



# HULLAGEOS

*For product specifications, materials and colours, please refer to the details inside*

# Hulla Geo S

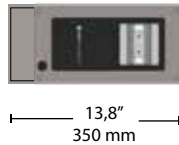
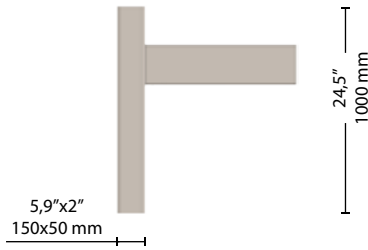
## Technical data

### ACCESSIBILITY



#### Openable

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



Scale: 1:12

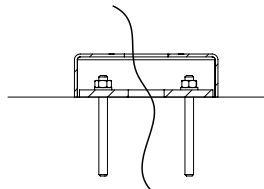
#### Max. weight

5 Kg

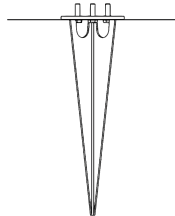
### FIXING TYPE



Flange



Earth pike

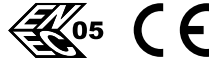


### STANDARD

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

### CONFORMITY | PROTECTION

#### Conformity

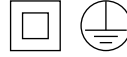


#### Salt spray test

ISO 9227



#### Insulation classes



#### Protection classes



#### Photobiological safety



Classe 0 Rischio  
essente IEC/TR62471

### PLUS



CUT OFF



OPTICAL  
FLEXIBILITY



LOW GLARE



COMPLIANT



IPEA MIN

### LIGHTING FIXTURE FEATURES

#### General features

Power source:	220-240V   50/60Hz   tolerance +/-10%
	120-277V   50/60Hz   tolerance +/-10%
Current supply:	350 mA   525 mA   700 mA   1050 mA (P <sub>max</sub> = 42W)
Power Factor   THD:	≥0.95   <10 % (At full load)
Expected life (Ta=25°):	> 100.000 h   L90B10   @ LED 700mA
Operational temperature (Ta):	T <sub>min</sub> = -40°C   T <sub>max</sub> = +55°C
Storage temperature:	-40°C/+80°C
Standard functions:	Current fixed   Virtual Midnight   1-10V   CLO

#### Materials

Lighting fixture:	Die cast aluminium   EN1706
Optical system:	Aluminium reflector, 99.7% oxidised and polished purity
Structure:	Steel S235
Screen:	Ultraclear tempered glass   Th. 4mm
Gaskets:	Neoprene
Cable gland:	Polyamide PA66   PG16   Ø 14mm MAX   IP 66
Screws and bolts:	AISI 304 stainless steel
Fixture color:	GMR light
Flange:	Powder coated hot galvanized S235 steel

### LED FEATURES

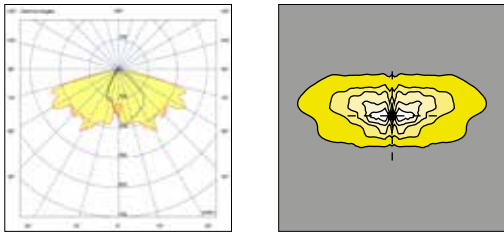
LED data 4.000 K - 700mA:	340 lm/LED   180 lm/W   25°C [Tj]   ≤ 3 step MacAdam
Color temperature:	3.000 K   4.000 K   CRI ≥ 70

### OPTIONAL

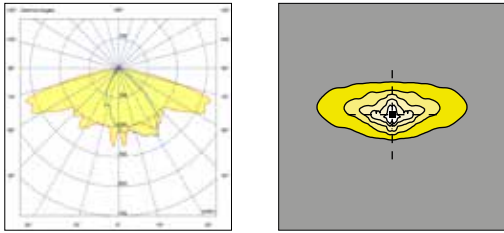
Additional surge protector device:	SPD with warning LED CLASS 1   CLASS 2 10kV/kA
Mechanical equipment:	Fixing by means of an AISI 304 stainless steel stake
Optional functions:	DALI-DALI2

### ASYMMETRICAL DISTRIBUTION \\\

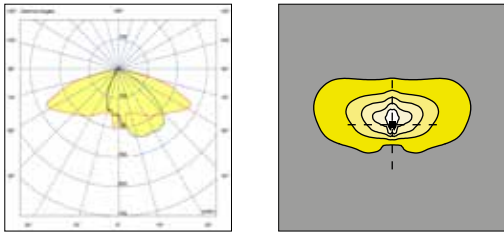
R2A



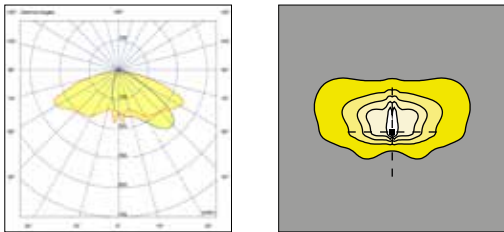
R2B



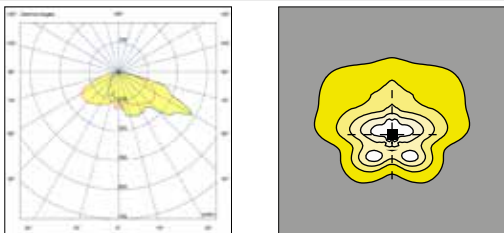
R3A



R3B



R3C



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	2539	12,8	198
	525	3603	18,7	193
	700	4573	24,8	184
	1050	6247	38,3	163

### Lighting fixture measured data (4000 K | OPTIC R3B | $t_a=77^\circ\text{F}$ | 25°C)

Order code: HGB1S_RFxx	(•) I [mA]	Luminous flux [lm]	LED power [W]	Efficiency [lm/W]
RF03 	350	2234	15	149
	525	3171	21,5	147
	700	4024	28,5	141
	1050	5497	42,5	129

#### 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

### 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.

### On request functionality

#### DALI - DALI2 Control and monitoring system

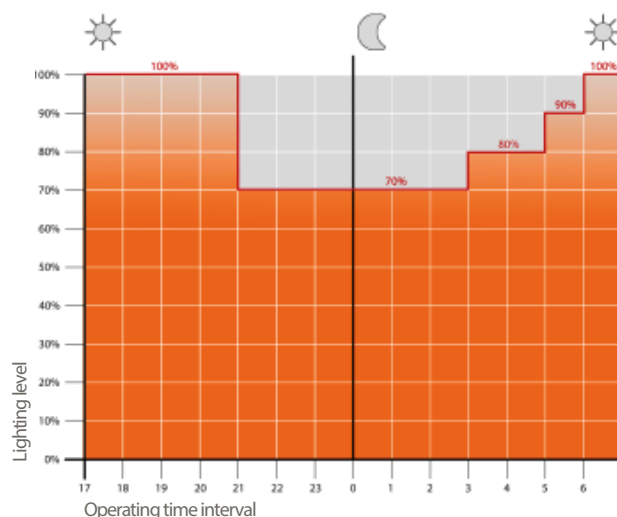
On request, the fixture can be fitted with a DALI2 communication interface. This protocol allows it to be monitored and controlled remotely through use of Dali control buses.

#### LINESWITCH

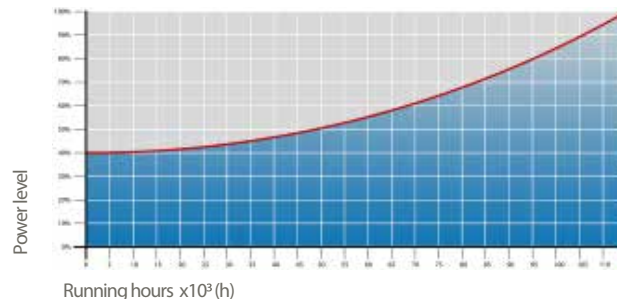
This functionality by using an extra wire within the streetlight's power line, allows to dimmer to a pre-set level. For example, a centralised timer can change this value from 100% to 50%, and vice versa.

#### 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°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.



**GMR ENLIGHTS s.r.l.**

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