PT8101

Heavy Industrial • Voltage Divider

Absolute Linear Position to 60 inches (1524 mm)
Aluminum or Stainless Steel Enclosure Options
VLS Option To Prevent Free-Release Damage
IP68 • NEMA 6 Protection

CE

GENERAL

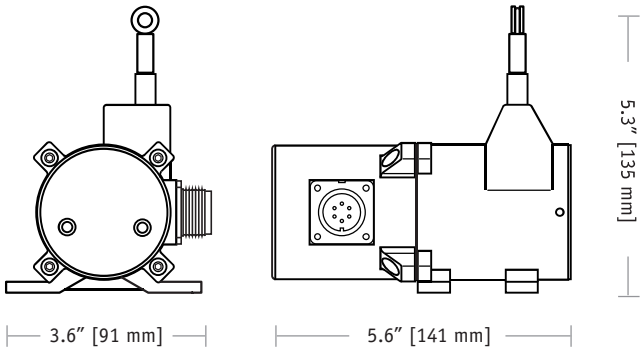
Full Stroke Range Options	0-2 to 0-60 inches
Output Signal Options	voltage divider (potentiometer)
Accuracy	see ordering information
Repeatability	± 0.02% full stroke
Resolution	essentially infinite
Measuring Cable Options	stainless steel or thermoplastic
Enclosure Material	powder-painted aluminum or stainless steel
Sensor	plastic-hybrid precision potentiometer
Potentiometer Cycle Life	see ordering information
Maximum Retraction Acceleration	see ordering information
Weight, Aluminum (Stainless Steel) Enclosure	3 lbs. (6 lbs.) max.

ELECTRICAL

Input Resistance Options	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

ENVIRONMENTAL

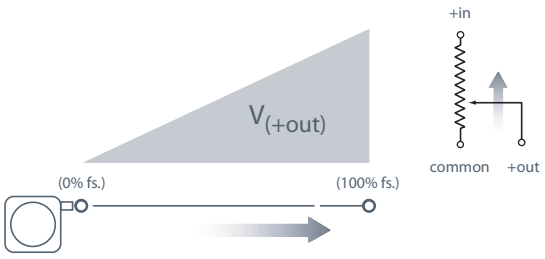
Enclosure	NEMA 4/4X/6, IP 67/68
Operating Temperature	-40° to 200°F (-40° to 90°C)
Vibration	up to 10g to 2000 Hz maximum



The PT8101, using a high cycle plastic-hybrid potentiometer, operates with any basic panel meter or programmable controller in factories and harsh environments requiring linear position measurements in ranges up to 60".

As a member of Celesco's innovative family of NEMA 4 rated cable-extension transducers, the PT8101: installs in minutes by mounting it's body to a fixed surface and attaching it's cable to the movable object, works without perfect parallel alignment, and when it's stainless-steel cable is retracted, it measures only 5".

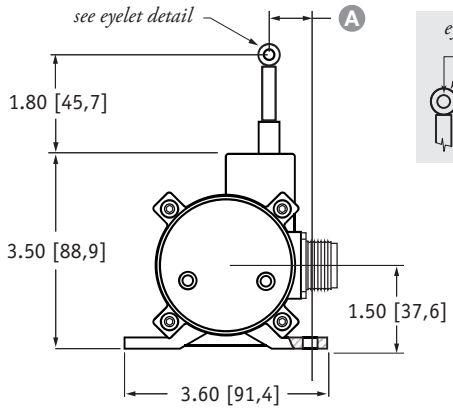
Output Signal:

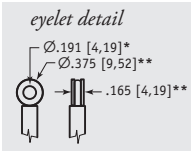


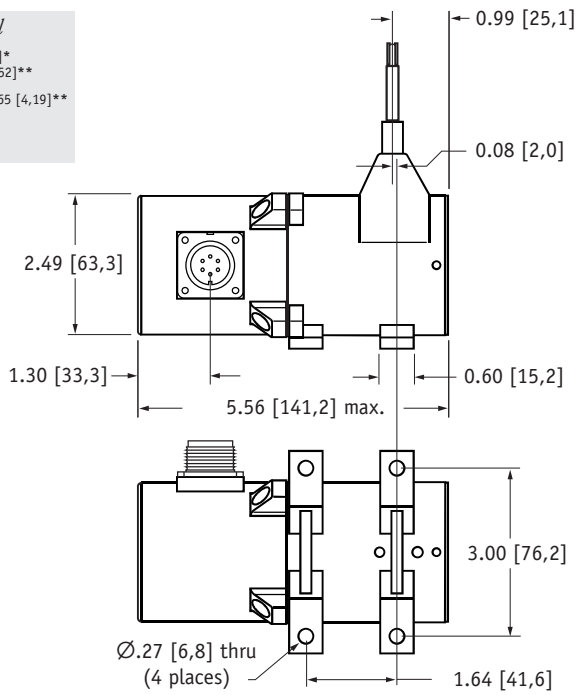
-- bridge circuit option available, see ordering information

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

Outline Drawing:







RANGE	A
2", 10"	1.16 [29,5]
5", 25", 50"	0.66 [16,8]
15"	0.99 [25,7]
20", 40"	0.85 [21,6]
30", 60"	0.52 [13,3]

DIMENSIONS ARE IN INCHES [MM]
tolerances are ±0.02 in. [±0,5 mm] unless otherwise noted

note: *tolerance = +.005 –.001 [+.13 –.03] **tolerance = +.005 –.005 [+.13 –.13]

Ordering Information:

Model Number:

PT8101-_____ - __ __ 1 - __ 1 __ __
order code: R A B C D E F G

Sample Model Number:

PT8101 - 0030 - 111 - 1110

R	range:	30 inches
A	enclosure/cable tension:	aluminum/standard (13 oz.)
B	measuring cable:	.034 nylon-coated stainless
D	output signal:	500 ohm potentiometer
F	electrical connection:	6-pin plastic connector
G	cable guide option:	standard nylon cable guide

Full Stroke Range:

R order code:	0002	0005	0010	0015	0020	0025	0030	0040	0050	0060
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50	60
accuracy (% of f.s.) 500...10K ohm options:	0.25%	0.25%	0.15%	0.15%	0.15%	0.15%	0.15%	0.10%	0.10%	0.10%
accuracy (% of f.s.) bridge circuit options:	0.30%	0.30%	0.20%	0.20%	0.20%	0.20%	0.15%	0.15%	0.15%	0.15%
potentiometer cycle life*:	2.5×10^6	2.5×10^6	5×10^5	5×10^5	5×10^5	5×10^5	5×10^5	2.5×10^5	2.5×10^5	2.5×10^5

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

Enclosure Material and Measuring Cable Tension:

A order code:	1	5	2	3	6	4	8	7	9
enclosure:	aluminum			303 stainless			316 stainless		
cable tension:	standard	medium	high	standard	medium	high	standard	medium	high
max. acceleration:	15 g	25 g	40 g	6 g	12 g	18 g	6 g	12 g	18 g

Range:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.	60 in.
cable tension option specifications Standard:	39 oz.	16 oz.	39 oz.	26 oz.	20 oz.	16 oz.	13 oz.	20 oz.	16 oz.	13 oz.
Medium:	65 oz.	26 oz.	65 oz.	43 oz.	33 oz.	26 oz.	22 oz.	33 oz.	26 oz.	22 oz.
High:	116 oz.	47 oz.	116 oz.	77 oz.	60 oz.	47 oz.	40 oz.	60 oz.	47 oz.	40 oz.

tension tolerance: ± 50%

Ordering Information (cont.):

Measuring Cable:

Ⓑ order code:

1	2	3	4
Ø.034-inch nylon-coated stainless steel *available in all ranges*	Ø.047-inch non-coated stainless steel *5, 15, 20, 25, 30-inch ranges only*	Ø.062-inch thermoplastic *all ranges up to 30 inches only*	Ø.031-inch non-coated stainless steel *40, 50, 60-inch ranges only*

Output Signals:

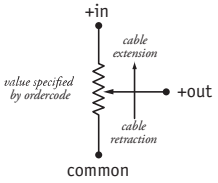
Ⓓ order code:

1	2	3	4	5	6
500 ohm*	1000 ohm*	5000 ohm*	10,000 ohm* **tolerance = ±10%*	fixed bridge (2 mV/V)	adjustable bridge (0...30 mV/V)

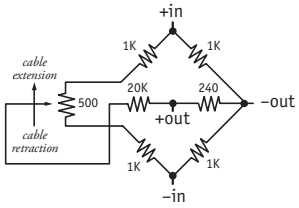
max. input voltage and power rating, options: 1 – 4

	2-inch, 5-inch range	*10-inch to 60-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

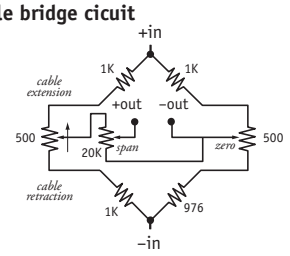


fixed bridge circuit



full scale output: 2 mV/V
zero adjust: not available

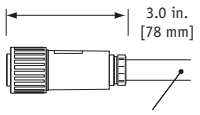
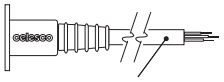
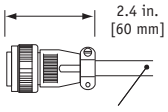
adjustable bridge cicuit



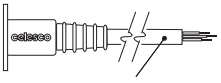
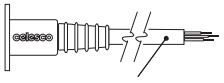
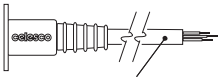
full scale output: adjustable from 0 to 30mV/V
zero adjust: to 50% of full stroke

Electrical Connection:

Ⓕ order code:

1	2	3	4
6-pin plastic connector w/mating plug **IP 67, NEMA 4X**,6**	10-ft. [3 M] waterproof cable **IP 67, NEMA 4X**, 6**	6-pin metal connector w/mating plug **IP 65, NEMA 4**	25-ft. [7.5 M] instrumentation cable **IP 67, NEMA 6**
			
1/2 - 5/16" [14 - 8 mm] cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S	10 ft. x 0.4-in. dia. [3 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW	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.] 6-conductor, 24 AWG shielded

Ⓕ order code:

5	6	7
100-ft. [30 M] waterproof cable **IP 67, NEMA 4X**,6**	10-ft. [3 M] **pressure tested*** waterproof cable **IP 68, NEMA 4X**, 6P**	100-ft. [30 M] **pressure tested*** waterproof cable **IP 68, NEMA 4X**, 6P**
		
100 ft. x 0.4-in. dia. [30 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW	10 ft. x 0.4-in. dia. [3 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW	100 ft. x 0.4-in. dia. [30 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW

6-pin Mating Plug

pin	standard	bridge
A	+ in	+ in
B	common	– in
C	+ out	– out
D	-	+ out

contact view

Waterproof Cable

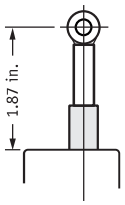
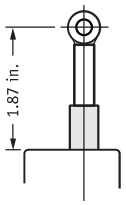
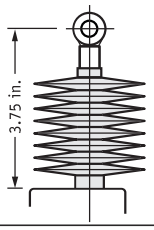
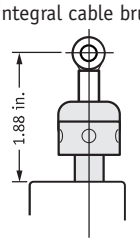
color code	standard	bridge
WHITE	+ in	n/a
BLACK	common	n/a
GREEN	+ out	n/a

Instrumentation Cable

color code	standard	bridge
RED	+ in	+ in
BLACK	common	– in
GREEN	+ out	+ out
WHITE	-	– out
BLUE	-	-
BROWN	-	-

**–Test pressure: 100 feet [30 meters] H_2O (40 PSID); Test Medium: Air; Duration: 2 hours. **–Applies to stainless steel enclosure only.*

Cable Guide Options:

Ⓖ order code:	0	1	2*	3
	standard cable guide	stainless steel cable guide	polyurethane cable bellows	integral cable brush
				

**note: all ranges up to 25 inches only*

VLS Option - Free Release Protection

The patented Celesco Velocity Limiting System (VLS) is an option for PT8000 Series cable extension transducers that limits cable retraction to a safe 40 to 55 inches per second.

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

VLS is NOT available for medium and high cable tension options or 2, 5 and 15-inch stroke ranges.

How To Configure Model Number for VLS Option:

VLS 8101- ____ - ____ ____ ____ - ____ ____ ____ ____

Ⓡ	Ⓐ
0010	1
0020	3
0025	8
0030	
0040	
0050	
0060	

= only available options**

creating VLS model number (example):

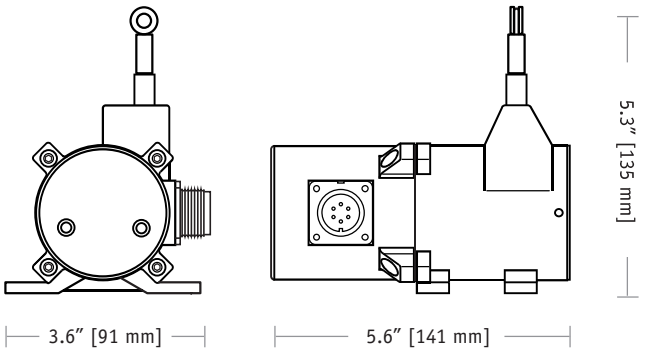
1. select PT8101 model	PT8101-0060-111-1110
2. remove "PT" from the model number	~~PT~~ 8101-0060-111-1110
3. add "VLS"	VLS + 8101-0060-111-1110
4. completed model number !	VLS8101-0060-111-1110

***Note: please contact factory for a solution to options not supported.*

PT8420

Heavy Industrial • 4..20mA / 0..20mA

Absolute Linear Position to 60 inches (1524 mm)
Aluminum or Stainless Steel Enclosure Options
VLS Option To Prevent Free-Release Damage
IP68 / NEMA 6 • Hazardous Area Certification



GENERAL

Full Stroke Range Options	0-2 to 0-60 inches
Output Signal Options	4...20 mA (2-wire) and 0...20 mA (3-wire)
Accuracy	see ordering information
Repeatability	± 0.05% full stroke
Resolution	essentially infinite
Measuring Cable Options	stainless steel or thermoplastic
Enclosure Material	powder-painted aluminum or stainless steel
Sensor	plastic-hybrid precision potentiometer
Potentiometer Cycle Life	see ordering information
Maximum Retraction Acceleration	see ordering information

ELECTRICAL

Input Voltage	see ordering information
Input Current	20 mA max.
Maximum Loop Resistance (Load)	(loop supply voltage - 8)/0.020
Circuit Protection	38 mA max.
Impedance	100M ohms@100 VDC, min.
Signal Adjust, Zero	from factory set zero to 50% of full stroke range
Signal Adjust, Span	to 50% of factory set span
Thermal Effects, Zero	0.01% f.s./°F, max.
Thermal Effects, Span	0.01% f.s./°F, max.

EMC COMPLIANCE PER DIRECTIVE 89/336/EEC

Emission/Immunity	EN50081-2 / EN50082-2

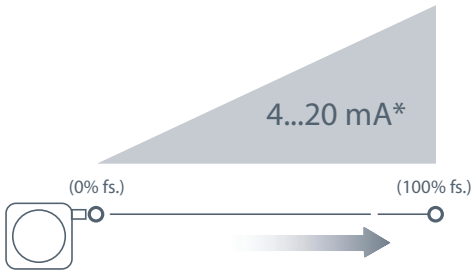
ENVIRONMENTAL

Enclosure	NEMA 4/4X/6, IP 67/68
Hazardous Area Certification	see ordering information
Operating Temperature	-40° to 200°F (-40° to 90°C)
Vibration	up to 10 g's to 2000 Hz maximum
Weight, Aluminum (Stainless Steel) Enclosure	3 lbs. (6 lbs.) max.

The PT8420 with its 4-20 mA feedback signal, is ideal for monitoring the stroke of a hydraulic cylinder and other applications requiring position data acquistion in harsh environments.

As a member of our family of NEMA 4-rated cable-extension transducers, the PT8420 provides a feedback signal that is proportional to the linear movement of a traveling stainless-steel extension cable. Simply mount the body of the transducer to a fixed surface and attach the extension cable to the moving object.

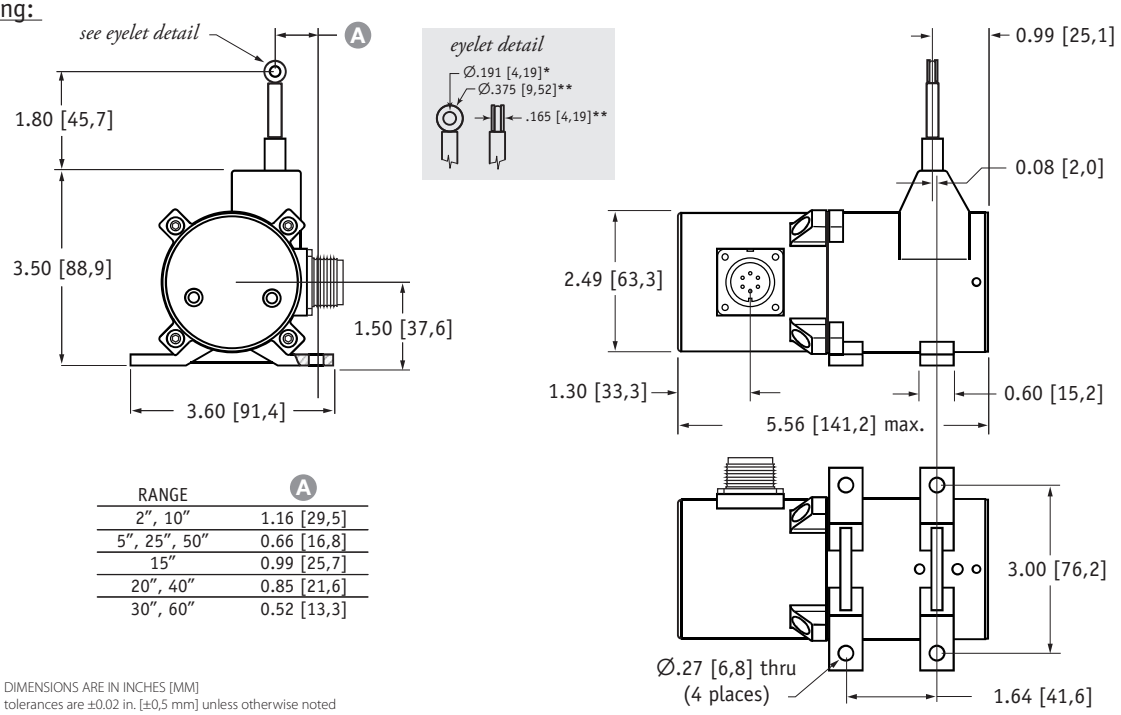
Output Signal:



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

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

Outline Drawing:



RANGE	Ⓐ
2", 10"	1.16 [29,5]
5", 25", 50"	0.66 [16,8]
15"	0.99 [25,7]
20", 40"	0.85 [21,6]
30", 60"	0.52 [13,3]

DIMENSIONS ARE IN INCHES [MM]
tolerances are ±0.02 in. [±0,5 mm] unless otherwise noted

note: *tolerance = +.005 –.001 [+.13 –.03] **tolerance = +.005 –.005 [+.13 –.13]

Ordering Information:

Model Number:

PT8420-____Ⓡ - __Ⓐ__Ⓑ__Ⓒ - __Ⓓ__Ⓔ__Ⓕ__Ⓖ
order code:

Sample Model Number:

PT8420 - 0030 - 111 - 1110

Ⓡ	range:	30 inches
Ⓐ	enclosure/cable tension:	aluminum/standard (13 oz.)
Ⓑ	measuring cable:	.034 nylon-coated stainless
Ⓔ	output signal:	4...20mA, 2-wire
Ⓕ	electrical connection:	6-pin plastic connector
Ⓖ	cable guide option:	standard nylon cable guide

Full Stroke Range:

Ⓡ *order code:*	0002	0005	0010	0015	0020	0025	0030	0040	0050	0060
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.	60 in.
accuracy (% of f.s.):	0.28%	0.28%	0.18%	0.18%	0.18%	0.18%	0.18%	0.15%	0.15%	0.15%
potentiometer cycle life*:	2.5×10^6	2.5×10^6	5×10^5	5×10^5	5×10^5	5×10^5	5×10^5	2.5×10^5	2.5×10^5	2.5×10^5

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

Enclosure Material and Measuring Cable Tension:

Ⓐ *order code:*	1	5	2	3	6	4	8	7	9
enclosure:	aluminum			303 stainless			316 stainless		
cable tension:	standard	medium	high	standard	medium	high	standard	medium	high
max. acceleration:	15 g	25 g	40 g	6 g	12 g	18 g	6 g	12 g	18 g

cable tension option specifications

Range:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.	60 in.
Standard:	39 oz.	16 oz.	39 oz.	26 oz.	20 oz.	16 oz.	13 oz.	20 oz.	16 oz.	13 oz.
Medium:	65 oz.	26 oz.	65 oz.	43 oz.	33 oz.	26 oz.	22 oz.	33 oz.	26 oz.	22 oz.
High:	116 oz.	47 oz.	116 oz.	77 oz.	60 oz.	47 oz.	40 oz.	60 oz.	47 oz.	40 oz.

tension tolerance: ± 50%

Ordering Information (cont.):

Measuring Cable:

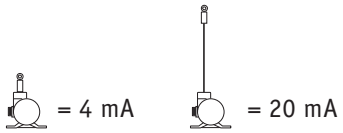
Ⓑ order code:	1	2	3	4
	Ø.034-inch nylon-coated stainless steel *available in all ranges*	Ø.047-inch non-coated stainless steel *5, 15, 20, 25, 30-inch ranges only*	Ø.062-inch thermoplastic *all ranges up to 30 inches only*	Ø.031-inch non-coated stainless steel *40, 50, 60-inch ranges only*

Output Signals:

Ⓔ order code:	1	2	3	4	5*	6*
output signal options:	4...20 mA	20...4 mA	0...20 mA	20...0 mA	4...20 mA	20...4 mA
sensitivity:	16 mA/full stroke ±0.25%		20 mA/full stroke ±0.25%		16 mA/full stroke ±0.25%	
wiring configuration:	2 – wire		3 – wire		2 – wire	
input voltage:	8 – 34 vdc		14 – 29 vdc		14 – 32 vdc	
hazardous area certification:	not certified				CSA • Cenelec	

Example:

ordercode = **1** = 4...20 mA



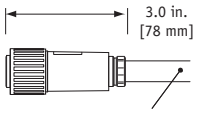
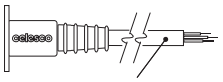
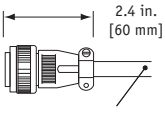
Hazardous Area Certifications:

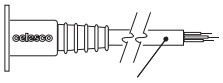
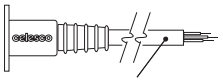
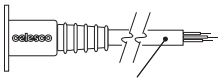
CSA Standard 22.2
Class 1
Groups A, B, C and D

Cenelec
LCIE EEx
ia IIc T4

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

Electrical Connection:

Ⓕ order code:	1	2	3	4
	6-pin plastic connector w/mating plug **IP 67, NEMA 4X**,6**	10-ft. [3 M] waterproof cable **IP 67, NEMA 4X**, 6**	6-pin metal connector w/mating plug **IP 65, NEMA 4**	25-ft. [7.5 M] instrumentation cable **IP 67, NEMA 6**
				
	1/2 - 5/16" [14 - 8 mm] cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S	10 ft. x 0.4-in. dia. [3 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW	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. [7,5 M x 5 mm] dia. 6-conductor, 24 AWG shielded

Ⓕ order code:	5	6	7
	100-ft. [30 M] waterproof cable **IP 67, NEMA 4X**,6**	10-ft. [3 M] **pressure tested*** waterproof cable **IP 68, NEMA 4X**, 6P**	100-ft. [30 M] **pressure tested*** waterproof cable **IP 68, NEMA 4X**, 6P**
			
	100 ft. x 0.4-in. dia. [30 M x 10 mm dia.] 18 AWG, type SJTW	10 ft. x 0.4-in. dia. [3 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW	100 ft. x 0.4-in. dia. [30 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW

6-pin Mating Plug

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

contact view

Waterproof Cable

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

Instrumentation Cable

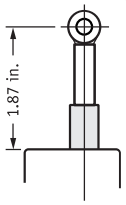
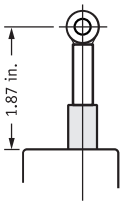
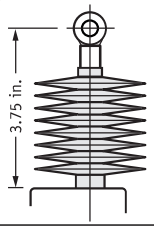
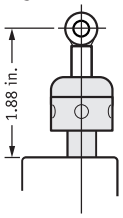
color code	2-wire	3-wire
RED	8...34 vdc***	14...29 vdc
BLACK	4...20 mA out	common
GREEN	case ground	0...20 mA out

Note: WHITE, BLUE, BROWN are not used.

**–Test pressure: 100 feet [30 meters] H_2O (40 PSID) Test Medium: Air; Duration: 2 hours. **–applies to stainless steel enclosure only. ***14-32 VDC for hazardous area option.*

Cable Guide Options:

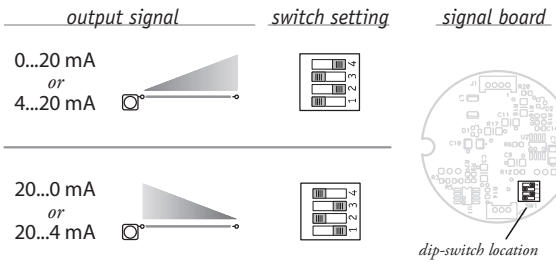
Ⓖ *order code:*

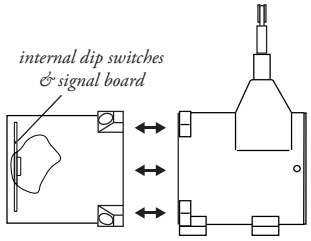
0	1	2*	3
standard cable guide	stainless steel cable guide	polyurethane cable bellows	integral cable brush
			

**note: all ranges up to 25 inches only*

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 rear cover.

VLS Option - Free Release Protection

The patented Celesco Velocity Limiting System (VLS) is an option for PT8000 Series cable extension transducers that limits cable retraction to a safe 40 to 55 inches per second.

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

VLS is NOT available for medium and high cable tension options or 2, 5 and 15-inch stroke ranges.

How To Configure Model Number for VLS Option:

VLS 8420 - ____ **-** ____ ____ ____ **-** ____ ____ ____ ____

Ⓡ 0010, 0020, 0025, 0030, 0040, 0050, 0060

Ⓐ 1, 3, 8

= only available options**

creating VLS model number (example):

1. select PT8420 model — **PT8420-0060-111-1110**
2. remove "PT" from the model number — **~~PT~~ 8420-0060-111-1110**
3. add "VLS" — **VLS + 8420-0060-111-1110**
4. completed model number ! — **VLS8420-0060-111-1110**

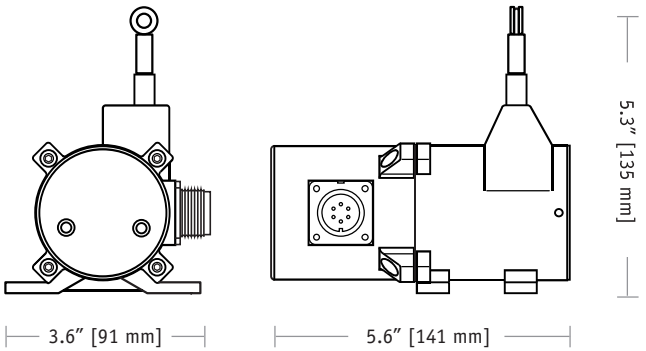
***Note: please contact factory for a solution to options not supported.*

PT8510

Heavy Industrial • 0...5, 0...10 Vdc

Absolute Linear Position to 60 inches (1524 mm)
Aluminum or Stainless Steel Enclosure Options
VLS Option To Prevent Free-Release Damage
IP68 • NEMA 6 Protection

CE



GENERAL

Full Stroke Range Options	0-2 to 0-60 inches
Output Signal Options	0...5, 0...10, -5...+5, -10...+10 VDC
Accuracy	see ordering information
Repeatability	± 0.05% full stroke
Resolution	essentially infinite
Measuring Cable Options	nylon-coated stainless steel or thermoplastic
Enclosure Material	powder-painted aluminum or stainless steel
Sensor	plastic-hybrid precision potentiometer
Potentiometer Cycle Life	see ordering information
Maximum Retraction Acceleration	see ordering information
Weight, Aluminum (Stainless Steel) Enclosure	3 lbs. (6 lbs.) max.

ELECTRICAL

Input Voltage	see ordering information
Input Current	10 mA maximum
Output Impedence	1000 ohms
Maximum Load	5000 ohms
Zero and Span Adjustment	see ordering information

EMC COMPLIENCE PER DIRECTIVE 89/336/EEC

Emission/Immunity	EN50081-2 / EN50082-2

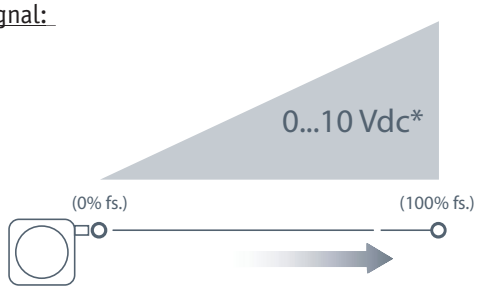
ENVIRONMENTAL

Enclosure	NEMA 4/4X/6, IP 67/68
Operating Temperature	-40° to 200°F (-40° to 90°C)
Vibration	up to 10 G's to 2000 Hz maximum

The PT8510 can operate from an unregulated 14.5 to 40 VDC power supply while providing an output signal that is proportional to the linear movement of it's measuring cable. The PT8510 has a maximum measurement range up to 60" and has 4 output signal options to choose from: 0...10, 0...5, -10...+10 and -5...+5 Vdc.

As a member of Celesco's innovative family of NEMA-4 rated cable-extension transducers, the PT8510 offers numerous benefits. It installs in minutes, fits into areas unsuited for rod-type measurement devices, and works without perfectly parallel alignment.

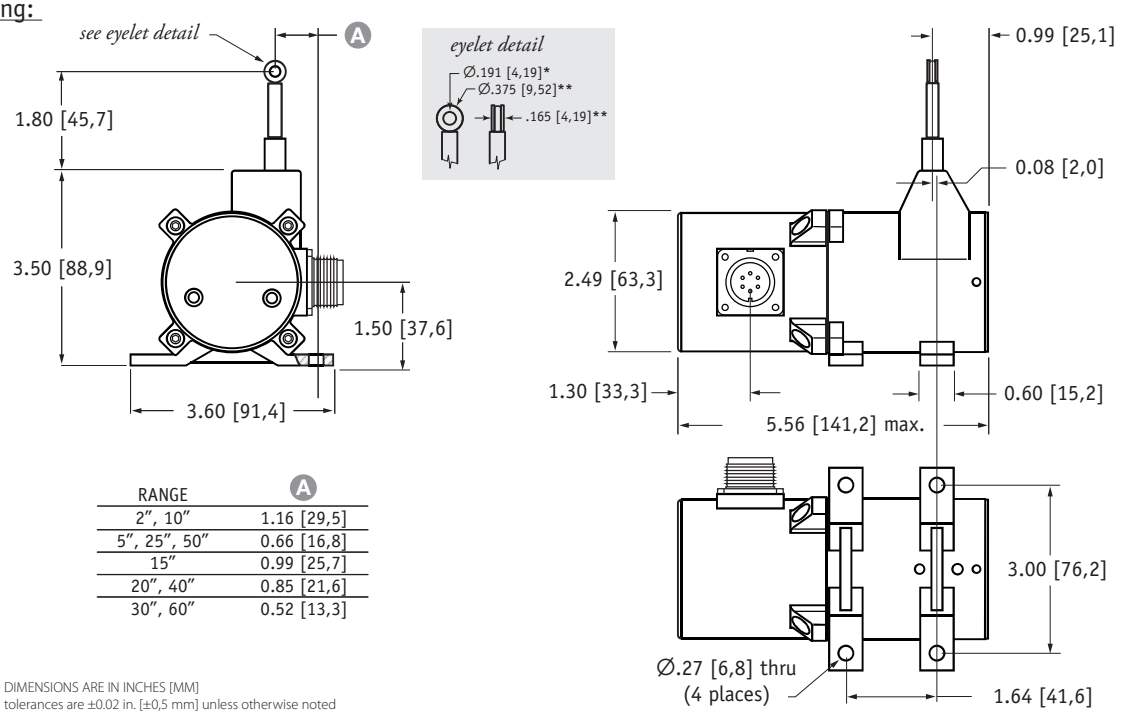
Output Signal:



**Additional Output Options: 0...5, ⁻5...⁺5, ⁻10...⁺10 Vdc*

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

Outline Drawing:



RANGE	A
2", 10"	1.16 [29,5]
5", 25", 50"	0.66 [16,8]
15"	0.99 [25,7]
20", 40"	0.85 [21,6]
30", 60"	0.52 [13,3]

DIMENSIONS ARE IN INCHES [MM]
tolerances are ±0.02 in. [±0,5 mm] unless otherwise noted

note: *tolerance = +.005 –.001 [+.13 –.03] **tolerance = +.005 –.005 [+.13 –.13]

Ordering Information:

Model Number:

PT8510-_____ - ____ ____ 1 - 1 ____ ____ ____
order code: ® Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ

Sample Model Number:

PT8510 - 0030 - 111 - 1110

®	range:	30 inches
Ⓐ	enclosure/cable tension:	aluminum/standard (9 oz.)
Ⓑ	measuring cable:	.034 nylon-coated stainless
Ⓔ	output signal:	0...10 vdc
Ⓕ	electrical connection:	6-pin plastic connector
Ⓖ	cable guide option:	standard nylon cable guide

Full Stroke Range:

® order code:	0002	0005	0010	0015	0020	0025	0030	0040	0050	0060
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.	60 in.
accuracy (% of f.s.):	0.28%	0.28%	0.18%	0.18%	0.18%	0.18%	0.18%	0.15%	0.15%	0.15%
potentiometer cycle life*:	2.5×10^6	2.5×10^6	5×10^5	5×10^5	5×10^5	5×10^5	5×10^5	2.5×10^5	2.5×10^5	2.5×10^5

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

Enclosure Material and Measuring Cable Tension:

Ⓐ order code:	1	5	2	3	6	4	8	7	9
enclosure:	aluminum			303 stainless			316 stainless		
cable tension:	standard	medium	high	standard	medium	high	standard	medium	high
max. acceleration:	15 g	25 g	40 g	6 g	12 g	18 g	6 g	12 g	18 g

cable tension option specifications

Range:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50 in.	60 in.
Standard:	39 oz.	16 oz.	39 oz.	26 oz.	20 oz.	16 oz.	13 oz.	20 oz.	16 oz.	13 oz.
Medium:	65 oz.	26 oz.	65 oz.	43 oz.	33 oz.	26 oz.	22 oz.	33 oz.	26 oz.	22 oz.
High:	116 oz.	47 oz.	116 oz.	77 oz.	60 oz.	47 oz.	40 oz.	60 oz.	47 oz.	40 oz.

tension tolerance: ± 50%

Ordering Information (cont.):

Measuring Cable:

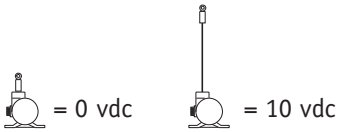
Ⓑ order code:	1	2	3	4
	Ø.034-inch nylon-coated stainless steel	Ø.047-inch non-coated stainless steel	Ø.062-inch thermoplastic	Ø.031-inch non-coated stainless steel
	available in all ranges	*5, 15, 20, 25, 30-inch ranges only*	*all ranges up to 30 inches only*	*40, 50, 60-inch ranges only*

Output Signals:

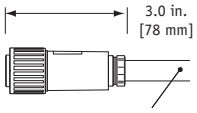
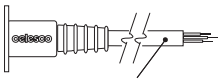
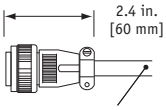
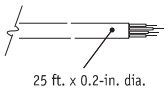
Ⓔ order code:	1	2	3	4	5	6	7	8
output signal options:	0...10 VDC	10...0 VDC	0...5 VDC	5...0 VDC	-10...+10 VDC	+10...-10 VDC	-5...+5 VDC	+5...-5 VDC
input voltage:	14.5 – 40 vdc		10.5 – 40 vdc		14.5 – 40 vdc		10.5 – 40 vdc	
span adjustment:	to 50% of factory set span				to 75% of factory set span			
zero adjustment:	from factory set zero to 50% of full stroke range				from factory set zero to 25% of full stroke range			

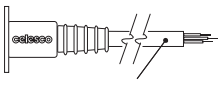
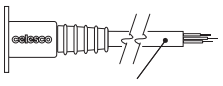
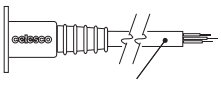
Example:

ordercode = **1** = 0...10 vdc



Electrical Connection:

Ⓕ order code:	1	2	3	4
	6-pin plastic connector w/mating plug	10-ft. [3 M] waterproof cable	6-pin metal connector w/mating plug	25-ft. [7.5 M] instrumentation cable
	IP 67, NEMA 4X,6**	**IP 67, NEMA 4X**, 6**	**IP 65, NEMA 4**	**IP 67, NEMA 6**
				
	1/2 - 5/16" [14 - 8 mm] cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S	10 ft. x 0.4-in. dia. [3 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW	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.] 6-conductor, 24 AWG shielded

Ⓕ order code:	5	6	7
	100-ft. [30 M] waterproof cable	10-ft. [3 M] **pressure tested*** waterproof cable	100-ft. [30 M] **pressure tested*** waterproof cable
	IP 67, NEMA 4X,6**	**IP 68, NEMA 4X**, 6P**	**IP 68, NEMA 4X**, 6P**
			
	100 ft. x 0.4-in. dia. [30 M x 10 mm dia.] 18 AWG, type SJTW	10 ft. x 0.4-in. dia. [3 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW	100 ft. x 0.4-in. dia. [30 M x 10 mm dia.] 3-conductor, 18 AWG type SJTW

6-pin Mating Plug

pin	signal
A	input voltage
B	output signal
C	common

contact view

Waterproof Cable

color code	signal
WHITE	input voltage
GREEN	output signal
BLACK	common

Instrumentation Cable

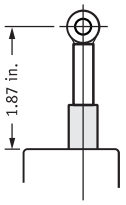
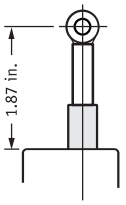
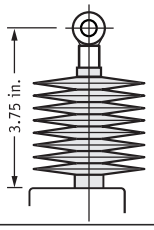
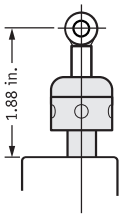
color code	signal
RED	input voltage
GREEN	output signal
BLACK	common

Note: WHITE, BLUE, BROWN are not used.

**–Test pressure: 100 feet [30 meters] H_2O (40 PSID); Test Medium: Air; Duration: 2 hours. **–Applies to stainless steel enclosure only.*

Cable Guide Options:

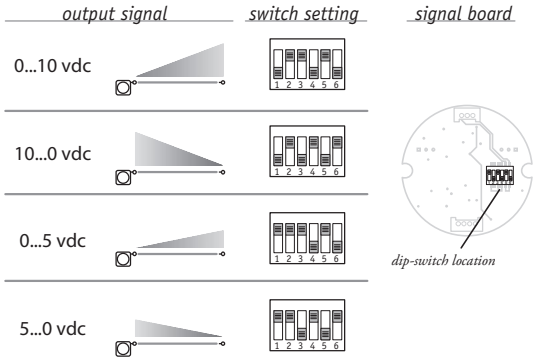
Ⓖ *order code:*

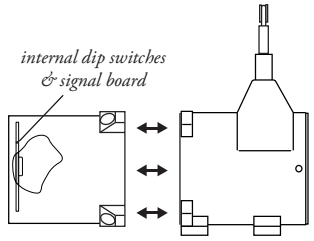
0	1	2*	3
standard cable guide	stainless steel cable guide	polyurethane cable bellows	integral cable brush
			

**note: all ranges up to 25 inches only*

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 rear cover.

VLS Option - Free Release Protection

The patented Celesco Velocity Limiting System (VLS) is an option for PT8000 Series cable extension transducers that limits cable retraction to a safe 40 to 55 inches per second.

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

VLS is NOT available for medium and high cable tension options or 2, 5 and 15-inch stroke ranges.

How To Configure Model Number for VLS Option:

VLS 8510 - ____ **-** ____ ____ ____ **-** ____ ____ ____ ____

Ⓡ	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ
0010	1						
0020	3						
0025	8						
0030							
0040							
0050							
0060							

= only available options**

creating VLS model number (example):

1. select PT8420 model — **PT8510-0060-111-1110**
2. remove "PT" from the model number — **~~PT~~ 8510-0060-111-1110**
3. add "VLS" — **VLS + 8510-0060-111-1110**
4. completed model number ! — **VLS8510-0060-111-1110**

version: **7.0** last updated: **November 5, 2012**

***Note: please contact factory for a solution to options not supported.*

PT8150

Heavy Industrial • Incremental Encoder

Linear Position to 60 inches • 1250mm (metric range)
Aluminum or Stainless Steel Enclosure Options
VLS Option To Prevent Free-Release Damage
IP67 • NEMA 6 Protection

GENERAL

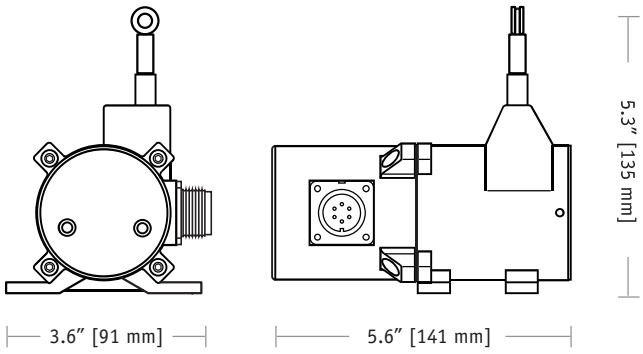
Full Stroke Range Options	0-30, 0-60 inches, 0-625, 0-1250 mm
Output Signal	incremental encoder (quadrature)
Accuracy	0.04% full stroke (contact factory for higher accuracy)
Repeatability	± 0.02% full stroke
Resolution Options	20 to 500 pulses per inch
Measuring Cable Options	stainless steel or thermoplastic
Enclosure Material	powder-painted aluminum or stainless steel
Sensor	optical encoder
Maximum Retraction Acceleration	see ordering information
Weight, Aluminum (Stainless Steel) Enclosure	3 lbs. (6 lbs.) max.

ELECTRICAL

Input Voltage	see ordering information
Input Current	see ordering information
Output Driver Options	see ordering information

ENVIRONMENTAL

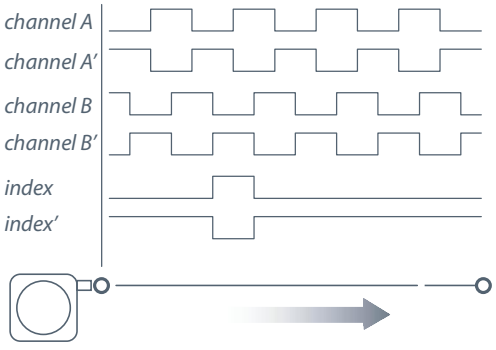
Enclosure	NEMA 4/4X/6, IP 67
Operating Temperature	0° to 160°F (-17° to 71°C)
Vibration	up to 10g to 2000 Hz maximum



With its incremental optical encoder and industrial design, this rugged transducer provides the highest accuracy and longest life of any measurement device of its kind. For measurements up to 60 inches, this model is available in a variety of resolutions and output stages to fit virtually any requirement.

The PT8150 offers numerous advantages over other industrial-grade sensors: It installs in minutes by mounting its body to a fixed surface and attaching it's cable to the movable object, fits into areas unsuited for rod-type measurement devices, and works without perfect parallel alignment.

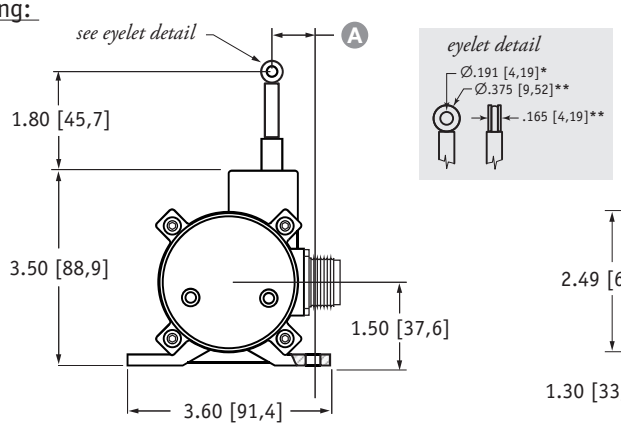
Output Signal Options:

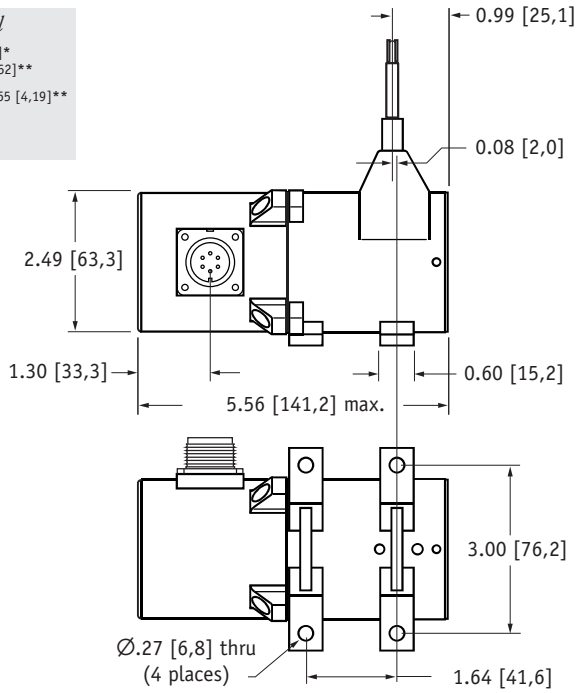


-- see ordering information for available channels

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

Outline Drawing:





RANGE	A
30", 60"	0.66 [16,8]
625, 1250mm	0.85 [21,6]

DIMENSIONS ARE IN INCHES [MM]
tolerances are ±0.02 in. [±0,5 mm] unless otherwise noted

note: *tolerance = +.005 –.001 [+.13 –.03] **tolerance = +.005 –.005 [+.13 –.13]

Ordering Information:

Model Number:

PT8150-_____ - __ __ 1 - __ __ __ __
order code: R A B C D E F G

Sample Model Number:

PT8150 - 0030 - 111 - 1110

R	range:	30 inches
A	enclosure/cable tension:	aluminum/standard (12 oz.)
B	measuring cable:	.034 nylon-coated stainless
D	output signal:	TTL/CMOS driver
E	resolution:	200 ±4 pulses per inch
F	electrical connection:	6-pin plastic connector
G	cable guide option:	standard nylon cable guide

Full Stroke Range:

R order code:	0030	0060	0625	1250
full stroke range, min:	30 in.	60 in.	625 mm	1250 mm

Enclosure Material and Measuring Cable Tension:

A order code:	1	5	2	3	6	4	8	7	9
enclosure:	aluminum			303 stainless			316 stainless		
cable tension:	standard	medium	high	standard	medium	high	standard	medium	high
max. acceleration:	15 g	25 g	40 g	6 g	12 g	18 g	6 g	12 g	18 g

cable tension option specifications
(tension tolerance: ± 50%)

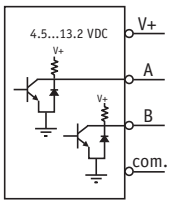
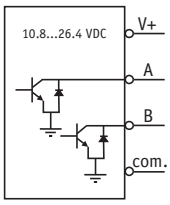
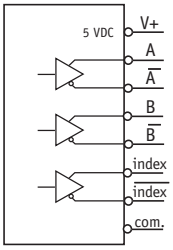
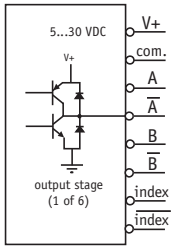
Range:	30 in.	60 in.	625 mm	1250 mm
Standard:	16 oz.	16 oz.	4,5 N	4,5 N
Medium:	26 oz.	26 oz.	7,2 N	7,2 N
High:	47 oz.	47 oz.	13,1 N	13,1 N

Ordering Information (cont.):

Measuring Cable:

Ⓑ order code:	1	2	3	4
	Ø.034-inch nylon-coated stainless steel *available in **all** ranges*	Ø.047-inch non-coated stainless steel ***30 in.** and **625 mm** ranges only*	Ø.062-inch thermoplastic ***30 in.** and **625 mm** ranges only*	Ø.031-inch non-coated stainless steel ***60 in.** and **1250 mm** ranges only*

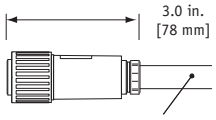
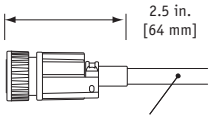
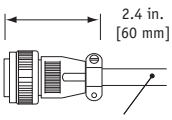
Output Signals:

Ⓓ order code:	1	2	3	4
output driver:	TTL - CMOS	Open Collector	5 V - Line Driver	Universal Line Driver
	Input voltage (V+): 4.5...13.2 Vdc Sink current: 20 mA max. Input current: 80 mA max.	Input voltage (V+): 10.8...26.4 Vdc Sink current: 20 mA max. Input current: 80 mA max.	Input voltage (V+): 5 Vdc Sink current: 20 mA max. Input current: 150 mA max.	Input voltage (V+): 5...30 VDC Source/Sink: 20 mA max. Input current: 100 mA max, no load
				

Resolution:

Ⓔ order code:	1	2	3	4
english ranges:	200 ±4 pulses per in.	400 ±8 pulses per in.	500 ±10 pulses per in.	20 ±0.4 pulses per in.
metric ranges:	10 ±0,2 pulses per mm	20 ±0,4 pulses per mm	25 ±0,5 pulses per mm	1 ±0,02 pulses per mm

Electrical Connection:

Ⓕ order code:	1	2	3	4
	6-pin plastic connector with mating plug **IP 67, NEMA 4X*,6**	25-ft. instrumentation cable 24 AWG, shielded **IP 67, NEMA 6**	18-pin plastic connector with mating plug **IP 65, NEMA 4**	6-pin metal 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	25 ft. x 0.2-in. dia. [7,5 M x 5 mm dia.] 24 AWG, shielded	.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	.375 in. [9 mm] max cable dia. 16 AWG max conductor size connector: MS3102E-14S-6P mating plug: MS3106E-14S-6S

6-pin mating plug:

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'

contact view

18-pin mating plug:

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'

contact view

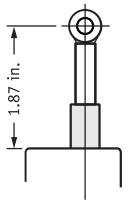
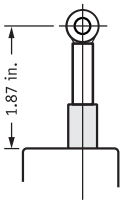
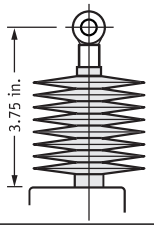
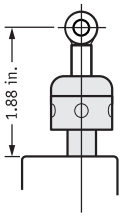
25-ft. instrumentation cable:

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'

** –applies to stainless steel enclosure only.*

Cable Guide Options:

Ⓖ *order code:*

0	1	2*	3
standard cable guide	stainless steel cable guide	polyurethane cable bellows	integral cable brush
			

**important! – bellows limits measuring cable travel to 25 inches, contact factory before ordering.*

VLS Option - Free Release Protection

The patented Celesco Velocity Limiting System (VLS) is an option for PT8000 Series cable extension transducers that limits cable retraction to a safe 40 to 55 inches per second.

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

VLS is NOT available for medium and high cable tension options or 2, 5 and 15-inch stroke ranges.

How To Configure Model Number for VLS Option:

VLS 8150 - ____ Ⓡ **-** ___ Ⓐ Ⓑ Ⓒ **-** Ⓓ Ⓔ Ⓕ Ⓖ

Ⓡ	Ⓐ
0030	1
0060	3
0625	8
1250	

= only available options**

creating VLS model number (example):

1. select PT8150 model — **PT8150-0060-111-1110**
2. remove "PT" from the model number — **~~PT~~ 8150-0060-111-1110**
3. add "VLS" — **VLS + 8150-0060-111-1110**
4. completed model number ! — **VLS8150-0060-111-1110**

***Note: please contact factory for a solution to options not supported.*

PT8232

Heavy Industrial • RS232

Absolute Linear Position to 60 inches (1524 mm)
Aluminum or Stainless Steel Enclosure Options
VLS Option To Prevent Free-Release Damage
IP67 • NEMA6 Protection

GENERAL

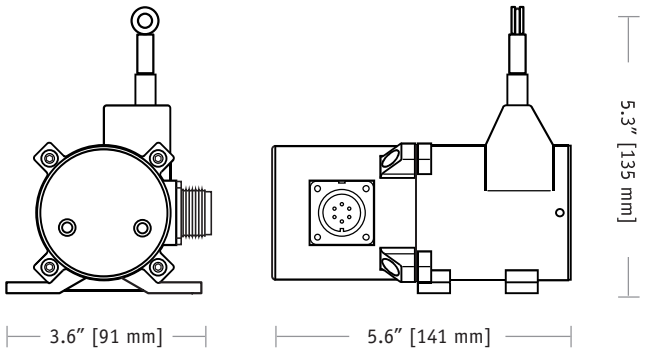
Full Stroke Ranges	0-2 to 0-60 inches
Electrical Interface	RS232
Format	HEX
Accuracy	± 0.25% to ± 0.10% full stroke
Repeatability	± 0.02% full stroke
Resolution	± 0.003% full stroke
Measuring Cable	stainless steel or thermoplastic
Enclosure Material	powder-painted aluminum or stainless steel
Sensor	plastic-hybrid precision potentiometer
Potentiometer Cycle Life	see ordering information
Maximum Retraction Acceleration	see ordering information
Weight, Aluminum (Stainless Steel) Enclosure	3 lbs. (6 lbs.), max.

ELECTRICAL

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

ENVIRONMENTAL

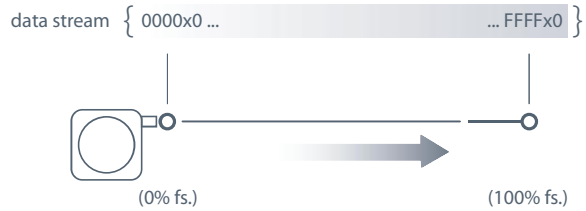
Environmental Suitability	NEMA 4X/6, IP 67
Operating Temperature	-40° to 200°F (-40° to 90°C)
Vibration	up to 10 g's to 2000 Hz maximum



The PT8232 delivers position feedback via RS232 serial communication to your data acquisition or controller system. The PT8232 sends a raw 16-bit count from 0000H to FFFFH. 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.

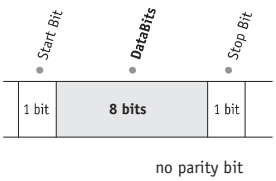
Output Signal:



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:

Data Format



no parity bit

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.

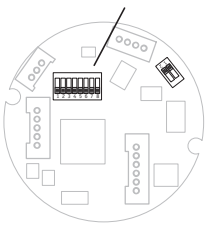
Example: 08054 = August 5, 2004

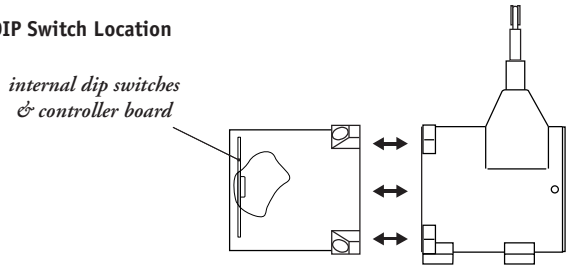
Baud Rate

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

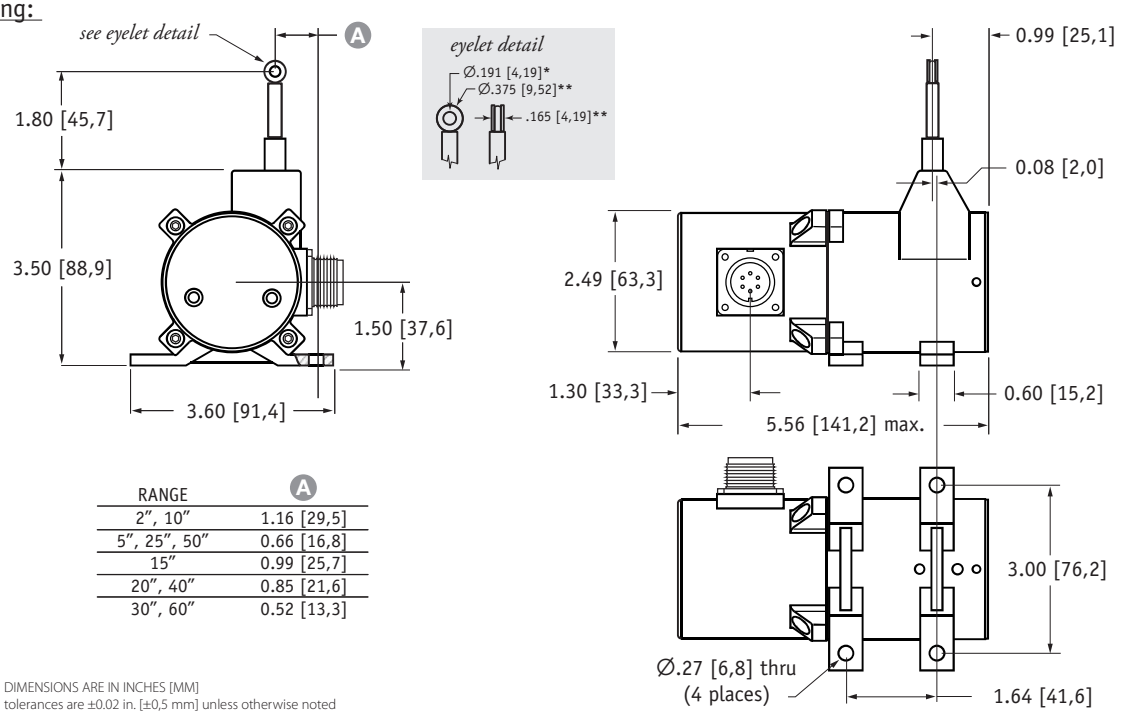
RS232 Controller Board and DIP Switch Location





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

Outline Drawing:



RANGE	A
2", 10"	1.16 [29,5]
5", 25", 50"	0.66 [16,8]
15"	0.99 [25,7]
20", 40"	0.85 [21,6]
30", 60"	0.52 [13,3]

DIMENSIONS ARE IN INCHES [MM]
tolerances are ±0.02 in. [±0,5 mm] unless otherwise noted

note: *tolerance = +.005 –.001 [+.13 –.03] **tolerance = +.005 –.005 [+.13 –.13]

Ordering Information:

Model Number:

PT8232 - ____ - ___ - ___ - ___ - ___ - ___ - ___
order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Sample Model Number:
PT8232 - 50 - AL - N34 - T1 - CG - M6

Ⓡ	range:	200 inches
Ⓐ	enclosure	aluminum
Ⓑ	measuring cable:	.034 nylon-coated stainless
Ⓒ	measuring cable tension:	standard
Ⓓ	cable guide:	standard
Ⓔ	electrical connection:	6-pin plastic connector

Full Stroke Range:

Ⓡ order code:	2	5	10	15	20	25	30	40	50	60
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50	60
accuracy (% of f.s.):	0.25%	0.25%	0.15%	0.15%	0.15%	0.15%	0.15%	0.10%	0.10%	0.10%
potentiometer cycle life*:	2.5×10^6	2.5×10^6	5×10^5	5×10^5	5×10^5	5×10^5	5×10^5	2.5×10^5	2.5×10^5	2.5×10^5

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

Enclosure Material:

Ⓐ order code:	AL	SS	316
	powder-painted aluminum	303 stainless steel	316 stainless steel

Measuring Cable:

Ⓑ order code:	N34	S47	V62
	Ø.034-inch nylon-coated stainless steel *available in all ranges*	Ø.047-inch stainless steel *5, 15, 20, 25, 30-inch ranges only*	Ø.062-inch thermoplastic *all ranges up to 30 inches only*

Ordering Information (cont.):

Measurina Cable Tension:

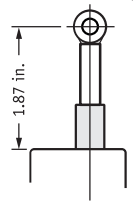
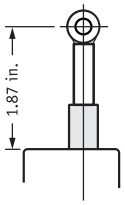
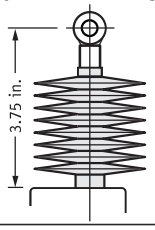
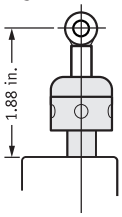
C order code:	T1	T2	T3
	standard tension	medium tension	high tension
full stroke range cable tension specifications — 2, 10-inch:	39 oz.	65 oz.	116 oz.
15-inch:	26 oz.	43 oz.	77 oz.
20, 40-inch:	20 oz.	33 oz.	60 oz.
5, 25, 50-inch:	16 oz.	26 oz.	47 oz.
30, 60-inch:	13 oz.	22 oz.	40 oz.

tension tolerance: ± 50%

	maximum acceleration	*maximum acceleration*	*maximum acceleration*
aluminum enclosure:	15 g	25 g	40 g
stainless steel enclosure:	6 g	12 g	18 g

Cable Guide Options:

D order code:

CG	SS	CB*	BR
standard cable guide	stainless steel cable guide	polyurethane cable guide	integral cable brush
			

*note: all ranges up to 25 inches only

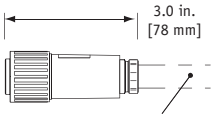
Electrical Connection:

E order code:

M6

6-pin plastic connector with mating plug

IP 67, NEMA 6, NEMA 4X (stainless enclosure only)



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

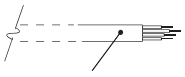
contact view

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: **6.0** last updated: **November 5, 2012**

CANbus • SAE J1939
Ranges: 0-2 to 0-60 inches
Industrial Grade

PT8CN

The PT8CN, using a high cycle plastic-hybrid potentiometer, communicates to your PLC via the CANbus SAE J1939 interface. Suitable for factory and harsh environment applications requiring linear position feedback in ranges up to 60".

As a member of Celesco's innovative family of NEMA 4 rated cable-extension transducers, the PT8CN 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.

Specification Summary:

GENERAL

Full Stroke Ranges	0-2 to 0-60 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, nylon-coated or thermoplastic
Enclosure Material	powder-painted aluminum or stainless steel
Sensor	plastic-hybrid precision potentiometer
Potentiometer Cycle Life	*see ordering information*
Maximum Retraction Acceleration	*see ordering information*
Weight, Aluminum (Stainless Steel) Enclosure	3 lbs. (6 lbs.), max.

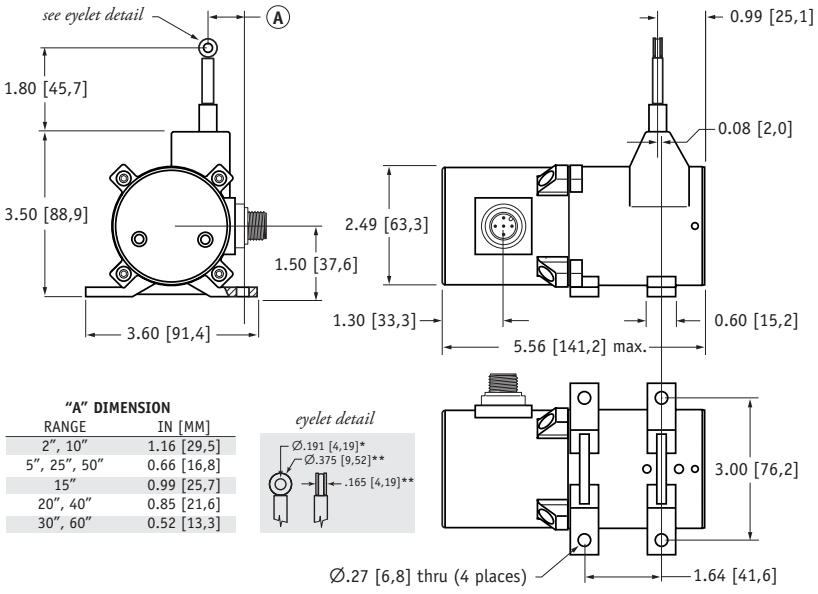
ELECTRICAL

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

Outline Drawing



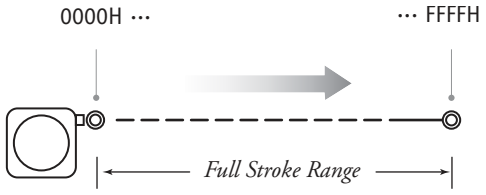
"A" DIMENSION

RANGE	IN [MM]
2", 10"	1.16 [29,5]
5", 25", 50"	0.66 [16,8]
15"	0.99 [25,7]
20", 40"	0.85 [21,6]
30", 60"	0.52 [13,3]

DIMENSIONS ARE IN INCHES [MM]
tolerances are ±0.02 in. [±0,5 mm] unless otherwise noted

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

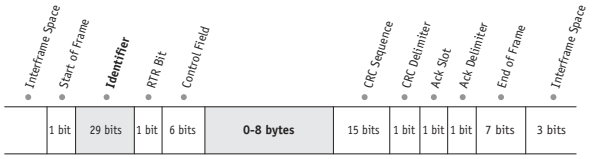
Output Signal



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

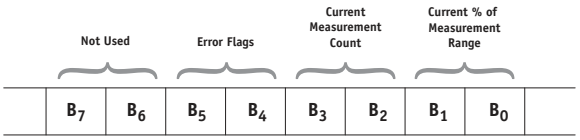
I/O Format

Data Frame



repetition = 8 msec.

Data Field



B_0 = LSB current % of measurement range byte
B_1 = MSB current % of measurement range byte
B_4 - B_5 = error flags
B_2 = LSB current measurement count byte
B_3 = MSB current measurement count byte
B_6 - B_7 = not used

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.

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.

address setting:

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 setting:

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

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%

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_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 **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.

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.

Converting CMC to Inches

If required, the CMC can easily be converted 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:

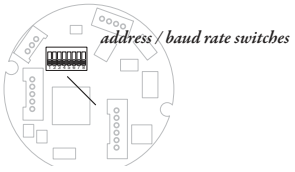
$$\left(\frac{\text{CMC}}{65{,}535}\right) \text{ X FSR}$$

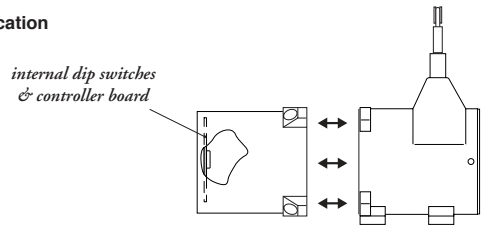
Example:

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

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

CANBus Controller Board and DIP Switch Location





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

Ordering Information:

Model Number:

PT8CN - ____ - ___ - ___ - ___ - ___ - J - ___ - ___ - ___ - ___
order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ Ⓗ

Sample Model Number:

PT8CN - 50 - AL - N34 - T1 - CG - J - 500 - 32 - SC

Ⓡ	range:	50 inches
Ⓐ	enclosure	aluminum
Ⓑ	measuring cable:	.034 nylon-coated stainless
Ⓒ	measuring cable tension:	standard
Ⓓ	cable guide:	standard
Ⓔ	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:	2	5	10	15	20	25	30	40	50	60
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50	60
accuracy (% of f.s.):	0.25%	0.25%	0.15%	0.15%	0.15%	0.15%	0.15%	0.10%	0.10%	0.10%
potentiometer cycle life*:	2.5×10^6	2.5×10^6	5×10^5	5×10^5	5×10^5	5×10^5	5×10^5	2.5×10^5	2.5×10^5	2.5×10^5

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

Enclosure Material:

Ⓐ order code:	AL	SS	316
	powder-painted aluminum	303 stainless steel	316 stainless steel

Measuring Cable:

Ⓑ order code:	N34	S47	V62
	Ø.034-inch nylon-coated stainless steel *available in all ranges*	Ø.047-inch stainless steel *5, 15, 20, 25, 30-inch ranges only*	Ø.062-inch thermoplastic *all ranges up to 30 inches only*

Measuring Cable Tension:

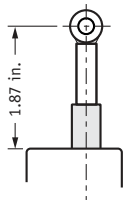
Ⓒ order code:	T1	T2	T3
	standard tension	medium tension	high tension
full stroke range cable tension specifications 2, 10-inch:	39 oz.	65 oz.	116 oz.
15-inch:	26 oz.	43 oz.	77 oz.
20, 40-inch:	20 oz.	33 oz.	60 oz.
5, 25, 50-inch:	16 oz.	26 oz.	47 oz.
30, 60-inch:	13 oz.	22 oz.	40 oz.

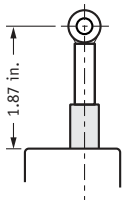
tension tolerance: ± 30%

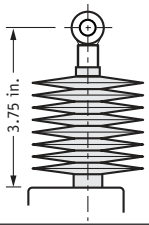
	maximum acceleration	*maximum acceleration*	*maximum acceleration*
aluminum enclosure:	15 G	25 G	40 G
stainless steel enclosure:	6 G	12 G	18 G

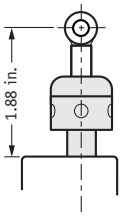
Cable Guide:

Ⓓ order code:	CG	SS	CB*	BR
	standard cable guide	stainless steel cable guide	polyurethane cable guide	integral cable brush









**note: all ranges up to 25 inches only*

Ordering Information (cont.)

Baud Rate:

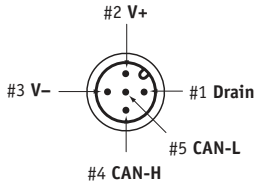
order code:	125	250	500
	125 kbaud	250 kbaud	500 kbaud

Node ID:

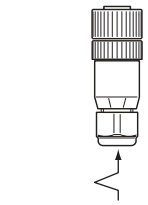
order code:	0	1	2	...	62	63
	select address (0 - 63 Decimal)					

Electrical Connection:

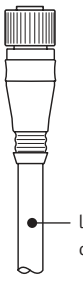
order code:	blank	MC5	SC5	NC5
	5-pin micro-connector *(no mating plug supplied)*	5-pin micro-connector w/ mating plug	5-pin micro-connector and 5 meter length cordset w/straight mating plug	5-pin micro-connector and 5 meter length cordset w/90° mating plug



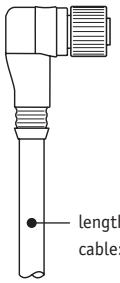
connector
(contact view)



0.16" - 0.32" OD Cable (THIN)

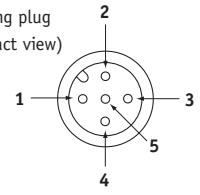


length: 16ft [5M]
cable: Thin



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

DeviceNET®
Ranges: 0-2 to 0-60 inches
Industrial Grade

PT8DN

Specification Summary:

GENERAL

Full Stroke Ranges ..... 0-2 to 0-60 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, nylon-coated or thermoplastic
Enclosure Material ..... powder-painted aluminum or stainless steel
Sensor ..... plastic-hybrid precision potentiometer
Potentiometer Cycle Life ..... *see ordering information*
Maximum Retraction Acceleration ..... *see ordering information*
Weight, Aluminum (Stainless Steel) Enclosure ..... 3 lbs. (6 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

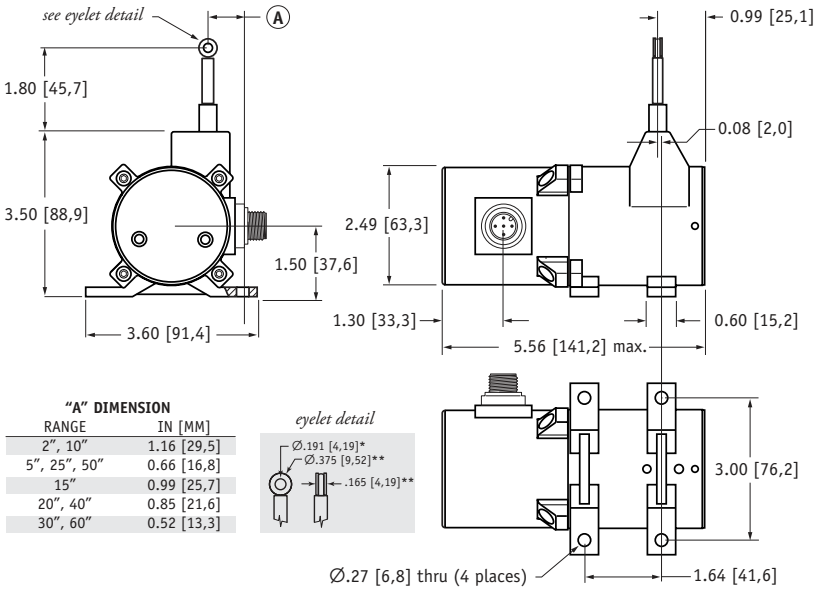
ENVIRONMENTAL

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

The PT8DN, 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 60".

As a member of Celesco's innovative family of NEMA 4 rated cable-extension transducers, the PT8DN 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



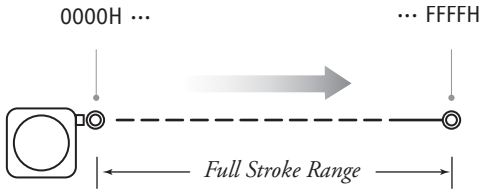
"A" DIMENSION

RANGE	IN [MM]
2", 10"	1.16 [29,5]
5", 25", 50"	0.66 [16,8]
15"	0.99 [25,7]
20", 40"	0.85 [21,6]
30", 60"	0.52 [13,3]

DIMENSIONS ARE IN INCHES [MM]
tolerances are ±0.02 in. [±0,5 mm] unless otherwise noted

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

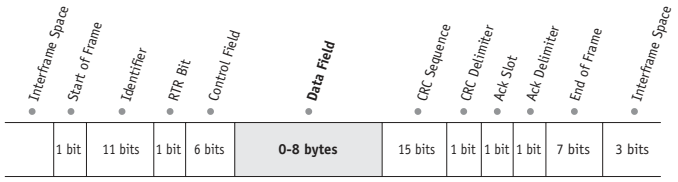
Output Signal



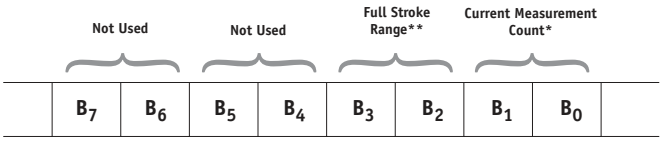
Celesco Transducer Products, Inc.
20630 Plummer Street • Chatsworth, CA 91311
tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799
celesco.com • info@celesco.com

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 **0FF2 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.

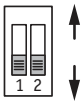
The baud rate can be set using switches **7** & **8** on the 8-pole DIP switch found on the DeviceNET controller board located inside the transducer.

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

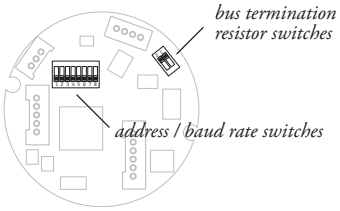
Bus Termination

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.

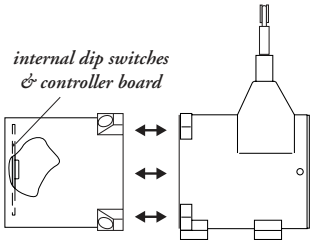
The bus termination resistor is activated setting switches **1** & **2** on the 2-pole DIP switch (located on the internal DeviceNET controller board) to the "ON" position.



DeviceNET Controller Board and DIP Switch Location



to gain access to the controller board, remove four Allen-Head Screws and remove rear cover



Ordering Information:

Model Number:

PT8DN - ____ Ⓡ - ____ Ⓐ - ____ Ⓑ - ____ Ⓒ - ____ Ⓓ - ____ Ⓔ - ____ Ⓕ - ____ Ⓖ
order code:

Sample Model Number:

PT8DN - 50 - AL - N34 - T1 - CG - 500 - TR - SC

Ⓡ	range:	50 inches
Ⓐ	enclosure	aluminum
Ⓑ	measuring cable:	.034 nylon-coated stainless
Ⓒ	measuring cable tension:	standard
Ⓓ	cable guide:	standard
Ⓔ	baud rate:	500 k bits/sec.
Ⓕ	terminating resistor:	yes
Ⓖ	electrical connection:	5-meter cordset with straight plug

Full Stroke Range:

Ⓡ *order code:*	2	5	10	15	20	25	30	40	50	60
full stroke range, min:	2 in.	5 in.	10 in.	15 in.	20 in.	25 in.	30 in.	40 in.	50	60
accuracy (% of f.s.):	0.25%	0.25%	0.15%	0.15%	0.15%	0.15%	0.15%	0.10%	0.10%	0.10%
potentiometer cycle life*:	2.5×10^6	2.5×10^6	5×10^5	5×10^5	5×10^5	5×10^5	5×10^5	2.5×10^5	2.5×10^5	2.5×10^5

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

Enclosure Material:

Ⓐ *order code:*	AL	SS	316
	powder-painted aluminum	303 stainless steel	316 stainless steel

Measuring Cable:

Ⓑ *order code:*	N34	S47	V62
	Ø.034-inch nylon-coated stainless steel *available in all ranges*	Ø.047-inch stainless steel *5, 15, 20, 25, 30-inch ranges only*	Ø.062-inch thermoplastic *all ranges up to 30 inches only*

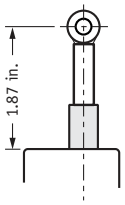
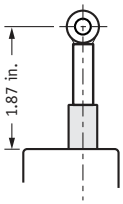
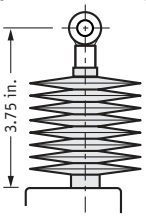
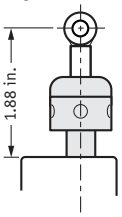
Measuring Cable Tension:

Ⓒ *order code:*	T1	T2	T3
	standard tension	medium tension	high tension
full stroke range cable tension specifications — 2, 10-inch:	39 oz.	65 oz.	116 oz.
15-inch:	26 oz.	43 oz.	77 oz.
20, 40-inch:	20 oz.	33 oz.	60 oz.
5, 25, 50-inch:	16 oz.	26 oz.	47 oz.
30, 60-inch:	13 oz.	22 oz.	40 oz.

tension tolerance: ± 30%

	maximum acceleration	*maximum acceleration*	*maximum acceleration*
aluminum enclosure:	15 G	25 G	40 G
stainless steel enclosure:	6 G	12 G	18 G

Cable Guide:

Ⓓ *order code:*	CG	SS	CB*	BR
	standard cable guide	stainless steel cable guide	polyurethane cable guide	integral cable brush
				

**note: all ranges up to 25 inches only*

Ordering Information (cont.)

Baud Rate:

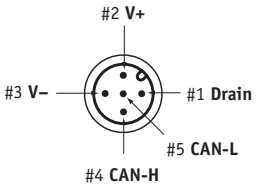
order code:	125	250	500
	125 kbaud	250 kbaud	500 kbaud

Terminating Resistor:

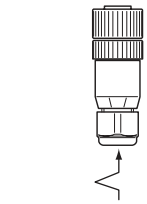
order code:	TR	NR
	terminating resistor	no terminating resistor

Electrical Connection:

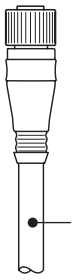
order code:	blank	MC5	SC5	NC5
	5-pin micro-connector *(no mating plug supplied)*	5-pin micro-connector w/ mating plug	5-pin micro-connector and 5 meter length cordset w/straight mating plug	5-pin micro-connector and 5 meter length cordset w/90° mating plug



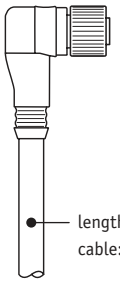
connector
(contact view)



0.16" - 0.32" OD Cable (THIN)

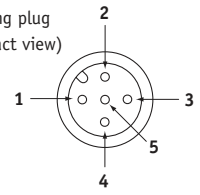


length: 16ft [5M]
cable: Thin



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

Mates To Virtually Any Encoder
Ranges: 0-25 to 0-50 inches
Available With or Without Encoder

PT8600

Specification Summary:

GENERAL

Full Stroke Range Options ..... 0-25, 0-50 in. and 0-625, 0-1250 mm
Motion Conversion Ratio:
English Ranges ..... 5 inches per turn, *see ordering information*
Metric Ranges ..... 125 mm per turn, *see ordering information*
Accuracy ..... ±0.04% full stroke, *contact factory for better accuracy*
Measuring Cable Options ..... *see ordering information*
Module Material ..... powder-painted aluminum
Maximum Allowable Rotational Sensor Torque ..... 1.0 in-lbs.
Weight ..... 3 lbs. max.

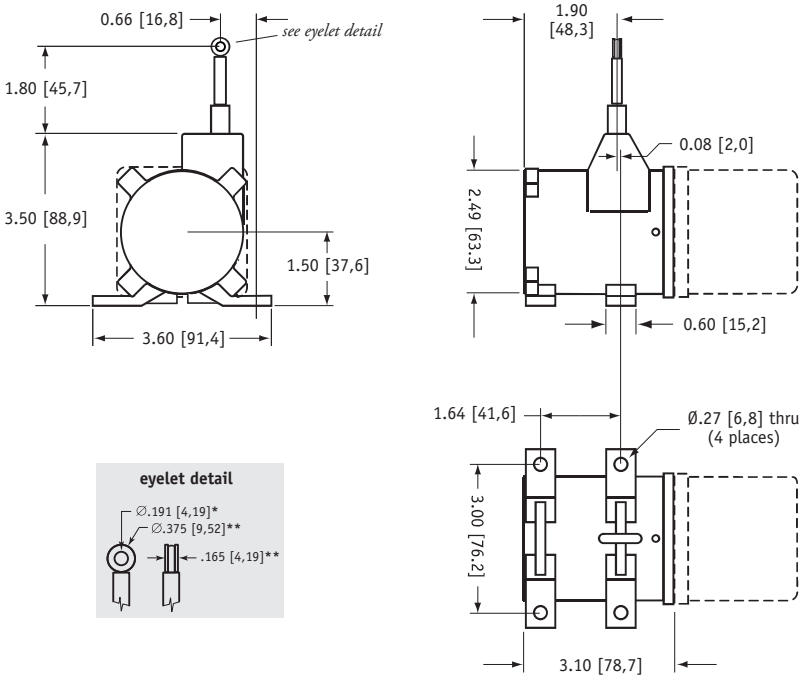
ENVIRONMENTAL

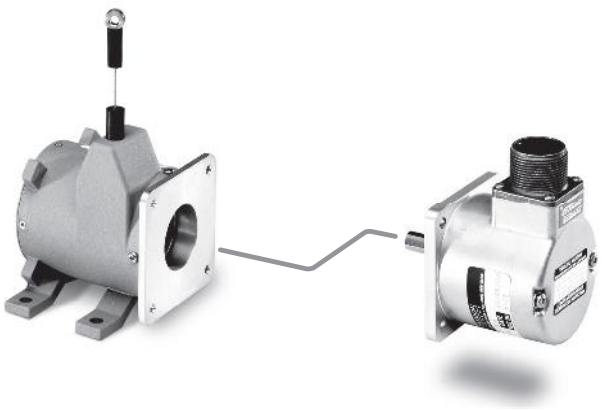
Operating Temperature ..... -40º to 200ºF (-40º to 90ºC)

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 PT8600 takes just minutes to install, fits easily into tight areas and does not require perfectly parallel alignment. To order, simply select the stroke range, the cable tension and the mounting style that matches your encoder.

If you want us to provide the encoder or you don't see the mounting style you need, please give us a call.

Outline Drawing





DIMENSIONS ARE IN INCHES [MM]
tolerances are ±0.02 in. [±0,5 mm] unless otherwise noted

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

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:

PT8600 - _____ - ___ ___ 1 - ___ - _____
order code: Ⓡ Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Sample Model Number:

PT8600 - 0025 - 111 - BR - F01

Ⓡ	range:	25 inches
Ⓐ	measuring cable tension:	standard (12 oz.)
Ⓑ	measuring cable:	.034 nylon-coated stainless
Ⓓ	cable guide option:	cable brush
Ⓔ	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:	0025	0050	0625	1250
full stroke range, min:	25 in.	50 in.	625 mm	1250 mm

Measuring Cable Tension:

Ⓐ order code:	1	2
cable tension (±30%)	standard tension	high tension
25, 50-inch ranges:	17 oz. [5 G max. acceleration]	50 oz. [15 G max. acceleration]
625, 1250-mm ranges:	4,2 N [8 G max. acceleration]	13,9 N [30 G max. acceleration]

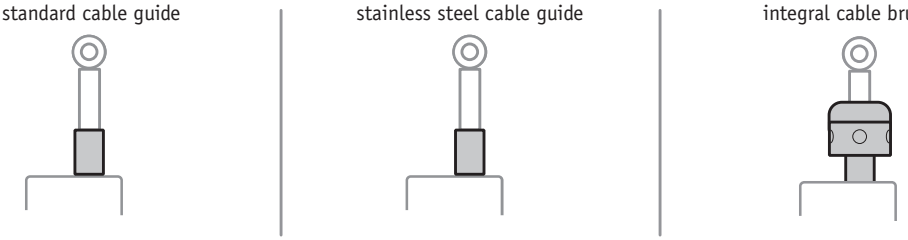
Measuring Cable:

Ⓑ order code:	1	2*
measuring cable:	.034 nylon-coated stainless steel	.047 stainless steel
conversion ratio { **english** ranges:	1 turn = 5.000 ± 0.0094 in.	1 turn = 5.034 ± 0.0094 in.
conversion ratio { **metric** ranges:	1 turn = 125,001 ± 0,2394 mm	1 turn = 125,879 ± 0,2394 mm

****25-inch and 625-mm** ranges only*

Cable Guide Options:

Ⓓ order code:	blank	SS	BR
	standard cable guide	stainless steel cable guide	integral cable brush

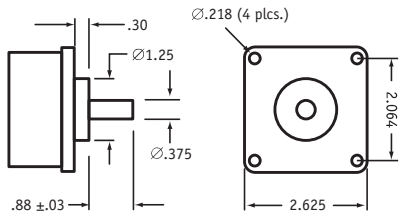


Rotational Sensor Mounting Style:

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

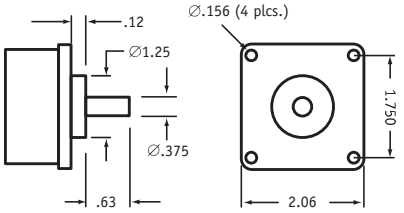
Note: If you don't see your encoder style, please contact factory. All encoder types supported.

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



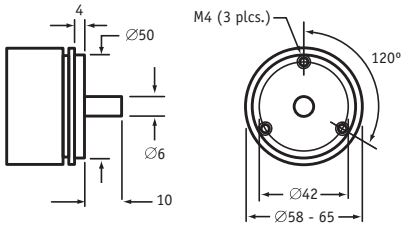
all dimensions are in ***inches***

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



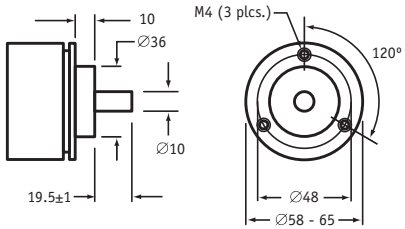
all dimensions are in ***inches***

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



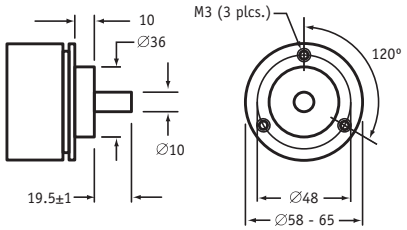
all dimensions are in ***mm***

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



all dimensions are in ***mm***

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



all dimensions are in ***mm***