

# PT9420

Heavy Industrial • 4...20mA, 0...20mA

Absolute Linear Position to 550 inches (1400 cm)

Aluminum or Stainless Steel Enclosure Options

VLS Option To Prevent Free-Release Damage

IP68 • NEMA 6 Protection • Hazardous Area Certification



## GENERAL

|   |  |
|---|--|
| Full Stroke Range Options (on this datasheet) | 0-75 to 0-550 inches                           |
| Output Signal Options                         | 4...20 mA (2-wire) and 0...20 mA (3-wire)      |
| Accuracy                                      | ± 0.12% full stroke                            |
| Repeatability                                 | ± 0.05% full stroke                            |
| Resolution                                    | essentially infinite                           |
| Measuring Cable Options                       | stainless steel or thermoplastic               |
| Enclosure Material                            | powder-painted aluminum or 303 stainless steel |
| Sensor  | plastic-hybrid precision potentiometer         |
| Potentiometer Cycle Life                      | ≥ 250,000                                      |
| Maximum Retraction Acceleration               | see ordering information                       |
| Maximum Velocity                              | see ordering information                       |
| Weight, Aluminum (Stainless Steel) Enclosure  | 8 lbs. (16 lbs.) max.                          |

## ELECTRICAL

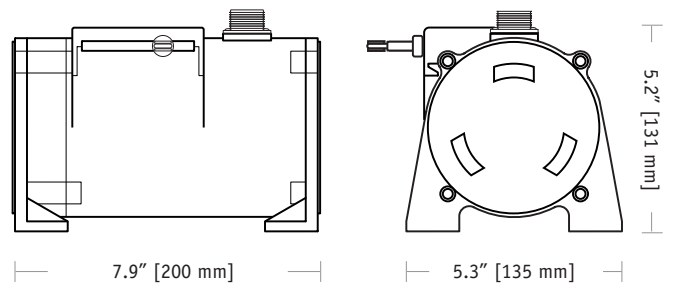
|                                |                                 |
|--------------------------------|---------------------------------|
| Input Voltage                  | see ordering information        |
| Input Current                  | 20 mA max.                      |
| Maximum Loop Resistance (Load) | (loop supply voltage – 8)/0.020 |
| Circuit Protection             | 38 mA max.                      |
| Impedance                      | 100M ohms @ 100 VDC, min.       |
| Output Signal, Zero Adjust     | up to 50% of full stroke range  |
| Output Signal, Span Adjust     | to 50% of factory set span      |

## ENVIRONMENTAL

|                              |                               |
|------------------------------|-------------------------------|
| Enclosure                    | NEMA 4/4X/6, IP 67/68         |
| Hazardous Area Certification | see ordering information      |
| Operating Temperature        | -40° to 200°F (-40° to 90°C)  |
| Vibration                    | up to 10 g to 2000 Hz maximum |
| Thermal Effects, Zero        | 0.01% f.s./°F, max.           |
| Thermal Effects, Span        | 0.01%/°F, max.                |

## EMC COMPLIANCE PER DIRECTIVE 89/336/EEC

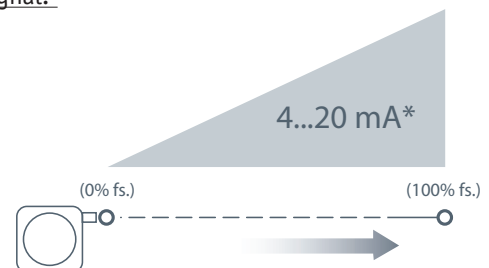
|                     |                       |
|---------------------|-----------------------|
| Emission / Immunity | EN50081-2 / EN50082-2 |
|---------------------|-----------------------|



The PT9420 is a great value for demanding long-range applications requiring a 4 - 20 mA linear position feedback signal. Sealed to meet NEMA 4 standards, this Cable-Extension Transducer will perform even under the harshest of environmental conditions.

As a member of our innovative family of NEMA-4 rated cable-extension transducers, the PT9420 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:



\*Optional 3-wire, 0...20mA output signal available.

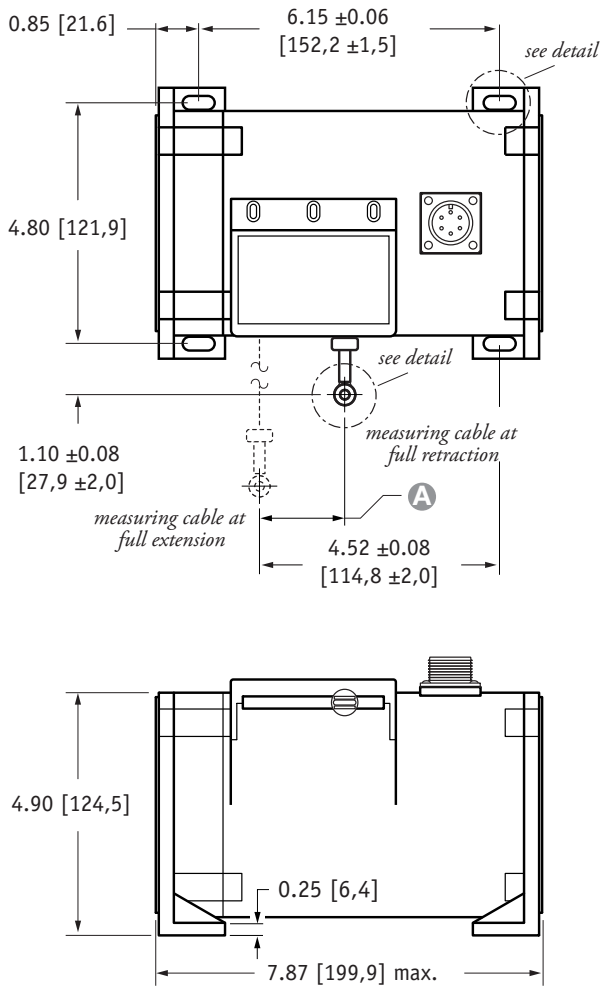
20630 Plummer Street • Chatsworth, CA 91311  
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799



**celesco**

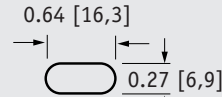
celesco.com • info@celesco.com

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

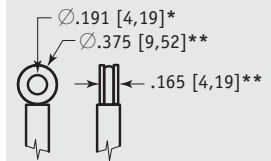


DIMENSIONS ARE IN INCHES [MM]  
tolerances are 0.03 IN. [0.5 MM] unless otherwise noted.

mounting hole detail

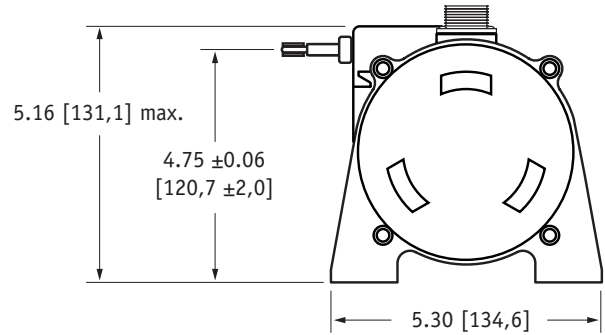


eyelet detail



**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:

**PT9420** -      -      -      -      -      -      -      -      -      -       
order code:                      **R**                      **A**                      **B**                      **C**                      **D**                      **E**                      **F**                      **G**

Sample Model Number:

**PT9420 - 0500 - 111 - 1110**

- R** range: 500 inches
- A** enclosure/cable tension: aluminum/18 oz.
- B** measuring cable: .034 nylon-coated stainless front
- C** cable exit:
- E** output signal: 4...20 mA, 2-wire
- F** electrical connection: 6-pin plastic connector

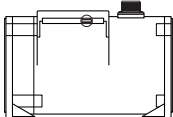
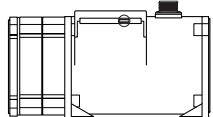
Full Stroke Range:

| <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

## Ordering Information (cont.):

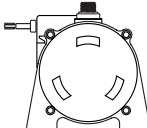
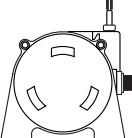
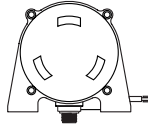
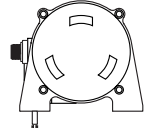
### Enclosure Material and Measuring Cable Tension:

| Ⓐ 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<br>see fig 1. |  | dual-spring housing<br>see fig 2. |







### Measuring Cable:

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


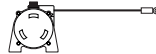
### Cable Exit:

| Ⓒ order code: | 1   | 2   | 3   | 4   |
|---------------|---|---|---|---|
|               | front   | top   | back  | down  |
|               |  |  |  |  |



### Output Signals:

| Ⓓ order code:                 | 1  | 2  | 3  | 4   | 5*   | 6*   |
|-------------------------------|--|--|--|---|--|--|
| output signal options:        | 4...20 mA<br> | 20...4 mA<br> | 0...20 mA<br> | 20...0 mA<br> | 4...20 mA<br> | 20...4 mA<br> |
| 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 - 34 vdc   |  | 14 - 29 vdc  |   | 14 - 32 vdc  |  |
| hazardous area certification: | not certified  |  | not certified  |   | CSA • Cenelec  |  |

Output Signal Example:

ordercode = 1 = 4...20 mA →  
 4 mA =   
 20 mA = 

Hazardous Area Certifications:

 CSA Standard 22.2 Class 1 Groups A, B, C and D  
 Cenelec LCIE EEx ia IIC T4

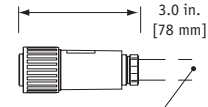
\*IMPORTANT: intrinsically safe when powered from a CSA certified zener barrier rated 28 VDC max, 110 mA max per installation drawing#677984

Ordering Information (cont.):

**Electrical Connection:**

**1** order code:

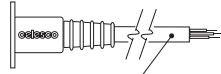
**1**  
6-pin plastic connector w/mating plug  
IP 67, NEMA 4X\*\*,6



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

**2**

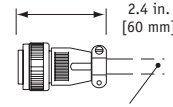
10-ft. [3 M]  
waterproof cable  
IP 67, NEMA 4X\*\*, 6



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

**3**

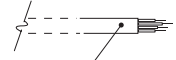
6-pin metal connector w/mating plug  
IP 65, NEMA 4



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

**4**

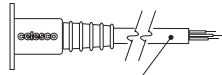
25-ft. [7.5 M]  
instrumentation cable  
IP 67, NEMA 6



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

**5** order code:

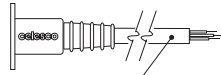
100-ft. [30 M]  
waterproof cable  
IP 67, NEMA 4X\*\*,6



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

**6**

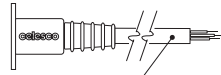
10-ft. [3 M]  
pressure tested\*  
waterproof cable  
IP 68, NEMA 4X\*\*, 6P



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

**7**

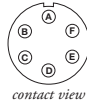
100-ft. [30 M]  
pressure tested\*  
waterproof cable  
IP 68, NEMA 4X\*\*, 6P



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

**6-pin Mating Plug**

| pin | 2-wire        | 3-wire             |
|-----|---------------|--------------------|
| A   | 8...34 vdc*** | 14...29 vdc common |
| B   | 4...20 mA out | 0...20 mA out      |
| C   | -             | -                  |
| D   | case ground   | -                  |



contact view

**Waterproof Cable**

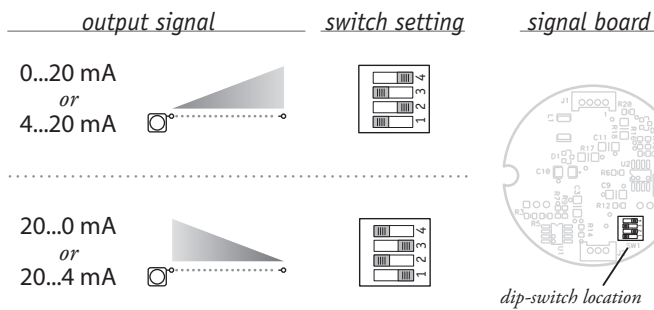
| color code | 2-wire        | 3-wire             |
|------------|---------------|--------------------|
| WHITE      | 8...34 vdc*** | 14...29 vdc common |
| BLACK      | 4...20 mA out | 0...20 mA out      |
| GREEN      | case ground   | -                  |

**Instrumentation Cable**

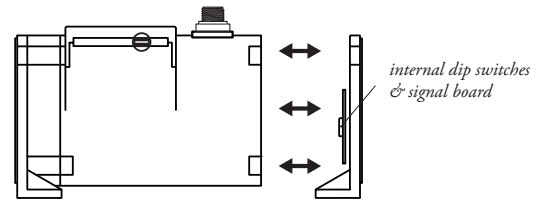
| color code | 2-wire        | 3-wire             |
|------------|---------------|--------------------|
| RED        | 8...34 vdc*** | 14...29 vdc common |
| BLACK      | 4...20 mA out | n/a                |
| WHITE      | n/a           | n/a                |
| GREEN      | case ground   | 0...20 mA out      |

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.  
\*\*\* -14-32 VDC for hazardous area option.

Output Signal Selection (not available with intrinsically safe option):



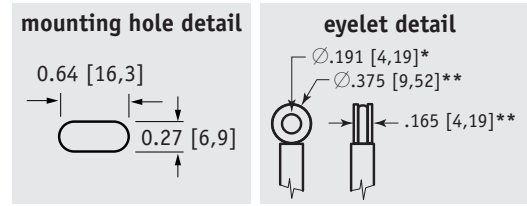
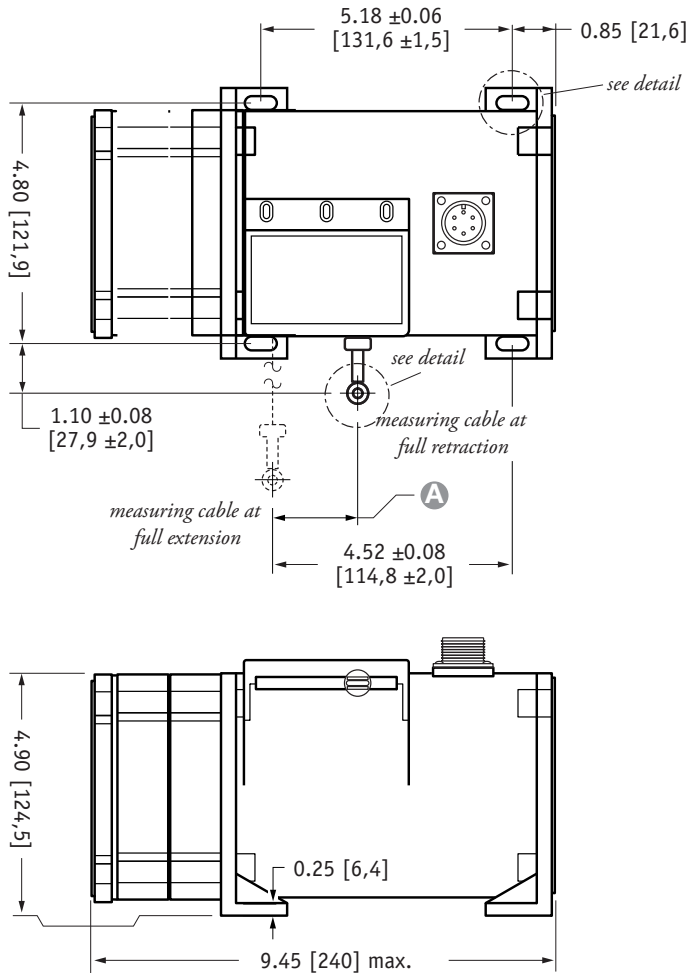
To gain access to the signal board, remove four Allen-Head Screws and remove end cover bracket.



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

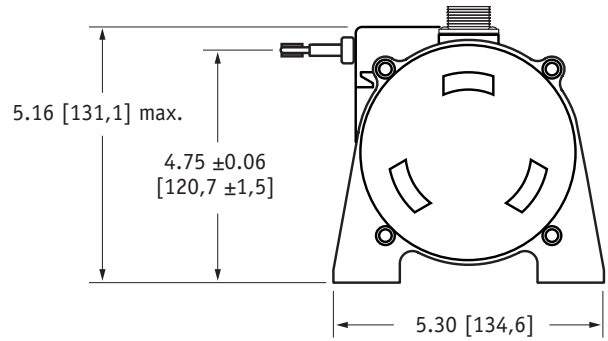
The output signal direction can be reversed at any time by simply changing the dip-switch settings found on the internal signal board. After the settings have been changed, adjustment of the Zero and Span trimpots will be required to precisely match signal values to the beginning and end points of the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

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



**A DIMENSION (INCHES)**

| RANGE | MEASURING CABLE |           |           |           |
|-------|-----------------|-----------|-----------|-----------|
|       | Ø.031 in.       | Ø.034 in. | Ø.047 in. | Ø.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       |



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

\* tolerance = +.005 –.001 [+0.13 –.03]  
\*\* tolerance = +.005 –.005 [+0.13 –.13]

## VLS Option - Free Release Protection

The patented Celesco Velocity Limiting System (VLS) is an option for PT9000 Series cable extension transducers that limits cable retraction to a safe 40 to 55 inches per second for the single spring option and 40 to 80 inches per second for the higher tension dual spring option.

The VLS option prevents the measuring cable from ever reaching a damaging velocity during an accidental free release. This option is ideal for mobile applications that require frequent cable disconnection and reconnection. It prevents expensive unscheduled downtime due to accidental cable mishandling or attachment failure.

### How To Configure Model Number for VLS Option:

**VLS 9420** -      -      -      -      -      -      -     

creating VLS model number (example)...

1. select PT9420 model **PT9420-0100-111-1110**
2. remove "PT" from the model number ~~PT~~ **9420-0100-111-1110**
3. add "VLS" **VLS + 9420-0100-111-1110**
4. completed model number! **VLS9420-0100-111-1110**