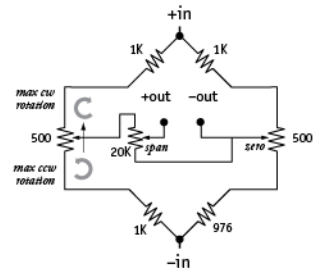
|                      |            |  |           |             |                                 |
|----------------------|------------|--|-----------|-------------|---------------------------------|
| <b>D</b> order code: | <b>1</b>   | <b>2</b>   | <b>3</b>  | <b>4</b>    | <b>5</b>                        |
|                      | 500 ohm*   | 1000 ohm*  | 5000 ohm* | 10,000 ohm* | adjustable bridge (0...30 mV/V) |
| available ranges:    | all ranges | not available for .125-turn (R125) and .25-turn (OR25) range options |           |             |                                 |
|                      |            |  |           |             | *tolerance = ±10%               |

options 1, 2, 3, 4



adjustable bridge option

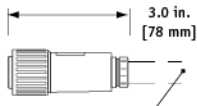
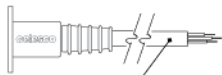
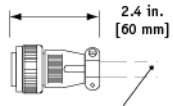

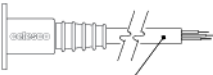
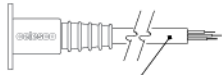
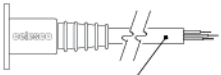

full scale output: adjustable from 0 to 30mV/V  
zero adjust: to 50% of full stroke



# RT8101

0-45° to 0-200 Turns • Voltage Divider

## Electrical Connection:

| <p><b>1</b></p> <p><b>order code:</b></p> <p>6-pin plastic connector w/mating plug<br/><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.<br/>16 AWG max conductor size<br/>connector: MS3102E-14S-6P<br/>mating plug: MS3106E-14S-6S</p>   | <p><b>2</b></p> <p>10-ft. [3 M] waterproof cable<br/><b>IP 67, NEMA 4X**, 6</b></p>  <p>10 ft. x 0.4-in. dia. [3 M x 10 mm dia.]<br/>18 AWG, type SJTW</p>                          | <p><b>3</b></p> <p>6-pin metal connector w/mating plug<br/><b>IP 65, NEMA 4</b></p>  <p>2.4 in. [60 mm]</p> <p>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</p> | <p><b>4</b></p> <p>25-ft. [7.5 M] instrumentation cable<br/><b>IP 67, NEMA 6</b></p>  <p>25 ft. x 0.2-in. dia. [7.5 M x 5 mm dia.]<br/>24 AWG, shielded</p> |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
|--|--|--|--|--------|---|------|------|---|--------|------|---|-------|-------|---|---|-------|--|--|------------|----------|--------|-------|------|-----|-------|--------|-----|-------|-------|-----|------------|----------|--------|-----|------|------|-------|--------|------|-------|-------|-------|-------|---|-------|
| <p><b>5</b></p> <p><b>order code:</b></p> <p>100-ft. [30 M] waterproof cable<br/><b>IP 67, NEMA 4X**, 6</b></p>  <p>100 ft. x 0.4-in. dia. [30 M x 10 mm dia.]<br/>18 AWG, type SJTW</p>  | <p><b>6</b></p> <p>10-ft. [3 M] <b>pressure tested*</b> waterproof cable<br/><b>IP 68, NEMA 4X**, 6P</b></p>  <p>10 ft. x 0.4-in. dia. [3 M x 10 mm dia.]<br/>18 AWG, type SJTW</p> | <p><b>7</b></p> <p>100-ft. [30 M] <b>pressure tested*</b> waterproof cable<br/><b>IP 68, NEMA 4X**, 6P</b></p>  <p>100 ft. x 0.4-in. dia. [30 M x 10 mm dia.]<br/>18 AWG, type SJTW</p>  |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| <p><b>6-pin Mating Plug</b></p> <table border="1"> <thead> <tr> <th>pin</th> <th>standard</th> <th>bridge</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>+ in</td> <td>+ in</td> </tr> <tr> <td>B</td> <td>common</td> <td>- in</td> </tr> <tr> <td>C</td> <td>+ out</td> <td>- out</td> </tr> <tr> <td>D</td> <td>-</td> <td>+ out</td> </tr> </tbody> </table>  <p>contact view</p> |  | pin  | standard   | bridge | A | + in | + in | B | common | - in | C | + out | - out | D | - | + out | <p><b>Waterproof Cable</b></p> <table border="1"> <thead> <tr> <th>color code</th> <th>standard</th> <th>bridge</th> </tr> </thead> <tbody> <tr> <td>WHITE</td> <td>+ in</td> <td>n/a</td> </tr> <tr> <td>BLACK</td> <td>common</td> <td>n/a</td> </tr> <tr> <td>GREEN</td> <td>+ out</td> <td>n/a</td> </tr> </tbody> </table> <p><b>Instrumentation Cable</b></p> <table border="1"> <thead> <tr> <th>color code</th> <th>standard</th> <th>bridge</th> </tr> </thead> <tbody> <tr> <td>RED</td> <td>+ in</td> <td>+ in</td> </tr> <tr> <td>BLACK</td> <td>common</td> <td>- in</td> </tr> <tr> <td>GREEN</td> <td>+ out</td> <td>+ out</td> </tr> <tr> <td>WHITE</td> <td>-</td> <td>- out</td> </tr> </tbody> </table> |  | color code | standard | bridge | WHITE | + in | n/a | BLACK | common | n/a | GREEN | + out | n/a | color code | standard | bridge | RED | + in | + in | BLACK | common | - in | GREEN | + out | + out | WHITE | - | - out |
| pin  | standard   | bridge   |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| A  | + in   | + in   |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| B  | common   | - in   |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| C  | + out  | - out  |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| D  | -  | + out  |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| color code   | standard   | bridge   |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| WHITE  | + in   | n/a  |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| BLACK  | common   | n/a  |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| GREEN  | + out  | n/a  |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| color code   | standard   | bridge   |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| RED  | + in   | + in   |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| BLACK  | common   | - in   |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| GREEN  | + out  | + out  |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |
| WHITE  | -  | - out  |  |        |   |      |      |   |        |      |   |       |       |   |   |       |  |  |            |          |        |       |      |     |       |        |     |       |       |     |            |          |        |     |      |      |       |        |      |       |       |       |       |   |       |

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.

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### TE.com/sensorsolutions

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RT8101 12/01/2015