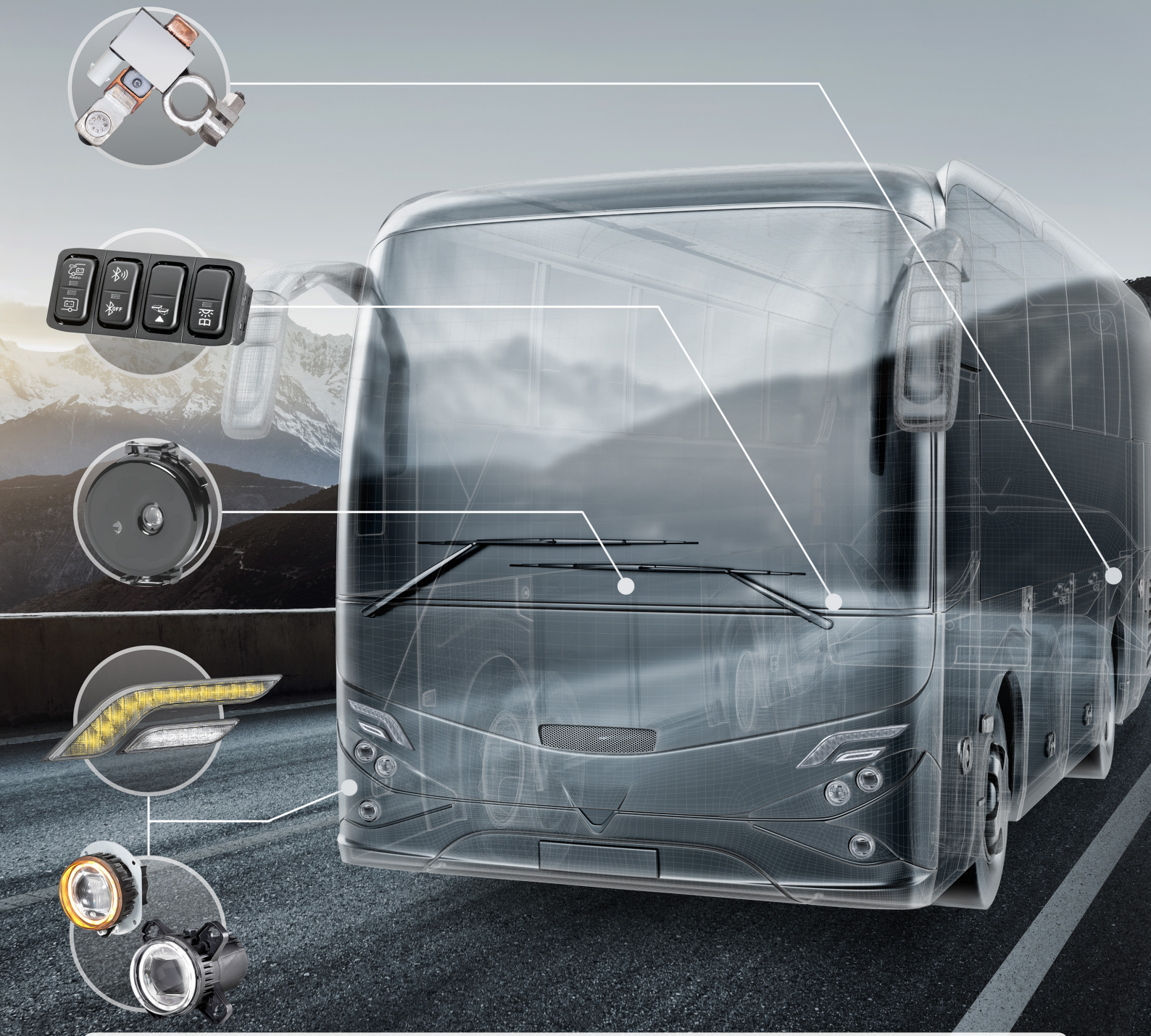
PRODUCT OVERVIEW
CITY BUSES AND COACHES



www.hella.com/bus

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Photo: © MAN Truck & Bus AG

TODAY AND IN THE FUTURE - ARRIVING SAFELY AT YOUR DESTINATION WITH HELLA

It makes no difference if the journey is short or long: when you travel by bus, it is quite normal to rely on the bus carrying you safely to your destination. And HELLA is indeed a decisive and crucial safety factor in this equation. Our wide range of lighting and electronic products enable us to help achieve the maximum degree of safety on our road networks for public transport, too.

With our modular designs and our specially developed, customer-specific products for city buses and coaches, we are meeting the increasing demands of this sector - right now and will continue to do so in the future. We have on offer a wealth of diverse, tried-and-tested equipment, which you can use to set trends and ultimately highlight your own particular type of brand.

In addition to proven products such as the 90 mm module series for front lighting, our product portfolio also includes new highlights such as the Shapeline lamp series. The modular, extremely design-orientated, building block system with a multitude of lamp functions is the perfect way of giving your vehicles a personalised yet at the same time consistent light signature.

In order to guarantee first-class product quality at all times, we make use of our expertise gained from experience in large-scale production: at HELLA, every product undergoes strict quality controls, which are far more stringent than the legally required test procedures. Take a look and see for yourself!


VDL

KEY OF ICONS

ECE

This product is tested in line with ECE guidelines.

Further information about the ECE test mark can be found on the relevant products.

Asymmetrical light distribution

The product complies with the ECE guideline R112, which regulates asymmetrical low beam for passenger cars, buses, commercial vehicles and the majority of larger vehicles.

Symmetrical light distribution

The product complies with ECE guideline R113, which regulates the symmetrical low beam for many agricultural vehicles and also for lighter vehicles (2, 3 or 4-wheeled).

SAE

Product has SAE type approval.

Vehicle electrical system voltage

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

Operating temperature

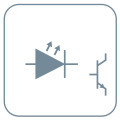
Thermal management and an optimised housing design guarantee full functionality for all operating temperatures as a result of product testing, e.g. from - 40°C to 60°C

IP protection classes

International protection (IP) in accordance with DIN 40050, Part 9. Specific definition for road vehicles:

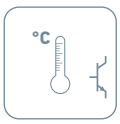
First digit:
Protection against dust and dirt
5K = Dust protected
6K = Dustproof

Second digit:
Protection against water
4K = Protection against all-round splashing of water under higher pressure
7 = Protection against temporary immersion
9K = Protection against water during high pressure/ steamjet cleaning



Active

Passive



Active

Passive

Electronic circuit

Basically, two different circuits are possible for LED lamps.

Active (AE):
LED current regulation by means of active electronics

Passive (PT):
Setting a specific voltage range for the LED 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:
Optimal layout of components for even temperature distribution and temperature spread.

Overvoltage protection

Complement to electronics to protect the LED against high voltage / current in the vehicle network as per ISO 7637-2.

Overloading of the LEDs can be caused by increased voltage peaks in vehicles as a result of the following:
→ Starting aid
→ Defective control units
→ Load dump impulse (faulty battery contact)

Such peaks stress / damage the LEDs, which can lead to function failure or to a reduction in lifetime. Complementing the circuit with appropriate components protects the circuit and can extend lifetime or even prevent failure.

Bipolarity of the lamps

If the connecting cable is fitted the wrong way round, the LED still functions fully.

The semiconductor in an LED must always be operated with the specified polarity. Incorrect polarity will damage the LED so LED lamps are generally equipped with polarity reversal protection (diode). However, this function only works if "+" and "-" are correctly connected. If a lamp has a bipolar circuit, its functioning is independent of the contact connections. This then ensures that Poka Yoke (avoidance of faulty installations) is present in operations such as indentation clamping technology. However, the additional components then found on the printed circuit board increase the cost outlay.

Polarity reversal protection

Even if the connecting cable is fitted the wrong way round, there is still no danger for the electronics.

Electromagnetic compatibility

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

If the lamp is not designed and constructed according to EMC specifications, and thus is not certified, then interactions between it and other safety-relevant electronic systems may occur.

Direction indicator failure control in accordance with ECE R48

Regulation in accordance with ECE R48:
The driver must be informed if the direction indicator function on the vehicle fails. In order to remain legally compliant, this requirement must also be met for LED direction indicators. Such a requirement is met by means of an integrated self-diagnosis system on the printed circuit board of the LEDs and with an electrical pulse. Since the end of 2011, this HELLA failure control with pulse has been an ISO standard: ISO 13207.

If the direction indicator failure control cannot be guaranteed, then the General Certification for such a vehicle expires. Therefore it is not permitted to operate vehicles without a direction indicator failure control in countries subject to ECE R48.

Integrated short-circuit fuse

Protected against short circuit by means of an amp fuse.

Approved for dangerous goods transports

Lamp is approved for dangerous goods transports in accordance with the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR - in German abbreviated to GGVS).

Automotive Electronic Council

Components qualified in accordance with automotive standard. Electronic components (LEDs, diodes, ...) governed by automotive specifications are more robust and safer than electronic components designed for industry.

Automotive Safety Integrity Level

Product electronics are developed using cutting-edge methods and in accordance with the ISO 26262 safety guideline.

Tourist solution (passive)

The lamp can be used without adjustments for a short time in countries with left-hand traffic.

IP PROTECTION CLASSES

What is an IP protection class?

IP stands for International Protection. The IP protection classes are defined in accordance with DIN 40050, Part 9. The purpose of the norm is to specify precisely the resistance of electrical equipment components for vehicles against the penetration of solid foreign matter, dust and water. The varying degrees of protection important for signalling systems are explained in more detail below.

Protection class IP 5K4K

Dust may only penetrate to such an extent that function and safety are not impaired. Water that splashes or sprays from any direction at an increased rate of pressure against the housing must not have any damaging effect: with water pressure being ca. 4 bar.

Protection class IP 9K

Water that is directed onto the housing during high pressure/steamjet cleaning must not have any harmful effects: with the water pressure being ca. 80 – 100 bar.

Protection class: IP 6K7

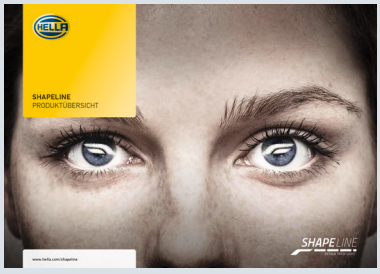
Dust must not penetrate. Even during temporary immersion, no water is to penetrate.

HELLA products meet the highest requirements and are optimally protected against all weather conditions.

DESIGN FREEDOM WITH JUST THE CLICK OF A MOUSE

The HELLA Shapeline online configuration tool turns you into a lighting designer: with just a few clicks, you can create your own complete and personalised lighting design for the front, sides, and rear of your vehicle – and then see the result displayed straight afterwards when it is strikingly and realistically applied to the outline of a car.

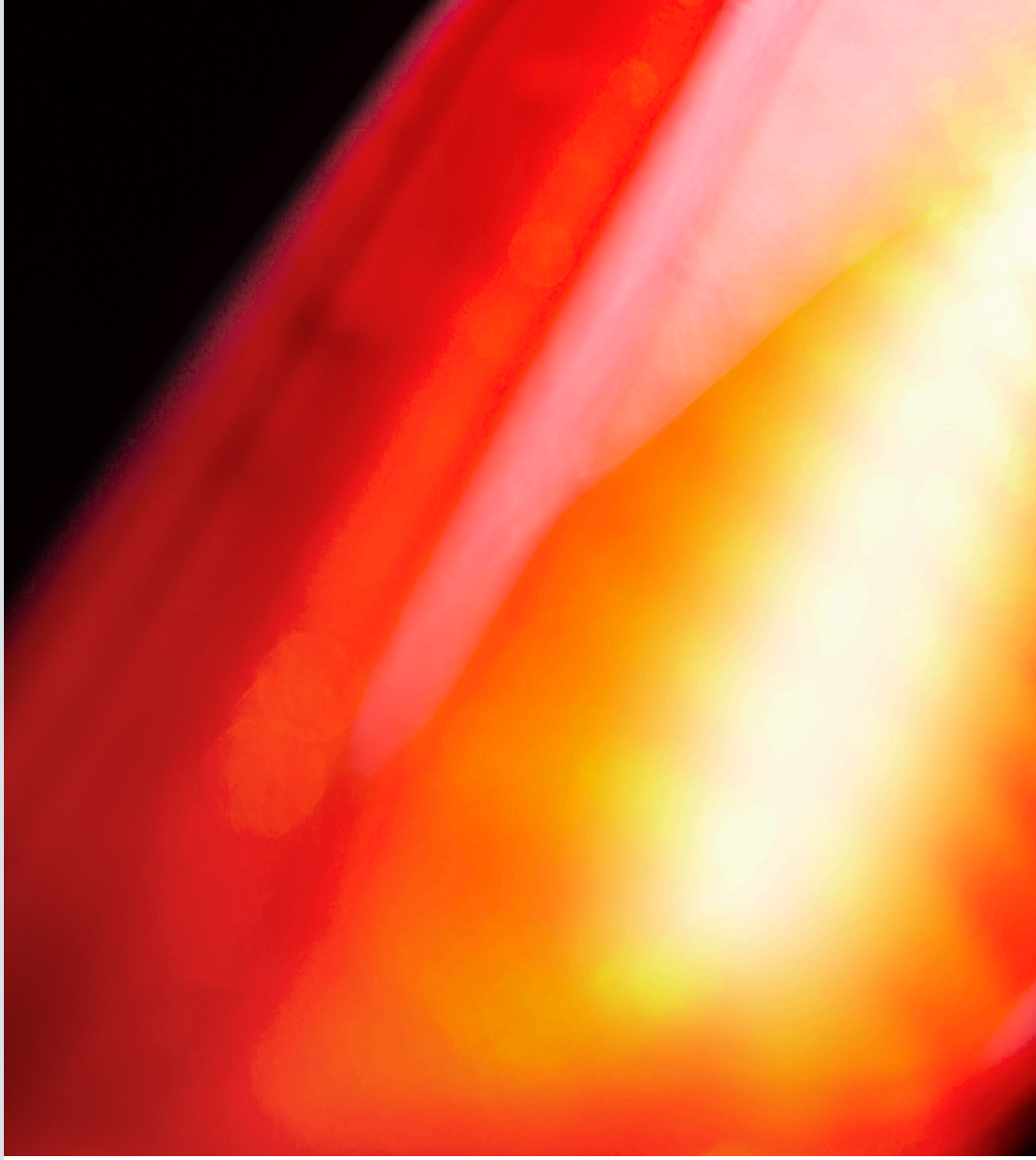
www.hella.com/shapeline



HELLA SHAPELINE BROCHURE

The complete product range in one brochure. Comprehensive product information covering all aspects of the Shapeline series will help you to select the right lamps for your purpose. You will also find the current brochure at:

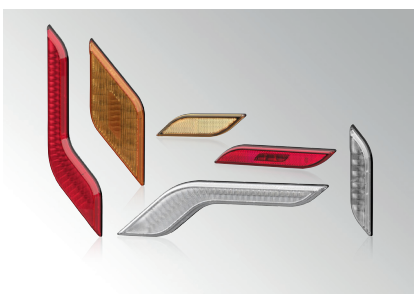
www.hella.com/shapeline



DESIGN YOUR LIGHT – WITH HELLA SHAPELINE!

The variety and range of shapes and the various combination options paired with a technically optimised product design make the new Shapeline lamp series a true innovation in vehicle lighting.

STYLE DESIGN



TECH DESIGN

THE HIGHLIGHTS

The HELLA Shapeline series gives you the chance of enjoying design freedom for almost every kind of application.

- → **Diversity of functions:** a countless variety of individually combinable LED lighting functions means that virtually every wish can be fulfilled.
- → **Flexible design:** whether you prefer the classic straight lines of the Shapeline Tech design or the dynamically curved Shapeline Style design – the choice is yours.
- → **High recall value:** with Shapeline you will achieve a unique, yet nevertheless consistent light signature for your vehicles.

YOUR ADVANTAGES

Shapeline offers a huge variety of shapes and combination options paired with a technically optimised product design.

- → **Innovation:** the modular Shapeline series consists entirely of LED technology – durable and energy-efficient.
- → **Individuality:** you can design your very own light signature for the front, side and rear of your vehicle by selecting personalised lamp combinations and designing their arrangement yourself.
- → **Variability:** thanks to Shapeline, even manufacturers who produce small batches are able to lend their vehicles a unique look.

All information about the product range can be found in the **HELLA Shapeline brochure** at **www.hella.com/shapeline**

HELLA SHAPELINE MODULE OVERVIEW

The modular HELLA Shapeline product range offers a variety of diverse lighting functions that can be individually combined with one another. All lamps are available in two different designs: the classic straight lines of the Shapeline Tech design and the dynamically sweeping contours of Shapeline Style.

	Style	Tech
FRONT	POSITION LAMPS	
	 2PF 013 324-...  2PF 013 325-...  2PF 013 325-...  2PF 013 326-...  2PF 013 326-...	 2PF 013 323-...
	REFLEX REFLECTORS	
	 8RA 013 347-...	 8RA 013 403-...
	DIRECTION INDICATORS	
	 2BA 013 334-...  2BA 013 334-...  2BA 013 335-...  2BA 013 335-...	 2BA 013 330-...  2BA 013 398-...
	DAYTIME RUNNING AND POSITION LAMPS	
	 2PT 014 627-...	
SIDE	DIRECTION INDICATORS	
	 2BM 013 338-...  2BM 013 339-...	 2BM 013 336-...  2BM 013 337-...  2BM 013 337-...
	REFLEX REFLECTORS	
	 8RA 013 347-...	 8RA 013 403-...
	CLEARANCE LAMPS	
		 2XS 013 327-...
	SIDE MARKER LAMPS	
	 2PS 013 305/6-...  2PS 013 305-...  2PS 013 307-...  2PS 013 307-...	 2PS 013 300/2-...  2PS 013 300-...  2PS 013 303-...  2PS 013 303-...  2PS 013 301/2-...  2PS 013 301-...  2PS 013 304-...  2PS 013 304-...

REAR

Style	Tech

POSITION LAMPS

2SA 013 324-...

2SA 013 323-...

TAIL-STOP LAMPS

2SB 013 342-...

2SB 013 342-...

2SB 013 399-...

2SB 013 399-...

2SB 013 343-...

2SB 013 343-...

2SB 013 341-...

DIRECTION INDICATORS

2BA 013 331-...

2BA 013 331-...

2BA 013 331-...

2BA 013 331-...

2BA 013 333-...

2BA 013 333-...

2BA 013 330-...

2BA 013 330-...

2BA 013 332-...

2BA 013 332-...

TAIL-STOP-DIRECTION INDICATOR LAMPS

2SD 013 342-...

2SD 013 342-...

2SD 013 341-...

REVERSE LAMPS

2ZR 013 345-...

2ZR 013 345-...

2ZR 013 401-...

2ZR 013 401-...

2ZR 013 401-...

2ZR 013 344-...

REAR FOG LAMPS

2NE 013 345-...

2NE 013 345-...

2NR 013 345-...

2NR 013 345-...

2NE 013 343-...

2NE 013 343-...

2NE 013 343-...

2NE 013 344-...

2NR 013 344-...

REFLEX REFLECTORS

8RA 013 402-...

8RA 013 347-...

8RA 013 403-...

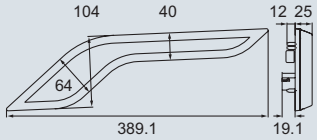
HELLA SHAPELINE
VERSATILE MODULE COMBINATIONS

Our Shapeline range offers you countless mounting and combination options.
Thanks to the modular nature of the product range, these lamps can be combined in virtually every conceivable constellation. You simply just have to configure your own individual lighting design.

DIMENSIONAL DRAWINGS

1

2



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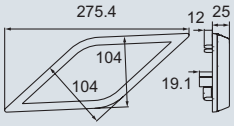

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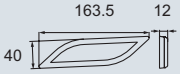

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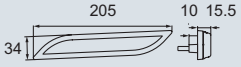


EXAMPLE OF FRONT VIEW

Daytime running and position lamp, Slim, front

Homologation	ECE / SAE
Number of LEDs	6
Connectors & wiring	3-pin AMP SUPERSEAL integrated
Dimensional drawing	1

2PT 014 627-021

Direction indicator, Wing, front

Homologation	ECE / SAE
Number of LEDs	12
Connectors & wiring	2-pin AMP SUPERSEAL integrated
Dimensional drawing	2

2BA 013 334-021

EXAMPLE OF REAR VIEW

Tail-stop lamp, Wing

Homologation	ECE / SAE
Number of LEDs	30
Connectors & wiring	3-pin AMP SUPERSEAL integrated
Dimensional drawing	2

2SB 013 399-031

Direction indicator, Wing, rear

Homologation	ECE
Number of LEDs	30
Connectors & wiring	2-pin AMP SUPERSEAL integrated
Dimensional drawing	2

2BA 013 333-031

Rear fog lamp

Homologation	ECE / SAE
Number of LEDs	12
Connectors & wiring	3-pin AMP SUPERSEAL integrated (with 2-pin function)
Dimensional drawing	3

2NE 013 345-031

Reflex reflector, rear

Homologation	ECE / SAE
Number of LEDs	–
Connectors & wiring	–
Dimensional drawing	4

8RA 013 347-061

Clearance lamp*

Homologation	ECE
Number of LEDs	–
Connectors & wiring	2-pin AMP integrated
Dimensional drawing	–

2XS 013 327-001

* Side mounting, light radiation to the front and the rear

9 – 32 V | °C -40 – +60°C | IP

Protection class: IP X9K, IP 6K7

Direction indicator, category 6, on the side

Homologation	ECE
Number of LEDs	2
Connectors & wiring	500 mm cable, open-ended
Dimensional drawing	1

2BM 013 339-021

Reverse lamp

Homologation	ECE / SAE
Number of LEDs	4
Connectors & wiring	3-pin AMP SUPERSEAL integrated (with 2-pin function)
Dimensional drawing	3

2ZR 013 345-131

Side marker lamp, amber

Homologation	ECE / SAE
Number of LEDs	3
Connectors & wiring	AMP SUPERSEAL, 250 mm cable, overmoulded
Dimensional drawing	5

2PS 013 305-011

FRONT LIGHTING

Look ahead – with front lighting solutions from HELLA. On long journeys you are totally lost without powerful headlamps. They are, so to speak, the eyes of the vehicle and they ensure that you and your passengers are safe on the road.

The HELLA 90 mm front lighting modules are specially tailored to suit the requirements of city buses and coaches and, because of their functional versatility, they are able to be implemented in virtually all vehicles and situations. The modules are small but powerful – and offer a high degree of flexibility thanks to their modular concept, particularly so when it comes to buses. And as a result of the future-proof HELLA upgrade concept, traditional halogen modules, at a later date, can also be converted to efficient, light-intense LED technology, a feature which is already present in most of the modules.

90 MM MODULES
PROGRAM OVERVIEW

The heavy duty HELLA 90 mm headlamps are used in many vehicle types. Again because of the modular design, they offer maximum flexibility leading to a wide range of possible applications and also to a customised front design.

The 90 mm module headlamp range caters for both halogen and LED technology and offers a choice between them depending on requirements, thus enabling an easy switch from halogen to LED. All the modules score really high points because of their sturdy construction and can therefore also be used in demanding work environments.

The differences between the individual series of the 90 mm range lie in the detail. The L 4060 LED modules, for example, impress with their outstanding light output and supplementary lighting functions. The light colour of the LED modules, which is similar to daylight, considerably improves visibility and levels of concentration during night-time journeys and thus ramps up the safety factor. The L 70 and L 5570 Bi-LED modules and also the Bi-halogen modules combine low beam and high beam in a single headlamp module and, as such, are ideal for installation in situations where space is limited.

	Low beam	High beam	Low beam and high beam		Fog light
LED	PERFORMANCE				
	 L 4060	 L 4060	 Bi-LED L 70 1st gen.	 Bi-LED L 5570 2nd gen.	 L 4060
	ESSENTIAL				
	 R 80	 R 80			
HALOGEN	PERFORMANCE				
					

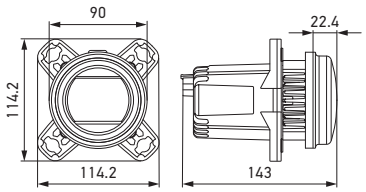
HELLA 90 MM MODULE HEADLAMPS STAND FOR

→ PREMIUM QUALITY
→ RELIABILITY
→ AND COST EFFICIENCY.

MODULE FINDER

A couple of clicks away from the right module headlamp: simply use the filter to select the required criteria, such as lighting function or homologation, and you will be shown the suitable products right away.

www.hella.com/headlamp-modules

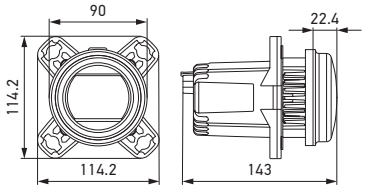


LED low beam headlamp L 4060

Module headlamp with 40 x 60 mm polycarbonate lens, rugged diecast aluminium housing

Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	1BL 012 488-001: E1 3831 1ML 012 488-011: E1 4090 1BL 012 488-101: E1 3881 1ML 012 488-111: E1 4090

1BL 012 488-001	Right-hand traffic, ECE, SAE, FEP connector
1ML 012 488-011	Left-hand traffic, ECE, FEP connector
1BL 012 488-101	Right-hand traffic, ECE, SAE, DEUTSCH connector
1ML 012 488-111	Left-hand traffic, ECE, DEUTSCH connector



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

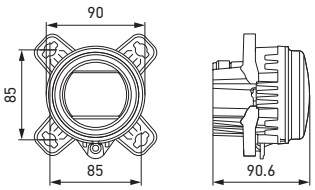
Module headlamp with 40 x 60 mm polycarbonate lens, rugged diecast aluminium housing

Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	1BL 012 488-021: E1 3831 1ML 012 488-031: E1 4090 1BL 012 488-121: E1 3881 1ML 012 488-131: E1 4090

1BL 012 488-021	Right-hand traffic, ECE, SAE, FEP connector
1ML 012 488-031	Left-hand traffic, ECE, FEP connector
1BL 012 488-121	Right-hand traffic, ECE, SAE, DEUTSCH connector
1ML 012 488-131	Left-hand traffic, ECE, DEUTSCH connector

LED HIGH BEAM

ECE · R112 · SAE · 9 – 32 V · IP · PRP · EMC



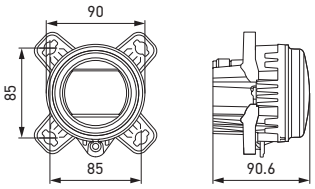
LED high beam headlamp L 4060

Module headlamp with 40 x 60 mm polycarbonate lens, rugged diecast aluminium housing

Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	E1 3831

1F0 011 988-021	With preassembled carrier frame
1F0 011 988-121	For Performance mounting

ECE · R112 · SAE · 9 – 32 V · IP · PRP · EMC



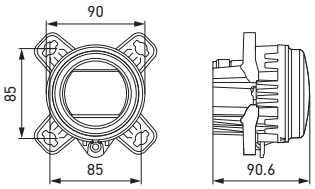
LED high beam headlamp L 4060 with daytime running light/position light

Module headlamp with 40 x 60 mm polycarbonate lens, rugged diecast aluminium housing

Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	E1 3831

1F0 011 988-031	With preassembled carrier frame
1F0 011 988-131	For Performance mounting

ECE · R112 · SAE · 9 – 32 V · IP · PRP · EMC



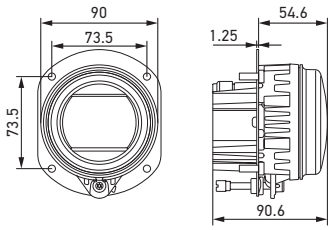
LED high beam headlamp L 4060 with direction indicator light

Module headlamp with 40 x 60 mm polycarbonate lens, rugged diecast aluminium housing

Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	E1 3831

1F0 011 988-081	With preassembled carrier frame, with pulse generator
1F0 011 988-071	With preassembled carrier frame, without pulse generator
1F0 011 988-181	For Performance mounting, with pulse generator
1F0 011 988-171	For Performance mounting, without pulse generator

Pulse generator | Malfunctions of the high beam module with direction indicator light can usually be detected by means of the vehicle control unit. The detection stages are as follows: direction indicator light (DI): < 400 mA | high beam (HB): < 800 mA. If your vehicle's control unit cannot detect stage < 400 mA for the DI, the pulse generator will increase the amperage in an interval of 100 to 120 ms to simulate the level consistent with a standard 12 V (21 watt) bulb.

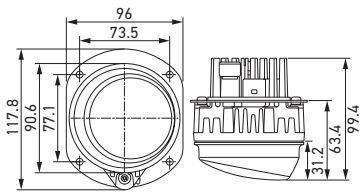


LED fog lamp L 4060

Module headlamp with 40 x 60 mm polycarbonate lens, rugged diecast aluminium housing, preassembled carrier frame

Rated voltage	Multi voltage (12/24V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	E1 3831

1N0 011 988-001	Without daytime running light/position light
1N0 011 988-011	With daytime running light/position light



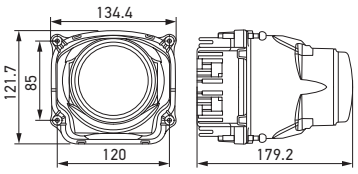
LED fog lamp L 4060 with cornering light

Module headlamp with 40 x 60 mm polycarbonate lens, rugged diecast aluminium housing, preassembled carrier frame

Rated voltage	Multi voltage (12/24V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	E1 3832

1N0 011 988-061	Module, right
1N0 011 988-051	Module, left
8JD 156 151-807[1)]	Connector set
8KB 163 160-801[2)]	Wiring harness
5DF 009 244-007[3)]	Control electronics

BI-LED LOW AND HIGH BEAM



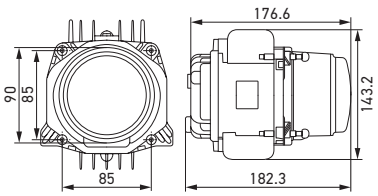
The **L 5570 modules** are equipped with an integrated function monitoring system that monitors current consumption as an alternative to the vehicle. There is a separate pin for the function confirmation signal.

Bi-LED low and high beam headlamp L 5570, 2nd generation

Module headlamp with 55 x 70 mm polycarbonate lens, robust diecast aluminium housing, hardened plastic cover lens, no moving parts

Rated voltage	Multi voltage (12/24V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	Right-hand traffic: E1 4208 Left-hand traffic: E1 4209

1AL 012 758-001	Right-hand traffic, ECE, 4-pin FEP connector
1LL 012 758-011	Left-hand traffic, ECE, 4-pin FEP connector
1AL 012 758-021	Right-hand traffic, SAE, 4-pin FEP connector
1AL 012 758-101	Right-hand traffic, ECE, 4-pin DEUTSCH connector
1LL 012 758-111	Left-hand traffic, ECE, 4-pin DEUTSCH connector
1AL 012 758-121	Right-hand traffic, SAE, 4-pin DEUTSCH connector



Bi-LED low and high beam headlamp L 70, 1st generation

Module headlamp with 70 mm DE lens

Rated voltage	Multi voltage (12/24V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	Right-hand traffic: E1 3351 / 6189 Left-hand traffic: E1 3352 / 6189

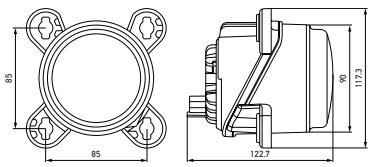
1AL 010 820-021	Right-hand traffic
1LL 010 820-031	Left-hand traffic

LED low beam headlamp L 70, 1st generation

Module headlamp with 70 mm DE lens

Rated voltage	Multi voltage (12/24V)
Protection class	IP X9K, IP X4K, IP 5KX
ECE test mark	Right-hand traffic: E1 3359 / 6189, left-hand traffic: E1 3160 / 6189

1BL 010 820-001	Right-hand traffic
1ML 010 820-011	Left-hand traffic



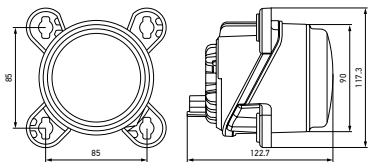
LED low beam headlamp R 80*

Module headlamp with innovative reflector and rugged plastic housing

Rated voltage	Multi voltage (12/24V)
Protection class	IP X9K, IP X4K, IP 5KX

1B0 015 050-001	Right-hand traffic, ECE, 2-pin DEUTSCH connector
1B0 015 050-031	Right-hand traffic, SAE, 2-pin DEUTSCH connector
1M0 015 050-011	Left-hand traffic, ECE, 2-pin DEUTSCH connector
1B0 015 050-101	Right-hand traffic, ECE, 2-pin FEP connector
1B0 015 050-131	Right-hand traffic, SAE, 2-pin FEP connector
1M0 015 050-111	Left-hand traffic, ECE, 2-pin FEP connector

Available from 01 / 2020
* Mounting set 254 163-00 not included.



LED high beam headlamp R 80*

Module headlamp with innovative reflector, robust plastic housing

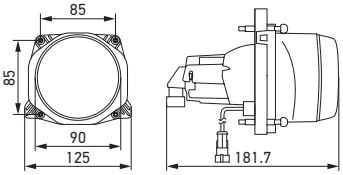
Rated voltage	Multi voltage (12/24V)
Protection class	IP X9K, IP X4K, IP 5KX

1K0 015 050-021	2-pin DEUTSCH connector
1K0 015 050-121	2-pin FEP connector

Available from 01 / 2020
*Mounting set 254 163-00 not included.

90 MM MODULES / HALOGEN / PERFORMANCE
BI-HALOGEN LOW BEAM AND HIGH BEAM

ECE | R112 | SAE | 12 V | 24 V | IP



Bi-halogen low and high beam headlamp

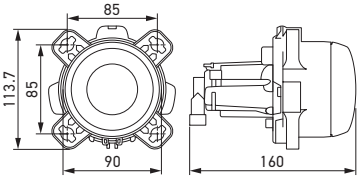
Module headlamp with high quality aluminium reflector, unpatterned and hardened glass cover lens for direct view on lens, including light source.

Rated voltage	12 or 24 V
Protection class	IP 5K4K
ECE test mark	E1 2484, E1 2485

1AL 009 998-001	12 V, right-hand traffic, H7, ECE
1LL 009 998-011	12 V, left-hand traffic, H7, ECE
1AL 009 998-021	12 V, right-hand traffic, H9, SAE
1AL 009 998-041	24 V, right-hand traffic, H7, ECE
1LL 009 998-051	24 V, left-hand traffic, H7, ECE

HALOGEN LOW BEAM

ECE | R112 | 12 V | 24 V | IP



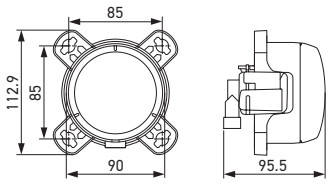
Halogen low beam headlamp

Module headlamp with aluminium reflector and clear DE lens behind unpatterned glass cover lens, including light source.

Rated voltage	12 or 24 V
Protection class	IP 5K4K
ECE test mark	E1 2397, E1 2398

1BL 247 042-007	12 V, right-hand traffic, H1, for Performance mounting
1ML 247 042-027	12 V, left-hand traffic, H1, for Performance mounting
1BL 247 042-177	12 V, right-hand traffic, H1, for Premium mounting
1ML 247 042-187	12 V, left-hand traffic, H1, for Premium mounting
1BL 247 042-017	24 V, right-hand traffic, H1, for Performance mounting
1ML 247 042-037	24 V, left-hand traffic, H1, for Performance mounting
1BL 247 042-197	24 V, right-hand traffic, H1, for Premium mounting
1ML 247 042-207	24 V, left-hand traffic, H1, for Premium mounting

HALOGEN HIGH BEAM



Halogen high beam headlamp

Module headlamp with FF aluminium reflector and unpatterned glass cover lens, including light source.

Rated voltage	12 or 24 V
Protection class	IP 5K4K
ECE test mark	E1 2397

1K0 247 043-007	12 V, with position light, H1, for Performance mounting
1K0 247 043-017	12 V, without position light, H1, for Performance mounting
1K0 247 043-117	12 V, with position light, H1, for Premium mounting
1K0 247 043-127	12 V, without position light, H1, for Premium mounting
1K0 247 043-027	24 V, with position light, H1 Heavy Duty Longlife, for Performance mounting
1K0 247 043-037	24 V, without position light, H1, for Performance mounting
1K0 247 043-137	24 V, with position light, for Premium mounting
1K0 247 043-147	24 V, without position light, for Premium mounting
1K0 247 043-157	12 V, with position light, H1, for replacement of Halogen Essential
1K0 247 043-167	12 V, H1, for replacement of Halogen Essential

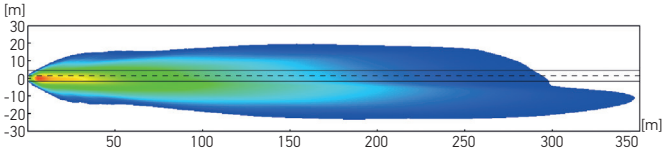
UPGRADE TO LED

LED lamps offer a number of rock-solid benefits. More and more consumers are therefore deciding to upgrade their existing systems.

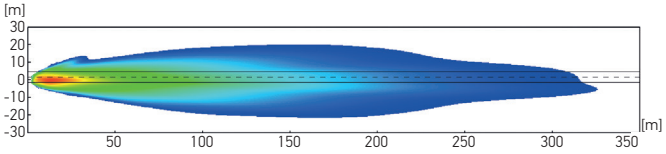
The 90 mm halogen single and multifunctional modules from HELLA make the changeover very easy. The installation instructions supplied describe which adjustments are necessary in order to convert each individual lighting function to LED products on the basis of the halogen version currently in use. As the mounting solutions are compatible, the conversion can be completed in the shortest space of time.

90 MM MODULES - COMPARISON OF THE THREE COMBINATIONS
OF LOW BEAM AND HIGH BEAM MODULES

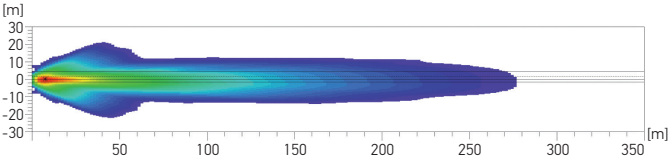
L 4060 LED
(012 488 + 011 988)



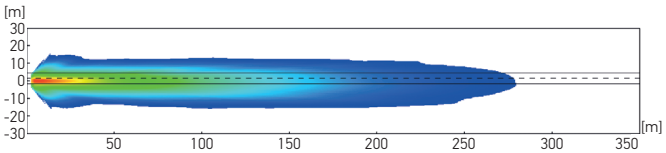
R 80 LED
(015 050 + 015 050)



L 4060 LED + Performance halogen
(012 488 + 247 043)



Performance halogen
(247 042 + 247 043)

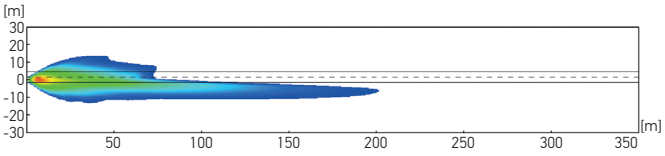


Explanatory notes
Headlamp mounting height: 0.65 m /
gap between the headlamps: 1.20 m

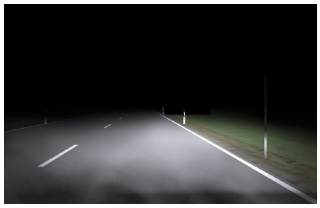
Key for isolux diagram (1 – 350 Lux)

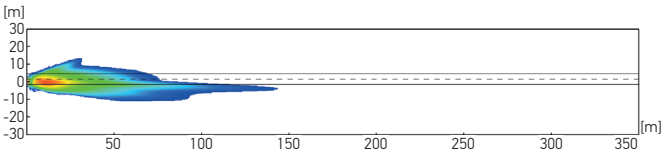
90 MM MODULES - COMPARISON OF LED ILLUMINATION
LED LOW BEAM

L 4060 LED
(012 488)

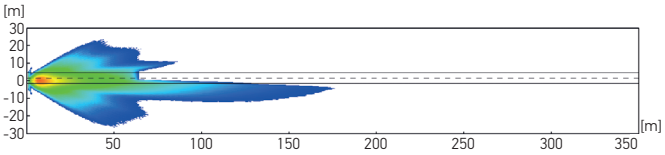


R 80 LED
(015 050)

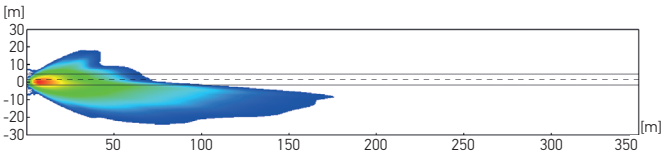




L 5570, Bi-LED, 2nd generation
(012 758)



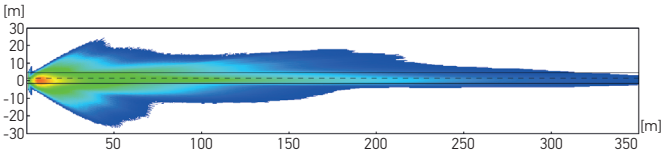
L 70, Bi-LED, 1st generation
(010 820)



BI-MODULES FOR LED HIGH BEAM

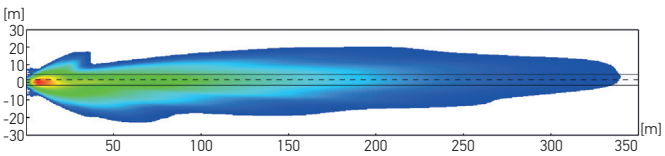
L 5570 Bi-LED, 2nd generation
(012 758)

Please note | Bi-light distributions are generated when low beam is switched on and are only available as a bi-version.



L 70 Bi-LED, 1st generation
(010 820)

Please note | Bi-light distributions are generated when low beam is switched on and are only available as a bi-version.

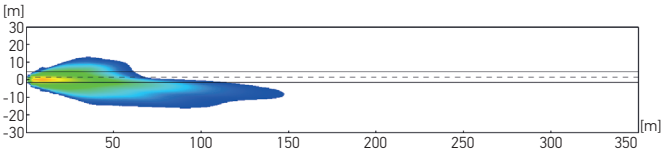


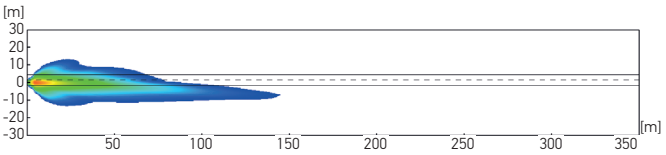
90 MM MODULES - COMPARISON OF HALOGEN ILLUMINATION

HALOGEN LOW BEAM

Bi-halogen
(009 998)

Performance halogen
(247 042)

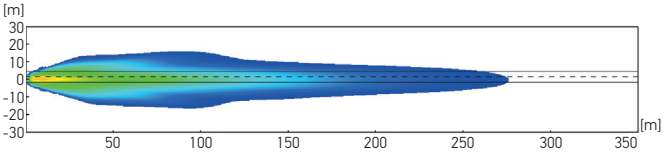




BI-MODULES FOR HALOGEN HIGH BEAM

Bi-halogen
(009 998)

Please note | Bi-light distributions are generated when low beam is switched on and are only available as a bi-version.



Key
•) Accessories for correct connection and also mandatory accessories
••) Optional accessories

Accessory components	Article number	Features
Carrier frames		
Premium carrier frame	**9AH 169 580-011**	Black
Performance carrier frame	**9AH 254 228-012**	Black
Performance carrier frame for agricultural and truck applications	**9AH 185 978-011**	Black
Premium carrier frame	**9AH 205 652-011**	Black
Performance carrier frame	**9AH 205 652-111**	Black
Adapter for 1:1 replacement from 009 999 bi-halogen modules to bi-LED	**9AH 213 181-001**	Black
Adapter for 1:1 replacement from bi-LED to 009 999 bi-halogen modules	**9AH 205 653-001**	Black
Surplus supply LED: AMP SUPERSEAL connector, 3-pin		
Housing	**8JA 746 184-032**	10 pieces
Socket contact	**8KW 744 837-002**	50 pieces
Single conductor insulation	**9GD 746 185-002**	50 pieces
Surplus supply LED: FEP connector, 4-pin		
Housing	**8JA 202 231-002**	10 pieces
Flat contact	**8KW 863 933-013**	50 pieces
Single conductor insulation 0.35 – 0.5 mm^2 or	**9GD 863 952-022**	50 pieces
Single conductor insulation 0.75 mm^2	**9GD 863 952-012**	50 pieces
Dummy plug	**9GD 863 952-002**	50 pieces
Surplus supply LED: DEUTSCH connector, 4-pin (in conjunction with adapter cable, see [1], except for 012 488-1xx and 012 758-1xx)		
Connector housing	**8JA 201 022-042**	10 pieces
Locking system / wedge lock	**9NB 201 024-042**	10 pieces
Contact sleeve 0.5 – 1.5 mm^2	**8KW 201 025-112**	50 pieces
Dummy plug	**9NB 201 026-012**	50 pieces
Set (1 connector housing, 1 locking system, 5 contact sleeves, 3 dummy plugs)	**8JA 201 022-821**	
Headlamp levelling systems		
Headlamp levelling, 12 V	**6NM 007 282-221**	1 piece
Headlamp levelling, 24 V	**6NM 008 299-501**	1 piece
Bracket for right-side mounting of actuator	**8HG 138 620-007**	100 pieces
Bracket for left-side mounting of actuator	**8HG 138 619-007**	100 pieces
Left bracket / interface for headlamp levelling actuator for connection to module	**9XX 208 791-011**	1 piece
Right bracket / interface for headlamp levelling actuator for connection to module	**9XX 208 791-001**	1 piece
Accessories for cornering light		
Connecting cable LED module - cornering light control unit	**8KB 163-160-811**	1 piece
Cornering light control unit	**5DF 009 244-007**	24 pieces
Adapter cable		
[1] Adapter from FEP connector to DEUTSCH connector (4-pin)	**8KA 202 117-001**	1 piece
Adapter from FEP connector to Performance module (247 043) or DynaView (009 295)	**8KA 202 117-011**	1 piece
Other accessories		
Function monitoring device, 12 V	**5DS 011 630-001**	1 piece
Function monitoring device, 24 V	**5DS 011 630-011**	1 piece
Function monitoring device, 24 V	**5DS 011 630-211**	1 piece

L 4060															L 5570		L 70		R 80	
Low beam 012 488-001 / -011	Low beam 012 488-101 / -111	Low beam, daytime running light and position light 012 488-021 / -031	Low beam, daytime running light and position light 012 488-121/-131	High beam 011 988-021	High beam 011 988-121	High beam, daytime running light and position light 011 988-031	High beam, daytime running light and position light 011 988-131	High beam and direction indicator light (with pulse) 011 988-081	High beam and direction indicator light (with pulse) 011 988-181	High beam and direction indicator light (without pulse) 011 988-071	High beam and direction indicator light (without pulse) 011 988-171	Fog light 011 988-001	Fog light, daytime running light and position light 011 988-011	Fog light and comering light 011 988-051 / -061	Bi-LED low beam and high beam 012 758-001 / -011 / -021	Bi-LED low beam and high beam 012 758-101 / -111 / -121	Bi-LED low beam and high beam 010 820-021 / -031	Low beam 010 820-001 / -011	Low beam 015 050	High beam 015 050
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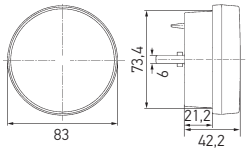
90 MM MODULES
HALOGEN ACCESSORIES

Key
•) Accessories for correct connection and also mandatory accessories
••) Optional accessories

Accessory components	Article number	Features	Performance: Low beam and high beam, bi-halogen H7 009 998	Low beam and high beam, bi-halogen H9 009 998	Low beam, halogen 247 042	High beam, halogen 247 043	High beam, halogen H1 with position light 247 043
Carrier frames							
Premium carrier frame	**9AH 169 580-011**	Black	••	••	••	••	••
Performance carrier frame	**9AH 254 228-012**	Black			••	••	••
Caps							
Flat for angled plugs							
Ventilated	**9GH 152 654-007**	–					
Ventilated	**9GH 152 654-012**	–					
Deep for female connector housing							
Ventilated	**9GH 145 943-001**	–					
Non-ventilated	**9GH 145 943-012**	–					
Connector (vehicle side)							
Surplus supply H1 / H7	**8JD 156 151-807**	20 systems	•		•	•	•
Surplus supply H9	**8JD 158 175-807**	20 systems		•			
Parking light	**8JD 156 150-807**	20 systems					•
Changeover high beam – AMP SUPERSEAL, 2-pin							
Housing	**8JA 746 184-022**	10 pieces	•	•			
Socket contact	**8KW 744 837-002**	50 pieces	•	•			
Single conductor insulation	**9GD 746 185-002**	50 pieces	•	•			

90 MM MODULES
AUXILIARY LIGHTING FUNCTIONS

ECE · 12 V · 24 V · IP · EMC



83 mm LED direction indicator, daytime running and position lamp

LED 3-function lamp with integrated electronics, which is configured so that the daytime running lamp switches off during flashing; pre-wired with a 2,500-mm-long, sheathed, four-wire cable.

Rated voltage	12 or 24 V
Protection class	IP 6K7, IP 6K9K
ECE test mark	E24 5854

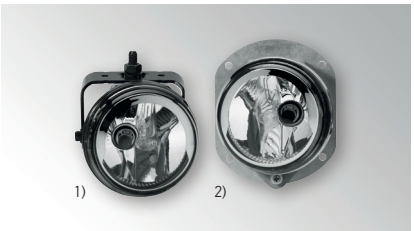
2BE 980 691-001*	Single lamp, 12 V
2BE 980 690-001*	Single lamp, 24 V

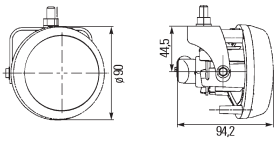
Optional accessories

9GD 980 696-001	The adapter ring is used to replace a 90 mm lamp with a 83 mm lamp. This means that vehicles previously using a 90 mm HELLA lamp can now easily be converted to a 83 mm lamp.

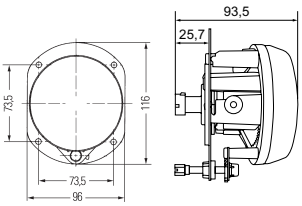
* No integrated pulse, switching-off of daytime running light when direction indicator is flashing.

ECE | 12 V | 24 V | IP





With fastening clamp



With carrier frame

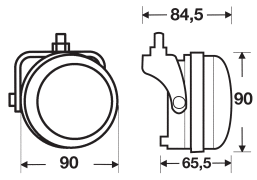
DynaView® Evo 2

Cornering light and fog light, including H7 bulb, vertical or pendant mounting

Light source	H7 bulb
Rated voltage	12 or 24 V
Protection class	IP 5KX, IP X4K, IP X9K
ECE test mark	ECE E1 1951 Cornering light: ECE R119 Fog light: ECE R19 B series 02 / B series 03

1N0 009 295-801[1)]	12 V, set with fastening clamp, including control electronics and wiring harness
1N0 009 295-077[2)]	12 V, single left, with carrier frame
1N0 009 295-087[2)]	12 V, single right, with carrier frame
1N0 009 295-057[2)]	24 V, single left, with carrier frame
1N0 009 295-067[2)]	24 V, single right, with carrier frame
8JD 156 151-807[A)]	Connector set
8KB 163 160-801[B)]	Wiring harness
5DF 009 244-007[C)]	Control electronics

ECE | SAE | 9 – 33 V | IP | EMC



90 mm LED daytime running lamp set

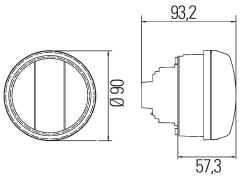
Black aluminium housing, for upright and pendant mounting in or on the front, set contents: 2 brackets and 2 lamps

Light source	3 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 6K7, IP 6K9K
ECE test mark	E1 2372

2PT 009 599-811	Daytime running lamp, set
2PT 009 599-111	Daytime running lamp, left
2PT 009 599-121	Daytime running lamp, right
2PT 009 599-131	Daytime running lamp with position light, left
2PT 009 599-141	Daytime running lamp with position light, right

Optional accessories

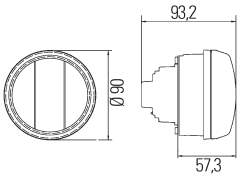
9AH 165 968-001	Universal carrier frame
8KA 165 959-001	Wiring harness, preassembled



90 mm direction indicator with position light

Headlamp with unpatterned glass cover lens, direction indicator light in bulb technology, position light in LED technology

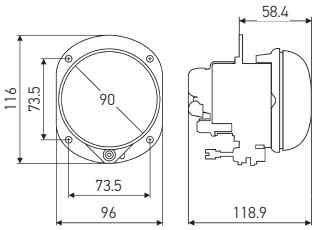
Light source	Direction indicator light: bulb (12 or 24 V) Position light: 2 white LEDs
Rated voltage	12 or 24 V
ECE test mark	E1 2586
2BE 010 102-001	12 V, with silver-coloured bulb
2BE 010 102-011	24 V, with amber bulb
	Accessories
9AH 165 968-001	Optional carrier frame with 3 screws



90 mm daytime running lamp with position light

Headlamp with unpatterned glass cover lens, daytime running light in bulb technology, position light in LED technology

Light source	Daytime running light: white bulb (12 or 24 V) Position light: 2 white LEDs
Rated voltage	12 or 24 V
ECE test mark	E1 2586
2BE 010 102-101	12 V
2PT 010 102-111	24 V
	Accessories
8JD 162 581-802	Connector set, 3-pin
9AH 165 968-001	Optional carrier frame with 3 screws



90 mm high beam headlamp or fog lamp

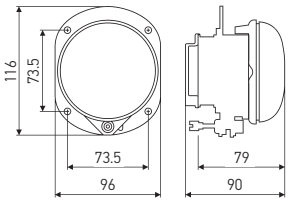
Module headlamp with unpatterned glass cover lens, with carrier frame

Light source	H15 bulb
Rated voltage	12 or 24 V
ECE test mark	High beam: E1 2680, ECE R87, ECE R112 Fog light: E1 2681, ECE R19 B series 02, B series 03, ECE R87

1F0 010 293-001	12 V, with high beam (additional option: daytime running light)
1F0 010 293-011	24 V, with high beam (additional option: daytime running light)
1N0 010 294-001	12 V, with fog light (additional option: daytime running light)
1N0 010 294-011	24 V, with fog light (additional option: daytime running light)

Accessories for combinations

8JD 162 581-802	Connector set, 3-pin (20 systems)
8JA 179 631-002	Connector housing, 3-pin (250 pieces)



90 mm fog lamp

Minimum installation dimensions for an understated yet impressive lighting design, aluminium reflectors with clear lens, ideal in combination with the matching 90 mm high beam and low beam headlamps.

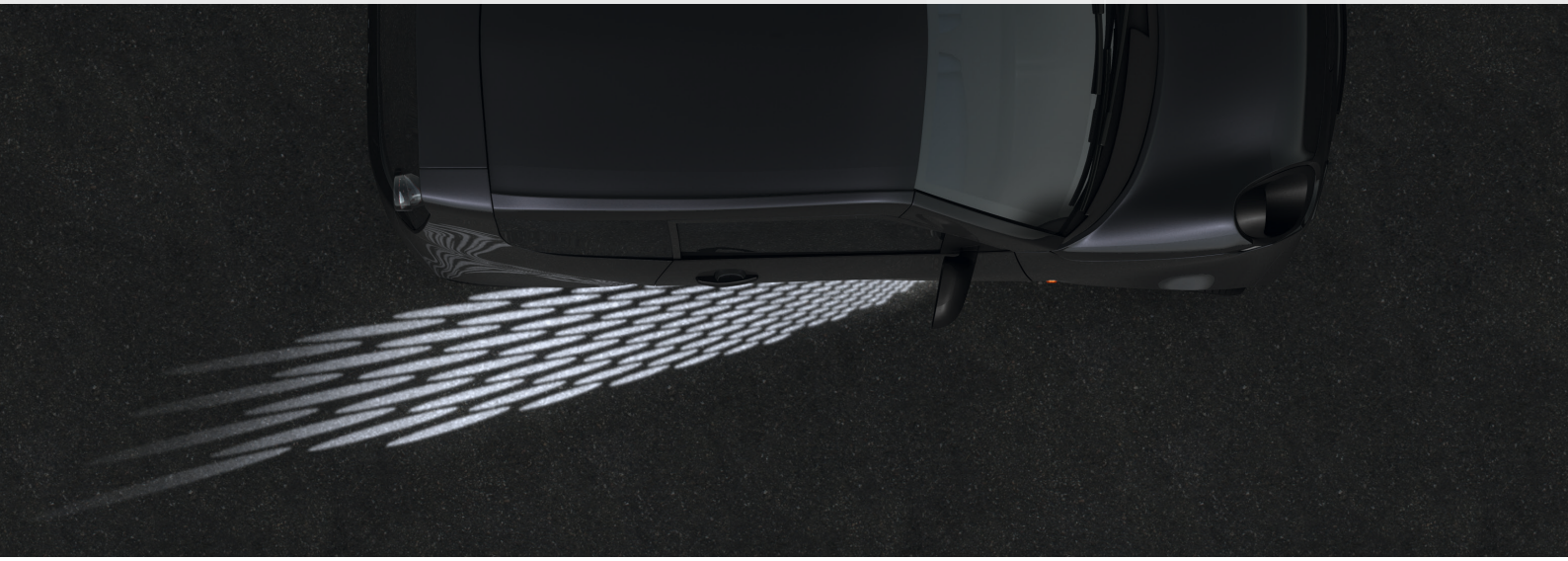
Light source	H7 bulb
Rated voltage	12 or 24 V
ECE test mark	E1 1342, ECE R19 B series 02, B series 03

1N0 008 582-007	12 V
1N0 008 582-017	24 V

Accessories

9GH 158 051-007	Rubber cap

Accessories

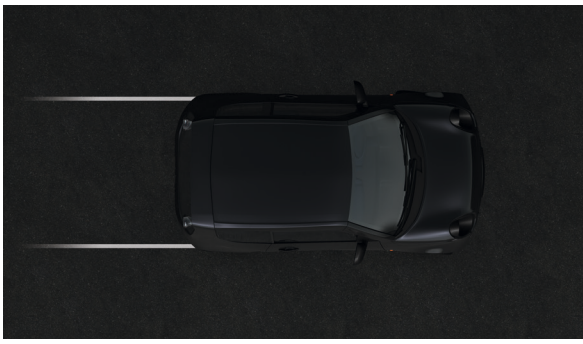


MULTI LENS ARRAY PROJECTOR
PROJECTION MODULE

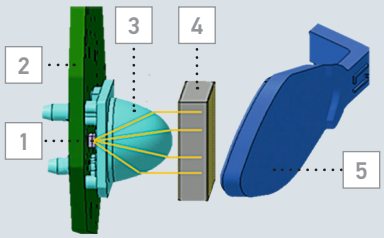
It's dark and the car park is unlit. Now where exactly did I leave the car? With the multi lens array projection module (MLA), a quick touch of a button on the car key is all it takes to find your vehicle. The projector creates on both sides of the vehicle a four-metre-long, so-called light carpet, which is visible from a distance - or indeed it can set up one of many other possible welcoming scenarios around the exterior or in the interior of the vehicle.

The optics of the module consist of a large number of very small micro lenses whose projections combine to form a very sharp, high contrast and homogeneous image. Since each lens contributes only part of the light, the projection is still clearly visible even if the cover lens is slightly soiled in some places

Why not get in touch with us so that we can work together on a project to design a customised solution that suits your individual requirements perfectly?



Virtually unlimited fields of application
In this video HELLA shows you which lighting effects are possible with the multi lens array projector. In addition to creating a light carpet or ambient interior lighting, attractive lighting motifs can also be projected.

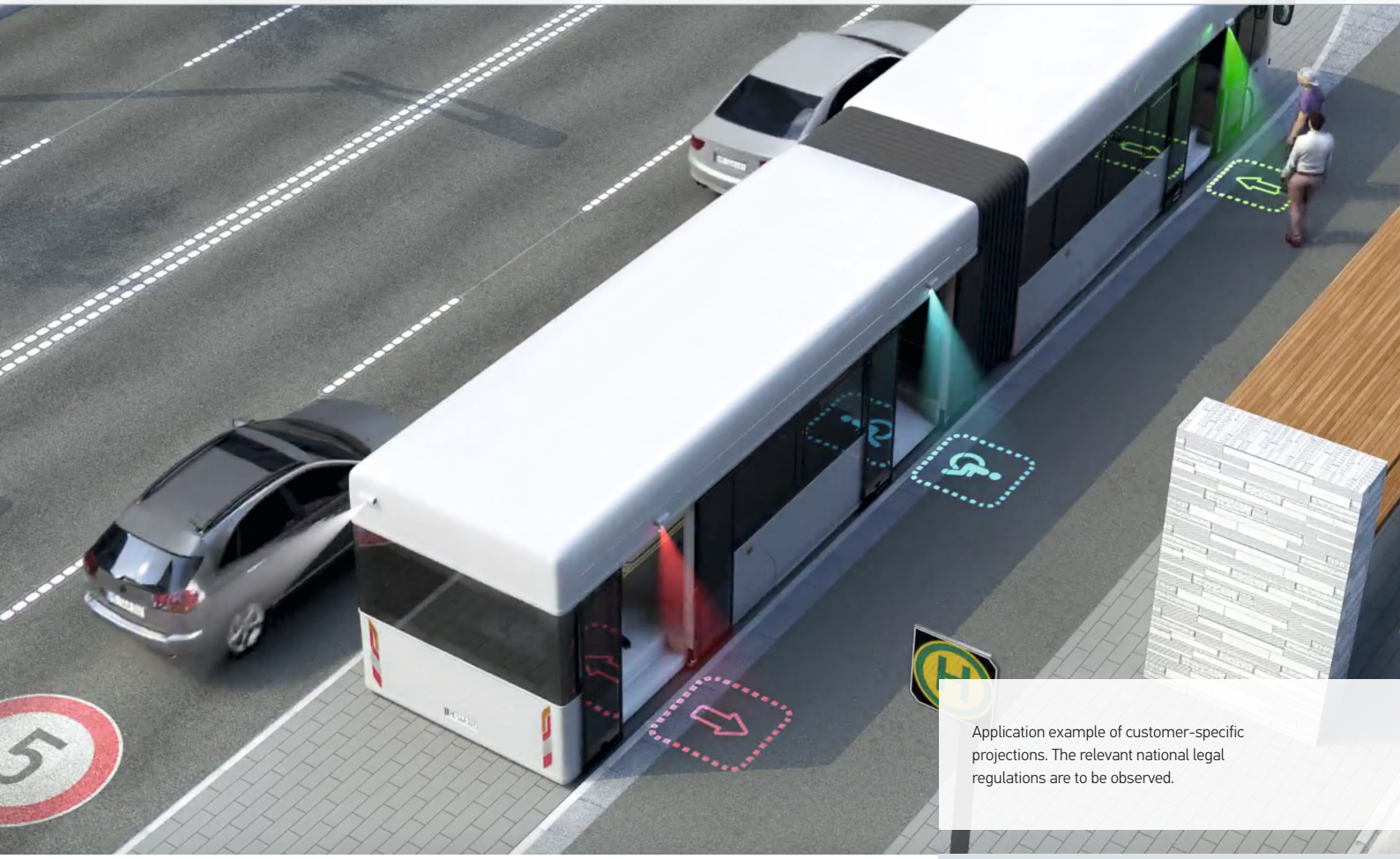


Optical system components

1. LED light source
2. Printed circuit board (PCB)
3. Collimator: focuses the wide light beam of the LED
4. Multi lens array: generation of the light pattern
5. Lens cover

MICRO LENS ARRAY

Each micro lens array consists of many individual micro lenses, each of which produces a low intensity projection. The combination of a large number of these small projectors results in a very bright and sharp light pattern. One image is created by approximately 150 micro projection lenses per multi lens array.



Application example of customer-specific projections. The relevant national legal regulations are to be observed.

VISIOTECH PROJECTION TECHNOLOGY
ENABLES COMMUNICATION BY LIGHT

Vehicle lighting plays an important role when it is a question of safety and a convenient working environment. For this reason, HELLA has further developed the current technical status of projections - which are now also regularly used in everyday life - and expanded them to suit other areas of application. The aim is to ramp up occupational safety levels in the operations of special and commercial vehicles.

With its projection module, HELLA has developed a product that uses VISIOTECH projection technology to project an exclamation mark onto the ground as a warning symbol, thus visually warning other vehicles or pedestrians with the objective of significantly increasing safety. During this process, the light of several LEDs is guided through a printed symbol disc and several lenses.

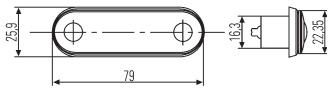
The version with the warning triangle is already available for original equipment manufacturers. If so required, other projection symbols can be developed and set up in collaboration with customers.

Projection module with warning sign
Article number: 2XA 996 200-101

Projection

BETTER VISIBILITY WITH VISIOTECH PROJECTION TECHNOLOGY.

What could tomorrow's technologies look like on our roads?
Public means of transport such as buses can, for example, project symbols onto the ground by means of light projections in order to identify entrances and exits more clearly. In this video HELLA illustrates how VISIOTECH projection technology could be used in the future.

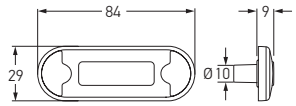


LED position lamp

For horizontal or vertical flush mounting, with 500 mm cable

Light source	1 white LED
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	approx. 40 mA
Protection class	IP 6K6, IP 6K7
ECE test mark	E4 7597, e1 031721

2PF 959 590-401	10 – 33 V



Spare parts / accessories

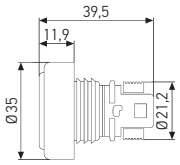
DuraLED position lamp

Surface mounting variant, slimline design with 9 mm profile, horizontal or vertical installation, high vibration resistance, extremely low energy consumption, hermetically sealed against dirt and humidity.

Light source	2 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 6K7, IP 6K9K
ECE test mark	E24 587

2PF 959 855-201	With 500 mm cable, black end cap
2PF 959 855-241	With 2,500 mm cable, black end cap
2PF 959 855-251	With 500 mm cable, white end cap

	Spare parts / accessories
9AB 959 685-201	Decorative cover, polished stainless steel (ECE engraving)
9GD 958 028-001	Contour seal
9GD 980 867-507	Flat, rectangular seal
9HD 980 858-008	Black end caps
9HD 980 858-018	White end caps

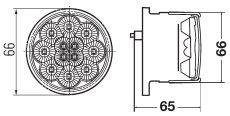


LED position lamp

For flush mounting, clear cover lens, black plastic housing with adhesive film for attaching to body, with 500 mm cable and 2-pin. AMP SUPERSEAL connector

Light source	2 white LEDs
Rated voltage	24 V
Current consumption	approx. 50 mA
ECE test mark	E4 11371

2PF 340 825-057	24 V

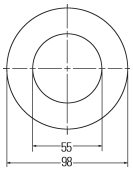


LED position lamp, Ø 66 mm

For flush mounting

Light source	12 LEDs
Rated voltage	24 V
ECE test mark	E4 12390

2PF 009 001-521	24 V



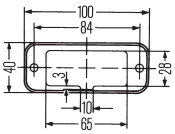
LED position lamp and chromium-plated circular cover

Suitable for lamp series 008 221 and 011 172, for surface mounting

Light source	12 LEDs
Rated voltage	24 V
ECE test mark	E11 1696, E11 2295

2PF 008 405-051	Position lamp
	Accessories
8XU 008 405-031	Circular cover, chromium-plated

Accessories

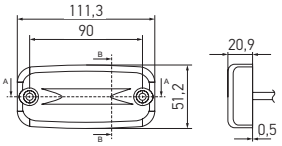


LED position lamp

For horizontal surface mounting, connection via flat connector

Light source	White LEDs
Rated voltage	24 V
Protection class	IP 5K9K
ECE test mark	E1 2300

2PF 009 514-001	Position/degree 10-20°
2PF 009 514-011	Position/degree 20-30°

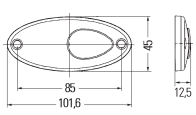


LED position lamp

For horizontal surface mounting, with screws (5.8 mm hole diameter).

Light source	2 white LEDs
Rated voltage	24 V
Protection class	IP 6K9K
ECE test mark	E17 10R-04 0072, E24 5881

2PG 345 600-401	With 500 mm cable, open end
2PG 345 600-411	With 5,000 mm cable, open end

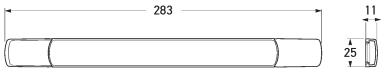


LED position lamp

For horizontal surface mounting, clear lens

Light source	2 LEDs
Rated voltage	24 V
Current consumption	ca. 30 mA
ECE test mark	E17 0301

2PG 964 295-111	With reflex reflector

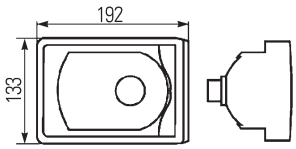


LED direction indicator "Strip Lamp"

Ultra flat design, surface mounting variant, without pulse for direction indicator failure monitor, low power consumption, lens made from highly impact-resistant Grilamid®

Light source	10 LEDs
Rated voltage	12 or 24 V
Protection class	IP 5KX X4K
ECE test mark	E24 5869, E24 5890

2BA 980 888-311	12 V, horizontal
2BA 980 888-411	24 V, horizontal

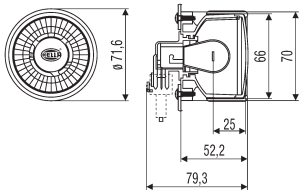


Direction indicator

For flush mounting, rear and front, left and right

Rated voltage	12 or 24 V
ECE test mark	E4 10151

2BA 008 805-051	ECE, with clear lens
2BA 008 805-187	ECE, SAE, with amber lens



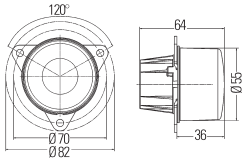
Direction indicator and position lamp, Ø 66 mm

With clear lens

Light source	Direction indicator: PY21W bulb Position lamp: P21/5W
Rated voltage	24 V
ECE test mark	Position lamp: E4 6546, E4 7613

2BA 009 001-167*	Direction indicator, amber bulb, ECE
2PF 009 001-177**	Position lamp, ECE, SAE

* ECE: distance > 40 mm / < 40 mm / < 20 mm to the low beam headlamp / fog lamp
** SAE: < 2,032 mm wide



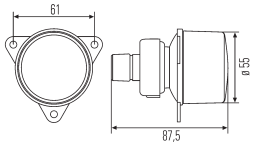
LED direction indicator and position lamp, modular, Ø 55 mm

For front flush mounting, clear lens with pattern and 500 mm connecting cable

Light source	3 LEDs
Rated voltage	24 V
ECE test mark	E1 3284

2BA 011 172-401*	Direction indicator, without pulse
2BA 011 172-411*	Direction indicator, with pulse

* ECE: distance < 40 mm to the low beam headlamp / fog lamp



Direction indicator and position lamp, Ø 55 mm

For flush mounting with clear lens

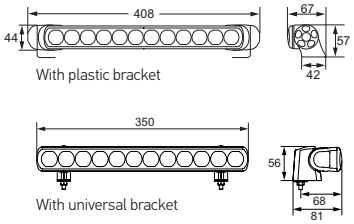
Light source	Direction indicator: 24 V HD bulb, amber
Rated voltage	24 V
ECE test mark	Direction indicator: E1 878 Position lamp: E1 879

2BA 008 221-217*	Direction indicator
2PF 008 221-011	Position lamp

Accessories

8KA 152 134-007	Wiring harness with grommet
9GT 137 236-007	Grommet separate

* ECE: distance < 40 mm / > 40 mm to the low beam headlamp / fog lamp



The **reference number (Ref.)** is a value that refers to high beam headlamps. Under ECE regulations, this reference number may not exceed the upper limit of 100 per vehicle. This figure includes the two values for the standard high beam (left and right headlamp) plus those of any other high beam headlamps that are mounted. The appropriate value is engraved on the lens of each approved headlamp.

Auxiliary high beam headlamp LED Light Bar 350

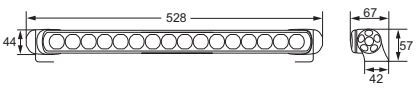
Power requirement: 25 watts, EMC R10

Light source	12 high-power LEDs
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 6K7
ECE test mark	Ref. 20: E24 0008 Ref. 30: E24 0009

1FJ 958 040-001	Ref. 20, with plastic bracket
1FJ 958 040-051	Ref. 30, with plastic bracket
1FJ 958 040-072	Ref. 20, with universal bracket
1FJ 958 040-082	Ref. 30, with universal bracket

Spare parts / accessories

8HG 958 053-801	1 plastic bracket
8HG 958 128-811	Bracket set (2 steel brackets for dual mounting), only for products with universal bracket



Auxiliary high beam headlamp LED Light Bar 470

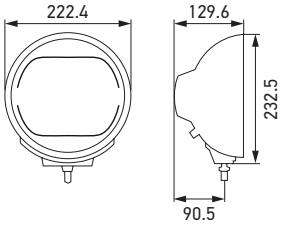
Power requirement: 35 watts, EMC R10

Light source	16 high-power LEDs
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 6K7
ECE test mark	Ref. 25: E24 0012 Ref. 37,5: E24 0013

1FJ 958 130-111	Ref. 25, with universal bracket
1FJ 958 130-011	Ref. 37.5, with universal bracket

Spare parts / accessories

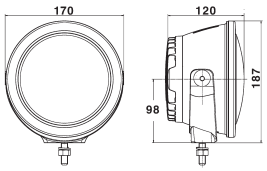
8HG 958 139-841	Bracket set (2 universal brackets)
8HG 958 139-071	Bracket (1 universal bracket without steel bracket, also for customised brackets)
8HG 958 128-811	Bracket set (2 steel brackets for dual mounting)



Luminator LED

High beam headlamp with position light with distinctive night design, with connecting cable and fastening material; vibration-resistant under extreme conditions

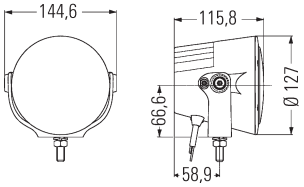
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP X9K, IP 6K7
ECE test mark	High beam: ECE R112 Position light: ECE R7
1F8 016 560-001	Ref. 25, Metal
1F8 016 560-021	Ref. 25, Chromium
	Spare part
1F8 241 400-011	Headlamp insert (Ref. 25) with LED position light



Luminator Compact LED

High beam headlamp, ECE Ref. 45

Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 5K4K, IP X9K Heavy Duty Version (-031): IP 67, IP X9K
ECE test mark	E1 3738
1F3 011 815-001	With chrome design ring
1F3 011 815-011	With black design ring
1F3 011 815-031	With black design ring (Heavy Duty with hose ventilation)
	Spare parts / accessories
9AG 195 614-001	Cover lens with chrome design ring
9AG 195 614-011	Cover lens with matt black design ring
8XS 199 170-011	Protective cap, not for use on public roads



Luminator X LED

High beam headlamps

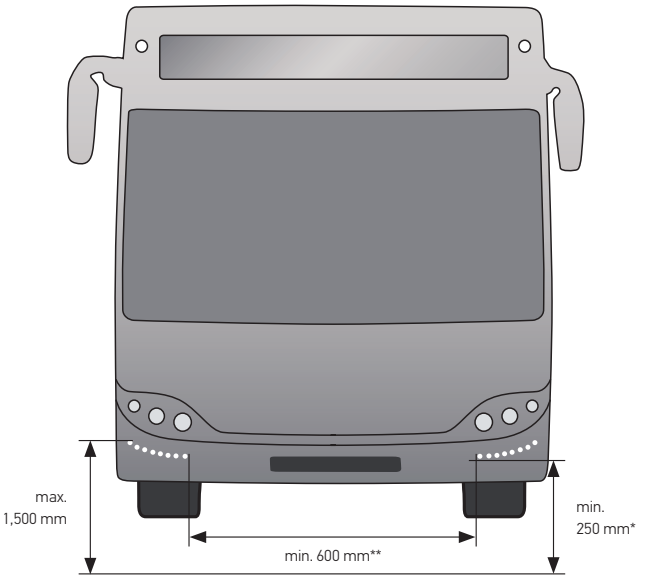
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 5K4K, IP X9K
ECE test mark	Ref. 37,5: E4 0009 Ref. 25: E4 0477

1F0 012 206-001	Ref. 37.5, with chrome design ring
1F0 012 206-011	Ref. 37.5, with black design ring
1F0 012 206-112	Ref. 25, with black design ring

Spare parts / accessories

9ES 199 813-001	Cover lens with seal
9AG 199 812-011	Black design ring

DAYTIME RUNNING LAMPS
LEGAL REGULATIONS



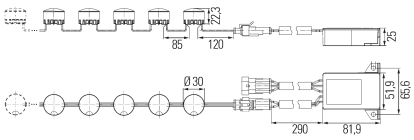
min. = minimum distance
max. = maximum distance

The daytime running light provides a significant safety advantage for you in road traffic and prevents ca. 58% of accidents, which would result in serious injuries – for it is indeed far easier to recognise than a normal low beam. Thanks to the daytime running light, your own visibility is considerably increased as your vehicle can be recognised much sooner, a situation which provides a few more seconds of vital response time. It also reduces fuel consumption quite substantially as compared to driving with the low beam switched on.

Required by law:
The law has recognised the advantages of daytime running lights: since 2012, daytime running lights have been obligatory for all commercial vehicles newly licenced to use the roads in EU countries. Various surface mounting variants are permitted. However, the distances and beam angles to be observed are specified.

- → * When used as a position light, the minimum attachment height must be 350 mm and the maximum distance from the outside edge must be 400 mm.
- → ** For vehicles with a width of < 1,300 mm, the spacing distance must be at least 400 mm.
- → When using the daytime running light as a position lamp, according to ECE R48 the standard position light has to be permanently deactivated.

For more information on legal stipulations and mounting regulations, consult the internet or a qualified vehicle workshop. See the relevant installation instructions for more detailed information.



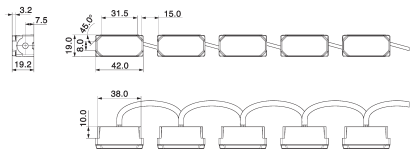
LED daytime running lamp set LEDayFlex

Set consists of two pre-cabled module chains with 5-8 round light modules and two electronics boxes to control the daytime running lamps; available with or without a position light; the system is connected to the vehicle electrical system via a 3-pin AMP SUPERSEAL connector.

Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 6K7, IP 6K9K
ECE test mark	Modules: E24 5852 Control unit: E9 1152

2PT 010 458-701	5 LED light modules
2PT 010 458-711	5 LED light modules, with position light
2PT 010 458-721	6 LED light modules
2PT 010 458-731	6 LED light modules, with position light
2PT 010 458-741	7 LED light modules
2PT 010 458-751	7 LED light modules, with position light
2PT 010 458-761	8 LED light modules
2PT 010 458-771	8 LED light modules, with position light

	Accessories
5DS 010 668-701	12 / 24 V, control unit for daytime running lamp, with position light
5DS 010 668-711	12 / 24 V, control unit for position light
8KA 165 959-001	Wiring harness (not included in delivery)



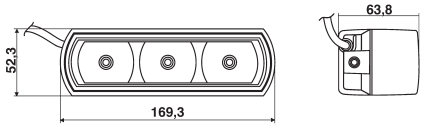
LED daytime running lamp set LEDayFlex II

Since 2012, LEDayFlex II has supplemented the system of the flexibly interconnected module chains; the two square LED daytime running lamp chains with 5 or 6 pre-cabled light modules create further design possibilities; includes bracket for screw attachment, positioned above.

Rated voltage	24 V
Protection class	IP 6K7, IP 6K9K
ECE test mark	E24 5864

2PT 980 789-901	5 LED light modules
2PT 980 789-911	6 LED light modules

	Accessories
	Bracket for screw attachment
8HG 980 797-801	Above, for 5-segment module chain (10 pieces)
8HG 980 797-811	Above, for 6-segment module chain (12 pieces)
8HG 980 793-801	Rear, for 5-segment module chain (10 pieces)
8HG 980 793-811	Rear, for 6-segment module chain (12 pieces)
8HG 980 795-801	Front, for 5-segment module chain (10 pieces)
8HG 980 795-811	Front, for 6-segment module chain (12 pieces)



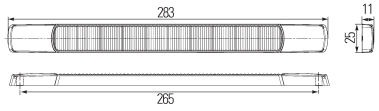
LED daytime running lamp set

LED daytime running lamp set with silver-grey aluminium housing and integrated relays for upright and pendant mounting in or on the front apron; set contents: two lamps, professional wiring harness with AMP SUPERSEAL connector

Light source	3 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 6K7, IP 6K9K
ECE test mark	E1 2344

2PT 009 496-801	Daytime running lamps, set*

* Consisting of 2 x 009 496-01; 2 x bracket 165 547-01, 2 x accessories group 168 974-00 and 1 x cable group 165 959-00

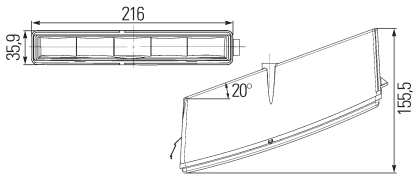


LED daytime running lamp set LEDayLine "Strip Lamp"

Lamp for surface mounting, lens made from highly impact-resistant Grilamid®, horizontal mounting, two fastening screws, one at each end of the lamp, cover caps for concealing the fixing points, with 2.5 m sheathed connecting cable, power consumption 3 W.

Light source	10 high-power LEDs
Rated voltage	12 or 24 V
ECE test mark	E24 5869

2PT 980 880-811	12 V, daytime running lamps, set
2PT 980 880-861	24 V, daytime running lamps, set



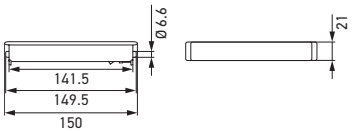
LED daytime running lamp set LEDayLine, with position light

2 lamps with integrated relay for fully automatic switch-on, including professional wiring harness and fastening material

Light source	5 LEDs
Rated voltage	12 or 24 V
Protection class	IP 6K7, IP 6K9K
ECE test mark	E1 2578

2PT 010 043-801	Surface mounting set, 12 V
2PT 010 043-011	12 V, left
2PT 010 043-021	12 V, right
2PT 010 043-031	24 V, left
2PT 010 043-041	24 V, right

ECE SAE 12 V 24 V IP PRP EMC



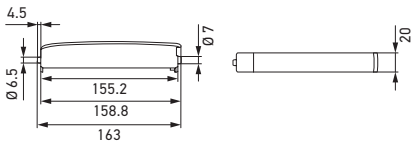
LEDayLine set Zero

For horizontal flush mounting, suitable for vehicles without angle, power consumption 2 W, high vibration resistance, set includes bracket and fastening accessories

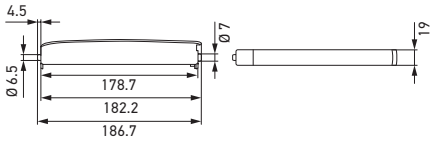
Light source	8 high-power LEDs
Rated voltage	12 or 24 V
Protection class	IP 6K7, IP 6K9K
ECE test mark	E24 5875

2PT 980 970-821	12 V, daytime running lamp, set
2PT 980 970-871	24 V, daytime running lamp, set

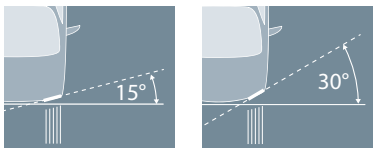
ECE SAE 12 V 24 V IP EMC



For vehicles with 15°angle



For vehicles with 30°angle



Top view

LEDayLine with position light

Suitable for vehicles with a 15° or 30° angle at the installation location, for horizontal flush mounting, power consumption 2 W

Light source	8 LEDs
Rated voltage	12 or 24 V
Protection class	IP 6K7, IP 6K9K
ECE test mark	Daytime running lamp for vehicles with 15° angle: E24 5863 Daytime running lamp for vehicles with 30° angle: E24 5862

2PT 980 860-001	12 V, for vehicles with 15°angle
2PT 980 860-501	24 V, for vehicles with 15°angle
2PT 980 850-001	12 V, for vehicles with 30°angle

	Accessories
8HG 980 864-101	Brackets (set right/left)
8KA 959 186-801	Control unit*, 12 V, with connecting cable
8KA 959 186-811	Control unit*, 24 V, with connecting cable

* Lamps cannot be switched on separately (right/ left) on the vehicle.

Photo: © Daimler AG

HEADLAMPS

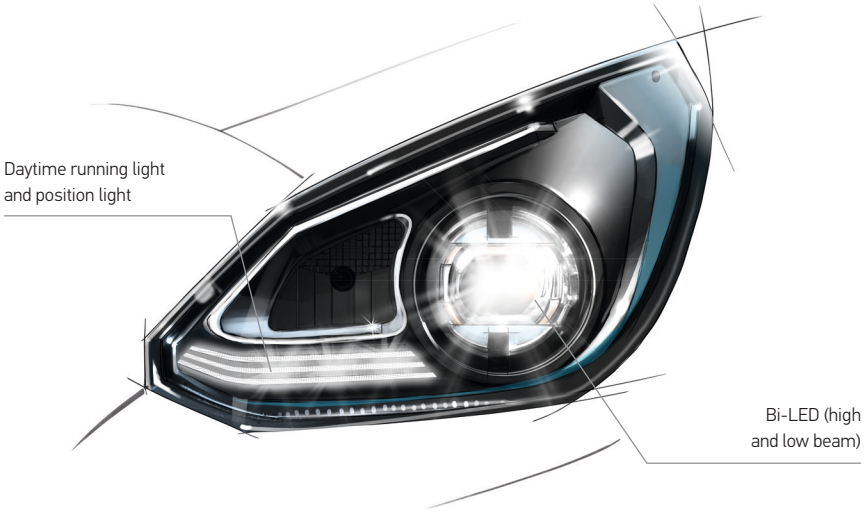
HELLA gives your vehicle the perfect look.
Reliable quality, the very highest comfort, first-class features and maximum safety – at HELLA all this is standard. We are the leading supplier of vehicle-specific lighting in Germany and in many parts of Europe. We use our innovation drive to continuously expand our product range. Functional safety, a perfect fit and product durability are all guaranteed through the 'HELLA Original Parts Quality'. Our wide product range and all the various modular systems serve to emphasise a unique brand character and enable customised trendsetting into the bargain. You, too, can benefit from HELLA's expertise in large-scale production and from the resulting ease with which this can be implemented in your vehicles.

EVOBUS HEADLAMPS
A SYMMETRY OF DESIGN AND QUALITY

Looks can be forgiving and beguiling – or they just give you that reassuring sense of safety. To this end HELLA has created a headlamp that combines timeless design and sophisticated, superior quality. Defined lines and soft shapes complement each other perfectly and characterise the design. And, thanks to pioneering technology, when lighting the way with HELLA, you travel as a shining example of how it should be.

TECHNOLOGICAL HIGHLIGHTS

The technology behind the design puts the Evobus headlamp in a particularly good light! An innovative bi-LED module ensures ideal light output – but nevertheless in an extravagantly stylish shape.



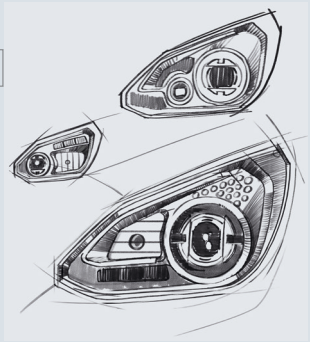
ARE YOU INTERESTED IN A CUSTOMISED LIGHTING SOLUTION THAT IS PERFECTLY SUITED TO YOUR VEHICLE?

THEN WE ARE THE PERFECT PARTNER FOR YOU.
COME AND TALK TO US.

FROM THE FIRST CONCEPT TO THE FINAL DESIGN

1

2



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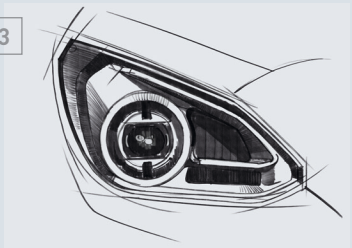

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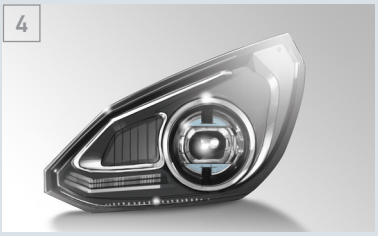
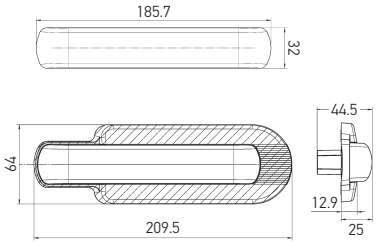


SIDE LIGHTING

Our wide product range of marker lamps ensures that vehicles are optimally visible for all road users even in the dark and in difficult visibility conditions - a real bonus for safety whatever the situation.

With these lamps, too, we only accept the highest quality standards and exclusively use efficient technologies. HELLA marker lamps stand out from the crowd in sharp relief because of their magnificent workmanship and stability – features reflected in their long lifetime. So do not leave safety to chance. Be smart and place your trust in HELLA marker lamps.

AUXILIARY DIRECTION INDICATORS



With frame

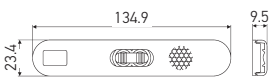
LED auxiliary direction indicator, CAT. 6

Auxiliary direction indicator in brilliant finish, for horizontal surface mounting, clear lens, can be used with or without frame

Light source	5 amber LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 290 mA (12 V), ca. 150 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E1 7506

	With black frame, direct screw connection
2BM 011 788-011	12 V, with 2-pin AMP SUPERSEAL
2BM 011 788-031	12 V, with 500 mm cable
2BM 011 788-001	24 V, with 2-pin AMP SUPERSEAL
2BM 011 788-021	24 V, with 500 mm cable
	Self-adhesive
2BM 011 788-051	12 V, with 2-pin AMP SUPERSEAL
2BM 011 788-041	24 V, with 2-pin AMP SUPERSEAL
2BM 011 788-061	24 V, with 500 mm cable

SIDE MARKER LAMPS

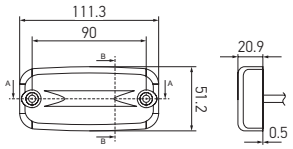


LED side marker lamp

For surface mounting, lens with reflex reflector, amber, self-adhesive

Light source	2 amber LEDs
Rated voltage	12 or 24 V
Protection class	IP 5K9K
ECE test mark	E4 10236

2PS 009 226-007	12 V, horizontal, with 250 mm cable
2PS 009 226-037	24 V, horizontal, with 250 mm cable
2PS 009 226-077	12 V, vertical, with 250 mm cable
2PS 009 226-087	24 V, vertical, with 250 mm cable
2PS 009 226-067	12 V, horizontal, with 6.3 mm contacts and mating connector grommet

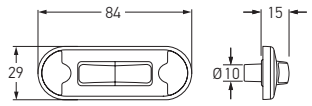


LED side marker lamp

Lens with reflex reflector, amber, base plate black, with 500 mm cable

Light source	2 LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 40 mA (12 V), ca. 50 mA (24 V)
Protection class	IP 5KX, IP X4K
ECE test mark	E24 5881

2PS 345 600-001	12 V
2PS 345 600-011	24 V



DuraLED side marker lamp

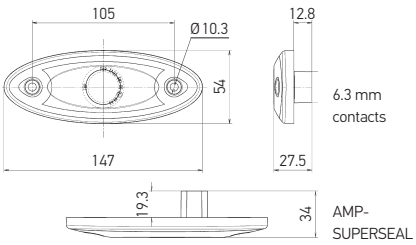
Surface mounting variant, slimline design with 9 mm profile, horizontal installation, high vibration resistance, extremely low energy consumption, hermetically sealed against dirt and humidity.

Light source	2 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 6K7, IP 6K9K
ECE test mark	E24 0007

2PS 980 868-201	With 500 mm cable
2PS 980 868-211	With 2,500 mm cable

Spare parts / accessories

	Spare parts / accessories
9AB 959 685-201	Decorative cover, polished stainless steel (ECE engraving)
9GD 958 028-001	Contour seal
9GD 980 867-507	Flat, rectangular seal
9HD 980 858-008	Black end caps
9HD 980 858-018	White end caps



LED side marker lamp OneLED

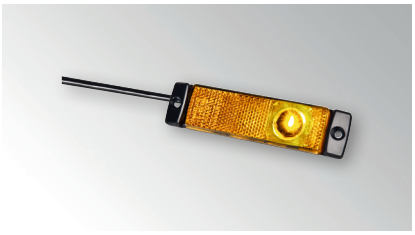
High level of safety thanks to maximum illuminating surface, modern night design, for horizontal and vertical mounting, lens with reflex reflector, amber

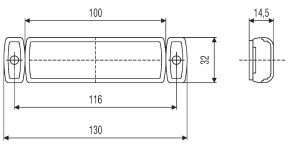
Light source	1 LED
Rated voltage	24 V
Protection class	IP 5KX, IP X9K
ECE test mark	E24 5853

2PS 344 690-627	24 V, housing black, with AMP-SUPERSEAL

Accessories

9GD 343 697-007	Rubber seal





Accessories

LED side marker lamp with reflex reflector

For horizontal or vertical surface mounting, lens amber, amber light, black housing, with cellular rubber seal to seal lamp and 2 holes for B4.2 fastening screws or with a bracket (to be ordered separately), ADR/GGVS-tested; with horizontal surface mounting the optical field must point to outside of vehicle; also suitable for flash function

Light source	1 LED
Rated voltage	24 V
Protection class	IP 6K9K
ECE test mark	E1 021395, E1 001396, E1 021397, E1 001397

2PS 008 645-001	Horizontal, with 1,500 mm cable
2PS 008 645-991	Vertical, with 1,500 mm cable
2PS 008 645-311	Horizontal, with 2-pin EasyConn connector housing and 1,300 mm cable
2PS 008 645-621	Horizontal, with Quick Link cabling and 1,300 mm cable
2PS 008 645-891	Horizontal, with AMP SUPERSEAL plug connection and 450 mm cable

Accessories

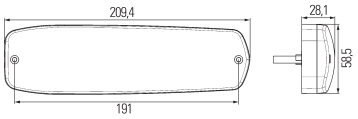
8HG 160 409-002	Bracket

REAR LIGHTING

LED lighting has also resulted in a quantum leap in the area of rear lighting. The development of ever-new, innovative lighting concepts has perceptibly improved vehicle safety and taken it to the next level - and from the very word go HELLA has been making a significant contribution to all this progress.

The combination of light emitting diodes and advanced optical systems also opens up attractive styling possibilities allowing the creation of an unmistakable look typical of any one brand.

UNIVERSAL REAR COMBINATION LAMPS

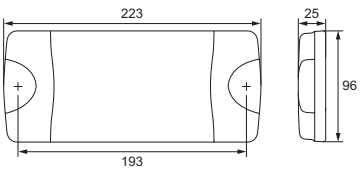


LeanLED

Tail-stop-direction indicator lamp for horizontal or vertical surface mounting; clear lens, with pulse for direction indicator failure control

Light source	24 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	Tail light: ca. 20 mA (24 V) Stop light: ca. 40 mA (24 V) Direction indicator light: ca. 60 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E1 035109, E4 12393

2SD 343 910-001	Silver, with 500 mm cable and open ends
2SD 343 910-017	Silver, with 200 mm cable and 4-pin AMP SUPERSEAL plug connection
2SD 343 910-027	Silver, with integrated 4-pin AMP connector 282 106-1
2SD 343 910-057	Silver, with 100 mm cable and 4-pin DEUTSCH connector
2SD 343 910-041	Red, with 500 mm cable and open ends

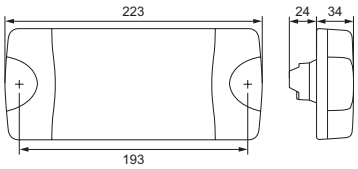


DuraLED Combi

Tail-stop-direction indicator lamp for horizontal or vertical surface mounting, with clear lens, ends red

Light source	30 LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 40 mA (24 V)
Protection class	IP 6K7, IP 6K9K
ECE test mark	E24 5883

2SD 980 613-211	With 2,500 mm cable with stripped ends

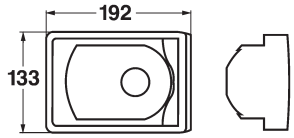


DuraLED

Tail-stop-direction indicator lamp for horizontal or vertical surface mounting, with clear lens, grey lacquer finish

Light source	30 LEDs
Rated voltage	12 or 24 V
ECE test mark	E24 5870, E24 10R-04 0958

2SK 980 615-001	With DEUTSCH connector



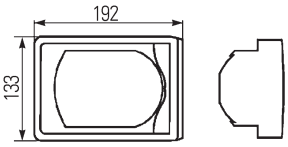
Rear combination lamp

For horizontal flush mounting

Rated voltage	12 or 24 V
ECE test mark	E4 10151

	Lens red
2SA 008 805-007	Tail lamp*
2DA 008 805-017	Stop lamp**
2SB 008 805-027	Tail-stop lamp for dual surface mounting**
2NE 008 805-037	Rear fog lamp
	Lens clear
2ZR 008 805-047	Reverse lamp*
2BA 008 805-057	Direction indicator for dual mounting

* With SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide
** With SAE type approval for vehicles > 2,031 mm wide

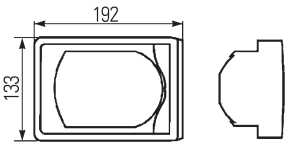


LED tail-stop lamp

For horizontal flush mounting, with red lens and cable with open ends

Light source	LED
Rated voltage	24 V
Current consumption	ca. 130 mA (24 V)
ECE test mark	E4 10880

2SB 345 982-007	24 V

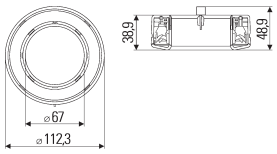


LED direction indicator

For horizontal flush mounting, with clear lens and cable with open ends

Light source	LED
Rated voltage	24 V
Current consumption	ca. 80 mA (24 V)
ECE test mark	E4 10880

2BA 345 982-047	24 V



Accessories

LED ring modules Edge, Ø 112 mm

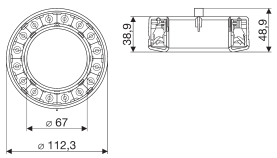
Tail-stop lamp in innovative LED EdgeLight technology, ideal for combination with lamp series 009 001 (Ø 66 mm), optionally available with clear or red cover lens

Rated voltage	12 or 24 V
ECE test mark	E24 7R-025889

2SB 009 362-301	12 V, lens red
2SB 009 362-321	24 V, lens red
2SB 009 362-311	12 V, lens clear
2SB 009 362-331	24 V, lens clear

Accessories

	Design rings, Ø 118 mm, perfect high sheen finish with one "click"
9HB 163 085-012	High gloss chromium-plated
9HB 163 085-001	Silver



Accessories

LED ring modules, Ø 112 mm

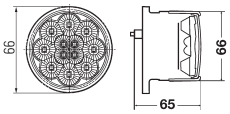
Tail-stop lamp, ideal for combination with lamp series 009 001 (Ø 66 mm)

Light source	16 LEDs
Rated voltage	24 V
ECE test mark	Tail-stop lamp: E4 7748 Reflex reflector: E4 3302

2SB 009 362-011	Tail-stop lamp, lens red
8RA 009 362-001	Reflex reflector, lens red (not shown)

Accessories

9XD 161 119-017	Adapter ring, for mounting reflex reflector, black
	Design rings, Ø 118 mm, perfect high sheen finish with one "click"
9HB 163 085-012	High gloss chromium-plated
9HB 163 085-001	Silver



LED tail-stop lamp and direction indicator, Ø 66 mm

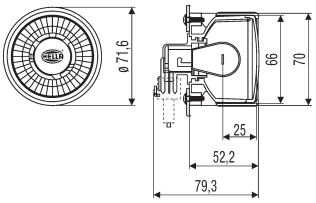
With clear lens, AMP connector

Light source	12 LEDs
Rated voltage	24 V
ECE test mark	E4 12390

2SB 009 001-501	Tail-stop lamp
2BA 009 001-511	Direction indicator, without pulse
2BA 009 001-531	Direction indicator, with pulse

Accessories

8JD 156 150-807	Mating connector, 2-pin
8JD 162 581-802	Mating connector, 3-pin
9XD 161 119-017	Adapter ring, for mounting LED lamps, black



Rear combination lamps Ø 66 mm

With mounted bulbs, including design ring

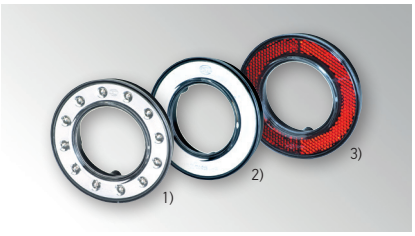
Rated voltage	24 V
ECE test mark	E4 3917, E4 6546, E4 7613, E4 23255, reflex reflector: E4 3189

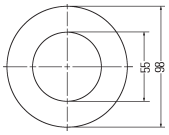
2DA 009 001-147*	Stop lamp, lens red
2SB 009 001-157*	Tail-stop lamp, lens red
2NE 009 001-127**	Rear fog lamp, lens red
2SA 009 001-137*	Tail lamp, lens red
2BA 009 001-107*	Direction indicator, lens grey
2ZR 009 001-117**	Reverse lamp, lens grey
2BA 009 001-191*	Direction indicator, with Silver Vision bulb

Accessories

8JD 156 150-807	Mating connector, 2-pin
8JD 162 581-802	Mating connector, 3-pin
9XD 161 119-007	Adapter ring screw connection, frontal, direct mounting and also ring module mounting, black
	Design rings, Ø 66 mm, perfect high sheen finish with one "click"
9HB 161 122-012	High gloss chromium-plated
9HB 161 122-007	Silver
9HB 164 168-002	Premium silver
8HG 162 530-002	Locking ring, comet silver

* With ECE approval for double lamps
** With SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide





LED ring modules, Ø 98 mm

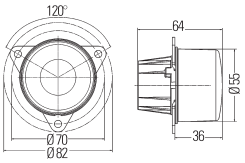
For flush mounting, ideal for combination with lamp series 011 172 (Ø 55 mm), optionally available with clear or red cover lens.

Light source	Tail-clearance lamp: 12 red LEDs Tail-stop lamp: 12 red LEDs Position lamp: 12 white LEDs
Rated voltage	24 V
Current consumption	Tail-clearance lamp: ca. 80 mA Tail-stop lamp: ca. 90 mA Position lamp: ca. 80 mA
ECE test mark	E1 1196, E1 1197, E1 1892 Position lamp: E1 1696

2SA 008 405-011[1)]	Tail-clearance lamp, lens clear
2SB 008 405-091[1)]	Tail-stop lamp, lens clear, with passive thermal management
2PF 008 405-051[1)]	Position lamp
8XU 008 405-031[2)]	Chromium-plated cover
8RA 008 405-001[3)]	Reflex reflector, red

Examples of combination possibilities, rear lighting

2BA 008 221-041[1)] **2SA 008 405-011**[1)]	Tail and direction indicator lamp
2XA 008 221-021[2)] **8RA 008 405-001**[2)]	Stop and reverse lamp
9XB 161 749-007	Heat conducting shield (required at ambient temperature > 50°C)

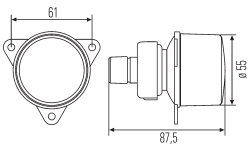


Modular LED lamps, Ø 55 mm

For flush and surface mounting, clear lens with pattern, with 500 mm cable and open ends, 1:1 replacement with bulb version 008 221

Light source	6 LEDs
Rated voltage	24 V
Current consumption	Direction indicator and stop lamp: ca. 30 mA (24 V) Tail lamp: ca. 10 mA (24 V) Rear fog and reverse lamp: ca. 80 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E1 3283, E1 3286, E1 3285, E1 10R-36 317

2BA 011 172-421	Direction indicator
2BA 011 172-431	Direction indicator with failure control
2SA 011 172-441	Tail lamp
2DA 011 172-461	Stop lamp
2NE 011 172-481	Rear fog lamp
2ZR 011 172-501	Reverse lamp



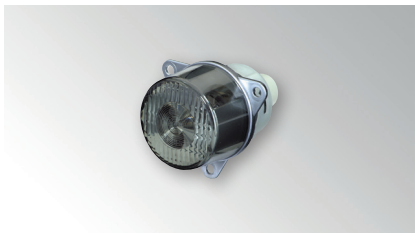
Tail-stop lamp and rear fog lamp Ø 55 mm

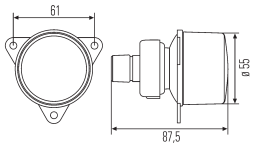
For flush mounting, with red lens

Rated voltage	12 or 24 V
ECE test mark	Tail lamp / Stop lamp: E1 1048, E1 1049 Rear fog lamp: E1 1050

2XA 008 221-021	Tail lamp or stop lamp without bulb
2NE 008 221-031	Rear fog lamp without bulb
	Accessories
8KA 152 134-007	Wiring harness with grommet
9GT 137 236-007	Grommet separate

UNIVERSAL REAR COMBINATION LAMPS
55 MM MODULES





Direction indicator and reverse lamp Ø 55 mm

For flush mounting with grey lens

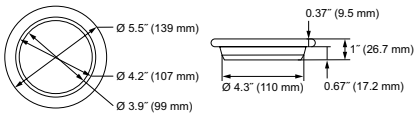
Rated voltage	12 or 24 V
ECE test mark	Direction indicator: E1 1051 Reverse lamp: E1 1052
2BA 008 221-041	Direction indicator
2ZR 008 221-051*	Reverse lamp

Accessories

8KA 152 134-007	Wiring harness with grommet
9GT 137 236-007	Grommet separate

* With SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide

UNIVERSAL REAR COMBINATION LAMPS



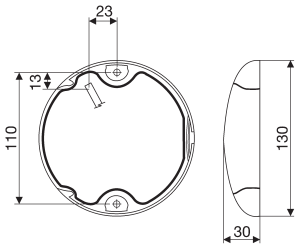
LED rear combination lamps 4", Ø 140 mm

With 300 mm cable and open cable ends, mounting with rubber seal

Light source	12 LEDS, except rear fog lamp: 16 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 67, IP 69
ECE test mark	E9 11734, E9 16240, E9 16341, E9 11874
2SB 328 870-047	Tail-stop lamp, ECE, SAE, with red lens
2BA 328 870-057	Direction indicator, ECE, SAE, with amber lens
2ZR 328 870-067	Reverse lamp, ECE, SAE, with clear lens
2NE 328 870-077	Rear fog lamp, ECE, with red lens

Accessories

9AR 328 882-007	Chrome ring

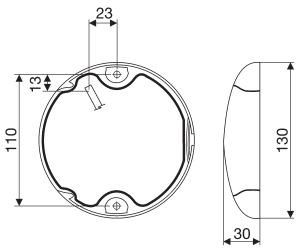


EuroLED rear combination lamps

For surface mounting, cast in one piece with black base plate, electrical connection with a 2,500 -mm-long cable

Light source	1 Power-LED
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	Tail-stop lamp: ca. 100 mA (24 V) Rear fog lamp: ca. 170 mA (24 V) Reverse lamp: ca. 100 mA (24 V)
Protection class	IP 6K6, IP 6K7
ECE test mark	E4 10208, E4 10R 2894

2SB 959 821-601	Tail-stop lamp, lens red
2NE 959 821-201	Rear fog lamp, lens clear
2ZR 959 820-601	Reverse lamp, lens clear

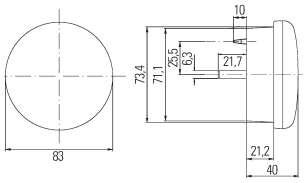


EuroLED direction indicator

For surface mounting, cast in one piece with black base plate, electrical connection with a 2,500 -mm-long cable and pulse for direction indicator failure control

Light source	1 Power-LED
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 100 mA (24 V)
Protection class	IP 6K7
ECE test mark	E4 10208

2BA 959 822-601	Direction indicator, lens amber

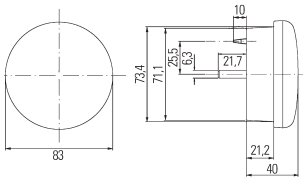


LED rear combination lamps, Ø 83 mm

For flush mounting, with 2,500 mm cable

Light source	12 LEDs, except tail-stop-direction indicator lamp: 16 LEDs
Rated voltage	24 V
Protection class	IP 6K7, IP 6K9K
ECE test mark	Tail-stop lamp: E4 12373 Tail-stop-direction indicator lamp: E9 1538, E4 042741 Direction indicator: E4 12373, E4 042741

2SB 959 010-301	Tail-stop lamp, with red lens
2SD 959 010-401	Tail-stop-direction indicator lamp, with red / amber lens
2BA 959 011-301	Direction indicator, with amber lens

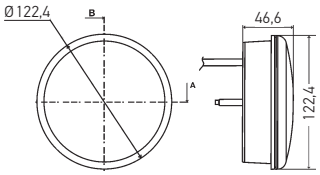


LED rear combination lamps, Ø 83 mm

With clear lens, for flush mounting, with 2,500 mm cable

Light source	24 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	Reverse lamp, ca. 330 mA (12 V), ca. 170 mA (24 V) Rear fog lamp: ca. 250 mA (12 V), ca. 130 mA (24 V)
ECE test mark	E4 11391, E4 042741

2ZR 959 010-501	Reverse lamp
2NE 959 011-501	Rear fog lamp

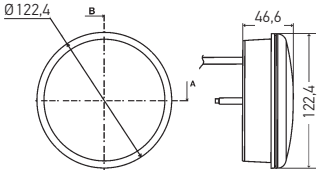


LED tail-stop-direction indicator Ø 122 mm

For surface mounting, redesign of series 964 169, with 500 mm cable

Light source	24 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	Tail light: ca. 80 mA (12 V), ca. 40 mA (24 V) Stop light: ca. 170 mA (12 V), ca. 80 mA (24 V) Direction indicator light: ca. 170 mA (12 V), ca. 80 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E4 12371, E4 12658, E4 14198

2SD 344 200-001	With clear lens
2SD 344 200-071	With red / clear lens

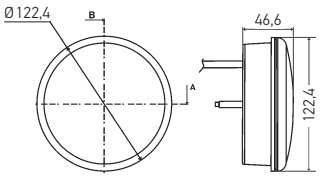


LED tail-stop lamp Ø 122 mm

For surface mounting, with 500 mm cable

Light source	24 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	Tail light: ca. 80 mA (12 V), ca. 40 mA (24 V) Stop light: ca. 250 mA (12 V), ca. 125 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E4 12658

2SB 344 200-021	With clear lens
2SB 344 200-081	With red lens

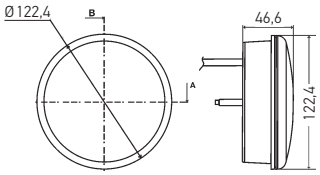


LED direction indicator Ø 122 mm

For surface mounting, with 500 mm cable

Light source	24 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 250 mA (12 V), ca. 125 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E4 12658

2BA 344 200-031	With clear lens

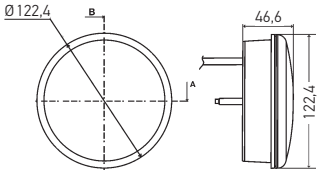


LED rear fog lamp Ø 122 mm

For surface mounting, with 500 mm cable

Light source	24 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 170 mA (12 V), ca. 80 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E4 14198

2NE 344 200-061	With clear lens
2NE 344 200-091	With red lens

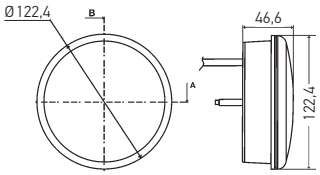


LED reverse lamp Ø 122 mm

For surface mounting, lens clear, with 500 mm cable

Light source	24 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 170 mA (12 V), ca. 80 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E4 14198

2ZR 344 200-051	Multi voltage

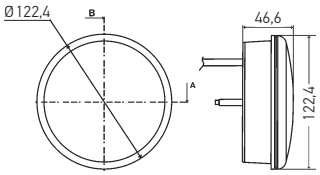


LED tail-stop lamp Ø 122 mm

For surface mounting, passive electronics, with 500 mm cable

Light source	24 LEDs
Rated voltage	12 or 24 V
Current consumption	Stop light: ca. 300 mA (12 V), ca. 200 mA (24 V) Tail light: ca. 80 mA (24 V), ca. 40 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E4 12658

2SB 344 200-221	12 V, lens clear
2SB 344 200-321	24 V, lens clear
2SB 344 200-231	12 V, lens red
2SB 344 200-331	24 V, lens red

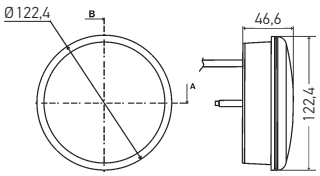


LED tail-stop-direction indicator Ø 122 mm

For surface mounting, passive electronics, with 500 mm cable

Light source	24 LEDs
Rated voltage	12 or 24 V
Current consumption	Tail light: ca. 80 mA (12 V), ca. 40 mA (24 V) Stop light: ca. 170 mA (12 V), ca. 80 mA (24 V) Direction indicator light: ca. 170 mA (12 V), ca. 80 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E4 12371

2SD 344 200-201	12 V, lens clear
2SD 344 200-211	12 V, lens red / clear
2SD 344 200-311	24 V, lens red / clear
2SD 344 200-301	24 V, lens clear

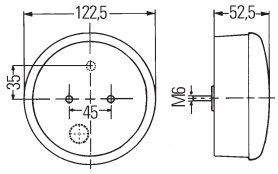


LED direction indicator Ø 122 mm

For surface mounting, lens clear, passive electronics, with 500 mm cable

Light source	24 LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 170 mA (12 V), ca. 80 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E4 12658

2BA 344 200-241	12 V
2BA 344 200-341	24 V

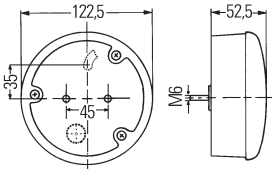


LED rear fog-reverse lamp Ø 122 mm

Combination lamp, long lifetime with low power consumption, rear fog light in red, for surface and flush mounting, lens clear, with moulded 500 mm cable

Light source	30 LEDs (9 red LEDs for rear fog light, 21 white LEDs for reversing light)
Rated voltage	12 or 24 V
Current consumption	Reversing light: ca. 375 mA (12 V), ca. 210 mA (24 V) Rear fog light: ca. 170 mA (12 V), ca. 120 mA (24 V)
Protection class	IP 5K9K
ECE test mark	E24 5876

2NR 344 169-441	12 V
2NR 344 169-461	24 V



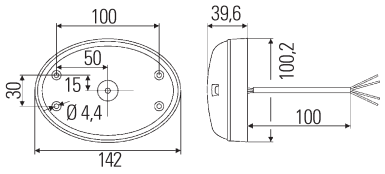
LED rear combination lamps

For surface mounting, with 500 mm cable

Light source	37 LEDs
Rated voltage	24 V
Current consumption	Tail-stop lamp: tail light ca. 46 mA (24 V), stop light ca. 270 mA (24 V) Tail-stop-direction indicator lamp: tail light ca. 50 mA (24 V), stop light ca. 200 mA (24 V), direction indicator light ca. 150 mA (24 V) Rear fog lamp: ca. 380 mA (24 V) Reverse lamp: ca. 300 mA (24 V) Direction indicator: ca. 280 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E24 10R-05 2822

2SB 964 169-301	Tail-stop lamp, lens red
2SD 964 169-331*	Tail-stop-direction indicator lamp, lens clear, left
2SD 964 169-421*	Tail-stop-direction indicator lamp, lens clear, right
2NE 964 169-341	Rear fog lamp, lens red
2ZR 964 169-351*	Reverse lamp, lens clear, left
2ZR 964 169-361*	Reverse lamp, lens clear, right
2BA 964 169-311*	Direction indicator, lens amber

* Without pulse for direction indicator failure control.



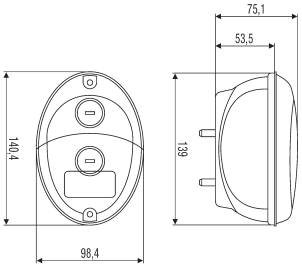
LED rear combination lamps "Oval"

For surface mounting on the vehicle, left or right, horizontal or vertical, with 100 mm cable and open end

Light source	Tail-stop lamp: 24 red LEDs, tail-stop direction indicator lamp: 12 red and 12 amber LEDs, direction indicator: 24 amber LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	Tail-stop lamp: ca. 120 mA (24 V) Tail-stop-direction indicator lamp: ca. 250 mA (24 V) Direction indicator: ca.130 mA (24 V)
Protection class	IP 6K9K
ECE test mark	Tail-stop lamp: E24 12381 Tail-stop-direction indicator lamp: E24 11785 Direction indicator: E24 12381

2SB 343 390-091	Tail-stop lamp
2SD 343 390-011*	Tail-stop-direction indicator lamp
2BA 343 390-071*	Direction indicator

* Direction indicator failure control integrated.



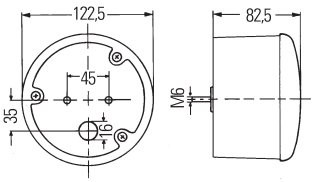
Rear combination lamps "Oval"

Suitable for horizontal and vertical flush and surface mounting, right or left, housing in black, without bulb

Rated voltage	12 or 24 V
ECE test mark	Tail-stop lamp: E4 7698 Rear fog lamp: E4 3919 Direction indicator: E4 6550 Reverse lamp: E4 23257

2SB 343 130-021	Tail-stop lamp, lens red
2NE 343 130-031	Rear fog lamp, lens red
2BA 343 130-051	Direction indicator, lens amber
2ZR 343 130-041	Reverse lamp, lens clear

With SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide



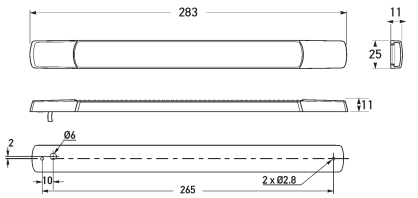
Rear combination lamps

For flush and surface mounting, right or left

Rated voltage	12 or 24 V
ECE test mark	Tail-stop lamp: E17 816 Rear fog lamp: E17 3809 Reverse lamp: E17 2312 Direction indicator: E17 653

2SB 964 169-531	Tail-stop lamp
2NE 964 169-521	Rear fog lamp
2ZR 964 169-511	Reverse lamp
2BA 964 169-501	Direction indicator

With SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide



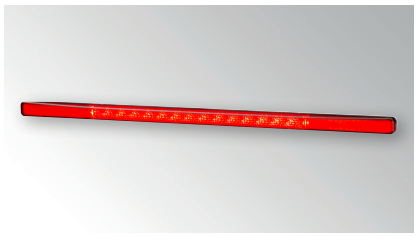
LED rear combination lamp "Strip Lamp"

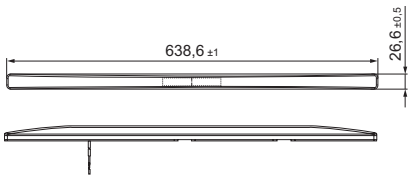
Surface mounting variant, low power consumption, lens made of particularly impact-resistant Grilamid®

Light source	10 LEDs
Rated voltage	12 or 24 V
ECE test mark	Tail-stop lamp: E4 10R 04-2913, E24 5891 Direction indicator: E4 10R 04-2910 (only 24 V), E24 5891 Auxiliary stop lamp: E4 10R 04-2910 (only 24 V), E24 0087 Rear fog lamp: E4 10R 04-2910 (only 24 V), E24 0010 Reverse lamp: E24 0027 (horizontal), E24 0028 (vertical)

2SB 980 887-011*	Tail-stop lamp, 12 V with 300 mm cable
2SB 980 887-211*	Tail-stop lamp, 24 V with 300 mm cable
2BA 980 888-011*	Direction indicator, 12 V, with 2,500 mm cable, without pulse for direction indicator failure control
2BA 980 888-211*	Direction indicator, 24 V, with 2,500 mm cable, without pulse for direction indicator failure control
2DA 980 887-311*	Auxiliary stop lamp, 12 V, with 2,500 mm cable
2DA 980 887-411*	Auxiliary stop lamp, 24 V, with 2,500 mm cable
2NE 980 889-501*	Rear fog lamp, 12 V, with 2,500 mm cable
2NE 980 889-601*	Rear fog lamp, 24 V, with 2,500 mm cable
2ZR 980 889-011	Reverse lamp, 12 V, for horizontal surface mounting, with 2,500 mm cable
2ZR 980 889-111	Reverse lamp, 12 V, for vertical surface mounting, with 2,500 mm cable
2ZR 980 889-211	Reverse lamp, 24 V, for horizontal surface mounting, with 2,500 mm cable
2ZR 980 889-311	Reverse lamp, 24 V, for vertical surface mounting, with 2,500 mm cable

* For horizontal and vertical surface mounting



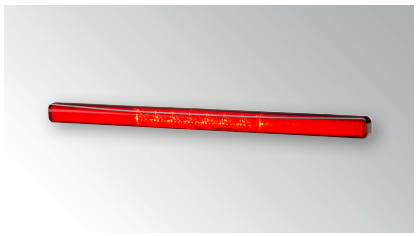


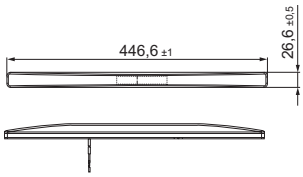
CHMSL auxiliary stop lamp LongLED 64

For horizontal surface mounting, 637 -mm-long, extremely slimline design with a profile height of just 11 mm, highly efficient electronic design with a power consumption of > 3 W, fully sealed housing, high vibration resistance, with 200 mm cable and 6.3 mm flat receptacles

Light source	16 LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 220 mA (12 V), ca. 60 mA (24 V)
Protection class	IP 67
ECE test mark	E1 4127

2DA 012 596-021	12 V
2DA 012 596-031	24 V



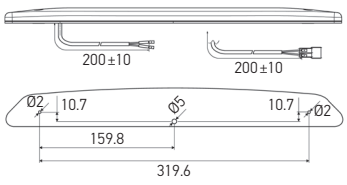


CHMSL auxiliary stop lamp LongLED 45

For horizontal surface mounting, 445 -mm-long, extremely slimline design with a profile height of just 11 mm, highly efficient electronic design with a power consumption of > 3 W, fully sealed housing, high vibration resistance, with 200 mm cable and 6.3 mm flat receptacles.

Light source	8 LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 120 mA (12 V), ca. 40 mA (24 V)
Protection class	IP 67
ECE test mark	E1 024128

2DA 012 596-001	12 V
2DA 012 596-017	24 V

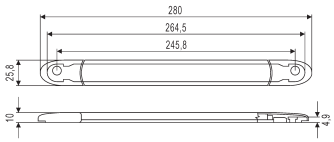


LED auxiliary stop lamp

For horizontal surface mounting, in a brilliant finish, with 3D depth effect by the embedding of each LED in a separate reflector, with 200 mm cable.

Light source	12 red LEDs
Rated voltage	24 V
Current consumption	ca. 150 mA
Protection class	IP 5KX, IP X9K
ECE test mark	E4 7715

2DA 343 800-047	Lens and housing red, seal fixed with double-sided adhesive tape

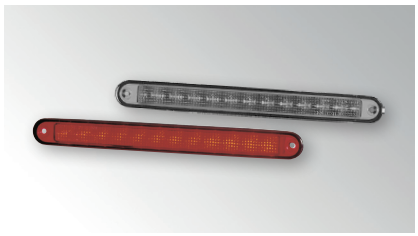


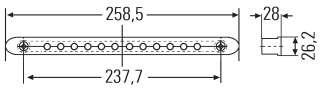
LED auxiliary stop lamp

For horizontal or vertical surface mounting, with 3,000 mm cable, mounting height of 9.5 mm (flush mounted position).

Light source	10 red LEDs
Rated voltage	24 V
Current consumption	approx. 60 mA
Protection class	IP 5KX, IP X9K
ECE test mark	E4 7696

2DA 343 106-011	Lens red, for screw attachment
2DA 343 106-211	Lens red, self-adhesive
2DA 343 106-031	Lens smoked glass, for screw attachment
2DA 343 106-231	Lens smoked glass, self-adhesive





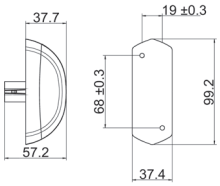
LED auxiliary stop lamp

For horizontal flush mounting, 2,500 mm cable and open cable ends

Light source	12 red LEDs
Rated voltage	24 V
ECE test mark	E4 7547

2DA 959 071-737	Lens red
2DA 959 071-237	Lens clear

CLEARANCE LAMPS

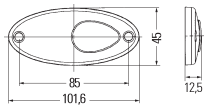


LED clearance lamp

Red / clear lens, with direct screw connection, black frame for direct screw connection, for side-rear surface mounting.

Light source	4 LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 50 mA (12 V), ca. 30 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E1 3011

2XS 205 020-001	12 V, with 2-pin AMP SUPERSEAL
2XS 205 020-011	24 V, with 2-pin AMP SUPERSEAL
2XS 205 020-041	12 V, with 500 mm cable
2XS 205 020-051	24 V, with 500 mm cable

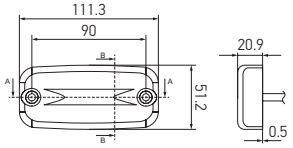


LED tail-reflex reflector lamp

For horizontal surface mounting, with seal, lens with red reflex reflector

Light source	2 LEDs
Rated voltage	24 V
Protection class	IP 5K9K
ECE test mark	E17 0302

2TM 964 295-097	With 5,000 mm cable

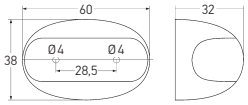


LED clearance lamp

For horizontal surface mounting

Light source	2 LEDs
Rated voltage	24 V
Protection class	IP 6K9K
ECE test mark	E17 10R-04 0072, E24 5881

2TM 345 600-317	With 5,000 mm cable, open end

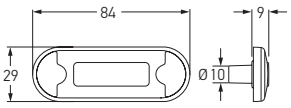


LED clearance lamp

For horizontal surface mounting, lens clear, inner lens red

Light source	2 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	approx. 40 mA
Protection class	IP 6K6, IP 6K7
ECE test mark	E1 7574

2XA 959 560-401	With 500 mm cable
2XA 959 560-411	With 5,000 mm cable



Spare parts / accessories

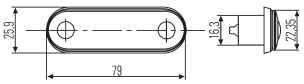
DuraLED clearance lamp

Surface mounting variant, slimline design with 9 mm profile, horizontal or vertical installation, high vibration resistance, extremely low energy consumption, hermetically sealed against dirt and humidity.

Light source	2 red LEDs
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 6K7, IP 6K9K
ECE test mark	E24 5878

2XS 959 855-401	With 500 mm cable and black end caps
2XS 959 855-441	With 2,500 mm cable and black end caps
2XS 959 855-451	With 500 mm cable and white end caps

	Spare parts / accessories
9AB 959 685-201	Decorative cover, polished stainless steel (ECE engraving)
9GD 958 028-001	Contour seal
9GD 980 867-507	Flat, rectangular seal
9HD 980 858-008	Black end caps
9HD 980 858-018	White end caps

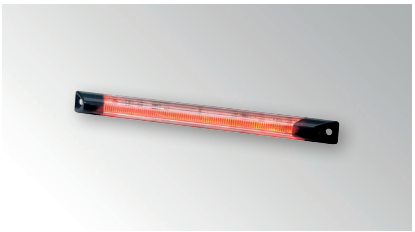


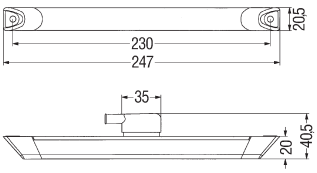
Clearance lamp

For horizontal or vertical flush mounting, lens clear, can be used as tail lamp or clearance lamp, with two cover caps for screw heads

Light source	2 red LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	approx. 40 mA
Protection class	IP 6K6, IP 6K7
ECE test mark	E4 7597

2XA 959 790-401	With 500 mm cable
2XA 959 790-411	With 5,000 mm cable





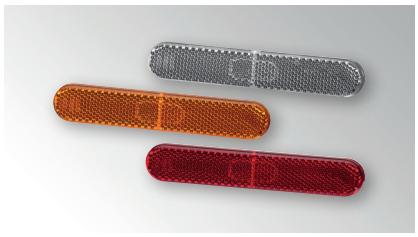
LED clearance lamp

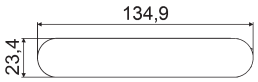
For horizontal or vertical surface mounting, light guide red, 2 screw holes Ø 5.4 mm for fastening screws, lens clear

Light source	2 red LEDs
Rated voltage	24 V
Current consumption	ca. 30 mA (24 V)
Protection class	IP 5K9K
ECE test mark	E13 0515

2XS 008 078-001	24 V

REFLEX REFLECTORS

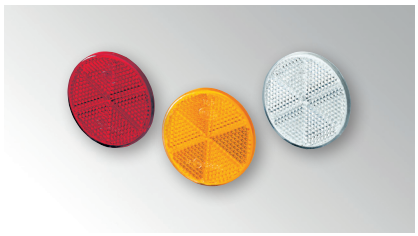


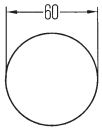


Reflex reflectors

For horizontal or vertical surface mounting, self-adhesive, suitable for combination with lamp series 009 226

ECE test mark	E1 020668
8RA 009 226-137	Red
8RA 009 226-127	Amber
8RA 009 226-117	White

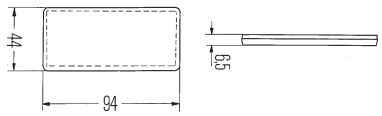




Reflex reflectors

Self-adhesive, effective, reflective surface of 22 cm², with plastic base plate

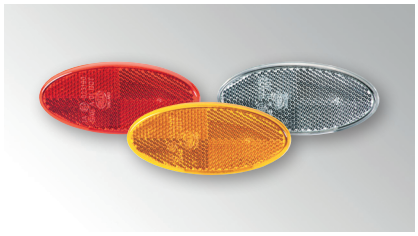
ECE test mark	E13 3535
8RA 002 014-281	Red
8RA 002 014-301	Amber
8RA 002 014-291	White

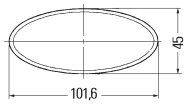


Reflex reflectors

For horizontal or vertical surface mounting, self-adhesive

ECE test mark	E2 0292031
8RA 003 326-031	Red
8RA 003 326-041	Amber
8RA 003 326-051	White

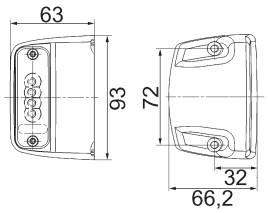




Reflex reflectors

For horizontal or vertical surface mounting, self-adhesive, suitable for combination with lamp series 964 295

ECE test mark	E4 3190
8RA 343 160-007	Red
8RA 343 160-027	Amber
8RA 343 160-017	White

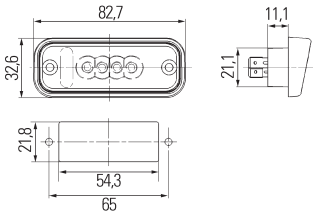


LED licence plate lamp

For surface mounting on the right or left next to the licence plate, only 1 lamp needed for illumination, lens clear, black plastic housing.

Light source	4 LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 80 mA (12 V), ca. 40 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E1 2609

	Licence plate 520 x 120 mm
2KA 010 278-321	12 V, with 6.3 x 0.8 mm flat connector
2KA 010 278-021	24 V, with 6.3 x 0.8 mm flat connector
2KA 010 278-051	24 V, with 500 mm cable and 2-pin EasyConn female connector housing
2KA 010 278-031	24 V, with 2,000 mm cable and 6.3 x 0.8 mm flat connector
	Licence plate 340 x 240 mm or 280 x 200 mm
2KA 010 278-421	12 V, with 6.3 x 0.8 mm flat connector
2KA 010 278-121	24 V, with 6.3 x 0.8 mm flat connector



LED licence plate lamp

For flush mounting above or below the licence plate, 2 lamps required for licence plate lighting

Light source	4 LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 80 mA (12 V), ca. 40 mA (24 V)
Protection class	IP 6K9K
ECE test mark	E1 2609

	Licence plate 520 x 120 mm
2KA 010 278-311	12 V, with 6.3 x 0.8 mm flat connector
2KA 010 278-011	24 V, with 6.3 x 0.8 mm flat connector
2KA 010 278-617	12 V, with 1,000 mm cable
2KA 010 278-607	24 V, with 1,000 mm cable
	Licence plate 340 x 240 mm
2KA 010 278-411	12 V, with 6.3 x 0.8 mm flat receptacles, 1 lamp required for licence plate lighting

MULTI-FUNCTION LAMPS

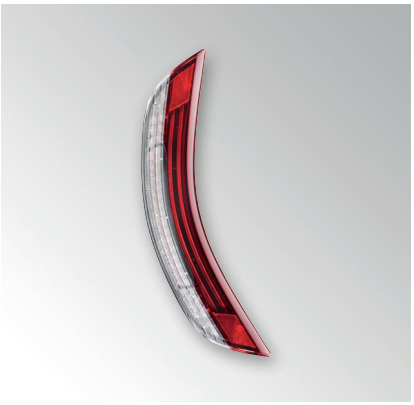
An individualised look for the rear. | Our area of expertise lies in developing individual solutions and then turning these into bespoke applications tailored to address your challenges. And also when it comes to rear lighting, you can benefit from the synergies that HELLA generates through its many years of experience in the development of original automotive equipment at international level.

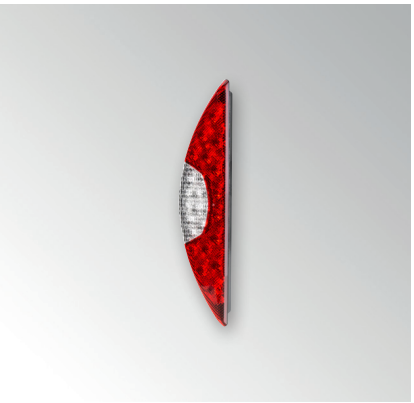
Photo: © EvoBus GmbH

EXCELLENT PERFORMANCE, ICONIC DESIGN - REAR LAMPS FROM HELLA

Maximum safety and reliability: a matter of course at HELLA. But outstanding performance also includes a striking and well-thought-out design, perfectly matched to suit each individual manufacturer and each individual vehicle.

Our solution is this: development and production at our own locations combined with creative consulting and styling support. Whether it is a question of full LED lighting or a hybrid one, with our decades of experience in lighting and electronics, we can guarantee the professional implementation and qualification of your design ideas.





MULTI-FUNCTION LAMPS FROM HELLA

Individual solutions in line with your requirements: HELLA means high-quality design and cutting-edge lighting technologies:

- Glowing body
- EdgeLight
- Light curtain

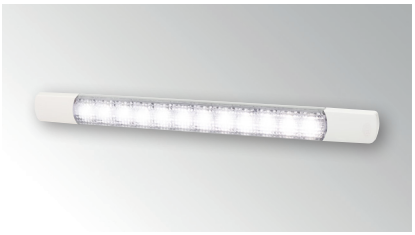
ARE YOU INTERESTED IN A CUSTOMISED LIGHTING SOLUTION THAT IS PERFECTLY SUITED TO YOUR VEHICLE?

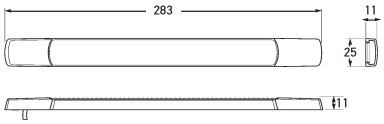
THEN WE ARE THE PERFECT PARTNER FOR YOU. COME AND TALK TO US.

INTERIOR LIGHTING

The LED also creates new accents in the interior of buses. Thanks to the constantly increasing performance of white and coloured LEDs, new kinds of applications are appearing all the time - not only in the area of functions, but also on the decorative side of interior lighting for city buses and coaches. The extremely low power consumption compared to bulbs and the almost unlimited lifetime of the lamps are, of course, decisive arguments in favour of using this modern technology.

INTERIOR LAMPS





LED interior lamp "Strip Lamp"

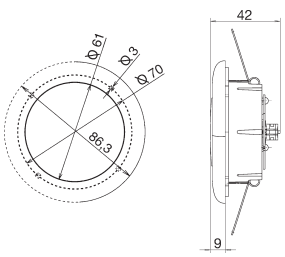
With white screw caps (end pieces right and left), for horizontal or vertical surface mounting, connection via 2,500 mm cable, lens clear

Light source	12 LEDs
Rated voltage	12 or 24 V
Protection class	IP 6K7, IP 6K9K

2JA 980 879-011	12 V, white
2JA 980 879-111	24 V, white
2JA 980 879-201	12 V, warm white
2JA 980 879-301	24 V, warm white

Accessories

	Spare parts / accessories
8HG 958 000-011	"Strip Lamp" bracket 45°, white
8HG 958 000-021	"Strip Lamp" bracket 45°, dark grey
9HD 980 885-018	Screw caps, dark grey
9HD 980 885-108	Screw caps, chromium-plated
9HD 980 885-008	Screw caps, white (as spare part)



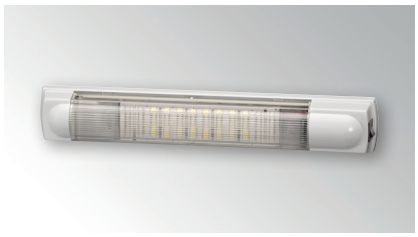
LED spotlights standard

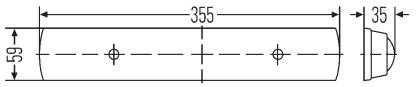
For flush mounting, adjustable, lens clear, optionally with screw or spring clamp fastening

Light source	1 white LED
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	Spot: ca. 200 mA (12 V), ca. 100 mA (24 V) Celis® light guide ring: ca. 40 mA (12 V)
Protection class	IP 3X
Illumination angle	40° or 20°
Illuminance in 1 m range	ca. 156 lux (20°), ca. 65 lux (40°)

	Wide illumination (40°), cover colour*.
2JA 343 790-301	White, with white, ambient Celis® light guide ring
2JA 343 790-311	Black, with white, ambient Celis® light guide ring
2JA 343 790-341	Silver, with white, ambient Celis® light guide ring
2JA 343 790-711	Black
2JA 343 790-741	Silver
	Spot illumination (20°), cover colour*:
2JA 343 790-441	Silver, with white, ambient Celis® light guide ring
2JA 343 790-611	Black

* Other cover colours (e. g. real wood look) or ambient CELIS® light guide ring (e.g. blue, red) on request.



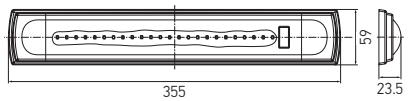


LED ceiling lamp

Lens and frame in impact-proof material, with switch, for surface mounting

Light source	12 or 24 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	12 LEDs: ca. 300 mA (12 V), ca. 150 mA (24 V) 24 LEDs: ca. 580 mA (12 V), ca. 290 mA (24 V)
Light colour	4,000 K (neutral white)
Illuminance in 1 m range	ca. 100 lux (12 LEDs), ca. 200 lux (24 LEDs)

2JA 007 373-151	12 LEDs
2JA 007 373-161	24 LEDs

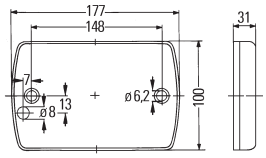


LED ceiling lamp

For surface mounting, lens clear

Light source	24 LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 400 mA (12 V), ca. 200 mA (24 V)
Protection class	IP 54 (with switch), IP 67 (without switch)
Light colour	4,000 K (neutral white)
Illuminance in 1 m range	ca. 200 lux (24 LEDs)

2JA 007 373-301	12 V, with switch
2JA 007 373-321	12 V, without switch
2JA 007 373-311	24 V, with switch
2JA 007 373-331	24 V, without switch

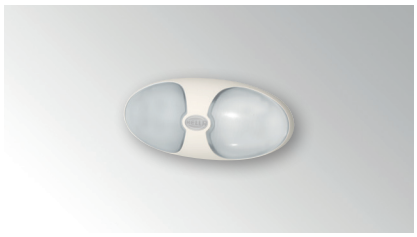


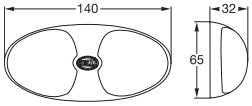
DuraLED ceiling lamp

For surface mounting; cast in one piece with white base plate, made of impact-resistant plastic and UV-resistant; electrical connection via 2,500 -mm-long cable

Light source	36 white LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 750 mA (12 V)
Protection class	IP 6K6, IP 6K7
Illumination angle	62°, wide horizontal and narrow vertical illumination
Illuminance in 1 m range	450 Lux

2JA 959 037-511	Multi voltage



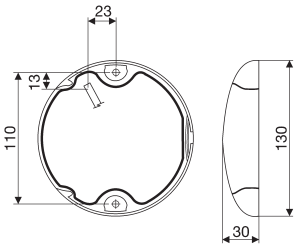


DuraLED oval ceiling lamp

Lens white, with 500 mm cable

Light source	12 white LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 250 mA
Protection class	IP 6K6, IP 6K7
LED beam angle	120°
Illuminance in 1 m range	ca. 60 lux

2JA 959 700-102	Multi voltage

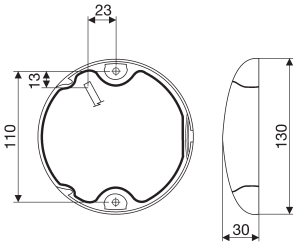


EuroLED ceiling lamp

For surface mounting, cast in one piece with base plate; electrical connection with a 2,500 -mm-long cable, lens white

Light source	1 white power LED
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 170 mA (24 V)

2JA 959 820-501	Multi voltage

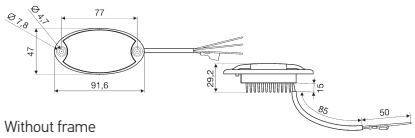


EuroLED Touch ceiling lamp

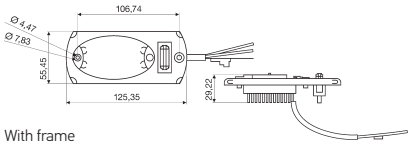
For surface mounting, cast in one piece with the base plate; electrical connection with a 2,500-mm-long cable, lens white; with sensitive switch, for on/off and dimming and also changing between white and red light

Light source	1 white and 8 red LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	White light: ca. 170 mA (24 V) Red light: ca. 100 mA (24 V)

2JA 959 950-031	Housing black



Without frame



With frame

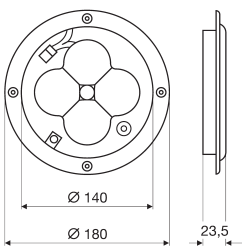
Mini Oval LED

Brilliant and clear lens, illumination of driver's side or instrument area, ambient lighting can be activated, for flush mounting, red or blue lighting possible

Light source	4 white LEDs, 1 ambient LED
Rated voltage	12 or 24 V
Current consumption	ca. 300 mA (12 V), ca. 150 mA (24 V)
Protection class	IP 6K9K (without frame/switch), IP 40 (with frame/switch)
Illumination angle	50° for main light (4 LEDs), 100° for ambient lighting (1 LED)
Illuminance in 1 m range	Standard = ca. 14.5 lux, Power = ca. 54 lux

	Without bracket and switch
2JA 343 570-117	Power LEDs, 12 V, blue
2JA 343 570-011	Power LEDs, 12 V, red
2JA 343 570-001	Power LEDs, 24 V, red
	With bracket and switch
2JA 343 570-157	Power LEDs, 12 V, blue
2JA 343 570-141	Power LEDs, 24 V, blue
2JA 343 570-051	Power LEDs, 12 V, red
2JA 343 570-041	Power LEDs, 24 V, red
2JA 343 570-061	Standard LEDs, 24 V, red

Other variants are available on request.

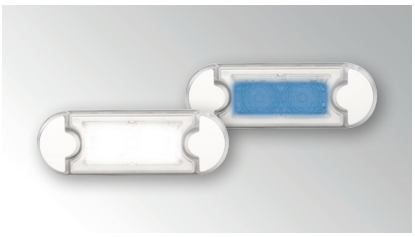


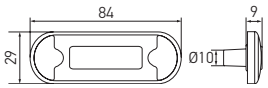
CargoLED ceiling lamp

Lens clear, for flush mounting (aluminium mounting frame), electrical connection with 310 -mm-long cable

Light source	4 white power LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 500 mA (12 V), ca. 250 mA (24 V)
Protection class	IP 6K9K
Illumination angle	44° (wider illumination at close range)
Illuminance in 1 m range	ca. 280 lux

2JB 344 227-001	Cold white
2JB 344 227-041	Warm white
	Accessories
9XD 344 118-101	Mounting frame, grey



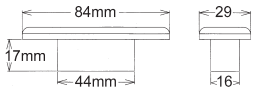


LED step lamp

Lens clear; seal, fastening screws and screw caps included; electrical connection with a 500 -mm-cable, for flush mounting

Light source	2 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	approx. 40 mA
Protection class	IP 6K9K
Connecting bracket	22°
Illuminance in 1 m range	ca. 25 lux

2XT 980 855-117	White LEDs
2XT 980 855-417	Blue LEDs

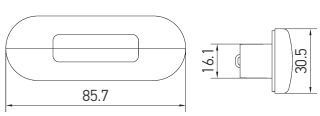


LED step lamp

Lens clear; seal, fastening screws and screw flaps included; electrical connection with a 120 -mm-long cable, for flush mounting

Light source	2 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	approx. 40 mA
Protection class	IP 6K6, IP 6K7
Illumination angle	30°
Illuminance in 1 m range	ca. 15 lux

2XT 959 510-427	White LEDs
2XT 959 510-657	Blue LEDs

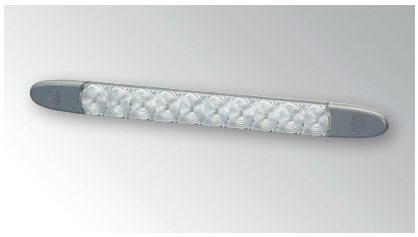


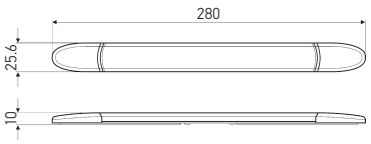
LED step lamp

With polished stainless steel frame, 120 mm cable, seal and fastening screws; for flush mounting

Light source	2 LEDs
Rated voltage	Multi voltage (12 / 24 V)
Protection class	IP 67

2XT 959 680-612	Blue LEDs
2XT 959 680-812	White LEDs



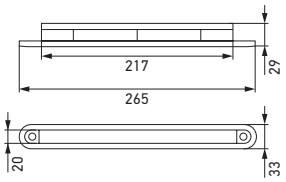


LED orientation lamp

Lens clear, for surface mounting; cast in one piece with grey base plate; electrical connection with a 500 -mm-long cable

Light source	10 LEDs
Rated voltage	24 V
Current consumption	ca. 70 mA (24 V)
Protection class	IP 6K9K
Illumination angle	38°
Illuminance in 1 m range	ca. 32 lux

2JA 343 606-017	White LEDs
2JA 343 606-217	Blue LEDs

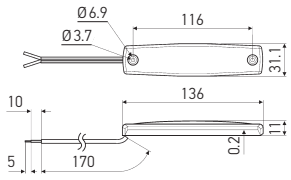


LED step lamp

Lens clear; screws, screw caps, seal and cable connector included; connection with a 2,500 -mm-cable, for flush mounting

Light source	12 white LEDs
Rated voltage	24 V
Current consumption	ca. 80 mA (24 V)
Illumination angle	24°
Illuminance in 1 m range	ca. 130 lux

2JA 959 073-201	24 V



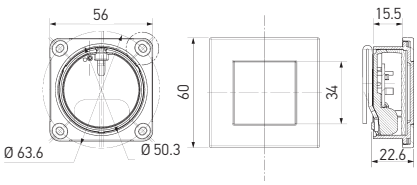
Mini Thin LED orientation lamp

Electrical connection with a 170 -mm-long cable

Light source	5 white LEDs
Rated voltage	12 or 24 V
Current consumption	ca. 230 mA (12 V), ca. 110 mA (24 V)
Protection class	IP 6K9K
Illumination angle	34°
Illuminance in 1 m range	ca. 7.2 lux

2JA 343 660-101	12 V
2JA 343 660-117	24 V

ORIENTATION LAMPS
LED STEP LAMPS

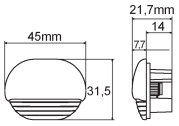


LED step lamp

Lens white, with square white frame, 120 mm cable, seal and fastening screws; for flush mounting

Light source	4 white LEDs
Rated voltage	24 V
Current consumption	ca. 35 mA (24 V)
Protection class	IP 67
Connecting bracket	32°
Illuminance in 1 m range	100 Lux

2JA 980 596-102	Passive electronics



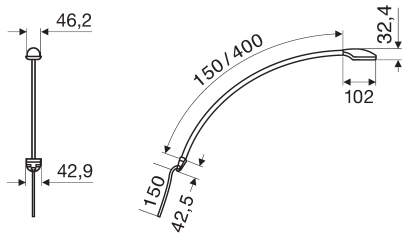
LED step lamp Generation 2

Lens clear, bright illumination at close range, cover cap white, pre-cabled with 120 mm cable, for flush mounting

Light source	1 LED
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 40 mA (12 V), ca. 20 mA (24 V)
Protection class	IP 67

2JA 958 126-017	White LED
2JA 958 126-117	Blue LED

READING LAMPS



LED reading lamp

Lens with pattern; with flexible arm, ideal for reading maps; electrical connection with a 150 -mm-long cable, for surface mounting

Light source	1 white power LED
Rated voltage	Multi voltage (12 / 24 V)
Current consumption	ca. 200 mA
Protection class	IP 53
Illumination angle	38°
Illuminance in 0.7 m range	ca. 110 lux

2JA 346 720-111	400 mm arm, cover colour white
2JA 346 720-121	400 mm arm, cover colour black
2JA 346 720-191	400 mm arm, cover colour silver

ELECTRONICS

HELLA electronic components have proved their worth millions of times over - and indeed frequently under adverse conditions. That is why they are also the first choice for city buses and coaches so as to ensure reliable and economical operation. We develop high-quality, customised solutions for the key issues in the automotive industry: increasing energy efficiency, minimising CO_2 emissions and improving safety and comfort.

We offer a versatile electronics portfolio specially for city buses and coaches that, besides sensors and actuators, also includes countless other components designed for a large number of application scenarios.

ELECTRONICS EXPERTISE
PRODUCT DIVISIONS, SPECIAL OE ELECTRONICS

We are constantly expanding our electronics expertise for special vehicles such as agricultural and construction vehicles, buses, motor homes, electric cars and we are also progressing in the marine sector: in line with all this, we are strengthening our global sales network and expanding our global development expertise on the one hand. While on the other, we are focusing on extending our electronics portfolio at a steady, constant pace.

Our application specialists are always available to support you with the integration of the latest technologies and functions. No matter how specific your requirements are, HELLA tackles the challenge and ensures that a customised solution is found and implemented.

Sales, Product Management and Development unite to focus on your electronics projects, offering flexibility and technical support for your product application.

Reliable, intensive and personal customer support: HELLA works hand in hand with you.

ENERGY MANAGEMENT

Intelligent battery sensors

ENVIRONMENTAL AND MEDIUM SENSORS

Rain/light sensors

POSITION SENSORS

Angular position sensors

ACTUATORS

Actuators (Medium Force)

Actuators (High Force)

Actuators (Smart URA)

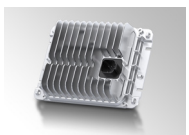
Actuators (Low Force)

BODY AND LIGHTING ELECTRONICS

Remote control systems

LED flasher unit:
towing vehicle

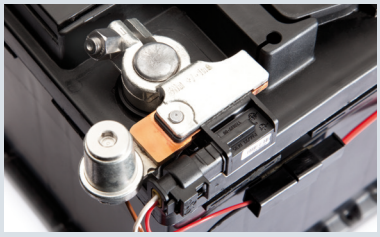
LED flasher unit:
for LED direction indicators
12 and 24 V



LED lamps
control unit

Control unit for
current monitoring

Simulation device
for cold check



Mounting on standard battery pole (battery pole adapter not included in delivery)

ENERGY MANAGEMENT
INTELLIGENT BATTERY SENSORS

PRODUCT DESCRIPTION

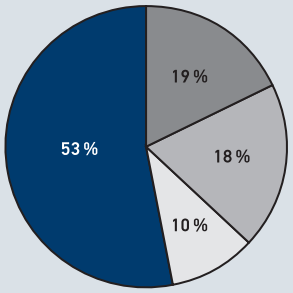
The 24 V intelligent battery sensor (IBS) from HELLA is the key element in vehicle energy management. The 24 V IBS reliably and accurately measures the battery parameters of voltage, current, and temperature. Information on the state of charge (SOC), ageing or state of health (SOH) and also on the expected starting capability or state of function (SOF) of the battery is calculated algorithmically using the measured values.

The 24 V IBS is designed for use in starter (standard or EFB), gel and AGM (fleece) batteries for the monitoring of in-vehicle starter or consumer batteries. The 24 V IBS can be directly integrated into the vehicle electrical system with the standardised LIN protocol.

Intelligent battery sensor (IBS) 24 V	
Voltage range	7,5 – 32 V
Rated voltage	24 V
Dimensions (length/width/height)	ca. 71.4 / 68.35 / 22.8
Weight	119,5 g
Operating temperature	-40°C to +80°C
Protection class	IP 6K7
Mating connector*	Hirschmann 872-858-546

6PK 011 700-001	IBS 24 V with cable lug, straight
6PK 011 700-317	IBS 24 V with cable lug, right-angled
9MK 179 472-007	Battery pole adapter for IBS 24 V

* This accessory is not included in the scope of delivery. It can be purchased from Hirschmann Automotive.



53 % – Battery
19 % – Alternator
18 % – Other causes
10 % – Starter

CUSTOMER BENEFITS

The 24 V intelligent battery sensor (IBS) provides information about the current energy balance, thus making it possible to plan the energy supply.

In order to prudently conserve the energy of the vehicle battery, it is necessary to know the state of charge, ageing and any changes to the battery. This is vital because weak batteries are the main cause of vehicle breakdown in more than 50% of cases according to a study by the German motoring organisation ADAC.

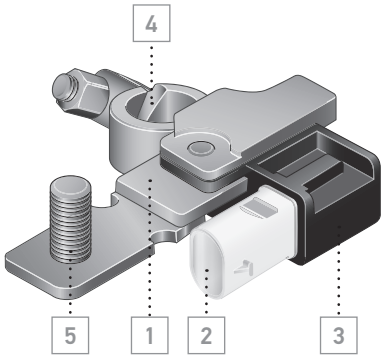
ADVANTAGES

- → Accurate measurement of battery voltage, current and temperature parameters
- → Determination of parameters regarding condition of the battery- i.e. state of charge (SOC), state of health (SOH) and state of function (SOF)
- → Simple electrical and mechanical integration

DESIGN AND FUNCTION

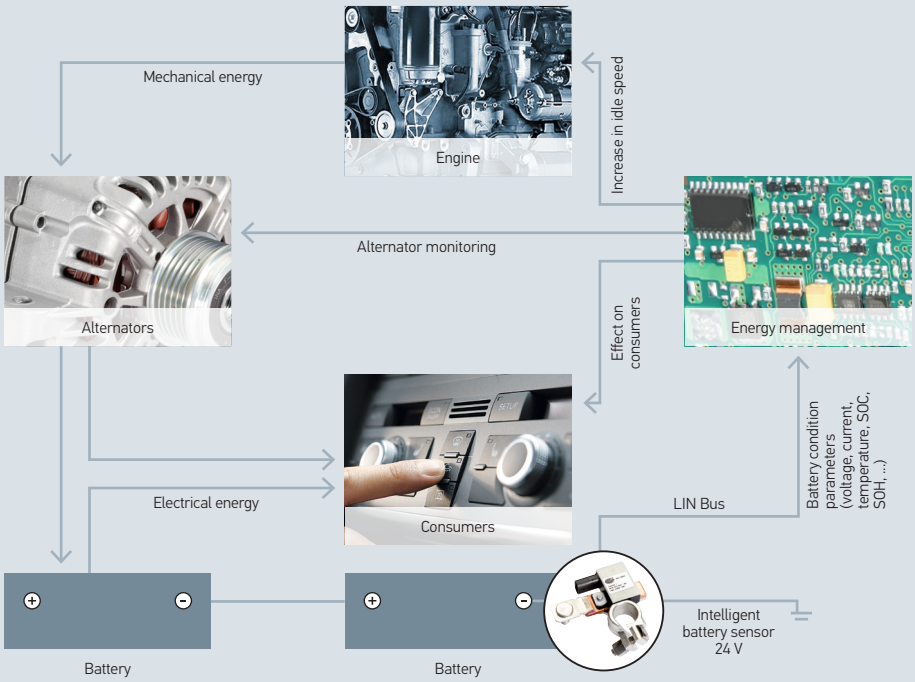
The 24 V IBS is attached directly to the negative pole of the battery via the pole terminal. In addition to the terminal, the mechanical part of the battery sensor consists of the following components: the shunt and earthing bolt. The shunt is attached to the vehicle's load path and serves as a measuring resistor to measure the current indirectly. The existing ground cable can be conveniently attached to the earthing bolt, e.g. with the optionally available battery pole adapter.

The electronics are located in a cast housing with a plug connector, which functions as the interface to the energy management system. The LIN protocol is the communication interface to the higher level control unit. The supply voltage, used simultaneously as the reference voltage for voltage measurement, is provided by the connection to the positive poles of both batteries.



Battery sensor IBS 24 V

1. Shunt on the sensor
2. Connector
3. Sensor module
4. Negative pole terminal
5. Screw-on bolts for battery pole adapter



ENERGY MANAGEMENT WITH 24 V INTELLIGENT BATTERY SENSOR

By using the 24 V intelligent battery sensor, the energy management system can react quickly in the case of a critical battery state and then influence both consumer behaviour and also the alternator.

COMPONENTS
RAIN-LIGHT SENSORS

PRODUCT DESCRIPTION

Rain sensor: The rain sensor is used to recognize different rain situations within the sensor range and it then activates the front windshield wiper accordingly. Manual driver intervention is virtually no longer required.

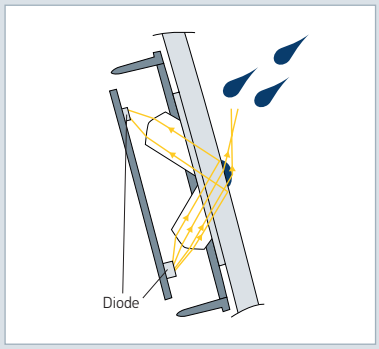
Light sensor: As a light sensor, it activates the switching on and off of the low beam in varying light conditions or in special situations e.g. in tunnels.

Rain-light sensor	
For vehicles with steeply sloping windshields, for the recording of environmental features	
Voltage range	9 – 16 V
Rated voltage	12 V
Dimensions (width/radius/height)	ca. 58.5 / Ø 49 / 22.6 (without protective cap)
Weight	≤ 42 g
Operating temperature	-40 to +85°C
Protection class	IP 50
Mating connector*	AMP C-1718346, coding A

On request

* This accessory is not included in the scope of delivery. It can be purchased from TE Connectivity.

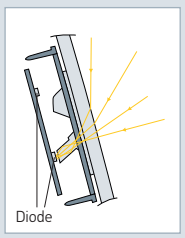
	Accessories
9XD 420 696-104	Bracket, fixing with liquid adhesive
9XD 748 921-011	Bracket, fixing with liquid adhesive, suitable for design cover 9HB 748 851-107
9XD 420 696-001	Bracket, fixing with 3M adhesive tape



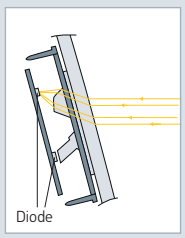
Rain sensor

OPERATING PRINCIPLE OF RAIN DETECTION:

Use of the successfully field-proven principle of total reflection. The large, homogeneous measuring section guarantees good starting behaviour and pleasant wiper performance. The sensor also has additional algorithms for detecting streaks and dirt.



Ambient light sensor



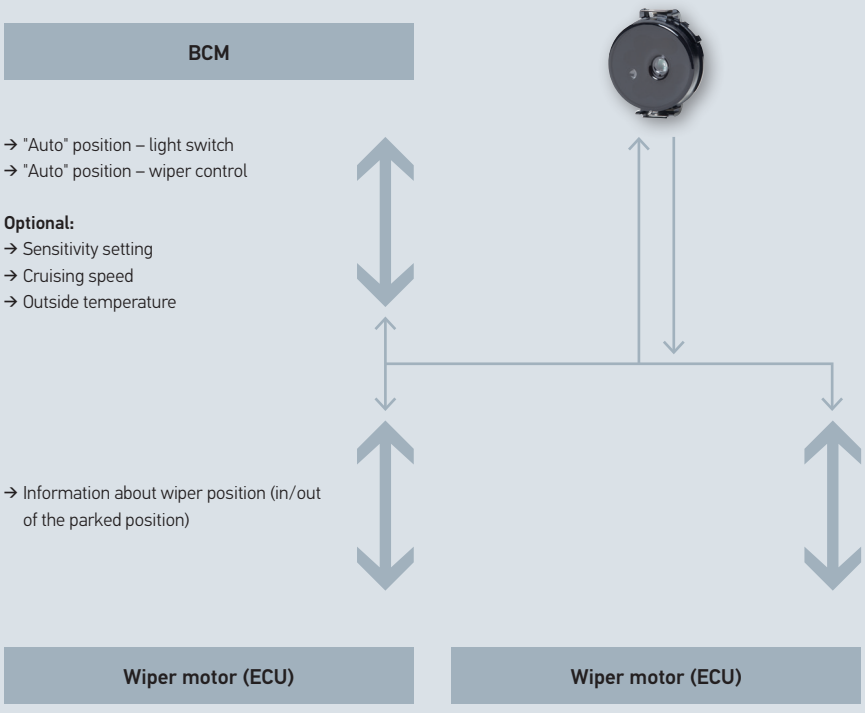
Front light sensor

OPERATING PRINCIPLE OF LIGHT DETECTION:

The light sensor contains separate diodes for detecting ambient light and front light. The optical concept is designed such that the light switching characteristics are stable and independent of the direction of travel. The large opening angles of the light diodes enable homogeneous light switching behaviour in all driving situations.

ADVANTAGES

- → The fourth generation in a long established line of rain sensors from HELLA
- → Optics specially designed for vehicles with steeply sloping windshields
- → Dual function: rain and light detection (ambient detection and tunnel detection)
- → Optimised design – extremely compact package space

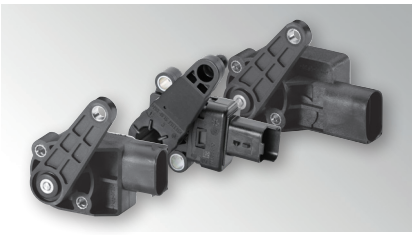


Wiper function control

Headlamps

INTERFACES / FUNCTIONAL DESCRIPTION

The following overview illustrates an option of how the sensor communicates with other system components in the vehicle via the LIN interface. Here the sensor is activated by the master control unit and supplied with voltage. It thus provides the system with information but does not directly interfere with the system.



Angular position sensor

Precise and reliable angle measurement, with CIPOS® technology; high temperature stability and linearity, insensitivity to magnetic fields

Angle range	Mechanically unlimited (full 360° rotation)
Protection class	IP 6K9K
Polarity reversal protection	None, mechanical protection only
Zero position	Individually programmable

Single sensors

	Angle range	Lever arm	Zero position
6PM 008 161-241	-30° to +30°	50 mm	0° / 120° / 240°
6PM 008 161-251	-51° to +51°	50 mm	0° / 120° / 240°
6PM 008 161-121	-54° to +54°	70 mm	0° / 120° / 240°
6PM 008 161-131	-54° to +54°	70 mm	60° / 180° / 300°
6PM 008 161-141	-54° to +54°	50 mm	30° / 150° / 270°
6PM 008 161-151	-54° to +54°	50 mm	90° / 210° / 330°

Single sensors - compact design

	Angle range	Lever arm	Zero position
6PM 010 200-501	-54° to +54°	39 mm	0° / 120° / 240°
6PM 010 200-511	-54° to +54°	39 mm	0° / 120° / 240°
6PM 010 200-521	-54° to +54°	51 mm	0° / 120° / 240°
6PM 010 200-531	-54° to +54°	70 mm	0° / 120° / 240°

Double sensors

	Angle range	Lever arm	Zero position
6PD 009 583-001	-30° to +30°	50 mm	0° / 120° / 240°
6PD 009 583-011	-54 to +54°	50 mm	0° / 120° / 240°
6PD 009 580-017	-54 to +54°	70 mm	0° / 120° / 240°
6PD 009 584-017	-54 to +54°	90 mm	0° / 120° / 240°

Various connecting elements available

Remote control system

Switching lamps on and off or opening and locking doors and flaps

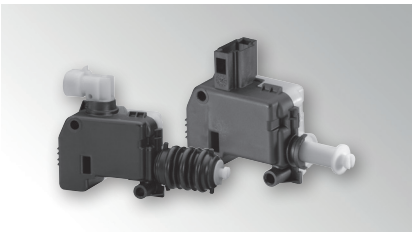
	Remote control transmitter
Transmission frequency	434,42 MHz
Transmission power	30 µW ERP
Battery type*	CR2032
Battery lifetime	100,000 clicks (ca. 3 years of use)
Average range**	70,5 m
Max./Min. range**	119 m / 51 m
Operating/ storage temperature	-20°C to +60°C
Protection class	IP 6K7, IP X5

	Remote receiver
Operating voltage	6 – 32 V
Operating temperature	-40°C to +80°C
Storage temperature	-40°C to +90°C
Power consumption	11 mA (signal output not activated)
Switching currents	up to 4 x < 300 mA
No-load current	< 2 mA
Max. voltage	58 V for a period of 250 ms
Overvoltage	36 V (at 40 °C, 1 hour)

On request	2 remote control transmitters with light symbol button and receiver, enhanced variant
5FA 012 485-817	2 remote control transmitters and receiver, enhanced variant
5FA 012 485-201	Spare key for 5FA 012 485-817

* A battery is included in the scope of delivery for the remote control transmitter.

** Ranges depend on the installation position and interference factors. The values specified are merely an example and must be verified for each new application.



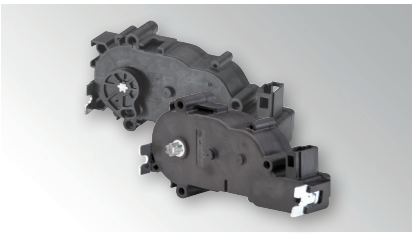
Door locking actuator/central locking system

Electrical locking/unlocking & closing (Medium Force) of all doors (locking systems), flaps, sunroofs, seats, covers, bonnets, glove compartments

Rated voltage	12 or 24 V
Voltage range	9 – 15 V (12 V), 18 – 30 V (24 V)
Position when delivered	Retracted or extended
Mainspring reset	None, retract/extend
Actuating force on the tappet	From 30 to 170°N
Manual adjustment	From zero to < 35 N
Functional stroke	≤ 18 mm
Operating temperature	-40°C to +80°C
Lifetime	Up to 100,000 cycles

	Electrical retraction and extension
6NW 009 203-401	12 V, actuating force 30 - 130 N, IP 5K0, with manual adjustment
6NW 009 203-411	12 V, actuating force 30 – 140 N, IP 5K0
6NW 009 203-441	24 V, actuating force 30 - 130 N, IP 5K4, with manual adjustment
6NW 009 203-451	24 V, actuating force 40 – 150 N, IP 5K4
6NW 009 203-557	12 V, actuating force 30 – 140 N, IP 5K4
6NW 009 203-621	12 V, actuating force 20 - 130 N, IP 5K4, with manual adjustment
6NW 009 203-631	12 V, actuating force 30 – 160 N, IP 5K4
	Electrical retraction and extension with mainspring
6NW 009 203-461	12 V, actuating force 30 – 170 N, IP 5K0
6NW 009 203-471	12 V, actuating force 30 – 170 N, IP 5K4
6NW 009 203-541	24 V, actuating force 15 - 90 N, IP 5K4, with manual adjustment
	Electrical extension and retraction with mainspring
6NW 009 203-491	12 V, actuating force 30 – 170 N, IP 5K0
6NW 009 203-501	12 V, actuating force 30 – 170 N, IP 5K4
6NW 009 203-521	24 V, actuating force 20 – 140 N, IP 5K4

* The actuating force depends on the operating voltage and ambient temperature.



Actuator as door closing assistance

Electrical locking/unlocking & closing (High Force), especially for applications requiring much force (e.g. large door locks, large hatchbacks, seat release)

Rated voltage	12 V
Voltage range	9 – 16 V
Functional angle	0° to 198°
Manual adjustment	None
Operating temperature	-40°C to +85°C
Protection class	IP 5K0

6NW 009 424-781	Retraction via spring, electrical extension, torque 150 Ncm
6NW 009 424-791	Electrical retraction and extension, torque 300 Ncm

Universal rotary actuator (Smart URA)

Electrical locking/unlocking & closing, electrical rotary movement right and left, with position feedback via CIPOS technology, application in supply/discharge air flaps (chokes), control of valves in the cooling circuit or the air flaps/chokes in the radiator grille

Rated voltage	13,5 V
Voltage range	9 – 16 V
Rated torque (13.5 V; RT)	60 Ncm
Max. torque (13.5 V; RT)	< 300 Ncm
Operating angle range	> 360° (< 180° true power on)
Operating temperature	-40°C to +85°C
Protection class	IP 6K9K, IP 6K7 (depending on mating connector category)
Lifetime	Typical 250,000 cycles (1 cycle = 90° angle open– closed – open)
Control system	LIN 2.0 & PWM

6NW 011 303-701

Fuel filler flap actuator

Electrical locking/unlocking of, for example, tank modules, service flaps or glove compartments; space-saving, with micro switch, electrical open rotation, return rotation via return spring, with soft touch button

Rated voltage	12 V
Voltage range	9 – 15,5 V
Function and lifetime	Electrical open and return rotation: 100,000 switching cycles; Electrical open and return rotation with micro-switch: 60,000 switching cycles; Electrical open rotation, return rotation via return spring: 7,500 switching cycles
Locking lever pulling force	> 75 N
Locking lever breaking force	≥ 300 N
Functional angle	≤ 78°
Operating temperature	-40°C to +85°C
Protection class	IP 5K4

6NW 011 122-017	Electrical open and return rotation
6NW 011 122-027	Electrical open and return rotation with micro switch
6NW 011 122-037	Electrical open and return rotation with micro switch, without operating and locking element
6NW 011 122-057	Electrical open and return rotation with micro switch, with operating element, without locking element
6NW 011 122-047	Electrical open rotation and return rotation via return spring with soft touch button

LED LAMP FAILURE CONTROL

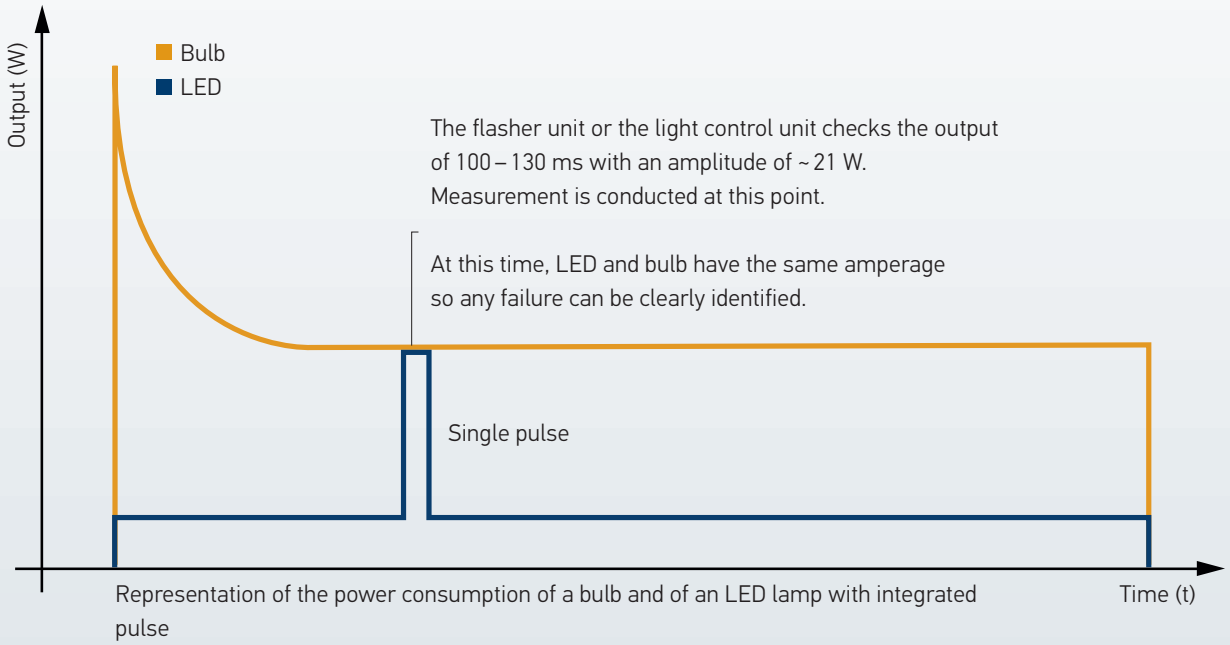
A defined standard such as for bulbs cannot be used for the monitoring of LED lamps. Every LED lamp is different in its technical implementation and in its energy consumption:
→ they are governed by the number of LEDs,
→ by the intensity with which they are driven
→ and also by the electronic ballast necessary for their operation.

Monitoring of the failure control is therefore no longer as simple as it once was with bulbs. HELLA has various approaches to solving this problem. They are summarised here under the heading of Lighting Electronics.

WHAT IS REQUIRED BY LAW?

The ECE R48 regulation defines that direction indicators have to be monitored and that their failure has to be signalled optically or visually.

There are two possibilities:
→ The LED lamp either has to be able to "communicate" with the vehicle
→ or it is monitored with regard to its energy consumption.
The "communication" option is the better approach here, but is not always possible, e.g. between towing vehicle and trailer.



Representation of the power consumption of a bulb and of an LED lamp with integrated pulse

SOLUTIONS

The optimum solution is to match the lighting electronics or the flasher unit to the connected lighting. This is only possible in the most seldom of cases, however, as either a towing vehicle or trailer is involved or the vehicle electronics have already been determined by third parties.

FLASHER UNITS

LED direction indicators in compliance with ISO 13207 can "communicate" with the flasher unit. The flasher unit checks for a defined energy requirement at a defined point in time: exactly 21 W for 100-130 ms after each activation of the direction indicator. The energy consumption or "pulse" corresponds here to that of a bulb, so that the flasher unit notices no difference between a bulb and an LED lamp that is in compliance with ISO 13207.

If the intelligent LED lamp conforming to ISO 13207 detects a defect or only a partial defect, this "pulse" is switched off and the flasher unit can interpret this as a failure. ISO 13207-conformant LED lamps and ISO 13207-conformant flasher units are required for this method.

The advantage:
Bulbs and ISO LED lamps can be operated in any combination on an ISO 13207 -conformant flasher unit. This is relevant both for vehicles that are frequently operated with different trailers and also for manufacturers who wish to offer several variants of the lighting system without having to modify the underlying electronics.

LED LAMP CONTROL UNITS FOR USE WITH THIRD-PARTY ELECTRONICS

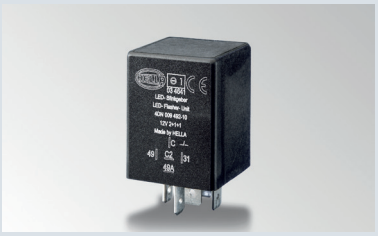
If the vehicle electronics have already been dictated by third parties, HELLA offers LED control units that, on the one hand, monitor the LED lamps, and, on the other, simulate to the vehicle that bulbs are connected. This allows LED lamps to be used without any problems.

MONITORING OF CURRENT

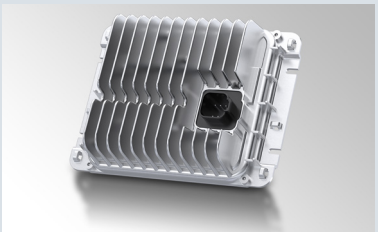
Another possibility is to measure the average energy consumption of the headlamp or the LED lamp.

The disadvantage:
In most cases, however, partial defects cannot be detected in this way: with very efficient LED lamps it is possible that their energy consumption is so low that they are detected as defective even when functioning correctly. Or in the worst case: the electronic ballast of the LED lamp requires so much energy that a failure cannot be detected even if all the LEDs are defective.

SUITABLE PRODUCTS

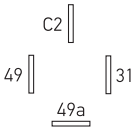


LED flasher unit: towing vehicle

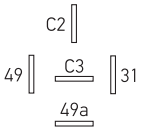


LED lamp control unit

Control unit for current monitoring



Pin configuration
LED flasher unit 3+1



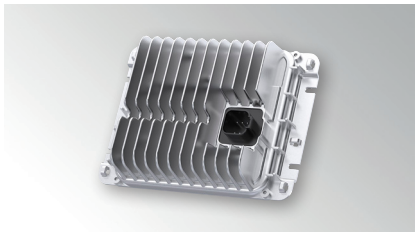
Pin configuration
LED flasher unit 2+1+1

LED flasher unit: towing vehicle

LED direction indicators in compliance with ISO 13207 can "communicate" with the flasher unit. The flasher unit checks for a defined energy requirement at a defined point in time: exactly 21 W for 100-130 ms after each activation of the direction indicator. The energy consumption or "pulse" corresponds here to that of a bulb, so that the flasher unit notices no difference between a bulb and an LED lamp that is in compliance with ISO 13207.

Operating voltage	10 – 15 V (12 V), 18 – 32 V (24 V)
Functional voltage	11 – 14 V (12 V), 20 – 28 V (24 V)
Protection class	IP 53 (contacts underneath)

4DW 009 492-111	12 V, LED flasher unit 3+1
4DN 009 492-101	12 V, LED flasher unit 2+1+1
4DW 009 492-011	24 V, LED flasher unit 3+1
4DM 009 492-001	24 V, LED flasher unit 2+1



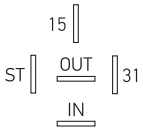
LED lamp control unit

Basic control unit: the control unit is **only** responsible for monitoring the direction indicators.

Premium control unit: the control unit is responsible for monitoring **the entire** rear lighting (tail lights, stop lights, direction indicator lights, reverse lights and rear fog lights).

Mating connector	Amphenol 6-pin (Basic control unit) Amphenol 6-pin / 12-pin (Premium control unit)

5DS 227 488-001	Basic control unit, 12 V
5DS 227 488-101	Basic control unit, 24 V
5DS 227 489-001	Premium control unit, 12 V Premium (1 stop light channel)
5DS 227 489-011	Premium control unit, 12 V Premium (2 stop light channels)
5DS 227 489-101	Premium control unit, 24 V Premium (1 stop light channel)

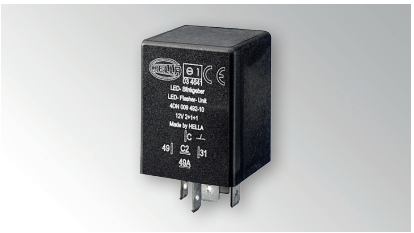


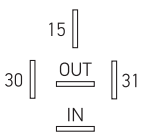
Pin configuration

Control unit for current monitoring

In order to test LED low beam headlamps, the average energy consumption is determined by measuring the current. The current monitors are matched to the HELLA products and enable very reliable monitoring.

5KG 011 630-001	Direct measurement, 12 V, 500 mA
5KG 011 630-011	Direct measurement, 24 V, 500 mA
5KG 011 630-211	Direct measurement, 24 V, 350 mA
5KG 011 630-101	Integrated measurement over time, 12 V





Pin configuration

Simulation device for cold check

If the existing vehicle electrical system is programmed to monitor the lighting even when it is not in operation, it is known as a cold check. During a cold check, a small test pulse is transmitted to the lamp while it is switched off to see whether this pulse is discharged via the bulb to ground. The energy here is so low that the bulb does not light up.

As LED lamps are essentially not suitable for this form of monitoring, HELLA offers an electronic system for "simulation of the cold check" in order to ensure operation.

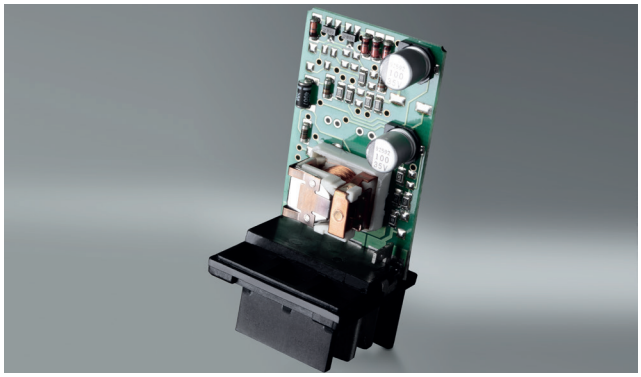
Functional voltage	1,5 A
Protection class	IP 54 (contacts underneath)

5DS 009 602-011	12 V
5DS 009 602-001	24 V

ELECTRICS AND ACCESSORIES

What does the perfect switch for the cockpit of city buses and coaches actually look like? Our development engineers have thought long and hard about this question - and the result is something to be proud of. The rocker switches from HELLA impress everyone with their timeless design, a pleasant touch and feel and lasered symbols that are reliably backlit by up to four LEDs. They have self-cleaning contacts so that even small currents can be switched without contamination. In addition, the modules can be freely configured. This means that the number and type of switches can be individually adapted to your requirements.

RELAYS



You can trust our quality relays

- Production competence: HELLA produces more than 100 million pieces per year in-house. And all thanks to optimised production at an attractive price for customers and with one of the lowest failure rates in the whole branch.
- Flexibility: large volumes are produced fully automatically, smaller volumes semi-automatically.
- Original equipment customers: HELLA develops and produces relays for AGCO, Claas, Daimler AG, Ford, VW, GM, JCB, John Deere, Chrysler to name some examples. Many of our customer relationships have existed for decades.
- Production locations: Xiamen (China); Berlin (Germany).

Relay applications in buses

ABS, starters, audio systems, indicators, stop lamps, injection pump, fanfares, horns, interior lighting, air-conditioning system, signage control, rear fog lamps, cleaning systems, headlamps, seat heating, seat adjustment, warning lamps ...

	Mini relay, 24 V 4RD 007 903-... 4RD 933 332-...	**Mini relay, 24 V** 4RA 003 530-... 4RA 007 957-... 4RA 933 332-... 4RA 933 791-... 4RA 965 400-...	**High performance relay, 24 V** 4RA 003 437-... 4RA 933 321-...
General specifications			
Test voltage	27 V	27 V	27 V
Test temperature	+23°C ± 5°C	+23°C ± 5°C	+23°C ± 5°C
Permissible ambient temperature	-40°C ... +125°C	-40°C ... +85°C	-40°C ... +85°C
Storage temperature	-40°C ... +130°C	-40°C ... +125°C	-40°C ... +125°C
Flat connector (in accordance with ISO 8092)			
30 / 87	6.3 x 0.8 mm	6.3 x 0.8 mm	9.5 x 1.2 mm
85 / 86	6.3 x 0.8 mm	6.3 x 0.8 mm	6.3 x 0.8 mm
87a	6.3 x 0.8 mm	–	–
87	–	6.3 x 0.8 mm	–
Coil specifications			
Rated voltage	24 V	24 V	24 V
Operating voltage range at permissible ambient temperature	16 V ... 30 V	16 V ... 30 V	16 V ... 30 V
Pick-up voltage at test temperature	< 17 V	< 15.6 V	< 17 V
Dropout voltage at test temperature	> 3.5 V	> 3.5 V	> 5 V
Coil resistance at test temperature without parallel component	305 / 315 Ohm ± 10 %	350 / 360 Ohm ± 10 %	310 Ohm ± 10 %
Response time	< 10 ms	< 10 ms	< 10 ms
Dropout time	< 10 ms	< 10 ms	< 10 ms
Insulation resistance - coil circuit/load circuit	> 100 MOhm	> 100 MOhm	> 100 MOhm
Dielectric strength - coil circuit/load circuit	> 1,000 VDC	> 1,000 VDC	> 1,000 VDC
Contact specifications Contact voltage dropout at test voltage ...			
... normally open contact in new state	< 10 mV / A	< 10 mV / A	< 3 mV / A
... break contact in new state	< 10 mV / A	< 15 mV / A	–
... normally open contact after life endurance test	< 10 mV / A	< 15 mV / A	< 10 mV / A
... break contact after life endurance test	< 15 mV / A	< 20 mV / A	–
Minimum load current	1 A / 6 V	1 A / 6 V	1 A / 6 V
Mechanical lifetime	107	107	107

SWITCH SERIES
3100

The waterproof modular switch series for electrical systems meets the requirements of protection class IP 68. The lasered symbols are illuminated by integrated LEDs.

The strengths of the product range:

- → IP 68 in accordance with test standard IEC EN 60529
- → Highly reliable in extreme conditions
- → The most diverse switch functions in 12 / 24 V
  - Normally open contact/ changeover contact
  - Button/grid
  - Locking functions
  - Warning light switches
- → Wide range of standard and customised lasered symbols
- → Up to 2 LED light sources enable direct symbol illumination
- → Easy to mount, either directly in the mounting hole or using a modular mounting frame
- → Display lamp in the same design for safety-related feedback

Technical data	
Mounting hole	21,1 mm x 37,0 mm
Material rocker	PC transparent, lacquer finish
Housing material	PBT
Flat connector	6,3 x 0,8 mm
Coating of switch contacts	CuZn silver-plated
Light source	Max. 2 LEDs 1 x orientation lighting, green 1 x function lighting, red Warning lamps available in amber and green
Symbol type	Lasered
Mechanical lifetime	150,000 switching cycles
Protection class	IP 68, connector side: IP 66
Operating temperature	-40°C to +85°C
Dashboard thickness	For direct installation: 1.6 mm to 6.3 mm
On request	12 V
On request	24 V

Our switch configurator can be found at: www.hella.com/switch

Accessories	
	Installation frame
9AR 169 209-102/7	End piece left, right
9AR 169 208-102/7	Centre piece
9HB 172 229-101/7	**Cover plate**
	Female connector housing
8JD 010 076-102/7	Type I
8JD 010 076-112/7	Type II
8JD 010 076-122/7	Type III
	Flat receptacle 6.3 mm
8KW 744 882-003	0,5 mm^2 – 1 mm^2
8KW 744 825-003	1,5 mm^2 – 2,5 mm^2
8PE 197 631-001	**Dismantling tool**

SWITCH SERIES
4100

The modular switch series with self-cleaning contacts is suitable for modern electrical and electronic systems. This ensures safe and reliable switching even of small currents without contamination of the contacts occurring. The series stands out from the crowd with its timeless design and with lasered symbols illuminated by integrated LEDs.

The strengths of the product range:

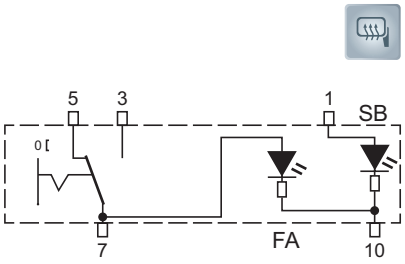
- → Modular design of the switch
- → Realisation of a wide variety of 12 V and 24 V switch functions:
  - Normally open contact/ changeover contact
  - Button/grid
  - Locking function
  - Warning light switches
- → Wide range of standard and customer-specific symbols
- → Selective, reliable and durable illumination of the symbols thanks to the using of up to 4 LED light sources
- → Easy to mount, either directly in the mounting hole or using a modular mounting frame
- → Display lamps in the same design for safety-related feedback
- → Modern and timeless design
- → Pleasant to the touch

Technical data	
Mounting hole	19,8 mm x 41,8 mm
Material rocker	PC transparent, lacquer finish
Base plate material	PA white, housing PA black
Flat connector	2,8 x 0,8 mm
Coating of switch contacts	AgNi
Light source	Max. 4 LEDs 2 x orientation lighting, green 2 x function lighting, red Warning lamps also available in blue and amber
Symbol type	Lasered
Mechanical lifetime	450,000 hours
Protection class	IP 52
Operating temperature	-40°C to +85°C
Dashboard thickness	For directly installed switches, 2 mm
On request	12 V
On request	24 V

Our switch configurator can be found at: www.hella.com/switch

Accessories	
	Installation frame
9AR 168 396-002/7	Simple
9AR 169 209-002/7	End piece, left
9AR 169 210-002/7	End piece, right
9AR 169 208-002/7	Centre piece
9HB 172 229-002/7	**Cover plate**
8JD 010 076-002/7	**Female connector housing, 10-pin**
	Flat receptacle 2.8 mm
8KW 863 934-003	Junior Power Timer 0,5 mm^2 – 1 mm^2
8KW 863 934-023/4	Junior Power Timer 1,5 mm^2 – 2,5 mm^2

ROCKER SWITCHES FROM SERIES 4100
FOR CITY BUSES AND COACHES

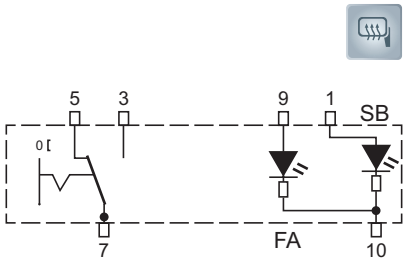


Heatable outside mirror

Latching changeover contact, 1-pin, 2-level

Function	01
Function control	1 x internal
Rated voltage	24 V
Symbol	1: 176
Packaging unit	1 piece

6FH 354 107-711

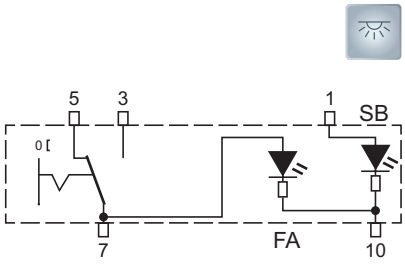


Heatable outside mirror

Latching changeover contact, 1-pin, 2-level

Function	08
Function control	1 x external
Rated voltage	24 V
Symbol	1: 176
Packaging unit	12 pieces

6FH 354 109-471

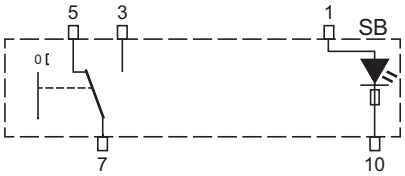


Interior lighting

Latching changeover contact, 1-pin, 2-level

Function	01
Function control	1 x internal
Rated voltage	24 V
Symbol	1 : 020
Packaging unit	1 piece

6FH 354 106-321

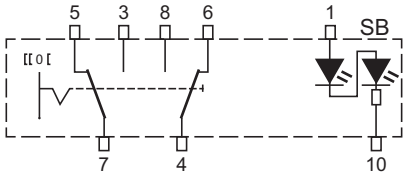


Stop request

Non-latching changeover contact, 1-pin, 2 level

Function	07
Function control	Without
Rated voltage	24 V
Symbol	1: 370
Packaging unit	12 pieces

6FH 354 130-581

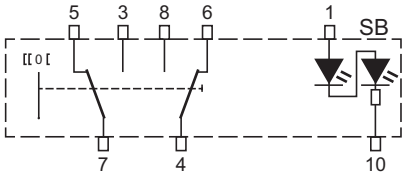


Air Condition

Latching changeover contact, 2 x 1-pin, 2-level

Function	14
Function control	Without
Rated voltage	24 V
Symbol	1: 235, 2 : 100
Packaging unit	1 piece

6FH 354 130-591

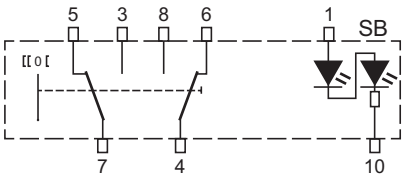


Window blind

Non-latching changeover contact, 2 x 1-pin, 2-level

Function	15
Function control	Without
Rated voltage	24 V
Symbol	1 : 308, 2 : 307
Packaging unit	12 pieces

6FH 354 106-701

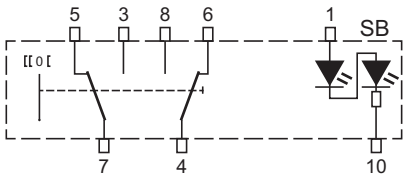


Close/open door

Non-latching changeover contact, 2 x 1-pin, 2-level

Function	15
Function control	Without
Rated voltage	24 V
Symbol	1: 522, 2: 523
Packaging unit	12 pieces

6FH 354 130-601

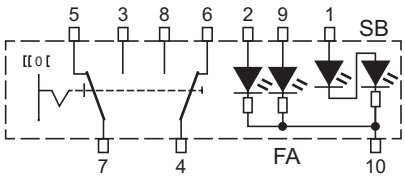


Lower/raise bus

Non-latching changeover contact, 2 x 1-pin, 2-level

Function	15
Function control	Without
Rated voltage	24 V
Symbol	1: 131, 2: 132
Packaging unit	12 pieces

6FH 354 130-611



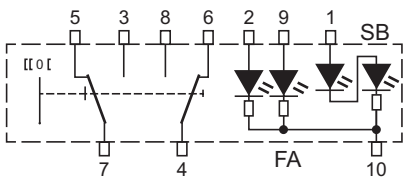
Blower

Latching changeover contact, 2 x 1-pin, 2-level

Function	21
Function control	2 x external
Rated voltage	24 V
Symbol	1 : 156, 2 : 155
Packaging unit	12 pieces

6FH 354 130-621

ROCKER SWITCHES FROM SERIES 4100
FOR CITY BUSES AND COACHES

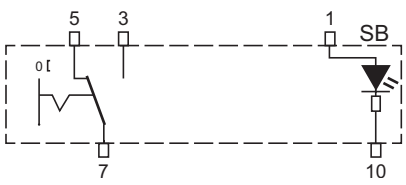


Defrosting windshield

Non-latching changeover contact, 2 x 1-pin, 2-level

Function	22
Function control	2 x external
Rated voltage	24 V
Symbol	1: 177, 2:177
Packaging unit	12 pieces

6FH 354 110-722

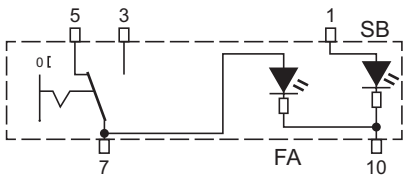


Reading light

Latching changeover contact, 1-pin, 1-level

Function	01
Function control	1 x internal
Rated voltage	24 V
Symbol	1: 027
Packaging unit	1 piece

6FH 354 111-941

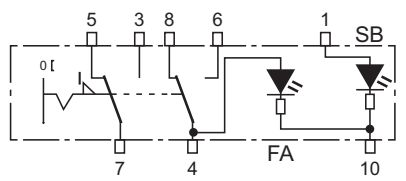


Refrigerator

Latching changeover contact, 1-pin, 1-level

Function	00
Function control	Without
Rated voltage	24 V
Symbol	1: 366
Packaging unit	1 piece

6FH 354 130-631

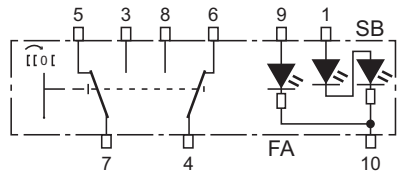


Lower bus

Latching changeover contact, 2-pin, 1-level

Function	05
Function control	1 x external
Rated voltage	24 V
Symbol	1: 278
Packaging unit	12 pieces

6FH 354 130-641

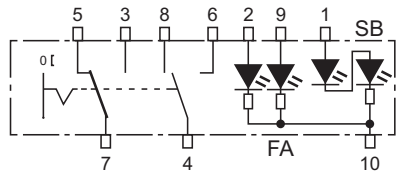


Bluetooth

Latching, non-latching changeover contact, 2 x 1-pin, 2-level

Function	20
Function control	1 x external
Rated voltage	24 V
Symbol	1: 646, 2: 645
Packaging unit	12 pieces

6FH 354 130-651



Night light

Latching changeover contact, 2-pin, 1-level

Function	13
Function control	2 x external
Rated voltage	24 V
Symbol	1: 020, 2: 036
Packaging unit	12 pieces

6FH 354 130-661

www.hella.com/switch

HELLA ROCKER SWITCH CONFIGURATOR

Configure your very own switches yourself! First of all, choose between the waterproof 3100 series or the 4100 series.

You can select any switch function, the operating voltage, combinations of symbols and also the matching accessories with only a few clicks. Your choices can easily be transferred to a favourites list, printed out or sent as an online request.

Your request will be processed individually with the desired symbol configuration and customer-specific article number on a project-specific basis.

UNIVERSAL ACCESSORIES
CONNECTORS, ADAPTERS AND SOCKETS

Universal connector

2-pin with screwed-on strain relief and 8 A fuse, suitable for cigarette lighters and standard sockets (ISO 4165), screw connection up to 2.5 mm

8JA 007 589-001 6 – 24 V

Connector

2-pin in accordance with ISO 4165, cross section of cable entry 9.2 mm

8JA 002 262-001 6 – 24 V

Connector

7-pin in accordance with ISO 1724, plastic version, screw connections

8JA 001 930-003 12 V

Connector

13-pin in accordance with ISO 11 446, plastic version, screw connections, with rubber grommet

8JA 005 951-001 12 V

Mini short adapter

From 7-pin socket (ISO 1724) on the towing vehicle to 13-pin connector (ISO 11 446) on the trailer

8JA 008 981-001 12 V

Cable adapter

From 13-pin socket (ISO 11 446) on the towing vehicle to 7-pin connector (ISO 11 446) on the trailer, with 250 mm cable

8JA 005 952-001 12 V

Super short adapter

From 13-pin socket (ISO 11 446) on the towing vehicle to 7-pin connector (ISO 11 446) on the trailer

8JA 008 969-001 12 V

Connector socket

7-pin in accordance with ISO 1724, plastic version, screw connections

8JB 001 943-003 12 V

Connector socket

13-pin in accordance with ISO 11 446, plastic version, screw connections, with rubber grommet and rubber seal in the cap

8JB 005 949-001 12 V

Connector socket

13-pin in accordance with ISO 11 446, plastic version, screw connections, with rear fog light deactivation.

8JB 005 949-011 12 V

Connector socket

2-pin in accordance with ISO 4165, without cover, 6.3 mm blade terminal connections, load-carrying capacity: max. 16 A, installation opening cross section 18.5 mm

8JB 001 946-072 6 – 24 V

Connector socket

2-pin in accordance with ISO 4165, 6.3 mm blade terminal connections, with spring-loaded cover, load-carrying capacity: max. 16 A, installation opening cross section 18.5 mm.

8JB 001 946-082 6 – 24 V

Connector socket

2-pin in accordance with ISO 4165, 6.3 mm blade terminal connections, with snap-on cover, load-carrying capacity: max. 16 A, installation opening cross section 18.5 mm.

8JB 001 946-092 6 – 24 V

Surface-mounted socket

2-pin in accordance with ISO 4165, screw connections, load-carrying capacity: max. 16 A.

8JB 004 123-001 6 – 24 V

Power socket

2-pin with cover and clamping sleeve, suitable for cigarette lighter socket, 6.3 mm blade terminal connections, load-carrying capacity: max. 16 A

8JB 008 023-001 6 – 24 V

BREAKDOWN ACCESSORIES

Hazard warning lamp Model 3003/3003 ACCU

Type-tested; with fastening bracket (for battery operation via 5 mono cells, not included in delivery)
ACCU version: type approved, autom. battery charging while engine is running; autom. changeover 12 / 24 V, operating time in flashing mode 40 h or 7 h with work light; charging cradle and lead-gel battery included in delivery

2XW 007 146-001 Model 3003

2XW 007 146-011 Model 3003 ACCU

ACOUSTIC WARNING SYSTEM FOR VEHICLES
AVAS

AVAS standard sound
Just have a listen!

The AVAS is an acoustic warning system for hybrid and electric vehicles designed to increase the safety of road users. Once a pre-defined speed has been reached, the noise fades in / fades out. An acoustic signal is also automatically given off when reversing. The driver can easily activate or deactivate the warning system by means of a switch. The AVAS consists of a dustproof and waterproof housing.

Product features:

- Designed for vehicles with noiseless engines in order to increase the safety of road users
- For vehicles solely with electric drive (PEV), hybrid electric vehicles (HEV) and fuel cell vehicles (FCV)
- Simulates simple engine sound
- Space-saving and compact sensor
- Low power consumption

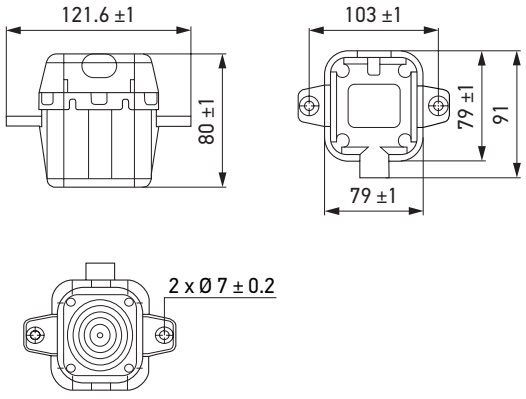
Technical data

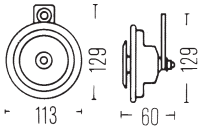
Operating voltage	9 – 16 V
Current consumption	100 mA (Normal condition)
Maximum current consumption	150 mA
No-load current in idle mode	100 uA
Weight	350 g
Operating temperature	-40°C to +85°C
CAN	Diagnostics (based on UDS standard)
Loudspeaker	2 inch (impedance 4 Ω)
Mute function	Support for On/Off status via CAN
Frequency range	160 Hz – 5 kHz
Sound pressure level	65 ±5 dB at 1 m Generation 0 km/h - 30 km/h (tbd) Minimum frequency change speed: 0.8% (km/h)
Operating vehicle speed	0 to 20 km/h
Protection class	IP 6K9K
Full digital amplifier	32 bits sampled at max 96 kHz
Housing volume	0.4 L
Housing material	PBT-GF15
Thermal overload protection	Yes
Connector	TYCO 114-18063-126
Mating connector	TYCO 1-967616-1

3SL 015 329-007*	Standard sound

* Customer-specific sounds are available on request.

Technical drawing

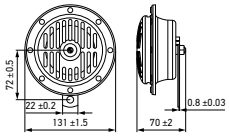




Signal horn B36

Zinc-coated metal housing, diaphragms black, bracket on the horn for fastening screw M8; with blade terminal connections 6.3 mm, protected; with Teflon pellet as humidity protection

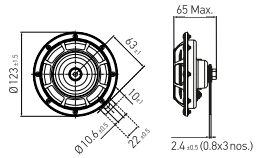
Sound pressure level at 2 m distance	116 dB(A)
Power consumption	72 W per horn
3BA 002 768-441	24 V, 335 Hz
3BA 002 768-201	24 V, 400 Hz



Supertone horn DL 50 V2

Metal housing, black lacquer finish with guard, bracket on the horn for fastening screw M8

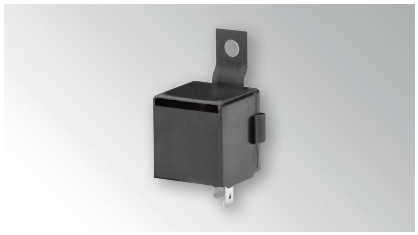
Sound pressure level at 2 m distance	114 dB(A)
Power consumption	84 W per horn
3CA 004 811-021	24 V, 310 Hz
3CA 004 811-031	24 V, 380 Hz



Electronic supertone horn B 133

Metal housing and guard in black lacquer finish, holder on horn for fastening screw M10; with DEUTSCH connector, protected; Teflon pellet for protection against humidity; with interference suppression capacitor

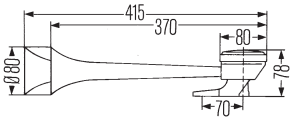
Sound pressure level at 2 m distance	115 dB(A)
Power consumption	78 W
3AF 005 631-227	24 V, 300 Hz
3AF 005 631-237	24 V, 450 Hz



Buzzer with bracket

2 blade terminal connections - 6.3 mm

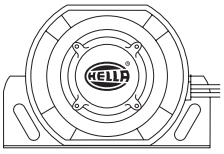
Sound pressure level at 1 m distance	70 dB(A)
Frequency	500 Hz
Operating temperature	-40°C to +85°C
3SB 003 985-061	24 V



Compressed air fanfare

For vehicles with pneumatic brake systems; with 2 trumpets; hood and trumpet chromium-plated, base matt black

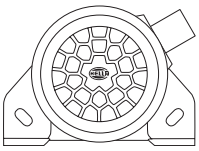
Compressed air range	4 – 8,5 bar
Frequency	300 Hz (trumpet 295 mm long) 320 Hz (trumpet 340 mm long)
3PB 005 411-001	24 V



Reversing and warning alarm

Deutsch DT04-2P, 12 – 24 V, automatic adjustment to environmental sound levels

Sound pressure level at 1.2 m distance	87 – 112 dB(A)
Frequency	1.200 Hz
Housing dimensions (L x W x H)	146 x 78 x 101 mm
3SL 996 139-202	12 – 24 V



Reversing and warning alarm

Deutsch DT04-2P, 12 – 24 V

Sound pressure level at 1.2 m distance	97 dB(A)
Frequency	1.200 Hz
Housing dimensions (L x W x H)	101 x 46 x 74 mm
3SL 009 148-011	12 – 24 V

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