

HX-P510 SERIES

0 to 5, 0 to 10, ±5, ±10 VDC ANALOG OUTPUT



The UniMeasure HX-P510 Series transducer offers a voltage output with wide adjustability to give a 0 to 5, 0 to 10, ±5 or ±10 VDC output. The device may be powered with an unregulated voltage in the range of 4.9 to 30 VDC. Zero and span adjustment potentiometers are readily accessible. With the zero position set anywhere within the first 30% of total travel, the span may be adjusted to give a full 0 to 5 or 0 to 10 VDC output with the span set anywhere within the last 20% of travel. Alternatively, the zero position may be set anywhere between 10% and 90% of full travel to give an output of ±5 or ±10 VDC with the span set between 50% to 100% of the longest travel from the zero position.



SPECIFICATIONS

GENERAL

Available Measurement RangesSee Supplemental Data¹, Table 12
 Sensing DevicePrecision Potentiometer
 ConnectorMS3102E-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
 ResolutionEssentially Infinite

ENVIRONMENTAL

Operating temperature-40°C to +85°C
 Storage Temperature-55° to +100°C
 Operating humidity100%
 Vibration15 G's 0.1 ms max.
 Shock50 G's 0.1 ms max.

INGRESS PROTECTION (Exclusive of Wire Rope Area)

StandardIP-65 (NEMA 4)
 OptionalIP-68 (NEMA 6)

ELECTRICAL

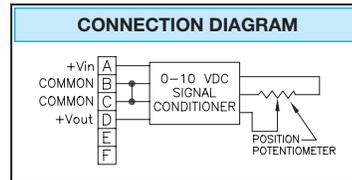
Output0 to 5 or 10 VDC, ±5 or ±10 VDC
 Excitation Voltage4.9 to 30 VDC
 Excitation Current25 mA max.
 Output Impedance10Ω max.
 Output Load5KΩ min.

ADJUSTMENT RANGE-0 to 5 or 0 to 10 VDC

Zero0 to 30% of Range
 Span80% to 100% of Range

ADJUSTMENT RANGE-±5 or ±10 VDC

Zero10% to 90% of Range
 Span50% to 100% of Longest Possible Travel from Zero Position
 ProtectionReversed Polarity
 Temperature Stability0.02%/°C of Span



FOOTNOTES TO SPECIFICATIONS

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

MODEL NUMBER CONFIGURATION

HX-P510- 0 1 2 3 4 5 6 7 8 9

BASIC CONFIGURATION (FOR ALL RANGES)

HX-P510-50-S10-N0S-1BC

0 RANGE
 Select Measurement Range From Supplemental Data Table 12^p 12 (next page), Insert Corresponding Measurement Range Designator

1 WIRE ROPE
S Stainless Steel (See Supplemental Data, Table 12)
N Ø.018 (0,45 mm) Nylon Jacketed Stainless Steel Ranges to 80" (2m) only. (formerly NJC)
J Ø.037 (0,94 mm) Nylon Jacketed Stainless Steel Ranges 100" (2.5m) to 500" (12.7m) only.

2 WIRE ROPE TENSION
1 Standard
2 Reduced (Ranges to 80" only)

3 WIRE ROPE EXIT DIRECTION
 Use Number designators shown RANGES TO 80" (2000 mm)

RANGES: 100" TO 2000" (2,5 m TO 50 M)

4 N Required Designator
5 0 Required Designator
6 ELECTRICAL OUTPUT POLARITY
S Standard (increasing output as wire rope is extended)
R Reversed (decreasing output as wire rope is extended)

NOTES FOR OPTION BOXES 7, 8, and 9

IP-65 (NEMA 4): Transducer equipped with body mounted connector and with or without mating connector. Mating connector with electrical cable available separately as part number 10119-xM where 'x' is length of electrical cable in meters.

IP-68 (NEMA 6): Transducer equipped with bulkhead fitting and length of electrical cable. Remote end of electrical cable may be outfitted with water proof connector. Mating connector with electrical cable available separately as part number 10424-xM where 'x' is length of electrical cable in meters.

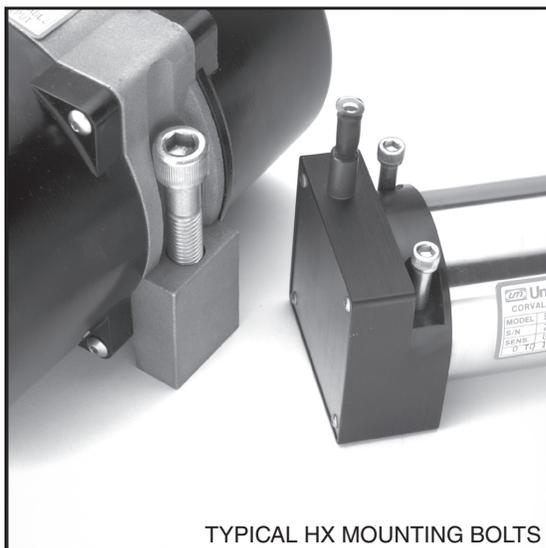
7 INGRESS PROTECTION
1 IP-65 (NEMA 4)
2 IP-68 (NEMA 6)
3 IP-68 (NEMA 6) Corrosion Resistant Construction

8 IP-65-NEMA 4 CONNECTOR
B 6 Pin 3102E Body Mounted Connector
IP-68-NEMA 6 ELECTRICAL CABLE
P Bulkhead Fitting w/ 0.3m (12") Electrical Cable
3 Bulkhead Fitting w/ 3m (10') Electrical Cable
4 Bulkhead Fitting w/ 4m (13.5') Electrical Cable
5 Bulkhead Fitting w/ 5m (16.5') Electrical Cable
6 Bulkhead Fitting w/ 6m (20') Electrical Cable
7 Bulkhead Fitting w/ 7m (23') Electrical Cable

9 IP-65-NEMA 4 MATING CONNECTOR
C IP-65 Mating Connector Included
K IP-65 Mating Connector Omitted*
 *Electrical cable with mating connector may be ordered separately as part number 10119-xM where 'x' is the length required in meters.

IP-68-NEMA 6 CABLE MOUNTED CONNECTOR
N No connector on end of electrical cable
K IP-68 Cable to cable connector with **NO** mating connector**
 **Electrical cable with mating connector may be ordered separately as part number 10424-xM where 'x' is the length required in meters. Mating connector alone unavailable.

MECHANICAL SPECIFICATIONS



TYPICAL HX MOUNTING BOLTS

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 MS3106E-14S-6S
- Optional NEMA 6 Capability Bulkhead fitting with shielded twisted pair cable

Life⁽¹⁾

- 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" 200x10⁶ lineal inches

NOTES:

1. 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

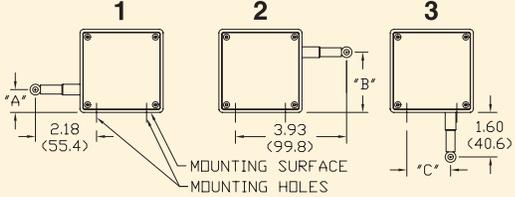
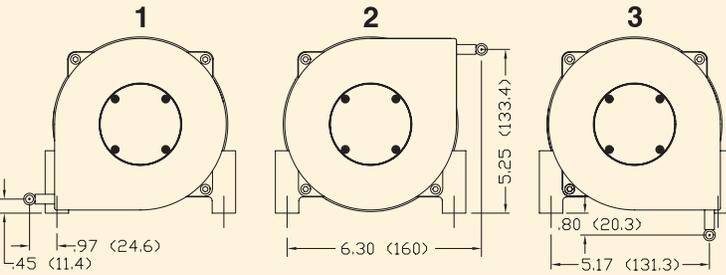
Check mark indicates available measurement range

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-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

OPTION DESCRIPTIONS

| OPTION | OPTION DESIGNATOR | DESCRIPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----------------------|--|-------------|-----------|--------------|----------------------|------------|----------------------|---------------|----------------------|--------------|-----------|-------------|-------------|--------------|------------|-------------|-------------|--------------|------------|-------------|-------------|---------|------------|-------------|-------------|-----|-----------|-------------|-------------|
| NYLON JACKETED WIRE ROPE <u>RANGES TO 80" ONLY</u> | N | 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 <u>RANGES 100" TO 500" ONLY</u> | J | Replaces standard stainless steel wire rope with Ø.037 nylon jacketed wire rope. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALTERNATE WIRE ROPE EXIT <u>RANGES TO 80" (2.0 m)</u> | 1, 2, 3 | <div style="text-align: center;">  <p>1 2 3</p> <p>2.18 (55.4) 3.93 (99.8) 1.60 (40.6)</p> <p>“A” “B” “C”</p> <p>MOUNTING SURFACE MOUNTING HOLES</p> <table border="1" data-bbox="792 747 1307 949"> <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><small>Dimensions in brackets are millimeters</small></p> </div> | 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 <u>RANGES 100" (2.5 m) and GREATER</u> | 1, 2, 3 | <div style="text-align: center;">  <p>1 2 3</p> <p>.45 (11.4) .97 (24.6) 5.25 (133.4)</p> <p>6.30 (160) .80 (20.3) 5.17 (131.3)</p> <p><small>Dimensions in brackets are millimeters</small></p> </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NON-STANDARD POTENTIOMETER <u>APPLIES TO HX-PA & HX-VPA ONLY</u> | 3, 4 | Non-standard potentiometer linearity is as follows: <table border="1" data-bbox="792 1318 1266 1453"> <thead> <tr> <th>RANGE</th> <th>LINEARITY</th> </tr> </thead> <tbody> <tr> <td>5" and Below</td> <td>±1.00% of full scale</td> </tr> <tr> <td>10" to 25"</td> <td>±0.50% of full scale</td> </tr> <tr> <td>30" and above</td> <td>±0.25% of full scale</td> </tr> </tbody> </table> <p><i>Note: This option is subject to potentiometer availability.</i></p> | RANGE | LINEARITY | 5" and Below | ±1.00% of full scale | 10" to 25" | ±0.50% of full scale | 30" and above | ±0.25% of full scale | | | | | | | | | | | | | | | | | | | | |
| RANGE | LINEARITY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5" and Below | ±1.00% of full scale | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10" to 25" | ±0.50% of full scale | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30" and above | ±0.25% of full scale | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REVERSED OUTPUT | R | Output is at a maximum when wire rope is fully retracted. Output decreases as wire rope is extended. Does not apply to velocity signal. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IP-68, (NEMA 6) CAPABILITY | 2 | <div style="display: flex; align-items: center;">  <p>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 IP-68, (NEMA 6) capability.</p> </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CORROSION RESISTANT CONSTRUCTION | 3 | All external anodized aluminum parts of transducer are replaced with stainless steel and corrosion resistant plastic. Transducer is sealed to IP-68 (NEMA 6) capability. Urethane jacketed, shielded, twisted pair cable exits unit. No connector on unit. <div style="text-align: right; margin-top: 10px;">  </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

DIMENSIONAL INFORMATION

HX SERIES – RANGES TO 80" (2 m)

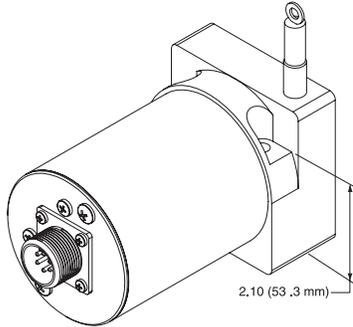
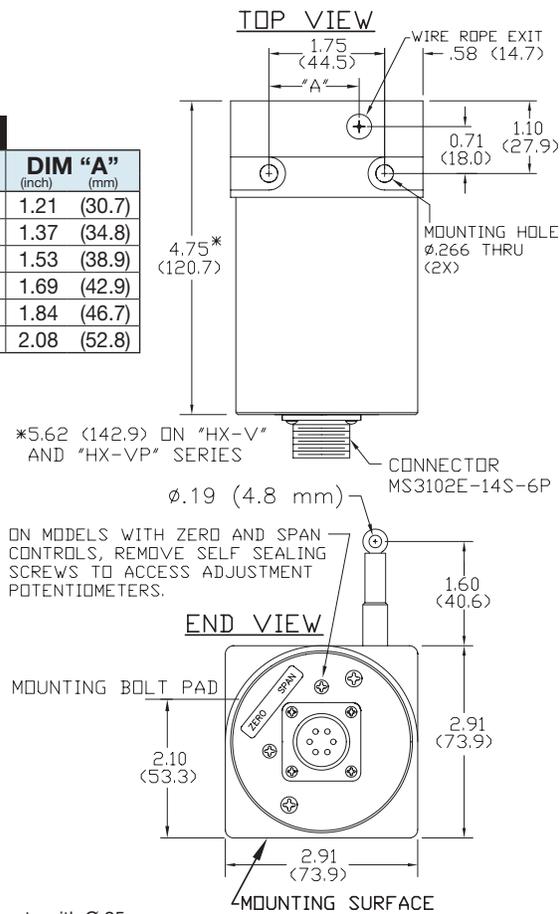


FIG. 1

TABLE 13

| RANGE | DIM "A" (inch) | (mm) |
|--------------|-------------------|--------|
| 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) |
| 6", 60" | 1.84 | (46.7) |
| 80" | 2.08 | (52.8) |



NOTES:
1. Transducer mounts with Ø.25 or M6 Socket head cap bolts.

Dimensions in brackets are millimeters

TABLE 14

| RANGE | DIM "A" (inch) | (mm) | DIM "B" (inch) | (mm) |
|----------------|-------------------|-------|-------------------|-------|
| 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.

HX SERIES – RANGES GREATER THAN 80" (2 m)

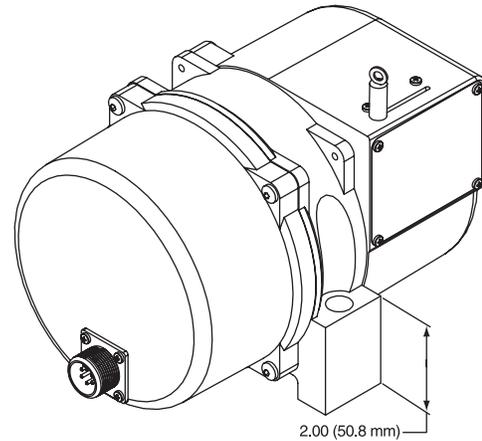
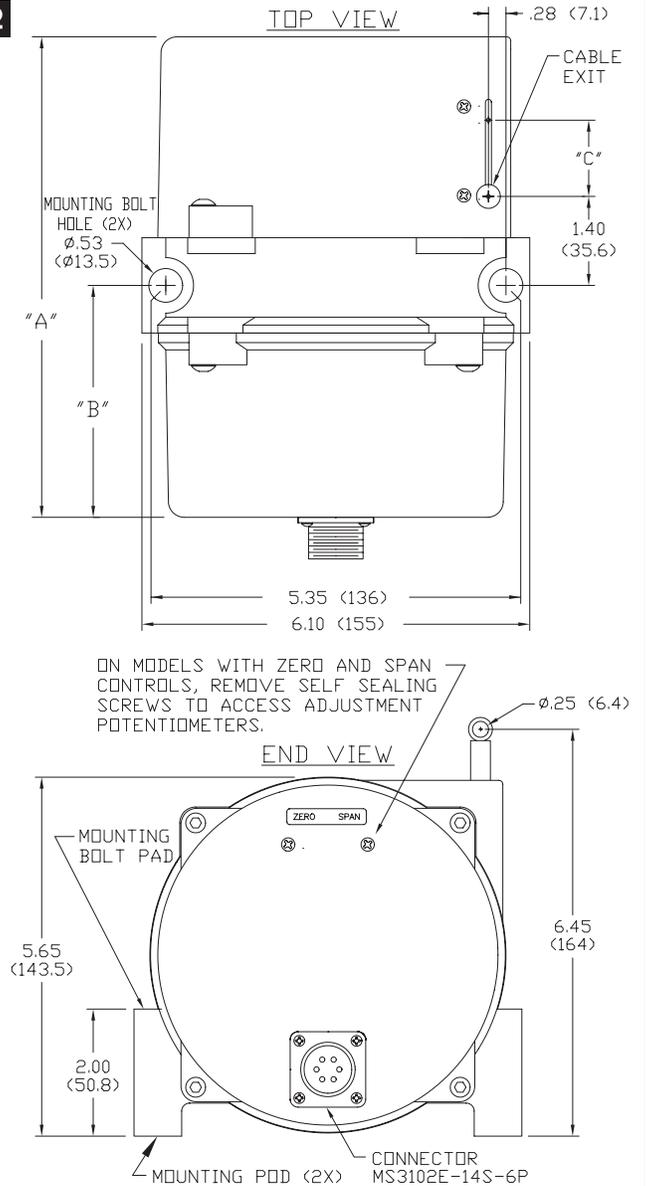


FIG. 2



Dimensions in brackets are millimeters