PT5A

Precision Potentiometric Output
Ranges: 0-10 to 0-250 inches
Industrial Grade • High Cycle Applications

CE

Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-10 to 0-250 inches
Output Signal Options ..... voltage divider (potentiometer)
Accuracy ..... ± 0.75% to ±0.18% full stroke *see ordering information*
Repeatability ..... *see ordering information*
Resolution ..... essentially infinite
Measuring Cable Options ..... stainless steel or thermoplastic
Enclosure Material ..... hard anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Measuring Cable Velocity ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 5 lbs. max.

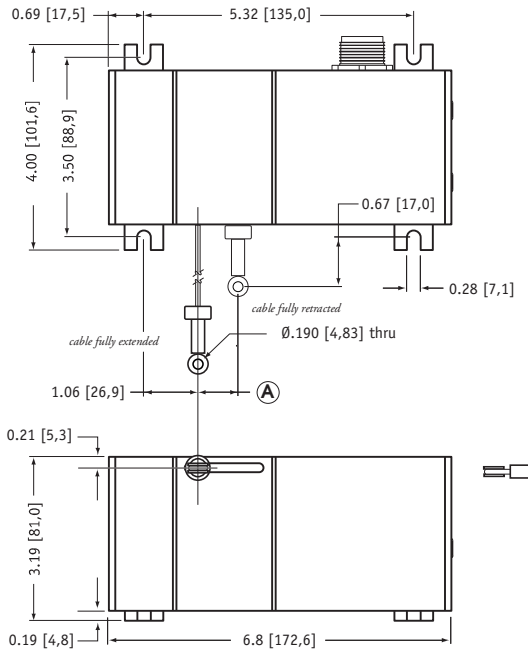
ELECTRICAL

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

ENVIRONMENTAL

Enclosure ..... NEMA 4/6, IP 65/67
Operating Temperature ..... -40° to 200°F (-40° to 90°C)
Vibration ..... up to 10 G's to 2000 Hz maximum

Outline Drawing



"A" Dimension

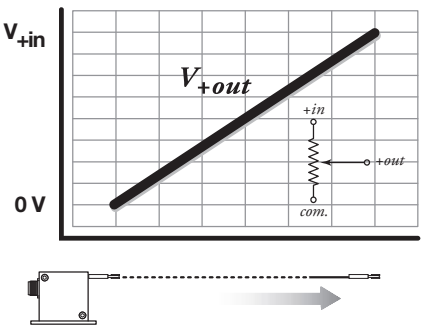
stroke range	measuring cable S47 • V62	measuring cable N34
10	0.08 [2,0]	0.05 [1,2]
15	0.12 [3,0]	0.07 [1,8]
20	0.16 [3,9]	0.09 [2,4]
30	0.23 [5,9]	0.14 [3,5]
40	0.31 [7,9]	0.19 [4,7]
50	0.39 [9,9]	0.23 [5,9]
60	0.47 [11,8]	0.28 [7,0]
80	0.62 [15,8]	0.37 [9,4]
100	0.78 [19,7]	0.46 [11,7]
125	0.97 [24,7]	0.58 [14,7]
150	1.16 [29,6]	0.69 [17,6]
200	n/a	0.92 [23,5]
250	n/a	1.16 [29,3]

ALL DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.03 inches [0,8 mm]
unless otherwise noted

The PT5A potentiometric cable-extension transducer uses a unique thermoplastic cable that has virtually an infinite fatigue life. This cable, known as V62, has properties that are superior for high cycle and rugged applications.

Like Celesco's other transducers, the PT5A installs in minutes, functions properly without perfectly parallel alignment, and fits easily into small areas. The PT5A offers additional installation flexibility since its cable exit can be rotated relative to the mounting surface, providing four different cable exit orientations.

Output Signal



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Ordering Information:

Model Number:

PT5A - _____ - ___ - ___ - ___ - ___
order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ

Sample Model Number:

PT5A - 100 - N34 - FR - 500 - M6

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

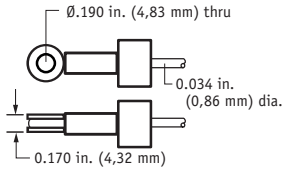
Full Stroke Range:

Ⓡ 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	

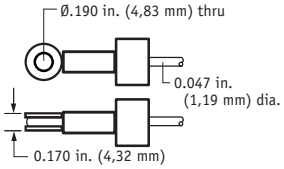
Measuring Cable:

Ⓐ order code:

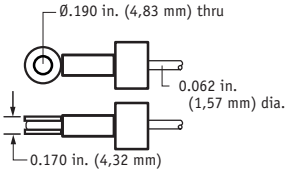
N34 — .034 nylon-coated stainless steel
available in all ranges



S47 — .047 stainless steel
all ranges up to 150 inches



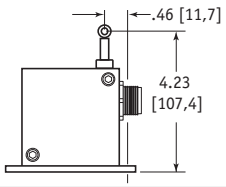
V62 — .062 thermoplastic
all ranges up to 150 inches



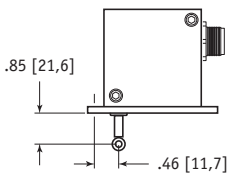
Cable Exit:

Ⓑ order code:

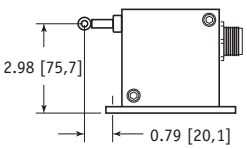
UP — up



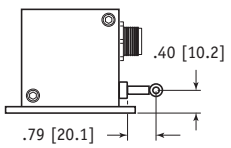
DN — down



FR — front



BK — back



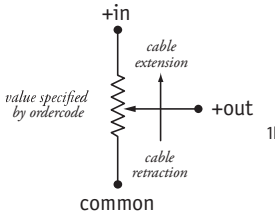
inches [mm]

Output Signals:

Ⓒ order code:

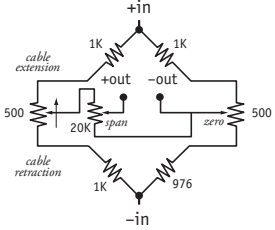
500	1K	5K	10K	B
500 ohm*	1000 ohm*	5000 ohm*	10,000 ohm*	adjustable bridge (0...30 mV/V)

*tolerance = ±10%



max. input voltage and power rating

	10 to 30-inch range	40 to 250-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)



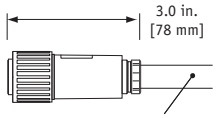
full scale output: adjustable from 0 to 30mV/V
zero adjust: to 50% of full stroke

Ordering Information (cont.)

Electrical Connection:

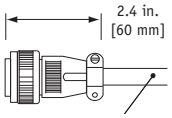
order code:

M6
6-pin plastic connector with mating plug
IP 67, NEMA 6



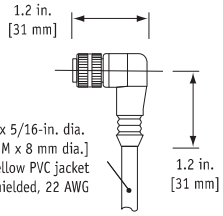
.30 – .39 in. [8 – 10 mm] cable dia.
16 AWG max conductor size
connector: MS3102E-14S-6P
mating plug: MS3106E-14S-6S

M6M
6-pin metal connector with mating plug
IP 65, NEMA 4



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

MC4
4-pin micro-connector with 12 ft [3.5 M] cordset
IP 67, NEMA 6



12 ft. x 5/16-in. dia.
[3,5 M x 8 mm dia.]
yellow PVC jacket
shielded, 22 AWG

C25
25-ft. instrumentation cable
24 AWG, shielded
IP 67, NEMA 6

25 ft. x 0.2-in. dia.
[7,5 M x 5 mm dia.]
24 AWG, shielded

6-pin mating plug:

contact view

pin	standard	bridge
A	+IN	+IN
B	COMMON	-IN
C	+OUT	-OUT
D	-	+OUT

4-pin mating plug and cord set:

contact view

pin	color code	standard	bridge
1	RED-BLK TR.	+IN	+IN
2	RED-WHT TR.	COMMON	-IN
3	RED	+OUT	+OUT
4	GREEN	-	-OUT

25-ft. cable:

color code	standard	bridge
RED	+IN	+IN
BLACK	COMMON	-IN
GREEN	+OUT	+OUT
WHITE	-	-OUT

0/4...20 mA Output
Ranges: 0-10 to 0-250 inches
Industrial Grade

PT5MA

CE

Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-10 to 0-250 inches
Output Signal Options ..... 4...20 mA (2-wire) and 0...20 mA (3-wire)
Accuracy ..... ± 0.75% to ±0.18% full stroke *see ordering information*
Repeatability ..... *see ordering information*
Resolution ..... essentially infinite
Measuring Cable Options ..... stainless steel or thermoplastic
Enclosure Material ..... hard anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Measuring Cable Velocity ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 5 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 ..... 100 M ohms @ 100 VDC, min.
Output Signal Adjustment
Zero Adjustment ..... from factory set zero to 50% of full stroke range
Span Adjustment ..... to 50% of factory set span

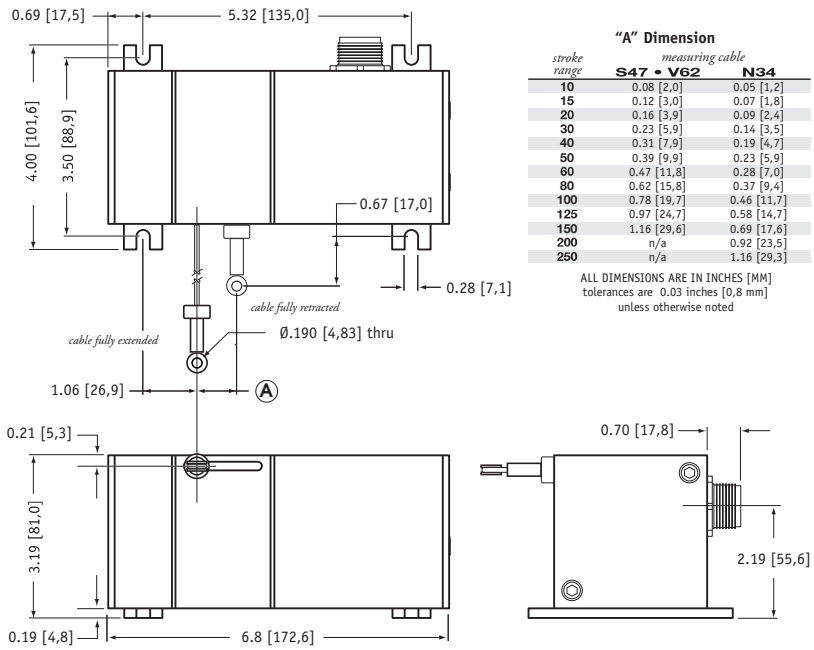
ENVIRONMENTAL

Enclosure ..... NEMA 4/6, IP 65/67
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

Outline Drawing



"A" Dimension

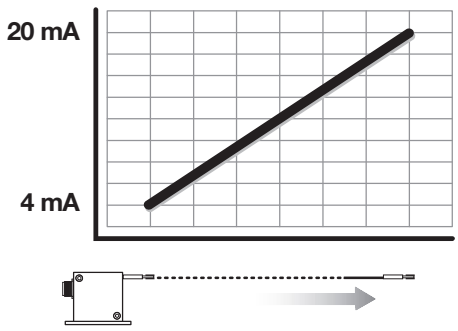
stroke range	measuring cable S47 • V62	measuring cable N34
10	0.08 [2,0]	0.05 [1,2]
15	0.12 [3,0]	0.07 [1,8]
20	0.16 [3,9]	0.09 [2,4]
30	0.23 [5,9]	0.14 [3,5]
40	0.31 [7,9]	0.19 [4,7]
50	0.39 [9,9]	0.23 [5,9]
60	0.47 [11,8]	0.28 [7,0]
80	0.62 [15,8]	0.37 [9,4]
100	0.78 [19,7]	0.46 [11,7]
125	0.97 [24,7]	0.58 [14,7]
150	1.16 [29,6]	0.69 [17,6]
200	n/a	0.92 [23,5]
250	n/a	1.16 [29,3]

ALL DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.03 inches [0,8 mm]
unless otherwise noted

The PT5MA potentiometric cable-extension transducer uses a unique thermoplastic cable that has virtually an infinite fatigue life. This cable, known as V62, has properties that are superior for high cycle and rugged applications.

Like Celesco's other transducers, the PT5MA installs in minutes, functions properly without perfectly parallel alignment, and fits easily into small areas. The PT5MA offers additional installation flexibility since its cable exit can be rotated relative to the mounting surface, providing four different cable exit orientations.

Output Signal



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tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799

Ordering Information:

Model Number:

PT5MA - _____ Ⓡ - ___ Ⓐ - ___ Ⓑ - ___ Ⓒ - ___ Ⓓ
order code:

Sample Model Number:

PT5MA - 100 - N34 - FR - 420E - M6

Ⓡ	range:	100 inches
Ⓐ	measuring cable:	.034 nylon-coated stainless
Ⓑ	cable exit:	front
Ⓒ	output signal:	4...20 mA
Ⓓ	electrical connection:	6-pin plastic connector

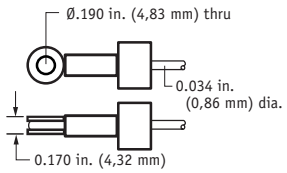
Full Stroke Range:

Ⓡ *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	

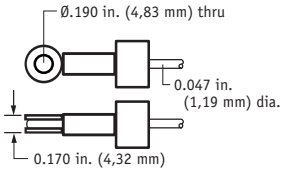
Measuring Cable:

Ⓐ *order code:*

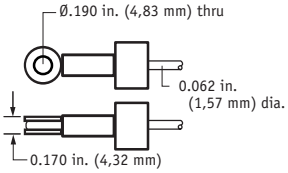
N34 — .034 nylon-coated stainless steel
available in all ranges



S47 — .047 stainless steel
all ranges up to 150 inches



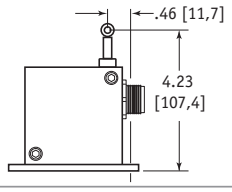
V62 — .062 thermoplastic
all ranges up to 150 inches



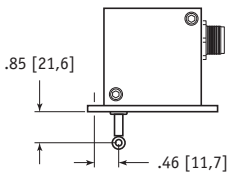
Cable Exit:

Ⓑ *order code:*

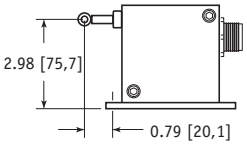
UP — up



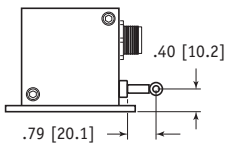
DN — down



FR — front



BK — back



inches [mm]

Output Signals:

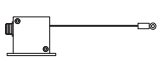
Ⓒ *order code:*

	420E	420R	020E	020R
output signal options:	4...20 mA	20...4 mA	0...20 mA	20...0 mA
sensitivity:	16 mA/full stroke ±0.25%		20 mA/full stroke ±0.25%	
wiring configuration:	2 – wire		3 – wire	
input voltage:	8 – 34 vdc		14 – 29 vdc	

example:

ordercode = **420E** = 4...20 mA

4 mA = 

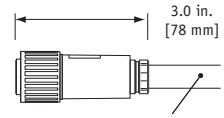
20 mA = 

Ordering Information (cont.)

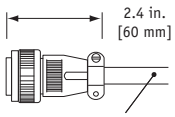
Electrical Connection:

order code:

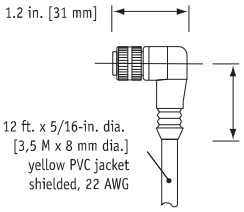
M6	M6M	MC4	C25
6-pin plastic connector with mating plug **IP 67, NEMA 6**	6-pin metal connector with mating plug **IP 65, NEMA 4**	4-pin micro-connector with 12 ft [3.5 M] cordset **IP 67, NEMA 6**	25-ft. instrumentation cable 24 AWG, shielded **IP 67, NEMA 6**



.30 – .39 in. [8 – 10 mm] cable dia.
16 AWG max conductor size
connector: MS3102E-14S-6P
mating plug: MS3106E-14S-6S



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



12 ft. x 5/16-in. dia.
[3,5 M x 8 mm dia.]
yellow PVC jacket
shielded, 22 AWG

25 ft. x 0.2-in. dia.
[7,5 M x 5 mm dia.]
24 AWG, shielded

6-pin mating plug:

contact view

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

4-pin mating plug and cordset:

contact view

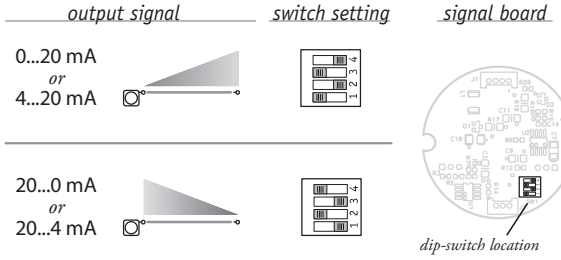
pin	color code	2-wire	3-wire
1	RED-BLK TR.	8...34 vdc	14...29 vdc
2	RED-WHT TR.	4...20 mA	0...20 mA
3	RED	-	common
4	GREEN	earth ground	-

25-ft. cable:

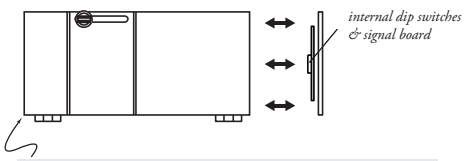
color code	2-wire	3-wire
RED	8...34 vdc	14...29 vdc
BLACK	4...20 mA	common
WHITE	-	-
GREEN	earth ground	0...20 mA

Output Signal Selection:

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.



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.

version: **7.0** last updated: **May 21, 2013**

PT5DC

0...5, 0...10, –5...+5, –10...+10 VDC Output Options
Ranges: 0-10 to 0-250 inches
Industrial Grade • High Cycle Applications

CE

Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-10 to 0-250 inches
Output Signal Options ..... 0...5, 0...10, -5...+5, -10...+10 VDC
Accuracy ..... ± 0.75% to ±0.18% full stroke *see ordering information*
Repeatability ..... *see ordering information*
Resolution ..... essentially infinite
Measuring Cable Options ..... stainless steel or thermoplastic
Enclosure Material ..... hard anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Measuring Cable Velocity ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 5 lbs. max.

ELECTRICAL

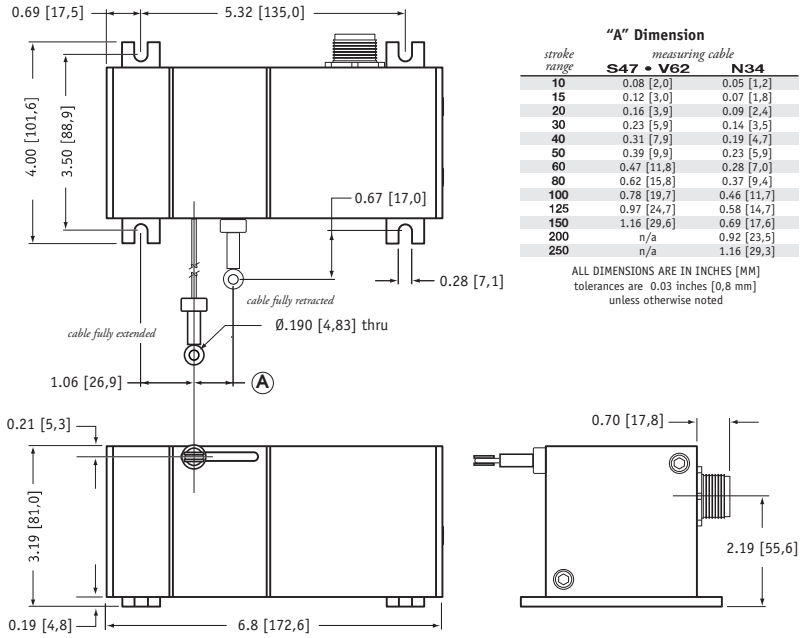
Input ..... 14.5-40 VDC (10.5-40 VDC for 0...5 and -5...+5 volt output)
Input Current ..... 10 mA maximum
Output Impedence ..... 1000 ohms
Maximum Load ..... 5000 ohms
Zero and Span Adjustment ..... *see ordering information*

ENVIRONMENTAL

Enclosure ..... NEMA 4/6, IP 65/67
Operating Temperature ..... -40° to 200°F (-40° to 90°C)
Vibration ..... up to 10 G's to 2000 Hz maximum

EMC COMPLIENCE PER DIRECTIVE 89/336/EEC

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



"A" Dimension

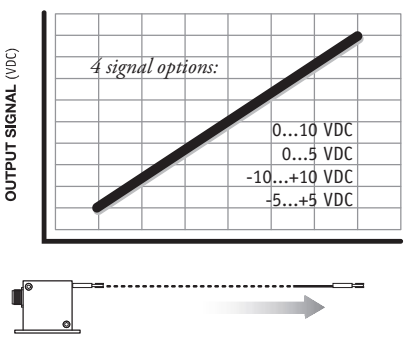
stroke range	measuring cable S47 • V62	measuring cable N34
10	0.08 [2,0]	0.05 [1,2]
15	0.12 [3,0]	0.07 [1,8]
20	0.16 [3,9]	0.09 [2,4]
30	0.23 [5,9]	0.14 [3,5]
40	0.31 [7,9]	0.19 [4,7]
50	0.39 [9,9]	0.23 [5,9]
60	0.47 [11,8]	0.28 [7,0]
80	0.62 [15,8]	0.37 [9,4]
100	0.78 [19,7]	0.46 [11,7]
125	0.97 [24,7]	0.58 [14,7]
150	1.16 [29,6]	0.69 [17,6]
200	n/a	0.92 [23,5]
250	n/a	1.16 [29,3]

ALL DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.03 inches [0,8 mm]
unless otherwise noted

The PT5DC cable-extension transducer uses a unique thermoplastic cable that has virtually an infinite fatigue life. This cable, known as V62, has properties that are superior for high cycle and rugged applications.

Like Celesco's other transducers, the PT5DC installs in minutes, functions properly without perfectly parallel alignment, and fits easily into small areas. The PT5DC offers additional installation flexibility since its cable exit can be rotated relative to the mounting surface, providing four different cable exit orientations.

Output Signal



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tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799

Ordering Information:

Model Number:

PT5DC - _____ - ___ - ___ - ___ - ___
order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ

Sample Model Number:

PT5DC - 100 - N34 - FR - Z10 - M6

Ⓡ	range:	100 inches
Ⓐ	measuring cable:	.034 nylon-coated stainless
Ⓑ	cable exit:	front
Ⓒ	output signal:	0...10 vdc
Ⓓ	electrical connection:	6-pin plastic connector

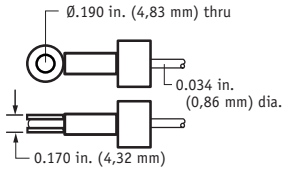
Full Stroke Range:

Ⓡ 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	

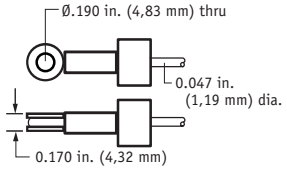
Measuring Cable:

Ⓐ order code:

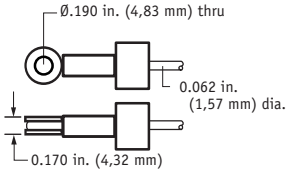
N34 — .034 nylon-coated stainless steel
available in all ranges



S47 — .047 stainless steel
all ranges up to 150 inches



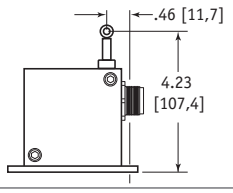
V62 — .062 thermoplastic
all ranges up to 150 inches



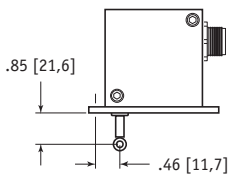
Cable Exit:

Ⓑ order code:

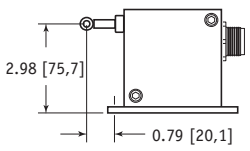
UP — up



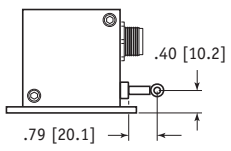
DN — down



FR — front



BK — back



inches [mm]

Output Signals:

Ⓒ order code:

	Z10	10Z	Z5	5Z	M0P0	P0M0	M5P5	P5M5
output signal options:	0...10 VDC	10...0 VDC	0...5 VDC	5...0 VDC	-10...+10 VDC	+10...-10 VDC	-5...+5 VDC	+5...-5 VDC
input voltage:	14.5 – 40 vdc		10.5 – 40 vdc		14.5 – 40 vdc		10.5 – 40 vdc	
span adjustment:	to 50% of factory set span				to 75% of factory set span			
zero adjustment:	from factory set zero to 50% of full stroke range				from factory set zero to 25% of full stroke range			

example:

ordercode = **Z10** = 0...10 VDC

0 vdc =

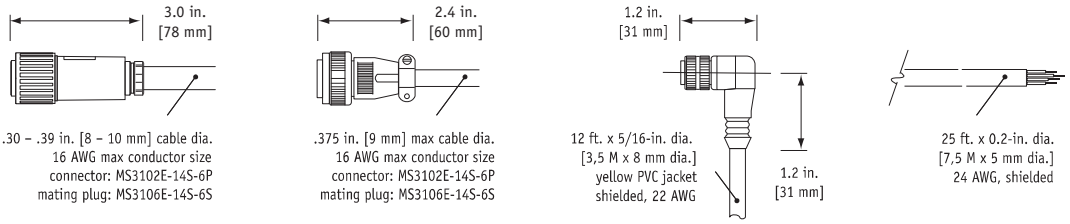
10 vdc =

Ordering Information (cont.)

Electrical Connection:

order code:

M6	M6M	MC4	C25
6-pin plastic connector with mating plug	6-pin metal connector with mating plug	4-pin micro-connector with 12 ft [3.5 M] cord set	25-ft. instrumentation cable 24 AWG, shielded
IP 67, NEMA 6	**IP 65, NEMA 4**	**IP 67, NEMA 6**	**IP 67, NEMA 6**



6-pin mating plug:

contact view

pin	signals
A	input voltage
B	output signal
C	common

4-pin mating plug and cord set:

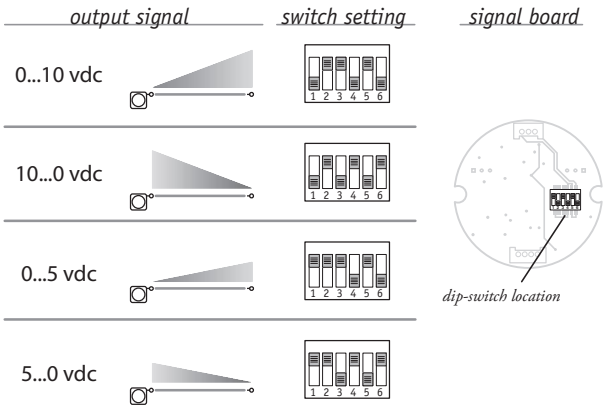
contact view

pin	color code	signals
1	RED-BLK TR.	input voltage
2	RED-WHT TR.	output signal
3	RED	common

25-ft. cable:

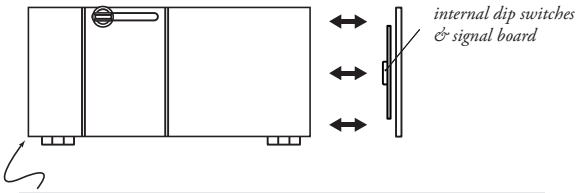
color code	standard
RED	input voltage
BLACK	common
GREEN	output signal

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



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.

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.

Cable-Extension Position Transducer

Incremental Encoder Output
Ranges: 0-50 to 0-250 inches
Industrial Grade • High Cycle Applications

PT5E

CE

Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-50 to 0-250 inches
Output Signal Options ..... incremental encoder (quadrature)
Accuracy ..... *see ordering information*
Repeatability ..... *see ordering information*
Resolution ..... 10 to 250 pulses per inch
Measuring Cable Options ..... stainless steel or thermoplastic
Enclosure Material ..... hard anodized aluminum
Sensor ..... optical encoder
Maximum Measuring Cable Velocity ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 5 lbs. max.

ELECTRICAL

Input Voltage ..... *see ordering information*
Input Current ..... *see ordering information*

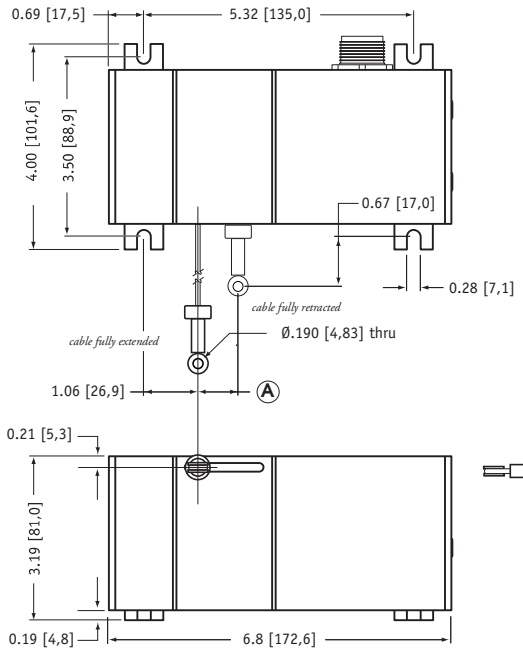
ENVIRONMENTAL

Enclosure ..... NEMA 4/6, IP 65/67
Operating Temperature ..... 0° to 160°F (-17° to 71°C)
Vibration ..... up to 10 G's to 2000 Hz maximum

The PT5E encoder-based cable-extension transducer offers a unique thermoplastic cable that has virtually an infinite fatigue life. This cable, known as V62, has properties that are superior for high cycle and rugged applications.

Like Celesco's other transducers, the PT5E installs in minutes, functions properly without perfectly parallel alignment, and fits easily into small areas. The PT5E offers additional installation flexibility since its cable exit can be rotated relative to the mounting surface, providing four different cable exit orientations.

Outline Drawing

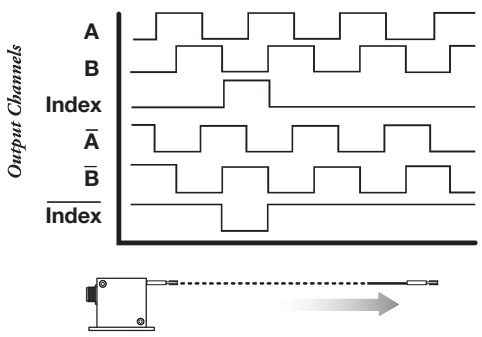


"A" Dimension

stroke range	measuring cable S47 • V62	measuring cable N34
10	0.08 [2,0]	0.05 [1,2]
15	0.12 [3,0]	0.07 [1,8]
20	0.16 [3,9]	0.09 [2,4]
30	0.23 [5,9]	0.14 [3,5]
40	0.31 [7,9]	0.19 [4,7]
50	0.39 [9,9]	0.23 [5,9]
60	0.47 [11,8]	0.28 [7,0]
80	0.62 [15,8]	0.37 [9,4]
100	0.78 [19,7]	0.46 [11,7]
125	0.97 [24,7]	0.58 [14,7]
150	1.16 [29,6]	0.69 [17,6]
200	n/a	0.92 [23,5]
250	n/a	1.16 [29,3]

ALL DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.03 inches [0,8 mm]
unless otherwise noted

Output Signal



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Ordering Information:

Model Number:

PT5E - ____ Ⓡ - ___ Ⓐ - ___ Ⓑ - ___ Ⓒ - ___ Ⓓ - ___ Ⓔ
order code:

Sample Model Number:

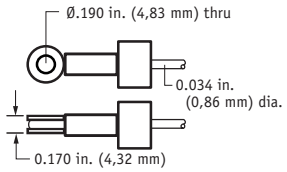
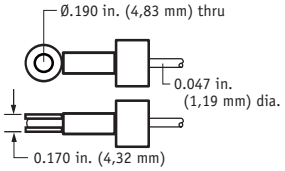
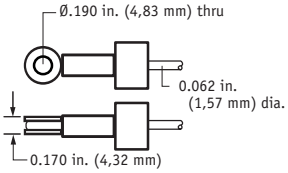
PT5E - 100 - N34 - FR - 100 - AB-TTL - M6

Ⓡ	range:	100 inches
Ⓐ	measuring cable:	.034 nylon-coated stainless
Ⓑ	cable exit:	front
Ⓒ	resolution:	100±2 pulses per inch
Ⓓ	output signal:	TTL/CMOS compatible driver
Ⓔ	electrical connection:	6-pin plastic connector

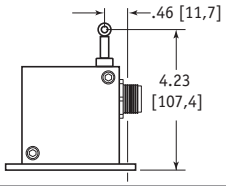
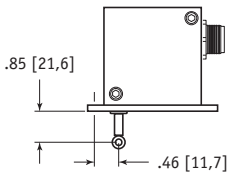
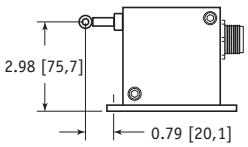
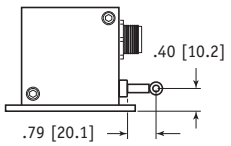
Full Stroke Range:

Ⓡ *order code:*	50	100	150	200	250	1250	2500	3750	5000	6250
full stroke range, min:	50 in.	100 in.	150 in.	200 in.	250 in.	1250 mm	2500 mm	3750 mm	5000 mm	6250 mm
⚠1 accuracy (± % of f.s.):	.1	.07	.06	.05	.04	.1	.07	.06	.05	.04
repeatability (± % of f.s.):	.02	.01	.01	.01	.01	.02	.01	.01	.01	.01
cable tension (±20%):	41 ounces			21 ounces		11,4 N			5,8 N	
max. cable velocity • acceleration:	300 in./sec • 5 G's			120 in./sec • 2 G's		8 M/sec • 5 G's			3 M/sec • 2 G's	

Measuring Cable:

Ⓐ *order code:*	**N34**	**S47**	**V62**
	.034 nylon-coated stainless steel *available in all ranges*	.047 stainless steel *all ranges up to 150 inches*	.062 thermoplastic *all ranges up to 150 inches*
			

Cable Exit:

Ⓑ *order code:*	**UP**	**DN**	**FR**	**BK**
	up	down	front	back
				

inches [mm]

Resolution:

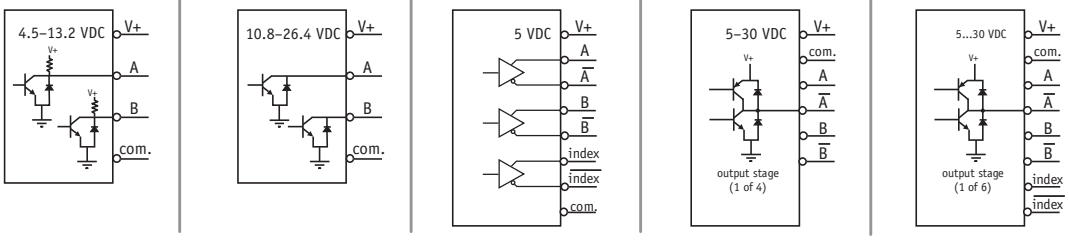
Ⓒ *order code:*	**10**	**100**	**200**	**250**
resolution for **english** ranges:	10 ±0.2 pulses per inch	100 ±2 pulses per inch	200 ±4 pulses per inch	250 ±5 pulses per inch

Ⓒ *order code:*	**.5**	**5**	**10**	**12.5**
resolution for **metric** ranges:	0.5 ±0.01 pulses per mm	5 ±0.1 pulses per mm	10 ±0.2 pulses per mm	12.5 ±0.3 pulses per mm

Ordering Information (cont.)

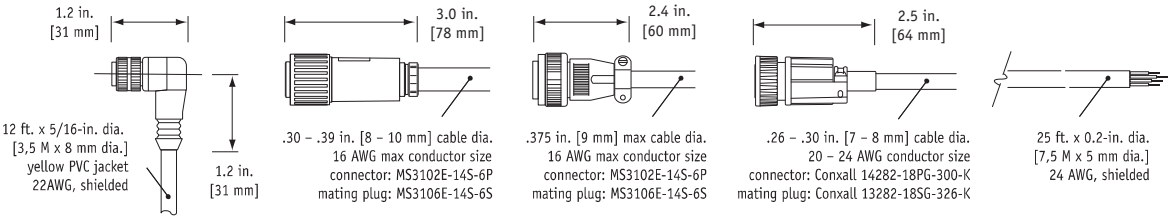
Output Signals:

Ⓓ order code:	AB-TTL	AB-OC	ABC-LD	ABC-UD	ABZC-UD
output driver:	TTL/CMOS compatible	open collector	5-volt line driver	universal line driver *(no index)*	universal line driver *(with index)*
input voltage:	4.5...13.2 VDC	10.8...26.4 VDC	5 VDC	5...30 VDC	5...30 VDC
max. source/sink current:	20 mA sink	20 mA sink	20 mA sink	20 mA source/sink	20 mA source/sink
max. input current:	80 mA	80 mA	150 mA	100 mA, no load	100 mA, no load



Electrical Connection:

Ⓔ order code:	MC4	M6	M6M	M18	C25
	4-pin micro-connector with 12 ft [3.5 M] cord set	6-pin plastic connector with mating plug	6-pin metal connector with mating plug	18-pin plastic connector with mating plug	25-ft. instrumentation cable 24 AWG, shielded
	IP 67, NEMA 6	**IP 67, NEMA 6**	**IP 65, NEMA 4**	**IP 67, NEMA 6**	**IP 67, NEMA 6**



	M6	M6M	M18	C25
	.30 – .39 in. [8 – 10 mm] cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S	.375 in. [9 mm] max cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S	.26 – .30 in. [7 – 8 mm] cable dia. 20 – 24 AWG conductor size connector: Conxall 14282-18PG-300-K mating plug: Conxall 13282-18SG-326-K	25 ft. x 0.2-in. dia. [7,5 M x 5 mm dia.] 24 AWG, shielded

4-pin cordset:

contact view

pin	color code	TTL/CMOS Open Collector
1	RED-BLK TR.	input voltage
2	RED-WHT TR.	channel A
3	RED	channel B
4	GREEN	common

6-pin mating plug:

contact view

pin	TTL/CMOS Open Collector	5 V Line Driver Universal Line Driver
A	input voltage	input voltage
B	common	common
C	channel A	channel A
D	channel B	channel B
E	-	channel A'
F	-	channel B'

18-pin mating plug:

contact view

pin	TTL/CMOS Open Collector	5 V Line Driver Universal Line Driver
1	input voltage	input voltage
2	common	common
3	channel B	channel B
6	channel A	channel A
7	-	index
11	-	channel B'
12	-	channel A'
15	-	index'

25-ft. instrumentation cable:

color	TTL/CMOS Open Collector	5 V Line Driver Universal Line Driver
red	input voltage	input voltage
black	common	common
green	channel A	channel A
white	channel B	channel B
blue	-	channel A'
brown	-	channel B'
yellow	-	index
orange	-	index'

[1] *Total accuracy includes uncertainty due to resolution and is calculated:* {± [(%FS)(FS) + length of 1 pulse]}

Example: *Model Number:* PT5E-100-N34-FR100-AB-TTL-M6
Full Stroke: 100 inches
Accuracy: [.07% (100 in.) + 1/100 in.] = ± .08 inches

version: **5.0** last updated: **December 26, 2007**

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 ..... ± 0.75% to ±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 Ω, *see ordering information*
Power Rating, Watts ..... *see ordering information*
Recommended Maximum Input Voltage ..... *see ordering information*
Output Signal Change Over Full Stroke Range ..... 94% ±4% of input voltage

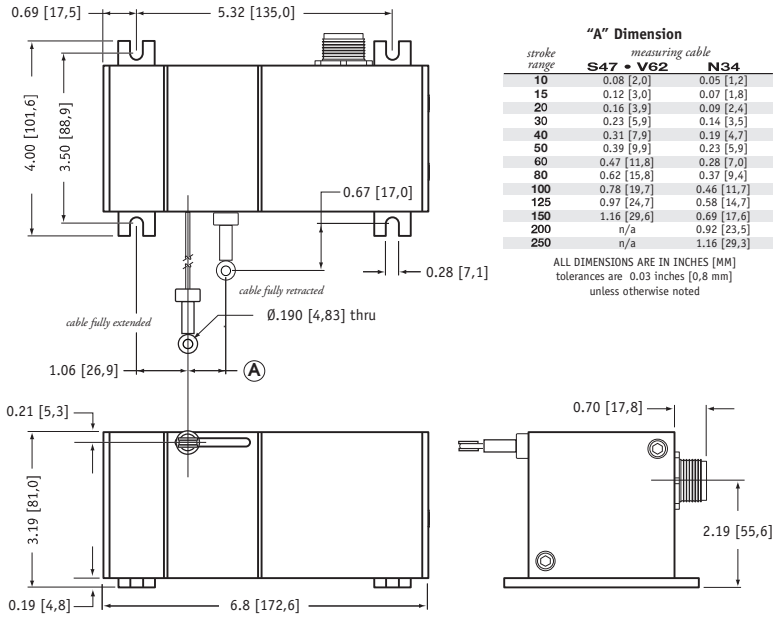
VELOCITY
Output Signal ..... DC voltage
Linearity ..... better than ±0.10% of output at any velocity
Repeatability ..... ±0.10% of reading
Maximum Velocity • Retraction Acceleration ..... *see ordering information*
Sensor ..... tach generator
Input Voltage ..... none required
Output Voltage @ 100 inches per minute—*varies slightly with measuring cable*
N34 cable option ..... 354 mV ±4%
S47 cable option ..... 352 mV ±4%
V62 cable option ..... 351 mV ±4%
Output Impedance ..... 350 ohms ±10%
Output Ripple (for velocity ≥ 1.35 inches per second) ..... ±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° to 200°F (-40° to 90°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.

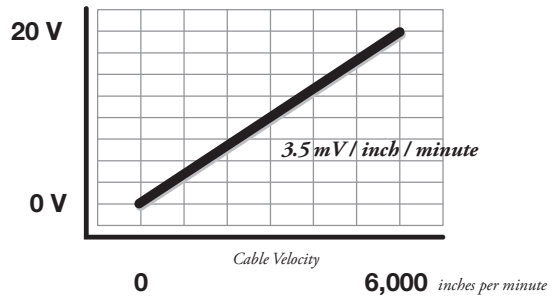


"A" Dimension

stroke range	measuring cable S47 • V62	measuring cable N34
10	0.08 [2,0]	0.05 [1,2]
15	0.12 [3,0]	0.07 [1,8]
20	0.16 [3,9]	0.09 [2,4]
30	0.23 [5,9]	0.14 [3,5]
40	0.31 [7,9]	0.19 [4,7]
50	0.39 [9,9]	0.23 [5,9]
60	0.47 [11,8]	0.28 [7,0]
80	0.62 [15,8]	0.37 [9,4]
100	0.78 [19,7]	0.46 [11,7]
125	0.97 [24,7]	0.58 [14,7]
150	1.16 [29,6]	0.69 [17,6]
200	n/a	0.92 [23,5]
250	n/a	1.16 [29,3]

ALL DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.03 inches [0,8 mm]
unless otherwise noted

Output Signal



Celesco Transducer Products, Inc.
20630 Plummer Street • Chatsworth, CA 91311
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799
celesco.com • info@celesco.com

Ordering Information:

Model Number:

PT5AV - _____ - ___ - ___ - ___ - ___
order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ

Sample Model Number:

PT5AV - 100 - N34 - FR - 500 - M6

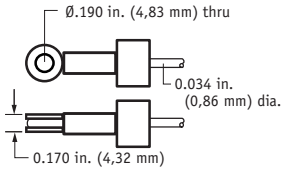
Ⓡ	range:	100 inches
Ⓐ	measuring cable:	.034 nylon-coated stainless
Ⓑ	cable exit:	front
Ⓒ	output signal:	500 ohm potentiometer
Ⓓ	electrical connection:	6-pin plastic connector

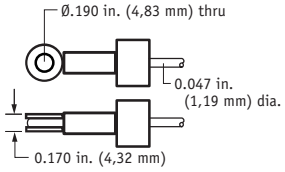
Full Stroke Range:

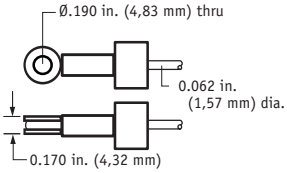
Ⓡ order code:	10	15	20	25	30	40	50	60	80	100	125	150	200	250
full stroke range, min:	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.	60 in.	80 in.	100 in.	125 in.	150 in.	200 in.	250 in.
accuracy (±% of f.s.):	.75%	.6%	.5%	.5%	.5%	.3%	.3%	.25%	.25%	.25%	.25%	.18%	.18%	.18%
repeatability (±% of f.s.):	.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:

Ⓐ order code:	N34	S47	V62
	.034 nylon-coated stainless steel *available in all ranges*	.047 stainless steel *all ranges up to 150 inches*	.062 thermoplastic *all ranges up to 150 inches*

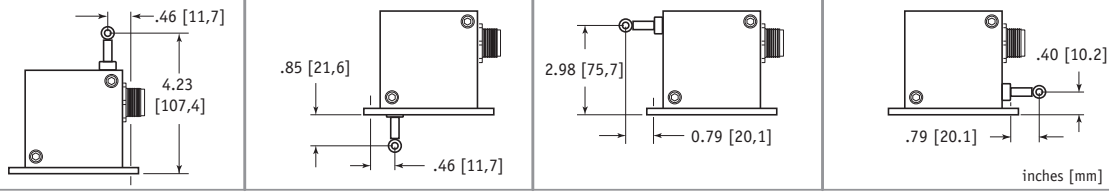






Cable Exit:

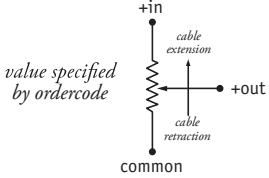
Ⓑ order code:	UP	DN	FR	BK
	up	down	front	back



Output Signals:

Ⓒ order code:	500	1K	5K	10K
position sensing potentiometer:	500 ohms*	1000 ohms*	5000 ohms*	10,000 ohms*

position sensing circuit



position circuit max input voltage & power rating

	10 to 30-inch range	*40 to 250-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)

velocity sensing circuit

–tolerance = ±10%

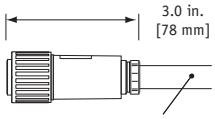
Ordering Information (cont.)

Electrical Connection:

order code:

M6

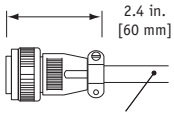
6-pin plastic connector
with mating plug
IP 67, NEMA 6



.30 - .39 in. [8 - 10 mm] cable dia.
16 AWG max conductor size
connector: MS3102E-14S-6P
mating plug: MS3106E-14S-6S

M6M

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



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

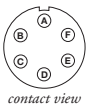
C25

25-ft. instrumentation cable
24 AWG, shielded
IP 67, NEMA 6

25 ft. x 0.2-in. dia.
[7,5 M x 5 mm dia.]
24 AWG, shielded

6-pin mating plug:

pin	signal	
A	+ in	} *position*
B	common	
C	+ out	
D	-	
E	+ out	} *velocity*
F	- out	



contact view

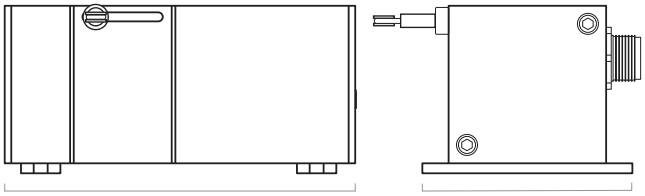
25-ft. instrumentation cable:

color	signal	
red	+ in	} *position*
black	common	
green	+ out	
white	+ out	} *velocity*
brown	- out	

PT5CN

CANbus • SAE J1939 Output Signal

Absolute Linear Position to 250 inches (6350 mm)
Hard Anodized Aluminum Enclosure
High Cycle Applications
IP67 • NEMA 6 Protection



The PT5CN cable extension position transducer communicates linear position via the CANbus SAE J1939 interface providing a precision position feedback to your PLC. The PT5DN is offered in full stroke ranges up to 250 inches and a thermoplastic measuring cable for high cycle and rugged applications.

Because the PT5CN uses a potentiometer as it's sensing element, the position signal is "absolute" and does not have to be reset to a "home" position upon startup.

GENERAL

Full Stroke Ranges	0-10 to 0-250 inches
Electrical Interface	CANbus SAE J1939
Protocol	Proprietary B
Accuracy	± 0.25% to ± 0.10% full stroke
Repeatability	± 0.02% full stroke
Resolution	± 0.003% full stroke
Measuring Cable	stainless steel or thermoplastic
Enclosure Material	hard anodized aluminum
Sensor	plastic-hybrid precision potentiometer
Potentiometer Cycle Life	see ordering information
Maximum Retraction Acceleration	see ordering information
Weight	5 lbs. max.

ELECTRICAL

Input Voltage	7 - 18 VDC
Input Current	60 mA max.
Baud Rate	125K, 250K, or 500K via DIP switches
Update Rate	10 ms. (20 ms. available–*contact factory*)

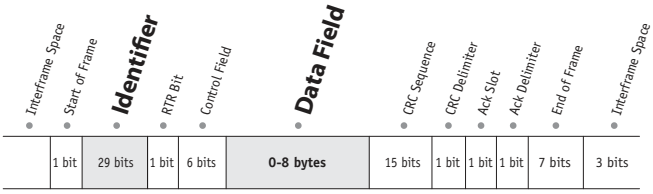
ENVIRONMENTAL

Environmental Suitability	NEMA 4/6, IP 65/67
Operating Temperature	-40° to 185°F (-40° to 85°C)
Vibration	up to 10 g to 2000 Hz maximum

Output Signal:

20630 Plummer Street • Chatsworth, CA 91311
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799
measurement SPECIALTIES™
celesco
celesco.com • info@celesco.com

I/O Format and Settings



repetition = 8 msec.

• Identifier

	Message Priority			Future Use		J1939 Reference Proprietary B								Data Field Type*								Not Used		Node ID**					
Example –	1	0	0	0	0	1	1	1	1	1	1	1	1	0	1	0	1	0	0	1	1	0	0	1	1	1	1	1	1
Identifier Bit No. –	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Hex Value –		0				F				F				5				3				3				F			

*Sensor field data can be factory set to customer specific value. **Customer defined, set via Dips 1-6. Bit values shown for example only, see **Address Setting** below.

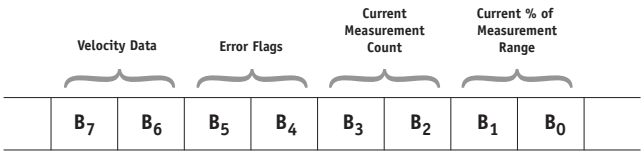
• Data Field

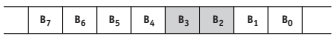
B_0 = LSB current % of measurement range byte
B_1 = MSB current % of measurement range byte

B_2 = LSB current measurement count byte
B_3 = MSB current measurement count byte

B_4 = error flag
B_5 = error flag

B_6 = LSB velocity data byte
B_7 = MSB velocity data byte





Current Measurement Count

The **C**urrent **M**easurement **C**ount (**CMC**) is the output data that indicates the present position of the measuring cable. The CMC is a 16-bit value that occupies bytes B_2 and B_3 of the data field. B_2 is the **LSB** (least significant byte) and B_3 is the **MSB** (most significant byte).

The **CMC** starts at **0x0000** with the measuring cable fully retracted and continues upward to the end of the stroke range stopping at **0xFFFF**. This holds true for all ranges.

Converting CMC to Linear Measurement

To convert the current measurment count to inches or millimeters, simply divide the count by 65,535 (total counts over the range) and then multiply that value by the full stroke range:

$$\left(\frac{\text{current measurement count}}{65{,}535}\right) \text{X} \text{ full stroke range}$$

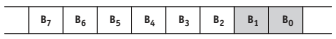
Sample Conversion:

If the full stroke range is **30 inches** and the current position is **0x0FF2** (4082 Decimal) then,

$$\left(\frac{4082}{65{,}535}\right) \text{X } 30.00 \text{ inches} = 1.87 \text{ inches}$$

If the full stroke range is **625 mm** and the current position is **0x0FF2** (4082 Decimal) then,

$$\left(\frac{4082}{65{,}535}\right) \text{X } 625 \text{ mm} = 39 \text{ mm}$$



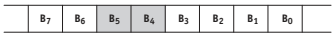
Current % of Measurement Range

The Current % of Measurement Range is a 2-byte value that expresses the current linear position as a percentage of the entire full stroke range. Resolution is **.1 %** of the full stroke measurement range.

This value starts at **0x0000** at the beginning of the stroke and ends at **0x03E8**.

Example:

Hex	Decimal	Percent
0000	0000	0.0%
0001	0001	0.1%
0002	0002	0.2%
...	...	...
03E8	1000	100.0%

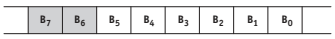


Error Flags

0x55 (yellow LED on controller board) indicates that the sensor has begun to travel beyond the calibrated range of the internal position potentiometer.

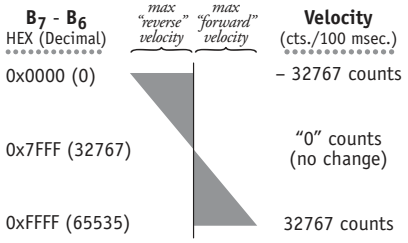
0xAA (red LED on controller board) indicates that the sensor has moved well beyond the calibrated range of the internal position potentiometer.

If either error flag occurs within the full stroke range of the sensor, the unit should be returned to the factory for repair and recalibration.



Velocity

Data in bytes B_7 - B_6 is the change in the **CMC** (current measurement count) over a 100 msec time period. This data can then be used to calculate velocity in a post processing operation.



Velocity Calculation

$$\left(\frac{\text{count change} - 32767}{.1 \text{ sec. time period}}\right) \text{X} \left(\frac{\text{full stroke range}}{65{,}535}\right)$$

Sample Calculations

Cable Extension (positive direction):

B_7–B_6 = 0x89C6 (43462 Dec), **full stroke = 60 in.**

$$\left(\frac{35270 - 32767}{.1 \text{ sec}}\right) \text{X} \left(\frac{60 \text{ in.}}{65{,}535}\right) = 22.92 \text{ in./sec.}$$

Cable Retraction (negative direction):

B_7–B_6 = 0x61A8 (25000 Dec), **full stroke = 60 in.**

$$\left(\frac{25000 - 32767}{.1 \text{ sec}}\right) \text{X} \left(\frac{60 \text{ in.}}{65{,}535}\right) = -71.11 \text{ in./sec.}$$

Setting the Address (Node ID) and Baud Rate

Address Setting (Node ID)

The Address Setting (Node ID) is set via 6 switches located on the 8-pole DIP switch found on the DeviceNET controller board located inside the transducer.

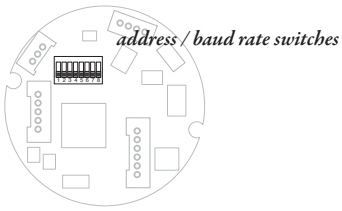
The DIP switch settings are binary starting with switch number **1** (= 2^0) and ending with switch number **6** (= 2^5).

Baud Rate

The transmission baud rate may be either factory preset at the time of order or set manually at the time of installation.

The baud rate can be set using switches **7** & **8** on the 8-pole DIP switch found on the DeviceNET controller board located inside the transducer.

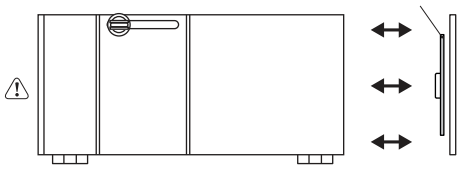
CANBus Controller Board



DIP-1 (2^0)	DIP-2 (2^1)	DIP-3 (2^2)	DIP-4 (2^3)	DIP-5 (2^4)	DIP-6 (2^5)	*address* (decimal)
0	0	0	0	0	0	0
1	0	0	0	0	0	1
0	1	0	0	0	0	2
...	...	...	...	...	...	...
1	1	1	1	1	1	63

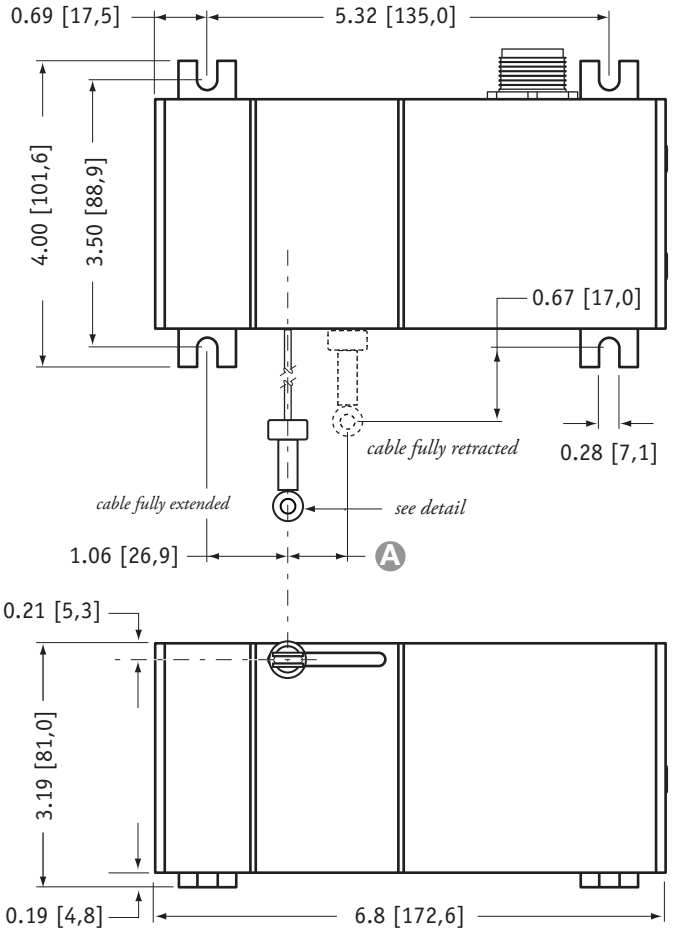
DIP-7	DIP-8	baud rate
0	0	125k
1	0	250k
0	1	500k
1	1	125k

internal dip switches & controller board
to gain access to the controller board, remove four Allen-Head Screws and remove end cover bracket.

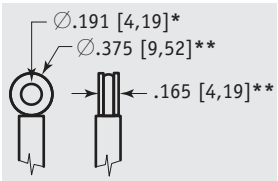


Caution! Do Not Remove Spring-Side End Cover
removing spring-side end cover could cause spring to become unseated and permanently damaged.

Outline Drawing:

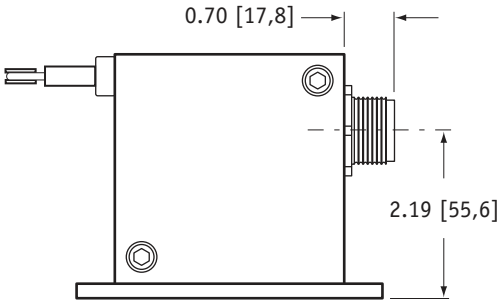


eyelet detail



A DIMENSION (inches[mm])

RANGE	N34 *measuring cable*	S47 & V62 *measuring cable*
10	0.05 [1,2]	0.08 [2,0]
15	0.07 [1,8]	0.12 [3,0]
20	0.09 [2,4]	0.16 [3,9]
30	0.14 [3,5]	0.23 [5,9]
40	0.19 [4,7]	0.31 [7,9]
50	0.23 [5,9]	0.39 [9,9]
60	0.28 [7,0]	0.47 [11,8]
80	0.37 [9,4]	0.62 [15,8]
100	0.46 [11,7]	0.78 [19,7]
125	0.58 [14,7]	0.97 [24,7]
150	0.69 [17,6]	1.16 [29,6]
200	0.92 [23,5]	n/a
250	1.16 [29,3]	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]

Ordering Information:

Model Number:

PT5CN - ____ - ___ - ___ - **J** - ___ - ___ - ___

order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

Sample Model Number:

PT5CN - 50 - S47 - FR - J - 500 - 32 - SC5

Ⓡ	range:	50 inches
Ⓐ	measuring cable:	.047 stainless steel
Ⓑ	measuring cable exit:	front
Ⓒ	interface:	CANbus SAE J1939
Ⓓ	baud rate:	500 k bits/sec.
Ⓔ	node ID:	32 decimal
Ⓕ	electrical connection:	5-meter cordset with straight plug

Full Stroke Range:

Ⓡ 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												120 in./sec • 2 g	

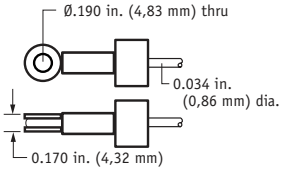
Measuring Cable:

Ⓐ order code:

N34

.034 nylon-coated stainless steel

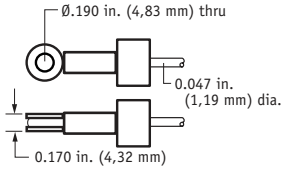
available in all ranges



S47

.047 stainless steel

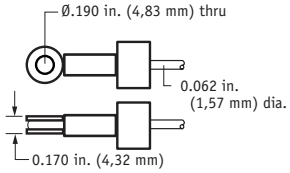
all ranges up to 150 inches



V62

.062 thermoplastic

all ranges up to 150 inches

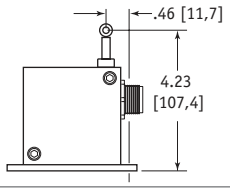


Cable Exit:

Ⓑ order code:

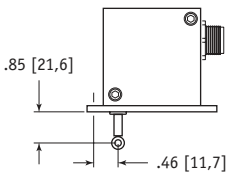
UP

up



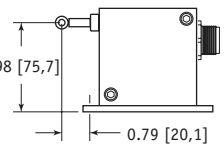
DN

down



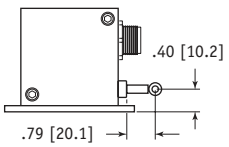
FR

front



BK

back



inches [mm]

Baud Rate:

Ⓓ order code:

125	250	500
125 kbaud	250 kbaud	500 kbaud

Node ID:

Ⓔ order code:

0	1	2	...	62	63

select address (0 - 63 Decimal)

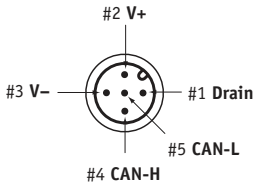
Ordering Information (cont.):

Electrical Connection:

order code:

blank

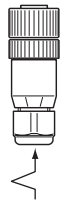
5-pin micro-connector
(no mating plug supplied)



connector
(contact view)

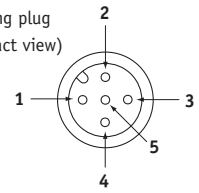
MC5

5-pin micro-connector
w/ mating plug



0.16" - 0.32" OD Cable (THIN)

mating plug
(contact view)



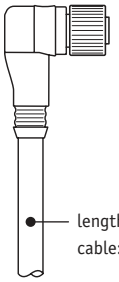
SC5

5-pin micro-connector
and 5 meter length cordset
w/straight mating plug

length: 16ft [5M]
cable: Thin

NC5

5-pin micro-connector
and 5 meter length cordset
w/90° mating plug



length: 16ft [5M]
cable: Thin

pin	signal	wire color
1	drain	brown
2	V+	white
3	V-	blue
4	Can-H	black
5	Can-L	grey

DeviceNET®
Ranges: 0-10 to 0-250 inches
Industrial Grade

PT5DN

Specification Summary:

GENERAL

Full Stroke Ranges ..... 0-10 to 0-250 inches
Electrical Interface ..... CANbus ISO 11898
Protocol ..... DeviceNET version 2.0
Accuracy ..... ± 0.25% to ± 0.10% full stroke
Repeatability ..... ± 0.02% full stroke
Resolution ..... ± 0.003% full stroke
Measuring Cable ..... stainless steel or thermoplastic
Enclosure Material ..... hard anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight ..... 5 lbs. max.

ELECTRICAL

Input Voltage ..... bus powered
Input Current ..... 40 mA
Address Setting/Node ID ..... 0...63 set via DIP switches –*default setting: 63*
Baud Rate ..... 125K, 250K or 500K set via DIP switches
EDS File ..... available @ http://www.celeso.com/download

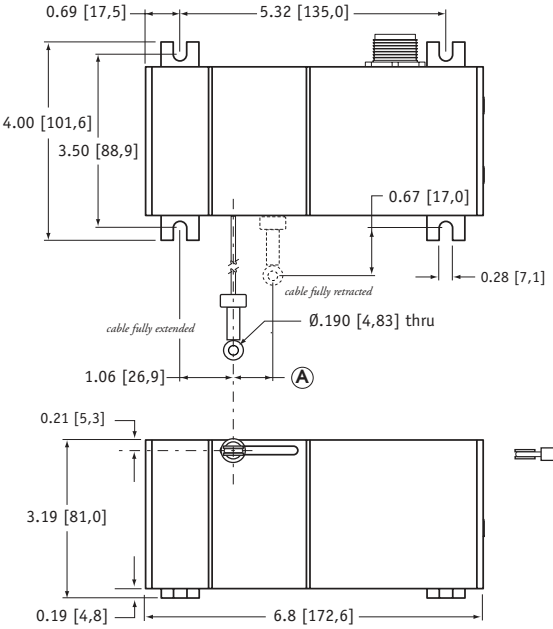
ENVIRONMENTAL

Environmental Suitability ..... NEMA 4/6, IP 67
Operating Temperature ..... -40º to 185ºF (-40º to 85ºC)
Vibration ..... up to 10 G's to 2000 Hz maximum

The PT5DN, using a high cycle plastic-hybrid potentiometer, communicates via DeviceNET protocol with programmable controllers in factories and harsh environments requiring linear position measurements in ranges up to 250".

As a member of Celesco's innovative family of NEMA 4 rated cable-extension transducers, the PT5DN installs in minutes by simply mounting it's body to a fixed surface and attaching it's cable to the movable object. Perfect parallel alignment not required.

Outline Drawing

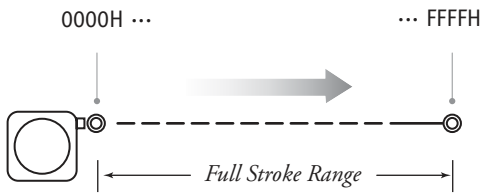


"A" Dimension

stroke range	measuring cable S47 • V62	measuring cable N34
10	0.08 [2,0]	0.05 [1,2]
15	0.12 [3,0]	0.07 [1,8]
20	0.16 [3,9]	0.09 [2,4]
30	0.23 [5,9]	0.14 [3,5]
40	0.31 [7,9]	0.19 [4,7]
50	0.39 [9,9]	0.23 [5,9]
60	0.47 [11,8]	0.28 [7,0]
80	0.62 [15,8]	0.37 [9,4]
100	0.78 [19,7]	0.46 [11,7]
125	0.97 [24,7]	0.58 [14,7]
150	1.16 [29,6]	0.69 [17,6]
200	n/a	0.92 [23,5]
250	n/a	1.16 [29,3]

ALL DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.03 inches [0,8 mm]
unless otherwise noted

Output Signal



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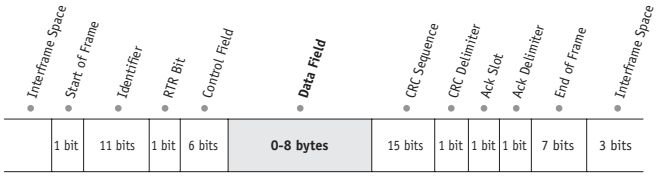
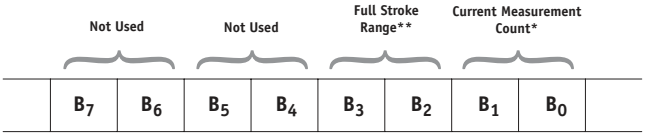
20630 Plummer Street • Chatsworth, CA 91311
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799
celesco.com • info@celesco.com

I/O Format:

Data Frame



Data Field



B_0 = LSB current measurement byte
B_1 = MSB current measurement byte
B_2 = LSB full stroke range byte
B_3 = MSB full stroke range byte
B_4 - B_7 = not used

***Current Measurement Count**

The **C**urrent **M**easurement **C**ount (**CMC**) is the output data that indicates the present position of the measuring cable.

The CMC is a 16-bit value that occupies the first two bytes (B_0 and B_1) of the data field. B_0 is the LSB (least significant byte) and B_1 is the MSB (most significant byte).

The CMC starts at 0000H with the measuring cable fully retracted and continues upward to the end of the stroke range stopping at FFFFH. This holds true for all ranges.

****Full Stroke Range**

The **F**ull **S**troke **R**ange **(FSR)** is a 16-bit value in the data field that expresses the full range of the sensor in inches. This value can be used to convert the actual count to units of measurement should the application require it.

The full stroke measurement range occupies the second two bytes (B_2 and B_3) of the data field.

B_2 is the LSB (least significant byte) and B_3 is the MSB (most significant byte).

This value is expressed in inches.

Example:

Hex Value	*Decimal Equivalent*	*Full Stroke Range*
001E	30	30 inches

Converting CMC to Inches

If required, the CMC can easily be converted to a linear measurement expressed in inches instead of just counts.

This is accomplished by first dividing the CMC by 65,535 (total counts over the range) and then multiplying that value by the FSR:

$$\left(\frac{\text{CMC}}{65{,}535}\right) \text{X FSR}$$

Example:

If the full stroke range is **30 inches** and the current position is **OFF2 Hex** (4082 Decimal) then,

$$\left(\frac{4082}{65{,}535}\right) \text{X } 30.00 \text{ inches} = 1.87 \text{ inches}$$

Address Setting (Node ID), Baud Rate and Bus Termination Settings

Address Setting (Node ID)

The Address Setting (Node ID) is set via 6 switches located on the 8-pole DIP switch found on the DeviceNET controller board located inside the transducer.

The DIP switch settings are binary starting with switch number **1** (= 2^0) and ending with switch number **6** (= 2^5).

DIP-1 (2^0)	DIP-2 (2^1)	DIP-3 (2^2)	DIP-4 (2^3)	DIP-5 (2^4)	DIP-6 (2^5)	*address* (decimal)
0	0	0	0	0	0	0
1	0	0	0	0	0	1
0	1	0	0	0	0	2
…	…	…	…	…	…	…
1	1	1	1	1	1	63

Baud Rate

The transmission baud rate may be either factory preset at the time of order or set manually at the time of installation.

The baud rate can be set using switches **7** & **8** on the 8-pole DIP switch found on the DeviceNET controller board located inside the transducer.

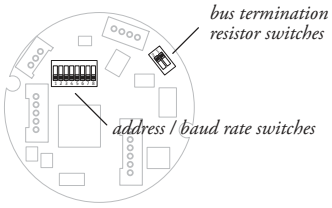
DIP-7	DIP-8	baud rate
0	0	125k
1	0	250k
0	1	500k
1	1	125k

Bus Termination

The setting of the internal bus termination resistor may be specified upon order or manually changed by the end user at the time of installation.

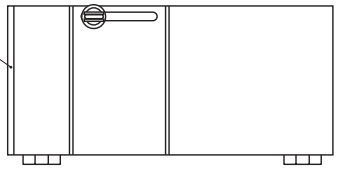
The bus termination resistor is activated setting switches **1** & **2** on the 2-pole DIP switch (located on the internal DeviceNET controller board) to the "ON" position.

DeviceNET Controller Board and DIP Switch Location



Caution! Do Not Remove Spring-Side End Cover

removing spring-side end cover could cause spring to become unseated and permanently damaged.



internal dip switches & controller board

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

Ordering Information:

Model Number:

PT5DN - ____ Ⓡ - ____ Ⓐ - ____ Ⓑ - ____ Ⓒ - ____ Ⓓ - ____ Ⓔ
order code:

Sample Model Number:

PT5DN - 50 - S47 - FR - 500 - TR - SC5

Ⓡ	range:	50 inches
Ⓐ	measuring cable:	.047 stainless steel
Ⓑ	measuring cable exit:	front
Ⓒ	baud rate:	500 k bits/sec.
Ⓓ	terminating resistor:	yes
Ⓔ	electrical connection:	5-meter cordset with straight plug

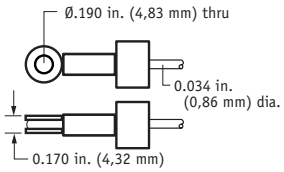
Full Stroke Range:

Ⓡ *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	

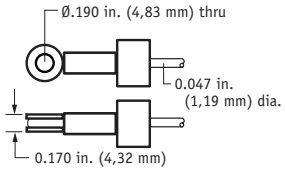
Measuring Cable:

Ⓐ *order code:*

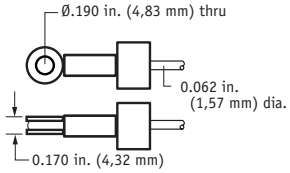
N34
.034 nylon-coated stainless steel
available in all ranges



S47
.047 stainless steel
all ranges up to 150 inches



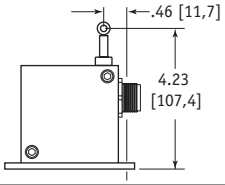
V62
.062 thermoplastic
all ranges up to 150 inches



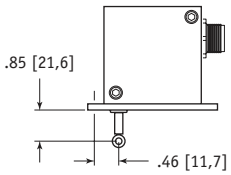
Cable Exit:

Ⓑ *order code:*

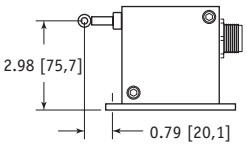
UP
up



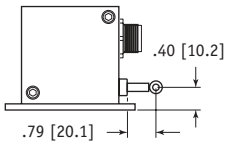
DN
down



FR
front



BK
back



inches [mm]

Baud Rate:

Ⓒ *order code:*

125	250	500
125 kbaud	250 kbaud	500 kbaud

Terminating Resistor:

Ⓓ *order code:*

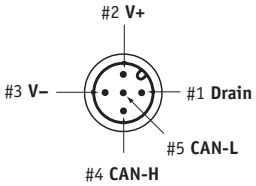
TR	NR
terminating resistor	no terminating resistor

Ordering Information (cont.)

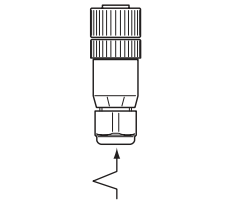
Electrical Connection:

order code:

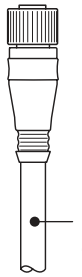
blank	MC5	SC5	NC5
5-pin micro-connector *(no mating plug supplied)*	5-pin micro-connector w/ mating plug	5-pin micro-connector and 5 meter length cordset w/straight mating plug	5-pin micro-connector and 5 meter length cordset w/90° mating plug



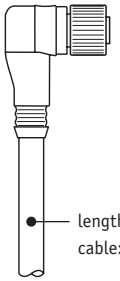
connector
(contact view)



0.16" - 0.32" OD Cable (THIN)

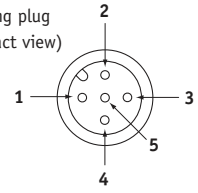


length: 16ft [5M]
cable: Thin



length: 16ft [5M]
cable: Thin

mating plug
(contact view)



pin	signal	wire color
1	drain	brown
2	V+	white
3	V-	blue
4	Can-H	black
5	Can-L	grey

RS232 Data Communication
Ranges: 0-10 to 0-250 inches
Industrial Grade

PT5232

Specification Summary:

GENERAL

Full Stroke Ranges ..... 0-2 to 0-50 inches
Electrical Interface RS232
Format ..... Hex
Accuracy ..... ± 0.75 to 0.18% full stroke
Repeatability ..... *see ordering information*
Resolution ..... ± 0.003% full stroke
Measuring Cable ..... thermoplastic or stainless steel
Enclosure Material ..... hard-anodized aluminum
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Cable Velocity • Acceleration ..... *see ordering information*
Weight ..... 5 lbs., max.

ELECTRICAL

Input Voltage ..... 9...22 VDC
Input Current ..... 40 mA
Baud Rate ..... 9600 (selectable to 38.4K)
Update Rate 32msec

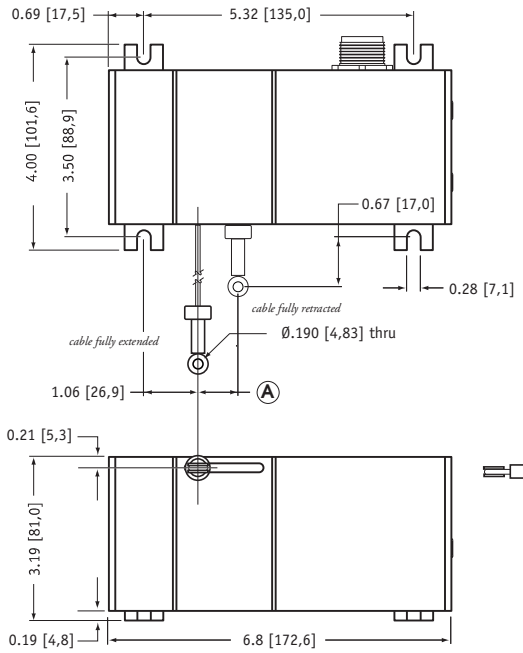
ENVIRONMENTAL

Environmental Suitability ..... NEMA 6, IP 67
Operating Temperature ..... -40° to 200°F (-40° to 90°C)
Vibration ..... up to 10 G's to 2000 Hz maximum

The PT5232, delivers position feedback via RS232 serial communication to your data acquisition or controller system. The PT5232 sends a raw 16-bit position count from 0000 to FFFF (hex). Additionally this device can be set to continuously send data or send data only when polled.

As the internal position sensing element is a precision potentiometer, this transducer maintains current accurate position even during power loss and does not need to be reset to a "home" position.

Outline Drawing

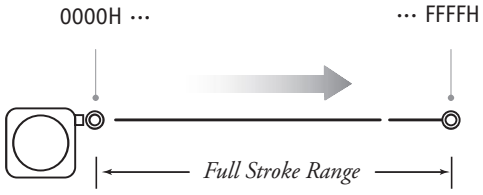


"A" Dimension

stroke range	measuring cable S47 • V62	N34
10	0.08 [2,0]	0.05 [1,2]
15	0.12 [3,0]	0.07 [1,8]
20	0.16 [3,9]	0.09 [2,4]
30	0.23 [5,9]	0.14 [3,5]
40	0.31 [7,9]	0.19 [4,7]
50	0.39 [9,9]	0.23 [5,9]
60	0.47 [11,8]	0.28 [7,0]
80	0.62 [15,8]	0.37 [9,4]
100	0.78 [19,7]	0.46 [11,7]
125	0.97 [24,7]	0.58 [14,7]
150	1.16 [29,6]	0.69 [17,6]
200	n/a	0.92 [23,5]
250	n/a	1.16 [29,3]

ALL DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.03 inches [0,8 mm]
unless otherwise noted

Output Signal



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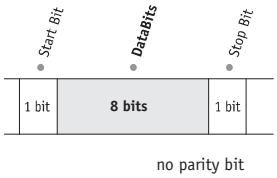
20630 Plummer Street • Chatsworth, CA 91311
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799

I/O Format:

Data Format



Data Frame

6 byte Hex string:

STX	CMD	B_0	B_1	B_2	ETX

STX = 0x02 **CMD** = Command Code* **B_0 - B_2** = Data Field* **ETX** = 0x03

** –see below*

Important! All communications to/from the transducer are in **HEX**!

User Commands:

	User Command				Sensor Response			
Description	**<CMD>**	**<B_0>**	**<B_1>**	**<B_2>**	**<CMD>**	**<B_0>**	**<B_1>**	**<B_2>**
Get Sensor Info	0x05	0x00	0x00	0x00	0x05	version(4)	date(5)	date(5)
Get Serial Number	0x15	0x00	0x00	0x00	0x15	serial number(3)		
Start Continuous Data	0x25	0x00	0x00	0x00	0x25	0x00	0x00	0x00
Stop Continuous Data	0x35	0x00	0x00	0x00	0x35	0x00	0x00	0x00
Get Position Data	0x45	0x00	0x00	0x00	0x45	CMC(1)	CMC(1)	status(2)

(1)CMC - Current Measurement Count (Position)

The **C**urrent **M**easurement **C**ount (**CMC**) is the output data that indicates the present position of the measuring cable.

The CMC is a 16-bit value that occupies the first two bytes (B_0 and B_1) of the data field. B_0 is the MSB (most significant byte) and B_1 is the LSB (least significant byte).

The CMC starts at 0000H with the measuring cable fully retracted and continues upward to the end of the stroke range stopping at FFFFH. This holds true for all ranges.

(2)Status

The status byte is used as a flag to indicate the validity of the position signal that the internal electronics receives from the potentiometer.

Flags are as follows:
0x00 = GREEN, 0x55 = YELLOW, 0xAA = RED

A "green" flag shows everything OK. A "yellow" or "red" flag indicates that the sensor has either been extended beyond its range or that there is a problem with the potentiometer.

(3)Serial Number

Each sensor has it's own unique serial number. This information can be retrieved by sending the sensor the "Get Serial Number" command.

The serial number is a 3 byte value from which ranges from 0 to 9999999 (decimal).

(4)Version

This is a single byte value (0-255 decimal) which indicates the currently installed firmware version of the sensor.

(5)Date

This is a 2 byte value showing the date of currently installed firmware. This value ranges from 01011 - 12319 (decimal). Format is MMDDY. While the month and day are expressed as two digit numbers the year is expressed in a single digit only.

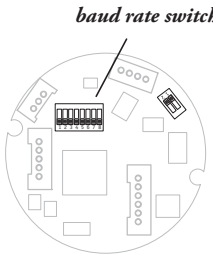
Example: 08054 = August 5, 2004

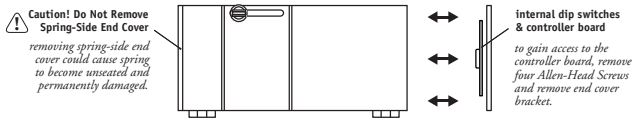
Baud Rate

The baud rate can be set using switches **7** & **8** on the 8-pole DIP switch found on the rs232 controller board located inside the transducer.

DIP-7	DIP-8	baud rate
0	0	9600
1	0	19200
0	1	38400
1	1	9600

RS232 Controller Board and DIP Switch Location





Ordering Information:

Model Number:

PT5232 - ____ - ____ - ____ - ____
order code: Ⓡ Ⓐ Ⓑ Ⓒ

Sample Model Number:

PT5232 - 50 - N34 - UP - M6

Ⓡ	range:	50 inches
Ⓐ	measuring cable:	.034 nylon-coated stainless
Ⓑ	measuring cable exit:	up (top exit)
Ⓒ	electrical connection:	6-pin plastic connector

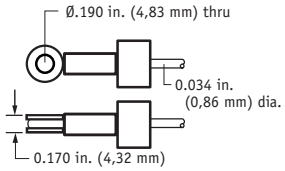
Full Stroke Range:

Ⓡ 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	

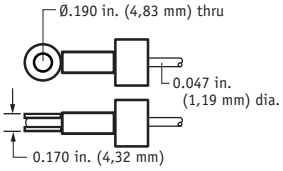
Measuring Cable:

Ⓐ order code:

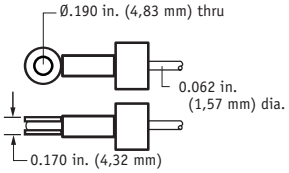
N34
.034 nylon-coated stainless steel
available in all ranges



S47
.047 stainless steel
all ranges up to 150 inches



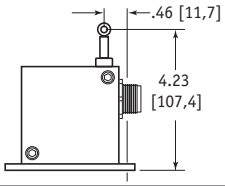
V62
.062 thermoplastic
all ranges up to 150 inches



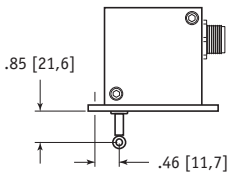
Cable Exit:

Ⓑ order code:

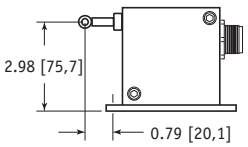
UP
up



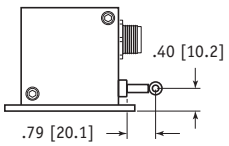
DN
down



FR
front



BK
back

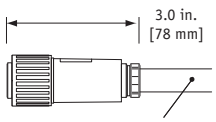


inches [mm]

Electrical Connection:

Ⓒ order code:

M6
6-pin plastic connector with mating plug
IP 67, NEMA 6



.30 – .39 in. [8 – 10 mm] cable dia.
16 AWG max conductor size
connector: MS3102E-14S-6P
mating plug: MS3106E-14S-6S

contact view

pin	signal
A	9...22 VDC
B	common
C	–
D	Transmitted Data
E	Received Data
F	common

C25
25-ft. instrumentation cable 24 AWG, shielded
IP 67, NEMA 6

25 ft. x 0.2-in. dia.
[7,5 M x 5 mm dia.]
24 AWG, shielded

color code	signal
Red	9...22 VDC
Black	common
White	–
Green	Transmitted Data
Blue	Received Data
Brown	common

version: **3.0** last updated: **July 10, 2008**

Mates To Virtually Any Encoder
Ranges: 0-50 to 0-250 inches
Available With or Without Encoder

PT5600

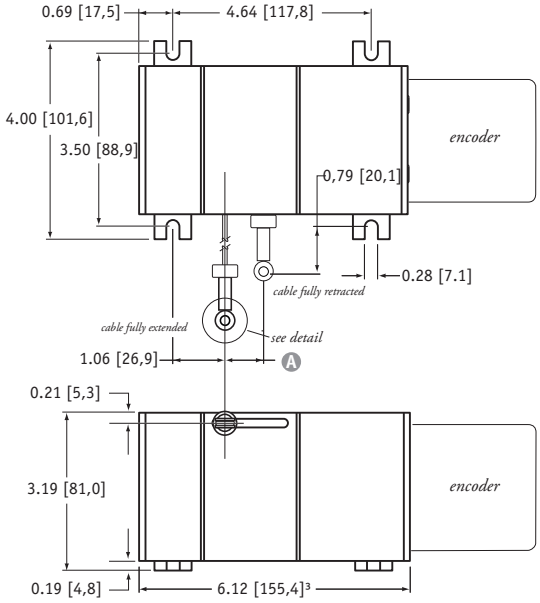
Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-50 to 0-250 inches
Motion Conversion Ratio ..... 8 inches per turn, *see ordering information*
Accuracy ..... the lesser of 0.02% full stroke or 0.04% of measurement range
Measuring Cable Options ..... stainless steel or thermoplastic
Module Material ..... hard anodized aluminum
Maximum Allowable Rotational Sensor Torque ..... 1.0 in-lbs.
Weight ..... 5 lbs. max.

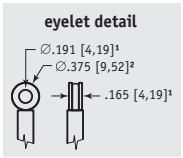
ENVIRONMENTAL

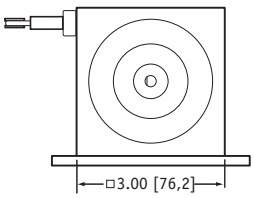
Operating Temperature ..... -40° to 200°F (-40° to 90°C)



Ⓐ DIMENSION - INCHES [MM]

stroke range	measuring cable S47 • V62	measuring cable N34
50	0.39 [9,9]	0.23 [5,9]
100	0.78 [19,7]	0.46 [11,7]
150	1.16 [29,6]	0.69 [17,6]
200	n/a	0.92 [23,5]
250	n/a	1.16 [29,3]





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

¹ tolerance = +.005 −.001 [+.13 −.03]
² tolerance = +.005 −.005 [+.13 −.13]
³Overall dimension may vary depending on encoder configuration.

Our unique linear-to-rotational, industrial-grade string encoder module mates to virtually any encoder, giving you a cost-effective linear position measurement solution that precisely fits your requirements. The PT5600 takes just minutes to install, fits easily into tight areas, does not require perfectly parallel alignment, and provides reliable and precise position measurements without needing periodic adjustments.

For any high resolution or absolute encoder requirement, the PT5600 delivers the ultimate in flexibility. To order, simply select the measurement range and encoder mounting style—it's that easy! We even supply all the necessary encoder mounting tools and attaching hardware. If you can't find your encoder mounting style or you want us to provide the encoder, please give us a call.

Ordering Information:

Model Number:

PT5600 - _____ - ___ - ___ - ___
order code: Ⓡ Ⓐ Ⓑ Ⓒ

Sample Model Number:

PT5600 - 100 - N34 - FR - F01

Ⓡ	range:	100 inches
Ⓐ	measuring cable:	.034 nylon-coated stainless
Ⓑ	cable exit:	front
Ⓒ	rotational sensor mounting style:	F01 (2.5-in. sq. flange)

» Trying to reorder but can't find your existing model number? Please contact factory for help.

Full Stroke Range:

Ⓡ order code:	50	100	150	200	250
full stroke range, min:	50 in.	100 in.	150 in.	200 in.	250 in.
cable tension (±20%):	41 ounces	41 ounces	41 ounces	21 ounces	21 ounces

celesco
celesco.com • info@celesco.com

Celesco Transducer Products, Inc.
20630 Plummer Street • Chatsworth, CA 91311
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799

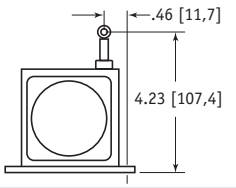
Measuring Cable:

Ⓐ order code:	N34	S47	V62
measuring cable:	.034 nylon-coated stainless steel	.047 stainless steel	.062 thermoplastic
available stroke ranges:	*all ranges*	*all ranges up to 150 inches*	*all ranges up to 150 inches*
conversion ratio:	1 turn = 8.002 ± 0.022 inches	1 turn = 8.042 ± 0.022 inches	1 turn = 8.077 ± 0.022 inches

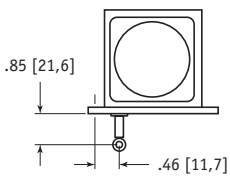
Cable Exit:

Ⓑ order code:

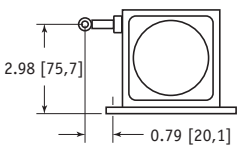
UP — up



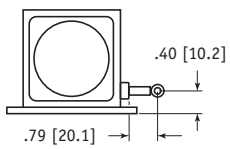
DN — down



FR — front



BK — back



inches [mm]

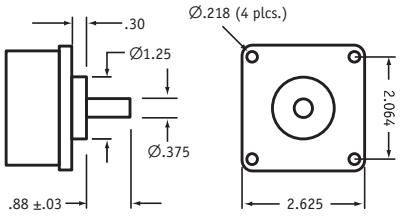
Rotational Sensor Mounting Style:

Ⓒ order code:

F01	F02	S01	S02	S04
2.5-in. Flange Mount 3/8-inch shaft	2-in. Flange Mount 3/8-inch shaft	Face-Mount 6 mm shaft M4 mounting screws	Face-Mount 10 mm shaft M4 mounting screws	Face-Mount 10 mm shaft M3 mounting screws

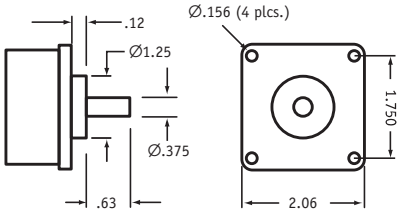
Note: If you don't see your encoder style, please contact factory. All encoder types supported.

F01 - 2½-inch Sq. Flange Mount (3/8-inch shaft)



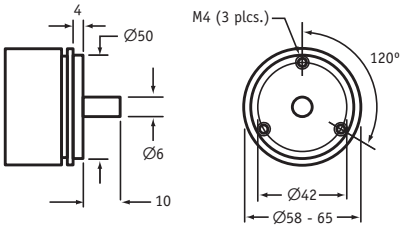
all dimensions are in ***inches***

F02 - 2-inch Sq. Flange Mount (3/8-inch shaft)



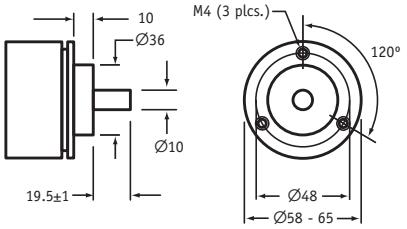
all dimensions are in ***inches***

S01 - Face-Mount (6mm shaft/M4 screws)



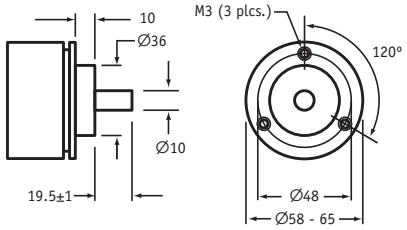
all dimensions are in ***mm***

S02 - Face-Mount (10mm shaft/M4 screws)



all dimensions are in ***mm***

S04 - Face-Mount (10mm shaft/M3 screws)



all dimensions are in ***mm***