

HULLAGEOL
double

Hulla Geo large double

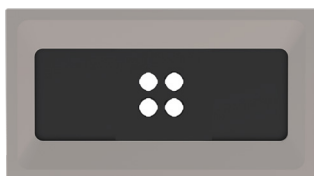
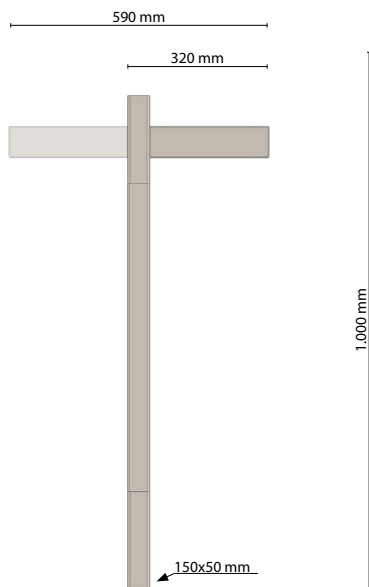
Technical data

ACCESSIBILITY



Compact

Sealed fixture with short power cable and IP electrical connector for a quick and simple linkage to the mains.



Scale: 1:10

Max. weight

15,0 Kg

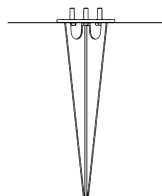
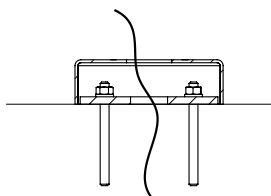
ANCHORAGE TYPE



Flange



Earth spike (on request)



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



8000 hr

Insulation classes



Protection classes



Photobiological safety



Classe 0
Exempt group
IEC/TR62471

PLUS



CUTOFF



OPTICAL FLEXIBILITY



LOW GLARE



A++

IPEA MIN

LIGHTING FIXTURE FEATURES

General features

Power source:	220-240V 50/60Hz tolerance +/-10% other voltages on request
Current supply:	350 mA 525 mA 700 mA (P _{max} = 19,5W)
Power Factor THD:	≥0.95 <10 % (At full load)
Expected life (Ta=25°):	> 100.000 h L90B10 @700mA
Operational temperature (Ta):	T _{min} = -40°C T _{max} = +55°C
Storage temperature:	-40°C/+80°C

Standard functions:

(page: Functionality)

Current fixed | Virtual Midnight | 1-10V | CLO

Materials

Lighting fixture:	Die cast aluminium EN1706 - Extruded aluminium EN573-3
Structure:	Steel S235
Optical system:	Nano-optics in PMMA with direct low glare reflector
Screen:	Ultraclear tempered glass Th. 4mm
Gaskets:	Neoprene
Cable gland:	Polyamide PA66 PG16 Ø 14mm MAX IP 68
Screws and bolts:	AISI 304 stainless steel
Fixing device:	⊥ Flange: steel S235 hot galvanized and powder coated ⊕ Earth spike: 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
Colour temperature:	3000 K 4000 K 5700 K CRI ≥ 70

OPTIONAL

Overcharge protection:	optional - SPD with warning LED CLASS 1 CLASS 2 10kV
Optional functions:	DALI-DALI2 (page: Functionality)

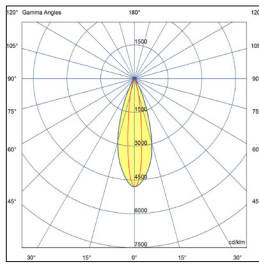
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Available optical system



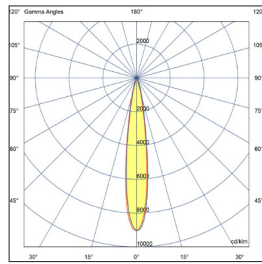
PROJECTION OPTICS \\ OPTIC TYPES 7 | OPTIC TYPES 8

TYPE 7A



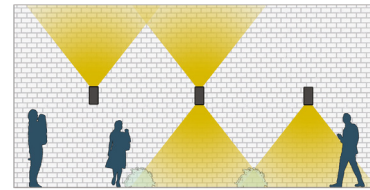
Elliptical optic,
suitable for grazing
effects both on walls
and pedestrian paths.

TYPE 8A

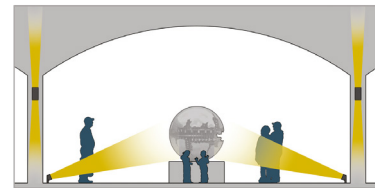


Symmetrical optic.
Luminous beam
distribution
for projections.

APPLICATION EXAMPLES \\



TYPE 7A



TYPE 8A

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 6A 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]	Power [W]	Efficiency [lm/W]
GL01	350	752	4	188
	525	1084	6	181
	700	1562	9	174
GL02	350	1505	8	188
	525	2168	12	181
	700	2951	17	174

Lighting fixture measured data (4000 K | OTTICA 6A | $t_a=25^\circ$)

Order code: HGB2L_GLxx	(°) I [mA]	Luminous flux [lm]	Power [W]	Efficiency [lm/W]
GL01	350	633	6,0	106
	525	925	8,5	109
	700 (max)	1197	11,0	109
GL02	350	1258	10,5	120
	525	1839	15,0	123
	700 (max)	2378	19,5	122

Tk CONVERSION FACTOR LUMINOUS FLUX

Tk [K]	Flux multiplier
3.000	0,94
5.700	1,01

CRI CONVERSION FACTOR LUMINOUS FLUX

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

Functions

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.

1-10V Analog control system

On request, the fixture can be equipped with 1-10V dimming interface. This protocol provides the possibility of dimming a single device or a public lighting line through a 1-10V control bus.

On request functionality

DALI - DALI2 Control and monitoring system

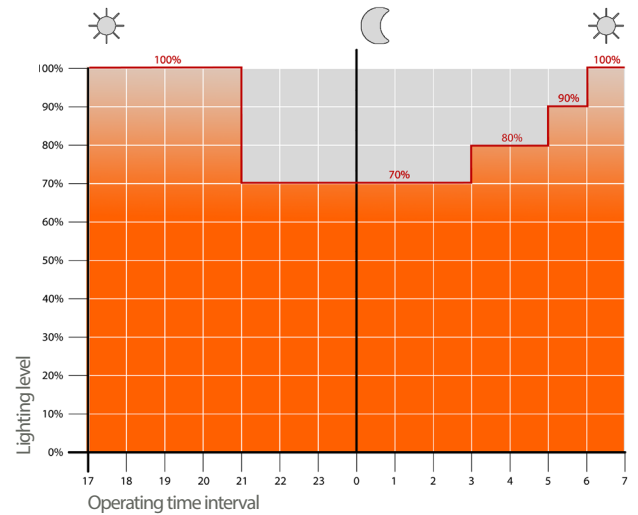
On request, the fixture can be fitted with a DALI2 communication interface. This protocol allows it to be monitored and controlled remotely through use of Dali control buses.

LINESWITCH

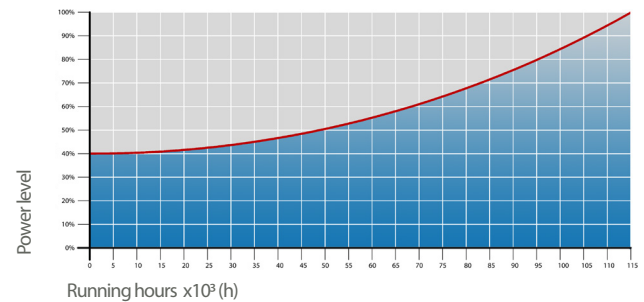
This functionality by using an extra wire within the streetlight's power line, allows to dimmer to a pre-set level. For example, a centralised timer can change this value from 100% to 50%, and vice versa.

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).



Example of 4-step adjustment with virtual midnight



CLO Light Flow Compensation

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°;
- 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

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°;
- Final powder layer application using a High Durability product and final kiln roasting at 180°C.



Salt spray test | FLORIDA 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 and demonstrated through the report test released.



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