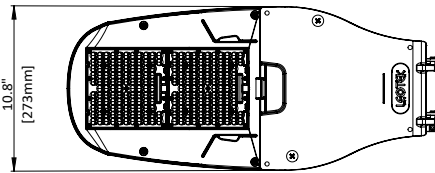
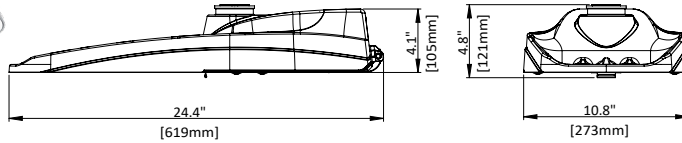


KarbonCobra ComfortEnhanced™ LED Streelight Series

KC2CE Specification Data Sheet



Luminaire Data

Weight 10.8 lbs [4.9kg]

EPA 0.46 ft²

Ordering Information

Sample Catalog No.: KC2CE-224A-MV-30K7-T2R-DB1-CF-P5-SP2-PS-WL1-BBL-PT6

Product	LED Code	Voltage	Color Temp CRI	Optical Distribution	Finish*	Performance Code
KC2CE KarbonCobra Size 2 ComfortEnhanced	224 A 224 LEDs Gen-A	MV 120-277Vac HV 347-480Vac	22K7 2700K, 70CRI 27K7 2700K, 70CRI 30K7 3000K, 70CRI 40K7 4000K, 70CRI 50K7 5000K, 70CRI	T2R Type-2(regular) T3R Type-3(regular)	BK Black DB1 Dark Bronze (RAL8019) GY Gray CF¹ Coastal Finish	P1 to P16 (see Page 3, 4 for details)

Driver & Control Options	General Options
Driver Options (0-10V driver standard) D4i² DALI D4i Driver	Surge (10kV/5kA, Fail-to-On Surge Protection Device standard) LSSP2 20kV/10kA Extreme Surge, Fail-to-Off SP2 20kV/10kA Extreme Surge, Fail-to-On
Receptacle Options (ANSI 7-PIN Control Ready Receptacle standard.) ³ LPCR No Receptacle On Top of the luminaire TLR4U² D4i DALI 4-PIN Twist Lock Receptacle (Top) TLR4L² D4i DALI 4-PIN Twist Lock Receptacle (Bottom)	Wattage Label WL Wattage Label, ANSI C136.15-2015 compliant WL1 Wattage Label, ANSI C136.15-2020 compliant
Control Options LLPC⁴ Long Life Photocell PS⁵ Field Adjustable Performance Selector SC⁴ Shorting Cap (factory installed) ZMSL2⁹ Zhaga Book 18 Motion Sensor w/ L2 Lens ZMSL7⁹ Zhaga Book 18 Motion Sensor w/ L7 Lens	Shields* CSS Cul-De-Sac Shield, Snap-On (factory installed) FSS Front Side Shield, Snap-On (factory installed) HSS House Side Shield, Snap-On (factory installed) VHS 80 Degree Cutoff Shield, Snap-On (factory installed) Other 4B 4-Bolt Mounting Bracket BBL Bubble level (inside of the housing) DSC Optional Door Safety Cable DFXXX⁷ Double Fuse ('XXX' = specify 208, 240, 480V) IP54⁶ Luminaire level IP54 PTX⁸ 12 AWG Three-Wire Pigtail with Length in Feet ('X' = specify length 3, 6, 10) RWG Rubber Wildlife Guard SFXXX⁷ Single Fuse ('XXX' = specify 120, 277, 347V)

New Features

- ComfortEnhanced technology provides low glare for enhanced visual comfort and safety.
- 7 Pin ControlReady Receptacle Standard.
- Luminaire-level IP54 rating optional.
- Up to 16 Performance Codes.
- Full dimming capability with PS, up to 2,000+ output options.
- Up to 50°C rating.
- Die-cast aluminum ADC1 housing.
- Single Hand door release, tool free.
- Standard 3-position straight terminal block.

General Accessories*
Shields* CSSKC2CE Cul-De-Sac Shield, Snap-On* FSSKC2CE Front Side Shield, Snap-On* HSSKC2CE House Side Shield, Snap-On* VHSC2CE 80 Degree Cutoff Shield, Snap-On*
Mounting Brackets (Specify finish)** PTB Pole Top Tenon Horizontal Arm Bracket PTB2 Pole Top Tenon Horizontal Arm Bracket (2@180°) RPB Round Pole Horizontal Arm Bracket SPB Square Pole Horizontal Arm Bracket WB Wall Horizontal Arm Bracket
Other** BSK Bird Deterrent Spider Kit LLPCMV Long Life Photocontrol MV LLPCHV Long Life Photocontrol HV
*Unless specified for field installation, Shields are shipped installed. **All Mounting and Other Accessories are ordered & shipped separately, not to be included in the luminaire's catalog number.

1. Specify the CF Option for coastal installation. See warranty for details.
2. 'TLR4U' & 'TLR4L' twist lock receptacle option requires 'D4i' DALI driver option to be selected.
3. ANSI 7-PIN Control Ready Receptacle standard, is compatible with 'LLPC', 'SC', and 'PS' and Networked Lighting Controls (NLC) nodes (by LEOTEK or others).
4. 'LLPC' & 'SC' do not ship installed, included w/ luminaire.
5. 'PS' Field Adjustable Performance Selector enables field adjustable light output dimming control from the specified Performance Code (see table on pg.3 and pg.4 for details).
6. When 'IP54' is specified, 'RWG' will be included.
7. For single or double fusing, 'XXX' must specify required voltage.
8. 'PTX' option, 'X' must specify pigtail length in feet.
9. 'ZMSL2', or 'ZMSL7' Zhaga Book 18 motion sensor option require both "D4i" DALI driver option and 'TLR4L' D4i DALI 4-PIN twist lock receptacle (bottom) to be selected.
Top receptacle for use with wireless DALI control node (by LEOTEK or others).

Luminaire Specifications

Housing & Construction

Die-cast aluminum ADC1 housing with universal two-bolt slip fitter mounts to 1-1/4" to 2" (1-5/8" to 2-3/8" O.D. diameter mast arm. One-piece aluminum housing provides passive heat-sinking of the LEDs and has upper surfaces that shed precipitation. Four-bolt mounting bracket (4B option) is available. Mounting provisions meet 3G vibration per ANSI C136.31 Normal Application, Bridge & Overpass by independent lab. Mounting has leveling adjustment from $\pm 5^\circ$ in 2.5° steps. All hardware is stainless steel. Electrical components are accessed without tools via die cast aluminum door with one stainless steel quick release latch. Provided standard with removable polycarbonate wildlife guard. For additional protection, optional rubber wildlife guard (RWG) which conforms snugly to the mast arm is offered. All exposed hardware and fasteners are corrosion resistant stainless-steel. Entire luminaire is IP54 rated if 'IP54' is specified.

Light Emitting Diodes

Hi-flux/Hi-power white LEDs produce a minimum of 90% of initial lumen output at 60,000 hours of life based on IES TM-21 (at 25°C) LEDs are tested in accordance with IES LM-80 testing procedures. IES TM-21 lumen maintenance life projection is based on 6X the duration of the LED's IES LM-80 performance data. LED correlated color temperature options of 2200K, 2700K, 3000K, 4000K, or 5000K @ 70CRI. LEDs are 100% mercury and lead free.

Power Supply

IP66 rated power supply with high power factor of > 90%. Auto sensing universal AC input from 120 to 277VAC (MV model) and 347 to 480VAC (HV mode) rated for both line to line and line to neutral applications. Maximum THD rating of 20%. Class 1 or Class 2. Built-in overheating protection mechanism will reduce drive current to LEDs and electrical components if the driver experiences unusual internal overheating situation. Built-in short circuit, voltage overload, and current overload protection with automatic recovery after correction.

Optical Systems

ComfortEnhanced™ low glare LED engine with angled transition plate design. (patent pending). All micro-lens optical systems produce IESNA Type2, or Type 3 distributions and are fully sealed to maintain an IP66 rating. Luminaire produces 0% total lumens above 90° (BUG Rating, U=0). Optional house side shield(HSS) cuts light off at 1/2 mounting height behind luminaire. Front side shield (FSS) cuts light off at approximately one mounting height in front of the luminaire (street side). Cul-de-sac shield (CSS) provides back and side light control for end of cul-de-sac applications. 80 degree cutoff shield (VHS) eliminates very high angle light above 80 degrees from luminaire. All shields are field installable without tools. (see 'Ordering Information' for details).

Photometry

luminaires photometry are tested by certified independent testing laboratories in accordance with IES LM-79 testing procedures.

Electrical

Rated life of electrical components is 100,000 hours. Standard 0-10V dimmable drivers use an isolated power supply with 6kV integral surge standard. Power supply features a minimum power factor of 0.90 and <20% Total Harmonic Distortion (THD). EMC meets or exceeds FCC CFR Part 15. Optional DALI D4i certified LED drivers also available, which complies with IEC 62386 and ANSI C137.4 and DiA. Standard 3-position straight terminal block accommodates 6 to 16 AWG wire. Standard surge protection (10kV/5kA) complies with IEEE/ANSI C62.41 and ANSI C136.2-2015. Optional 'SP2' and 'LSSP2' provides (20kV/ 10kA) extreme level surge protection.

Field Adjustability

Optional Performance Selector 'PS' is an integral 8-step fixed position dial allowing field adjustable lumen and wattage dimming control for added project and design versatility to meet installation specific requirements. The specified Performance Code provides maximum lumen output and will be factory set when the 'PS' option is selected. Only compatible KarbonCobra standard 0-10V drivers. Not compatible with 'D4i' DALI driver option.

Controls

Standard ANSI C136.41 7-wire controls ready receptacle is compatible with shorting cap ('SC'), photocell ('LLPCMV'/'LLPCHV'), wireless control module/node by others and LEOTEK's smart lighting control solutions (contact factory for details and availability). All 7-wire photocontrol receptacles have tool-less rotatable bases with a positive lock to not allow for over-rotation and possible damage to the receptacle. Optional DALI D4i driver configurations are also available for added controllability and design flexibility. DALI compatible 'TLR4U' and 'TLR4L' 4-PIN twist lock receptacle options available (wireless DALI control nodes or sensors by others).

Quality Control

Every luminaire is assembled in the USA and is performance tested before and after a 2-hour burn-in period.

Finish

Housing receives a fade and abrasion resistant polyester powder coat finish with 3.0 mil nominal thickness. Finish tested to withstand 5000 hours in salt spray exposure per ASTM B117 and Coastal Finish per ASTM G85. Finish tested 500 hours in UV exposure per ASTM G154 and meets ASTM D523 gloss retention.

Listings/Ratings/Labels

Luminaires are UL listed for use in wet locations in the United States and Canada. IP54 rating is optional. Luminaires are qualified to operate at ambient temperatures of -40°C to 50°C (-40°F to 122°F), some performance codes are qualified to operate at ambient temperatures of -40°C to 40°C (-40°F to 104°F), see details on page 3 and page 4.

Warranty

10-year limited warranty is standard on luminaire and components. See LEOTEK.com for warranty details, terms and conditions.

Standards

Luminaire complies with: ANSI: C136.2, C136.3, C136.10, C136.13, C136.15, C136.22, C136.31, C136.35, C136.37, C136.41, C62.41, C78.377, C82.77 Other: FCC 47 CFR, IEC 60598, ROHS II, UL 1449, UL 1598

Vandal Resistance

Housing and optics rated to IK10.

Color Specifications

Order Code	Color	RAL #	Pantone Equivalent
GY	Gray	7040	429C
BK	Black	9004	BLACK 6C
DB1	Dark Bronze	8019	412

TM21 Lumen Maintenance per IEC TM21-11 Calculation

Model Number	50,000 Hours	60,000 Hours	80,000 Hours	100,000 Hours
KC2CE 224A (P1-P16)	94%	94%	92%	91%

Nominal Performance Data 2200K (22K7) (2R optic, 70CRI, standard IK10 rated lens)

All data shown is nominal. Normal tolerance +/- 10% due to factors that include distribution type, LED bin variance and ambient temperatures.

LED Code	Performance Code	System Wattage (W) WL ²	Delivered Lumens(Lm) ¹	Wattage Label WL ¹ ³	Lumen Label WL ¹ ³	Efficacy (Lm/W)
224A	P1	62	8,962	60	9,000	146
	P2	68	9,881	70	10,000	145
	P3	76	10,781	80	11,000	143
	P4	83	11,671	80	12,000	141
	P5	90	12,530	90	13,000	139
	P6	98	13,378	100	13,000	137
	P7	105	14,225	100	14,000	136
	P8	110	15,168	110	15,000	137
	P9	118	15,967	120	16,000	136
	P10	125	16,755	130	17,000	134
	P11	133	17,496	130	17,000	132
	P12	140	18,264	140	18,000	130
	P13	148	18,908	150	19,000	128
	P14	155	19,635	160	20,000	126

Nominal Performance Data 2700K (27K7) (2R optic, 70CRI, standard IK10 rated lens)

All data shown is nominal. Normal tolerance +/- 10% due to factors that include distribution type, LED bin variance and ambient temperatures.

LED Code	Performance Code	System Wattage (W) WL ²	Delivered Lumens(Lm) ¹	Wattage Label WL ¹ ³	Lumen Label WL ¹ ³	Efficacy (Lm/W)
224A	P1	62	9,816	60	10,000	160
	P2	68	10,822	70	11,000	158
	P3	76	11,808	80	12,000	156
	P4	83	12,783	80	13,000	154
	P5	90	13,723	90	14,000	152
	P6	98	14,652	100	15,000	150
	P7	105	15,580	100	16,000	148
	P8	110	16,613	110	17,000	150
	P9	118	17,488	120	17,000	148
	P10	125	18,350	130	18,000	147
	P11	133	19,162	130	19,000	144
	P12	140	20,003	140	20,000	143
	P13	148	20,709	150	21,000	140
	P14	155	21,505	140	17,000	121
	P15	163	22,241	140	17,000	121

Notes:

1. Nominal lumens. Normal tolerance ± 10% due to factors including distribution type, LED bin variance, and ambient temperatures
2. WL- Wattage Label, ANSI C136.15-2015 compliant.
Wattage- is rounded to the nearest value multiples of 10.
3. WL1- Wattage Label, ANSI C136.15-2020 compliant:
Wattage- is rounded to the nearest value multiples of 10.
Lumens- is rounded to the nearest value multiples of 1,000 lumens. (up to 24,000 lumens).
4. Maximum LED drive current is 500mA.

Nominal Performance Data 3000K (30K7) (2R optic, 70CRI, standard IK10 rated lens)

All data shown is nominal. Normal tolerance +/- 10% due to factors that include distribution type, LED bin variance and ambient temperatures.

LED Code	Performance Code	System Wattage (W) WL ²	Delivered Lumens(Lm) ¹	Wattage Label WL ¹ ³	Lumen Label WL ¹ ³	Efficacy (Lm/W)
224A	P1	62	10,243	60	10,000	166
	P2	68	11,292	70	11,000	165
	P3	76	12,321	80	12,000	163
	P4	83	13,339	80	13,000	161
	P5	90	14,320	90	14,000	159
	P6	98	15,289	100	15,000	157
	P7	105	16,258	100	16,000	155
	P8	110	17,335	110	17,000	157
	P9	118	18,248	120	18,000	155
	P10	125	19,148	130	19,000	153
	P11	133	19,995	130	20,000	151
	P12	140	20,873	140	21,000	149
	P13	148	21,610	150	22,000	146
	P14	155	22,440	160	22,000	144
	P15	163	23,208	160	23,000	142

Nominal Performance Data 4000K (40K7) / 5000K (50K7) (2R optic, 70CRI, standard IK10 rated lens)

All data shown is nominal. Normal tolerance +/- 10% due to factors that include distribution type, LED bin variance and ambient temperatures.

LED Code	Performance Code	System Wattage (W) WL ²	Delivered Lumens(Lm) ¹	Wattage Label WL ¹ ³	Lumen Label WL ¹ ³	Efficacy (Lm/W)
224A	P1	62	10,670	60	11,000	173
	P2	68	11,763	70	12,000	172
	P3	76	12,835	80	13,000	169
	P4	83	13,894	80	14,000	168
	P5	90	14,916	90	15,000	165
	P6	98	15,926	100	16,000	163
	P7	105	16,935	100	17,000	161
	P8	110	18,057	110	18,000	163
	P9	118	19,009	120	19,000	161
	P10	125	19,946	130	20,000	159
	P11	133	20,828	130	21,000	157
	P12	140	21,742	140	22,000	155
	P13	148	22,510	150	23,000	152
	P14	155	23,375	160	23,000	150
	P15	163	24,175	160	24,000	148
	P16	171	24,967	170	25,000	146

Notes:

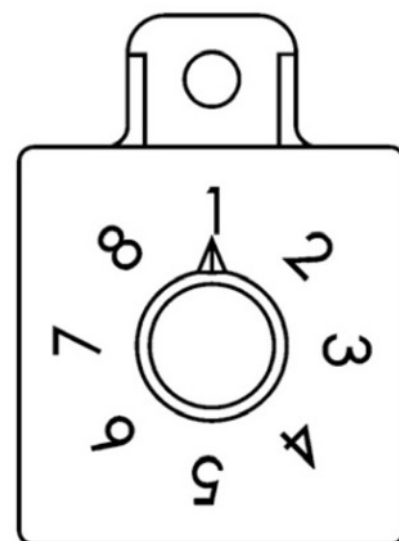
1. Nominal lumens. Normal tolerance $\pm$ 10% due to factors including distribution type, LED bin variance, and ambient temperatures
2. WL- Wattage Label, ANSI C136.15-2015 compliant.
Wattage- is rounded to the nearest value multiples of 10.
3. WL1- Wattage Label, ANSI C136.15-2020 compliant:
Wattage- is rounded to the nearest value multiples of 10.
Lumens- is rounded to the nearest value multiples of 1,000 lumens. (up to 24,000 lumens).
4. Maximum LED drive current is 500mA.

Field Adjustable Performance Selector 'PS'

The optional Performance Selector is an integral dial that allows for field adjustable lumen/wattage dimming control for added design versatility. Normal tolerance +/- 5%. 'PS' dial ships from the factory at the maximum 100% output setting #8 which equals the customer specified Performance Code.

PS Position	Lumen Output %	P1 Wattage	P2 Wattage	P3 Wattage	P4 Wattage	P5 Wattage	P6 Wattage	P7 Wattage	P8 Wattage	P9 Wattage	P10 Wattage
8	100%	62	68	76	83	90	98	105	110	118	125
7	90%	55	61	68	75	81	88	94	99	106	113
6	80%	49	55	60	66	72	78	84	88	94	100
5	70%	43	48	53	58	63	68	73	77	82	88
4	60%	37	41	45	50	54	59	63	66	71	75
3	50%	31	34	38	41	45	49	52	55	59	63
2	40%	25	27	30	33	36	39	42	44	47	50
1	30%	18	20	23	25	27	29	31	33	35	38

PS Position	Lumen Output %	P11 Wattage	P12 Wattage	P13 Wattage	P14 Wattage	P15 Wattage	P16 Wattage
8	100%	133	140	148	155	163	171
7	90%	119	126	133	140	147	154
6	80%	106	112	118	124	130	137
5	70%	93	98	103	109	114	120
4	60%	80	84	89	93	98	102
3	50%	66	70	74	78	82	85
2	40%	53	56	59	62	65	68
1	30%	40	42	44	47	49	51



Example of Field Adjustable Selector (PS) and Label.

BUG Ratings: 2200K (22K7)

Product & LED Code	Performance Code	Type 2R	Type 3R
		BUG Rating	BUG Rating
KC2CE-224A	P1	B2-U0-G2	B2-U0-G2
	P2	B2-U0-G2	B2-U0-G2
	P3	B2-U0-G2	B2-U0-G2
	P4	B2-U0-G2	B2-U0-G2
	P5	B3-U0-G3	B3-U0-G2
	P6	B3-U0-G3	B3-U0-G2
	P7	B3-U0-G3	B3-U0-G3
	P8	B3-U0-G3	B3-U0-G3
	P9	B3-U0-G3	B3-U0-G3
	P10	B3-U0-G3	B3-U0-G3
	P11	B3-U0-G3	B3-U0-G3
	P12	B3-U0-G3	B3-U0-G3
	P13	B3-U0-G3	B3-U0-G3
	P14	B3-U0-G3	B3-U0-G3

BUG Ratings: 3000K (30K7)

Product & LED Code	Performance Code	Type 2R	Type 3R
		BUG Rating	BUG Rating
KC2CE-224A	P1	B2-U0-G2	B2-U0-G2
	P2	B2-U0-G2	B2-U0-G2
	P3	B2-U0-G2	B3-U0-G2
	P4	B3-U0-G3	B3-U0-G2
	P5	B3-U0-G3	B3-U0-G3
	P6	B3-U0-G3	B3-U0-G3
	P7	B3-U0-G3	B3-U0-G3
	P8	B3-U0-G3	B3-U0-G3
	P9	B3-U0-G3	B3-U0-G3
	P10	B3-U0-G3	B3-U0-G3
	P11	B3-U0-G3	B3-U0-G3
	P12	B3-U0-G3	B3-U0-G3
	P13	B3-U0-G3	B3-U0-G3
	P14	B3-U0-G3	B3-U0-G3
	P15	B3-U0-G3	B3-U0-G3

BUG Ratings: 2700K (27K7)

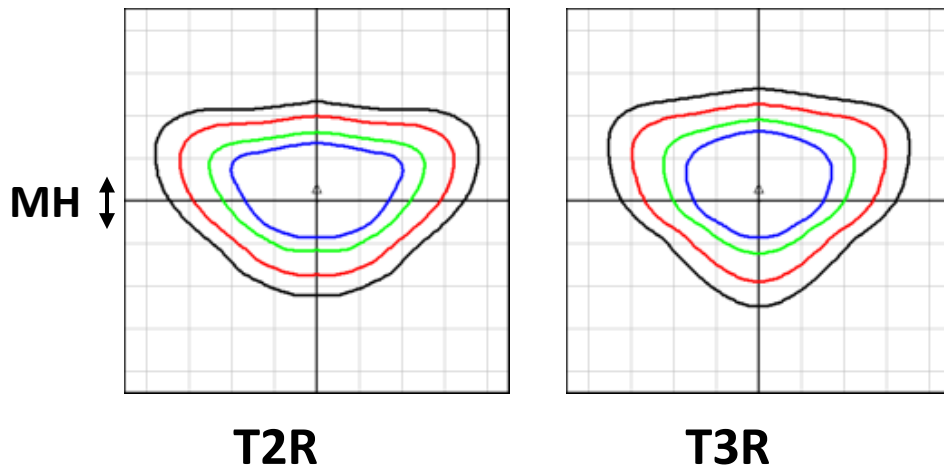
Product & LED Code	Performance Code	Type 2R	Type 3R
		BUG Rating	BUG Rating
KC2CE-224A	P1	B2-U0-G2	B2-U0-G2
	P2	B2-U0-G2	B2-U0-G2
	P3	B2-U0-G2	B2-U0-G2
	P4	B3-U0-G3	B3-U0-G2
	P5	B3-U0-G3	B3-U0-G2
	P6	B3-U0-G3	B3-U0-G3
	P7	B3-U0-G3	B3-U0-G3
	P8	B3-U0-G3	B3-U0-G3
	P9	B3-U0-G3	B3-U0-G3
	P10	B3-U0-G3	B3-U0-G3
	P11	B3-U0-G3	B3-U0-G3
	P12	B3-U0-G3	B3-U0-G3
	P13	B3-U0-G3	B3-U0-G3
	P14	B3-U0-G3	B3-U0-G3
	P15	B3-U0-G3	B3-U0-G3

BUG Ratings: 4000K (40K7) / 5000K (50K7)

Product & LED Code	Performance Code	Type 2R	Type 3R
		BUG Rating	BUG Rating
KC2CE-224A	P1	B2-U0-G2	B2-U0-G2
	P2	B2-U0-G2	B2-U0-G2
	P3	B3-U0-G3	B3-U0-G2
	P4	B3-U0-G3	B3-U0-G2
	P5	B3-U0-G3	B3-U0-G3
	P6	B3-U0-G3	B3-U0-G3
	P7	B3-U0-G3	B3-U0-G3
	P8	B3-U0-G3	B3-U0-G3
	P9	B3-U0-G3	B3-U0-G3
	P10	B3-U0-G3	B3-U0-G3
	P11	B3-U0-G3	B3-U0-G3
	P12	B3-U0-G3	B3-U0-G3
	P13	B3-U0-G3	B3-U0-G3
	P14	B3-U0-G3	B3-U0-G3
	P15	B3-U0-G3	B3-U0-G3
	P16	B3-U0-G3	B3-U0-G3

Optical Distribution

(Each square block represents one mounting height, MH)

**MH = 30ft**

Motion Sensor (Optional) Specifications*

'ZMSL2', or 'ZMSL7' 4 pin (for Zhaga Book 18 installation) motion sensor option require both "D4i" DALI driver option and 'TLR4L' D4i DALI 4-PIN twist lock receptacle (bottom) to be selected. Top receptacle for use with wireless DALI control node (by LEOTEK or others).

Description

Digital passive infrared luminaire 4-PIN outdoor occupancy sensor provides high/low/off control based on motion detection. Initial setup and subsequent sensor adjustments are made using the iOS or Android Sensor Configuration App (search for Wattstopper Sensor Configuration App) or through compatible DALI devices and outdoor lighting controllers conforming to Zhaga or Dii standards (103 and 303*) remotely. Available with both MV or HV input voltage options.

Operation

Standard factory setting will dim the luminaire to 50% until motion is sensed and then it will power to 100%. When motion is not detected for five minutes, the luminaire will dim back to 50%. Ramp up and fade down times are adjustable, but initially set to NONE. The percent dimming and time durations may be field adjusted using the iOS or Android Sensor Configuration App by Bluetooth* low energy technology commissioning (search for Wattstopper Sensor Configuration App) or through compatible DALI devices and outdoor lighting controllers conforming to Zhaga or DiiA standards (103 and 303**) remotely.

*Devices with Bluetooth 5.0, iPhone 8 and Samsung Galaxy S8 and later devices are recommended for optimal performance.

**DALI 303 features are continually released. Please consult Wattstopper for a list of current features.

Optical System

Multi-cell, multi-tier Fresnel lens with a 360 degree view detects unobstructed motion within one mounting height, up lens configurations for 8-15 ft. ('ZMSL2') or up to 40 ft. ('ZMSL7'). Consult factory for higher mounting height requirements.

Finish

Sensor exterior ring and lens are gray polycarbonate, UV and impact resistant.

Listings/Ratings

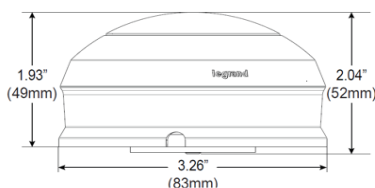
Sensor is UL and cUL listed(E101196), IP65 rated and CE compliant.

Warranty

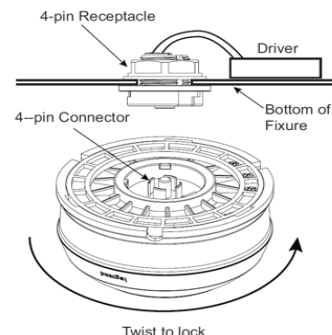
5-year limited warranty on luminaires and components with a motion sensor.

Motion Sensor (Optional) Data

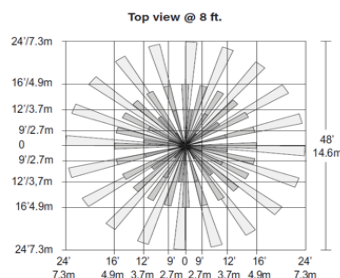
ZMSL2/ZMSL7 Dimensions



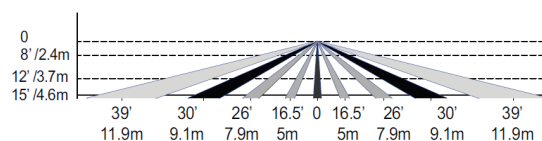
ZMSL2/ZMSL7 Installation



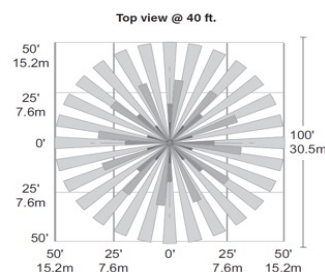
L2 Lens Coverage Top View



L2 Lens Coverage Side View



L7 Lens Coverage Top View



L7 Lens Coverage Side View

