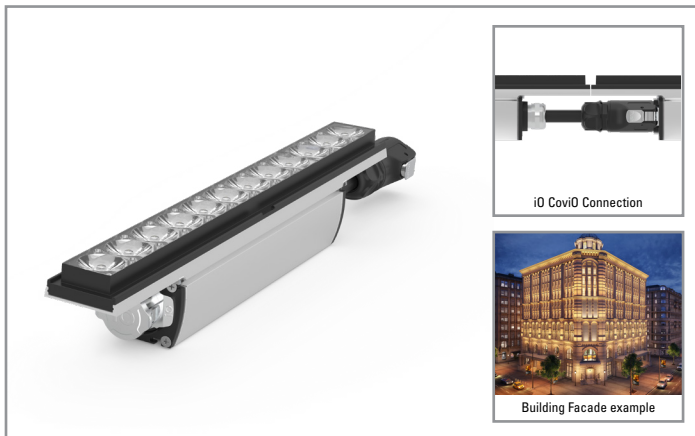


Project		Catalog #		Type	
Prepared by		Notes		Date	



iO LED

CoviO

Interior / Exterior LED
Architectural Wall Graze / Wall Wash / Cove
Integral Driver

Typical Applications

- Commercial Office Spaces • Schools • Hospitals • Retail • Municipal
- Hotels • Restaurants

Interactive Menu

- Order Information [page 2](#)
- Photometric Data [page 6](#)
- Energy and Performance Data
- Mounting and Installation [page 14](#)
- Product Warranty [page 4](#)



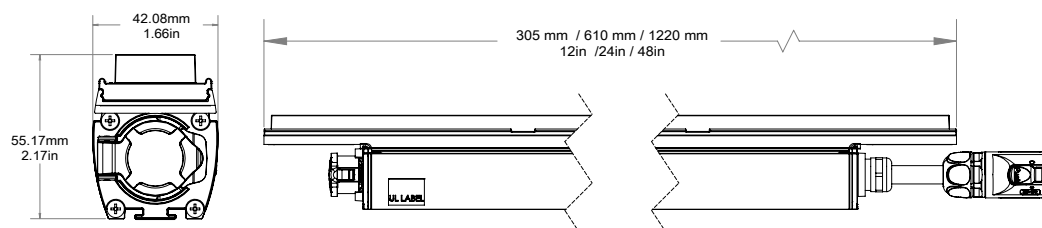
*Note: Adjustable mount does not have ROHS certification. Not applicable to 1' length.

Top Product Features

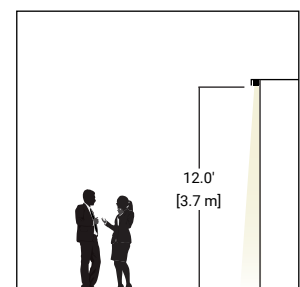
- Wall washing and grazing lighting fixture with integral driver
- 10 unique patented optical distributions (US 12,078,340)
- Dimming to 1% (0-10V, 100% - 1%)
- 90+ CRI, 4 CCT options

- 1.5 step MacAdam ellipse binning and $Du'v' < 0.005$ for maximum color consistency and uniformity
- Up to 1419 lm/ft (3 outputs available)
- Up to 16,457CD maximum intensity per 1' length of luminaire
- Up to 121.1 lm/W (dependent upon optic and CCT)
- Up to 300 ft run from a single power drop

Dimensions



Scale



[additional product diagrams](#)

Order Information

SAMPLE ORDER NUMBER: **GRZ-10L-935-10x10-OD-277-S-SM-STD-50F**

Color Key: Blue shading indicates options that must be ordered under the CoviO LM series

* Denotes stocked item. Check for availability. Lead times may be longer for non-stocked items.

Domestic Preferences	Series	Lumen Package	LED CRI & CCT Standard CRI	Optical Distribution	Environment
[Blank] =Standard BAA =Buy American Act	GRZ =CoviO Graze LED	05L =500 lumens/ft (5 W/ft)* 10L =1000 lumens/ft (10 W/ft)* 15L =1500 lumens/ft (15 W/ft) *	927 =90 CRI, 2700K CCT 930 =90 CRI, 3000K CCT* 935 =90 CRI, 3500K CCT * 940 =90 CRI, 4000K CCT	10x10 =10 deg x 10 deg 10x10FR =10 deg x 10 deg, 1/3 Frosted 10x30 =10 deg x 30 deg 10x60 =10 deg x 60 deg 17x30 =17 deg x 30 deg 17x75 =17 deg x 75 deg 30x60 =30 deg x 60 deg 50x60 =50 deg x 60 deg ASYMx40 =Asymmetric x 40 deg	ID =Indoor* OD =Outdoor*
	LM =CoviO Cove*			120 =120 deg cove distribution*	
Notes Only product configurations with this designated prefix are built to be compliant with the Buy American Act of 1933 (BAA). Please refer to DOMESTIC PREFERENCES website for more information. Components shipped separately may be separately analyzed under domestic preference requirements.	Notes Architectural LED wall grazing and washing luminaire from iO LED *Stocked Architectural LED cove specifications should use LM series which is limited to only the 120 optical distribution. Details available here	Notes Nominal source lumens for 12" section. See photometry details by optical distribution on pg 8-10 for delivered lumens by optic. 05L meets ASHRAE requirements for facade lighting.	Notes 90 CRI standard. 1.5-step MacAdam Ellipse (SDCM) standard. du'v' < 0.005 standard (see pg 12 for Du'v' details) See pg 12 for TM30 and color over angle performance details. *Stocked	Notes LM series is only available with 120 deg cove distribution See CoviO LM spec sheet for more details on 120 deg distribution *Stocked	Notes Contact Cooper Lighting Solutions for coastal specifications.
LM series is not available as BAA					

Voltage	Housing Color	Mounting	Control Options	Length	Accessories
UNV =120-277V* 277 =277V	S =Standard Silver*	SM =Surface Mount* ADJ =Adjustable Mount	STD =0-10V (1%-100%)* 5LT =DALI WL =WaveLinx wireless	F =specify nominal run length in feet F/1 =specify nominal run of 1 ft fixtures F/2 =specify nominal run of 2 ft fixtures F/4 =specify nominal run of 4 ft fixtures 1F =1 ft (12") Individual fixture 2F =2 ft (24") Individual fixture 4F =4 ft (48") Individual fixture	See pg 3 for accessories. Accessories must be ordered separately.
Notes For run specifications, 120V will be the default. For 277 V systems, selecting 277 will allow for longer run specifications. See below or pg 3 or 11 for run length limits by output and voltage.	Notes Contact Cooper Lighting Solutions for custom color availability. Minimum order qty will apply.	Notes For "SM" one mounting bracket/fixture is required. Mounting angle with 15deg and 30deg position standard. For "ADJ" two mounting brackets/fixture are required for 2F and 4F fixtures; one mounting bracket/fixture for 1F fixtures. 3G vibration rating requires use of ADJ mount. ADJ mount required for Visor or Mask accessories.	Notes "STD" control specifications include beginning of run power feed and junction box for line voltage connection. One is included for each individual fixture or run specification. All other control specifications include beginning of run control module. See page 15 for details and dimensions.	Notes Run specifications will include 1 power feed/run. Individual fixtures will include 1 power feed/fixture. Run specifications will maximize 4F fixtures unless _F/2 or _F/1 is specified. Contact customer service for custom run configurations.	Notes See "Mechanical / Electrical Accessories" and "Optical Accessories" on page 3 for additional components for run length

Accessory Ordering Information¹

Mechanical/Electrical Accessories

(purchase separately)

Catalog #	Description
LM-IC-STD ⁽²⁾	Beginning of run power harness
LM-JHARN01-012 ⁽¹⁾	1 ft jumper cable
LM-JHARN01-060 ⁽¹⁾	5 ft jumper cable
LM-JHARN01-144 ⁽¹⁾	12 ft jumper cable
LM-KIT-ADJ-MNT01 ⁽²⁾	Adjustable Mount (+/- 90 deg)
LM-KIT-ANG-MNT01 ⁽²⁾	Surface Mount (includes 15 or 30 deg mounting wedge)

(1) Accessories must be ordered separately

(2) These accessories are included in individual fixture or run specifications.

Material numbers are included here for ordering additional accessories.

(3) Contact factory for other colors.

(4) See pages 14 - 17 for additional details

Optical Accessories

Catalog #	Description
GRZ-LV45-1F ⁽²⁾	1ft Louver with 45 deg shielding angle
GRZ-LV45-2F ⁽²⁾	2 ft Louver with 45 deg shielding angle 4F fixtures requires 2x 2F accessories
GRZ-VSR-1F-B ⁽²⁾⁽⁴⁾	1 ft visor (black)
GRZ-VSR-2F-B ⁽²⁾⁽⁴⁾	2 ft visor (black) 4F fixtures requires 2x 2F accessories
GRZ-VSR-1F-W ⁽²⁾⁽⁴⁾	1 ft visor (white)
GRZ-VSR-2F-W ⁽²⁾⁽⁴⁾	2 ft visor (white) 4F fixtures requires 2x 2F accessories
GRZ-MSK-1F-B ⁽²⁾⁽⁴⁾	1 ft masking plate (black)
GRZ-MSK-1F-W ⁽²⁾⁽⁴⁾	1 ft masking plate (white)
GRZ-MSK-2F-B ⁽²⁾⁽⁴⁾	2 ft masking plate (black) 4F fixtures requires 2x 2F accessories
GRZ-MSK-2F-W ⁽²⁾⁽⁴⁾	2 ft masking plate (white) 4F fixtures requires 2x 2F accessories

(1) Accessories must be ordered separately

(2) Contact factory for other RAL color options.

(3) See pages 14 - 17 for additional details.

(4) Visor and Mask require ADJ mount.

Product Specifications

Construction

- Housing is powder coated, extruded aluminum
- All housing hardware is stainless steel
- Clear, UV stabilized polycarbonate injection molded lens with integral silicone gasket
- Proprietary IP66 exterior-rated, quick connect plugs
- Self-closing IP66 end cap to simplify installation and eliminate end of run shorting risks.
- Available in 1F (12"), 2F (24") and 4F (48") lengths. Refer to catalogue logic for ordering information.

Electrical

- Integral high performance constant current driver
- Standard 0-10V dimming (1% - 100%)
- Flicker free performance with PST < 1.0 and SVM < 1.0
- Beginning of run power harness required for connection to line voltage
- Each fixture is configured for a line voltage feed while providing through wiring and quick connects for continuous mounting applications
- See pg 3 or 13 for Run Length Limits
- See pg 13 for Dimmer compatibility chart
- Emergency circuits can be achieved by utilizing jumpers to create two circuits.

LED and Optics

- Fixture equipped with proprietary 90+ CRI LED module available in 2700, 3000, 3500 or 4000K
- All LED CCTs within 1.5-step MacAdam ellipse (SDCM) binning for excellent color consistency along a run of fixtures
- $du'v' < 0.005$ for excellent color uniformity without sacrificing efficacy. See page 12 for color over angle details
- Discrete high-powered LED array designed for best in class color over angle to provide clean illumination without undesirable color bands
- 9 bi-directional optical control (perpendicular x parallel) options give designers maximum capability to deliver the perfect wash or graze for any installation. See pg 5-7 for more optical distribution details. See pgs. 8-10 for detailed photometric data
- 10x10 FR option includes integral frost on 1/3 of optic face to improve the near field appearance of tight installations where optimal spacing is not available with minimal impact to optical distribution, lumen output and maximum candela
- Luminaires tested per IESNA LM-79

- LM-80 data utilized in TM-21 lumen maintenance projections:
L70 > 54,000 hrs
L90 = 44,000 hrs
- Louver, visor and masking plate accessories are available. Optical accessories should be specified by adding -LVR, -VSRx or -MSKx to Optical Distribution specification. Details on pg 16.
- ADJ mount required for Visor or Mask accessories.
- Visor accessory can be used to provide optical shielding and hide fixture, cables and mounts from view. Visor available in White or Black. Contact factory for other colors. See pg 16 for visor dimensional details.
- Mask accessory can be used to hide fixture, cables and mounts from view. Mask available in White or Black. Contact factory for other colors. See pg 17 for visor dimensional details.

Mounting

- Surface mount bracket is stainless steel and is designed to align long runs by spanning two fixtures (includes optional angled mounting base plates to adjust output angle to 15° and 30°) and can be mounted in any direction (surface, ceiling or vertically)
- Adjustable mounting bracket is extruded, anodized aluminum. The adjustable bracket allows for +/- 60 deg aiming and can be mounted in any direction (surface, ceiling or vertically). Adjustable mounting bracket includes a set screw to secure aiming. Additional brackets can be added for increased security
- ADJ mount meets 3G vibration rating with required mounts/fixture (2 mounts for 2F and 4F fixtures and 1 mount for 1F fixtures) at specified 7 - 10 in-lbs torque of the set screws
- STD option includes beginning of run power harness + junction box for line voltage connection
- Control options include beginning of run power harness + dimming converter + junction box for line voltage connection
- Bulk specifications can be specified a la carte by quantity of each fixture length and must include power harness accessory
- Run length will include necessary number of jumpers to account for maximum run length (see page 13)
- Individual fixtures will include 1 power feed/fixture
- Run specifications will maximize 4F fixtures unless /1 or /2 is specified
- Contact customer service for custom run configurations
- See page 13 for run length limitations from voltage and lumen output.

Finish

- Fixture housing is powder coated aluminum
- Standard color is silver with black end caps and wiring harness
- Contact Cooper Lighting Solutions for custom color availability (minimum order quantity will apply)

Compliance

- Luminaires are cULus listed for -40° to 50° C ambient environments
- cULus Wet Location Listed
- IP66 rated
- 3000 hour salt spray tested
- RoHS compliant*
- Tested according to IESNA LM-79
- 05L output meets ASHRAE requirements for facade lighting
- Complies with FCC part 15 Class B
- Meets Buy American standards

Environment

- Suited for indoor or outdoor installations
- Rated for operating temperature range of -40C to 50C

Control

- 0-10V dimming to 1% is standard
- Additional dimming protocols including DALI supported through an added control module at the beginning of the run
- Wireless control is supported through the Cooper Lighting Solutions WaveLinX system
- See pg 5 for run length limits

Weight

- 1F=1 lb
- 2F=1.8lbs
- 4F=3.5lbs

Warranty

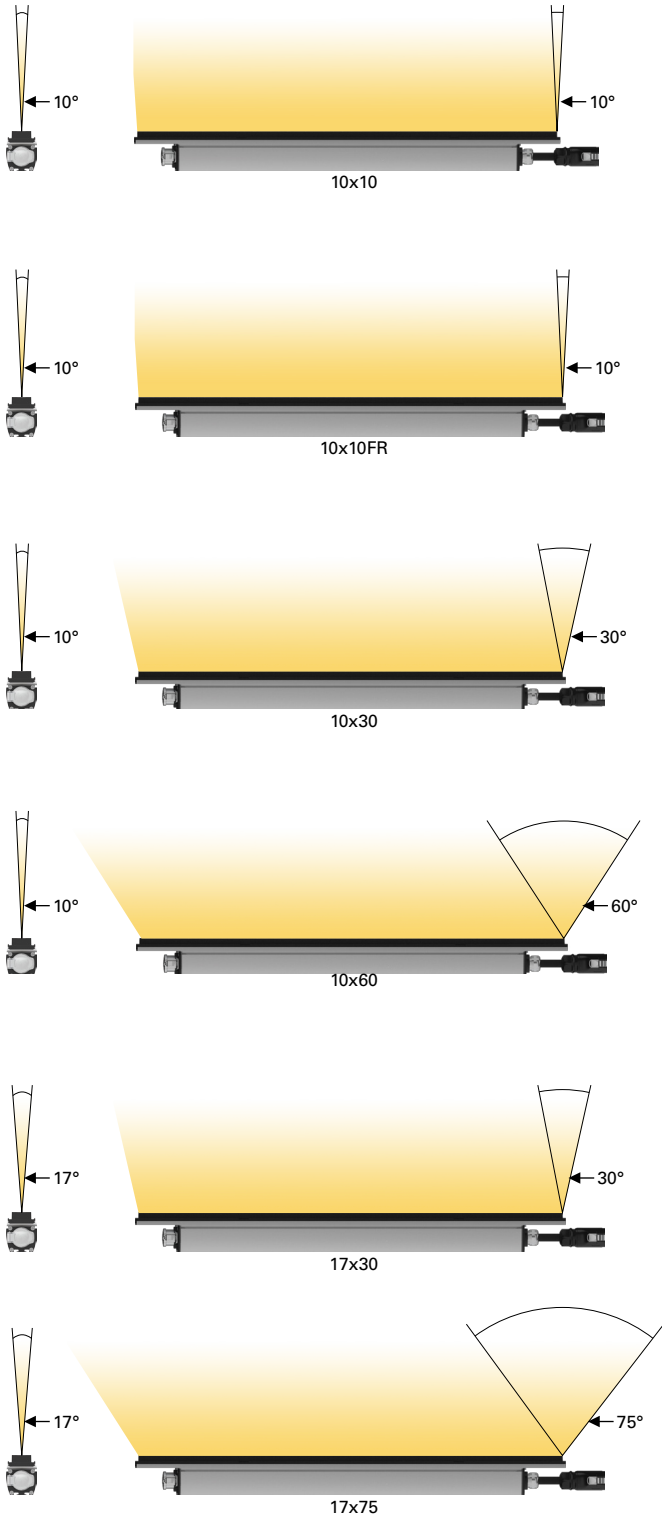
- Five year limited warranty standard.

*Adjustable mount does not have ROHS certification.

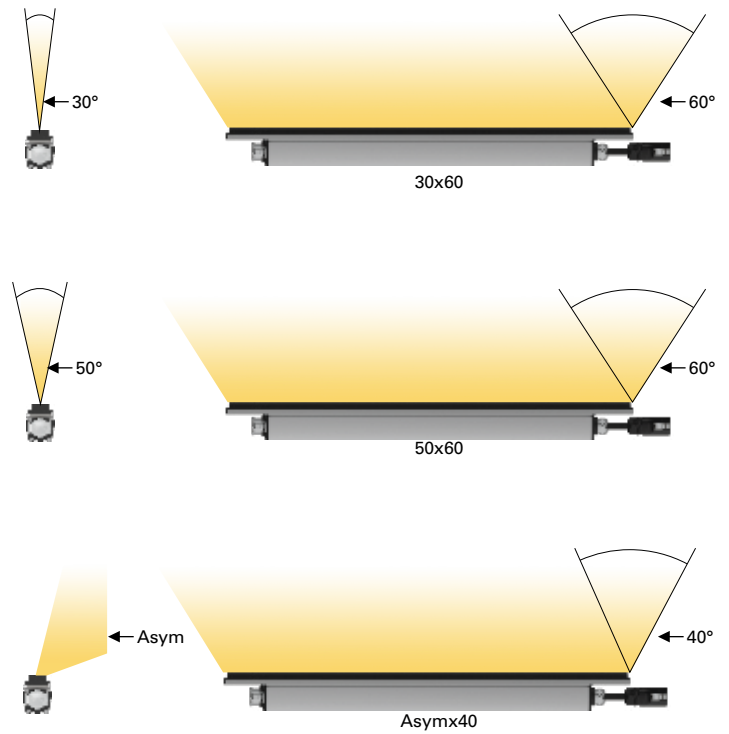
Bi-Directional Optical Control Overview

NOTE: Diagrams depict nominal optical distributions. (See photometric details on pgs. 7-9 for more details).

Wall Graze Optics Overview



Wall Wash Optics Overview

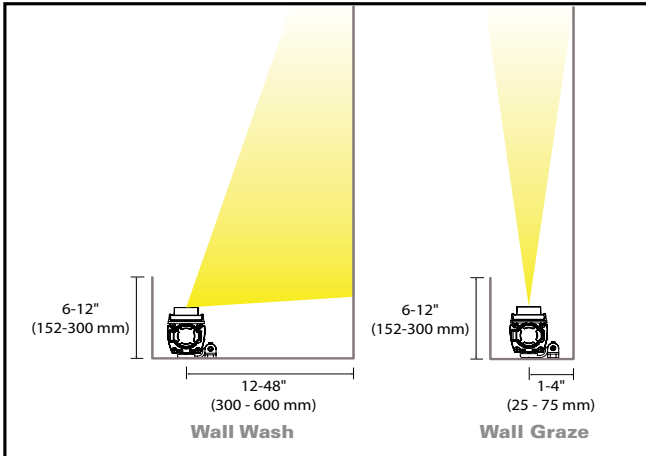


Cove Optics Overview



NOTE: 120 deg optical distribution must be ordered under the LM series. LM series details including photometry are available [here](#).

Wall Graze/Wall Wash Design Guidelines



Wall Graze Optics Overview¹

Mounting Guidelines

- Wall graze optics are designed to highlight architectural details and texture by utilizing a narrow optical distribution to illuminate raised features while creating shadows in recessed areas.
- Graze fixtures should be mounted at least 1" to 4" from the vertical surface depending on the architectural detail or texture depth being grazed. The grazing beam should be carefully placed and aimed to adjust the amount of shadowing and therefore the intensity and impact of the grazing effect. See the diagram above for Wall Graze application installation guidelines.
- Graze fixtures should be elevated at least 6" in elevation to optimize consistency of illumination
- When mounting limitations do not allow for recommended offset spacing from the surface or elevation, the 10 x 10 FR optic is recommended to improve near field illumination consistency
- See pgs 8-10 for detailed photometric data.

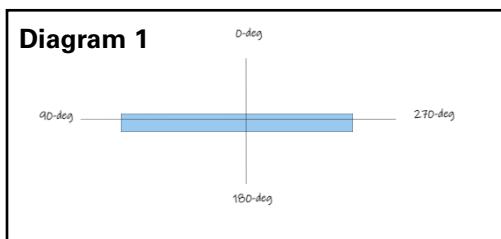
Optic (nominal)	10x10	10x10 FR	10x30	10x60	17x30	17x75
Vertical Beam Photometrics						
Actual Vertical Beam Angle (50%)	9.6	11.4	9.2	12	16	15.2
Actual Horizontal Beam Angle 50%	10.2	14.3	26.2	57.9	31	80.1
Luminaire output (lumens)	5268	5404	5915	5826	6004	5860
Luminaire Power (W)	56	56	56	56	56	56
Luminaire Efficacy (lm/W)	94.1	96.5	105.6	104	107.2	104.6
Maximum candela (cd)	65,828	58,649	37,311	19,050	25,256	12184
Test Information	<p>File Name GRZ-15L-940-10x10-X-UNV-STD-4F</p> <p>Test Method LM-79-08</p> <p>Report Number P592113</p> <p>TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2111-457-14)</p> <p>Description iO LED GRAZER WITH 10x10 OPTIC 1500 LUMENS PER FOOT, 4 FOOT FIXTURE 4000K CCT, 90 CRI LEDS</p>	<p>File Name GRZ-15L-940-10x10FR-X-UNV-STD-4F</p> <p>Test Method LM-79-08</p> <p>Report Number P592115</p> <p>TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2111-457-16)</p> <p>Description iO LED GRAZER WITH 10x10FR OPTIC 1500 LUMENS PER FOOT, 4 FOOT FIXTURE 4000K CCT, 90 CRI LEDS</p>	<p>File Name GRZ-15L-940-10x30-X-UNV-STD-4F</p> <p>Test Method LM-79-08</p> <p>Report Number P592117</p> <p>TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2111-457-17)</p> <p>Description iO LED GRAZER WITH 10x30 OPTIC 1500 LUMENS PER FOOT, 4 FOOT FIXTURE 4000K CCT, 90 CRI LEDS</p>	<p>File Name GRZ-15L-940-10x60-X-UNV-STD-4F</p> <p>Test Method LM-79-08</p> <p>Report Number P592119</p> <p>TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2111-457-18)</p> <p>Description iO LED GRAZER WITH 10x60 OPTIC 1500 LUMENS PER FOOT, 4 FOOT FIXTURE 4000K CCT, 90 CRI LEDS</p>	<p>File Name GRZ-15L-940-17x30-X-UNV-STD-4F</p> <p>Test Method LM-79-08</p> <p>Report Number P592121</p> <p>Description TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2111-457-19)</p> <p>iO LED GRAZER WITH 17x30 OPTIC 1500 LUMENS PER FOOT, 4 FOOT FIXTURE 4000K CCT, 90 CRI LEDS</p>	<p>File Name GRZ-15L-935-17x75-X-UNV-STD-4F</p> <p>Test Method LM-79-08</p> <p>Report Number P977178</p> <p>TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2309-147-12)</p> <p>Description iO LED GRAZER WITH 17x75 OPTIC 1500 LUMENS PER FOOT, 4 FOOT FIXTURE 4000K CCT, 90 CRI LEDS</p>

NOTES:
 (1) All overview data given for 15L, 4000K, 48" fixture. See pgs. 8-10 for detailed photometric data by output, optical distribution, CCT and fixture length
 (2) All IES files oriented as shown in the diagram 1 on page 7.

Wall Wash Design Guidelines

Wall Wash Optics Overview ¹			
Mounting Guidelines	<ul style="list-style-type: none"> • Wall Wash optics are designed to illuminate a surface uniformly. The smooth washing of a wall flattens the visual appearance and hides imperfections and texture while increasing area light levels and the perception of brightness in the room / area. • Fixtures with wash optics should be mounted 12" to 48" from the vertical surface depending upon the height to be washed. The wash beam should be carefully placed and aimed to create consistent illumination across the entire target surface. See the diagram on pg. 6 for Wall Wash application installation guidelines. • Wash fixtures should be recessed at least 6" to optimize consistency of illumination • See page 6 for Wall Wash installation diagram. • See pgs. 8-10 for detailed photometric data. 		
Optic (nominal)	30x60	50x60	ASYMx40
Photometrics (2)			
Actual Vertical Beam Angle (50%)	31.6	53.4	16.1
Actual Horizontal Beam Angle (10%)	61.8	62.7	35.3
Luminaire output (lumens)	5665	5715	5365
Luminaire Power (W)	56	56	56
Luminaire Efficacy (lm/W)	101.2	102.1	95.8
Maximum candela (cd)	6,388	6,250	14,298
Test Information	<p>File Name GRZ-15L-940-30x60-X-UNV-STD-4F</p> <p>Test Method LM-79-08</p> <p>Report Number P592123</p> <p>TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2111-457-21)</p> <p>Description iO LED GRAZER WITH 30x60 OPTIC 1500 LUMENS PER FOOT, 4 FOOT FIXTURE 4000K CCT, 90 CRI LEDS</p>	<p>File Name GRZ-15L-940-50x60-X-UNV-STD-4F</p> <p>Test Method LM-79-08</p> <p>Report Number P592125</p> <p>TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2111-457-22)</p> <p>Description iO LED GRAZER WITH 50x60 OPTIC 1500 LUMENS PER FOOT, 4 FOOT FIXTURE 4000K CCT, 90 CRI LEDS</p>	<p>File Name GRZ-15L-940-ASYMx40-X-UNV-STD-4F</p> <p>Test Method LM-79-08</p> <p>Report Number P592127</p> <p>TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2111-457-24)</p> <p>Description iO LED GRAZER WITH ASYMx40 OPTIC 1500 LUMENS PER FOOT, 4 FOOT FIXTURE 4000K CCT, 90 CRI LEDS</p>

NOTES:
 (1) All overview data given for 15L, 4000K, 48" fixture. See pgs. 8-10 for detailed photometric data by output, optical distribution, CCT and fixture length.
 (2) All IES files oriented as shown in diagram 1 below:



Energy and Performance Data

Delivered Lumen Output Table														
			1F = 12" fixture				2F = 24" fixture				4F = 48" fixture			
			Photometric Performance (Actual) ⁽²⁾				Photometric Performance (Actual) ⁽²⁾				Photometric Performance (Actual) ⁽²⁾			
			Delivered Lumens	Watts	Efficacy (lm/W)	Maximum Candela (cd)	Delivered Lumens	Watts	Efficacy (lm/W)	Maximum Candela (cd)	Delivered Lumens	Watts	Efficacy (lm/W)	Maximum Candela (cd)
10x10	05L	2700K	503	5.3	94.9	6283	863	9.6	89.9	10,784	1726	19.3	89.4	21,568
		3000K	522	5.3	98.4	6520	895	9.6	93.2	11,184	1790	19.3	92.7	22,368
		3500K	540	5.3	101.9	6749	927	9.6	96.6	11,584	1854	19.3	96.1	23,167
		4000K	559	5.3	105.5	6985	959	9.6	99.9	11,984	1918	19.3	99.4	23,967
	10L	2700K	916	10	91.6	11451	1647	19.1	86.2	20,581	3294	38.0	86.7	41,161
		3000K	951	10	95.1	11882	1708	19.1	89.4	21,343	3416	38.0	89.9	42,686
		3500K	984	10	98.4	12300	1769	19.1	92.6	22,105	3538	38.0	93.1	44,210
		4000K	1019	10	101.9	12730	1830	19.1	95.8	22,867	3660	38.0	96.3	45,735
	15L	2700K	1305	14.9	87.6	16303	2371	29.0	81.8	29,628	4741	56.0	84.7	59,255
		3000K	1354	14.9	90.9	16916	2458	29.0	84.8	30,715	4917	56.0	87.8	61,430
		3500K	1401	14.9	94.1	17512	2546	29.0	87.8	31,814	5092	56.0	90.9	63,629
		4000K	1450	14.9	97.3	18125	2634	29.0	90.8	32,914	5268	56.0	94.1	65,828
10x10 FR	05L	2700K	469	5.3	88.4	5086	876	9.6	91.3	9,787	1751	19.3	90.7	18,975
		3000K	486	5.3	91.7	5277	908	9.6	94.6	9,834	1816	19.3	94.1	19,668
		3500K	503	5.3	95	5463	941	9.6	98.0	10,191	1881	19.3	97.5	20,383
		4000K	521	5.3	98.3	5654	973	9.6	101.4	10,538	1946	19.3	100.8	21,076
	10L	2700K	854	10	85.4	9268	1680	19.1	88.0	18,195	3361	38.0	88.4	36,390
		3000K	886	10	88.6	9617	1743	19.1	91.3	18,877	3485	38.0	91.7	37,755
		3500K	917	10	91.7	9955	1805	19.1	94.5	19,549	3610	38.0	95.0	39,098
		4000K	949	10	94.9	10304	1867	19.1	97.7	20,220	3734	38.0	98.3	40,440
	15L	2700K	1216	14.9	81.6	13196	2432	29.0	83.9	26,339	4863	56.0	86.8	52,679
		3000K	1262	14.9	84.7	13692	2522	29.0	87.0	27,314	5044	56.0	90.1	54,628
		3500K	1306	14.9	87.6	14174	2612	29.0	90.1	28,289	5224	56.0	93.3	56,578
		4000K	1352	14.9	90.7	14670	2702	29.0	93.2	29,264	5404	56.0	96.5	58,527
10x30	05L	2700K	510	5.3	96.2	3216	959	9.6	99.9	6,050	1917	19.3	99.3	12,100
		3000K	529	5.3	99.8	3337	994	9.6	103.5	6,271	1988	19.3	103.0	12,542
		3500K	548	5.3	103.3	3455	1030	9.6	107.3	6,498	2059	19.3	106.7	12,996
		4000K	567	5.3	106.9	3576	1065	9.6	110.9	6,719	2130	19.3	110.4	13,438
	10L	2700K	929	10	92.9	5862	1839	19.1	96.3	11,602	3678	38.0	96.8	23,204
		3000K	964	10	96.4	6082	1907	19.1	99.8	12,031	3815	38.0	100.4	24,062
		3500K	998	10	99.8	6296	1975	19.1	103.4	12,460	3951	38.0	104.0	24,920
		4000K	1033	10	103.3	6517	2044	19.1	107.0	12,895	4087	38.0	107.6	25,791
	15L	2700K	1323	14.9	88.8	8346	2662	29.0	91.8	16,794	5323	56.0	95.1	33,589
		3000K	1373	14.9	92.1	8659	2760	29.0	95.2	17,413	5520	56.0	98.6	34,825
		3500K	1421	14.9	95.4	8964	2859	29.0	98.6	18,037	5718	56.0	102.1	36,074
		4000K	1471	14.9	98.7	9278	2957	29.0	102.0	18,655	5915	56.0	105.6	37,311

NOTE:
 Consult IES files online for specific candela distribution.
 (2) All IES files oriented as shown in the diagram 1 on page 7.

Delivered Lumen Output Table

		Delivered Lumen Output Table												
		1F = 12" fixture				2F = 24" fixture				4F = 48" fixture				
		Photometric Performance (Actual) ⁽²⁾				Photometric Performance (Actual) ⁽²⁾				Photometric Performance (Actual) ⁽²⁾				
		Delivered Lumens	Watts	Efficacy (lm/W)	Maximum Candela (cd)	Delivered Lumens	Watts	Efficacy (lm/W)	Maximum Candela (cd)	Delivered Lumens	Watts	Efficacy (lm/W)	Maximum Candela (cd)	
10x60	05L	2700K	500	5.3	94.4	1636	944	9.6	98.3	3,043	1888	19.3	97.8	6,085
		3000K	519	5.3	98	1697	979	9.6	102.0	3,155	1958	19.3	101.5	6,311
		3500K	537	5.3	101.4	1757	1014	9.6	105.6	3,268	2028	19.3	105.1	6,536
		4000K	556	5.3	105	1819	1049	9.6	109.3	3,381	2098	19.3	108.7	6,762
	10L	2700K	912	10	91.2	2981	1812	19.1	94.9	5,840	3623	38.0	95.3	11,680
		3000K	946	10	94.6	3094	1879	19.1	98.4	6,056	3757	38.0	98.9	12,112
		3500K	979	10	97.9	3202	1946	19.1	101.9	6,272	3892	38.0	102.4	12,544
		4000K	1014	10	101.4	3315	2013	19.1	105.4	6,488	4026	38.0	105.9	12,976
	15L	2700K	1298	14.9	87.1	4245	2622	29.0	90.4	8,451	5243	56.0	93.6	16,902
		3000K	1347	14.9	90.4	4404	2719	29.0	93.8	8,764	5437	56.0	97.1	17,527
		3500K	1394	14.9	93.6	4559	2816	29.0	97.1	9,076	5632	56.0	100.6	18,152
		4000K	1443	14.9	96.9	4719	2913	29.0	100.4	9,389	5826	56.0	104.0	18,778
17x30	05L	2700K	509	5.3	96.1	2141	973	9.6	101.4	4,011	1946	19.3	100.8	8,022
		3000K	528	5.3	99.7	2222	1009	9.6	105.1	4,159	2018	19.3	104.6	8,319
		3500K	547	5.3	103.2	2300	1045	9.6	108.9	4,308	2090	19.3	108.3	8,616
		4000K	566	5.3	106.8	2381	1081	9.6	112.6	4,456	2162	19.3	112.0	8,913
	10L	2700K	928	10	92.8	3903	1867	19.1	97.7	7,696	3734	38.0	98.3	15,393
		3000K	963	10	96.3	4049	1936	19.1	101.4	7,981	3872	38.0	101.9	15,962
		3500K	996	10	99.6	4192	2005	19.1	105.0	8,265	4010	38.0	105.5	16,531
		4000K	1031	10	103.1	4339	2074	19.1	108.6	8,550	4149	38.0	109.2	17,099
	15L	2700K	1321	14.9	88.6	5556	2702	29.0	93.2	11,139	5403	56.0	96.5	22,277
		3000K	1370	14.9	92	5765	2802	29.0	96.6	11,551	5603	56.0	100.1	23,102
		3500K	1419	14.9	95.2	5968	2902	29.0	100.1	11,963	5803	56.0	103.6	23,926
		4000K	1468	14.9	98.6	6177	3002	29.0	103.5	12,375	6004	56.0	107.2	24,750
17x75	05L	2700K	493	5.3	93	919	1051	9.6	109.5	2276	2102	19.3	108.9	4551
		3000K	511	5.3	96.4	954	1091	9.6	113.6	2361	2181	19.3	113	4722
		3500K	529	5.3	99.8	987	1129	9.6	117.6	2444	2258	19.3	117	4889
		4000K	548	5.3	103.3	1022	1169	9.6	121.7	2530	2337	19.3	121.1	5060
	10L	2700K	898	10	89.8	1675	1916	19.1	100.3	4147	3831	38	100.8	8295
		3000K	931	10	93.1	1738	1987	19.1	104.1	4303	3975	38	104.6	8606
		3500K	964	10	96.4	1799	2058	19.1	107.7	4455	4115	38	108.3	8909
		4000K	998	10	99.8	1863	2130	19.1	111.5	4611	4259	38	112.1	9221
	15L	2700K	1278	14.9	85.8	2385	2727	29	94	5905	5455	56	97.4	11810
		3000K	1326	14.9	89	2475	2830	29	97.6	6126	5659	56	101.1	12253
		3500K	1373	14.9	92.1	2562	2930	29	101	6342	5859	56	104.6	12685
		4000K	1421	14.9	95.4	2652	3032	29	104.6	6565	6064	56	108.3	13129

NOTE:
 Consult IES files online for specific candela distribution.
 (2) All IES files oriented as shown in the diagram 1 on page 7.

Delivered Lumen Output Table														
			1F = 12" fixture				2F = 24" fixture				4F = 48" fixture			
			Photometric Performance (Actual) ⁽²⁾				Photometric Performance (Actual) ⁽²⁾				Photometric Performance (Actual) ⁽²⁾			
			Delivered Lumens	Watts	Efficacy (lm/W)	MAXIMUM CANDELA (cd)	Delivered Lumens	Watts	Efficacy (lm/W)	MAXIMUM CANDELA (cd)	Delivered Lumens	Watts	Efficacy (lm/W)	MAXIMUM CANDELA (cd)
30x60	05L	2700K	414	5.3	78.1	467	918	9.6	95.6	1,000	1836	19.3	95.1	2,001
		3000K	429	5.3	81	484	952	9.6	99.2	1,037	1904	19.3	98.7	2,075
		3500K	445	5.3	83.9	502	986	9.6	102.7	1,074	1972	19.3	102.2	2,149
		4000K	460	5.3	86.8	519	1020	9.6	106.3	1,111	2040	19.3	105.7	2,223
	10L	2700K	754	10	75.4	851	1762	19.1	92.3	1,920	3523	38.0	92.7	3,840
		3000K	783	10	78.3	883	1827	19.1	95.7	1,991	3654	38.0	96.2	3,982
		3500K	810	10	81	914	1892	19.1	99.1	2,062	3784	38.0	99.6	4,123
		4000K	839	10	83.9	946	1957	19.1	102.5	2,132	3914	38.0	103.0	4,265
	15L	2700K	1074	14.9	72.1	1211	2549	29.0	87.9	2,778	5098	56.0	91.0	5,555
		3000K	1114	14.9	74.8	1257	2644	29.0	91.2	2,881	5287	56.0	94.4	5,762
		3500K	1154	14.9	77.4	1301	2738	29.0	94.4	2,983	5476	56.0	97.8	5,967
		4000K	1194	14.9	80.1	1347	2832	29.0	97.7	3,086	5665	56.0	101.2	6,172
50x60	05L	2700K	419	5.3	79.1	458	926	9.6	96.5	1,004	1852	19.3	96.0	2,008
		3000K	435	5.3	82	476	960	9.6	100.0	1,041	1921	19.3	99.5	2,081
		3500K	450	5.3	84.9	492	995	9.6	103.6	1,079	1989	19.3	103.1	2,157
		4000K	466	5.3	87.9	510	1029	9.6	107.2	1,116	2058	19.3	106.6	2,231
	10L	2700K	764	10	76.4	835	1777	19.1	93.0	1,926	3554	38.0	93.5	3,853
		3000K	792	10	79.2	867	1843	19.1	96.5	1,998	3686	38.0	97.0	3,996
		3500K	820	10	82	897	1909	19.1	99.9	2,069	3817	38.0	100.4	4,139
		4000K	849	10	84.9	929	1975	19.1	103.4	2,141	3949	38.0	103.9	4,282
	15L	2700K	1087	14.9	73	1189	2572	29.0	88.7	2,788	5143	56.0	91.8	5,576
		3000K	1128	14.9	75.7	1234	2667	29.0	92.0	2,891	5334	56.0	95.3	5,782
		3500K	1168	14.9	78.4	1277	2762	29.0	95.2	2,994	5524	56.0	98.6	5,988
		4000K	1209	14.9	81.1	1322	2857	29.0	98.5	3,097	5715	56.0	102.1	6,194
Asym x40	05L	2700K	411	5.3	77.6	718	869	9.6	90.5	1,049	1739	19.3	90.1	2,098
		3000K	427	5.3	80.6	745	902	9.6	94.0	1,089	1803	19.3	93.4	2,178
		3500K	442	5.3	83.4	771	934	9.6	97.3	1,127	1868	19.3	96.8	2,255
		4000K	457	5.3	86.3	798	966	9.6	100.6	1,166	1932	19.3	100.1	2,332
	10L	2700K	750	10	75	1308	1668	19.1	87.3	2,013	3337	38.0	87.8	4,027
		3000K	778	10	77.8	1357	1730	19.1	90.6	2,088	3460	38.0	91.1	4,176
		3500K	805	10	80.5	1405	1792	19.1	93.8	2,163	3584	38.0	94.3	4,326
		4000K	834	10	83.4	1454	1854	19.1	97.1	2,238	3707	38.0	97.6	4,476
	15L	2700K	1068	14.9	71.7	1862	2414	29.0	83.2	2,914	4828	56.0	86.2	5,828
		3000K	1108	14.9	74.3	1932	2504	29.0	86.3	3,022	5007	56.0	89.4	6,045
		3500K	1147	14.9	77	2000	2593	29.0	89.4	3,130	5186	56.0	92.6	6,260
		4000K	1187	14.9	79.7	2070	2682	29.0	92.5	3,237	5365	56.0	95.8	6,475

NOTE:
 Consult IES files online for specific candela distribution.
 (2) All IES files oriented as shown in the diagram 1 on page 7.

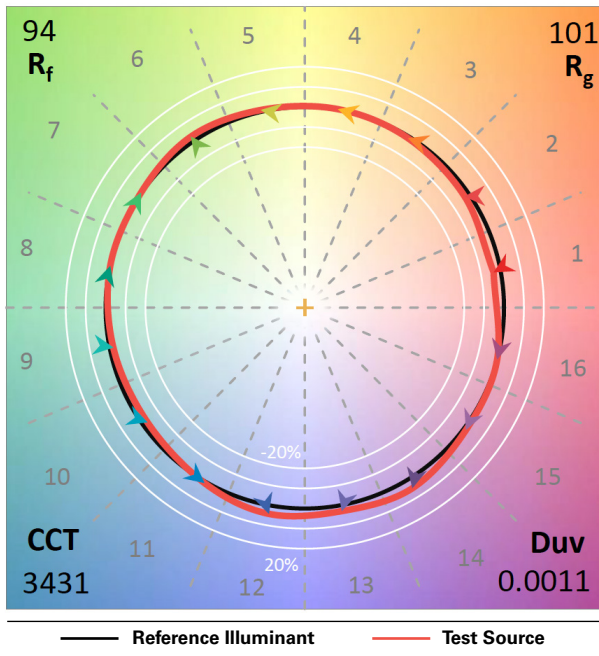
Delivered Lumen Output Table											
		1F = 12" fixture			2F = 24" fixture			4F = 48" fixture			
		Photometric Performance (Actual) ⁽²⁾			Photometric Performance (Actual) ⁽²⁾			Photometric Performance (Actual) ⁽²⁾			
		Delivered Lumens	Watts	Efficacy (lm/W)	Delivered Lumens	Watts	Efficacy (lm/W)	Delivered Lumens	Watts	Efficacy (lm/W)	
120 ⁽¹⁾	05L	927	562	5.1	110.2	1147	9.9	115.9	2362	19	124.3
		930	583	5.1	114.3	1190	9.9	120.2	2450	19	128.9
		935	604	5.1	118.4	1232	9.9	124.5	2537	19	133.5
		940	614	5.1	120.4	1254	9.9	126.6	2581	19	135.8
	10L	927	1080	9.9	109.1	2211	18.8	117.6	4538	37.5	121
		930	1120	9.9	113.1	2293	18.8	121.9	4706	37.5	125.5
		935	1160	9.9	117.2	2374	18.8	126.3	4874	37.5	130
		940	1180	9.9	119.2	2415	18.8	128.5	4958	37.5	132.2
	15L	927	1581	14.6	108.3	3234	28.9	111.9	6576	56.5	116.4
		930	1640	14.6	112.3	3354	28.9	116.0	6820	56.5	120.7
		935	1698	14.6	116.3	3473	28.9	120.2	7064	56.5	125
		940	1727	14.6	118.3	3533	28.9	122.3	7185	56.5	127.2

NOTE:

(1)120 deg optical distribution must be ordered under the LM series. (ie. LM-05L-930-120-OD-UNV-S-SM-STD-xxF)
 (2)LM series performance provided here for reference only. Details including all photometry files are available [here](#) and [here](#) .

Photometric Color Data

ANSI/IES TM-30-18 Color Rendition Report



TM-30 and Photometric Sphere test results are summarized in the table below. Contact Cooper Lighting Solutions for specific TM-30 reports.

CCT	CRI	R _f	R _g	R9
2700K	94.7	94	100	67
3000K	94.1	94	100	66.4
3500K	94.0	94	101	69.9
4000K	93.3	93	100	69.2

Light Output Conversion Table

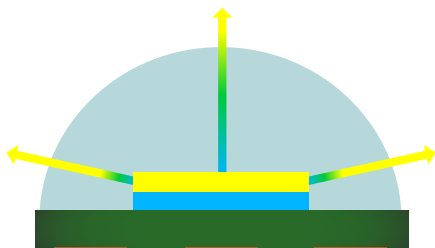
CCT	05L	10L	15L
2700K	0.333	0.621	0.900
3000K	0.346	0.644	0.933
3500K	0.358	0.667	0.967
4000K	0.370	0.690	1.00

Energy Data
120V - 277V 50/60 Hz
>0.9 Power Factor
<20% Total Harmonic Distortion (THD)
Efficacy = up to 109 Lm/W depending on optic
-40°C Min Temperature
50°C Max Temperature

Color Uniformity

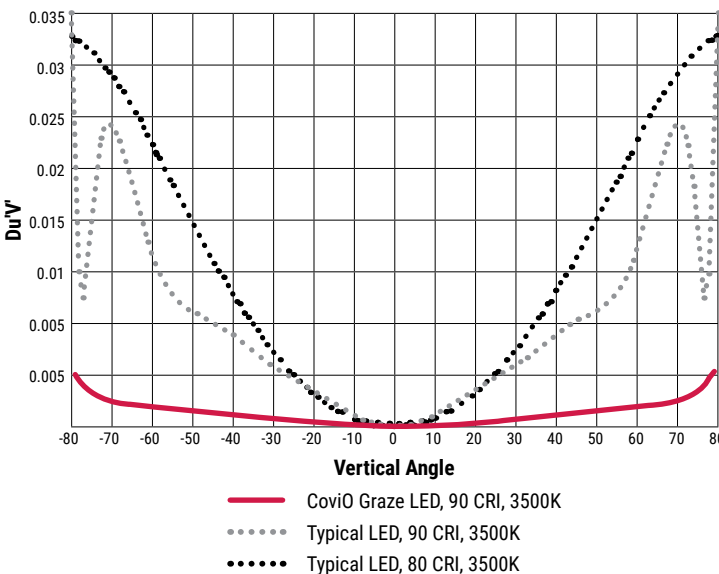
The CoviO Graze specifies Du'v' < 0.005 for maximum CCT color uniformity in all optical distributions. Please see [CoviO Graze Spec Features brochure](#) for more details.

Light at the center is extracted directly by the lens and therefore less light mixing and tends to appear White and less yellowish

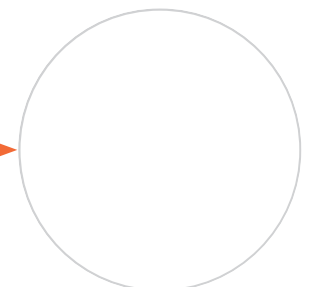
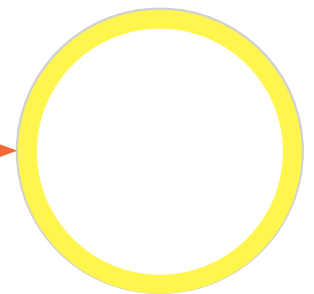


Light under larger angles travels a longer distance through the converter and appears to be more yellowish.

Higher Du'v' values indicate greater variance of chromaticity (CCT / Duv) throughout the LED's emission angles. This can result in undesirable yellow (or purple) bands in the LED output. High Du'v' becomes a greater concern when high angle output is captured and re-focused like it is in a high efficiency grazing optic.



Lower Du'v' values indicate consistent chromaticity (CCT / Duv) throughout the LED emission range. This results in noticeably more consistent color in the LED output.



Run Length Limits

		Run Length Limits (ft)			
		Lumen Package	05L (500lm)	10L (1000lm)	15L (1500lm)
		Fixture Input Wattage	5.1W	9.9W	14.6W
Dimming Protocol	0-10V (STD) WaveLinX (WL)	Maximum Run Length (ft) @ 120V	140	70	50
		Maximum Run Length (ft) @ 277V	300*	170	120
	DALI (5LT)	Maximum Run Length (ft) @ 120V	92	47	32
		Maximum Run Length (ft) @ 277V	216	110	76

*NOTE: Run length can be extended to 340 ft. for 05L fixtures @ 277V when using 2F and 4F fixtures as long as runs are limited to 300 fixtures or less.

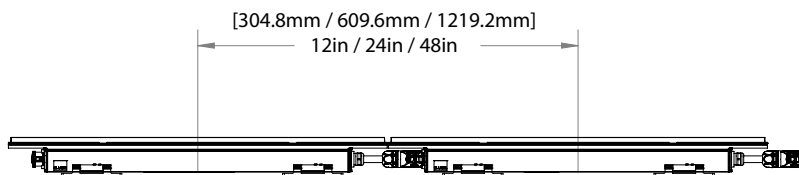
Dimmer Compatability

List of Tested Dimmers		
Manufacturer	Technology	Part Number
EWD (Eaton)	0-10Vdc	SF10P-W
EWD (Eaton)	0-10Vdc	SF10P-W
Lutron	0-10Vdc	DVSTV-WH
Lutron	0-10Vdc	IP710-LFZ
EWD (Eaton)	0-10Vdc	WBSD-010M-C1

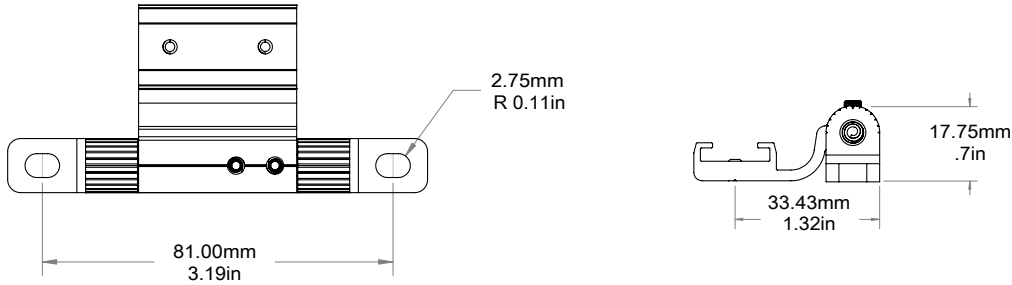
Mounting And Installation Notes

- All CoviO mounts can be used in any orientation.
- ADJ mount requirements are
 - 1x ADJ mount for 1F
 - 2x ADJ mount for 2F and 4F fixtures
 - 2mm allen wrench must be used to secure aiming angle.
 - Additional mounts can be ordered for increased mounting and aiming security.
 - SM brackets are designed to self-align CoviO fixtures in a linear run. See installation instructions for additional details.
 - SM bracket stand-off can be removed for tight installations.
 - Bracket can be cut in half for runs, end of run or curved runs.
 - Jumper accessory is required for any bend radius > 20 deg (see pg 13 for details on jumper accessories)
 - see pg 14 for additional run radius details
 - Utilize jumpers to create a second EM circuit if required

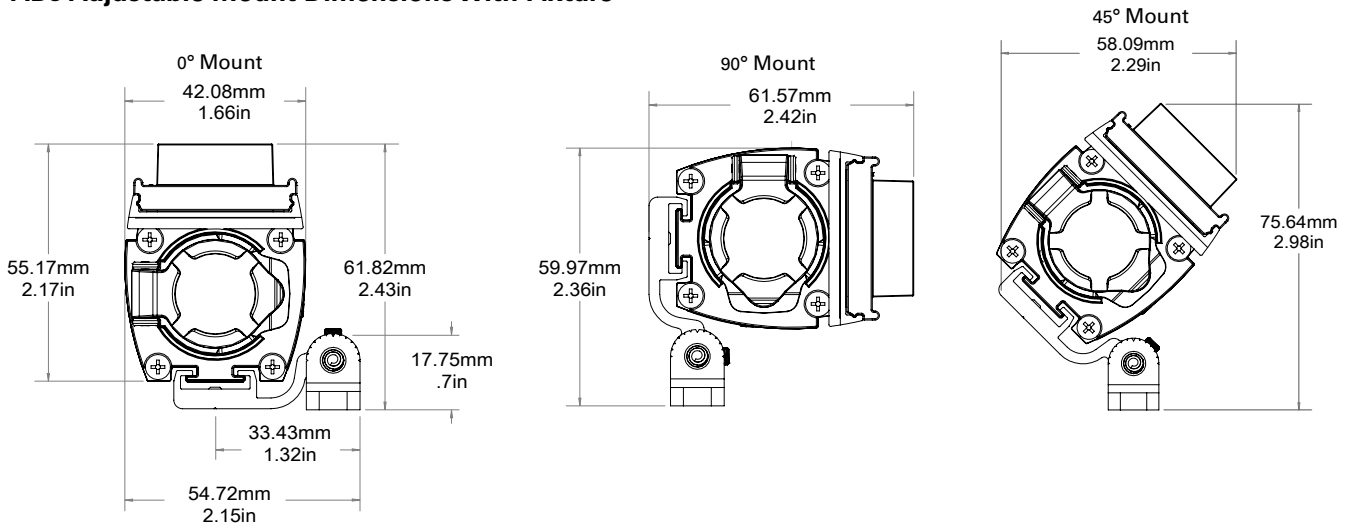
Typical Dimensions for Connected Fixtures



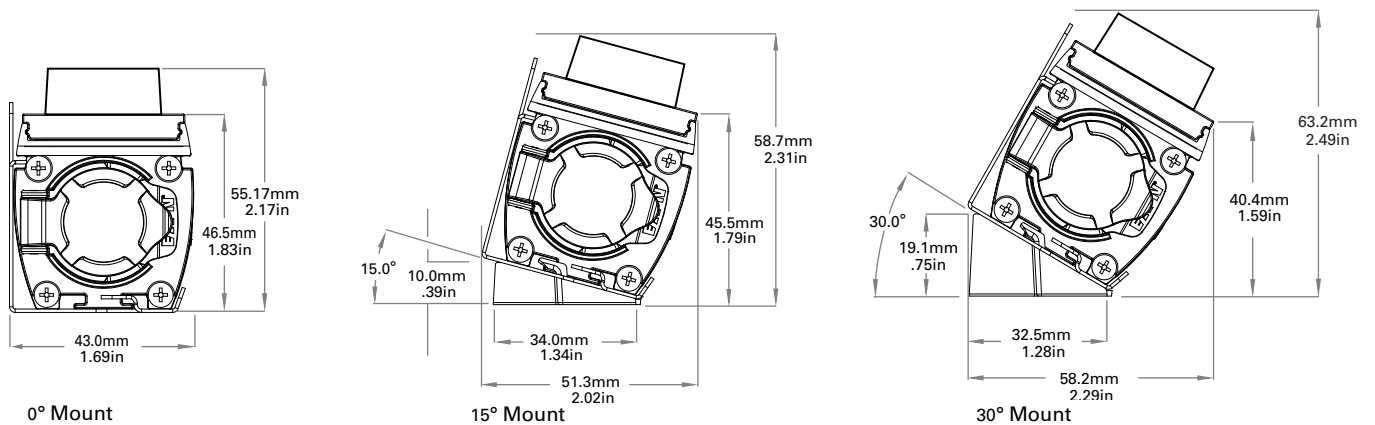
ADJ Mounting Bracket Dimensions



ADJ Adjustable Mount Dimensions With Fixture

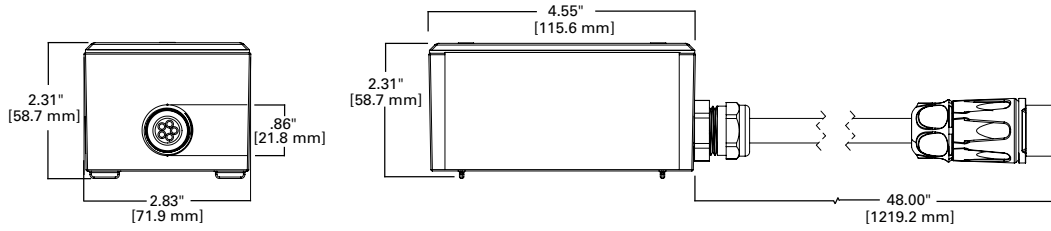


SM Surface Mount dimensions with fixture (with optional angle mounting plate)

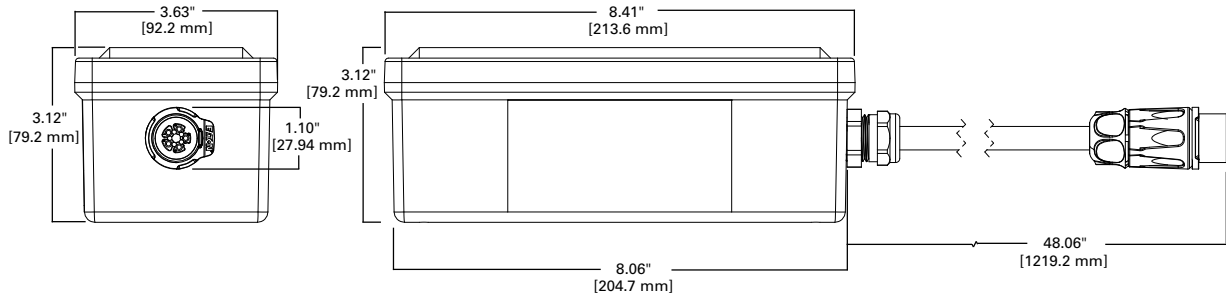


Controls Dimensions

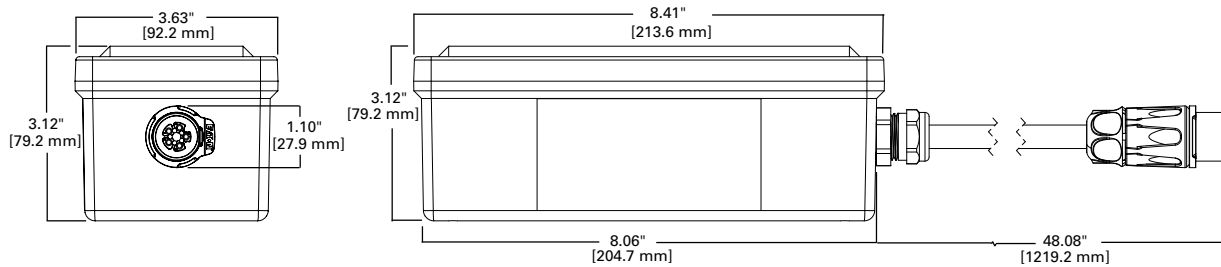
STD - Beginning of Run Power Harness



5LT - DALI Control Module

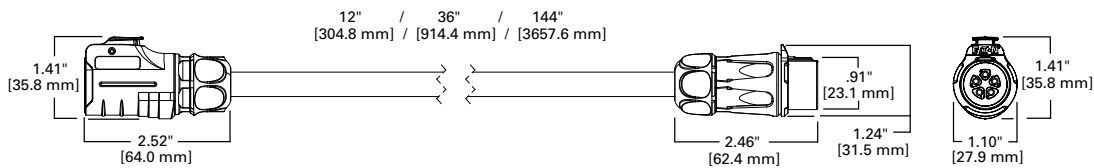


WL - Wavelinx Wireless Control Module



Accessory Dimensions

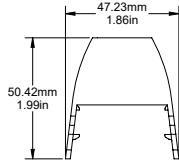
Jumper Harness



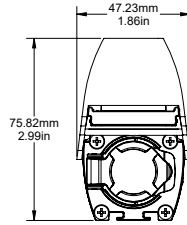
Accessory Dimensions

Louver

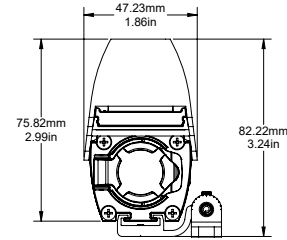
Note: 45deg cutoff louver may be added in catalogue logic as part of the optical distribution specification to match fixture specification or ordered separately as an accessory. Standard louver color is black. Consult factory for additional color options.



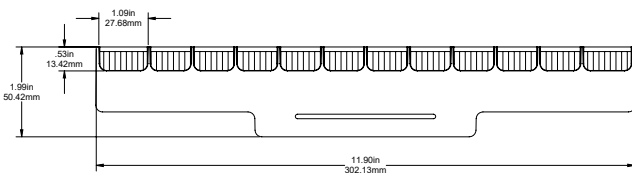
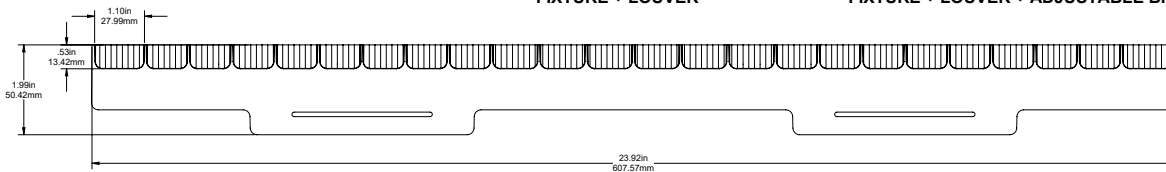
OVERALL LOUVER DIMENSIONS



OVERALL DIMENSIONS
FIXTURE + LOUVER



OVERALL DIMENSIONS
FIXTURE + LOUVER + ADJUSTABLE BRACKET



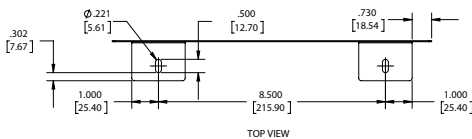
Visor

Note: Visor with 45deg shielding angle provides glare reduction and optical shielding in addition to shielding the fixture, cables and mounts. Visors can be added as part of the optical distribution specification to match fixture specification or separately as an accessory. Standard visor color options are black or white. Consult factory for other RAL colors.

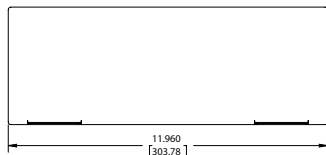


1 Foot

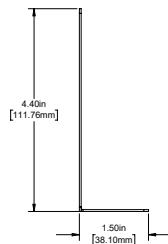
2 Foot



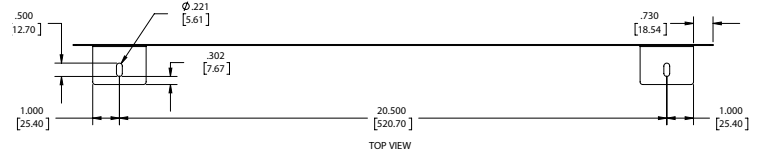
TOP VIEW



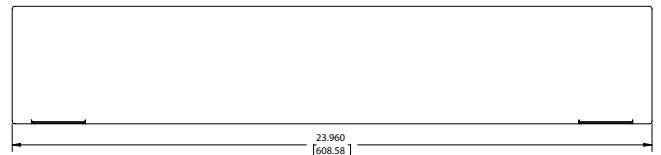
RIGHT VIEW



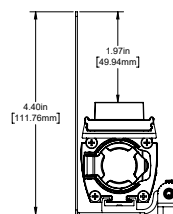
OVERALL VISOR DIMENSIONS



TOP VIEW



RIGHT VIEW



OVERALL DIMENSIONS
FIXTURE + VISOR

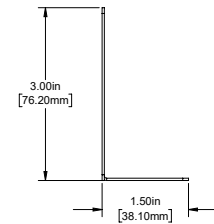
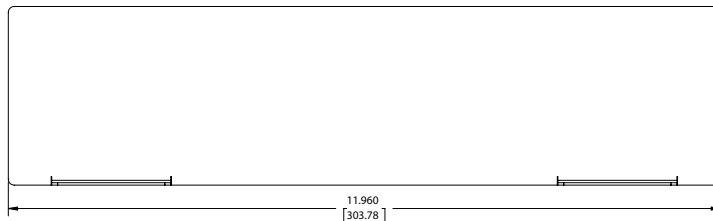
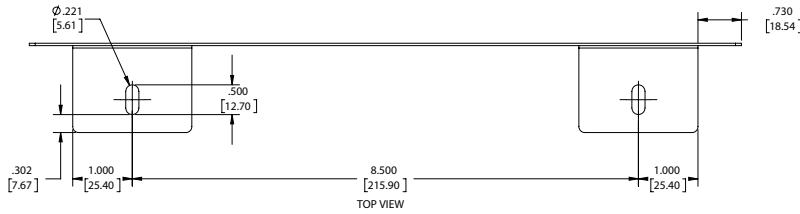
Accessory Dimensions

Mask

Note: Masking plate is aesthetic feature used to hide the fixture cables and/or provide custom RAL color. Masks can be added as part of the optical distribution specification to match fixture specification or separately as an accessory. Standard color options for masking plate are on visor page black and white are not capitalized. Consult factory for other RAL colors.

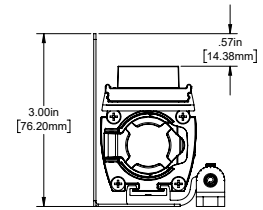
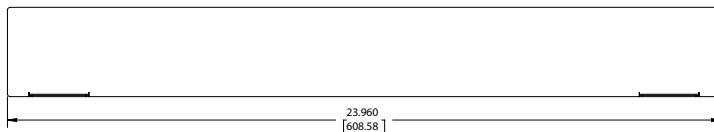
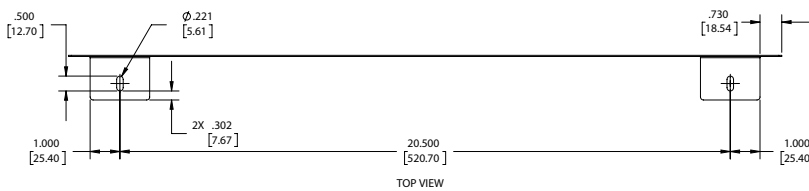


1 Foot



OVERALL MASKING SHIELD DIMENSIONS

2 Foot



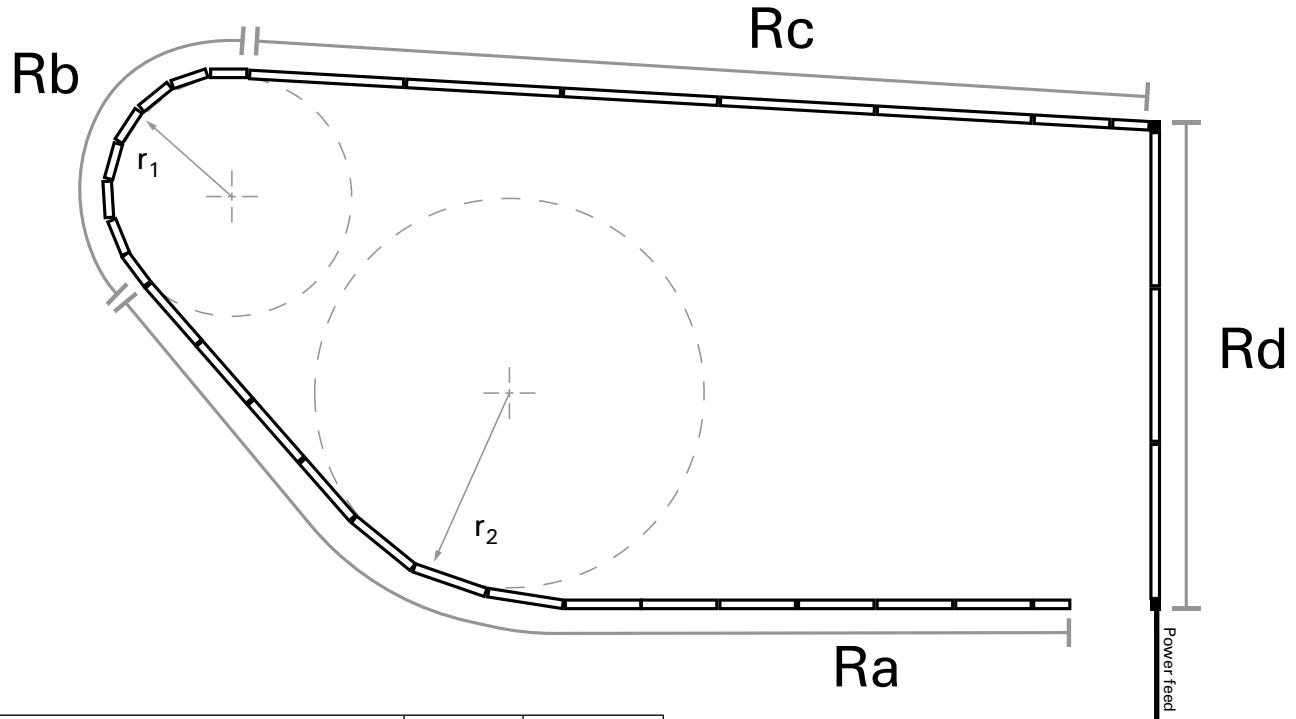
OVERALL DIMENSIONS
FIXTURE + MASKING SHIELD

Arms

Note: For offset and arm options, consult factory



Run Specification Guidelines



Min allowable radius of cove for 1F Fixtures	$r_1 =$	35"
Min allowable radius of cove for 2F Fixtures	$r_2 =$	70"
Min allowable radius of cove for 4F Fixtures	$r_4 =$	140"

Linear Run Specifications

Linear runs can be broken down into segments for easier specifications. Mounting brackets and power feeds are included in any run specifications. Jumper accessory is required for bend radius > 20 deg. For example, the architectural drawing above would be specified as 3 separate runs that could be combined together into a 70 ft run using 1x power feed for either 05L or 10L output fixtures.

If this was a 70 ft run of 15L fixtures, it would require 2x power feeds at 120V but still only 1x power feed at 277V:

- Ra would be specified with Length = $27F/2 = 27$ ft linear run (13x 2 ft fixtures + 1x 1 ft fixture + power feed) Note: Bend radius > 70°.
- Rb would be specified with Length = $8F/1 = 8$ ft linear run of 1 ft fixtures (8x 1 ft fixture) Note: Bend radius > 35°.
- Rc + Rd would be specified with Length = $35F = 35$ ft linear run (8x 4 ft fixtures + 1x 2 ft fixture + 1x 2 ft fixture)

Note: Square corner between Rc and Rd uses a 1 ft jumper. Jumpers are required for angles > 20 deg.

This run could be specified as multiple runs or as a bulk order by fixture quantity. Contact customer service for custom run configurations.

