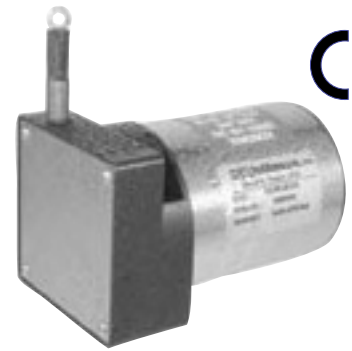


# HX-P510 SERIES

## 0 to 5 VDC or 0 to 10 VDC OUTPUT



The HX-P510 position transducer provides a 0 to 5 or 0 to 10 VDC output utilizing a potentiometric sensor. Pins B and C of the connector are both COMMON and are connected together internally at the transducer enabling a three or four wire connection. With adjustable zero and span, zero position may be set within the first 30% of the total measurement range. The span allows maximum output voltage to be adjusted to 5 VDC or 10 VDC for displacements between 80% and 100% of total range. The HX-P510 may be powered by an unregulated supply voltage in the range of 4.9 to 30 VDC.



### SPECIFICATIONS

#### General

Available Measurement Ranges..... See Supplemental Data<sup>1</sup>, Table 12  
 Sensing Device..... Precision Potentiometer  
 Connector..... MS3102E-14S-6P  
 Mating Connector (included) ..... MS3106E-14S-6S

#### Performance

Linearity  
 2", 3", 4", 5" & 6" Ranges ..... ±0.30% Full Scale  
 10", 15", 20" & 25" Ranges..... ±0.20% Full Scale  
 All other ranges ..... ±0.15% Full Scale  
 Repeatability ..... ±0.015% Full Scale  
 Resolution ..... Essentially Infinite

#### Electrical

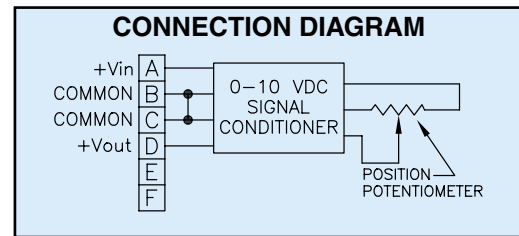
Output..... 0 to 5 VDC adjustable to 10 VDC  
 Excitation Voltage ..... 4.9 to 30 VDC  
 Excitation Current..... 25 mA max.  
 Output Impedance..... 10Ω max.  
 Output Load..... 5KΩ min.  
 Insulation Resistance ..... 100 megohms min. at 100 VDC  
 Zero Adjustment Range ..... 0 to 30% of Range  
 Span Adjustment Range ..... 80% to 100% of Range  
 Protection ..... Reversed Polarity

#### Environmental

Operating temperature ..... -40°C to +85°C  
 Storage Temperature ..... -55° to +100°C  
 Operating humidity ..... 100%  
 Vibration ..... 15 G's 0.1 ms max.  
 Shock..... 50 G's 0.1 ms max.  
 Ingress Protection  
 Exclusive of Wire Rope Area..... NEMA 4 (IP-65)  
 Optional Ingress Protection ..... NEMA 6 (IP-68)

#### FOOTNOTES TO SPECIFICATIONS

1. Supplemental Data section located at end of HX Series pages.



## Model Number Configuration

**Range**  
 Select measurement range from Supplemental Data, Table 12, Insert corresponding Measurement Range Designator

**Wire Rope**  
 \*.....Stainless Steel (See Supplemental Data, Table 12)  
**NJC** .....Ø.018 (0,45 mm) Nylon Jacketed Stainless Steel Ranges to 80" (2m) only.  
**NJC037** .....Ø.037 (0,94 mm) Nylon Jacketed Stainless Steel Ranges 100" (2.5m) to 500" (12.7m) only.

**Wire Rope Tension**  
 \*..... Standard  
**004**..... Reduced (Ranges to 80" only)

**Wire Rope Exit Direction**  
 \*..... Top Exit  
**E1** ..... Side Exit (Left)  
**E2** ..... Side Exit (Right)  
**E3** ..... Bottom Exit

**Wire Rope Exit Direction**  
 \*..... Standard  
**E1** ..... Side Exit (Left)  
**E2** ..... Side Exit (Right)  
**E3** ..... Bottom Exit

**Housing**  
 \*..... NEMA 4 (IP-65) Aluminum  
**N6** ..... NEMA 6 (IP-68) Aluminum  
**SS**..... NEMA 6 (IP-68) Corrosion Resistant Stainless Steel and Non-Metallic Construction



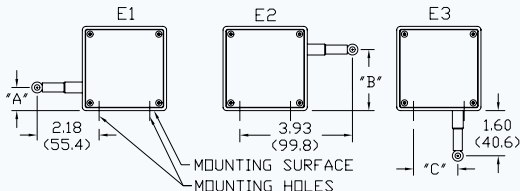
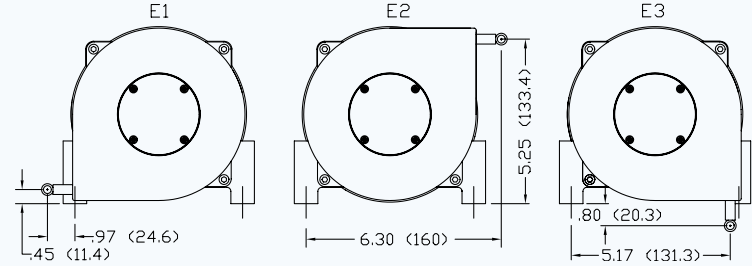
**Electrical Interface**  
 \*..... Mating Connector Included (See note 1 below)  
**L3M** .....3 m (10') electrical cable (See note 2 below)  
**L4M** .....4 m (13.5') electrical cable (See note 2 below)  
**L5M** .....5 m (16.5') electrical cable (See note 2 below)  
**L6M** .....6 m (20') electrical cable (See note 2 below)  
**L7M** .....7 m (23') electrical cable (See note 2 below)  
 1. Applies to NEMA 4 Housing option only. Does not apply to N6 or SS Housing options.  
 2. Select one of options L3M through L7M when electrical cable is required with mating connector when Housing option NEMA 4 is also selected. Select one of options L3M through L7M when Housing option N6 or SS is selected. Connector is **not** available with Housing option N6 or SS.

**Electrical Output Polarity**  
 \*..... Standard (increasing output as wire rope is extended)  
**R**..... Reversed (decreasing output as wire rope is extended)

**NOTE**  
 1) \*—Asterisk items are standard configuration. No option designator is required.  
 2) Shaded options available at additional cost.  
 3) See Supplemental Data for options.

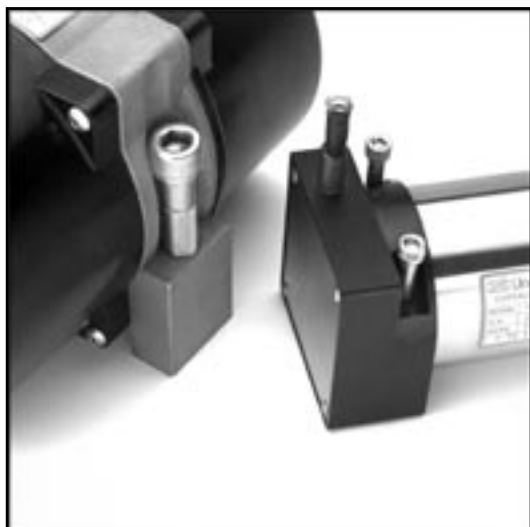
**Example**  
**HX-P510-50-NJC-N6**

### ADDITIONAL OPTIONS

OPTION	OPTION DESIGNATOR	DESCRIPTION																												
Nylon jacketed wire rope (Ranges to 80" only)	<b>NJC</b>	Replaces standard stainless steel wire rope with Ø.018 nylon jacketed wire rope. This option increases wire rope life dramatically but may increase non-linearity by as much as ±.05% of full scale.																												
Nylon jacketed wire rope (Ranges 100" to 500" only)	<b>NJC037</b>	Replaces standard stainless steel wire rope with Ø.037 nylon jacketed wire rope.																												
Reversed output	<b>R</b>	Output is at a maximum when wire rope is fully retracted. Output decreases as wire rope is extended. Does not apply to velocity signal.																												
NEMA 6, IP-68 capability	<b>N6</b>	 Connector is replaced with a bulkhead fitting and a designated length of urethane jacketed, shielded, twisted pair cable. Retraction mechanism and electrical components are sealed to NEMA 6, IP-68 capability. No connector.																												
Corrosion Resistant Construction	<b>SS</b>	All external anodized aluminum parts of transducer are replaced with stainless steel and corrosion resistant plastic. Transducer is sealed to NEMA 6, IP-68 capability. Urethane jacketed, shielded, twisted pair cable exits unit. No connector. 																												
Non-standard potentiometer (Applies to HX-PA only)	<b>PXK</b>	Replace "X" in option designator with required potentiometer value in K ohms. Non-standard potentiometer linearity is as follows: Ranges 0 to 2" to 0 to 5" ..... ±1.00% of full scale Ranges 0 to 10" to 0 to 25" ..... ±0.50% of full scale Ranges 30" and above ..... ±0.25% of full scale Note: This option is subject to potentiometer availability.																												
Alternate wire rope exit Measurement ranges to 80" (2.0 m)	<b>E1, E2, E3</b>	 <table border="1" data-bbox="649 1386 1166 1612"> <thead> <tr> <th>RANGE</th> <th>"A"</th> <th>"B"</th> <th>"C"</th> </tr> </thead> <tbody> <tr> <td>2", 10"</td> <td>1.12 (28.4)</td> <td>1.79 (45.5)</td> <td>1.21 (30.7)</td> </tr> <tr> <td>3", 15", 30"</td> <td>.96(24.4)</td> <td>1.95 (49.5)</td> <td>1.37 (34.8)</td> </tr> <tr> <td>4", 20", 40"</td> <td>.80 (20.3)</td> <td>2.11 (53.6)</td> <td>1.53 (38.9)</td> </tr> <tr> <td>5", 25", 50"</td> <td>.64 (16.3)</td> <td>2.27 (57.7)</td> <td>1.69 (42.9)</td> </tr> <tr> <td>6", 60"</td> <td>.49 (12.4)</td> <td>2.42 (61.5)</td> <td>1.84 (46.7)</td> </tr> <tr> <td>80"</td> <td>.25 (6.4)</td> <td>2.66 (67.6)</td> <td>2.08 (52.8)</td> </tr> </tbody> </table> <p style="text-align: right;">Dimensions in brackets are millimeters.</p>	RANGE	"A"	"B"	"C"	2", 10"	1.12 (28.4)	1.79 (45.5)	1.21 (30.7)	3", 15", 30"	.96(24.4)	1.95 (49.5)	1.37 (34.8)	4", 20", 40"	.80 (20.3)	2.11 (53.6)	1.53 (38.9)	5", 25", 50"	.64 (16.3)	2.27 (57.7)	1.69 (42.9)	6", 60"	.49 (12.4)	2.42 (61.5)	1.84 (46.7)	80"	.25 (6.4)	2.66 (67.6)	2.08 (52.8)
RANGE	"A"	"B"	"C"																											
2", 10"	1.12 (28.4)	1.79 (45.5)	1.21 (30.7)																											
3", 15", 30"	.96(24.4)	1.95 (49.5)	1.37 (34.8)																											
4", 20", 40"	.80 (20.3)	2.11 (53.6)	1.53 (38.9)																											
5", 25", 50"	.64 (16.3)	2.27 (57.7)	1.69 (42.9)																											
6", 60"	.49 (12.4)	2.42 (61.5)	1.84 (46.7)																											
80"	.25 (6.4)	2.66 (67.6)	2.08 (52.8)																											
Alternate wire rope exit Measurement ranges 100" (2.5 m) and greater.	<b>E1, E2, E3</b>	 <p style="text-align: center;">Dimensions in brackets are millimeters.</p>																												

Specifications subject to change without notice.

# HX SERIES SUPPLEMENTAL DATA



Typical HX mounting bolts.

## MECHANICAL SPECIFICATIONS

### Mechanical Specifications

Available Measurement Ranges.....	See Table 12
Construction	
Ranges 80" (2 m) and under.....	Anodized Aluminum Mounting Base, Stainless Steel & Anodized Aluminum Housing
Ranges 100" (2.5 m) and greater .....	Stainless Steel Mounting Base High Impact, Corrosion Resistant Thermoplastic Housings
Wire Rope Tension .....	See Table 12
Wire Rope Diameter.....	See Table 12
Weight .....	See Table 12
Connector.....	MS3102A-14S-6P
Mating Connector (included).....	MS3106E-14S-6S
Optional NEMA 6 Capability.....	Bulkhead fitting with shielded, twisted pair cable
Life*	
Ranges 2" to 6" .....	5,000,000 full stroke cycles
Ranges 10" to 25" .....	500,000 full stroke cycles
Ranges 30" to 400" .....	250,000 full stroke cycles
Ranges 500" to 2000" .....	200x10 <sup>6</sup> lineal inches

\* with 1K ohm potentiometer, wire rope misalignment 2° maximum at full stroke, relatively dust free environment, nylon jacketed wire rope on units with ranges 80" and less.

Use value from this column to indicate overall measurement range

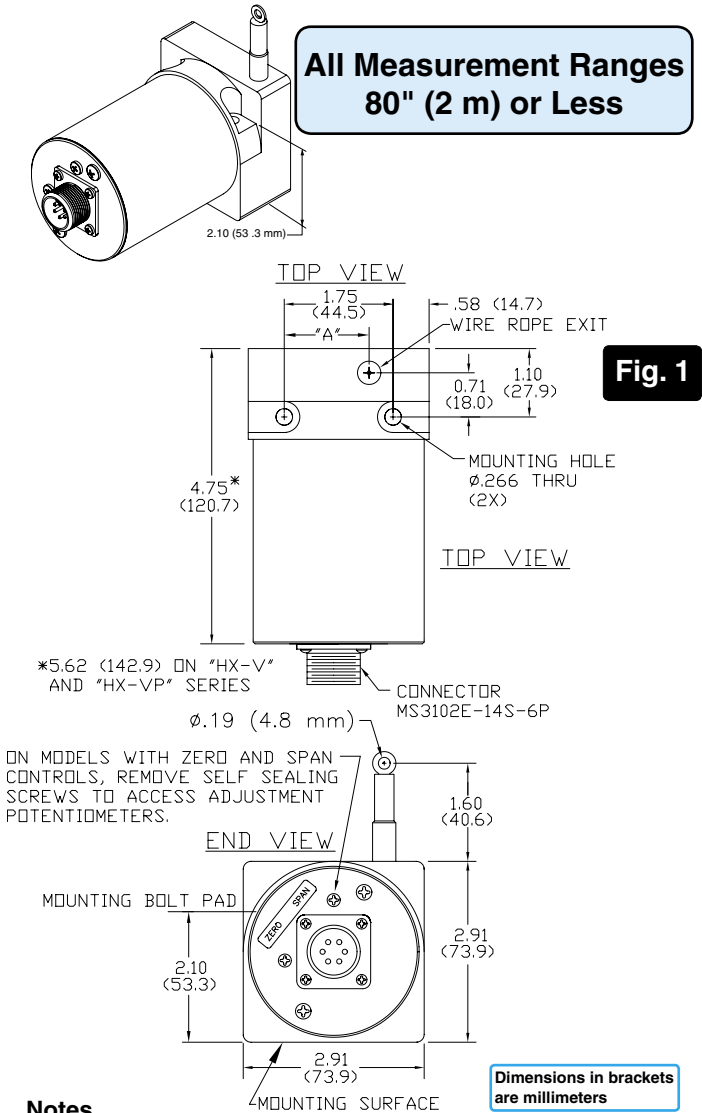
Check mark indicates available measurement range

# TABLE 12

MEASUREMENT RANGE DESIGNATOR	STANDARD MEASUREMENT RANGES		APPLICABLE SERIES			WIRE ROPE TENSION (NOMINAL)		WIRE ROPE DIAMETER		TRANSDUCER WEIGHT		Product Photo	
	(in)	(mm)	HX-PA HX-PB HX-P420 HX-P510 HX-P1010	HX-EP	HX-V HX-VP	(oz)	(N)	(in)	(mm)	(lb)	(Kg)		
2	2	50	✓	-	✓	34	9.4	.016	0.4	2	0.9		
3	3	75	✓	-	✓	24	6.7	.016	0.4	2	0.9		
4	4	100	✓	-	✓	24	6.7	.016	0.4	2	0.9		
5	5	125	✓	-	✓	19	5.3	.016	0.4	2	0.9		
6	6	150	✓	-	✓	24	6.7	.016	0.4	2	0.9		
10	10	250	✓	✓	✓	34	9.4	.016	0.4	2	0.9		
15	15	390	✓	-	✓	24	6.7	.016	0.4	2	0.9		
20	20	500	✓	-	✓	24	6.7	.016	0.4	2	0.9		
25	25	640	✓	✓	✓	19	5.3	.016	0.4	2	0.9		
30	30	750	✓	-	✓	24	6.7	.016	0.4	2	0.9		
40	40	1000	✓	-	✓	24	6.7	.016	0.4	2	0.9		
50	50	1250	✓	✓	✓	19	5.3	.016	0.4	2	0.9		
60	60	1500	✓	✓	✓	24	6.7	.016	0.4	2	0.9		
80	80	2.0m	✓	✓	✓	21	5.8	.016	0.4	2	0.9		
100	100	2.5m	✓	✓	✓	36	10.0	.024	0.6	6.8	3.1		
120	120	3.0m	✓	✓	✓	36	10.0	.024	0.6	6.8	3.1		
150	150	3.8m	✓	✓	✓	36	10.0	.024	0.6	6.8	3.1		
200	200	5.0m	✓	✓	✓	36	10.0	.024	0.6	6.8	3.1		
250	250	6.3m	✓	✓	✓	36	10.0	.024	0.6	6.8	3.1		
300	300	7.5m	✓	✓	✓	36	10.0	.024	0.6	6.8	3.1		
350	350	8.8m	✓	✓	✓	36	10.0	.024	0.6	6.8	3.1		
400	400	10.0m	✓	✓	✓	36	10.0	.024	0.6	6.8	3.1		
500	500	12.5m	✓	✓	✓	36	10.0	.024	0.6	8.6	3.9		
600	600	15.2m	✓	✓	✓	36	10.0	.024	0.6	8.6	3.9		
800	800	20.3m	✓	✓	✓	36	10.0	.024	0.6	8.6	3.9		
1000	1000	25.4m	✓	✓	-	36	10.0	.024	0.6	12.0	5.4		
1200	1200	30.4m	✓	✓	-	36	10.0	.024	0.6	12.3	5.6		
1600	1600	40.6m	✓	✓	-	36	10.0	.024	0.6	14.1	6.4		
1800	1800	45.7m	✓	✓	-	36	10.0	.021	0.6	15.9	7.2		
2000	2000	50.8m	✓	✓	-	36	10.0	.021	0.5	16.3	7.4		

Specifications subject to change without notice.

### DIMENSIONAL INFORMATION



#### Notes

1. Transducer mounts with Ø.25 or M6 socket head cap bolts.

**Table 13**

RANGE	"A"
2", 10"	1.21 (30.7)
3", 15", 30"	1.37 (34.8)
4", 20", 40"	1.53 (38.9)
5", 25", 50"	1.69 (42.9)
60"	1.84 (46.7)
80"	2.08 (52.8)

**Table 14**

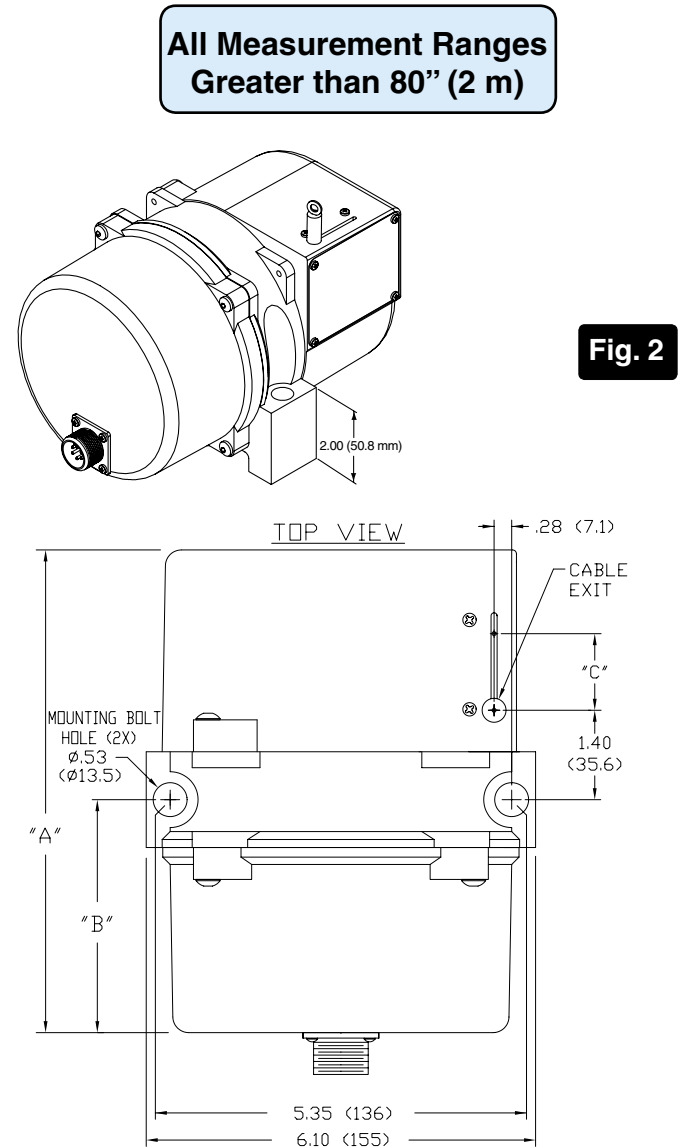
RANGE	DIM "A"	DIM "B"
Ranges to 800"	7.70 (196)	3.80 (97)
1000" to 2000"	11.0 (280)	5.60 (142)

#### Notes

1. Transducer mounts with Ø.50 or M12 socket head cap bolts.  
2. Dimension "C" is the cable offset that occurs as the cable is extended from the transducer.

For "C" in inches,  $C = .0016 \times E$  where E = extension in inches.

For "C" in millimeters,  $C = .0016 \times E$  where E = extension in mm.



ON MODELS WITH ZERO AND SPAN CONTROLS, REMOVE SELF SEALING SCREWS TO ACCESS ADJUSTMENT POTENTIOMETERS.

#### END VIEW

Dimensions in brackets are millimeters

Specifications subject to change without notice.