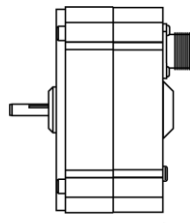


4.5" [114 mm]

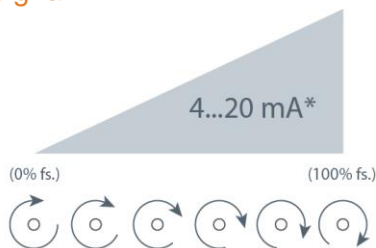


2.4" [59 mm]

The RT9420 provides rotational position feedback via 4...20 mA current loop signal. This device combines the superb linearity and resolution of a plastic-hybrid potentiometer and the durability of Celesco's 4...20mA circuit to provide an accurate and reliable electrical signal. Additionally the zero and span settings are adjustable through access holes in the housing.

This innovative sensor from Celesco, designed to meet NEMA-4 and IP67 standards, is available in full stroke ranges of 1/4 to 50 turns.

### Output Signal



\*Optional 3-wire, 0...20mA output signal available.

## RT9420

0–90° to 0–50 Turns • 0..20mA • 4..20mA

**Industrial Grade Rotational Position Sensor**  
**Absolute Rotary Position up to 50 turns**  
**Aluminum or Stainless Steel Enclosure Options**  
**IP68 / NEMA 6 • Hazardous Area Certification**

### General

<b>Full Stroke Range</b>	0-0.25 to 0-50 turns
<b>Output Signal Options</b>	4...20 mA (2-wire) and 0...20 mA (3-wire)
<b>Accuracy</b>	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 35 lbs. radial and 5 lbs. axial
<b>Weight, Aluminum (Stainless Steel) Enclosure</b>	5 lbs. (10 lbs.) max.

### Electrical

<b>Input Voltage</b>	see ordering information
<b>Input Current</b>	20 mA max.
<b>Maximum Loop Resistance (Load)</b>	(loop supply voltage - 8)/0.020
<b>Circuit Protection</b>	38 mA max.
<b>Impedance</b>	100M ohms@100 VDC, min.
<b>Output Signal Adjustment</b>	
<b>Zero Adjustment</b>	from factory set zero to 50% of full stroke range
<b>Span Adjustment</b>	to 50% of factory set span
<b>Thermal Effects, Zero</b>	0.01% f.s./°F, max.
<b>Thermal Effects, Span</b>	0.01% f.s./°F, max.

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

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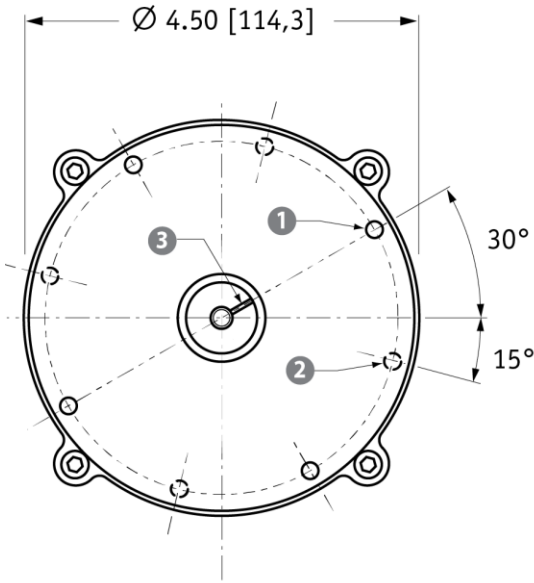
### Environmental

<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

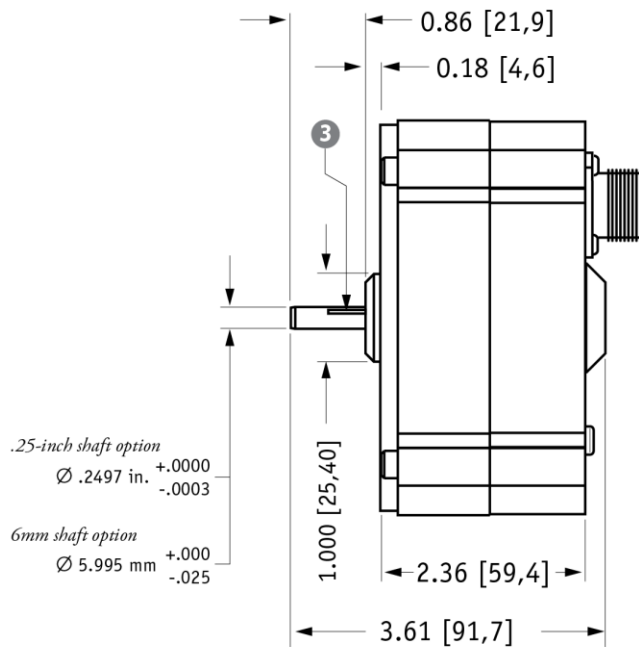
# RT9420

0–90° to 0–50 Turns • 0..20mA • 4..20mA

## Outline Drawing



- 1 mounting holes for .25-inch shaft diameter option  
#8-32 x 0.180 @ 90° apart on a 4.15 in. dia. BC (4 places)
- 2 mounting holes for 6-mm shaft diameter option  
M4 x 4,5 mm @ 90° apart on a 105,4 mm dia. BC (4 places)
- 3 reference mark  
full counter-clockwise position - align mark on shaft to mark on face for start of measurement range



.25-inch shaft option  
Ø .2497 in. +.0000  
-.0003

6mm shaft option  
Ø 5.995 mm +.000  
-.025

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

## Ordering Information

### Model Number:

**RT9420-** \_\_\_\_\_ **1 - 1 0**

order code:      R      A      B      C      D      E      F      G

### Sample Model Number:

**RT9420 - 0005 - 111 - 1110**

- R range: 5 turns (clockwise shaft rotations)
- A enclosure: aluminum
- B shaft diameter: .25 inches
- F output signal: 4..20 mA signal increasing clockwise
- F electrical connection: 6-pin plastic connector

### Full Stroke Range:

R order code:	R125	0R25	0R50	0001	0002	0003	0005	0010	0020	0030	0050
clockwise shaft rotations, min:	0.125	0.25	0.50	1	2	3	5	10	20	30	50
accuracy (% of f.s.):	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.15%	0.15%	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>	2.5 x 10 <sup>6</sup>	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.

### Enclosure Material:

A order code:      **1**      **2**

powder-painted aluminum      303 stainless steel

### Shaft Diameter:

B order code:      **1**      **2**      **3**      **4**

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

# RT9420

0–90° to 0–50 Turns • 0...20mA • 4...20mA

## Output Signals:

Order code:	1	2	3	4	5*	6*
output signal options:	4...20 mA 	20...4 mA 	0...20 mA 	20...0 mA 	4...20 mA 	20...4 mA 
sensitivity:	16 mA/full stroke ±0.25%		20 mA/full stroke ±0.25%		16 mA/full stroke ±0.25%	
wiring configuration:	2 – wire		3 – wire		2 – wire	
input voltage:	8 – 34 vdc		14 – 29 vdc		14 – 32 vdc	
hazardous area certification:	not certified		not certified		CSA • Cenelec	

<i>Example:</i>	ordercode = 1 = 4...20 mA	max ccw max cw	= 4 mA = 20 mA	<b>Hazardous Area Certifications:</b> CSA Standard 22.2 Class 1 Groups A, B, C and D Cenelec LCIE EEx ia IIC T4
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*\*IMPORTANT: intrinsically safe when powered from a CSA certified zener barrier rated 28 VDC max, 110 mA max per installation drawing#677984*

## Electrical Connection:

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

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

	<b>6-pin Mating Plug</b> <table border="0"> <tr> <td>pin</td> <td>2-wire</td> <td>3-wire</td> </tr> <tr> <td>A</td> <td>8...34 vdc***</td> <td>14...29 vdc common</td> </tr> <tr> <td>B</td> <td>4...20 mA out</td> <td>0...20 mA out</td> </tr> <tr> <td>C</td> <td>-</td> <td>-</td> </tr> <tr> <td>D</td> <td>case ground</td> <td>-</td> </tr> </table>	pin	2-wire	3-wire	A	8...34 vdc***	14...29 vdc common	B	4...20 mA out	0...20 mA out	C	-	-	D	case ground	-	<b>Waterproof Cable</b> <table border="0"> <tr> <td>color code</td> <td>2-wire</td> <td>3-wire</td> </tr> <tr> <td>WHITE</td> <td>8...34 vdc***</td> <td>14...29 vdc common</td> </tr> <tr> <td>BLACK</td> <td>4...20 mA out</td> <td>0...20 mA out</td> </tr> <tr> <td>GREEN</td> <td>case ground</td> <td>-</td> </tr> </table>	color code	2-wire	3-wire	WHITE	8...34 vdc***	14...29 vdc common	BLACK	4...20 mA out	0...20 mA out	GREEN	case ground	-	<b>Instrumentation Cable</b> <table border="0"> <tr> <td>color code</td> <td>2-wire</td> <td>3-wire</td> </tr> <tr> <td>RED</td> <td>8...34 vdc***</td> <td>14...29 vdc common</td> </tr> <tr> <td>BLACK</td> <td>4...20 mA out</td> <td>n/a</td> </tr> <tr> <td>WHITE</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>GREEN</td> <td>case ground</td> <td>0...20 mA out</td> </tr> </table>	color code	2-wire	3-wire	RED	8...34 vdc***	14...29 vdc common	BLACK	4...20 mA out	n/a	WHITE	n/a	n/a	GREEN	case ground	0...20 mA out
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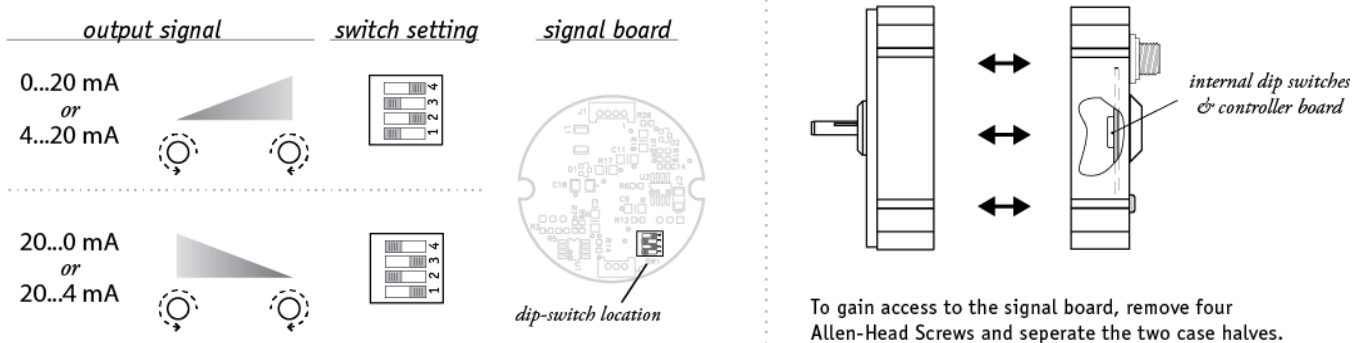
Notes: { \* –Test pressure: 100 feet [30 meters] H<sub>2</sub>O (40 PSID); Test Medium: Air; Duration: 2 hours.  
 \*\* –NEMA 4X applies to stainless steel enclosure only.  
 \*\*\* –14-32 VDC for hazardous area option.

## RT9420

0–90° to 0–50 Turns • 0..20mA • 4..20mA

### 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.



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RT9420 12/01/2015