

## Circadian Cleanroom KL Troffers

1x4, 2x2 and 2x4 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**
- **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**



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### ORDERING GUIDE

Series	Installation Type	Material	Size	Roq Qty.	LED Type	CCT/Dim Type	Voltage	Options
<b>KL</b>								
Series	Installation Type	Material	Size	Light Source			Voltage	Options
				Row Qty.	LED Type	CCT/Dim Type		
KL	R: Recessed (Suitable for Flange & Grid)	3: White 430 SS Hsg. & Polished 304 SS Door	1x4: 1' x 4' Housing	1	LED-XBL1	835BIOS-DY	UNV	<b>FF:</b> Fuse & Holder (One Supplied Per Circuit) <b>WHIP:</b> Must Specify Length and Wire Qty <b>.125 FROST:</b> 1/8" Frost Acrylic Lens <b>EM10:</b> 10W Integral LED EM (Specify Input Voltage) <b>EM20:</b> 20W Remote LED EM (Specify Input Voltage) <b>WHT:</b> White Finished Door & HSG <b>LEX:</b> .125" Prismatic Polycarbonate <b>A19:</b> .156" Prismatic P19 Pattern Clear Acrylic <b>HIA:</b> .140" High Impact P12 Pattern Clear Acrylic <b>TG:</b> .156" Prismatic Tempered Glass <b>SW:</b> Wet Locatoin Hub Supplied (not installed) <b>PxL:</b> Programmed to User Specified Lumen Value.000 <b>PxW:</b> Programmed to User Specified Wattage Value.000 <b>10KV:</b> 10KV Parallel Surge Protection (One Supplied Per Circuit) <b>OCCMW:</b> Internal microwave OCC Sensor
		4: White AL Hsg. & Polished 304 SS Door		2	LED-XBL2	840BIOS-DY		
		5: White AL Hsg. & White AL Door	2x2: 2' x 2' Housing OR	1	LED-XBL1	835BIOS-DY		
		7: White AL Hsg. & White CRS Door		2	LED-XBL2	840BIOS-DY		
			2x4: 2' x 4' Housing	3	LED-XBL3	835BIOS-ST		
				4	LED-XBL3	840BIOS-ST		
	S: Surface	1: White CRS Hsg. & White CRS Door	1x4: 1' x 4' Housing	1	LED-XBL1	835BIOS-DY		
		2: White CRS Hsg. & Polished 304 SS Door		2	LED-XBL2	840BIOS-DY		
		3: White 430 SS Hsg. & Polished 304 SS Door	2x2: 2' x 2' Housing OR	1	LED-XBL1	835BIOS-DY		
		4: White AL Hsg. & Polished 304 SS Door		2	LED-XBL2	840BIOS-DY		
		5: White AL Hsg. & White AL Door	2x4: 2' x 4' Housing	3	LED-XBL3	835BIOS-ST		
		6: White CRS Hsg. & White AL Door		4	LED-XBL3	840BIOS-ST		
		7: White AL Hsg. & White CRS Door						

#### Notes:

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

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### 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 .050" 3003 Aluminum, 18Ga 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 .050" 3003 Powder coated Alum., 20Ga 304 Polished SS, or 18Ga 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.

**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.

**DRIVERS:** Standard Universal Voltage Class 2 drivers are 0-10v Dimmable to 1% for most LED configurations, and rated -20C (-4F). 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.

**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.

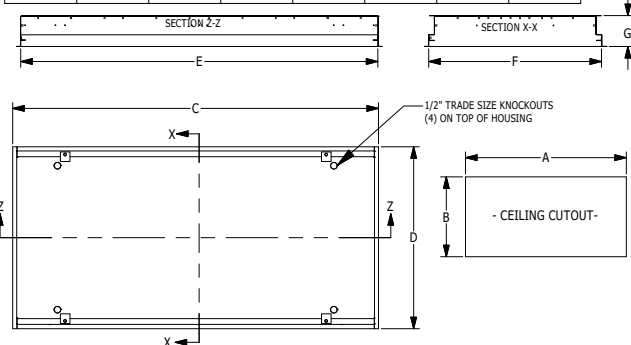
**INSTALL SURFACE:** Four .312" dia. mounting holes and a removable gasketed wiring access plate with Supply entry via 1/2" trade size flattened knockouts.

**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.

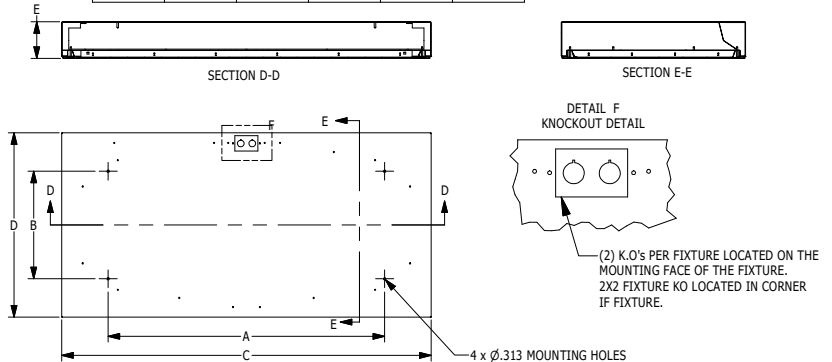
**LISTINGS:** IP66 rated for dust and water ingress. Suitable for 1700 PSI high pressure hosedowns. ETL listed per UL\_1598 for wet locations. Chicago Plenum Rated. Certified ISO-14644-1 for class 3 through class 9 cleanspaces. Certified Fed Std 209E for Class 1 through Class 100,000 cleanspaces. NSF2 Listed for Food Zones. 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
1X4	47.00"	11.00"	47.63"	11.69"	46.50"	10.50"
2X2	23.00"	23.00"	23.63"	23.69"	22.50"	22.50"
2X4	47.00"	23.00"	47.63"	23.69"	46.50"	22.50"



"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"



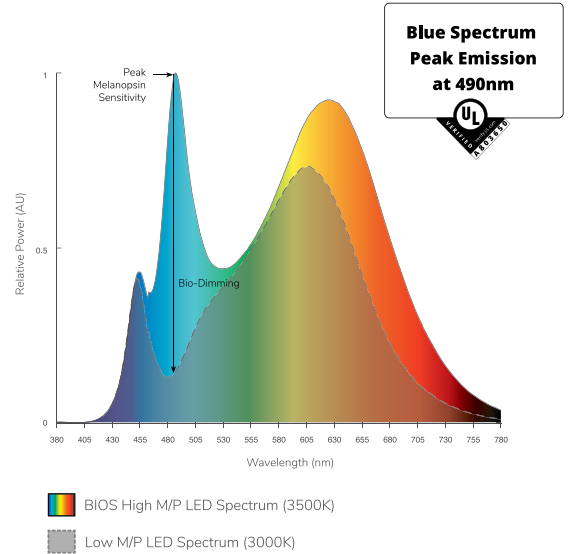
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### ENERGY DATA - BIOS® LED

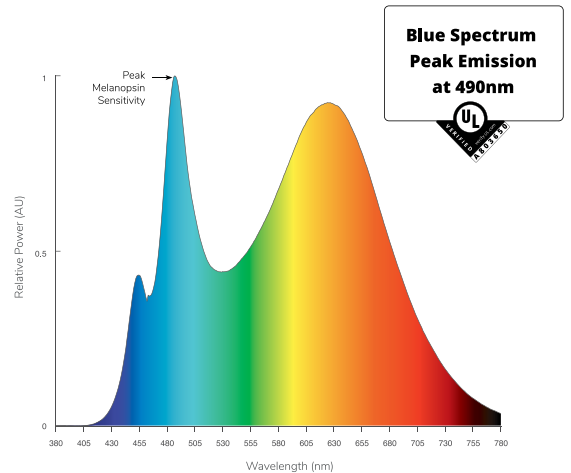
BIOS® OVERLAP DOOR FRAME TROFFERS						
ENCLOSURE SIZE	LIGHT PACKAGE	PERFORMANCE SPECS			AMBIENT TEMP	
		LUMENS	WATTS	EFFICACY	MIN	MAX
1X4	1/LED-XBL1	2,757	44	63	-20C (-4F)	40C (104F)
1X4	1/LED-XBL2	3,747	58	65	-20C (-4F)	40C (104F)
1X4	2/LED-XBL1	5,513	88	62	-20C (-4F)	40C (104F)
1X4	1/LED-XBL3	5,698	88	65	-20C (-4F)	40C (104F)
1X4	2/LED-XBL2	7,494	115	65	-20C (-4F)	40C (104F)
1X4	2/LED-XBL3	11,396	175	65	-20C (-4F)	40C (104F)
2X2	1/LED-XBL1	1,472	22	67	-20C (-4F)	40C (104F)
2X2	1/LED-XBL2	2,005	29	69	-20C (-4F)	40C (104F)
2X2	2/LED-XBL1	2,944	44	67	-20C (-4F)	40C (104F)
2X2	1/LED-XBL3	2,972	44	68	-20C (-4F)	40C (104F)
2X2	2/LED-XBL2	4,009	58	69	-20C (-4F)	40C (104F)
2X2	3/LED-XBL1	4,415	66	67	-20C (-4F)	40C (104F)
2X2	4/LED-XBL1	5,887	89	66	-20C (-4F)	40C (104F)
2X2	2/LED-XBL3	5,943	88	68	-20C (-4F)	40C (104F)
2X2	3/LED-XBL2	6,014	87	69	-20C (-4F)	40C (104F)
2X2	4/LED-XBL2	8,018	116	69	-20C (-4F)	40C (104F)
2X2	3/LED-XBL3	8,915	132	68	-20C (-4F)	40C (104F)
2X2	4/LED-XBL3	11,886	175	68	-20C (-4F)	40C (104F)
2X4	1/LED-XBL1	3,145	44	71	-20C (-4F)	40C (104F)
2X4	1/LED-XBL2	4,314	58	74	-20C (-4F)	40C (104F)
2X4	2/LED-XBL1	6,290	88	71	-20C (-4F)	40C (104F)
2X4	1/LED-XBL3	6,588	88	75	-20C (-4F)	40C (104F)
2X4	2/LED-XBL2	8,628	116	74	-20C (-4F)	40C (104F)
2X4	3/LED-XBL1	9,435	132	71	-20C (-4F)	40C (104F)
2X4	4/LED-XBL1	12,580	176	72	-20C (-4F)	40C (104F)
2X4	3/LED-XBL2	12,942	174	74	-20C (-4F)	40C (104F)
2X4	2/LED-XBL3	13,177	176	75	-20C (-4F)	40C (104F)
2X4	4/LED-XBL2	17,256	231	75	-20C (-4F)	40C (104F)
2X4	3/LED-XBL3	19,765	264	75	-20C (-4F)	40C (104F)
2X4	4/LED-XBL3	26,353	351	75	-20C (-4F)	40C (104F)

### PHOTOMETRICS - DYNAMIC



Dynamic Board Spectral Power Distribution (3500K)

### PHOTOMETRICS - STATIC



Static Board Spectral Power Distribution (3500K)

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### 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.

**Blue Spectrum  
Peak Emission  
at 490nm**



### 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.