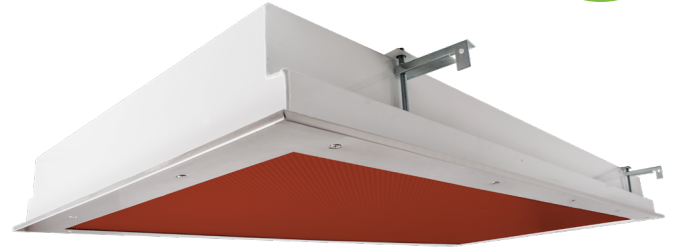


Circadian Cleanroom KL Vivarium Troffers

1x4, 2x2 and 2x4 Red/BIOS® LED Luminaires

- **Rated IP66**
- **Suitable for ISO 3-9 Cleanspaces**
- **Suitable for 209E class 1-100,000 Cleanspaces**
- **ETL listed for Wet Locations**
- **One piece overlapping doorframe**
- **Robotically seam welded housing**
- **Narrow Spectrum 630nm and 660nm Red non-filtered LEDs**
- **White / Red separately controlled circuits**
- **Recessed Housing suitable for Tbar Grid AND Hardlid Installations**
- **Made in the USA by a Family Owned US Corporation**
- **This Kurtzon product is illuminated by BIOS® to provide healthy, low energy lighting that promotes improved sleep, better health and well-being**



DISCLAIMER: Although KURTZON has prepared the information contained in this document with all due care, KURTZON does not warrant or represent that the information is free from errors or omission. While the information is considered to be true and correct at the date of publication, changes in circumstances after the time of publication may impact on the accuracy of the information. The information may change without notice and KURTZON is not in any way liable for the accuracy of any information printed and stored or in any way interpreted or used.

ORDERING GUIDE

Series Installation Type Material Size Red LED Wavelength Row Qty. LED Type CCT/Dim Type Voltage Options

KL

| Series | Installation Type | Material | Size | Red LED | Wavelength | Light Source | | | Voltage | Options |
|--------|---|---|---|---------|------------|--------------|----------------------|--|---|---------|
| | | | | | | Row Qty. | LED Type | CCT/Dim Type | | |
| KL | R: Recessed (Suitable for Flange & Grid Installations) | 3: White 430 SS Hsg. & Polished 304 SS Door 4: White AL Hsg. & Polished 304 SS Door 5: White AL Hsg. & White AL Door 7: White AL Hsg. & White CRS Door | 1x4: 1' x 4' Housing MAX 3 Arrays Total (2 Max Per Color) | 1/RLED | 630: 630nm | 1 | LED-XBL1 | 835BIOS-DY | UNV FC: Fuse & Holder (One Supplied Per Circuit) 2/EDW: Two Circuits of White Light 2/EDR: Two Circuits of Red Light EM10: 10W Integral LED EM (Specify Input Voltage) EM20: 20W External LED EM (Specify Input Voltage) WHT: White Finished Door & HSG LEX: .125" Prismatic Polycarbonate A19: .156" Prismatic P19 Pattern Clear Acrylic HIA: .140" High Impact P12 Pattern Clear Acrylic TG: .156" Prismatic Tempered Glass SW: Wet Location Hub Supplied (not installed) PxL: Programmed to User Specified Lumen Value. PxW: Programmed to User Specified Wattage Value. 10KV: 10KV Parallel Surge Protection (1 Per Circuit) WHIP: Must Specify Length and Wire Qty .125 FROST: 1/8" Frost Acrylic Lens OCCMW: Internal microwave OCC Sensor | |
| | | | | 2/RLED | 660: 660nm | 2 | LED-XBL2 LED-XBL3 | 840BIOS-DY 835BIOS-ST 840BIOS-ST | | |
| | | | 2x2: 2' x 2' Housing MAX 4 Arrays Total OR | 1/RLED | 630: 630nm | 1 | LED-XBL1 | 835BIOS-DY | | |
| | | | | 2/RLED | 660: 660nm | 2 | LED-XBL2 | 840BIOS-DY | | |
| | | | 2x4: 2' x 4' Housing MAX 4 Arrays Total | 3/RLED | | 3 | LED-XBL3 | 835BIOS-ST | | |
| | | | | 4/RLED | | | | | | |
| | S: Surface | 1: White CRS Hsg. & White CRS Door 2: White CRS Hsg. & Polished 304 SS Door 3: Polished 304 SS Hsg. & Polished 304 SS Door 4: White AL Hsg. & Polished 304 SS Door 5: White AL Hsg. & White AL Door 6: White CRS Hsg. & White AL Door 7: White AL Hsg. & White CRS Door | 1x4: 1' x 4' Housing MAX 2 Arrays Total | 1/RLED | 630: 630nm | 1 | LED-XBL1 | 835BIOS-DY | | |
| | | | | 2/RLED | 660: 660nm | 2 | LED-XBL2 LED-XBL3 | 840BIOS-DY 835BIOS-ST 840BIOS-ST | | |
| | | | 2x2: 2' x 2' Housing MAX 4 Arrays Total OR | 1/RLED | 630: 630nm | 1 | LED-XBL1 | 835BIOS-DY | | |
| | | | | 2/RLED | 660: 660nm | 2 | LED-XBL2 | 840BIOS-DY | | |
| | | | 2x4: 2' x 4' Housing MAX 4 Arrays Total | 3/RLED | | 3 | LED-XBL3 | 835BIOS-ST | | |
| | | | | 4/RLED | | | | | | |

Notes:

BIOS-DY - Dynamic dimming module BIOS-ST - Static dimming module

Circadian Cleanroom KL Vivarium Troffers

1x4, 2x2 and 2x4 Red/BIOS® LED Luminaires

SPECIFICATIONS

HOUSING: One piece, hole free, robotically seam welded housing has flattened knockouts for a superior seal. Recessed housings are available in .040" 3003 Aluminum or 20Ga 430 Stainless Steel. Surface housings are available in .040" 3003 Aluminum, 20Ga 304 Stainless Steel, or 20Ga Cold Rolled Steel.

DOOR FRAME: One piece door frame with welded corners overlaps the fixture allowing the NSF approved microcellular gasket to seal to the mounting surface. Door frame is hinged by aircraft cables and is supplied with captive stainless steel flush head screws to allow easy wiping of the surface. Available in .040" 3003 Powder coated Alum. , 20Ga 304 Polished SS, or 18Ga 1008 Powder coated CRS.

GASKETS: NSF Listed closed cell microcellular extruded KleanLock SealPro gasket with vulcanized corners making a one-piece oil and solvent resistant gasket system.

LENS: Impact resistant .135" thick virgin acrylic with P12 prismatic pattern inverted. Sealed to door with NSF listed RTV silicone. See "Options" for other choices.

BIOS® LEDs: Provided with BIOS® LED modules that are available in 3 different luminous flux intensities. When Dynamic dimming is specified, a bio dimmer is included with each driver inside the fixture. BIOS® LEDs have been expertly crafted to perform as advertised. Engineered to only include the highest quality components, the LEDs are backed by a limited 5 year warranty. See last page for more information on how BIOS® works.

RED LEDs: Red LEDs provide a narrow 630nm spectrum light for wavelength sensitive applications. Alternately available are 660nm narrow spectrum LEDs for a wider range of applications.

DRIVERS: Standard Universal Voltage Class 2 drivers are 0-10v Dimmable to 1% for most LED configurations. They come with at least 2.5Kv surge protection, have less than 10% THD at max load, Ballast Factor Greater than .95 and are programmable to match specific lumen or wattage requirements. Drivers with higher input voltage ratings are available, consult factory for driver specifications. (each color LED comes standard with its own driver)

RED DRIVERS: Standard Universal Voltage Class 2 drivers are 0-10v Dimmable to 1% . They come with at least 2.5Kv surge protection, have less than 10% THD at max load, Ballast Factor Greater than .95 and are programmable to match specific lumen or wattage requirements. Red LEDs come with their own driver so they can be switched separately from the white LEDs.

REFLECTOR: Die formed metal with high reflectance white polyester powder coat finish. Typical reflectivity 92%.

INSTALL RECESSED: One fixture suitable for Grid and Flanged installation. Accommodates 1" and 1.5" T-Bar Grid (Consult factory for 2" T-Bar Grid compatibility). Four adjustable toggle arms with holes for seismic support wire attachment. Supply entry via 1/2" trade size flattened knockouts.

INSTALL SURFACE: Four .312" dia. mounting holes and a removable gasketed wiring access plate with Supply entry via 1/2" trade size flattened knockouts.

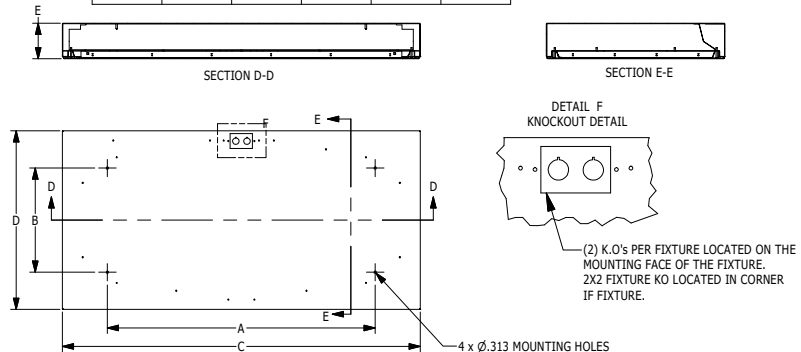
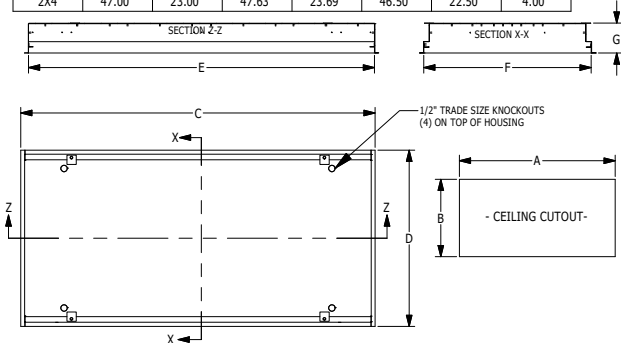
FINISH: Gloss white high reflectance 1000 hr. salt spray polyester powder coat finish standard for all recessed housings. Stainless steel doorframes and surface housings are satin polished unless option WHT is chosen.

LISTINGS: IP66 rated for dust and water ingress. Suitable for 1700 PSI high pressure hosedowns. ETL listed per UL_1598 for wet locations. Chicago Plenum Rated. Certified ISO-14644-1 for class 3 through class 9 cleanspaces. Certified Fed Std 209E for Class 1 through Class 100,000 cleanspaces. Drivers and LEDs are covered by a 5 year warranty, the remaining fixture is covered by a 10 year warranty.

PRODUCT DRAWINGS

| "R" HOUSING REFERENCE DIMENSIONS | | | | | | | |
|----------------------------------|--------|--------|--------|--------|--------|--------|-------|
| SIZE | A | B | C | D | E | F | G |
| 1X4 | 47.00" | 11.00" | 47.63" | 11.69" | 46.50" | 10.50" | 4.00" |
| 2X2 | 23.00" | 23.00" | 23.63" | 23.69" | 22.50" | 22.50" | 4.00" |
| 2X4 | 47.00" | 23.00" | 47.63" | 23.69" | 46.50" | 22.50" | 4.00" |

| "S" REFERENCE DIMENSIONS | | | | | |
|--------------------------|--------|--------|--------|--------|-------|
| SIZE | DIM A | DIM B | DIM C | DIM D | DIM E |
| 1X4 | 43.00" | 4.75" | 48.08" | 12.00" | 4.75" |
| 2X2 | 12.00" | 14.00" | 24.08" | 24.00" | 4.75" |
| 2X4 | 36.00" | 14.00" | 48.08" | 24.00" | 4.75" |



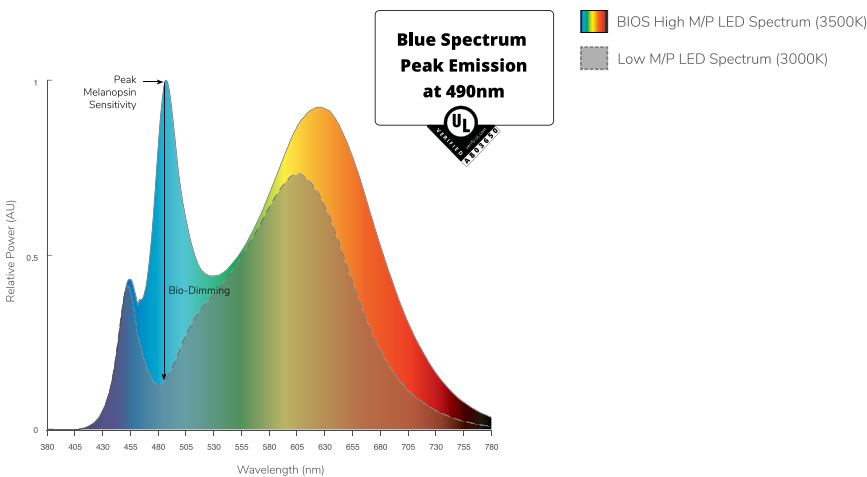
Circadian Cleanroom **KL Vivarium Troffers**

1x4, 2x2 and 2x4 Red/BIOS® LED Luminaires

ENERGY DATA - WHITE LED

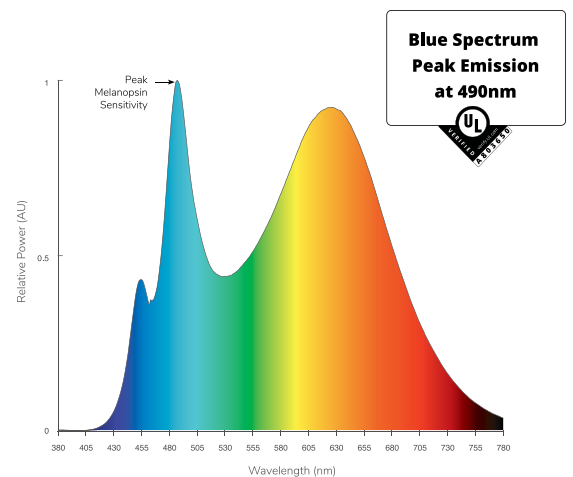
Energy Data Pending

PHOTOMETRICS - DYNAMIC



Dynamic Board Spectral Power Distribution (3500K)

PHOTOMETRICS - STATIC



Static Board Spectral Power Distribution (3500K)

Circadian Cleanroom KL Vivarium Troffers

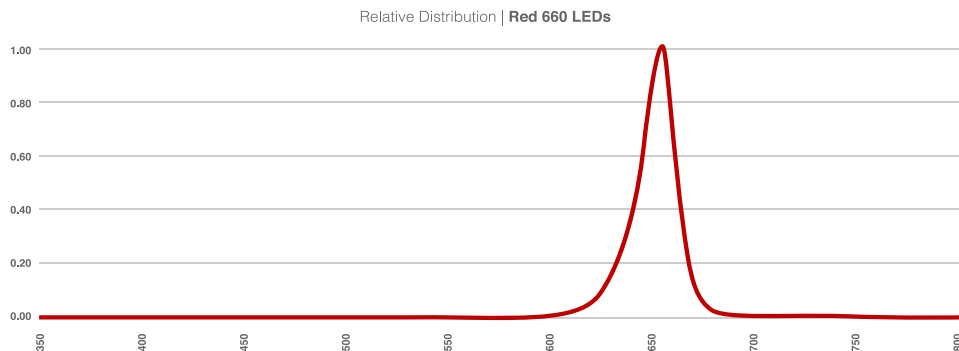
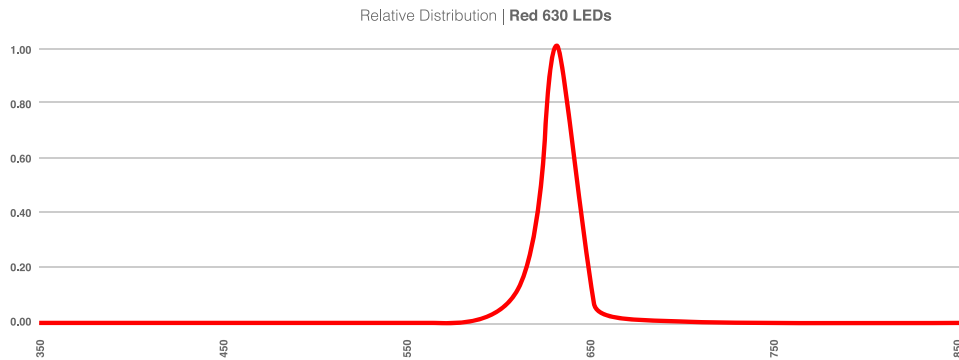
1x4, 2x2 and 2x4 Red/BIOS® LED Luminaires

ENERGY DATA - COLOR LED

| OVERLAP-FGRS-RED LED TROFFER | | | | | | | | |
|------------------------------|---------------|-------------|-------|----------|-------------|-------|----------|----------------------|
| ENCLOSURE SIZE | LED SELECTION | 630nm (RED) | | | 660nm (RED) | | | AMBIENT TEMP RATING |
| | | LUMENS | WATTS | EFFICACY | LUMENS | WATTS | EFFICACY | MAXIMUM ³ |
| 1X4 | 1RLED | 1,122 | 27 | 42 | 1,202 | 44.5 | 27 | 40°C (104°F) |
| 1X4 | 2RLED | 2,068 | 53 | 39 | 2,405 | 88.9 | 27 | 40°C (104°F) |
| 2X2 | 1RLED | 549 | 14 | 39 | 593 | 22.2 | 26.7 | 40°C (104°F) |
| 2X2 | 2RLED | 1,011 | 27 | 37 | 1,185 | 44.5 | 26.7 | 40°C (104°F) |
| 2X2 | 3RLED | 1,560 | 51 | 31 | 1,778 | 66.7 | 26.7 | 40°C (104°F) |
| 2X2 | 4RLED | 2,022 | 53 | 38 | 2,371 | 88.9 | 26.7 | 40°C (104°F) |
| 2X4 | 1RLED | 1,247 | 27 | 46 | 1,281 | 44.5 | 28.8 | 40°C (104°F) |
| 2X4 | 2RLED | 2,298 | 53 | 43 | 2,562 | 89 | 28.8 | 40°C (104°F) |
| 2X4 | 3RLED | 3,545 | 80 | 44 | 3,844 | 133.5 | 28.8 | 40°C (104°F) |
| 2X4 | 4RLED | 4,596 | 106 | 43 | 5,125 | 178 | 28.8 | 40°C (104°F) |

* View previous page for energy data notes.

COLOR LED RELATIVE DISTRIBUTION



Circadian Cleanroom KL Vivarium Troffers

1x4, 2x2 and 2x4 Red/BIOS® LED Luminaires

HOW BIOS® WORKS

Production of melatonin, the hormone that helps us to sleep, is regulated by the ipRGC, a non-visual photoreceptor in the human eye. The wavelength of blue sky light at 490nm, present in sunlight, prevents melatonin production during the day. These signals are crucial in allowing humans to distinguish between day and night, promoting better sleep, health and well-being.



DYNAMIC LIGHT ENGINE

The SkyBlue® Dynamic Light Engine automatically calibrates the light level, reducing melanopic lux while keeping photopic lux at a constant. Dynamic light engines are paired with the current sensing smart BIOS® Bio-Dimming module allowing it operate using any single channel CC LED driver, using any dimming interface. Available in 3500K (dim to 3000K), and 4000K (dim to 3500K).

STATIC LIGHT ENGINE

The SkyBlue® Static Spectrum Light Engine delivers the industry’s best melanopic-to-photopic (m/p) ratio, with R9 greater than 90 at each color temperature. Easily integrated into existing LED fixtures and compatible with all LED drivers, the SkyBlue® Static Spectrum Light Engine is the ideal replacement for static color light fixtures. Static light engines have the full output of BIOS® SkyBlue® all the time and the peak cannot be adjusted.

DIMMER SETTINGS WITH BIOS® DYNAMIC DIMMING TECHNOLOGY

| | DIMMER SETTING | BIOS® SKYBLUE® | LIGHT OUTPUT |
|--|----------------|----------------|----------------|
| | 100% (full on) | 100% | 100% |
| | 99%-51% | 100%-0% | 100%-90% |
| | 50% | No BIOS® | ~90% |
| | 49%-0% | No BIOS® | Linear Dimming |

BIOS® SkyBlue® operates at 100% when the light output is at 100%, for maximum circadian impact. As the light is dimmed, BIOS® SkyBlue® dims until 50% is reached when the BIOS® SkyBlue® is no longer present.