L-3 ELECTRODYNAMICS, INC.

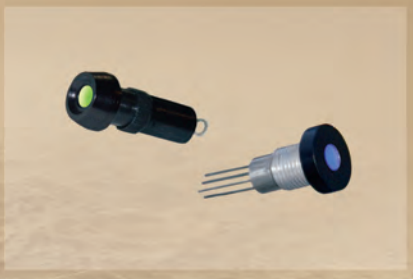
STATUS INDICATORS

RUGGEDIZED STATUS INDICATORS

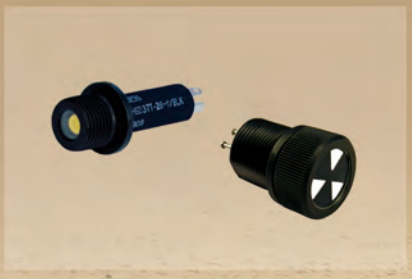
COMMERCIAL | MILITARY

Event Counter / Hour Meter
ETIs

Filtered / NVIS
LEDs



Flag / Ball / Drum Display
Indicators



L-3 Electrodynamics, Inc.

CONTENTS

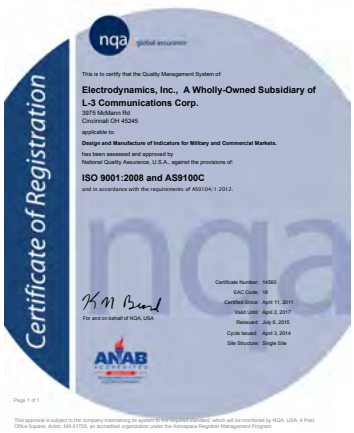
L-3 Electrodynamics, Inc. (L-3 EDI) designs and manufactures a wide range of high-reliability and military specification electromechanical, electromagnetic, and solid-state status indicators. In addition, L-3 EDI provides custom products and solutions that meet or exceed the requirements of the U.S. and international military and aerospace markets from our company-owned manufacturing facility in Cincinnati, Ohio.

Our products include a wide variety of the following indicators:

- Electromechanical and solid-state hour meters and event counters
- Electromagnetic fault indicators
- LED indicators and light filters, including NVIS and infrared secure indicators
- Custom solutions, including value-added assembly

Committed to providing the highest level of quality, L-3 EDI has developed and maintains an ISO 9001/AS9100 certified Quality Management System. In addition, we manage a mature Lean Six Sigma program that insures continuous improvement and offers reliable and accurate product support.

We invite you to review our product line presented in this catalog and choose from an array of standard offerings or ask us about customizing a product to meet your specific application. You can contact our Sales Department by phone at (513) 943-2000, via email at **EDI.info@L-3com.com**, or on the web at **www.L-3com.com/EDI**.



ISO 9001/AS9100 Certification

QUALITY POLICY "DO IT ONCE, DO IT RIGHT."

L-3 Electrodynamics is committed to meet or exceed all of our customer's requirements and expectations, using continual improvement methods.

Eric Ellis, President

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NON-VOLATILE BALL, DRUM & FLAG STATUS 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.

Fig. 1
Miniature BITE, Latching
Model BHG/BHGD, BIS

Fig. 2
Low Power BITE
Model MI51LP

Fig. 3
Rear Mount
Model MI57DA

Fig. 4
Dual color BITE
Model MI61SA

Fig. 5
Dual color with Switch
Model MI61SW

Fig. 6
Latching or Self-restoring
Model MI61L, LD & M

Fig. 7
Large display
Model CI/CID75

Fig. No.	Models	Environ Sealed	Magnetic Latching	Manual Reset	Electrical Reset	Rear Mount	Panel Mount	Latched Switch	Comment	Page No.
1	BHG, BHGD	•	•		•	•	•		High Visibility	4
1	BIS	•				•	•		Self Restoring	6
2	MI51LP	•	•	•			•		Low power; 50mW sensitivity	8
3	MI57DA	•	•		•	•			Rear Mount	10
4	MI61SA, RA	•	•	•			•		Dual color BITE	12
5	MI61SW	•	•	•	•		•	•	Dual color with Switch	14
6	MI61, LD & M	•	•		•(LD)		•		Optional legend display	16
7	CI75, CID75		•		•		•		Single coil; Dual coil models	18

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

For indicators qualified to MIL-PRF-83287/3, see page 29.

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

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

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

BHGD21

BHGD37T

BHGD27T

BHGD21T

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, BHG37T 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.)

L-3 Electrodynamics, Inc.
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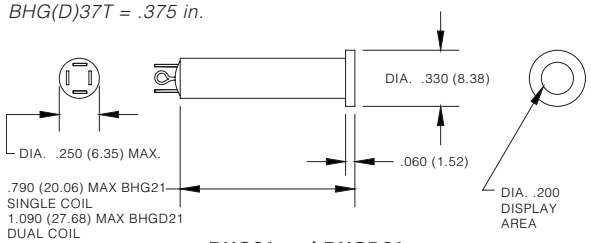
ORDERING INFORMATION

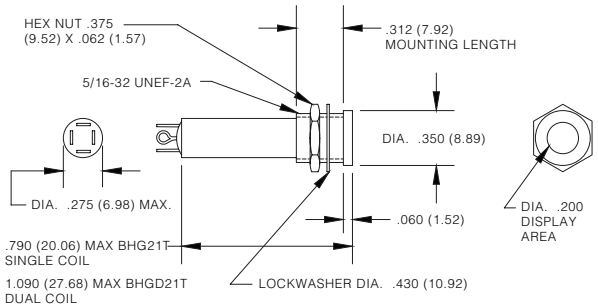
When ordering, show model number first, coil voltage and the color combination desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

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.

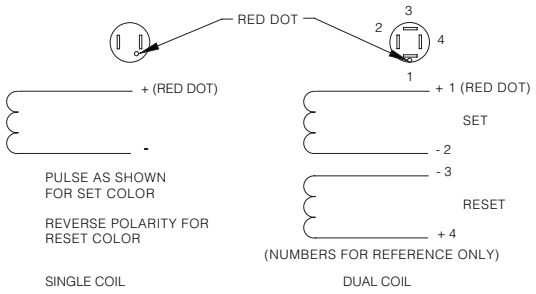
Recommended cut-outs:
BHG(D)21 = .265 in., BHG(D)21T & BHG(D)27T = .315 in.,
BHG(D)37T = .375 in.



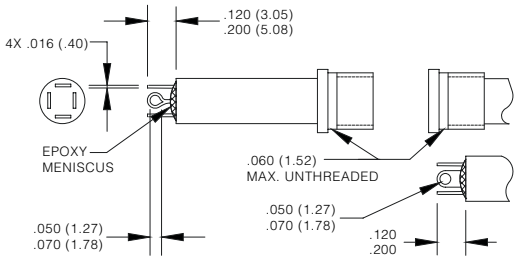
BHG21 and BHGD21



BHG21T and BHGD21T



ELECTRICAL DATA



MECHANICAL DATA

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.

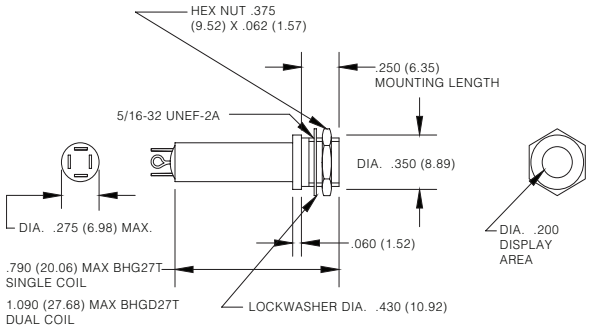
BHG21T - 12 - W / BLK - ( )

Standard factory options are designated by "-Sxxx"

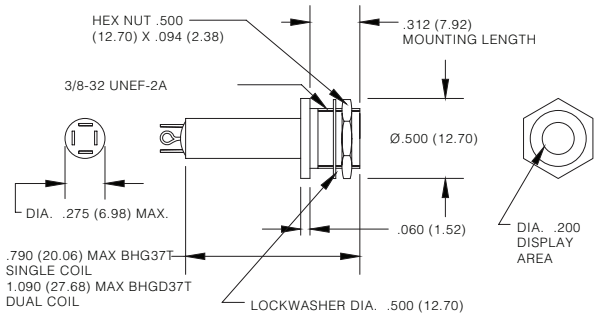
Basic Model Number	Coil Voltage	Fault or Set Color	No-fault or Reset Color
BHG21	1.5	R Red	R Red
BHG21T	3	W White	W White
BHG27T	5	BLK Black	BLK Black
BHG37T	6	G Green	G Green
BHGD21	12	Y Yellow	Y Yellow
BHGD21T	24	O Orange	O Orange
BHGD27T	28		

BHG.....TL = Domed lens

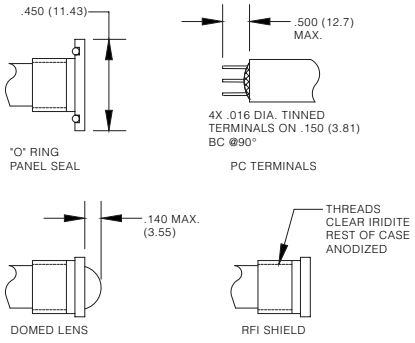
* MIL qualified indicators Set/Reset colors are White/Black



BHG27T and BHGD27T



BHG37T and BHGD37T



OPTIONS AVAILABLE (consult factory)

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

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
- Small, lightweight
- Sunlight readable
- 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

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

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.)

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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.

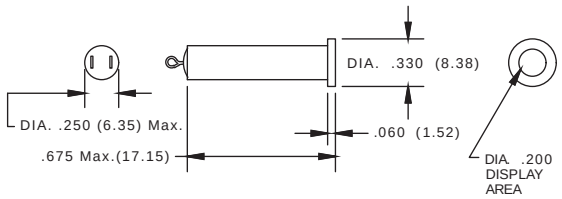
BIS21T - 12 - W / BLK - ( )

Standard factory options are designated by "-Sxxx"

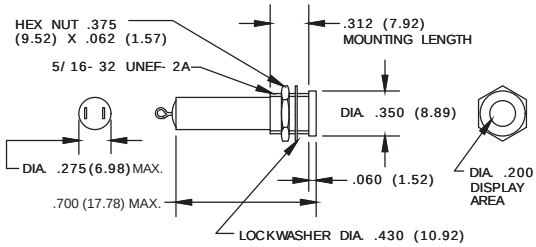
Basic Model Number	Coil Voltage	Fault or Set Color	No Fault or Reset Color
BIS21	1.5	R Red	R Red
BIS21T	3	W White	W White
BIS27T	5	BLK Black	BLK Black
BIS37T	6	G Green	G Green
	12	Y Yellow	Y Yellow
	24	O Orange	O Orange
	28		

BIS.....TL = Domed lens

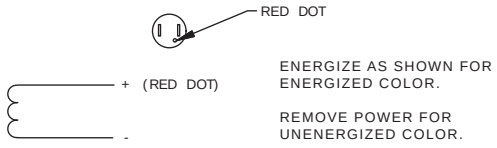
Recommended cut-outs:
BIS21 = .265 in., BIS21T & BIS27T = .315 in., BIS37T = .375 in.



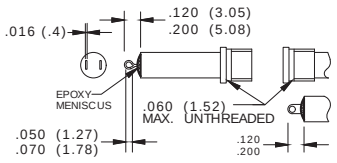
BIS21



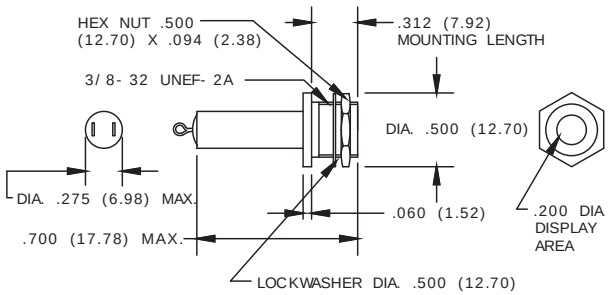
BIS21T



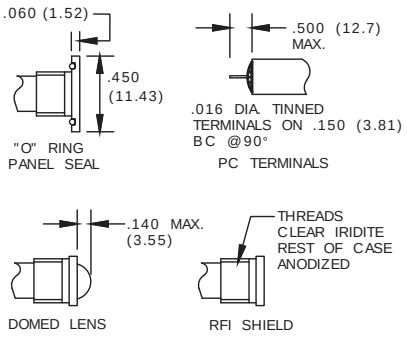
ELECTRICAL DATA



MECHANICAL DATA



BIS37T



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.

MI51LP

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 latches 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

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

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
350 volts AC RMS

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.)

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ORDERING INFORMATION

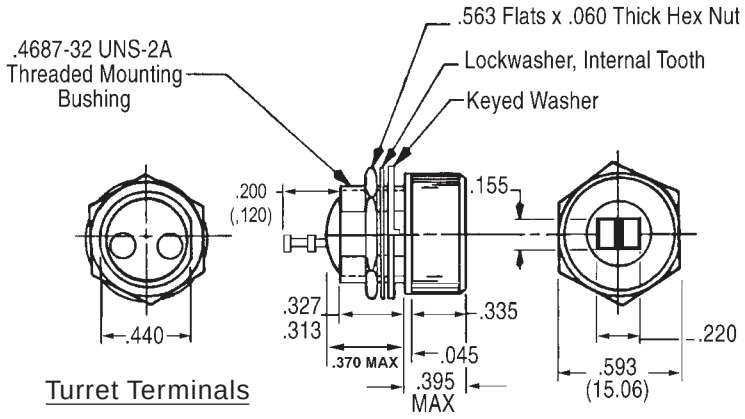
When ordering, show model number first, coil voltage, the color combination desired, terminal type, and glass type. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

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.

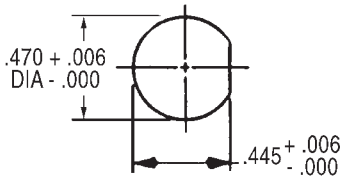
MI51LP - 12 - W / BLK - TT - S - ( )

Standard factory options are designated by "-Sxxx"

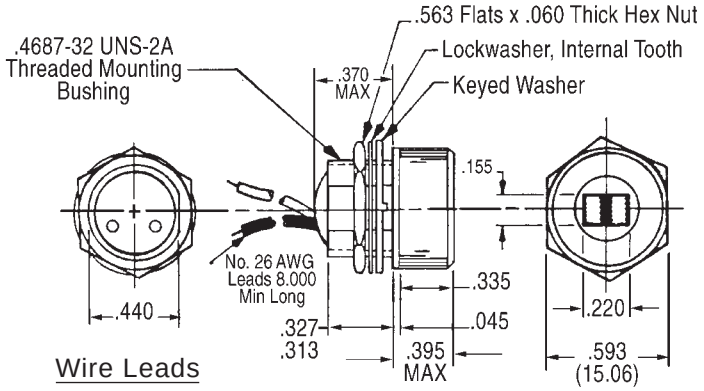
Basic Model Number	Coil Voltage	Fault Color	No-fault or Reset Color	Terminal Type	Glass Type
MI51LP	1.5	W White	BLK Black	LT Loop Terminals	S Standard Glass
	3			TT Turret Terminals	N Non-glare Glass
	5			WL Wire Leads	
	6				
	12				
	24				
	28				



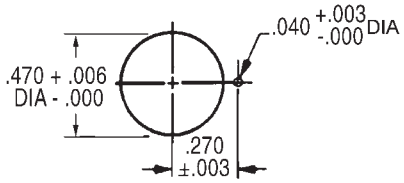
Turret Terminals



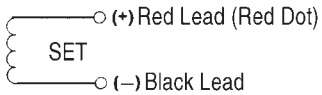
Panel Layout



Wire Leads



Optional Panel Layout Using Keyed Washer



Schematic

MI 51LP

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 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.

MI57DA

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

Standard coil voltages and resistances			
Nominal Voltage DC	Operating Voltage Minimum	Operating Voltage Maximum	DC Coil Resistance in Ohms, @25°C
5.0	4.0	6.0	19-35
12.0	9.6	14.4	130-230
28.0	22.4	30.0	675-880

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

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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.

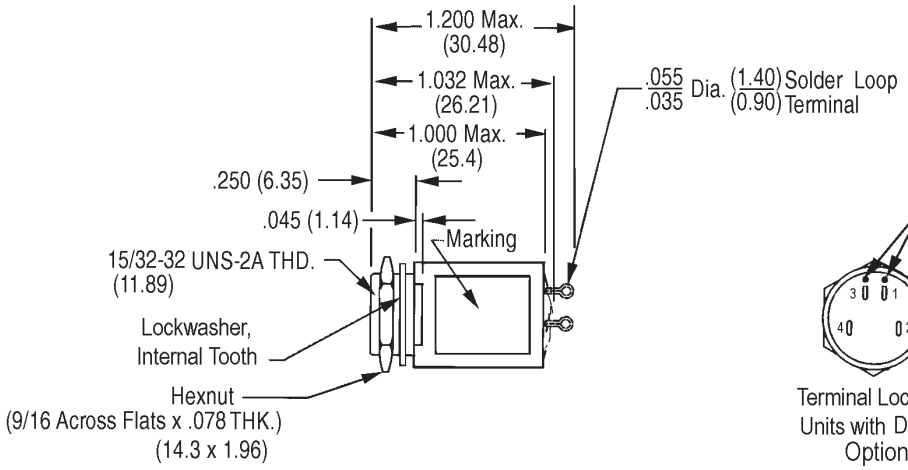
Example:
Basic model with front panel threaded case for 12 volts with black/white as set color and all black as reset color, wire leads, non-glare glass would be Model MI57DA-12-W/BLK-WL-N.

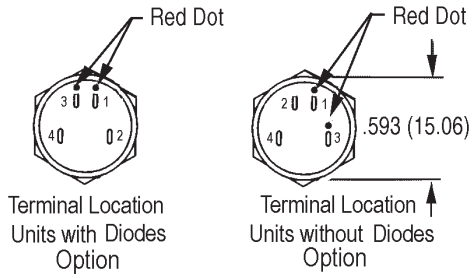
MI57DA - 12 - W / BLK - WL - S - ( )

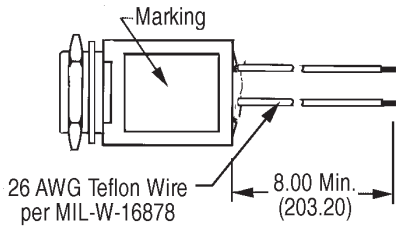
Standard factory options are designated by "-Sxxx"

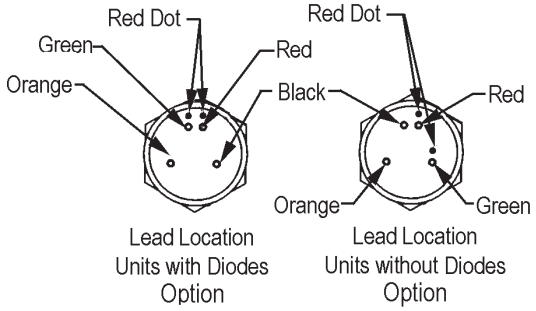
Basic Model Number	Coil Voltage	Fault or Set Color	No-fault or Reset Color	Terminal Type	Glass Type
MI57DA	5	Black/White	Black	LT Loop Terminals	S Standard Glass
	12			TT Turret Terminals	N Non-glare Glass
	28			WL Wire Leads	

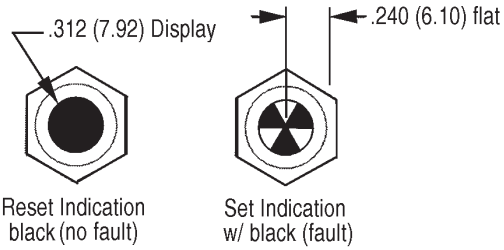
Loop Terminal Option

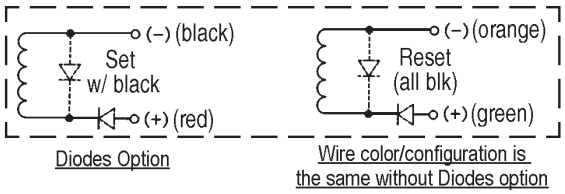


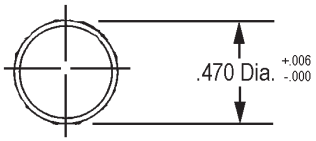












Panel Layout

MI57DA

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.

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Models MI61SA and RA①

For Indicators qualified to MIL-PRF-83287/1, see page 28.

The MI61SA and RA① (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.

MI61SA

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

Standard coil voltages and resistances			
Nominal Voltage DC	Operating Voltage Minimum	Operating Voltage Maximum	DC Coil Resistance in Ohms, @25°C
3.0	2.4	3.6	8.5-18
5.0①	4.0	6.0	22-52.8
6.0	4.8	7.2	33-77
12.0	9.6	14.4	130-303
20.0	16.0	30.0	360-1225
24.0①	19.2	28.8	530-880
28.0	22.4	30.0	720-1331

①*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.)

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ORDERING INFORMATION

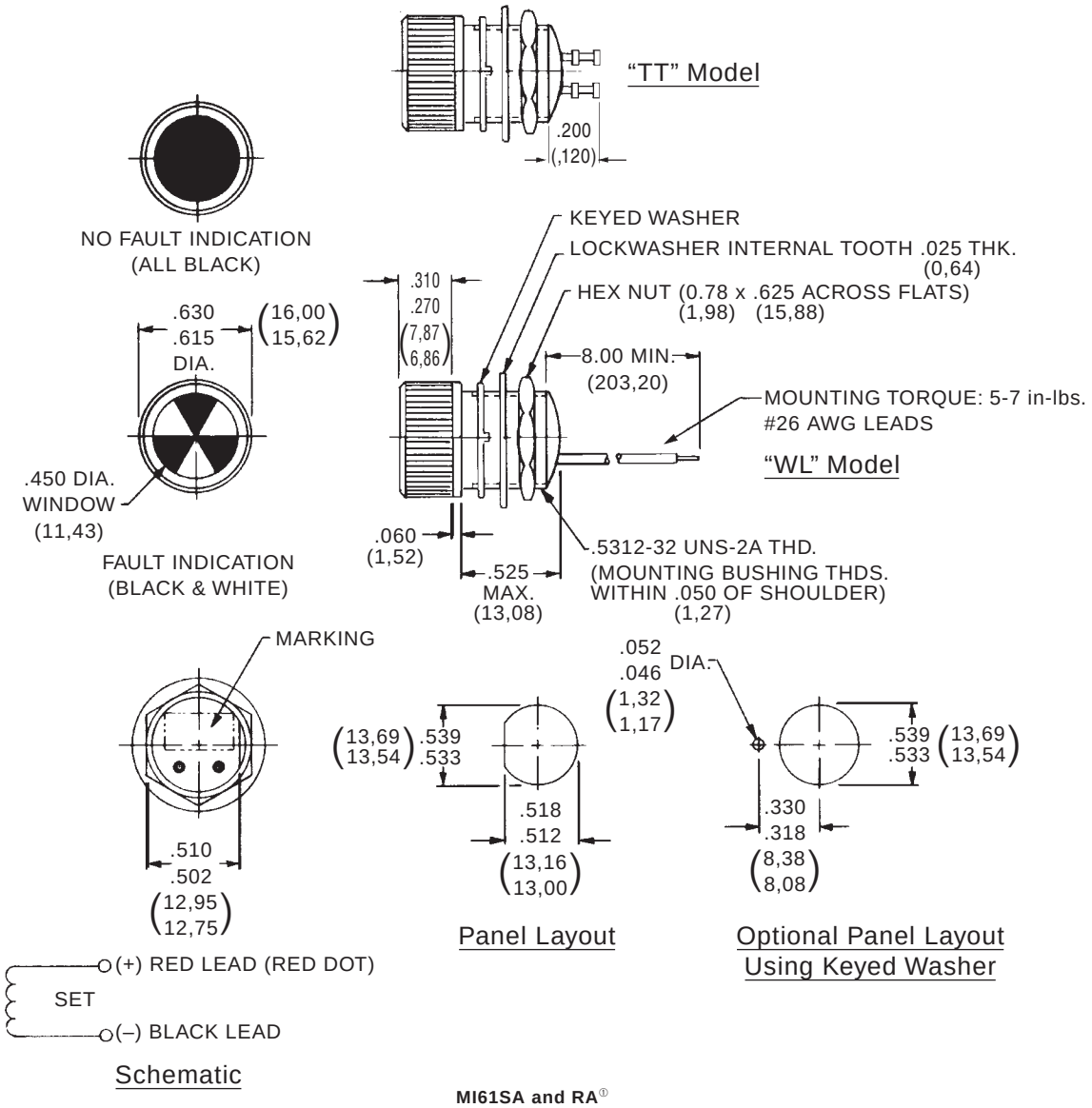
When ordering, show model number first, coil voltage, the color combination desired, terminal type, and glass type. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

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.

MI61SA - 12 - W / BLK - TT - S - ( )

Standard factory options are designated by "-Sxxx"

Basic Model Number	Coil Voltage	Fault or Set Color	No-fault or Reset Color	Terminal Type	Glass Type
MI61SA	3	Black/White	Black	TT Turret Terminals	S Standard Glass
MI61RA①	5			WL Wire Leads	N Non-glare Glass
	6				
	12				
	20				
	24				
	28				



MI61SA and RA①

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.

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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.

MI61SW

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

Standard coil voltages and resistances

Model Number	Anti-Reflection Coated Lens No	Anti-Reflection Coated Lens Yes	Operating Voltage (DC) Rated	Min.	Max.	DC Coil Resistance in Ohms @25°C
MI61SW-6-M06	X		6.0	4.8	7.2	30-36
MI61SW-6-M08		X				
MI61SW-12-M14	X		12.0	9.6	14.4	248-303
MI61SW-12-M16		X				
MI61SW-24-M18	X		24.0	19.2	28.8	513-627
MI61SW-24-M20		X				
MI61SW-28-M22	X		28.0	22.4	30.0	1090-1331
MI61SW-28-M24		X				

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.)

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ORDERING INFORMATION

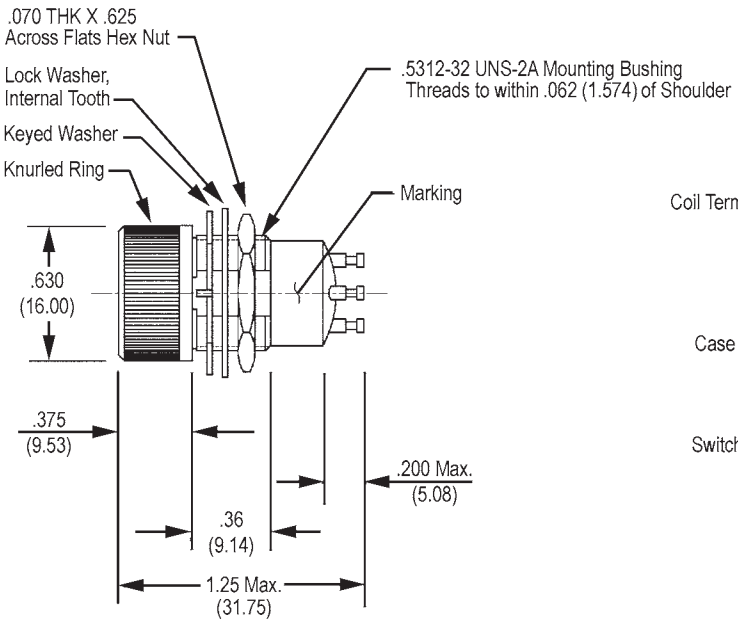
When ordering, show model number first, coil voltage, and the lens coating desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

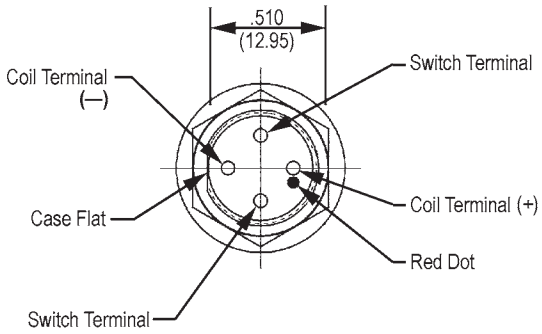
Example:
Basic model for 12 volts with anti-reflection coated lens would be Model MI61SW-12-M16.

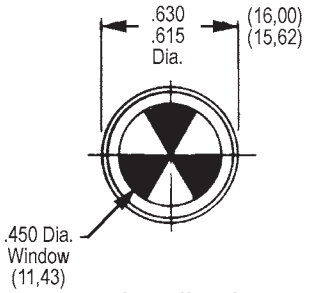
MI61SW - 12 - M16 - ( )

Standard factory options are designated by "-Sxxx"

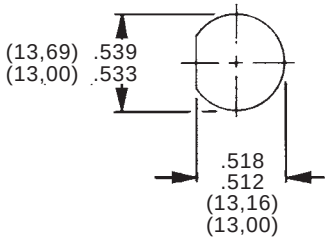
Basic Model Number	Coil Voltage	Coated Lens
MI61SW	6	(Refer to chart on previous page)
	12	
	24	
	28	



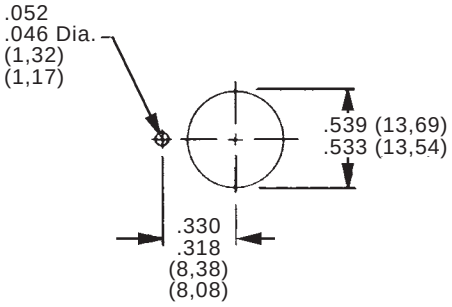




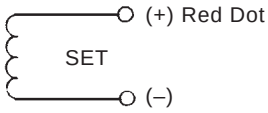
Fault Indication
(Black & White)



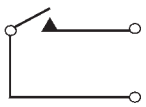
Panel Layout



Optional Panel Layout
Using Keyed Washer



Coil Diagram



Switch Diagram
(Switch shown in
Reset Position)

MI61SW

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.

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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.

ELECTRICAL SPECIFICATIONS

Standard coil voltages and resistances						
Standard Coil Voltages and Resistance: *Resistance ± 10% shown at 25°C.*						
DC Voltage	3.0	5.0	6.0	12.0	24.0	28.0
Resistance (Ohms)	6.0	20.0	24.0	103.0	385.0	520.0

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

MI61M

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.)

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ORDERING INFORMATION

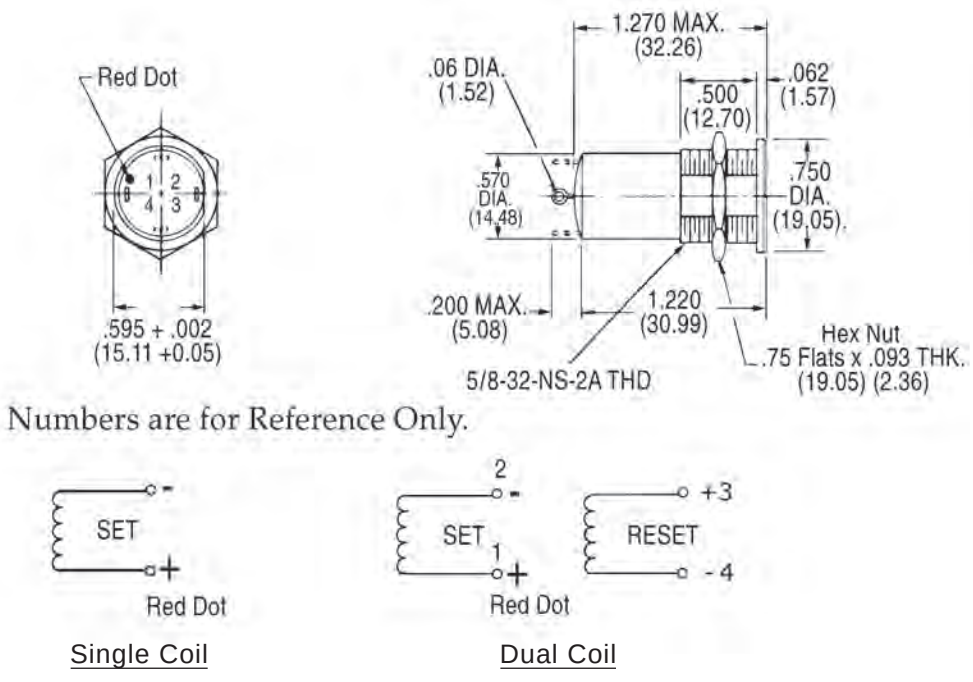
When ordering, show model number first, coil voltage, and the color combination desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

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.

MI61LD - 24 - BLK / R - ( )

Standard factory options are designated by "-Sxxx"

Basic Model Number	Coil Voltage	Fault or Set Color	Reset Color
MI61M	3	R Red	R Red
	5	W White	W White
MI61LD	6	BLK Black	BLK Black
	12	G Green	G Green
	24	Y Yellow	Y Yellow
	28	O Orange	O Orange



Single Coil

Dual Coil

Panel Cut-out

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.

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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

Standard coil voltages and resistances			
Nominal Voltage DC	Operating Voltage Minimum	Operating Voltage Maximum	CI75 Coil Resistance in Ohms, ± 10%@25°C
5.0	4.5	5.5	30*
6.0	5.5	6.5	41*
12.0	11.0	13.0	150*
20.0	18.0	22.0	460*
24.0	21.0	27.0	660*
28.0	25.0	31.0	875*

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

CID75

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

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ORDERING INFORMATION

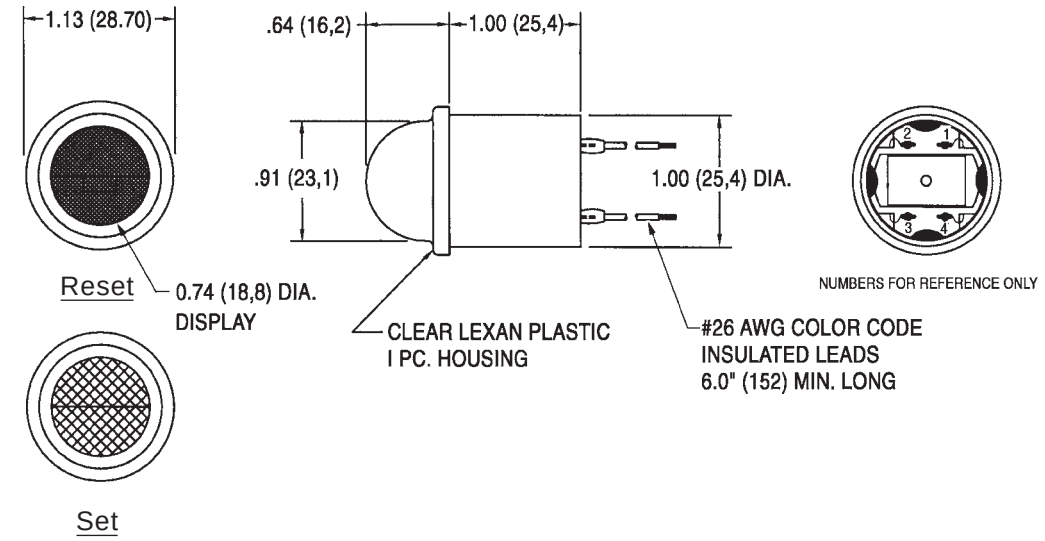
When ordering, show model number first, coil voltage, and the color combination desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

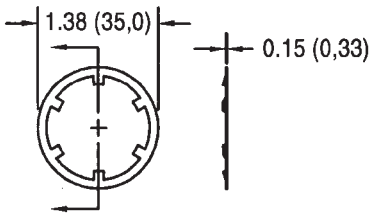
Example:
Single coil unit for 24 volt with red for set and black for reset would specify CI75-24-R/BLK.

CI75 - 24 - R / BLK - ( )

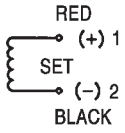
Standard factory options are designated by "-Sxxx"

Basic Model Number	Coil Voltage	Fault or Set Color	Reset Color
CI75	5	O Orange	BLK Black
CID75	6	R Red	
	12	Y Yellow	
	20	W White	
	24		
	28		



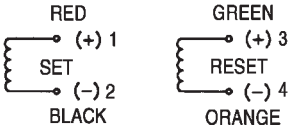


NOTE
SPRING RETAINER CLIP FOR MOUNTING
TO PANEL IS SUPPLIED WITH UNIT



Schematic
Single Coil

(To reset, reverse polarity of applied voltage)



Schematic
Dual Coil

CI75 and CID75

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .020 (0.50)

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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 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: 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)

PL 25 AC

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.

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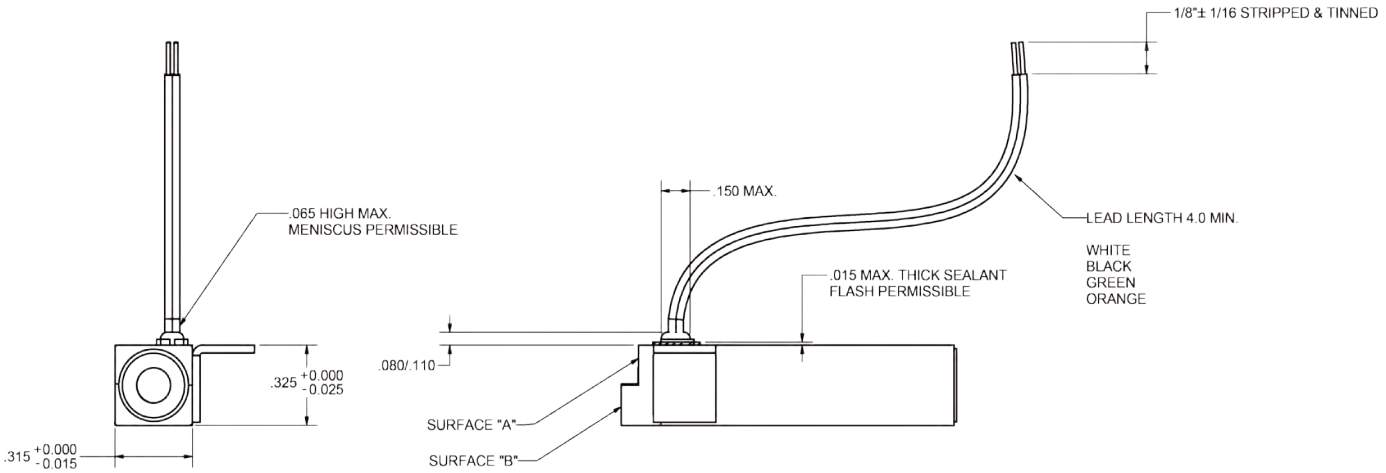
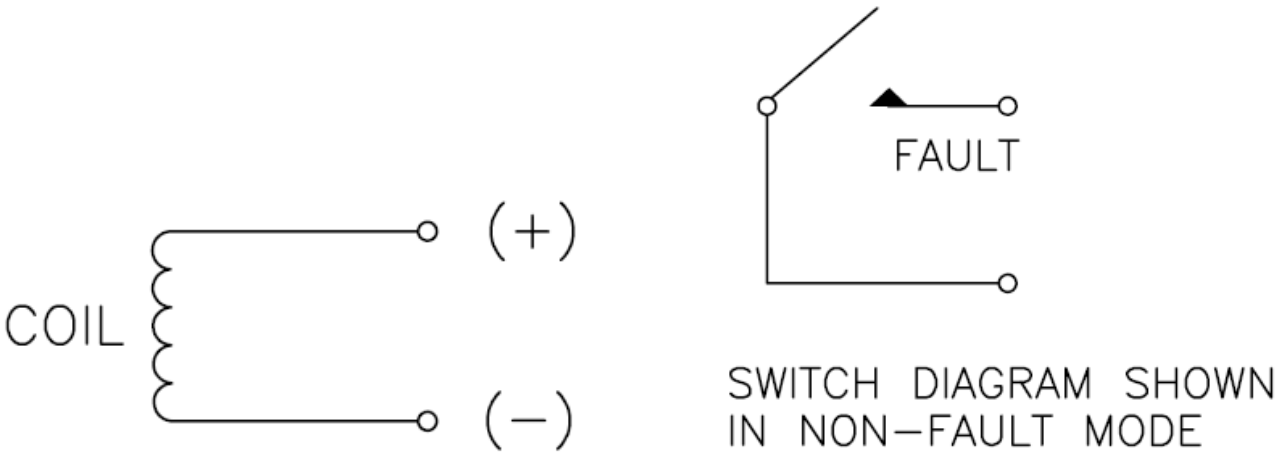
Model PL 25 AC (continued)





SCHEMATIC

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)

PL 25 DC

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.

L-3 Electrodynamics, Inc.
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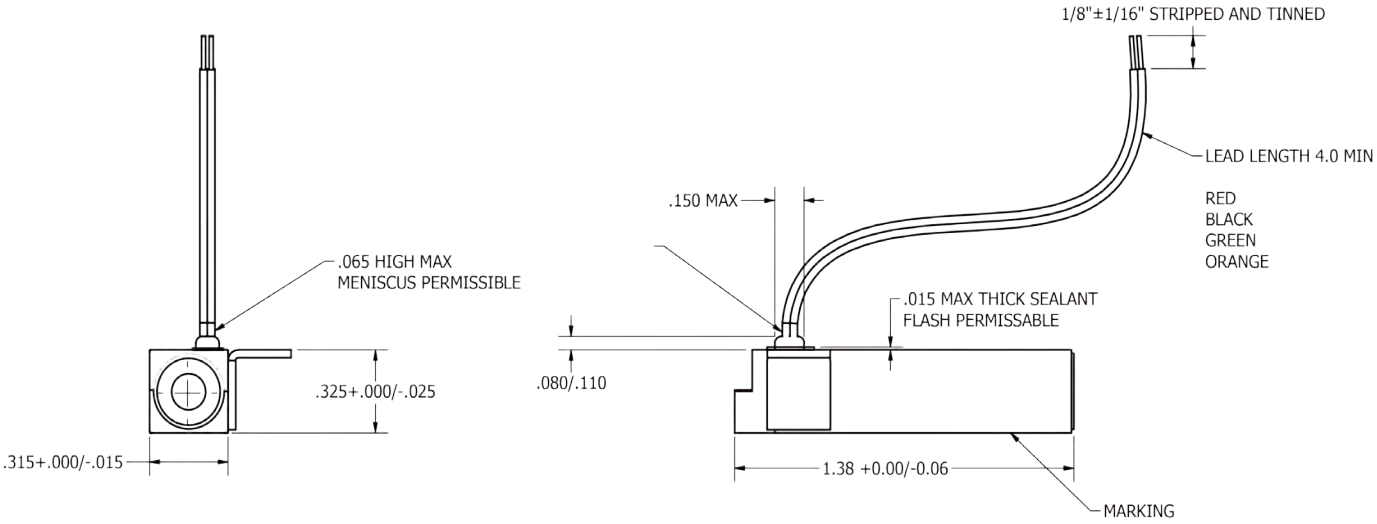
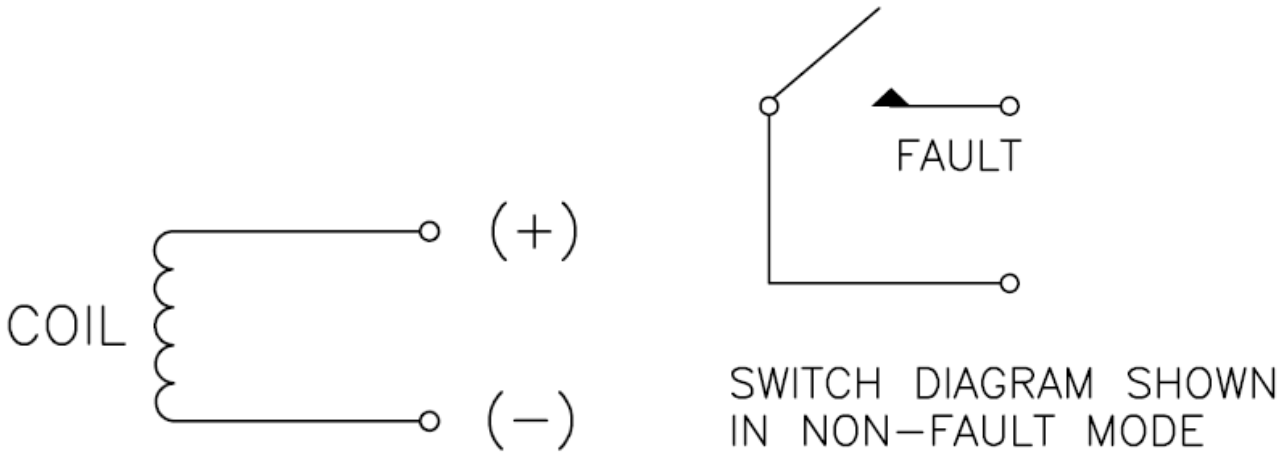
Model PL 25 DC (continued)





SCHEMATIC

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.

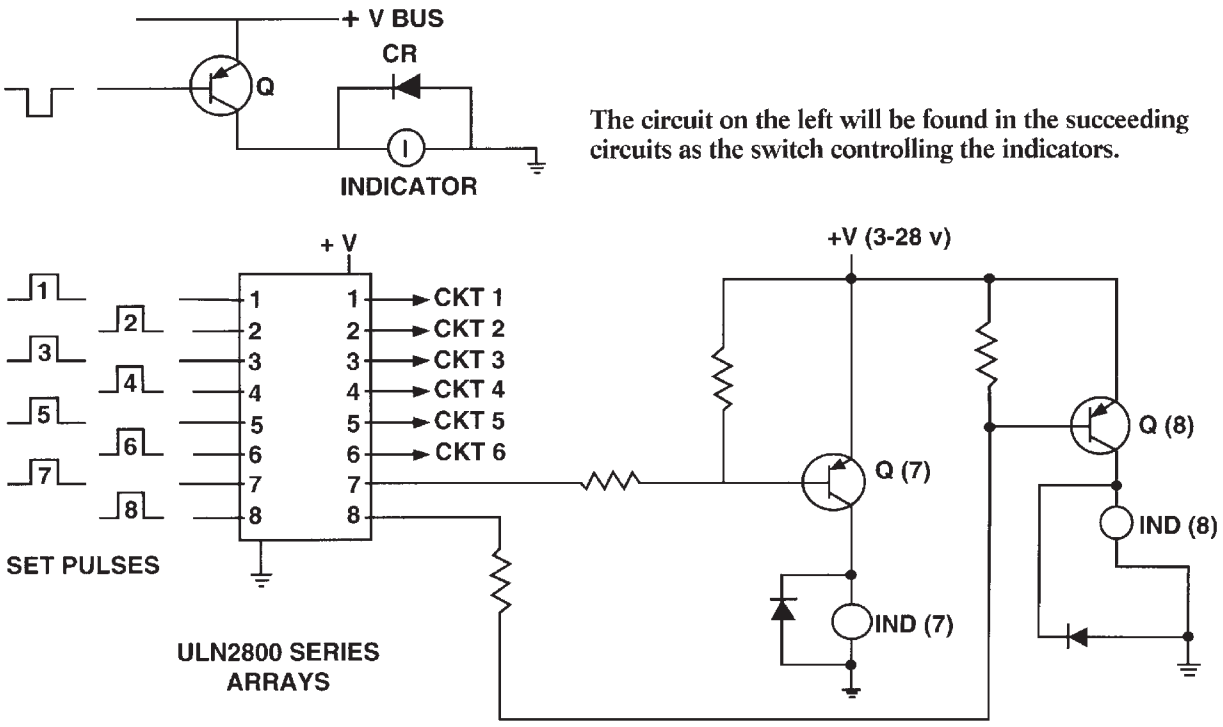


FIGURE 1

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.

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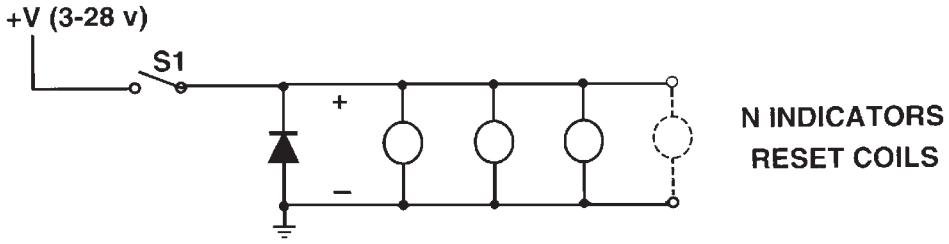

FIGURE 2

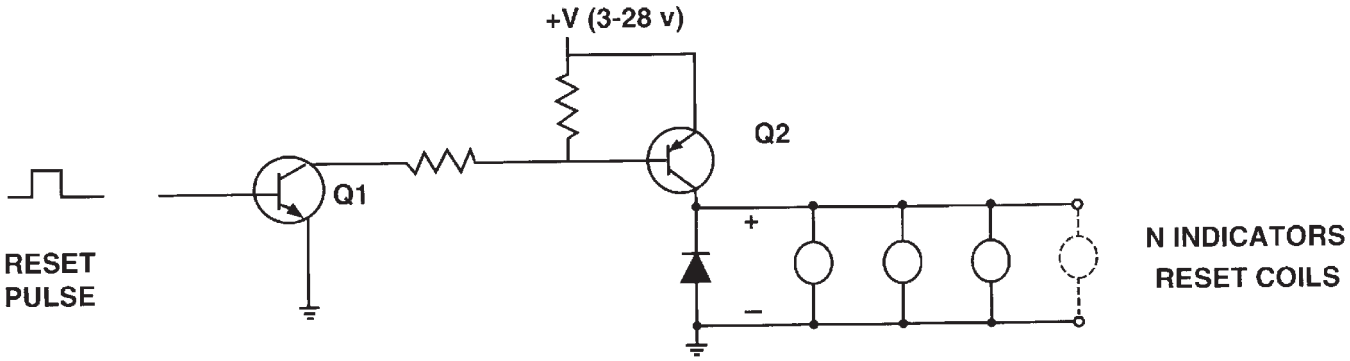

FIGURE 3

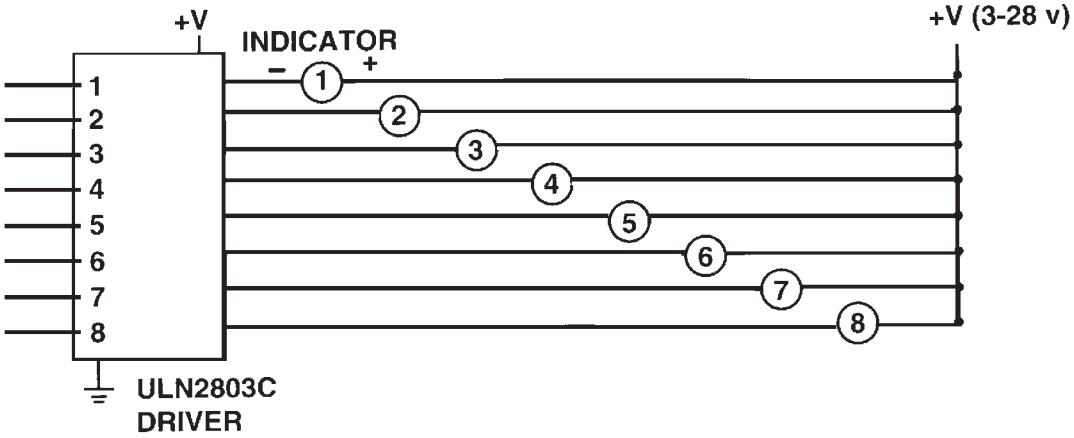

FIGURE 4

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.

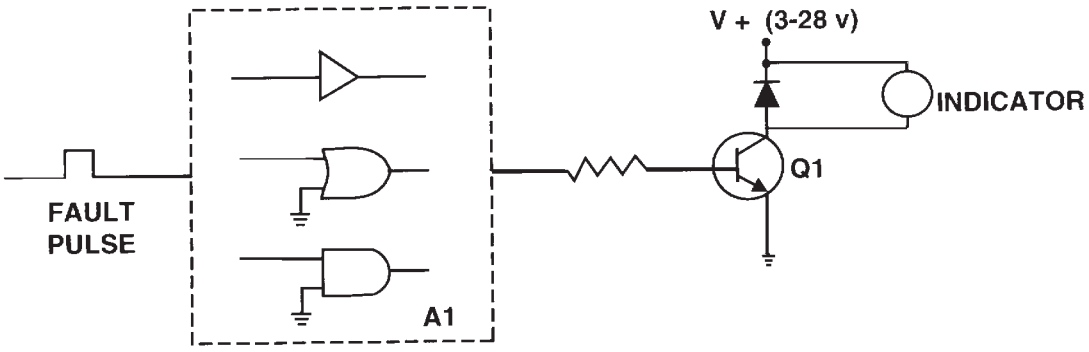

FIGURE 5

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.

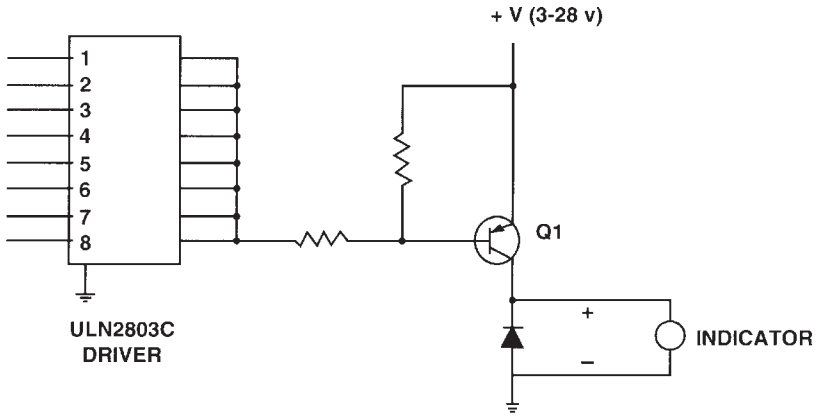

FIGURE 6
"OR" FAULT INDICATOR

A fault consisting of a positive voltage on any one (or all) of the inputs to the driver will cause the indicator to “set”.

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GENERAL NOTES ON INDICATOR APPLICATION

1. Series (steering) diodes and shunt diodes are often built into our indicators.

Typical diode configurations are:

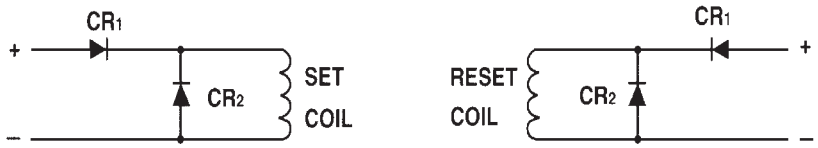

FIGURE 7

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.

M83287/1
MANUAL RESET FLAG INDICATORS

See pages 12 & 13 for product specifications

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER	GLASS TYPE	TERMINAL STYLE
M83287/01-01	MI61SA-3-W/BLK-WL-S	STANDARD	26 G LEADS
M83287/01-02	MI61SA-3-W/BLK-TT-S	STANDARD	SOLDER TERM
M83287/01-03*		NON-GLARE	26 G LEADS
M83287/01-04*		NON-GLARE	SOLDER TERM
M83287/01-05	MI61SA-5-W/BLK-WL-S	STANDARD	26 G LEADS
M83287/01-06	MI61SA-5-W/BLK-TT-S	STANDARD	SOLDER TERM
M83287/01-07*		NON-GLARE	26 G LEADS
M83287/01-08*		NON-GLARE	SOLDER TERM
M83287/01-09	MI61SA-6-W/BLK-WL-S	STANDARD	26 G LEADS
M83287/01-10	MI61SA-6-W/BLK-TT-S	STANDARD	SOLDER TERM
M83287/01-11*		NON-GLARE	26 G LEADS
M83287/01-12*		NON-GLARE	SOLDER TERM
M83287/01-13	MI61SA-12-W/BLK-WL-S	STANDARD	26 G LEADS
M83287/01-14	MI61SA-12-W/BLK-TT-S	STANDARD	SOLDER TERM
M83287/01-15*		NON-GLARE	26 G LEADS
M83287/01-16*		NON-GLARE	SOLDER TERM
M83287/01-17	MI61SA-24-W/BLK-WL-S	STANDARD	26 G LEADS
M83287/01-18	MI61SA-24-W/BLK-TT-S	STANDARD	SOLDER TERM
M83287/01-19*		NON-GLARE	26 G LEADS
M83287/01-20*		NON-GLARE	SOLDER TERM
M83287/01-21	MI61SA-28-W/BLK-WL-S	STANDARD	26 G LEADS
M83287/01-22	MI61SA-28-W/BLK-TT-S	STANDARD	SOLDER TERM
M83287/01-23*		NON-GLARE	26 G LEADS
M83287/01-24*		NON-GLARE	SOLDER TERM
M83287/01-25	MI61SA-28-W/BLK-WL-S	STANDARD	26 G LEADS
M83287/01-26	MI61SA-28-W/BLK-TT-S	STANDARD	SOLDER TERM
M83287/01-27*		NON-GLARE	26 G LEADS
M83287/01-28*		NON-GLARE	SOLDER TERM
M83287/01-29	MI61RA-5-W/BLK-WL-S	STANDARD	26 G LEADS
M83287/01-30	MI61RA-5-W/BLK-TT-S	STANDARD	SOLDER TERM
M83287/01-31*		NON-GLARE	26 G LEADS
M83287/01-32*		NON-GLARE	SOLDER TERM
M83287/01-33	MI61RA-24-W/BLK-WL-S	STANDARD	26 G LEADS
M83287/01-34	MI61RA-24-W/BLK-TT-S	STANDARD	SOLDER TERM
M83287/01-35*		NON-GLARE	26 G LEADS
M83287/01-36*		NON-GLARE	SOLDER TERM

* Consult the factory for a commercial part number.

M83287/2
ELECTRICAL RESET FLAG INDICATORS

See pages 10 & 11 for product specifications

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER	GLASS TYPE	TERMINAL STYLE	DIODES? (Yes/No)
M83287/02-01	MI57DA-28-W/BLK-WL-S	STANDARD	26 G LEADS	No
M83287/02-02*		STANDARD	26 G LEADS	Yes
M83287/02-03*		STANDARD	SOLDER TERM.	No
M83287/02-04*		STANDARD	SOLDER TERM.	Yes
M83287/02-05*	MI57DA-28-W/BLK-WL-N	NON-GLARE	26 G LEADS	No
M83287/02-06*		NON-GLARE	26 G LEADS	Yes
M83287/02-07*		NON-GLARE	SOLDER TERM.	No
M83287/02-08*		NON-GLARE	SOLDER TERM.	Yes
M83287/02-09*		STANDARD	26 G LEADS	No
M83287/02-10*		STANDARD	26 G LEADS	Yes
M83287/02-11*		STANDARD	SOLDER TERM.	No
M83287/02-12*		STANDARD	SOLDER TERM.	Yes
M83287/02-13*		NON-GLARE	26 G LEADS	No
M83287/02-14*		NON-GLARE	26 G LEADS	Yes
M83287/02-15*		NON-GLARE	SOLDER TERM.	No
M83287/02-16*		NON-GLARE	SOLDER TERM.	Yes
M83287/02-17*		STANDARD	26 G LEADS	No
M83287/02-18*		STANDARD	26 G LEADS	Yes
M83287/02-19*		STANDARD	SOLDER TERM.	No
M83287/02-20*		STANDARD	SOLDER TERM.	Yes
M83287/02-21*		STANDARD	26 G LEADS	No
M83287/02-22*		STANDARD	SOLDER TERM.	No
M83287/02-23*		NON-GLARE	26 G LEADS	No
M83287/02-24*		NON-GLARE	SOLDER TERM.	No
M83287/02-25*		STANDARD	26 G LEADS	No
M83287/02-26*		STANDARD	SOLDER TERM.	No
M83287/02-27*		NON-GLARE	26 G LEADS	No
M83287/02-28*		NON-GLARE	SOLDER TERM.	No
M83287/02-29	MI57DA-12-W/BLK-WL-S	STANDARD	26 G LEADS	No
M83287/02-30*		STANDARD	26 G LEADS	Yes
M83287/02-31*		STANDARD	SOLDER TERM.	No
M83287/02-32*		STANDARD	SOLDER TERM.	Yes
M83287/02-33*		NON-GLARE	26 G LEADS	No
M83287/02-34*		NON-GLARE	26 G LEADS	Yes
M83287/02-35*		NON-GLARE	SOLDER TERM.	No
M83287/02-36*		NON-GLARE	SOLDER TERM.	Yes
M83287/02-37*		STANDARD	26 G LEADS	No
M83287/02-38*		STANDARD	SOLDER TERM.	No
M83287/02-39*		NON-GLARE	26 G LEADS	No
M83287/02-40*		NON-GLARE	SOLDER TERM.	No
M83287/02-41	MI57DA-5-W/BLK-WL-S	STANDARD	26 G LEADS	No
M83287/02-42*		STANDARD	26 G LEADS	Yes
M83287/02-43*		STANDARD	SOLDER TERM.	No
M83287/02-44*		STANDARD	SOLDER TERM.	Yes
M83287/02-45*	MI57DA-5-W/BLK-WL-N	NON-GLARE	26 G LEADS	No
M83287/02-46*		NON-GLARE	26 G LEADS	Yes
M83287/02-47*		NON-GLARE	SOLDER TERM.	No
M83287/02-48*		NON-GLARE	SOLDER TERM.	Yes
M83287/02-49*		NON-GLARE	26 G LEADS	No
M83287/02-50*		NON-GLARE	SOLDER TERM.	No
M83287/02-51*		STANDARD	26 G LEADS	No
M83287/02-52*		STANDARD	SOLDER TERM.	No

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.

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M83287/3
BALL INDICATORS

See pages 4 & 5 for product specifications

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER
M83287/03-01	BHGD21T-3-W/BLK
M83287/03-02	BHGD21T-6-W/BLK
M83287/03-03	BHGD21T-12-W/BLK
M83287/03-04	BHGD21T-24-W/BLK
M83287/03-05	BHGD21T-28-W/BLK
M83287/03-06	BHG21T-3-W/BLK
M83287/03-07	BHG21T-6-W/BLK
M83287/03-08	BHG21T-12-W/BLK
M83287/03-09	BHG21T-24-W/BLK
M83287/03-10	BHG21T-28-W/BLK
M83287/03-11	BHGD27T-3-W/BLK
M83287/03-12	BHGD27T-6-W/BLK
M83287/03-13	BHGD27T-12-W/BLK
M83287/03-14	BHGD27T-24-W/BLK
M83287/03-15	BHGD27T-28-W/BLK
M83287/03-16	BHG27T-3-W/BLK
M83287/03-17	BHG27T-6-W/BLK
M83287/03-18	BHG27T-12-W/BLK
M83287/03-19	BHG27T-24-W/BLK
M83287/03-20	BHG27T-28-W/BLK
M83287/03-21	BHG21T-5-W/BLK
M83287/03-22	BHGD21T-5-W/BLK
M83287/03-23	BHG27T-5-W/BLK
M83287/03-24	BHGD27T-5-W/BLK

MI51LP
MECHANICAL RESET LOW POWER FLAG INDICATORS

See pages 8 & 9 for product specifications

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

*MIL Spec numbers are no longer available

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NOTES

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Solid-state indicators provide system information

FEATURES

- Environmentally sealed
- Rugged packaging
- Pinpoint or wide-angle viewing area
- EMI shielding available
- Anti-reflective coating optional
- Panel mount & rear mount designs
- Models available to meet NVIS and MIL-Spec requirements
- Custom designs

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

FIGURE 5

FIGURE 6

FIGURE 7

FIGURE 8

FIGURE 9

FIGURE 10

FIGURE 11

FIGURE 12

FIGURE 13

FIGURE 14

FIGURE 15

Fig. No.	Models	Environ Sealed	Panel Seal	Rear Mount	Panel Mount	Internal Resistors	Wide Operating Voltage	Night Vision	Infrared Secure	High Brightness	EMI Shielded	Tri-Color Bi-Color LED	Page No.
1	ML1600 ②	•			•	•							32
2	ML1610	•	•		•								32
3	ML1618 ④	•			•				•				34
4	ML1619 ④⑨	•			•				•		•		36
5	MLD1619 ④⑤	•			•				•		•		38
6/7	ML1620/ML1630 ②	•	•		•	•					•		40
6/7	ML1620-S/ML1630-S	•	•		•						•		42
6/7	ML1622/ML1632 ②	•	•		•	•					•	B	44
8/7	ML1623-S/ML1633-S ①②	•	•		•	•					•	B	46
9	ML1631 ⑧	•	•	•							•	T	48
10	ML1634	•	•	•							•	B	50
11	ML1635 ①	•	•	•							•	B	52
10	ML1636 ②	•	•	•		•					•		54
10	ML1636-U	•	•	•						•	•		56
10	ML1638 ③	•	•	•				•			•		58
11	ML1638 Bi-Color ①③	•	•	•				•			•	B	60
12	ML1640 ⑦	•	•		•						•		62
4	ML1662 ③	•	•		•			•			•		64
13	ML2030E ⑥	•	•		•						•		66
14	ML2031 ⑧	•	•		•						•	T	68
13	ML2038E ③	•	•		•			•			•		70
15	ML4036	•	•	•			•			•	•		72

Notes: ① 3-Leaded
② Internal Resistors for 5VDC to 28VDC usage.
③ MIL-L-85762A
④ CECOM Secure Lighting
⑤ Dimmable Filter feature
⑥ MIL-DTL-3661
⑦ DESC Drawing 85122
⑧ 4-Leaded
⑨ DESC Drawing 87019

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

Models ML1600 & ML1610

Designed for use as function indicators on aircraft, test equipment, machine tools and wherever severe environmental conditions need to be met.

FEATURES

- Performs in severe environments
- Low power use
- Long life
- High efficiency
- High visibility
- Rugged construction
- Readily mounted on panel

MECHANICAL SPECIFICATIONS

Case: Black anodized aluminum

Mounting: Front panel by 5/16"-32 nut and lockwasher

Weight: 1.5 grams with hardware

Seal: Environmentally sealed. Added front panel O-ring seal for model ML1610.

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS*

Absolute Maximum Ratings @Temp = 25°C				
Color		**Red**	**Yellow**	**Green**
Forward Voltage (VDC) typical @ 20 mA		1.9	2.0	2.1
Peak Forward Current (mA) ①		90	60	90
Max DC Forward Current (mA) ②		30	20	30
Reverse Voltage (VDC) @ I_R = 100 µA		5	5	5
Power Dissipation (mW)		135	85	135
Luminous Intensity (mcd) typical @ I_F = 10 mA ML1600	Non-diffused Diffused	60 7.0	50 8.0	70 5.2
Luminous Intensity (mcd) typical @ I_F = 10 mA ML1610	Non-diffused Diffused	22 5.4	14.7 5.7	10.6 4.2
Dominant Wave Length (nm) typical		626	585	569
Viewing Angle (2 Ø $^{1/2}$) typical	Non-diffused Diffused	35° 60°	35° 60°	24° 60°
Operating Temperature (°C)		-55 to +100	-55 to +100	-20 to +100
Storage Temperature (°C)		-55 to +100	-55 to +100	-55 to +100
Lead Soldering Temperature		260°C for 5 seconds		

Notes: ① Typical pulsing values: $t_p \leq 10$ µsec, Duty cycle = 10%
② For red and green, derate linearly from 50°C @ 0.5 mA/°C. For yellow, derate linearly from 50°C @ 0.2 mA/°C

*These characteristics reflect the baseline model. Variations may imply a difference in luminous characteristics and/or operability features. Please contact the EDI Sales Department for more information.

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ORDERING INFORMATION

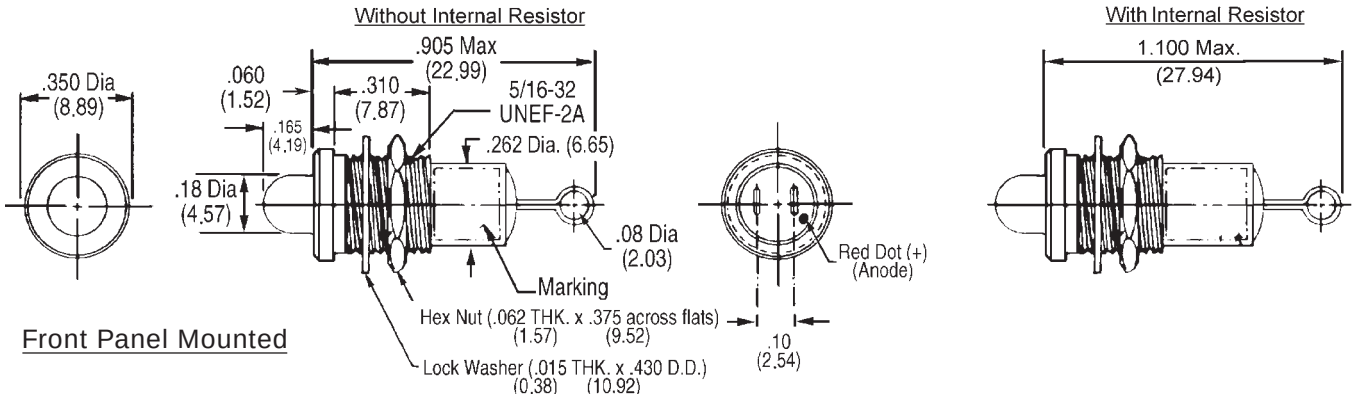
When ordering, show basic part number first, followed by the color of the LED, lens type, and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example:
A basic model with an O-ring panel seal, a yellow LED, a diffused lens, and loop terminals would be ML1610-Y-D-LT.

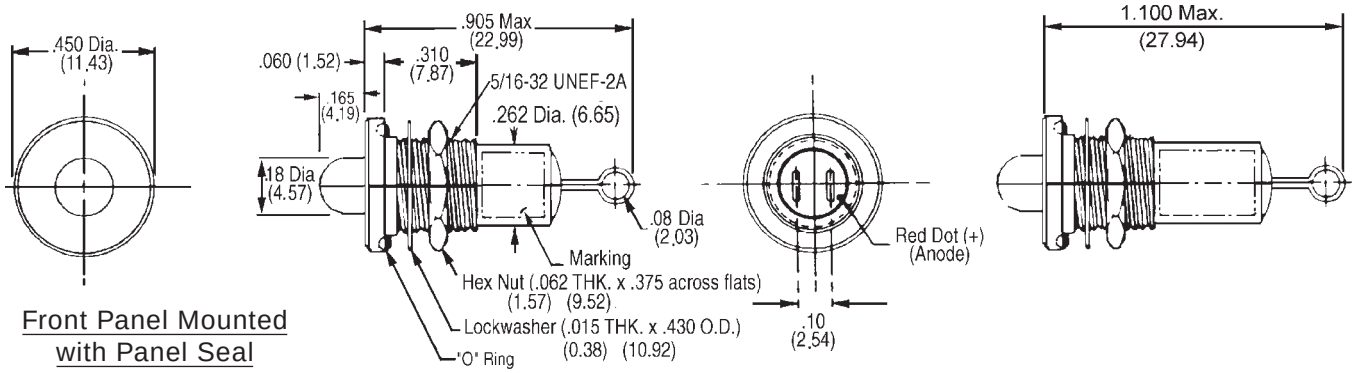
ML1610 - Y - D - LT - ( ) - ( )

Standard factory options are designated by "-Sxxx"

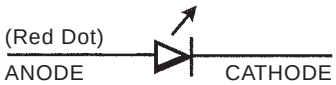
Basic Model Number	LED Color	Lens Type	Terminal Style	Internal Resistor
ML1600 (w/o O-ring)	R Red	ND Non-diffused	ST Straight Terminals	( ) No Resistor
ML1610 (with O-ring)	Y Yellow	D Diffused	LT Loop Terminals	5 5V
	G Green			24 24V



ML1600
Environmentally sealed – no O-ring



Recommended Mounting Hole



Schematic

Schematic with Internal Resistor

ML1610
Environmentally sealed – with front panel O-ring

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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MINIATURE LED INDICATOR
INFRARED SECURE

Model ML1618

This defense article is controlled under the International Traffic in Arms Regulations (ITAR) USML Category XII(e).

Developed for use as a function indicator, this solid-state lamp with infrared blocking lens is designed to meet the spectral requirements for Secure Lighting per DESC drawing 87019 and the U.S. Army Statement of Work. It is panel mountable with solderable leads, and includes press-lock mounting sleeve. Modified versions to meet MIL-L-85762A NVIS requirements as well as industrial requirements are available.

ML1618

FEATURES

- Infrared filtered
- Designed to meet CECOM secure lighting statement of work per DESC drawing 87019
- Environmentally sealed
- Colors: red, yellow, & green
- Quick panel mount seal, Press-lock
- Black contrasting bezel
- Non-MIL configurations available

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized

Mounting: Via Press-Lock bushing

Terminals: Solder loops

Weight: 1.5 grams with hardware

Seal: Environmentally sealed with front panel PTFE press-lock bushing

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

Seal Test: MIL-DTL-3661C; 30 PSIG

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C			
Color	**Red**	**Yellow**	**Green**
Forward Voltage (VDC) typical @ 20 mA	2.6	2.6	3
Peak Forward Current (mA) ①	90	60	90
DC Forward Current (mA) ②	30	20	30
Reverse Voltage (VDC) @ I_R = 100 µA	5	5	5
Power Dissipation (mW)	135	85	135
Luminous Intensity (mcd) typical @ I_F = 20 mA DC	6.0	6.0	6.0
Dominant Wave Length (nm) typical	626	585	569
Viewing Angle (2 Ø $^{1/2}$) typical	45°	45°	45°
Operating Temperature (°C)	-55 to +100	-55 to +100	-20 to +100
Storage Temperature (°C)	-55 to +100	-55 to +100	-55 to +100
Lead Soldering Temperature	260°C for 5 seconds		

Notes: ① Typical pulsing values: $t_p \leq 10$ µsec, Duty cycle = 10%
② For red and green, derate linearly from 50°C @ 0.5 mA/°C. For yellow, derate linearly from 50°C @ 0.2 mA/°C

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MINIATURE LED INDICATOR
INFRARED SECURE

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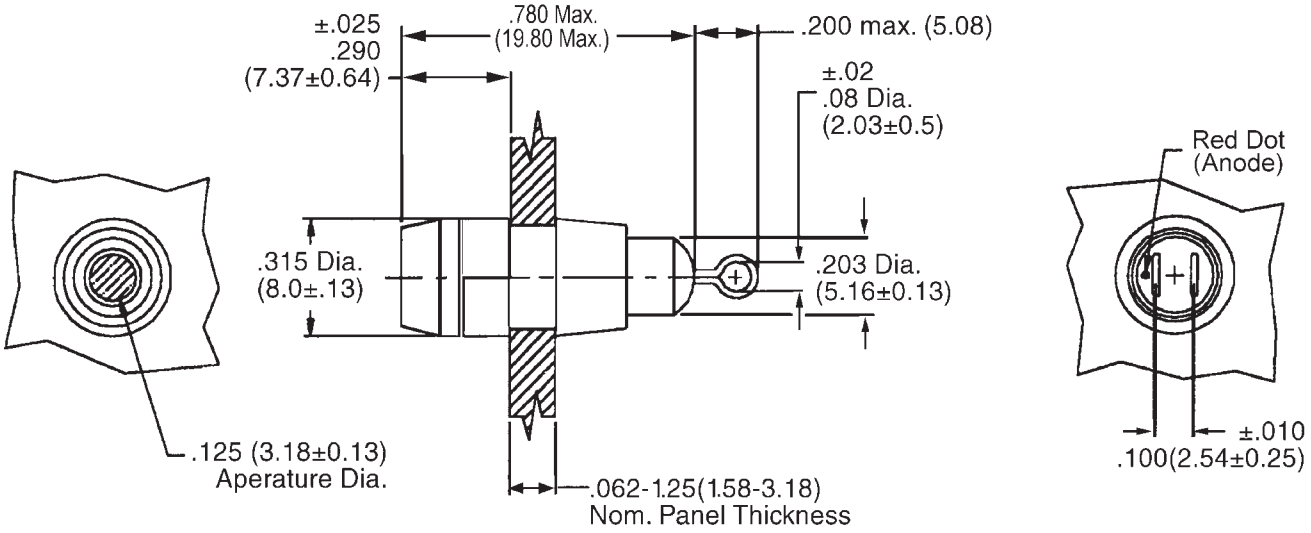
ORDERING INFORMATION

When ordering, show model number first, then color. If this is a special part, a factory assigned modification number will be added at the end. Consult the factory for special configurations.

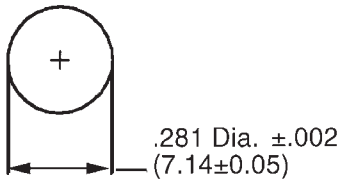
Example: Basic unit with standard green color would be model ML1618-G.

ML1618 - G

Basic Model Number	LED Color
ML1618	R Red
	Y Yellow
	G Green



Schematic



Recommended Mounting Hole

ML1618

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

LED INDICATOR
INFRARED SECURE

LED INDICATORS

Model ML1619

This defense article is controlled under the International Traffic in Arms Regulations (ITAR) USML Category XII(e).

Developed for use as a function indicator, this solid-state lamp with infrared blocking lens is designed to meet the requirements of Secure Lighting per DESC drawing 87019 and the U.S. Army Statement of Work. It is panel mountable with solderable leads and includes mounting hardware.

ML1619

FEATURES

- Designed to meet CECOM secure lighting statement of work.
- Environmentally sealed
- Optional EMI protection
- Colors: red, yellow, & green
- Panel mount seal

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized bezel with clear chromate body

Mounting: Front panel by 5/16"-32 nut and lockwasher

Weight: 1.5 grams with hardware

Seal: Environmentally sealed with front panel PTFE ring seal

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C			
Color	**Red**	**Yellow**	**Green**
Forward Voltage (VDC) typical @ 20 mA	1.9	2.1	2.2
Peak Forward Current (mA) ①	90	60	90
DC Forward Current (mA) ②	30	20	30
Reverse Voltage (VDC) @ I_R = 100 µA	5	5	5
Power Dissipation (mW)	135	85	135
Luminous Intensity (mcd) typical @ I_F = 10 mA DC	2.5	5	4
Dominant Wave Length (nm) typical	626	585	571
Viewing Angle (2 Ø $^{1/2}$) typical	32°	32°	32°
Operating Temperature (°C)	-55 to +100	-55 to +100	-20 to +100
Storage Temperature (°C)	-55 to +100	-55 to +100	-55 to +100
Lead Soldering Temperature	260°C for 5 seconds		

Notes: ① Typical pulsing values: $t_p \leq 10$ µsec, Duty cycle = 10%
② For red and green, derate linearly from 50°C @ 0.5 mA/°C. For yellow, derate linearly from 50°C @ 0.2 mA/°C

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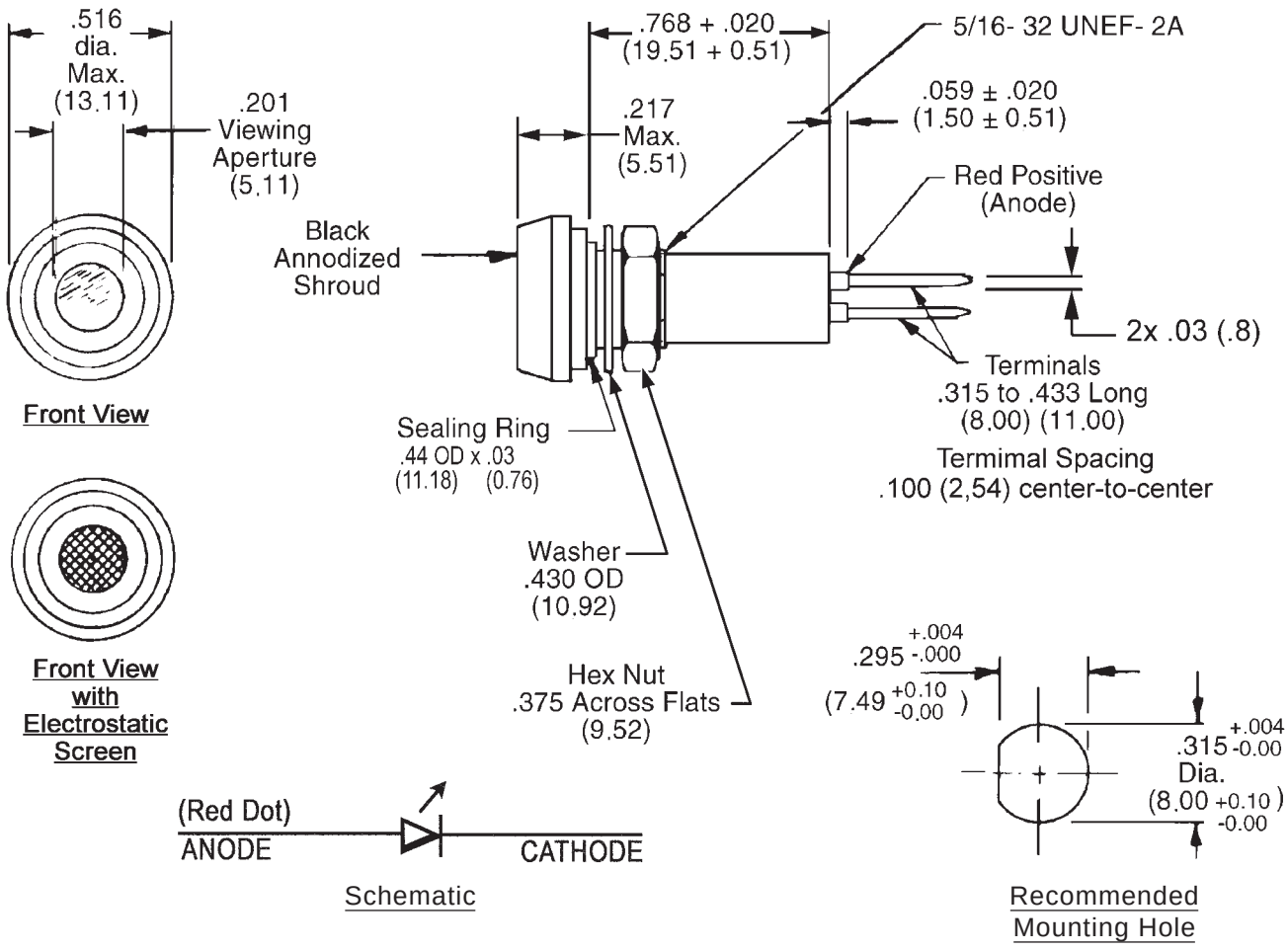
ORDERING INFORMATION

When ordering, show model number first, then LED color, EMI screen, body finish, and the terminal style 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 with red LED with a screen would be model ML1619-R-1-2-1.

ML1619 - R 1 2 1 ()

Basic Model Number	LED Color	EMI Screen	Body / Finish Color	Terminal Style
ML1619	R Red	0 None	2 Clear Chromate	() Straight Tin Lead
	Y Yellow	1 Screen		2 Loop Terminals
	G Green			



ML1619

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

LED INDICATOR
DIMMABLE INFRARED SECURE

Model MLD1619

This defense article is controlled under the International Traffic in Arms Regulations (ITAR) USML Category XII(e).

Developed for use as a function indicator, this solid-state indicator provides reduced infrared emissions and variable dimming per CECOM statement of work. It is panel mountable with solderable leads and includes hardware. It can also be produced for non-mil applications.

MLD1619

FEATURES

- Designed to meet CECOM secure lighting statement of work
- Dimmable to 0.05 foot-lamberts
- Optional EMI protection screen
- Colors: red, yellow, & green
- Panel mount seal

MECHANICAL SPECIFICATIONS

Case: Aluminum, conductive clear chromate

Cap: Aluminum, black anodized

Mounting: Front panel by 5/16"-32 nut and lockwasher

Seal: Environmentally sealed with front panel PTFE ring seal and internal O-ring seal

Terminal Style: Straight tin/lead

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" D.A. or 20 Gs Peak, whichever is less, 10Hz to 2kHz, MIL STD 202, Method 204, Test Condition D

Shock: 50 Gs MIL STD 202, Method 213, Test Condition G

Moisture Resistance (Humidity): MIL STD 202, Method 106

Barometric Pressure (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C			
Color	**Red**	**Yellow**	**Green**
Forward Voltage (VDC) typical @ 20 mA	1.9	2.1	2.2
Peak Forward Current (mA) ①	90	60	90
DC Forward Current (mA) ②	30	20	30
Reverse Voltage (VDC) @ I_R = 100 µA	5	5	5
Power Dissipation (mW)	135	85	135
Luminous Intensity (fL) typical @ I_F = 20 mA DC	2.5	4.0	5.0
Dominant Wave Length (nm) typical	626	585	569
Viewing Angle (2 Ø $^{1/2}$) typical	30°	30°	30°
Operating Temperature (°C)	-55 to +100	-55 to +100	-20 to +100
Storage Temperature (°C)	-55 to +100	-55 to +100	-55 to +100
Lead Soldering Temperature	260°C for 5 seconds		

Notes: ① Typical pulsing values: $t_p \leq 10$ µsec, Duty cycle = 10%
② For red and green, derate linearly from 50°C @ 0.5 mA/°C. For yellow, derate linearly from 50°C @ 0.2 mA/°C

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LED INDICATOR
DIMMABLE INFRARED SECURE

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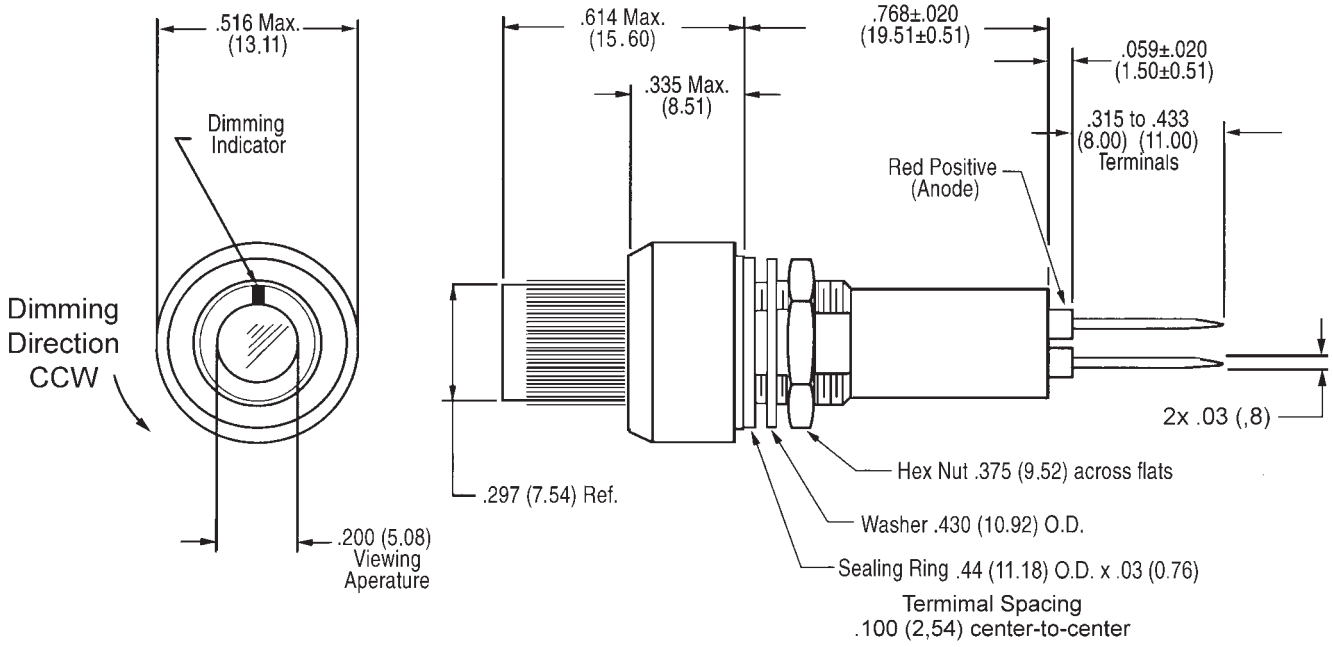
ORDERING INFORMATION

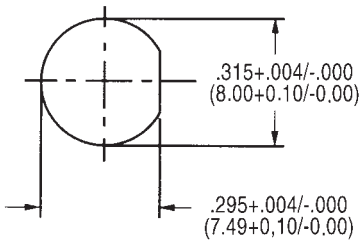
When ordering, show model number first, followed by EMI screen, LED color, lens type, and the terminal style desired. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example: Basic model with an EMI screen, red LED, a non-diffused lens, and straight terminals is MLD1619E-R-ND-ST.

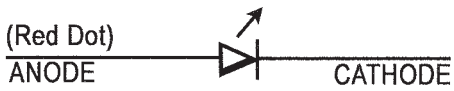
MLD1619E - R - ND - ST

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
MLD1619	( ) None	R Red	ND Non-diffused	ST Straight Leads
	E Screen	Y Yellow	D Diffused	
		G Green		





Recommended
Mounting Hole



Schematic

MLD1619

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

MINIATURE LED INDICATOR
PANEL MOUNT

Models ML1620 & ML1630

Designed for use as function indicators on aircraft, test equipment, machine tools, and wherever severe environmental conditions need to be met, especially vibration and EMI.

ML1620

ML1630E

FEATURES

- Performs in severe environments
- Low power use
- High efficiency
- Rugged construction
- Readily mounted on panel
- Optional EMI screen
- Optional internal resistor

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized front with conductive clear chromate back

Mounting: Front panel by 5/16"-32 nut and lockwasher

Seal: Environmentally sealed. Added front panel O-ring seal for model ML1630.

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS*

Absolute Maximum Ratings @Temp = 25°C				
Color		**Red**	**Yellow**	**Green**
Forward Voltage (VDC) typical @ 20 mA (no resistor)		1.9	2.1	2.2
Peak Forward Current (mA DC) ①		90	60	90
DC Forward Current (mA DC) ② (no resistor)		30	20	30
Reverse Voltage (VDC) @ I_R = 100 µA		5	5	5
Power Dissipation (mW)		135	85	135
Luminous Intensity (mcd) typical @ I_F = 10 mA DC	Non-diffused Diffused	60 12	40 12	50 12
Dominant Wave Length (nm) typical		626	585	569
Viewing Angle (2 Ø $^{1/2}$) typical	Non-diffused Diffused	30° 60°	30° 60°	30° 60°
Operating Temperature (°C)		-55 to +100	-55 to +100	-20 to +100
Storage Temperature (°C)		-55 to +100	-55 to +100	-55 to +100
Lead Soldering Temperature		260°C for 5 seconds		

Notes: ① Typical pulsing values: $t_p \leq 10$ µsec, Duty cycle = 10%
② For red and green, derate linearly from 50°C @ 0.5 mA/°C. For yellow, derate linearly from 50°C @ 0.2 mA/°C

*These characteristics reflect the baseline straight terminal model. Variations may imply a difference in luminous characteristics and/or operability features. Please contact the EDI Sales Department for more information.

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MINIATURE LED INDICATOR
PANEL MOUNT

ORDERING INFORMATION

When ordering, show basic part number first, then EMI screen, LED color, lens type, and voltage 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 with an O-ring panel seal, an EMI screen, a red LED, a diffused lens, straight leads, and no internal resistor would be ML1630E-R-D-ST.

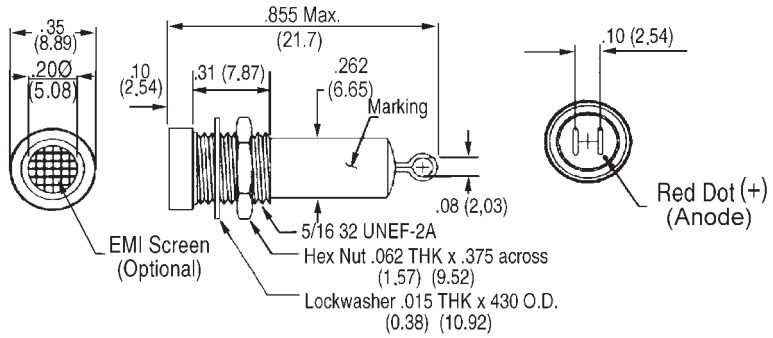
ML1630E - R - D - ST - ( ) - ( )

Standard factory options are designated by "-Sxxx"

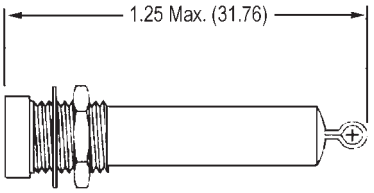
Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style	Internal Resistor
ML1620 (w/o O-ring)	( ) None	R Red	ND Non-diffused	ST Straight Leads	( ) No Resistor
ML1630 (with O-ring)	E Screen	Y Yellow	D Diffused	LT Loop Terminals	5 5V*
		G Green			12 12V*
					14 14V*
					24 24V*
					28 28V*

*Operating temperature for internal resistor option is -40°C to +85°C

Case Length without Internal Resistor

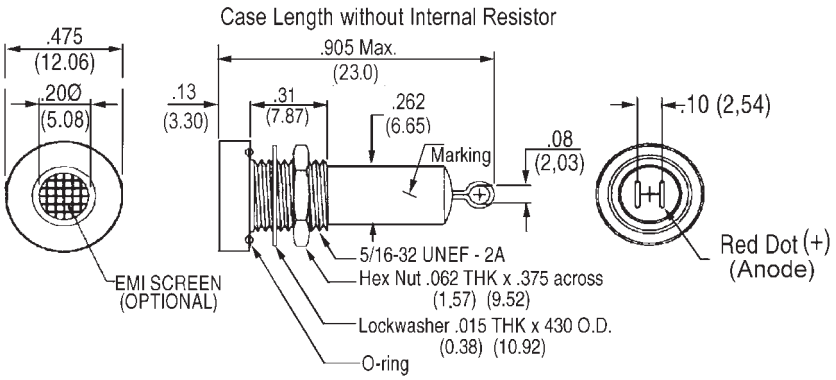


Case Length with Internal Resistor

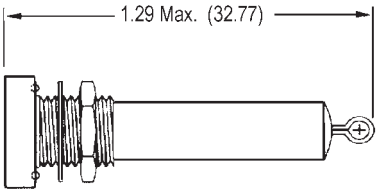


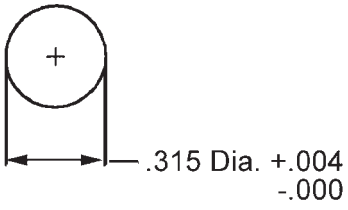
ML1620

Case Length without Internal Resistor

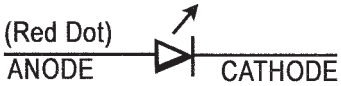


Case Length with Internal Resistor





Recommended Mounting Hole



Schematic

Schematic with Internal Resistor

ML1630

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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MINIATURE LED INDICATOR
PANEL MOUNT

Models ML1620-S & ML1630-S

Designed for use as function indicators on aircraft, test equipment, machine tools, and wherever severe environmental conditions need to be met, especially vibration and EMI.

ML1620-S

ML1630E-S

FEATURES

- Performs in severe environments
- Low power use
- High efficiency
- High luminosity
- Rugged construction
- Readily mounted on panel
- Optional EMI screen

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized front with conductive clear chromate back

Mounting: Front panel by 5/16"-32 nut and lockwasher

Seal: Environmentally sealed. Added front Panel O-ring seal for model ML1630.

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C				
Color		**Red**	**Yellow**	**Green**
Forward Voltage (VDC) typical @ 20 mA		1.9	2.1	2.2
DC Forward Current (mA DC)		30	30	25
Reverse Voltage (VDC) @ I_R = 100 µA		5	5	5
Power Dissipation (mW) ①		100	105	105
Luminous Intensity (mcd) typical @ I_F = 20 mA DC	Diffused	250	300	40
Dominant Wave Length (nm) typical		640	588	568
Viewing Angle (2 Ø $^{1/2}$) typical	Diffused	60°		
Operating Temperature (°C)		-40 to +85		
Storage Temperature (°C)		-55 to +100		
Lead Soldering Temperature		260°C for 5 seconds		

Notes: ① Power derating: derate linearly from 25°. For Green and Yellow: -1.2mW/°C. For Red: -1.3mW/°C

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ORDERING INFORMATION

When ordering, show basic part number first, then EMI screen, LED color, and lens 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.

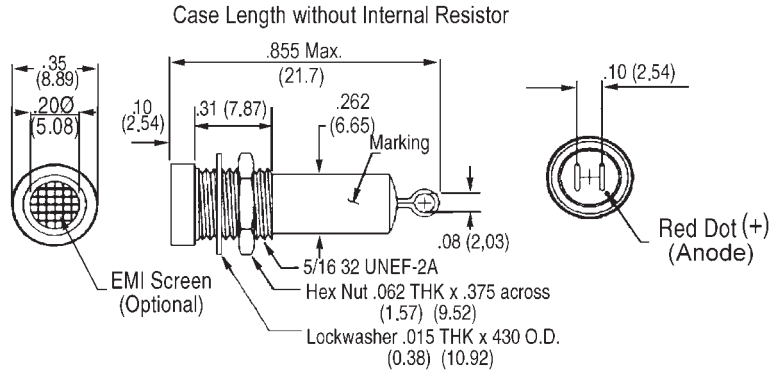
Example: Basic model with an O-ring panel seal, an EMI screen, a red LED, a diffused lens, and straight leads would be ML1630E-SR-D-ST.

ML1630E - SR - D - ST - ( ) - ( )

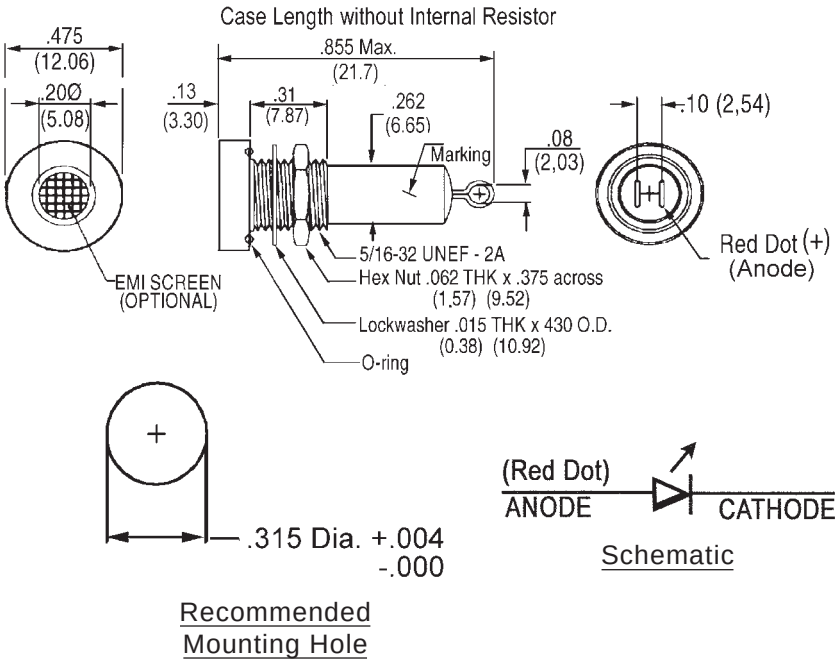
Standard factory options are designated by "-Sxxx"

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style	Internal Resistor
ML1620 (w/o O-ring)	( ) None	SR Red	ND Non-diffused	ST Straight Leads	( ) No Resistor
ML1630 (with O-ring)	E Screen	SY Yellow	D Diffused	LT Loop Terminals	5 5V*
		SG Green			12 12V*
					14 14V*
					24 24V*
					28 28V*

*Operating temperature for internal resistor option is -40°C to +85°C



ML1620-S



ML1630-S

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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LED INDICATOR
BI-COLOR PANEL MOUNT

Models ML1622 & ML1632

Designed for use as function indicators on aircraft, test equipment, machine tools and wherever severe environmental conditions need to be met, especially vibration and EMI.

ML1622

ML1632E

FEATURES

- Multiple status indication within a single package
- Performs in severe environments
- Low power use
- Rugged construction
- Panel mounted
- Optional EMI screen
- Internal resistor available

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized front with clear chromate back

Mounting: Front panel by 5/16"-32 nut and lockwasher

Seal: Environmentally sealed. Added front panel O-ring seal for model ML1632.

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS*

Absolute Maximum Ratings @Temp = 25°C						
Color	**Red / Green**		**Yellow / Green**		**Super Red / Super Green**	
Forward Voltage (VDC) typical @ 20 mA	2.1	2.1	2.1	2.1	1.85	2.2
Peak Forward Current (mA) ①	150	150	150	150	155	140
DC Forward Current (mA)	30	25	30	25	30	25
Power Dissipation (mW) ②	105	105	105	105	75	62.5
Luminous Intensity (mcd) typical @ I_F = 20 mA	30	20	20	20	100	30
Dominant Wave Length (nm) typical	625	568	588	568	640	568
Viewing Angle (2 Ø $^{1/2}$) typical	60°					
Operating Temperature (°C)	-40 to +85					
Storage Temperature (°C)	-55 to +100				-40 to +85	
Lead Soldering Temperature	260°C for 5 seconds					

Notes: ① Typical pulsing values: $t_p \leq 10$ µsec, Duty cycle = 10%
② Derate at 1.6 mW/°C above +25°C Ambient

*These characteristics reflect the baseline model. Variations may imply a difference in luminous characteristics and/or operability features. Please contact the EDI Sales Department for more information.

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LED INDICATOR

BI-COLOR PANEL MOUNT

ORDERING INFORMATION

When ordering, show basic part number first, then EMI screen, LED color, lens type, terminal style, and voltage. 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 O-ring panel seal, an EMI screen, with a yellow/green LED, a diffused lens, loop terminals, and 24 volt internal resistor would be an ML1632E-Y/G-D-LT-24.

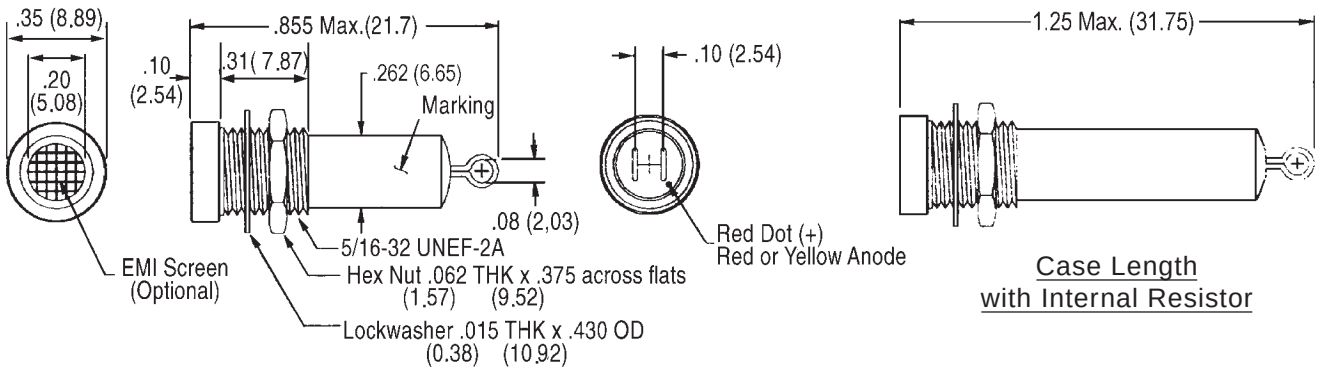
ML1632E - Y/G - D - LT - 24 - ( )

Standard factory options are designated by "-Sxxx"

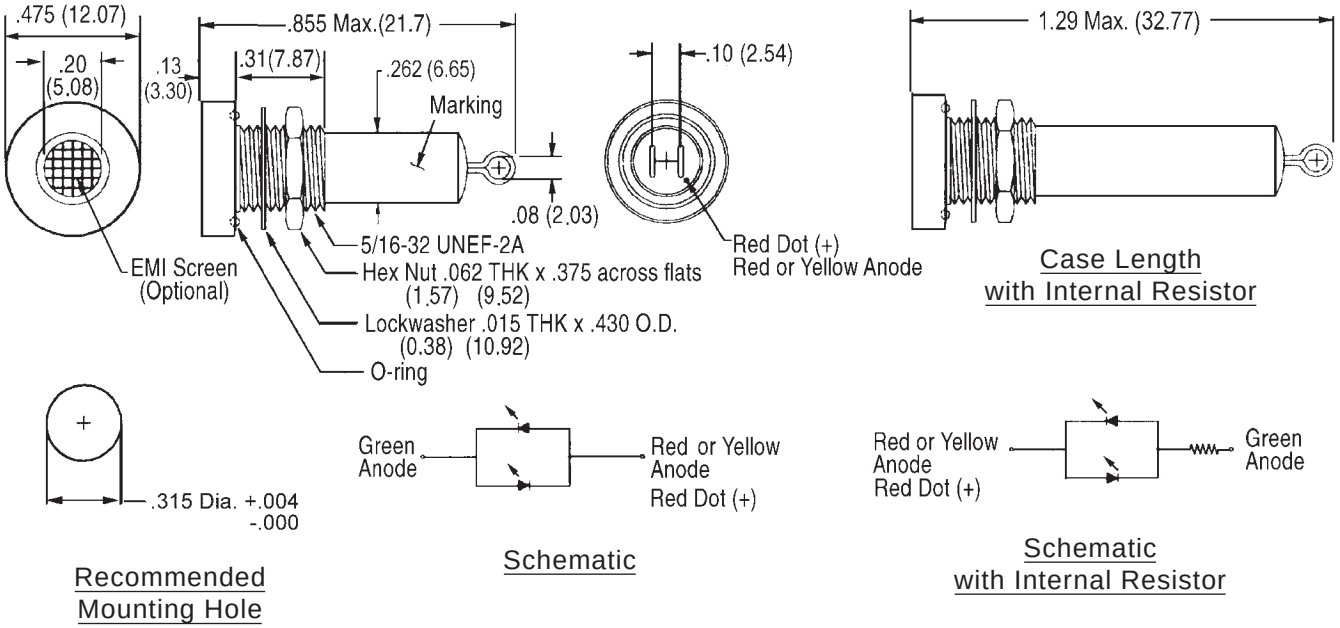
Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style	Internal Resistor
ML1622 (w/o O-ring)	( ) None	R/G Red/Green	D Diffused	ST Straight Leads	( ) No Resistor
ML1632 (with O-ring)	E Screen	Y/G Yellow/Green		LT Loop Terminals	5 5V
					12 12V
					14 14V
					24 24V
					28 28V

Without Internal Resistor

With Internal Resistor



ML1622



ML1632
with front panel O-ring

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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Models ML1623-S & ML1633-S

Designed for use as function indicators on aircraft, test equipment, machine tools and wherever severe environmental conditions need to be met, especially vibration and EMI.

ML1623-S

ML1633E-S

FEATURES

- Multiple status indication within a single package
- Performs in severe environments
- Low power use
- Rugged construction
- Panel mounted
- Optional EMI screen

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized front with clear chromate back

Mounting: Front panel by 5/16"-32 nut and lockwasher

Seal: Environmentally sealed. Added front panel O-ring seal for model ML1633.

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C					
Color		**Red / Green**		**Yellow / Green**	
Forward Voltage (VDC) typical @ 20 mA		1.7	2.2	2.1	2.2
Peak Forward Current (mA) ①		150	150	150	150
DC Forward Current (mA)		30	25	30	25
Reverse Voltage (VDC) @ I_R = 100 µA		5	5	5	5
Power Dissipation (mW) ②		100	105	100	105
Luminous Intensity (mcd) typical @ I_F = 20 mA DC	Non-diffused Diffused	500 200	140 60	NA 150	NA 60
Dominant Wave Length (nm) typical		640	568	588	568
Viewing Angle (2 Ø $^{1/2}$) typical	Non-diffused Diffused	30° 60°		30° 60°	
Operating Temperature (°C)		-40 to +85		-40 to +85	
Storage Temperature (°C)		-55 to +100		-55 to +100	
Lead Soldering Temperature		260°C for 5 seconds			

Notes: ① Typical pulsing values: $t_p \leq 10$ µsec, Duty cycle = 10%
② Derate at 1.6 mW/°C above +25°C Ambient

*These characteristics reflect the baseline model. Variations may imply a difference in luminous characteristics and/or operability features. Please contact the EDI Sales Department for more information.

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LED INDICATOR

THREE LEAD BI-COLOR PANEL MOUNT

ORDERING INFORMATION

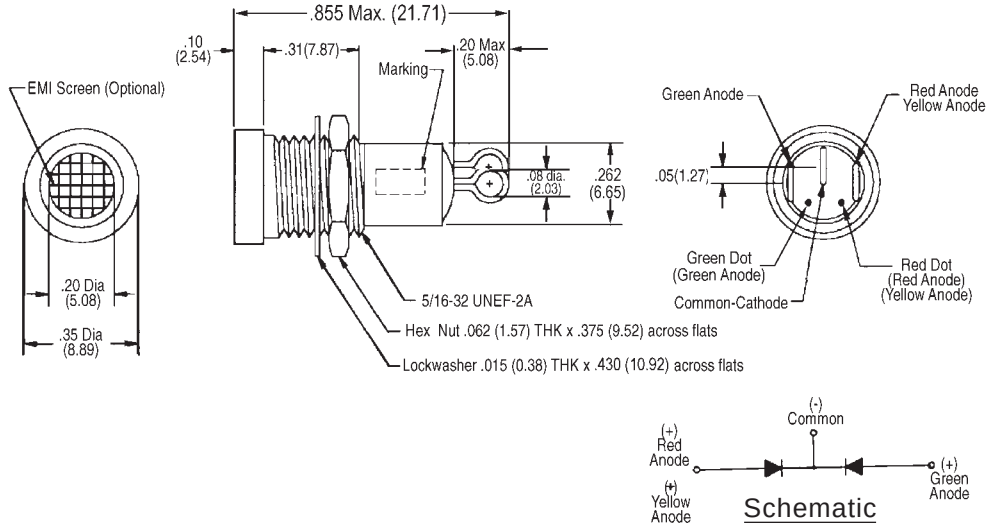
When ordering, show model number first, followed by EMI screen, then LED color, lens type, and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example: Basic model without an O-ring panel seal, with an EMI screen, a yellow/green LED, a diffused lens, and loop terminals would be an ML1623E-SY/SG-D-LT.

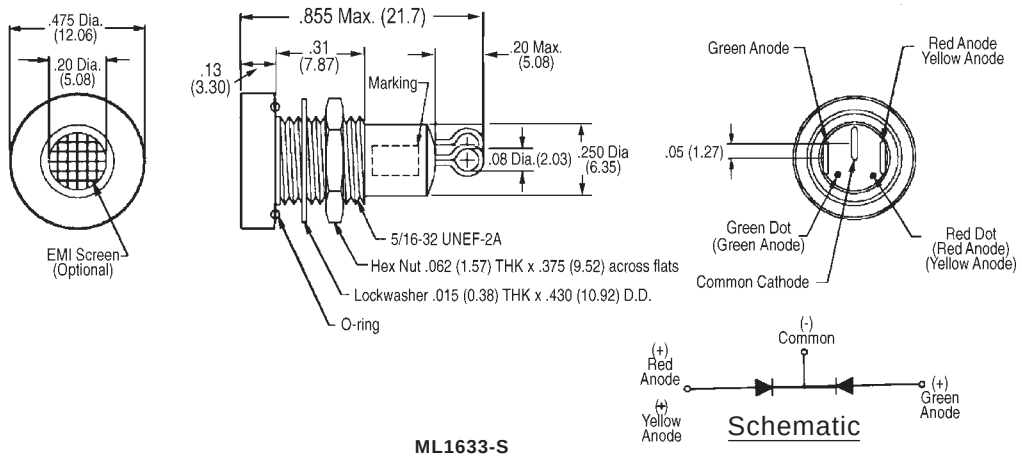
ML1623E - SY/SG - D - LT - ( )

Standard factory options are designated by "-Sxxx"

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
ML1623 (w/o O-ring)	( ) None	SR/SG Red/Green	ND Non-diffused	ST Straight Leads
ML1633 (with O-ring)	E Screen	SY/SG Yellow/Green	D Diffused	LT Loop Terminals



ML1623-S



ML1633-S
with front panel O-ring

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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Model ML1631

Developed for use as a status indicator, the ML1631 was designed to survive in the most severe environments. The small size and rugged package make it ideal for applications where status indication is critical to the operation of your equipment. The environmentally sealed case includes an O-ring panel seal that insures the integrity of your system. The ML1631 comes complete with fluorosilicone O-ring and mounting hardware.

ML1631E

FEATURES

- Multiple status indication within a single package
- Ideal for rugged environments
- Environmentally sealed
- Panel-mount seal
- Colors: red, green and blue
- Compact case design
- EMI screen
- Decorative bezel
- Wide viewing angle

MECHANICAL SPECIFICATIONS

Case: Aluminum Clear chromate
Mounting: Rear-mount by 5/16"-32 nut and lockwasher
O-Ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C			
Color	**Red**	**Green**	**Blue**
Forward Voltage (VDC) typical @ 20 mA	1.9	3.3	3.3
DC Forward Current (mA) ①	30	25	30
Reverse Voltage (VDC) @ I_R = 100 µA	5	5	5
Power Dissipation (mW)	75	102	120
Luminous Intensity (mcd) typical @ I_F = 20 mA	60	125	85
Dominant Wave Length (nm) typical	630	525	465
Viewing Angle	130°		
Operating Temperature (°C)	-40 to +85		
Storage Temperature (°C)	-55 to +100		
Lead Soldering Temperature	260°C for 5 seconds		

Notes: ① Derate linearly from 25°C @ -0.4 mA/°C.

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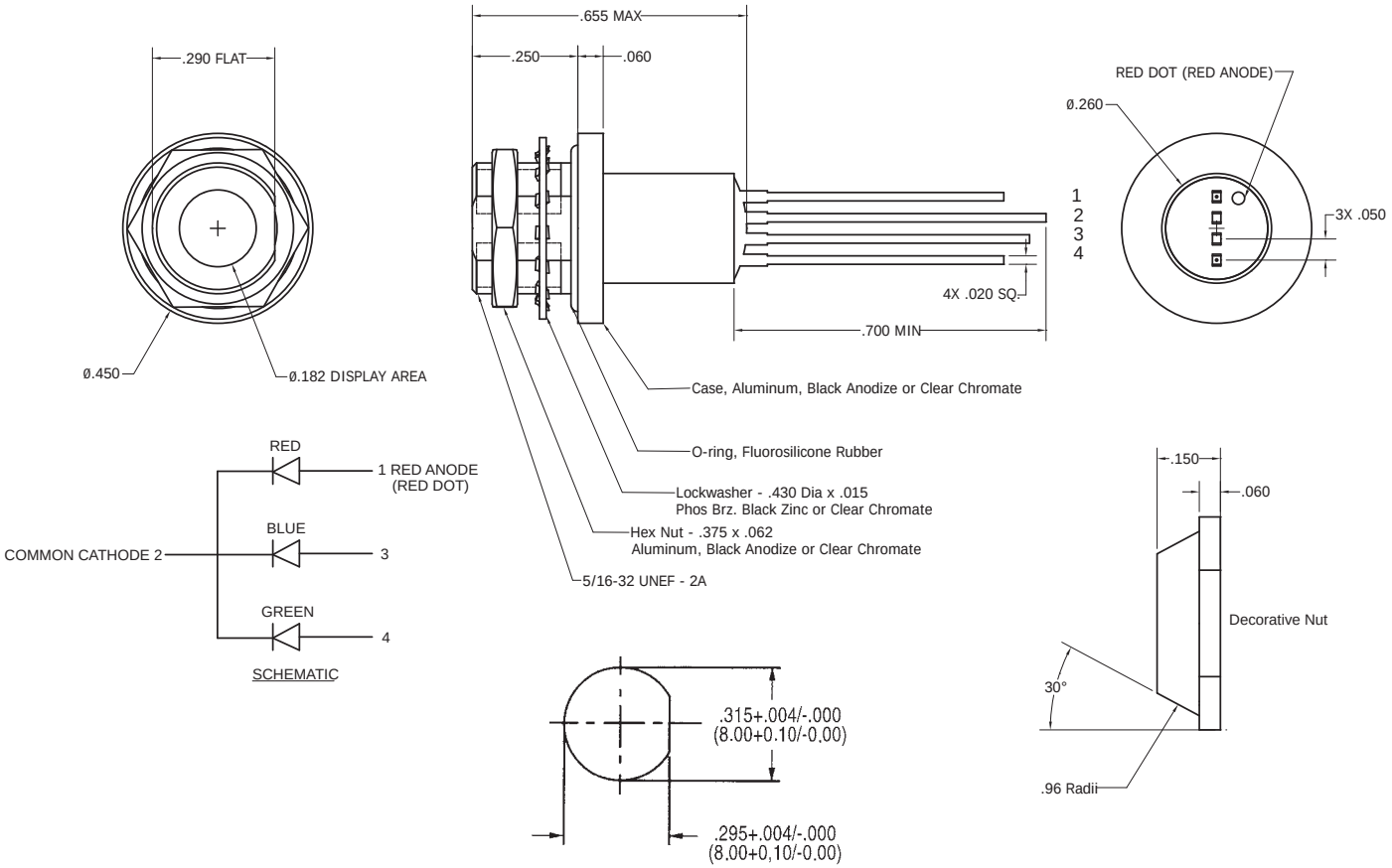
ORDERING INFORMATION

When ordering, show model number first, followed by EMI screen, then LED colors, lens style, and terminal style. If this part requires customization, a special factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example: Basic model with an EMI screen, with a red/green/blue LED, a diffused lens, and straight leads would be ML1631E-RGB-D-ST.

ML1631E - RGB - D - ST

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
ML1631	E Screen	RGB Red, Green, Blue	D Diffused	ST Straight Leads



ML1631

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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Model ML1634

Designed for use as function indicators on aircraft, test equipment, machine tools and wherever severe environmental conditions need to be met, especially vibration and EMI.

FEATURES

- Multiple status indication within a single package
- Performs in severe environments
- Colors: red/green, yellow/green
- Rugged construction
- Panel mounted
- Optional EMI screen
- Decorative bezel

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized, standard. Clear chromate case with EMI screen option.

Mounting: Rear-mount by 5/16"-32 nut and lockwasher

Seal: Environmentally sealed. Added front panel fluorosilicone O-ring.

Panel Thickness: 0.118" max.

ML1634

Standard Case

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C						
Color	**Red / Green**		**Yellow / Green**		**Super Red / Super Green**	
Forward Voltage (VDC) typical @ 20 mA	1.9	2.2	2.1	2.2	1.85	2.2
DC Forward Current (mA)	30	25	30	25	30	25
Power Dissipation (mW) ①	105	105	105	105	75	62.5
Luminous Intensity (mcd) typical @ I_F = 20 mA DC	30	20	20	20	100	30
Dominant Wave Length (nm) typical	640	568	588	568	640	568
Viewing Angle (2 Ø $^{1/2}$) typical	60°					
Operating Temperature (°C)	-40 to +85					
Storage Temperature (°C)	-55 to +100				-40 to +85	
Lead Soldering Temperature	260°C for 5 seconds					
Notes: ① Derate linearly from 25°C at -1.2 mW/°C						

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ORDERING INFORMATION

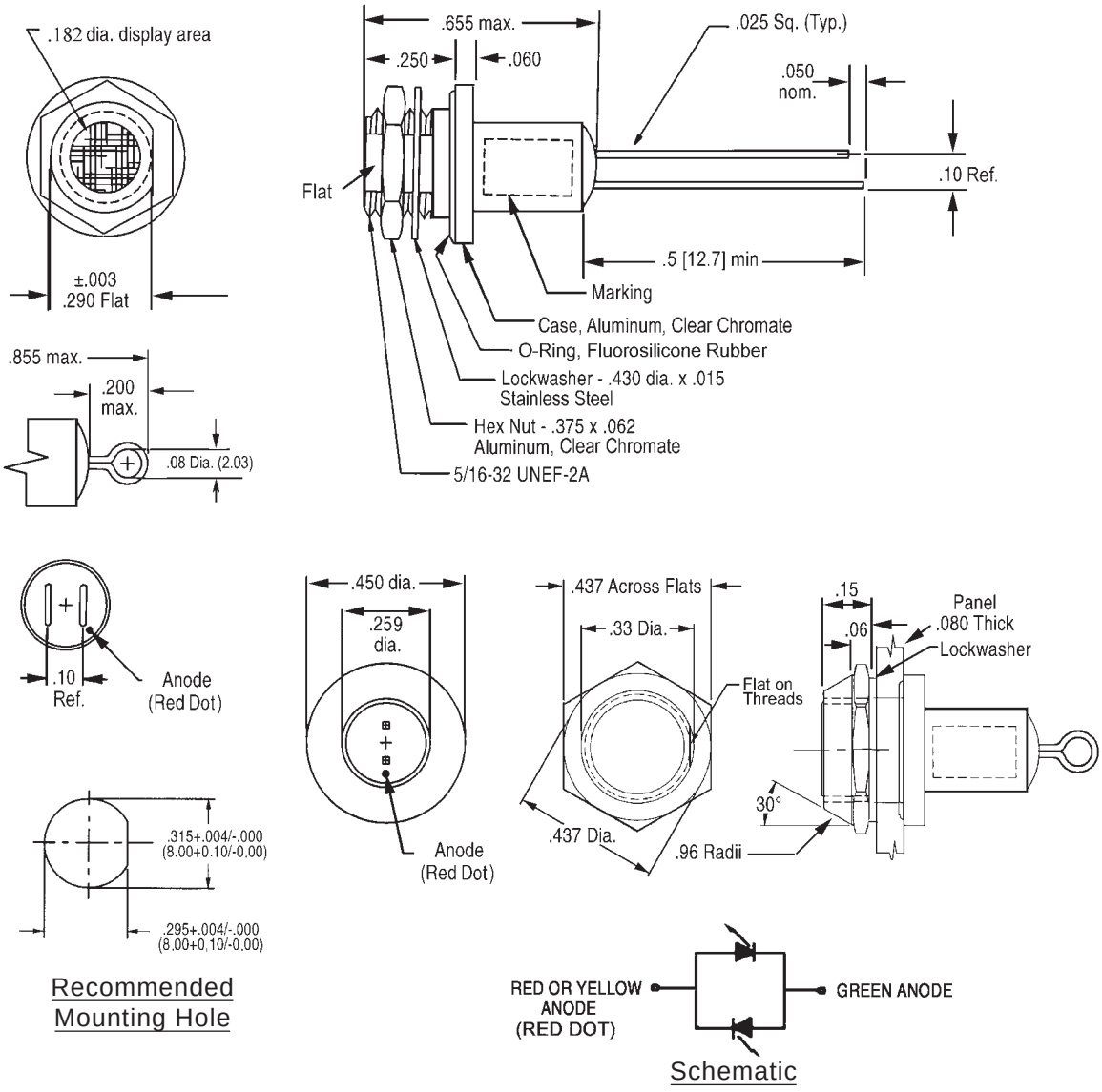
When ordering, show basic part number first, then EMI screen, LED color, lens type, and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example: Basic model with an EMI screen, with a red/green LED, a diffused lens, and straight terminals would be an ML1634E-R/G-D-ST.

ML1634E - R/G - D - ST - ( )

Standard factory options are designated by "-Sxxx"

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
ML1634	( ) None	R/G Red/Green	D Diffused	ST Straight Leads
	E Screen	Y/G Yellow/Green		LT Loop Terminals
		SR/SG Red/Green		



ML1634

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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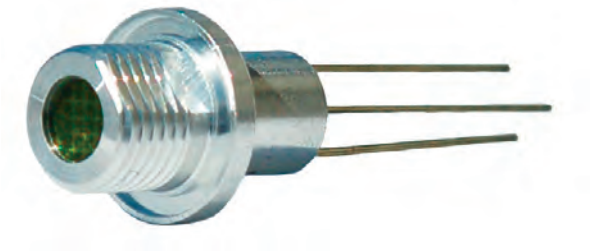
LED INDICATOR
THREE LEAD BI-COLOR REAR-MOUNT

Model ML1635

Developed for use as a status indicator, the ML1635 was designed to survive in the most severe environments. The small size and rugged package make it ideal for applications where status indication is critical to the operation of your equipment. The environmentally sealed case includes an O-ring panel seal that insures the integrity of your system. Comes complete with Fluorosilicone O-ring and mounting hardware.

ML1635E



Case with EMI Screen

FEATURES

- Multiple status indication within a single package
- Environmentally sealed
- Panel mount seal
- Colors: red/green & yellow/green
- Compact case design
- EMI screen option
- Decorative bezel

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized, standard. Clear chromate case with EMI screen option.

Mounting: Rear-mount by 5/16"-32 nut and lockwasher

O-ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C					
Color		**Red / Green**		**Yellow / Green**	
Forward Voltage (VDC) typical @ 20 mA		2.0	2.1	2.0	2.1
DC Forward Current (mA)		30	25	30	25
Reverse Voltage (VDC) @ I_R = 100 µA		5	5	5	5
Power Dissipation (mW) ①		100	105	105	105
Luminous Intensity (mcd) typical @ I_F = 20 mA DC	Diffused	200	60	150	60
Dominant Wave Length (nm) typical		630	570	588	570
Viewing Angle	Diffused	60°			
Operating Temperature (°C)		-40 to +85			
Storage Temperature (°C)		-40 to +85			
Lead Soldering Temperature		260°C for 5 seconds			

Notes: ① Derate linearly from 25°C at -1.2 mW/°C

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LED INDICATOR

THREE LEAD BI-COLOR REAR-MOUNT

ORDERING INFORMATION

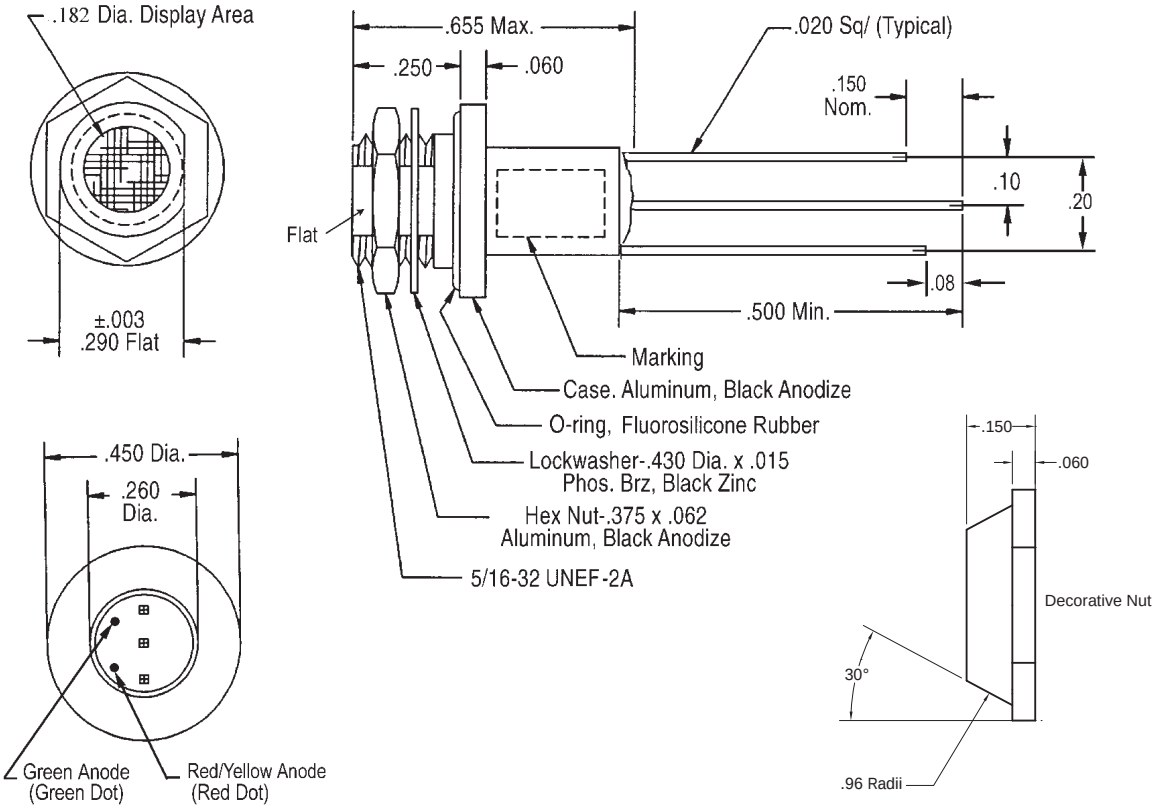
When ordering, show model number first, followed by EMI screen, then LED color, lens style, and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

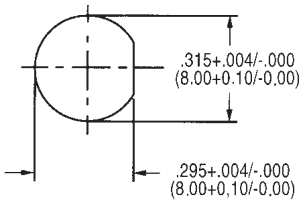
Example: Basic model with an EMI screen, with a yellow/green LED, a diffused lens, and straight leads would be ML1635E-SY/SG-D-ST.

ML1635E - SY/SG - D - ST - ( )

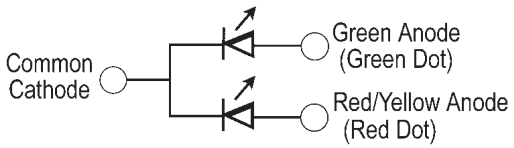
Standard factory options are designated by "-Sxxx"

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
ML1635	( ) None	SR/SG Red/Green	D Diffused	ST Straight Leads
	E Screen	SY/SG Yellow/Green		





Recommended Mounting Hole



Schematic

ML1635

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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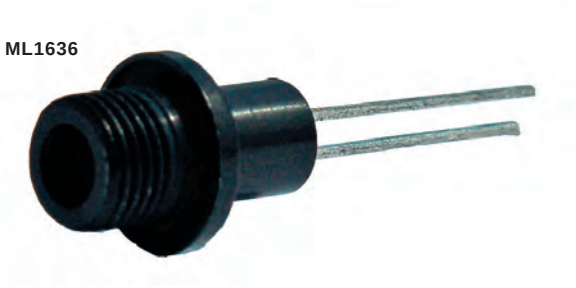
Model ML1636

Developed for use as a status indicator, the ML1636 was designed to survive in the most severe environments. The small size and rugged package make it ideal for applications where status indication is critical to the operation of your equipment. The environmentally sealed case includes an O-ring panel seal that insures the integrity of your system. Comes complete with fluorosilicone O-ring and mounting hardware.



Standard Case

FEATURES

- Ideal for rugged environments
- Environmentally sealed
- Panel mount seal
- Colors: yellow, green & red
- Compact case design
- EMI screen option
- Decorative bezel

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized, standard. Clear chromate case with EMI screen option.

Mounting: Rear-mount by 5/16"-32 nut and lockwasher

O-ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C				
Color		**Red**	**Yellow**	**Green**
Forward Voltage (VDC) typical @ 10 mA		1.9	2.0	2.1
Peak Forward Current (mA) ①		90	60	90
DC Forward Current (mA) ②		30	30	25
Reverse Voltage (VDC) @ I_R = 100 µA		5	5	5
Power Dissipation (mW)		135	85	135
Luminous Intensity (mcd) typical @ I_F = 10 mA	Non-diffused Diffused	60 12	50 12	70 12
Dominant Wave Length (nm) typical		626	585	569
Viewing Angle	Non-diffused Diffused	35° 60°	35° 60°	24° 60°
Operating Temperature (°C)		-55 to +100	-55 to +100	-20 to +100
Storage Temperature (°C)		-55 to +100	-55 to +100	-50 to +100
Lead Soldering Temperature		260°C for 5 seconds		

Notes: ① Typical pulsing values: $t_p \leq 10$ µsec, Duty cycle = 10%
② For red and green, derate linearly from 50°C @ 0.5 mA/°C. For yellow, derate linearly from 50°C @ 0.2 mA/°C

*These characteristics reflect the baseline model. Variations may imply a difference in luminous characteristics and/or operability features. Please contact the EDI Sales Department for more information.

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ORDERING INFORMATION

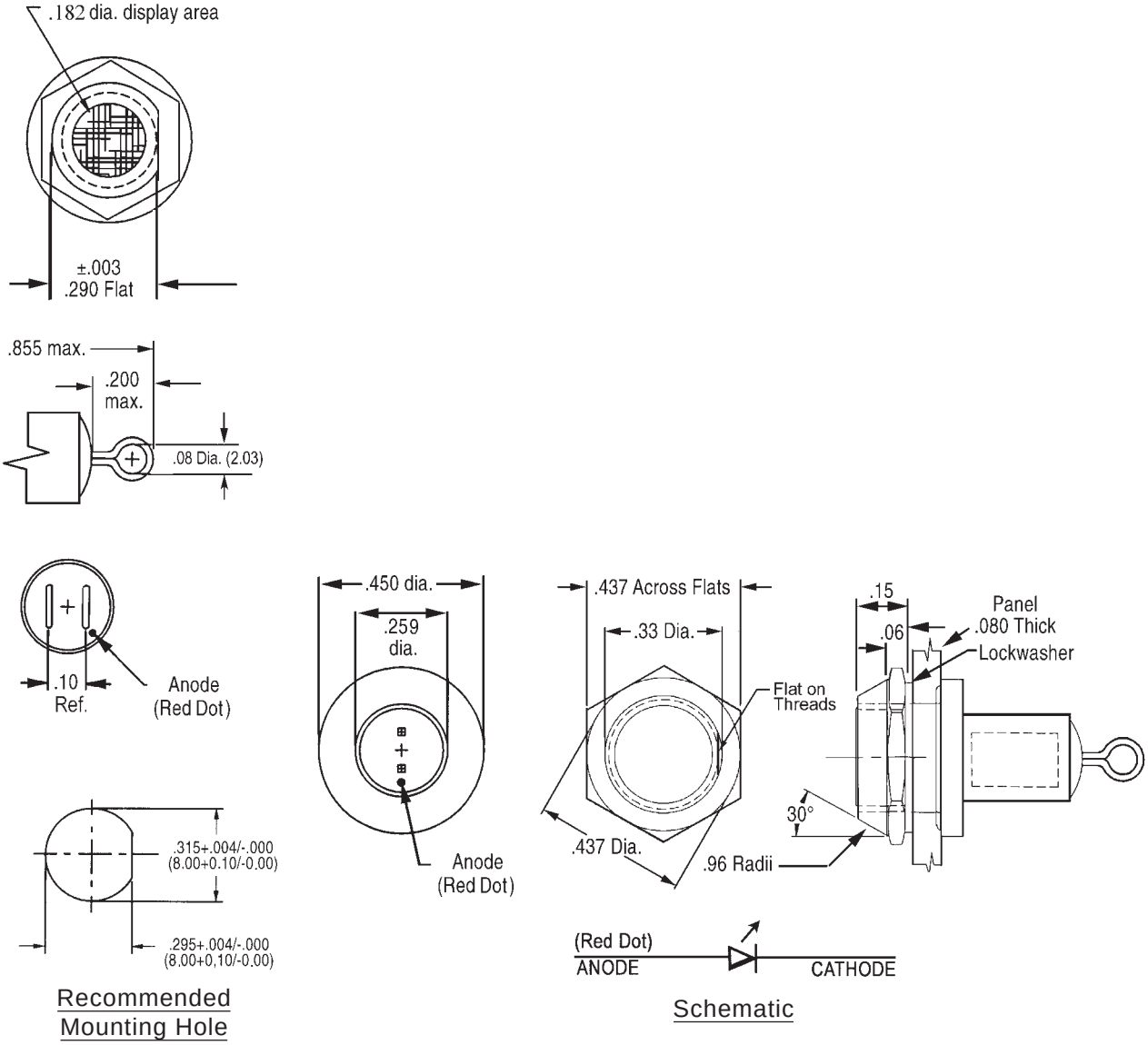
When ordering, show model number first, followed by EMI screen, then LED color, lens style and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example: Basic model with an EMI screen, with a yellow LED, diffused lens, and straight leads would be ML1636E-Y-D-ST.

ML1636E - Y - D - ST - ( )

Standard factory options are designated by "-Sxxx"

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style	Internal Resistor
ML1636	( ) None	R Red	ND Non-diffused	ST Straight Leads	() - None
	E Screen	Y Yellow	D Diffused	LT Loop Terminals	5 - 5V
		G Green			



ML1636

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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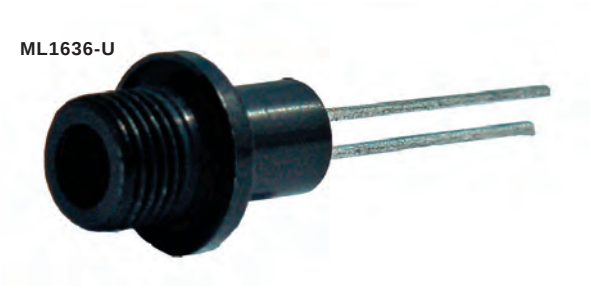
Model ML1636-U

Developed for use as a status indicator, the ML1636-U series was designed to survive in the most severe environments. The small size and rugged package make it ideal for applications where status indication is critical to the operation of your equipment. The environmentally sealed case includes an O-ring panel seal that insures the integrity of your system. Comes complete with fluorosilicone O-ring and mounting hardware.

ML1636-U



FEATURES

- Ideal for rugged environments
- Environmentally sealed
- Panel mount seal
- Compact case design
- Colors: green, red, amber, orange and red-orange
- EMI screen option
- Decorative bezel

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized, standard. Clear chromate case with EMI screen option.

Mounting: Rear-mount by 5/16"-32 nut and lockwasher

O-ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C					
Color	**Red-Orange**	**Orange**	**Amber**	**Green**	**Red**
Forward Voltage (VDC) typical @ 20 mA	1.9	2.0	2.0	3.2	1.9
DC Forward Current (mA) ①	50	50	50	30	50
Reverse Voltage (VDC) @ I_R = 100 µA	5	5	5	5	5
Junction Temperature	130°C	130°C	130°C	130°C	130°C
Luminous Intensity (mcd) typical @ I_F = 20 mA Non-diffused	600	600	600	1000	600
Dominant Wave Length (nm) typical @ I_F = 20 mA	615	605	590	526	626
Viewing Angle (2 Ø $^{1/2}$) typical	30°	30°	30°	30°	30°
Operating Temperature (°C)	-40 to +100	-40 to +100	-40 to +100	-40 to +80	-40 to +100
Storage Temperature (°C)	-40 to +100	-40 to +100	-40 to +100	-40 to +100	-40 to +100
Lead Soldering Temperature	260°C for 5 seconds				

Notes: ① Derate linearly from 50°; green @ 0.6 mA/°C; all other colors @ 0.7 mA/°C

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ORDERING INFORMATION

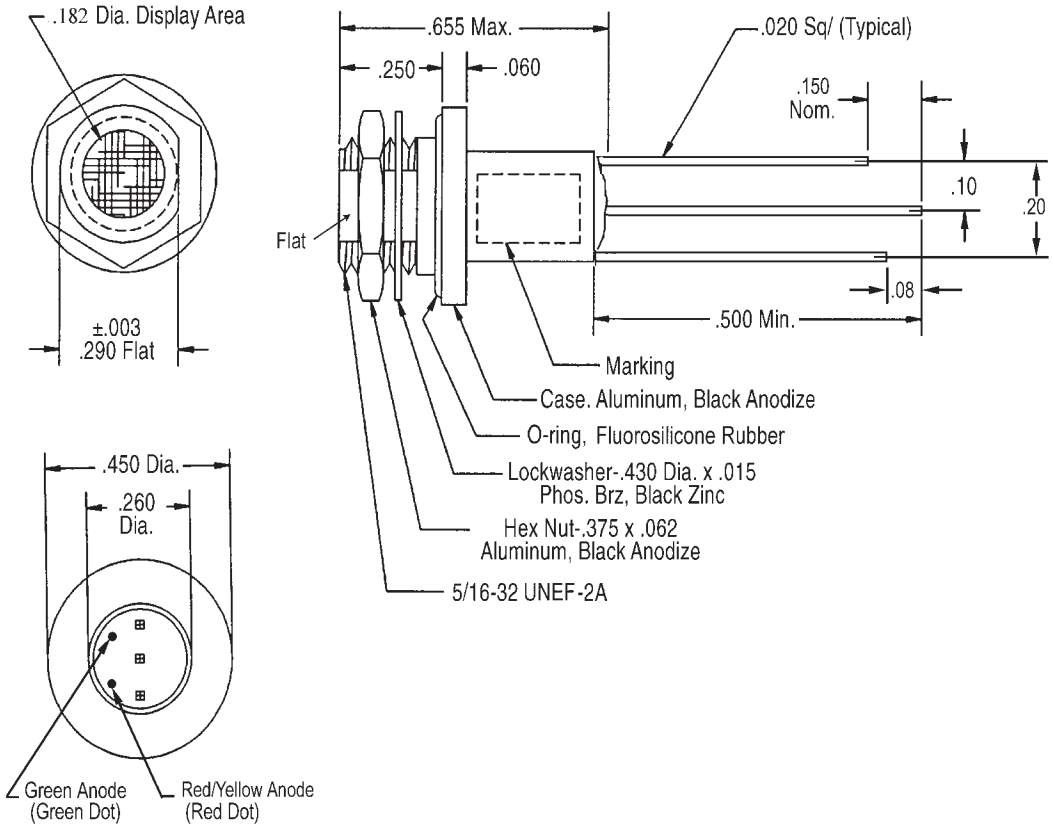
When ordering, show model number first, followed by EMI screen, then LED color, lens style and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example: Basic model with an EMI screen, with a red LED a non- diffused lens, and loop terminals would be ML1636E-UR-ND-LT.

ML1636E - UR - ND - LT - ( )

Standard factory options are designated by "-Sxxx"

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
ML1636	( ) None	UR Red	ND Non-diffused	WL Wire Leads
	E Screen	UG Green		LT Loop Terminals
		UA Amber		ST Straight Terminals
		UO Orange		
		UP Red-Orange		



Recommended Mounting Hole

Schematic

ML1636-U

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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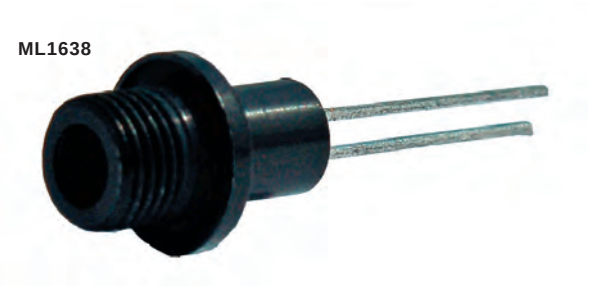
LED INDICATOR
NVIS COMPATIBLE REAR-MOUNT

Model ML1638

The ML1638 status indicator was designed to meet the requirements of MIL-L-85762A and MIL-STD-3009. This solid-state LED indicator has an infrared blocking lens that is compatible with NVIS environments. It is a rear-mount indicator and comes complete with O-ring and mounting hardware.



Standard Case

FEATURES

- Designed to meet MIL-L-85762A and MIL-STD-3009 lighting, aircraft, interior night vision imaging system (NVIS) compatible
- Environmentally sealed
- Panel mount seal
- Colors: red, yellow & green
- Compact case design
- Decorative bezel
- Optional EMI screen

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized, standard. Clear chromate case with EMI screen option.

Mounting: Rear-mount by 5/16"-32 nut and lockwasher

O-ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C				
Color		**NVIS Red**	**NVIS Yellow**	**NVIS Green B**
Forward Voltage (VDC) typical @ 20 mA		2.0	2.0	2.1
DC Forward Current (mA) ①		50	20	50
Reverse Voltage @ I_R = 100 µA		4	5	4
Power Dissipation (mW) typical		120	85	120
Luminous Intensity (mcd) typical @ I_F = 20 mA	Non-diffused Diffused	200 100	3.0 1.8	20 10
Chromaticity per MIL-L-85762A & MIL-STD-3009		NVIS Red	NVIS Yellow	NVIS Green B
Dominant Wave Length (nm) typical		605	585	558
NVIS Radiance per MIL-L-85762A & MIL-STD-3009		NR_B 1.4 x 10^{-7} @15 fL	NR_A 1.5 x 10^{-7} @15 fL NR_B 1.4 x 10^{-7} @15 fL	NR_A 1.7 x 10^{-10} @0.1 fL NR_B 1.7 x 10^{-10} @0.1 fL
Viewing Angle (2 Ø $^{1/2}$) typical	Non-diffused Diffused	30° x 50° 50°	32° 50°	32° 50°
Operating Temperature (°C)		-40 to +100	-55 to +100	-40 to +100
Storage Temperature (°C)		-55 to +100	-55 to +100	-55 to +100

Notes: ① DC Forward Current Derating. Yellow indicators, derate linearly from 50°C at 0.2 mA per °C. Green & Red indicators, derate linearly from 50°C at 0.5 mA per °C

*These characteristics reflect the baseline model. Variations may imply a difference in luminous characteristics and/or operability features. Please contact the EDI Sales Department for more information.

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ORDERING INFORMATION

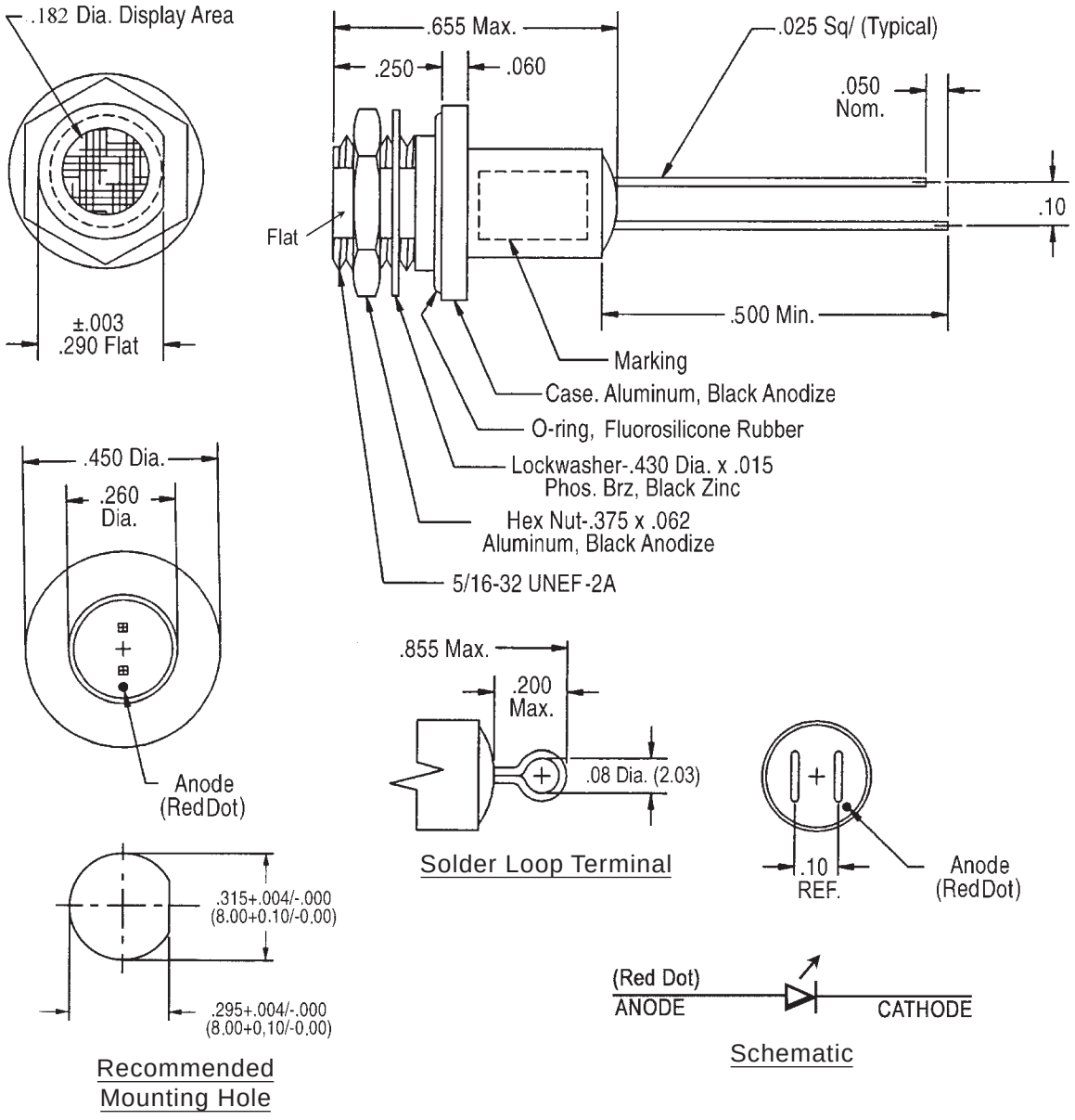
When ordering, show model number first, followed by EMI screen, then LED color, lens type, and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example: Basic model, with an EMI screen, NVIS yellow LED, diffused lens, and straight leads would be ML1638E-Y-D-ST.

ML1638E - Y - D - ST - ( )

Standard factory options are designated by "-Sxxx"

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
ML1638	( ) None	R Red	ND Non-diffused	ST Straight Leads
	E Screen	Y Yellow	D Diffused	LT Loop Terminals
		G Green		



ML1638

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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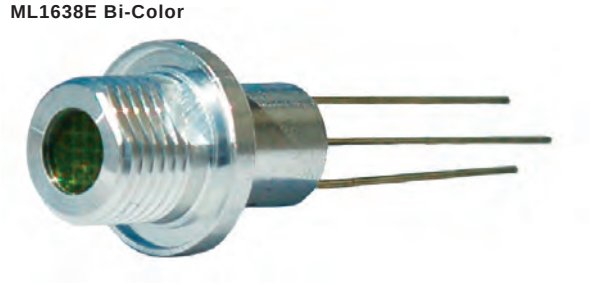
Model ML1638 Bi-Color 3-Leaded

The ML1638 Bi-Color status indicator was designed to meet the requirements of MIL-L-85762A and MIL-STD-3009. This solid-state LED indicator has an infrared blocking lens that is compatible with NVIS environments. It is a rear-mount indicator and comes complete with O-ring and mounting hardware.

ML1638E Bi-Color



Case with EMI Screen

FEATURES

- Designed to meet MIL-L-85762A and MIL-STD-3009 lighting, aircraft, interior night vision imaging system (NVIS) compatible
- Environmentally sealed
- Panel mount seal
- Colors: red/green
- Compact case design
- Decorative bezel
- Optional EMI screen

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized, standard. Clear chromate case with EMI screen option.

Mounting: Rear-mount by 5/16"-32 nut and lockwasher

O-ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C			
Color		**NVIS Red**	**NVIS Green B**
Forward Voltage (VDC) typical @ 20 mA		2.0	2.2
DC Forward Current (mA)		30	25
Reverse Voltage @ I_R = 100 µA		5	5
Power Dissipation (mW) typical ①		120	120
Luminous Intensity (mcd) typical @ I_F = 20 mA	Diffused	12	1
Chromaticity per MIL-L-85762A & MIL-STD-3009		NVIS Red	NVIS Green B
Dominant Wave Length (nm) typical		600	558
NVIS Radiance per MIL-L-85762A & MIL-STD-3009		NR_B 1.4 x 10^{-7} @15 fL	NR_A 1.7 x 10^{-10} @0.1 fL NR_B 1.7 x 10^{-10} @0.1 fL
Viewing Angle (2 Ø $^{1/2}$) typical	Diffused	60°	
Operating Temperature (°C)		-40 to +85	
Storage Temperature (°C)		-55 to +100	

Notes: ① Derate linearly from 25°C at ~1.2 mW per °C

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ORDERING INFORMATION

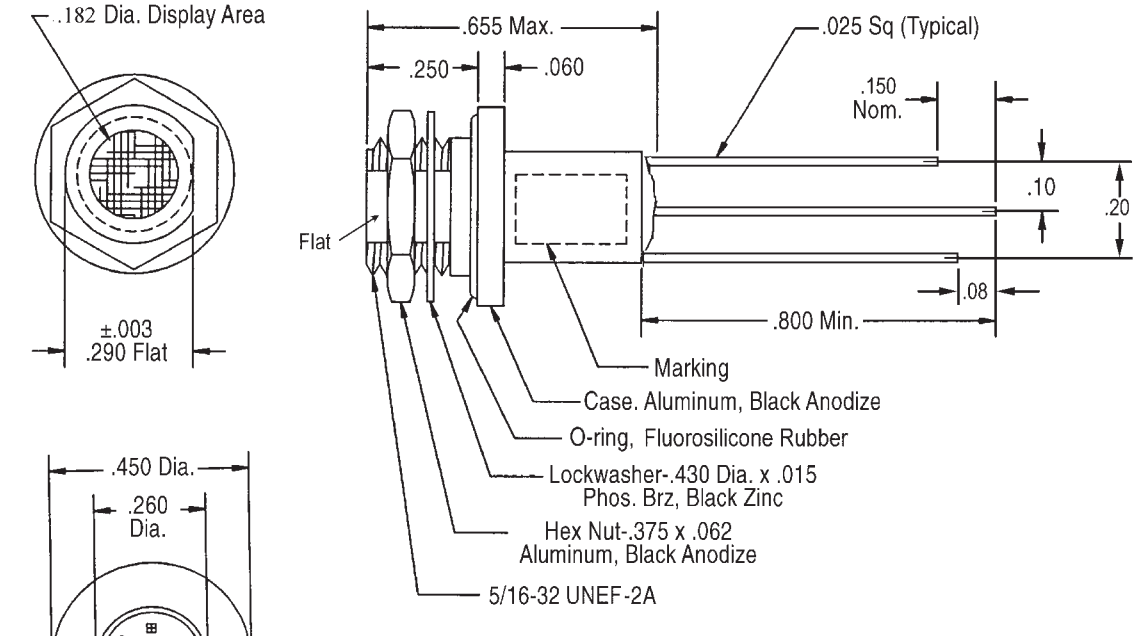
When ordering, show model number first, followed by EMI screen, LED color, common type, lens type, and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

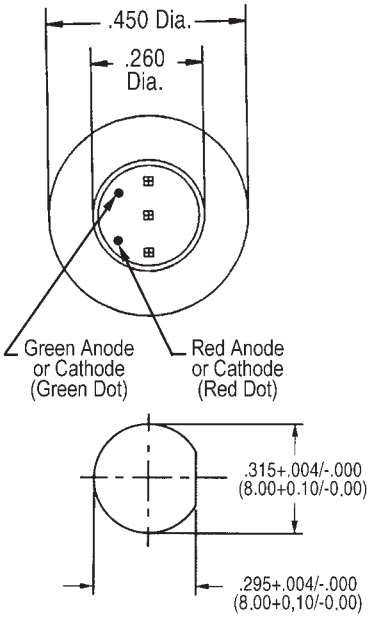
Example: Basic model with EMI screen, NVIS Red/Green Bi-Color LED, Anode Common, diffused lens, and straight leads would be ML1638E-R/G-CA-D-ST.

ML1638E - R/G - CA - D - ST - ( )

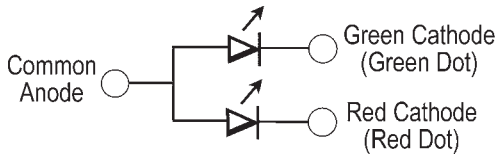
Standard factory options are designated by "-Sxxx"

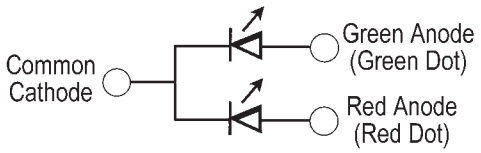
Basic Model Number	EMI Screen	LED Color	Common Lead	Lens Type	Terminal Style
ML1638	( ) None	R/G Red/Green	CA Anode	D Diffused	ST Straight Leads
	E Screen		CC Cathode		LT Loop Terminals





Recommended Mounting Hole





Schematic

ML1638 Bi-Color

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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ML1640 Series

Developed for use as a function indicator, this solid-state lamp with plain or filtered type lens, designed for sunlight viewing, is designed to meet the requirements of DESC drawing 85122. It is panel mountable with solderable leads and includes hardware. Available with anti-reflection lens coating.

ML1640

FEATURES

- Design meets DESC drawing 85122
- Optional EMI protection screen
- Environmentally sealed
- Colors: red, yellow & green
- Panel mount

MECHANICAL SPECIFICATIONS

Bezel: Aluminum, black anodized
Case: Aluminum, clear chromate
Mounting: Front panel by 5/16"-32 nut and lockwasher
Seal: Environmentally sealed with front panel PTFE ring seal

ENVIRONMENTAL SPECIFICATIONS

Units meet 100% screening in compliance with DESC 85122 and MIL-STD-750.

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C			
Color	**Red**	**Yellow**	**Green**
Forward Voltage (VDC) Typical I_F @ 20 mA	1.9	2.1	2.2
Peak Forward Current (mA)	90	60	90
DC Forward Current (mA)	30	20	30
Reverse Voltage (VDC) @ I_R = 100 µA	5	5	5
Power Dissipation (mW)	135 ①	85 ②	135 ①
Luminous Intensity (mcd) typical	See chart	See chart	See chart
Dominant Wave Length (nm) typical	626	585	569
Operating Temperature (°C)	-55 to +100	-55 to +100	-20 to +100
Storage Temperature (°C)	-55 to +100	-55 to +100	-55 to +100
Lead Soldering Temperature	260°C for 5 seconds		

Notes: ① Derate at 1.8 mW/°C above +25°C Ambient
② Derate at 1.6 mW/°C above +50°C Ambient

Electrodyamics Model No. ③	DESC 85122 Dash No. ④	Type of Lens	Anti-reflect. Coating	EMI Screen	Outline Figure
ML1641-X011	R01, Y01, G01	Plano Convex	No	No	1
ML1644-X011	R02, Y02, G02	Plano Convex	No	No	2
ML1644-X111	R11, Y11, G11	Plano Convex	No	Yes	2a
ML1642-X011	R03, Y03, G03	Flat 30° View. Angle	No	No	3
ML1645-X011	R05, Y05, G05	Flat 30° View. Angle	No	No	4
ML1645-X021	R07, Y07, G07	Flat 30° View. Angle	Yes	No	4
ML1645-X121	R09, Y09, G09	Flat 30° View. Angle	Yes	Yes	4a
ML1643-X011	R04, Y04, G04	Flat 100° View. Angle	No	No	3
ML1646-X011	R06, Y06, G06	Flat 100° View. Angle	No	No	4
ML1646-X021	R08, Y08, G08	Flat 100° View. Angle	Yes	No	4
ML1646-X121	R10, Y10, G10	Flat 100° View. Angle	Yes	Yes	4a

DESC 85122 Dash No. ④	Min. Luminous Intensity @ Forward Current
R01, R02, R11	15 mcd @ 10 mA
Y01, Y02, Y11	12 mcd @ 10 mA
G01, G02, G11	12 mcd @ 20 mA
R03, R05, R07, R09	10 mcd @ 20 mA
Y03, Y05, Y07, Y09	5 mcd @ 15 mA
G03, G05, G07, G09	10 mcd @ 20 mA
R04, R06, R08, R10	1.0 mcd @ 15 mA
Y04, Y06, Y08, Y10	0.5 mcd @ 15 mA
G04, G06, G08, G10	1.0 mcd @ 20 mA

Notes: ③ Substitute color X in Model No., i.e.: R=RED Y=YELLOW G=GREEN
④ Add **1A** to end of DESC P/N's

This page cleared by DoD/OSR for public release under 12-S-1675 on 04/23/2012.

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ORDERING INFORMATION

When ordering, show model number first, then LED color, EMI screen, coated lens, and the type of lead 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 with red LED, EMI screen, uncoated lens, and straight lead would be model ML1644-R111.

ML1644 - R 1 1 1

Basic Model Number	LED Color	EMI Screen	Lens Coating	Terminal Style
ML1640	R Red	0 None	1 Uncoated	1 Straight Tin Lead
	Y Yellow	1 Screen	2 Anti-reflection Coating	2 Loop Terminals
	G Green			

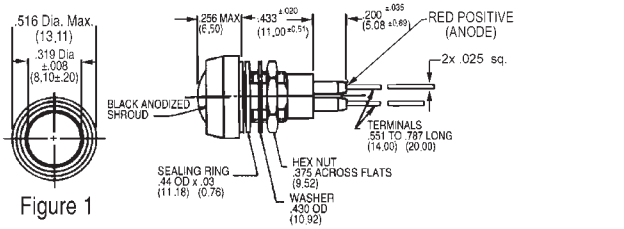


Figure 1

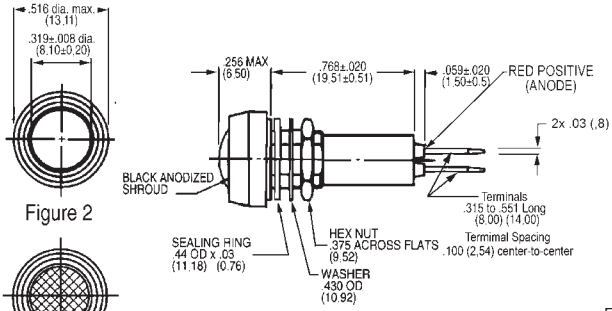
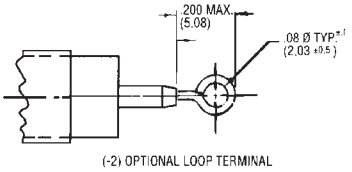


Figure 2

WITH EMI SCREEN

Figure 2a



(-2) OPTIONAL LOOP TERMINAL

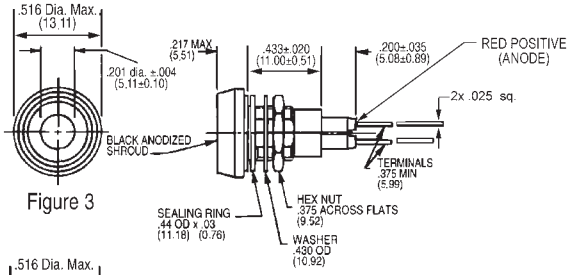
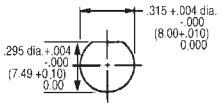


Figure 3



RECOMMENDED MOUNTING HOLE

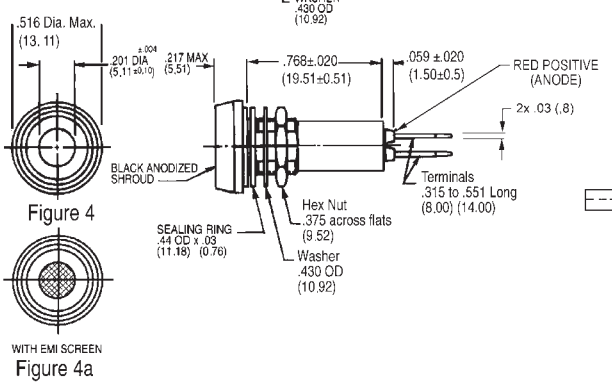
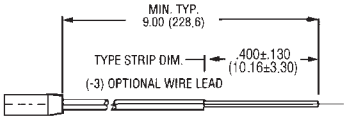
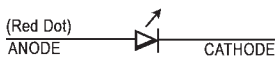


Figure 4

WITH EMI SCREEN

Figure 4a





Schematic

ML1640 Series

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

LIGHTING INDICATOR
MIL-SPEC NVIS COMPATIBLE

Model ML1662

The ML1662 status indicator was developed to meet the requirements of MIL-L-85762A and MIL-STD-3009. This solid-state lamp with infrared blocking lens is compatible with NVIS environments. It is a panel mount device with solderable leads and includes hardware.

ML1662

FEATURES

- Designed to meet MIL-L-85762A and MIL-STD-3009 lighting, aircraft, interior night vision imaging system (NVIS) compatible
- Environmentally sealed
- Optional EMI protection screen
- Colors: yellow, green & red
- Front panel mount seal

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized bezel with clear chromate body.

Mounting: Front panel by 5/16"-32 nut and lockwasher.

Seal: Environmentally sealed with front panel PTFE ring seal.

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C			
Color	**NVIS Red**	**NVIS Yellow**	**NVIS Green B**
Forward Voltage (VDC) typical @ 20 mA	2.0	2.0	2.1
DC Forward Current (mA) ①	50	20	50
Reverse Voltage @ I_R = 100 µA	4	5	4
Power Dissipation (mW)	120	85	120
Luminous Intensity (mcd) typical @ 20 mA diffused	100	1.8	10
Chromaticity per MIL-L-85762A & MIL-STD-3009	NVIS Red	NVIS Yellow	NVIS Green B
NVIS Radiance per MIL-L-85762A & MIL-STD-3009	NR_B 1.4 x 10^{-7} @15 fL	NR_A 1.5 x 10^{-7} @15 fL NR_B 1.4 x 10^{-7} @15 fL	NR_A 1.7 x 10^{-10} @0.1 fL NR_B 1.7 x 10^{-10} @0.1 fL
Dominant Wave Length (nm) typical	605	585	558
Viewing Angle (2 Ø $^{1/2}$) diffused	50°	50°	50°
Operating Temperature (°C)	-40 to +100	-55 to +100	-40 to +100
Storage Temperature (°C)	-55 to +100	-55 to +100	-55 to +100

Notes: ① DC Forward Current Derating. Yellow indicators, derate linearly from 50°C at 0.2 mA per °C. Green & Red indicators, derate linearly from 50°C at 0.5 mA per °C

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LIGHTING INDICATOR

MIL-SPEC NVIS COMPATIBLE

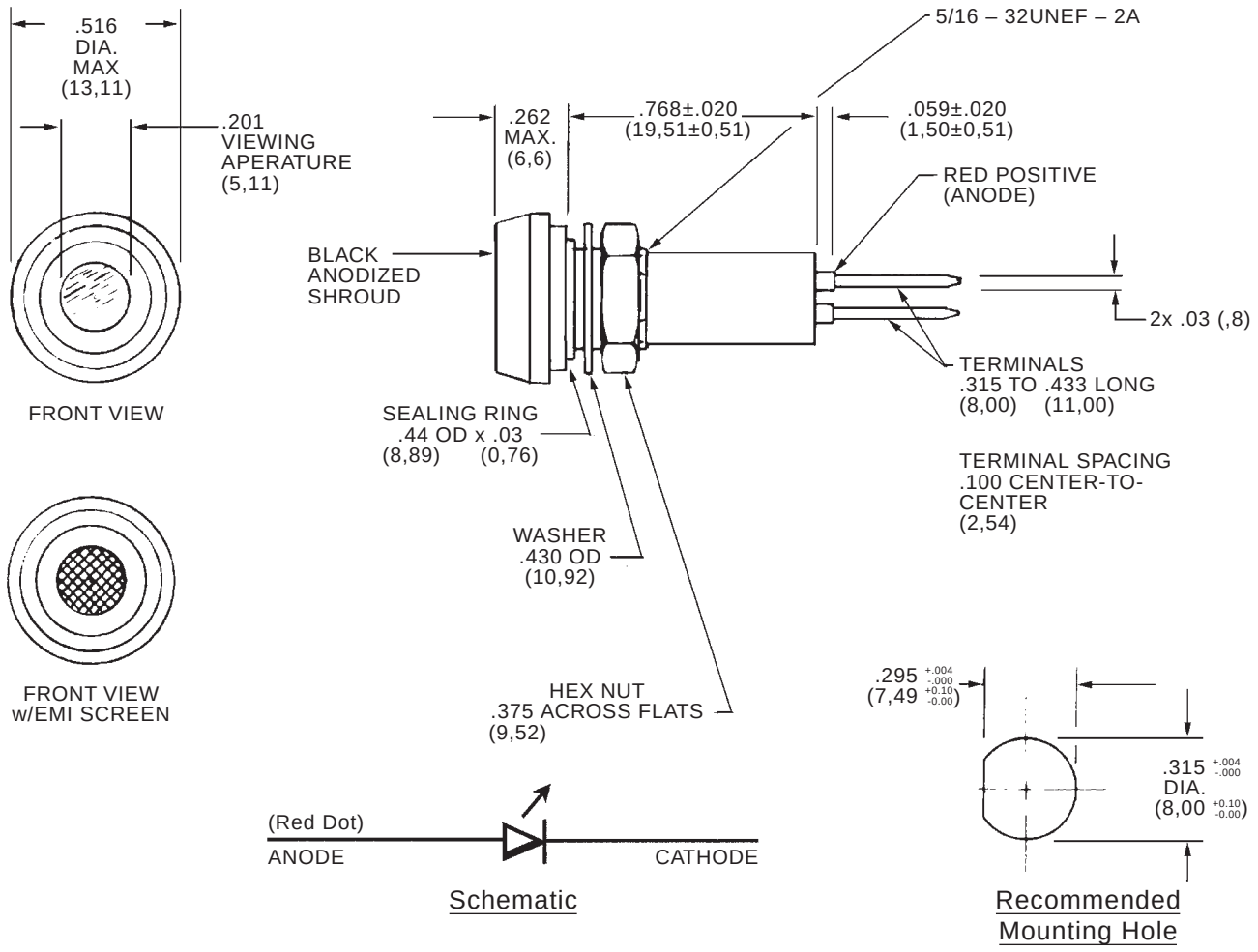
ORDERING INFORMATION

When ordering, show model number first, then LED color, EMI screen, body finish, and the terminal style 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 with green LED, EMI screen, a clear chromate body finish, and a tin lead terminal finish would be model ML1662-G121.

ML1662 - G - 1 - 2 - 1

Basic Model Number	LED Color	EMI Screen	Body Finish Color	Terminal Style
ML1662	R Red	0 None	2 Clear Chromate	1 Straight Tin Lead
	Y Yellow	1 Screen		2 Loop Terminals
	G Green			



ML1662

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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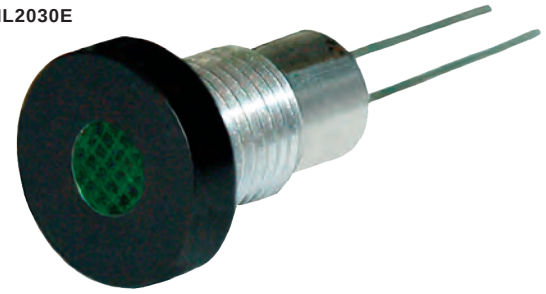
LED INDICATOR

SOLID FRONT WATERTIGHT PANEL SEAL

Model ML2030

Designed for use where a watertight panel seal is required for system performance. Can be used as a function indicator on aircraft avionics systems, test equipment, medical equipment, machine tools, and wherever severe environmental conditions are present.

ML2030E



FEATURES

- O-ring panel seal
- Dual finish case
- Low power use
- Performs in severe environments
- Rugged construction

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized front bezel with conductive clear chromate body.

Mounting: Front panel mount with 5/16"-32 nut and lock washer.

Seal: Environmentally sealed case. MIL-DTL-3661, Para. 4.6.11.1

O-ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C				
Color		**Red**	**Yellow**	**Green**
Forward Voltage (VDC)		1.9	2.0	2.1
DC Forward Current (mA DC) ①		30	20	30
Reverse Voltage (VDC) @ I_R = 100 µA		5	5	5
Power Dissipation (mW)		135	85	135
Luminous Intensity (mcd) typical @ I_F = 10 mA	Non-diffused Diffused	60 11	50 12	70 12
Dominant Wave Length (nm) typical		626	585	569
Viewing Angle (2 Ø $^{1/2}$) typical	Non-diffused Diffused	35° 60°	35° 60°	24° 60°
Operating Temperature (°C)		-55 to +100	-55 to +100	-20 to +100
Storage Temperature (°C)		-55 to +100	-55 to +100	-55 to +100
Lead Soldering Temperature		260°C for 5 seconds		

Notes: ① For red and green, derate linearly from 50°C @ 0.5 mA/°C. For yellow derate linearly from 50°C @ 0.2 mA/°C

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LED INDICATOR

SOLID FRONT WATERTIGHT PANEL SEAL

ORDERING INFORMATION

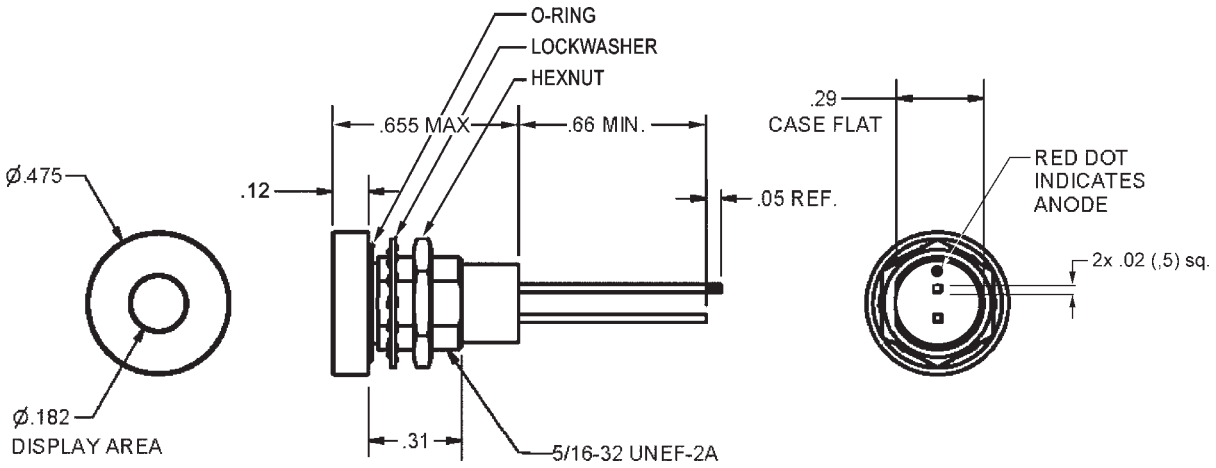
When ordering, show basic part number first, LED color, lens type, and terminal style. If this part requires customization, a special factory assigned modification number will be assigned to the end of the ordering number. Consult the factory for special configurations.

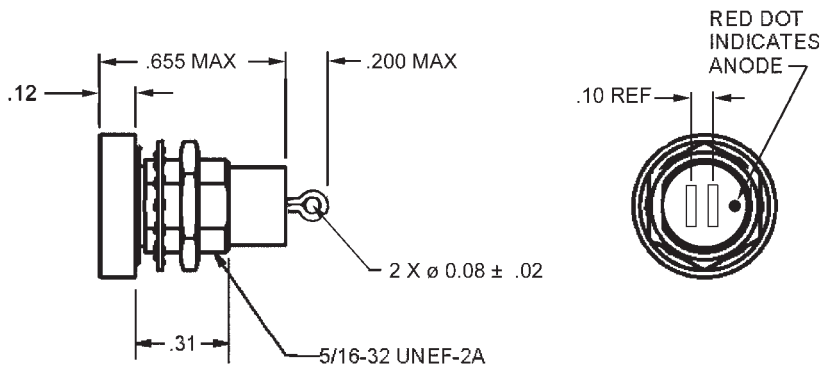
Example: Basic model with EMI screen, a red LED, a diffused lens, and looped terminals would be ML2030E-R-D-LT.

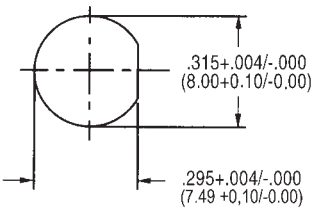
ML2030E - R - D - LT - ( )

Standard factory options are designated by "-Sxxx"

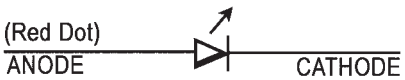
Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
ML2030		R Red	ND Non-diffused	ST Straight Leads
	E Screen	Y Yellow	D Diffused	LT Loop Terminals
		G Green		







Recommended Mounting Hole



Schematic

NOTE:
Ø .475 AND FRONT SURFACE OF FLANGE IS BLACK ANODIZED.
ALL OTHER SURFACES ARE CLEAR CHROMATE.

ML2030

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 10-12 in. lbs.

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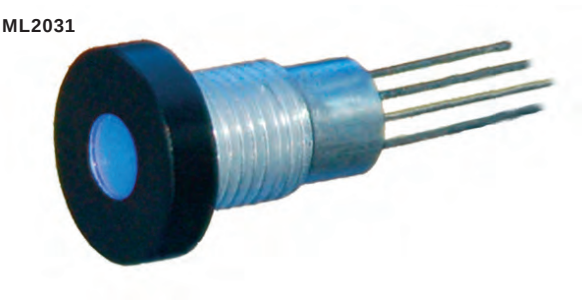
LED INDICATOR
WATERTIGHT PANEL SEAL TRI-COLOR

Model ML2031

Designed for use where a watertight panel seal is required for system performance. Can be used as a function indicator on aircraft avionics systems, test equipment, medical equipment, machine tools and wherever severe environmental conditions are present.

ML2031



FEATURES

- O-ring panel seal
- Dual-finish case
- Performs in severe environments
- Low power use
- Rugged construction
- Colors: red, green and blue
- Multiple status indication within a single package
- Wide viewing angle

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized front bezel with conductive clear chromate body

Mounting: Front panel mount with 5/16"-32 nut and lock washer

Seal: Environmentally sealed case. MIL-DTL-3661, Para. 4.6.11.1

O-Ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C			
Color	**Red**	**Green**	**Blue**
Forward Voltage (VDC) typical @ 20 mA	1.9	3.3	3.3
DC Forward Current (mA DC) ①	30	25	30
Reverse Voltage (VDC) @ I_R = 100 µA	5	5	5
Power Dissipation (mW)	75	102	120
Luminous Intensity (mcd) typical @ I_F = 20 mA DC	60	125	85
Dominant Wave Length (nm) typical	630	525	465
Viewing Angle (2 Ø $^{1/2}$) typical	130°		
Operating Temperature (°C)	-40 to +85		
Storage Temperature (°C)	-55 to +100		
Lead Soldering Temperature	260°C for 5 seconds		

Notes: ① Derate linearly from 25°C @ -0.4 mA/°C.

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LED INDICATOR

WATERTIGHT PANEL SEAL TRI-COLOR

ORDERING INFORMATION

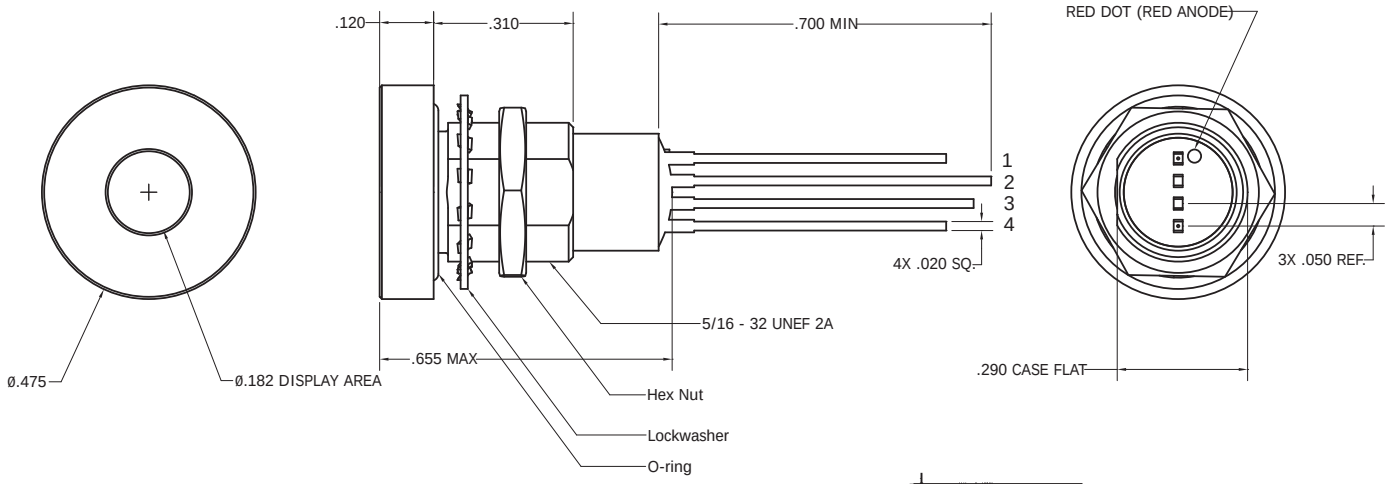
When ordering, show model number first, followed by EMI screen, then LED colors, lens style, and terminal style. If this part requires customization, a special factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

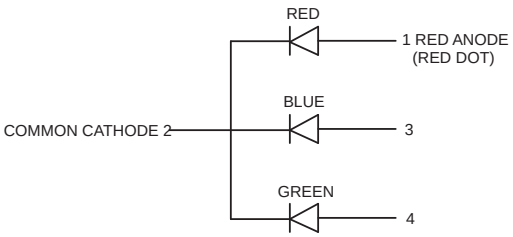
Example: Basic model with an EMI screen, red/green/blue LED, a diffused lens and straight leads would be ML2031E-RGB-D-ST.

ML2031E - RGB - D - ST - ( )

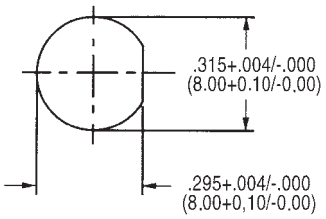
Standard factory options are designated by "-Sxxx"

Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
ML2031	( ) None	RGB Red, Green, Blue	D Diffused	ST Straight Leads
	E Screen			





Schematic



Recommended Mounting Hole

ML2031

LED INDICATORS

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 10-12 in. lbs.

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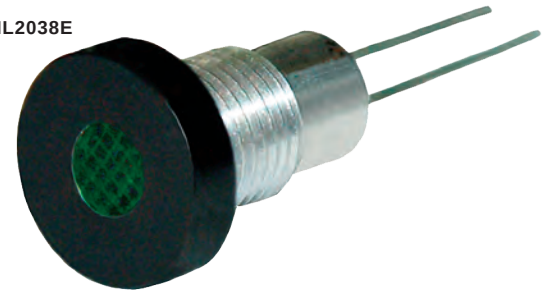
LED INDICATOR
NVIS COMPATIBLE TIGHT PANEL SEAL

Model ML2038

The ML2038E status indicator is designed to meet the requirements of MIL-L-85762A and MIL-STD-3009. This solid-state LED indicator has an infrared blocking lens that is compatible with NVIS environments. It is a rear-mount indicator and comes complete with O-ring and mounting hardware.

ML2038E



FEATURES

- Designed to meet MIL-L-85762A and MIL-STD-3009 lighting, aircraft, interior night vision imaging system (NVIS) compatible
- Performs in severe environments
- O-ring panel seal
- Dual-finish case
- Compact case design
- Rugged construction

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized, front bezel with conductive clear chromate body.

Mounting: Front Panel mount with 5/16"-32 nut and lockwasher

Seal: MIL-DTL-3661C, paragraph 4.6.11.1

O-ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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 (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C				
Color		**NVIS Red**	**NVIS Yellow**	**NVIS Green B**
Forward Voltage (VDC) typical @ 20 mA		2.0	2.0	2.1
DC Forward Current (mA) ①		50	20	50
Reverse Voltage @ I_R = 100 µA		4	5	4
Power Dissipation (mW) typical		120	85	120
Luminous Intensity (mcd) typical @ I_F = 20 mA	Non-diffused Diffused*	200 N/A	3.0 N/A	20 10
Chromaticity per MIL-L-85762A & MIL-STD-3009		NVIS Red	NVIS Yellow	NVIS Green B
Dominant Wave Length (nm) typical		605	585	558
NVIS Radiance per MIL-L-85762A & MIL-STD-3009		NR_B 1.4 x 10^{-7} @15 fL	NR_A 1.5 x 10^{-7} @15 fL NR_B 1.4 x 10^{-7} @15 fL	NR_A 1.7 x 10^{-10} @0.1 fL NR_B 1.7 x 10^{-10} @0.1 fL
Viewing Angle (2 Ø $^{1/2}$) typical	Non-diffused Diffused*	30° x 50° N/A	32° N/A	32° 50°
Operating Temperature (°C)		-40 to +100	-55 to +100	-40 to +100
Storage Temperature (°C)		-55 to +100	-55 to +100	-40 to +100

Notes: ① DC Forward Current Derating. Yellow indicators, derate linearly from 50°C at 0.2 mA per °C. Green & Red indicators, derate linearly from 50°C at 0.5 mA per °C

* Only available for NVIS Green B

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ORDERING INFORMATION

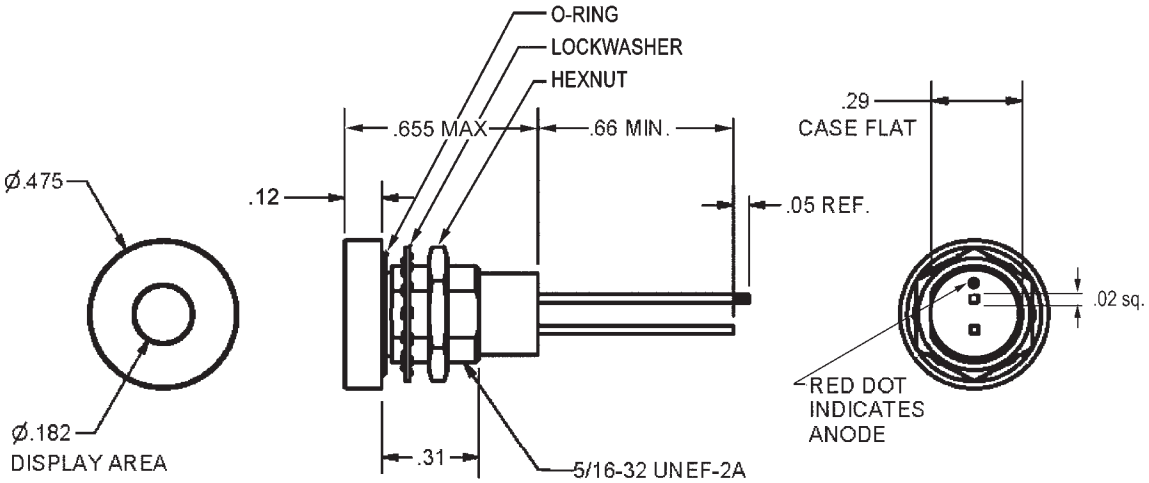
When ordering, show model number first, followed by EMI screen, then LED color, lens type, and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

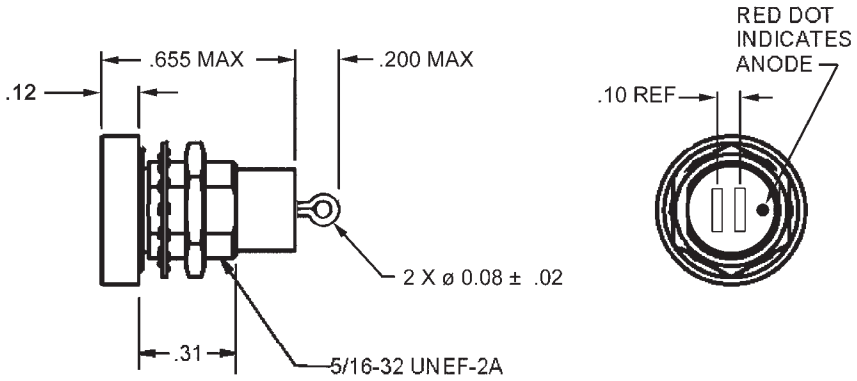
Example: Basic model, with an EMI screen, NVIS yellow LED, non-diffused lens, and straight leads would be ML2038E-Y-ND-ST.

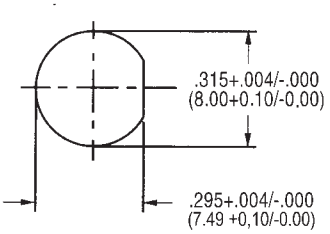
ML2038E - Y - ND - ST - ( )

Standard factory options are designated by "-Sxxx"

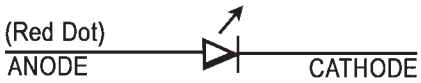
Basic Model Number	EMI Screen	LED Color	Lens Type	Terminal Style
ML2038		R Red	ND Non-diffused	ST Straight Leads
	E Screen	Y Yellow	D Diffused	LT Loop Terminals
		G Green		







Recommended Mounting Hole



Schematic

NOTE:
Ø .475 AND FRONT SURFACE OF FLANGE IS BLACK ANODIZED.
ALL OTHER SURFACES ARE CLEAR CHROMATE.

ML2038

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 10-12 in. lbs.

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Model ML4036

The ML4036 operates across a wide voltage range without the need for any external resistors. Nearly constant light intensity is maintained across the operating voltage range. The LED package is environmentally sealed and it comes complete with a fluorosilicone O-ring and mounting hardware.

ML4036

FEATURES

- Ideal for rugged environments
- Environmentally sealed
- Panel mount seal
- Colors: yellow, green & red
- Decorative bezel
- Wide operating voltage

MECHANICAL SPECIFICATIONS

Case: Aluminum, black anodized, standard.

Mounting: Rear-mount by 5/16"-32 nut and lockwasher

O-ring: Fluorosilicone rubber

ENVIRONMENTAL SPECIFICATIONS

Vibration: .06" 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

Dielectric Withstanding Voltage: MIL-STD-202, Method 301, 1000VAC

Barometric Pressure (Reduced): 100,000 ft., MIL STD 202, Method 105, Test Condition D

Reliability: 3 x 10^6 hours min. MTBF @ 25°C

Salt Atmosphere (Corrosion): MIL STD 202, Method 101, Test Condition B

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings @Temp = 25°C				
Color		**Red**	**Yellow**	**Green**
Operating Voltage (VDC) min.			5.0	
Operating Voltage (VDC) max.			28	
DC Forward Current (mA)			12	
Reverse Voltage (VDC) @ I_R = 100 µA			5	
Power Dissipation (mW)			300	
Luminous Intensity (mcd) typical @ V_F = 10 VDC	Non-diffused Diffused	500 125	500 250	100 20
Dominant Wave Length (nm) typical		640	588	558
Viewing Angle	Non-diffused Diffused		30° 60°	
Operating Temperature (°C)			-40 to +85	
Storage Temperature (°C)			-40 to +85	
Lead Soldering Temperature			260°C for 3 seconds	

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ORDERING INFORMATION

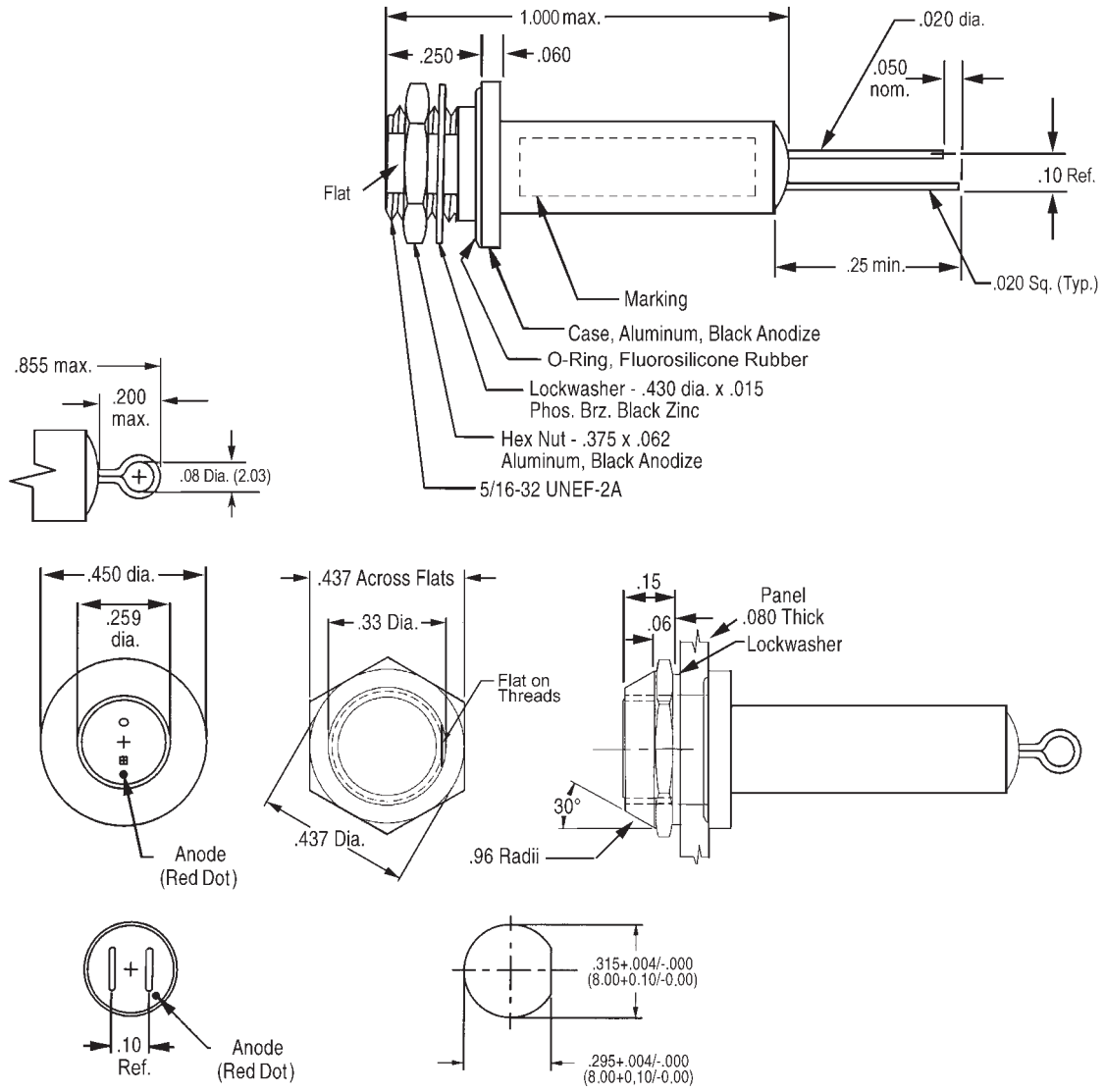
When ordering, show model number first, followed by LED color, then lens style, and terminal style. If this is a special part, a factory assigned modification number will be added at the end of the ordering number. Consult the factory for special configurations.

Example: Basic model with a yellow LED, a diffused lens, and straight leads would be ML4036-Y-D-ST.

ML4036 - Y - D - ST - ( )

Standard factory options are designated by "-Sxxx"

Basic Model Number	LED Color	Lens Type	Terminal Style
ML4036	R Red	ND Non-diffused	ST Straight Leads
	Y Yellow	D Diffused	LT Loop Terminals
	G Green		



Recommended Mounting Hole

ML4036

NOTE: Dimensions in ( ) are mm. Tolerances: Decimals: ± .010 (0.25)
Fractions: ± 1/64 Mounting Torque: 5-7 in. lbs.

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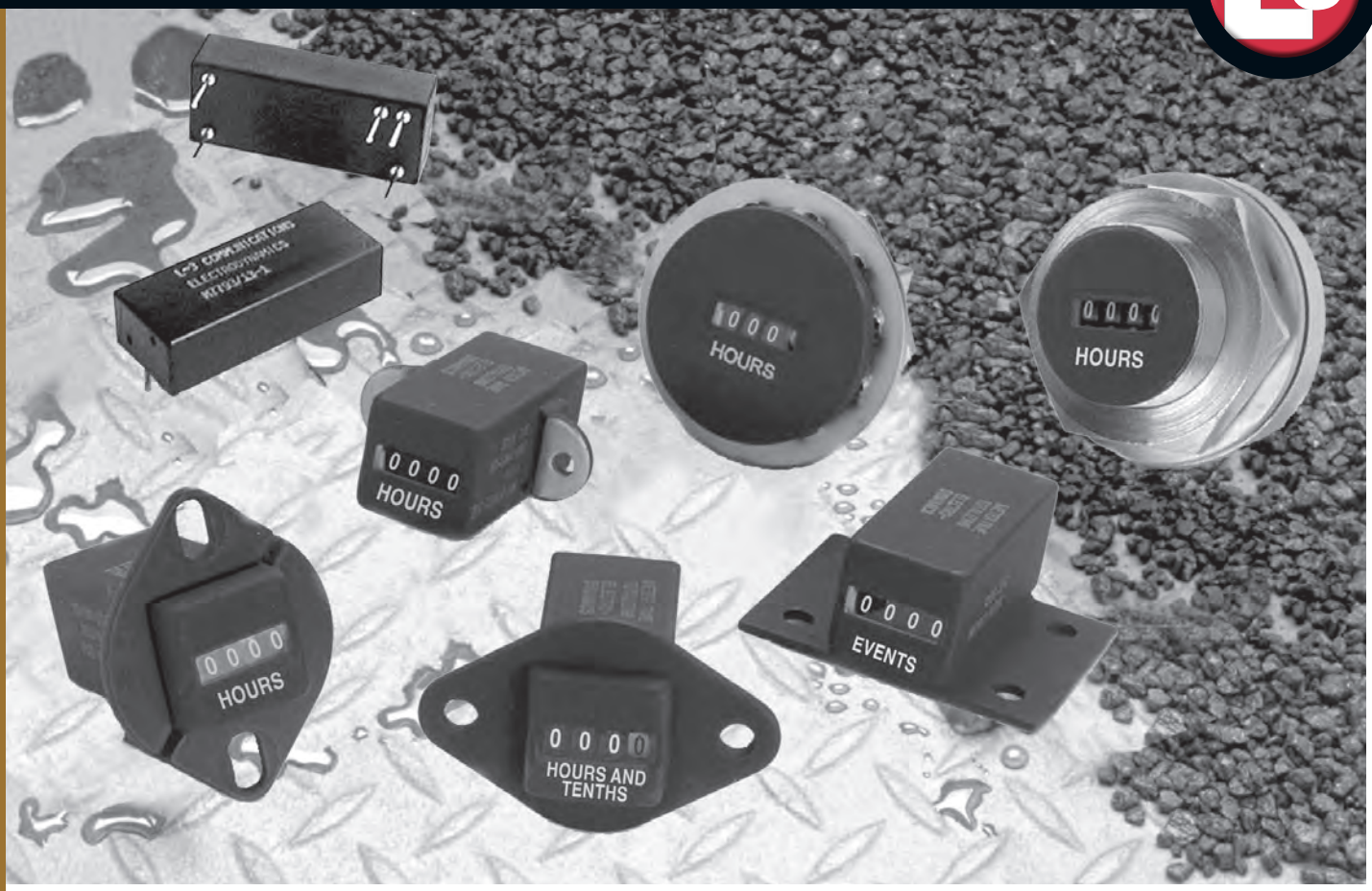
CONTENTS



Electromechanical & Solid-State Elapsed Time Indicators and Event Counters

Contents

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Models 16, D16 & D46

See the Military Cross Reference for military qualified models, page 82.

The Electrodynamics DC meter was developed to meet the difficult requirements of most military and aerospace applications. They provide a wide range of supply voltage options and are packaged in a hermetically sealed miniature enclosure. This rugged design meets or exceeds an array of tough environmental specifications including shock, vibration, and temperature. A variety of mounting configurations are available as shown on pages 78 and 79. We also welcome inquires for special requirements.

FEATURES

- Rugged design
- Hermetically sealed
- Low voltage models available

MECHANICAL SPECIFICATIONS

Case: Copper-nickel or brass, with durable black finish. E and F mounts are nickel-plated case with black face.

Max. case length: Short version: 1.094 in.
Long version: 2.082 in.

Flange: Brass

Terminals: Solder hook

Weight: 0.4 ounces maximum without mount
0.6 ounces maximum with C flange

Numerals: .035" wide, .078" high. Hour digits are white on black. Tenths are red on white.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65 to +125°C

Shock: MIL-STD-202, Method 213, Condition I

Vibration: MIL-STD-202, Method 204, Condition D

ESD Susceptibility: Classified as Class 3 ESD sensitive in accordance with MIL-STD-1686

ELECTRICAL SPECIFICATIONS

Meters meet or exceed applicable requirements of MIL-DTL-7793 M7793/1, /2, /5 and MS21341 A & B. Special ratings and configurations are also available.

Transient Protection: MIL-STD-704A, 80 & 600 V (Models 16 & D16)

Ripple Protection: MIL-STD-704A, para. 5.2.2 to 5.2.2.1 & Fig. 7 (Models 16 & D16)

Dielectric: 350 VRMS @ 80,000 ft., 600 VRMS @ sea level

Insulation Resistance: MIL-STD-202, Method 302, Condition B

Accuracy: 0.1% over temperature/voltage range

Power Consumption: D16 & 16 = .085 Watts, D46=.010 Watts

Reading Allowed at time of Shipments: Meters can be delivered with +/- 1 hour upon delivery per MIL-DTL-7793

ORDERING INFORMATION

When ordering, show model number first (D), then operating voltage, case type, maximum hours (4 or 5 digit), mount type, and mount setback desired. If this is a special part, a factory modification number will be added at the end of the ordering number. This order chart lists standard features. Other ratings and configuration are also available. Example: D16C8CE-136

D 16 C 8 C E - 136

Case Length	Operating Voltage	Case Type	Maximum Hours 4 Digit / 5 Digit	Mount Type	Mount Setback
D = Short	16 = 10-34 VDC	B = 4 Digit Round	3 = 999.9 / N/A	A = No Mount	A = Flush
( ) Long ①	46 = 4.5-6.5 VDC②	C = 4 Digit Square	8 = 9999 / 9999.9	Others available, see page 78	B to Z See "Table A" on page 81 for "X" Dimensional Code desired
	Other voltages also available	D = 4 Digit Square (Side-Read)	9 = N/A / 99999		
		G = 5 Digit Rect.			

Standard Factory Option Examples Code*	Description
1	Rotated 90° type C, C7, V, W mount
14	4-40 Clinch Nuts, for type C mount
16	Tin-plate front of mount, type C mount
136	Tin-plate front of mount, type C (M7793/1 & /2), C7, V & W

① Omit "D" for long case ② 5 VDC not MIL qualified

*See "Table C Standard Options" on page 81 for all codes

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ELAPSED TIME INDICATORS

AC SERIES: SUBMINIATURE

Models D21, D25, D91, D92 & D95

See the Military Cross Reference for military qualified models, pages 82-84.

The AC meter was developed to meet the most difficult requirements of many military and aerospace applications. Available in 50Hz, 60Hz and 400Hz configurations, the AC series meters meet or exceed an array of tough environmental specifications including shock, vibration, and temperature. A variety of mounting configurations are available as shown on pages 78 and 79. We also welcome inquires for special requirements.

FEATURES

- Rugged design
- Hermetically sealed

MECHANICAL SPECIFICATIONS

Case: Copper nickel or brass, with durable black finish. E and F mounts are nickel-plated case with black face.

Max. case length: Short version: 1.094 in.
Long version: 2.082 in.

Flange: Brass

Terminals: Solder hook

Weight: 0.4 ounces maximum without mount
0.6 ounces maximum with C flange

Numerals: .035" wide, .078" high. Hour digits are white on black. Tenths are red on white.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65 to +125°C

Shock: MIL-STD-202, Method 213, Condition I

Vibration: MIL-STD-202, Method 204, Condition D

ESD Susceptibility: Classified as Class 3 ESD sensitive in accordance with MIL-STD-1686

ELECTRICAL SPECIFICATIONS

Meters meet or exceed applicable requirements of MIL-M-7793 M7793/3, /4, /6, /8, /9, /10 (if QPL'd) MS27650 & 27651. Special ratings and configurations are also available.

Transient Protection: As applicable, 180 VRMS up to 0.15 seconds

Dielectric: 350 VRMS @ 80,000 ft., 600 VRMS @ sea level

Insulation Resistance: MIL-STD-202, Method 302, Condition B

Accuracy: 0.1% over temperature/voltage range

Power Consumption:
D21 & D25= .015 Watts
D91, D92, & D95 = .3 Watts

Reading Allowed at time of Shipments: Meters can be delivered with +/- 1 hour upon delivery per MIL-DTL-7793

ORDERING INFORMATION

When ordering, show model number first (D), then operating voltage, case type, maximum hours (4 or 5 digit), mount type, and mount setback desired. If this is a special part, a factory modification number will be added at the end of the ordering number. This order chart lists standard features. Other ratings and configuration are also available. Example: D95C8CE-16

D 95 C 8 C E - 16

Case Length	Operating Voltage	Case Type	Maximum Hours 4 Digit / 5 Digit	Mount Type	Mount Setback	Standard Factory Option Examples Code*	Description
D	21 = 20-40 VAC/ 45-70 Hz	B = 4 Digit Round	3 = 999.9 / N/A	A = No Mount	A = Flush	1	Rotated 90° type C, C7, V, W mount
D	25 = 15-40 VAC/ 380-420 Hz	C = 4 Digit Square	8 = 9999 / 9999.9	Others available, see page 78	B to Z See "Table B Mount Setback Data" on page 81 for "X" Dimensional Code desired	14	4-40 Clinch Nuts, for type C mount
D	91 = 75-150 VAC/ 50-400 Hz	D = 4 Digit Square (Side-Read)	9 = N/A / 99999			16	Tin-plate front of mount, type C mount
D	92 = 100-130 VAC/ 50-70 Hz	G = 5 Digit Rect.				136	Tin-plate front of mount, type C (M7793/1 & /2), C7, V & W
D	95 = 100-130 VAC/ 380-420 Hz					*See "Table C Standard Options" on page 81 for all codes	

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Models B16 & L16 Ruggedized

MIL-I-8974 Equivalent Part Numbers	
Mil Spec	**L-3 EDI Commercial**
M8974/2-003*	B16C8A-232
M8974/2-004*	B16C8CE-232

***MIL Spec numbers are no longer available**

The Electrodynamics subminiature event counters were designed to meet the most difficult requirements of many military and aerospace applications. These rugged counters meet or exceed an array of tough environmental specifications including shock, vibration, temperature and are packaged in a hermetically sealed miniature enclosure. A variety of mounting configurations are available as shown on pages 78 and 79. We also welcome inquires for special requirements.

The ruggedized event counters are assembled and filled with a dielectric lubricant that dampens the effects of extreme vibration and thermal shock.

FEATURES

- Rugged design
- Hermetically sealed

MECHANICAL SPECIFICATIONS

Case: Copper-nickel or brass, with black face.
E and F mounts are nickel-plated case with black face.

Max. case length: 1.094 in.

Flange: Brass

Terminals: Solder hook

Weight: Standard: Will not exceed 1.2 ounces with C flange
Ruggedized: Will not exceed 1.8 ounces with C flange

Numerals: .035" wide, .078" high. All digits are white on black.

ELECTRICAL SPECIFICATIONS

Polarity: Not polarity sensitive

Dielectric: 500 VRMS @ 80,000 feet

Insulation Resistance: MIL-STD-202, Method 302, Condition B

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: Standard: -65 to +125°C
Ruggedized: -55 to +125°C

STANDARD RATINGS

Count Rate: 5 Counts/Second

Minimum Impulse Time: 50ms / 150ms off

Thermal Shock: MIL-STD-202, Method 107, Condition B

Shock: MIL-STD-202, Method 213, Condition A

Vibration: MIL-STD-202, Method 204, Condition D except at 10 Gs max.

Life: One million counts @ 25°C

RUGGEDIZED RATINGS

Count Rate: 5 Counts/Second

Minimum Impulse Time: 50ms / 150ms off

Thermal Shock: MIL-STD-202, Method 107, Condition B, except temperature -55 °C to +°125 C

Shock: MIL-STD-202, Method 213, Condition A

Vibration: MIL-STD-202, Method 204, Condition D

Life: 5 million counts @ 25°C

POWER CONSUMPTION (for Standard & Ruggedized):
4 digit oil filled: 3.4 Watts max. @ 28VDC
4 digit dry: 1.5 Watts max. @ 28VDC
5 digit oil filled: 3.4 Watts max. @ 28VDC
5 digit dry: 2.5 Watts max. @ 28VDC
6 digit dry: 2.5 Watts max. @ 28VDC

ORDERING INFORMATION

When ordering, show model number first (B), then operating voltage, case type, maximum counts (4 or 5 digit), mount type, and mount setback desired. If this is a special part, a factory modification number will be added at the end of the ordering number. This order chart lists standard features. Other ratings and configurations are also available. Example: B16C8CE-1

B 16 C 8 C E - 1

Model Number	Operating Voltage	Case Type	Maximum Hours Maximum Event 4,5,&6 Digit	Mount Type	Mount Setback	Standard Factory Option Examples Code*	Description
B = Standard	23-29 VDC	C = 4 Digit Square	8 = 9999	A = No Mount	A = Flush	1	Rotated 90° type C, C7, V, W mount
L = Ruggedized	18-32 Others available	G = 5 Digit Rect.	9 = 99999	Others available, see page 78	B to Z See "Table A" on page 81 for "X" Dimensional Code desired	14	4-40 Clinch Nuts, for type C mount
		F = 6 Digit Rect.	6 = 999999			136	Tin-plate front of mount, type C, C7, V & W

*See "Table C Standard Options" on page 81 for all codes

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

ELAPSED TIME INDICATORS AND EVENT COUNTERS

Standard Cases & Mounts

Recommended mounting torque: 2 in. lbs.*

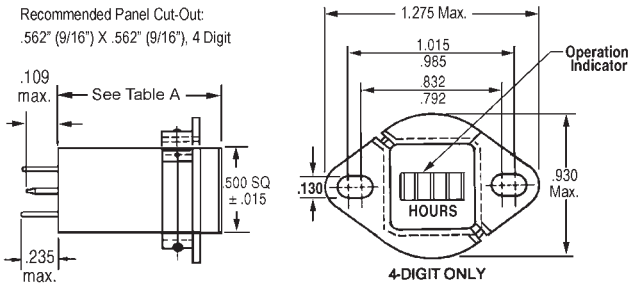

Figure 1. C2 ADJUSTABLE MOUNT

Recommended mounting torque: 3 to 5 in. lbs.*

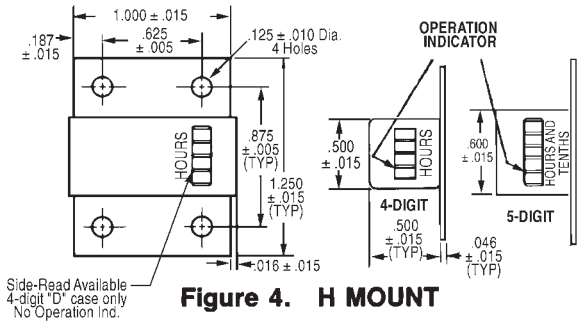

Figure 4. H MOUNT

Recommended mounting torque: 3 to 5 in. lbs.*

Recommended Panel Cut-Out: .562" (9/16") X ..625" (5/8"), 5 Digit

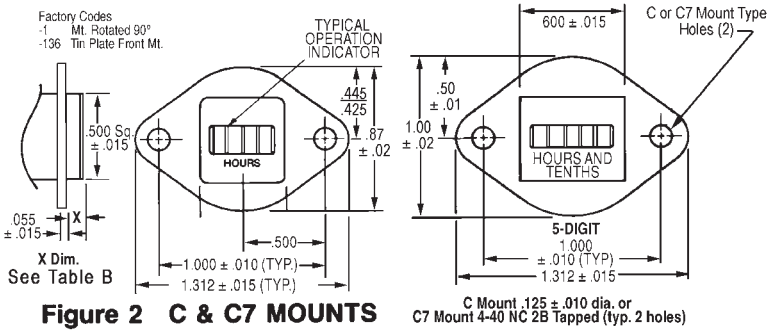

Figure 2 C & C7 MOUNTS

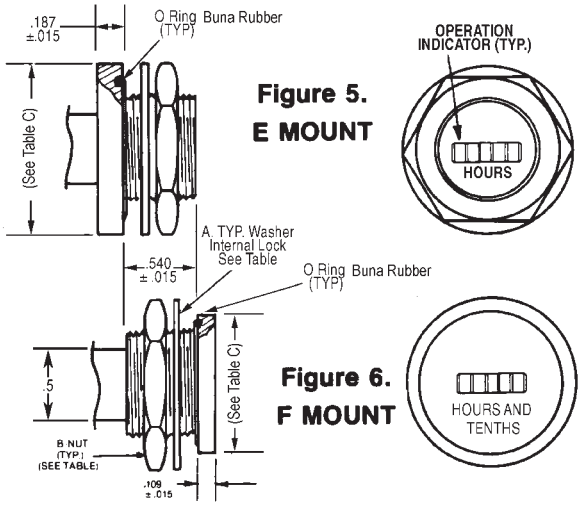

Figure 5. E MOUNT

Figure 6. F MOUNT

	A Max. Dia.	B (Nut)	C ± .015 E Mount	C ± .015 F Mount
4 Digit	1.250	3/4"-32 UN	1.250	1.000
5 Digit	1.410	7/8"-20 UN	1.375	

Recommended mounting torque, E & F mount
4 digit .....20 to 30 in. lbs.
5 digit .....60 to 70 in. lbs.
6 digit .....70 to 80 in. lbs.

Recommended mounting torque: 3 to 5 in. lbs.*

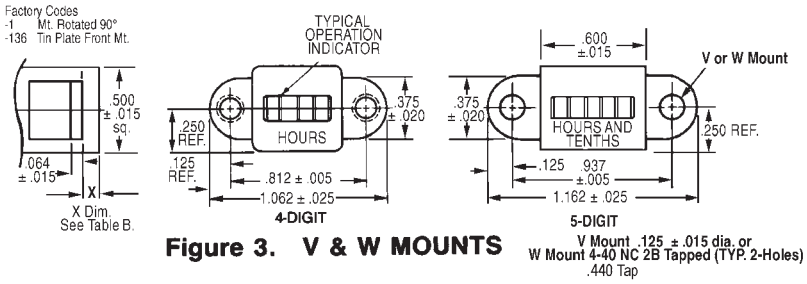

Figure 3. V & W MOUNTS

Round Cases & Mounts (for ETI only)

Recommended mounting torque: 2 in. lbs.*

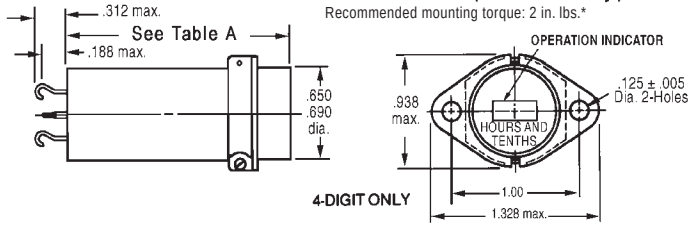

Figure 7. C2 ADJUSTABLE MOUNT

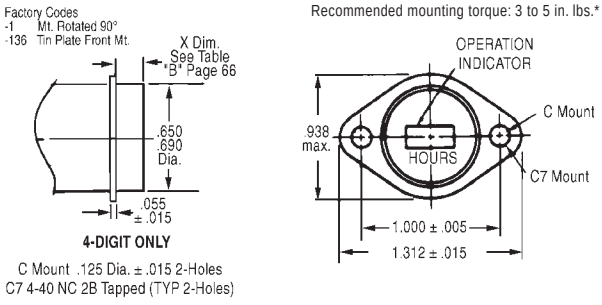

Figure 8. C & C7 MOUNTS

*When mounting flanged units, it is recommended to distribute the mounting torque evenly across the mounting surface. Each mounting screw should be alternately tightened about one quarter to one half turn until the recommended torque is attained on each screw. The mounting surface should be flat to avoid exerting stress on the body of the unit.

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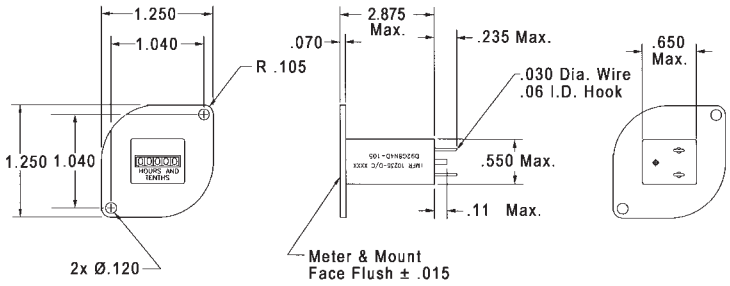
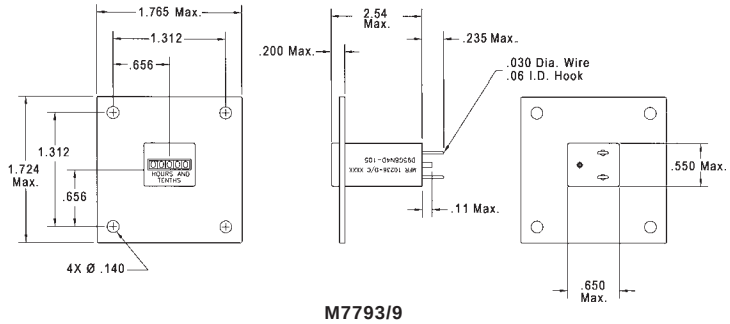
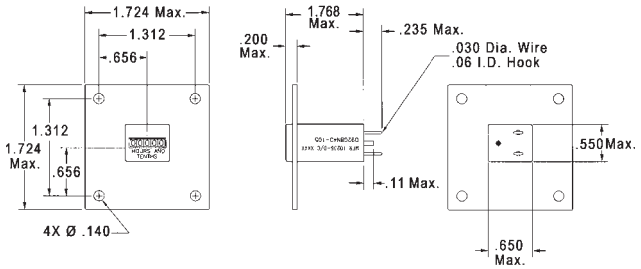
Standard Cases & Mounts



M7793/8

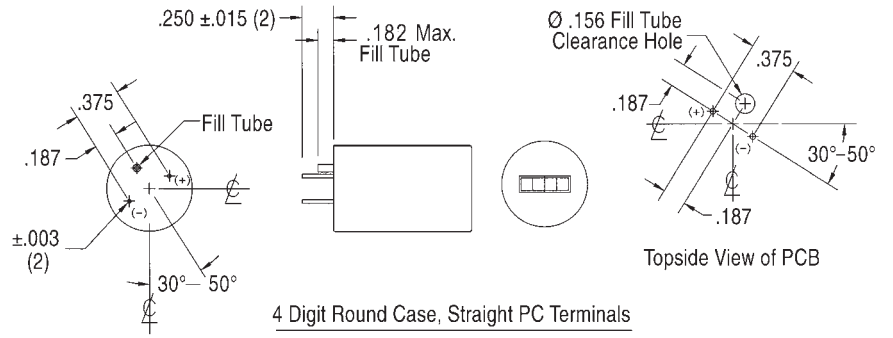


M7793/9

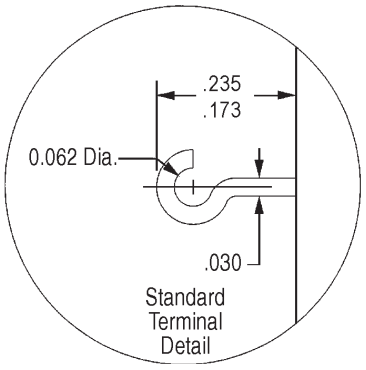


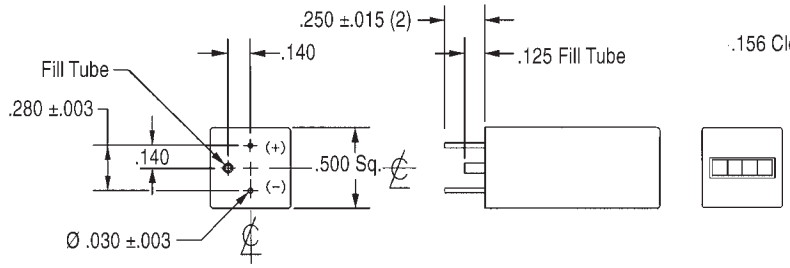
M7793/10

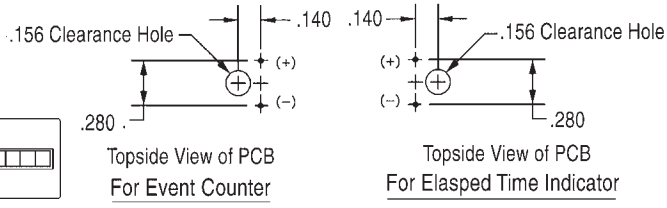
Standard and Straight Pin Headers



4 Digit Round Case, Straight PC Terminals







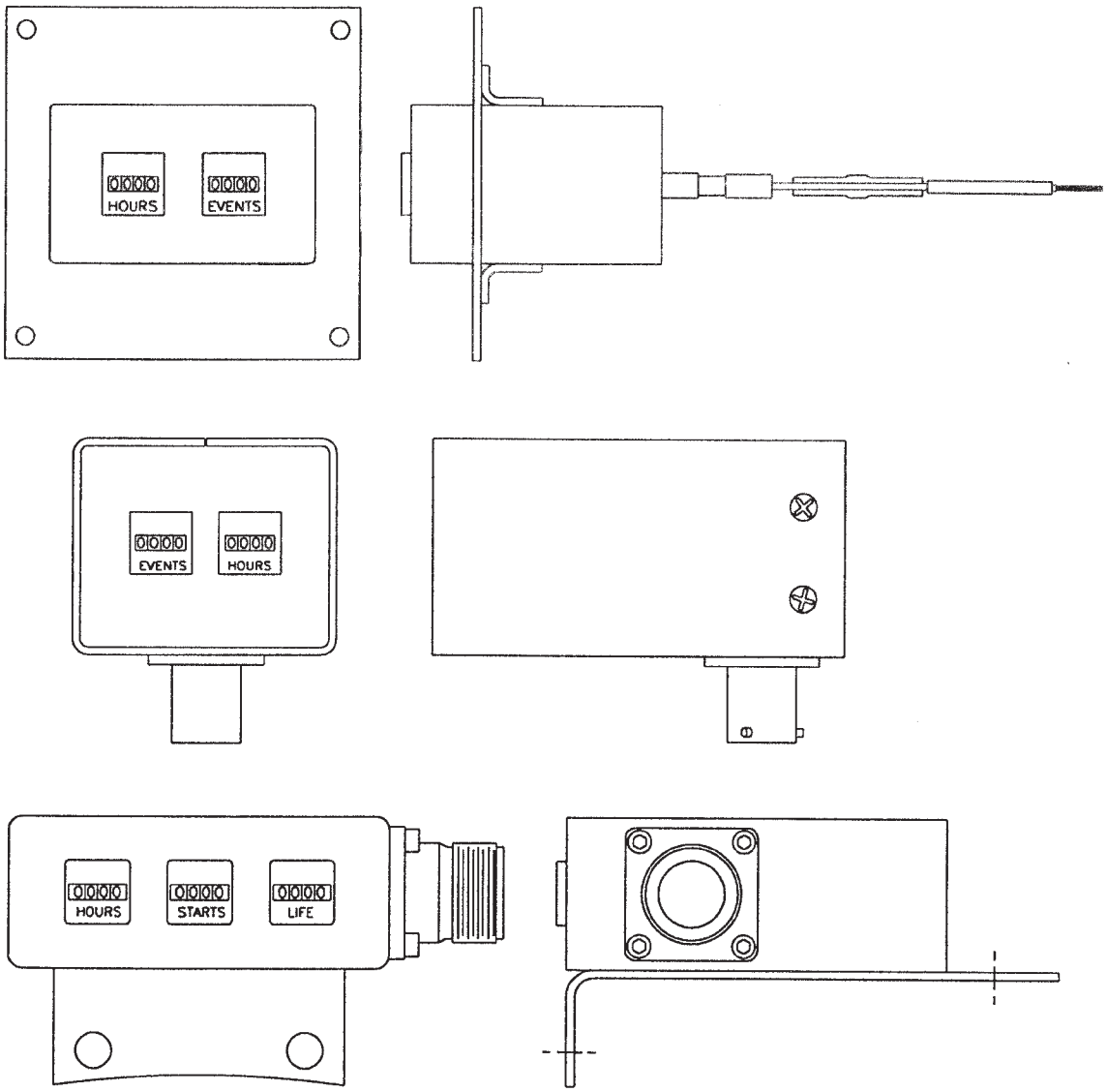
999A Series Enclosures

L-3 Electrodynamics, Inc. offers customized enclosures to house a variety of Elapsed Time Indicators and Event Counters. The customized enclosures include the connectors, wire leads and mounting brackets, as required, for mounting into final assemblies. Refer to the Elapsed Time Indictor and Event Counter sections of the catalog for mechanical, electrical and environmental specifications.

DC series Elapsed Time Indicators meet or exceed requirements of MIL-M-7793-M7793/1, /2, /5 and MS21341 A & B.

AC series Elapsed Time Indicators meet or exceed applicable requirements of MIL-M-7793-M7793/3, /4, /6, /8, /9, /10 (if QPL'd), MS27650 and MS21651.

ENCLOSURE EXAMPLES



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MILITARY ELAPSED TIME INDICATOR GUIDE

Table A Specifications

Operating Voltage	Case Length Max. Inches	L-3 Electrodynamics Model Number	Fig. No.	Military Number
10–34 VDC	1.094 Short	D16C8C*-16	2	M7793/1-XXX
		D16C8C2	1	M7793/1-001
		D16C8A	—	M7793/1-002
		D16C8C*-136	2	M7793/1-XXX
		D16B8C2	7	M7793/2-001
		D16B8A	—	M7793/2-002
		D16B8C*-136	8	M7793/2-XXX
	2.062	16B8C2	7	M7793/5-001
	2.062	16C8C2	1	M7793/5-002
	2.062	16C8C*-16	2	MS21341B-XX
	2.062	16C8C*-136	2	M7793/1-XXX
100-130 VAC 50-70Hz	1.094 Short	D92C8C2	1	M7793/3-001
		D92C8A	—	M7793/3-002
		D92C8C*-136	2	M7793/3-XXX
		D92B8C2	7	M7793/4-001
		D92B8A	—	M7793/4-002
		D92B8C*-136	8	M7793/4-XXX
100-130 VAC 380-420Hz	1.765	D95B8C2	7	M7793/6-001
	1.094	D95C8C2	1	M7793/6-002
	1.094 Short	C7*-16	2	MS27651-XXA
		C7*-1-16	2	MS27651-XXB
		D95C8 C*-16	2	MS27651-XXC
		C*-1-16	2	MS27651-XXD
		W*-16	3	MS27651-XXE
		W*-1-16	3	MS27651-XXF
		V*-16	3	MS27651-XXG
		V*-1-16	3	MS27651-XXH
15-40 VAC 380-420Hz		Replace **D95** above with **D25** Example: **D25C8CE-16** = **MS27650-05C**		Replace **MS27651** above with **MS27650**

Notes:

1. All meter readouts are to 9999 Hours, maximum.
2. See "Table B Mount Setback Data" to select desired "X" Dim. (* in model no.) and corresponding military dash no. (xx & xxx).
3. "-136" in model number denotes tin-plated mount face; "-16" in model number is same plus USAF testing; "-1" in model number is mount rotated 90°.

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.

Table B Mount Setback Data

M7793/1 to /4 Dash No.	MS21341, 27650, 27651 Dash No.	Setback ± .015 In.	"X" Dim. Code
-003	-01	Flush	A
-004	-02	.031	B
-005	-03	.062	C
-006	-04	.094	D
-007	-05	.125	E
-008	-06	.156	F
-009	-07	.188	G
-010	-08	.219	H
-011	-09	.250	I
-012	-10	.281	J
-013	-11	.312	K
-014	-12	.344	L
-015	-13	.375	M
-016	-14	.406	N
-017	-15	.438	O
-018	-16	.469	P
-019	-17	.500	R
-020	-18	.531	S
-021	-19	.562	T
-022	-20	.594	T-8
-023	-21	.625	U
-024	-22	.656	U-8
-025	-23	.688	V
-026	-24	.719	V-8
-027	-25	.750	W
-028	-26	.781	W-8
		.813	X
		.875	Y
		.938	Z

Table C Standard Options

Code	Additional Standard Factory Options	AC/DC Meters	Events
1	Flange rotated 90° clockwise from standard	X	X
2	Flange rotated 180° clockwise from standard	X	X
3	Flange rotated 270° clockwise from standard	X	X
13	#4-40 self locking nylon clinch nut on backside of flange	X	X
14	#4-40 self locking stainless steel clinch nut on backside of flange	X	X
16	Front face of flange is pure tin plated and unit is tested an additional 25 hours per MS27650 / 27651 / 21341	X	
26	A flat is added to E mounts for D hole installation - .710" for 4 digit meter, .810" for 5 digit meter	X	X
28	"C/C7 type flanges, RFI gasket - Must be used with tin plated flange (-105, -136, -200) E & F mounts - RFI o-ring"	X	X
46	.150" long .030" diameter straight pins in place of hook terminals	X	X
47	.250" long .030" diameter straight pins in place of hook terminals	X	X
75	RFI conductive glass window	X	X
105	Rear face of flange is pure tin plated	X	X
136	Front face of flange is pure tin plated	X	X
200	Front & rear face of flange is pure tin plated	X	X
237	Entire unit except terminals is painted and unit is tested an additional 25 hours per MS27650 / 27651 / 21341	X	
493	A flat is added to F mounts for D hole installation- .710" for 4 digit, .810" for 5 digit	X	X

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

If ordering a MIL part, use MIL Spec & EDI Number.
If ordering a Commercial part, use the Commercial Number.

MIL SPEC & EDI NUMBER M7793/1	COMMERCIAL NUMBER 4 Digit Short Square 10-34 VDC
M7793/1-001	D16C8C2
M7793/1-002	D16C8A
M7793/1-003	D16C8CA-136
M7793/1-004	D16C8CB-136
M7793/1-005	D16C8CC-136
M7793/1-006	D16C8CD-136
M7793/1-007	D16C8CE-136
M7793/1-008	D16C8CF-136
M7793/1-009	D16C8CG-136
M7793/1-010	D16C8CH-136
M7793/1-011	D16C8CI-136
M7793/1-012	D16C8CJ-136
M7793/1-013	D16C8CK-136
M7793/1-014	D16C8CL-136
M7793/1-015	D16C8CM-136
M7793/1-016	D16C8CN-136
M7793/1-017	D16C8CO-136
M7793/1-018	D16C8CP-136
M7793/1-019	D16C8CR-136
M7793/1-020	D16C8CS-136
M7793/1-021	D16C8CT-136
M7793/1-022	D16C8CT-8-136
M7793/1-023	D16C8CU-136
M7793/1-024	D16C8CU-8-136
M7793/1-025	D16C8CV-136
M7793/1-026	D16C8CV-8-136
M7793/1-027	D16C8CW-136
M7793/1-028	D16C8CW-8-136

MIL SPEC & EDI NUMBER M7793/2	COMMERCIAL NUMBER 4 Digit Short Round 10-34 VDC
M7793/2-001	D16B8C2
M7793/2-002	D16B8A
M7793/2-003	D16B8CA-136
M7793/2-004	D16B8CB-136
M7793/2-005	D16B8CC-136
M7793/2-006	D16B8CD-136
M7793/2-007	D16B8CE-136
M7793/2-008	D16B8CF-136
M7793/2-009	D16B8CG-136
M7793/2-010	D16B8CH-136
M7793/2-011	D16B8CI-136
M7793/2-012	D16B8CJ-136
M7793/2-013	D16B8CK-136
M7793/2-014	D16B8CL-136
M7793/2-015	D16B8CM-136
M7793/2-016	D16B8CN-136
M7793/2-017	D16B8CO-136
M7793/2-018	D16B8CP-136
M7793/2-019	D16B8CR-136
M7793/2-020	D16B8CS-136
M7793/2-021	D16B8CT-136
M7793/2-022	D16B8CT-8-136
M7793/2-023	D16B8CU-136
M7793/2-024	D16B8CU-8-136
M7793/2-025	D16B8CV-136
M7793/2-026	D16B8CV-8-136
M7793/2-027	D16B8CW-136
M7793/2-028	D16B8CW-8-136

MIL SPEC & EDI NUMBER M7793/3	COMMERCIAL NUMBER 4 Digit Short Square 100-130 VAC/50-70Hz
M7793/3-001	D92C8C2
M7793/3-002	D92C8A
M7793/3-003	D92C8CA-136
M7793/3-004	D92C8CB-136
M7793/3-005	D92C8CC-136
M7793/3-006	D92C8CD-136
M7793/3-007	D92C8CE-136
M7793/3-008	D92C8CF-136
M7793/3-009	D92C8CG-136
M7793/3-010	D92C8CH-136
M7793/3-011	D92C8CI-136
M7793/3-012	D92C8CJ-136
M7793/3-013	D92C8CK-136
M7793/3-014	D92C8CL-136
M7793/3-015	D92C8CM-136
M7793/3-016	D92C8CN-136
M7793/3-017	D92C8CO-136
M7793/3-018	D92C8CP-136
M7793/3-019	D92C8CR-136
M7793/3-020	D92C8CS-136
M7793/3-021	D92C8CT-136
M7793/3-022	D92C8CT-8-136
M7793/3-023	D92C8CU-136
M7793/3-024	D92C8CU-8-136
M7793/3-025	D92C8CV-136
M7793/3-026	D92C8CV-8-136
M7793/3-027	D92C8CW-136
M7793/3-028	D92C8CW-8-136

MIL SPEC & EDI NUMBER M7793/4	COMMERCIAL NUMBER 4 Digit Short Round 100-130 VAC/50-70Hz
M7793/4-001	D92B8C2
M7793/4-002	D92B8A
M7793/4-003	D92B8CA-136
M7793/4-004	D92B8CB-136
M7793/4-005	D92B8CC-136
M7793/4-006	D92B8CD-136
M7793/4-007	D92B8CE-136
M7793/4-008	D92B8CF-136
M7793/4-009	D92B8CG-136
M7793/4-010	D92B8CH-136
M7793/4-011	D92B8CI-136
M7793/4-012	D92B8CJ-136
M7793/4-013	D92B8CK-136
M7793/4-014	D92B8CL-136
M7793/4-015	D92B8CM-136
M7793/4-016	D92B8CN-136
M7793/4-017	D92B8CO-136
M7793/4-018	D92B8CP-136
M7793/4-019	D92B8CR-136
M7793/4-020	D92B8CS-136
M7793/4-021	D92B8CT-136
M7793/4-022	D92B8CT-8-136
M7793/4-023	D92B8CU-136
M7793/4-024	D92B8CU-8-136
M7793/4-025	D92B8CV-136
M7793/4-026	D92B8CV-8-136
M7793/4-027	D92B8CW-136
M7793/4-028	D92B8CW-8-136

MIL SPEC & EDI NUMBER M7793/5	COMMERCIAL NUMBER 4 Digit Round & Square 10-34 VDC
M7793/5-001	16B8C2(Rnd)
M7793/5-002	16C8C2(Sqr)

MIL SPEC & EDI NUMBER M7793/6	COMMERCIAL NUMBER 4 Digit Round & Square 100-130 VAC/380-420Hz
M7793/6-001	D95B8C2(Rnd)
M7793/6-002	D95C8C2(Sqr)

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER
M7793/8-001A	D95G8N3A-105
M7793/8-002A	D92G8N3A-105
M7793/8-003A	D95G9N3A-105
M7793/8-004A	D92G9N3A-105
M7793/13-1	2301000-1
M7793/14-1	2301021-1

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER
M7793/9-001A	D95G8N4D-105
M7793/9-002A	D95G9N4D-105
M7793/10-001A	D92G8N4D-105
M7793/10-002A	D92G9N4D-105

MIL SPEC & EDI NUMBER MS21341A	COMMERCIAL NUMBER ①
MS21341A-01	D16C8CA-16
MS21341A-02	D16C8CB-16
MS21341A-03	D16C8CC-16
MS21341A-04	D16C8CD-16
MS21341A-05	D16C8CE-16
MS21341A-06	D16C8CF-16
MS21341A-07	D16C8CG-16
MS21341A-08	D16C8CH-16
MS21341A-09	D16C8CI-16
MS21341A-10	D16C8CJ-16
MS21341A-11	D16C8CK-16
MS21341A-12	D16C8CL-16
MS21341A-13	D16C8CM-16
MS21341A-14	D16C8CN-16
MS21341A-15	D16C8CO-16
MS21341A-16	D16C8CP-16
MS21341A-17	D16C8CR-16
MS21341A-18	D16C8CS-16
MS21341A-19	D16C8CT-16
MS21341A-20	D16C8CT-8-16
MS21341A-21	D168CU-16
MS21341A-22	D16C8CU-8-16
MS21341A-23	D16C8CV-16
MS21341A-24	D16C8CV-8-16
MS21341A-25	D16C8CW-16
MS21341A-26	D16C8CW-8-16

MIL SPEC & EDI NUMBER MS21341B	COMMERCIAL NUMBER ②
MS21341B-01	16C8CA-16
MS21341B-02	16C8CB-16
MS21341B-03	16C8CC-16
MS21341B-04	16C8CD-16
MS21341B-05	16C8CE-16
MS21341B-06	16C8CF-16
MS21341B-07	16C8CG-16
MS21341B-08	16C8CH-16
MS21341B-09	16C8CI-16
MS21341B-10	16C8CJ -16
MS21341B-11	16C8CK-16
MS21341B-12	16C8CL-16
MS21341B-13	16C8CM-16
MS21341B-14	16C8CN-16
MS21341B-15	16C8CO-16
MS21341B-16	16C8CP-16
MS21341B-17	16C8CR-16
MS21341B-18	16C8CS-16
MS21341B-19	16C8CT-16
MS21341B-20	16C8CT-8-16
MS21341B-21	16C8CU-16
MS21341B-22	16C8CU-8-16
MS21341B-23	16C8CV-16
MS21341B-24	16C8CV-8-16
MS21341B-25	16C8CW-16
MS21341B-26	16C8CW-8-16

Notes: ① 4-Digit Short Square 10-34 VDC ③ 4-Digit Short Square 23-29 VAC/380-420 Hz
② 4-Digit Long Square 10-34 VDC ④ 4-Digit Short Square 100-130 VAC/380-420 Hz

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.

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

If ordering a MIL part, use MIL Spec & EDI Number.
If ordering a Commercial part, use the Commercial Number.

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ③
MS27650-01A	D25C8C7A-16
MS27650-02A	D25C8C7B-16
MS27650-03A	D25C8C7C-16
MS27650-04A	D25C8C7D-16
MS27650-05A	D25C8C7E-16
MS27650-06A	D25C8C7F-16
MS27650-07A	D25C8C7G-16
MS27650-08A	D25C8C7H-16
MS27650-09A	D25C8C7I-16
MS27650-10A	D25C8C7J-16
MS27650-11A	D25C8C7K-16
MS27650-12A	D25C8C7L-16
MS27650-13A	D25C8C7M-16
MS27650-14A	D25C8C7N-16
MS27650-15A	D25C8C7O-16
MS27650-16A	D25C8C7P-16
MS27650-17A	D25C8C7R-16
MS27650-18A	D25C8C7S-16
MS27650-19A	D25C8C7T-16
MS27650-20A	D25C8C7T-8-16
MS27650-21A	D25C8C7U-16
MS27650-22A	D25C8C7U-8-16
MS27650-23A	D25C8C7V-16
MS27650-24A	D25C8C7V-8-16
MS27650-25A	D25C8C7W-16
MS27650-26A	D25C8C7W-8-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ③
MS27650-01B	D25C8C7A-1-16
MS27650-02B	D25C8C7B-1-16
MS27650-03B	D25C8C7C-1-16
MS27650-04B	D25C8C7D-1-16
MS27650-05B	D25C8C7E-1-16
MS27650-06B	D25C8C7F-1-16
MS27650-07B	D25C8C7G-1-16
MS27650-08B	D25C8C7H-1-16
MS27650-09B	D25C8C7I-1-16
MS27650-10B	D25C8C7J-1 -16
MS27650-11B	D25C8C7K-1-16
MS27650-12B	D25C8C7L-1-16
MS27650-13B	D25C8C7M-1-16
MS27650-14B	D25C8C7N-1-16
MS27650-15B	D25C8C7O-1-16
MS27650-16B	D25C8C7P-1-16
MS27650-17B	D25C8C7R-1-16
MS27650-18B	D25C8C7S-1-16
MS27650-19B	D25C8C7T-1-16
MS27650-20B	D25C8C7T-8-16
MS27650-21B	D25C8C7U-1-16
MS27650-22B	D25C8C7U-8-1-16
MS27650-23B	D25C8C7V-1-16
MS27650-24B	D25C8C7V-8-1-16
MS27650-25B	D25C8C7W-1-16
MS27650-26B	D25C8C7W-8-1-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ③
MS27650-01E	D25C8WA-16
MS27650-02E	D25C8WB-16
MS27650-03E	D25C8WC-16
MS27650-04E	D25C8WD-16
MS27650-05E	D25C8WE-16
MS27650-06E	D25C8WF-16
MS27650-07E	D25C8WG-16
MS27650-08E	D25C8WH-16
MS27650-09E	D25C8WI-16
MS27650-10E	D25C8WJ-16
MS27650-11E	D25C8WK-16
MS27650-12E	D25C8WL-16
MS27650-13E	D25C8WM-16
MS27650-14E	D25C8WN-16
MS27650-15E	D25C8WO-16
MS27650-16E	D25C8WP-16
MS27650-17E	D25C8WR-16
MS27650-18E	D25C8WS-16
MS27650-19E	D25C8WT-16
MS27650-20E	D25C8WT-8-16
MS27650-21E	D25C8WU-16
MS27650-22E	D25C8WU-8-16
MS27650-23E	D25C8WV-16
MS27650-24E	D25C8WV-8-16
MS27650-25E	D25C8WW-16
MS27650-26E	D25C8WW-8-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ③
MS27650-01F	D25C8WA-1-16
MS27650-02F	D25C8WB-1-16
MS27650-03F	D25C8WC-1-16
MS27650-04F	D25C8WD-1-16
MS27650-05F	D25C8WE-1-16
MS27650-06F	D25C8WF-1-16
MS27650-07F	D25C8WG-1-16
MS27650-08F	D25C8WH-1-16
MS27650-09F	D25C8WI-1-16
MS27650-10F	D25C8WJ-1 -16
MS27650-11F	D25C8WK-1-16
MS27650-12F	D25C8WL-1-16
MS27650-13F	D25C8WM-1-16
MS27650-14F	D25C8WN-1-16
MS27650-15F	D25C8WO-1-16
MS27650-16F	D25C8WP-1-16
MS27650-17F	D25C8WR-1-16
MS27650-18F	D25C8WS-1-16
MS27650-19F	D25C8WT-1-16
MS27650-20F	D25C8WT-8-16
MS27650-21F	D25C8WU-1-16
MS27650-22F	D25C8WU-8-1-16
MS27650-23F	D25C8WV-1-16
MS27650-24F	D25C8WV-8-1-16
MS27650-25F	D25C8WW-1-16
MS27650-26F	D25C8WW-8-1-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ③
MS27650-01C	D25C8CA-16
MS27650-02C	D25C8CB-16
MS27650-03C	D25C8CC-16
MS27650-04C	D25C8CD-16
MS27650-05C	D25C8CE-16
MS27650-06C	D25C8CF-16
MS27650-07C	D25C8CG-16
MS27650-08C	D25C8CH-16
MS27650-09C	D25C8CI-16
MS27650-10C	D25C8CJ-16
MS27650-11C	D25C8CK-16
MS27650-12C	D25C8CL-16
MS27650-13C	D25C8CM-16
MS27650-14C	D25C8CN-16
MS27650-15C	D25C8CO-16
MS27650-16C	D25C8CP-16
MS27650-17C	D25C8CR-16
MS27650-18C	D25C8CS-16
MS27650-19C	D25C8CT-16
MS27650-20C	D25C8CT-8-16
MS27650-21C	D25C8CU-16
MS27650-22C	D25C8CU-8-16
MS27650-23C	D25C8CV-16
MS27650-24C	D25C8CV-8-16
MS27650-25C	D25C8CW-16
MS27650-26C	D25C8CW-8-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ③
MS27650-01D	D25C8CA-1-16
MS27650-02D	D25C8CB-1-16
MS27650-03D	D25C8CC-1-16
MS27650-04D	D25C8CD-1-16
MS27650-05D	D25C8CE-1-16
MS27650-06D	D25C8CF-1-16
MS27650-07D	D25C8CG-1-16
MS27650-08D	D25C8CH-1-16
MS27650-09D	D25C8CI-1-16
MS27650-10D	D25C8CJ-1 -16
MS27650-11D	D25C8CK-1-16
MS27650-12D	D25C8CL-1-16
MS27650-13D	D25C8CM-1-16
MS27650-14D	D25C8CN-1-16
MS27650-15D	D25C8CO-1-16
MS27650-16D	D25C8CP-1-16
MS27650-17D	D25C8CR-1-16
MS27650-18D	D25C8CS-1-16
MS27650-19D	D25C8CT-1-16
MS27650-20D	D25C8CT-8-16
MS27650-21D	D25C8CU-1-16
MS27650-22D	D25C8CU-8-1-16
MS27650-23D	D25C8CV-1-16
MS27650-24D	D25C8CV-8-1-16
MS27650-25D	D25C8CW-1-16
MS27650-26D	D25C8CW-8-1-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ③
MS27650-01G	D25C8VA-16
MS27650-02G	D25C8VB-16
MS27650-03G	D25C8VC-16
MS27650-04G	D25C8VD-16
MS27650-05G	D25C8VE-16
MS27650-06G	D25C8VF-16
MS27650-07G	D25C8VG-16
MS27650-08G	D25C8VH-16
MS27650-09G	D25C8VI-16
MS27650-10G	D25C8VJ-16
MS27650-11G	D25C8VK-16
MS27650-12G	D25C8VL-16
MS27650-13G	D25C8VM-16
MS27650-14G	D25C8VN-16
MS27650-15G	D25C8VO-16
MS27650-16G	D25C8VP-16
MS27650-17G	D25C8VR-16
MS27650-18G	D25C8VS-16
MS27650-19G	D25C8VT-16
MS27650-20G	D25C8VT-8-16
MS27650-21G	D25C8VU-16
MS27650-22G	D25C8VU-8-16
MS27650-23G	D25C8VV-16
MS27650-24G	D25C8VV-8-16
MS27650-25G	D25C8VW-16
MS27650-26G	D25C8VW-8-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ③
MS27650-01H	D25C8VA-1-16
MS27650-02H	D25C8VB-1-16
MS27650-03H	D25C8VC-1-16
MS27650-04H	D25C8VD-1-16
MS27650-05H	D25C8VE-1-16
MS27650-06H	D25C8VF-1-16
MS27650-07H	D25C8VG-1-16
MS27650-08H	D25C8VH-1-16
MS27650-09H	D25C8VI-1-16
MS27650-10H	D25C8VJ-1 -16
MS27650-11H	D25C8VK-1-16
MS27650-12H	D25C8VL-1-16
MS27650-13H	D25C8VM-1-16
MS27650-14H	D25C8VN-1-16
MS27650-15H	D25C8VO-1-16
MS27650-16H	D25C8VP-1-16
MS27650-17H	D25C8VR-1-16
MS27650-18H	D25C8VS-1-16
MS27650-19H	D25C8VT-1-16
MS27650-20H	D25C8VT-8-16
MS27650-21H	D25C8VU-1-16
MS27650-22H	D25C8VU-8-1-16
MS27650-23H	D25C8VV-1-16
MS27650-24H	D25C8VV-8-1-16
MS27650-25H	D25C8VW-1-16
MS27650-26H	D25C8VW-8-1-16

Notes: ① 4-Digit Short Square 10-34 VDC ③ 4-Digit Short Square 23-29 VAC/380-420 Hz
② 4-Digit Long Square 10-34 VDC ④ 4-Digit Short Square 100-130 VAC/380-420 Hz

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.

If ordering a MIL part, use MIL Spec & EDI Number.
If ordering a Commercial part, use the Commercial Number.

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ④
MS27651-01A	D95C8C7A-16
MS27651-02A	D95C8C7B-16
MS27651-03A	D95C8C7C-16
MS27651-04A	D95C8C7D-16
MS27651-05A	D95C8C7E-16
MS27651-06A	D95C8C7F-16
MS27651-07A	D95C8C7G-16
MS27651-08A	D95C8C7H-16
MS27651-09A	D95C8C7I-16
MS27651-10A	D95C8C7J-16
MS27651-11A	D95C8C7K-16
MS27651-12A	D95C8C7L-16
MS27651-13A	D95C8C7M-16
MS27651-14A	D95C8C7N-16
MS27651-15A	D95C8C7O-16
MS27651-16A	D95C8C7P-16
MS27651-17A	D95C8C7R-16
MS27651-18A	D95C8C7S-16
MS27651-19A	D95C8C7T-16
MS27651-20A	D95C8C7T-8-16
MS27651-21A	D95C8C7U-16
MS27651-22A	D95C8C7U-8-16
MS27651-23A	D95C8C7V-16
MS27651-24A	D95C8C7V-8-16
MS27651-25A	D95C8C7W-16
MS27651-26A	D95C8C7W-8-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ④
MS27651-01B	D95C8C7A-1-16
MS27651-02B	D95C8C7B-1-16
MS27651-03B	D95C8C7C-1-16
MS27651-04B	D95C8C7D-1-16
MS27651-05B	D95C8C7E-1-16
MS27651-06B	D95C8C7F-1-16
MS27651-07B	D95C8C7G-1-16
MS27651-08B	D95C8C7H-1-16
MS27651-09B	D95C8C7I-1-16
MS27651-10B	D95C8C7J-1 -16
MS27651-11B	D95C8C7K-1-16
MS27651-12B	D95C8C7L-1-16
MS27651-13B	D95C8C7M-1-16
MS27651-14B	D95C8C7N-1-16
MS27651-15B	D95C8C7O-1-16
MS27651-16B	D95C8C7P-1-16
MS27651-17B	D95C8C7R-1-16
MS27651-18B	D95C8C7S-1-16
MS27651-19B	D95C8C7T-1-16
MS27651-20B	D95C8C7T-8-16
MS27651-21B	D95C8C7U-1-16
MS27651-22B	D95C8C7U-8-1-16
MS27651-23B	D95C8C7V-1-16
MS27651-24B	D95C8C7V-8-1-16
MS27651-25B	D95C8C7W-1-16
MS27651-26B	D95C8C7W-8-1-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ④
MS27651-01E	D95C8WA-16
MS27651-02E	D95C8WB-16
MS27651-03E	D95C8WC-16
MS27651-04E	D95C8WD-16
MS27651-05E	D95C8WE-16
MS27651-06E	D95C8WF-16
MS27651-07E	D95C8WG-16
MS27651-08E	D95C8WH-16
MS27651-09E	D95C8WI-16
MS27651-10E	D95C8WJ-16
MS27651-11E	D95C8WK-16
MS27651-12E	D95C8WL-16
MS27651-13E	D95C8WM-16
MS27651-14E	D95C8WN-16
MS27651-15E	D95C8WO-16
MS27651-16E	D95C8WP-16
MS27651-17E	D95C8WR-16
MS27651-18E	D95C8WS-16
MS27651-19E	D95C8WT-16
MS27651-20E	D95C8WT-8-16
MS27651-21E	D95C8WU-16
MS27651-22E	D95C8WU-8-16
MS27651-23E	D95C8WV-16
MS27651-24E	D95C8WV-8-16
MS27651-25E	D95C8WW-16
MS27651-26E	D95C8WW-8-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ④
MS27651-01F	D95C8WA-1-16
MS27651-02F	D95C8WB-1-16
MS27651-03F	D95C8WC-1-16
MS27651-04F	D95C8WD-1-16
MS27651-05F	D95C8WE-1-16
MS27651-06F	D95C8WF-1-16
MS27651-07F	D95C8WG-1-16
MS27651-08F	D95C8WH-1-16
MS27651-09F	D95C8WI-1-16
MS27651-10F	D95C8WJ-1 -16
MS27651-11F	D95C8WK-1-16
MS27651-12F	D95C8WL-1-16
MS27651-13F	D95C8WM-1-16
MS27651-14F	D95C8WN-1-16
MS27651-15F	D95C8WO-1-16
MS27651-16F	D95C8WP-1-16
MS27651-17F	D95C8WR-1-16
MS27651-18F	D95C8WS-1-16
MS27651-19F	D95C8WT-1-16
MS27651-20F	D95C8WT-8-16
MS27651-21F	D95C8WU-1-16
MS27651-22F	D95C8WU-8-1-16
MS27651-23F	D95C8WV-1-16
MS27651-24F	D95C8WV-8-1-16
MS27651-25F	D95C8WW-1-16
MS27651-26F	D95C8WW-8-1-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ④
MS27651-01C	D95C8CA-16
MS27651-02C	D95C8CB-16
MS27651-03C	D95C8CC-16
MS27651-04C	D95C8CD-16
MS27651-05C	D95C8CE-16
MS27651-06C	D95C8CF-16
MS27651-07C	D95C8CG-16
MS27651-08C	D95C8CH-16
MS27651-09C	D95C8CI-16
MS27651-10C	D95C8CJ-16
MS27651-11C	D95C8CK-16
MS27651-12C	D95C8CL-16
MS27651-13C	D95C8CM-16
MS27651-14C	D95C8CN-16
MS27651-15C	D95C8CO-16
MS27651-16C	D95C8CP-16
MS27651-17C	D95C8CR-16
MS27651-18C	D95C8CS-16
MS27651-19C	D95C8CT-16
MS27651-20C	D95C8CT-8-16
MS27651-21C	D95C8CU-16
MS27651-22C	D95C8CU-8-16
MS27651-23C	D95C8CV-16
MS27651-24C	D95C8CV-8-16
MS27651-25C	D95C8CW-16
MS27651-26C	D95C8CW-8-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ④
MS27651-01D	D95C8CA-1-16
MS27651-02D	D95C8CB-1-16
MS27651-03D	D95C8CC-1-16
MS27651-04D	D95C8CD-1-16
MS27651-05D	D95C8CE-1-16
MS27651-06D	D95C8CF-1-16
MS27651-07D	D95C8CG-1-16
MS27651-08D	D95C8CH-1-16
MS27651-09D	D95C8CI-1-16
MS27651-10D	D95C8CJ-1 -16
MS27651-11D	D95C8CK-1-16
MS27651-12D	D95C8CL-1-16
MS27651-13D	D95C8CM-1-16
MS27651-14D	D95C8CN-1-16
MS27651-15D	D95C8CO-1-16
MS27651-16D	D95C8CP-1-16
MS27651-17D	D95C8CR-1-16
MS27651-18D	D95C8CS-1-16
MS27651-19D	D95C8CT-1-16
MS27651-20D	D95C8CT-8-16
MS27651-21D	D95C8CU-1-16
MS27651-22D	D95C8CU-8-1-16
MS27651-23D	D95C8CV-1-16
MS27651-24D	D95C8CV-8-1-16
MS27651-25D	D95C8CW-1-16
MS27651-26D	D95C8CW-8-1-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ④
MS27651-01G	D95C8VA-16
MS27651-02G	D95C8VB-16
MS27651-03G	D95C8VC-16
MS27651-04G	D95C8VD-16
MS27651-05G	D95C8VE-16
MS27651-06G	D95C8VF-16
MS27651-07G	D95C8VG-16
MS27651-08G	D95C8VH-16
MS27651-09G	D95C8VI-16
MS27651-10G	D95C8VJ-16
MS27651-11G	D95C8VK-16
MS27651-12G	D95C8VL-16
MS27651-13G	D95C8VM-16
MS27651-14G	D95C8VN-16
MS27651-15G	D95C8VO-16
MS27651-16G	D95C8VP-16
MS27651-17G	D95C8VR-16
MS27651-18G	D95C8VS-16
MS27651-19G	D95C8VT-16
MS27651-20G	D95C8VT-8-16
MS27651-21G	D95C8VU-16
MS27651-22G	D95C8VU-8-16
MS27651-23G	D95C8VV-16
MS27651-24G	D95C8VV-8-16
MS27651-25G	D95C8VW-16
MS27651-26G	D95C8VW-8-16

MIL SPEC & EDI NUMBER	COMMERCIAL NUMBER ④
MS27651-01H	D95C8VA-1-16
MS27651-02H	D95C8VB-1-16
MS27651-03H	D95C8VC-1-16
MS27651-04H	D95C8VD-1-16
MS27651-05H	D95C8VE-1-16
MS27651-06H	D95C8VF-1-16
MS27651-07H	D95C8VG-1-16
MS27651-08H	D95C8VH-1-16
MS27651-09H	D95C8VI-1-16
MS27651-10H	D95C8VJ-1 -16
MS27651-11H	D95C8VK-1-16
MS27651-12H	D95C8VL-1-16
MS27651-13H	D95C8VM-1-16
MS27651-14H	D95C8VN-1-16
MS27651-15H	D95C8VO-1-16
MS27651-16H	D95C8VP-1-16
MS27651-17H	D95C8VR-1-16
MS27651-18H	D95C8VS-1-16
MS27651-19H	D95C8VT-1-16
MS27651-20H	D95C8VT-8-16
MS27651-21H	D95C8VU-1-16
MS27651-22H	D95C8VU-8-1-16
MS27651-23H	D95C8VV-1-16
MS27651-24H	D95C8VV-8-1-16
MS27651-25H	D95C8VW-1-16
MS27651-26H	D95C8VW-8-1-16

Notes: ① 4-Digit Short Square 10-34 VDC ② 4-Digit Long Square 10-34 VDC ③ 4-Digit Short Square 23-29 VAC/380-420 Hz ④ 4-Digit Short Square 100-130 VAC/380-420 Hz

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.

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Digital Series
Models DDS100 & DDS101

Elapsed Time Indicator Model

DDS100 Solid-State Elapsed Time Indicators have been developed to meet the most difficult requirements of many military and aerospace applications. In one PCB mount package, the DDS100 provides highly reliable means of monitoring the system. All connections are made via printed wiring and the output brought to a data collection point for system reading or to a single dedicated connector.

Elapsed time can be read from the meter by mating the printed wiring board connections with the M7793/12-1 reader's connector and operating the reader. Time range is 99999.99 hours.

Event Counter Model

The DDS101 Solid-State Event Counter records counts when the unit receives power for greater than 5 seconds. Power-on times of less than 4 seconds will not cause the counter to increment, allowing the count to be read without affecting the results. The count range is 9,999,999.

All connections, data collection, and the display of counts are made in the same manner as the DDS100 Elapsed Time Indicator. The DDS101 Event Counter meets the requirements of M7793 and the same environmental, mechanical, and electrical specifications as the DDS100.

FEATURES

- Monitors your system usage
- PCB mount
- Non-volatile memory
- Elapsed Time Indicator model meets MIL-M-7793/13
- MIL-M-7793/13 qualified model is also available

MECHANICAL SPECIFICATIONS

Case Dimensions: 1.1" long x .450" wide x .275" high

Package Size: I/A/W meets M7793/13

Weight: Less than 0.2 ounces

Model DDS100: Elapsed Time Indicator

Model DDS101: Event Counter

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65 to +125°C

Shock: MIL-STD-202, Method 213, Condition I

Vibration: MIL-STD-202, Method 204, Condition D

Life Accuracy: ±0.1% from -65 to +125°C and 4.5 to 10 VDC

Power Consumption: 5 VDC

ELECTRICAL SPECIFICATIONS

The meters meet or exceed applicable requirements of MIL-M-7793 and M7793/13.

Operating Voltage Range: 4.5 to 10 VDC

Ripple Voltage: 2 volt peak (4 volt peak-to-peak) ripple between 10Hz and 10kHz superimposed on 7.0 VDC

Output Impedance: 100kΩ ± 10%

Logic Zero: Between 0.0 and +0.2 volts

Logic One: Between +3.3 and +6.6 volts

Power Consumption: 2 milliwatts, max.

Transient Protection: Operation when subjected to ±25 volt transients of 10 microsecond duration occurring at a 1 millisecond repetition rate

Dielectric: Withstands 600 VRMS (room) and 350 VRMS (altitude) applied between the power terminals (+5 VDC and common) and an external ground that contact the meter case on the five sides without terminals

Insulation Resistance: MIL-STD-202, Method 302, Cond. B

Accuracy: 0.1% over temperature/voltage range

Output Data: Serial binary coded decimal format

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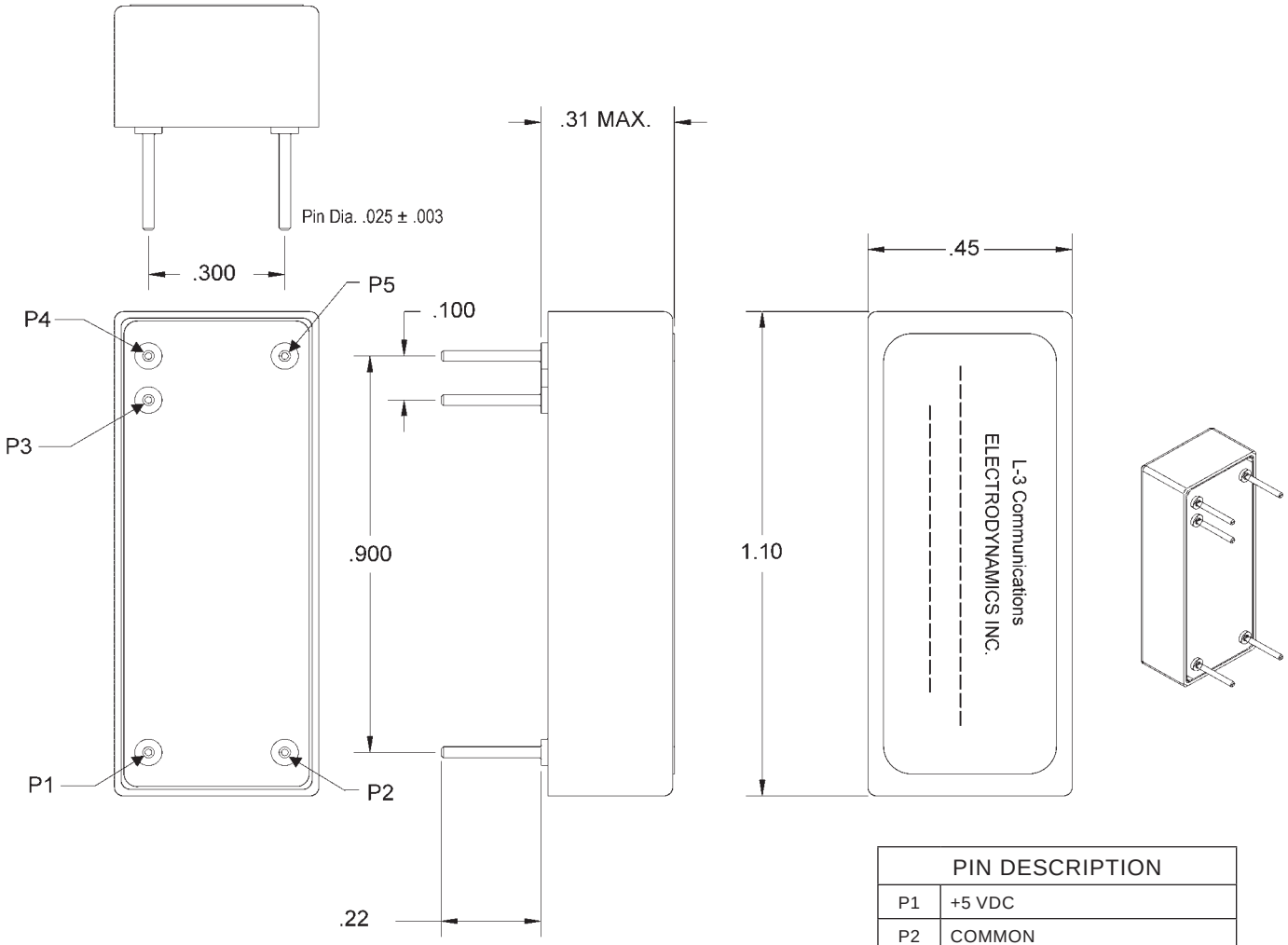

PIN DESCRIPTION	
P1	+5 VDC
P2	COMMON
P3	OUTPUT DATA TO READER
P4	INPUT FROM READER (+5 V)
P5	COMMON

Common pins are internally connected

DDS100 and DDS101

NOTE:
Dimensions in inches.
Tolerances, decimals: ±.02 for two-place decimals;
±.015 for three-place decimals.

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Digital Series
Models DDS232H & DDS232C

DDS232H Elapsed Time Indicator Model

DDS232H Solid-State Elapsed Time Indicators have been developed to meet the most difficult requirements of many military and aerospace applications. In one PCB mount package, the DDS232H provides a highly reliable means of monitoring the system and provides an RS232/TTL output making it more compatible with industry standard electronic system design. It requires an RS232 driver/receiver chip such as a MAX232 for RS232 operation.

The indicator operates with 4.5 to 10 VDC and has a range of 99999.99 hours. In addition, the DDS232H has been tested to the MIL-M-7793/13 specification and can be applied to any severe environment.

DDS232C Event Counter Model

The DDS232C Solid-State Event Counter records counts when the unit receives power for greater than 5 seconds. Power-on times of less than 4 seconds will not cause the counter to increment, allowing the count to be read without affecting the results. The count range is 9,999,999.

All connections, data collection, and the display of counts are made in the same manner as the DDS232H Elapsed Time Indicator.

FEATURES

- Monitors your system usage
- RS232/TTL output
- PCB mount
- Non-volatile memory
- Meets mechanical and environmental characteristics of MIL-M-7793/13

MECHANICAL SPECIFICATIONS

Case Dimensions: 1.1" long x .450" wide x .275" high

Weight: Less than 0.2 ounces

Model DDS232H: Elapsed Time Indicator

Model DDS232C: Event Counter

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65 to +125°C

Shock: MIL-STD-202, Method 213, Condition I

Vibration: MIL-STD-202, Method 204, Condition D

Life Accuracy: ±0.1% from -65 to +125°C and 4.5 to 10 VDC

Power Consumption: 2 mW max @ 5 VDC0.1

ELECTRICAL SPECIFICATIONS

The meters meet or exceed applicable requirements of MIL-M-7793 and M7793/13.

Operating Voltage Range: 4.5 to 10 VDC

Ripple Voltage: 2 volt peak (4 volt peak-to-peak) ripple between 10Hz and 10kHz superimposed on 7.0 VDC

Output Impedance: 465Ω ± 10%

Logic Zero: Between 0.0 and +0.26 volts

Logic One: Between +3.3 and +4.5 volts

Power Consumption: 2 milliwatts, max.

Transient Protection: Operation when subjected to ±25 volt transients of 10 microsecond duration occurring at a 1 millisecond repetition rate

Dielectric: Withstands 600 VRMS (room) and 350 VRMS (altitude) applied between the power terminals (+5 VDC and common) and an external ground that contact the meter case on the five sides without terminals

Insulation Resistance: MIL-STD-202, Method 302, Cond. B

Accuracy: 0.1% over temperature/voltage range

Output Data: RS232/TTL, ASCII

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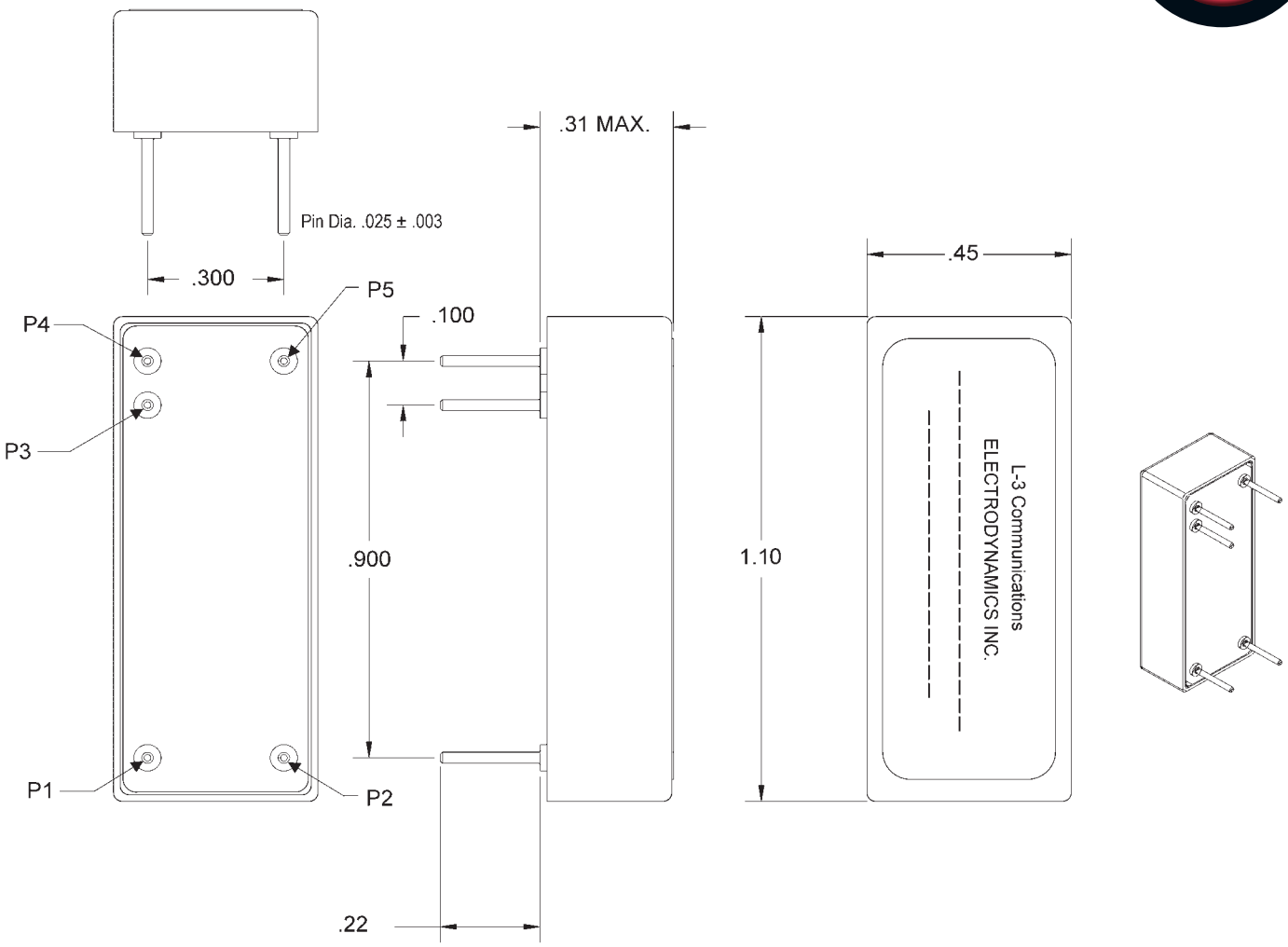

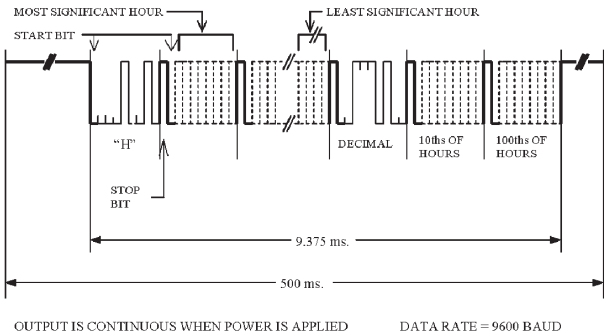

OUTPUT IS CONTINUOUS WHEN POWER IS APPLIED DATA RATE = 9600 BAUD

UART COMPATIBLE - OUTPUT REQUIRES A LEVEL SHIFTING DEVICE SUCH AS A MAX232

DDS232H OUTPUT DATA FORMAT (ASCII)

PIN DESCRIPTION	
P1	+5 VDC
P2	COMMON
P3	OUTPUT DATA TO READER
P4	INPUT FROM READER (+5 V)
P5	COMMON

Common pins are internally connected

DDS232H and DDS232C

NOTE:
Dimensions in inches.
Tolerances, decimals: ±.02 for two-place decimals;
±.015 for three-place decimals.

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Digital Series
Models DDS200 & DDS201

Model DDS200: Elapsed Time Indicator

Model DDS201: Event Counter

DDS200 Elapsed Time Indicator Model

The DDS200 Solid-State Elapsed Time Indicator and the DDS201 Solid-State Event Counter have been developed to meet the most difficult requirements of military and aerospace applications. In one panel mount package, the DDS200 series provides a highly reliable means of monitoring critical system usage, important for proper equipment maintenance.

The elapsed time and events data can be read via the M7793/12 reader.

The time range for the DDS200 Elapsed Time Indicator is 99999.99 hours.

DDS201 Event Counter Model

The DDS201 Solid-State Event Counter meets the electrical, mechanical and environment requirements of MIL-M-7793/14 and records counts when the unit receives power for greater than 5 seconds. Power-on times of less than 4 seconds will not cause the counter to increment. The count range is 9,999,999.

FEATURES

- Monitors your system usage
- Panel mount configuration
- Non-volatile memory
- Meets MIL-M-7793/14
- MIL-M-7793/14 qualified model is also available.

MECHANICAL SPECIFICATIONS

Case Dimensions: See next page for detailed dimensions

Weight: 1 ounce max.

Elapsed Time Indicator—Time Range: 99999.99 hours

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65 to +125°C

Shock: MIL-STD-202, Method 213, Condition I

Vibration: MIL-STD-202, Method 204, Condition D

Salt Spray: MIL-STD-202, Method 101, Condition B

Moisture Resistance: MIL-STD-202, Method 106, Figure 106-1

Altitude: MIL-STD-202, Method 105, 0-80,000 feet

ELECTRICAL SPECIFICATIONS

These meters meet or exceed applicable requirements of MIL-M-7793 and M7793/14.

Operating Voltage Range: 10-34 VDC and 20-30 VAC, 50-2400Hz

Ripple Voltage: Operates normally when subjected to a cyclic peak of ripple voltage of less than 2.0 VDC and the frequency-voltage coordinates of Figure 2 of MIL-DTL-7793/14

Output Impedance: 100kΩ ± 10%

Logic Zero: 0.0 to 0.2 V

Logic One: 3.3 to 6.6 V

Power Consumption: 50mW max. at 28 VDC; 25 mW max. at 26 VAC 400Hz

Transient Protection: Input voltage and time values shown on Figure 5 and Figure 6 (80V and 600V transient respectively) of MIL-DTL-7793/14.

Dielectric: Withstands 600 VRMS (room) and 350 VRMS (altitude) applied between the power terminals and an external ground

Insulation Resistance: MIL-STD-202, Method 302, Condition B

Accuracy: ±0.1% over temperature/voltage range

EMC: MIL-STD-461, Test Methods CE102 and RE102.

Output Data: Serial binary coded decimal format

Reading Allowed at time of Shipments: Meters can be delivered with +/- 1 hour upon delivery per MIL-DTL-7793

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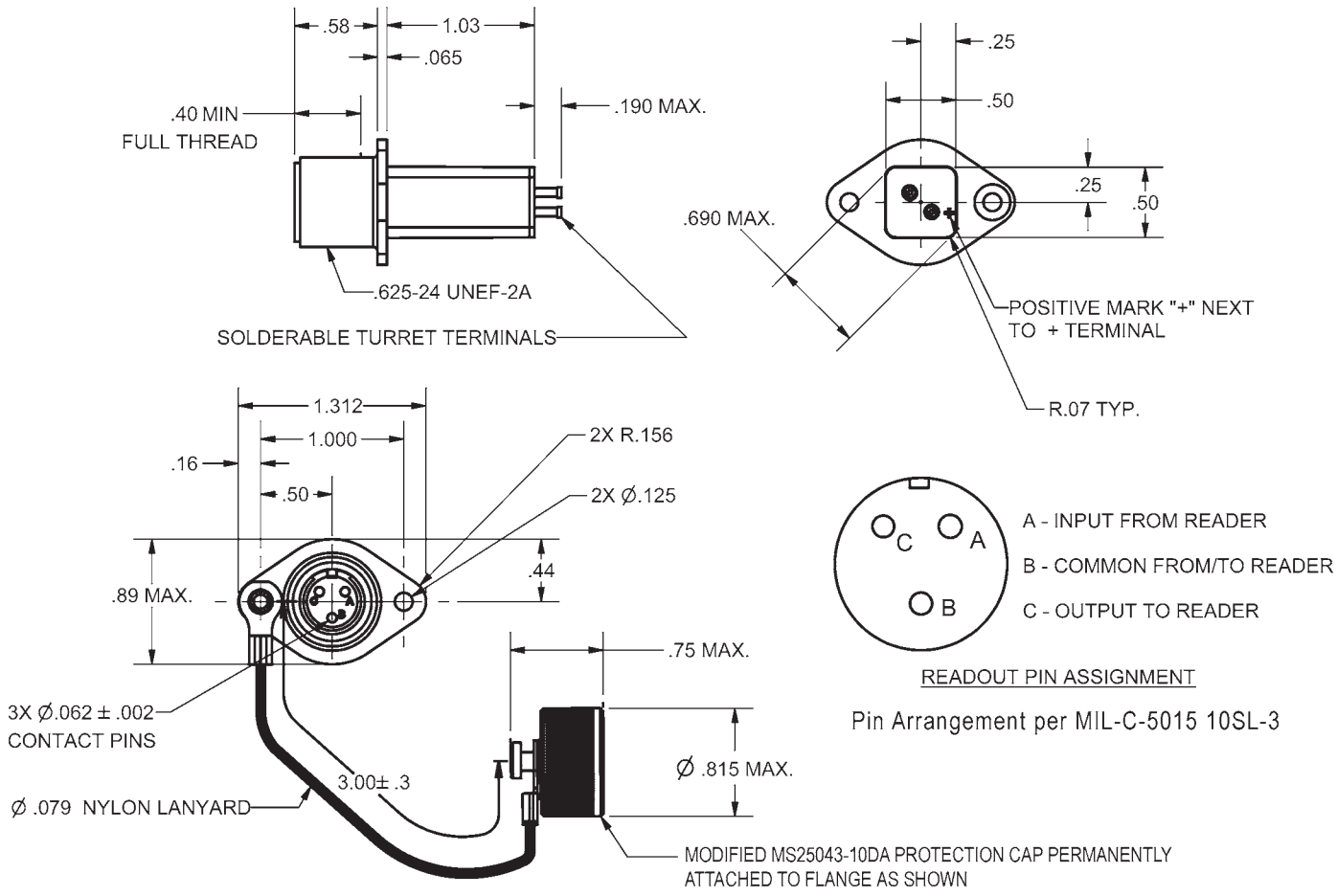

DDS200 and DDS201

NOTE:
Dimensions in inches.
Tolerances, decimals: ±.02 for two-place decimals;
±.015 for three-place decimals.

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SSETI READER
FOR SOLID-STATE, PANEL MOUNT

Model 1170-004

For model DDS200 Solid-State Elapsed Time Indicators and model DDS201 Solid-State Event Counters

MECHANICAL SPECIFICATIONS

Case Dimensions: See below for detail dimensions

Weight: 15 ounce max. including battery

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range:
Continuous Operation: -20°C to +55°C

Storage Temperature Range: -30°C to +80°C

Accuracy: ±0.5% (max. deviation for the display)

Shock: MIL-STD-202E, Method 213B, Test Condition G, 50 Gs Peak, 11 millisecond sawtooth.

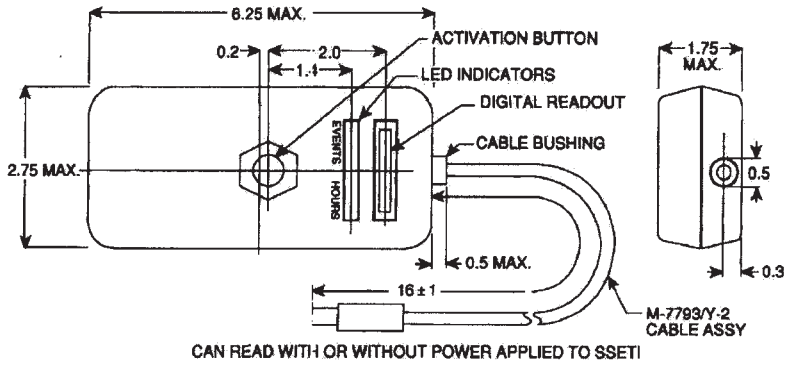
Vibration: MIL-STD-202E, Method 201A, 10 to 55Hz, 0.06 inch double amplitude.

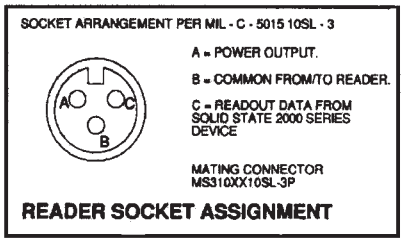
Power Source: 9 Volt alkaline manganese primary battery (NEDA 1604)

Battery Life: 1200 readings or 2 years (whichever comes first), at 25°C

Power Consumption: Discharge current shall not exceed 80 ma at any time during operational cycle; 2 µA when non-operational.

Model 1170-004 is compatible with the M7793/12 reader





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