

HULLA module combining

The pictures shown are for illustrative purposes only. For shape, material and color specifications refer to internal descriptions.

Hulla MC

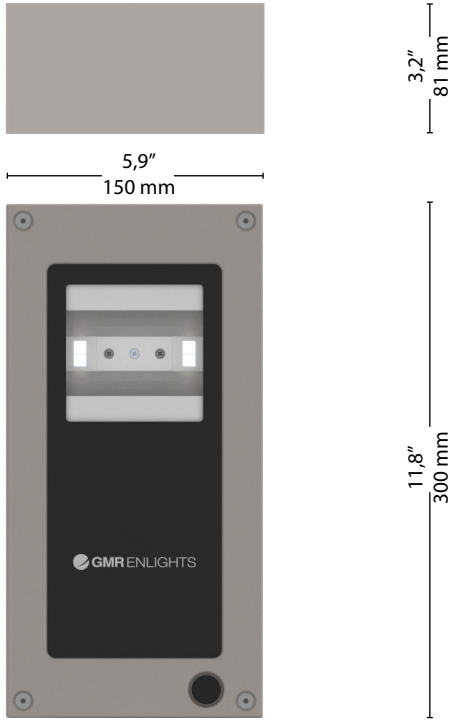
Technical data

ACCESSIBILITY



Openable

Openable fixture with basic tools
Replaceable internal components
using basic tools.



Scale: 1:5

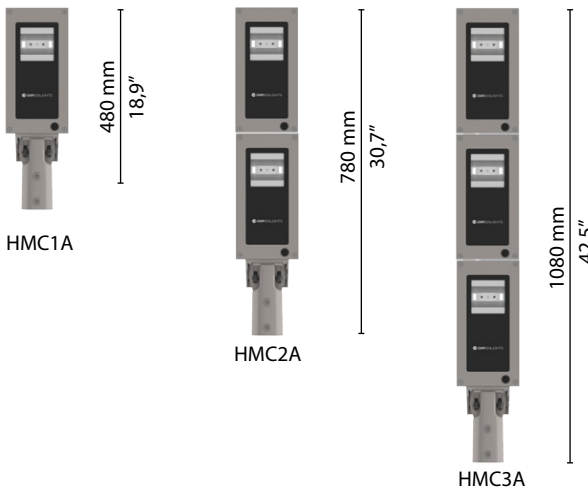
Max. weight

1A 4 Kg

CXS

Lateral: 0,02 m² | Plan: 0,04 m²

MODULE COMBINING

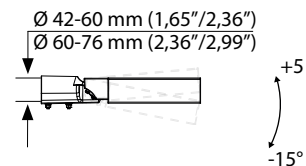


FIXING TYPE



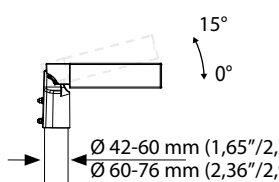
Side

Adjustable in 5° steps



Pole top

Adjustable in 5° steps



STANDARD

EN 60598-1, EN 60598-2-3, EN 62471, EN 55015, EN 61547, EN 61000-3-2, EN 61000-3-3

CONFORMITY | PROTECTION

Conformity



Salt spray test

ISO 9227



Vibration test passed

IEC 60068-2-6



Insulation classes



Protection classes



Photobiological safety



Classe 0 Rischio
essente IEC/TR62471

PLUS



CUT OFF



OPTICAL
FLEXIBILITY



LOW GLARE



CAM
2017
COMPLIANT



A++
IPEA MIN

LIGHTING FIXTURE FEATURES

General features

Power source:	220-240V 50/60Hz tolerance +/-10%
Current supply:	350 mA 525 mA 700 mA 1050 mA (3 modules= 126W) <small>max</small>
Power Factor THD:	≥0.95 <10 % (At full load)
Expected life (Ta=25°):	> 100.000 h L90B10 @ LED 700mA
Operational temperature (Ta):	T _{min} = -40°C T _{max} = +55°C 700 mA
Storage temperature:	-40°C/+80°C
Standard functions:	Current fixed Virtual midnight CLO
Overcharge protection:	Main surge immunity up to 10kV

Materials

Lighting fixture:	Die cast aluminium EN1706
Optical system:	Aluminium reflector, 99.7% oxidised and polished purity
Screen:	Screen-printed ultraclear tempered glass Th. 4mm
Gaskets:	Removable silicon
Cable gland:	Polyamide PA66 PG16 Ø 14mm MAX IP 66
Screws and bolts:	AISI 304 stainless steel
Fixture color:	GMR light

LED FEATURES

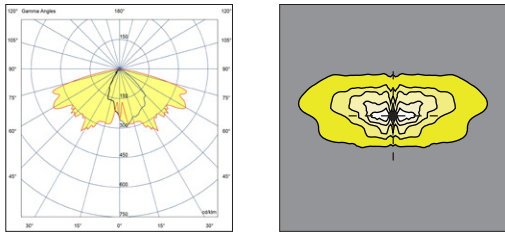
LED data 4.000 K - 700mA:	340 lm/LED 180 lm/W 25°C [Tj] ≤ 3 step MacAdam
Color temperature:	3.000 K 4.000 K CRI ≥ 70

OPTIONAL

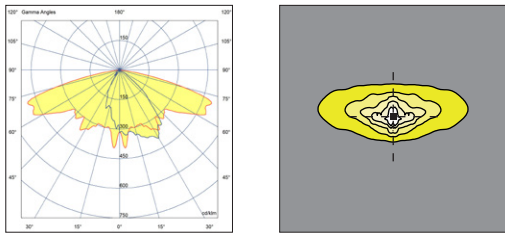
Additional surge protector device:	SPD with warning LED CLASS 1 CLASS 2 12kV
Additional surge protector device SPD 400:	SPD with warning LED CLASS 1 CLASS 2 12kV+ permanent overvoltage protection higher than 270Vac
Optional functions:	DALI-DALI2

ASYMMETRICAL DISTRIBUTION \\

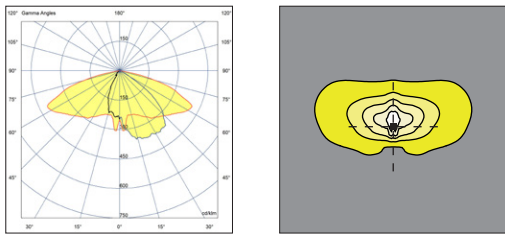
R2A



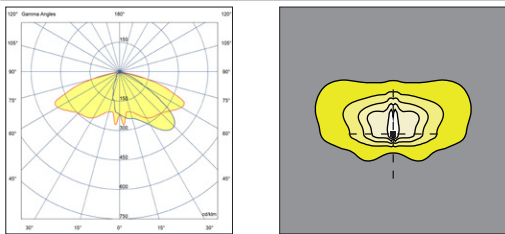
R2B



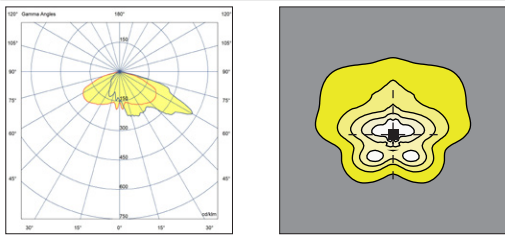
R3A



R3B

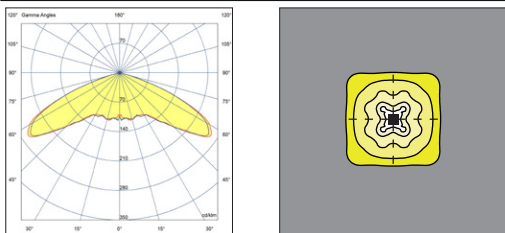


R3C



SYMMETRICAL DISTRIBUTION \\

R5A



R2B



R3A




The LED modules nominal data refers only to the LED light sources in a standard version, with 4000 K color temperature, color rendering index CRI 70 min. and a junction temperature t_j of 25°C. The LED nominal data are extrapolated from the manufacturer documentations.

The lighting fixture measured data refers to GMR ENLIGHTS products in a standard version, with 4000 K color temperature, optica type R3B and an ambient temperature t_a of 25 °C.


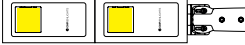

GMR ENLIGHTS offers the possibility of driving the device with custom currents (•).

To obtain luminous fluxes and efficiencies of the lighting fixture in case of color temperature and/or color rendering index different from the standard use the conversion factors shown in the tables.

LED modules nominal data (4000 K | CRI 70 min. | $t_j=25^\circ$)

LED code	I [mA]	Luminous flux [lm]	LED power [W]	Efficiency [lm/W]
RF03 	350	2377	11,9	200,2
	525	3374	18,2	185,5
	700	4282	24,7	173,5
	1050	5850	38,0	154,0
RF06 	350	4667	23,6	197,6
	525	6622	36,2	183,0
	700	8402	49,1	171,2
	1050	11473	75,6	151,8
RF09 	350	6934	35,3	196,3
	525	9839	54,1	181,8
	700	12360	73,2	168,8
	1050	16868	112,8	149,6

Lighting fixture measured data (4000 K | OPTIC R3A | $t_a=25^\circ$)

Order code:HMC_GLxx	(•) I [mA]	Luminous flux [lm]	LED power [W]	Efficiency [lm/W]
RF03 	350	2234	15,0	148,9
	525	3171	21,5	147,5
	700	4024	28,5	141,2
	1050	5497	42,5	129,3
RF06 	350	4385	28,0	156,6
	525	6223	40,5	153,7
	700	7896	55,0	143,6
	1050	10781	83,0	129,9
RF09 	350	6516	40,0	162,9
	525	9246	61,5	150,3
	700	11616	83,0	140,0
	1050	15852	124,0	127,8

OPTIC CONVERSION FACTOR LUMINOUS FLUX

Optic	Flux multiplier
R2A	0,99
R2B	0,98
R3B R3C	1,00

Tk CONVERSION FACTOR LUMINOUS FLUX

Tk [K]	Flux multiplier
2.200 (*)	0,70
3.000	0,94
4.000	1,00

CRI CONVERSION FACTOR LUMINOUS FLUX

CRI (color render index)	Flux multiplier
70	1,00
80	0,93

Standard functionality

Fixed current

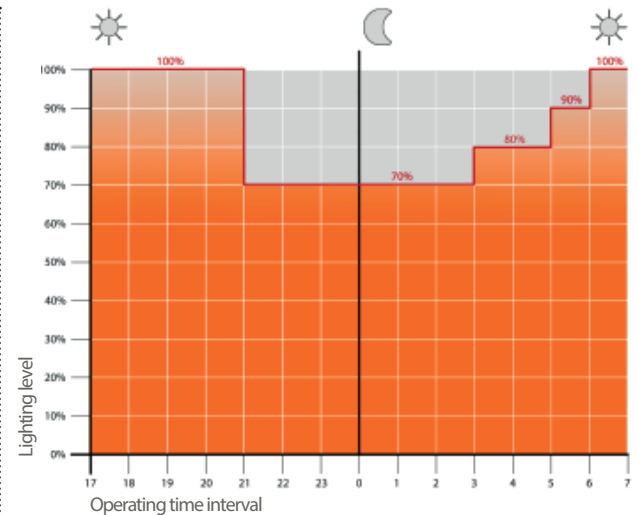
During production, the light fixture is pre-set with a fixed current amongst the standard settings that appear in the tables on page 3. Upon customer's request, it is also possible to set a specific current (custom setting).

Virtual Midnight | Automatic dimming

The driver is programmed to automatically dim the light output according to the time. As required by regulations, the maximum output is set during initial hours and towards the end of the light fixture's operating time interval. During these hours there is statistically more traffic. The light output is then dimmed during the central hours of the operating time interval. This management is achievable through a self-learning process of the device, that establishes the centre point of the time interval. This moment is called "virtual midnight" and it is the point that the dimming profile refers to in order to know when to reduce the light output. We can manage up to 8hrs of programming that evolve around the virtual midnight and up to 5 steps of dimming. This way the light output will adjust automatically, adapting throughout the year to the duration of the nighttime, by referring to the pre-set parameters based on the centre point of the operating time interval.

CLO Constant Lumen Output

LEDs over time are inevitably subject to performance depreciation. This light reduction may be compensated by gradually increasing the LED's current during its lifespan, this corresponds to a gradual increase of lumen output proportional to the amount that is naturally depreciated.



Example of 4-step adjustment with virtual midnight

On request functionality

DALI - DALI2 Control and monitoring system

On request, the fixture can be fitted with a DALI2 communication interface. This protocol allows it to be monitored and controlled remotely through use of Dali control buses.

DALI SENSOR (D4i)

On request, the fixture can be equipped with a D4i certified power supply. This is the ideal solution for wireless sensors and/or controls. This system was developed to integrate various systems to address smart city requirements. Included is DALI2 protocol + auxiliary power (AUX) to supply power to devices and sensors. This system is usually required when using a Zhaga Lumawise socket.

LINESWITCH

This functionality by using an extra wire within the streetlight's power line, allows to dimmer to a pre-set level. For example, a centralised timer can change this value from 100% to 50%, and vice versa.

AMPDIM

This feature allows dimming using the power line controlled by an upstream flow regulator. For this feature, the flow controller must use amplitude modulation (AM).

On request connectors and external sockets

NEMA | Nema Socket (7 PIN)

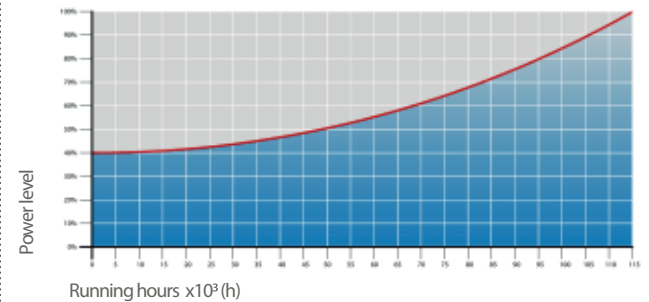
The Nema Socket is a 7 PIN connector/socket with IP66 rating, that is fitted on the fixture to make it interfaceable with various ANSI C136 compliant devices and remote-control gear. These devices can be installed during or after installation of the light fixtures. The NEMA socket can provide power interruption and is interfaceable with DALI buses and/or 1-10V dimming. It is compatible with point-to-point node connection, and twilight sensors ect.

ZHAGA Lumawise Zhaga Socket (4 PIN)

The Lumawise Zhaga socket is a small and compact 4 Pin connector/socket, that is fits ideally with the design of GMR ENLIGHTS fixtures. With ZHAGA Lumawise sockets it is possible install the devices, sensors, ZHAGA remote controls during or after installation of the light fixtures. This socket is usually required in conjunction with the DALI Sensor feature, which involves a DALI2/D4i communication protocol in addition to 12/24V auxiliary port to supply power to the sensors. It is compatible with point-to-point wireless control solutions and SMART CITY applications to control and monitor the public lighting infrastructure.

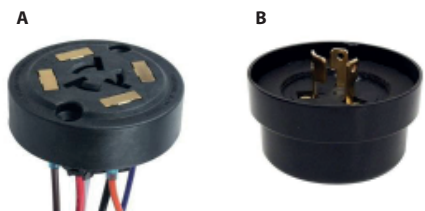
Third-party remote control

GMR ENLIGHTS fixtures are compatible with most third-party remote controls, powerline communication systems, wired systems (buses) and wireless systems.



CLO Light Flow Compensation

7 Pin Nema Socket 7 (A) and IP66 shorting cap (B)



4 Pin Lumawise Zhaga Socket (C) and IP66 cap (D)



Installation example of Lumawise Zhaga



Protection cycles

GMR ENLIGHTS works with cast iron, steel and aluminum. The materials are selected and processed to maximize performance and quality.

GALVANIZED STEEL

Protection of galvanized steel surfaces for poles

The protection of galvanized steel elements is achieved by following steps:

- Micro sandblasting;
- First epoxy layer application followed by: Wilting > Drying > Cooling;
- Acrylic glaze layer application followed by: Wilting > Drying > Cooling;
- Packing at least after 24-hour-drying at room temperature.

Protection of galvanized steel surfaces for brackets and pastorals

The protection of the galvanized steel elements is achieved thanks to:

- Micro sandblasting;
- Phosphoric pickling bath at a ph level ranging from 1.5 to 3;
- Rinsing with demineralised water;
- First powder layer application;
- Kiln firing;
- Application of a final powder layer;
- Kiln roasting of the final powder layer at 180°C (356°F);
- Cooling.

CAST IRON

Protection of cast iron surfaces for bases

The protection of cast iron elements is achieved by the following treatments:

- Surface micro shotblasting;
- Mono-component dip galvanizing followed by: Wilting > Drying > Cooling;
- Epoxy micaceous primer application followed by: Wilting > Drying > Cooling;
- Acrylic enamel application followed by: Wilting > Drying > Cooling;
- Packing at least after 24-hour-drying at room temperature.

DIE-CAST ALUMINIUM

Protection of die-cast aluminium surfaces for lighting fixtures, tops, collars, brackets and pastorals

Lighting fixtures, brackets, pastoral, and die-cast accessories undergo a cycle of powder painting which creates a barrier against the corrosion of metal parts. Moreover this barrier makes the finished product comply with design specifications in terms of surface roughness, color and reflectance.

The cycle consists of the following steps:

- Micro sandblasting;
- Hot pickling bath in a zinc-based phosphodegreasing solution;
- Specific process for the preparation of surfaces before painting;
- Washing with water;
- Rinsing with demineralised water and subsequent drying;
- First powder layer application followed by kiln baking at 180°C (356°F);
- Final powder layer application using a High Durability product and final kiln roasting at 180°C (356°F).



Salt spray test

The top quality of such treatments is confirmed by salt spray tests performed in accordance with standard ISO 9227:2017 Neutral Salt Spray test (NSS).

The test was carried out for 8.000 hours at 35°C (95°F) and demonstrated through the report test released.



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