

# Cable-Extension Position Transducer

0...5, 0...10, -5...+5, -10...+10 VDC Output Options  
Ranges: 0-75 to 0-550 inches  
Industrial Grade



# PT9510

## Specification Summary:

### GENERAL

Full Stroke Range Options—on this datasheet..... 0-75 to 0-550 inches  
Output Signal Options..... 0...10, 0...5, -5...+5, -10...+10 VDC  
Accuracy.....  $\pm 0.12\%$  full stroke  
Repeatability.....  $\pm 0.05\%$  full stroke  
Resolution..... essentially infinite  
Measuring Cable Options..... nylon-coated stainless steel or thermoplastic  
Enclosure Material..... powder-painted aluminum or stainless steel  
Sensor..... plastic-hybrid precision potentiometer  
Potentiometer Cycle Life..... 250,000, min. —before signal degradation can occur  
Maximum Retraction Acceleration..... see ordering information  
Maximum Velocity..... see ordering information  
Weight, Aluminum (Stainless Steel) Enclosure..... 8 lbs. (16 lbs.) max.

### ELECTRICAL

Input Voltage..... 14.5-40VDC (10.5-40VDC for 0-5 volt output)  
Input Current..... 10 mA maximum  
Output Impedance..... 1000 ohms  
Maximum Output Load..... 5000 ohms  
Zero and Span Adjustment..... see ordering information

### 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

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

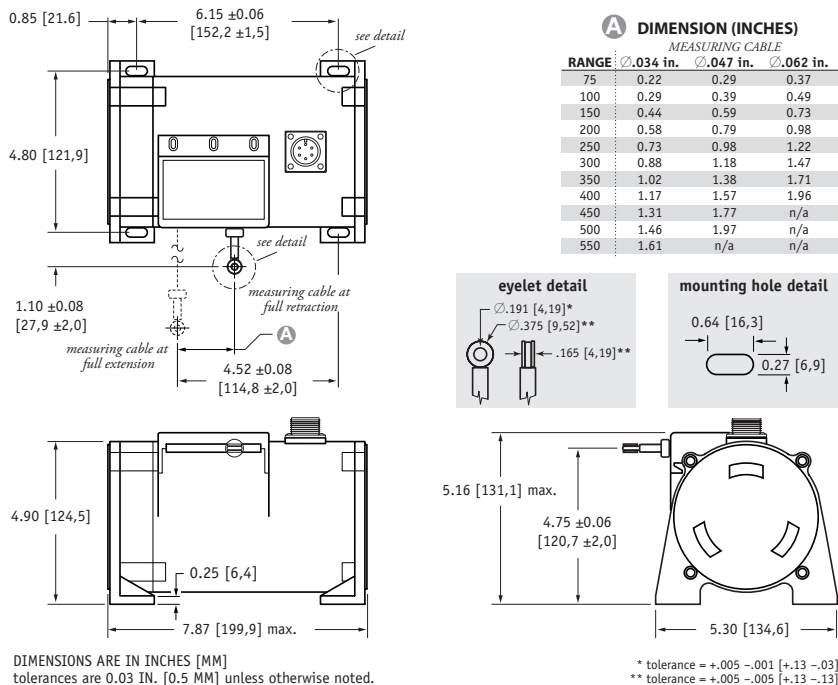
Emission / Immunity..... EN50081-2 / EN50082-2



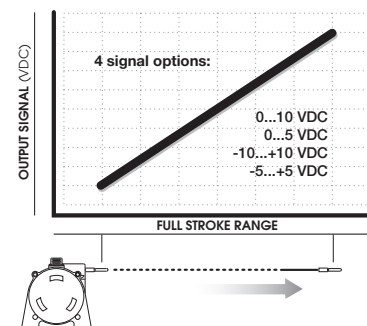
The PT9510 can operate from an unregulated 14.5 to 40 VDC power supply while providing a regulated output signal over its full extended range of up to 1700". It provides a 0 - 10 VDC position feedback signal proportional to the linear movement of its stainless steel measuring cable.

As a member of Celesco's innovative family of NEMA-4 rated cable-extension transducers, the PT9510 offers numerous benefits. It installs in minutes, functions properly without perfectly parallel alignment, and when its cable is retracted, it measures only 6".

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



## Output Signal



## Ordering Information:

## Model Number:

**PT9510-** \_\_\_\_\_ **- 1 0**

order code:      **R**      **A**      **B**      **C**      **D**      **E**      **F**      **G**

Sample Model Number:

**PT9510 - 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  
**E** output signal: 0...10 vdc  
**F** electrical connection: 6-pin plastic connector

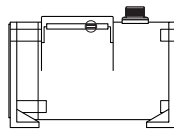
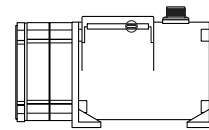
## Full Stroke Range:

|                         |             |             |             |             |             |             |             |             |              |              |              |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|
| <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:

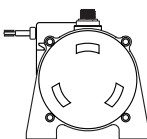
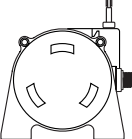
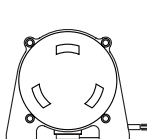
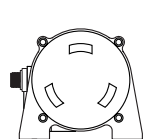
|                         |                         |                     |                         |                     |
|-------------------------|-------------------------|---------------------|-------------------------|---------------------|
| <b>A</b> order code:    | <b>1</b>                | <b>3</b>            | <b>2</b>                | <b>4</b>            |
| 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: | <b>1</b>                                                                  | <b>2</b>                                                         | <b>3</b>                                                       |
|                      | Ø.034-inch nylon-coated stainless steel<br>available in <i>all</i> ranges | Ø.047-inch stainless steel<br>all ranges up to <i>500 inches</i> | Ø.062-inch thermoplastic<br>all ranges up to <i>400 inches</i> |

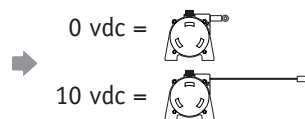
## Cable Exit:

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

## Output Signals:

|                        |                                                                                                   |                                                                                                   |                                                                                                  |                                                                                                  |                                                                                                       |                                                                                                        |                                                                                                      |                                                                                                      |
|------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>E</b> order code:   | <b>1</b>                                                                                          | <b>2</b>                                                                                          | <b>3</b>                                                                                         | <b>4</b>                                                                                         | <b>5</b>                                                                                              | <b>6</b>                                                                                               | <b>7</b>                                                                                             | <b>8</b>                                                                                             |
| output signal options: | 0...10 VDC<br> | 10...0 VDC<br> | 0...5 VDC<br> | 5...0 VDC<br> | -10...+10 VDC<br> | +10...-10 VDC<br> | -5...+5 VDC<br> | +5...-5 VDC<br> |
| input voltage:         | 14.5 – 40 vdc                                                                                     |                                                                                                   | 10.5 – 40 vdc                                                                                    |                                                                                                  | 14.5 – 40 vdc                                                                                         |                                                                                                        | 10.5 – 40 vdc                                                                                        |                                                                                                      |
| span adjustment:       | to 50% of full stroke range                                                                       |                                                                                                   |                                                                                                  |                                                                                                  | to 75% of full stroke range                                                                           |                                                                                                        |                                                                                                      |                                                                                                      |
| zero adjustment:       | from factory set zero to 50% of full stroke range                                                 |                                                                                                   |                                                                                                  |                                                                                                  | from factory set zero to 25% of full stroke range                                                     |                                                                                                        |                                                                                                      |                                                                                                      |

example:

ordercode = **1** = 0...10 VDC

Ordering Information:

Electrical Connection:

**F** order code:

**1**

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

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

**2**

10-ft. [3 M]  
waterproof cable  
**IP 67, NEMA 4X\*\*, 6**

10 ft. x 0.4-in. dia.  
[3 M x 10 mm dia.]  
18 AWG, type SJTW

**3**

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

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. [7.5 M]  
instrumentation cable  
**IP 67, NEMA 6**

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

**F** order code:

**5**

100-ft. [30 M]  
waterproof cable  
**IP 67, NEMA 4X\*\*, 6**

100 ft. x 0.4-in. dia.  
[30 M x 10 mm dia.]  
18 AWG, type SJTW

**6**

10-ft. [3 M]  
**pressure tested\***  
waterproof cable  
**IP 68, NEMA 4X\*\*, 6P**

10 ft. x 0.4-in. dia.  
[3 M x 10 mm dia.]  
18 AWG, type SJTW

**7**

100-ft. [30 M]  
**pressure tested\***  
waterproof cable  
**IP 68, NEMA 4X\*\*, 6P**

100 ft. x 0.4-in. dia.  
[30 M x 10 mm dia.]  
18 AWG, type SJTW

**6-pin Mating Plug**

| pin | signal        |
|-----|---------------|
| A   | input voltage |
| B   | output signal |
| C   | common        |

contact view

**Waterproof Cable**

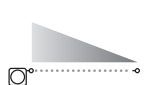
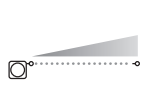
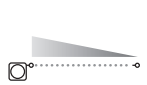
| color code | signal        |
|------------|---------------|
| WHITE      | input voltage |
| GREEN      | output signal |
| BLACK      | common        |

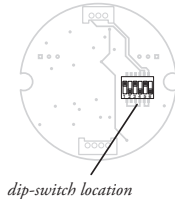
**Instrumentation Cable**

| color code | signal        |
|------------|---------------|
| RED        | input voltage |
| GREEN      | output signal |
| BLACK      | common        |

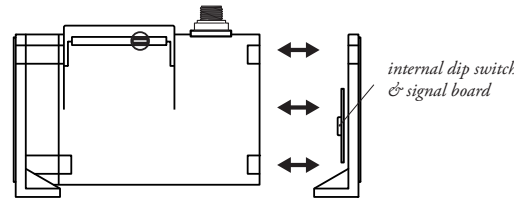
Notes: { \* -Test pressure: 100 feet [30 meters] H<sub>2</sub>O (40 PSID); Test Medium: Air; Duration: 2 hours.  
\*\* -NEMA 4X applies to stainless steel enclosure only.

Output Signal Selection (does not apply to -5...+5 & -10...+10 vdc options)

| output signal | switch setting                                                                      | signal board                                                                        |
|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 0...10 vdc    |  |  |
| 10...0 vdc    |  |  |
| 0...5 vdc     |  |  |
| 5...0 vdc     |  |  |



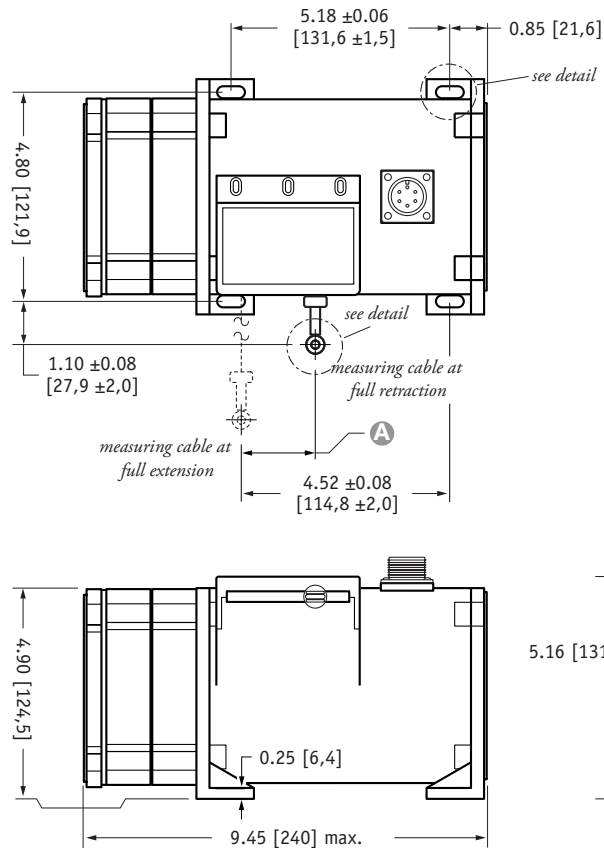
To gain access to the signal board, remove four Allen-Head Screws and remove end cover bracket.



**Caution! Do Not Remove Spring-Side End Cover**  
Removing spring-side end cover could cause spring to become unseated and permanently damaged.

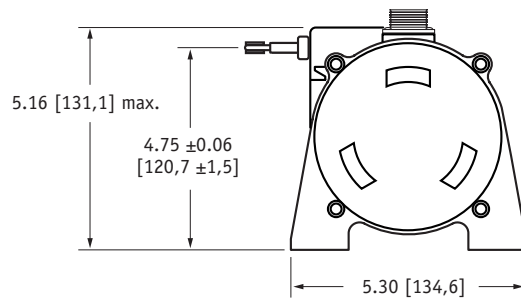
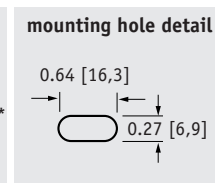
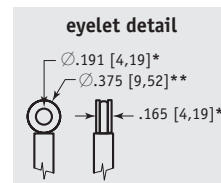
The output signal direction can be reversed at any time by simply changing the dip-switch settings found on the internal signal board. After the settings have been changed, adjustment of the Zero and Span trimpots will be required to precisely match signal values to the beginning and end points of the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

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



**A DIMENSION (INCHES)**

| MEASURING CABLE |           |           |           |
|-----------------|-----------|-----------|-----------|
| RANGE           | Ø.034 in. | Ø.047 in. | Ø.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]