PHILIPS LUMEC

Roadway

RoadFocus

RFL (large)

Project:

Location:

Cat.No: RFL190W112LED4K-G2-R3M-UNV-PH9/RCD-G

Type: LED D

Lamps: Qty:

Notes:

The Philips Lumec RoadFocus LED Cobra Head luminaires feature a sleek design that provides seamless replacement of existing HID luminaires. RoadFocus is available in three sizes, offers multiple lumen packages, and a complete array of optical distributions, making it an outstanding solution for all types of roadway applications.

Ordering guide

example: RFL-215W96LED4K-G2-R3M-UNV-DMG-RCD-GY3

Prefix	LED module	Series	Distribution	Voltage	Options: Controls	Options: Luminaire	Finish
RFL	190W112LED4K	G2	R3M	UNV		PH9/RCD	GY3
RFL RoadFocus Roadway, large	**3000K** **145W64LED3K** **90W80LED3K**[7] **135W80LED3K** **180W80LED3K** **160W96LED3K** **190W112LED3K**[7] **215W96LED3K** **241W112LED3K** **335W96LED3K**[8] **350W112LED3K**[8] **4000K** **145W64LED4K** **90W80LED4K**[7] **135W80LED4K** **180W80LED4K** **160W96LED4K** **190W112LED4K** **215W96LED4K** **241W112LED4K** **335W96LED4K**[8] **350W112LED4K**[8]	**G2** Generation 2	**Type 2** **R2S** Type II short (ASYM) **R2M** Type II Medium (ASYM) **Type 3** **R3S** Type III short (ASYM) **R3M** Type III Medium (ASYM) **Type 4** **4** Type IV (ASYM) **Type 5** **5**[2] Type V (SYMM)	**UNV** 120-277V **HVU** 347-480VAC	**AST**[1,4] Pre-set driver for progressive start-up **CDMGE25**[1,4] 8 hrs. 25% reduction **CDMGE50**[1,4] 8 hrs. 50% reduction **CDMGE75**[1,4] 8 hrs. 75% reduction **CDMGM25**[1,4] 6 hrs. 25% reduction **CDMGM50**[1,4] 6 hrs. 50% reduction **CDMGM75**[1,4] 6 hrs. 75% reduction **CDMGS25**[1,4] 4 hrs. 25% reduction **CDMGS50**[1,4] 4 hrs. 50% reduction **CDMGS75**[1,4] 4 hrs. 75% reduction **CLO**[1,4] Pre-set driver to manage lumen depreciation **DALI**[1,4] Digitally addressable lighting interface **DMG**[5] 0-10V **OTL**[1,4] Pre-set driver to signal end of life of the lamp	**API** Factory installed NEMA label, ANSI C136.15 compliant **FAWS**[6] Field adjustable wattage selector **HS** House Side Shield, shield, 1 per 16 LED light engine **PH8**[1] Twist-lock Photoelectric Cell, UNV (120-277VAC) **PH8/347**[1] Twist-lock Photoelectric Cell, 347VAC **PH8/480**[1] Twist-lock Photoelectric Cell, 480VAC **PHXL**[1] Twist-lock Photoelectric Cell, extended life, UNV (120-277VAC) **PH9** Shorting cap **RCD**[3,5] Receptacle for twist-lock photocell or shorting cap, 5-pin (standard) **RCD7**[3] Receptacle for twist-lock photocell or shorting cap, 7-pin (optional) **SP2** 20kV / 20kA Surge Protector (optional)	**Textured** **BK** Black **BZ** Bronze **GY3** Gray **WH** White

1. **347V** and **480V** not available.
2. Not available with **HS** option.
3. Use of photoelectric cell or shorting cap is required to ensure proper illumination.
4. Dimming choices: Select either **DMG**, **DALI** or one of the **CDMG** options.
5. Please note this integrated feature come standard with RoadFocus.
6. **FAWS** not available with **CDMG** options, **DALI** or **CLO**.
7. **FAWS** table accuracy +/- 15% on these models.
8. Not available with driver options, **AST**, **CLO**, **CDMG**, **DALI**, **OTL**.

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Accessories (must be ordered as separate line items - quickly and easily installed in the field)

CPC or CPCD[1]
CityTouch Connector Node.

1. Contact the factory for additional support when connected lighting or additional services are desired.

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions.L_{70} is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L_{70} hours limited to 6 times actual LED test hours

Ambient Temperature °C	Driver mA	Calculated L_{70} Hours	L_{70} per TM-21	Lumen Maintenance % at 60,000 hrs
25°C	up to 1050 mA	>100,000 hours	>60,000 hours	>88%

LED Wattage and Lumen Values: 3000K

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type R2S			Type R2M			Type R3S			Type R3M		
					Lumen Output	Efficacy (LPW)	BUG Rating	Lumen Output	Efficacy (LPW)	BUG Rating	Lumen Output	Efficacy (LPW)	BUG Rating	Lumen Output	Efficacy (LPW)	BUG Rating
RFL-145W64LED3K-G2	64	700	3000	137	16,813	123	B3-U0-G2	16,458	120	B3-U0-G3	16,181	118	B2-U0-G3	16,127	118	B3-U0-G3
RFL-90W80LED3K-G2	80	350	3000	93	11,541	124	B2-U0-G2	11,297	122	B2-U0-G2	11,107	120	B2-U0-G2	11,070	119	B2-U0-G2
RFL-135W80LED3K-G2	80	530	3000	136	16,601	122	B3-U0-G2	16,251	119	B3-U0-G3	15,977	117	B2-U0-G3	15,924	117	B3-U0-G3
RFL-180W80LED3K-G2	80	700	3000	174	21,016	121	B3-U0-G2	20,572	118	B3-U0-G3	20,226	116	B2-U0-G3	20,159	116	B3-U0-G3
RFL-160W96LED3K-G2	96	530	3000	161	19,921	124	B3-U0-G2	19,501	121	B3-U0-G3	19,172	119	B2-U0-G3	19,109	119	B3-U0-G3
RFL-215W96LED3K-G2	96	700	3000	207	25,219	122	B3-U0-G3	24,687	119	B3-U0-G3	24,271	117	B2-U0-G4	24,190	117	B3-U0-G3
RFL-335W96LED3K-G2	96	1050	3000	323	35,094	109	B4-U0-G4	34,354	106	B4-U0-G4	33,775	105	B3-U0-G4	33,663	104	B4-U0-G4
RFL-190W112LED3K-G2	112	530	3000	188	23,241	124	B3-U0-G3	22,751	121	B3-U0-G3	22,368	119	B3-U0-G4	22,294	119	B3-U0-G3
RFL-241W112LED3K-G2	112	700	3000	243	29,422	121	B3-U0-G3	28,801	119	B3-U0-G3	28,316	117	B3-U0-G4	28,222	116	B3-U0-G4
RFL-350W112LED3K-G2	112	950	3000	340	37,731	111	B4-U0-G4	36,935	109	B4-U0-G4	36,313	107	B3-U0-G5	36,193	107	B4-U0-G4

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 4			Type 5		
					Lumen Output	Efficacy (LPW)	BUG Rating	Lumen Output	Efficacy (LPW)	BUG Rating
RFL-145W64LED3K-G2	64	700	3000	137	16,210	118	B2-U0-G3	16,851	123	B4-U0-G2
RFL-90W80LED3K-G2	80	350	3000	93	11,127	120	B2-U0-G2	11,567	125	B4-U0-G2
RFL-135W80LED3K-G2	80	530	3000	136	16,006	117	B2-U0-G3	16,639	122	B4-U0-G2
RFL-180W80LED3K-G2	80	700	3000	174	20,263	116	B3-U0-G4	21,064	121	B5-U0-G3
RFL-160W96LED3K-G2	96	530	3000	161	19,207	119	B3-U0-G4	19,967	124	B5-U0-G3
RFL-215W96LED3K-G2	96	700	3000	207	24,315	117	B3-U0-G4	25,277	122	B5-U0-G3
RFL-335W96LED3K-G2	96	1050	3000	323	33,836	105	B3-U0-G5	35,175	109	B5-U0-G4
RFL-190W112LED3K-G2	112	530	3000	188	22,408	119	B3-U0-G4	23,295	124	B5-U0-G3
RFL-241W112LED3K-G2	112	700	3000	243	28,368	117	B3-U0-G4	29,489	121	B5-U0-G4
RFL-350W112LED3K-G2	112	950	3000	340	36,379	107	B3-U0-G5	37,818	111	B5-U0-G4

Actual performance may vary due to installation variables including optics, mounting/ceiling height, dirt depreciation, light loss factor, etc.; highly recommended to confirm performance with a layout - contact Applications at outdoorlighting.applications@philips.com.

Note: Some data may be scaled based on tests of similar. But not identical luminaries.

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LED Wattage and Lumen Values: 4000K

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type R2S			Type R2M			Type R3S			Type R3M		
					Lumen Output	Efficacy (LPW)	BUG Rating	Lumen Output	Efficacy (LPW)	BUG Rating	Lumen Output	Efficacy (LPW)	BUG Rating	Lumen Output	Efficacy (LPW)	BUG Rating
RFL-145W64LED4K-G2	64	700	4000	137	17,820	130	B3-U0-G2	17,444	127	B3-U0-G3	17,150	125	B2-U0-G3	17,093	125	B3-U0-G3
RFL-90W80LED4K-G2	80	350	4000	93	12,232	132	B3-U0-G2	11,974	129	B2-U0-G2	11,772	127	B2-U0-G2	11,733	127	B2-U0-G2
RFL-135W80LED4K-G2	80	530	4000	136	17,596	129	B3-U0-G2	17,224	126	B3-U0-G3	16,934	124	B2-U0-G3	16,878	124	B3-U0-G3
RFL-180W80LED4K-G2	80	700	4000	174	22,275	128	B3-U0-G3	21,805	125	B3-U0-G3	21,438	123	B3-U0-G4	21,367	123	B3-U0-G3
RFL-160W96LED4K-G2	96	530	4000	161	21,115	131	B3-U0-G2	20,669	129	B3-U0-G3	20,321	126	B2-U0-G3	20,254	126	B3-U0-G3
RFL-215W96LED4K-G2	96	700	4000	207	26,730	129	B3-U0-G3	26,166	126	B3-U0-G3	25,725	124	B3-U0-G4	25,640	124	B3-U0-G3
RFL-335W96LED4K-G2	96	1050	4000	323	37,197	115	B4-U0-G4	36,412	113	B4-U0-G4	35,799	111	B3-U0-G5	35,680	110	B4-U0-G4
RFL-190W112LED4K-G2	112	530	4000	188	24,634	131	B3-U0-G3	24,114	129	B3-U0-G3	23,708	126	B3-U0-G4	23,629	126	B3-U0-G3
RFL-241W112LED4K-G2	112	700	4000	243	31,185	128	B4-U0-G3	30,527	126	B3-U0-G4	30,013	124	B3-U0-G4	29,913	123	B3-U0-G4
RFL-350W112LED4K-G2	112	950	4000	340	39,992	118	B4-U0-G4	39,148	115	B4-U0-G4	38,489	113	B3-U0-G5	38,361	113	B4-U0-G4

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 4			Type 5		
					Lumen Output	Efficacy (LPW)	BUG Rating	Lumen Output	Efficacy (LPW)	BUG Rating
RFL-145W64LED4K-G2	64	700	4000	137	17,181	125	B2-U0-G3	17,861	130	B4-U0-G2
RFL-90W80LED4K-G2	80	350	4000	93	11,794	127	B2-U0-G2	12,260	132	B4-U0-G2
RFL-135W80LED4K-G2	80	530	4000	136	16,965	124	B2-U0-G3	17,636	129	B4-U0-G2
RFL-180W80LED4K-G2	80	700	4000	174	21,477	123	B3-U0-G4	22,326	128	B5-U0-G3
RFL-160W96LED4K-G2	96	530	4000	161	20,358	127	B3-U0-G4	21,163	132	B5-U0-G3
RFL-215W96LED4K-G2	96	700	4000	207	25,772	125	B3-U0-G4	26,791	129	B5-U0-G3
RFL-335W96LED4K-G2	96	1050	4000	323	35,864	111	B3-U0-G5	37,282	115	B5-U0-G4
RFL-190W112LED4K-G2	112	530	4000	188	23,751	127	B3-U0-G4	24,690	132	B5-U0-G3
RFL-241W112LED4K-G2	112	700	4000	243	30,067	124	B3-U0-G5	31,256	129	B5-U0-G4
RFL-350W112LED4K-G2	112	950	4000	340	38,559	114	B3-U0-G5	40,084	118	B5-U0-G4

Actual performance may vary due to installation variables including optics, mounting/ceiling height, dirt depreciation, light loss factor, etc.; highly recommended to confirm performance with a layout - contact Applications at outdoorlighting.applications@philips.com.

Note: Some data may be scaled based on tests of similar. But not identical luminaries.

Field Adjustable Wattage (FAWS) Multiplier Chart

FAWS Position	Typical Delivered Lumens Multiplier	Typical System wattage
1	0.31	0.28
2	0.53	0.50
3	0.62	0.58
4	0.70	0.67
5	0.78	0.75
6	0.83	0.81
7	0.89	0.87
8	0.92	0.91
9	0.96	0.95
10	1.00	1.00

Note: Typical value accuracy +/- 5%

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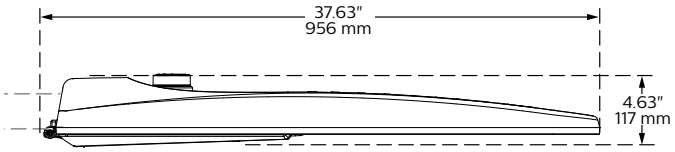
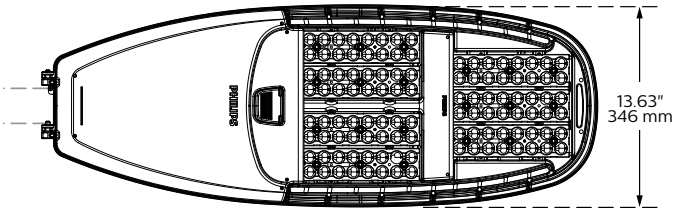
Dimensions

Side View



Bottom View



Weight: 27.3 Lbs

EPA: 0.92 sq. ft.

Specifications

Housing

Made of a low copper die cast Aluminum alloy (A360), 0.100" (2.5mm) minimum thickness. Fits on a 1.66" (42mm) O.D. (1.25" NPS), 1.9" (48mm) O.D. (1.5" NPS) or 2 3/8" (60mm) O.D. (2" NPS) by 5 1/2" (140mm) minimum long tenon. Comes with 2 zinc plated clamps fixed by 4 zinc plated hexagonal bolts 3/8 16 UNC for ease of installation. Provides an easy step adjustment of +/- 5° tilt in 2.5º increments. Includes integral bubble level standard (always included). A quick release, tool less entry, single latch, hinged, removable door opens downward to provide access to electronic components and to a terminal block. Door is secured to prevent accidental dropping or disengagement. A clearance of 13" (330mm) at the rear is required in order to remove the door. Complete with a bird guard protecting against birds and similar intruders and an ANSI label to identify wattage and source (both included in box). Housing (including electrical compartment) rated IP54 per ANSI C136.37.

Light Engine

Composed of 4 main components: LED Module / Optical System / Heat Sink / Driver.

Electrical components are RoHS compliant, IP66 sealed light engine LEDs tested by ISO 17025-2005 accredited lab in accordance with IESNA LM-80 guidelines in compliance with EPA ENERGY STAR, extrapolations in accordance with IESNA TM-21. Metal core board ensures greater heat transfer and longer lifespan.

LED Module: Composed of high-performance white LEDs. Color temperature as per ANSI/NEMA bin Neutral White, 3000 Kelvin nominal (3045K +/- 175K) or 4000 Kelvin nominal (3985K +/- 275K), CRI 70 Min. 75 Typical.

Optical System: Composed of high performance UV stabilized optical grade polymer refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. System is rated IP66. Performance shall be tested per LM-63, LM-79 and TM-15 (IESNA) certifying its photometric performance. 0% uplight and U0 per IESNA TM-15.

Heat Sink: Built in the housing, designed to ensure high efficacy and superior cooling by natural vertical convection air flow pattern always close to LEDs and driver optimising their efficiency and life. Product does not use any cooling device with moving parts (only passive cooling). Wide openings enable natural cleaning and removal of dirt and debris. Entire luminaire is rated for operation in ambient temperature of -40°C / -40°F up to +40°C / +104°F.

Driver: High power factor of 90% min. Electronic driver, operating range 50/60 Hz. Auto adjusting universal voltage input from 120 to 277 or 347 to 480 VAC rated for both application line to line or line to neutral, Class I, THD of 20% max. 1 driver (64 LED); 2 drivers (all others).

DMG: Dimming compatible 0-10 volts. The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built in driver surge protection of 2.5kV (min).

Integrated Features

DMG: Dimmable driver 0-10V.

RCD*: Receptacle with 5 pins enabling dimming, can be used with a twist lock Starsense or photoelectric cell or a shorting cap.

SP1: Surge protection device tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with DOE MSSLC Model Specification for LED Roadway Luminaires Appendix D Electrical Immunity High test level 10kV/10kA.

Please note that these integrated features always come with RoadFocus luminaire.

** Use of photoelectric cell or shorting cap is required to ensure proper illumination.*

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Specifications (continued)

Driver and Luminaire Options

AST*: Pre-set driver for progressive start-up of the LED module(s) to optimize energy management and enhance visual comfort at start-up.

CLO*: Pre-set driver to manage the lumen depreciation by adjusting the power given to the LEDs offering the same lighting intensity during the entire lifespan of the LED module.

DALI*: Pre-set driver compatible with the DALI control system.

OTL*: Pre-set driver to signal end of life of the LED module(s) for better fixture management.

CDMG*: Dynadimmer standard dimming functionalities including pre-programmed scenarios to suit many applications and needs from safety to maximum energy savings.

Safety Mode:
CDMGS25: 4 hours, 25% power dimming
CDMGS50: 4 hours 50% power dimming
CDMGS75: 4 hours 75% power dimming

Median Mode:
CDMGM25: 6 hours 25% power dimming
CDMGM50: 6 hours 50% power dimming
CDMGM75: 6 hours 75% power dimming

Economy Mode:
CDMGE25: 8 hours 25% power dimming
CDMGE50: 8 hours 50% power dimming
CDMGE75: 8 hours 75% power dimming

FAWS: Field Adjustable Wattage Selector, pre-set to the highest position, can be easily switched in the field to the required position. This reduces total luminaire wattage consumption and reduces the light level – see the FAWS multiplier chart for more details.

Note: It is not recommended to use FAWS with other dimming or controls; if you do, set the switch to position 10 (maximum output) to enable the other dimming or controls. Switching FAWS to any position other than 10 will disable the other dimming or controls.

S**P2:** 20kV / 20kA surge protection device that provides extra protection beyond the SP1 10kV/10kA level.

RCD7*: Receptacle with 7 pins enabling dimming and additional functionality (to be determined), can be used with a twist lock Starsense node or photoelectric cell or a shorting cap.

Please note: Additional hardware will be required to utilize the additional 2 pins on this receptacle.

HS: House side shield, 1 per 16 LED light engine.

PH8*: Twist-lock Photoelectric Cell, UNV (120-277VAC).

PH8/347*: Twist-lock Photoelectric Cell, HVU (347VAC).

PH8/480*: Twist-lock Photoelectric Cell, HVU (480VAC).

PHXL*: Twist-lock Photoelectric Cell, extended life, UNV (120-277VAC).

PH9*: Shorting cap.

API: Factory Installed NEMA label, ANSI C136.15 compliant

** Use of photoelectric cell or shorting cap is required to ensure proper illumination.*

Luminaire Useful Life

Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT in situ thermal testing in accordance with UL1598 and UL8750, Philips System Reliability Tool, Philips Advance data and Philips Lumileds LM-80/TM-21 data, expected to reach 100,000 + hours with >L70 lumen maintenance @ 25°C. Luminaire Useful Life accounts for LED lumen maintenance AND all of these additional factors including: LED life, driver life, PCB substrate, solder joints, on/off cycles, burning hours and corrosion.

Wiring

The connection of the luminaire is done using a terminal block connector 600V, 85A for use with #2 14 AWG. wires from the primary circuit, located inside the housing. Due to the inrush current that occurs with electronic drivers, recommend using a 10Amp time-delay fuse to avoid unwanted fuse blowing (false tripping) that can occur with normal or fast acting fuses.

Hardware

All exposed screws shall be complete with Ceramic primer seal to reduce seizing of the parts, also offers a high resistance to corrosion. All seals and sealing devices are made and/or lined with EPDM and/or silicone and/or rubber.

Finish

Color in accordance with the AAMA 2603 standard. Application of polyester powder coat paint (4 mils/100 microns) with ± 1 mils/24 microns of tolerance. The Thermosetting resins provides a discoloration resistant finish in accordance with the ASTM D2244 standard, as well as luster retention in keeping with the ASTM D523 standard and humidity proof in accordance with the ASTM D2247 standard.

The surface treatment achieves a minimum of 3000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard.

LED products manufacturing standard

The electronic components sensitive to electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with IEC61340-5-1 and ANSI/ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.

Vibration Resistance

The RFL meets the ANSI C136.31, American National Standard for Roadway Luminaire Vibration specifications for Bridge/overpass applications. (Tested for 3G over 100,000 cycles by independent lab)

Certifications and Compliance

cULus Listed for Canada and USA. Luminaire meets DOE and MSSLC Model Specification for LED Roadway Luminaires. RoadFocus LED Cobrahead luminaires are DesignLights Consortium qualified. Luminaire complies with or exceeds the following ANSI C136 standards: .2, .3, .10, .14, .15, .22, .25, .31, .37, .41.

Limited Warranty

10-year limited warranty.
See philips.com/warranties for details and restrictions.

Brackets/Arms

For brackets / arms available with this luminaire, see Lumec 3D for details.

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