General Information

Until now, the choice of an absolute encoder meant an expensive, and larger-sized product. Through the use of combinatorial mathematics, the absolute code pattern of the Bourns® Absolute Contacting Encoder (ACE™) is placed on a single track for a very economical, energy-efficient and compact product. Bourns® ACE™ provides an absolute digital output that will also retain its last position in the event of a power failure.

An intelligent alternative to incremental encoders and potentiometers, the Bourns® ACE™ is ideally suited for many industrial, medical and consumer product applications.

Recommended Control Diagram for ACE-128

Electrical Characteristics

- Output: 8-bit code with 128 absolute states
- Closed Circuit Resistance: 5 ohms maximum
- Open Circuit Resistance: 100 K ohms minimum
- Contact Rating: 10 milliamp @ 10 VDC or 0.1 watt maximum
- Dielectric Withstanding Voltage (MIL-STD-202 Method 301): 1,000 megalohms minimum
- Sea Level: 1,000 VAC minimum
- Electrical Travel: Continuous
- RPM (Operating): 2.7 milliseconds maximum
- Electrical Travel: 120 maximum

Environmental Characteristics

- Operating Temperature Range: -40 °C to +85 °C (-40 °F to +185 °F)
- Storage Temperature Range: -40 °C to +85 °C (-40 °F to +185 °F)
- Vibration: 15 G
- Contact Bounce (60 RPM): 0.1 millisecond maximum
- Contact Bounce (60 RPM): 0.1 millisecond maximum
- Rotational Life: 50,000 shaft revolutions minimum
- IP Rating: IP 40

Mechanical Characteristics

- Mechanical Angle: 360 ° Continuous
- Running Torque: 0.5 to 1.5 N-cm (0.75 to 2.50 oz-in.)
- Mounting Torque: 79 N-cm (7 lb.-in.) maximum
- Weight: Approximately 14 gms. (0.50 oz.)
- Terminals: Printed circuit board terminals
- Soldering Condition:
  - Manual Soldering: 96.5Sn/3.0Ag/0.5Cu solid wire or no-clean rosin cored wire
  - Wave Soldering: 370 °C (700 °F) max. for 3 seconds
- Wash processes: Not recommended
- Hardware: One lockwasher and one mounting nut are shipped with each encoder, except where noted in the part number.
- Packaging: 45 pcs./tray

*High probability of missing quadrature codes with maximum bounce.

EAW - Absolute Contacting Encoder (ACE™)

Features

- Absolute encoder / absolute code output
- Digital output
- Sturdy construction
- Bushing mount
- Available with PC board mounting bracket (optional)
- RoHS compliant

Specifications are subject to change without notice. Users should verify actual device performance in their specific applications. The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf

WARNING Cancer and Reproductive Harm
www.P65Warnings.ca.gov
Bit/Pin correlation: b7 b6 b5 b4 b3 b2 b1 b0 = p8 p7 p6 p5 p4 p3 p2 p1

A binary “1” denotes an “open” switch and a binary “0” denotes a “closed” switch.

Positions 0-127 are seen by a clockwise rotation of the shaft.

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EAW - Absolute Contacting Encoder (ACE™)

Dimensional Drawings

Bushing Mounted: Housing A with Rear Facing Terminals

PCB Bracket Mounted: Housing B

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# How to Order

## PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>50,000 Revolutions</td>
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</tbody>
</table>

## BUSHING CONFIGURATION

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>9 mm x 1/4˝ Length. Threaded M9x0.75</td>
</tr>
<tr>
<td>L</td>
<td>9 mm x 3/8˝ Length. Threaded M9x0.75  (Use B shaft only.)</td>
</tr>
</tbody>
</table>

## DETENT CONFIGURATION

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-Detented</td>
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</tbody>
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## ANTI-ROTATION LUG POSITION

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>J</td>
<td>9:00 Position</td>
</tr>
<tr>
<td>D</td>
<td>None</td>
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</table>

## SHAFT STYLE (See Outline Drawing for Details)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Plain with Inserted Slot (1/4˝ Dia.)</td>
</tr>
<tr>
<td>C</td>
<td>Single Flatted (1/4˝ Dia.)</td>
</tr>
<tr>
<td>R</td>
<td>Plain with Inserted Slot (6 mm Dia.)</td>
</tr>
</tbody>
</table>

## RoHS IDENTIFIER

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>L</td>
<td>Compliant</td>
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</table>

## PERFORMANCE CODE

<table>
<thead>
<tr>
<th>Code</th>
<th>Detents</th>
<th>States/Rev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>E0128</td>
<td>0</td>
<td>128</td>
</tr>
</tbody>
</table>

## HOUSING TERMINAL CONFIGURATION

(X indicates “Equipped With”)

<table>
<thead>
<tr>
<th>Features</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>H</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear Mount Terminals</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward Facing Terminals</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PCB Bracket</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware Included</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

## SHAFT LENGTH (FMS)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Available Shaft Styles</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>3/4˝ (19.05 mm) Length</td>
<td>B, C</td>
</tr>
<tr>
<td></td>
<td>Metric</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>19 mm Length</td>
<td>R</td>
</tr>
</tbody>
</table>

The sample part number demonstrates the identification code for Bourns contacting encoders. The part number shown is a commonly used model, typically available from stock.

*Consult factory concerning special inquiries.*
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