RUGGEDIZED STATUS INDICATORS

COMMERCIAL | MILITARY

Event Counter / Hour Meter
ETIs

Filtered / NVIS
LEDs

Flag / Ball / Drum Display
Indicators
Latching indicators display fault conditions for system maintenance

**FEATURES**
- Electromagnetic latching display
- Electrical or manual reset
- Pulse operated
- High visibility
- Low power
- Environmentally sealed
- Rugged packaging
- Custom design
- Commercial & MIL-PRF-83287

Status changes are indicated by high contrast color change.

---

<table>
<thead>
<tr>
<th>Fig. No.</th>
<th>Models</th>
<th>Environ Sealed</th>
<th>Magnetic Latching</th>
<th>Manual Reset</th>
<th>Electrical Reset</th>
<th>Rear Mount</th>
<th>Panel Mount</th>
<th>Latched Switch</th>
<th>Comment</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BHG, BHGD</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
<td>High Visibility</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>BIS</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td>•</td>
<td></td>
<td></td>
<td>Self Restoring</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>MI51LP</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
<td>•</td>
<td>•</td>
<td>Low power; 50mW sensitivity</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>MI57DA</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td>•</td>
<td></td>
<td>•</td>
<td>Rear Mount</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>MI61SA, RA</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Dual color BITE</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>MI61SW</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>Dual color with Switch</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>M161, LD &amp; M</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td>•</td>
<td></td>
<td>•</td>
<td>Optional legend display</td>
<td>16</td>
</tr>
<tr>
<td>7</td>
<td>CI75, CID75</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td>•</td>
<td>•</td>
<td></td>
<td>Single coil; Dual coil models</td>
<td>18</td>
</tr>
</tbody>
</table>

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
MINIATURE BITE INDICATORS
LATCHING TYPE INDICATOR

Models BHG (Single Coil) and BHGD (Dual Coil)

For indicators qualified to MIL-PRF-83287/3, see page 23.

Our latching feature assures fast positive response to a fault signal. The display ball changes color only when the indicator coil is pulsed by a BITE (Built-In Test Equipment) system. Our magnetic indicators have no bearings, springs or filaments to wear out and offer excellent visibility in high ambient light.

FEATURES

• Magnetic latching
• High visibility
• Small, lightweight
• Ruggedized

OPERATION

When the indicator coil is energized with a 40 millisecond (or longer) pulse, the highly visible, two color display ball spins 180° and latches to the magnetic core. The displayed ball will remain magnetically latched to the core in the position last pulsed. Even if the fault signal is removed, the indicator will “remember” that a fault has occurred. Return to “No-fault” color is accomplished electrically. Model BHG (single coil) is reset by reversing polarity of input signal to the coil. Model BHGD (dual coil) is reset by pulsing a separate internal coil. Optional features include insulated lead wire termination, special lenses (radius dome, cylindrical, non-glare), O-ring panel seal, internally mounted diodes and RFI panel shield. Consult the factory for details. Care should be taken in the application of the device as it is subject to magnetic interference from other devices that may emit magnetic fields.

ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Standard coil voltages and resistances</th>
<th>Nominal Voltage DC</th>
<th>Operating Voltage Minimum</th>
<th>Operating Voltage Maximum</th>
<th>DC Coil Resistance in Ohms, ±10% @ 25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.25</td>
<td>1.75</td>
<td>3.45</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>2.5</td>
<td>3.5</td>
<td>13.8</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>4.5</td>
<td>5.5</td>
<td>38.0</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>5.5</td>
<td>6.5</td>
<td>55.0</td>
<td></td>
</tr>
<tr>
<td>12.0</td>
<td>9.0</td>
<td>15.0</td>
<td>220.0</td>
<td></td>
</tr>
<tr>
<td>24.0</td>
<td>17.0</td>
<td>27.0</td>
<td>880.0</td>
<td></td>
</tr>
<tr>
<td>28.0</td>
<td>20.0</td>
<td>30.0</td>
<td>1200.0</td>
<td></td>
</tr>
</tbody>
</table>

Nominal pulse power: 650 milliwatts
Operating pulse length: will operate at 40 milliseconds or greater
Dielectric withstanding voltage: 500 VAC RMS case to terminals; 500 VAC RMS coil to coil (BHGD style)
Insulation resistance: 100 megohms minimum at 500 VDC

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized with sealed glass window
Mounting: Front panel threaded, rear panel threaded, and press fit sleeve
Weight:
Models BHG21, BHG21T, BHG27T 2.5 grams
Models BHGD21, BHGD21T, BHGD27T, BHGD37T 3.0 grams
Model BHGD37T 4.0 grams
Display Colors: Any combination of: Red (R), White (W), Black (BLK), Green (G), Yellow (Y), or Orange (O)
Mounting Hardware: Lockwasher, internal tooth phosphor bronze, nylon mounting sleeve. Hex nuts are black anodized aluminum. Body diameter on all MIL qualified units is .275 in. (7.00 mm). See page 5 for indicator dimensions.
Display Area: All units measure .200 in. (5.08 mm) diameter

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65°C to +125°C
Vibration*:
Sinusoidal: .06 in. D.A. or 20 Gs Peak, whichever is less, 10Hz to 2kHz, MIL STD 202, Method 204, Test Condition D
Random: 11.6 Gs per MIL STD 202, Method 214, Test Condition D, Curve I
Shock: 100 Gs MIL STD 202, Method 213, Test Condition I
Moisture Resistance: (Humidity): MIL STD 202, Method 106
Barometric Pressure: 100,000 ft., MIL STD 202, Method 105, Test Condition D, 350 VAC RMS
Thermal Shock: MIL STD 202, Method 107, Test Condition B
Salt Spray: MIL STD 202, Method 101, Test Condition B
Life: 1,000,000 cycles

* (During vibration testing caution should be taken to shield the indicator from the strong magnetic field.)
MINIATURE BITE INDICATORS
LATCHING TYPE INDICATOR

ORDERING INFORMATION
When ordering, show model number first, coil voltage and the color combination desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:
Single coil model with front panel threaded case for 12 volts with white as set color and black as reset color would be Model BHG21T-12-W/BLK.

Recommended cut-outs:
BHG(D)21 = .265 in., BHG(D)21T & BHG(D)27T = .315 in., BHG(D)37T = .375 in.

When ordering, show model number first, coil voltage and the color combination desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:
Single coil model with front panel threaded case for 12 volts with white as set color and black as reset color would be Model BHG21T-12-W/BLK.

Recommended cut-outs:
BHG(D)21 = .265 in., BHG(D)21T & BHG(D)27T = .315 in., BHG(D)37T = .375 in.

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Coil Voltage</th>
<th>Fault or Set Color</th>
<th>No-fault or Reset Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHG21T</td>
<td>1.5</td>
<td>R Red</td>
<td>R Red</td>
</tr>
<tr>
<td>BHG27T</td>
<td>3</td>
<td>W White</td>
<td>W White</td>
</tr>
<tr>
<td>BHGD21</td>
<td>6</td>
<td>G Black</td>
<td>G Black</td>
</tr>
<tr>
<td>BHGD21T</td>
<td>12</td>
<td>Y Yellow</td>
<td>Y Yellow</td>
</tr>
<tr>
<td>BHGD22T</td>
<td>24</td>
<td>O Orange</td>
<td>O Orange</td>
</tr>
<tr>
<td>BHGD22T</td>
<td>28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BHGD……TL = Domed lens
* MIL qualified indicators Set/Reset colors are White/Black

EPOXY MENISCUS
0.050 (1.27)
0.070 (1.78)

4X .016 (0.40)

EPOXY MENISCUS
0.050 (1.27)
0.070 (1.78)

4X .016 (0.40)

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64—All mounting hardware is black anodized aluminum. Mounting Torque: 5-7 in. lbs.

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.

L-3 Electrodynamics, Inc.
3975 McMann Rd.  |  Cincinnati, OH 45245  |  Tel: 513-943-2000  |  email: edi.info@L-3com.com  |  L-3com.com/EDI

ED16-16
**MINIATURE BITE INDICATORS**
**SELF-RESTORING TYPE INDICATOR**

**Model BIS**

Our BIS series indicators provide visual indication of the status of any circuit parameter being monitored. This series is a self-restoring design that automatically returns to a neutral state when power is removed.

**FEATURES**
- Self-restoring
- Sunlight readable
- Small, lightweight
- Ruggedized

**OPERATION**

When the indicator coil is energized, the highly visible two color display ball changes color by spinning 180°. It does not latch to the core magnet, but remains suspended in that position until power is removed. The BIS indicator offers excellent visibility in high ambient light and does not contain any bearings, springs, or filaments that can wear out. Optional features include insulated lead wire termination, special lenses (radius dome, cylindrical, non-glare), O-ring panel seal, and RFI panel shield. Consult the factory for details. Care should be taken in the application of this device. As a magnetic component, it is subject to magnetic interference from other devices which may emit magnetic fields. Consult the factory if any possibility of interaction exists.

**ELECTRICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Standard coil voltages and resistances</th>
<th>Operating Voltage DC Nominal</th>
<th>Operating Voltage DC Minimum</th>
<th>Operating Voltage DC Maximum</th>
<th>DC Coil Resistance in Ohms, ± 10%@25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.25</td>
<td>1.75</td>
<td></td>
<td>3.45</td>
</tr>
<tr>
<td>3.0</td>
<td>2.5</td>
<td>3.5</td>
<td></td>
<td>13.8</td>
</tr>
<tr>
<td>5.0</td>
<td>4.5</td>
<td>5.5</td>
<td></td>
<td>38.0</td>
</tr>
<tr>
<td>6.0</td>
<td>5.5</td>
<td>6.5</td>
<td></td>
<td>55.0</td>
</tr>
<tr>
<td>12.0</td>
<td>9.0</td>
<td>15.0</td>
<td></td>
<td>220.0</td>
</tr>
<tr>
<td>24.0</td>
<td>17.0</td>
<td>27.0</td>
<td></td>
<td>880.0</td>
</tr>
<tr>
<td>28.0</td>
<td>20.0</td>
<td>30.0</td>
<td></td>
<td>1200.0</td>
</tr>
</tbody>
</table>

Nominal pulse power: 650 milliwatts
Operating pulse length: will operate at 40 milliseconds or greater
Dielectric withstanding voltage: 500 VAC RMS case to terminals
Insulation resistance: 100 megohms minimum at 500 VDC

**MECHANICAL SPECIFICATIONS**

- **Case:** Aluminum, black anodized with sealed glass window
- **Mounting:** Front panel threaded, rear panel threaded, and press fit sleeve
- **Weight:**
  - Models BIS21, BIS21T, BIS27T 2.5 grams
  - Model BIS37T 3.0 grams
- **Display Colors:** Any combination of: Red (R), White (W), Black (BLK), Green (G), Yellow (Y), or Orange (O)
- **Mounting Hardware:** Lockwasher, internal tooth phosphor bronze, nylon mounting sleeve, hex nuts are black anodized aluminum.
- **Display Area:** All units measure .200 in. (5.08 mm) diameter

**ENVIRONMENTAL SPECIFICATIONS**

- **Operating Temperature Range:** -65°C to +125°C
- **Vibration,* Sinusoidal:** .06 in. D.A. or 20 Gs Peak, whichever is less, 10Hz to 2kHz, MIL STD 202, Method 204, Test Condition D
- **Shock:** 100 Gs MIL STD 202, Method 213, Test Condition I
- **Moisture Resistance:** (Humidity): MIL STD 202, Method 106
- **Barometric Pressure:** 100,000 ft., MIL STD 202, Method 105, Test Condition D, 350 VAC RMS
- **Thermal Shock:** MIL STD 202, Method 107, Test Condition B
- **Salt Spray:** MIL STD 202, Method 101, Test Condition B
- **Life:** 1,000,000 cycles

* (During vibration testing caution should be taken to shield the indicator from the strong magnetic field.)

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
**MINIATURE BITE INDICATORS**

**SELF-RESTORING TYPE INDICATOR**

**ORDERING INFORMATION**

When ordering, show model number first, coil voltage, and the color combination desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:
A basic model with a front panel threaded case for 12 volts with white as a Set color and black as a Reset color would be Model BIS21T-12-W/BLK.

Recommended cut-outs:
BIS21 = .265 in., BIS21T & BIS27T = .315 in., BIS37T = .375 in.

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Coil Voltage</th>
<th>Fault or Set Color</th>
<th>No Fault or Reset Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIS21</td>
<td>1.5</td>
<td>R Red</td>
<td>R Red</td>
</tr>
<tr>
<td>BIS21T</td>
<td>3</td>
<td>W White</td>
<td>W White</td>
</tr>
<tr>
<td>BIS27T</td>
<td>5</td>
<td>BLK Black</td>
<td>BLK Black</td>
</tr>
<tr>
<td>BIS37T</td>
<td>6</td>
<td>G Green</td>
<td>G Green</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Y Yellow</td>
<td>Y Yellow</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>O Orange</td>
<td>O Orange</td>
</tr>
</tbody>
</table>

**BIS21T - 12 - W / BLK - ( )**

**Basic Model**

**ELECTRICAL DATA**

**MECHANICAL DATA**

**OPTIONS AVAILABLE (consult factory)**

**NOTE:** Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)

Fractions: ± 1/64—All mounting hardware is black anodized aluminum. Mounting Torque: 5-7 in. lbs.

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
Model MI51LP

The MI51LP is a miniature, dual-drum, magnetic latching indicator featuring a nonvolatile two-drum display, excellent positive indication of a fault condition with superior visibility in high ambient light. It is designed to monitor electronic systems where space is limited.

FEATURES

- 50 milliwatt
- Manual reset
- Magnetic latching
- Environmentally sealed

OPERATION

When the indicator coil is energized with a 25 millisecond (or longer) pulse, the highly visible drums spin 180° and latch to the magnetic core. The drums will remain magnetically latched to the core in the position last pulsed. Even if the fault signal is removed, the indicator will “remember” that a fault had occurred. Reset is accomplished manually by rotating the knurled ring clockwise 60°. The knob returns to its normal position automatically.

ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Standard coil voltages and resistances</th>
<th>Nominal Voltage DC</th>
<th>Operating Voltage Minimum</th>
<th>Operating Voltage Maximum</th>
<th>DC Coil Resistance in Ohms, ±10% @ 25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.2</td>
<td>1.8</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>2.4</td>
<td>3.6</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>4.0</td>
<td>6.0</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>4.8</td>
<td>7.2</td>
<td>720</td>
<td></td>
</tr>
<tr>
<td>12.0</td>
<td>9.6</td>
<td>14.4</td>
<td>2,880</td>
<td></td>
</tr>
<tr>
<td>24.0</td>
<td>19.2</td>
<td>28.8</td>
<td>11,500</td>
<td></td>
</tr>
<tr>
<td>28.0</td>
<td>22.4</td>
<td>30.0</td>
<td>15,700</td>
<td></td>
</tr>
</tbody>
</table>

Pulse Power: 50 mw.
Nominal Pulse Length: 25 milliseconds, minimum.
Dielectric Withstanding Voltage: 500 VAC RMS
Insulation Resistance: 100 megohms minimum at 500 VDC.
Electromagnetic Interference and Magnetic Susceptibility: MI51LP will not malfunction or false transfer when subjected to a 20 ampere turn field at 400Hz.

MECHANICAL SPECIFICATIONS

Case: Black, anodized aluminum
Mounting: Front-panel mount (D-hole or keyed washer)
Weight: 6.5 grams for loop or turret terminals; 10 grams for wire leads.
Display Colors: “No-fault” (reset) is black, “Fault” (set) is white, as shown.
Terminations: Solder terminals (turret type), solder loops, and wire leads are also available.
Glass: Standard (S), Non-glare (N)

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65°C to +125°C.
Vibration*: .06” D.A. or 15 Gs Peak, whichever is less, 10Hz to 2kHz per MIL STD 202, Method 204, Test Condition B
Shock: 100 Gs MIL STD 202, Method 213, Test Condition I
Moisture Resistance: (Humidity): MIL STD 202, Method 106
Barometric Pressure: 100,000 ft., MIL STD 202, Method 105, Test Condition D
Thermal Shock: MIL STD 202, Method 107, Test Condition B
Salt Spray: MIL STD 202, Method 101, Test Condition B
Life: 10,000 cycles
* (During vibration testing caution should be taken to shield the indicator from the strong magnetic field.)

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
LOW POWER BITE INDICATORS

ORDERING INFORMATION

When ordering, show model number first, coil voltage, the color combination desired, terminal type, and glass type. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:
Basic model for 12 volts with white as set color and black as reset color, turret terminals, and non-glare glass would be MI51LP-12-W/BLK-TT-N.

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Coil Voltage</th>
<th>Fault Color</th>
<th>No-fault or Reset Color</th>
<th>Terminal Type</th>
<th>Glass Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI51LP</td>
<td>1.5</td>
<td>W White</td>
<td>BLK Black</td>
<td>LT Loop Terminals</td>
<td>S Standard Glass</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td>TT Turret Terminals</td>
<td>N Non-glare Glass</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>WL Wire Leads</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Standard factory options are designated by "-Sxxx"

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64—All mounting hardware is black anodized aluminum. Mounting Torque: 5-7 in. lbs.

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
BITE INDICATORS

Model MI57DA

For Indicators qualified to MIL-PRF-83287/2, see page 28.

The MI57DA magnetic latching fault indicator displays a highly visible dual color internal flag when the indicator coil is pulsed by a BITE (Built-in Test Equipment) system. The “cloverleaf” pattern provides a high-contrast, visual identification and an effective warning of system results.

FEATURES

- Electrical reset
- Magnetic latching
- Positive identification
- Environmentally sealed
- Rear mount

OPERATION

When the indicator coil is energized with a 40 millisecond (or longer) pulse, the highly visible display disc rotates and latches to the magnetic core. The display disc will remain magnetically latched to the core in the position last pulsed. Even if the fault signal is removed, the indicator will “remember” that a fault had occurred. Return to the “No-fault” position is accomplished electromechanically by pulsing a separate coil.

ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Standard coil voltages and resistances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Voltage DC</td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>5.0</td>
</tr>
<tr>
<td>12.0</td>
</tr>
<tr>
<td>28.0</td>
</tr>
</tbody>
</table>

Pulse Power: One Watt. Nominal
Nominal Pulse Length: 40 milliseconds, minimum with a maximum rise time of 5 milliseconds
Dielectric Withstanding Voltage: 500 VAC RMS
Insulation Resistance: 100 megohms minimum at 500 VDC

MECHANICAL SPECIFICATIONS

Case: Black, anodized aluminum.
Mounting: Rear mount (D-hole or keyed washer).
Display Colors: “No-fault” is black, “Fault” is black/white
Leads: WL—Eight inches of #26 AWG Teflon insulated wire leads, turret terminals (TT), and loop terminals (LT).
Glass: Standard (S), Non-glare (N)

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65°C to +125°C
Vibration*:
- Sinusoidal: .06” D.A. or 20 Gs Peak, whichever is less, 10Hz to 2kHz per MIL STD 202, Method 204, Test Condition D
- Random: 11.6 Gs per MIL STD 202, Method 214, Test Condition D, Curve 1
Shock: 100 Gs MIL STD 202, Method 213, Test Condition I
Moisture Resistance: (Humidity): MIL STD 202, Method 106
Thermal Shock: MIL STD 202, Method 107, Test Condition B
Salt Spray: MIL STD 202, Method 101, Test Condition B
Barometric Pressure: 100,000 ft. MIL STD 202, Method 105, Test Condition D, 350 VAC RMS
Life: 100,000 cycles

* (During vibration testing caution should be taken to shield the indicator from the strong magnetic field.)
Optional: RFI panel shielding available

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
**ORDERING INFORMATION**

When ordering, show model number first, coil voltage, the color combination desired, terminal type, and glass type. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:
Basic model with front panel threaded case for 12 volts with black/white as set color and all black as reset color, wire leads, non-glare glass would be Model MI57DA-12-W/BLK-WL-N.

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Coil Voltage</th>
<th>Fault or Set Color</th>
<th>No-fault or Reset Color</th>
<th>Terminal Type</th>
<th>Glass Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI57DA</td>
<td>5</td>
<td>Black/White</td>
<td>Black</td>
<td>LT Loop Terminals</td>
<td>S Standard Glass</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td>TT Turret Terminals</td>
<td>N Non-glare Glass</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td></td>
<td></td>
<td>WL Wire Leads</td>
<td></td>
</tr>
</tbody>
</table>

Standard factory options are designated by "-Sxx".
Models MI61SA and RA®
For Indicators qualified to MIL-PRF-83287/1, see page 28.

The MI61SA and RA® (MIL-PRF-83287/1) series magnetic latching fault indicators display highly visible dual color internal flag when the indicator coil is pulsed by a BITE (Built-In Test Equipment) system. The “cloverleaf” pattern provides a high contrast visual indication and an effective warning of system results.

FEATURES
- Manual reset return
- Magnetic latching
- Environmentally sealed
- Random vibration capability

OPERATION
When the indicator coil is energized with a 40 millisecond (or longer) pulse, the highly visible display disc rotates and latches to the magnetic core. The display disc will remain magnetically latched to the core in the position last pulsed. Even if the fault signal is removed, the indicator will “remember” that a fault had occurred. Return to the “No-fault” position is accomplished mechanically by rotating the knurled knob clockwise to 60°. The knob automatically returns to its normal position. Optional features include insulated lead wire or turret termination, non-glare lens, and RFI panel shield. Consult your representative or the factory for details.

ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Standard coil voltages and resistances</th>
<th>Nominal Voltage DC (V)</th>
<th>Operating Voltage Minimum (V)</th>
<th>Operating Voltage Maximum (V)</th>
<th>DC Coil Resistance in Ohms, @25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>2.4</td>
<td>3.6</td>
<td>8.5-18</td>
<td></td>
</tr>
<tr>
<td>5.0°</td>
<td>4.0</td>
<td>6.0</td>
<td>22-52.8</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>4.8</td>
<td>7.2</td>
<td>33-77</td>
<td></td>
</tr>
<tr>
<td>12.0</td>
<td>9.6</td>
<td>14.4</td>
<td>130-303</td>
<td></td>
</tr>
<tr>
<td>20.0</td>
<td>16.0</td>
<td>30.0</td>
<td>360-1225</td>
<td></td>
</tr>
<tr>
<td>24.0°</td>
<td>19.2</td>
<td>28.8</td>
<td>530-880</td>
<td></td>
</tr>
<tr>
<td>28.0</td>
<td>22.4</td>
<td>30.0</td>
<td>720-1331</td>
<td></td>
</tr>
</tbody>
</table>

°MI61RA offered in 5VDC and 24VDC versions only.

Pulse Power: One Watt Nominal
Nominal Pulse Length: 40 milliseconds minimum with a maximum rise time of 5 milliseconds
Dielectric Withstanding Voltage: 500 VAC RMS
Insulation Resistance: 100 megohms minimum at 500 VDC
Electromagnetic Interference and Magnetic Susceptibility: Per MIL-PRF-83287. MI61SA and MI61RA will not malfunction or false transfer when subjected to a 20 ampere turn field at 400Hz.

MECHANICAL SPECIFICATIONS
Case: Black anodized aluminum
Mounting: Front-panel mount (D-hole or keyed washer)
Weight: 13 grams
Display Colors: “No-fault” is black “Fault” is black/white, as shown
Leads: WL-Eight inches of #26 teflon insulated standard wire leads or turret terminals (TT)
Glass: Standard (S), Non-glare (N)

ENVIRONMENTAL SPECIFICATIONS
Operating Temperature Range: -65°C to +125°C
Vibration*: Sinusoidal: .06” D.A. or 20 Gs Peak, whichever is less, 10Hz to 2kHz per MIL STD 202, Method 204, Test Condition D
Random: 11.6 Gs rms per MIL STD 202, Method 214, Test Condition D, Curve 1
Shock: 100 Gs MIL STD 202, Method 213, Test Condition I
Moisture Resistance: (Humidity): MIL STD 202, Method 106
Thermal Shock: MIL STD 202, Method 107, Test Condition B
Salt Spray: MIL STD 202, Method 101, Test Condition B
Barometric Pressure: 100,000 ft. MIL STD 202, Method 105, Test Condition D, with 350 VAC, RMS
Life: 10,000 cycles

* (During vibration testing caution should be taken to shield the indicator from the strong magnetic field.)

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.


**BITING INDICATORS**

**ORDERING INFORMATION**

When ordering, show model number first, coil voltage, the color combination desired, terminal type, and glass type. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:

Basic model for 12 volts with all black for reset (No-fault) color and black/white for set (Fault) color, turret terminals, non-glare glass would be Model MI61SA-12-W/BLK-TT-N.

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Coil Voltage</th>
<th>Fault or Set Color</th>
<th>No-fault or Reset Color</th>
<th>Terminal Type</th>
<th>Glass Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI61SA 3</td>
<td>12</td>
<td>Black/White</td>
<td>Black</td>
<td>TT Turret Terminals</td>
<td>S Standard Glass</td>
</tr>
<tr>
<td>MI61RA* 5</td>
<td>12</td>
<td>Black/White</td>
<td>Black</td>
<td>WL Wire Leads</td>
<td>N Non-glare Glass</td>
</tr>
</tbody>
</table>

MI61SA and RA* Standard factory options are designated by "Sxxx".

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± 0.10 (0.25) Fractions: ± 1/64—All mounting hardware is black anodized aluminum. Mounting Torque: 5-7 in-lbs.

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
**Model MI61SW**

*Meets MIL-PRF-83287*

The MI61SW series magnetic latching fault indicator displays highly visible dual color internal flag when the indicator coil is pulsed by a BITE (Built-In Test Equipment) system. The “cloverleaf” pattern provides a high contrast visual indication and an effective warning of system results.

**FEATURES**

- Manual reset return
- Magnetic latching
- Environmentally sealed
- Random vibration capability
- Internal switch

**OPERATION**

The indicator is set by energizing the coil with a 40 millisecond (or longer) pulse. The indicator will change from a normally all-black display to a distinctive black/white pattern visible through a window on the front of the indicator. The internal switch will also close. The display disc and the switch will remain magnetically latched to the core in the position last pulsed. Even if the fault signal is removed, the indicator and the switch will “remember” that a fault had occurred.

Return to the “No-fault” position is accomplished mechanically by rotating the knurled knob clockwise 60°. The knob automatically returns to its normal position.

**ELECTRICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Standard coil voltages and resistances</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model Number</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>MI61SW-6-M06</td>
</tr>
<tr>
<td>MI61SW-6-M08</td>
</tr>
<tr>
<td>MI61SW-12-M14</td>
</tr>
<tr>
<td>MI61SW-12-M16</td>
</tr>
<tr>
<td>MI61SW-24-M18</td>
</tr>
<tr>
<td>MI61SW-24-M20</td>
</tr>
</tbody>
</table>

- **Nominal Pulse Length:** 40 milliseconds minimum with a maximum risetime of 5 milliseconds
- **Dielectric Withstanding Voltage:** 500 VAC RMS
- **Resistance:** 100 megohms minimum at 500 VDC
- **Electromagnetic Interference and Magnetic Susceptibility:** Per MIL-PRF-83287. MI61SW will not malfunction or false transfer when subjected to a 20 ampere turn field at 400Hz.
- **Switch Rating:** 250mA at 28 VDC, non-inductive load

**MECHANICAL SPECIFICATIONS**

- **Case:** Black anodized aluminum
- **Mounting:** Front-panel mount (D-hole or keyed washer)
- **Weight:** 20 grams
- **Display Colors:** “No-fault” is black (Switch Open) “Fault” is black/white, as shown (Switch Closed)
- **Leads:** Turret terminals (TT), only

**ENVIRONMENTAL SPECIFICATIONS**

- **Operating Temperature Range:** -65°C to +125°C
- **Vibration**: *
  - **Sinusoidal:** .06” D.A. or 20 Gs Peak, whichever is less, 10Hz to 2kHz per MIL STD 202, Method 204, Test Condition D
  - **Random:** 11.6 Gs rms per MIL STD 202, Method 214, Test Condition D, Curve 1
- **Shock:** 100 Gs MIL STD 202, Method 213, Test Condition I
- **Moisture Resistance:** (Humidity): MIL STD 202, Method 106
- **Thermal Shock:** MIL STD 202, Method 107, Test Condition B
- **Salt Spray:** MIL STD 202, Method 101, Test Condition B
- **Barometric Pressure:** 100,000 ft., MIL STD 202, Method 105, Test Condition D, with 350 VAC, RMS
- **Life:** 10,000 cycles

* (During vibration testing caution should be taken to shield the indicator from the strong magnetic field.)

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
MANUAL RESET BITE INDICATORS
WITH NORMALLY OPEN SWITCH

ORDERING INFORMATION
When ordering, show model number first, coil voltage, and the lens coating desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:
Basic model for 12 volts with anti-reflection coated lens would be Model MI61SW-12-M16.

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Coil Voltage</th>
<th>Coated Lens</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI61SW</td>
<td>6</td>
<td>(Refer to chart on previous page)</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25) Fractions: ± 1/64—All mounting hardware is black anodized aluminum. Mounting Torque: 5-7 in. lbs.

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
Models MI61, LD & M

The MI61 series magnetic latching fault indicator displays a highly visible, dual-color drum when the indicator coil is pulsed by a BITE (Built-In Test Equipment) system. The drum provides a high contrast visual indication and an effective warning of system faults. The drum can accommodate a legend such as “GO” or “FAIL” when specific information needs to be displayed.

FEATURES
- Environmentally sealed
- Optional legend display
- Choice of self-restoring or magnetic latching types

OPERATION
When the indicator coil is energized with a 50 millisecond or longer pulse, the drum rotates to display the message or system status.

Model MI61M is a self-restoring, steady-state indicator that automatically returns to a neutral state when power is removed. It does not latch to the core magnet, but remains suspended in the position until power is removed.

Model MI61LD is a latching indicator that remains magnetically latched to the core in the position last pulsed.

For the MI61LD, a dual coil device, reset to the “No-fault” position is accomplished electronically by pulsing the reset coil.

MECHANICAL SPECIFICATIONS
Case: Black anodized aluminum with sealed glass window
Mounting: Front panel mount
Weight: 20 grams maximum
Display Colors: Any combination of: Black (Blk), White (W), Red (R), Orange (O), Yellow (Y), and Green (G)
Legend: Available maximum letter height 1/8”
Hardware: Units supplied with hex nut

ENVIRONMENTAL SPECIFICATIONS
Operating Temperature Range: -65°C to +125°C
Vibration*: 10 Gs, 10 to 2kHz, MIL STD 202
Shock: 50 Gs - MIL STD 202, Method 213, Condition G
Humidity: 95% relative humidity MIL STD 202, Method 103, Test Condition B
Salt Spray: MIL STD 202, Method 101, Test Condition B
Thermal Shock: MIL STD 202, Method 107, Test Condition B
Barometric Pressure: 100,000 ft. MIL STD 202, Method 105, Test Condition D
Operational Life: 10,000 cycles minimum
* (During vibration testing caution should be taken to shield the indicator from the strong magnetic field.)

ELECTRICAL SPECIFICATIONS
Power: Steady state for model MI61M – 1.5 Watts
Pulse Power for Latching Models: 1.5 Watts, minimal
Pulse Length for Latching Models: 50 ms min.
Dielectric Withstanding Voltage: 500 VDC case to terminals. 100 VDC coil to coil on dual coil units
Insulation Resistance: 100 megohms minimum at 500 VDC

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
BITE INDICATORS
LATCHING OR SELF-RESTORING

ORDERING INFORMATION

When ordering, show model number first, coil voltage, and the color combination desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:
Dual coil magnetically latching unit for 24 volts with black for the fault color and red for reset color would be: Model MI61LD-24-BLK/R.

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Coil Voltage</th>
<th>Fault or Set Color</th>
<th>Reset Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI61M</td>
<td>3</td>
<td>R Red</td>
<td>R Red</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>W White</td>
<td>W White</td>
</tr>
<tr>
<td>MI61LD</td>
<td>6</td>
<td>BLK Black</td>
<td>BLK Black</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>G Green</td>
<td>G Green</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>Y Yellow</td>
<td>Y Yellow</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>O Orange</td>
<td>O Orange</td>
</tr>
</tbody>
</table>

- Standard factory options are designated by ‘-Sxxx’
- MI61, LD and M

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64—All mounting hardware is black anodized aluminum. Mounting Torque: 5-7 in. lbs.

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
LARGE DISPLAY STATUS INDICATOR
FOR INDUSTRIAL APPLICATIONS

Model CI75 (Single Coil)
Model CID75 (Dual Coil)

The CI series large-display, status indicator features a highly visible dual color internal flag. Available in single and dual coil models. For industrial applications demanding large displays while subjected to outdoor elements, high ambient light areas and remote areas requiring low-power drain.

FEATURES

- Large 3/4” display
- Visible in bright light or in dimly lit area
- No bulbs to replace
- Low power usage
- No power needed when latched in either position
- Low cost
- Strong magnetic memory

OPERATION

When the indication coil is energized by a 50 millisecond or longer pulse, color display flips 180° and latches to coil core. Display will remain magnetically latched to the core in the position last pulsed. Even if the signal is removed, the indicator will “remember” the signal instruction.

Reset to black is accomplished electrically by pulsing a separate reset coil or by reversing polarity in the single coil unit. The display then remains magnetically latched to the core and remains black.

ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Nominal Voltage DC</th>
<th>Operating Voltage Minimum</th>
<th>Operating Voltage Maximum</th>
<th>CI75 Coil Resistance in Ohms, ±10% @ 25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>4.5</td>
<td>5.5</td>
<td>30*</td>
</tr>
<tr>
<td>6.0</td>
<td>5.5</td>
<td>6.5</td>
<td>41*</td>
</tr>
<tr>
<td>12.0</td>
<td>11.0</td>
<td>13.0</td>
<td>150*</td>
</tr>
<tr>
<td>20.0</td>
<td>18.0</td>
<td>22.0</td>
<td>460*</td>
</tr>
<tr>
<td>24.0</td>
<td>21.0</td>
<td>27.0</td>
<td>660*</td>
</tr>
<tr>
<td>28.0</td>
<td>25.0</td>
<td>31.0</td>
<td>875*</td>
</tr>
</tbody>
</table>

* Resistance for dual coil (CID75) units is approximately one-half the value listed for single coil, all models.

Nominal Operating Pulse Power (at 25°C): 900 mW (CI75); 1.8 W (CID75). Designed for pulse operation.

Operating Pulse Length: 50 ms min.

Reset Pulse Length: 50 ms min. (Max. “On” time 50%)

Dielectric Withstanding Voltage: 100 VDC coil to coil, for dual coil units. 500 VDC, terminals to mounting panel.

MECHANICAL SPECIFICATIONS

Case: Molded plastic, clear viewing lens
Mounting: Spring retainer, supplied with unit
Weight: 30 grams
Display Colors: Red (set) and Black (reset). Other colors or legends available.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -20°C to +85°C
Operational Life: 10,000 cycles minimum

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
ORDERING INFORMATION

When ordering, show model number first, coil voltage, and the color combination desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:
Single coil unit for 24 volt with red for set and black for reset would specify CI75-24-R/BLK.

CI75 - 24 - R / BLK - ( )

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Coil Voltage</th>
<th>Fault or Set Color</th>
<th>Reset Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI75</td>
<td>5</td>
<td>O Orange</td>
<td>BLK Black</td>
</tr>
<tr>
<td>CID75</td>
<td>6</td>
<td>R Red</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Y Yellow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>W White</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Dimensions in ( ) are mm. Tolerances: ±.020 (0.50)
MANUAL RESET POP-UP INDICATORS
WITH NORMALLY OPEN SWITCH

Model PL 25 AC

The PL 25 AC magnetic latching fault indicator displays highly visible white flag (button), when the indicator coil is pulsed by a BITE (Built-In Test Equipment) system.

FEATURES

- Push button, manual reset indicator
- Magnetic Latching
- Environmentally Sealed
- Random Vibration Capability
- Internal Switch

OPERATION

The Pop-Up Indicator is an electromechanical indicator encased in a brass housing measuring 1.38” x .315” x .325”. Electrical connection to the unit is made via 4 wire leads that have a standard 4” in length. When an electrical pulse (half wave rectified) is sent to the unit it causes a .25” diameter button to pop up approximately .05” to provide indication to the user that a fault has occurred. The internal magnet will then latch in place. The Pop-Up Indicator is manually reset by pressing down on the indicator and returning the indicator to its originally state. The magnet will keep the indicator in the “Reset” state until an electrical pulse of appropriate power is applied to the unit. The internal switch operates in conjunction with the operation of the fault indicator. When the indicator is in button down “Reset” position, the switch is closed. When indicator is in button up “Set” position, the switch is open.

ELECTRICAL SPECIFICATIONS

Pulse Length: 17 to 50 ms
Voltage Rating: 43 to 56 VDC, half wave rectified.
Insulation Resistance: 100 MOhms minimum at 500 VDC.
Dielectric Withstand Voltage: 1250 VRMS between closed switch and housing and between closed switch and coil; 1000 VRMS between coil winding and housing.
Switch Voltage Rating: 28 VDC.
Make / Carry / Brake Rating: 500 mA (400mA @ 32VDC)

MECHANICAL SPECIFICATIONS

Case: Brass, Alloy 260
Mounting: via .07” hole in the mounting flange
Weight: 8.5 g max.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -25°C to +105°C
Random Vibration: 4.9 g RMS, 3 axis, 5 hours per axis.
Shock: 15 g peak, half-sine pulse.
Moisture Resistance (Humidity): RTCA/DO 160, Section 6, Cat A.
Waterproofness: RTCA/DO 160, Section 10, Cat W.
Thermal Shock: MIL-STD-202, Method 107, Test Condition B, but temperatures are -40°C to +120°C.
Barometric Pressure: -2000 ft to 45000 ft, 2 hours each.
Operational Life: 10,000 cycles minimum

PATENTS

US Patent No. 0220896A1

ORDERING INFORMATION

Description: PL 25 AC. Standard Factory Options (Mounting Flange) are designated by “-Sxxx” at the end. Contact Sales for alternative mounting options.
MANUAL RESET POP-UP INDICATORS
WITH NORMALLY OPEN SWITCH

Model PL 25 AC (continued)

SCHEMATIC

COIL

(+)

(−)

FAULT

SWITCH DIAGRAM SHOWN IN NON-FAULT MODE

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
Model PL 25 DC

The PL 25 DC magnetic latching fault indicator displays highly visible white flag (button), when the indicator coil is pulsed by a BITE (Built-In Test Equipment) system.

FEATURES

- Push button, manual reset indicator
- Magnetic Latching
- Environmentally Sealed
- Random Vibration Capability
- Internal Switch

OPERATION

The Pop-Up Indicator is an electromechanical indicator encased in an aluminum housing measuring 1.38” x .315” x .325”. Electrical connection to the unit is made via 4 wire leads that have a standard 4” in length. When an electrical pulse is sent to the unit it causes a .25” diameter button to pop up approximately .05” to provide indication to a user that a fault has occurred. The internal magnet will then latch in place. The Pop-Up Indicator is manually reset by pressing down on the indicator and returning the indicator to its originally state. The magnet will keep the indicator in the “Reset” state until an electrical pulse of appropriate power is applied to the unit. The internal switch operates in conjunction with the operation of the fault indicator. When the indicator is in button down “Reset” position, the switch is closed. When indicator is in button up “Set” position, the switch is open.

ELECTRICAL SPECIFICATIONS

Pulse Length: 17 to 50 ms
Voltage Rating: 18-32 VDC.
Insulation Resistance: 100 MOhms minimum at 500 VDC.
Dielectric Withstand Voltage: 1250 VRMS between closed switch and housing and between closed switch and coil; 1000 VRMS between coil winding and housing.
Switch Voltage Rating: 28 VDC.
Make/ Carry / Brake Rating: 500 mA (400mA @ 32VDC)

MECHANICAL SPECIFICATIONS

Case: Brass, Alloy 260
Mounting: via .07” hole in the mounting flange
Weight: 8.5 g max.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -25°C to +105°C
Random Vibration: 4.9 g RMS, 3 axis, 5 hours per axis.
Shock: 15 g peak, half-sine pulse.
Moisture Resistance (Humidity): RTCA/DO 160, Section 6, Cat A.
Waterproofness: RTCA/DO 160, Section 10, Cat W.
Thermal Shock: MIL-STD-202, Method 107, Test Condition B, non-operating temperatures are -40°C to +120°C.
Barometric Pressure: -2000 ft to 45000 ft, 2 hours each.
Operational Life: 5000 cycles.

PATENTS

US Patent No. 0220896A1

ORDERING INFORMATION

Description: PL 25 DC. Standard Factory Options (Mounting Flange) are designated by “-Sxxx” at the end. Contact Sales for alternative mounting options.
Model PL 25 DC (continued)

SCHEMATIC

SWITCH DIAGRAM SHOWN IN NON-FAULT MODE

L-3 Electrodynamics, Inc.
3975 McMann Rd. | Cincinnati, OH 45245 | Tel: 513-943-2000 | email: edi.info@L-3com.com | L-3com.com/EDI
These generalized circuits illustrate various methods of driving our electromagnetic indicators. Presently available semiconductor amplifiers and logic switches are used. The specific application will determine the complexity of the interfacing circuitry. General guidelines for the use of our indicators are also included.

Our indicators are electromagnetic devices which are typically low impedance. They are designed for specific voltages and require 50 mW to 1 watt and activating pulse widths of 20 to 100 milliseconds, depending on the device selected.

Because of the power and impedance levels a transistor switch is generally used as a driver from higher impedance sources. The transistor need not be high speed and is selected on the basis of its low “on” resistance and its current carrying ability at the highest ambient temperature encountered.

The indicator presents a highly inductive load which will cause a high voltage back-spike at the cessation of the “on” pulse. This may be removed by connecting a diode across the indicator as shown in Figure 1 (Some indicators already include this diode). Fast turn-on diodes are preferred.

The most common circuit employed by indicator users is the “open collector” transistor drive. It is used for both “set” and “reset” functions.

Eight channels of fault indication at higher currents may be controlled in the above manner by duplicating the output transistor circuit. If total power, voltage, and current requirements are met using sensitive indicators, the control circuit may consist of two ULN-2068 Darlington (quad) switches without using the transistor output stage.

**FIGURE 1**

The circuit on the left will be found in the succeeding circuits as the switch controlling the indicators.
Figure 2 circuit will reset all indicators from operation of one manually operated switch.

Figure 3 circuit will reset all indicators with one positive input pulse.

Figure 4 will selectively reset eight indicators depending upon which input of the sink driver is positively pulsed. Protective diodes are built into the driver.
A1 of Figure 5 may consist of any logic gate as an interference with the transistor driver. The logic gate and transistor driver may be replaced by a power relay driver to UHP-400, or UHP-402.

A fault consisting of a positive voltage on any one (or all) of the inputs to the driver will cause the indicator to "set".
CR1 insures that only the correct polarity current will flow in the set or reset coils. CR2 clamps the back-spike voltage which is present from either coil when power is suddenly removed.

2. The sensitivity of the indicator is specified as the voltage required at a minimum pulse duration to produce an indicator transfer.

In general, longer pulse applications will not reduce the peak pulse voltage required.

The pulse shape must be such that the required voltage is present over the minimum pulse length time to effect transfer.

Rise time of the applied pulse does not affect operation of the ball or drum indicators. Response is obtained to fast and slow pulses, DC, and rectified AC as long as the pulse has the prescribed amplitude and duration. The flag indicators will operate upon the application of a 40-millisecond minimum, DC voltage square wave pulse with a rise time of 5-millisecond maximum. The fault indicator does not operate satisfactorily from a slowly increasing ramp voltage due to the anti-vibration feature designed into the fault indicator.

3. The minimum operating voltage may be confused with minimum non-operating requirements. The minimum voltage is designed to operate well below the minimum operating voltage in order to insure that the unit will always operate at the minimum voltage at the maximum operating temperature specified. This is necessary because the coil resistance increases with an increase in ambient temperature.

4. Since the typical status indicator is a magnetic latching non-volatile device, the resistance to vibration may often be increased over specified values by reducing clearances and magnet spacing within the device.

In practically all instances, the amplitude of vibration a given type of indicator can withstand is proportional to the magnetic latching properties and therefore to the amount of voltage required for transfer. Therefore, higher vibration level resistance requires a higher voltage for transfer and an increase in the minimum operate voltage level.

MAGNETIC INTERACTION

The fundamental driving indicator elements are magnetic. To insure that the magnetic environment is free from an interfering field, the following should be considered:

1) Locate the indicators at least 0.5" apart, center to center, except where otherwise noted (some units can be mounted side by side).

2) Do not locate the device adjacent to magnetic sources such as power relays, transformers, etc.

3) Mount indicators on nonmagnetic material.

4) If it is impossible to follow the 3 rules above, then magnetic shielding may be necessary.

For further information please contact the sales department at L-3 Electrodynamics, Inc.
### FAULT INDICATORS

#### MILITARY CROSS REFERENCE GUIDE

**M83287/1**

**MANUAL RESET FLAG INDICATORS**

*See pages 12 & 13 for product specifications*

<table>
<thead>
<tr>
<th>MIL SPEC &amp; EDI NUMBER</th>
<th>COMMERCIAL NUMBER</th>
<th>GLASS TYPE</th>
<th>TERMINAL STYLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>M83287/01-01</td>
<td>M616SA-3-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/01-02</td>
<td>M616SA-3-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-03*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-04*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-05</td>
<td>M616SA-5-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/01-06</td>
<td>M616SA-5-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-07*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-08*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-09</td>
<td>M616SA-6-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/01-10</td>
<td>M616SA-6-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-11*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-12*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-13</td>
<td>M616SA-12-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/01-14</td>
<td>M616SA-12-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-15*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-16*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-17</td>
<td>M616SA-24-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/01-18</td>
<td>M616SA-24-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-19*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-20*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-21</td>
<td>M616SA-28-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/01-22</td>
<td>M616SA-28-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-23*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-24*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-25</td>
<td>M616SA-28-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/01-26</td>
<td>M616SA-28-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-27*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-28*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-29</td>
<td>M616RA-5-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/01-30</td>
<td>M616RA-5-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-31*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-32*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-33</td>
<td>M616RA-24-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/01-34</td>
<td>M616RA-24-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-35*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
<tr>
<td>M83287/01-36*</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
<td>SOLDER TERM</td>
</tr>
</tbody>
</table>

* Consult the factory for a commercial part number.

Qualified products purchased to the Military Part Number comply with the latest revision of the applicable Military Specification. Commercial, Non-Qualified, and EDI versions of Military Specification products are designed in accordance with the applicable Military Specification, but may not be tested and/or qualified per said Military Specification.

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.
### FAULT INDICATORS
### MILITARY CROSS REFERENCE GUIDE

**M83287/3**
**BALL INDICATORS**

<table>
<thead>
<tr>
<th>MIL SPEC &amp; EDI NUMBER</th>
<th>COMMERCIAL NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>M83287/03-01</td>
<td>BHGD21T3-W/BLK</td>
</tr>
<tr>
<td>M83287/03-02</td>
<td>BHGD21T6-W/BLK</td>
</tr>
<tr>
<td>M83287/03-03</td>
<td>BHGD21T12-W/BLK</td>
</tr>
<tr>
<td>M83287/03-04</td>
<td>BHGD21T24-W/BLK</td>
</tr>
<tr>
<td>M83287/03-05</td>
<td>BHGD21T28-W/BLK</td>
</tr>
<tr>
<td>M83287/03-06</td>
<td>BHGD21T3-W/BLK</td>
</tr>
<tr>
<td>M83287/03-07</td>
<td>BHGD21T6-W/BLK</td>
</tr>
<tr>
<td>M83287/03-08</td>
<td>BHGD21T12-W/BLK</td>
</tr>
<tr>
<td>M83287/03-09</td>
<td>BHGD21T24-W/BLK</td>
</tr>
<tr>
<td>M83287/03-10</td>
<td>BHGD21T28-W/BLK</td>
</tr>
<tr>
<td>M83287/03-11</td>
<td>BHGD21T3-W/BLK</td>
</tr>
<tr>
<td>M83287/03-12</td>
<td>BHGD21T6-W/BLK</td>
</tr>
<tr>
<td>M83287/03-13</td>
<td>BHGD21T12-W/BLK</td>
</tr>
<tr>
<td>M83287/03-14</td>
<td>BHGD21T24-W/BLK</td>
</tr>
<tr>
<td>M83287/03-15</td>
<td>BHGD21T28-W/BLK</td>
</tr>
<tr>
<td>M83287/03-16</td>
<td>BHGD21T3-W/BLK</td>
</tr>
<tr>
<td>M83287/03-17</td>
<td>BHGD21T6-W/BLK</td>
</tr>
<tr>
<td>M83287/03-18</td>
<td>BHGD21T12-W/BLK</td>
</tr>
<tr>
<td>M83287/03-19</td>
<td>BHGD21T24-W/BLK</td>
</tr>
<tr>
<td>M83287/03-20</td>
<td>BHGD21T28-W/BLK</td>
</tr>
<tr>
<td>M83287/03-21</td>
<td>BHGD21T5-W/BLK</td>
</tr>
<tr>
<td>M83287/03-22</td>
<td>BHGD21T5-W/BLK</td>
</tr>
<tr>
<td>M83287/03-23</td>
<td>BHGD21T5-W/BLK</td>
</tr>
<tr>
<td>M83287/03-24</td>
<td>BHGD21T5-W/BLK</td>
</tr>
</tbody>
</table>

**MI51LP**
**MECHANICAL RESET LOW POWER FLAG INDICATORS**

<table>
<thead>
<tr>
<th>MIL SPEC &amp; EDI NUMBER</th>
<th>COMMERCIAL NUMBER</th>
<th>GLASS TYPE</th>
<th>THERMAL STYLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>M83287/04-01*</td>
<td>MI51LP-1.5-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-02*</td>
<td>MI51LP-1.5-W/BLK-WL-N</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-03*</td>
<td>MI51LP-1.5-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-04*</td>
<td>MI51LP-1.5-W/BLK-TT-N</td>
<td>NON-GLARE</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-05*</td>
<td>MI51LP-3-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-06*</td>
<td>MI51LP-3-W/BLK-WL-N</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-07*</td>
<td>MI51LP-3-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-08*</td>
<td>MI51LP-3-W/BLK-TT-N</td>
<td>NON-GLARE</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-09*</td>
<td>MI51LP-6-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-10*</td>
<td>MI51LP-6-W/BLK-WL-N</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-11*</td>
<td>MI51LP-6-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-12*</td>
<td>MI51LP-6-W/BLK-TT-N</td>
<td>NON-GLARE</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-13*</td>
<td>MI51LP-12-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-14*</td>
<td>MI51LP-12-W/BLK-WL-N</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-15*</td>
<td>MI51LP-12-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-16*</td>
<td>MI51LP-12-W/BLK-TT-N</td>
<td>NON-GLARE</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-17*</td>
<td>MI51LP-24-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-18*</td>
<td>MI51LP-24-W/BLK-WL-N</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-19*</td>
<td>MI51LP-24-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-20*</td>
<td>MI51LP-24-W/BLK-TT-N</td>
<td>NON-GLARE</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-21*</td>
<td>MI51LP-28-W/BLK-WL-S</td>
<td>STANDARD</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-22*</td>
<td>MI51LP-28-W/BLK-WL-N</td>
<td>NON-GLARE</td>
<td>26 G LEADS</td>
</tr>
<tr>
<td>M83287/04-23*</td>
<td>MI51LP-28-W/BLK-TT-S</td>
<td>STANDARD</td>
<td>TURRETT</td>
</tr>
<tr>
<td>M83287/04-24*</td>
<td>MI51LP-28-W/BLK-TT-N</td>
<td>NON-GLARE</td>
<td>TURRETT</td>
</tr>
</tbody>
</table>

*MIL Spec numbers are no longer available

Qualified products purchased to the Military Part Number comply with the latest revision of the applicable Military Specification. Commercial, Non-Qualified, and EDI versions of Military Specification products are designed in accordance with the applicable Military Specification, but may not be tested and/or qualified per said Military Specification.

This page consists of basic marketing information that is not defined as technical data under EAR Part 772.