

# Cable-Extension Position Transducer

**Precision Potentiometric Output**  
**Ranges: 0-2 to 0-100 inches**  
**Instrument Grade**



# PT101



## Specification Summary:

### GENERAL

Full Stroke Range Options.....0-2 to 0-100 inches  
 Output Signal Options..... voltage divider (potentiometer)  
 Accuracy ..... *see ordering information*  
 Repeatability .....  $\pm 0.02\%$  full stroke  
 Resolution ..... essentially infinite  
 Measuring Cable ..... *see ordering information*  
 Enclosure Material ..... powder-painted and anodized aluminum  
 Sensor ..... plastic-hybrid precision potentiometer  
 Potentiometer Cycle Life ..... *see ordering information*  
 Maximum Retraction Acceleration..... *see ordering information*  
 Weight ..... 2 lbs. max.

### ELECTRICAL

Input Resistance Options..... 500, 1K, 5K, 10K or bridge  
 Maximum Input Voltage ..... *see ordering information*  
 Power Rating..... *see ordering information*  
 Output Signal Change Over Full Stroke Range..... 94%  $\pm 4\%$  of input voltage

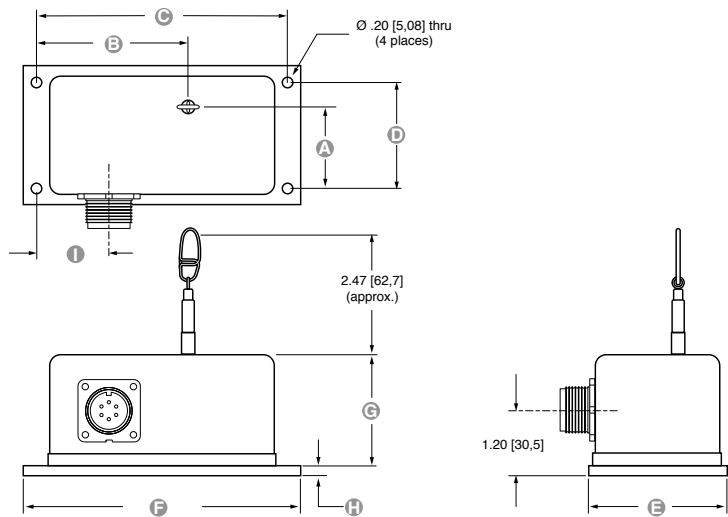
### ENVIRONMENTAL

Enclosure ..... NEMA 1  
 Temperature Coefficient of Sensing Element..... 88 PPM/ $^{\circ}$ F  
 Humidity ..... 100% RH @ 90 $^{\circ}$ F (32 C)  
 Operating Temperature..... -40 $^{\circ}$  to 200 $^{\circ}$ F (-40 $^{\circ}$  to 90 $^{\circ}$ C)  
 Vibration..... up to 10 G's to 2000 Hz maximum

Based on Celesco's original string pot design dating back to the late 1960's, the PT101 has become a standard throughout the years for literally thousands of applications including aircraft structural testing, hydraulic cylinder control, valve stem opening, and factory automation.

Available in full stroke ranges up to 100-inches, the PT101 provides a voltage feedback signal linearly proportional to the position of its traveling stainless steel measuring cable. Additionally the PT101 installs in minutes and doesn't require perfect parallel alignment. Simply secure the base to a fixed surface and attach the measuring cable to your moving object.

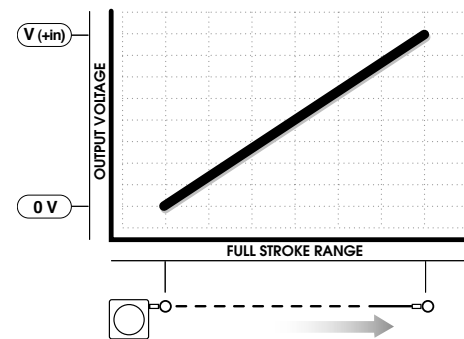
fig. 1: Top Exit Option



Range	A	B	C	D	E	F	G	H	I
2", 10", 20"	1.34 [34,0]	2.88 [73,1]	4.75 [120,6]	2.00 [25,4]	2.63 [66,8]	5.25 [133,4]	2.10 [53,3]	.16 [4,1]	1.37 [34,8]
5", 25", 50"	1.83 [46,5]	2.88 [73,1]	4.75 [120,6]	2.00 [25,4]	2.63 [66,8]	5.25 [133,4]	2.10 [53,3]	.16 [4,1]	1.37 [34,8]
15", 30"	1.56 [39,6]	2.88 [73,1]	4.75 [120,6]	2.00 [25,4]	2.63 [66,8]	5.25 [133,4]	2.10 [53,3]	.16 [4,1]	1.37 [34,8]
40"	1.64 [41,6]	2.88 [73,1]	4.75 [120,6]	2.00 [25,4]	2.63 [66,8]	5.25 [133,4]	2.10 [53,3]	.16 [4,1]	1.37 [34,8]
60"	2.16 [54,9]	2.88 [73,1]	6.75 [171,4]	2.37 [60,2]	3.25 [82,5]	7.50 [190,5]	2.60 [66,0]	.19 [4,8]	1.37 [34,8]
75", 80"	2.45 [62,2]	2.38 [60,4]	6.75 [171,4]	2.50 [63,5]	3.63 [92,2]	7.50 [190,5]	2.86 [72,6]	.19 [4,8]	1.37 [34,8]
100"	3.10 [78,7]	2.47 [62,8]	7.38 [187,5]	3.00 [76,2]	4.25 [108,0]	8.00 [203,2]	3.79 [96,3]	.19 [4,8]	3.69 [93,7]

ALL DIMENSIONS ARE IN INCHES [MM] tolerances are  $\pm 0.02$  in. [ $\pm 0.5$ mm] unless otherwise noted

## Electrical Output Signal



# PT101 Cable-Extension Transducer: Precision Potentiometric Output

## Ordering Information:

### Model Number:

**PT101** -      -      **1** -      **1** -      **0**

order code:      R      A      B      C      D      E      F      G

Sample Model Number:

**PT101 - 0025 - 111 - 1110**

- R** range: 25 inches
- A** measuring cable tension: standard - 5 oz.
- C** cable exit: top
- D** sensing circuit: 500 ohms
- F** electrical connection: 6-pin plastic connector

### Full Stroke Range:

<b>R</b> order code:	<b>0002</b>	<b>0005</b>	<b>0010</b>	<b>0015</b>	<b>0020</b>	<b>0025</b>	<b>0030</b>	<b>0040</b>	<b>0050</b>	<b>0060</b>	<b>0075</b>	<b>0080</b>	<b>0100</b>
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.	60 in.	75 in.	80 in.	100 in.
accuracy (% of f.s.):	0.25%		0.15%		0.10%		0.15%		0.10%				
potentiometer cycle life*:	2.5 x 10 <sup>6</sup>		5 x 10 <sup>5</sup>		2.5 x 10 <sup>5</sup>		5 x 10 <sup>5</sup>		2.5 x 10 <sup>5</sup>				

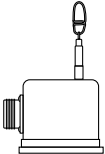
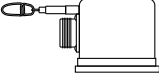
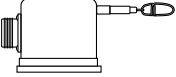
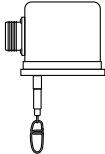
\*-1 cycle is defined as the travel of the measuring cable from full retraction to full extension and back to full retraction

### Measuring Cable Tension:

<b>A</b> order code:	<b>1</b>	<b>A</b>	<b>2**</b>	<b>3**</b>
	standard tension*/ acceleration	high tension*/ acceleration		
2, 10, 20 inch range:	12 oz. / 11 G	65 oz. / 53 G	72 oz.	144 oz.
5, 25, 50 inch range:	5 oz. / 2 G	26 oz. / 11 G	30 oz.	60 oz.
15, 30 inch range:	8 oz. / 3 G	43 oz. / 23 G	48 oz.	96 oz.
40 inch range:	6 oz. / 4 G	33 oz. / 16 G	36 oz.	72 oz.
60 inch range:	13 oz. / 4 G	22 oz. / 8 G	26 oz.	52 oz.
75, 80 inch range:	10 oz. / 3 G	40 oz. / 12 G	20 oz.	40 oz.
100 inch range:	13 oz. / 5 G	52 oz. / 20 G	26 oz.	52 oz.
measuring cable:	.019-in. dia. nylon-coated stainless steel		.024-in. dia. stainless steel	

\*-note: spring tension tolerance: ±20%    \*\*-note: outline dimensions for these options not controlled on this datasheet.

### Measuring Cable Exit:

<b>G</b> order code:	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
	top exit (see fig. 1)	front exit (see fig. 3)	rear exit (see fig. 3)	bottom exit (see fig. 2)
				

### Sensing Circuit:

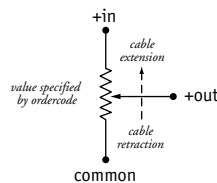
<b>D</b> order code:	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
	500 ohm*	1000 ohm*	5000 ohm*	10,000 ohm*	fixed bridge (2 mV/V)	adjustable bridge (0...30 mV/V)

\*tolerance ±10%

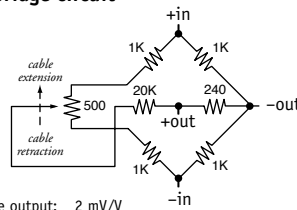
#### max. input voltage and power rating, options 1-4

	2-inch, 5-inch range	10-inch to 100-inch range
500-ohms:	20 V AC/DC (1 W)	30 V AC/DC (2 W)
1K to 10K-ohms:	30 V AC/DC (1 W)	30 V AC/DC (2 W)

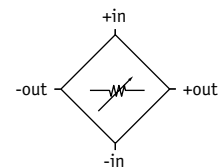
#### circuit, options 1-4



#### fixed bridge circuit



#### adjustable bridge circuit



# PT101 Cable-Extension Transducer: Precision Potentiometric Output

## Ordering Information (cont.):

### Electrical Connection:

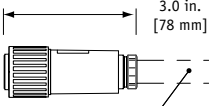
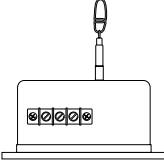
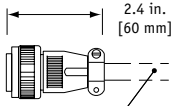

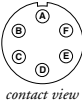
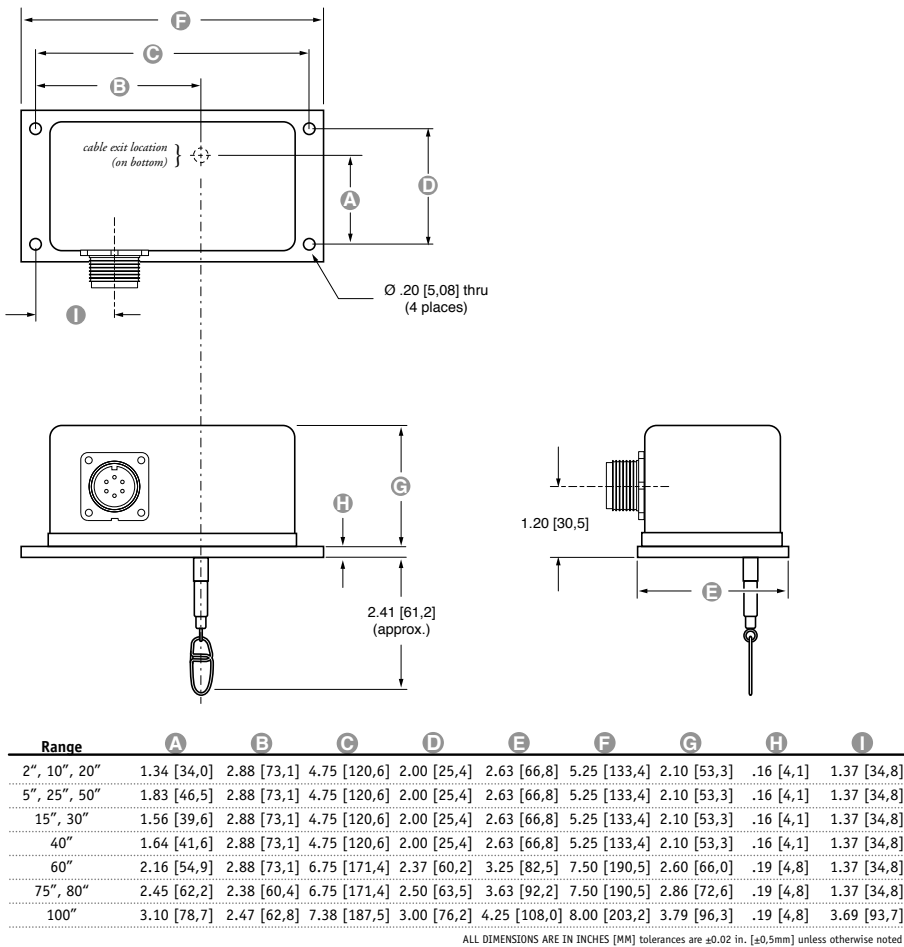
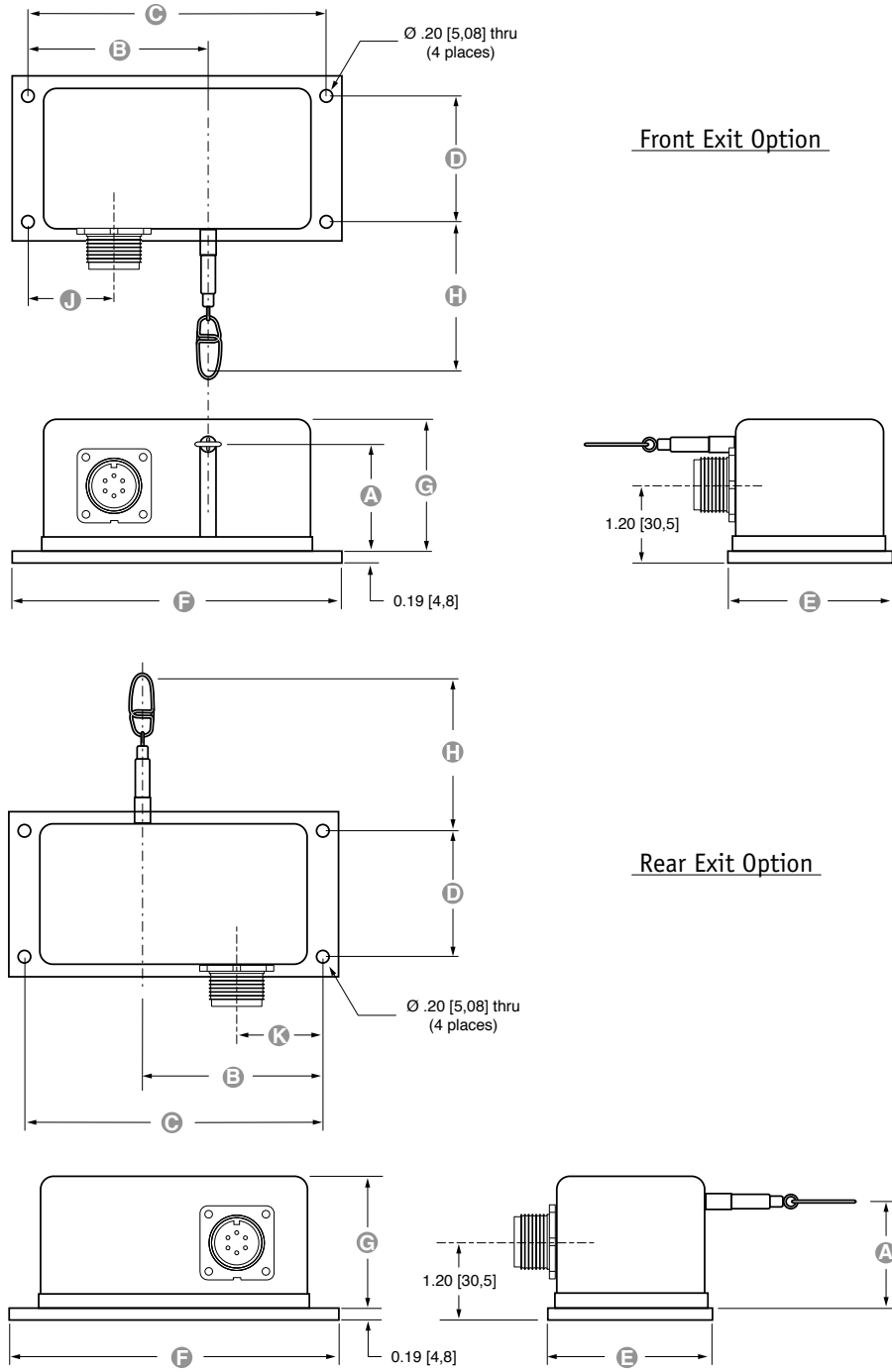
order code:	1	2	3	4																																							
	6-pin plastic connector with mating plug	terminal strip	6-pin metal connector with mating plug	25-ft. instrumentation cable 24 AWG, shielded																																							
																																											
	1/2 - 5/16" [14 - 8 mm] cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S		3/8-in. [9 mm] max cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S	25 ft. x 0.2-in. dia. [7,5 M x 5 mm dia.] 24 AWG, shielded																																							
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	<table border="1"> <thead> <tr> <th>pin</th> <th>standard</th> <th>bridge</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>+ in</td> <td>+ in</td> </tr> <tr> <td>B</td> <td>common</td> <td>- in</td> </tr> <tr> <td>C</td> <td>+ out</td> <td>- out</td> </tr> <tr> <td>D</td> <td>-</td> <td>+ out</td> </tr> </tbody> </table>	pin	standard	bridge	A	+ in	+ in	B	common	- in	C	+ out	- out	D	-	+ out	 <p>contact view</p>	<table border="1"> <thead> <tr> <th>terminal</th> <th>signals</th> <th>color code</th> <th>standard</th> <th>bridge</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+ in</td> <td>RED</td> <td>+ in</td> <td>+ in</td> </tr> <tr> <td>2</td> <td>common</td> <td>BLACK</td> <td>common</td> <td>- in</td> </tr> <tr> <td>3</td> <td>+ out</td> <td>GREEN</td> <td>+ out</td> <td>+ out</td> </tr> <tr> <td></td> <td></td> <td>WHITE</td> <td>-</td> <td>- out</td> </tr> </tbody> </table>	terminal	signals	color code	standard	bridge	1	+ in	RED	+ in	+ in	2	common	BLACK	common	- in	3	+ out	GREEN	+ out	+ out			WHITE	-	- out
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fig. 2: Bottom Exit Option



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fig. 3: Front and Rear Exit Options



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2", 10", 20"	1.34 [34,0]	2.87 [72,9]	4.75 [120,6]	2.00 [25,4]	2.63 [66,8]	5.25 [133,4]	2.10 [53,3]	2.57 [65,3]	.16 [4,1]	1.37 [34,8]	1.37 [34,8]
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version: 4.0 last updated: July 31, 2007