PHILIPS LUMEC

Roadway

RoadFocus

RFM (medium)

Project:

Location:

Cat.No: RFM160W48LED4K-G2-R3M-UNV-PH9/RCD-G

Type: LED C

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: RFM-108W32LED3K-G2-R3M-UNV-DMG-RCD-GY3

Prefix	LED module	Series	Distribution	Voltage	Options: Controls	Options: Luminaire	Finish
RFM	160W48LED4K	G2	R3M	UNV		PH9/RCD	GY3

Prefix

RFM RoadFocus Roadway, medium

LED module

3000K

35W32LED3K[7]
55W32LED3K[7]
55W48LED3K[7]
72W32LED3K
80W48LED3K
108W32LED3K
108W48LED3K
160W48LED3K

4000K

35W32LED4K[7]
55W32LED4K[7]
55W48LED4K[7]
72W32LED4K
80W48LED4K
108W32LED4K
108W48LED4K
160W48LED4K

Series

G2 Generation 2

Distribution

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)

Voltage

UNV 120-277V
HVU 347-480VAC

Options: Controls

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

Options: Luminaire

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)

Finish

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.

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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
RFM-35W32LED3K-G2	32	350	3000	37	4,555	123	B1-U0-G1	4,406	119	B1-U0-G1	4,401	119	B1-U0-G1	4,411	119	B1-U0-G1
RFM-55W32LED3K-G2	32	530	3000	54	6,552	121	B2-U0-G1	6,339	117	B2-U0-G1	6,331	117	B1-U0-G2	6,345	118	B2-U0-G1
RFM-72W32LED3K-G2	32	700	3000	73	8,294	114	B2-U0-G1	8,024	110	B2-U0-G2	8,015	110	B1-U0-G2	8,033	110	B2-U0-G2
RFM-108W32LED3K-G2	32	1050	3000	108	11,542	107	B3-U0-G1	11,166	103	B2-U0-G2	11,153	103	B2-U0-G2	11,178	104	B2-U0-G2
RFM-55W48LED3K-G2	48	350	3000	55	6,832	124	B2-U0-G1	6,610	120	B2-U0-G1	6,602	120	B1-U0-G2	6,617	120	B2-U0-G1
RFM-80W48LED3K-G2	48	530	3000	81	9,828	122	B2-U0-G2	9,508	118	B2-U0-G2	9,497	118	B1-U0-G2	9,518	118	B2-U0-G2
RFM-108W48LED3K-G2	48	700	3000	106	12,441	117	B3-U0-G2	12,036	114	B3-U0-G2	12,022	113	B2-U0-G2	12,049	114	B3-U0-G2
RFM-160W48LED3K-G2	48	1050	3000	161	17,313	108	B3-U0-G2	16,749	104	B3-U0-G3	16,730	104	B2-U0-G3	16,768	104	B3-U0-G3

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
RFM-35W32LED3K-G2	32	350	3000	37	4,388	119	B1-U0-G1	4,528	122	B3-U0-G1
RFM-55W32LED3K-G2	32	530	3000	54	6,312	117	B1-U0-G2	6,513	121	B3-U0-G1
RFM-72W32LED3K-G2	32	700	3000	73	7,990	109	B1-U0-G2	8,245	113	B3-U0-G2
RFM-108W32LED3K-G2	32	1050	3000	108	11,119	103	B2-U0-G2	11,474	106	B4-U0-G2
RFM-55W48LED3K-G2	48	350	3000	55	6,582	119	B1-U0-G2	6,791	123	B3-U0-G2
RFM-80W48LED3K-G2	48	530	3000	81	9,468	118	B2-U0-G2	9,769	121	B4-U0-G2
RFM-108W48LED3K-G2	48	700	3000	106	11,985	113	B2-U0-G2	12,367	117	B4-U0-G2
RFM-160W48LED3K-G2	48	1050	3000	161	16,679	104	B2-U0-G3	17,210	107	B4-U0-G2

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
RFM-35W32LED4K-G2	32	350	4000	37	4,826	131	B1-U0-G1	4,670	126	B1-U0-G1	4,665	126	B1-U0-G1	4,675	126	B1-U0-G1
RFM-55W32LED4K-G2	32	530	4000	54	6,942	129	B2-U0-G1	6,718	124	B2-U0-G1	6,711	124	B1-U0-G2	6,726	125	B2-U0-G1
RFM-72W32LED4K-G2	32	700	4000	73	8,788	120	B2-U0-G1	8,505	117	B2-U0-G2	8,495	116	B1-U0-G2	8,514	117	B2-U0-G2
RFM-108W32LED4K-G2	32	1050	4000	108	12,229	113	B3-U0-G2	11,835	110	B2-U0-G2	11,822	109	B2-U0-G2	11,848	110	B3-U0-G2
RFM-55W48LED4K-G2	48	350	4000	55	7,239	131	B2-U0-G1	7,006	127	B2-U0-G1	6,998	127	B1-U0-G2	7,013	127	B2-U0-G2
RFM-80W48LED4K-G2	48	530	4000	81	10,413	129	B2-U0-G2	10,077	125	B2-U0-G2	10,066	125	B2-U0-G2	10,088	125	B2-U0-G2
RFM-108W48LED4K-G2	48	700	4000	106	13,182	124	B3-U0-G2	12,757	120	B3-U0-G2	12,743	120	B2-U0-G2	12,771	120	B3-U0-G2
RFM-160W48LED4K-G2	48	1050	4000	161	18,344	114	B3-U0-G2	17,753	110	B3-U0-G3	17,733	110	B2-U0-G3	17,772	111	B3-U0-G3

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
RFM-35W32LED4K-G2	32	350	4000	37	4,651	126	B1-U0-G2	4,799	130	B3-U0-G1
RFM-55W32LED4K-G2	32	530	4000	54	6,690	124	B1-U0-G2	6,903	128	B3-U0-G2
RFM-72W32LED4K-G2	32	700	4000	73	8,469	116	B1-U0-G2	8,739	120	B3-U0-G2
RFM-108W32LED4K-G2	32	1050	4000	108	11,785	109	B2-U0-G2	12,161	113	B4-U0-G2
RFM-55W48LED4K-G2	48	350	4000	55	6,976	127	B1-U0-G2	7,198	131	B3-U0-G2
RFM-80W48LED4K-G2	48	530	4000	81	10,035	125	B2-U0-G2	10,355	129	B4-U0-G2
RFM-108W48LED4K-G2	48	700	4000	106	12,703	120	B2-U0-G3	13,109	124	B4-U0-G2
RFM-160W48LED4K-G2	48	1050	4000	161	17,678	110	B3-U0-G3	18,242	113	B4-U0-G2

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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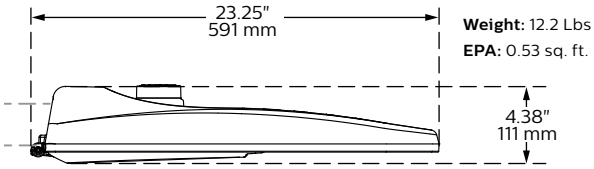
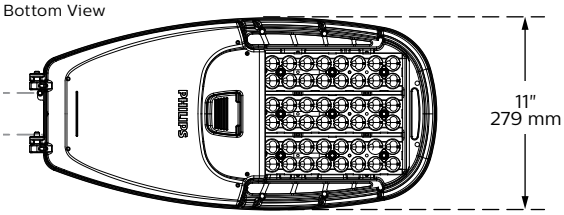
Dimensions

Side View



Weight: 12.2 Lbs
EPA: 0.53 sq. ft.

Bottom View



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 a zinc plated clamp fixed by 2 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.

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

** Not available with HVU (347-480V)*

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.

SP2: 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 (72W32LED and 108W48LED at 700mA) or 94,500 hours (108W32LED and 160W48LED at 1050mA) 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 RFM 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.

Philips Lighting North America Corporation
200 Franklin Square Drive, Somerset, NJ 08873
Tel. 855-486-2216

Philips Lighting Canada Ltd.
281 Hillmount Rd, Markham, ON, Canada L6C 2S3
Tel. 800-668-9008