

# Rotational Transducer

- ▼ Industrial Grade – Up to 50 Turns
- ▼ 4...20 mA Output Signal
- ▼ Intrinsically Safe



# RT9420

## Specification Summary:

### GENERAL

Full Stroke Range ..... 0-0.25 to 0-50 turns, see ① next page  
 Output Signal ..... 4 - 20 mA (2-wire), 0 - 20 mA (3-wire), see ④  
 Accuracy .....  $\pm 0.30$  to  $\pm 0.15\%$  full stroke, see ②  
 Repeatability .....  $\pm 0.05\%$  full stroke, max.  
 Resolution ..... essentially infinite  
 Enclosure Material ..... powder-painted aluminum or stainless steel, see ③  
 Sensor ..... plastic-hybrid precision potentiometer  
 Shaft Loading ..... up to 35 lbs. radial and 5 lbs. axial  
 Weight, Aluminum (Stainless Steel) Enclosure ..... 5 lbs. (10 lbs.) max.

### ELECTRICAL

Input Voltage ..... 12 to 40 VDC  
 Input Current ..... 4 - 20 mA  
 Loop Resistance (Load) ..... (loop supply voltage - 12) / 0.02, max  
 Circuit Protection ..... 38 mA maximum  
 Impedance ..... 100 MW @ 100 VDC, min.  
 Zero and Span Adjustment ..... 2:1 turndown

### ENVIRONMENTAL

Enclosure Design ..... NEMA 4/4X/6, IP 65/67/68, see ⑤ and ⑥  
 Hazardous Area Certification ... CSA 22.2: Class 1, Groups A, B, C and D, see ④  
 Operating Temperature ..... -40° F to 200° F  
 Thermal Effects  
 Zero ..... 0.01% full stroke / °F, max.  
 Span ..... 0.01% / °F, max.  
 Vibration ..... up to 10 G's to 2000 Hz max.



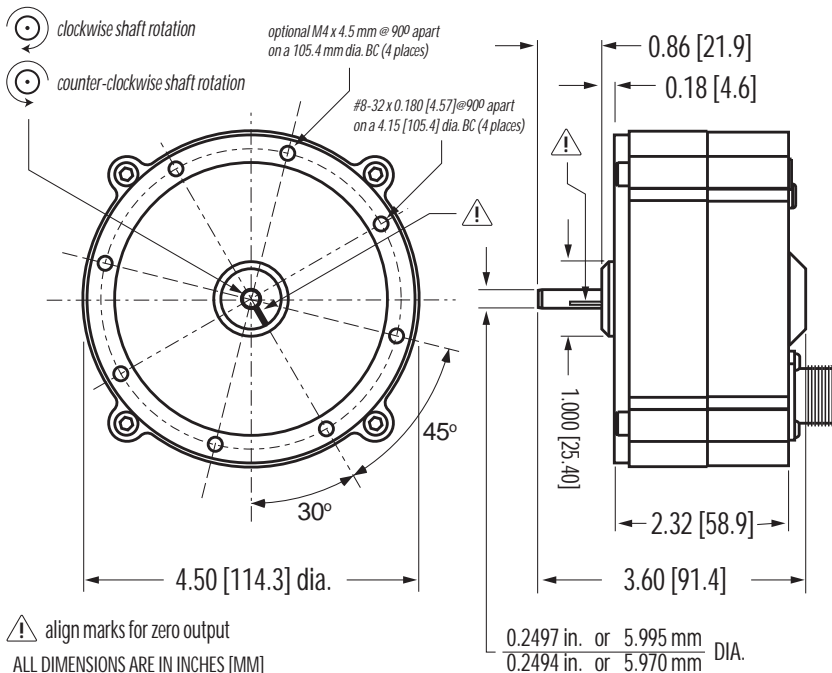
### EMC COMPLIANCE PER DIRECTIVE 89/336/EEC

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

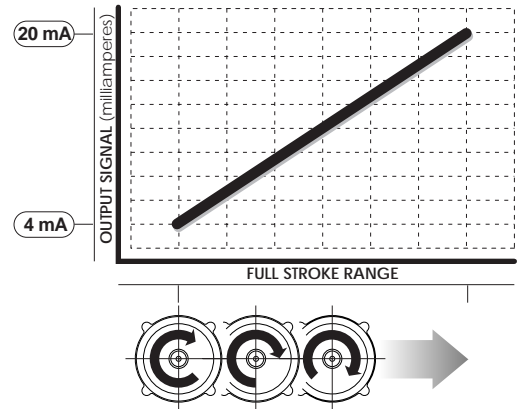


The RT9420 provides rotational position feedback via 4...20 mA current loop signal. This device combines the superb linearity and resolution of a plastic-hybrid potentiometer and the durability of Celesco's 4...20mA circuit to provide an accurate and reliable electrical signal. Additionally the zero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



### Electrical Output Signal:



**celesco**

Celesco Transducer Products, Inc.  
 20630 Plummer Street • Chatsworth, CA • 91311  
 tel: (800) 423-5483 • (818) 701-2750 • fax: (818) 701-2799  
[www.celesco.com](http://www.celesco.com) • [info@celesco.com](mailto:info@celesco.com)

## ▼ Ordering Information

### Model Number:

**RT9420-** \_\_\_\_\_ - \_\_\_\_\_ **1** - **1** \_\_\_\_\_ **0**  
order code:                      R                      A                      B                      C                      D                      E                      F                      G

### Full Stroke Range:

	<b>R</b> order code: <b>0R25</b>	<b>0R50</b>	<b>0001</b>	<b>0002</b>	<b>0003</b>
① clockwise shaft rotations, min:	0.25	0.50	1	2	3
② accuracy (% of f.s.):	0.30%	0.30%	0.30%	0.30%	0.30%
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>

	<b>R</b> order code: <b>0005</b>	<b>0010</b>	<b>0020</b>	<b>0030</b>	<b>0050</b>
clockwise shaft rotations, min:	5	10	20	30	50
accuracy (% of f.s.):	0.20%	0.15%	0.15%	0.15%	0.15%
potentiometer cycle life*:	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>

\*note: **potentiometer cycle life** is defined as the minimum number of times the sensor can be cycled back and forth, from beginning to end, before any measurable degradation of the output signal occurs.

### Enclosure Material:

	<b>A</b> order code: <b>1</b>	<b>2</b>
③ enclosure material:	powder-painted aluminum	303 stainless steel

### Mounting Configuration and Shaft Diameter:

	<b>B</b> order code: <b>1</b>	<b>2</b>
shaft diameter:	0.25 inch diameter	6 mm diameter
mounting holes:	8-32 x 0.25 in.	M4 x 6 mm

### Output Signals:

	<b>D</b> order code: <b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5*</b>	<b>6*</b>
④ output signal configuration:	4...20 mA [2-wire]	20...4 mA [2-wire]	0...20 mA [3-wire]	20...0 mA [3-wire]	4...20 mA [2-wire]	20...4 mA [2-wire]
⑤ hazardous area certification	none	none	none	none		CSA Standard 22.2 Class 1 Groups A, B, C and D

\*Important: Inherently Safe when powered from a CSA certified zener barrier rated 28 VDC max, 110 mA max as per Installation Drawing 677984.

# RT9420 • Rotational Transducer • 4...20 mA Output Signal

## Electrical Connection:

① order code:

	1	2	3	4																																																																								
electrical connection:	6-pin plastic connector and mating plug	10 ft. waterproof cable	6-pin metal connector and mating plug	25 ft. instrumentation cable																																																																								
	<table border="1"> <thead> <tr> <th>contact view</th> <th>connections</th> </tr> </thead> <tbody> <tr> <td></td> <td> <table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>A</td> <td>A</td> </tr> <tr> <td>4...20 mA out</td> <td>B</td> <td>C</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>B</td> </tr> <tr> <td>case ground</td> <td>D</td> <td>n/a</td> </tr> </tbody> </table> </td> </tr> </tbody> </table>	contact view	connections		<table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>A</td> <td>A</td> </tr> <tr> <td>4...20 mA out</td> <td>B</td> <td>C</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>B</td> </tr> <tr> <td>case ground</td> <td>D</td> <td>n/a</td> </tr> </tbody> </table>		2-wire	3-wire	12...40 VDC	A	A	4...20 mA out	B	C	common	n/a	B	case ground	D	n/a	<table border="1"> <thead> <tr> <th>connections</th> </tr> </thead> <tbody> <tr> <td> <table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>WHT</td> <td>n/a</td> </tr> <tr> <td>4...20 mA out</td> <td>BLK</td> <td>n/a</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>case ground</td> <td>GRN</td> <td>n/a</td> </tr> </tbody> </table> </td> </tr> </tbody> </table>	connections	<table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>WHT</td> <td>n/a</td> </tr> <tr> <td>4...20 mA out</td> <td>BLK</td> <td>n/a</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>case ground</td> <td>GRN</td> <td>n/a</td> </tr> </tbody> </table>		2-wire	3-wire	12...40 VDC	WHT	n/a	4...20 mA out	BLK	n/a	common	n/a	n/a	case ground	GRN	n/a	<table border="1"> <thead> <tr> <th>contact view</th> <th>connections</th> </tr> </thead> <tbody> <tr> <td></td> <td> <table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>A</td> <td>A</td> </tr> <tr> <td>4...20 mA out</td> <td>B</td> <td>C</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>B</td> </tr> <tr> <td>case ground</td> <td>D</td> <td>n/a</td> </tr> </tbody> </table> </td> </tr> </tbody> </table>	contact view	connections		<table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>A</td> <td>A</td> </tr> <tr> <td>4...20 mA out</td> <td>B</td> <td>C</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>B</td> </tr> <tr> <td>case ground</td> <td>D</td> <td>n/a</td> </tr> </tbody> </table>		2-wire	3-wire	12...40 VDC	A	A	4...20 mA out	B	C	common	n/a	B	case ground	D	n/a	<table border="1"> <thead> <tr> <th>connections</th> </tr> </thead> <tbody> <tr> <td> <table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>RED</td> <td>RED</td> </tr> <tr> <td>4...20 mA out</td> <td>BLK</td> <td>BLK</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>WHT</td> </tr> <tr> <td>case ground</td> <td>GRN</td> <td>n/a</td> </tr> </tbody> </table> </td> </tr> </tbody> </table>	connections	<table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>RED</td> <td>RED</td> </tr> <tr> <td>4...20 mA out</td> <td>BLK</td> <td>BLK</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>WHT</td> </tr> <tr> <td>case ground</td> <td>GRN</td> <td>n/a</td> </tr> </tbody> </table>		2-wire	3-wire	12...40 VDC	RED	RED	4...20 mA out	BLK	BLK	common	n/a	WHT	case ground	GRN	n/a
contact view	connections																																																																											
	<table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>A</td> <td>A</td> </tr> <tr> <td>4...20 mA out</td> <td>B</td> <td>C</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>B</td> </tr> <tr> <td>case ground</td> <td>D</td> <td>n/a</td> </tr> </tbody> </table>		2-wire	3-wire	12...40 VDC	A	A	4...20 mA out	B	C	common	n/a	B	case ground	D	n/a																																																												
	2-wire	3-wire																																																																										
12...40 VDC	A	A																																																																										
4...20 mA out	B	C																																																																										
common	n/a	B																																																																										
case ground	D	n/a																																																																										
connections																																																																												
<table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>WHT</td> <td>n/a</td> </tr> <tr> <td>4...20 mA out</td> <td>BLK</td> <td>n/a</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>case ground</td> <td>GRN</td> <td>n/a</td> </tr> </tbody> </table>		2-wire	3-wire	12...40 VDC	WHT	n/a	4...20 mA out	BLK	n/a	common	n/a	n/a	case ground	GRN	n/a																																																													
	2-wire	3-wire																																																																										
12...40 VDC	WHT	n/a																																																																										
4...20 mA out	BLK	n/a																																																																										
common	n/a	n/a																																																																										
case ground	GRN	n/a																																																																										
contact view	connections																																																																											
	<table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>A</td> <td>A</td> </tr> <tr> <td>4...20 mA out</td> <td>B</td> <td>C</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>B</td> </tr> <tr> <td>case ground</td> <td>D</td> <td>n/a</td> </tr> </tbody> </table>		2-wire	3-wire	12...40 VDC	A	A	4...20 mA out	B	C	common	n/a	B	case ground	D	n/a																																																												
	2-wire	3-wire																																																																										
12...40 VDC	A	A																																																																										
4...20 mA out	B	C																																																																										
common	n/a	B																																																																										
case ground	D	n/a																																																																										
connections																																																																												
<table border="1"> <thead> <tr> <th></th> <th>2-wire</th> <th>3-wire</th> </tr> </thead> <tbody> <tr> <td>12...40 VDC</td> <td>RED</td> <td>RED</td> </tr> <tr> <td>4...20 mA out</td> <td>BLK</td> <td>BLK</td> </tr> <tr> <td>common</td> <td>n/a</td> <td>WHT</td> </tr> <tr> <td>case ground</td> <td>GRN</td> <td>n/a</td> </tr> </tbody> </table>		2-wire	3-wire	12...40 VDC	RED	RED	4...20 mA out	BLK	BLK	common	n/a	WHT	case ground	GRN	n/a																																																													
	2-wire	3-wire																																																																										
12...40 VDC	RED	RED																																																																										
4...20 mA out	BLK	BLK																																																																										
common	n/a	WHT																																																																										
case ground	GRN	n/a																																																																										
IP rating:	67	67, 68*	65	67																																																																								
NEMA rating:	6, 4X**	6, 4X**	4	6																																																																								
notes:	* requires factory submersion test		** applies to stainless steel enclosure, see ③																																																																									

⑥  
⑦

## ▼ Sample Model Number

**RT9420-0005** - 1 1 1 - 1 1 1 0  
order code: ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

Specifications: Full Stroke Range: 5 turns (5 clockwise shaft rotations)  
 Enclosure Material: powder-painted aluminum  
 Shaft Diameter: 0.25 inches  
 Mounting Holes: 8-32 x 0.250 in.  
 Output Signals: 4-20 mA, 2-wire, output increasing with clockwise shaft rotation  
 Electrical Connection: 6-pin plastic connector