

# Cable-Extension Position Transducer

**Position and Velocity Output Signals**  
**Ranges: 0-10 to 0-250 inches**  
**Industrial Grade • High Cycle Applications**

# PT5AV

## Specification Summary:

**GENERAL**  
 Full Stroke Range Options ..... 0-10 to 0-250 inches

**POSITION**  
 Output Signal ..... voltage divider (potentiometer)  
 Accuracy .....  $\pm 0.75\%$  to  $\pm 0.18\%$  full stroke, *see ordering information*  
 Repeatability ..... *see ordering information*  
 Resolution ..... *essentially infinite*  
 Sensor ..... plastic-hybrid precision potentiometer  
 Potentiometer Cycle Life ..... *see ordering information*  
 Input Resistance Options ..... 500, 1K, 5K or 10K  $\Omega$ , *see ordering information*  
 Power Rating, Watts ..... *see ordering information*  
 Recommended Maximum Input Voltage ..... *see ordering information*  
 Output Signal Change Over Full Stroke Range .....  $94\% \pm 4\%$  of input voltage

**VELOCITY**  
 Output Signal ..... DC voltage  
 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—*varies slightly with measuring cable*  
 N34 cable option ..... 354 mV  $\pm 4\%$   
 S47 cable option ..... 352 mV  $\pm 4\%$   
 V62 cable option ..... 351 mV  $\pm 4\%$   
 Output Impedance ..... 350 ohms  $\pm 10\%$   
 Output Ripple (for velocity  $\geq 1.35$  inches per second) .....  $\pm 3\%$  rms

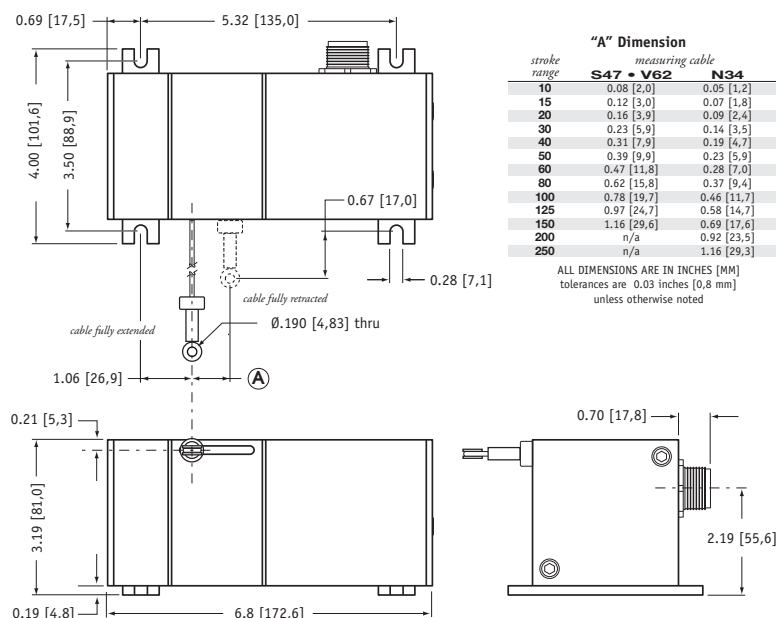
**GENERAL**  
 Measuring Cable Options ..... stainless steel, nylon-coated or thermoplastic  
 Enclosure Material ..... hard anodized aluminum  
 Weight ..... 5 lbs. max.

**ENVIRONMENTAL**  
 Enclosure ..... NEMA 4/6, IP 65/67  
 Operating Temperature .....  $-40^\circ$  to  $200^\circ\text{F}$  ( $-40^\circ$  to  $90^\circ\text{C}$ )  
 Vibration ..... up to 10 G's to 2000 Hz maximum

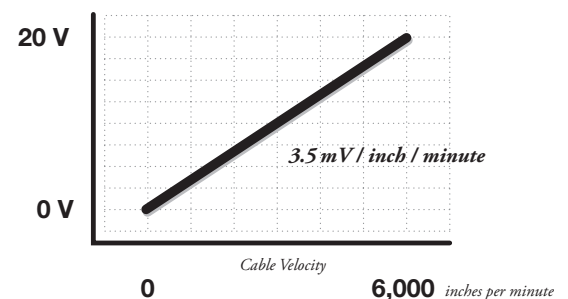


The PT5AV is a combination position and velocity transducer. A precision plastic-hybrid potentiometer provides accurate position feedback while a self-generating DC tachometer provides a velocity signal that is proportional to the speed of the traveling measuring cable.

Like Celesco's other transducers, the PT5AV installs in minutes, functions properly without perfectly parallel alignment, and fits easily into small areas. The PT5AV also has an optional unique thermoplastic measuring cable that has virtually an infinite fatigue life for high-cycle applications.



### Output Signal



**Ordering Information:**

**Model Number:**

**PT5AV** - \_\_\_\_\_  
*order code:*                      **R**                      **A**                      **B**                      **C**                      **D**

Sample Model Number:

**PT5AV - 100 - N34 - FR - 500 - M6**

- R** range: 100 inches
- A** measuring cable: .034 nylon-coated stainless steel
- B** cable exit: front
- C** output signal: 500 ohm potentiometer
- D** electrical connection: 6-pin plastic connector

**Full Stroke Range:**

| <b>R</b> order code:              | 10                  | 15     | 20     | 25     | 30     | 40     | 50             | 60     | 80     | 100     | 125     | 150                 | 200            | 250     |
|-----------------------------------|---------------------|--------|--------|--------|--------|--------|----------------|--------|--------|---------|---------|---------------------|----------------|---------|
| full stroke range, min:           | 10 in.              | 15 in. | 20 in. | 25 in. | 30 in. | 40 in. | 50 in.         | 60 in. | 80 in. | 100 in. | 125 in. | 150 in.             | 200 in.        | 250 in. |
| accuracy (±% of f.s.):            | .75%                | .6%    | .5%    | .5%    | .5%    | .3%    | .3%            | .25%   | .25%   | .25%    | .25%    | .18%                | .18%           | .18%    |
| repeatability (±% of f.s.):       | .1%                 | .1%    | .05%   | .05%   | .05%   | .05%   | .05%           | .02%   | .02%   | .02%    | .02%    | .02%                | .02%           | .02%    |
| potentiometer cycle life:         | 2,500,000 cycles    |        |        |        |        |        | 500,000 cycles |        |        |         |         |                     | 250,000 cycles |         |
| cable tension (20%):              | 41 ounces           |        |        |        |        |        |                |        |        |         |         | 21 ounces           |                |         |
| max. cable velocity/acceleration: | 300 in./sec • 5 G's |        |        |        |        |        |                |        |        |         |         | 120 in./sec • 2 G's |                |         |

**Measuring Cable:**

| <b>A</b> order code: | N34   | S47   | V62   |
|----------------------|---|---|---|
|                      | .034 nylon-coated stainless steel<br><i>available in all ranges</i>         | .047 stainless steel<br><i>all ranges up to 150 inches</i>                  | .062 thermoplastic<br><i>all ranges up to 150 inches</i>                    |
|                      | Ø.190 in. (4,83 mm) thru<br>0.034 in. (0,86 mm) dia.<br>0.170 in. (4,32 mm) | Ø.190 in. (4,83 mm) thru<br>0.047 in. (1,19 mm) dia.<br>0.170 in. (4,32 mm) | Ø.190 in. (4,83 mm) thru<br>0.062 in. (1,57 mm) dia.<br>0.170 in. (4,32 mm) |

**Cable Exit:**

| <b>B</b> order code: | UP<br>up    | DN<br>down | FR<br>front | BK<br>back |
|----------------------|-------------|------------|-------------|------------|
|                      |             |            |             |            |
|                      | inches [mm] |            |             |            |

**Output Signals:**

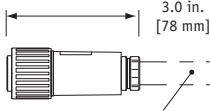
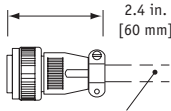
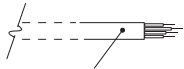
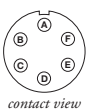
| <b>C</b> order code:                | 500   | 1K         | 5K   | 10K          |
|-------------------------------------|---|------------|--|--------------|
| position sensing potentiometer:     | 500 ohms*   | 1000 ohms* | 5000 ohms*   | 10,000 ohms* |
| <b>position sensing circuit</b>     |   |            | <b>position circuit max input voltage &amp; power rating</b> |              |
| <i>value specified by ordercode</i> | 500-ohms: 10 to 30-inch range: 20 V AC/DC (1 W)<br>1K to 10K-ohms: 30 V AC/DC (1 W) |            | 40 to 250-inch range: 30 V AC/DC (2 W)<br>30 V AC/DC (2 W)   |              |
|                                     |   |            | <b>velocity sensing circuit</b>                              |              |
|                                     |   |            |  |              |

\*-tolerance = ±10%

Ordering Information (cont.)

**Electrical Connection:**

① *order code:*

| <b>M6</b>   | <b>M6M</b>  | <b>C25</b>  |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
|---|---|---|-------------------|---|------|---|--------|---|-------|---|---|---|-------|---|-------|-------------------|---|--|--------------|---------------|-------------------|-----|------|-------|--------|-------|-------|-------------------|-------|-------|-------|-------|
| 6-pin plastic connector with mating plug<br><b>IP 67, NEMA 6</b>  | 6-pin metal connector with mating plug<br><b>IP 65, NEMA 4</b>  | 25-ft. instrumentation cable<br>24 AWG, shielded<br><b>IP 67, NEMA 6</b>            |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
|    |                                       |  |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| .30 - .39 in. [8 - 10 mm] cable dia.<br>16 AWG max conductor size<br>connector: MS3102E-14S-6P<br>mating plug: MS3106E-14S-6S   | .375 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                    |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| <b>6-pin mating plug:</b>   |   | <b>25-ft. instrumentation cable:</b>  |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| <table border="0"> <tr> <td><b>pin</b></td> <td><b>signal</b></td> <td rowspan="6">} <i>position</i></td> </tr> <tr> <td>A</td> <td>+ in</td> </tr> <tr> <td>B</td> <td>common</td> </tr> <tr> <td>C</td> <td>+ out</td> </tr> <tr> <td>D</td> <td>-</td> </tr> <tr> <td>E</td> <td>+ out</td> </tr> <tr> <td>F</td> <td>- out</td> <td>} <i>velocity</i></td> </tr> </table> | <b>pin</b>  | <b>signal</b>   | } <i>position</i> | A | + in | B | common | C | + out | D | - | E | + out | F | - out | } <i>velocity</i> |  <p>contact view</p> | <table border="0"> <tr> <td><b>color</b></td> <td><b>signal</b></td> <td rowspan="3">} <i>position</i></td> </tr> <tr> <td>red</td> <td>+ in</td> </tr> <tr> <td>black</td> <td>common</td> </tr> <tr> <td>green</td> <td>+ out</td> <td rowspan="3">} <i>velocity</i></td> </tr> <tr> <td>white</td> <td>+ out</td> </tr> <tr> <td>brown</td> <td>- out</td> </tr> </table> | <b>color</b> | <b>signal</b> | } <i>position</i> | red | + in | black | common | green | + out | } <i>velocity</i> | white | + out | brown | - out |
| <b>pin</b>  | <b>signal</b>   | } <i>position</i>   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| A   | + in  |   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| B   | common  |   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| C   | + out   |   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| D   | -   |   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| E   | + out   |   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| F   | - out   | } <i>velocity</i>   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| <b>color</b>  | <b>signal</b>   | } <i>position</i>   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| red   | + in  |   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| black   | common  |   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| green   | + out   | } <i>velocity</i>   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| white   | + out   |   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |
| brown   | - out   |   |                   |   |      |   |        |   |       |   |   |   |       |   |       |                   |   |  |              |               |                   |     |      |       |        |       |       |                   |       |       |       |       |