90mm ROUND UNIVERSAL HEADLAMP MODULES

www.hella.com/headlamp-modules

90MM MODULE
durable and powerful!

HELLA headlamp modules stand for the highest quality, reliability and cost efficiency.

Whether bus, tractor, truck, motorhome or motorbike: the robust HELLA headlamp modules are used in many types of vehicles. Thanks to their modular design, they offer maximum flexibility and a wide range of possible applications. The headlamp module range caters for both halogen and LED technology based on requirements, enabling an easy switch from halogen to LED. All modules impress with their robust construction and can therefore also be used in demanding work environments. They are all powerful, durable and reliable, and therefore stand for safety.

The difference is in the detail: In the 90 mm series, the L 4060 LED modules in particular outshine others with their outstanding light output and additional light functions. The Bi-LED modules combine low beam and high beam in a single headlamp module – ideal for constructions with limited space or special designs.

You can rely on HELLA expertise when selecting the right headlamp modules because all our products guarantee a high level of safety and quality while being costefficient at the same time.

Photo: © CLAAS Tractor SAS

TABLE OF CONTENTS

Photo: © AIXAM-MEGA

A SOPHISTICATED SOLUTION:
the smart module selector

Find the right headlamp module in just a few clicks:
Our smart module selector will make your search easier. Simply use the filter to select the required criteria, such as the lighting function or homologation, and you will see suitable products right away.

www.hella.com/headlamp-modules

Simple menu structure and use

Our module selector is easy to use and makes it simple for original equipment manufacturers and end customers to find the right module – just like its predecessor, which has already proved its worth in practice. We have built on this and added further module types to the configurator.

Illumination comparison

Compare the lighting technology for selected main light functions: Spot the difference between halogen and LED with realistic images from Europe's largest light testing facility! Compare the light distribution and choose the one that suits your application.

Upgrade to modern LED technology

Existing halogen versions can be easily converted to LED modules. More detailed information is found in the assembly instructions supplied with the LED modules.

It is easy to order parts

Use the selector to easily create your order list and send it to HELLA.

Precise comparison

All key technical details for each module can be found in the detailed overview – including optional accessories!

LEGEND

Icons at a glance

ECE
This product is approved according to ECE guidelines.

Asymmetrical light distribution
The product complies with ECE regulation R149 Class B, which regulates asymmetrical low beam for passenger cars, buses, commercial vehicles and most larger vehicles.

Symmetrical light distribution
The product complies with ECE regulation R149 Class DS, which regulates the symmetrical low beam for many agricultural vehicles and also for lighter vehicles (2, 3 or 4-wheeled).

Vehicle electrical system voltage
Defines the power supply of the lamp. This can be 12 V, 24 V or a flexible voltage range for multi-voltage (e.g. 8 – 33 V).

CCC
Please contact us for the current certificate.

Operating temperature
Thermal management and an optimised housing design ensure full functionality for all operating temperatures as a result of product testing from -40 °C to +60 °C, for example.

Dust and water protection class - IP
International Protection (IP) according to DIN 40050, Part 9. Specific definition for road vehicles:

First digit: Protection against dust and dirt
5K = dust protection
6K = dust-tight

Second digit: Protection against water
4K = protection against splashing water from any direction with increased pressure
7 = protection against temporary immersion
9K = protection against water during high-pressure/steam-jet cleaning

Electronic circuit
Two different circuits are fundamentally possible for LED lamps.
Active:
LED current regulation via active electronics.

Passive:
Setting a specific voltage range for the LEDs by means of a series resistor.

Thermal management
Active:
Electronic power control of the LEDs when high ambient temperatures exceed permitted levels. This ensures that LEDs are protected against destruction caused by overheating.

Passive:
Optimised layout of the components for even temperature distribution and spread.

Polarity reversal protection
Even if the connecting cable is connected with reverse polarity, there is still no danger to the electronics.

Electromagnetic compatibility
Electromagnetic compatibility (EMC) tested and EU type approval issued.

AT A GLANCE

Universal headlamp modules

90 MM MODULE

LED

LOW BEAM	HIGH BEAM	LOW BEAM AND HIGH BEAM	FOG LIGHT
Performance:			
 **L 4060** Page 14	 **L 4060** Page 16	 **Bi-LED L 4565** Page 21	 **L 4060** Page 18
Essential:			
 **R 80** Page 12	 **R 80** Page 12	 **Bi-LED L 4565** Page 20	

LED low beam headlamp R 80*

Left-hand traffic, ECE, DEUTSCH connector	**1M0 015 050-011**

LED high beam headlamp R 80*

ECE, SAE, DEUTSCH Connector	**1K0 015 050-021**

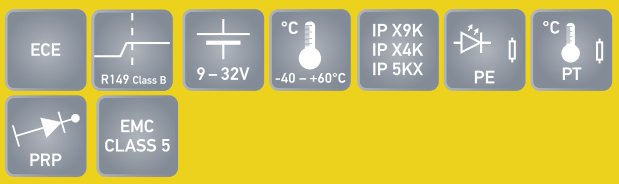
* Mounting kit 9XX 254 163-001 not included in scope of supply.

90 MM MODULES – ESSENTIAL

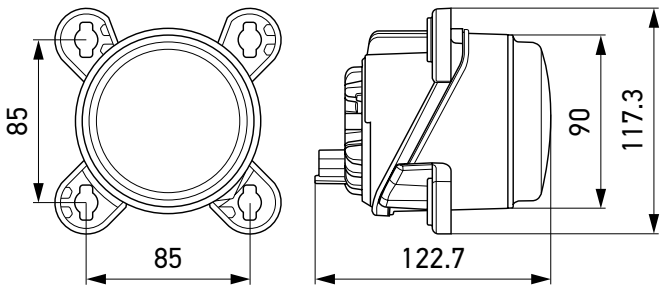
LOW BEAM AND HIGH BEAM

SPECIFICATIONS

- Specially developed reflector design for homogeneous illumination
- Compact and robust design
- Enables cost-effective switch from halogen to LED
- DEUTSCH connector



Dimensional sketches of the LED low and high beam headlamp R 80

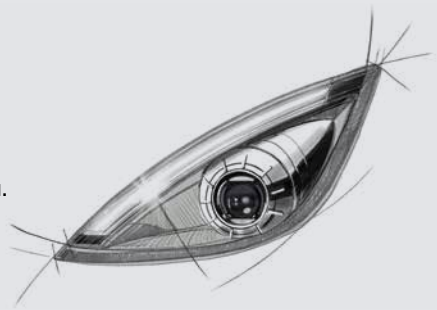


To the product video

FAR EXCEEDING THE STANDARD

Are you interested in a customised lighting solution that is perfectly suited to your vehicle? Then we are the perfect partner for you.

Just get in touch with us. More information on p. 34.



LED low beam headlamp L 4060*

Left-hand traffic, ECE, DEUTSCH connector	**1ML 012 488-111**

LED low beam headlamp L 4060 with daytime running / position light*

Left-hand traffic, ECE, DEUTSCH connector	**1ML 012 488-131**

* Mounting kit 9XX 254 163-027 and 9XX 254 163-001 included in scope of supply.
** More information on p. XX

Photo: © VDL Bus & Coach bv VG

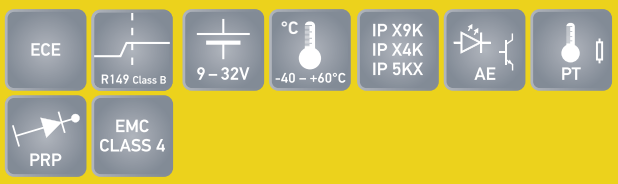
LED

90 MM MODULES – PERFORMANCE

LOW BEAM

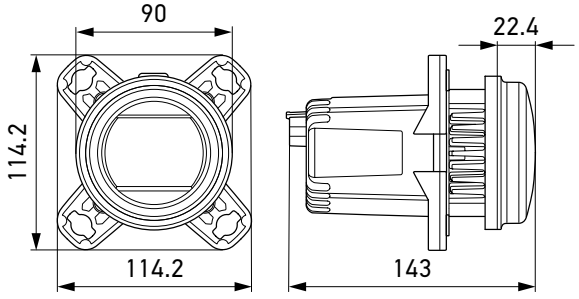
SPECIFICATIONS

- Homogeneous high-end illumination similar to daylight thanks to innovative LED technology
- Low beam, daytime running light and position light in one module or as a separate low beam
- Simple conversion from halogen to LED possible
- DEUTSCH connector
- Individual front design thanks to modular design of the 90 mm series



For further information on each product, see general overview on page 42

Dimensional sketches of the LED low beam headlamp L 4060



DID YOU KNOW?

Malfunctions of the high beam (HB) with direction indicator (DI) module can usually be detected using the vehicle control unit. The stages of detection are as follows: DI: < 400 mA // HB: < 800 mA

If your control unit cannot detect stage < 400 mA for DI, the pulse generator will increase the current in an interval of 100 to 120 ms to simulate the level consistent with a standard 12 V (21 W) bulb.

LED high beam headlamp L 4060	
With pre-assembled carrier frame	**1F0 011 988-021**
Without carrier frame	**1F0 011 988-121***

LED high beam headlamp L 4060 with daytime running / position light	
With pre-assembled carrier frame	**1F0 011 988-031**
Without carrier frame	**1F0 011 988-131***

* Mounting kit 9XX 254 163-001 and 9XX 254 163-027 included in scope of supply.
** More information on p. 46.

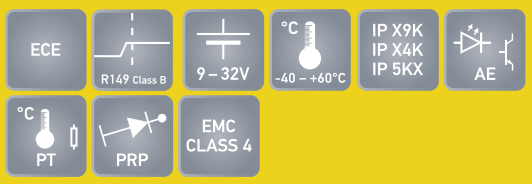
LED

90 MM MODULES – PERFORMANCE

HIGH BEAM

SPECIFICATIONS

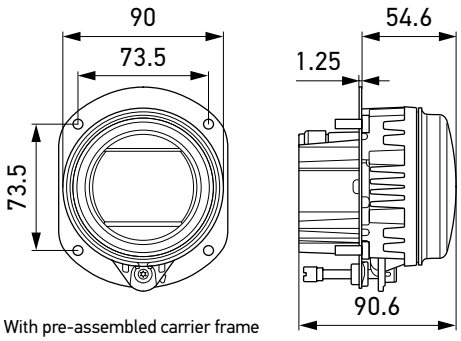
- High-end illumination thanks to innovative LED technology
- High beam, daytime running and position light in one module, high beam and direction indicator light combination or high beam as a separate module
- Simple conversion from halogen to LED possible
- Robust die-cast aluminium housing with integrated driver electronics and FEP connector
- Individual front design thanks to modular design of the 90 mm series



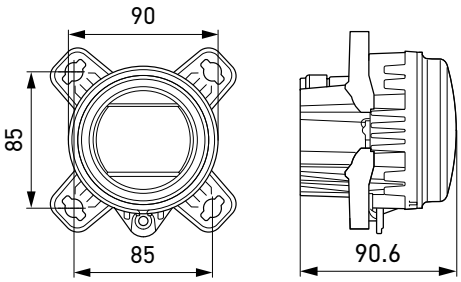
For further information on each product, see general overview on page 42

LED high beam headlamp L 4060 with direction indicator light	
With pulse generator and pre-assembled carrier frame	1F0 011 988-081
With pulse generator, without carrier frame	1F0 011 988-181*
Without pulse generator, with pre-assembled carrier frame	1F0 011 988-071
Without pulse generator, without carrier frame	1F0 011 988-171*
With pulse generator, without carrier frame, with fording ability**	1F0 011 988-191*

Dimensional sketches of the LED high beam headlamp L 4060



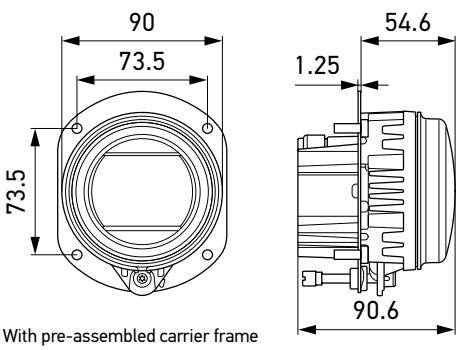
With pre-assembled carrier frame



Without carrier frame

LED fog lamp L 4060	
Without daytime running/position light	**1N0 011 988-001**
With daytime running/position light	**1N0 011 988-011**

Dimensional sketches of the LED fog lamp L 4060



With pre-assembled carrier frame

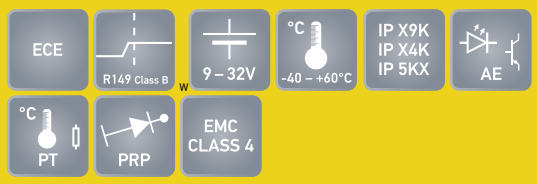
LED

90 MM MODULES – PERFORMANCE

FOG LIGHT

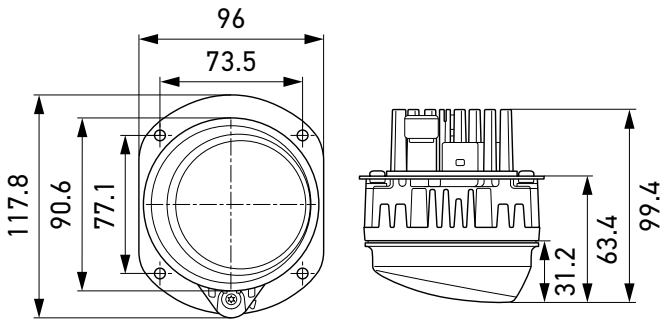
SPECIFICATIONS

- Homogeneous illumination, similar to daylight
- Fog light in various combinations or as a separate module, with daytime running light, position light and cornering light.
- Simple conversion from halogen to LED possible
- Robust die-cast aluminium housing with integrated driver electronics and FEP connector
- Weight saving thanks to polycarbonate lens
- Individual front design thanks to modular design of the 90 mm series
- With pre-assembled carrier frame

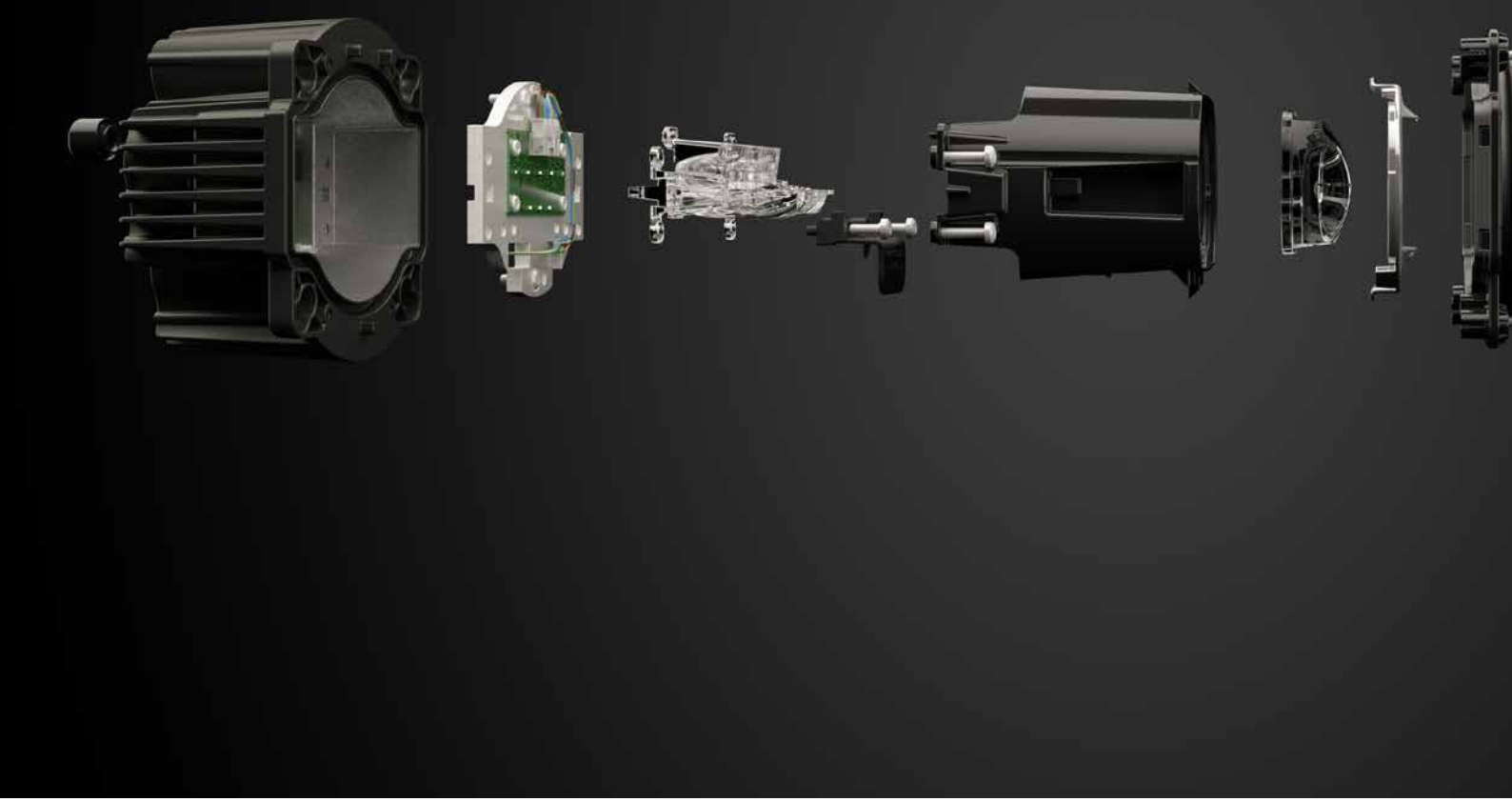


LED fog lamp L 4060 with cornering light	
Left headlamp	1N0 011 988-051
Right headlamp	1N0 011 988-061

Dimensional sketches of the LED fog lamp L 4060 with cornering light



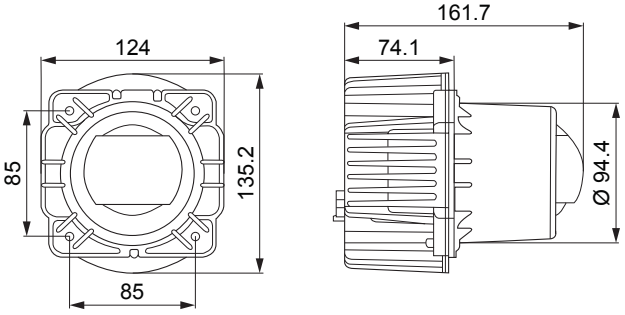
With pre-assembled carrier frame



Bi-LED low beam and high beam headlamp L 4565 - Essential*	
Left-hand traffic, ECE	**1LL 015 318-011**

To the product video

Dimensional sketches of the Bi-LED low beam and high beam headlamp L 4565 – Essential



* Mounting kit 9XX 236 655-011 included in scope of supply.

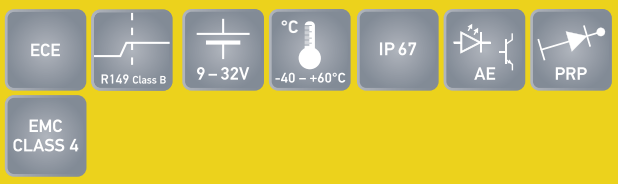
BI-LED

90 MM MODULES – ESSENTIAL AND PERFORMANCE

LOW BEAM AND HIGH BEAM

SPECIFICATIONS

- Excellent low beam and high beam from one single headlamp module
- Design freedom thanks to a modular system
- For the most diverse applications and the highest demands
- With 4-pin DEUTSCH connector
- Performance version with special features:
  - "Zero Tolerance Integration" for new design freedoms (see video)
  - 4 additional LEDs for even stronger light performance
  - Advanced light electronics

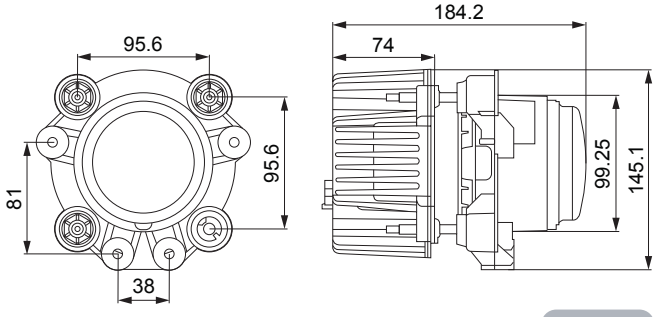


Bi-LED low beam and high beam headlamp L 4565 – Performance*

Left-hand traffic, ECE	**1LL 015 318-041**

To the product video

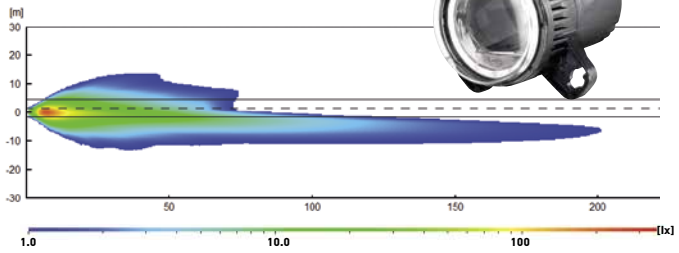
Dimensional sketches of the Bi-LED low beam and high beam headlamp L 4565 – Performance



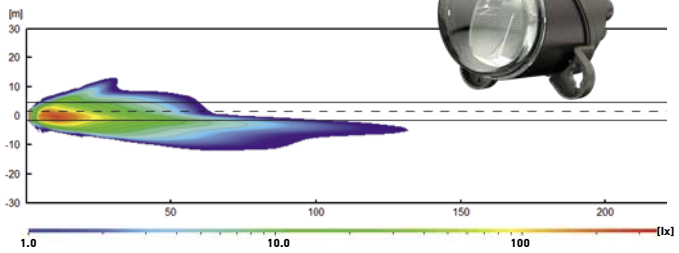
90 MM MODULE LIGHT DISTRIBUTIONS

Low beam comparison

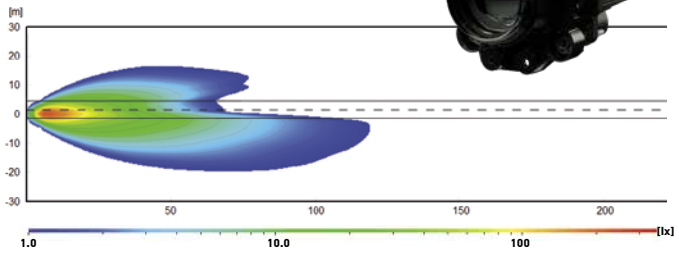
LED Performance L 4060
(012 488)



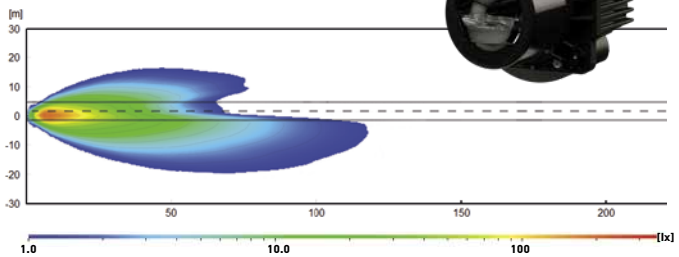
LED Essential R 80
(015 050)



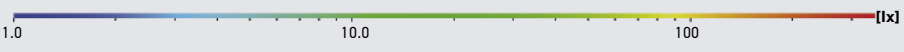
Bi-LED Performance L 4565
(015 318)



Bi-LED Essential L 4565
(015 318)



Legend for isolux diagram (1 – 350 Lux)

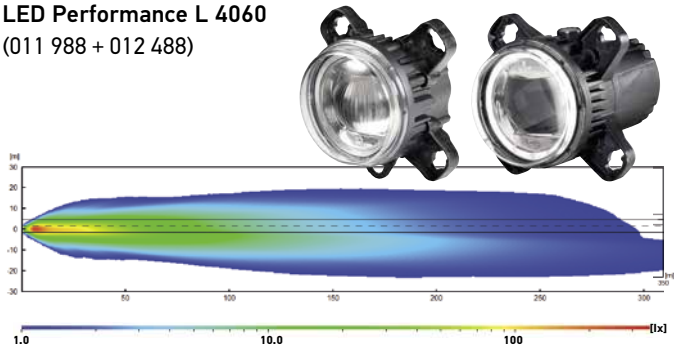


Remarks
Mounting height of the headlamps: 0.65 m
Distance between the headlamps: 1.20 m

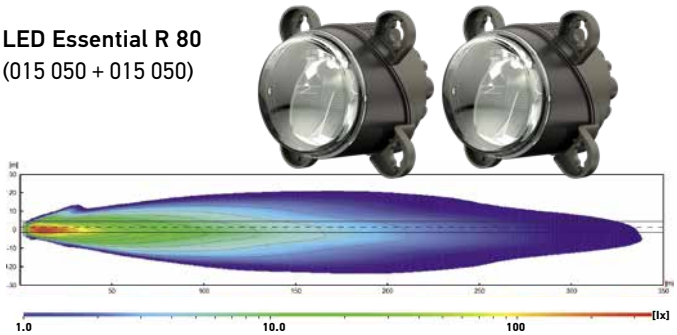
90 MM MODULE LIGHT DISTRIBUTIONS

High beam comparison*

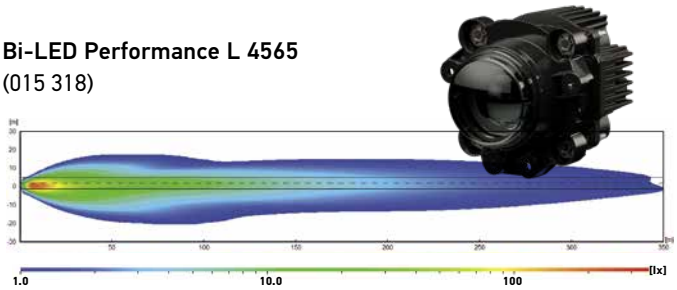
LED Performance L 4060
(011 988 + 012 488)



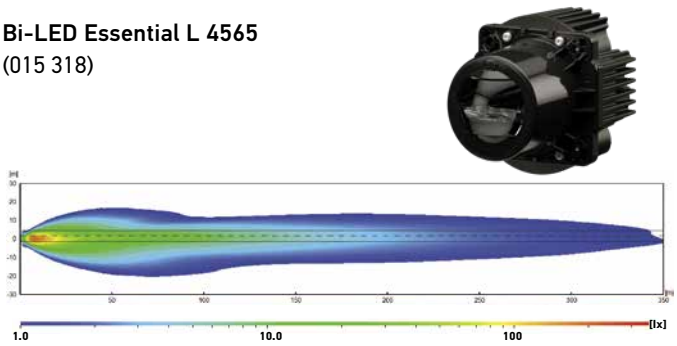
LED Essential R 80
(015 050 + 015 050)



Bi-LED Performance L 4565
(015 318)



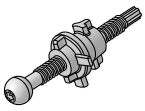
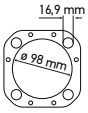
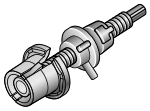
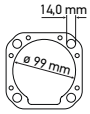
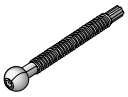
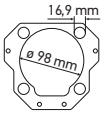
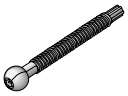
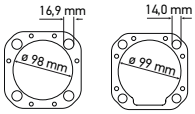
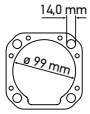
Bi-LED Essential L 4565
(015 318)



***Please note:**
Representation of high beam including low beam, as high beam is supplemented by low beam during driving.
Bi-light distributions are generated when low beam is switched on and are only available as a bi-version.

FOR THE 90 MM MODULE

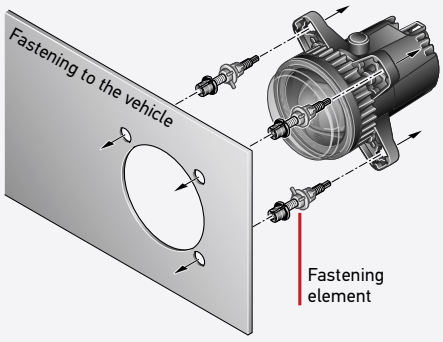
Mounting kits

Part number	Product image	PU	Fastening concept	Holder
9XX 254 163-001	3 x  3 x  3 x 	1 piece	Performance	
9XX 254 163-027	3 x 	200 pieces	Premium	
9XX 236 655-011	3 x  3 x  3 x 	200 pieces	Heavy Duty	
9XX 236 655-011	3 x  3 x  3 x 	200 pieces	Heavy Duty	No carrier frame required
9XX 202 748-001	3 x  3 x  3x 	1 piece	Premium + Performance	
9XX 169 098-007	3 x 	200 pieces	Premium	

Installation examples

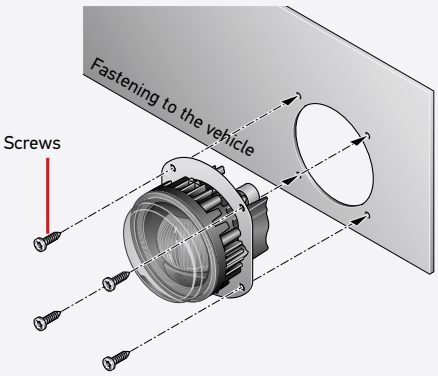
Important note:
The relevant country-specific statutory specifications and regulations for motor vehicles must be observed when installing headlamps!

Installation example 1
Without carrier frame

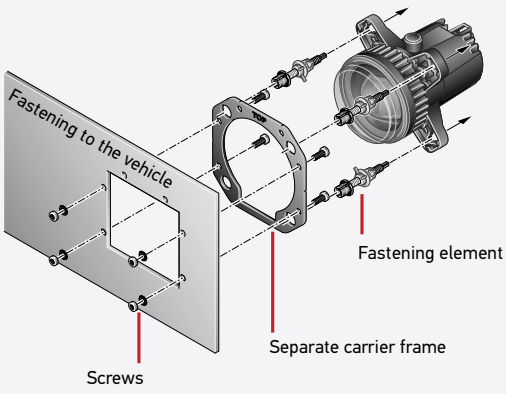


Centre-to-centre distance	Hole diameter	Panel thickness	Bracket part number	Module series
85 x 85	16,9 mm	3 mm	9AH 254 288-012	247 042 247 043 012 488 011 988 015 050
85 x 85	14 mm	3 mm	9AH 169 580-011	247 042 247 043 012 488 011 988
85 x 85	16,9 mm	3 mm	9AH 185 978-011	015 318 (Essential)
				015 318 (Performance)
85 x 85	16,9 mm + 14 mm	3 mm	9AH 254 288-012 9AH 169 580-011	009 998
85 x 85	14 mm	3 mm	9AH 169 580-011	009.998

Installation example 2
With pre-assembled carrier frame

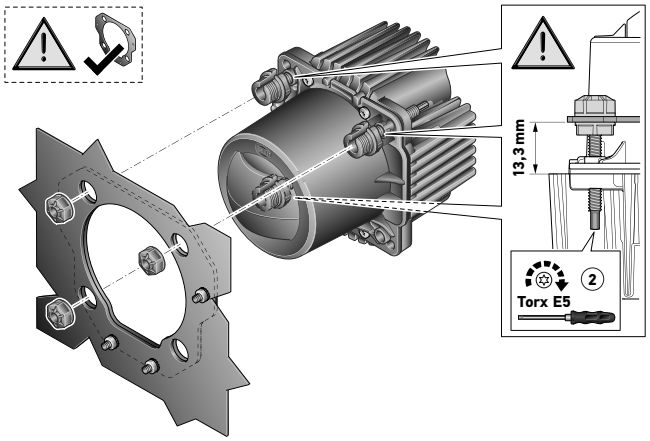


Installation example 3
With additional carrier frame

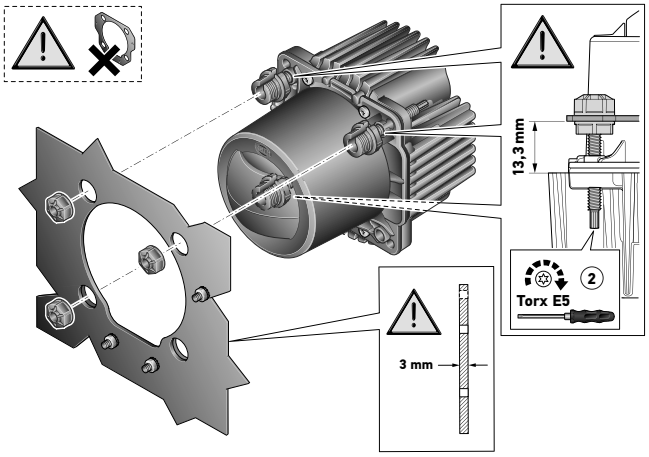


USING THE EXAMPLE OF MODULE L 4565 ESSENTIAL
Installation story

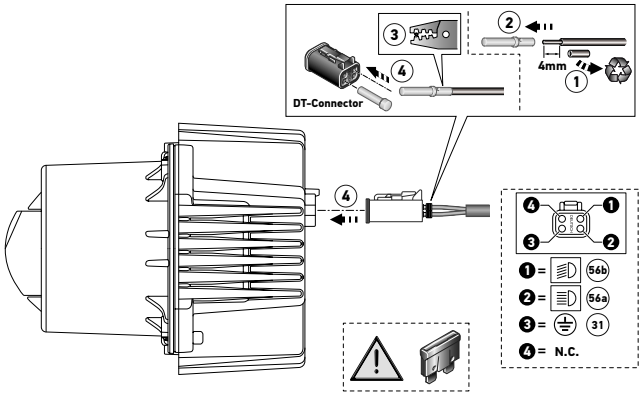
NOTES ON MOUNTING



Integration on the vehicle with carrier frame
The HELLA carrier frame helps to mount the module correctly on the vehicle body.



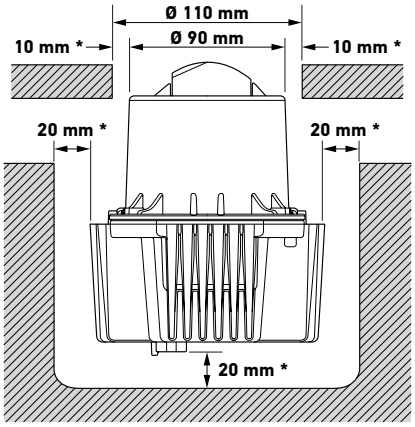
Integration on the vehicle without carrier frame
If no carrier frame is used and the module is mounted directly onto the vehicle body, a wall thickness of 3 mm must be observed.



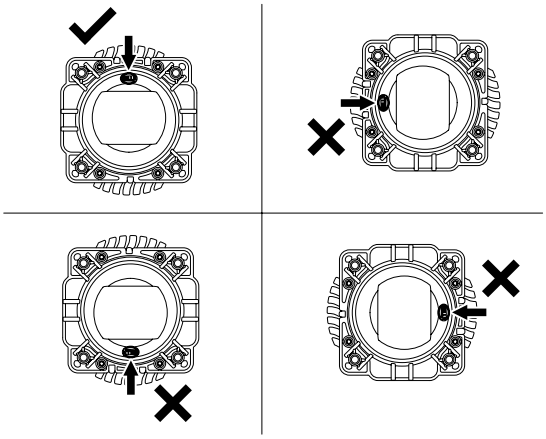
Electrical connection
For the electrical connection of the module,
a sealed connector is required that fits the plug connection.

The advice given on this double page is deliberately general.
Product-specific instructions can be found in the respective mounting instructions enclosed with the product or in the technical drawing.
If you have any questions, please contact us (see p. 47).

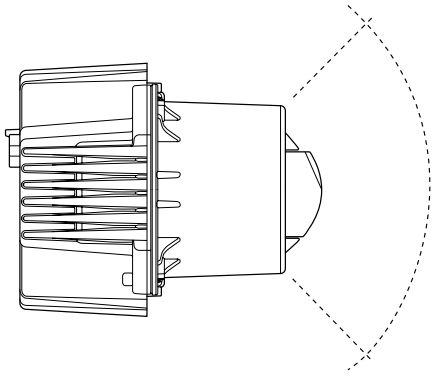
GENERAL INFORMATION TO OBSERVE



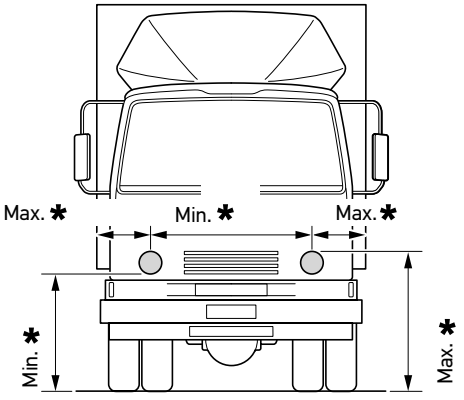
Ventilation installation space* and adjustment way
The minimum ventilation installation space must be ensured. This means that the dimensions around the module must be adhered to in order to ensure optimum heat dissipation. Furthermore, there must be sufficient space for adjusting the module.



Aligning the module
The module is correctly aligned when the HELLA logo is legible.



Compliance with legal visibility angles
When installing the module, the legal visibility angles must be observed so that the light cone or light output is not impaired.

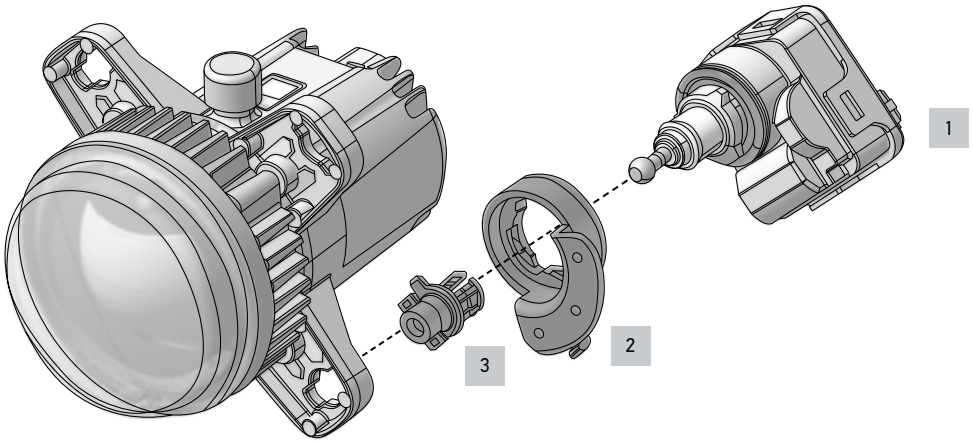


Legal regulations
The relevant country-specific statutory specifications and regulations for motor vehicles must be observed when installing headlamps.

OVERVIEW
Accessories

				90 mm Module LED - Performance								
				Low beam 012 488-001 / -011	**Low beam** 012 488--111	**Low beam, daytime running light and position light** 012 488 -131	High beam 011 988-021 / -121	High beam, daytime running light and position light 011 988-031 / -131	High beam and direction indicator light 011 988-081 / -181 / -071 / -171 / -191	Fog light 011 988-001	Fog light, daytime running light and position light 011 988-011	Fog light and cornering light 011 988-051 / -061
Product image	Description	Part number	PU									
Headlamp levelling systems, 12 V												
	**Mounting set Headlamp levelling motor (1), bracket for left-hand mounting(2), joint pieces & clamping element (3)**	6NM 007 282-221	1 piece	x	x	x						
	Alternatively: Bracket for right-hand mounting	8HG 138 619-007	100 piece	x	x	x						
	Mounting set	**Available soon**										
Headlamp levelling systems, 24 V												
	**Headlamp levelling motor (1)**	6NM 008 299-501	1 piece	x	x	x						
	Joint for Performance (3)	9XS 254 299-007		x	x	x						
	Bracket for left-hand mounting (2)	8HG 138 620-007	100 piece	x	x	x						
	Alternatively: Bracket for right-hand mounting	8HG 138 619-007	100 piece	x	x	x						
	Mounting set	**Available soon**										
Accessories												
	**Locking element**	9XD 198 241-002	100 piece									

INSTALLATION EXAMPLE



	90 mm Module LED - Essential		
Low beam and high beam (Bi-LED) 015 318-041	**Low beam and high beam (Bi-LED)** 015 318-011	**Low beam** 015 050-001-011	High beam 015 050-021
		x	
		x	
x	x		
		x	
		x	
		x	
		x	
x	x		
Accessoires			

OVERVIEW
Accessories

													90 mm modules LED - Essential	
				Low Beam 012 488-111	Low beam, daytime running light and position light 012 488-121 / -131	High Beam 011 988-121	High beam, daytime running light and position light 011 988-031 / -131	High beam and direction indicator light 011 988-081 / -181 / -071 / -171 / -191	Fog Light 011 988-001	Fog light, daytime running light and position light 011 988-011	Fog light and cornering light 011 988-051 / -061	Low beam and high beam (Bi-LED) 015 318-041	Low beam and high beam (Bi-LED) 015 318-011	Low beam 015 050-011	High beam 015 050-021
Product Image	Description	Part Number	PU												
LED surplus supply: FEP connector, 2- or 4-pin															
	**Housing, 4-pin**	8JA 202 231-002	10 Pieces			x	x	x	x	x	x				
	**Housing, 2-pin**	8JD 162 211-801	1 Piece												
	**Flat contact**	8KW 863 933-013	50 Pieces			x	x	x	x	x	x				
	**Single conductor insulation (0,35 - 0,5 mm²)**	9GD 863 952-022	50 Pieces			x	x	x	x	x	x				
	**Single conductor insulation (0,75 mm²)**	9GD 863 952-012	50 Pieces			x	x	x	x	x	x				
	**Dummy plug**	9GD 863 952-002	50 Pieces			x		x	x		x				
LED surplus supply: DEUTSCH connector, 2- or 4-pin															
	**Plug housing, 4-pin**	8KW 905 026-001	10 Pieces	x	x							x	x		
	**Plug housing, 2-pin**	8KW 905 683-001	15 Pieces											x	x
	**Contact sleeve (1.0-2.0 mm²)**	8KW 905 026-001	100 Pieces	x	x							x	x		
	**Dummy plug**	8JA 905 048-001	50 Pieces	x	x							x	x		
	**Pre-Packed Plug with terminals**	8JA 959 736-811	1 Piece											x	x

LB: Low beam
HB: High beam
Bi: Low beam and high beam

PO: Position light
DRL: Daytime running light
DI: Direction indicator light

ES: Right-hand traffic
LES: Left-hand traffic
SAE: USA

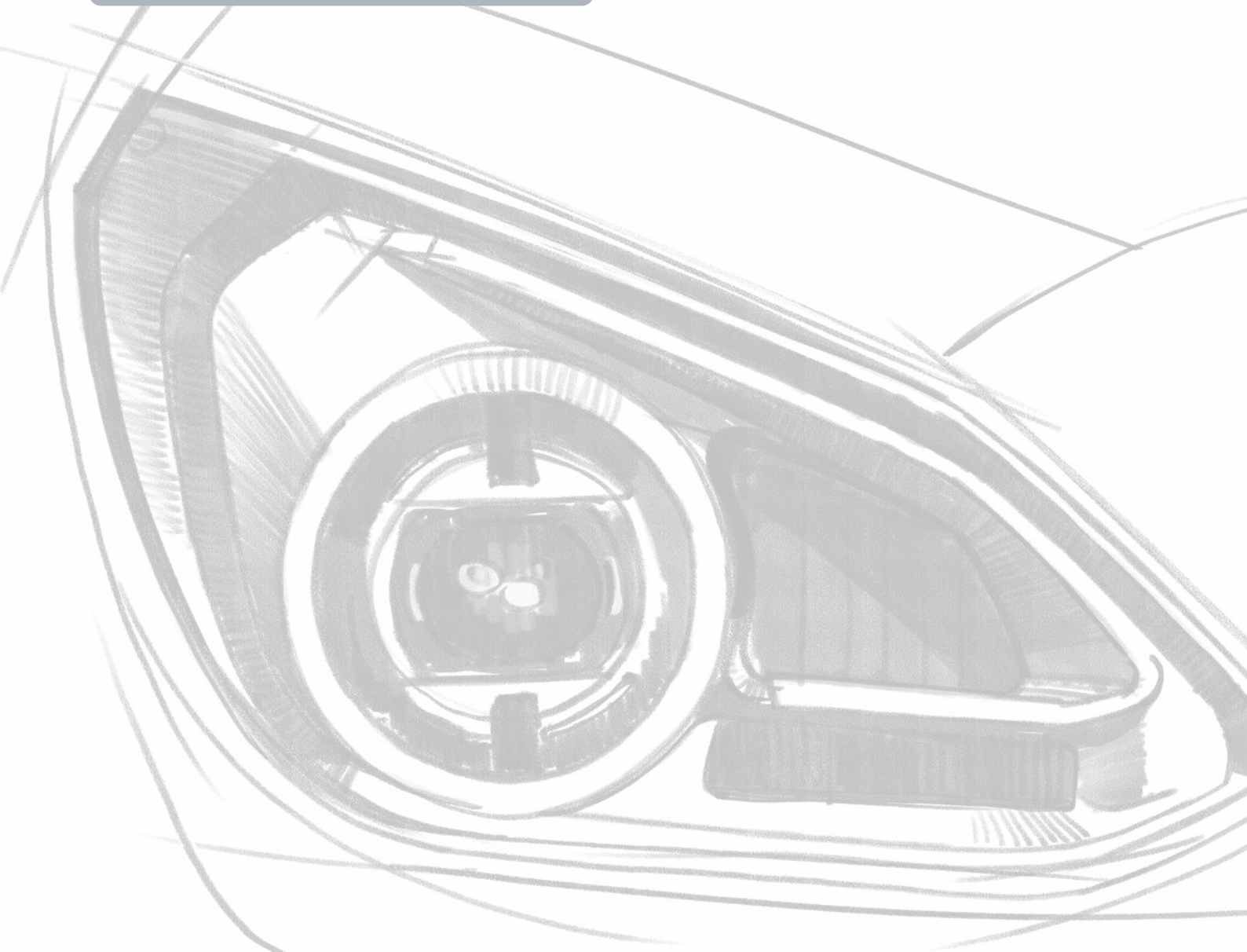
FL: Fog light
CL: Cornering light

* More information about approvals and suitable vehicle classes is available on request.

OVERVIEW

Type approvals

	Part number	Main light functions	Auxiliary light functions	Variant	Weight	Voltage	Light source	ECE test mark	Approval*		
									ECE		SAE
									R149 Class B	R149 Class DS	
90 mm Modules LED – Performance	1ML 012 488-111	LB	–	LES	764 g	Multi-voltage	LED	E1 4090	×		
	1ML 012 488-131	LB	DRL / PO	LES	781 g	Multi-voltage	LED	E1 4090	×		
	1F0 011 988-021	HB	–	–	519 g	Multi-voltage	LED	E1 3831	×		×
	1F0 011 988-121	HB	–	–	552 g	Multi-voltage	LED	E1 3831	×		×
	1F0 011 988-031	HB	DRL / PO	–	524 g	Multi-voltage	LED	E1 3831	×		×
	1F0 011 988-131	HB	DRL / PO	–	556 g	Multi-voltage	LED	E1 3831	×		×
	1F0 011 988-081	HB	DI	–	584 g	Multi-voltage	LED	E1 3831	×		×
	1F0 011 988-181	HB	DI	–	616 g	Multi-voltage	LED	E1 3831	×		×
	1F0 011 988-071	HB	DI	–	524 g	Multi-voltage	LED	E1 3831	×		×
	1F0 011 988-171	HB	DI	–	556 g	Multi-voltage	LED	E1 3831	×		×
	1F0 011 988-191	HB	DI	–	624 g	Multi-voltage	LED	E1 3831	×		×
	1N0 011 988-001	FL	–	–	521 g	Multi-voltage	LED	E1 3831	×		×
	1N0 011 988-011	FL	DRL / PO	–	527 g	Multi-voltage	LED	E1 3831	×		×
	1N0 011 988-051	FL	CL L	–	516 g	Multi-voltage	LED	E1 3832	×		×
	1N0 011 988-061	FL	CL R	–	516 g	Multi-voltage	LED	E1 3832	×		×
	1LL 015 318-041	Bi	–	LES	1.366 g	Multi-voltage	LED	In Vorbereitung	×		
90 mm Modules LED – Essential	1M0 015 050-011	LB	–	LES	445 g	Multi-voltage	LED	E1 0008	×		
	1K0 015 050-021	HB	–	–	445 g	Multi-voltage	LED	E1 0009	×		×
	1LL 015 318-011	Bi	–	LES	1.307 g	Multi-voltage	LED	E1 0015	×		



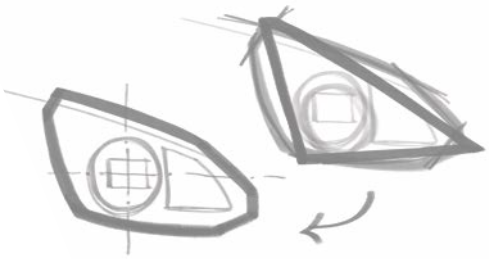
BREAKING NEW GROUND WITH MODULARITY

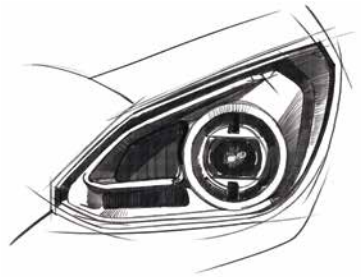
HELLA lends radiance to individual projects

With high quality standards, HELLA creates special modular solutions for a wide range of applications.
The outstanding light output is not only reserved for proven technologies, but also brings safety, reliability and radiance to unusual projects.

With lighting expertise and automotive know-how, HELLA is a reliable development partner for bringing the form and function of customised vehicle lighting to life. New standards can be set based on specific requirements. The styling and design options are just as strong as the potential for high-tech advancements.

Development process based on individual needs – for maximum individuality
Individual projects always light the way towards specifically developing and integrating existing modules of the right type, scope and performance. They provide a high level of individuality and innovation as well as a broad range of options. For example, customised headlamp housings can be fitted with existing HELLA modules from a large variety of modern headlamps from the product range. Whenever there are precise design specifications and strict technological requirements that have to fit in perfectly with the character of the vehicle, the order of the day is: Everything but standard.

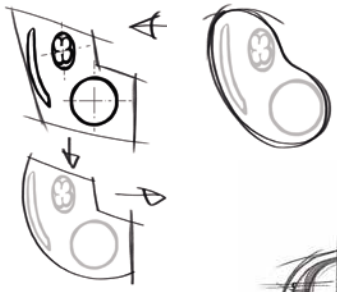


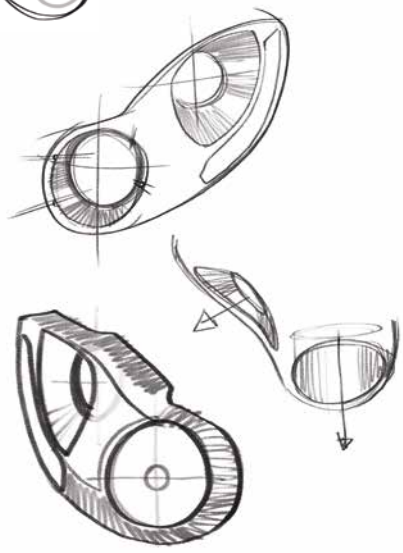


EVOBUS HEADLAMPS

A SYMMETRY OF DESIGN AND QUALITY.

Illuminating the way forward with a reassuring sense of safety, HELLA created a headlamp that combines timeless design and sophistication with superior quality. Clean lines and smooth angles complement each other perfectly while characterizing the distinctive design.





STEYR HEADLAMPS

FOR THE HIGHEST DEMANDS.

Adverse weather conditions, rough terrain, heavy transport. Vehicles that are regularly exposed to the highest of loads must work perfectly. HELLA is well aware of the challenges and works tirelessly to overcome these so that our lights continue to function even when far from the nearest road. With HELLA's advanced technology integrated into a custom-made headlamp we are able to increase driver productivity while projecting an exclusive design.

FAQ

Important information at a glance

→ **Do HELLA headlamps satisfy functional safety requirements?**
All HELLA low beam headlamps (and front direction indicators) have been developed in accordance with the ISO 26262 functional safety standard.

→ **Do I need a headlamp levelling system for low beam?**
This varies, depending on the vehicle. The decisive factor is the extent to which the light cone of the headlamp changes when the vehicle is loaded. If regulation is necessary, this can be controlled either manually using the rotary switch or automatically using inclination sensors. If, however, the low beam headlamp produces more than 2,000 lumens, control must always be automatic.

→ **Which headlamp levelling system can be used?**
Further information can be found on page 40 of this brochure.

→ **How many setting adjustments must be possible for a headlamp?**
If a headlamp levelling system is necessary, the extent of movement of the headlamp must cover the full range of the anticipated inclination of the vehicle.

→ **What characterises a product with fording ability?**
Lighting products with fording ability are used on vehicles that briefly drive through waterways, streams or rivers in offroad situations. Here the vehicle can be immersed in water up to the maximum fording depth (water depth) specified in each case, or the bow wave may briefly wash over the front of the vehicle up to the maximum fording depth. A suitably designed seal prevents headlamps with fording ability being damaged by water ingress up to a specified water pressure (e.g. up to 0.6 bar).

→ **Can the LED lamps be used with pulse duration modulation?**
Our LED modules have not been developed for pulse duration modulation. Please ask about our accessories here.

→ **How many lumens do the LED modules produce?**
All our LED modules have a lumen output of < 2,000 lumens so that no cleaning unit and an automatic headlamp levelling system is necessary.

→ **Can halogen modules be upgraded to LED?**
HELLA's LED modules are similar to the halogen modules in terms of physical structure so that they can be easily replaced or upgraded. However, consideration should be given to electronic modifications required due to the reduced power requirements of LED modules and fault monitoring by the vehicle lighting control system.

→ **What do the abbreviations R149 Class B and R149 Class DS mean?**
Due to ECE regulation updates, the older R112 and R113 regulations will no longer be valid in future. Instead, the R149 regulation is now the new standard for all ECE vehicle headlamps. All HELLA products in this catalogue are or are currently being updated to the latest version of the regulation. In order to optimally equip or retrofit a vehicle, the legal regulations must be observed. The specifications of ECE Regulation 48/86 include requirements for front lighting. Class B is required for most road vehicles. There are several other standards for light and slow-moving vehicles, with class DS being the most common. The most noticeable feature of Class DS is the symmetrical cut-off line for low beam (in contrast to Class B with a graduated cut-off line, which directs more light to the side of the vehicle and less towards oncoming traffic). The acceptance of the DS standard varies within the ECE regulatory area. Not all countries that follow the ECE regulations observe the provisions in every detail. There are some special extensions. We therefore recommend that every vehicle manufacturer checks all local requirements.

→ **What is the difference between DOT, SAE and ASABE?**
ASABE: The American Society of Agricultural and Biological Engineers. Among other things, it defines standards for agricultural vehicles.

DOT: The US Department of Transportation; headlamps that are designed, manufactured, tested and approved for US road use carry a DOT marking.

SAE (Society of Automotive Engineers) is the association of American automotive designers and engineers. Advocates for standards in the automotive industry, e.g. the standard for assembling and manufacturing components in the automotive sector.

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