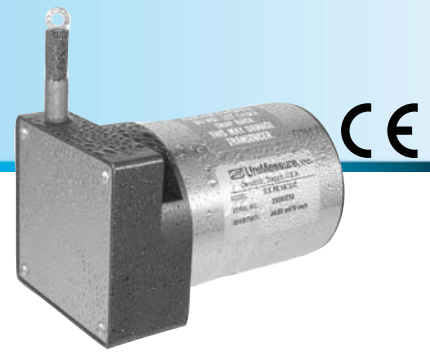


# HX-VP SERIES

## VELOCITY-POSITION OUTPUT

The UniMeasure HX-VP series combines a self-generating tachometer and a precision potentiometer to give an output of both velocity and analog position. Standard position output is ratiometric voltage. Optionally available position outputs include ratiometric voltage from a bridge circuit, 4 to 20 mA, 0 to 10 VDC, and ±10 VDC. See HX-PB, HX-P420, HX-P510 and HX-P1010 data sheets for electrical specifications.



### SPECIFICATIONS

#### General

Available Measurement Ranges..... See Supplemental Data<sup>1</sup>, Table 12  
 Connector..... MS3102A-14S-6P  
 Mating Connector (included)..... MS3106E-14S-6S

#### Performance

Positional Linearity  
 2", 3", 4" & 5" Ranges..... ±0.25% Full Scale  
 10", 15", 20" & 25" Ranges..... ±0.15% Full Scale  
 All other ranges..... ±0.10% Full Scale  
 Repeatability..... ±0.015% Full Scale  
 Positional Resolution..... Essentially Infinite

#### Electrical (Position)

Input Impedance ("A" Circuit)..... 1000Ω ±10%  
 Output Impedance ("A" Circuit)..... 0 to 1000Ω  
 Excitation Voltage (Ve)..... 25 Volts Max. AC or DC  
 Nominal Output Voltage.....  $\frac{990}{\text{Range in Inches}}$  mV/inch/Ve  
 (Use total measurement range in calculation)  
 $\frac{990}{\text{Range in mm}}$  mV/mm/Ve

#### Electrical (Velocity)

Output..... See Table 11  
 Accuracy..... Within ±0.10% of Output Voltage  
 Ripple..... 3% Max.  
 Output Impedance..... 350Ω

#### Environmental

Thermal Coeff't of potentiometer... ±100 PPM/°C max.  
 Operating temperature..... -40°C to +95°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)8

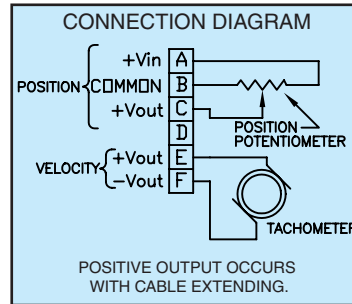


TABLE 11—VELOCITY OUTPUT

MEASUREMENT RANGE DESIGNATOR	VELOCITY OUTPUT	
	(mV per in/sec)	(mV per cm/sec)
2, 10	200	78
3, 15, 30	136	53
4, 20, 40	103	40
5, 25, 50	82	32
6, 60	69	27
80	52	20
100	180	71
ALL RANGES GREATER THAN 100*	180	71

#### FOOTNOTES TO SPECIFICATIONS

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

#### Electrical Output (Position)

A..... Voltage Divider Circuit  
 B..... Bridge Circuit  
 420.... 4 to 20 mA  
 510.... 0 to 10 VDC  
 1010.. ±10VDC

#### Range

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

#### Wire Rope

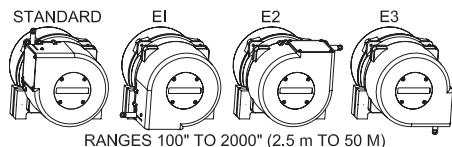
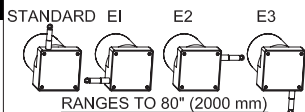
\*.....Stainless Steel (See Supplemental Data, Table 12)  
 NJC.....Ø.018 (0,45 mm) Nylon Jacketed Stainless Steel  
 Ranges to 80" (2m) only.  
 NJC037.....Ø.037 (0,94 mm) Nylon Jacketed Stainless Steel  
 Ranges 100" (2.5m) to 500" (12.7m) only.

#### Wire Rope Tension

\*..... Standard

#### Wire Rope Exit Direction

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



## Model Number Configuration

HX-VP- - - - - -

#### 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)

#### Potentiometer Value

(Applies to VPA model only)  
 \*..... 1K ohm  
 P2K..... 2K ohm  
 P5K..... 5K ohm  
 P10K..... 10K ohm  
 (VP1010 optional inputs only)  
 SI..... 4.9 to 30 VDC Single Input

#### Housing



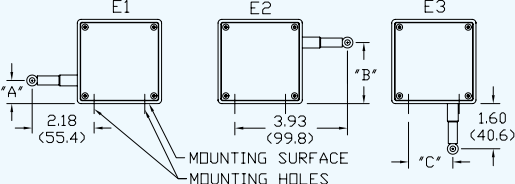
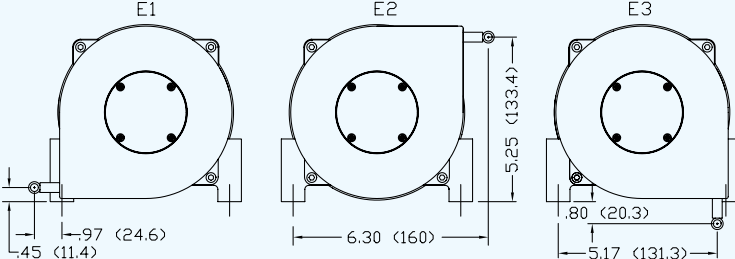
\*..... NEMA 4 (IP-65) Aluminum  
 N6..... NEMA 6 (IP-68) Aluminum  
 SS..... NEMA 6 (IP-68) Corrosion Resistant Stainless Steel and Non-Metallic Construction

#### NOTE

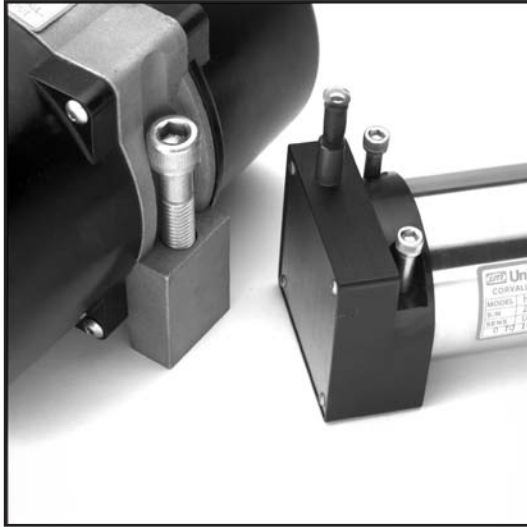
- \*—Asterisk items are standard configuration. No option designator is required.
- Shaded options available at additional cost.
- See Supplemental Data for options.

Example  
**HX-VP420-50-NJC-E1**

### ADDITIONAL OPTIONS

OPTION	OPTION DESIGNATOR	DESCRIPTION																												
Nylon jacketed wire rope (Ranges to 80" only)	<b>NJC</b>	Replaces standard stainless steel wire rope with $\varnothing.018$ nylon jacketed wire rope. This option increases wire rope life dramatically but may increase non-linearity by as much as $\pm.05\%$ of full scale.																												
Nylon jacketed wire rope (Ranges 100" to 500" only)	<b>NJC037</b>	Replaces standard stainless steel wire rope with $\varnothing.037$ 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" ..... $\pm 1.00\%$ of full scale Ranges 0 to 10" to 0 to 25" ..... $\pm 0.50\%$ of full scale Ranges 30" and above ..... $\pm 0.25\%$ 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="654 1388 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>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>Dimensions in brackets are millimeters.</p>																												

Specifications subject to change without notice.



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

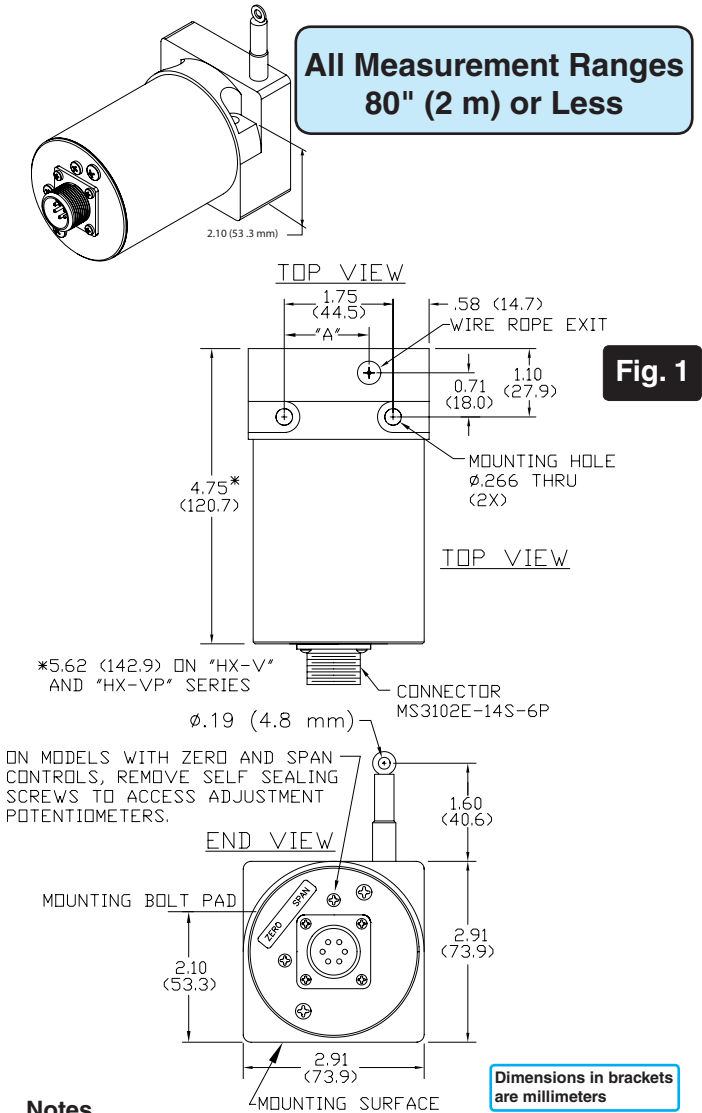
Check mark indicates available measurement range

# TABLE 12

MEASUREMENT RANGE DESIGNATOR	STANDARD MEASUREMENT RANGES (in) (mm)		APPLICABLE SERIES			WIRE ROPE TENSION (NOMINAL) (oz) (N)		WIRE ROPE DIAMETER (in) (mm)		TRANSDUCER WEIGHT (lb) (Kg)		Product Photo
			HX-PA HX-PB HX-P420 HX-P510 HX-P1010	HX-EP	HX-V HX-VP							
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**

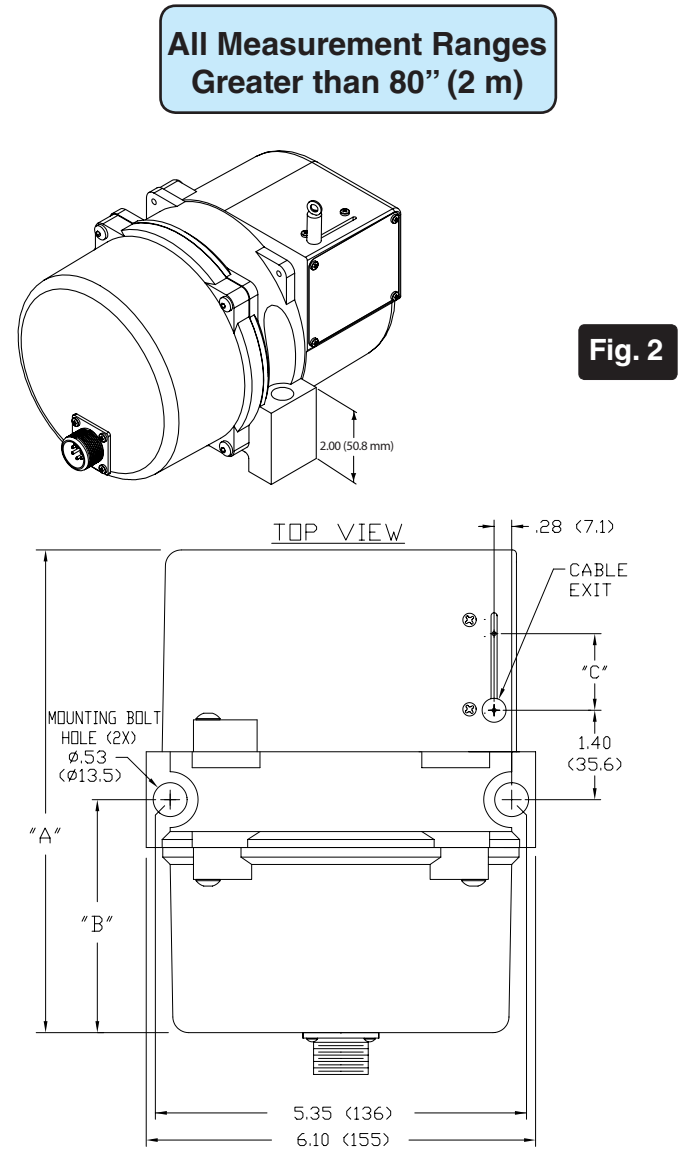
RANGE	"A"
2", 10"	1.21 (30.7)
3", 15", 30"	1.37 (34.8)
4", 20", 40"	1.53 (38.9)
5", 25", 50"	1.69 (42.9)
60"	1.84 (46.7)
80"	2.08 (52.8)

**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

- Transducer mounts with Ø.50 or M12 socket head cap bolts.
- 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.



Dimensions in brackets are millimeters

Specifications subject to change without notice.