

# Rotational Position Transducer

0/4...20 mA Output • Hazardous Area Certification  
Ranges: 0-90° to 0-50 Turns  
Industrial Grade



# RT9420

## Specification Summary:

### GENERAL

Full Stroke Range Options ..... 0-0.125 to 0-50 turns  
Output Signal Options ..... 4...20 mA (2-wire) and 0...20 mA (3-wire)  
Accuracy .....  $\pm 0.30\%$  to  $\pm 0.15\%$  full stroke *see ordering information*  
Repeatability .....  $\pm 0.05\%$  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 35 lbs. radial and 5 lbs. axial  
Weight, Aluminum (Stainless Steel) Enclosure ..... 5 lbs. (10 lbs.) max.

### ELECTRICAL

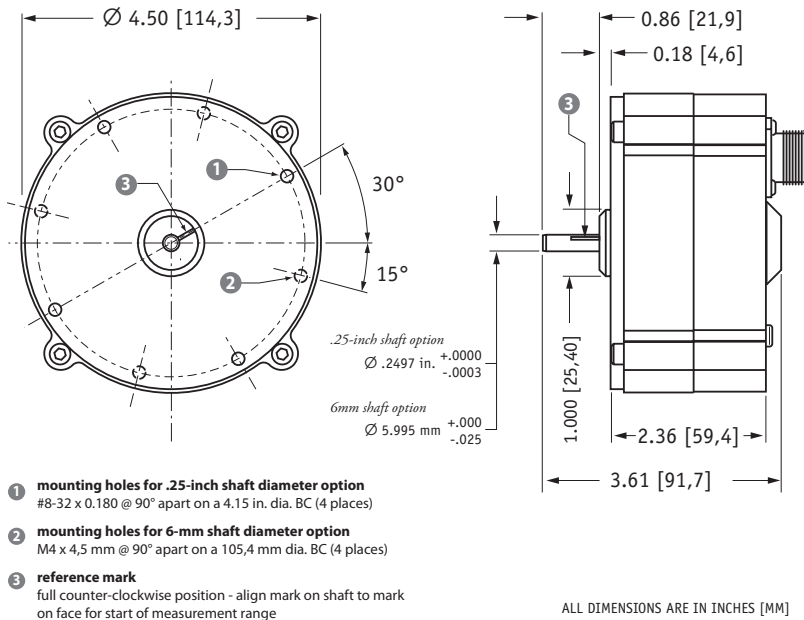
Input Voltage ..... *see ordering information*  
Input Current ..... 20 mA max.  
Maximum Loop Resistance (Load) ..... (loop supply voltage - 8)/0.020  
Circuit Protection ..... 38 mA max.  
Impedance ..... 100M ohms@100 VDC, min.  
Output Signal Adjustment  
Zero Adjustment ..... from factory set zero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

### ENVIRONMENTAL

Enclosure ..... NEMA 4/4X/6, IP 67/68  
Hazardous Area Certification ..... *see ordering information*  
Operating Temperature ..... -40° to 200°F (-40° to 90°C)  
Vibration ..... up to 10 G's to 2000 Hz maximum

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

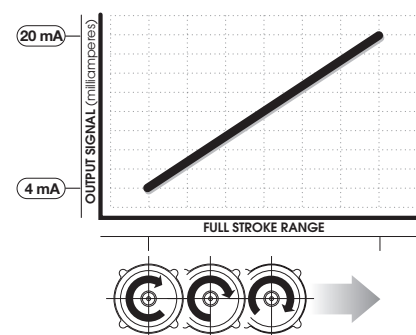
Emission/Immunity ..... EN50081-2/EN50082-2



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



**celesco**

celesco.com • info@celesco.com

# RT9420 • Rotational Transducer: 0/4...20 mA Output

## 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  
**E** output signal: 4...20 mA signal increasing clockwise  
**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>	<b>0030</b>	<b>0050</b>
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:

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

### Shaft Diameter:

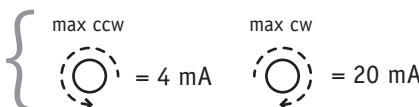
<b>B</b> order code:	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
	0.25-in. diameter	6 mm diameter	0.25-in. dia. w/flats	6 mm dia. w/flats
	 .2497 in. (+.0000 - .0003)	 5.995 mm (+.000 - .025)	 0.33 in.      0.025 in.	 8.4 mm      0.64 mm

### Output Signals:


<b>E</b> order code:	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5*</b>	<b>6*</b>
output signal options:	4...20 mA 	20...4 mA 	0...20 mA 	20...0 mA 	4...20 mA 	20...4 mA 
	CCW  CW 	CCW  CW 	CCW  CW 	CCW  CW 	CCW  CW 	CCW  CW 
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			CSA • Cenelec	

Example:

ordercode = **1** = 4...20 mA



Hazardous Area Certifications:

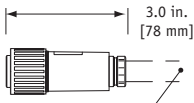
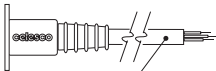
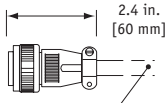

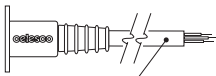
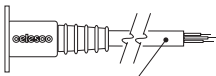
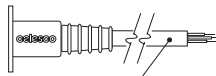
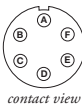
  
 CSA Standard 22.2  
 Class 1  
 Groups A, B, C and D

  
 Cenelec  
 LCIE EEx  
 ia IIc T4

**\*IMPORTANT:** intrinsically safe when powered from a CSA certified zener barrier rated 28 VDC max, 110 mA max per installation drawing#677984

## Ordering Information:

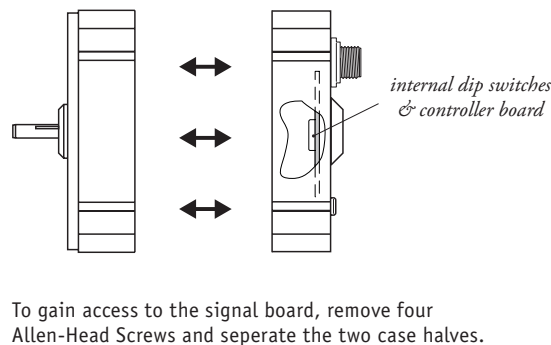
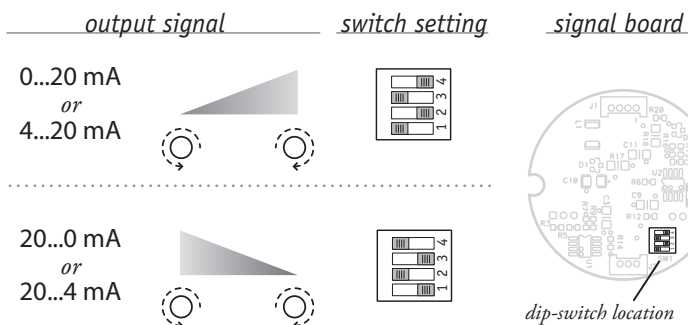
### Electrical Connection:

<b>F order code:</b>		<b>2</b>		<b>3</b>		<b>4</b>	
6-pin plastic connector w/mating plug <b>IP 67, NEMA 4X**,6</b>		10-ft. [3 M] waterproof cable <b>IP 67, NEMA 4X**, 6</b>		6-pin metal connector w/mating plug <b>IP 65, NEMA 4</b>		25-ft. [7.5 M] instrumentation cable <b>IP 67, NEMA 6</b>	
							
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	
<b>5</b>		<b>6</b>		<b>7</b>			
<b>F order code:</b>		<b>F order code:</b>		<b>F order code:</b>			
100-ft. [30 M] waterproof cable <b>IP 67, NEMA 4X**,6</b>		10-ft. [3 M] <b>pressure tested*</b> waterproof cable <b>IP 68, NEMA 4X**, 6P</b>		100-ft. [30 M] <b>pressure tested*</b> waterproof cable <b>IP 68, NEMA 4X**, 6P</b>			
							
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>		<b>Waterproof Cable</b>		<b>Instrumentation Cable</b>			
pin	2-wire	3-wire		color code	2-wire	3-wire	color code
A	8...34 vdc***	14...29 vdc common		WHITE	8...34 vdc***	14...29 vdc common	RED
B	4...20 mA out	0...20 mA out		BLACK	4...20 mA out	n/a	BLACK
C	-	-		GREEN	case ground	0...20 mA out	WHITE
D	case ground	-					GREEN
		contact view					

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.

## 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.



version: 6.0 last updated: May 21, 2013