0/4...20 mA Output • Hazardous Area Certification
Ranges: 0-90º 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 ..... ± 0.30% to ±0.15% full stroke *see ordering information*
Repeatability ..... ± 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 Resitance (Load) ..... (loop supply voltage - 8)/0.020
Circuit Protection ..... 38 mA max.
Impedence ..... 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./ºF, max.
Span ..... 0.01% f.s./ºF, max.

ENVIRONMENTAL

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

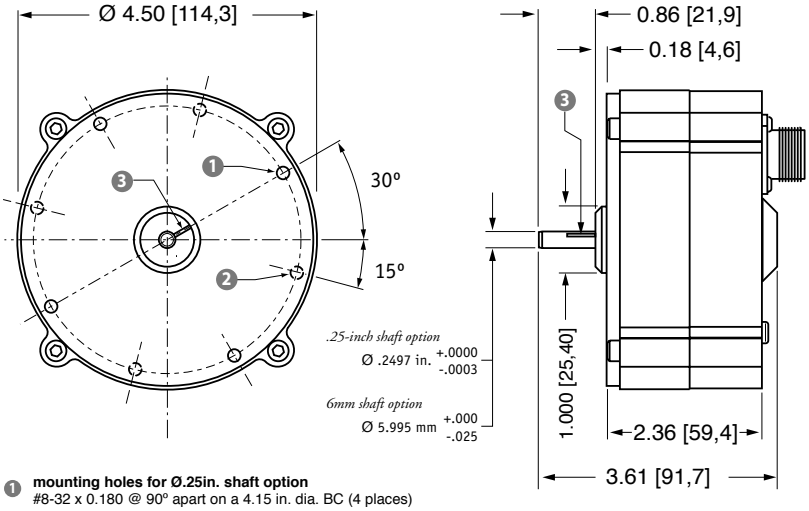
EMC COMPLIENCE PER DIRECTIVE 89/336/EEC

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.

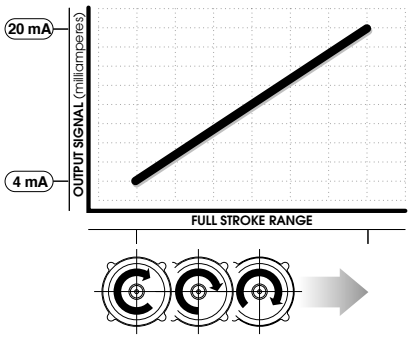
Outline Drawing



1. **mounting holes for Ø.25in. shaft option**
   #8-32 x 0.180 @ 90º apart on a 4.15 in. dia. BC (4 places)
2. **mounting holes for Ø 6mm shaft option**
   M4 x 4,5 mm @ 90º 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

ALL DIMENSIONS ARE IN INCHES [MM]

Output Signal



Ordering Information:

Model Number:

RT9420-_____ - __ __ 1 - 1 __ __ 0
order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ

Sample Model Number:

RT9420 - 0005 - 111 - 1110

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

Full Stroke Range:

Ⓡ 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*:	2.5×10^6	2.5×10^6	2.5×10^6	2.5×10^6	2.5×10^6	2.5×10^6	5×10^5	2.5×10^5	2.5×10^5	2.5×10^5	2.5×10^5

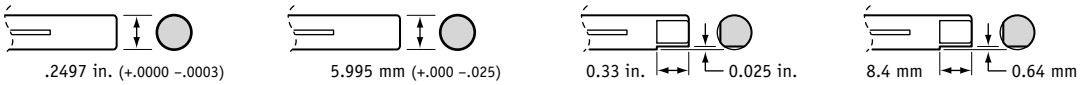
**–number of times the sensor shaft can be cycled back and forth from beginning to end and back to the beginning before any measurable signal degradation may occur.*

Enclosure Material:

Ⓐ order code:	1	2
	powder-painted aluminum	303 stainless steel

Shaft Diameter:

Ⓑ order code:	1	2	3	4
	0.25-in. diameter	6 mm diameter	0.25-in. dia. w/flats	6 mm dia. w/flats



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	4...20 mA
	4 → 20	20 → 4	0 → 20	20 → 0	4 → 20	20 → 4
	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 – 40 vdc		14 – 40 vdc		14 – 32 vdc	
hazardous area certification:	not certified				CSA • Cenelec	

Example:

ordercode = **1** = 4...20 mA { max ccw = 4 mA; max cw = 20 mA

Hazardous Area Certifications:

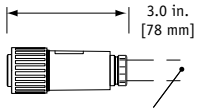
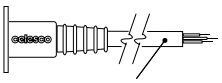
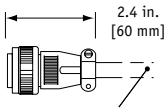
CSA Standard 22.2 Class 1 Groups A, B, C and D

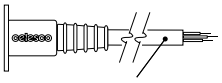
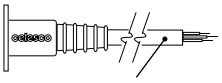
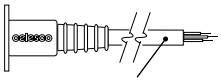
Cenelec LCIE EEx ia IIc T4

**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:

Ⓕ order code:	1	2	3	4
	6-pin plastic connector w/mating plug	10-ft. [3 M] waterproof cable	6-pin metal connector w/mating plug	25-ft. [7.5 M] instrumentation cable
	IP 67, NEMA 4X,6**	**IP 67, NEMA 4X**, 6**	**IP 65, NEMA 4**	**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	10-ft. [3 M] **pressure tested*** waterproof cable	100-ft. [30 M] **pressure tested*** waterproof cable
	IP 67, NEMA 4X,6**	**IP 68, NEMA 4X**, 6P**	**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

6-pin Mating Plug

pin	2-wire	3-wire
A	8...40 vdc***	14...40 vdc
B	4...20 mA out	common
C	–	0...20 mA out
D	case ground	–

contact view

Waterproof Cable

color code	2-wire	3-wire
WHITE	8...40 vdc***	14...40 vdc
BLACK	4...20 mA out	common
GREEN	case ground	0...20 mA out

Instrumentation Cable

color code	2-wire	3-wire
RED	8...40 vdc***	14...40 vdc
BLACK	4...20 mA out	common
WHITE	n/a	n/a
GREEN	case ground	0...20 mA out

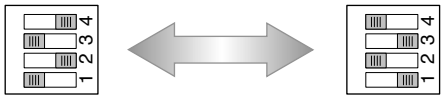
Notes:
- * *–Test pressure: 100 feet [30 meters] H_2O (40 PSID); Test Medium: Air; Duration: 2 hours.*
- ** *–NEMA 4X applies to stainless steel enclosure only.*
- *** *–14-32 VDC for hazardous area option.*

Output Signal Selection:

2-wire, 4...20 mA sensors only!

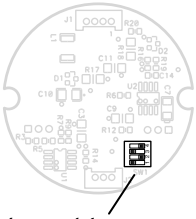
The output signal direction can be reversed at any time by simply changing the dip-switch settings found on the internal signal board. After the settings have been changed, adjustment of the Zero and Span trimpots will be required to precisely match the 4 mA and 20mA signal values to the beginning and end points of the stroke.

switch settings



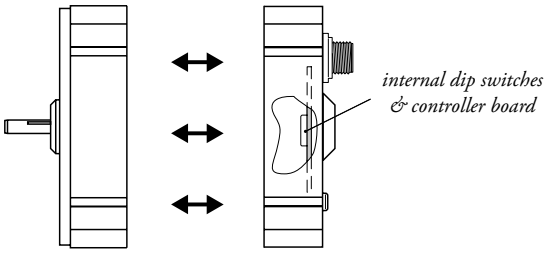
flip all 4 switches to reverse signal !

signal board



dip-switch location

To gain access to the signal board, remove four Allen-Head Screws and seperate the two case halves.



version: **3.1** last updated: **March 19, 2007**

celesco