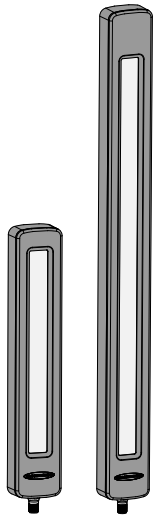
# BL60 Sealed LED Bar Light Instruction Manual

## Features

*Sealed IP67, IP68, and IP69K lighting for use with Vision Systems in washdown environments*

To view or download the latest technical information about this product, including specifications, dimensions, accessories, and wiring, go to www.bannerengineering.com.



- Four high-intensity, visible wavelengths, plus IR and UV
- Oil, chemical, and water resistant with IP67, JIS C IP68G, and IP69K per DIN 40050-9
- Available in 340 mm and 640 mm lengths
- Highly resistant to vibration and shock
- High-power, solid-state LED array; continuous or strobed operation
- PNP and NPN strobe operation
- Black e-coated aluminum housing

## Model Key

| Family | Color | Length (mm) | Window | Lensing | Control | Sealed | Connection |
|---|---|---|---|---|---|---|---|
| **BL60** | **W** | **340** | | **L14** | **A** | **S** | **Q** |
| | W = Daylight white (5000K)<br>R = Red<br>G = Green<br>B = Blue<br>I = Infrared<br>UV365 = 365 nm Ultraviolet<br>UV395 = 395 nm Ultraviolet | 340<br>640 | Blank = Clear polycarbonate<br>D = Diffused polycarbonate<br>G = Borosilicate glass | Visible and IR Models: L14 = 14-degree FWHM narrow lenses<br>UV Models: L30 = 30-degree FWHM wide lenses | A = Adjustable PWM/Strobe and 1 V to 10 V dimming | S = Sealed | Q = Integral 5-pin M12 male quick-disconnect connector |

The following caution applies to white LED models and blue LED models:

**CAUTION:**
**Risk Group 2: Possibly hazardous optical radiation emitted from this product.**

Do not stare at the operating lamp. May be harmful to the eyes. Risk Group 2 (RG 2) products generally do not pose a realistic optical hazard if aversion responses limit the exposure duration or where lengthy exposures are unrealistic.

- IEC 62471

The following caution applies to ultraviolet models:

**CAUTION:**
**Risk Group 2: UV Emitted from this product.**

Eye or skin irritation may result from exposure. Use appropriate shielding and eye protection. Risk Group 2 (RG 2) products generally do not pose a realistic optical hazard if aversion responses limit the exposure duration or where lengthy exposures are unrealistic.

- IEC 62471

The following caution applies to infrared models: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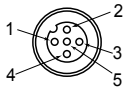
**CAUTION:**
**Risk Group 1: IR Emitted from this product.**

Use appropriate shielding or eye protection. Risk Group 1 (RG 1) products are safe for most use applications, except for very prolonged exposures where direct ocular exposures may be expected.

- IEC 62471

# Wiring

| Pinout | Pin Number | Wire Color | 1 V to 10 V Analog Dimming and Strobing/PWM Dimming Models |
|---|---|---|---|
|  | Pin 1 | Brown | 12 V DC to 30 V DC |
| | Pin 2 | White | NPN PWM/Strobe Input: For maximum intensity, leave the white wire floating, or connect to 12 V DC to 30 V DC. Connecting to DC common causes the LEDs to shut off. |
| | Pin 3 | Blue | DC common |
| | Pin 4 | Black | PNP PWM/Strobe Input: For maximum intensity, leave the black wire floating, or connect to DC common. Connecting to 12 V DC to 30 V DC causes the LEDs to shut off. |
| | Pin 5 | Gray | 1 V DC to 10 V DC Analog Dimming |

# Specifications

**Supply Voltage**

12 V DC to 30 V DC

Use only with a suitable Class 2 power supply (UL) or SELV power supply (CE)

See the electrical characteristics on the product label.

**Supply Protection Circuitry**

Protected against reverse polarity and transient voltages

**Pulse Width Modulation (PWM)/Strobe Control**

Maximum Frequency: 30 kHz

Minimum On Time: 20 µs

Input Delay Time: 5 µs

Input Voltage Threshold:

PNP: > 7 V DC
NPN: < 2 V DC

Input Current Maximum: 5 mA

**Analog Control**

Intensity Adjustment Range: 10% to 100%

Input Voltage Range: 1 V DC to 10 V DC

Input Current Maximum: 5 mA

**Construction**

**Housing:** Black e-coated aluminum housing

**Window:** Clear or diffuse polycarbonate window, or clear borosilicate glass window

**Mounting**

(6) M6×1 threaded holes in back; multiple bracket options available

**Connections**

Integral 5-pin M12 male quick-disconnect connector, accessory cordset required

**LED Lifetime**

Lumen Maintenance: L70

When operating within specifications, the output decreases less than 30% after the following time periods:

Daylight White: 90,000 hours
Red: 70,000 hours
Green: 70,000 hours
Blue: 50,000 hours
Yellow: 60,000 hours
UV: 35,000 hours

**Vibration and Mechanical Shock**

Meets IEC 60068-2-6 requirements (Vibration: 10 Hz to 55 Hz, 1.0 mm amplitude, 5 minutes sweep, 30 minutes dwell)

Meets IEC 60068-2-27 requirements (Shock: 15G 11 ms duration, half sine wave)

**Operating Conditions**

–40 °C to +50 °C (–40 °F to +122 °F)

**Storage Temperature**

–40 °C to +70 °C (–40 °F to +158 °F)

**Environmental Rating**

IP67, JIS C IP68G, IP69K per DIN 40050-9

**Required Overcurrent Protection**

**WARNING:** Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.

Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.

Supply wiring leads < 24 AWG shall not be spliced.

For additional product support, go to www.bannerengineering.com.

| Supply Wiring (AWG) | Required Overcurrent Protection (A) | Supply Wiring (AWG) | Required Overcurrent Protection (A) |
|---|---|---|---|
| 20 | 5.0 | 26 | 1.0 |
| 22 | 3.0 | 28 | 0.8 |
| 24 | 1.0 | 30 | 0.5 |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### Certification

Banner Engineering BV
Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

Turck Banner LTD Blenheim House
Blenheim Court
Wickford, Essex SS11 8YT
GREAT BRITAIN

### Supply Current

| Light Length (mm) | Color | Max. Current Draw (A) at 12 V DC | Typical Current Draw (A) | | |
|---|---|---|---|---|---|
| | | | 12 V DC | 24 V DC | 30 V DC |
| 340 | White | 1.6 | 1.290 | 0.600 | 0.485 |
| | Red | 1.6 | 0.965 | 0.460 | 0.375 |
| | Green | 1.6 | 1.100 | 0.525 | 0.425 |
| | Blue | 1.6 | 1.175 | 0.550 | 0.445 |
| | Infrared | 1.6 | 0.680 | 0.340 | 0.280 |
| | 365 nm UV | 1.6 | 1.525 | 0.695 | 0.560 |
| | 395 nm UV | 1.6 | 1.355 | 0.625 | 0.500 |
| 640 | White | 3.0 | 2.475 | 1.130 | 0.910 |
| | Red | 3.0 | 1.845 | 0.880 | 0.720 |
| | Green | 3.0 | 2.005 | 0.955 | 0.780 |
| | Blue | 3.0 | 2.135 | 1.005 | 0.820 |
| | Infrared | 3.0 | 1.270 | 0.635 | 0.525 |
| | 365 nm UV | 3.0 | 2.815 | 1.280 | 1.040 |
| | 395 nm UV | 3.0 | 2.555 | 1.180 | 0.955 |

# FCC Part 15 Class B for Unintentional Radiators

(Part 15.105(b)) This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

(Part 15.21) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.


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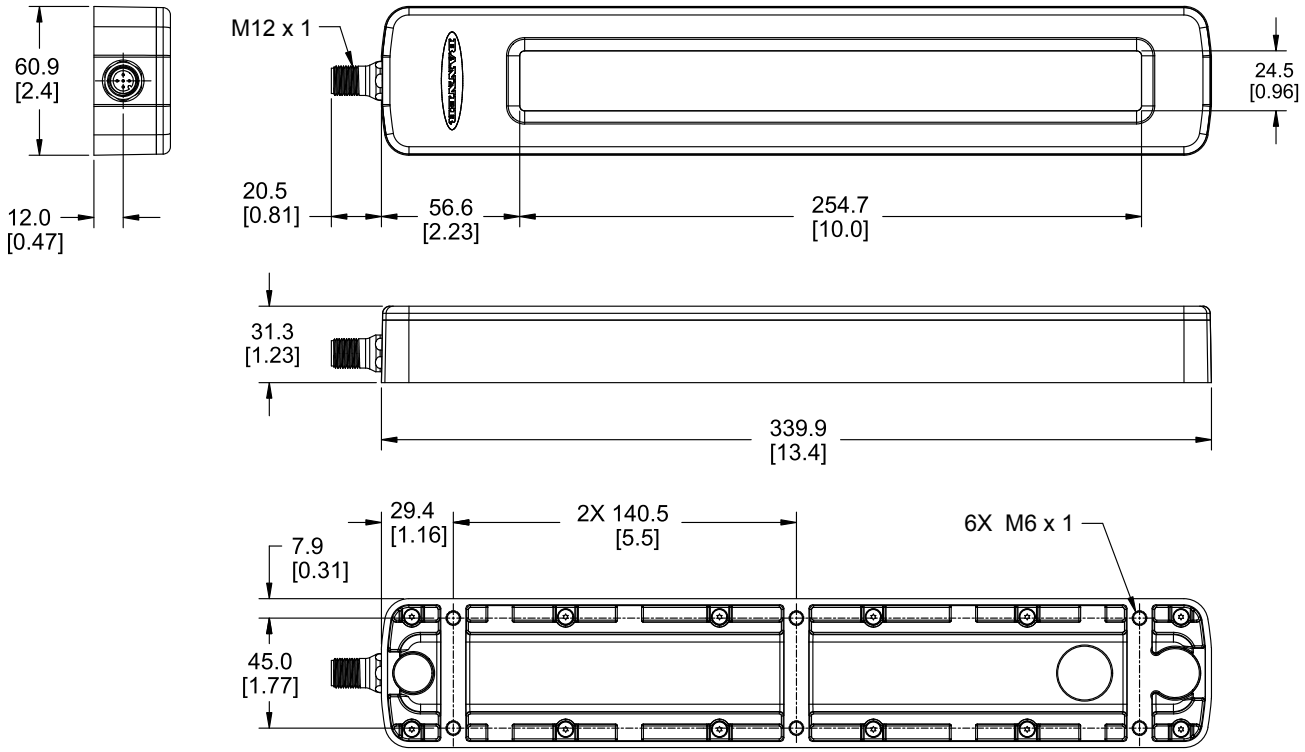
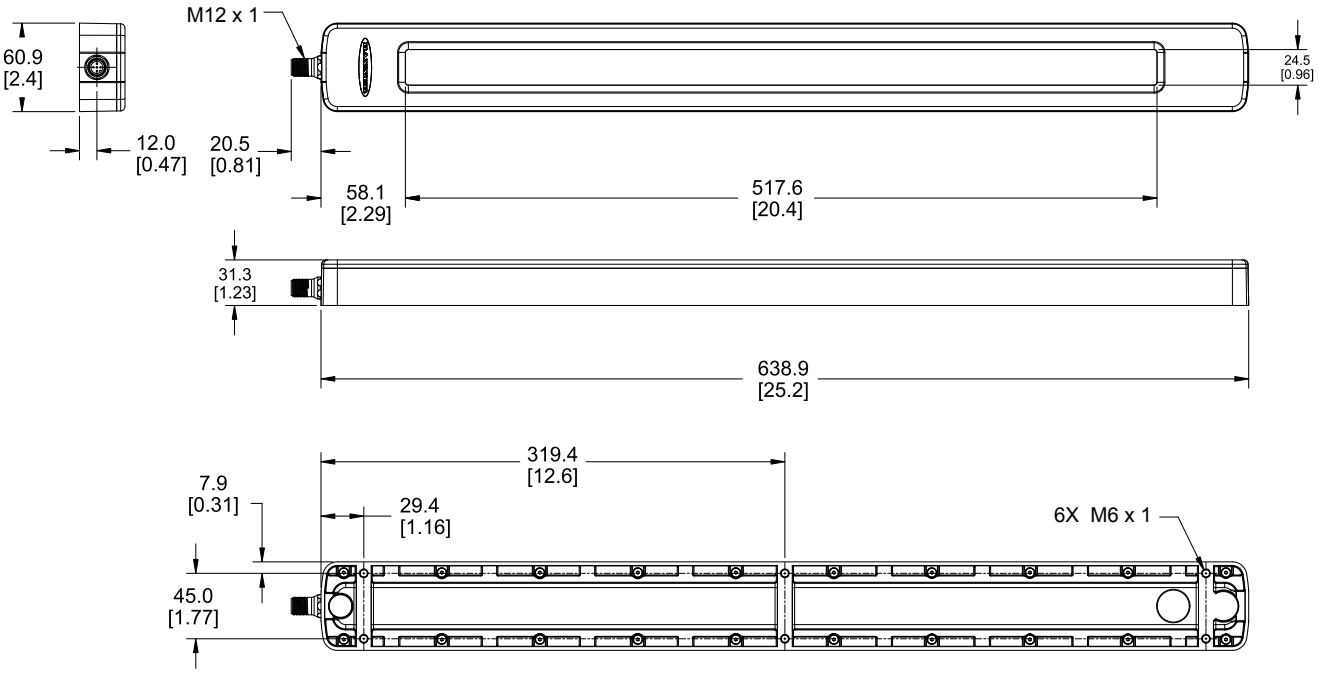
# Dimensions

*340 mm Models*




*640 mm Models*





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# Optical Data

**Light Characteristic: Clear and Diffuse Window**

Values shown are typical at 25 °C.

| Lighted Length (mm) | Lumens | | | | mWatts | | |
|---|---|---|---|---|---|---|---|
| | Daylight White (5000K) | Green (525nm) | Red (625nm) | Blue (475nm) | UV365 (365nm) | UV395 (395nm) | IR (850nm) |
| 340 | 1375 | 1025 | 650 | 300 | 2500 | 2750 | 2450 |
| 640 | 2600 | 1950 | 1275 | 575 | 4600 | 5000 | 4550 |

# Photometric Data

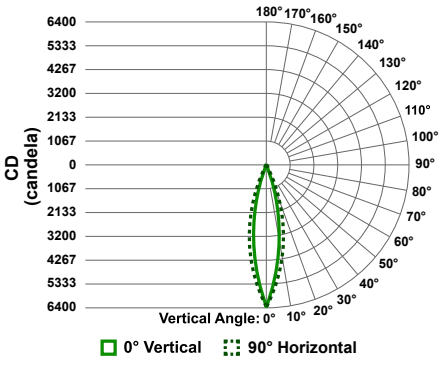
Optical data shown below is for daylight white and UV 365nm models only. To get lux/irradiance and candela/radiant intensity values for models with other colors, multiply the values shown on the charts by the following factors:

| Color | Multiplier |
|---|---|
| Green | 0.750 |
| Red | 0.473 |
| Blue | 0.218 |
| UV395 | 1.100 |
| IR | 1.782 |

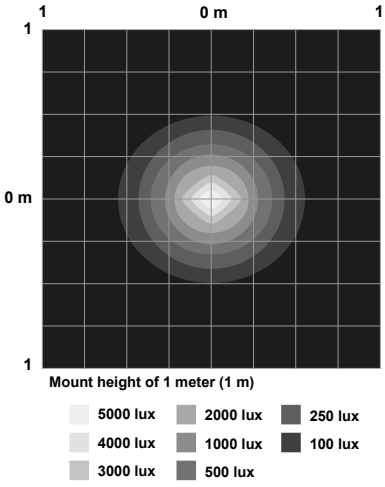
*340 mm White Clear Window*

**BL60 White Clear (340)**

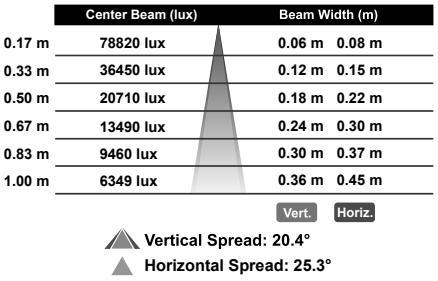
**Polar Candela Distribution**




**Isolux Pattern**




**Illuminance at a Distance**





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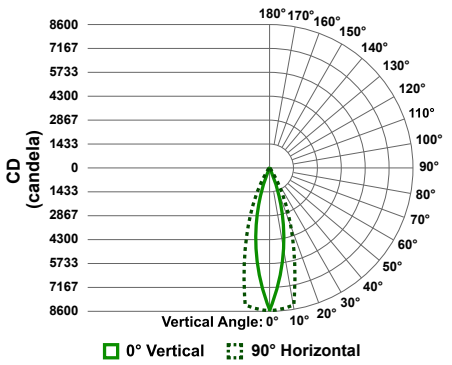
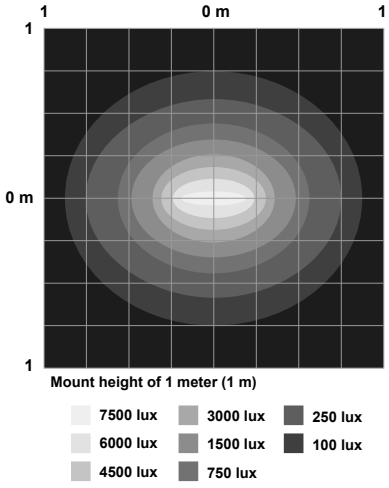
*640 mm White Clear Window*

## BL60 White Clear (640)

### Polar Candela Distribution




### Isolux Pattern




### Illuminance at a Distance

| | Center Beam (lux) | Beam Width (m) | |
|---|---|---|---|
| 0.17 m | 72850 lux | 0.07 m | 0.11 m |
| 0.33 m | 34100 lux | 0.13 m | 0.22 m |
| 0.50 m | 21760 lux | 0.20 m | 0.33 m |
| 0.67 m | 15470 lux | 0.27 m | 0.44 m |
| 0.83 m | 11720 lux | 0.33 m | 0.55 m |
| 1.00 m | 8519 lux | 0.40 m | 0.66 m |

Vert. Horiz.

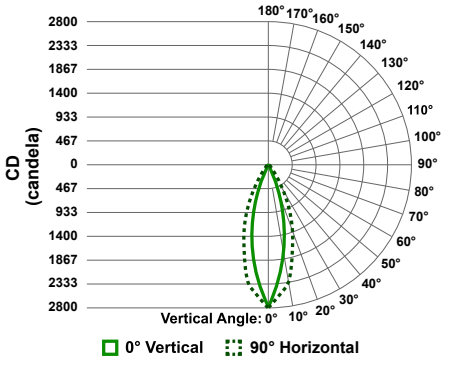
Vertical Spread: 22.8°

Horizontal Spread: 36.5°

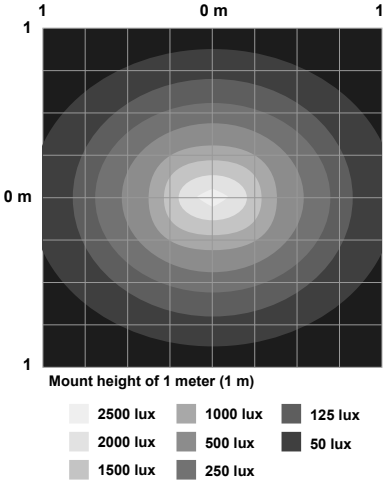
*340 mm White Diffuse Window*

## BL60 White Diffuse (340)

### Polar Candela Distribution




### Isolux Pattern




### Illuminance at a Distance

| | Center Beam (lux) | Beam Width (m) | |
|---|---|---|---|
| 0.17 m | 42960 lux | 0.09 m | 0.12 m |
| 0.33 m | 18650 lux | 0.17 m | 0.24 m |
| 0.50 m | 9732 lux | 0.26 m | 0.35 m |
| 0.67 m | 6023 lux | 0.35 m | 0.47 m |
| 0.83 m | 4015 lux | 0.44 m | 0.59 m |
| 1.00 m | 2890 lux | 0.52 m | 0.71 m |

Vert. Horiz.

Vertical Spread: 29.4°

Horizontal Spread: 39.0°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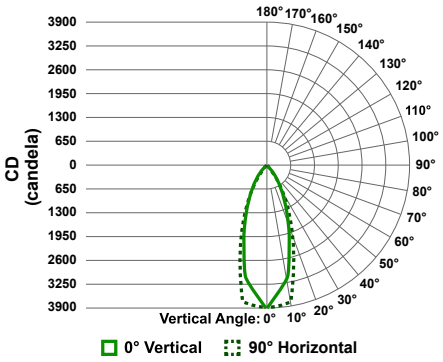
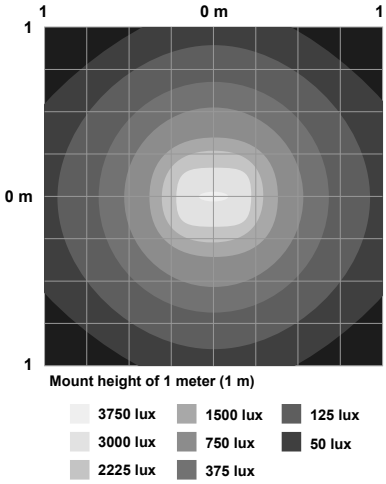
*640 mm White Diffuse Window*

## BL60 White Diffuse (640)

### Polar Candela Distribution




### Isolux Pattern




### Illuminance at a Distance

| | Center Beam (lux) | Beam Width (m) | |
|---|---|---|---|
| 0.17 m | 38200 lux | 0.11 m | 0.12 m |
| 0.33 m | 18040 lux | 0.23 m | 0.25 m |
| 0.50 m | 11090 lux | 0.34 m | 0.37 m |
| 0.67 m | 8305 lux | 0.46 m | 0.50 m |
| 0.83 m | 5519 lux | 0.57 m | 0.62 m |
| 1.00 m | 3950 lux | 0.69 m | 0.74 m |

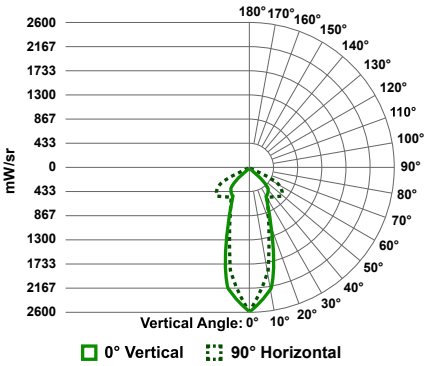
Vert. Horiz.

Vertical Spread: 37.8°
Horizontal Spread: 40.8°

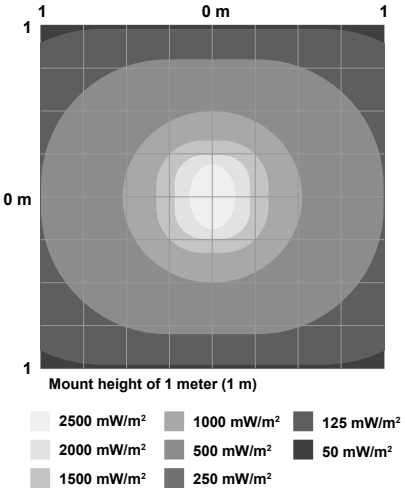
*340 mm UV365*

## BL60 UV365 Clear (340)

### Polar Radient Intensity Distribution




### Iso-irradiance Pattern




### Irradiance at a Distance

| | Center Beam (lux) | Beam Width (m) | |
|---|---|---|---|
| 0.17 m | 25900 mW/m² | 0.10 m | 0.10 m |
| 0.33 m | 12540 mW/m² | 0.21 m | 0.20 m |
| 0.50 m | 7430 mW/m² | 0.31 m | 0.31 m |
| 0.67 m | 4700 mW/m² | 0.42 m | 0.41 m |
| 0.83 m | 3500 mW/m² | 0.52 m | 0.51 m |
| 1.00 m | 2500 mW/m² | 0.63 m | 0.62 m |

Vert. Horiz.

Horizontal Spread: 34.2°
Vertical Spread: 34.8°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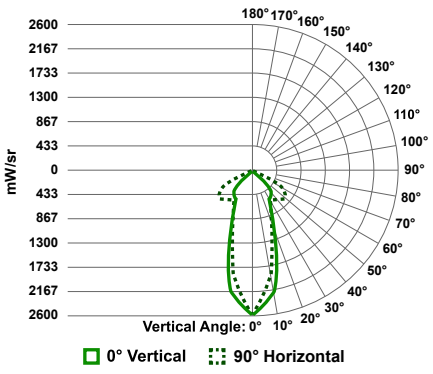
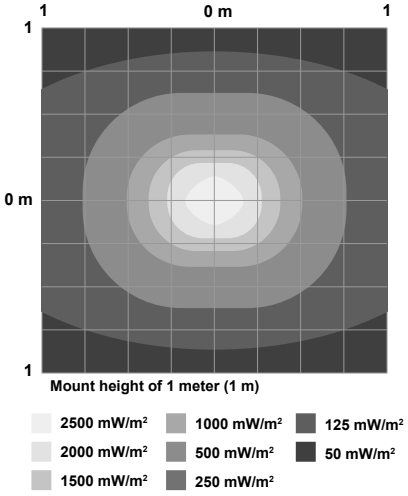
*640 mm UV365*

**BL60 UV365 Clear (640)**

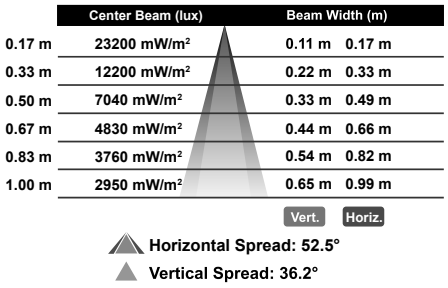
**Polar Radient Intensity Distribution**




**Iso-irradiance Pattern**

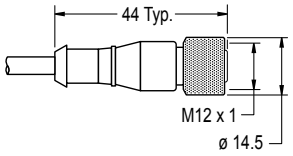
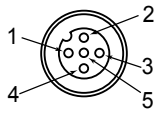
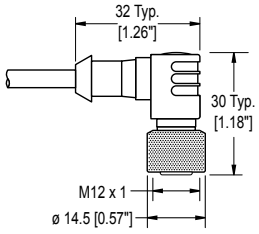



**Irradiance at a Distance**




# Accessories

# Cordsets

| 5-Pin Threaded M12 Cordsets—Single Ended | | | | |
|---|---|---|---|---|
| **Model** | **Length** | **Style** | **Dimensions** | **Pinout (Female)** |
| **MQDC1-501.5** | 0.5 m (1.5 ft) | Straight |   |   1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray |
| **MQDC1-503** | 0.9 m (2.9 ft) | | | |
| **MQDC1-506** | 2 m (6.5 ft) | | | |
| **MQDC1-515** | 5 m (16.4 ft) | | | |
| **MQDC1-530** | 9 m (29.5 ft) | | | |
| **MQDC1-560** | 18 m (59 ft) | | | |
| **MQDC1-5100** | 31 m (101.7 ft) | | | |
| **MQDC1-506RA** | 2 m (6.5 ft) | Right-Angle |   | |
| **MQDC1-515RA** | 5 m (16.4 ft) | | | |
| **MQDC1-530RA** | 9 m (29.5 ft) | | | |
| **MQDC1-560RA** | 19 m (62.3 ft) | | | |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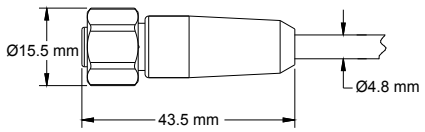
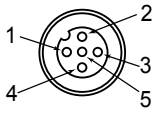
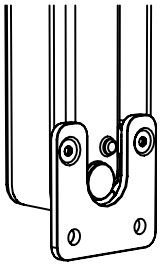
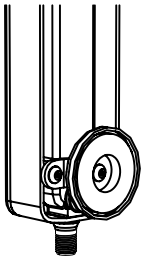
| 5-Pin Threaded M12 Stainless Steel Washdown Cordsets—Single Ended | | | | |
|---|---|---|---|---|
| **Model** | **Length** | **Style** | **Dimensions** | **Pinout (Female)** |
| **MQDC-WDSS-0506** | 2 m (6.56 ft) | Straight |  | <br>1 = Brown<br>2 = White<br>3 = Blue<br>4 = Black<br>5 = Gray |
| **MQDC-WDSS-0515** | 5 m (16.4 ft) | | | |
| **MQDC-WDSS-0530** | 9 m (29.5 ft) | | | |

# Brackets

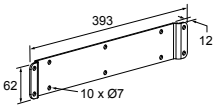
**LMBWLC60F**
- Set of two flat brackets
- 300 series stainless steel
- Includes M6 flathead screws for mounting to light
- Clearance for M6 or 1/4-20 mounting hardware



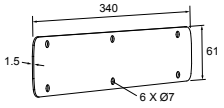
**LMBWLC60MAG**
- Magnetic mounting kit (set of two)
- Two-inch magnets
- Mounting hardware included



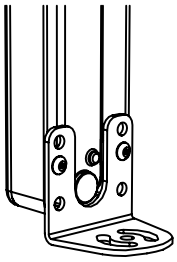
**LMBWLC60B340**
- Plate for sealing the cavity on the back of the 340 mm models
- 300 series stainless steel
- Includes hardware for mounting to the light




**ACC-WLC60-340-GSK-N-1**
- Black nitrile gasket
- Thickness: 1.5 mm




**LMBWLC60RA**
- Set of two right-angle brackets
- 300 series stainless steel
- Includes M6 button head screws for mounting to light
- Clearance for M6 or 1/4-20 mounting hardware

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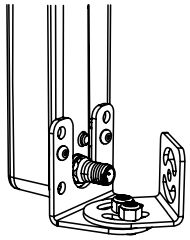
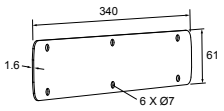
|---|---|
| **LMBWLC60RAS**<br>• Pair of two swivel mount, right-angle brackets<br>• 300 series stainless steel<br>• Includes hardware for mounting to light |  |
| **ACC-WLC60-340-GSK-FDA-1**<br>• Blue FDA-approved silicone gasket<br>• Thickness: 1.6 mm |  |

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