## 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 ..... ± 0.10% full stroke
Repeatability ..... ± 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 Ω *–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% ±4% of input voltage

**VELOCITY**
Output Signal ..... DC tachometer output
Linearity ..... better than ±0.10% of output at any velocity
Repeatability ..... ±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 ±3%
Output Impedance ..... 350 ohms ±10%
Output Ripple (for velocity ≥ 1.29 inches per second) ..... ±3% rms

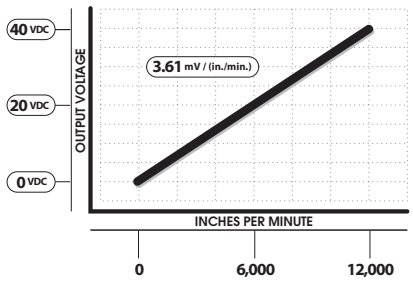
**GENERAL**
Measuring Cable Options ..... nylon-coated stainless steel or thermoplastic
Enclosure Material ..... powder-painted aluminum or stainless steel
Weight, Aluminum (Stainless Steel) Enclosure ..... 8 lbs. (16 lbs.) max.

**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



## Ordering Information:

### Model Number:

PT9301-_____ - ____ ____ ____ - ____ 1 ____ 0
order code: ⓇⒶⒷⒸⒹⒺⒻⒼ

Sample Model Number:

**PT9301 - 0500 - 111 - 1110**

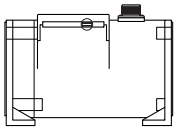
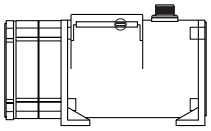
| | | |
|---|---|---|
| Ⓡ | range: | 500 inches |
| Ⓐ | enclosure/cable tension: | aluminum/18 oz. |
| Ⓑ | measuring cable: | .034 nylon-coated stainless |
| Ⓒ | cable exit: | front |
| Ⓓ | output signal: | 500 ohm position / DC tachometer velocity |
| Ⓕ | electrical connection: | 6-pin plastic connector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

### Full Stroke Range:

| Ⓡ 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*

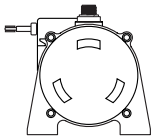
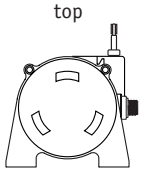
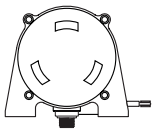
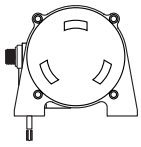
### Enclosure Material and Measuring Cable Tension:

| Ⓐ order code: | 1 | 3 | 2 | 4 |
|---|---|---|---|---|
| tension (±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:

| Ⓑ order code: | 1 | 2 | 3 |
|---|---|---|---|
| | ∅.034-inch nylon-coated stainless steel *available in **all** ranges* | ∅.047-inch stainless steel *all ranges up to **500 inches*** | ∅.062-inch thermoplastic *all ranges up to **400 inches*** |

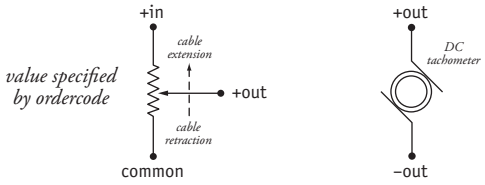
### Cable Exit:

| Ⓒ 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**

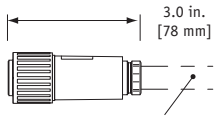
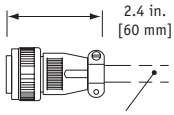
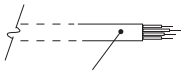



**–tolerance = ±10%*

## Ordering Information:

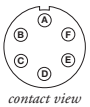
## *Electrical Connection:*

Ⓕ order code:

| 1 | 3 | 4 |
|---|---|---|
| 6-pin plastic connector with mating plug<br>**IP 67, NEMA 4X*,6** | 6-pin metal connector with mating plug<br>**IP 65, NEMA 4** | 25-ft. instrumentation cable 24 AWG, shielded<br>**IP 67, NEMA 6** |
|  |  |  |
| 1/2 - 5/16" [14 - 8 mm] cable dia.<br>16 AWG max conductor size<br>connector: MS3102E-14S-6P<br>mating plug: MS3106E-14S-6S | 3/8-in. [9 mm] max cable dia.<br>16 AWG max conductor size<br>connector: MS3102E-14S-6P<br>mating plug: MS3106E-14S-6S | 25 ft. x 0.2-in. dia.<br>[7,5 M x 5 mm dia.]<br>24 AWG, shielded |

**6-pin mating plug:**

| pin | signal | |
|---|---|---|
| A | + in | position |
| B | common | position |
| C | + out | position |
| D | - | |
| E | + out | velocity |
| F | - out | velocity |



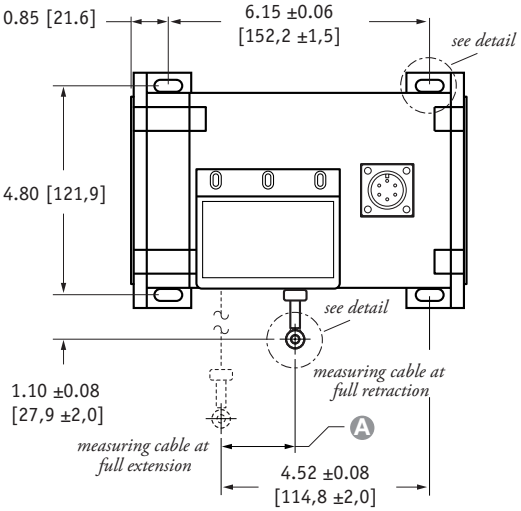
*contact view*

**25-ft. instrumentation cable:**

| color | signal | |
|---|---|---|
| red | + in | position |
| black | common | position |
| green | + out | position |
| white | + out | velocity |
| brown | - out | velocity |

**–applies to stainless steel enclosure only*

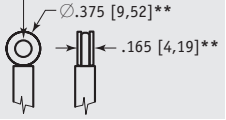
Fig. 1 – Outline Drawing (18 oz. cable tension only)



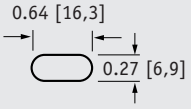

Ⓐ **DIMENSION (INCHES)**

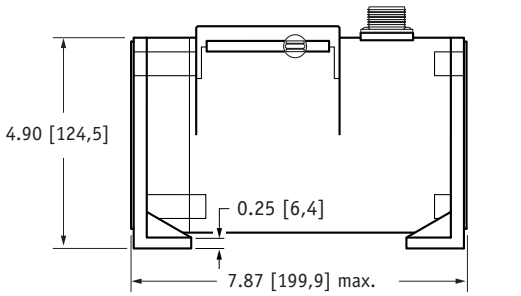
| RANGE | MEASURING CABLE ∅.034 in. | ∅.047 in. | ∅.062 in. |
|---|---|---|---|
| 75 | 0.22 | 0.29 | 0.37 |
| 100 | 0.29 | 0.39 | 0.49 |
| 150 | 0.44 | 0.59 | 0.73 |
| 200 | 0.58 | 0.79 | 0.98 |
| 250 | 0.73 | 0.98 | 1.22 |
| 300 | 0.88 | 1.18 | 1.47 |
| 350 | 1.02 | 1.38 | 1.71 |
| 400 | 1.17 | 1.57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

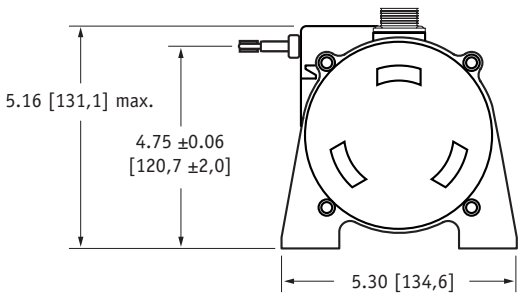
**eyelet detail**




**mounting hole detail**



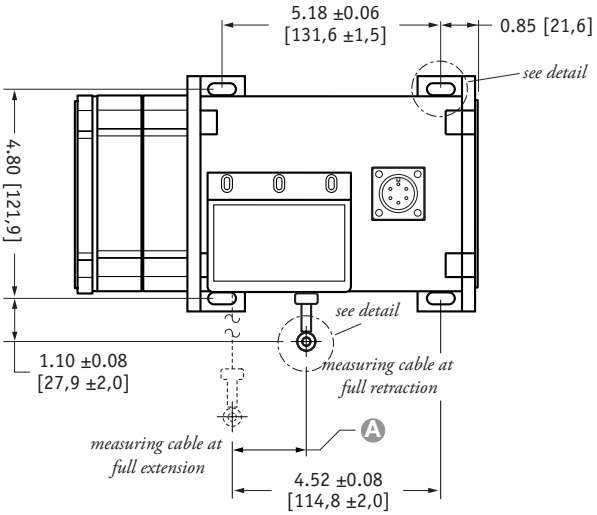




DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.03 IN. [0.5 MM] unless otherwise noted.

* tolerance = +.005 –.001 [+.13 –.03]
** tolerance = +.005 –.005 [+.13 –.13]

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

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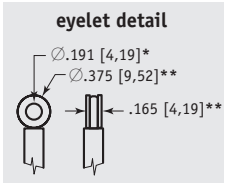
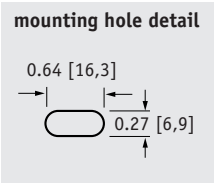
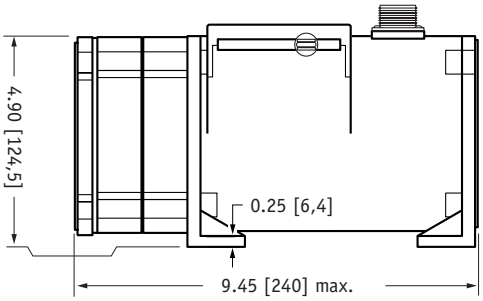
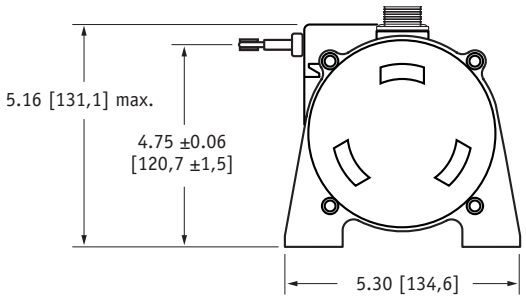
| RANGE | MEASURING CABLE ∅.034 in. | ∅.047 in. | ∅.062 in. |
|---|---|---|---|
| 75 | 0.22 | 0.29 | 0.37 |
| 100 | 0.29 | 0.39 | 0.49 |
| 150 | 0.44 | 0.59 | 0.73 |
| 200 | 0.58 | 0.79 | 0.98 |
| 250 | 0.73 | 0.98 | 1.22 |
| 300 | 0.88 | 1.18 | 1.47 |
| 350 | 1.02 | 1.38 | 1.71 |
| 400 | 1.17 | 1.57 | 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]