Cable-Extension Position Transducer

World’s Smallest Stringpot
Range: 0-1.5 inches
High-Cycle • Space-Critical Applications

Specification Summary:

**GENERAL**
- Full Stroke Range: 0-1.5 inches
- Output Signal Options: voltage divider (potentiometer)
- Accuracy: ± 1% full stroke
- Resolution: essentially infinite
- Measuring Cable: .014-inch dia. nylon-coated stainless steel
- Measuring Cable Tension: 4 oz. ±25%
- Enclosure Material: anodized aluminum
- Sensor: conductive plastic precision potentiometer
- Potentiometer Cycle Life: 5 million cycles
- Weight: 0.5 oz. max.

**ELECTRICAL**
- Input Resistance: 5K ±10% ohms
- Recommended Output Signal Current: < 1µA
- Recommended Maximum Input Voltage: 20 VDC
- Output Signal Change Over Full Stroke Range: 94% ±4% of input voltage

**ENVIRONMENTAL**
- Enclosure: NEMA 12, IP 50
- Operating Temperature: -40º to 185ºF (-40º to 85ºC)
- Temp. Coefficient of Sensing Element: 0.0028%/ºF (0.005%/ºC)
- Vibration: up to 10 G’s at 30 to 2000 Hz max.

Introducing the world’s smallest stringpot. The M150 is smaller than a thumbprint and occupies a tiny space of only .74 x .74 x .38 inches. With a full stroke measurement range of 1.5 inches, the M150 has been designed for many aerospace and automotive space-critical test applications such as throttle position and crash-test instrumentation.

The heart of the M150 is a precision high-cycle conductive plastic precision potentiometer that delivers a high-linearity voltage position feedback signal. With its rugged all aluminum construction, the M150 has been engineered for reliability and to provide quick, easy and hassle-free installation.

**Output Signal**

**Electrical Connection**
Ordering Information:

Model Number:

M150 - 4 - - - 5K - C1

Mounting Hole Style:

H1 order code: .093 thru

H2* threaded

Measuring Cable Termination:

E order code: Eyelet

L Leader Cable

Sample Model Number:

M150 - 4 - H1 - E - 5K - C1

 mounting hole style: .093 inch dia. thru
 measuring cable termination: eyelet

*--includes: 4) #2-56 x 3/8" pan head mounting screws with washers

*note: crimped stop prevents leader cable from retracting into sensor body

included:

1 - eyelet 5 - crimps

#2-56 threaded
Precision Potentiometric Output
Ranges: 0-3 and 0-5 inches
Compact Size • Crash Test • Flight Test • OEM

Specification Summary:

GENERAL
Full Stroke Ranges.......................................................... 0-3 and 0-5 inches, min.
Output Signal................................................................. voltage divider (potentiometer)
Accuracy ........................................................................ ±0.15% full stroke
Repeatability ................................................................. ±0.02% full stroke
Resolution ................................................................. essentially infinite
Potentiometer Cycle Life .................................................. 50 million cycles*
Measuring Cable .......................................................... 0.024-in. dia. nylon-coated stainless steel
Enclosure Material ........................................................ anodized aluminum
Sensor ................................................................. conductive plastic potentiometer
Weight (maximum) ........................................................ 3-inch: 0.10 lbs., 5-inch: 0.26 lbs.

ELECTRICAL
Input Resistance .............................................................. 5K ohms (±10%)
Power Rating, Watts .................................................. 1.0 at 40º C (derated to 0 @ 110ºC)
Recommended Maximum Input Voltage ......................... 30V (AC or DC)
Temperature coefficient of voltage dividing ratio ............... < 2 ppm/ºC
Temperature coefficient of resistance
-50...+75ºC .................................................................... ±200 ppm/ºC
+75...+100ºC ................................................................. ±300 ppm/ºC
Output Signal Change Over Measurement Range........... 94% ±4% of input voltage

MECHANICAL
Measuring Cable Tension ................................................ see ordering information

ENVIRONMENTAL
Enclosure Design ........................................................ NEMA 12, IP55
Operating Temperature ........................................... -67º to 212ºF (-55º to 100ºC)

*note: potentiometer cycle life is defined as the minimum number of times the measuring cable can be fully extended and retracted before any measurable degradation of the output signal occurs.

Outline Drawing

The MTA is part of Celesco’s new miniature line of cable-extension position transducers that is perfect for short-ranged testing and control applications where space is at a premium.

This transducer uses a high-cyle conductive plastic potentiometer to provide a precision voltage divider feedback signal for measurement ranges of 3 or 5 inches full stroke. With an accuracy of ±0.15% and a repeatability of ±0.02%, the MTA conveniently mounts using servo-clips for easy rotational adjustment.
Ordering Information:

**Model Number:**

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>3A</th>
<th>5</th>
<th>5A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range/Cable Tension</td>
<td>2.0 oz.</td>
<td>4.0 oz.</td>
<td>1.2 oz.</td>
<td>2.4 oz.</td>
</tr>
<tr>
<td>Measuring Cable Termination</td>
<td>3 inches</td>
<td>5 inches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Acceleration</td>
<td>30 G's</td>
<td>60 G's</td>
<td>3 G's</td>
<td>6 G's</td>
</tr>
</tbody>
</table>

**Measuring Cable Termination:**

- **Eyelet**: 1-eyelet, 1-snubber, 5-crimps
- **Leader Cable**: leader cable 24" long

**Electrical Connection:**

- **Wire Leads**: 4-inch Wire Leads
  - 28 AWG
  - 4 in. [100 mm] length
  - wiring connections: +in = brown, +out = red, com. = orange

- **Instrumentation Cable**: 40-inch Instrumentation Cable
  - Ø.2 in. [5 mm]
  - shielded, 24 AWG multiconductor w/strain relief
  - 40 in. [1 meter] length
  - wiring connections: +in = red, +out = green, com. = black

Sample Model Number:

MTA - 3AE - 5KC - MB

- Full Stroke Range: 3 inches/4 oz.
- Measuring Cable Termination: Eyelet
- Electrical Connection: Instrumentation Cable, 40-in.
- Mounting Bracket: Yes

Contact Information:

- Tel: 800.423.5483, +1.818.701.2750
- Fax: +1.818.701.2799
- Email: info@celesco.com
- Website: celesco.com
Ordering Information (cont.)

**Mounting Options:**

- **Servo Clip Mount Option**
  - includes 3 servo-clips and 3 4-40 screws
  - 3-in. range: 1.65 [41.9] BC. 120° Apart
  - 5-in. range: 2.52 [63.9] BC. 120° Apart

- **Mounting Bracket Option**

*use 4-40 or M3 screws and servo-clips to mount sensor.*
## Specification Summary:

### GENERAL
- **Full Stroke Range Options**: 0-3, 0-9, 0-15, 0-30 inches, min.
- **Output Signal**: Voltage divider (potentiometer)
- **Accuracy**: ± 1% to 0.25% full stroke, see ordering information
- **Repeatability**: ± 0.02% full stroke
- **Resolution**: Essentially infinite
- **Measuring Cable**: 0.019-in. nylon-coated stainless steel
- **Enclosure Material**: Anodized aluminum
- **Sensor Cover Options**: Aluminum or polycarbonate
- **Sensor**: Conductive plastic-hybrid potentiometer
- **Weight**: 0.5 lb. max.

### ELECTRICAL
- **Input Resistance**: 10K ohms (± 10%)
- **Power Rating, Watts**: 2.0 at 158°F (70°C), derated to 0 @ 255°F (125°C)
- **Recommended Maximum Input Voltage**: 30V (AC or DC)
- **Output Signal Change Over Measurement Range**: 94% ± 4% of input voltage
- **Mating Plug**: LEMO FGG.08.304.CLADS2

### MECHANICAL
- **Measuring Cable Tension Options**: 9, 14 and 33 oz., see ordering information
- **Maximum Measuring Cable Acceleration**: 136 G’s, see ordering information

### ENVIRONMENTAL
- **Operating Temperature**: -65° to 255° F (-55° to 125°C)

### GAM EG 13 CERTIFICATION
- **Specifications**: see back page

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The MT2A is a member of our family of rugged, accurate miniature cable-extension position transducers designed specifically for test applications. One of the major benefits to this sensor is its 2-axis 360° rotating mounting bracket to allow for fast and simple installation in any direction.

The MT2A comes in 4 different measuring ranges: 0-3”, 0-9”, 0-15” and 0-30” and features a highly-tensioned heavy-duty measuring cable designed for the high-acceleration demands encountered in flight testing and automotive crash tests.

For extreme impact applications, a new rugged all-aluminum sensor cover is now available!

### Output Signal

![Schematic](schematic.png)

NOTE: ALL DIMENSIONS ARE IN INCHES [MM]
Ordering Information

Model Number:

**MT2A - 9E - 33 - 10K - M1A**

<table>
<thead>
<tr>
<th>Full Stroke Range:</th>
<th>3 inches</th>
<th>9 inches</th>
<th>15 inches</th>
<th>30 inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>order code:</td>
<td>3</td>
<td>9</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>potentiometer cycle-life:</td>
<td>2.5 x 10^6</td>
<td>8.3 x 10^5</td>
<td>5.0 x 10^5</td>
<td>2.5 x 10^5</td>
</tr>
<tr>
<td>accuracy (% of full stroke):</td>
<td>1%</td>
<td>.25%</td>
<td>.25%</td>
<td>.25%</td>
</tr>
</tbody>
</table>

Measuring Cable Termination:

<table>
<thead>
<tr>
<th>Measuring Cable Tension:</th>
<th>9 oz.</th>
<th>14 oz.</th>
<th>33 oz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>order code:</td>
<td>9</td>
<td>14</td>
<td>33</td>
</tr>
<tr>
<td>max. cable acceleration:</td>
<td>99 G's</td>
<td>136 G's</td>
<td>136 G's</td>
</tr>
</tbody>
</table>

Electrical Connection/ Sensor Cover:

<table>
<thead>
<tr>
<th>Electrical Connection/ Sensor Cover:</th>
<th>M1</th>
<th>M1A</th>
<th>M2</th>
<th>M2A</th>
<th>M3</th>
<th>M3A</th>
</tr>
</thead>
<tbody>
<tr>
<td>sensor cover:</td>
<td>polycarbonate</td>
<td>aluminum</td>
<td>polycarbonate</td>
<td>aluminum</td>
<td>polycarbonate</td>
<td>aluminum</td>
</tr>
<tr>
<td>electrical connection:</td>
<td>end-mount connector*</td>
<td>side-mount connector*</td>
<td>top-mount connector*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>order code:</td>
<td>C1</td>
<td>C1A</td>
<td>C2</td>
<td>C2A</td>
<td>C3</td>
<td>C3A</td>
</tr>
<tr>
<td>sensor cover:</td>
<td>polycarbonate</td>
<td>aluminum</td>
<td>polycarbonate</td>
<td>aluminum</td>
<td>polycarbonate</td>
<td>aluminum</td>
</tr>
<tr>
<td>electrical connection:</td>
<td>end-mount, instrumentation cable (15-ft. long, 24 ga., shielded)</td>
<td>side-mount, instrumentation cable (15-ft. long, 24 ga., shielded)</td>
<td>top-mount, instrumentation cable (15-ft. long, 24 ga., shielded)</td>
<td>solder terminals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sample Model Number:

**MT2A - 9E - 33 - 10K - M1A**

- range: 9 inches
- measuring cable termination: eyelet
- measuring cable tension: 33 oz. (+6 oz.)
- electrical connection: end-mounted connector w/ aluminum sensor cover

Sample Model Number:

**MT2A - 9E - 33 - 10K - M1A**

- range: 9 inches
- measuring cable termination: eyelet
- measuring cable tension: 33 oz. (+6 oz.)
- electrical connection: end-mounted connector w/ aluminum sensor cover

* mating plug included  **blank cover available, see Accessories on next page
Accessories:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9603957-0015</td>
<td>15 ft. long cordset. Includes mating connector with 15 ft., 24 gauge, shielded multiconductor cable</td>
</tr>
</tbody>
</table>

QUALIFICATION LEVEL FOR MECHANICAL ENVIRONMENT

Random Vibrations (GAM EG 13 Fasc.42 mod. Op1)
20...2000 Hz, 3 min. per axis, operating, 34 g.
20...2000 Hz, 20 sec. per axis, operating, 45 g.

Random Vibrations (GAM EG 13 Fasc.41 mod. Op3)
Compensated Levels, short duration
3...300 Hz @ .2 – .002 g/Hz.

Research Critical Frequency
Logarithmic Run, 1 octave / min., 1...2000 Hz.

Steady Acceleration, operating (GAM EG 13 Fasc.45)
37 g, 3 min. per direction (2 directions per axis)

Sinusoidal Vibrations, operating (GAM EG 13 Fasc.41 mod. Op3)
Logarithmic run, 1 octave/min. on 3 axis
3...50 Hz, 9 hours per axis @ 0.6...1.25 g

Sinusoidal Vibrations, operating (GAM EG 13 Fasc.41 mod. Op3)
Logarithmic run, 1 octave/min. on 3 axis
5...2 KHz, 3 axis @ 12...25 g.

Average Shock (GAM EG 13 Fasc.43 Mode Op1)
1 shock, 1/2 sinusoidal, 100g., 6 msec. operating, longitudinal and back direction

Free Fall (GAM EG 13 Fasc.43 Mode Op4)
6 consecutive drops on wood table, height = 100mm

GAM EG 13 Certification

QUALIFICATION LEVEL FOR CLIMATIC AND THERMAL ENVIRONMENT

External Overpressure, operating (GAM EG 13 Fasc.21)
5 cycles: 1...4.5 Bar in 3 min., 4.5 Bar for 12 hours, 4.5...1 Bar in 1 min.
1 cycle: 1...3.2 Bar in 7.5 min., 3.2 Bar for 2 min., 3.2...8 Bar in 5 sec., 8 Bar for 2 hours, 8...1 Bar in 2 Bar/sec.
1 cycle: 1...4.5 Bar in 20 msec., 4.5 Bar for 5 sec, 4.5...1 Bar in 20 msec.

Thermal Vacuum Transitory, operating (GAM EG 13 Fasc.10)
Room pressure and temperature (1 Bar A; 20ºC ±2ºC)
1...10-3 mBar in 100 seconds
Vacuum (10-3 mBar) for 10 min.

Climatic Cycles (GAM EG 13 Fasc.8)
Dry heat: 24 hours @ 70ºC ±2ºC Relative Humidity < 50%
Wet heat: 24 hours @ 70ºC ±2ºC Relative Humidity = 50%
Cold: 24 hours @ -10ºC ±2ºC Relative Humidity < 50%
Wet heat: 24 hours @ 70ºC ±2ºC Relative Humidity = 100%

Dry Heat (Relative Humidity <50%)
Room temperature to 70ºC in 30 mins
70ºC for 5 hours, non operating
70ºC for 5 hours, operating
70ºC to room temperature in 20 minutes

version: 5.1  last updated: June 18, 2009
Cable-Extension Position Transducer

Precision Potentiometric Output
Ranges: 0-3, 0-9, 0-15, 0-30 inches
Test Applications • Wet Environments

**Specification Summary:**

**GENERAL**
- Full Stroke Ranges: 0-3, 0-9, 0-15, 0-30 inches, min., see ordering information
- Output Signal: voltage divider (potentiometer)
- Accuracy: ± 1 to 0.25% full stroke, see ordering information
- Repeatability: ± 0.02% full stroke
- Resolution: essentially infinite
- Measuring Cable: Φ 0.019-in. nylon-coated stainless steel
- Enclosure Material: anodized aluminum
- Sensor Cover: polycarbonate
- Sensor: conductive plastic-hybrid potentiometer
- Weight: 0.5 lb. max.

**ELECTRICAL**
- Input Resistance: 10K ohms (± 10%)
- Power Rating, Watts: 2.0 at 70° C (derated to 0 @ 125°C)
- Recommended Maximum Input Voltage: 30V (AC or DC)
- Output Signal Change Over Measurement Range: 94% ±4% of input voltage

**MECHANICAL**
- Measuring Cable Tension Options: see ordering information
- Maximum Measuring Cable Acceleration: see ordering information

**ENVIRONMENTAL**
- Enclosure: NEMA 4 / IP67
- Operating Temperature: -40° to 250°F (-40° to 125°C)

**Output Signal**

```
V (+in)  V (+out)
```

**Schematic**

```
+in

10K ohms

+out  common
```

The MT3A is the solution for high-acceleration test applications in potentially wet environments. Just like the MT2A, the MT3A comes in 4 different full-stroke ranges, has a high-tension heavy-duty measuring cable designed for the demands of flight and automotive crash tests and comes with an easy to use 2-axis 360° rotation mounting bracket for installation in hard to fit areas.

For extreme high impact applications, the MT3A is now available with a rugged all aluminum sensor cover!
### Ordering Information:

#### Model Number:

| MT3A - | 10K - |

#### Full Stroke Range:

<table>
<thead>
<tr>
<th>order code:</th>
<th>3</th>
<th>9</th>
<th>15</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>full stroke range, min:</td>
<td>3 inches</td>
<td>9 inches</td>
<td>15 inches</td>
<td>30 inches</td>
</tr>
<tr>
<td>potentiometer cycle-life:</td>
<td>$2.5 \times 10^6$</td>
<td>$8.3 \times 10^5$</td>
<td>$5.0 \times 10^5$</td>
<td>$2.5 \times 10^5$</td>
</tr>
<tr>
<td>accuracy (% of full stroke):</td>
<td>1 %</td>
<td>.25%</td>
<td>.25%</td>
<td>.25%</td>
</tr>
</tbody>
</table>

#### Measuring Cable Termination:

<table>
<thead>
<tr>
<th>order code:</th>
<th>E</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyelet:</td>
<td>Leader Cable (24 in. long)</td>
<td></td>
</tr>
</tbody>
</table>

- **includes**
  - 1-eyelet
  - 1-snubber
  - 5-crimps

| Ø.190 in. (4.8 mm) |
| 0.080 in. (4.3 mm) |

#### Measuring Cable Tension:

<table>
<thead>
<tr>
<th>order code:</th>
<th>9</th>
<th>14</th>
<th>33</th>
</tr>
</thead>
<tbody>
<tr>
<td>tension:</td>
<td>$9 \pm 2$ oz.</td>
<td>$14 \pm 4$ oz.</td>
<td>$33 \pm 6$ oz.</td>
</tr>
<tr>
<td>max. cable acceleration:</td>
<td>17 G’s</td>
<td>50 G’s</td>
<td>90 G’s</td>
</tr>
</tbody>
</table>

#### Electrical Connection/Sensor Cover:

<table>
<thead>
<tr>
<th>order code:</th>
<th>C1</th>
<th>C1A</th>
<th>C4</th>
<th>C4A</th>
<th>C2</th>
<th>C2A</th>
<th>C5</th>
<th>C5A</th>
</tr>
</thead>
<tbody>
<tr>
<td>sensor cover:</td>
<td>polycarbonate</td>
<td>aluminum</td>
<td>polycarbonate</td>
<td>aluminum</td>
<td>polycarbonate</td>
<td>aluminum</td>
<td>polycarbonate</td>
<td>aluminum</td>
</tr>
<tr>
<td>electrical cable length:</td>
<td>15 ft (4.5 m)</td>
<td>30 ft (9 m)</td>
<td>15 ft (4.5 m)</td>
<td>30 ft (9 m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **end-mount strain relief**
- **side-mount strain relief**

<table>
<thead>
<tr>
<th>order code:</th>
<th>C3</th>
<th>C3A</th>
<th>C6</th>
<th>C6A</th>
<th>BC</th>
<th>BCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>sensor cover:</td>
<td>polycarbonate</td>
<td>aluminum</td>
<td>polycarbonate</td>
<td>aluminum</td>
<td>polycarbonate</td>
<td>aluminum</td>
</tr>
<tr>
<td>electrical cable length:</td>
<td>15 ft (4.5 m)</td>
<td>30 ft (9 m)</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **blank cover**

*blank cover* option is for customers who want to provide their own connector or strain relief. This cover comes without electrical wiring access holes so customer can drill to their requirements.

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**Sample Model Number:**

MT3A - 9E - 33 - 10K - C1A

- Range: 9 inches
- Measuring cable termination: eyelet
- Measuring cable tension: 33 oz. (±6 oz.)
- Electrical connection: 15-ft cable w/end-mounted strain relief/aluminum cover

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Version: 7.0  Last updated: January 15, 2010

tel: 800.423.5483 • +1.818.701.2750 • fax: +1.818.701.2799
Compact String Pot

Ranges: Up to 50 inches
Precision Potentiometric Output
Water Resistant • Low Cost • Fast Delivery

SP2

40-inch Electrical Cable
Sealed strain relief

Water and Chemical Resistant Design
Polycarbonate enclosure with sealed electrical connections

Handy Mounting Bracket
Mounts easily and quickly in several directions

Tolerant of Cable Misalignment
Long cable life, even when installation isn’t perfect

The SP2 String Pot from Celesco is a compact, economical and water resistant device that utilizes a flexible cable, a spring-loaded spool and a potentiometer to detect and measure linear position.

The SP2 is identical to the SP1 except for an added 40-inch electrical cable with a watertight rubber strain relief. The SP2 has been compactly designed for tight spaces and high cycle applications and generously allows for measuring cable misalignment. With 4 different ranges and a handy mounting bracket, the SP2 is a perfect solution for many applications from light industrial to OEM.

Specification Summary:

**GENERAL**
Full Stroke Range Options ............................................................... 0-4.75, 0-12.5, 0-25, 0-50 inches
Output Signal ...................................................................................... voltage divider (potentiometer)
Accuracy .......................................................... ±0.25 to ±1.00%  see ordering information
Repeatability .............................................. ± 0.05% full stroke
Resolution ................................................................. essentially infinite
Measuring Cable .................................................. 0.019-in. dia. nylon-coated stainless steel
Enclosure Material ................................................................. polycarbonate
Mounting Bracket Material .......................................................... stainless steel
Sensor ................................................................. plastic-hybrid precision potentiometer
Weight ................................................................. 3 oz. (w/o mounting bracket) max.

**ELECTRICAL**
Input Resistance ................................................................. 10K ohms, ±10%
Power Rating, Watts ................................................................. 2.0 at 70°F derated to 0 at 250°
Recommended Maximum Input Voltage ........................................... 30 V (AC/DC)
Output Signal Change Over Full Stroke Range .................. 94% ±4% of input voltage

**ENVIRONMENTAL**
Operating Temperature ................................................ 0° to 160°F (-18° to 71°C)
Vibration ................................................................. up to 10 G's to 2000 Hz maximum

Ordering Information:

<table>
<thead>
<tr>
<th>Item Number:</th>
<th>SP2-4</th>
<th>SP2-12</th>
<th>SP2-25</th>
<th>SP2-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full stroke range:</td>
<td>4.75 in.</td>
<td>12.5 in.</td>
<td>25 in.</td>
<td>50 in.</td>
</tr>
<tr>
<td>Accuracy (% of f.s.):</td>
<td>1.00%</td>
<td>0.25%</td>
<td>0.25%</td>
<td>0.25%</td>
</tr>
<tr>
<td>Potentiometer cycle life:</td>
<td>2.5M cycles</td>
<td>500K cycles</td>
<td>500K cycles</td>
<td>250K cycles</td>
</tr>
<tr>
<td>Cable tension (±25%):</td>
<td>7 oz.</td>
<td>7 oz.</td>
<td>7 oz.</td>
<td>7 oz.</td>
</tr>
<tr>
<td>Max. cable acceleration:</td>
<td>15 G</td>
<td>15 G</td>
<td>15 G</td>
<td>15 G</td>
</tr>
</tbody>
</table>
**Installation Information:**

**Outline Drawing (w/o bracket):**

![Outline Drawing](attachment:outline_drawing.png)

**Electrical Connection:**

![Electrical Connection](attachment:electrical_connection.png)

**Mounting Options:**

![Mounting Options](attachment:mounting_options.png)

---

Electrical Cable, 24 GA, 3 conductor, shielded 40 in. (1 meter) long

All dimensions are in inches [millimeters]

Version: 5.2 Last updated: May 19, 2009