

MIL-SPEC LED Indicator

ML 1640 Series

FEATURES

- Design meets DESC Drwg. 85122
- Environmentally Sealed
- Optional EMI Protection Screen
- Colors: Red, Yellow & Green
- Panel Mount

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 Drwg. 85122. It is panel mountable with solderable leads and includes hardware. Available with anti-reflection lens coating.

ENVIRONMENTAL SPECIFICATIONS

Units meet 100% screening, group A and group B testing, in compliance with DESC 85122, and MIL-STD-750.

MECHANICAL SPECIFICATIONS

Bezel: aluminum, black anodized

Case: aluminum, chromate.

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

Seal: Environmentally sealed with front panel PTFE ring seal.

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS Absolute Maximum Ratings

Color	Red	Yellow	Green
Forward Voltage (VDC) typical $I_f=20$ mA	2.2	2.2	2.3
Peak Forward Current (mA)	90	60	90
DC Forward Current (mA)	30	20	30
Reverse Voltage (VDC) @ $I_r = 100$ μ A	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		

¹Derate at 1.8 mW/°C above +25°C Ambient

²Derate at 1.6 mW/°C above +50°C Ambient

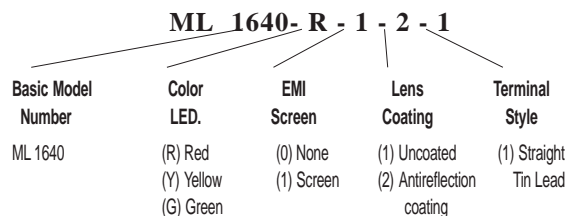
Electrodyan. Model No.	DESC 85122 Dash No.	Type of Lens	Anti-reflect. Coating	EMI Screen	Outline Figure	DESC 85122 Dash No.	Min. Luminous Intensity @ Forward Current
ML1641-X011	R01, Y01, G01	Plano Convex	No	No	1	R01, R02, R11	15 mcd @ 10 mA
ML1644-X011	R02, Y02, G02	Plano Convex	No	No	2	Y01, Y02, Y11	12 mcd @ 10 mA
ML1644-X111	R11, Y11, G11	Plano Convex	No	Yes	2a	G01, G02, G11	12 mcd @ 20 mA
ML1642-X011	R03, Y03, G03	Flat 30° View. Angle	No	No	3	R03, R05, R07, R09	10 mcd @ 20 mA
ML1645-X011	R05, Y05, G05	Flat 30° View. Angle	No	No	4	Y03, Y05, Y07, Y09	5 mcd @ 15 mA
ML1645-X021	R07, Y07, G07	Flat 30° View. Angle	Yes	No	4	G03, G05, G07, G09	10 mcd @ 20 mA
ML1645-X121	R09, Y09, G09	Flat 30° View. Angle	Yes	Yes	4a	R04, R06, R08, R10	1.0 mcd @ 20 mA
ML1643-X011	R04, Y04, G04	Flat 100° View. Angle	No	No	3	Y04, Y06, Y08, Y10	0.5 mcd @ 15 mA
ML1646-X011	R06, Y06, G06	Flat 100° View. Angle	No	No	4	G04, G06, G08, G10	1.0 mcd @ 20 mA
ML1646-X021	R08, Y08, G08	Flat 100° View. Angle	Yes	No	4		
ML1646-X121	R10, Y10, G10	Flat 100° View. Angle	Yes	Yes	4a		

*Substitute color X in Model No., i.e.: R=RED Y=YELLOW G=GREEN

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, the factory assigned modification number will be added at the end of the ordering number.

Example: Basic model with red a LED, with a screen and type of lead would be model ML 1640 - R-1-2-1.





MIL-SPEC LED Indicator

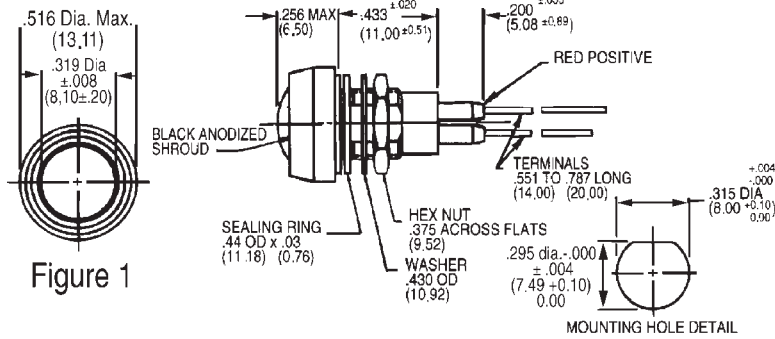


Figure 1



ML 1640 Series

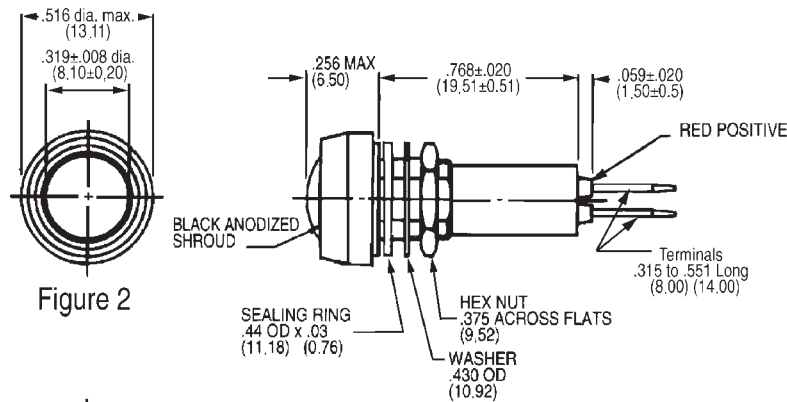
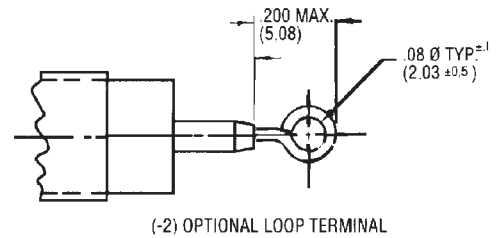
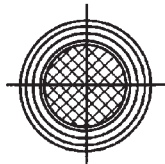


Figure 2



(-2) OPTIONAL LOOP TERMINAL



WITH EMI SCREEN

Figure 2a

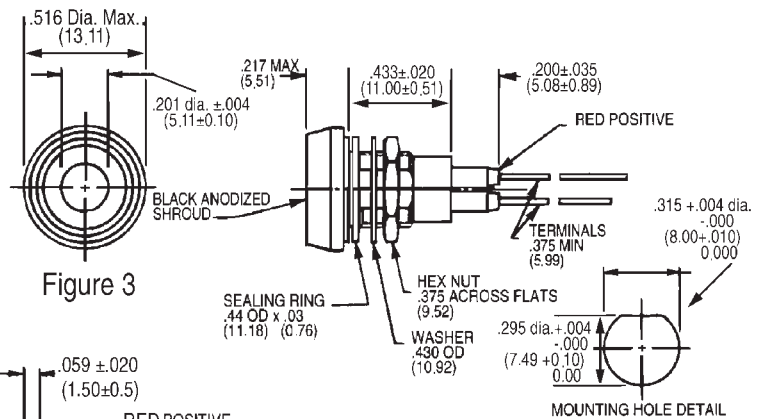


Figure 3

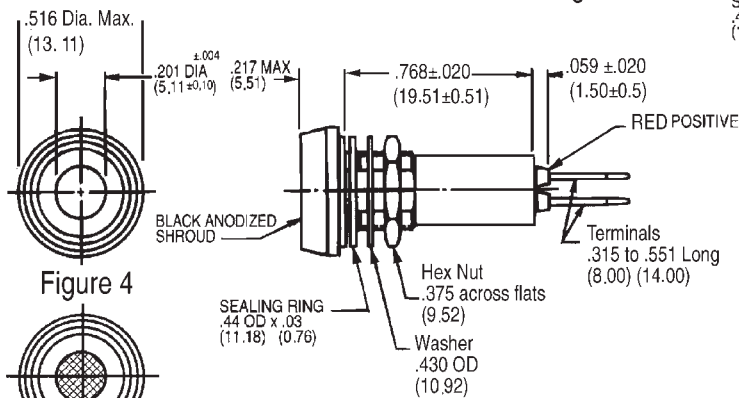
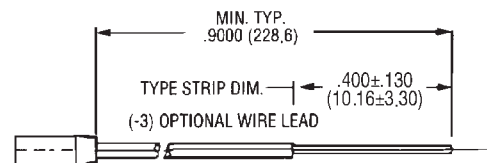


Figure 4



WITH EMI SCREEN

Figure 4a



(-3) OPTIONAL WIRE LEAD

NOTE:

Dimensions in () are mm.

Tolerances: Decimals: ± .010 (0,25)

Fractions: ± 1/64

Mounting Torque: 5-7 in. lbs.

MIL-SPEC NVIS Compatible Lighting Indicator

ML 1662



communications
Electrodynamics, Inc.



ML 1662

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

The ML 1662 status indicator was developed to meet the requirements of MIL-L-85762A 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.

ENVIRONMENTAL SPECIFICATIONS

- Vibration:** .06" D.A. or 20G Peak, whichever is less, 10 Hz to 2 kHz, MIL STD 202, Method 204, Test Condition D.
- Shock:** 100 G's MIL STD 202, Method 213, Test Condition I.
- Moisture Resistance (Humidity):** MIL STD 202, Method 106.
- Altitude:** 100,000 ft., MIL STD 202, Method 105, Test Condition D.
- Reliability:** Operational 6 x 10⁶ hours min. MTBF @ 25°C
- Salt Spray:** MIL STD 202, Method 101, Test Condition B.

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.

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS Absolute Maximum Ratings

Color	Red	Yellow	Green
Forward Voltage (VDC)	2.4	2.0	2.1
Peak Forward Current (mA)	50	60	90
DC Forward Current (mA)	25	20	30
Reverse Voltage (VDC) @ I _R = 100 μA	4	5	5
Power Dissipation (mW)	70 ¹	85 ²	135 ³
Luminous Intensity (mcd)	3	5	10
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 NR _B 1.4 x 10 ⁻⁷ @ 15 fL	NR _A 1.7 x 10 ⁻¹⁰ NR _B 1.7 x 10 ⁻¹⁰ @ 0.1 fL
Dominant Wave Length (nm)	620	585	569
Viewing Angle (2 Ø 1/2)	50°	50°	50°
Operating Temperature (°C)	-20 to +70	-55 to +100	-20 to +100
Storage Temperature (°C)	-20 to +100	-55 to +100	-55 to +100

¹Derate at 1.8 mW/°C above +25°C Ambient

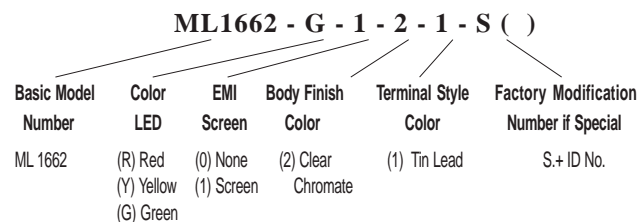
²Derate at 1.6 mW/°C above +50°C Ambient

³Derate at 1.6 mW/°C above 25°C Ambient

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, customer's modification number will be added at the end of the ordering number.

Example: Basic model with in with red LED., with a screen, a clear chromate body finish, and a tin lead terminal finish would be model ML 1662 -G - 1 - 2 - 1.



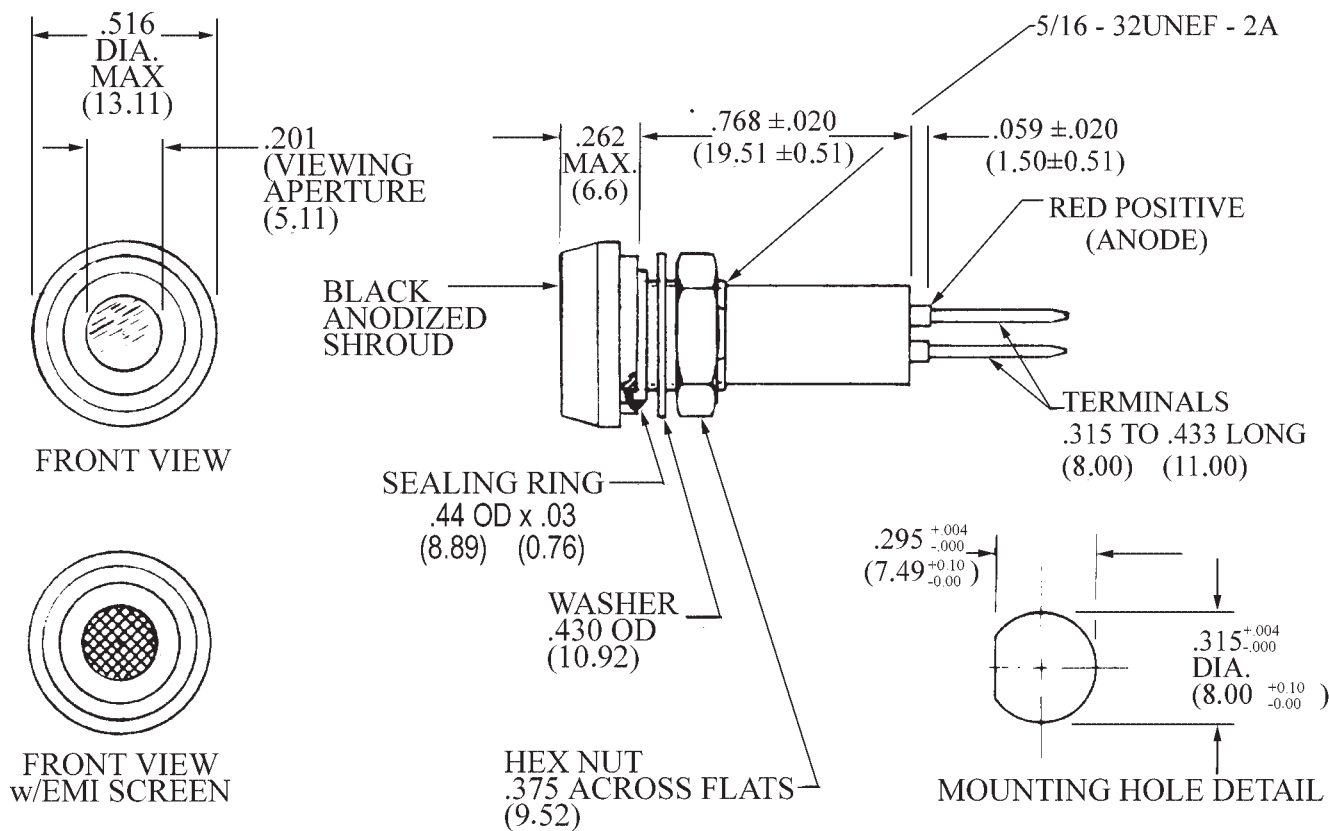


MIL-SPEC NVIS Compatible Lighting Indicator ML 1662



ML 1662

Model ML 1662



LED INDICATORS

NOTE:

Dimensions in () are mm.

Tolerances: Decimals: ± .010 (0.25)

Fractions: ± 1/64

Mounting Torque: 5-7 in. lbs.

LED Status Indicator Series

Solid Front LED Indicatorcommunications
Electrodynamics, Inc.**Provides water tight panel seal****ML 2030E****FEATURES**

- O-Ring Panel Seal
- Dual Finish Case
- EMI Screen Standard
- Performs in Severe Environments
- Low Power Use
- Sunlight Readable
- Rugged Construction
- Custom Configurations Available including Bi Color LED and NVIS compatible filtering

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.

Environmental Specifications

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

Shock: 100 G's MIL STD 202, Method 213, Test Condition I.

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

Altitude: 100,000 ft., MIL STD 202, Method 105, Test Condition D.

Reliability: Operational 6×10^6 hours min. MTBF @ 25 °C

Salt Spray: MIL STD 202, Method 101, Test Condition B.

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.

O-Ring: Fluoro-silicone rubber

ELECTRO-OPTICAL CHARACTERISTIC SPECIFICATIONS

Absolute Maximum Ratings

Color		Red	Yellow	Green
Forward Voltage (VDC)		1.9	2.0	2.1
Peak Forward Current (mA DC)		90	60	90
DC Forward Current (mA DC)*		30	20	30
Reverse Voltage (VDC) @ $I_R = 100 \mu A$		5	5	5
Power Dissipation (mW)		135	85	135
Luminous Intensity (mcd) typical	Non-diffused	2	2	2
@ $I_f = 10 \text{ mA DC}$	Diffused	8	8	8
Dominant Wave Length (nm) typical		626	585	569
Viewing Angle ($2 \theta^{1/2}$) typical	Non-diffused	30°	30°	30°
	Diffused	60°	60°	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		

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

LED Status Indicator Series

Solid Front LED Indicator

Provides water tight panel seal

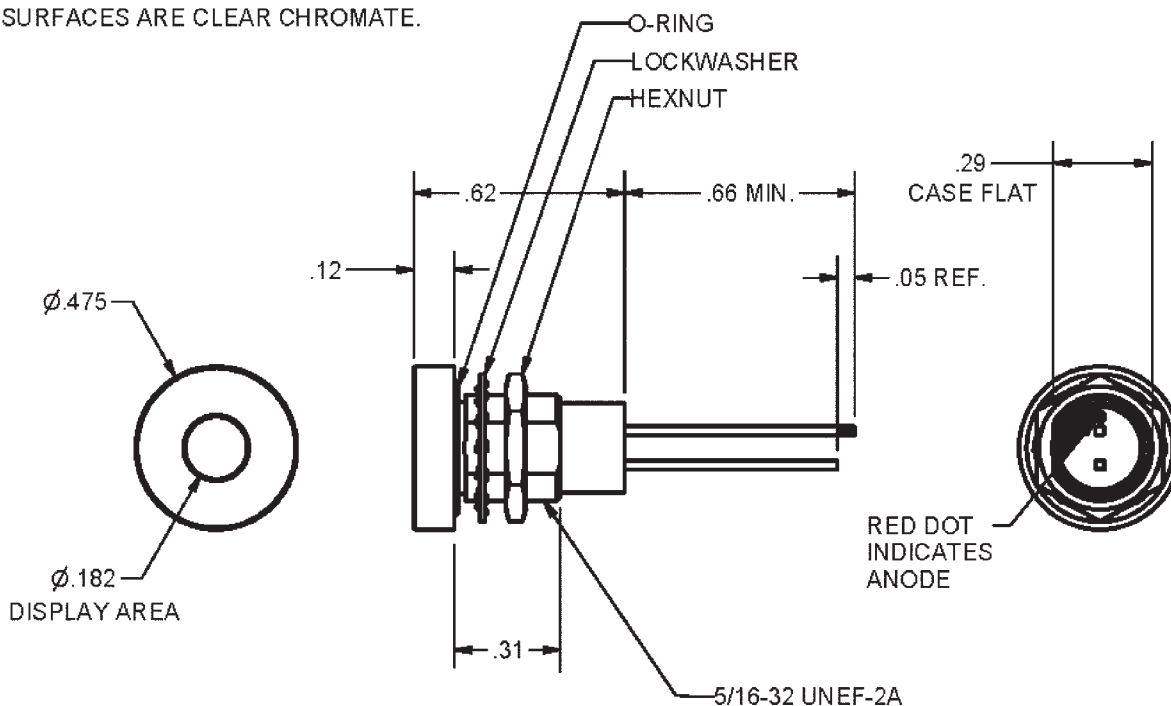
ML 2030E



MIL 2030E Series

NOTE:

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



ML 2030E SERIES, SOLID FRONT

NOTE:

Dimensions in inches.
Tolerances: ± .010 for two-place decimals;
± .005 for three-place decimals.

ORDERING INFORMATION

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

Example: Basic model with a red LED, a diffused lens, and straight leads would be ML 2030E-R-D-LT

ML 2030E - R - D - LT - S ()

Basic Model Number	LED. Color	Lens Type	Terminal Style	Factory Modification Number if Special
ML 2030E	R Red Y Yellow G Green	ND Non-Diffused D Diffused	ST Straight Leads LT Solder Loops	S.+ ID No.

LED INDICATORS