TOUGH SENSORS FOR
MOBILE EQUIPMENT
Mobile Equipment and Harsh Duty

- Extended sensing range
- Heavy gauge cable
- -40 °F to +185 °F operating temperature
- IP69K rated
- High shock/vibration immunity
- Up to 100 V/m radiated field immunity
- 12 mm, 18 mm, and 30 mm models with load dump circuitry (per ISO 7637-2)
- Compatible with Deutsch, Weatherpack (Packard), and Amp/Tyco connectors

Technical Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUPPLY VOLTAGE Flat Pack</td>
<td>5-60 VDC</td>
</tr>
<tr>
<td>SUPPLY VOLTAGE Cylindrical</td>
<td>10-60 VDC*</td>
</tr>
<tr>
<td>LOAD CURRENT (I_L)</td>
<td>200 mA max.</td>
</tr>
<tr>
<td>LEAKAGE CURRENT (OFF-STATE)</td>
<td>≤ 0.5 mA (10 µA typical)</td>
</tr>
<tr>
<td>OUTPUT Suffix E0 NPN normally open</td>
<td></td>
</tr>
<tr>
<td>OUTPUT Suffix E2 PNP normally open</td>
<td></td>
</tr>
<tr>
<td>VOLTAGE DROP AT I_L (MAX.)</td>
<td>≤ 3 VDC</td>
</tr>
<tr>
<td>HYSTERESIS</td>
<td>3-15% (5% typical)</td>
</tr>
<tr>
<td>SHORT CIRCUIT AND OVERLOAD PROTECTION</td>
<td>Yes</td>
</tr>
<tr>
<td>REVERSE POLARITY PROTECTED</td>
<td>Yes</td>
</tr>
<tr>
<td>LED INDICATION</td>
<td>See dimension drawings</td>
</tr>
<tr>
<td>SENSING FACE MATERIAL</td>
<td>PBT</td>
</tr>
<tr>
<td>ENVIRONMENTAL PROTECTION</td>
<td>IP69K</td>
</tr>
<tr>
<td>AMBIENT TEMPERATURE</td>
<td>-40 °F to +185 °F (-40 °C to +85 °C)</td>
</tr>
<tr>
<td>STANDARDS</td>
<td>EN 60947-5-2</td>
</tr>
<tr>
<td>APPROVALS</td>
<td></td>
</tr>
</tbody>
</table>

* For 5-30 VDC consult factory

Wiring Diagrams

3-Wire DC

**Cable Connection**

- NPN Normally open
  - E0: Black (A), Brown (B), Blue (C)
  - E2: Black (A), Brown (B), Blue (C)

**Deutsch Connection**

- E0 NPN Normally open
  - C (A), B (B), White (C)
- E2 PNP Normally open
  - C (A), B (B), White (C)
### Cable and Deutsch Connector Models

<table>
<thead>
<tr>
<th>Housing</th>
<th>Model Number</th>
<th>Range (mm)</th>
<th>Voltage</th>
<th>Switching Frequency</th>
<th>Barrel Material</th>
<th>Termination</th>
<th>EMC Rating</th>
<th>Load Dump Circuitry</th>
<th>Dwg. No.</th>
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</thead>
<tbody>
<tr>
<td>12</td>
<td>NBB4-12GM60-E0-M</td>
<td>4 10-60 VDC</td>
<td>NPN N.O.</td>
<td>800 Hz</td>
<td>Ni-brass</td>
<td>PUR/#18 AWG</td>
<td>100 V/m</td>
<td>n/a</td>
<td>1</td>
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<td></td>
<td>NBB4-12GM60-E2-M</td>
<td>4 10-60 VDC</td>
<td>PNP N.O.</td>
<td>800 Hz</td>
<td>Ni-brass</td>
<td>PUR/#18 AWG</td>
<td>100 V/m</td>
<td>n/a</td>
<td>1</td>
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<tr>
<td></td>
<td>NBB4-12GM60-E0-M-150MM-3DT04</td>
<td>4 10-60 VDC</td>
<td>NPN N.O.</td>
<td>800 Hz</td>
<td>Ni-brass Deutsch Conn.</td>
<td>100 V/m</td>
<td>n/a</td>
<td>n/a</td>
<td>2</td>
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<tr>
<td></td>
<td>NBB4-12GM60-E2-M-150MM-3DT04</td>
<td>4 10-60 VDC</td>
<td>PNP N.O.</td>
<td>800 Hz</td>
<td>Ni-brass Deutsch Conn.</td>
<td>100 V/m</td>
<td>n/a</td>
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<td>18</td>
<td>NBB8-18GM50-E0-M</td>
<td>8 10-60 VDC</td>
<td>NPN N.O.</td>
<td>400 Hz</td>
<td>Ni-brass</td>
<td>Deutsch Conn.</td>
<td>100 V/m</td>
<td>Per ISO 7637-2</td>
<td>3</td>
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<td>NBB8-18GM50-E2-M</td>
<td>8 10-60 VDC</td>
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<td>30</td>
<td>NBB15-30GM50-E0-M</td>
<td>15 10-60 VDC</td>
<td>NPN N.O.</td>
<td>200 Hz</td>
<td>Ni-brass</td>
<td>Deutsch Conn.</td>
<td>100 V/m</td>
<td>Per ISO 7637-2</td>
<td>6</td>
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<td>NBB15-30GM50-E2-M</td>
<td>15 10-60 VDC</td>
<td>PNP N.O.</td>
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<td>Ni-brass</td>
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<td>100 V/m</td>
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<td>100 V/m</td>
<td>Per ISO 7637-2</td>
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<tr>
<td>Flat</td>
<td>NBB8-F33-E0-M</td>
<td>8 5-60 VDC</td>
<td>NPN N.O.</td>
<td>350 Hz</td>
<td>PBT</td>
<td>Deutsch Conn.</td>
<td>100 V/m</td>
<td>Per ISO 7637-2</td>
<td>8</td>
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<td>NBB8-F33-E2-M</td>
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<td>PNP N.O.</td>
<td>350 Hz</td>
<td>PBT</td>
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<td>8 5-60 VDC</td>
<td>NPN N.O.</td>
<td>350 Hz</td>
<td>PBT Deutsch Conn.</td>
<td>100 V/m</td>
<td>Per ISO 7637-2</td>
<td>9</td>
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<td>NBB8-F33-E2-M-150MM-3DT04</td>
<td>8 5-60 VDC</td>
<td>PNP N.O.</td>
<td>350 Hz</td>
<td>PBT Deutsch Conn.</td>
<td>100 V/m</td>
<td>Per ISO 7637-2</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

**Drawing No. 1**
- NBB4-12GM60-E0-M [NPN N.O. & N.C.]
- NBB4-12GM60-E2-M [PNP N.O. & N.C.]
- LED: Yellow: Output Status
- 17 across the flats
- 4 thickness
- M12 x 1

**Drawing No. 2**
- NBB4-12GM60-E0-M-150MM-3DT04 [NPN N.O. & N.C.]
- NBB4-12GM60-E2-M-150MM-3DT04 [PNP N.O. & N.C.]
- LED: Yellow: Output Status
- 17 across the flats
- 4 thickness
- M12 x 1

**Drawing No. 3**
- NCB4-12GM70-E0-M [NPN N.O.]
- NCB4-12GM70-E2-M [PNP N.O.]
- 4-way LED (90º apertures)
- Yellow: Output Status

**Drawing No. 4**
- NBB8-18GM50-E0-M [NPN N.O.]
- NBB8-18GM50-E2-M [PNP N.O.]
- LED: Yellow: Output Status
- 24 across the flats
- 4 thickness
- M18 x 1

**Drawing No. 5**
- NBB8-18GM50-E0-M-150MM-3DT04 [NPN N.O.]
- NBB8-18GM50-E2-M-150MM-3DT04 [PNP N.O.]
- LED: Yellow: Output Status
- 17 across the flats
- 4 thickness
- M18 x 1

**Drawing No. 6**
- NBB15-30GM50-E0-M [NPN N.O.]
- NBB15-30GM50-E2-M [PNP N.O.]
- LED: Yellow: Output Status
- 36 across the flats
- 5 thickness
- M20 x 1.5

**Drawing No. 7**
- NBB15-30GM50-E0-M-150MM-3DT04 [NPN N.O.]
- NBB15-30GM50-E2-M-150MM-3DT04 [PNP N.O.]
- LED: Yellow: Output Status
- 36 across the flats
- 5 thickness
- M20 x 1.5

**Drawing No. 8**
- NBB8-F33-E0-M [NPN N.O. & N.C.]
- NBB8-F33-E2-M [PNP N.O. & N.C.]

**Drawing No. 9**
- NBB8-F33-E0-M-150MM-3DT04 [NPN N.O.]
- NBB8-F33-E2-M-150MM-3DT04 [PNP N.O.]

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**Notes:**
- Cable Length:
  - 150 mm
- M18 x 1
- 24 across the flats
- 4 thickness
- M12 x 1

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**Yellow:**
- Output Status
- LED: Yellow: Output Status
- 4-way LED (90º apertures)
- LED: Yellow: Output Status

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**LED:**
- Yellow: Output Status
- 4-way LED (90º apertures)
- LED: Yellow: Output Status
- 4-way LED (90º apertures)
Pepperl+Fuchs sets the standard in quality and innovative technology for the world of automation. Our expertise, dedication, and heritage of innovation have driven us to develop the largest and most versatile line of industrial sensor technologies and interface components in the world. With our global presence, reliable service, and flexible production facilities, Pepperl+Fuchs delivers complete solutions for your automation requirements—wherever you need us.