

# 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

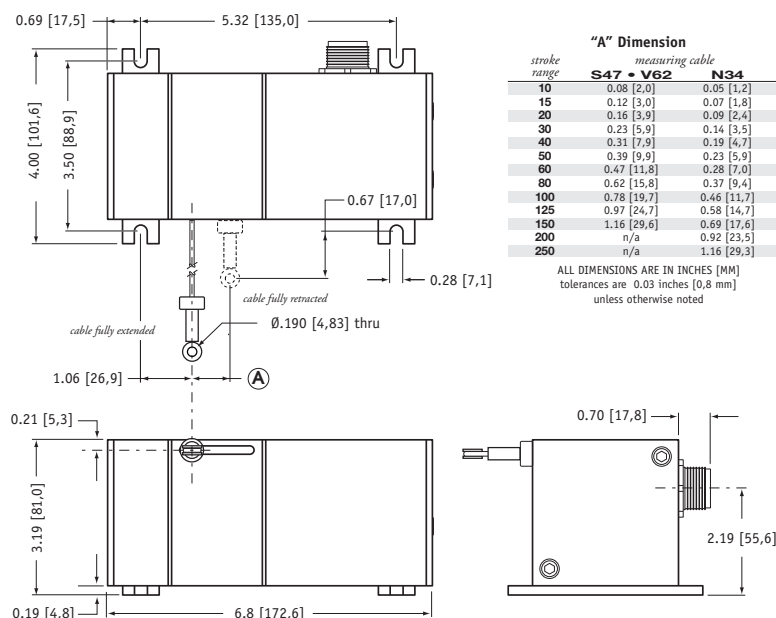
**GENERAL**  
 Measuring Cable Options ..... stainless steel, nylon-coated or thermoplastic  
 Enclosure Material ..... hard anodized aluminum  
 Weight ..... 5 lbs. max.

**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

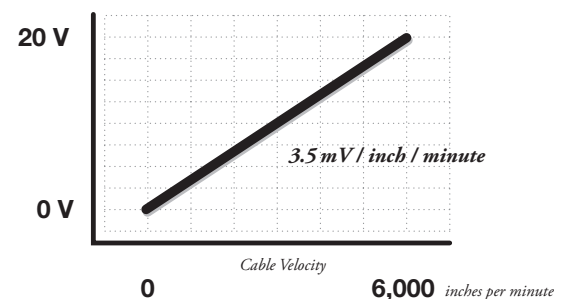


The PT5AV is a combination position and velocity transducer. A precision plastic-hybrid potentiometer provides accurate position feedback while a self-generating DC tachometer provides a velocity signal that is proportional to the speed of the traveling measuring cable.

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



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**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 <i>available in all ranges</i>	.047 stainless steel <i>all ranges up to 150 inches</i>	.062 thermoplastic <i>all ranges up to 150 inches</i>
	Ø.190 in. (4,83 mm) thru 0.034 in. (0,86 mm) dia. 0.170 in. (4,32 mm)	Ø.190 in. (4,83 mm) thru 0.047 in. (1,19 mm) dia. 0.170 in. (4,32 mm)	Ø.190 in. (4,83 mm) thru 0.062 in. (1,57 mm) dia. 0.170 in. (4,32 mm)

**Cable Exit:**

<b>B</b> order code:	UP up	DN down	FR front	BK 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>		<b>velocity sensing circuit</b>							
<i>value specified by ordercode</i>	<table border="1"> <tr> <td>500-ohms:</td> <td>10 to 30-inch range 20 V AC/DC (1 W)</td> <td>40 to 250-inch range 30 V AC/DC (2 W)</td> </tr> <tr> <td>1K to 10K-ohms:</td> <td>30 V AC/DC (1 W)</td> <td>30 V AC/DC (2 W)</td> </tr> </table>		500-ohms:	10 to 30-inch range 20 V AC/DC (1 W)	40 to 250-inch range 30 V AC/DC (2 W)	1K to 10K-ohms:	30 V AC/DC (1 W)	30 V AC/DC (2 W)		
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1K to 10K-ohms:	30 V AC/DC (1 W)	30 V AC/DC (2 W)								

\*-tolerance = ±10%

Ordering Information (cont.)

**Electrical Connection:**

① order code:

<p style="text-align: center;"><b>M6</b></p> <p style="text-align: center;">6-pin plastic connector with mating plug <b>IP 67, NEMA 6</b></p> <div style="text-align: center;"> </div> <p style="text-align: center;">.30 - .39 in. [8 - 10 mm] cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S</p>	<p style="text-align: center;"><b>M6M</b></p> <p style="text-align: center;">6-pin metal connector with mating plug <b>IP 65, NEMA 4</b></p> <div style="text-align: center;"> </div> <p style="text-align: center;">.375 in. [9 mm] max cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S</p>	<p style="text-align: center;"><b>C25</b></p> <p style="text-align: center;">25-ft. instrumentation cable 24 AWG, shielded <b>IP 67, NEMA 6</b></p> <div style="text-align: center;"> </div> <p style="text-align: center;">25 ft. x 0.2-in. dia. [7.5 M x 5 mm dia.] 24 AWG, shielded</p>																																					
<p><b>6-pin mating plug:</b></p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">pin</td> <td style="text-align: center;">signal</td> <td rowspan="6" style="font-size: 2em; vertical-align: middle;">}</td> <td rowspan="6" style="vertical-align: middle;"><i>position</i></td> </tr> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">+ in</td> </tr> <tr> <td style="text-align: center;">B</td> <td style="text-align: center;">common</td> </tr> <tr> <td style="text-align: center;">C</td> <td style="text-align: center;">+ out</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">-</td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">+ out</td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">- out</td> <td rowspan="2" style="font-size: 2em; vertical-align: middle;">}</td> <td rowspan="2" style="vertical-align: middle;"><i>velocity</i></td> </tr> </table>		pin	signal	}	<i>position</i>	A	+ in	B	common	C	+ out	D	-	E	+ out	F	- out	}	<i>velocity</i>	<p style="text-align: center; font-size: 0.8em;">contact view</p>	<p><b>25-ft. instrumentation cable:</b></p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">color</td> <td style="text-align: center;">signal</td> <td rowspan="6" style="font-size: 2em; vertical-align: middle;">}</td> <td rowspan="6" style="vertical-align: middle;"><i>position</i></td> </tr> <tr> <td style="text-align: center;">red</td> <td style="text-align: center;">+ in</td> </tr> <tr> <td style="text-align: center;">black</td> <td style="text-align: center;">common</td> </tr> <tr> <td style="text-align: center;">green</td> <td style="text-align: center;">+ out</td> </tr> <tr> <td style="text-align: center;">white</td> <td style="text-align: center;">+ out</td> </tr> <tr> <td style="text-align: center;">brown</td> <td style="text-align: center;">- out</td> </tr> <tr> <td></td> <td></td> <td rowspan="2" style="font-size: 2em; vertical-align: middle;">}</td> <td rowspan="2" style="vertical-align: middle;"><i>velocity</i></td> </tr> </table>	color	signal	}	<i>position</i>	red	+ in	black	common	green	+ out	white	+ out	brown	- out			}	<i>velocity</i>
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