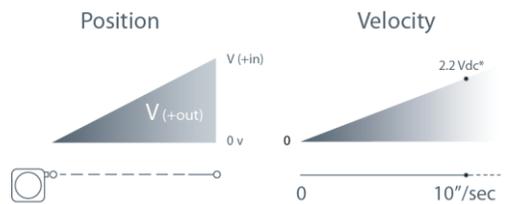


The PT9301 is a combination position and velocity transducer for demanding long-range applications requiring a linear position measurements in ranges up to 1700". A precision plastic-hybrid potentiometer provides accurate position feedback while a self-generating DC tachometer provides a velocity signal 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".

### Output Signal



\*velocity output rate = 361 mV ± 3% @ 100 inches per min.

## PT9301

### Cable Actuated Sensor Heavy Industrial • Position/Velocity Output

**Linear Position/Velocity to 550 inches (1400 cm)**  
**Rugged Powder-Painted Aluminum Enclosure**  
**VLS Option to Prevent Free-Release Damage**  
**IP68 • NEMA 6 Protection**

#### General

<b>Full Stroke Range</b>	0-75 to 0-550 inches
<b>Measuring Cable Options</b>	stainless steel or thermoplastic
<b>Enclosure Material</b>	powder-painted aluminum
<b>Sensor, Position</b>	plastic-hybrid precision potentiometer
<b>Sensor, Velocity</b>	DC tach generator
<b>Maximum Retraction</b>	see ordering information
<b>Acceleration</b>	
<b>Maximum Velocity</b>	see ordering information
<b>Weight, Aluminum</b>	8 lbs. (16 lbs.) max.
<b>(Stainless Steel) Enclosure</b>	

#### Position

<b>Output Signal</b>	voltage divider (potentiometer)
<b>Accuracy</b>	± 0.10% full stroke
<b>Repeatability</b>	± 0.02% full stroke
<b>Resolution</b>	essentially infinite
<b>Sensor, Position</b>	plastic-hybrid precision potentiometer
<b>Potentiometer Cycle Life</b>	≥250,000
<b>Input Resistance Options</b>	500, 1K, 5K or 10K Ω (see ordering information)
<b>Power Rating, Watts</b>	2.0 at 70°F derated to 0 at 250°F
<b>Recommended Maximum Input Voltage</b>	30V (AC/DC)
<b>Output Signal Change Over</b>	94% ±4% of input voltage
<b>Full Stroke Range</b>	

#### Velocity

<b>Output Signal</b>	DC tachometer output
<b>Linearity</b>	better than ±0.10% of output at any velocity
<b>Repeatability</b>	±0.10% of reading
<b>Sensor</b>	tach generator
<b>Input Voltage</b>	none required
<b>Output Voltage @ 100 inches per minute</b>	361 mV ±3%
<b>Output Impedance</b>	350 ohms ±10%
<b>Output Ripple (for velocity ≥ 1.29 inches per second)</b>	±3% rms

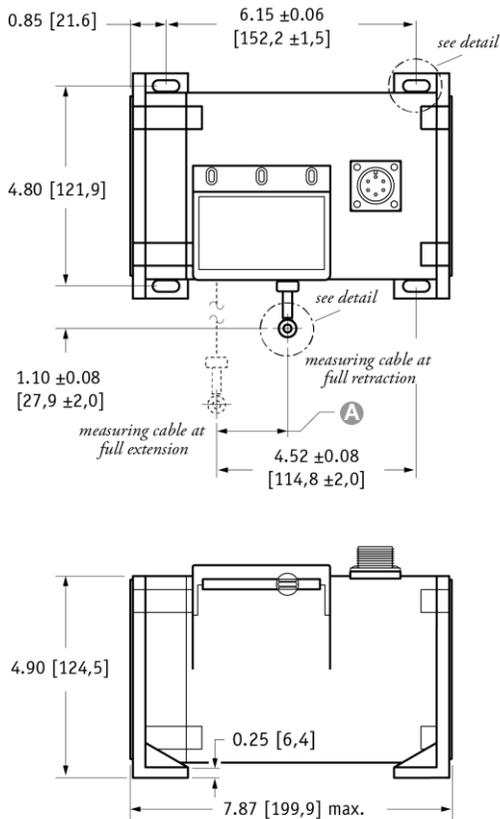
#### Environmental

<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

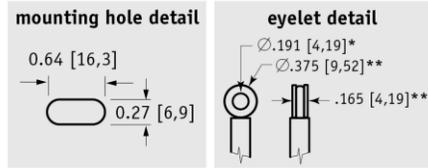
# PT9301

Heavy Industrial • Position/Velocity Output

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

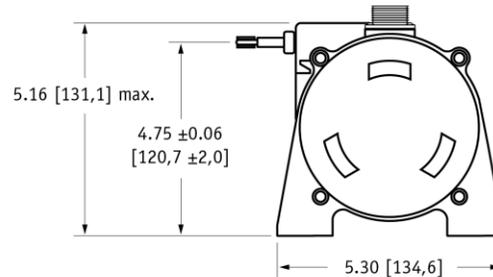


DIMENSIONS ARE IN INCHES [MM]  
tolerances are 0.03 IN. [0.5 MM] unless otherwise noted.



### A DIMENSION (INCHES)

RANGE	MEASURING CABLE			
	∅.031 in.	∅.034 in.	∅.047 in.	∅.062 in.
75	n/a	0.22	0.29	0.37
100	n/a	0.29	0.39	0.49
150	n/a	0.44	0.59	0.73
200	n/a	0.58	0.79	0.98
250	n/a	0.73	0.98	1.22
300	n/a	0.88	1.18	1.47
350	n/a	1.02	1.38	1.71
400	n/a	1.17	1.57	1.96
450	n/a	1.31	1.77	n/a
500	n/a	1.46	1.97	n/a
550	1.61	1.61	n/a	n/a



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

## Ordering Information

### Model Number:

**PT9301** -      -      -      -      -      -      -      -       
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

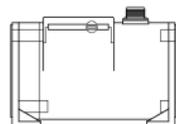
### Full Stroke Range:

<b>R</b> order code:	<b>0075</b>	<b>0100</b>	<b>0150</b>	<b>0200</b>	<b>0250</b>	<b>0300</b>	<b>0350</b>	<b>0400</b>	<b>0450*</b>	<b>0500*</b>	<b>0550*</b>
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.

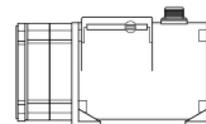
\* - 36 oz. cable tension strongly recommended

### Enclosure Material and Measuring Cable Tension:

<b>A</b> order code:	<b>1</b>	<b>2</b>
tension (±30%):	18 oz.	36 oz.
enclosure material:	powder-painted aluminum	powder-painted aluminum
max. acceleration:	1 g	5 g
max. velocity:	60 inches/sec	200 inches/sec



standard housing  
see fig 1.



dual-spring housing  
see fig 2.

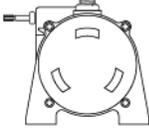
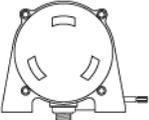
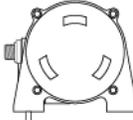
# PT9301

Heavy Industrial • Position/Velocity Output

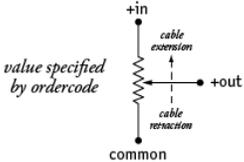
## Measuring Cable:

order code:	1	2	3	4
cable construction:	Ø.034-inch nylon-coated stainless steel rope	Ø.047-inch bare stainless steel rope	Ø.058-inch PVC jacketed vectra fiber rope	Ø.031-inch bare stainless steel rope
available ranges:	<i>all ranges</i>	<i>all ranges up to 500 inches</i>	<i>all ranges up to 400 inches</i>	<i>550-inch range only</i>
general use:	indoor	outdoor, debris, high temperature	high voltage or magnetic field	outdoor, debris, high temperature

## Cable Exit:

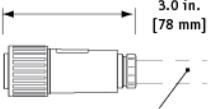
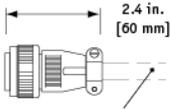
order code:	1	2	3	4
	front	top	back	down
				

## Output Signals:

order code:	1	2	3	4
position sensing potentiometer:	500 ohms*	1000 ohms*	5000 ohms*	10,000 ohms*
position sensing circuit			velocity sensing circuit	

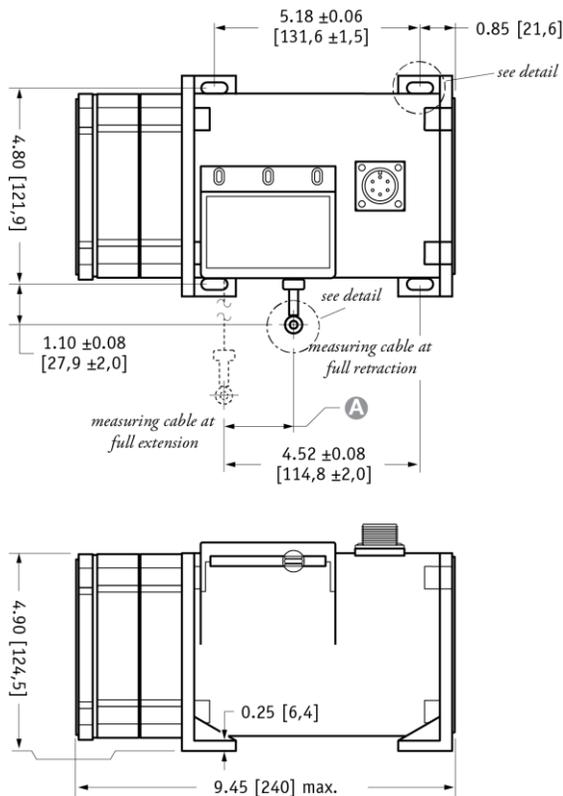
\*tolerance = ±10%

## Electrical Connection:

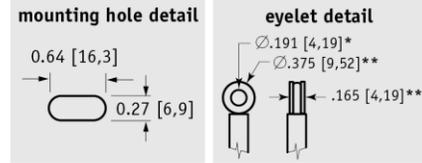
order code:	1	3	4																																			
	6-pin plastic connector with mating plug IP 67, NEMA 4X*, 6	6-pin metal connector with mating plug IP 65, NEMA 4	25-ft. instrumentation cable 24 AWG, shielded IP 67, NEMA 6																																			
	 <p>3.0 in. [78 mm]</p>	 <p>2.4 in. [60 mm]</p>																																				
	1/2 - 5/16" [14 - 8 mm] cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S	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>6-pin mating plug:</b> <table border="0"> <tr> <td>pin</td> <td>signal</td> <td rowspan="2">} position</td> </tr> <tr> <td>A</td> <td>+ in</td> </tr> <tr> <td>B</td> <td>common</td> <td rowspan="2">} velocity</td> </tr> <tr> <td>C</td> <td>+ out</td> </tr> <tr> <td>D</td> <td>-</td> <td></td> </tr> <tr> <td>E</td> <td>+ out</td> <td></td> </tr> <tr> <td>F</td> <td>- out</td> <td></td> </tr> </table>		pin	signal	} position	A	+ in	B	common	} velocity	C	+ out	D	-		E	+ out		F	- out		<b>25-ft. instrumentation cable:</b> <table border="0"> <tr> <td>color</td> <td>signal</td> <td rowspan="2">} position</td> </tr> <tr> <td>red</td> <td>+ in</td> </tr> <tr> <td>black</td> <td>common</td> <td rowspan="2">} velocity</td> </tr> <tr> <td>green</td> <td>+ out</td> </tr> <tr> <td>white</td> <td>+ out</td> <td></td> </tr> <tr> <td>brown</td> <td>- out</td> <td></td> </tr> </table>	color	signal	} position	red	+ in	black	common	} velocity	green	+ out	white	+ out		brown	- out	
pin	signal	} position																																				
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B	common	} velocity																																				
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D	-																																					
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red	+ in																																					
black	common	} velocity																																				
green	+ out																																					
white	+ out																																					
brown	- out																																					
	 <p>contact view</p>																																					

\*—applies to stainless steel enclosure only

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

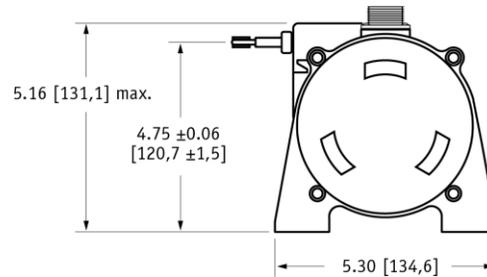


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**A DIMENSION (INCHES)**

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450	n/a	1.31	1.77	n/a
500	n/a	1.46	1.97	n/a
550	1.61	1.61	n/a	n/a



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



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PT9301 12/01/2015