

# Cable-Extension Position Transducer

## Position and Velocity Output Signals

Ranges: 0-75 to 0-550 inches

Industrial Grade

# PT9301

### Specification Summary:

#### GENERAL

Full Stroke Range Options—*on this datasheet* ..... 0-75 to 0-550 inches

#### POSITION

Output Signal ..... voltage divider (potentiometer)  
Accuracy .....  $\pm 0.10\%$  full stroke  
Repeatability .....  $\pm 0.02\%$  full stroke  
Resolution ..... *essentially infinite*  
Sensor ..... plastic-hybrid precision potentiometer  
Potentiometer Cycle Life ..... 250,000, min. —*before signal degradation can occur*  
Input Resistance Options ..... 500, 1K, 5K or 10K  $\Omega$  —*see ordering information*  
Power Rating, Watts ..... 2.0 at 70°F derated to 0 at 250° F  
Recommended Maximum Input Voltage ..... 30V (AC/DC)  
Output Signal Change Over Full Stroke Range ..... 94%  $\pm 4\%$  of input voltage

#### VELOCITY

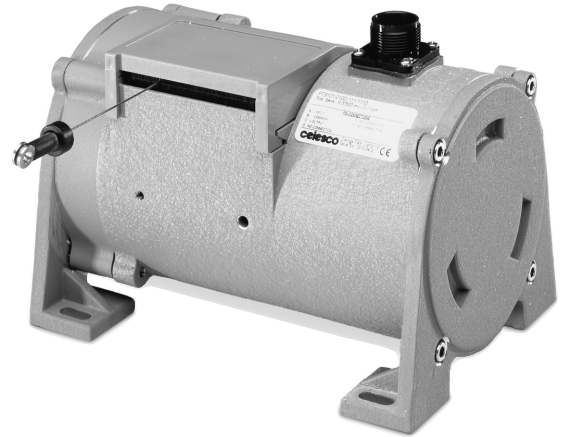
Output Signal ..... DC tachometer output  
Linearity ..... better than  $\pm 0.10\%$  of output at any velocity  
Repeatability .....  $\pm 0.10\%$  of reading  
Maximum Velocity • Retraction Acceleration ..... *see ordering information*  
Sensor ..... tach generator  
Input Voltage ..... none required  
Output Voltage @ 100 inches per minute ..... 361 mV  $\pm 3\%$   
Output Impedance ..... 350 ohms  $\pm 10\%$   
Output Ripple (for velocity  $\geq 1.29$  inches per second) .....  $\pm 3\%$  rms

#### GENERAL

Measuring Cable Options ..... nylon-coated stainless steel or thermoplastic  
Enclosure Material ..... powder-painted aluminum or stainless steel  
Weight, Aluminum (Stainless Steel) Enclosure ..... 8 lbs. (16 lbs.) max.

#### ENVIRONMENTAL

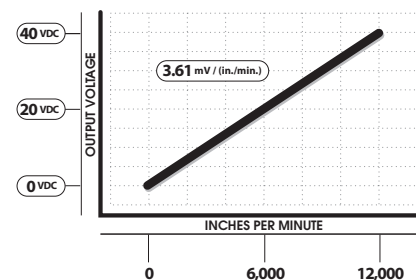
Enclosure ..... NEMA 4/4X/6, IP 67/68  
Operating Temperature ..... -40° to 200°F (-40° to 90°C)  
Vibration ..... up to 10 G's to 2000 Hz maximum



The PT9301 is a combination position and velocity transducer for demanding long-range applications requiring a linear position measurements in ranges up to 1700". A precision plastic-hybrid potentiometer provides accurate position feedback while a self-generating DC tachometer provides a velocity signal that is proportional to the speed of the traveling stainless-steel measuring cable.

As a member of Celesco's innovative family of NEMA-4 rated cable-extension transducers, the PT9301 offers numerous benefits. It installs in minutes, functions properly without perfectly parallel alignment, and when its cable is retracted, it measures only 6".

### Velocity Output Signal



# PT9301 • Cable-Extension Transducer: Position and Velocity Output Signals

## Ordering Information:

### Model Number:

**PT9301-** \_\_\_\_\_ **1** **0**  
order code:                      R                      A                      B                      C                      D                      E                      F                      G

Sample Model Number:

**PT9301 - 0500 - 111 - 1110**

- R** range: 500 inches
- A** enclosure/cable tension: aluminum/18 oz.
- B** measuring cable: .034 nylon-coated stainless
- C** cable exit: front
- D** output signal: 500 ohm position / DC tachometer velocity
- F** electrical connection: 6-pin plastic connector

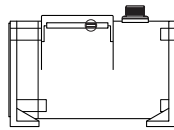
### Full Stroke Range:

<b>R</b> order code:	0075	0100	0150	0200	0250	0300	0350	0400	0450*	0500*	0550*
full stroke range, min:	75 in.	100 in.	150 in.	200 in.	250 in.	300 in.	350 in.	400 in.	450 in.	500 in.	550 in.

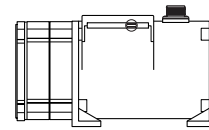
\* - 36 oz. cable tension strongly recommended

### Enclosure Material and Measuring Cable Tension:

<b>A</b> order code:	1	3	2	4
tension ( $\pm 30\%$ ):	18 oz.			36 oz.
enclosure material:	powder-painted aluminum	303 stainless steel	powder-painted aluminum	303 stainless steel
max. acceleration:	1 G	.33 G	5 G	2 G
max. velocity:	60 inches/sec	20 inches/sec	200 inches/sec	80 inches/sec



standard housing  
see fig 1.



dual-spring housing  
see fig 2.

### Measuring Cable:

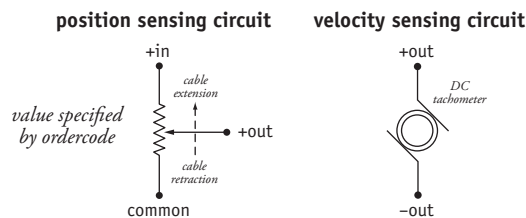
<b>B</b> order code:	1	2	3
	$\varnothing$ .034-inch nylon-coated stainless steel available in <b>all</b> ranges	$\varnothing$ .047-inch stainless steel all ranges up to <b>500 inches</b>	$\varnothing$ .062-inch thermoplastic all ranges up to <b>400 inches</b>

### Cable Exit:

<b>C</b> order code:	1	2	3	4
	front	top	back	down

### Output Signals:

<b>D</b> order code:	1	2	3	4
position sensing potentiometer:	500 ohms*	1000 ohms*	5000 ohms*	10,000 ohms*



\*-tolerance =  $\pm 10\%$

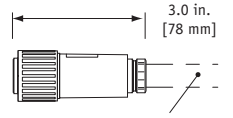
**Ordering Information:**

**Electrical Connection:**

**Order code:**

**1**

6-pin plastic connector  
with mating plug  
**IP 67, NEMA 4X\*,6**

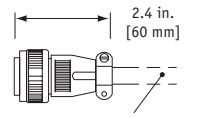


3.0 in.  
[78 mm]

1/2 - 5/16" [14 - 8 mm] cable dia.  
16 AWG max conductor size  
connector: MS3102E-14S-6P  
mating plug: MS3106E-14S-6S

**3**

6-pin metal connector  
with mating plug  
**IP 65, NEMA 4**

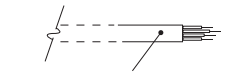


2.4 in.  
[60 mm]

3/8-in. [9 mm] max cable dia.  
16 AWG max conductor size  
connector: MS3102E-14S-6P  
mating plug: MS3106E-14S-6S

**4**

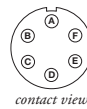
25-ft. instrumentation cable  
24 AWG, shielded  
**IP 67, NEMA 6**



25 ft. x 0.2-in. dia.  
[7,5 M x 5 mm dia.]  
24 AWG, shielded

**6-pin mating plug:**

pin	signal	} <i>position</i>
A	+ in	
B	common	} <i>velocity</i>
C	+ out	
D	-	
E	+ out	
F	- out	

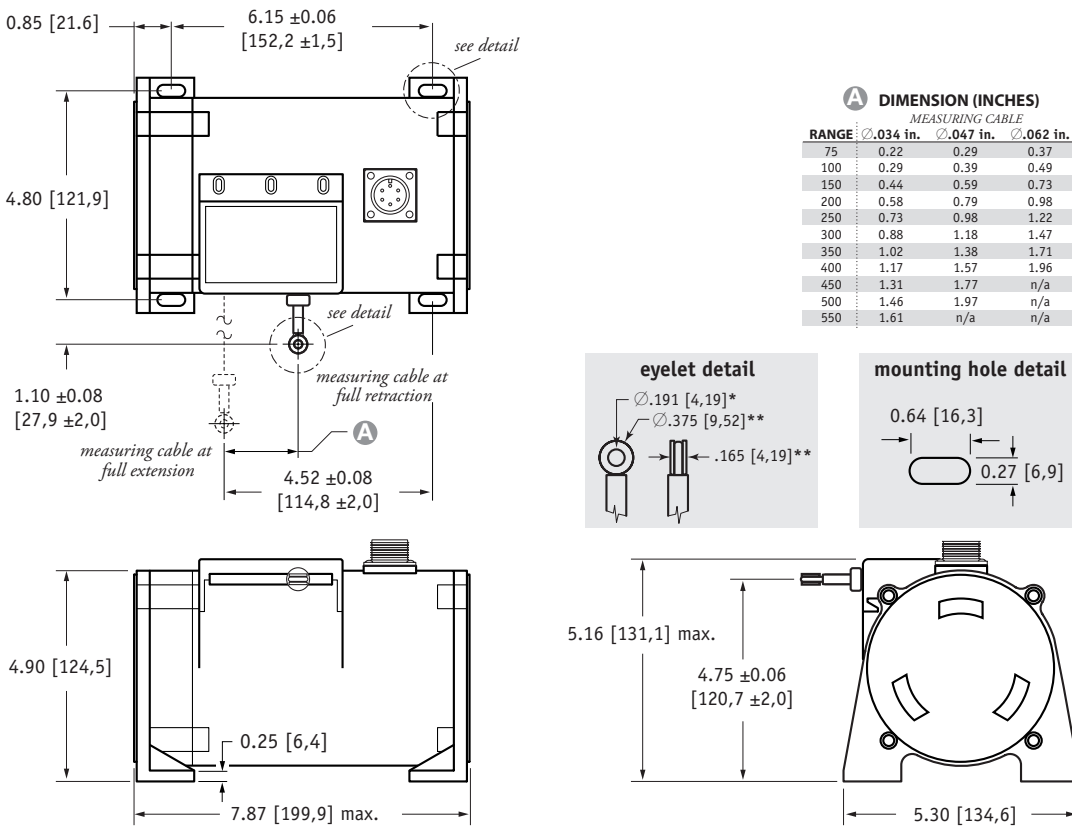


**25-ft. instrumentation cable:**

color	signal	} <i>position</i>
red	+ in	
black	common	} <i>velocity</i>
green	+ out	
white	+ out	
brown	- out	

\*-applies to stainless steel enclosure only

**Fig. 1 – Outline Drawing (18 oz. cable tension only)**

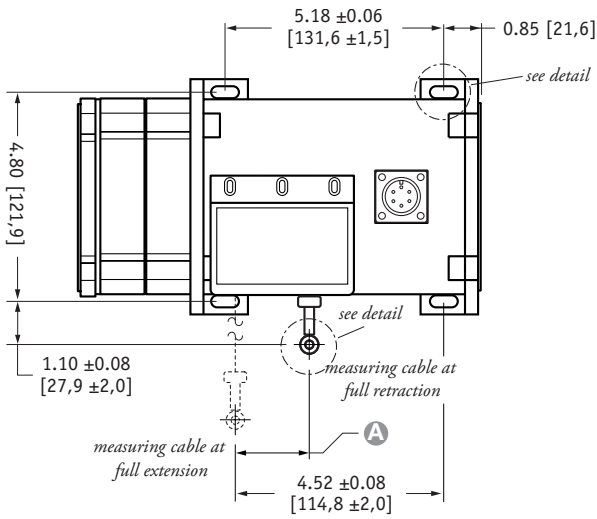


DIMENSIONS ARE IN INCHES [MM]  
tolerances are 0.03 IN. [0.5 MM] unless otherwise noted.

\* tolerance = +.005 -.001 [+,.13 -.03]  
\*\* tolerance = +.005 -.005 [+,.13 -.13]

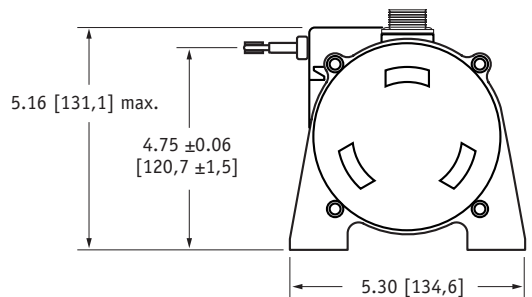
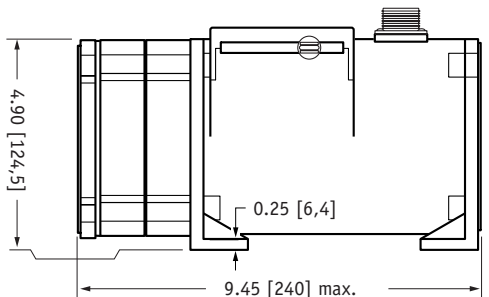
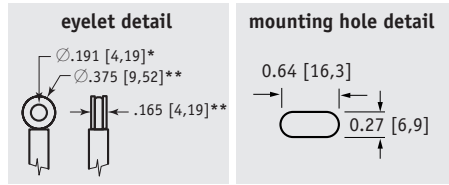
**PT9301 • Cable-Extension Transducer: Position and Velocity Output Signals**

Fig. 2 – Outline Drawing (36 oz. cable tension only)



**A DIMENSION (INCHES)**  
MEASURING CABLE

RANGE	∅.034 in.	∅.047 in.	∅.062 in.
75	0.22	0.29	0.37
100	0.29	0.39	0.49
150	0.44	0.59	0.73
200	0.58	0.79	0.98
250	0.73	0.98	1.22
300	0.88	1.18	1.47
350	1.02	1.38	1.71
400	1.17	1.57	1.96
450	1.31	1.77	n/a
500	1.46	1.97	n/a
550	1.61	n/a	n/a



DIMENSIONS ARE IN INCHES [MM]  
tolerances are 0.03 IN. [0.5 MM] unless otherwise noted.

\* tolerance = +.005 -.001 [+.13 -.03]  
\*\* tolerance = +.005 -.005 [+ .13 -.13]

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