MUNICIPAL AND OTHER SPECIAL VEHICLES

www.hella.com/municipal

Powerful product range

Municipal emergency vehicles are operating day and night to provide the safety required on the roads. Continuous operations of up to 13 hours and difficult environmental conditions are no rarity and place high demands on people and materials. Demands that you can tackle with HELLA products for municipal vehicles: after all, our powerful products for municipal vehicles not only provide optimal illumination and excellent warning effects, they also create a great impression with their resistance and durability!

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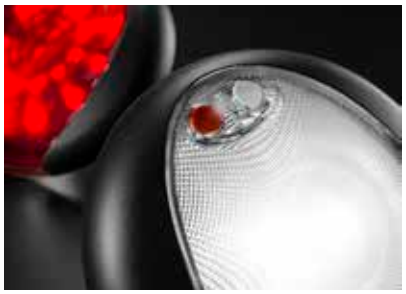

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Quality is a tradition at HELLA

HELLA has set itself the ambitious standard of guaranteeing consistently high product quality in every respect.
This is achieved by defining quality criteria and checking every detail of the entire manufacturing process against these. Production quality is ensured by parallel quality monitoring and testing.

Quality products from HELLA are subjected to different test procedures according to the HELLA standard 67101, conducted by the HELLA test laboratory in Lippstadt.

First-class quality by conviction
HELLA offers a long-term guarantee of the perfect operation of its products and is dedicated to making its customer satisfied in the spare parts, accessories and light sources industries.

The long-standing company from Lippstadt is an efficient partner of the automotive industry, meaning that HELLA products are manufactured to perfectly meet the relevant tolerance specifications. This, combined with its use of sophisticated test procedures during the product development phase, means that you can depend on HELLA products in any situation.

HELLA products are subject to the following test procedures:

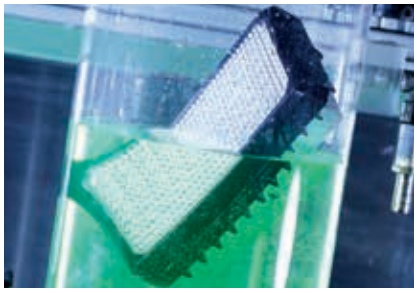
Splashing water test
HELLA products are tested under realistic environmental conditions in universal splash water cabins. The cabins are equipped with devices for rain, splash water, water jets and water mist. In water cycle and spray water tests, the test products are exposed to a pressure of up to 5 bar and in the water jet test to a pressure of up to 10 bar to check their leak tightness. (IP XK4K)

High-pressure cleaner test
In one test system, the products are exposed to a water pressure of up to 120 bar and a water temperature of +85 °C.

This test simulates carwash cleaning or cleaning with a high-pressure cleaner (IP XK9K).

Dust-tightness test
In this test, the products' dust tightness is tested. Unfired Portland cement is used as a test medium for all products. The test can be performed in sample function operation, and with overpressure or underpressure exposure in the tested device.

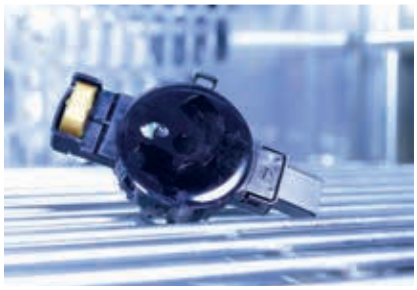
The tests are evaluated by determining the photometric value before and after the test (IP 5K), for example. This is the only way that HELLA can ensure that dust will not penetrate the product and can guarantee the long lifetime of the product.



Immersion and pressure tightness test
Depending on requirements, this test is carried out for all lighting technology products.

An immersion pipe can be submerged to a depth of 1 m in water. Another test system can reach a depth of 6 m. Furthermore, an overpressure test up to 1.6 bar is conducted in an immersion pool.

All tests are carried out in accordance with HELLA Norm 67101 and applicable legal requirements (IP 67).



Heat, moisture and cold tests
In temperature cycle tests, HELLA products are exposed to temperature fluctuations from -40 °C to +100 °C in climatic chambers which have a volume of between 600 to 1,000 litres. In addition, condensation and de-icing tests are carried out up to max. 95 % air humidity and up to 80 °C. In the “shock chamber”, the temperatures change within seconds (intervals of max. 6 seconds) between 40 °C and +100 °C.

These tests put intense stress on any material, from lighting to individual electronics components. The heat and cold tests last up to 48 hours.

Vibration test
This test simulates the behaviour of the products over a "poor stretch of road" and shows, for example, responses to potholes, gravel tracks, gravel, stones, fields and farm tracks. Special rally profiles are tests for specific products, such as auxiliary headlamps.

The wide band random vibration test is used to test the mechanical endurance strength in the vertical and horizontal axes. Here, the frequency range extends from 10 to 1000 Hertz. Alongside the vibration test, the products are subjected to a temperature overload of -40 °C to +80 °C , which checks the ageing process of the plastic, for example. All products are tested for proper operation for up to 24 hours.

During this process, a mechanical shock test is also performed. This simulates what would happen if there were impact (products in packaging during shipping) with an acceleration of between 300 and 500 m per second.

Thermal management

The lifetime of an LED heavily depends on its temperature and the applied current. If the LEDs overheat (usually because the input currents are too high), their lifetime will be drastically reduced, meaning that effective thermal management is extremely important.

HELLA uses state-of-the-art simulation programs to precisely calculate the heat flow. The task of the developer is to protect the LED from overheating and to safely and efficiently dissipate the heat into the surroundings.

Why thermal management?

- → The basis of effective and consistent lighting
- → Keeps the LEDs within the optimum temperature range
- → Increases the lifetime of the product
- → Reduces risk of failure

The most important components

- → Cooling fins incorporated into headlamp casing
- → High-quality LEDs (automotive standard)
- → Thermal sensors for temperature monitoring
- → Heat-dissipating substances (film, paste, etc.)

⊖ Insufficient thermal management

The heat on the printed circuit board is not sufficiently dissipated by the heat sink, i.e. the heat transfer is poor, meaning there is a risk of the LEDs overheating. If they are damaged, they could cause a failure.

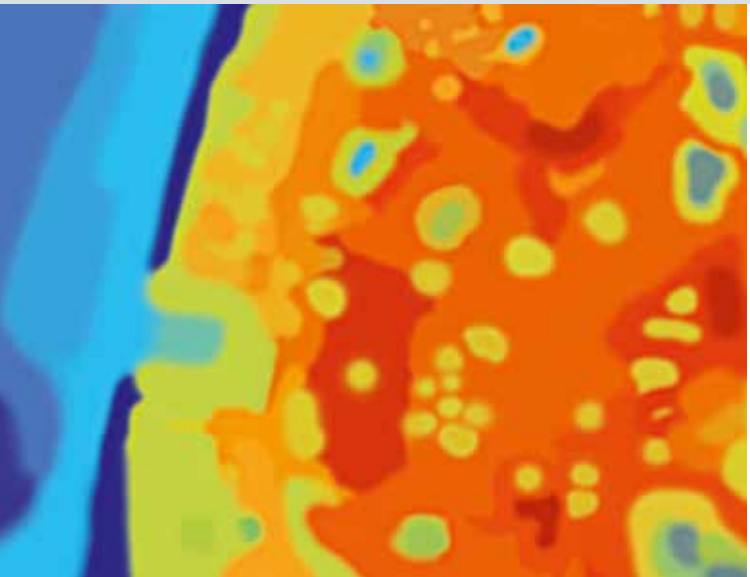
⊖ Disadvantages:

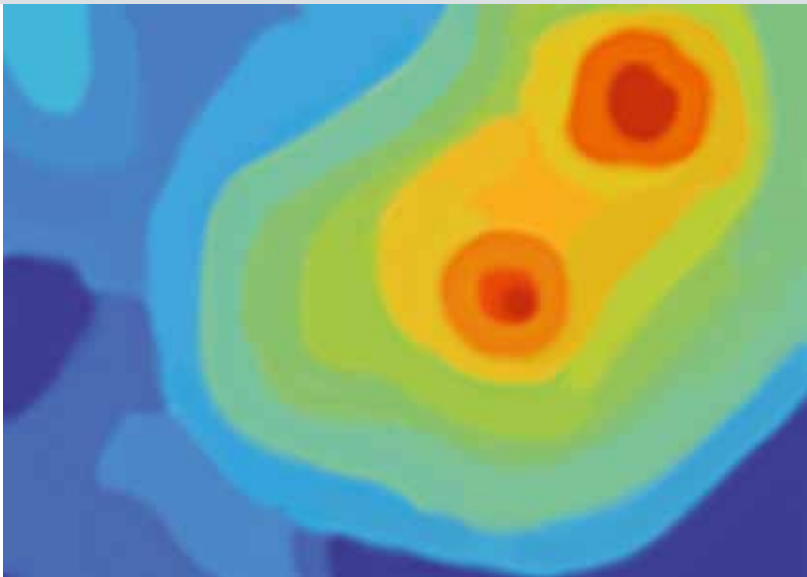
- → Low light output
- → Accelerated wear
- → Reduced lifetime
- → Overheating = downtimes and repair time

Hot spots cause the components to expand at different rates, which normally leads to failure.

⊖ Disadvantages:

- → Mechanical stresses on the circuit board
- → The adhesive bond on components dissolves
- → Breaks in soldering points
- → Cracks in the circuit board
- → Result: Short circuit





Thermal sensors for greater safety

HELLA LED products are equipped with thermal management that can actively intervene in the system thanks to thermal sensors, which monitor the temperature of the LED and respond immediately. If the system identifies excessively high temperatures, it automatically reduces the input current. During this process, the light output of the headlamp is dimmed until the temperature of the LEDs is back within the optimum temperature range. This guarantees that the LEDs will always operate under perfect conditions. This is the only way to achieve a lifetime of up to 60,000 hours.

LEDs

Many LED products have impressively powerful light outputs. Many manufacturers push LEDs to their limits and beyond to maximise the light output. If the operating temperature of LEDs is too high, this has a direct effect on the lifetime and luminous efficiency of the product. The full potential of the LEDs can only be exploited if the heat generated is dissipated to the outside to prevent the LEDs from overheating.

If you want to get the best out of LED technology, thermal management is essential!

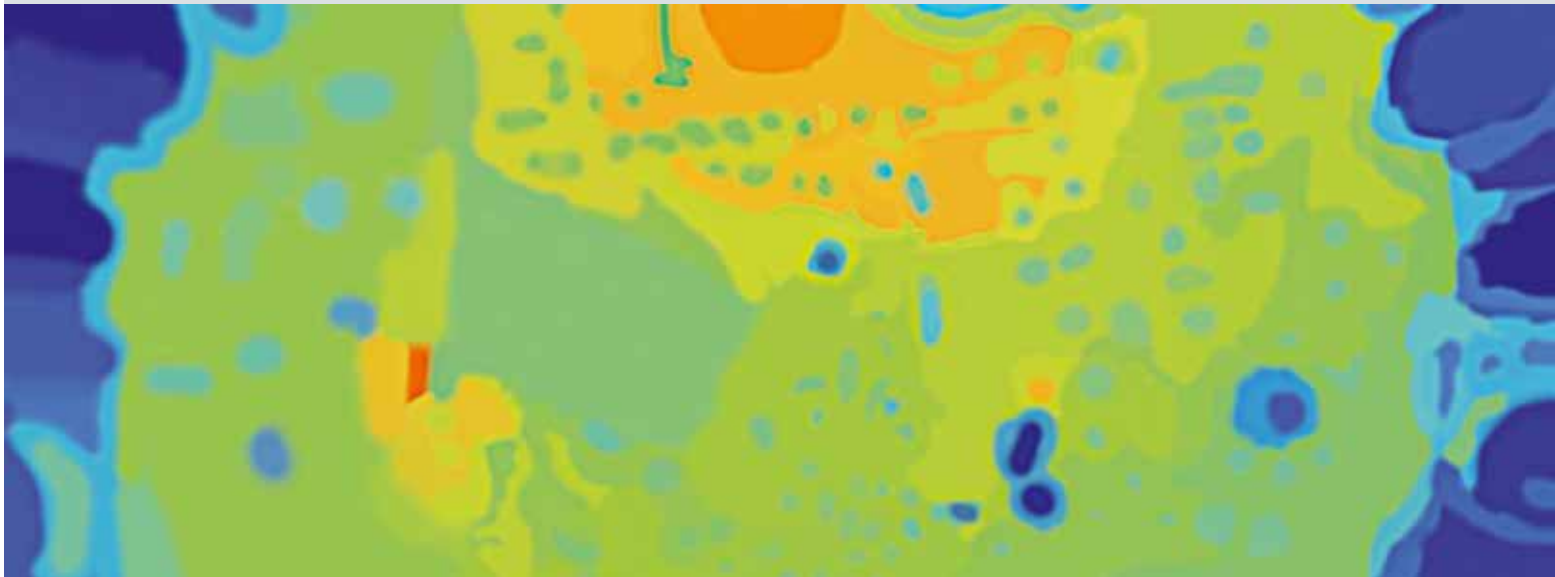
⊕ Example of HELLA's optimal thermal management using a beacon

Thermal imaging clearly shows how HELLA thermal management works: the LEDs' high temperatures are distributed consistently over a large surface area and are then transferred into the surroundings. In headlamps, for example, the heat dissipation, and therefore the thermal conductivity of the housing, can be improved by using cooling fins.

HELLA´s selection of heat-conducting materials and arrangement of components ensure effective heat flow: thermal management directs heat away from the LED. This means we can guarantee the long lifetime of our products!

⊕ Advantages:

- → Effective heat flow
- → Optimum temperature distribution
- → Long lifetime
- → Reliability



Electromagnetic compatibility (EMC)

What is EMC (ECE R10)?

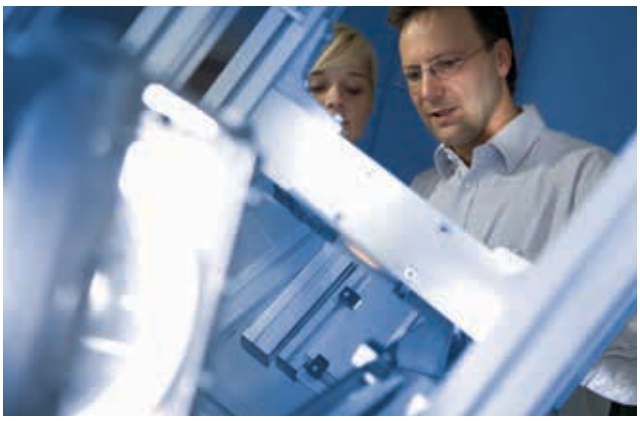
Electromagnetic compatibility (EMC) describes two factors that are major quality features for optical signaling systems:

- → **Radiated interference:** the limitation of radiated electromagnetic interference to a level that guarantees the operation of other devices in the environment without interference
- → **Immunity to interference:** guaranteeing sufficiently high resistance to electro-magnetic interference acting from the outside

The legal foundations for this are the CISPR 25 as well as the ISO 7637 and 11452.

1 ECE-R65
2 ECE-R10

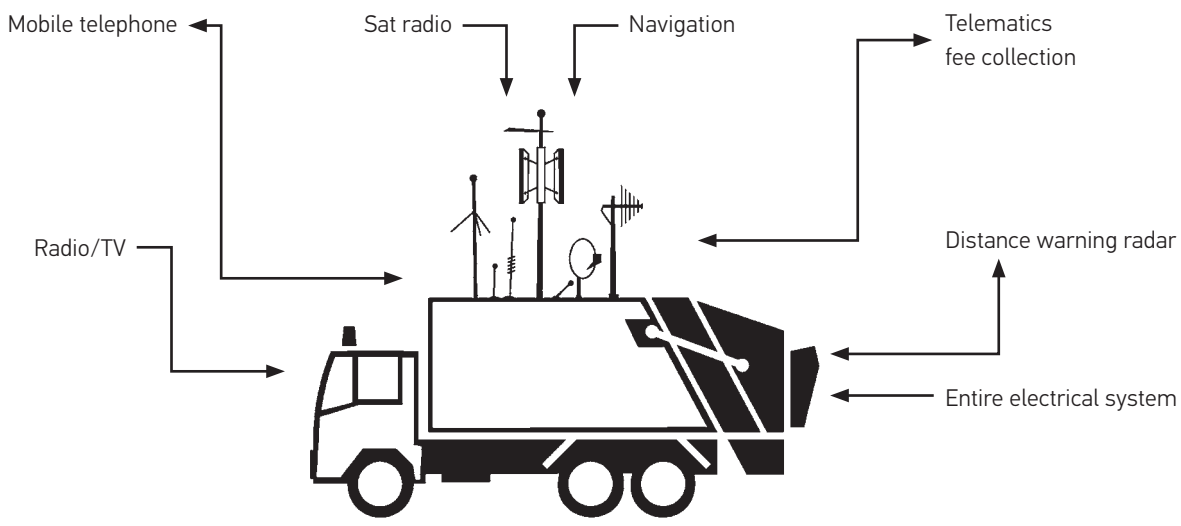
Only beacons, which can have both of these test numbers, are authorised for use on public roads.



CISPR 25 protection class standard:

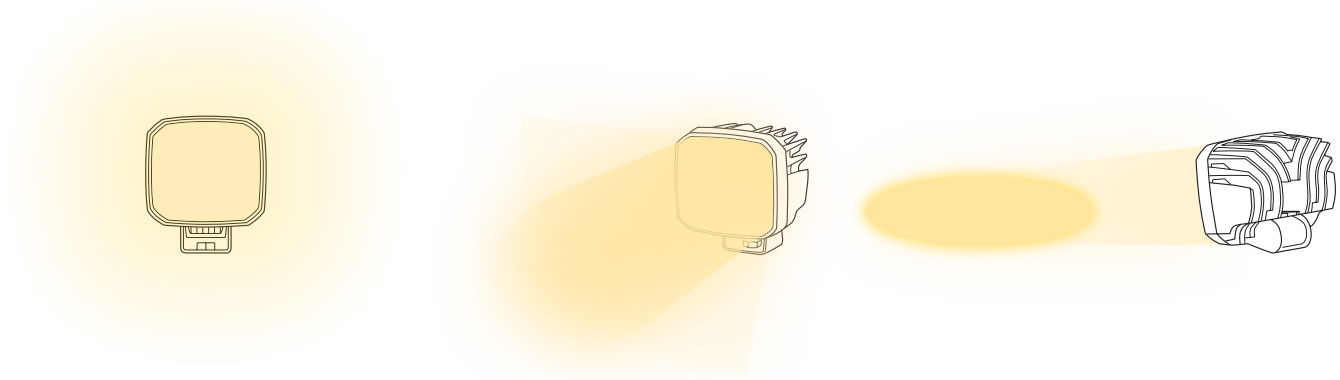
CISPR 25 is the standard for emitted interference: it applies a classification of 1 to 5. In doing so, category 5 products satisfy the most demanding requirements and are even suitable for surface mounting situations directly next to an aerial. The statutory standards are met by category 3, which guarantees adequate protection in standard practice. HELLA lighting systems satisfy at least category 3, many even category 5, and guarantee absolute functional safety in all application situations.

Electromagnetic interactions



Lumens, candela, lux – what's the difference?

These three terms are often confused. However, they are different lighting technology variables. We would like to "shed some light" on a few things:



Lumen (lm)

A lumen is the unit of luminous flux and describes the overall light that is emitted by a light source, such as an LED headlamp. However, the lumen value does not provide information on how the light is distributed in the room.

Candela (cd)

Candela is the unit that describes the strength of the light emission that is sent from a light source in a specific direction. Candela, like a lumen, is also a transmission value. Traditionally, one candela corresponds to the luminous intensity of a household candle. A candela is also used as the unit of luminance, i.e. of the subjective brightness perceived by the human eye from an illuminated surface. This also describes what is called "glare".

Lux (lx)

Lux is a unit of illuminance that specifies how much light from the light source strikes a certain surface. Unlike lumens and candelas, lux is a "receiver value", meaning that it measures the amount of light arriving at a specific area. This is crucial for achieving optimum work conditions.

For work lamps, the lumen value is often specified. For example, our Ultra Beam LED Gen. II work lamp achieves 4,000 lumens. Here, the difference between measured and calculated lumens is extremely important. Only measured lumens reflect the correct, precise value. Calculated lumens merely provide a theoretical value. Calculated lumens are not conclusive and are always higher than the measured lumens because they do not account for heat and light energy losses through the reflector and cover lens.

That's why HELLA only specifies real measured lumen values! When comparing or purchasing headlamps, always check if the lumen specifications are a measured or calculated value!

Another value is relevant for auxiliary (high beam) headlamps: the reference number (ref.). This value tells you the maximum luminous intensity the headlamp can produce. The reference number enables you to see at a glance how powerful a headlamp is. The reference number is obtained by converting the maximum luminous intensity in candela. It is a dimensionless number – so it has no associated unit of measurement. Please note the national regulations related to the reference value that apply in your country and check whether you are subject to the ECE Regulation in force since 2009. In some countries, the total reference value (the sum of the reference values of all high beam headlamps on the vehicle) must not exceed 100.

Product recommendation

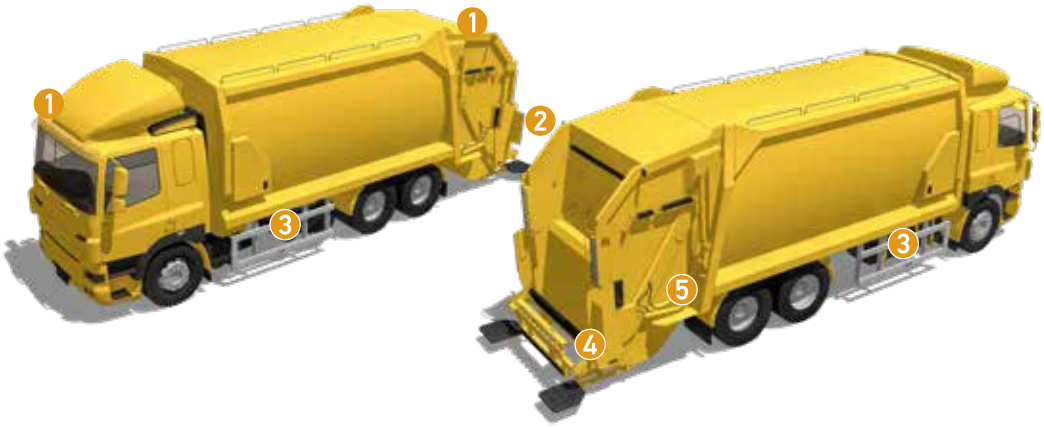
1 **K-LED 2.0**
Page 24

2 **Ultra Beam LED Gen. I**
Page 63

3 **Q90 Compact LED**
Page 61

4 **Coluna full LED rear combination lamp**
Page 109

5 **Shapeline tail-stop lamp, wing**
Page 97



Waste collection vehicles

Waste collection vehicles have evolved into highly specialised technological showcases over the past few years. Equipped with state-of-the-art safety systems, they ensure that waste generated is disposed of every day as quickly as possible, in an environmentally friendly and quiet manner, and with the utmost efficiency.

By developing innovative and high-quality technology in lighting, electronics and electrics, HELLA has made a small but significant contribution to this. Highly modern LED work lamps ensure an optimum view when manoeuvring and turn darkness into daylight for the disposal team. HELLA LED rotating beacons achieve the best possible safety for workers and warn road users from a distance that this vehicle wants a clean environment.

Street cleaning vehicles

They have a very versatile range of applications. They are used for cleaning pavements, pedestrianised zones, roads, runways or even industrial warehouses. They often appear from nowhere on the road, clean at lightening speed and disappear again just as quickly. They ensure inner cities are kept clean and sweep all sorts of road surfaces from little narrow alleyways to large public spaces or airports.

HELLA lighting technology helps ensure that no piece of waste is missed and the drivers always have optimum visibility, regardless of where they are sweeping. HELLA sensors allow precise measurement of vehicle properties so that problems can be detected early on and HELLA switches facilitate the quick and easy operation of all functions.

Product recommendation

1 **Rota LED**
Page 28

2 **Module 70 LED Gen. 4**
Page 64

3 **Intelligent battery sensor**
Page 138

4 **Shapeline tail-stop lamp, wing**
Page 97

5 **90 mm LED module**
Page 79

Product recommendation

1 **K-LED Rebelution**
Page 26

2 **BST warning lamp**
Page 51

3 **Q90 compact LED, red**
Page 61

4 **C140 LED headlamp**
Page 87

5 **Coluna full LED rear combination lamp**
Page 109

Winter maintenance vehicles

The drivers don't usually get to enjoy idyllic winter landscapes. When they are on the move, they need to take great care: usually the temperature is below freezing, visibility is poor, and there is a high risk of black ice and heavy snowfall. They often start work in the early hours before dawn and usually work until late in the evening or night. There is no question that snow ploughs play an important role in keeping roads, footpaths and airports, as well as many other public and private spaces, safe.

Such situations not only put a great strain on people, but also on the materials used. HELLA has been a partner of leading winter maintenance vehicle manufacturers for years and tries to support the work in this sector as much as possible with high-quality and innovative products. This is because reliability, safety, and durability are more important for winter maintenance vehicles than in virtually any other sector. HELLA products are checked down to the last detail throughout the entire manufacturing process, and are subject to the most demanding requirements, meaning that drivers can confidently rely on the HELLA lighting system.

Maintenance vehicles

They carry out safety checks and survey roads, crash barriers or paths. Wherever they stop, something needs to be done urgently. Despite usually being painted in a conspicuous colour, drivers approaching too quickly often don't notice them. In this scenario, the only way to provide more safety is to use the best warning systems. HELLA has been a reliable partner for roof bars, rotating beacons and other warning systems for many years now. HELLA work lamps ensure optimum visibility, even in the darkest hours.

Product recommendation

1 **OWS[7]**
from page 42

2 **K-LED 1.2**
Page 25

3 **BST warning lamp**
Page 51

4 **Q90 Compact LED**
Page 61

5 **Ultra Beam LED Gen. II**
Page 62

Product recommendation

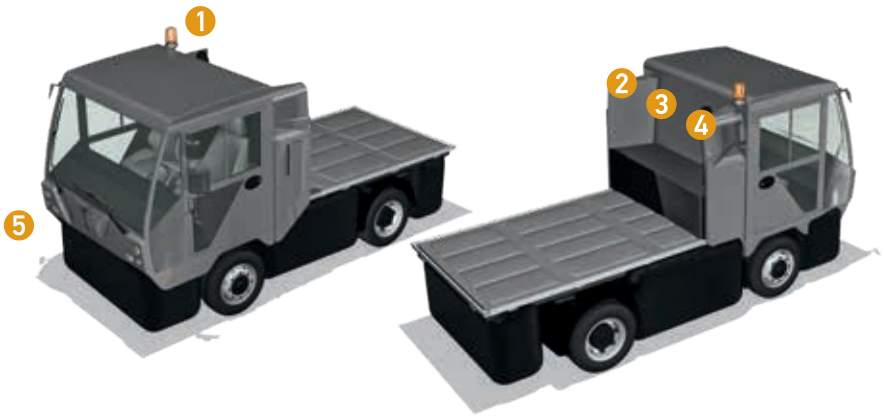
1 **K-LED 2.0 Airport**
Page 24

2 **Shapeline tail-stop lamp**
Page 97

3 **Q90 Compact LED**
Page 61

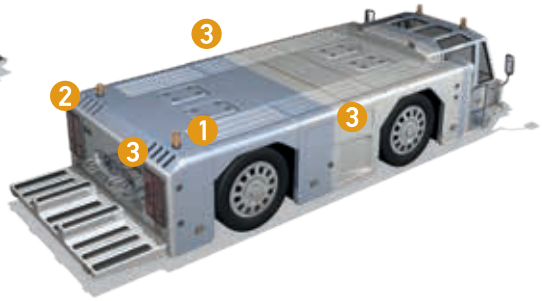
4 **Module 70 LED Gen. 3.2**
Page 64

5 **90 mm LED module**
Page 79



Baggage tug

Compact, robust, and special. This is how you can describe the large number of luggage trucks used at airports around the world. They ensure that luggage gets on the right aircraft or to the right passenger every day while always keeping to a tight schedule. Safety at airports is given top priority. HELLA warning systems ensure the highest level of warning effectiveness so that vehicles can be seen at all times. Front headlamps and work lamps ensure an optimum view when driving and working around the vehicle.



Aircraft tugs

They are powerhouses, moving unimaginable masses with great precision, and yet they often go unnoticed. They are operational for thousands of hours per year, which is only possible with top quality products. HELLA lighting technology makes an important contribution towards safety on airport vehicles. It stands for top quality, a high signal effect and minimum energy consumption. HELLA lighting systems mean working at the highest safety level with a reliable partner.

Product recommendation

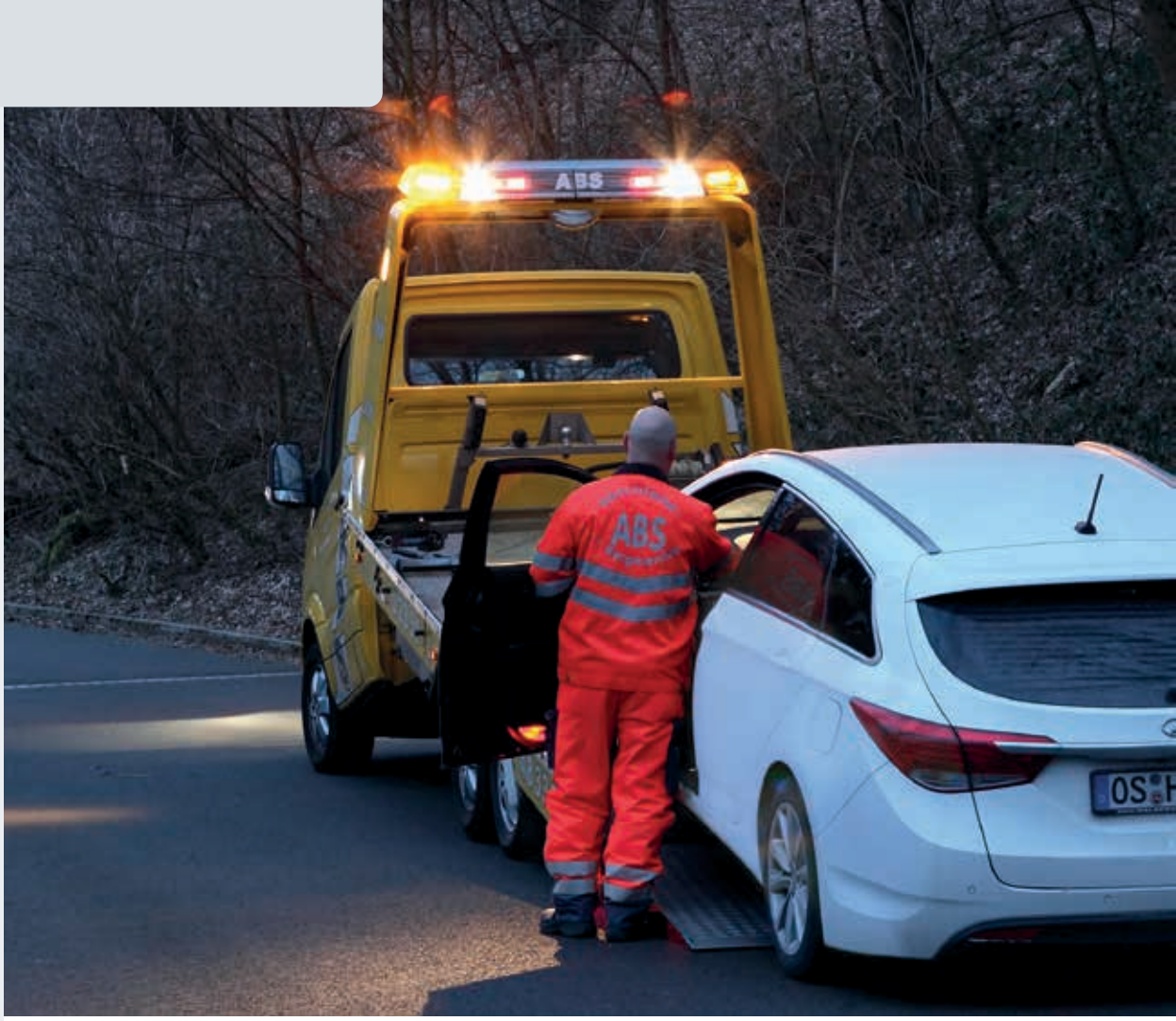
1 **K-LED 2.0 Airport**
Page 24

2 **Shapeline tail-stop lamp, wing**
Page 97

3 **Ultra Beam LED Gen. II**
Page 62

4 **C140 LED headlamp**
Page 87

5 **Intelligent battery sensor**
Page 138



Product recommendation

1 **K-LED Rebelution**
Page 26

2 **BST warning lamp**
Page 51

3 **Module 70 LED Gen. 4**
Page 64

4 **Ultra Beam LED Gen. I**
Page 62

Towing vehicles

They mostly work on roads in fast-moving traffic and where other road users might not notice them. They rescue vehicles on motorways, blind corners, or country roads with fast-moving traffic. It's a job that can only be done safely by people with nerves of steel, a lot of expertise, and optimum equipment. HELLA products help to achieve maximum safety for people and materials because it is important to be able to fully rely on the lighting equipment used.

Sewer cleaning vehicles

Equipped with the latest technology, sewer cleaning vehicles are used to clean and inspect sewers. They are particularly deployed when sewers become blocked due to deposits or contamination. Various cleaning devices are used to eliminate smaller materials in liquid, paste-like or solid form.

HELLA provides the best support possible for this job with its high-quality, innovative products: work lamps help give workers a better view, not only around the vehicle, but also within the sewers. State-of-the-art warning systems on the vehicle increase safety and warn other road users from a distance about the cleaning work being carried out.

Product recommendation

1 **K-LED 1.2**
Page 25

2 **Module 50 LED**
Page 65

3 **Coluna full LED rear combination lamp**
Page 109

4 **BST warning lamp**
Page 51

5 **Ultra Beam LED Gen. I**
Page 62

HELLA beacons with powerful warning effect signal to the other road users: please take care – work is going on around this vehicle.

They enable maximum safety for the user and for third parties thanks to their intensive warning effect. This level of safety is achieved by optimum light bundling and distribution, as well as the very high light intensity and high range that results.

You can fully rely on our beacons: HELLA beacons are characterised by outstanding quality when it comes to workmanship and stability – and their long lifetime proves all this!

Beacons – overview

Product line	F (Fixed attachment)	FL (Flexible pipe-socket mounting)	R (Pipe socket mounting)	M (Magnetic attachment)
LED				
K-LED 2.0 Page 24		–		
K-LED 1.2 Page 25		–		–
K-LED Rebelution Page 26			–	
K-LED Blizzard Page 27			–	
Rota LED Page 28			–	
RotaLED Compact Page 29			–	
KL 7000 LED Page 30		–		
Halogen				
KL 7000 Page 31				
Rotaflex / Rotafix beacon Page 32			–	
KL Rota Compact Page 33				

Other domes (blue, red and green) are available on request.

Sophisticated and tested technology for beacons

As early as 1955, HELLA was the first provider to bring a beacon onto the market. The first LED beacon followed in 2006. Alongside halogen lamps, HELLA currently has 14 LED beacons in its range. The newest models are the K-LED Blizzard in a modern chrome design and the black K-LED Rebelution beacon with its innovative light ring.

The LED technology offers numerous advantages, such as lower current consumption and lower maintenance costs. Beacons with LED technology also satisfy the maintenance-free "fit and forget" approach and are even suitable for continuous use.

Important certification symbol

e1	EMC test number	**TA1**	Specification according to ECE R65
E1	Certification symbol of ECE R65 directive	**T**	360°
CE	CE marking	**A**	Amber; B = Blue; R = Red
$P_{max.}$	Power consumption	**1**	1 = Night; 2 = Day and night
10 03 6194	ECE R10, EMC test incl. test number	**TA1**	Amber beacon with night-time level according to ECE R65
65 00 3397	ECE R65, lighting technology approval incl. test number	**TA2**	Amber beacon with day and night-time level according to ECE R65

ECE R65 and ECE R10

Only beacons that can carry both of these test numbers are authorised for use on public roads. It is a European directive for beacons. The ECE R65 contains specifications for which light values, light distribution and mounting type has to be achieve while ECE R10 regulates on electromagnetic compatibility.

Low life cycle costs

LED technology reduces maintenance costs and standstill times to a minimum, meaning that LED beacons are almost maintenance-free and are distinguished by their long lifetime.

Installation

The beacons can be optimally adapted to their areas of application and used flexibly thanks to different mounting options. Fixed attachment (F) is possible for all beacons. Furthermore, the beacon can be fixed using a fixed (R) or flexible (FL) pipe socket depending on the model. Magnet attachment (M) is another installation option.

Blue warning signal

Using blue beacons can be apt in communal areas, but may require special authorisation from the country's authorities.

Surface mounting variants

Fixed attachment (F)

Pipe socket mounting (R)

Flexible pipe-socket mounting (FL)

Magnetic attachment (M)

Thermal management
HELLA´s selection of heat-conducting materials and arrangement of components ensure effective heat flow: thermal management directs heat away from the LED, therefore ensuring an optimum temperature distribution, fail-safe operation and a long lifetime.

Intelligent and high-performance electronics
HELLA LED beacons' high-performance electronics facilitates multi-voltage function, protection against voltage peaks and polarity reversal protection.

Vibration resistance
The beacons do not have any moving parts and therefore are optimally protected against strong vibrations and shocks.

Ideal for continuous operation
The LED beacons are ideal for continuous use because of their low total current consumption and high-quality, durable LEDs.

EMC resistance
All HELLA beacons have a high EMC resistance, i.e. the radio signals are not disturbed by the beacons.

Compact height
The extra-flat beacons satisfy the 4 m maximum permissible vehicle height requirements on roads even for very high vehicles such as lorries with sleeping compartment structures.

Visibility of the warning signal

Incorrect

⊖ **Negative example:**
In a 25 m radius, the warning signal cannot be seen from all directions: it is not visible in the towing crane area.

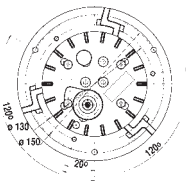
Correct

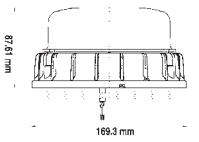
⊕ **Positive example:**
The warning signal can be seen from all directions in a 25 m radius thanks to an additional beacon on the driver's cab.

Beacon K-LED 2.0

- → **LED beacon**
- → **Two warning signal types combined in one product**
  The beacon is equipped with a flashing and rotating signal, which can be activated depending on the purpose. The signal is generated using an electronic concept, meaning that no moving parts are required. There are 16 different flashing sequences.
- → **Two brightness levels**
  An integrated light sensor enables automatic switching between day and night mode, which ensures the best possible warning effectiveness without glare.
- → **Very compact design**
  The beacon is very flat and has an impact-resistant dome made of polycarbonate. Depending on the design, the height is 87.6 mm (F) to 160.6 mm (R).
- → **Functional safety:** The IP 67 and IP X9K protected beacon is dustproof and can be immersed in water for a short period.

- → **High-quality corrosion protection**
  The housing is passivated and then powder-coated. This provides a considerable degree of protection against aggressive media like salt and lyes.

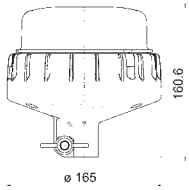




Beacon K-LED 2.0 F* (rotating and flashing)	
Amber	**2XD 011 557-101**[1)]
Blue	**2XD 011 557-111**
Red	**2XD 011 557-121**
Amber, black base plate	**2XD 011 557-841**

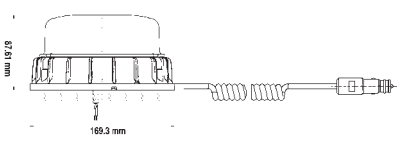
K-LED 2.0 Airport **	
Amber (fixed attachment)	**2XD 011 557-701**
Amber (pipe socket fixing)	**2XD 011 557-901**

** Tested according to ICAO Annex 14 (Low Intensity, Type C)



Technical data	
Rated voltage (U_N)	**Multi-voltage**
Operating voltage (U_B)	10 – 32 V
Total current consumption	0.45 A to 2.5 A
Power consumption	max. 30 W
Operating temperature range	-40°C to + 60°C
Dome	Polycarbonate
Installation	From below
Polarity reversal protection	Yes
Position of use	Upright
Protection class	IP 67, IP X9K
Type approval	
Approval	GGVSE / ADR SAE 7845, class 1
Lighting technology homologation	TR1 E1 003468 TA2 E1 003555 TB2 E1 003555 SAE W3-1[1)]
EMC protection	ECE-R10: 036816 CISPR 25, Class 5

Beacon K-LED 2.0 R* (rotating and flashing)	
Amber	**2XD 011 557-201**[1)]
Blue	**2XD 011 557-211**
Red	**2XD 011 557-221**
Amber, black base plate	**2XD 011 557-811**

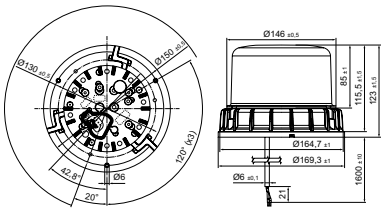


Beacon K-LED 2.0 M* (rotating and flashing)	
Amber	**2XD 011 557-301**[1)]
Blue	**2XD 011 557-311**
Red	**2XD 011 557-321**

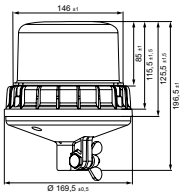
* Other colours are available on request.

Beacon K-LED 1.2

- → **LED beacon**
- → **Flashing or rotating light function**
  The dual lighting system gives the beacon a larger light exit area, making it especially effective at providing an excellent warning function. The beacon is available in rotating or flashing variants. The signal is generated using an electronic concept, meaning that no moving parts are required.
- → **High design**
  The beacon is approx.115.5 mm (F) to 196.5 mm (R) high due to the double lighting system. The dome is made of impact-resistant polycarbonate.
- → **Functional safety**
  The IP 6K7 und IP X9K protected beacon is dustproof, high-pressure jet cleaner resistant and even able to withstand brief immersion in water to a depth of up to one metre.
- → **High-quality corrosion protection**
  The housing is passivated and then powder-coated. This provides a considerable degree of protection against aggressive media like salt and lyes.



Beacon K-LED 1.2 F*	
Amber, rotating	**2RL 012 983-301**
Blue, rotating	**2RL 012 983-311**
Red, rotating	**On request**
Amber, flashing	**2XD 012 984-301**
Blue, flashing	**2XD 012 984-311**
Red, flashing	**On request**



Beacon K-LED 1.2 R*	
Amber, rotating	**2RL 012 983-401**
Blue, rotating	**On request**
Red, rotating	**On request**
Amber, flashing	**2XD 012 984-401**
Blue, flashing	**On request**
Red, flashing	**On request**

Technical data	
Rated voltage (U_N)	**Multi-voltage**
Operating voltage (U_B)	10 – 30 V
Total current consumption	
Rotating	approx. 1.6 A (12 V), approx. 0.8 A (24 V)
Flashing	approx. 1.8 A (12 V), approx. 0.9 A (24 V)
Power consumption	
Rotating	approx. 20 W
Flashing	approx. 22 W
Operating temperature range	-40 °C to +60 °C
Dome	Polycarbonate
Polarity reversal protection	Yes
Position of use	Upright
Protection class	IP 6K7, IP X9K

Type approval				
Approval	SAE J845 class 2			
EMC protection	ECE-R10, RCM CISPR 25, Class 5			
Rotating light function				
Homologation, amber	TA1	E1	10 65	057963 004439
Homologation, blue	TB1	E1	10 65	057963 004440
Homologation, red	TR1	E1	10 65	057963 004441
Flashing light function				
Homologation, amber	TA1	E1	10 65	057962 004442
Homologation, blue	TB1	E1	10 65	057962 004443
Homologation, red	TR1	E1	10 65	057962 004444

* Other colours are available on request.

K-LED Rebelution

- → **LED beacon**
- → **Flashing or rotating light function**
  The beacon is available in rotating or flashing variants. Both the very noticeable double flashing signal and the specially developed rotating signal generate a 360° warning effect.
- → **Very compact design**
  The beacon is very flat and has a minimalist design. The light is visible through a circumferential, ring-shaped light strip made of polycarbonate. Despite the minimal light exit area, the beacon produces optimal light values. Depending on the design, the height is only approx. 60.7 mm (F).
- → **Functional safety**
  The IP 6K7 und IP 6K9K protected beacon is dustproof, high-pressure jet cleaner resistant and even able to withstand brief immersion in water to a depth of up to 1 m.
- → **High-quality corrosion protection**
  The housing is passivated and then powder-coated. This provides a considerable degree of protection against aggressive media like salt and lyes.
- → **Innovative development**
  The LED technology used in the K-LED Rebelution is a real innovation for applications with warning lamps and has been patented by HELLA for this purpose.

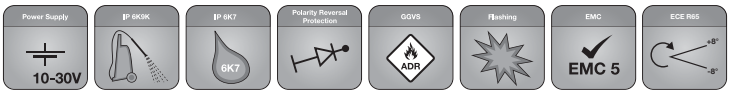
K-LED Rebelution F	
Amber, flashing	**2XD 455 255-001**
Amber, rotating	**2RL 455 256-001**

K-LED Rebelution FL	
Amber, flashing	**2XD 455 255-011**
Amber, rotating	**2RL 455 256-001**

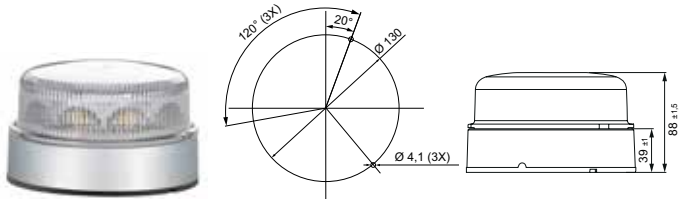
K-LED Rebelution M	
Amber, flashing	**2XD 455 255-021**
Amber, rotating	**2RL 455 256-021**

Technical data	
Rated voltage (U_N)	**Multi-voltage**
Operating voltage (U_B)	12 V / 24 V
Total current consumption	
Rotating	1.08 A (12 V), 0.54 A (24 V)
Flashing	3.16 A (12 V), 1.58 A (24 V)
Power consumption	
Rotating	max. 13 W
Flashing	max. 38 W
Housing	Aluminium
Position of use	Upright
Temperature range	-40°C to +60°C
Polarity reversal protection	Yes
Protection class	IP 6K7, IP 6K9K
Type approval	
Homologation, amber	TA1 E1 65 004744
Approval	GGVSE / ADR
EMC protection	ECE-R10: 058840 Rotating: CISPR 25, Class 3 Flashing: CISPR 25, Class 5

K-LED Blizzard



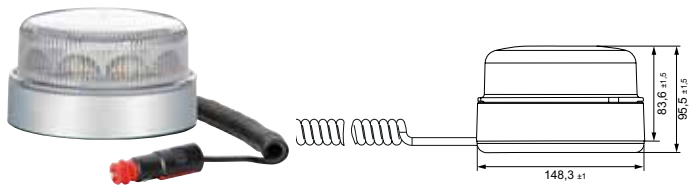
- → **LED beacon**
- → **Flashing light function**
  The beacon generates a very noticeable double flashing signal, which creates a 360° warning effect that draws attention.
- → **Multi-voltage**
  The beacon can be connected at an operating voltage of 10 – 30 V.
- → **Very compact design**
  The beacon is very flat and has an impact-resistant dome made of polycarbonate. Depending on the design, the height is approx. 88 mm (F) to 132 mm (FL).
- → **Functional safety**
  The IP 6K7 und IP X9K protected beacon is dustproof, high-pressure jet cleaner resistant and even able to withstand brief immersion in water to a depth of up to 1 m.
- → **High-quality corrosion protection**
  The housing is passivated and then powder-coated. This provides a considerable degree of protection against aggressive media like salt and lyes.
- → **Like-for-like replacement**
  The K-LED Blizzard follows the K-LED FO beacon series and facilitates a like-for-like replacement with the new variant.



K-LED Blizzard F	
Amber, flashing	**2XD 012 980-001**

K-LED Blizzard FL	
Amber, flashing	**2XD 012 980-011**

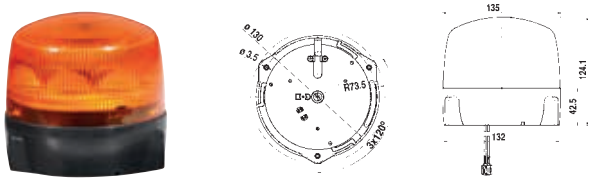
Technical data		
Rated voltage (U_N)	**Multi-voltage**	
Operating voltage (U_B)	10 – 30 V	
Total current consumption	approx. 1.3 A (12 V)	approx. 0.7 A (24 V)
Power consumption	16 W	
Dome	Polycarbonate	
Housing	Aluminium	
Position of use	Upright	
Temperature range	-40°C to +60°C	
Polarity reversal protection	Yes	
Protection class	IP 6K7, IP X9K	
Type approval		
Homologation, amber	TA1 E1	65 | 004744
Approval	GGVSE / ADR	
EMC protection	ECE-R10: 058356 CISPR 25, Class 5	



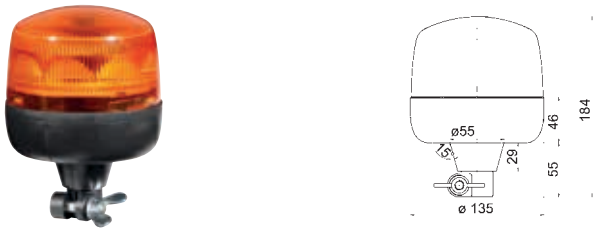
K-LED Blizzard M	
Amber, flashing	**2XD 012 980-021**

Rota LED beacon

- → **LED beacon**
- → **Flashing or rotating light function**
  The beacon is available in rotating or flashing variants. The signal is generated using an electronic concept, meaning that no moving parts are required.
- → **Compact design**
  The beacon is very flat and has an impact-resistant dome made of polycarbonate. Depending on the design, the height is approx. 124 mm (F) to 184 mm (FL).
- → **Functional safety**
  The beacon fulfills IP 5K4K and IP X9K requirements and is therefore protected against dust and splash water and is high-pressure jet cleaner resistant.

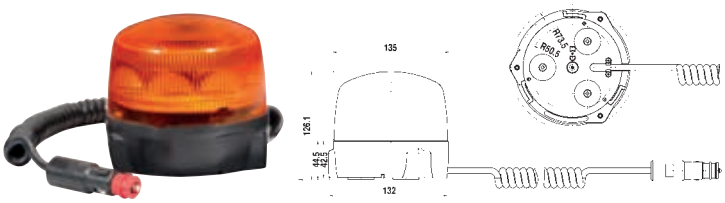


Beacon Rota LED F*	
Amber, rotating	**2RL 010 979-001**
Blue, rotating	**2RL 010 979-101**
Amber, flashing	**2XD 012 878-001**
Blue, flashing	**2XD 012 878-101**



Beacon Rota LED FL *	
Amber, rotating	**2RL 010 979-011**
Blue, rotating	**2RL 010 979-111**
Amber, flashing	**2XD 012 878-011**
Blue, flashing	**2XD 012 878-111**

Technical data			
Rated voltage (U_N)	**Multi-voltage**		
Operating voltage (U_B)	10 – 30 V		
Total current consumption	approx. 0.8 A (12 V), approx. 0.4 A (24 V)		
Power consumption	approx. 10 W		
Dome	Polycarbonate		
Position of use	Upright		
Protection class	IP 5K4K, IP X9K		
Type approval			
Approval	GGVSE / ADR SAE J845, class 2		
EMC protection	ECE-R10 CISPR 25, Class 5		
Rotating light function			
Homologation, amber	TA1	E1	10 046194 65 003109
Homologation, blue	TB1	E1	10 046194 65 003503
Flashing light function			
Homologation, amber	TA1	E1	10 057696 65 004154
Homologation, blue	TB1	E1	10 057696 65 004155
	TR1	E1	10 057696 65 004255

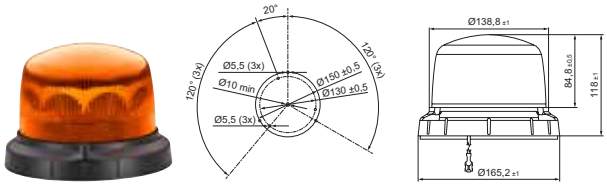


Beacon Rota LED M *	
Amber, rotating	**2RL 010 979-021**
Blue, rotating	**2RL 010 979-121**
Amber, flashing	**2XD 012 878-021**
Blue, flashing	**2XD 012 878-121**

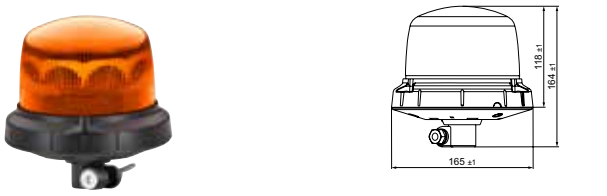
* Other colours are available on request.

RotaLED Compact

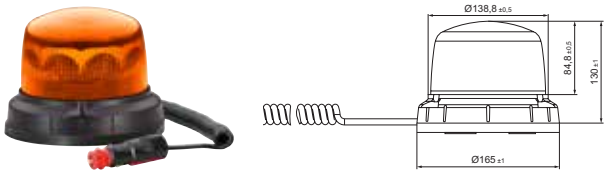
- → **LED beacon**
- → **Flashing or rotating light function**
  The beacon is available in rotating or flashing variants. The signal is generated using an electronic concept, meaning that no moving parts are required.
- → **Compact design**
  The beacon is very flat and has an impact-resistant dome made of polycarbonate. Depending on the design, the height is approx. 118 mm (F) to 164 mm (FL).
- → **Functional safety**
  The IP 67 und IP X9K protected beacon is dustproof, high-pressure jet cleaner resistant and even able to withstand brief immersion in water to a depth of up to 1 m.
- → **Like-for-like replacement to LED technology**
  The RotaLED Compact is the successor of the Rotafix, Rotaflex and Rota Compact halogen beacon series and facilitates a like-for-like LED technology replacement.



RotaLED Compact F*	
Amber, flashing	**2XD 013 979-001**
Amber, rotating	**2RL 014 979-001**



RotaLED Compact FL*	
Amber, flashing	**2XD 013 979-011**
Amber, rotating	**2RL 014 979-011**



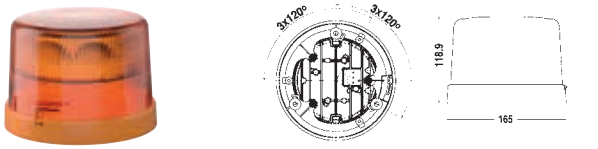
RotaLED Compact M*	
Amber, flashing	**2XD 013 979-021**
Amber, rotating	**2RL 014 979-021**

Technical data		
Rated voltage (U_N)	**Multi-voltage**	
Operating voltage (U_B)	10 – 30 V	
Total current consumption		
Flashing	0.8 A (12 V)	0.4 A (24 V)
Rotating	0.6 A (12 V)	0.3 A (24 V)
Power consumption	10 W	
Dome	Polycarbonate	
Position of use	Upright	
Protection class	IP 67, IP X9K	
Type approval		
Homologation, amber	TA1 E1	65 004636
Approval	GGVSE / ADR SAE J845, class 2	
EMC protection	CISPR 25, Class 5 Flashing: ECE R10: 058156 Rotating: ECE R10: 058523	

* Other colours are available on request.

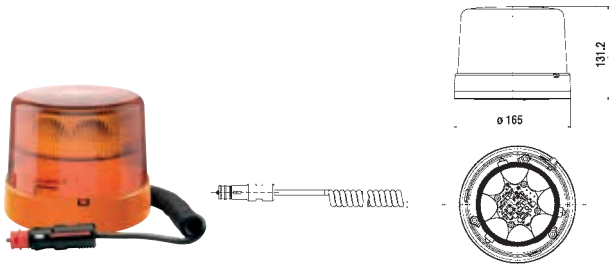
Beacon KL 7000 LED

- **LED beacon**
- **Flashing or rotating light function**
  The beacon is available in rotating or flashing variants. The signal is generated using an electronic concept, meaning that no moving parts are required.
- **Compact design**
  The beacon is very flat and has a scratch-resistant, smooth dome that is also resistant to soiling.
  Depending on the design, the height is approx. 119 mm (F) to 194 mm (R).
- **Functional safety**
  The beacon fulfills IP 5K4K and IP X9K requirements and is therefore protected against dust and splash water and is high-pressure jet cleaner resistant.
- **Like-for-like replacement with LED technology**
  The KL 7000 LED is the successor of the KL 700 and KL 7000 halogen beacon series and facilitates a like-for-like replacement with LED technology.



KL 7000 LED F*	
Amber, rotating	**2RL 011 484-001**
Blue, rotating	**2RL 011 484-101**
Amber, flashing	**2XD 012 972-001**

KL 7000 LED R*	
Amber, rotating	**2RL 011 484-011**
Blue, rotating	**2RL 011 484-111**
Amber, flashing	**2XD 012 972-011**



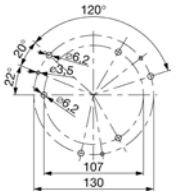
KL 7000 LED M*	
Amber, rotating	**2RL 011 484-021**
Blue, rotating	**2RL 011 484-121**
Amber, flashing	**2XD 012 972-021**

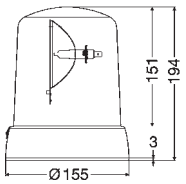
Technical data		
Rated voltage (U_N)	**Multi-voltage**	
Operating voltage (U_B)	10 – 32 V	
Total current consumption	0.8 A	0.4 A
Power consumption	10 W	
Dome	PMMA	
Position of use	Upright	
Protection class	IP 5K4K, IP X9K	
Type approval		
Homologation, amber	TA1 E1	65 003397
Approval	GGVSE / ADR SAE J845, class 2	
EMC protection	ECE-R10: 036194 CISPR 25, Class 5	

* Other colours are available on request.

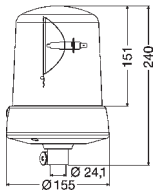
Beacon KL 7000

- → **Halogen beacon**
- → **Rotating light function**
  The beacon generates a rotating warning signal using a high-gloss metallised parabolic reflector and bulb. It is rotated using a twin-belt drive.
- → **Compact design**
  The beacon has a smooth dome with a handy pressure-point fixing. Depending on the design, the height is approx. 194 mm (F) to 240 mm (FL).
- → **Functional safety**
  The beacon fulfills IP 5K4K and IP 9K requirements and is therefore protected against dust and splash water and is high-pressure jet cleaner resistant.
- → **The KL 7000 LED is the LED successor**
  The KL 7000 (halogen) is not suitable for continuous use. The KL 7000 LED should be used for continuous operation.

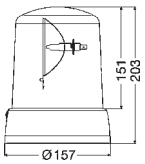




Beacon KL 7000 F*	
12 V, amber, rotating	**2RL 008 061-101**
24 V, amber, rotating	**2RL 008 061-111**
230 V, amber, rotating	**2RL 008 064-101***
12 V, blue, rotating	**2RL 008 061-001**
24 V, blue, rotating	**2RL 008 061-011**



Beacon KL 7000 FL*	
12 V, amber, rotating	**2RL 008 063-101**
24 V, amber, rotating	**2RL 008 063-111**
12 V, blue, rotating	**2RL 008 063-001**
24 V, blue, rotating	**2RL 008 063-011**



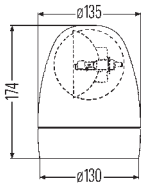
Beacon KL 7000 M*	
12 V, amber, rotating	**2RL 008 062-101**
24 V, amber, rotating	**2RL 008 062-111**
12 V, blue, rotating	**2RL 008 062-001**
24 V, blue, rotating	**2RL 008 062-011**

Technical data			
Rated voltage (U_N)	**12 V**	**24 V**	**230 V**
Operating voltage (U_B)	10.8 – 13.8 V	21.6 – 27.6 V	–
Bulb power consumption	55 W	70 W	25 W
Total current consumption	5.5 A	3.5 A	0.2 A
Operating temperature range	-40°C to +60°C		-30°C to +60°C
Installation (KL 7000 F)	From above or below		From above or below
Position of use	Upright		
Protection class	IP 5K4K, IP 9K		
Type approval			
Homologation, amber	E1 001241, (ECE-R65)		
Homologation, blue	E1 001240, (ECE-R65)		
EMC protection	ECE-R10: 031740 CISPR 25, Class 5		
230 V protective mark	CE VdS		

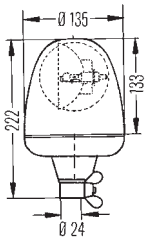
* Other colours are available on request.

Beacon KL Rotaflex / Rotafix

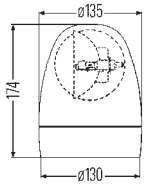
- → **Halogen beacon**
- → **Rotating light function**
  The beacon generates a rotating warning signal using a high-gloss metallised parabolic reflector and bulb. It rotates via a motor with plastic worm drive.
- → **Compact design**
  The beacon has a smooth dome.
  Depending on the design, the height is approx. 174 mm (F) to 222 mm (FL).
- → **Functional safety**
  The beacon fulfills IP 5K4K and IP 9K requirements and is therefore protected against dust and splash water and is high-pressure jet cleaner resistant.
- → **The RotaLED Compact is the LED successor**
  The Rotafix / Rotaflex (halogen) is not suitable for continuous use. The RotaLED Compact should be used for continuous operation.



Beacon KL Rotafix F*	
12 V, amber, rotating	**2RL 007 337-001**
24 V, amber, rotating	**2RL 007 337-011**
12 V / 24 V, amber (twin-belt drive), rotating	**2RL 007 337-041**
12 V, blue, rotating	**2RL 007 337-101**
24 V, blue, rotating	**2RL 007 337-111**



Beacon KL Rotaflex FL*	
12 V, amber, rotating	**2RL 006 846-001**
24 V, amber, rotating	**2RL 006 846-011**
12 V, blue, rotating	**2RL 006 846-101**
24 V, blue, rotating	**2RL 006 846-111**



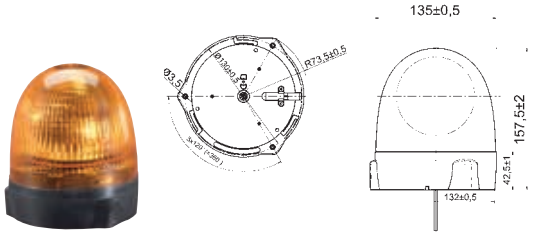
Beacon KL Rotafix M*	
12 V, amber, rotating	**2RL 007 337-021**
24 V, amber, rotating	**2RL 007 337-031**
12 V, blue, rotating	**2RL 007 337-121**

Technical data		
Rated voltage (U_N)	**12 V**	**24 V**
Operating voltage (U_B)	10.8 – 13.8 V	21.6 – 27.6 V
RPM	160 rpm	
Bulb power consumption	55 W	70 W
Total current consumption	5.5 A	3.5 A
Operating temperature range	-40°C to + 60°C	
Installation	From above or below	
Position of use	Upright	
Protection class	IP 5K4K, IP 9K	
Type approval		
Homologation, amber	E4 006509, (ECE-R65)	
Homologation, blue	E4 006513, (ECE-R65)	
Approval	SAE J845, class 2	
EMC protection	ECE-R10: 032181 CISPR 25, Class 3	

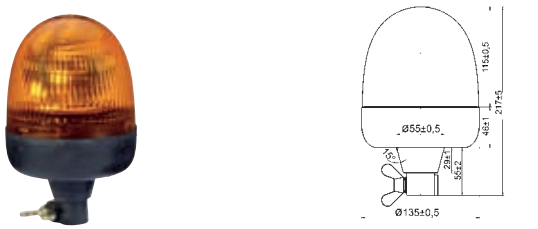
* Other colours are available on request.

Beacon KL Rota Compact

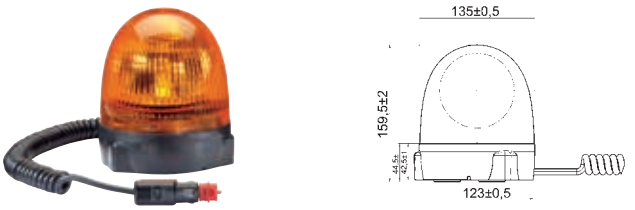
- → **Halogen beacon**
- → **Rotating light function**
  The beacon generates a rotating warning signal using a high-gloss metallised parabolic reflector and bulb. It rotates via a motor with belt drive.
- → **Compact design**
  The beacon has a smooth dome.
  Depending on the design, the height is approx. 157.5 mm (F) to 217 mm (R).
- → **Functional safety**
  The beacon fulfills IP 5K4K and IP 9K requirements and is therefore protected against dust and splash water and is high-pressure jet cleaner resistant.
- → **The RotaLED Compact is the LED successor**
  The KL Rota Compact (halogen) is not suitable for continuous use. The RotaLED Compact should be used for continuous operation.



Beacon KL Rota Compact F*	
12 V, amber, rotating	**2RL 009 506-201**
24 V, amber, rotating	**2RL 009 506-211**



Beacon KL Rota Compact FL*	
12 V, amber, rotating	**2RL 009 506-001**
24 V, amber, rotating	**2RL 009 506-011**



Beacon KL Rota Compact M*	
12 V, amber, rotating	**2RL 009 506-301**
24 V, amber, rotating	**2RL 009 506-311**

Technical data		
Rated voltage (U_N)	**12 V**	**24 V**
Operating voltage (U_B)	10.8 – 13.8 V	21.6 – 27.6 V
RPM	180 rpm	
Bulb power consumption	55 W	70 W
Total current consumption	5 A	3 A
Operating temperature range	-40°C to +60°C	
Dome	Polycarbonate	
Position of use	Upright	
Protection class	IP 5K4K, IP 9K	
Type approval		
Homologation, amber	E1 002076, (ECE-R65)	
EMC protection	ECE-R10: 034277 CISPR 25, Class 3	

* Other colours are available on request.

Accessories

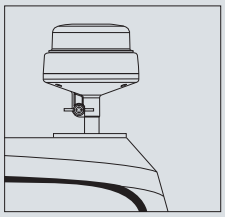
Product photo	Description	Part number	PU
	Socket pipe to weld on, straight, 100 mm long, with rubber stopper and socket according to DIN 14620	1-pin **8HG 002 365-001** 2-pin **8HG 006 294-101**	1
	Socket pipe with base plate with screw attachment, total height 126 mm, with rubber stopper and socket according to DIN 14620	1-pin **8HG 006 294-011** 2-pin **On request**	1
	Angled socket pipe with base plate for lateral screw attachment, clearance 90 mm, height 100 mm including rubber stopper, socket , 2 x hexagon screws M8 x 35, 2 x hexagon nuts M8, 2 x spring washers compliant with DIN 14620	1-pin **8HG 006 294-021** 2-pin **On request**	1
	Angled socket pipe with base plate for lateral screw attachment, clearance 120 mm, height 105 mm including rubber stopper, 2 x hexagon screws M8 x 35, 2 x hexagon nuts M8, 2 x spring washers compliant with DIN 14620 Particularly suitable for RotaLED Compact 2XD 013 979-011 / 2RL 014 979-011	1-pin **8HG 006 294-171** 2-pin **On request**	1
	Angled socket pipe with base plate for lateral screw attachment, clearance 50 mm, height 100 mm including rubber stopper, socket , 2 x hexagon screws M8 x 35, 2 x hexagon nuts M8, 2 x spring washers compliant with DIN 14620	1-pin **8HG 006 294-111** 2-pin **On request**	1
	Socket pipe for inclined screw-on surfaces, beacon adjustable parallel to the carriageway, height approx. 105 mm, with rubber stopper, socket, 2 x hexagon screws M8 x 35, 2 x hexagon nuts M8, 2 x spring washers according to DIN 14620	1-pin **8HG 006 294-031** 2-pin **8HG 006 294-141**	1
	Socket pipe with screw mounting, height approx. 100 mm, with rubber stopper and socket compliant with DIN 14620	1-pin **8HG 006 294-051** 2-pin **8HG 006 294-091**	1
	Socket pipe with 2 screw holes for surface mounting to the rear of the cab, with telescopic holder, total height approx. 1000 mm, Can be shifted up to 700 mm, with rubber stopper and socket compliant with DIN 14620	1-pin **8HG 006 294-041** 2-pin **On request**	1
	Socket pipe to weld on, straight, height 100 mm Compatible with 8HG 002 365-001 / -8HG 006 294-101	**8HG 096 531-007**	2
	Socket pipe, straight with base plate, for screw attachment, total height 126 mm Compatible with 8HG 006 294-011 / -121	**8HG 096 531-107**	2
	Angled socket pipe, with base plate for lateral screw attachment, clearance 90 mm Compatible with 8HG 006 294-021 and -221	**8HG 096 531-117**	2

Accessories

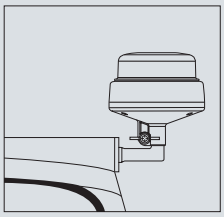
Product photo	Description	Part number	PU
	Angled socket pipe, with base plate for lateral screw attachment, clearance 50 mm Compatible with 8HG 006 294-111 and -211	**8HG 096 531-127**	2
	Socket pipe for inclined screwing on, beacon adjustable parallel to the carriageway, height approx. 105 mm Compatible with 8HG 06 294-031 / -141	**8HG 096 531-137**	2
	2-pin socket with cover, with 2 flat connector connections 6.3 mm	**8JB 004 777-001*** **8JB 004 777-002***	5 1
	2-pin round socket with ground contact, with 2 flat connector connections 6.3 mm	**8JB 862 757-001*** **8JB 862 757-007***	1 24
	2-pin 6-edge SW20 socket with ground contact, with 2 flat connector connections 6.3 mm	**8JB 862 757-027***	1 / 24
	2-pin socket with cover, with 300 mm cable 2.5 mm² and 2 flat connector connections 6.3 mm	**8JB 001 946-101***	1
	2-pin light alloy socket with cover and 1 screw connection, ground at the housing	**8JB 001 946-021***	10
	2-pin socket with cover and 2 flat connector connections 6.3 mm	**8JB 004 123-031***	1
	1-pin round socket with oval-head screw M4 x 8	**8JB 850 434-011***	10
	1-pin socket with cover	**8JB 001 946-011***	10
	12 V, equipment to monitor the function of rotating beacons and strobe-type beacons, indicates the failure of a beacon.	**5KG 011 630-101**	1
	Rubber stopper /cap according to DIN 14620	**9GH 096 532-001** **9GH 096 532-007**	10 200

* Sockets comply with DIN ISO 4165; installation opening: 18.5 mm diameter, control panel thickness max. 7 mm

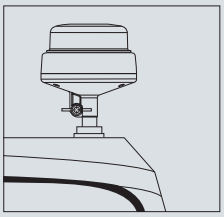
Installation examples



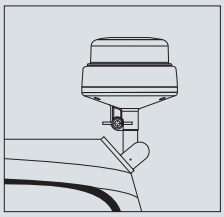
Bracket with screw attachment



Angle bracket



Bracket with thread



Variable bracket

Accessories for LED beacons

Page 24

Beacon K-LED 2.0	
Rubber base, wedge-shaped	9GD 856 863-001
Pipe socket adapter	8HG 005 436-041

Page 25

Beacon K-LED 2.1	
Pipe socket adapter	8HG 005 436-041

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K-LED Rebelution beacon	
Pipe socket adapter	8HG 863 302-021

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K-LED Blizzard beacon	
Pipe socket adapter	8HG 863 302-021

Page 28

Rota LED beacon	
Dome, amber (polycarbonate)	9EL 181 506-001
Dome, blue (polycarbonate)	9EL 181 506-011

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Beacon KL 7000 LED	
Dome, amber (polycarbonate)	9EL 190 025-001
Dome, blue (polycarbonate)	9EL 190 025-011
Dome, red (polycarbonate)	9EL 190 025-021
Rubber base, wedge-shaped	9GD 856 863-001
Rubber base, flat	9GD 856 562-001

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RotaLED Compact beacon	
Pipe socket adapter	8HG 223 805-011
Angled socket pipe (particularly suitable)	8HG 006 294-171

Accessories for halogen beacons

◂ Page 31

Beacon KL 7000	
Dome, amber (polycarbonate)	9EL 862 141-021
Dome, amber (PMMA)	9EL 862 141-001
Dome, blue (PMMA)	9EL 862 140-001
Dome, red (PMMA)	9EL 862 141-011*
Drive belt, 2 pieces	9XR 854 840-001
Motor (incl. printed circuit board)	9MN 862 741-001
Reflector (incl. base plate and drive belt)	9DX 862 740-001
Bulb 12 V/55 W	8GH 002 089-133
Bulb 24 V/70 W	8GH 002 089-251
Rubber base, flat (5 pieces)	9GD 862 164-001
Rubber base, wedge-shaped (1 piece)	9GD 863 033-001

◂ Page 32

KL Rotafix F and M beacon	
Dome, amber (polycarbonate)	9EL 859 020-001
Dome, blue (PMMA)	9EL 859 020-101
Drive belt (2 pieces)	9XR 854 840-001
Motor 12 V (incl. worm gear)	9MN 858 114-001
Motor 24 V (incl. worm gear)	9MN 858 114-011
Motor 12 /24 V (incl. printed circuit board)	9MN 862 741-001
Bulb 12 V/55 W	8GH 002 089-133
Bulb 24 V/70 W	8GH 002 089-251
Reflector (incl. worm wheel)	9DX 860 271-001
Rubber base, wedge	9GD 860 396-001

◂ Page 32

Beacon KL Rotaflex FL	
Dome, amber (PMMA)	9EL 859 020-001
Dome, blue (PMMA)	9EL 859 020-101
Motor 12 V (incl. worm gear)	9MN 858 114-001
Motor 24 V (incl. worm gear)	9MN 858 114-011
Reflector (incl. worm wheel)	9DX 860 438-001
Bulb 12 V/55 W	8GH 002 089-133
Bulb 24 V/70 W	8GH 002 089-251
Rubber housing with integrated socket	9GP 859 115-001

◂ Page 33

Beacon KL Rota Compact	
Dome, amber	9EL 864 074-001
Drive belt (2 pieces)	9XR 855 975-001
Motor group	9MN 863 026-001
Bulb 12 V/55 W	8GH 002 089-133
Bulb 24 V/70 W	8GH 002 089-251

Sometimes, single beacons do not provide sufficient optical warning. By positioning two or four beacons on the outside edges of the vehicle roof, HELLA OWS can offer optimum signalling.

When professionals have to rely on technology, the first choice is warning systems from HELLA. Our OWS guarantee maximum safety. You can rely on them. Always!

Choose different installation heights and widths for differing roof bars. The lighting technology can be selected from four different optical systems. Also, depending on the system, you can opt for various auxiliary lighting systems like work lamps, additional direction indicators or alley lights.

The OWS 7 is our "highlight"
The modular based system concept provides individual configuration options; from the basic through to the high-end version - all requirements are covered!

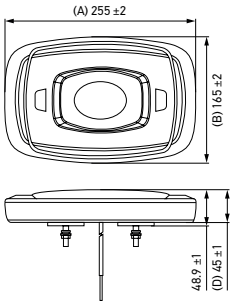
Optical warning systems (OWS) – overview

Product group	Variants		
Micro / Mini Lightbar	 Screw attachment	 Bracket mounting	 Magnetic attachment
Corner Module 270	 Flush mounting	 Bracket mounting	
OWS[7]	 Single reflector KL-ER	 360° LED module KL-LM2, flashing light function	 360° LED module KL-LM4, rotating light function
OWS	 OWS single reflector	 OWS-MR multiple reflector	 OWS-X xenon double flash
RAPTOR +	 598 mm	 1,118 mm	 1,248 mm
BST warning lamps	 BST (3 LED) Bracket mounting and fixed attachment	 BST (6 LED) Bracket mounting and fixed attachment	 BST-V (6 LED) Bracket mounting and fixed attachment
	 BST-Slim (3 LED) Fixed attachment	 BST-Slim (6 LED) Fixed attachment	 BST-V Slim (6 LED) Fixed attachment
	 BST-Round		

You can find additional product information at www.hella.com/municipal

Micro / Mini Lightbar

- → Multi-voltage function
- → User-defined flashing patterns (flashing and rotating)
- → Amber warning signal both with clear and amber lenses
- → Polarity reversal protection
- → Optimally protected against strong vibrations



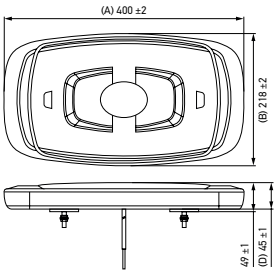
Technical data

	Micro Lightbar	Mini Lightbar
Rated voltage	Multi-voltage	
Operating voltage	10 – 30 V	
Dome and housing	Polycarbonate	
Current consumption	6.2 A (12 V) 2.9 A (24 V)	6.1 A (12 V) 2.8 A (24 V)
Power consumption	66 – 72 W	max. 70 W
Connection	500 mm cable (screw version), 2,500 mm cable (magnet version)	
Light function	flashing/rotating	
Light source	LED	
Weight	691 g	1,300 g
Temperature range	-40°C to +65°C	
Polarity reversal protection	Yes	
Protection class	IP 6X, IP X4K, IP X9K	
EMC protection	ECE R10, CISPR 25 Class 3	
Light technology homologation	ECE-R65 TA1* SAE J845 class 1	

* The dual colour variant of this product is only approved for SAE.

Micro Lightbar

Amber warning signal, clear cover lens	
Screw attachment, ECE	**2RL 014 566-001**
Screw attachment, SAE	**2RL 014 566-101**
Bracket mounting, ECE	**2RL 014 566-011**
Bracket mounting, SAE	**2RL 014 566-111**
Magnetic attachment, ECE	**2RL 014 566-021**
Magnetic attachment, SAE	**2RL 014 566-121**
Amber warning signal, amber cover lens	
Screw attachment, ECE	**2RL 014 566-201**
Screw attachment, SAE	**2RL 014 566-301**
Bracket mounting, ECE	**2RL 014 566-211**
Bracket mounting, SAE	**2RL 014 566-311**
Magnetic attachment, ECE	**2RL 014 566-221**
Magnetic attachment, SAE	**2RL 014 566-321**
Dual colour warning symbol, clear cover lens	
Screw attachment, SAE	**2RL 014 566-401**
Bracket mounting, SAE	**2RL 014 566-411**
Magnetic attachment, SAE	**2RL 014 566-421**



Mini Lightbar

Amber warning signal, clear cover lens	
Screw attachment, ECE	**2RL 014 565-001**
Screw attachment, SAE	**2RL 014 565-101**
Bracket mounting, ECE	**2RL 014 565-011**
Bracket mounting, SAE	**2RL 014 565-111**
Magnetic attachment, ECE	**2RL 014 565-021**
Magnetic attachment, SAE	**2RL 014 565-121**
Amber warning signal, amber cover lens	
Screw attachment, ECE	**2RL 014 565-201**
Screw attachment, SAE	**2RL 014 565-301**
Bracket mounting, ECE	**2RL 014 565-211**
Bracket mounting, SAE	**2RL 014 565-311**
Magnetic attachment, ECE	**2RL 014 565-221**
Magnetic attachment, SAE	**2RL 014 565-321**
Dual colour warning symbol, clear cover lens	
Screw attachment, SAE	**2RL 014 565-401**
Bracket mounting, SAE	**2RL 014 565-411**
Magnetic attachment, SAE	**2RL 014 565-421**

Corner Module 270

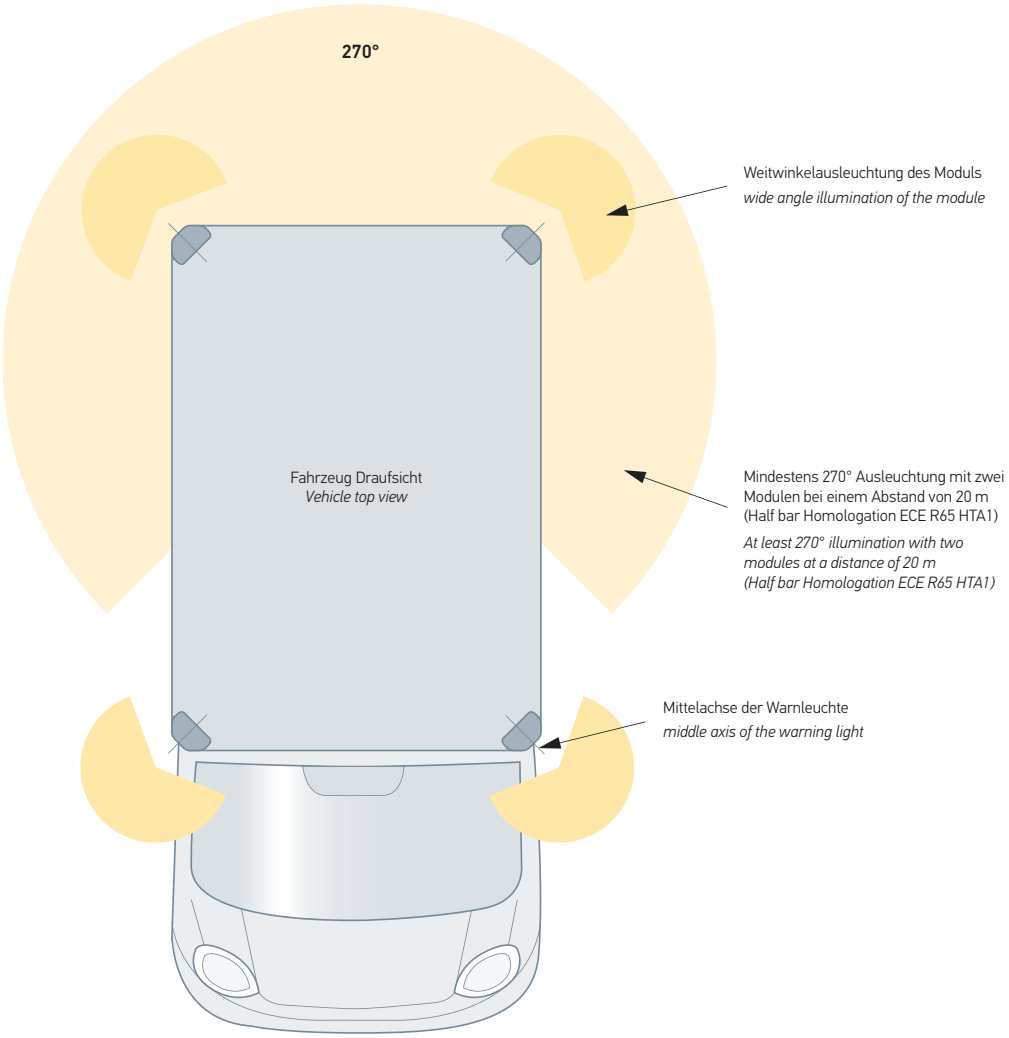
- → Set made up of two modules approved as "half bar" (ECE R65 HTA1)
- → Wide angle cover of at least 270 ° via two modules and 360 ° via four modules
- → Synchronisation of two or more modules
- → Integration into vehicle or installation as surface-mounted product
- → Black housing and flashing, amber warning signal
- → Polarity reversal protection and overvoltage protection

Flush mounting

Bracket mounting

Corner Module 270	
Set with two modules incl. holder	**2XD 455 355-001**

The new Corner Module 270 is a special wide-angle warning lamp that is approved as a "half bar" set of two modules. At a distance of 20 m from the vehicle, the modules light up an area of at least 270 °.



OWS[7]

The modular system concept OWS [7] provides individual configuration options: all requirements are covered from the basic version right up to the high-end version.

Single reflector KL-ER

360° LED module KL-LM2, flashing light function

360° LED module KL-LM4, rotating light function

Technical data	KL-ER	KL-LM2	KL-LM4
Operating temperature range	-40°C to +60°C	-40°C to +60°C	-40°C to +60°C
Interference suppression	Conducted Class 5 (CISPR 25)	Conducted Class 5 (CISPR 25)	Conducted Class 5 (CISPR 25)
Light source	H1 / 55 W	LED	LED
Rated voltage (U_N)	12 / 24 V	12 / 24 V	12 / 24 V
Current consumption	2 x 5 A / 2 x 3 A	2 x 3 A / 2 x 1.5 A	2 A / 1 A
Approvals	DIN 14620 e1 035717	DIN 14620 e1 035717	DIN 14620 e1 035717
Type approval			
Lighting technology homologation	TA1 E1 002 380 (ECE-R65)	TA1 E1 003232 (ECE-R65)	TA1 E1 003232 (ECE-R65)
EMC compatibility	e1 035 717	e1 035717	e1 035717

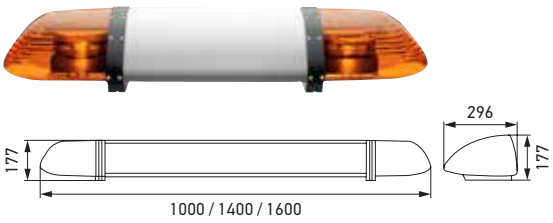
Configuration examples

OWS[7] with KL-LM2 module, 12 volts

Part number	Width	Alley Lights	Work lamps Halogen	LSB	Warning lamps	Backlighting module
2RL 010 710-951	900 mm	–	–	–	–	–
2RL 010 710-971	1,000 mm	–	–	–	–	–
2RL 010 710-981	1,000 mm	X	–	–	–	–
2RL 010 710-991	1,000 mm	X	–	5 modules, amber	–	–
2RL 010 711-001	1,100 mm	–	–	–	–	–
2RL 010 711-011	1,100 mm	X	–	–	–	–
2RL 010 711-021	1,100 mm	X	–	6 modules, amber	–	–
2RL 010 711-381	1,100 mm	–	–	–	–	Front/rear
2RL 010 711-641	1,100 mm	X	2 rear, 2 front	6 modules, amber	–	–
2RL 010 711-031	1,200 mm	–	–	–	–	–
2RL 010 711-061	1,200 mm	X	2 rear	–	–	–
2RL 010 711-081	1,200 mm	X	2 rear, 2 front	–	–	–
2RL 010 711-601	1,300 mm	–	–	–	–	–
2RL 010 711-101	1,400 mm	–	2 rear	–	–	–
2RL 010 711-111	1,400 mm	X	–	–	–	–
2RL 010 711-121	1,400 mm	X	2 rear	–	–	–
2RL 010 711-301	1,400 mm	–	–	–	–	–
2RL 010 711-611	1,400 mm	–	–	–	–	Front/rear
2RL 010 711-621	1,400 mm	–	2 rear	8 modules, amber	Rear	–
2RL 010 711-161	1,600 mm	X	2 rear	–	–	–
2RL 010 711-181	1,600 mm	X	2 rear, 2 front	–	–	–

OWS-E-LED

- → Optical warning system with 3 different width variants
- → LED update of the tried-and-tested OWS system (like-for-like replacement possible)
- → Various attachment options – e.g. using rubber base or support systems
- → Simple operation by means of a single switch (sold separately)



OWS-E-LED	
1,000 mm wide	**2RL 007 900-311**
1,400 mm wide	**2RL 007 900-321**
1,600 mm wide	**2RL 007 900-331**

Technical data	
Rated voltage (U_N)	Multi-voltage
Operating voltage (U_B)	10 – 30 V
Total current consumption	2 x 1.3 A (12 V) 2 x 0.7 A (24 V)
Power consumption	Max. 32 W
Connection	Cable length approx. 4,200 mm
Light function	Flashing
Light source	LED
Temperature range	- 40°C to + 60 °C
Polarity reversal protection	Yes
GGVSE / ADR	Yes
Protection class	IP 5K4K, IP 9K (OWS) IP 6K7K, IP 9K (electronics)
EMC protection	ECE-R10: 051309
Lighting technology homologation	TA1 E1 65 005048

Raptor +

Ultra-flat roof bar

→ **LED light functions**
As well as the main lighting modules, the auxiliary light functions alley light and LED signal bar are also based on LED technology

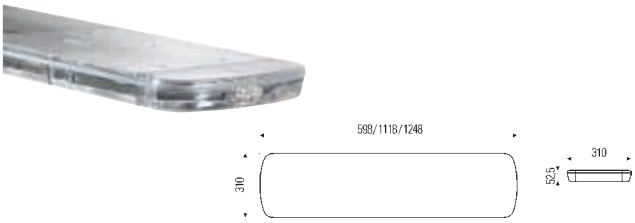
→ **Safety**
Best warning effectiveness thanks to focused signal radiation

→ **Aerodynamics**
Minimal height allows optimised air resistance coefficients

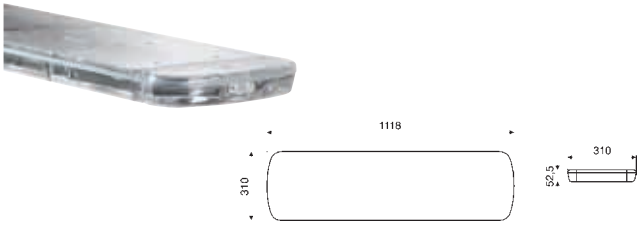
→ **Economical**
Long lifetime, low current consumption thanks to the LED technology,reduced fuel consumption thanks to optimised dynamics from the ultra-flat design

→ **Additional functions**
Top functionality in every situation thanks to the auxiliary functions: chaser signal to the rear (LSB: LED signal bar*) and road illumination alongside the vehicle (alley lights).

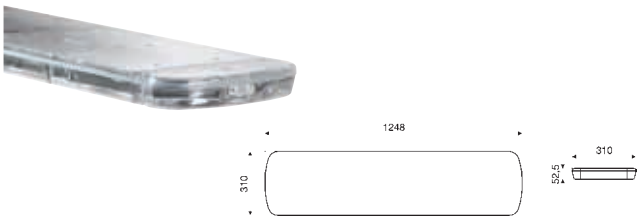
→ **Installation**
Flexible installation options: choose from 3 bracket systems (standard bracket system included in scope of supply).



Raptor + (598 mm)	
12 V, required accessories, 1 switch	**On request**



Raptor + (1,118 mm)	
12 V, necessary accessories: 1 switch	**2RL 010 743-011**
12 V, with alley light, necessary accessories: 3 switches	**2RL 010 743-101**
12 V, with LSB and alley light, necessary accessories: 4 switches and 1 control unit	**2RL 010 743-111**



Raptor + (1,248 mm)	
12 V, with alley light, necessary accessories: 3 switches	**2RL 010 743-121**
12 V, with LSB and alley light, necessary accessories: 4 switches and 1 control unit	**2RL 010 743-131**

Technical data	
Rated voltage (U_N)	**12 V**
Interference suppression	Power-controlled class 5 (CISPR 25)
Operating temperature range	-40°C to + 60°C
Protection class	IP 5K4K, IP X9K (DIN 40050, Teil 9)
Type approval	
Lighting technology homologation	TB1 E1 002989
EMC protection	e1 035947

* Use of LSB only as far as permitted by legislation. Please observe national regulations.

Accessories and spare parts

OWS[7]

Spare parts for ...	Designation	Part number
ER module	Dome, amber, without cut-out	**9EL 172 563-221**
ER module	Dome, amber, with cut-out	**9EL 172 563-321**
LED modules	Dome, amber, without cut-out	**9EL 172 563-251**
LED modules	Dome, amber, with cut-out	**9EL 172 563-351**
KL-ER	Module (halogen)	**2RL 864 233-001**
	12 V. alley lights, white	**2XD 176 235-001**
	12 V, work lamps (halogen)	**1GA 010 467-001**
	Rubber base 900 mm, cambered	**9GD 175 947-001**
	Rubber base 1,000 mm, cambered	**9GD 175 947-011**
	Rubber base 1,100 mm, cambered	**9GD 175 947-021**
	Rubber base 1,200 mm, cambered	**9GD 175 947-031**
	Rubber base 1,300 mm, cambered	**9GD 175 947-041**
	Rubber base 1,400 mm, cambered	**9GD 175 947-051**
	Rubber base 1,500 mm, cambered	**9GD 175 947-061**
	Rubber base 1,600 mm, cambered	**9GD 175 947-071**
	Rubber base, flat	**9GD 176 514-871**
	LSB operating unit for OWS[7] (incl. cable)	**9SX 178 258-001**
	KL-ER H1 bulb, 12 V/55 W	**8GH 002 089-131**

OWS-E-LED

Product image	Description	Part number
	Rubber base, 1,400 mm	**9GD 862 081-001**
	Rubber base, 1,600 mm	**9GD 862 085-001**
	Bracket for direct installation, 1,000 mm	**9XD 861 990-001**
	Bracket for direct installation, 1,400 mm	**9XD 861 990-011**
	Bracket for direct installation, 1,600 mm	**9XD 861 990-021**
	Support for welding to existing supports (for use under the OWS or the bracket for direct installation [9XD 861 990-...])	**9XD 861 995-801**
	Mounting system set (for screw attachment under the bracket for direct installation [9XD 861 990-...])	**9XD 857 445-801**
	Switch with indicator lamp	**6ED 004 778-011**

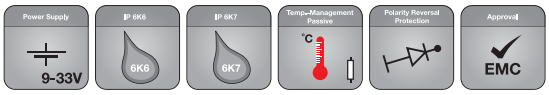
Accessories and spare parts

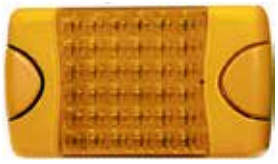
Raptor +

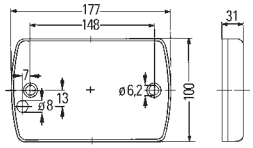
Product photo	Designation	Part number
	**Angled bracket system** 2 stainless steel brackets including fastening material	**8HG 168 011-001**
	**Switches** With orientation lighting	**6EH 007 832-011**
	**Installation strip for 3 switches** (Installation opening 77.6 x 48.2 mm)	**8HG 714 504-001**
	**Installation frame plug system** End piece (10 units)	**8HG 716 734-001**
	**Intermediate piece** (10 pieces)	**8HG 716 735-001**
	**Cover (10 pieces)** For sealing switch installation openings in the installation strips or in the installation strip plug system	**9HB 713 629-001**
	**LSB control unit** For triggering the chaser signal LED signal bar (LSB) Available for roof bar lengths 1,118 mm und 1,248 mm	**9SX 178 258-001**

Warning lamp: DuraLED and WL-LED

- → 36 high-power LEDs each
- → A total of 10 flashing sequences can be coded
- → Synchronisation of 2, 3 or 4 hazard warning lamps is possible
- → Vibration and impact-resistant
- → Extremely long lifetime
- → Very low current consumption
- → Flat design, compact dimensions
- → Easy to install thanks to concealed screw mounting



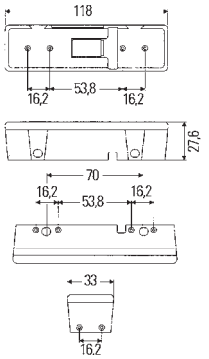




Technical data	
Rated voltage (U_N)	**Multi-voltage**
Operating voltage (U_B)	9 – 33 V
Operating temperature	-30°C to +50°C
Protection class	IP 6K6, IP 6K7
Current consumption	
Amber	500 mA (12 V), 265 mA (24 V)
Blue	580 mA (12 V), 310 mA (24 V)
Type approval	
EMC protection	e4 035517

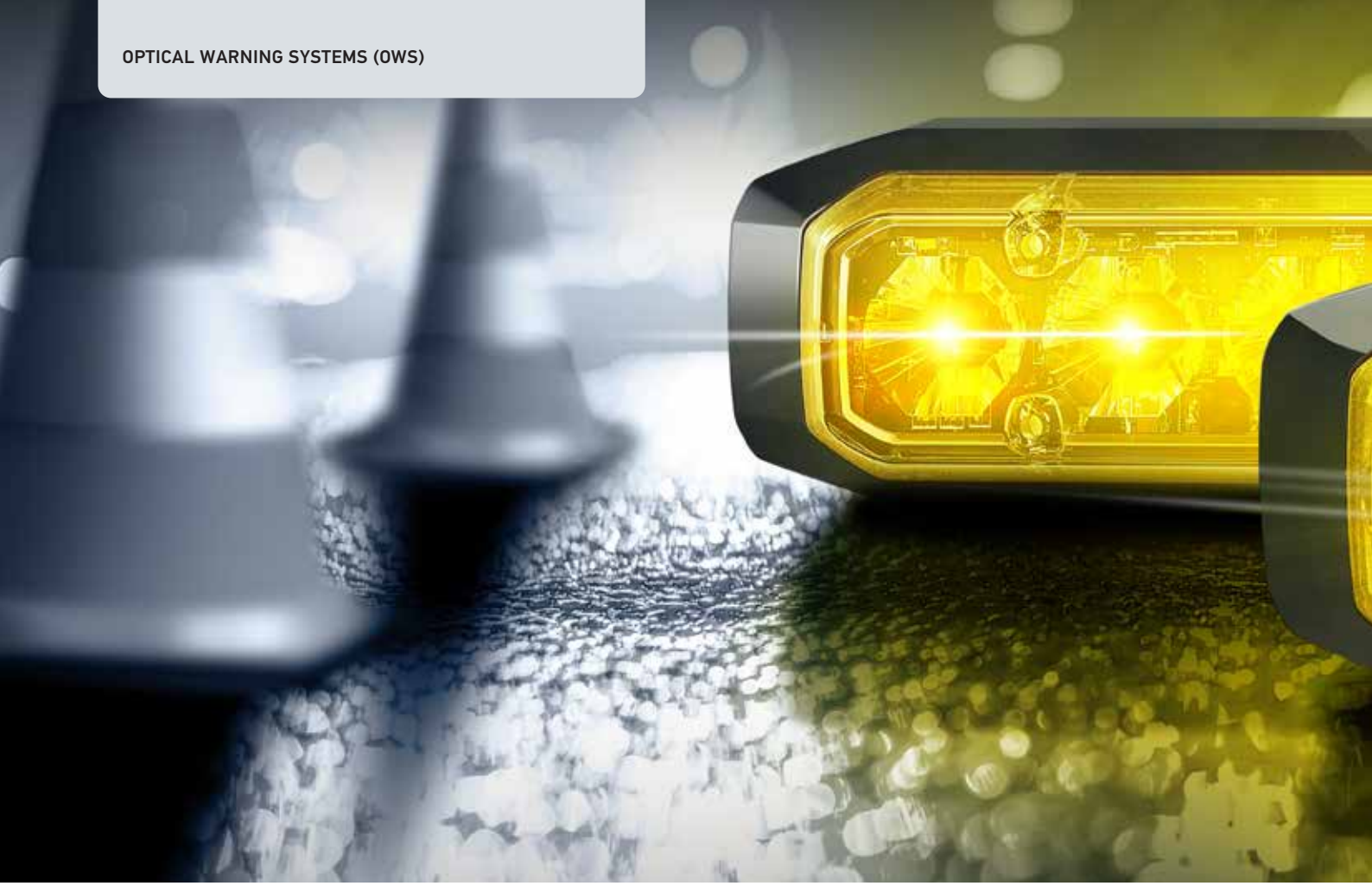
Warning lamp DuraLED	
Multi-voltage 9 to 33 V, amber	**2XD 965 429-021**
Multi-voltage 9 to 33 V, blue	**2XD 965 429-001**

- → 12 high-power LEDs each
- → 8 flashing frequencies can be coded
- → Synchronisation of up to 4 lamps
- → Vibration-proof
- → High-pressure jet cleaner resistant
- → Extremely low current consumption, high efficiency
- → Available in amber or red as well as in 12 V or 24 V
- → Extremely compact dimensions and low weight
- → Multitude of installation options



Technical data		
Rated voltage (U_N)	12 V	24 V
Operating voltage (U_B)	10 – 15 V	24 – 30 V
Current consumption	0.70 A	0.35 A
Interference suppression	Conducted Class 5 (CISPR 25)	
Flashing frequency	2 Hz	
Operating temperature	-40°C to +60°C	
Polarity reversal protection	Fuse	
Protection class	IP 5K4K, IP 9K	
Type approval		
EMC protection	e1 023686	

Warning lamp WL-LED	
12 V, amber, without installation frame	**2XD 008 997-011**
12 V, amber, with installation frame	**2XD 008 997-211**
24 V, amber, without installation frame	**2XD 009 048-011**
24 V, amber, with installation frame	**2XD 009 048-211**
Accessories	
Angle brackets, 2 pieces, incl. 4 screws optional for mounting, at the side or rear	**9XD 863 533-001**
Installation frame made of black coated aluminum, angle can be adjusted, incl. 4 screws	**9XD 863 828-001**



BST warning lamps

The BST warning lamp is available in different dimensions and surface mounting variants. 3 or 6 power LEDs ensure optimum signal effect. The lamp can be synchronised with two or more units and has different flashing sequence. Alongside the continuous light function, four different flashing patterns can be set and are approved according to the European directive for beacons ECE R65. The warning signal (from simple flashing to quadruple flashing) can be synchronous or alternating. Variants with "1 level" generate a constant brightness level irrespective of the ambient light.

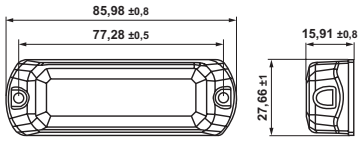
Variants with "day/night mode" adapt their brightness to the ambient light. This ensures increased visibility in the daytime and avoids glare at night. For fixed attachment, the housing is mounted to the vehicle using screws and for bracket mounting, using a bracket. The warning system is also available as a slim variant with an installation height of just 12.8 mm and as a round lamp with a diameter of 28 mm. It is particularly suitable as a warning signal that draws attention and for safeguarding dangerous areas. The product can be mounted horizontally and vertically at different positions around the vehicle depending on the variant.

Standard	The classic auxiliary BST warning lamp is available with 3 or 6 LEDs for horizontal surface mounting and with 6 LEDs for vertical surface mounting. It is installed using screws or a holder.	 BST (3 LED)	 BST (6 LED)	 BST-V (6 LED)
Slim	The flat BST-Slim variant has fixed mounting and its low installation height of just 12.8 mm is impressive. These auxiliary warning lamps are also available as variants with 3 or 6 LEDs.	 BST-Slim (3 LED)	 BST-Slim (6 LED)	 BST-V-Slim (6 LED)
Round	A round version is part of the BST product range. For BST-Round, 4 power LEDs ensure a warning signal that draws attention.	 BST-Round		

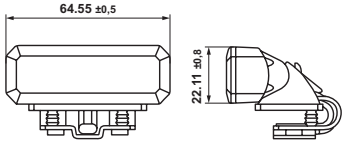
BST warning lamp (3 LED)

For horizontal mounting

Technical data	
	1 level
Rated voltage	Multi-voltage
Operating voltage	11 – 30 V
Operating temperature range	-40°C to +60°C
Protection class	IP 5K4K, IP 9K, IP 6K9K
Overvoltage protection	Yes
Power consumption	7 – 14 W
Current consumption	0.68 A (12 V) 0.34 A (24 V)
Type approval	ECE-R65 XA1
EMC protection	ECE-R10
K approval (Art. 53a, German Road Traffic Licensing Regulations (StVZO))	Yes



Fixed attachment



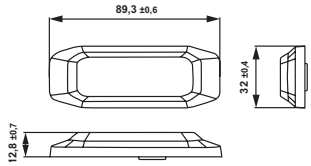
Bracket mounting

BST warning lamp (3 LED)	
Fixed attachment, amber, 1 level, 2 pieces, ECE	**2XD 014 561-201**
Bracket mounting, amber, 1 level, 2 pieces, ECE	**2XD 014 561-401**

BST-Slim warning lamp (3 LED)

For horizontal mounting

Technical data	
	1 level
Rated voltage	Multi-voltage
Operating voltage	11 - 30 V
Operating temperature range	-40°C to +80°C
Protection class	IP X7, IP X9K
Overvoltage protection	Yes
Power consumption	6 - 9 W
Current consumption	0.7 A (12 V) 0.35 A (24 V)
Type approval	ECE-R65 XA1
EMC protection	ECE-R10
K approval (Art. 53a, StVZO)	Yes

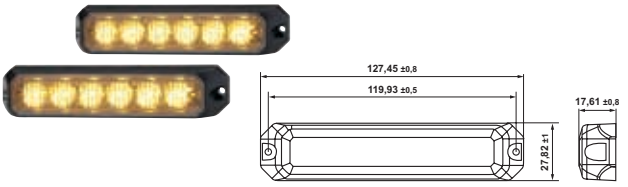


BST-SLIM warning lamp (3 LED)	
Fixed attachment, amber, 1 level, 2 pieces, ECE	**2XD 014 563-201**
Fixed attachment, amber, 1 level, 2 pieces, SAE	**2XD 014 563-401**

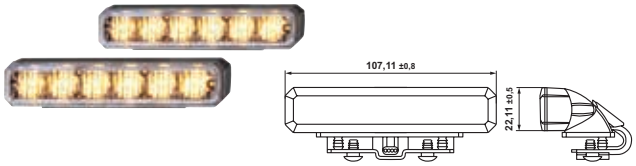
BST warning lamp (6 LED)

For horizontal mounting

Technical data		
	1 level	Day/night mode
Rated voltage	Multi-voltage	
Operating voltage	11 – 30 V	
Operating temperature range	-40°C to +60°C	
Protection class	IP 5K4K, IP 9K, IP 6K9K	
Overvoltage protection	Yes	
Power consumption	7 – 14 W	
Current consumption	"0.78 A (12 V) 0.40 A (24 V)"	"1.1 A (12 V) 0.55 A (24 V)"
Type approval	ECE-R65 XA1	ECE-R65 XA2
EMC protection	ECE-R10	–
K approval (Art. 53a, StVZO)	Yes	



Fixed attachment



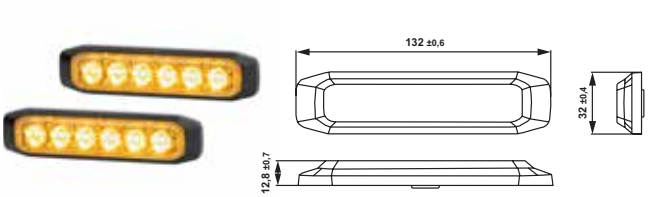
Bracket mounting

BST warning lamp (6 LED)	
Fixed attachment, amber, 1 level, 2 pieces, ECE	**2XD 012 160-851**
Fixed attachment, amber, day/night mode, 2 pieces, ECE	**2XD 014 560-201**
Bracket mounting, amber, 1 level, 2 pieces, ECE	**2XD 012 160-861**
Bracket mounting, amber, day/night mode, 2 pieces, ECE	**2XD 014 560-401**

BST-Slim warning lamp (6 LED)

For horizontal mounting

Technical data	
	Day/night mode
Rated voltage	Multi-voltage
Operating voltage	11 – 30 V
Operating temperature range	-40°C to +80°C
Protection class	IP X7, IP X9K
Overvoltage protection	Yes
Power consumption	13 – 17 W
Current consumption	1.4 A (12 V) 0.7 A (24 V)
Type approval	ECE-R65 XA2
EMC protection	ECE-R10
K approval (Art. 53a, StVZO)	Yes



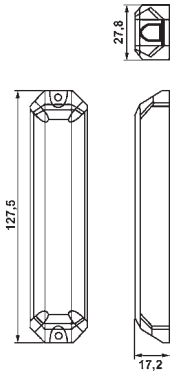
BST-Slim warning lamp (6 LED)	
Fixed attachment, amber, day/night mode, 2 pieces, ECE	**2XD 014 562-201**
Fixed attachment, amber, day/night mode, 2 pieces, SAE	**2XD 014 562-401**

BST-V warning lamp (6 LED)

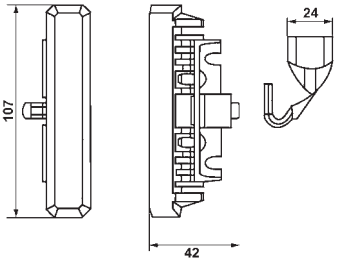
For vertical mounting

Technical data	
	1 level
Rated voltage	Multi-voltage
Operating voltage	11 – 30 V
Operating temperature range	-40°C to +60°C
Protection class	IP 5K4K, IP 9K, IP 6K9K
Overvoltage protection	Yes
Power consumption	7 – 14 W
Current consumption	0.78 A (12 V) 0.40 A (24 V)
Type approval	ECE-R65 XA1
EMC protection	ECE-R10
K approval (Art. 53a, StVZO)	Yes

Fixed attachment



Bracket mounting

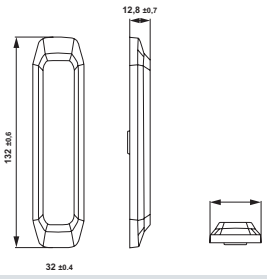


BST-V warning lamp (6 LED)	
Fixed attachment, amber, 1 level, 2 pieces, ECE	**2XD 012 160-951**
Bracket mounting, amber, 1 level, 2 pieces, ECE	**2XD 012 160-961**

BST-V-Slim warning lamp (6 LED)

For vertical mounting

Technical data	
	Day/night mode
Rated voltage	Multi-voltage
Operating voltage	11 – 30 V
Operating temperature range	-40°C to +80°C
Protection class	IP X7, IP X9K
Overvoltage protection	Yes
Power consumption	13 – 17 W
Current consumption	1.4 A (12 V) 0.7 A (24 V)
Type approval	ECE-R65 XA2
EMC protection	ECE-R10
K approval (Art. 53a, StVZO)	Yes

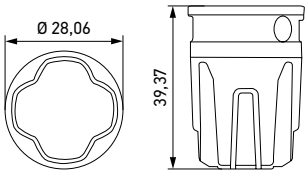


BST-V-Slim warning lamp (6 LED)	
Fixed attachment, amber, day/night mode, 2 pieces, ECE	**2XD 014 592-201**
Fixed attachment, amber, day/night mode, 2 pieces, SAE	**2XD 014 592-401**

BST-Round warning lamp

For integration into vehicle body

Technical data	
	1 level
Rated voltage	Multi-voltage
Operating voltage	11 – 30 V
Operating temperature range	-40°C to +60°C
Protection class	IP 5K4K, IP 9K, IP 6K9K
Overvoltage protection	Yes
Power consumption	7 – 14 W
Current consumption	0.78 A (12 V) 0.40 A (24 V)
Type approval	ECE-R65 XA1
EMC protection	ECE-R10
K approval (Art. 53a, StVZO)	Yes



BST-Round warning lamp	
Amber, day/night mode, 2 pieces, ECE	**2XD 014 564-211**
Amber, day/night mode, 2 pieces, SAE	**2XD 014 564-401**

Working at night or in the early hours of the morning in the dark is no problem – providing you have the right headlamp to work with!

HELLA work lamps generate the right illumination of the working area for every area of application. They have been specifically developed to illuminate as large an area as possible with a soft transition area at the edge.

Work lamps can be installed in the most varied of areas and environments: whether that's in agriculture, on construction vehicles, dangerous goods vehicles, towing vehicles or municipal vehicles.

So that every move is the right one, even in the dark: seeing more means working more precisely and more safely – with HELLA work lamps.

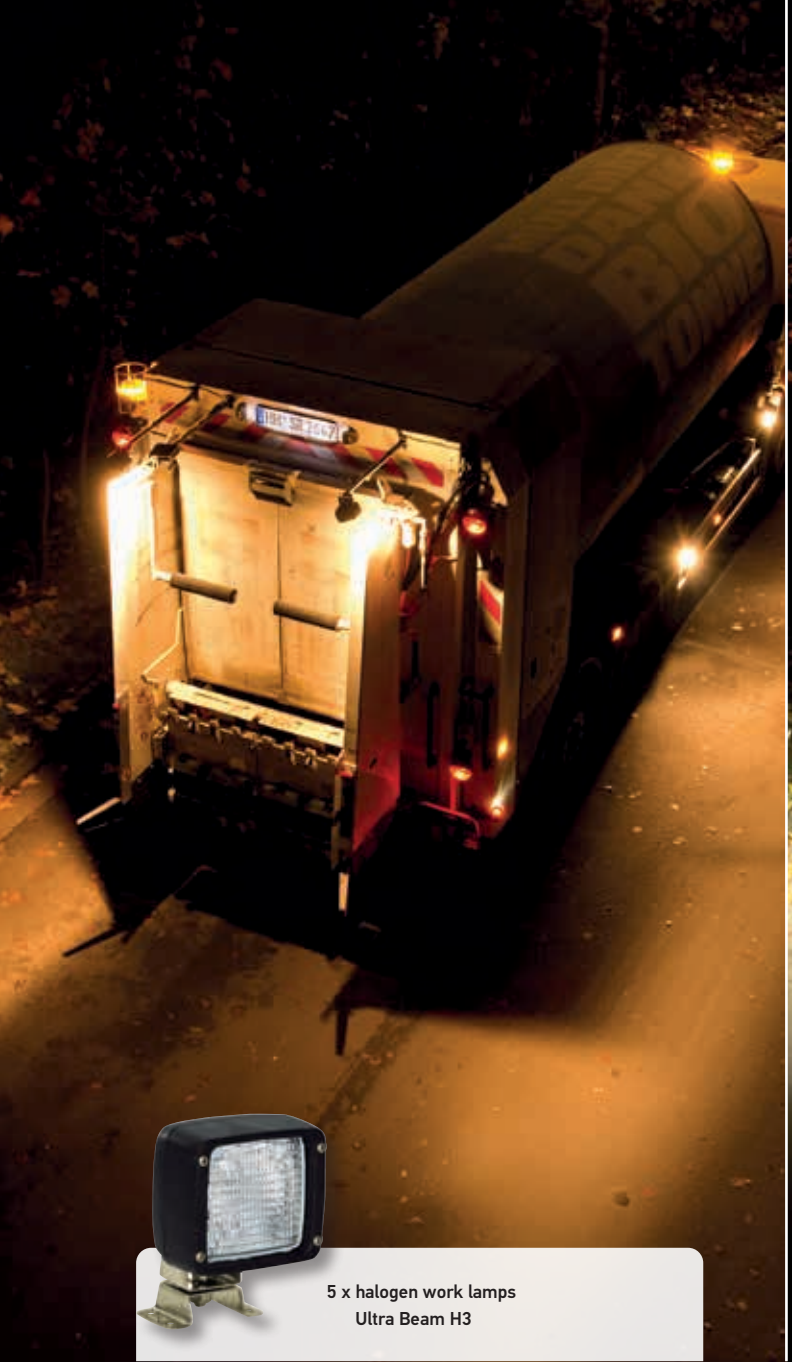
Work lamps – Overview

Product line	Overview of variants		
Power Beam Page 60	 **Power Beam 1000 compact** Light output (measured): 1,000 lumens	 **Power Beam 1500** Light output (measured): 1,300 lumens	 **Power Beam 1800 compact** Light output (measured): 1,850 lumens
Q90 / Eco Page 61	 **Q90 compact LED** Light output (measured): 1,200 lumens	 **ECO18 LED** Light output (measured): 1,350 lumens	 **ECO26 LED** Light output (measured): 2,000 lumens
Ultra Beam Page 62	 **Ultra Beam LED Generation 1** Light output (measured): 2,200 lumens	 **Ultra Beam LED Generation 2** Light output (measured): 4,000 lumens	
RokLUME Page 63	 **RokLUME 280 N** Light output (measured): 4,400 lumens	 **RokLUME 380 N** Light output (measured): 7,800 lumens	
Module 70 Page 64	 **Module 70 LED Generation 3** Light output (measured): 800 lumens	 **Module 70 LED Generation 3.2** Light output (measured): 1,800 lumens	 **Module 70 LED Generation 4** Light output (measured): 2,500 lumens
Module 50 / SL 60 Page 65	 **Module 50 LED** Light output (measured): 800 lumens	 **Module 50 LED Spot** Projection of a warning point	 **SL60 LED** Projection of a warning line
Oval Page 66	 **Oval 100 LED compact** Light output (measured): 1,850 lumens	 **Oval 100 LED Generation 2** Light output (measured): 1,700 lumens	
LED Light Bars Page 67	 **LED Light Bar 350** Light output (measured): 2,200 lumens	 **LED Light Bar 470** Light output (measured): 2,200 lumens	 **RokLUME S700 Diffuse Flood** Light output (measured): 3,600 lumens
Flat Beam / FMS Page 68	 **Flat Beam 500** Light output (measured): 550 lumens	 **Flat Beam 1000** Light output (measured): 1,100 lumens	 **FMS Base / Prime** Light output (measured): 1,200 / 2500 lumens

HELLA quality

Where others save, HELLA invests in the best quality. Attempting to save in the wrong place costs more in the end. That's because inferior headlamps provide less output and often fail. Here you'll see why you can rely on HELLA work lamps.

1	**Surface coating**	High-quality coatings protect against salt and chemicals, and therefore against corrosion.
2	**Thermal management**	The heat from the LEDs is evenly distributed and dissipated via the housing. If there is a risk of overheating, individual LEDs are dimmed automatically.
3	**Electromagnetic compatibility (EMC)**	The LED arrangement of HELLA work lamps and the construction of the reflector ensure that no interference occurs from magnetic fields.
4	**Electrostatic discharge (ESD)**	Before HELLA employees are allowed to enter the LED production area, they have to be statically discharged so that no components can be damaged by charge.
5	**Reverse polarity**	HELLA work lamps are protected against reverse polarity. They cannot be damaged by connecting them incorrectly.
6	**Light distribution via the reflector system**	The reflectors are calculated in such a way to ensure that the working area is evenly illuminated and the light optimally exploited.
7	**Cover lens material**	The cover lens consists of a high-quality, impact and scratch-proof plastic, making it 100% suitable for everyday use. The light exit remains homogeneous even after colliding with a branch or anything similar.
8	**Adhesion**	The work lamps at HELLA are hermetically sealed by high-accuracy adhesive robots. This guarantees that the cover lens is glued at an optimal angle for precisely calculated, optimum luminous efficiency.
9	**Quality of the LEDs**	Only LEDs that have undergone strict tests are used in HELLA work lamps. The screening process guarantees that the LEDs will have an extremely long lifetime of up to 60,000 hours.



5 x halogen work lamps
Ultra Beam H3

5 x LED work lamps
Power Beam 1500 | Page 60

Halogen lighting

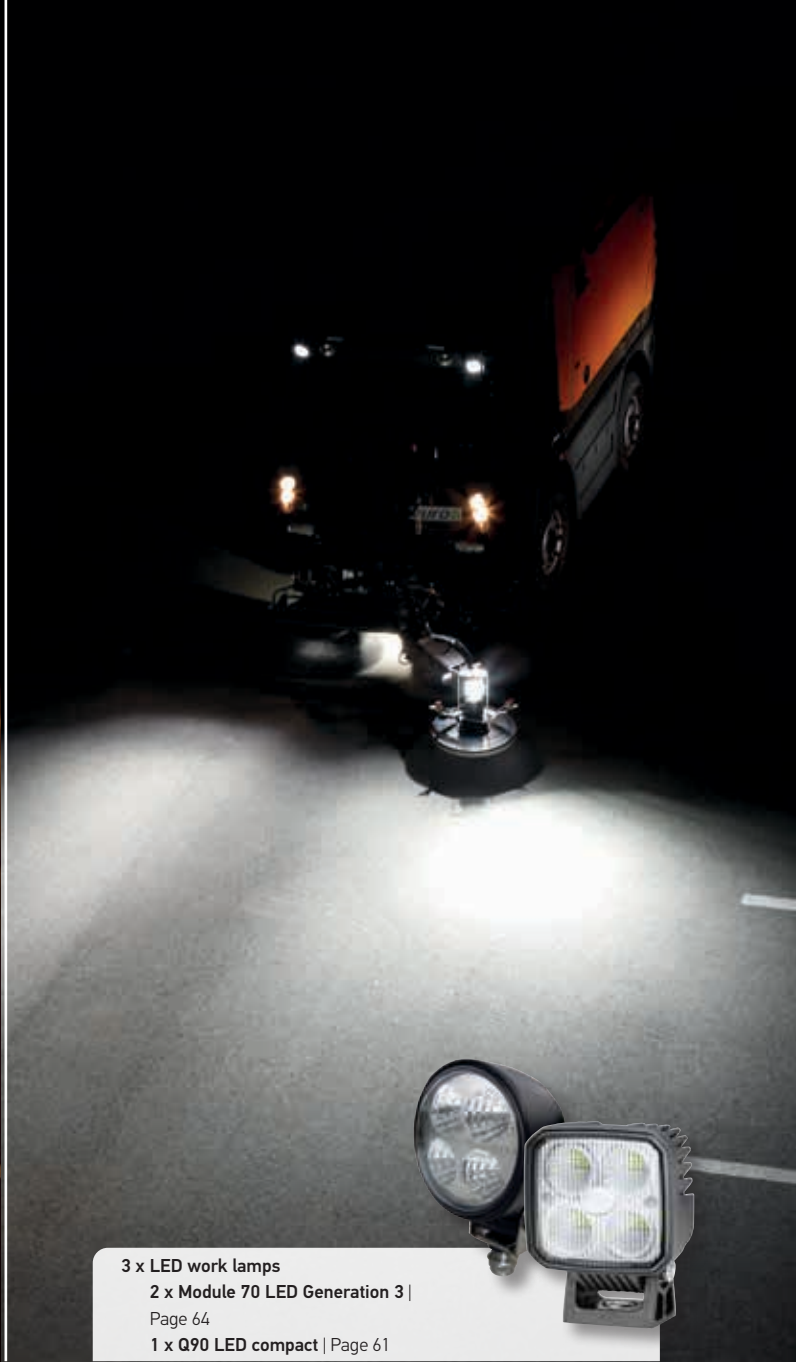
Waste collection vehicle with halogen lighting.
The vehicle is equipped with 3 Ultra Beam H3 work lamps to illuminate the area to the right side of the vehicle. This illumination helps the driver and the passengers identify obstacles and hazardous places in the work area. In addition, 2 HELLA Ultra Beam H3 work lamps are mounted on a telescopic pole (see accessories) at the rear of the vehicle to illuminate the tipping area.

LED lighting

The same waste collection vehicle, but with HELLA LED work lamps. During the conversion, a total of 5 Power Beam 1500 were installed: 3 to illuminate the side and 2 more to illuminate the tipping area. The work lamp is high-pressure jet cleaning resistant (IP 6K9K / IP 67), has an extremely robust housing and features innovative thermal management. This ensures that the LEDs do not overheat, allowing a longer lifetime to be attained.

The conversion to LED technology is not only worthwhile in terms of long-term costs, but it also creates more pleasant working conditions thanks to significantly improved illumination.

2 x halogen work lamps
Module 70 H3



3 x LED work lamps
2 x Module 70 LED Generation 3 | Page 64
1 x Q90 LED compact | Page 61

Halogen lighting

Road sweeper with halogen lighting. The vehicle is fitted with 2 halogen work lamps. Both 70 H3 modules are used to illuminate the area in front of the vehicle. The halogen work lamps are characterised by great robustness, high light output, and homogenous illumination. Halogen bulbs tend to generate less bright light with an obvious amber tinge. Due to the colour temperature (2,500 kelvins), it is quite difficult to detect the cut-off line with a halogen light. The energy consumption of a halogen work lamp is up to 70 watts. A comparable LED work lamp consumes 22 watts.

LED lighting

A comparable road sweeper, but fitted with HELLA LED work lamps. For the conversion, a total of 3 LED work lamps were installed to illuminate the work area.

You can clearly distinguish between the brightness of halogen and LED lamps. The colour temperature of LED light is similar to daylight and is up to 6,500 kelvins: this is significantly more pleasant for the human eye and therefore leads to better quality work at night. Furthermore, the image perfectly demonstrates the extent to which HELLA LED work lamps improve the illumination of the work area.

Tip:
You can watch the product video for the Module 70 LED Generation 3 LED work lamp on YouTube.

Tip:
You can see how a road sweeper is converted to LEDs on YouTube.

Designed for the toughest working conditions!

Thanks to modern technologies developed using our OE know-how, HELLA work lamps can withstand the most challenging environmental conditions. Particularly the sophisticated thermal management within the headlamp makes for a very long lifetime. After all, high-power illumination performance can only go unhindered when the heat is dissipated from the high-power LED headlamps in the best possible way. Go for the best quality and increase your working efficiency. Find out more about the latest work lamp innovations from HELLA here.

CoroSafe coating: for when the going gets really tough.

CoroSafe
New process to combat corrosion
HELLA is setting standards in work lamp durability and resistance with its new CoroSafe coating. The work lamps' resistance is greatly improved by two additional layers of surface coating. The sophisticated combination of different coating methods ensures a high level of corrosion resistance and improved protection against work lamp damage. This means that the housing is well-protected and ideal for use in environments with large amounts of salt and water. CoroSafe is used primarily in HELLA LED work lamps and LED reverse lamps.

Special thermally conductive plastics ensure optimum heat dissipation from the LEDs.

Compact series
A HELLA innovation
The innovative plastic material of the Compact series boasts similar thermal conductivity properties to aluminium. This allows the LEDs to operate using the full power supply even at high ambient temperatures.

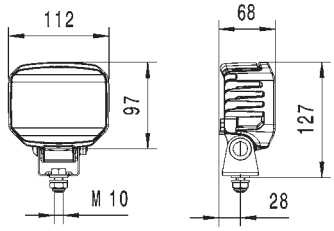
In addition, the Compact scores points with its considerably reduced weight and improved vibration characteristics. Plastic withstands even the toughest conditions and is completely resistant to corrosion, guaranteeing a long headlamp lifetime.

Improved operational safety thanks to a highly luminous and innovative projection system from HELLA
Our most recent development has enabled us to develop, for the first time, a projection module of such great luminous intensity that it is even optimal in the daylight. Thanks to the special lens optics, developed by HELLA, it is possible to project a customer-specific logo or warning light onto ground. This optically warns other vehicles or passengers, raises attention or visually demarcates certain work areas.

LED work lamps

Power Beam 1000 compact

Light output (measured): 1,000 lumens, power requirement: 12 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, heat-conductive plastic housing, ADR / GGVS tested, upright/pendant mounting.



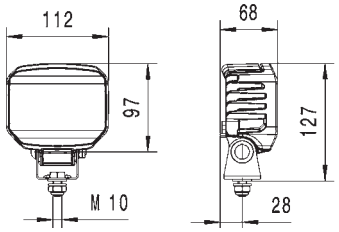
1GA 996 188- ...	-501	-511
Operating voltage	10.5 – 32 V	10.5 – 32 V
Close-range illumination	■	–
Long-range illumination	–	■
Connection	DT connector	DT connector

As reverse light **2ZR 996 188-521**.

Power Beam 1500

Light output (measured): 1,300 lumens, power requirement: 22 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/submersible), ECE R10 approval, high-quality aluminium housing., ADR tested.

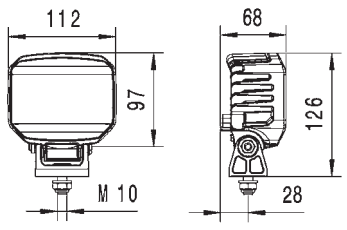
Also available with an orange cover lens: optimal for use in areas where normal LED work lamps could cause glare.



1GA 996 288- ...	-001	-011	-041
Operating voltage	9 – 33 V	9 – 33 V	9 – 33 V
Close-range illumination	–	■	–
Long-range illumination	■	–	■
Connection	DT connector	DT connector	DT connector
More features	–	–	Orange cover lens

Power Beam 1800 compact

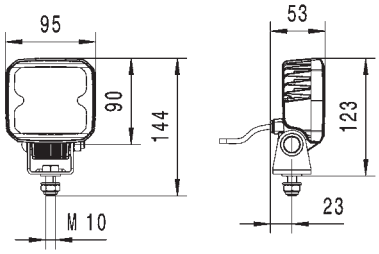
Light output (measured): 1,850 lumens, power requirement: 32 watts, colour temperature: 6,500 kelvins, only to be operated with 24 V operating voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, heat conductive plastic housing.



1GA 996 488-...	-001	-011
Operating voltage	10.5 – 32 V	10.5 – 32 V
Close-range illumination	■	–
Long-range illumination	–	■
Connection	DT connector	DT connector

Q90 compact LED

Light output (measured): 1,200 lumens, power requirement: 15 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, heat conductive plastic housing.

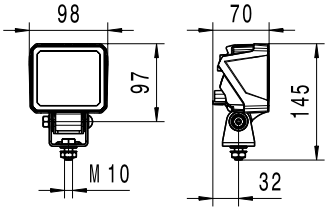


1GA 996 284-...	-001	-011	-081	-091
Operating voltage	9 – 32 V	9 – 32 V	9 – 32 V	9 – 32 V
Close-range illumination	■	–	■	–
Long-range illumination	–	■	–	■
Connection	500 mm cable	500 mm cable	150 mm cable and DT connector	150 mm cable and DT connector
More features	–	–	ADR / GGVSEB tested	ADR / GGVSEB tested

As reverse light **2ZR 996 284-501**.

ECO18 LED

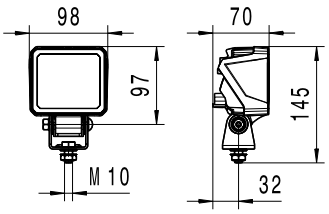
Light output (measured): 1,350 lumens, power requirement: 18 watts, colour temperature: 6,500/5,000 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, high-quality aluminium housing, upright/ pendant mounting.



1GA 996 479-...	-001	-021	-011	-031
Operating voltage	10.5 – 32 V	10.5 – 32 V	10.5 – 32 V	10.5 – 32 V
Close-range illumination	■	■	–	–
Long-range illumination	–	–	■	■
Connection	500 mm cable	DT connector	500 mm cable	DT connector

ECO26 LED

Light output (measured): 2,000 lumens, power requirement: 26 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K7 (high-pressure jet cleaning resistant/submersible), ECE R10 approval, high-quality aluminium housing, upright/ pendant mounting.



1GA 996 579-...	-001	-021	-011	-031
Operating voltage	10.5 – 32 V	10.5 – 32 V	10.5 – 32 V	10.5 – 32 V
Close-range illumination	■	■	–	–
Long-range illumination	–	–	■	■
Connection	500 mm cable	DT connector	500 mm cable	DT connector

LED work lamps

Ultra Beam LED Generation 1

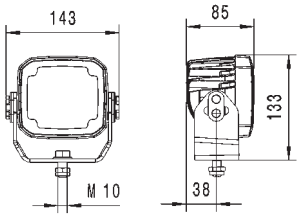
Light output (measured): 2,200 lumens, power requirement: 30 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/submersible), ECE R10 approval, high-quality aluminium housing, ADR/GGVS tested.

1GA 995 506-...	-001	-011	-031	-081
Operating voltage	9 – 32 V	9 – 32 V	9 – 32 V	9 – 32 V
Close-range illumination	■	■	–	■
Long-range illumination	–	–	■	–
Upright mounting	■	■	–	■
Pendant mounting	–	–	■	■
Connection	DT connector	DT connector	DT connector	DT connector
More features	–	–	Extra wide illumination	Heavy duty surrounding bracket

Ultra Beam LED Generation 2

Light output (measured): 4,000 lumens, power requirement: 56 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/submersible), ECE R10 approval, high-quality aluminium housing, 300 mm cable and DT connector.

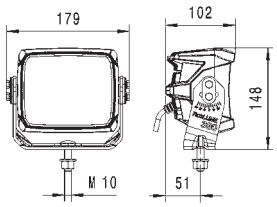
1GA 995 606-...	-001	-011	-071	-081	-171	-021
Operating voltage	9 – 32 V	9 – 32 V	9 – 32 V	9 – 32 V	9 – 32 V	9 – 32 V
ZEROGLARE	–	–	–	–	■	–
Close-range illumination	■	–	■	–	–	–
Long-range illumination	–	■	–	■	–	–
Spot illumination	–	–	–	–	–	■
Connection	DT connector	DT connector	DT connector	DT connector	DT connector	DT connector
More features	–	–	Heavy duty surrounding bracket	Heavy duty surrounding bracket	–	–



RokLUME 280 N

Light output (measured): 4,400 lumens, power requirement: 55 watts, colour temperature: 5,000 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, aluminium die-cast housing "NanoSafe non-stick easy to clean" – surface coating. Version with **ZERO**GLARE technology available.

1GA 995 606-...	**-501**	**-511**	**-541**	**-521**	**-751**
Operating voltage	9 – 32 V	9 – 32 V	9 – 32 V	9 – 32 V	9 – 32 V
ZEROGLARE	–	–	■	–	–
Close-range illumination	■	–	–	–	–
Long-range illumination	–	■	–	–	–
Spot illumination	–	–	–	■	–
Diffuse Flood	–	–	–	–	■
Connection	DT connector	DT connector	DT connector	DT connector	DT connector
More features	Heavy duty surrounding bracket	Heavy duty surrounding bracket	Heavy duty surrounding bracket	Heavy duty surrounding bracket	Heavy duty surrounding bracket

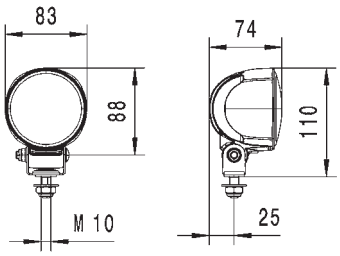


RokLUME 380 N

Light output (measured): 7,800 lumens, power requirement: 84 watts, colour temperature: 5,000 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, aluminium die-cast housing "NanoSafe non-stick easy to clean" – surface coating, 300 mm cable and DT connector.

1GA 996 197-...	**-001**	**-021**	**-011**	**-041**
Operating voltage	20 – 32 V	20 – 32 V	20 – 32 V	20 – 32 V
ZEROGLARE	■	–	–	–
Close-range illumination	–	–	■	–
Long-range illumination	–	■	–	–
Spot illumination	–	–	–	■
Connection	DT connector	DT connector	DT connector	DT connector

LED work lamps

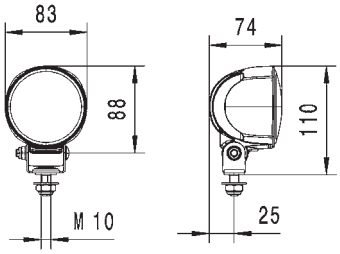


Module 70 LED Generation 3

Light output (measured): 800 lumens, power requirement: 13 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 67 (high-pressure jet cleaning resistant/submersible), ECE R10 approval, high-quality aluminium housing.

Now also available as a reverse lamp (ECE R23).

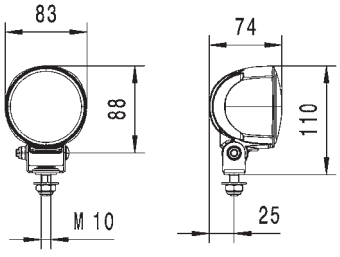
1G0 996 276-...	-451	-461	-481	2ZR 996 376-091
Operating voltage	9 – 32 V	9 – 32 V	9 – 32 V	9 – 32 V
Close-range illumination	■	■	■	–
Extra wide illumination	–	–	■	–
Reverse lamp	–	–	–	■
Connection	2,000 mm cable	2,000 mm cable	190 mm cable + DT connector	2,000 mm cable
More features	–	Pendant surface mounting	Upright mounting	ECE R23 approval



Module 70 LED Generation 3.2

Light output (measured): 1,800 lumens, power requirement: 20 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/submersible), ECE R10 approval, high-quality aluminium housing.

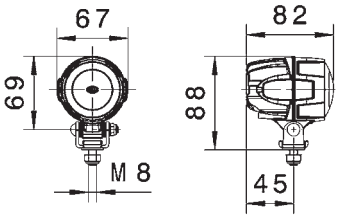
1G0 996 576-...	-001	-011	-031	-041
Operating voltage	9 – 32 V	9 – 32 V	9 – 32 V	9 – 32 V
Close-range illumination	–	–	■	■
Long-range illumination	■	■	–	–
Connection	2,000 mm cable	DT connector	2,000 mm cable	DT connector
More features	Upright/ pendant mounting	Upright/ pendant mounting	Upright/ pendant mounting	Upright/ pendant mounting



Module 70 LED Generation 4

Light output (measured): 2,500 lumens, power requirement: 30 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/submersible), ECE R10 approval, high-quality aluminium housing.

1G0 996 476-...	-001	-011	-031
Operating voltage	9 – 32 V	9 – 32 V	9 – 32 V
Close-range illumination	■	–	■
Long-range illumination	–	■	–
Connection	2,000 mm cable	2,000 mm cable	2,000 mm cable
More features	–	–	Extra wide illumination

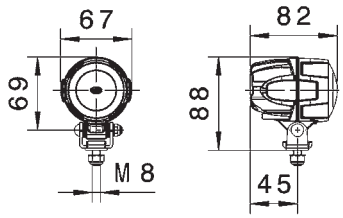


Module 50 LED

Light output (measured): 800 lumens, power requirement: 15 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/submersible), ECE R10 approval, high-quality aluminium housing, ADR/GGVSEB tested.

1G0 995 050-...	-001	-011	-021
Operating voltage	9 – 32 V	9 – 32 V	9 – 32 V
Close-range illumination	■	■	–
Long-range illumination	–	–	■
Connection	DT connector	DT connector	DT connector
More features	Upright mounting	Pendant mounting	Upright mounting

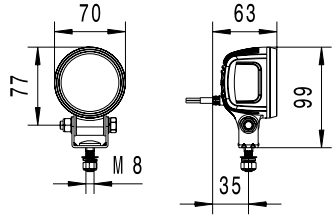
Different light colours available upon request.



Module 50 LED Spot

Power requirement: 15 watts, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, high-quality aluminium housing, ADR/GGVS tested.

1G0 995 050-...	-051	-061	-071	-081
Operating voltage	9 – 52 V	9 – 52 V	9 – 52 V	9 – 52 V
White	■	–	–	–
Blue	–	■	–	–
Green	–	–	■	–
Red	–	–	–	■
Connection	DT connector	DT connector	DT connector	DT connector

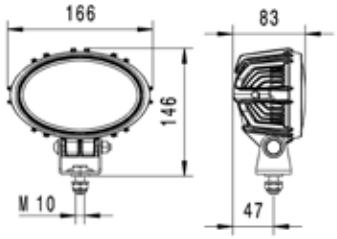


SL60 LED

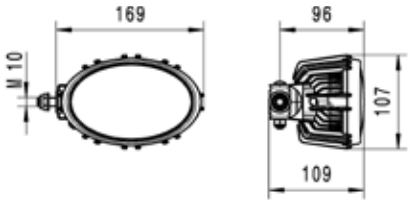
Power requirement: blue 7 watts, red 5.5 watts, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K7 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, high-quality aluminium housing.

1G0 996 210-...	-001	-011
Operating voltage	10 – 80 V	10 – 80 V
Blue	■	–
Red	–	■
Connection	500 mm cable	500 mm cable

LED work lamps



Upright/pendant mounting

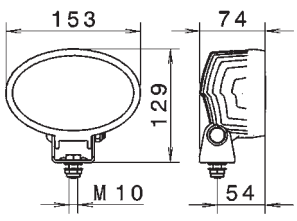


Lateral swivel mounting

Oval 100 LED compact

Light output (measured): 1,850 lumens, power requirement: 26 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, heat conductive plastic housing.

1GA 996 761-...	-101	-111	-171	-191
Operating voltage	10.5 – 32 V	10.5 – 32 V	10.5 – 32 V	10.5 – 32 V
Close-range illumination	■	–	■	–
Long-range illumination	–	■	–	■
Upright/pendant mounting	■	■	–	–
Lateral swivel mounting	–	–	■	■
Connection	DT connector	DT connector	DT connector	DT connector



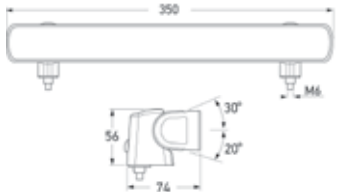
Oval 100 LED Generation 2

Light output (measured): 4,400 lumens, power requirement: 56 watts (12 V), 54 watts (24 V), colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/submersible), ECE R10 approval, high-quality aluminium housing.

1GA 996 761-...	-001	-011
Operating voltage	9 – 32 V	9 – 32 V
Close-range illumination	■	–
Long-range illumination	–	■
Connection	DT connector	DT connector

LED Light Bar 350

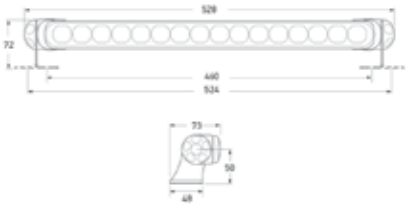
Light output (measured): 2,200 lumens, power requirement: 25 watts, colour temperature: 5,000 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K7 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, heat conductive plastic housing.



1GJ 958 040-...	-501
Operating voltage	9 – 32 V
Close-range illumination	■
Long-range illumination	–
Connection	2,500 mm cable
More features	Flexible bracket width

LED Light Bar 470

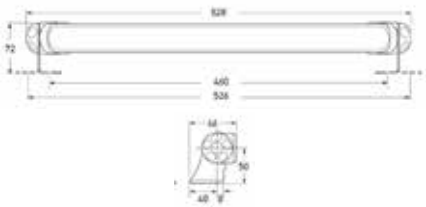
Light output (measured): 2,800 lumens, power requirement: 36 watts, colour temperature: 5,000 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K /IP 6K7, ECE R10 approval and EMV tested, heat conductive plastic housing.



1GJ 958 130-...	-011	-111
Operating voltage	9 – 32 V	9 – 32 V
Close-range illumination	■	–
Long-range illumination	–	■
Connection	2,500 mm cable	2,500 mm cable

LED Light Bar 470 Diffuse Flood

Light output (measured): 3,600 lumens, power requirement: 36 watts, colour temperature: 5,000 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K7/IP 6K9K, ECE R10 approval



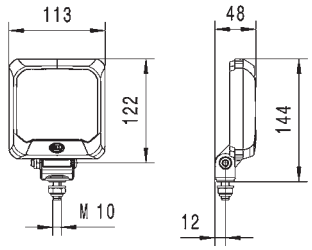
1GJ 958 130-...	-521
Operating voltage	9 – 32 V
Diffuse Flood	■
Connection	2,500 mm cable

LED work lamps

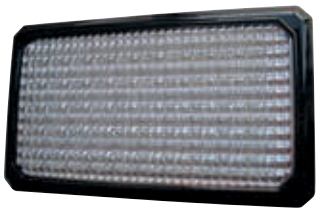
Flat Beam 500

Light output (measured): 550 lumens, power requirement: 7 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K7 (high-pressure jet cleaning resistant/ submersible), overheating protection, impact-resistant plastic housing, ECE approval, 45° illumination as standard.

Good close-range illumination possible even mounted flat to the wall.

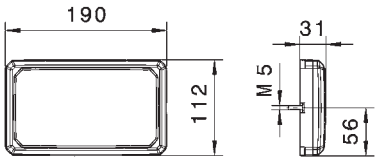


1GA 995 193-...	-001	-021
Operating voltage	9 – 32 V	9 – 32 V
Close-range illumination	■	■
Long-range illumination	–	–
Connection	2,000 mm cable	2,000 mm cable
More features	Standard bracket	Wall-mounting



Flat Beam 1000

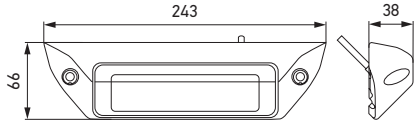
Light output (measured): 1,100 lumens, power requirement: 11 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K7 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, impact-resistant plastic housing. Upright mounting.



1GD 996 193-...	-001	-011	-051
Operating voltage	9 – 32 V	9 – 32 V	9 – 32 V
Close-range illumination	■	■	■
Long-range illumination	–	–	–
Connection	2,000 mm cable	2,000 mm cable	2,000 mm cable
45° illumination	–	–	■
More features	Wall-mounting	Surrounding bracket	Wall-mounting

FMS Base / Prime

Light output (measured): 1,200 lumens (base), 2,500 lumens (prime), power requirement: 14 watts (base), 28 watts (prime), colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure jet cleaning resistant/ submersible), ECE R10 approval, impact-resistant, plastic housing. Upright mounting.



1GD 996 098-...	-001	-011
Model	FMS Base	FMS Prime
Operating voltage	9 – 32 V	9 – 32 V
Close-range illumination	■	■
Long-range illumination	–	–
Connection	500 mm cable	500 mm cable

Improved operational safety thanks to a highly luminous and innovative projection system from HELLA

For us at HELLA, there is nothing better than a happy customer. That is why we put our heart and soul into our work every day and fully commit ourselves to developing new innovative safety solutions and comprehensive services for our customers.

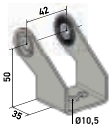
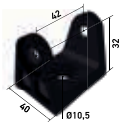
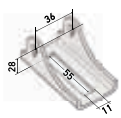
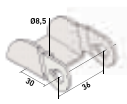
Our most recent development has enabled us to develop, for the first time, a projection module of such great luminous intensity that it is even optimal in the daylight. Thanks to the special lens optics, developed by HELLA, it is possible to project a customer-specific logo or warning light onto the ground, in turn optimally warning other vehicles or passengers, raising attention or visually demarcating certain work areas. This significantly improves operational safety and convenience during routine operations at any time of the day or night.

Especially in the construction industry and in mines, it is important that, when unloading shovels or dumper lorries for example, the danger zone is marked clearly and easily for everyone on site. For lorries, transport for disabled persons or emergency vehicles, the required loading or safety areas, for example, can be marked clearly and unambiguously. There are also many applications for agricultural machinery and municipal vehicles to increase operational safety and convenience during routine operations. Have we got you interested? Contact us and create your personal solution with us.

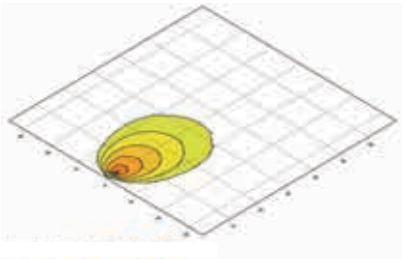
Demarcating a work area

Tip:
You can see our project system application example for waste collection on YouTube.

Accessories

Product photo	Description	Part number
Bracket		
	**Pipe-socket mounting bracket** For combination with 8HG 002 365-001 socket pipe. Suitable for surface mounting with 42 mm bracket width. Electrical contacting within the pipe socket via socket according to DIN 7 2 591.	
	With AMP connector or grommet **Model series:** Halogen: Ultra Beam, Mega Beam and Oval 100	**8HG 990 320-001**
	With DEUTSCH connector or grommet **Model series:** LED: Ultra Beam, Oval 100, Power Beam, and Module 90 Halogen: Ultra Beam	**8HG 990 320-011**
	**Mirror bracket mounting** Rotatable universal bracket for mounting on tubes (diameter: 15 to 25 mm). For replacement on work lamps with 36 mm or 42 mm bracket width.	
	36 mm bracket width **Model series:** Oval 90, Module 70 and Flat Beam 500	**8HG 990 263-111**
	42 mm bracket width **Model series:** Ultra Beam, Mega Beam, Oval 100, Power Beam, Module 90, Q90 LED and AP 1200 LED	**8HG 990 263-131**
	**Magnetic mounting bracket** For work lamps with U-bracket. Includes 2 x magnets and fastening materials. **Model series:** All work lamps with standard bracket	**8HG 004 806-001**
	**Four-point mounting** Made of yellow chrome-plated steel **Model series:** All work lamps with standard bracket	**9XD 990 298-001**
	**Four-point mounting** Made of stainless steel with oblong holes **Model series:** All work lamps with standard bracket	**9XD 130 261-001**
	**Angle bracket** Angle attachment for work lamps with 42 mm bracket width. **Model series:** Ultra Beam, Mega Beam, Oval 100, Power Beam, Module 90, Q90 LED and AP 1200 LED	**9XD 990 298-031**
	**Plastic bracket** Glass-fibre reinforced standard bracket for work lamps. **Model series:** Ultra Beam, Mega Beam, Oval 100, Power Beam, Module 90, Q90 LED and AP 1200 LED	
	42 mm bracket width	**8HG 332 912-002**
	**Standard bracket** With extra space to the rear. **Model series:** Ultra Beam, Mega Beam, Oval 100, Power Beam, Module 90, Q90 LED and AP 1200 LED	
	42 mm bracket width	**8HG 992 377-042**
	**Oblong hole bracket** Special bracket with oblong hole for mounting. **Model series:** Oval 90, Module 70 and Flat Beam 500	
	36 mm bracket width	**8HG 331 414-372**
	**Forked bracket** Special bracket for flat mounting. **Model series:** Oval 90, Module 70 and Flat Beam 500	
	36 mm bracket width	**8HG 994 412-372**
	**Standard bracket with eyelet** Standard bracket for extensions with restricted space to the rear. **Model series:** Ultra Beam, Mega Beam, Oval 100, Double Beam, AS 200, Power Beam, Module 90, Q90 LED and AP 1200 LED	
	42 mm bracket width	**8HG 994 974-002**

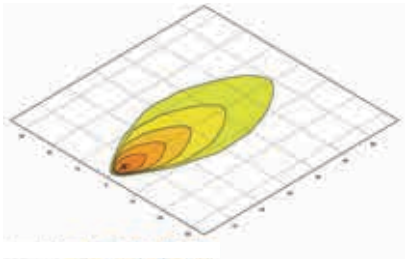
Work lamps – ISOLUX diagrams



Power Beam 1000 compact

Close-range

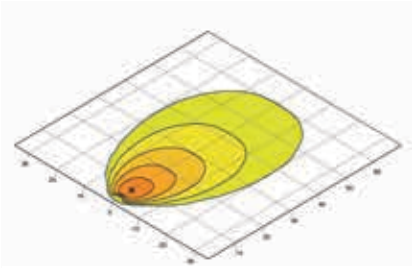
→ Page 60



Power Beam 1500

Close-range

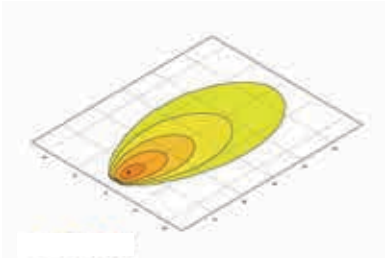
→ Page 60



Power Beam 1800 compact

Close-range

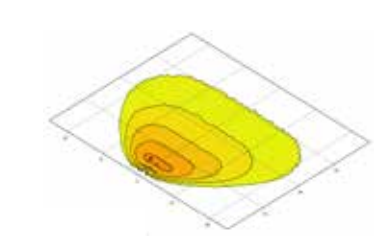
→ Page 60



Q90 LED compact

Close-range

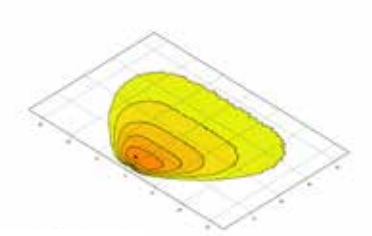
→ Page 61



ECO18 LED

Close-range

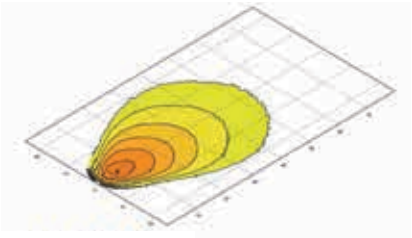
→ Page 61



ECO26 LED

Close-range

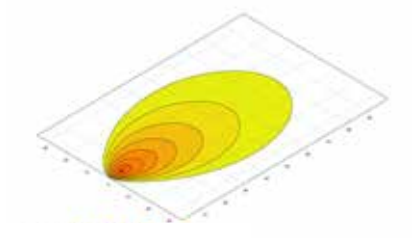
→ Page 61



Ultra Beam LED Generation 1

Close-range

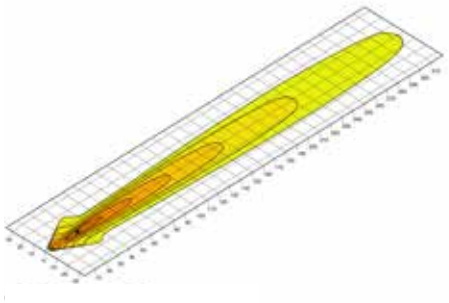
→ Page 62



Ultra Beam LED Generation 2

Close-range

→ Page 62

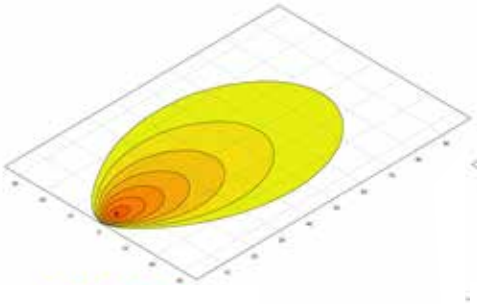


Ultra Beam LED Generation II Spot

Close-range

→ Page 62

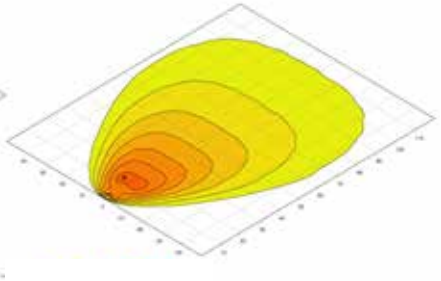
Work lamps – ISOLUX diagrams



RokLUME 280 N

Close-range

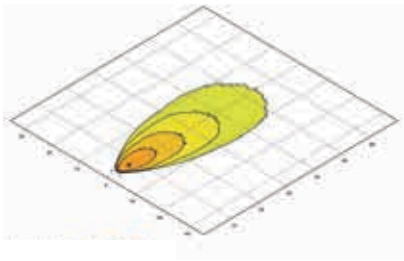
→ Page 63



RokLUME 380 N

Close-range

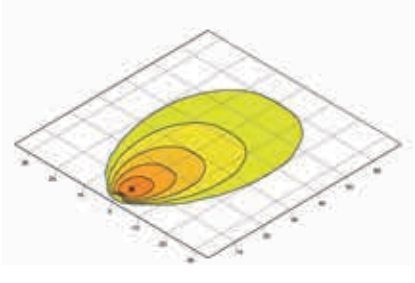
→ Page 63



Module 70 LED Generation 3

Close-range

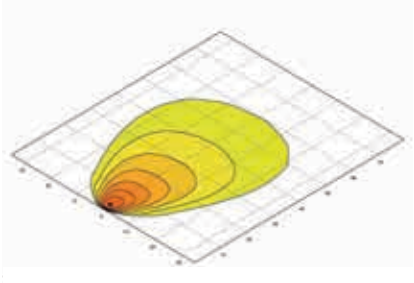
→ Page 64



Module 70 LED Generation 3.2

Close-range

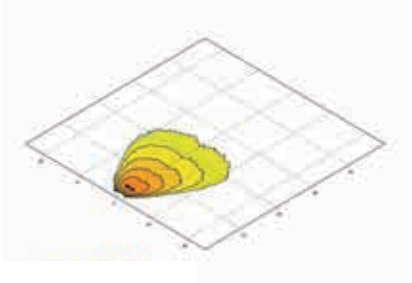
→ Page 64



Module 70 LED Generation 4

Close-range

→ Page 64



Module 50 LED

Close-range

→ Page 65

Module 50 LED Spot

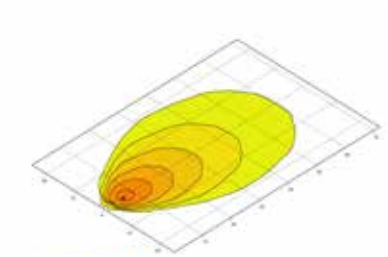
Projection of a warning point

→ Page 65

SL60 LED

Projection of a warning line

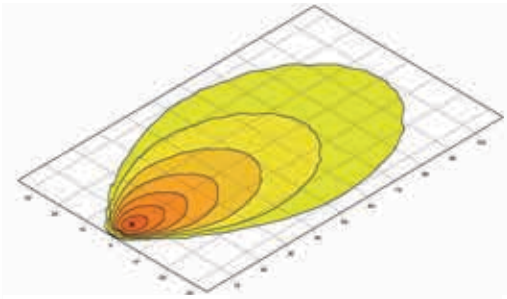
→ Page 65



Oval 100 LED compact

Close-range

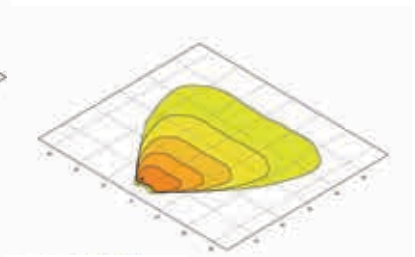
→ Page 66



Oval 100 LED Generation 2

Close-range

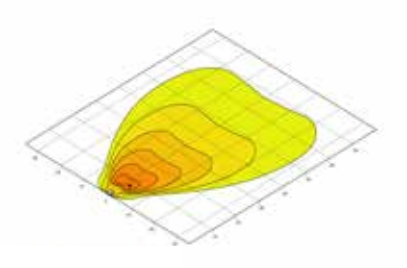
→ Page 66



LED Light Bar 350

Close-range

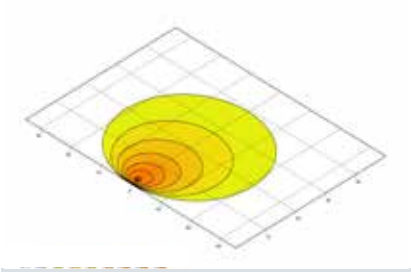
→ Page 67



LED Light Bar 470

Close-range

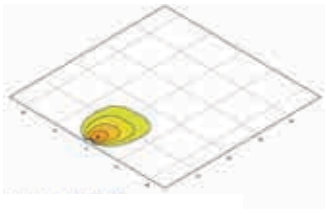
→ Page 67



LED Light Bar 470 Diffuse Flood

Close-range

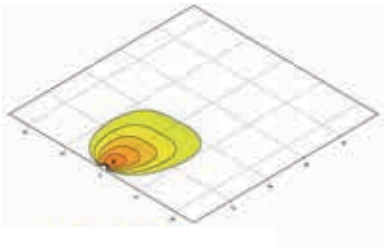
→ Page 67



Flat Beam 500

Close-range

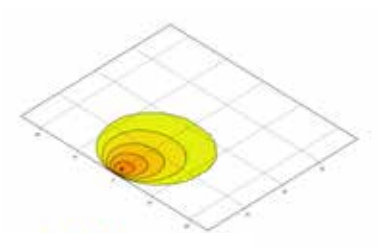
→ Page 68



Flat Beam 1000

Close-range

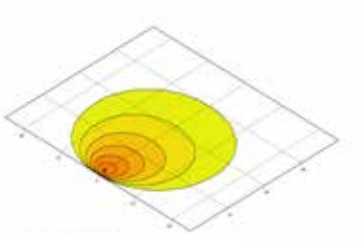
→ Page 68



FMS Base

Close-range

→ Page 68



FMS Prime

Close-range

→ Page 68

LED daytime running lights: safe and economical

Daytime running lights make driving on the roads safer and are becoming mandatory in more and more European countries. Save money now by converting your municipal commercial vehicles to ensure that you have the decisive advantage when it comes to safety.

Daytime running lights reduce the risk of accidents compared to low beam because daytime running lamps can be detected much more easily. Your own vehicle is immediately and permanently more visible in road traffic – other road users can see you in good time. In dangerous situations, daytime running lights can provide crucial additional seconds of response time. Furthermore, using daytime running lights means that you no longer have to drive with low beam, significantly reducing fuel consumption without compromising safety.

Daytime running lights do the job: they are safe, efficient, and switch on and off automatically.

Front lighting – Overview

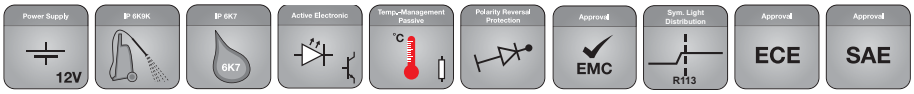
Module headlamp		Low beam	High beam	Low beam and high beam	Fog light
60 mm modules from page 76	LED	 Module 60 LED	 Module 60 LED		
	Halogen	 Module 60	 Module 60		
90 mm modules from page 78	LED	Performance		 Bi-LED L 5570	
		 L 4060	 L 4060	 Bi-LED L 70	 L 4060
		Essential			
		 R 80	 R 80		
	Halogen	Performance			
					
133 mm modules from page 86	LED			  M133 LED	

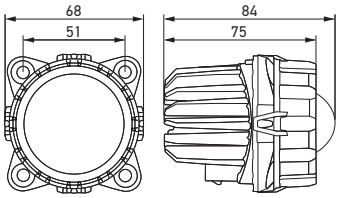
Daytime running lamps, direction indicators and position lamps

Discover more options from page 91, such as daytime running light module chains, direction indicators and our product range for position lamps.

60 mm modules

LED low beam

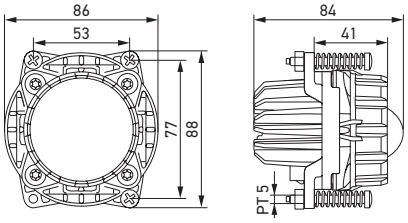




Without carrier frame

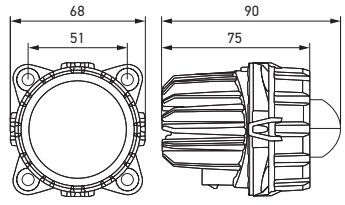
LED low beam headlamp Module 60 LED	
ECE-R113, SAE	**1TL 998 670-021**
ECE R113, SAE, with preassembled carrier frame	**1TL 998 670-041**

Type approval: ECE E4 0311



With carrier frame, vertical
(Horizontal mounting also possible)

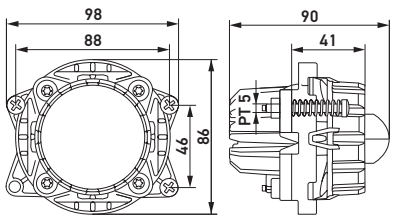
LED high beam



Without carrier frame

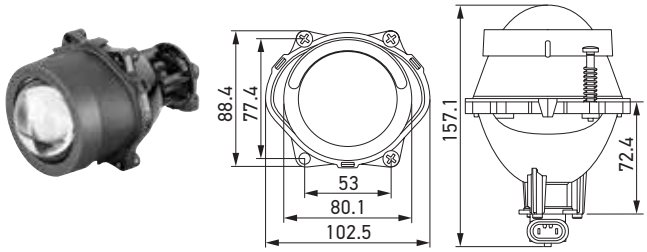
LED high beam headlamp Module 60 LED	
ECE-R113	**1KL 998 670-031**
ECE R113, SAE, with preassembled carrier frame	**1KL 998 670-051**
ECE-R112	**1KL 998 670-017**

Type approval: 1KL 998 670-031/-051: ECE E4 0313,
1KL 998 670-017: ECE E4 0536



With carrier frame, horizontal
(vertical mounting also possible)

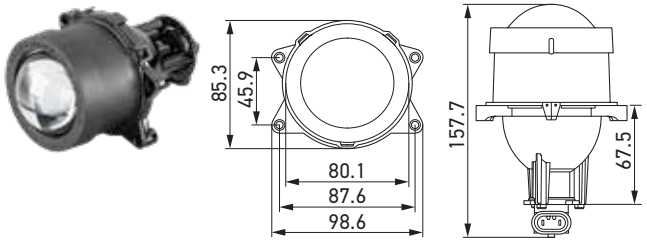
Halogen low beam



Halogen low beam headlamp Module 60	
ECE-R113, SAE	**1TL 998 570-641**
Right-hand traffic, ECE R112, SAE	**1BL 998 570-601**
Left-hand traffic, ECE R112, SAE	**1ML 998 570-611**

Type approval: 1TL 998 570-614: ECE E4 0237

Halogen high beam

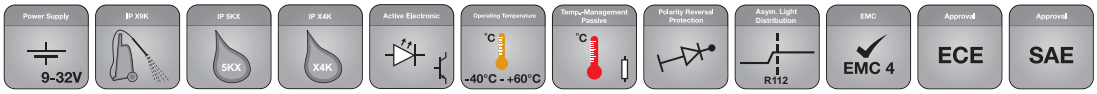


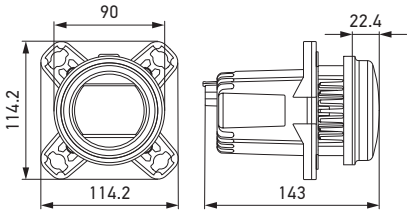
Halogen high beam headlamp Module 60	
ECE R112, SAE, without position light	**1KL 998 570-621**
ECE R112, SAE, with position light	**1KL 998 570-631**

Type approval: 1KL 998 570-621: ECE E4 24910,
1KL 998 570-631: ECE E4 26353

90 mm module/Performance

LED low beam

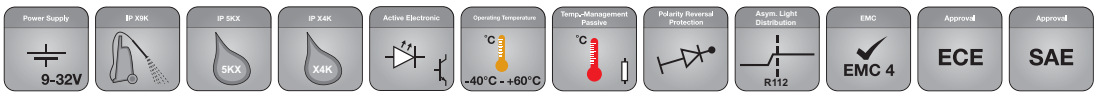


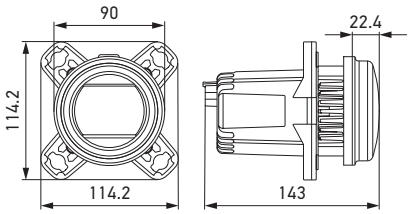


LED low beam headlamp L 4060*	
Right-hand traffic, ECE, SAE, FEP connector	**1BL 012 488-001**
Left-hand traffic, ECE, FEP connector	**1ML 012 488-011**
Right-hand traffic, ECE, SAE, DEUTSCH connector	**1BL 012 488-101**
Left-hand traffic, ECE, DEUTSCH connector	**1ML 012 488-111**

* Mounting set 9XX 254 163-00 and 9XX 254 163-02 included in scope of supply.

Type approval: 1BL 012 488-001: ECE E1 3831,
1BL 012 488-101: ECE E1 3881,
1ML 012 488-011/-111: ECE E1 4090



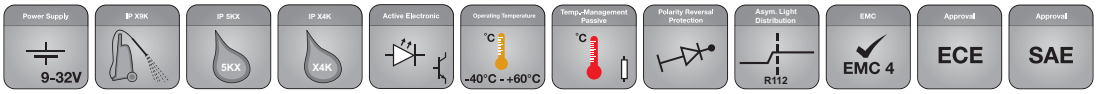


LED low beam headlamp L 4060 with daytime running lights/ position light*	
Right-hand traffic, ECE, SAE, FEP connector	**1BL 012 488-021**
Left-hand traffic, ECE, FEP connector	**1ML 012 488-031**
Right-hand traffic, ECE, SAE, DEUTSCH connector	**1BL 012 488-121**
Left-hand traffic, ECE, DEUTSCH connector	**1ML 012 488-131**
Right-hand traffic, ECE, FEP connector, with fording ability	**1BL 012 488-041**

* Mounting set 9XX 254 163-00 and 9XX 254 163-02 included in scope of supply.

Type approval: 1BL 012 488-021/-041: ECE E1 3831,
1ML 012 488-031/-131: ECE E1 4090,
1BL 012 488-121: ECE E1 3881

LED high beam



LED high beam headlamp L 4060	
With preassembled carrier frame	**1F0 011 988-021**
For Performance mounting	**1F0 011 988-121***

* Mounting set 9XX 254 163-00 and 9XX 254 163-02 included in scope of supply.

Type approval: ECE E1 3831

LED high beam headlamp L 4060 with daytime running lights / position light	
With preassembled carrier frame	**1F0 011 988-031**
For Performance mounting	**1F0 011 988-131***

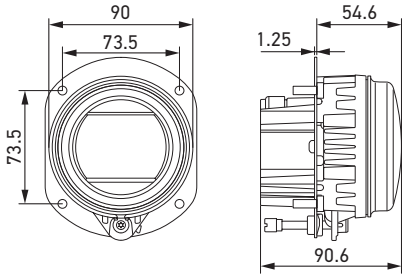
* Mounting set 9XX 254 163-00 and 9XX 254 163-02 included in scope of supply.

Type approval: ECE E1 3831

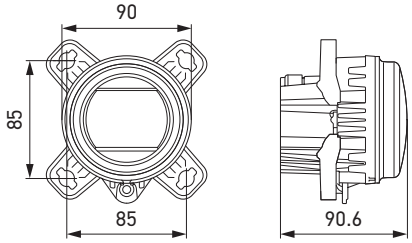
LED high beam headlamp L4060 with direction indicator light	
With pulse generator and preassembled carrier frame	**1F0 011 988-081**
With pulse generator, for Performance mounting	**1F0 011 988-181***
Without pulse generator and with preassembled carrier frame	**1F0 011 988-071**
Without pulse generator, for Performance mounting	**1F0 011 988-171***
With pulse generator, for Performance mounting, with fording ability	**1F0 011 988-191***

* Mounting set 9XX 254 163-00 and 9XX 254 163-02 included in scope of supply.

Type approval: ECE E1 3831



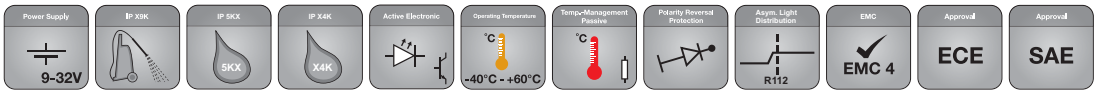
With preassembled carrier frame

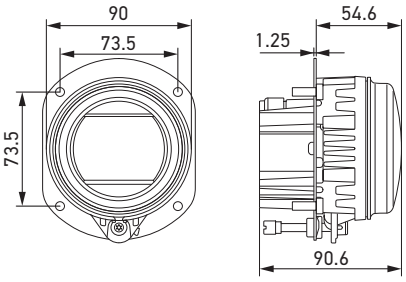


Without carrier frame

90 mm module/Performance

LED fog light

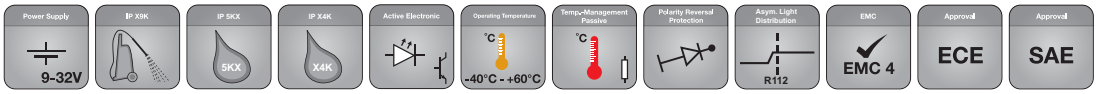


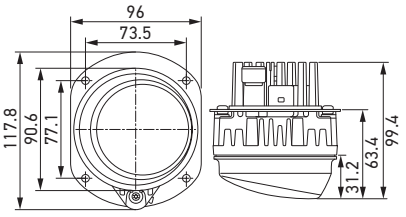


With preassembled carrier frame

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

Type approval: ECE E1 3831





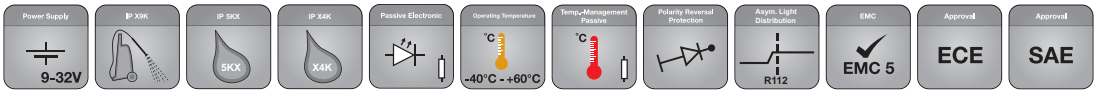
With preassembled carrier frame

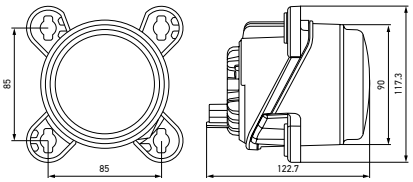
LED fog lamp L 4060 with cornering light	
Left headlamp	**1N0 011 988-051**
Right headlamp	**1N0 011 988-061**
Optional accessories	
Dynamic cornering light control unit, PU: 24	**5DF 009 244-007**
Termination cable LED module control unit Length: 2,600 mm	**8KB 163 160-811**

Type approval: ECE E1 3832

90 mm module/Essential

LED low beam

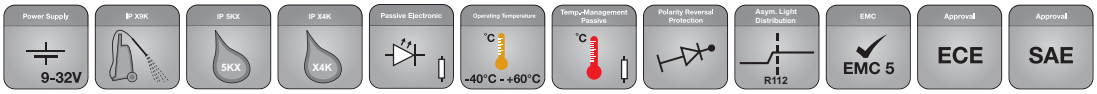


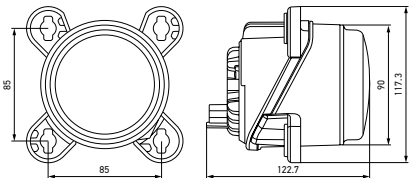


LED low beam headlamp R 80*	
Right-hand traffic, ECE, DEUTSCH connector	**1B0 015 050-001**
Right-hand traffic, SAE, DEUTSCH connector	**1B0 015 050-031**
Left-hand traffic, ECE, DEUTSCH connector	**1M0 015 050-011**
Right-hand traffic, ECE, FEP connector	**1B0 015 050-101**
Right-hand traffic, SAE, FEP connector	**1B0 015 050-131**
Left-hand traffic, ECE, FEP connector	**1M0 015 050-111**

* Mounting set 9XX 254 163-00 not included in scope of supply.

LED high beam



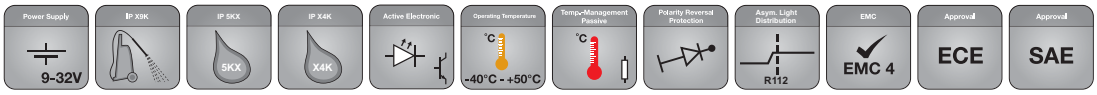


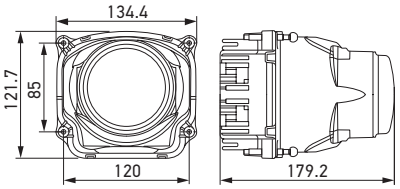
LED high beam headlamp R 80*	
ECE, SAE, DEUTSCH connector	**1K0 015 050-021**
ECE, SAE, FEP connector	**1K0 015 050-121**

* Mounting set 9XX 254 163-00 not included in scope of supply.

90 mm module/Performance

Bi-LED low and high beam



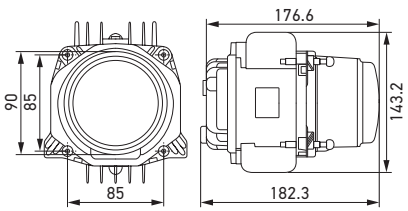


Bi-LED low and high beam headlamp L 5570*	
Right-hand traffic, ECE, 4-pin FEP connector	**1AL 012 758-001**
Left-hand traffic, ECE, 4-pin FEP connector	**1LL 012 758-011**
Right-hand traffic, SAE, 4-pin FEP connector	**1AL 012 758-021**
Right-hand traffic, ECE, 4-pin DEUTSCH connector	**1AL 012 758-101**
Left-hand traffic, ECE, 4-pin DEUTSCH connector	**1LL 012 758-111**
Right-hand traffic, SAE, 4-pin DEUTSCH connector	**1AL 012 758-121**

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.

***** Mounting set 9XX 202 748-00 included in scope of supply.

Type approval: 1AL 012 758-001/-101: ECE (E1) 4208,
1LL 012 758-011/-111: ECE (E1) 4209,



Bi-LED low and high beam headlamp L 70*	
Right-hand traffic, ECE, 3-pin AMP SUPERSEAL connector	**1AL 010 820-021**
Left-hand traffic, ECE, 3-pin AMP SUPERSEAL connector	**1LL 010 820-031**

* Mounting set 9XX 202 748-00 included in scope of supply.

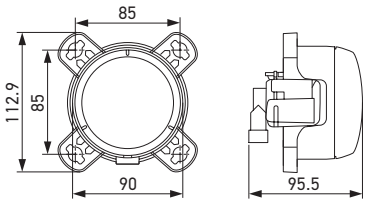
Type approval: 1AL 010 820-021: ECE (E1) 3351, ECE (E1) 6189,
1LL 010 820-031: ECE (E1) 3352, ECE (E1) 6189

LED low beam headlamp L 70*	
Right-hand traffic, ECE, 3-pin AMP SUPERSEAL connector	**1BL 010 820-001**
Left-hand traffic, ECE, 3-pin AMP SUPERSEAL connector	**1ML 010 820-011**

* Mounting set 9XX 202 748-00 included in scope of supply.

Type approval: 1BL 010 820-001: ECE (E1) 3159, ECE (E1) 6189,
1ML 010 820-011: ECE (E1) 3160, ECE (E1) 6189

Halogen high beam

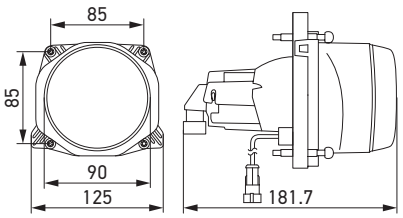


Halogen high beam headlamp	
12 V, with position light, for Performance mounting	**1K0 247 043-007***
12 V, without position light, for Performance mounting	**1K0 247 043-017***
12 V, with position light, for Premium mounting	**1K0 247 043-117****
12 V, without position light, for Premium mounting	**1K0 247 043-127****
24 V, with position light, for Premium mounting	**1K0 247 043-137****
24 V, without position light, for Premium mounting	**1K0 247 043-147****
24 V, with position light, for replacement of Halogen Essential	**1K0 247 043-097*****
24 V, without position light, for replacement of Halogen Essential	**1K0 247 043-107*****

* Mounting set 9XX 254 163-00 included in scope of supply.
** Mounting set 9XX 254 163-02 included in scope of supply.
*** Mounting set 9XX 254 163-01 included in scope of supply.

Type approval: ECE E1 2397

Bi-halogen low and high beam



Bi-halogen low and high beam headlamp	
12 V, H7, right-hand traffic, ECE	**1AL 009 998-001***
12 V, H7, left-hand traffic, ECE	**1LL 009 998-011***
12 V, H9, right-hand traffic, SAE	**1AL 009 998-021****
24 V, H7, right-hand traffic, ECE	**1AL 009 998-041*****
24 V, H7, left-hand traffic, ECE	**1LL 009 998-051*****
24 V, H7, right-hand traffic, ECE, with fording ability	**1AL 009 998-201***
24 V, H7, left-hand traffic, ECE, with fording ability	**1LL 009 998-221***

* Mounting set 9XX 202 748-00 included in scope of supply.
** Mounting set 9XX 169 098-01 included in scope of supply.
*** Mounting set 9XX 169 098-00 included in scope of supply.

Type approval: 1AL 009 998-001/-041/-201: ECE E1 2484,
1LL 009 998-011/-051/-221: ECE E1 2485

90 mm modules
LED accessories

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

Accessory components	Part 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 like-for-like replacement from 009 999 Bi-halogen modules to Bi-LED	**9AH 213 181-001**	Black
Adapter for like-for-like 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 to 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
Lock/ wedge lock	**9NB 201 024-042**	10 pieces
Contact sleeve 0.5 to 1.5 mm^2	**8KW 201 025-112**	50 pieces
Dummy plug	**9NB 201 026-012**	50 pieces
Set packaging (1 connector housing, 1 lock, 5 contact sleeves, 3 dummy plugs)	**8JA 201 022-821**	
Headlamp levelling system		
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
Cornering light accessories		
LED module connecting cable – 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 lights and position light 012 488-021 / -031	Low beam, daytime running lights and position light 012 488-121 / -131	High beam 011 988-021	High beam 011 988-121	High beam, daytime running lights and position light 011 988-031	High beam, daytime running lights 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 lights and position light 011 988-011	Fog light and cornering 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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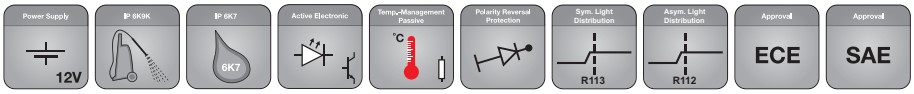
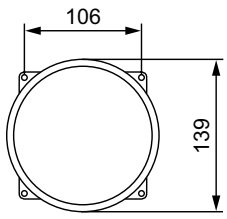
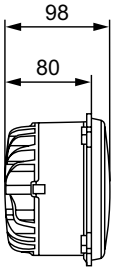
•• = Standard
• = Optional

133 mm modules

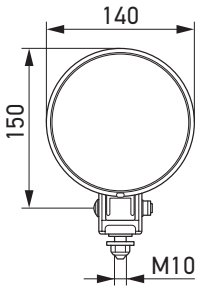
Bi-LED low and high beam

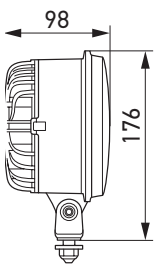






Flush mounting version





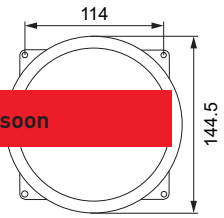
Surface mounting version

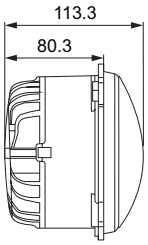
Bi-LED low and high beam headlamp M133 LED, R113	
Simultaneous*, ECE, SAE, flush mounting version	**1S3 996 362-101**
Separated**, ECE, flush mounting version	**1S3 996 362-111**
Simultaneous* with position light, ECE, SAE, flush mounting version	**1S3 996 362-001**
Separated** with position light, ECE, flush mounting version	**1S3 996 362-011**
Simultaneous*, ECE, SAE, surface mounting version	**1S3 996 362-301**
Separated**, ECE, surface mounting version	**1S3 996 362-311**
Simultaneous* with position light, ECE, SAE, surface mounting version	**1S3 996 362-201**
Separated** with position light, ECE, surface mounting version	**1S3 996 362-211**

* Simultaneous control: High beam can only be switched in combination with low beam. Low beam can also be switched on independently. Position light can be switched on at any time.
** Separated control: Low beam and high beam can only be switched separately. Position light can be switched on at any time.

Type approval: 1S3 996 362-101/-001/-301/-201: ECE E1 4989,
1S3 996 362-111/-011/-311/-211: ECE E1 4884

Available soon

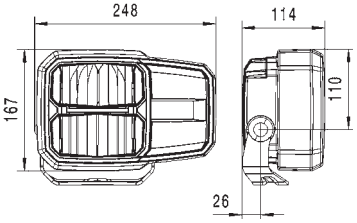




Bi-LED low and high beam headlamp M133 LED, R112	
Separated**, ECE, flush mounting version	**1A3 997 362-037**

** Separated control: Low beam and high beam can only be switched separately. Position light can be switched on at any time.

Combination headlamp



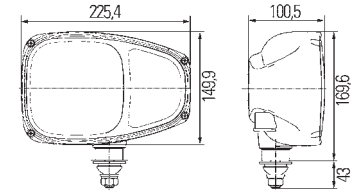
LED combination headlamp C140 LED

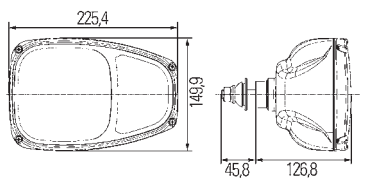
Combination headlamp with LED low and high beam, direction indicator light and position light (implemented as LED light guide), for vertical or horizontal surface mounting, with aluminium die-cast housing, lens made of scratch-proof polycarbonate, with 6-pin DEUTSCH connector, flexible surface mounting via swivelling bracket.

With bracket	
Vertical, right-hand traffic	**1EE 996 374-001**
Horizontal left, right-hand traffic	**1EE 996 374-011**
Horizontal right, right-hand traffic	**1EE 996 374-021**

More variants on request. Products also partially available for left-hand traffic.

Type approval: ECE E1 4079, ECE R112, R6, R7, ECE R10





Combination headlamp C220

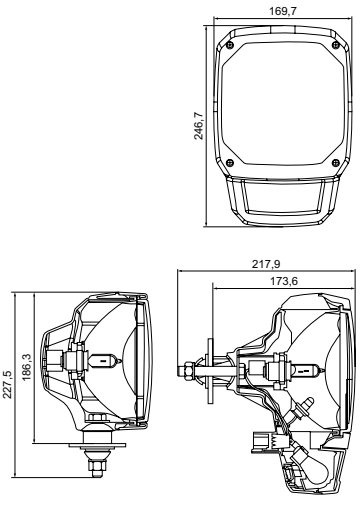
Halogen combination headlamp with H7 low beam, H3 high beam, position light with integrated direction indicator light towards front and rear (Category 1, 1a and 5), for upright mounting or central mounting, light exit 120 mm x 120 mm, with 6-pin DEUTSCH connector.

With lower fastening screw	
12 V, horizontal left, right-hand traffic	**1EE 996 174-251**
12 V, horizontal right, right-hand traffic	**1EE 996 174-261**

With rear central fastening screw	
12 V, horizontal left, right-hand traffic	**1EE 996 174-211**
12 V, horizontal right, right-hand traffic	**1EE 996 174-221**

More variants on request. Products also partially available for left-hand traffic.

Type approval: ECE E4 6556, 11372



Combination headlamp C310

Halogen combination headlamp with H4 low and high beam, P21W direction indicator light and T4W position light, for vertical or horizontal surface mounting, with aluminium die-cast housing, with 6-pin DEUTSCH connector (integrated in housing).

With lower fastening screw	
12 V, horizontal left, right-hand traffic	**1EA 328 450-411**
12 V, horizontal right, right-hand traffic	**1EA 328 450-421**
24 V, horizontal left, right-hand traffic	**1EA 328 450-511**
24 V, horizontal right, right-hand traffic	**1EA 328 450-521**

With rear central fastening screw	
12 V, vertical, right-hand traffic	**1EA 328 450-001**
12 V, horizontal left, right-hand traffic	**1EA 328 450-011**
12 V, horizontal right, right-hand traffic	**1EA 328 450-021**

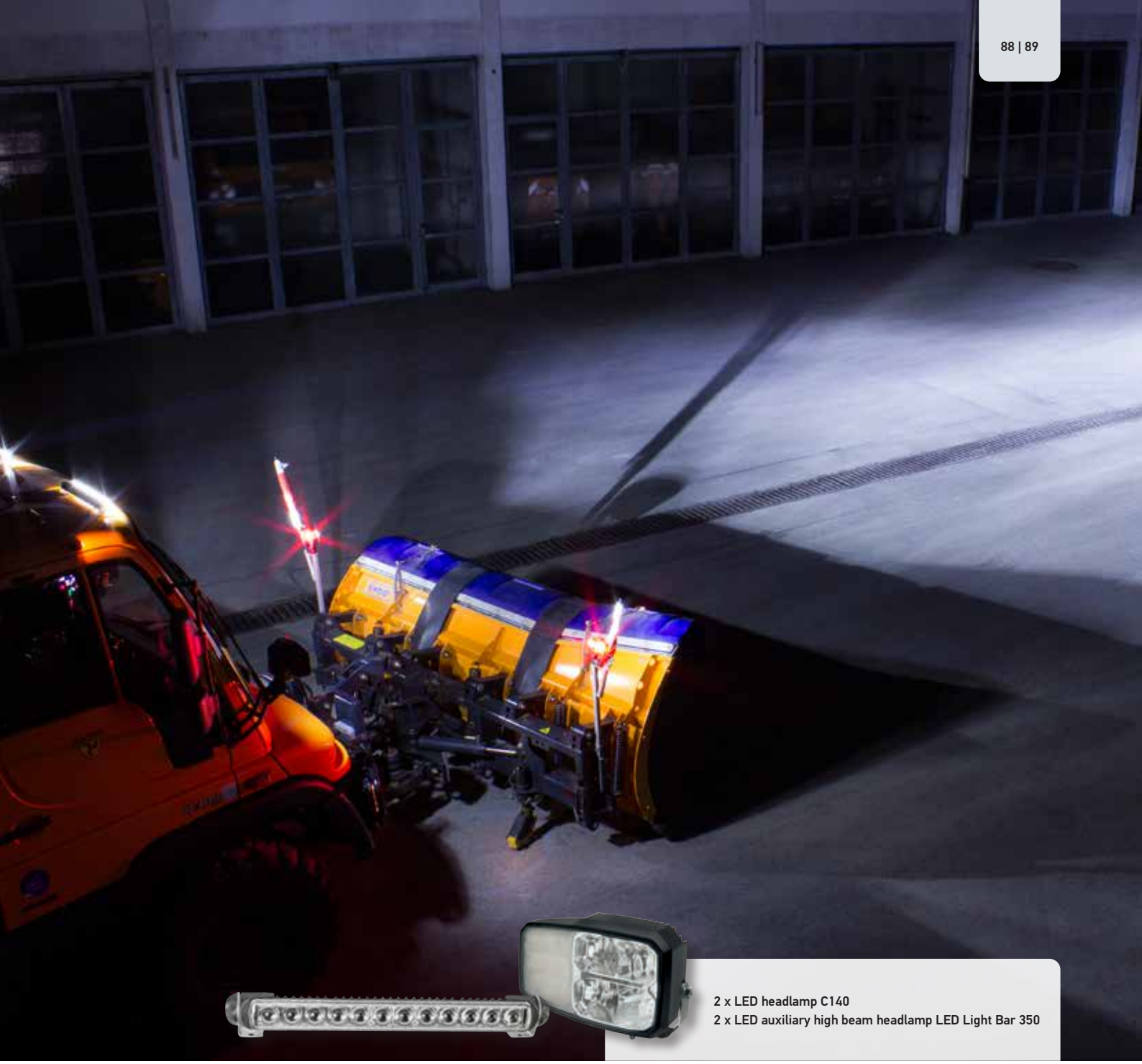
More variants on request. Products also partially available for left-hand traffic.

Type approval: ECE and AIS homologation, E9 16338, R6, R7, R112.00-B

2 x halogen headlamp module 120

Halogen lighting

Unimog with halogen lighting. The vehicle is equipped with 2 halogen headlamps to illuminate the area in front of the vehicle. Halogen bulbs tend to generate less bright light with an obvious amber tinge. It is quite difficult to detect the cut-off line with a halogen light.



2 x LED headlamp C140
2 x LED auxiliary high beam headlamp LED Light Bar 350

LED lighting

The same Unimog but fitted with HELLA LED combination headlamp. For the conversion, a total of 2 x C140 LED headlamps and 2 x LED Light Bar 350 LED auxiliary high beam headlamps were installed. These feature extremely high light output, are extremely robust, and have a long lifetime. The LED Light Bar 350 auxiliary high beam headlamps increase the high-beam range light output and have an impressively low power consumption, low weight and compact design.

Tip:
You can see how a Unimog is converted to LEDs on YouTube.

Daytime running lamps
Legal regulations

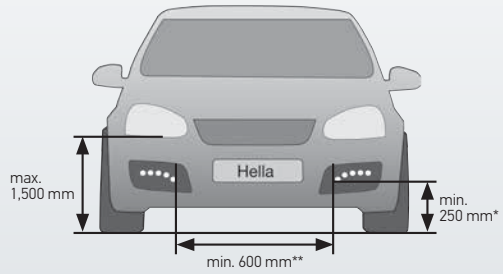
Required by law:

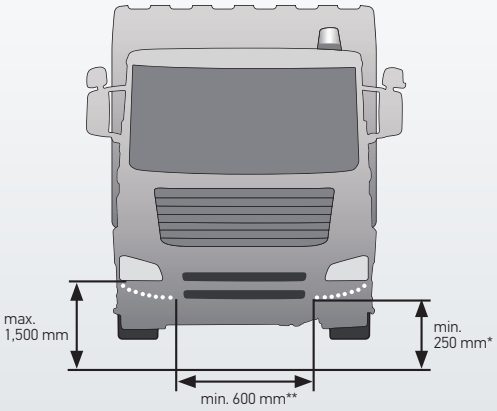
The law has recognised the advantages of daytime running lights:
Since 2012, they have been obligatory for all commercial vehicles newly licenced for use on the roads in EU countries. Various surface mounting variants are permitted. However, mandatory distances and beam angles are specified.

- → When using the daytime running lights as a position lamp, the standard position light has to be permanently deactivated according to ECE R48.
- → 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.

Advantages:

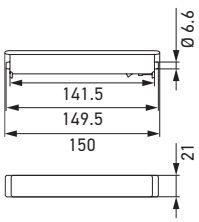
- → Daytime running lights offer you a decisive safety advantage in road traffic and prevent approx. 58 % of accidents with serious injuries.
- → It is significantly easier to detect than normal low beam.
- → Your own visibility is significantly increased.
- → The vehicle is noticed sooner, therefore providing more reaction time in those decisive seconds.
- → Fuel consumption is significantly reduced compared to driving with low beam.





min. = minimum distance | max. = maximum distance

* 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 distance must be at least 400 mm.



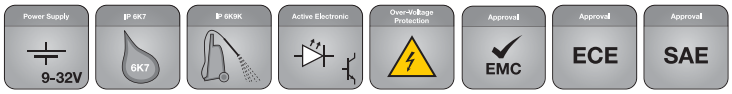
Set of LED daytime running lamps LEDayLine Zero

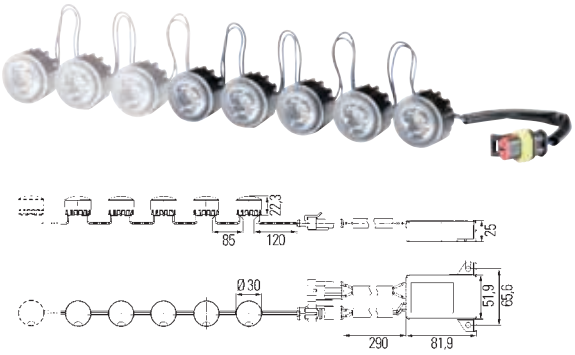
For horizontal flush mounting, 8 high-power LEDs per daytime running lamp, suitable for vehicles without angle, power consumption 2 W, high vibration resistance.

12 V, set of daytime running lamps	**2PT 980 970-821**
24 V, set of daytime running lamps	**2PT 980 970-871**

Type approval: ECE E24 5875

Daytime running lamps





Set of LED daytime running lamps LEDayFlex

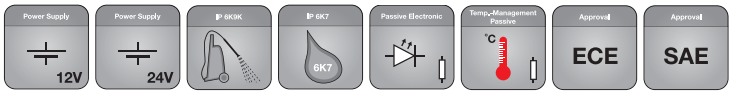
Set consisting of two pre-wired module chains with 5 - 8 round light modules as well as 2 electronics boxes for controlling the daytime running lamps, available with or without position light. The system is connected to the vehicle electrical system via a 3-pin AMP-SUPERSEAL connector.

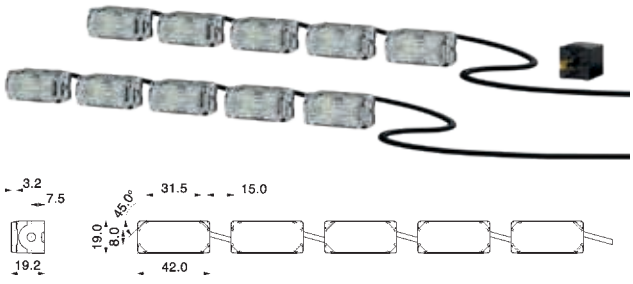
5 LED light modules	**2PT 010 458-701**
5 LED light modules with position light	**2PT 010 458-711**
6 LED light modules	**2PT 010 458-721**
6 LED light modules with position light	**2PT 010 458-731**
7 LED light modules	**2PT 010 458-741**
7 LED light modules with position light	**2PT 010 458-751**
8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

Type approval: ECE E24 5852

Accessories

Wiring harness	**8KA 165 959-001**





Set of LED daytime running lamps LEDayFlex II

LEDayFlex II supplements the system of flexibly interconnected module chains; the 2 square LED daytime running lamp chains with 5 or 6 pre-cabled light modules open up further design options; incl. bracket for screw mounting, positioned above.

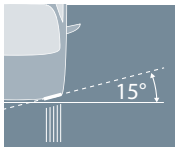
12 V, 5 LED light modules with position light	**2PT 980 789-851**
24 V, 5 LED light modules with position light	**2PT 980 789-901**
12 V, 6 LED light modules with position light	**2PT 980 789-861**
24 V, 6 LED light modules with position light	**2PT 980 789-911**

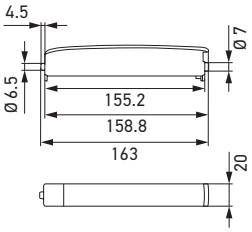
Type approval: ECE E24 5864

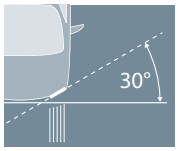
Bracket for screw mounting

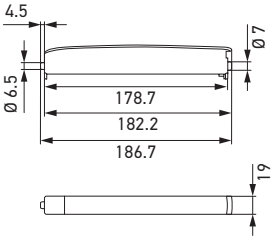
Rear, for 2 x 5-segment module chain	**8HG 980 793-801**
Rear, for 2 x 6-segment module chain	**8HG 980 793-811**
Front, for 2 x 5-segment module chain	**8HG 980 795-801**
Front, for 2 x 6-segment module chain	**8HG 980 795-811**

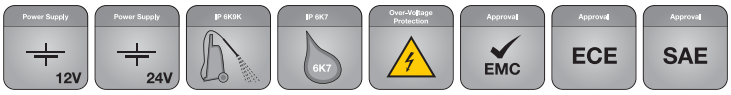
Daytime running lamps, direction indicators and position lamps











LEDayLine with position light

For horizontal flush mounting, 8 LEDs per daytime running lamp, power consumption: 2 W, 2 versions for horizontal flush mounting in various vehicle front ends.

LEDayLine 15
Suitable for vehicles with a 15° angle at the installation location

12 V, lamp module daytime running light/position light	**2PT 980 860-001**
24 V, lamp module daytime running light/position light	**2PT 980 860-501**
Brackets (right/left set)	**8HG 980 864-101**

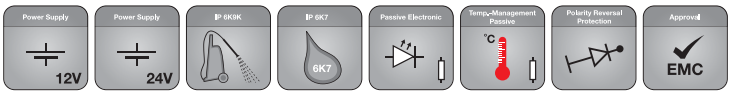
LEDayLine 30
Suitable for vehicles with a 30° angle at the installation location

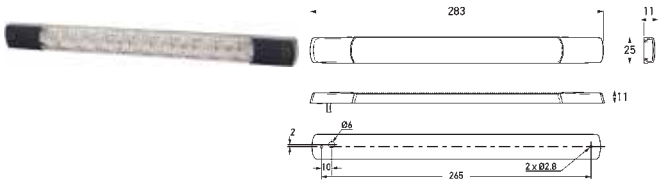
12 V, lamp module daytime running light/position light	**2PT 980 850-001**
Brackets (right/left set)	**8HG 980 854-101**

Control units

12 V, with connecting cables	**8KA 959 186-801**
24 V, with connecting cables	**8KA 959 186-811**

Type approval: 2PT 980 850: ECE E24 5862, 2PT 980 860: ECE E24 5863





LED signal lamp

Low power consumption, lens made from impact-resistant Grilamid, extremely durable, surface mounting variant, high vibration resistance.

Front direction indicator light
Without pulse for direction indicator failure control

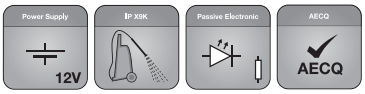
12 V, horizontal mounting: ±45° to lamp and vehicle axis, 2,500 mm cable	**2BA 980 888-311**
24 V, horizontal mounting: ±45° to lamp and vehicle axis, 2,500 mm cable	**2BA 980 888-411**
12 V, vertical mounting: ±45° to lamp and vehicle axis, 2,500 mm cable	**2BA 980 888-511**
24 V, vertical mounting: ±45° to lamp and vehicle axis, 2,500 mm cable	**2BA 980 888-611**

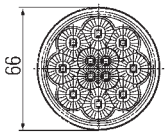
Daytime running lamp/position lamp

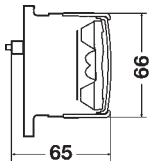
12 V, horizontal mounting, 2,500 mm cable	**2PT 980 880-811**
24 V, horizontal mounting, 2,500 mm cable	**2PT 980 880-861**

Type approval: ECE E24 5869, except 2BA 980 888-511: ECE E24 5890

Daytime running lamps, direction indicators and position lamps





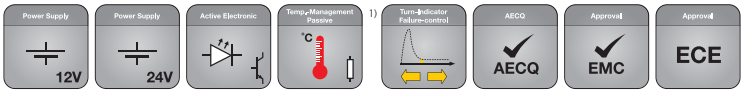


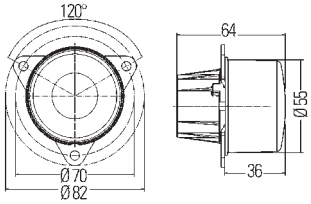
LED direction indicator and position lamp, diameter 66 mm

For flush mounting, with 12 LEDs.

Direction indicator	**2BA 009 001-411**
Position lamp	**2PF 009 001-421**

Type approval: ECE E4 12390





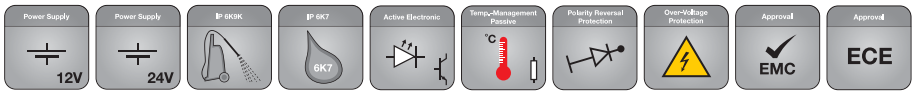
LED direction indicator and position lamp, modular, diameter 55 mm

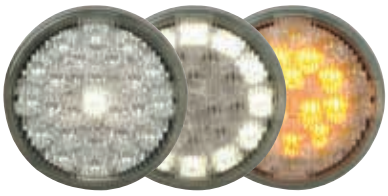
For front flush mounting, clear lens with optics and a 500 mm connecting cable.

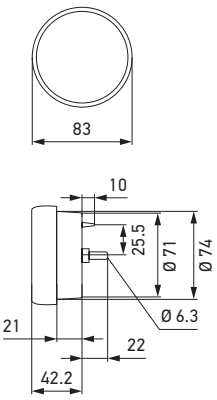
Direction indicator light, without pulse, 12 V	**2BA 011 172-001**
Direction indicator light, without pulse, 24 V	**2BA 011 172-401**
Direction indicator light, with pulse[1)], 12 V	**2BA 011 172-011**
Direction indicator light, with pulse[1)], 24 V	**2BA 011 172-411**

Type approval: ECE E1 3284

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







83 mm LED direction indicator, daytime running and position lamp

83 mm LED 3 function lamp: direction indicator light, position light, daytime running light. The integrated electronics are integrated such that the daytime running lamp switches off during flashing; pre-cabled with 2.5 m sheathed four-wire cable.

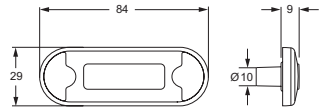
12 V position lamp, daytime running lamp and direction indicator	**2BE 980 691-001**
24 V position lamp, daytime running lamp and direction indicator	**2BE 980 690-001**
24 V position lamp and direction indicator	**2BE 980 690-301**
12 V, daytime running lamp	**2PT 980 691-601**
24 V, daytime running lamp	**2PT 980 690-601**

Type approval: ECE E24 5854

Optional accessories

Adapter ring 90 mm	**9GD 980 696-001**

Position lamps



DuraLED position lamp

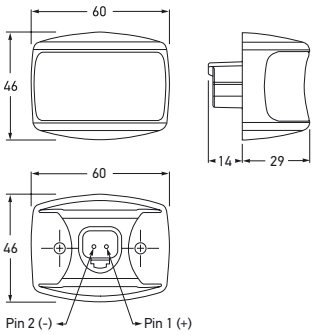
For horizontal or vertical surface mounting, 2 LEDs, power consumption 0.5 W, lens made from impact-resistant Grilamid, extremely durable, slim design, 9 mm profile, surface mounting variant, high vibration resistance.

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

Type approval: ECE E24 5878

Accessories and spare parts

Decorative cover, polished stainless steel (ECE engraving)	**9AB 959 685-201**
Contour seal	**9GD 958 028-001**
Flat, rectangular seal (8 pieces)	**9GD 980 867-507**
Cap for screw top, black (4 pieces)	**9HD 980 858-008**
Cap for screw top, white (4 pieces)	**9HD 980 858-018**

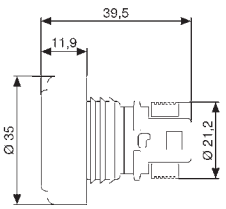


DuraLED marker lamp/position lamp

For horizontal surface mounting, 2 LEDs, power consumption < 1 W, simple installation: Plug & Play, impact-resistant lens made from UV-resistant Grilamid, surface mounting, high vibration resistance, polarity reversal protection.

DEUTSCH connector	**2PF 980 990-221**

Type approval: ECE E24 5892



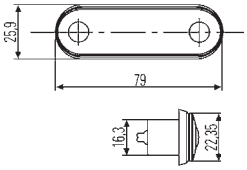
LED position lamp without reflex reflector

For flush mounting, clear lens, black plastic housing with adhesive film for attaching to the body. 2-pin cable, 150 mm, open cable ends, with 2 white LEDs.

12 V / 0.6 W, current consumption = approx. 0.05 A	**2PF 340 825-041**

Type approval: ECE E4 11371

Position lamps

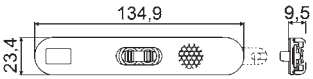


LED position lamp

For horizontal or vertical flush mounting, with 0.5 m cable
12 V/0.5 W, current consumption = approx. 0.04 A

9 – 33 V	**2PF 959 590-202**

Type approval: ECE E24 0054

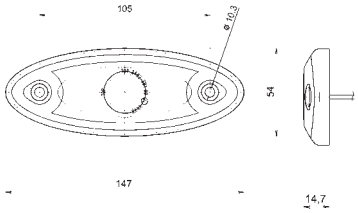


LED position lamp

For surface mounting, self-adhesive with 6.3 mm contacts and mating connector grommet.
Current consumption = 0.04 A

12 V	**2PF 009 226-097**
Mating connector grommet (order separately)	**9GT 186 597-007**

Type approval: ECE E11 3016



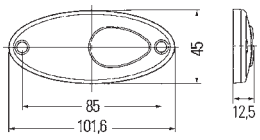
With cable

OneLED position lamp

For horizontal surface mounting, with 500 mm cable, modern night-time design and high level of safety thanks to maximum illumination area.

12 V, with reflex reflector	**2PG 344 690-307**

Type approval: ECE E24 5853

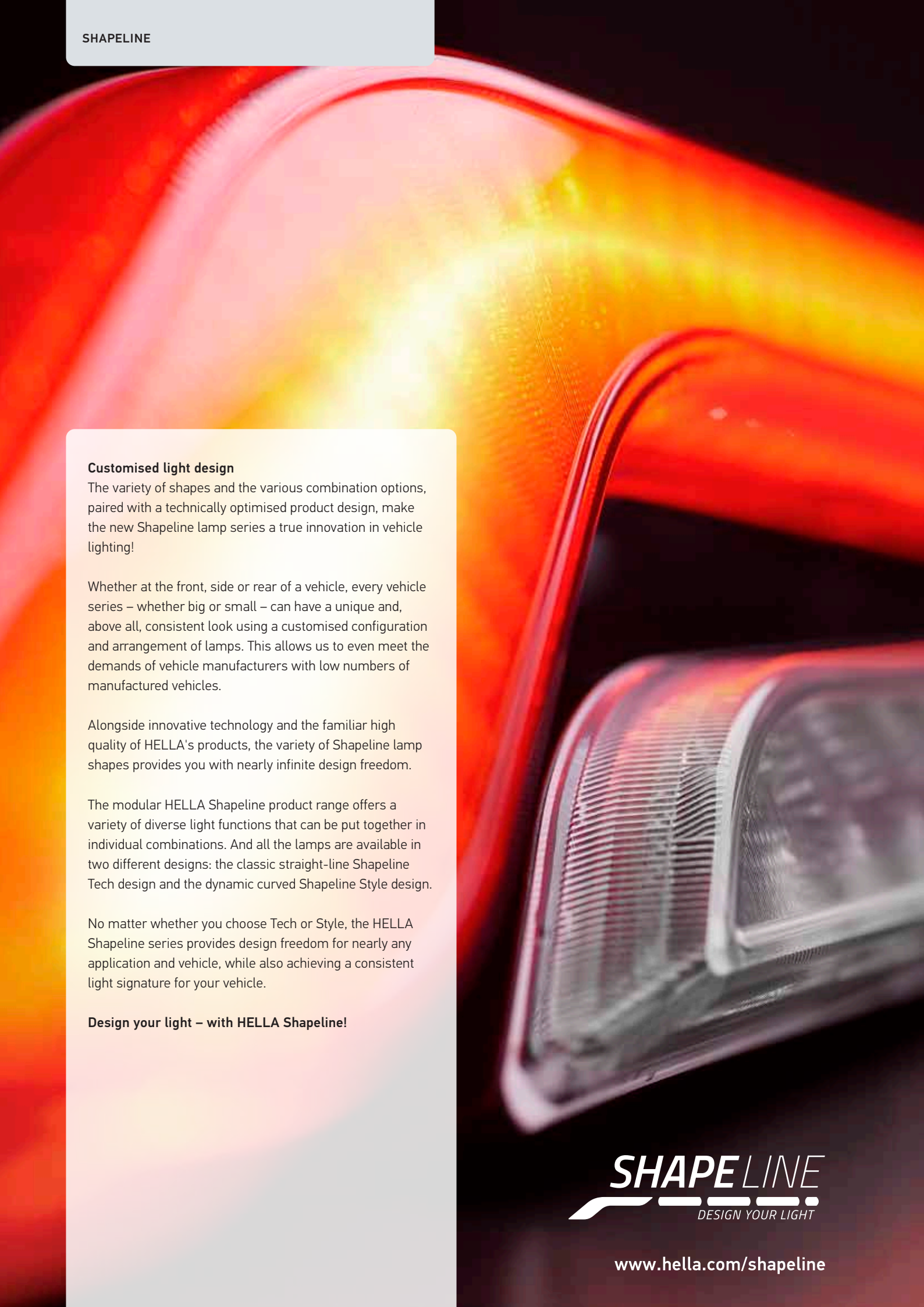


LED position lamp

For horizontal surface mounting, with 2 LEDs, current consumption approx. 0.03 A.

12 V, with reflex reflector	**2PG 964 295-121**

Type approval: ECE E17 0301



Customised light design
The variety 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!

Whether at the front, side or rear of a vehicle, every vehicle series – whether big or small – can have a unique and, above all, consistent look using a customised configuration and arrangement of lamps. This allows us to even meet the demands of vehicle manufacturers with low numbers of manufactured vehicles.

Alongside innovative technology and the familiar high quality of HELLA's products, the variety of Shapeline lamp shapes provides you with nearly infinite design freedom.

The modular HELLA Shapeline product range offers a variety of diverse light functions that can be put together in individual combinations. And all the lamps are available in two different designs: the classic straight-line Shapeline Tech design and the dynamic curved Shapeline Style design.

No matter whether you choose Tech or Style, the HELLA Shapeline series provides design freedom for nearly any application and vehicle, while also achieving a consistent light signature for your vehicle.

Design your light – with HELLA Shapeline!

SHAPELINE
DESIGN YOUR LIGHT

www.hella.com/shapeline

The example shows:

2SB 013 399-031
Tail-stop lamp, Wing

2BA 013 332-051
Direction indicator, Slim

2ZR 013 345-131
Reverse lamp

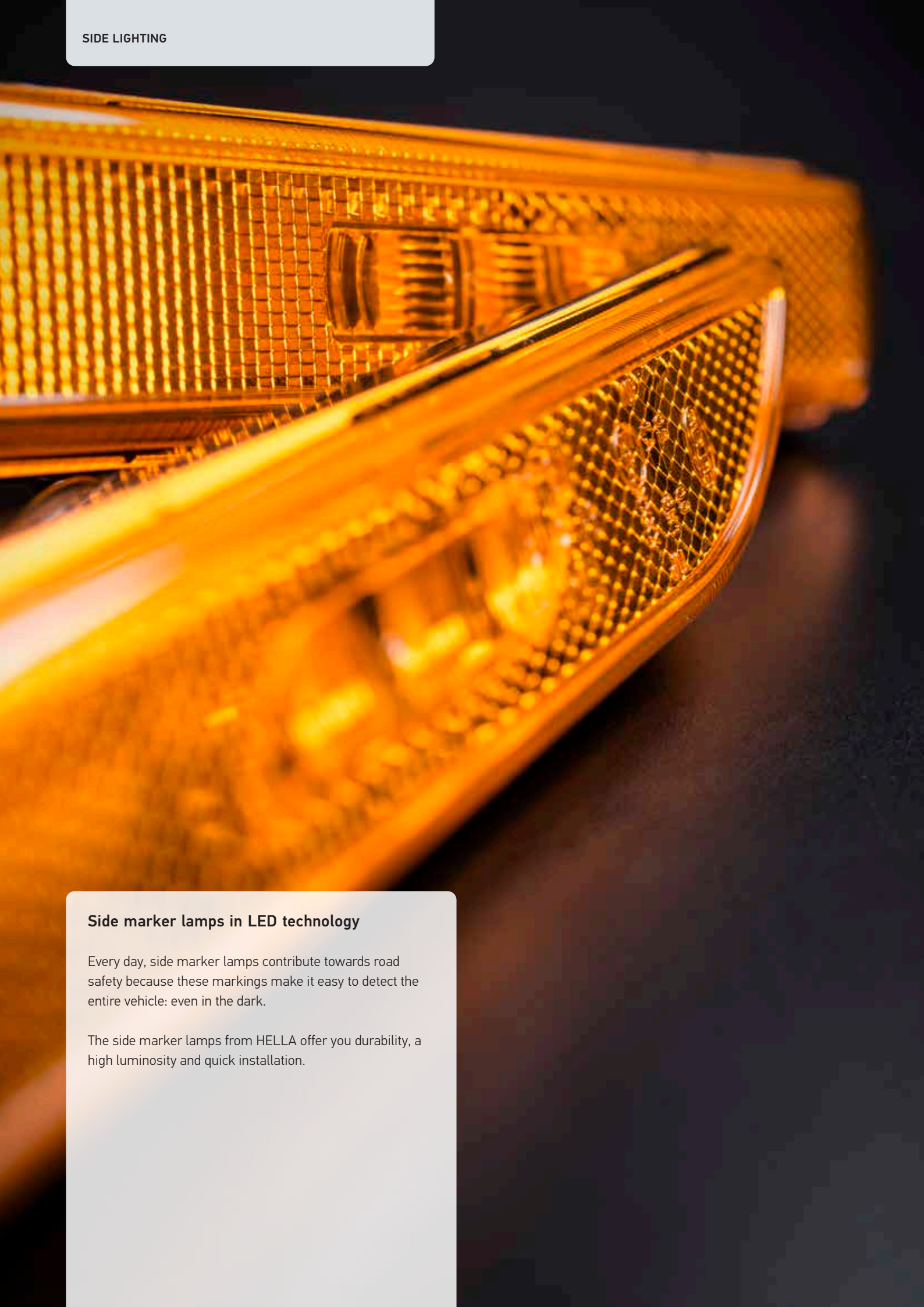
2NE 013 345-031
Rear fog lamp

2PS 013 305-011
Side marker lamp

Shapeline online configuration tool
Design freedom in just one click

The HELLA Shapeline online configuration tool turns you into a light designer: with just a few clicks, you can create your own personalised lighting design for the front, sides, and rear of your vehicle. Then you can take a look at the results, where your design is realistically applied to the outline of a car.

www.hella.com/shapeline

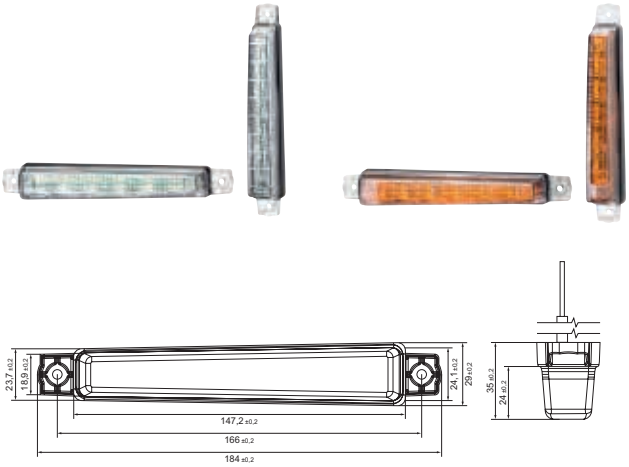


Side marker lamps in LED technology

Every day, side marker lamps contribute towards road safety because these markings make it easy to detect the entire vehicle: even in the dark.

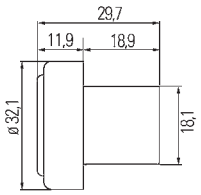
The side marker lamps from HELLA offer you durability, a high luminosity and quick installation.

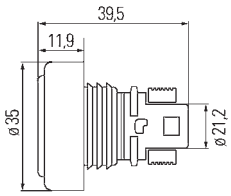
Direction indicators and position lamps



LED direction indicator and position lamp in striped look	
400 mm cable with open ends	
Position lamp	
12 V, horizontal	**2PF 012 846-401**
12 V, vertical	**2PF 012 846-411**
24 V, horizontal	**2PF 012 846-601**
24 V, vertical	**2PF 012 846-611**
Direction indicator with pulse for direction indicator failure control	
12 V, horizontal	**2BA 012 846-001**
12 V, vertical	**2BA 012 846-011**
24 V, horizontal	**2BA 012 846-211**
24 V, vertical	**2BA 012 846-201**
Direction indicator	
12 V, horizontal	**2BA 012 846-021**
12 V, vertical	**2BA 012 846-031**
24 V, horizontal	**2BA 012 846-231**
24 V, vertical	**2BA 012 846-221**

Type approval: ECE E24 6R-015896, 6R-015897, 6R-015898



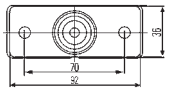


LED auxiliary direction indicator lamp, CAT. 5	
12 V, power consumption 0.7 W, operating temperature -40°C to +60°C, screwed, 2-pin EasyConn, rubber housing, AMP-SUPERSEAL, rubber housing, 6.3 mm receptacles and plastic housing.	
Screwed, 2-pin EasyConn With rubber housing	**2BM 340 825-201/7**
AMP-SUPERSEAL (AMP 282080-1) With rubber housing	**2BM 340 825-211/7**
6.3 mm receptacles With plastic housing	**2BM 340 825-301/7**
AMP-SUPERSEAL (AMP 282080-1) With plastic housing	**2BM 340 825-311/7**

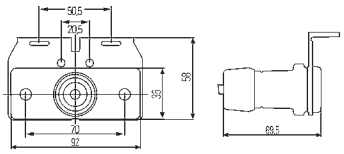
Type approval: ECE E24 01 0066

* Please observe the note on pages 132 and 133 regarding LED direction indicators and LED lamp failure control.

Side marker lamps



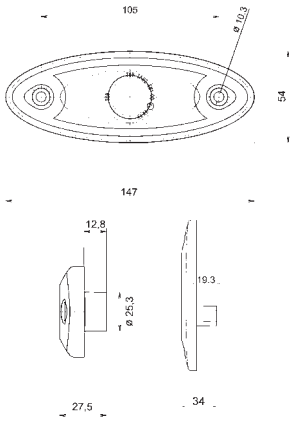
a)



b)

LED side marker lamp	
For horizontal flush mounting, with 4 amber LEDs, amber lens, amber lights, without reflex reflector, ADR / GGVS-tested.	
a) Without bracket 24 V / 1.0 W, current consumption= approx. 0.04 A	**2PS 008 382-007***
b) Set of side marker lamps without bracket, with separate reflex reflector	**2PS 008 382-801***
	2PS 008 382-807*
Set of side marker lamps with angle bracket, angled forwards, surface mounting	**2PS 008 382-811***
	2PS 008 382-817*

Type approval: ECE E4 3169 / 9111



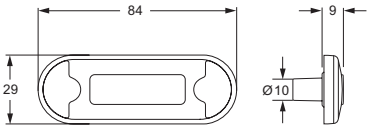
a) b)

Innovative side marker lamp	
a) With 6.3 mm contacts for horizontal and vertical mounting	
12 V, white housing	**2PS 344 690-007**
12 V, grey housing	**2PS 344 690-027**
12 V, black housing	**2PS 344 690-067**
24 V, black housing	**2PS 344 690-037**
b) With AMP-SUPERSEAL for horizontal and vertical mounting	
12 V, white housing	**2PS 344 690-607**
12 V, black housing	**2PS 344 690-617**
24 V, orange housing	**2PS 344 690-687**
24 V, black housing	**2PS 344 690-627**
Accessories	
Rubber seal	**9GD 343 697-007**
Grommet	**9GT 343 367-002**

Type approval: ECE E24 5853 and e17 03 0227

* Please observe the note on pages 132 and 133 regarding LED direction indicators and LED lamp failure control.

Side marker lamps

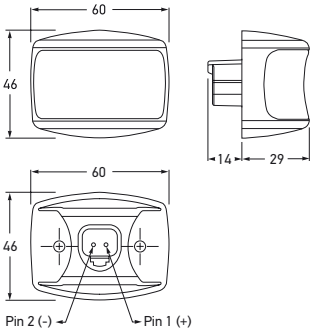


DuraLED side marker lamp

For horizontal surface mounting, 2 LEDs, power consumption 0.5 W, lens made from impact-resistant Grilamid, extremely durable, slim design, 9 mm profile, surface mounting variant, high vibration resistance, polarity reversal protection.

500 mm cable, black end caps	**2PS 980 868-201**
2,500 mm cable, black end caps	**2PS 980 868-211**

Type approval: ECE E24 0007

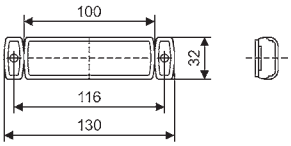


DuraLED marker lamp

For horizontal surface mounting, 2 LEDs, power consumption < 1 W, simple installation: Plug & Play, impact-resistant lens made from UV-resistant Grilamid, surface mounting, high vibration resistance, polarity reversal protection.

Side marker lamp (cat. SM1), DEUTSCH connector	**2PS 980 990-301**
Additional, side direction indicator light (Cat. 5), DEUTSCH connector	**2BM 980 990-121**

Type approval: ECE E24 5892 / 0067

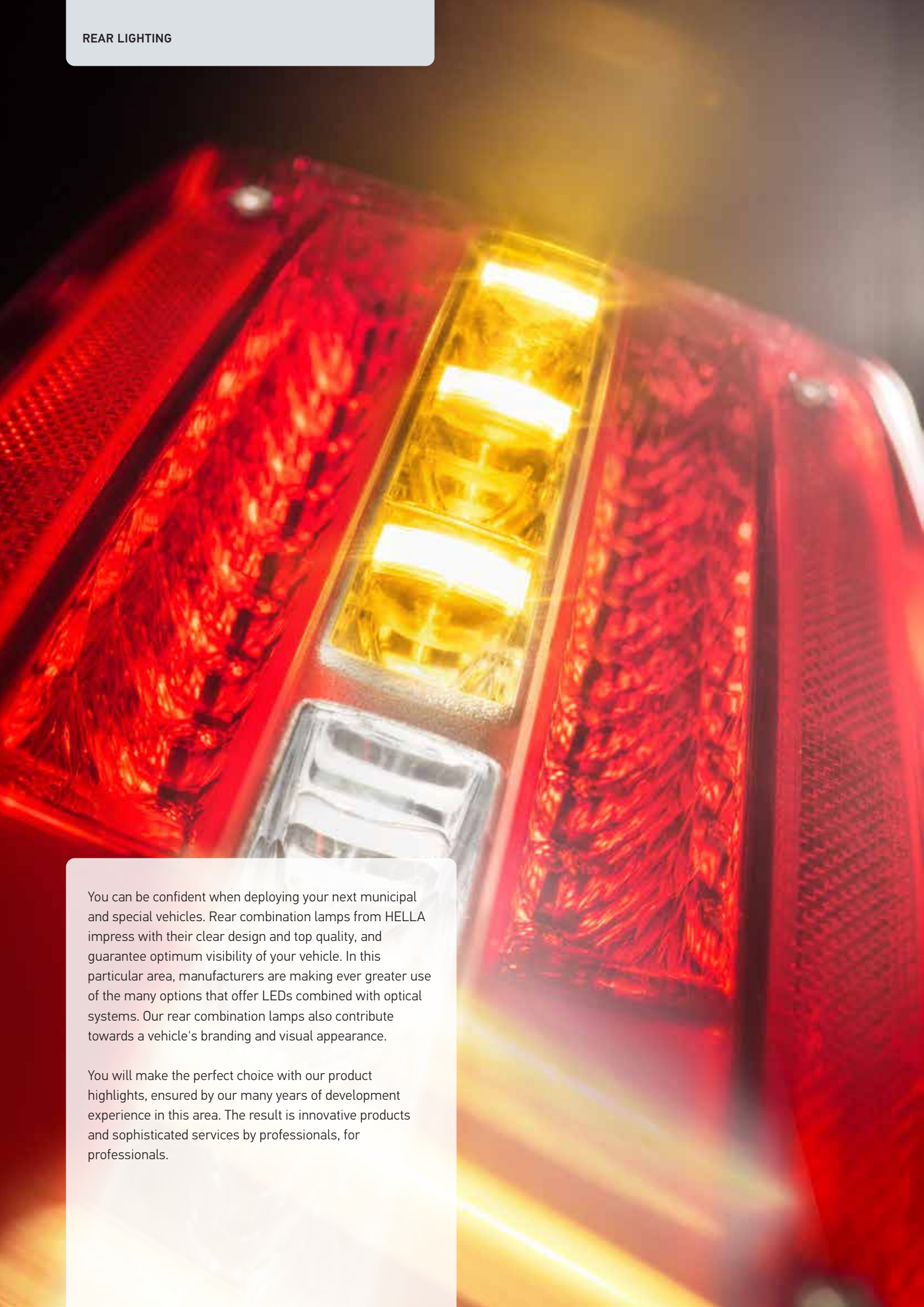


LED side marker lamp with reflex reflector

With 1 amber LED, for vertical mounting, amber lens, black housing, ADR-tested.

12 V, 1,500 mm cable	**2PS 008 645-981***
24 V, 1,500 mm cable	**2PS 008 645-991***

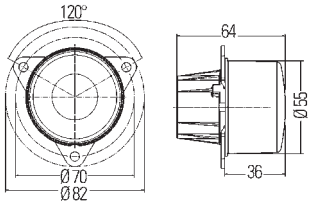
Type approval: E1 1395



You can be confident when deploying your next municipal and special vehicles. Rear combination lamps from HELLA impress with their clear design and top quality, and guarantee optimum visibility of your vehicle. In this particular area, manufacturers are making ever greater use of the many options that offer LEDs combined with optical systems. Our rear combination lamps also contribute towards a vehicle's branding and visual appearance.

You will make the perfect choice with our product highlights, ensured by our many years of development experience in this area. The result is innovative products and sophisticated services by professionals, for professionals.

Single-function lamps
55 mm LED module

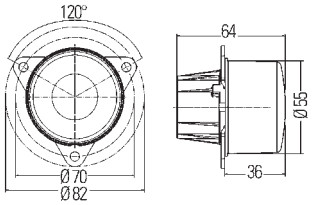


LED tail-stop-direction indicator lamp, diameter 55 mm

For rear flush mounting, clear lens with optics and 500 mm connecting cable, 12 V / 1.1 W.

12 V, tail lamp	**2SA 011 172-041**
12 V, stop lamp	**2DA 011 172-061**
12 V, direction indicator, without pulse	**2BA 011 172-021**
24 V, direction indicator, without pulse	**2BA 011 172-421**
12 V, direction indicator, with pulse	**2BA 011 172-031**
24 V, direction indicator, with pulse	**2BA 011 172-431**

Type approval: ECE E1 3283 / 3284, ECE E1 10R-036317 and CCC

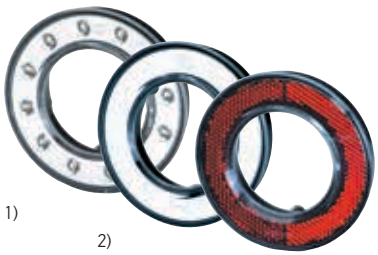


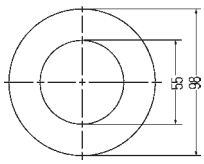
LED rear fog and reverse lamp, diameter 55 mm

For rear flush mounting, clear lens with optics and 500 mm connecting cable, 12 V / 2.5 W, current consumption = 0.21 A, 24 V / 1.9 W, current consumption = approx. 0.08 A.

12 V, rear fog lamp	**2NE 011 172-081**
24 V, rear fog lamp	**2NE 011 172-481**
Type approval: ECE E1 3286, E1 10R-036317 and CCC	
12 V, reverse lamp	**2ZR 011 172-101**
24 V, reverse lamp	**2ZR 011 172-501**

Type approval: ECE E1 3285, E1 10R-036317 and CCC





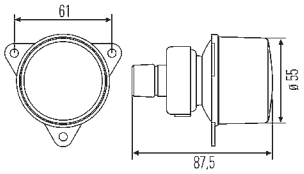
LED ring modules, diameter 98 mm

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

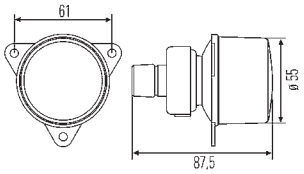
LED tail-clearance lamp, with 12 red LEDs, clear lens	
1) 12 V / 1.8 W, current consumption = approx. 0.15 A	**2SA 008 405-021**
1) 24 V / 1.8 W, current consumption = approx. 0.08 A	**2SA 008 405-017**
LED tail-stop lamp, with 12 red LEDs, clear lens, with passive thermal management	
1) 12 V / 2.1 W, current consumption = approx. 0.15 A	**2SB 008 405-101**
1) 24 V / 1.8 W, current consumption = approx. 0.08 A	**2SB 008 405-091**
1) LED position lamp 12 V / 1.8 W, current consumption = approx. 0.15 A	**2PF 008 405-061**
2) Chromium-plated cover	**8XU 008 405-031**
3) Reflex reflector	**8RA 008 405-001**

Type approval: ECE E1 1196 / 1197 / 1892

Single-function lamps
55 mm modules



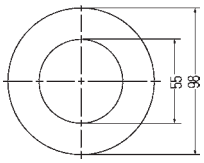
Tail-stop lamp and rear fog lamp, diameter 55 mm	
12 V and 24 V, for flush mounting, with red lens.	
Tail lamp	**2XA 008 221-021**
Tail lamp with mounted 12 V / 5 W bulb	**2SA 008 221-127**
Stop lamp	**2XA 008 221-021**
Stop lamp with mounted 12 V / 21 W bulb	**2DA 008 221-167**
Type approval: ECE E1 1048 / 1049	
Rear fog lamp	**2NE 008 221-031**
Rear fog lamp with mounted 12 V / 21 W bulb	**2NE 008 221-137**
Type approval: ECE E1 1050	
Accessories	
Wiring harness with grommet	**8KA 152 134-007**
Grommet separate	**9GT 137 236-007**



Direction indicator and reverse lamp diameter 55 mm	
12 / 24 V, for flush mounting with grey lens.	
Direction indicator	**2BA 008 221-041**
Direction indicator with mounted amber 12 V / 21 W bulb	**2BA 008 221-147**
Type approval: ECE E1 878, E1 879 and E1 1051	
Reverse lamp	**2ZR 008 221-051**
Reverse lamp with mounted 12 V / 21 W bulb	**2ZR 008 221-157**
Type approval: ECE E1 1052 and SAE type approval for vehicles with < 2,032 mm and > 2,031 mm wide	
Accessories	
Wiring harness with grommet	**8KA 152 134-007**
Grommet separate	**9GT 137 236-007**

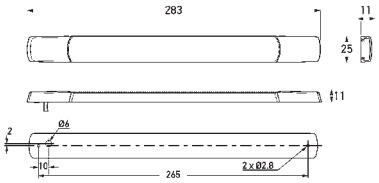
1)

2)



Examples of combination possibilities	
Rear lighting	
1) Tail and direction indicator lamp	**2BA 008 221-041 and 2SA 008 405-021**
2) Stop and reverse lamp	**2XA 008 221-021 and 8RA 008 405-001**
Heat conducting shield (necessary at > 50°C ambient temperature)	**9XB 161 749-007**

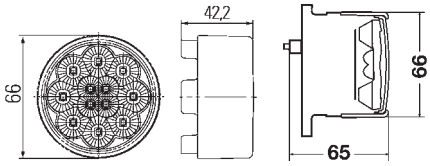
Single-function lamps



LED rear combination lamp	
Low power consumption, lens made from particularly impact-resistant Grilamid, extremely durable, surface mounting variant, high vibration resistance, polarity reversal protection.	
Rear direction indicator light Without pulse for direction indicator failure control	
12 V, horizontal/vertical mounting: 360° to lamp and vehicle axis, 2,500 mm cable	**2BA 980 888-011**
24 V, horizontal/vertical mounting: 360° to lamp and vehicle axis, 2,500 mm cable	**2BA 980 888-211**
Stop lamp/tail lamp	
12 V, horizontal/vertical mounting: 360° to lamp and vehicle axis, 300 mm cable	**2SB 980 887-011**
24 V, horizontal/vertical mounting: 360° to lamp and vehicle axis, 300 mm cable	**2SB 980 887-211**
Auxiliary stop lamp	
12 V, horizontal/vertical mounting, 2,500 mm cable	**2DA 980 887-311**
24 V, horizontal/vertical mounting, 2,500 mm cable	**2DA 980 887-411**
Rear fog lamp	
12 V, horizontal/vertical mounting, 2,500 mm cable	**2NE 980 889-501**
24 V, horizontal/vertical mounting, 2,500 mm cable	**2NE 980 889-601**
Reverse lamp	
12 V, horizontal mounting: ± 10° to lamp and vehicle axis, 2,500 mm cable	**2ZR 980 889-011**
12 V, vertical mounting: ± 15° to lamp and vehicle axis, 2,500 mm cable	**2ZR 980 889-111**
24 V, horizontal mounting: ± 10° to lamp and vehicle axis, 2,500 mm cable	**2ZR 980 889-211**
24 V, vertical mounting: ± 15° to lamp and vehicle axis, 2,500 mm cable	**2ZR 980 889-311**

Type approval: ECE R23, E4

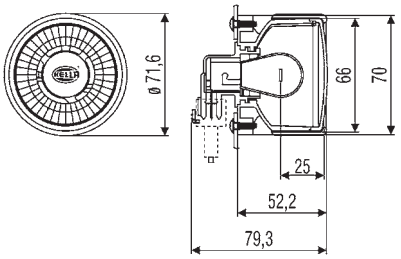
Single and multi-function lamps
66 mm modules

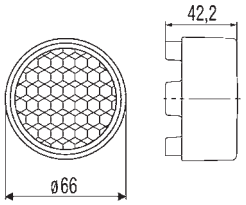


LED tail-stop lamp and direction indicator, diameter 66 mm	
With clear lens, 12 LEDs and AMP connector.	
12 V, tail-stop lamp	**2SB 009 001-401**
24 V, tail-stop lamp	**2SB 009 001-501**
12 V, direction indicator, without pulse	**2BA 009 001-411**
24 V, direction indicator, without pulse	**2BA 009 001-511**
12 V, direction indicator, with pulse	**2BA 009 001-431**[1)]
24 V, direction indicator, with pulse	**2BA 009 001-531**[1)]

Type approval: ECE E4 12390

Single and multi-function lamps
66 mm modules





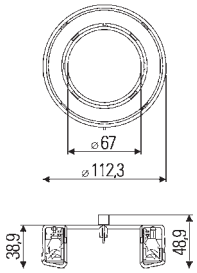
Rear combination lamps diameter 66 mm	
With mounted bulbs 12 V or 24 V, incl. design ring.	
Red lens	
24 V, direction indicator with ECE approval for double lamps	**2NE 009 001-127**
12 V, stop lamp with ECE approval for double lamps	**2DA 009 001-057**
12 V, tail-stop lamp with ECE approval for double lamps	**2SB 009 001-067**
12 V, rear fog lamp with SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide	**2NE 009 001-027**
12 V, macro reflex reflector with SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide	**8RA 009 001-037**
Grey lens	
12 V, direction indicator with ECE approval for double lamps	**2BA 009 001-007**
24 V, direction indicator with ECE approval for double lamps	**2BA 009 001-107**
24 V, tail lamp with ECE approval for double lamps	**2SA 009 001-137**
24 V, stop lamp with ECE approval for double lamps	**2DA 009 001-147**
24 V, tail-stop lamp with ECE approval for double lamps	**2SB 009 001-157**
12 V, reverse lamp with SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide	**2ZR 009 001-017**
24 V, reverse lamp with SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide	**2ZR 009 001-117**
With Silver Vision bulb	
12 V, direction indicator with ECE approval for double lamps	**2BA 009 001-191**

Type approval: ECE E4 3917 / 6546 / 7613, ECE E4 23255, ECE E4 3189 (Reflex reflector)

Rear combination lamps design rings, diameter 66 mm	
Suitable for 66 mm lamp modules with diameter 71.6 mm (part number ... 009 -001-... except for LED versions), perfect high sheen finish with one “click”.	
High gloss chromium-plated	**9HB 161 122-012**
Silver	**9HB 161 122-007**
Premium silver	**9HB 164 168-002**
Stop ring mounting (no image)	**8HG 162 530-002**

Accessories for rear combination lamps, diameter 66 mm	
Mating connector, 2-pin	**8JD 156 150-807**
Mating connector, 3-pin	**8JD 162 581-802**
Adapter ring screw connection, frontal for rear combination lamps, diameter 66 mm, direct installation as well as installation in ring module, black	**9XD 161 119-007**
Adapter ring, for installing LED lamps or the reflex reflector in the ring module series 009 362-..., black	**9XD 161 119-017**

Multi-function lamps
112 mm ring modules

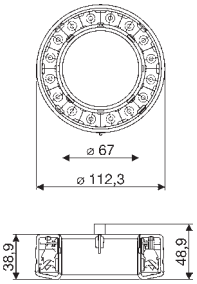


LED ring modules Edge, Ø 112 mm

12 or 24 V tail-stop lamp in innovative LED EdgeLight technology, ideal for combination with lamp series 009 001 (diameter 66 mm), optionally available with clear or red cover lens.

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

Type approval: ECE E24 7R-025889

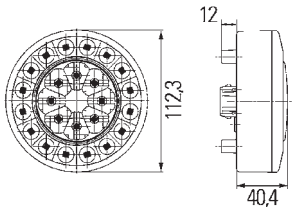


LED ring modules, diameter 112 mm

Tail-stop lamp, ideal for combination with lamp series 009 001 (diameter 66 mm), optionally available with clear or red cover lens.

24 V, tail-stop lamp, red lens With ECE approval for double lamps	**2SB 009 362-011**
12 V, tail-stop lamp, clear lens With ECE approval for double lamps	**2SB 009 362-021**
12 V, tail-stop lamp, red lens With ECE approval for double lamps	**2SB 009 362-041**
12 V, reflex reflector, red lens (no image)	**8RA 009 362-001**

Type approval: ECE E4 7747 / 7748



LED tail-stop-direction indicator lamp, diameter 112 mm

For rear flush mounting, clear lens, with 24 red LEDs, suitable for lamp series 009 362 and 009 001.

12 V / 4.8 W current consumption approx. 0.4 A	**2SD 009 362-201**

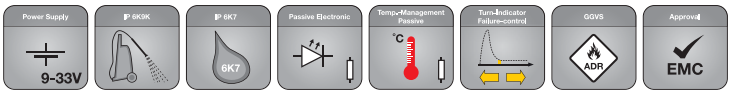
Type approval: SAE type approval for vehicles > 2,031 mm wide

Design rings, diameter 118 mm

Suitable for lamp series 009 362, perfect high sheen finish with one "click".

High gloss chromium-plated	**9HB 163 085-012**
Silver	**9HB 163 085-001**

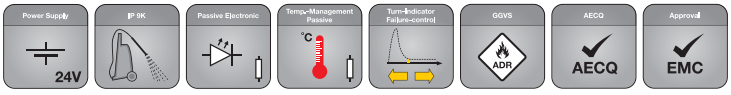
Multi-function lamps

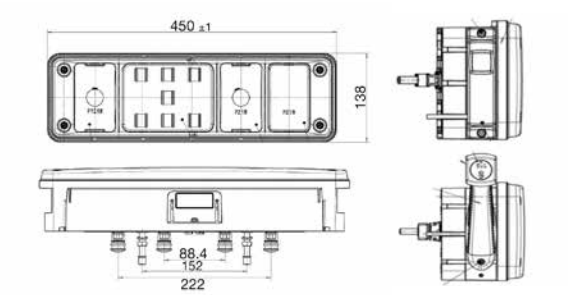


LED multi-function lamp

For flush mounting, with 2,500 cable and pulse for direction indicator failure control, protection class IP 6K6, IP 6K7.

a) LED tail-stop-direction indicator lamp	
With clear cover lens, 16 LEDs	**2SD 959 010-401***
Type approval: ECE E9 1538	
b) LED tail-stop lamp	
With red lens, 12 LEDs	**2SB 959 010-301***
Type approval: ECE E4 12373	
c) LED reverse lamp	
With clear lens, 24 LEDs	**2ZR 959 010-501***
Type approval: ECE E4 11391	
d) LED rear fog lamp	
With clear lens, 24 LEDs	**2NE 959 011-501***
Type approval: ECE E4 11391	
e) LED direction indicator	
With amber lens, 12 LEDs	**2BA 959 011-301***
Type approval: ECE E4 12373 / EMC	





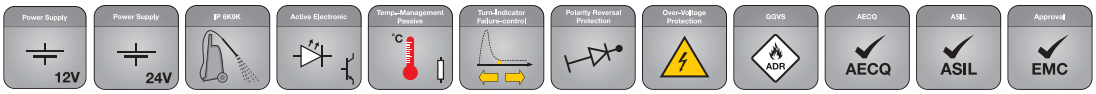
LED hybrid trailer lamp

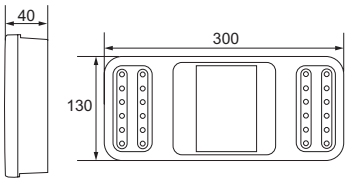
Modular multi-function rear combination lamp 24 V for horizontal surface mounting, clear lens, 7-pin EasyConn plug connection and 4 x 2-pin connector for the connection of various functions, with pulse for direction indicator failure control. Tail-stop light = 7 red LEDs, direction indicator light = 7 amber LEDs, reverse light = 6 white LEDs, rear fog light = 7 red LEDs. Lamp: IP 5K4K, LED module: IP 6K9K.

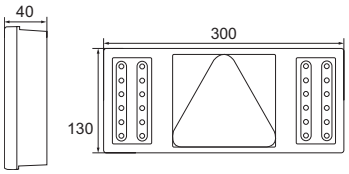
Full LED tail triangular reflex reflector stop light, direction indicator light, rear fog light, reverse light	
Left	**2VP 340 960-011***
Right	**2VP 340 960-021***
Full LED tail triangular reflex reflector stop light, direction indicator light, rear fog light, reverse light, clearance light in the rubber arm	
Left	**2VP 340 960-111***
Right	**2VP 340 960-121***
Type approval: ECE E24 5855 / 5856	

* Please observe the note on pages 132 and 133 regarding LED direction indicators and LED lamp failure control.

Multi-function lamps





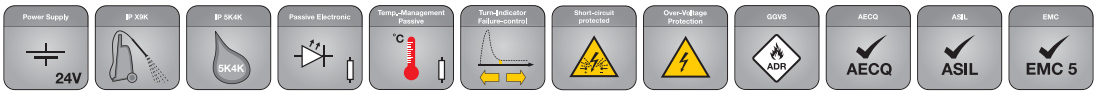


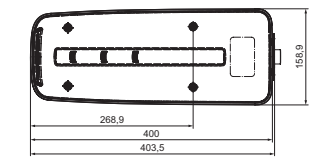
Coluna full LED rear combination lamp

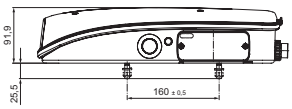
Tail lamp, stop lamp, direction indicator, rear fog lamp, reverse lamp with rectangular reflex reflector. Innovative and patented flat LED light guide, combined with reflex reflector. For horizontal and vertical mounting, with impact-resistant lens and high vibration resistance, mounting from front via fastening screws or from rear via fastening bolts, with and without pulse for direction indicator failure control. Long lifetime, low life cycle costs and great robustness. Upon request, the rear combination lamp is also available in other frame colours as well as with a triangular reflex reflector.

With pulse, front mounting, 500 mm cable	
12 V	**2VP 345 900-401**
24 V	**2VP 345 900-201**
Without pulse, front mounting, 500 mm cable	
12 V	**2VP 345 900-411**
24 V	**2VP 345 900-211**
With pulse, rear mounting	
500 mm cable, 12 V	**2VP 345 900-421**
250 mm cable, 24 V, 7-pin AMP connector, with bayonet closure	**2VP 345 900-221**
250 mm cable, 24 V	**2VP 345 900-281**
Without pulse, rear mounting, 500 mm cable	
12 V	**2VP 345 900-431**
24 V	**2VP 345 900-231**
With pulse, front mounting, 3,000 mm with 6.3 mm flat receptacle	
12 V	**2VP 345 900-441**
24 V	**2VP 345 900-241**
Without pulse, front mounting, 3,000 mm with 6.3 mm flat receptacle	
12 V	**2VP 345 900-451**
24 V	**2VP 345 900-251**
With pulse, rear mounting, 3,000 mm with 6.3 mm flat receptacle	
12 V	**2VP 345 900-461**
24 V	**2VP 345 900-261**
Without pulse, rear mounting, 3,000 mm with 6.3 mm flat receptacle	
12 V	**2VP 345 900-471**
24 V	**2VP 345 900-271**

Type approval: ECE E24 5879, E17 10R 04 0071, EMV







Full LED truck rear combination lamp

Hole pattern 152 mm, DIN (bayonet) at side, inner lens with optics, replaceable non-patterned lens, fully metallised reflector, innovative direction indicator light via dynamic indicators. All functions in LED for heavy-duty requirements.

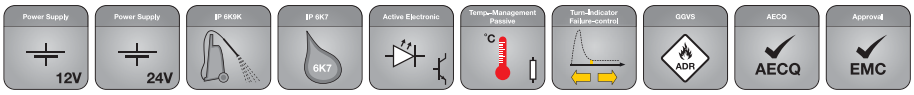
Left, integrated licence plate light	**2VD 012 381-351**
Right	**2VP 012 381-361**
Right, integrated backup alarm	**2VP 012 381-381**

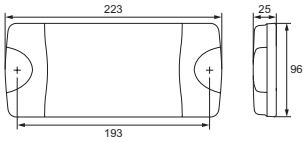
Type approval: ECE E24 5893

Spare parts

Lens	**9EL 208 551-001**

Multi-function lamps



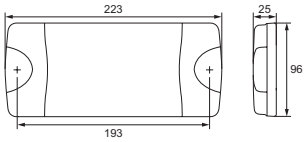


LED multi-function lamp DuraLED Combi

Dual volt 12 / 24 V, tail-stop-direction indicator lamp, for horizontal surface mounting, with 2,500 mm cable, stop light = 8 red LEDs (4 LEDs with reduced light output for tail light), direction indicator light = 8 amber LEDs, with reflex reflector, red/amber lens colour, ends decorated metallic grey.

12 / 24 V DC, with pulse for direction indicator failure control	**2VA 980 710-061***
24 V DC	**2VA 980 710-301**

Type approval: ECE R 5882, GGVS / ADR

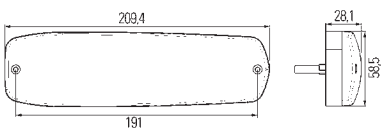


LED multi-function lamp DuraLED Combi

Dual volt 12 / 24 V, for horizontal or vertical surface mounting, with pulse for direction indicator failure control, stop light = 18 red LEDs (6 LEDs with reduced light output for tail light), direction indicator light = 12 amber LEDs, clear lens colour, ends decorated red.

Tail-stop-direction indicator lamp	
12 / 24 V DC, with 2,500 mm cable	**2SD 980 613-211***
12 / 24 V DC, with integrated pulse 6 -pin DEUTSCH connector (mating connector DT 06-6S to be used)	**2SD 980 602-211***
Tail-stop-direction indicator lamp, reverse light	
12 / 24 V DC	**2SK 980 603-503**
24 V DC	**2SK 980 613-501**
12 / 24 V DC	**2SK 980 615-001**
24 V DC	**2SK 980 602-501**

Type approval: ECE R 5883, GGVS / ADR



LeanLED rear combination lamp

Flush-mounted and compact tail-stop-direction indicator lamp in LED for horizontal or vertical surface mounting, with 24 LEDs, clear lens, with pulse for direction indicator failure control, multi-voltage 9 –32 V, long lifetime, partially metallised, other frame colours available on request.

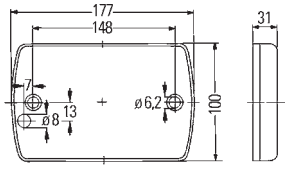
Silver, with 500 mm cable and open ends	**2SD 343 910-001***
Silver, with integrated 4-pin AMP connector	**2SD 343 910-027***
Silver, with 100 mm cable and 4-pin DEUTSCH connector	**2SD 343 910-057***

Type approval: ECE R 12393

Without type approval and without pulse for direction indicator failure control	
With 500 mm cable and open ends	**2SK 343 910-037**

* Please observe the note on pages 132 and 133 regarding LED direction indicators and LED lamp failure control.

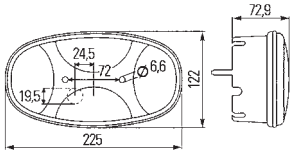
Multi-function lamps



Tail-stop-direction indicator lamp with reflex reflector			ECE	SAE (USA)
For 12 and 24 V, for horizontal and vertical surface mounting, with 8 LEDs, clear lens, 500 mm cable with stripped ends and adhesion bonded red reflex reflector. Detachable black retaining frame with 4 holes diameter 4.2 mm and 2 holes diameter 5.0 mm for fastening screws. Without pulse for direction indicator failure control.				
12 V/5 W, current consumption = 0.42 A 24 V/5 W, current consumption = 0.21 A				
12 / 24 V	**2VA 980 720-001**	①②③⑥	X	
12 / 24 V	**2VA 980 720-007**	①②③⑥	X	
With licence plate lighting for 370 mm x 120 mm und 520 mm x 120 mm plates, for horizontal surface mounting only.				
Direction indicator above, 12 / 24 V, with 500 mm cable and with open cable ends	**2VB 980 720-401/7**	①②③⑥⑧	X	
Direction indicator below, 12 / 24 V, with 500 mm cable and with open cable ends	**2VB 980 720-501/7**	①②③⑥⑧	X	

Type approval: E24 5860, E4 10 R-05 3262 (EMV)

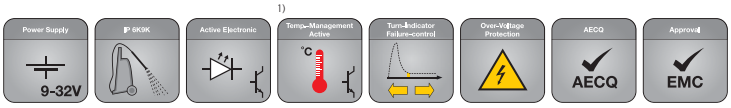
Accessories	
12 / 24 V, LED flasher unit	**4JZ 177 846-007**
Female connector housing	**8JA 003 526-001**

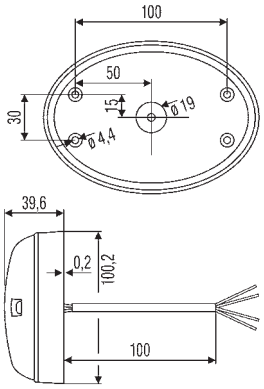


Cargoluna rear combination lamp			ECE	SAE (USA)
Surface/flush mounting suitable for horizontal and vertical mounting position, for 12/24 V and integrated reflex reflector.				
Left	**2VA 343 640-077**	①②③④⑥	X	
Right	**2VP 343 640-021**	①②③⑤⑥	X	
Left	**2VP 343 640-031**	①②③⑤⑥	X	

Type approval: E17 0303

Multi-function lamps



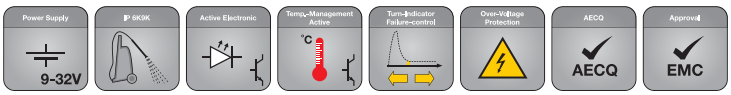


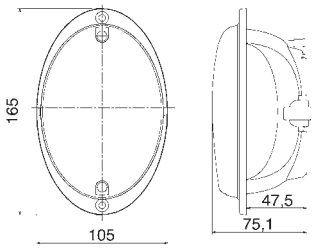
LED combination rear lamp "Oval"

For horizontal and vertical surface mounting, clear lens, 24 LEDs, can be used on the right and left, can be turned through 180°, 2 body fastening screws (diagonal arrangement) with 100 mm harness, multi-voltage 9-32 V.

Stop light, tail light, and direction indicator light	**2SD 343 390-011**[1)]
12 red LEDs for stop light: 12 V/1 W, current consumption = approx. 0.08 A	
12 red LEDs for tail light (reduced output): 12 V/0.2 W, current consumption = approx. 0.02 A	
12 amber LEDs for direction indicator light: 12 V/1.5 W, current consumption = approx. 0.13 A	
Direction indicator light	**2BA 343 390-071**[1)]
24 amber LEDs for direction indicator light: 12 V/1.5 W, current consumption = approx. 0.13 A	
Stop light and tail light	**2SB 343 390-091**
Stop light: 12 V/1 W, current consumption = approx. 0.08 A Tail light: 12 V/0.2 W, current consumption = approx. 0.02 A (reduced output)	

Type approval: ECE E4 11785





LED combination rear lamp "Oval"

Only for vertical surface mounting, with 24 LEDs, 12 red LEDs for stop light, with 4-pin DT connector integrated in the housing.

Stop light, tail light, and direction indicator light	**2SD 343 390-401 and 2SD 343 390-407**
12 red LEDs for stop light: 12 V / 1 W, current consumption = approx. 0.08 A	
12 red LEDs for stop light (reduced output): 12 V / 0.2 W, current consumption = approx. 0.02 A	
12 amber LEDs for direction indicator light 12 V / 1.5 W, current consumption = approx. 0.13 A	

Type approval: ECE E4 11785

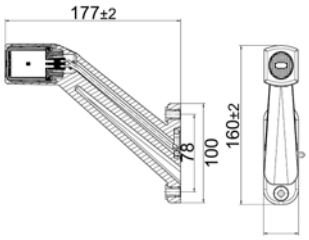
ECE note: Direction indicator approval by category
D ECE approval as double lamp

SAE type approval for vehicles
■ < 2,032 mm wide
● > 2,031 mm wide

① Tail light ② Stop light ③ Direction indicator light ④ Rear fog light ⑤ Reverse light
⑥ Reflex reflector ⑦ Side marker lamp with reflex reflector ⑧ Licence plate light ⑨ Position light

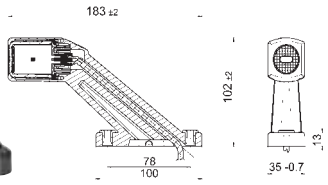
Please observe the note on pages 132 and 133 regarding LED direction indicators and LED lamp failure control.

Clearance lamps



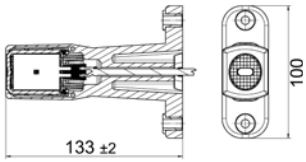
LED rubber arm clearance lamp with integrated side marker lamp	
24 V, vertical	
EasyConn 2-pin connector housing, angled, left, with 500 mm cable	**2XS 011 744-011**
EasyConn 2-pin connector housing, angled, right, with 500 mm cable	**2XS 011 744-021**
EasyConn 2-pin female connector housing, right, with 500 mm cable	**2XS 011 744-101**
EasyConn 2-pin female connector housing, left, with 500 mm cable	**2XS 011 744-111**
Quicklink connector, left, with 500 mm cable	**2XS 011 744-071**
Quicklink connector, right, with 500 mm cable	**2XS 011 744-081**
Quicklink connector, right, with 1,000 mm cable	**2XS 011 744-181**
Quicklink connector, left, with 1,000 mm cable	**2XS 011 744-191**
AMP-SUPERSEAL connector, left, with 2,000 mm cable	**2XS 011 744-051**
AMP-SUPERSEAL connector, right, with 2,000 mm cable	**2XS 011 744-061**
AMP-SUPERSEAL connector, right, with 800 mm cable	**2XS 011 744-201**
AMP-SUPERSEAL connector, left, with 800 mm cable	**2XS 011 744-211**
Flat receptacle 6.3 mm, left, with 3,000 mm cable	**2XS 011 744-031**
Flat receptacle 6.3 mm, right, with 3,000 mm cable	**2XS 011 744-041**
Flat receptacle 6.3 mm, right, with 150 mm cable	**2XS 011 744-161**
Flat receptacle 6.3 mm, left, with 300 mm cable	**2XS 011 744-171**

Type approval: ECE E4 7R-02 11392, 91R-00 11392, ECE E1 057951



LED rubber arm clearance lamp with integrated side marker lamp	
24 V, horizontal	
EasyConn 2-pin female connector housing, left, with 500 mm cable	**2XS 011 769-011**
EasyConn 2-pin female connector housing, right, with 500 mm cable	**2XS 011 769-021**
Quicklink connector, left, with 670 mm cable	**2XS 011 769-091**
Quicklink connector, right, with 670 mm cable	**2XS 011 769-101**

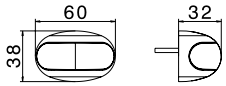
Type approval: ECE E4 7R-02 11392, 91R-00 11392, ECE E1 057951



LED rubber arm clearance lamp with integrated side marker lamp	
24 V, short	
EasyConn 2-pin connector housing, angled, with 500 mm cable	**2XS 011 768-011**
EasyConn 2-pin female connector housing, with 500 mm cable	**2XS 011 768-021**
Quicklink connector, with 500 mm cable	**2XS 011 768-001**
AMP-SUPERSEAL connector, with 2,000 mm cable	**2XS 011 768-031**
Flat receptacle 6.3 mm, right, with 3,000 mm cable	**2XS 011 768-061**
Flat receptacle 6.3 mm, left, with 2,000 mm cable	**2XS 011 768-071**
DEUTSCH connector, 2-pin, with 485 mm cable	**2XS 011 768-117**

Type approval: ECE E4 7R-02 11392, 91R-00 11392, ECE E1 057951

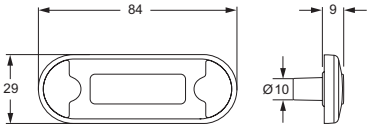
Clearance lamps



LED clearance lamp

For horizontal surface mounting, 2 LEDs, 8 – 28 V.			ECE	SAE (USA)
12 V / 24 V / 0.5 W, current consumption= approx. 0.04 A				
500 mm cable	**2XA 959 560-401**	⑨	X	
5,000 mm cable	**2XA 959 560-411**	⑨	X	

Type approval: E24 7574 and e1 03 1721

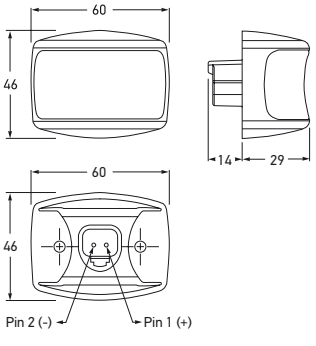


DuraLED clearance lamp

For horizontal or vertical surface mounting, 2 LEDs, power consumption 0.5 W, lens made from impact-resistant Grilamid, extremely durable, slim design, 9 mm profile, surface mounting variant, high vibration resistance, polarity reversal protection.

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

Type approval: ECE E24 5878



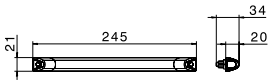
DuraLED marker lamp/clearance lamp

For horizontal surface mounting, 2 LEDs, power consumption < 1 W, simple installation: Plug & Play, impact-resistant lens made from UV-resistant Grilamid, surface mounting, high vibration resistance, polarity reversal protection.

DEUTSCH connector	**2XS 980 990-621**

Type approval: ECE E24 5892

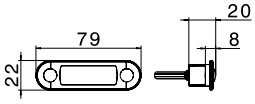
Clearance lamps



LED clearance lamp

For horizontal or vertical surface mounting, with 2 LEDs and light guide in red, 2 screw holes of diameter 5.4 mm for fastening screws.			ECE	SAE (USA)
12 V/0.7 W, current consumption = approx. 0.06 A	**2XS 008 078-011**	⑨	X	
24 V/1.4 W, current consumption = approx. 0.06 A	**2XS 008 078-001**	⑨	X	

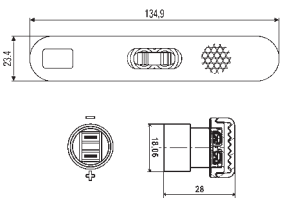
Type approval: E13 0515



LED clearance lamp

For horizontal or vertical flush mounting, clear lens with 2 red LEDs, can be used as tail lamp or clearance lamp, 8–28 V.			ECE	SAE (USA)
12 V / 24 V / 0.5 W, current consumption= approx. 0.04 A				
500 mm cable, with caps	**2XA 959 790-401**	⑨	X	
5,000 mm cable, with caps	**2XA 959 790-411**	⑨	X	

Type approval: E4 7597 and e1 03 1721

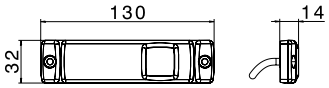


LED clearance lamp

For horizontal surface mounting, with 2 LEDs, self-adhesive, with 6.3 mm contacts and mating connector grommet.			ECE	SAE (USA)
	2XS 009 226-107	⑨	X	

Type approval: E1 4010

Clearance lamps



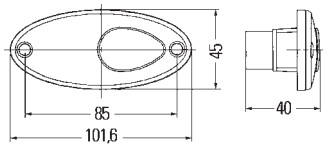
LED clearance lamp

For horizontal or vertical surface mounting, with reflex reflector, 12 V, 2 holes for fastening screws B 4.2. With horizontal surface mounting, the LED field must point to the outer edge of the vehicle. With vertical surface mounting, the LED field may point upwards or downwards. (Clearance lamp can also be used as a tail lamp with reflex reflector.)

12 V / 0.6 W, 24 V / 1.1 W

			ECE	SAE (USA)
Cable 500 mm, 12 V	**2TM 008 645-931**	①	X	■
Cable 5,000 mm, 12 V	**2TM 008 645-921**	①	X	■
Cable 500 mm, 24 V	**2TM 008 645-951**	①	X	■
Cable 5,000 mm, 24 V	**2TM 008 645-941**	①	X	■

Type approval: E1 1395 and E1 1398

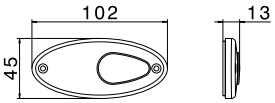


Clearance lamp

With mounted 12 V bulb and seal, for horizontal or vertical flush mounting.

			ECE	SAE (USA)
Oval	**2XS 964 295-031**	⑨	X	■

Type approval: E17 812

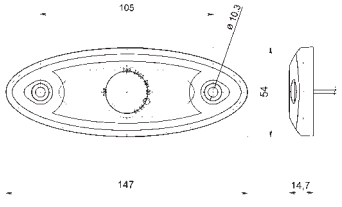


LED clearance lamp

For horizontal surface mounting, 2 LEDs, with seal and 5,000 mm long cable.

			ECE	SAE (USA)
12 V/0.5 W, current consumption = approx. 0.04 A	**2TM 964 295-101**	①	X	X
24 V/0.7 W, current consumption = 0.04 A	**2TM 964 295-091**	①	X	X

Type approval: E17 0302



LED clearance lamp

For surface mounting, modern night-time design and high level of safety thanks to maximum illuminated area, 12 V.

			ECE	SAE (USA)
500 mm cable, horizontal	**2TM 344 690-357**	①	X	

Type approval: E4 7597 and e1 03 1721

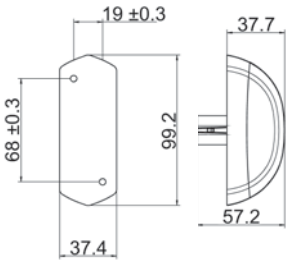
ECE note: Direction indicator approval by category
D ECE approval as double lamp

SAE type approval for vehicles
■ < 2,032 mm wide
● > 2,031 mm wide

① Tail light ② Stop light ③ Direction indicator light ④ Rear fog light ⑤ Reverse light
⑥ Reflex reflector ⑦ Side marker lamp with reflex reflector ⑧ Licence plate light ⑨ Position light

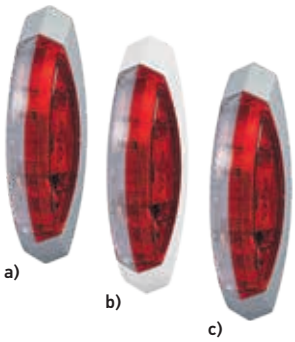
Please observe the note on pages 132 and 133 regarding LED direction indicators and LED lamp failure control.

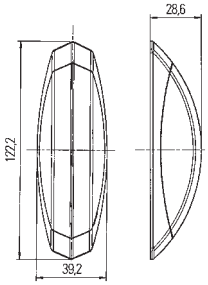
Clearance lamps



LED clearance lamp

For vertical surface mounting, red/white, with black base plate. Versions with grey base plate available on request.			ECE	SAE (USA)
12 V screw mounting, AMP-SUPERSEAL	**2XS 205 020-001**	⑨	X	
12 V rubber pendulum and angled bracket, AMP-SUPERSEAL	**2XS 205 020-021**	⑨	X	
12 V screw mounting, 500 mm cable	**2XS 205 020-041**	⑨	X	
12 V, rubber pendulum, AMP-SUPERSEAL	**2XS 205 020-121**	⑨	X	
24 V screw mounting, AMP-SUPERSEAL	**2XS 205 020-011**	⑨	X	
24 V rubber pendulum and angled bracket, AMP-SUPERSEAL	**2XS 205 020-031**	⑨	X	
24 V screw mounting, 500 mm cable	**2XS 205 020-051**	⑨	X	
24 V, rubber pendulum, AMP-SUPERSEAL	**2XS 205 020-131**	⑨	X	





Clearance lamp

For vertical surface mounting.			ECE	SAE (USA)
a) Red/white with grey base plate				
Left, with 12 V bulb	**2XS 008 479-001**	⑨	X	
Right, with 12 V bulb	**2XS 008 479-011**	⑨	X	
Left, with 24 V bulb	**2XS 008 479-041**			
Right, with 24 V bulb	**2XS 008 479-051**			
Left, without bulb	**2XS 008 479-061**	⑨	X	
Right, without bulb	**2XS 008 479-071**	⑨	X	
b) Red/white with white base plate				
Left	**2XS 008 479-081**	⑨	X	
Right	**2XS 008 479-091**	⑨	X	
c) Red with grey base plate, position light function silver-coloured, opaque				
Left, 12 V	**2XS 008 479-107**	⑨	X	
Right, 12 V	**2XS 008 479-117**	⑨	X	

Type approval: E1 1201

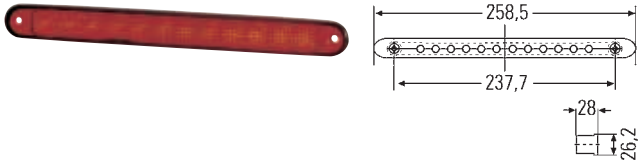
Auxiliary stop lamps

LED auxiliary stop lamp

For horizontal surface mounting, with 12 red LEDs, in brilliant optics, with 3D depth effect through embedding, each LED in a separate reflector, with 200 mm cable.			ECE	SAE (USA)
12 V / 1.8 W, red lens	**2DA 343 800-001**	②	X	■
12 V / 1.8 W, with rubber base	**2DA 343 800-057**	②	X	■
24 V / 2.1 W, red lens	**2DA 343 800-047**	②	X	■

Type approval: E4 7715

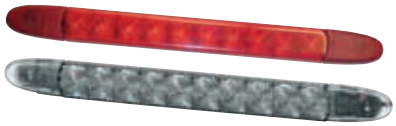
Auxiliary stop lamps

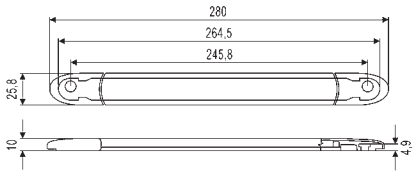


LED auxiliary stop lamp

For horizontal flush mounting, 12 LEDs, 2,500 mm cable and open cable ends.			ECE	SAE (USA)
12 V / 2 W, red lens	**2DA 959 071-537**	②	X	■
12 V / 2 W, clear lens	**2DA 959 071-037**	②	X	■
24 V / 2 W, red lens	**2DA 959 071-731**	②	X	■
24 V / 2 W, clear lens	**2DA 959 071-237**	②	X	■

Type approval: E24 7547

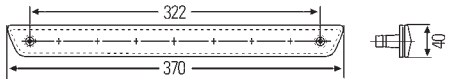




LED auxiliary stop lamp

For horizontal or vertical surface mounting, with 10 red LEDs, with 3,000 mm cable, installation height 9.5 mm (installation position).			ECE	SAE (USA)
12 V/0.7 W, current consumption = approx. 0.06 A 24 V/1.4 W, current consumption = approx. 0.06 A				
Red lens				
12 V, for screw mounting	**2DA 343 106-007**	②	X	
12 V, self-adhesive, for smooth and clean surfaces	**2DA 343 106-207**	②	X	
24 V, for screw mounting	**2DA 343 106-011**	②	X	
24 V, self-adhesive, for smooth and clean surfaces	**2DA 343 106-211**	②	X	
Smoked glass lens				
12 V, for screw mounting	**2DA 343 106-021**	②	X	
12 V, self-adhesive, for smooth and clean surfaces	**2DA 343 106-221**	②	X	
24 V, for screw mounting	**2DA 343 106-031**	②	X	
24 V, self-adhesive, for smooth and clean surfaces	**2DA 343 106-231**	②	X	

Type approval: E24 7696



Auxiliary stop lamp

For horizontal flush mounting, red lens, with mounted 12 V bulbs, 2.3 W.			ECE	SAE (USA)
With PE foam seal, coated on both sides with adhesive	**2DA 008 136-027**	②	X	
Screw mounting from the front through the lens (screws are not included in the scope)	**2DA 008 136-017**	②	X	

Type approval: E13 02799

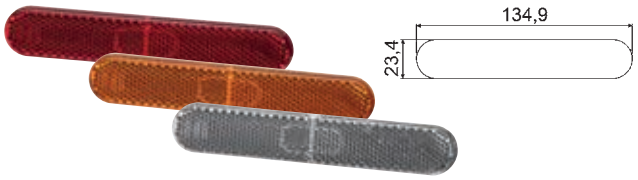
ECE note: Direction indicator approval by category
D ECE approval as double lamp

SAE type approval for vehicles
■ < 2,032 mm wide
● > 2,031 mm wide

① Tail light ② Stop light ③ Direction indicator light ④ Rear fog light ⑤ Reverse light
⑥ Reflex reflector ⑦ Side marker lamp with reflex reflector ⑧ Licence plate light ⑨ Position light

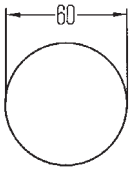
Please observe the note on pages 132 and 133 regarding LED direction indicators and LED lamp failure control.

Reflex reflector



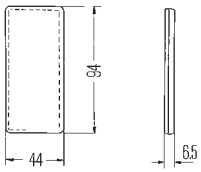
Reflex reflector				
For horizontal or vertical surface mounting.			ECE	SAE (USA)
Red, self-adhesive	**8RA 009 226-137**	⑥	X	
Amber, self-adhesive	**8RA 009 226-127**	⑥	X	
White, self-adhesive	**8RA 009 226-117**	⑥	X	

Illustrations similar



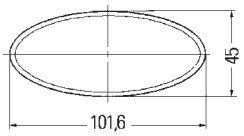
Reflex reflector				
			ECE	SAE (USA)
Red, self-adhesive	**8RA 002 014-281**	⑥	X	X
Amber, self-adhesive	**8RA 002 014-301**	⑥	X	
White, self-adhesive	**8RA 002 014-291**	⑥	X	

Type approval: E9 023535



Reflex reflector				
For horizontal or vertical surface mounting.			ECE	SAE (USA)
Red, self-adhesive	**8RA 003 326-031**	⑥	X	■
Amber, self-adhesive	**8RA 003 326-041**	⑥	X	■
White, self-adhesive	**8RA 003 326-051**	⑥	X	■

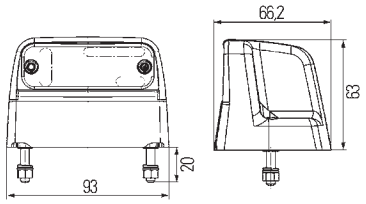
Type approval: E2 0292031



Reflex reflector				
For horizontal or vertical surface mounting, suitable for lamp series 9642.			ECE	SAE (USA)
Red, self-adhesive	**8RA 343 160-007**	⑥	X	■
Amber, self-adhesive	**8RA 343 160-027**	⑥	X	■
White, self-adhesive	**8RA 343 160-017**	⑥	X	■

Type approval: E4 3190

Licence plate lamps

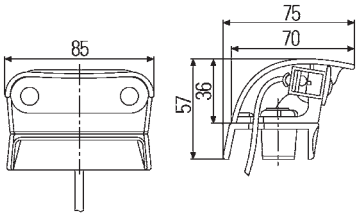


LED licence plate lamp

2 LEDs, for surface mounting on left and right, power consumption 0.3–0.5 W, lifetime 40,000 hours, operating temperature: -40°C to +85°C, ADR.

12 / 24 V, 500 mm cable, EasyConn	**2KA 012 271-057**

Type approval: E24 0032, E1 10R-047294

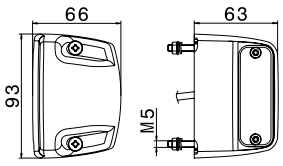


LED licence plate lamp

For surface mounting to the left and right of the 520 x 120 mm licence plate, with 2.5 m cable, bracket for mounting the lamp to the body, cover, fastening screws, cover caps for screws as well as a spacer for different surface mounting situations, multi-voltage 10–33 V; with 2 LEDs, 0.5 W.

12 V / 0.55 W, current consumption = approx. 0.04 A	
Clear lens, black housing, single	**2KA 959 640-601**
Clear lens, black housing	**2KA 959 640-607**

Type approval: E24 4068 and e1 03 1721



LED licence plate lamp

12 V, for surface mounting on the right or left of the licence plate, with 4 LEDs, clear lens, housing made of black plastic, with CE and ECE type approval, with flat connector 6.3 x 0.8.

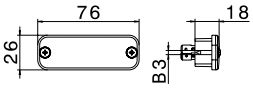
For 520 x 120 mm licence plates, only 1 lamp required for illumination	
12 V / 1 W, current consumption = approx. 0.08 A	**2KA 010 278-321**
24 V/1 W, current consumption = 0.04 A	**2KA 010 278-021**

Type approval: E1 2609

For 340 x 240 mm and 280 x 200 mm licence plates	
12 V / 1 W, current consumption = approx. 0.08 A	**2KA 010 278-421**
24 V/1 W, current consumption = 0.04 A	**2KA 010 278-121**

Type approval: E1 2911

Licence plate lamps

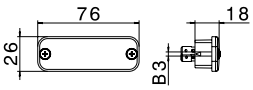


LED licence plate lamp

For flush mounting above the licence plate, with frame, with flat connector 6.3 x 0.8, for 340 x 240 mm and 280 x 200 mm licence plates, only 1 lamp required for illumination.

12 V	**2KA 010 278-411**
24 V	**2KA 010 278-111**

Type approval: E1 2911

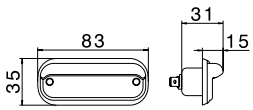


LED licence plate lamp

For flush mounting above the 520 x 120 mm licence plate, 2 lamps required for illumination, with black plastic frame, with flat connector 6.3 x 0.8

12 V / 1 W, current consumption = approx. 0.08 A	**2KA 010 278-311**
24 V/1 W, current consumption = 0.04 A	**2KA 010 278-011**

Type approval: E1 2609

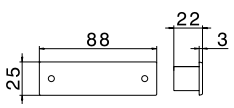


Licence plate lamp

For flush mounting above or below the 520 x 120 mm (2 or 3 lamps) and 340 x 240 mm (2 lamps) licence plates, 2 x M4 fastening screws, installation depth: approx. 25 mm, clear lens.

With brilliant chrome edge	**2KA 001 378-001**
With silver-coloured edge, without fastening material	**2KA 001 378-041**
With black edge and 12 V bulb	**2KA 001 378-127**

Type approval: E1 12958



Licence plate lamp

For flush mounting above or below (2 lamps) the 520 x 120 mm licence plate, 2 holes for fastening screws, installation depth: approx. 20 mm, clear lens.

With 12 V bulb	**2KA 004 331-061**
Type approval: E1 22890	
With 12 V bulb incl. fastening screws	**2KA 004 331-097**

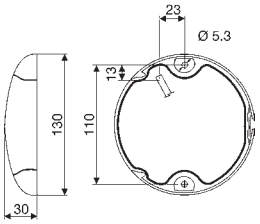
Type approval: E1 22890, SAE L82

HELLA offers a comprehensive product range of interior lighting for various vehicle applications and vehicle types.

The product range includes, but is not limited to, ambient lighting in the form of light guides and LED modules, consistent lighting systems/modules for ceiling systems, service sets (control units) and step lighting.

If you have any questions, please contact our sales representatives or our customer service centre.

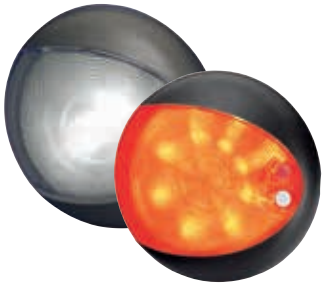
Ceiling lamps

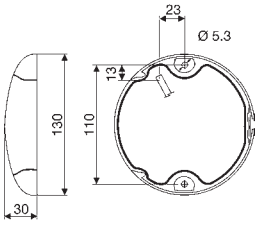


EuroLED ceiling lamp

Number of LEDs	1 white power LED
Connection	Electrical connection via a 2,500 mm-long cable
Lens	White
Power consumption	4 W (0.33 A at 12 V), white < 2.5 W (0.20 A at 12 V), red
Installation	Surface mounting, permanently bonded to base plate

Multi-voltage 9-33 V	**2JA 959 820-501**

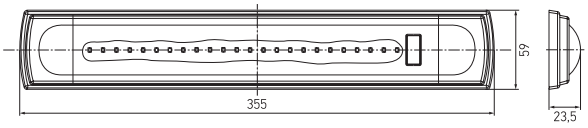




EuroLED Touch ceiling lamp

Number of LEDs	1 white and 8 red
Connection	Electrical connection via a 2,500 mm-long cable
Function	With sensitive switch, for ON/OFF and dimming as well as switching between red and white light
Lens	White
Power consumption	4 W (0.33 A at 12 V), white < 2.5 W (0.20 A at 12 V), red
Installation	Surface mounting, permanently bonded to base plate

Black housing	**2JA 959 950-031**
White housing	**2JA 959 950-041**

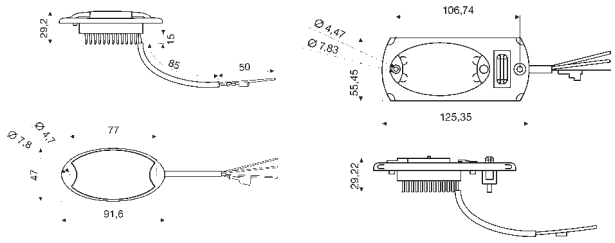


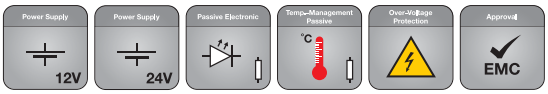
LED ceiling lamp, structure

Number of LEDs	24 LEDs
Illuminance at 1 m	approx. 200 lux (24 LEDs)
Length	355 mm
Light colour	4,000 K (neutral white)
Rated power	4.8 W
Current consumption	approx. 0.40 A at 12 V approx. 0.20 A at 24 V

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

Ceiling lamps



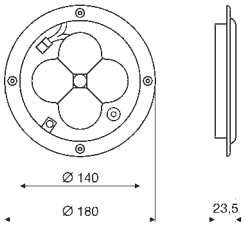


Mini Oval LED	
Number of LEDs	4 white LEDs, 1 ambient LED
Illumination angle	50°
Illumination	For the driver's side or the instrument panel
Illuminance at 1 m	Standard = 14.5 lux, Power = 54 lux
Function	Switchable ambient lighting
IP protection class	6K9K (without frame/switch), 40 (with frame/switch)
Power consumption	Standard = 1.7 watts (0.14 A at 12 V) Power = 3.6 watts (0.30 A at 12 V)
Lens	Brilliant and clear
Installation	Flush mounting
Current consumption	3.6 W = approx. 0.30 A (12 V) 3.6 W = approx. 0.15 A (24 V)
Voltage	12 V or 24 V
Temperature range	-40° to +60°C

LED equipment	Without frame and switches	With frame and switches
4 white power LEDs, 12 V, blue	**2JA 343 570-117**	**2JA 343 570-157**
4 white power LEDs, 24 V, blue	**2JA 343 570-101**	**2JA 343 570-141**
4 white power LEDs, 12 V, red	**2JA 343 570-011**	**2JA 343 570-051**
4 white power LEDs, 24 V, red	**2JA 343 570-001**	**2JA 343 570-041**
4 white standard LEDs, 12 V, red	**2JA 343 570-031**	–
4 white standard LEDs, 24 V, red	–	**2JA 343 570-061**

Other versions are available on request

Ceiling lamps

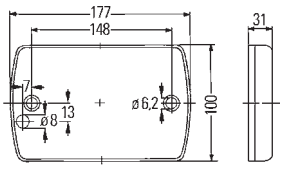


CargoLED ceiling lamp

Number of LEDs	4 white power LEDs
Connection	Electrical connection via a 310 mm-long cable
Illumination angle	44° (wider illumination at close range)
Illuminance at 1 m	180 Lux
Power consumption	6 watts (0.5 A at 12 V)
Lens	Clear
Installation	Flush mounting (aluminium installation frame)
Temperature range	-40°C to +60°C
Warm white	**2JB 343 227-041**

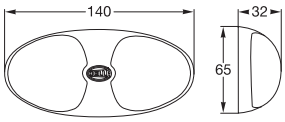
Accessories

Installation frame, grey	**9XD 344 118-101**



DuraLED interior lamp

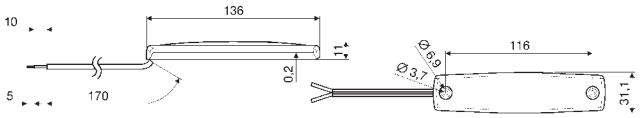
Number of LEDs	36 white LEDs
Connection	Electrical connection via a 2,500 mm-long cable
Illumination angle	70°, wide horizontal and narrow vertical illumination
Illuminance	720 Lux
Power consumption	9 watts (0.75 A at 12 V)
Lens	Clear
Material description	Impact-resistant plastic, UV-resistant
Installation	Surface mounting, permanently bonded to white base plate
Multi-voltage 9-33 V	**2JA 959 037-511**

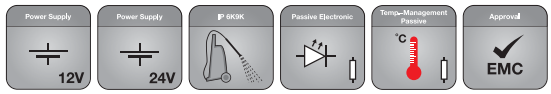


DuraLED ceiling lamp

Number of LEDs	4 white LEDs
LED beam angle	120°
Illuminance at 1 m	60 Lux
IP protection class	6K6 6K7
Power consumption	3 watts (0.25 A at 12 V)
Voltage	Dual-voltage 12 and 24 V
12 V	**2JA 959 700-102**

Orientation lamps
LED step lamps

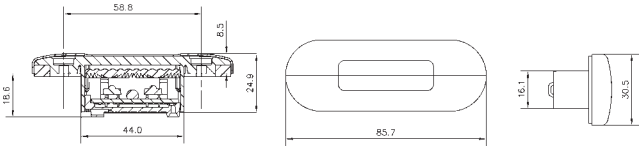




Mini Thin LED orientation lamp

Number of LEDs	5 white LEDs
Connection	Electrical connection via a 170 mm-long cable
Illumination angle	34°
Illuminance at 1 m	7.2 lux
IP protection class	6K9K
Power consumption	2.8 W (0.23 A at 12 V) 2.8 W (0.11 A at 24 V)
Voltage	12 V or 24 V

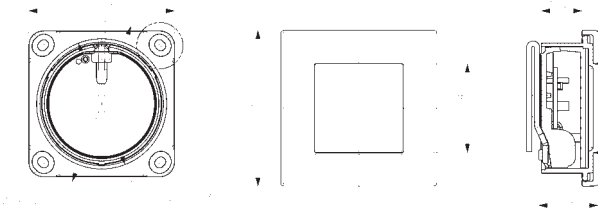
12 V	**2JA 343 660-101**
24 V	**2JA 343 660-117**

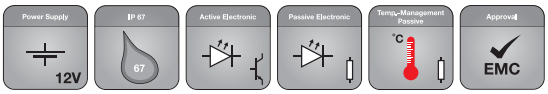


LED step lamp

Number of LEDs	1 LED
Property	With polished steel frame
Installation	Flush mounting

1 blue LED	**2XT 959 680-612**
1 white LED	**2XT 959 680-812**



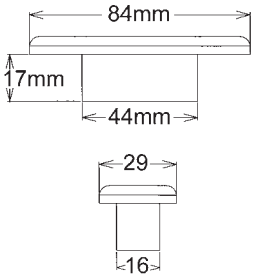


LED step lamp

Number of LEDs	4 white LEDs
Property	With square white frame
Power consumption	0.5 W (0.04 A at 12 V)
Lens	White
Installation	Flush mounting

12 V, passive electronics	**2XT 980 580-052**
12 V, active electronics	**2JA 980 596-002**

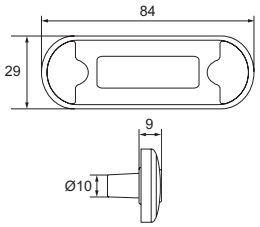
Orientation lamps
LED step lamps



LED step lamp

Number of LEDs	2 LEDs
Connection	Electrical, via a 120 mm-long cable
Illumination angle	30°
Illuminance at 1 m	15 lx
Property	With polarity reversal protection
IP protection class	5K9K
Power consumption	0.5 W (0.04 A at 12 V)
Lens	Clear
Scope of delivery	Seal, fastening screws, and screw caps
Installation	Flush mounting

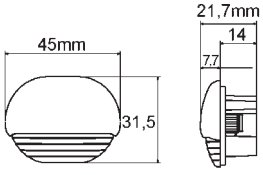
White LEDs	**2XT 959 510-427**
Blue LEDs	**2XT 959 510-657**



LED step lamp

Number of LEDs	2 LEDs
Connection	Electrical, via a 500-mm long cable
Connecting bracket	30°
Illuminance at 1 m	15 lx
Property	With polarity reversal protection
Power consumption	0.5 W (0.04 A at 12 V)
IP protection class	6K9K
Lens	Clear
Scope of delivery	Seal, fastening screws, and screw caps
Installation	Flush mounting

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

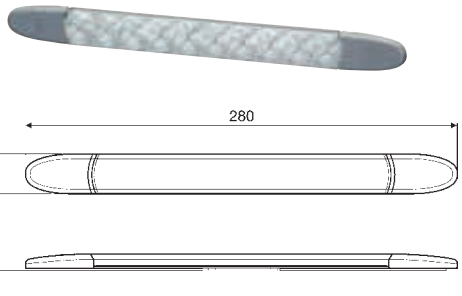


LED step lamp

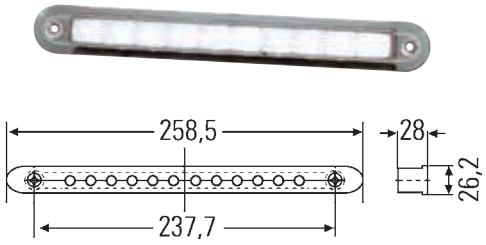
Number of LEDs	1 LED
Connection	Electrical connection via a 100 mm-long potted cable
Illumination	Wide in close range areas
Illuminance at 1 m	< 10 Lux
Colouring	White cover cap
Power consumption	0.5 W (0.04 A at 12 V)
Lens	Clear
Scope of delivery	With seal
Installation	Flush mounting, choice with 2 screws or possible with snap-on fastening

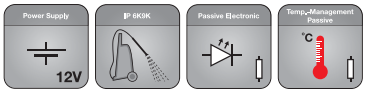
White LEDs	**2JA 998 560-017**
Blue LEDs	**2JA 998 560-057**

Orientation lamps
LED step lamps



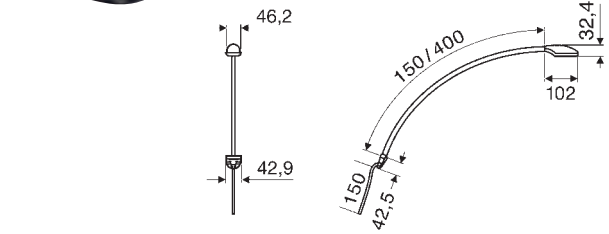
LED orientation lamp, structure, flat	
Number of LEDs	10 white LEDs
Connection	Electrical connection via a 500 mm-long cable
Illumination angle	38°
Illuminance at 1 m	32 Lux
Power consumption	1.8 W (0.15 A at 12 V)
Lens	Clear
Installation	Surface mounting, permanently bonded to grey base plate
Temperature range	-40°C to +60°C
12 V, white LEDs	**2JA 343 606-001/-007**
12 V, blue LEDs	**2JA 343 606-201**





LED step lamp	
Number of LEDs	10 white LEDs
Connection	2,500 mm cable
Illumination angle	24°
Illuminance at 1 m	130 Lux
Property	Cast in one piece
Power consumption	2 W (0.16 A at 12 V)
Lens	Clear
Scope of delivery	With screws, screw caps, seal, and cable connector
Installation	Flush mounting
12 V	**2JA 959 073-001**

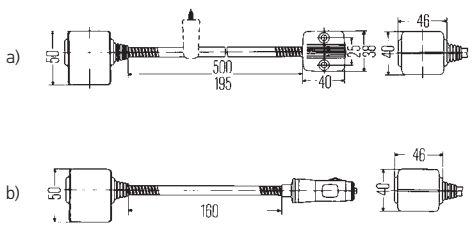
Reading lamps



LED reading lamp, flexibly adjustable arm

Number of LEDs	1 white power LED
Connection	Electrical, via a 150 mm-long cable
Illumination	Optimal for map-reading
Illumination angle	38°
Illuminance at 0.7 m	110 Lux
IP protection class	53
Power consumption	2.5 W (0.20 A at 12 V)
Lens	With optics
Installation	Surface mounting

150 mm	**2JA 343 720-011**
With connector for cigarette lighter (150 mm)	
Black cover colour	**2JA 343 720-081**



Xenon reading lamp, flexibly adjustable arm

Number of light sources	1 Xenon bulb 12 V/6 W
Property	With flexible metal arm
Light source	Strong and glare-free
Power consumption	6 W (0.50 A at 12 V)
Lens	Clear
Scope of delivery	With bracket for fixed attachment
Installation	Surface mounting
Voltage	12 V

a) For fixed installation	
500 mm	**2AB 004 532-001**
195 mm	**2AB 004 532-011**
b) With connector for cigarette lighter	
160 mm	**2AB 004 532-021**
Accessories	
Red lens	**9EL 128 922-011**
Spare parts	
Xenon bulb, 12 V	**8GP 007 676-121**
Bracket	**9XB 136 202-005**

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Energy management

Intelligent battery sensors

Environmental and medium sensors

Rain-light sensors

Position sensors

Accelerator pedal sensors

Angular position sensors

Actuators

Actuators (low force)

Actuators (medium force)

Actuators (high force)

Actuators (Smart URA)

Universal Turbo Actuators (UTA)

Operating systems – vehicle/driver interface

Rocker switches

Lighting electronics

LED flasher unit: towing vehicle

LED lamp control unit

Control unit for flashing side marker lamps

Simulation device for cold check

Body electronics

Remote control systems

Electronics tool

Our electronics tool informs you quickly and clearly of which electronic products HELLA offers for special original equipment. First of all, select an appropriate vehicle or area of application (drive train or cab). After selecting the appropriate product via mouse click, you will receive further information as well as PDFs with important information and technical data for download. In addition, the tool provides clear animations showing how the products work.

www.hella.com/electronictool

LED lighting:
Failure control and electrical connection

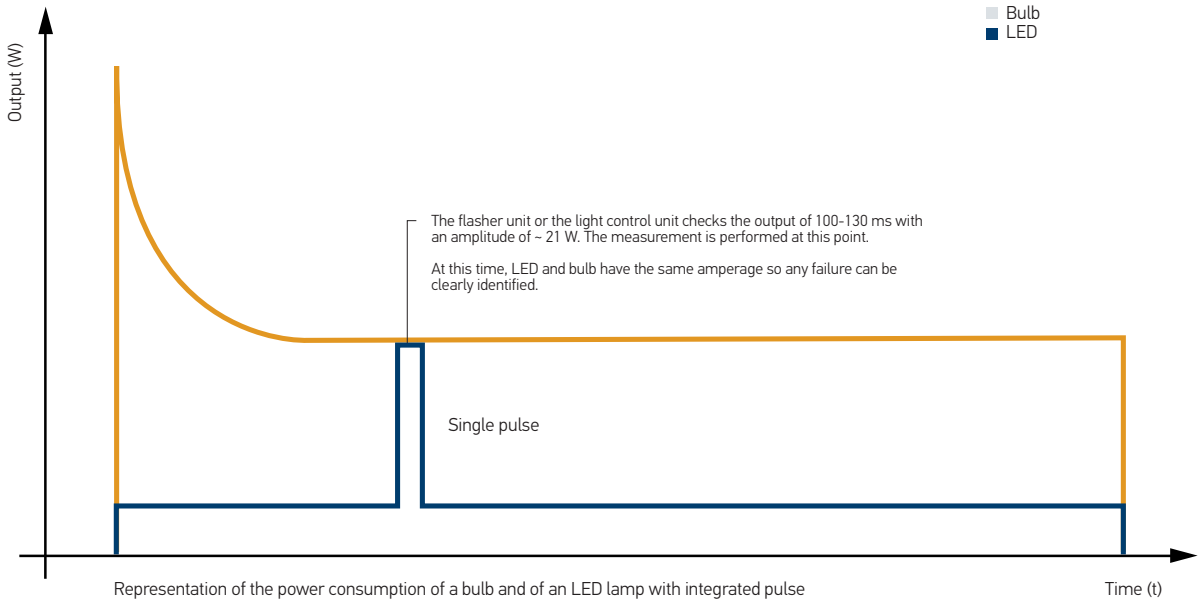
LED lamp failure control

A defined standard cannot be used for monitoring LED lamps like it is for bulbs. Every LED lamp has a different technical implementation and 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.

Therefore, monitoring failure control is no longer as simple as it once was with bulb-type lamps.
HELLA has various approaches to solving this problem. they are summarised here under the heading "Lighting Electronics".

Functional diagram



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

What is required by law?
In the ECE R48 area of application, it is necessary by law to ensure failure control for LED lamps in the vehicle electrical system using suitable measures. The driver must be made aware of the failure visually or acoustically in the vehicle.

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

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

Flasher units
LED direction indicators conforming to ISO 13207 can "communicate" with the flasher unit. At a defined period of time, the flasher unit checks the defined energy requirement at a defined point in time: At a period of 100–130 ms after each activation of the direction indicator, the power consumption must be exactly 21 W. The energy requirement or "pulse" corresponds to that of a bulb in this case, meaning that the flasher unit notices no difference between a bulb and an LED lamp that conforms to 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. This method requires LED lamps conforming to ISO 13207 and flasher units conforming to ISO 13207.

The advantage:
Bulbs and ISO LED lamps can be operated in any combination on a flasher unit that conforms to ISO 13207. 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 monitor the LED lamps and pretend to the vehicle that bulbs are connected. This allows LED lamps to be used without any problems.

Monitoring of current
Another option is measuring the average energy requirement 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 requirement is so low that they are detected as defective even when functioning correctly. Or in the worst case scenario, the electronic ballast of the LED lamp requires so much energy that a failure cannot be detected even if all the LEDs are defective.

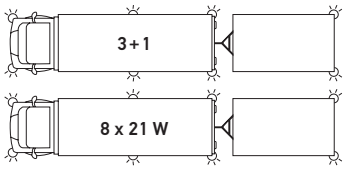
LED lighting
Failure control and electrical connection
LED flasher unit: towing vehicle

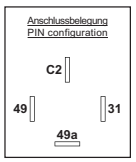
LED direction indicators conforming to ISO 13207 can "communicate" with the flasher unit. At a defined period of time, the flasher unit checks the defined energy requirement at a defined point in time: At a period of 100 –130 ms after each activation of the direction indicator, the power consumption must be exactly 21 W. The energy requirement or "pulse" corresponds to that of a bulb in this case, meaning that the flasher unit notices no difference between a bulb and an LED lamp that conforms to ISO 13207.

The advantage is that bulbs and ISO LED lamps can be operated in any combination on a flasher unit that conforms to ISO 13207. 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.

Technical data – 12 V	
Operating voltage	10 – 15 V
Functional voltage	11 – 14 V
Operating temperature	-40°C to +85°C
Protection class	IP 53 (contacts underneath)
Contact	Flat connector DIN 46244 A6, 3 x 0.8

Technical data – 24 V	
Operating voltage	18 – 32 V
Functional voltage	20 – 28 V
Operating temperature	-40°C to +85°C
Protection class	IP 53 (contacts underneath)
Contact	Flat connector DIN 46244 A6, 3 x 0.8



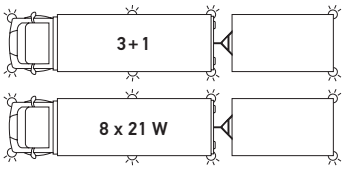


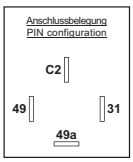
12 V, LED flasher unit 3+1

EP-control
Lamp failure control C: tractor, high frequency
Lamp failure control C2: 1st trailer C2 lamp off

Load	C2	Frequency (49a)
1 x 21 W	Off	F2
2 x 21 W	Off	F2
3 x 21 W	Off	F1
(3+1) x 21 W	F1	F1

4DW 009 492-111



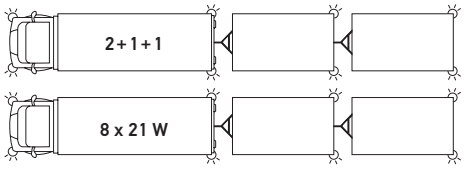


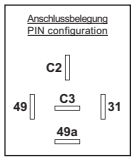
24 V, LED flasher unit 3+1

EP-control
Lamp failure control C: tractor, high frequency
Lamp failure control C2: 1st trailer C2 lamp off

Load	C2	Frequency (49a)
1 x 21 W	Off	F2
2 x 21 W	Off	F2
3 x 21 W	Off	F1
(3+1) x 21 W	F1	F1

4DW 009 492-011



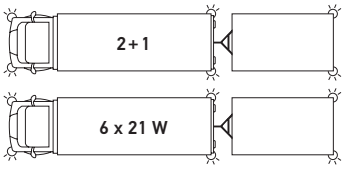


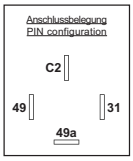
12 V, LED flasher unit 2+1+1

EP-control
Lamp failure control C: tractor, high frequency
Lamp failure control C2: 1st trailer C2 lamp off
Lamp failure control C3: 2nd trailer C3 lamp off

Load	C2	C3	Frequency (49a)
1 x 21 W	Off	Off	F2
2 x 21 W	Off	Off	F1
(2+1) x 21 W	F1	Off	F1
(2+1+1) x 21 W	F1	F1	F1

4DN 009 492-101





24 V, LED flasher unit 2+1

EP-control
Lamp failure control C: tractor, high frequency
Lamp failure control C2: 1st trailer C2 lamp off

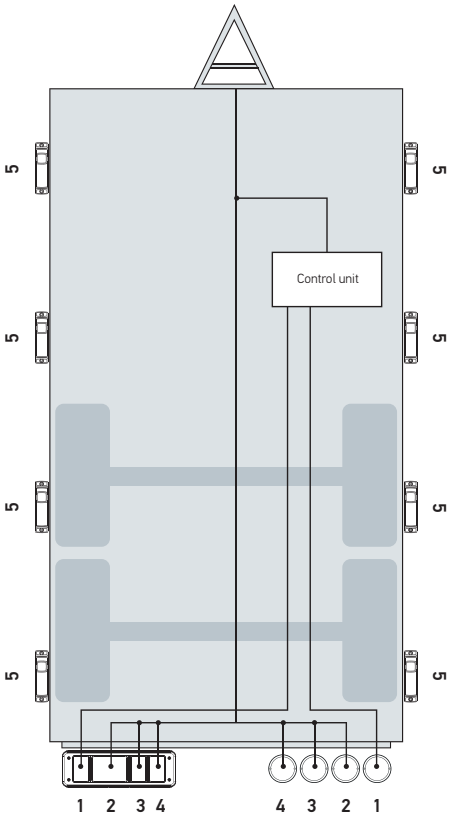
Load	C2	Frequency (49a)
1 x 21 W	Off	F2
2 x 21 W	Off	F1
(2+1) x 21 W	F1	F1

4DM 009 492-001

F1: normal flashing frequency, F2: increased flashing frequency

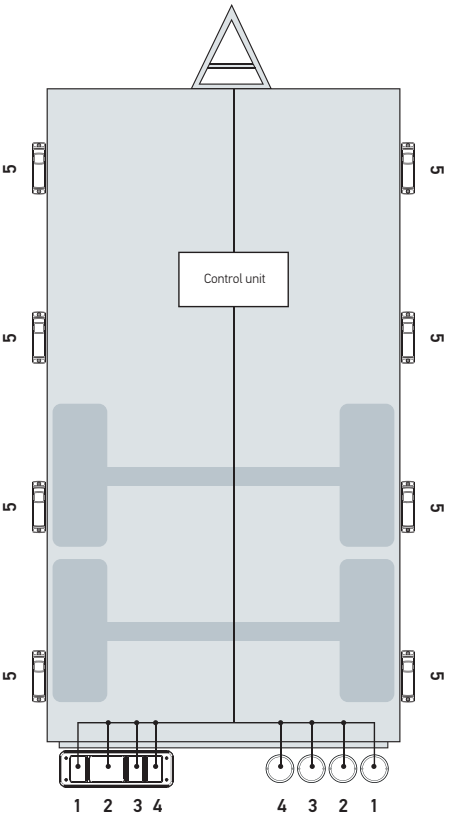
LED lighting
Failure control and electrical connection
LED lamp control unit

System representation: Basic
Control unit is **only** responsible for monitoring the direction indicators.



Key
1 – Direction indicator light
2 – Tail-stop light
3 – Reverse light
4 – Rear fog light
5 – Side marker light

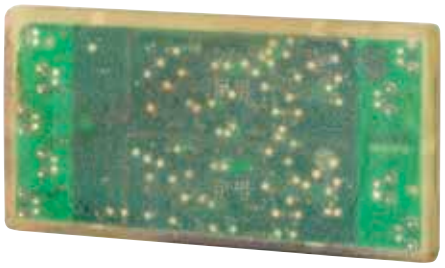
System representation: Premium
Control unit is responsible for monitoring **the whole** rear lighting (tail lights, stop lights, direction indicators, reverse light and rear fog light).



Key
1 – Direction indicator light
2 – Tail-stop light
3 – Reverse light
4 – Rear fog light
5 – Side marker light

Basic control unit	
12 V Basis	**5DS 227 488-001**
24 V Basis	**5DS 227 488-101**

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

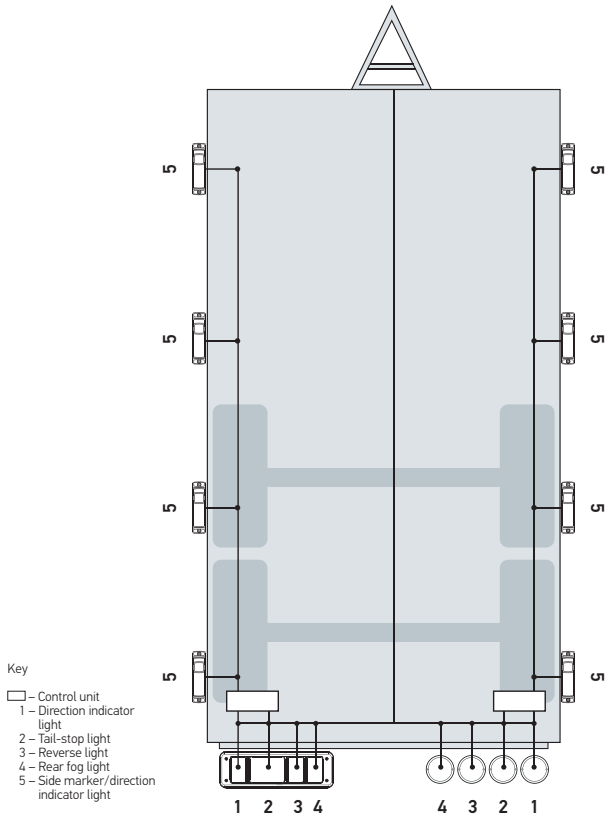


LED lighting

Control unit for flashing side marker lamps

In order to increase the safety of trailers, the side marker lamps can flash synchronously with the direction indicators.

This control unit can be connected to any side marker lamp and allows it to flash, if necessary.



Key

□ – Control unit
1 – Direction indicator light
2 – Tail-stop light
3 – Reverse light
4 – Rear fog light
5 – Side marker/direction indicator light

Technical data	
Operating temperature	-40°C to +65°C
Protection class	IP 6K9K
Contact	Flat connector DIN 46244 A6, 3 x 0.8

Control unit for flashing side marker lamps	
ECE R48 category 6, 24 V	**5DS 223 544-001**

LED lighting
Failure control and electrical connection
Simulation device for cold check

If the existing vehicle electrical system is programmed to monitor the lighting even when it is not in operation, this 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.

The cold check control unit is connected between the body control unit and a LED direction indicator that conforms to ISO 13207. The cold check control unit checks the function of the direction indicator during operation using the ISO pulse. If the direction indicator fails, the status is saved, meaning it can be displayed during the next cold check.

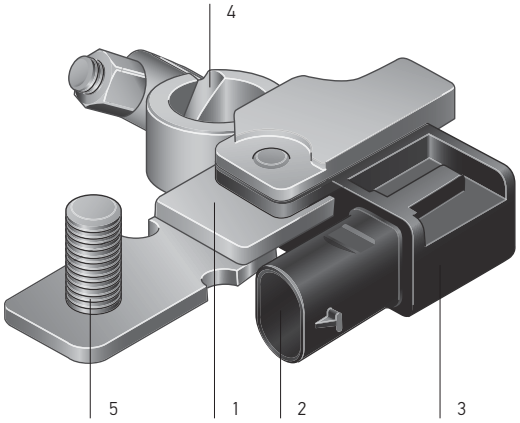
12 V	
Operating voltage	9 – 16 V
Rated current	1.5 A
Operating temperature	-40 to +85 °C
Protection class	IP 54 (contacts below)
Part number	**5DS 009 602-011**

24 V	
Operating voltage	18 – 32 V
Rated current	1.5 A
Operating temperature	-40 to +85 °C
Protection class	IP 54 (contacts below)
Part number	**5DS 009 602-001**

Intelligent battery sensors

Product features

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



Application

The intelligent battery sensor from HELLA (IBS) is the key element in vehicle energy management.

The IBS reliably and accurately measures the battery parameters: voltage, current, and temperature. Information on the state of charge (SOC), the state of ageing (SOH) and also the anticipated starting capability (SOF) of the battery is calculated via algorithms using the measured values. The IBS is designed to be used in starter, gel and AGM batteries to monitor starter or consumer batteries in the vehicle. The IBS can be directly integrated into the vehicle electrical system via the standardised LIN protocol.

Design and function

The IBS is attached directly to the negative pole of the battery via the pole terminal **(4)**. .

In addition to the terminal, the mechanical part of the battery sensor consists of shunt **(1)** and earthing bolt components **(5)**. 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 **(5)** e.g. with the battery pole that is available as an option.

The electronics are located in a moulded housing **(3)** with a plug connector **(2)** functioning 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 pole of the battery.

The ASIC is the main electronics component used to record and process measured values. Measured value acquisition in the ASIC, as a precision sensor, is the core function of the intelligent battery sensor and is used to record the physical parameters of current, voltage and temperature.

Battery condition algorithms
The intelligent battery sensor calculates and monitors the following battery conditions:

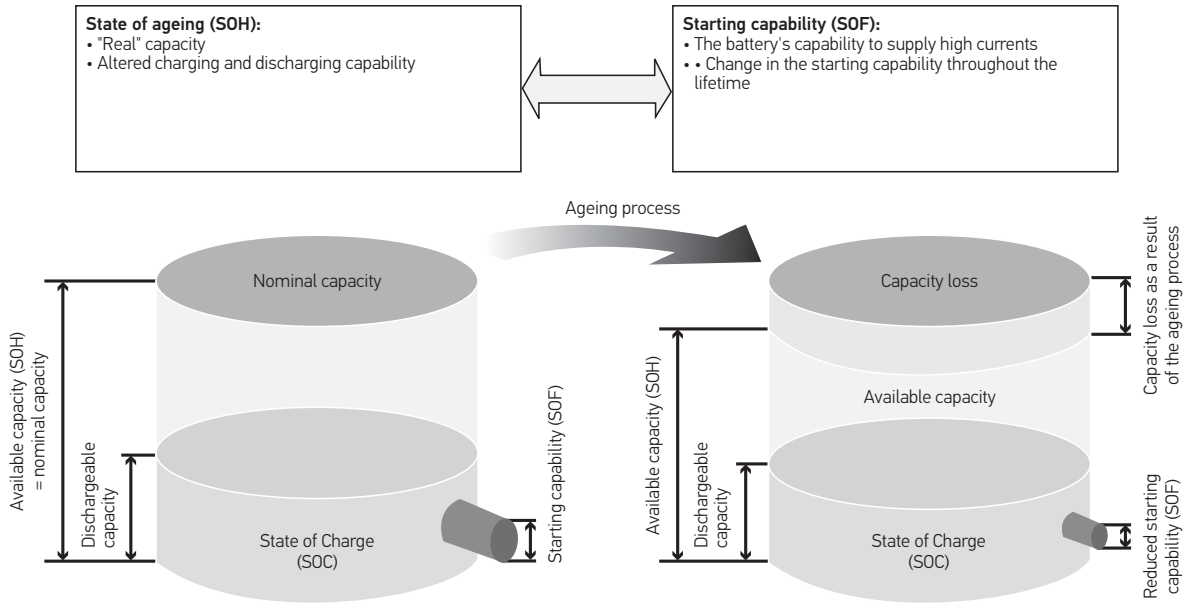
State of charge:
State of charge (SOC) describes the current state of charge of the battery.
The SOC is defined as:
SOC [%] = dischargeable capacity/nominal capacity

State of Health:
State of Health (SOH) indicates the battery's condition of ageing.
The State of Health (SOH) is defined as:
SOH [%] = available capacity/nominal capacity

The available capacity of the battery typically decreases as the battery ages and as a result of lengthy use.

State of Function:
State of Function (SOF) describes the future starting capability of the motor based on the actual measured current and the voltage.

Monitoring different battery states



Overview of variants

Four intelligent battery sensor variants are available. Sensor 1 is the basic version. Sensor 2 is used to monitor a second battery in the same communication network. The third variant is used when two 12 V batteries are series-connected (24 V vehicle electrical system). The fourth variant is intended for vehicles with high starting currents (e.g. agricultural and construction vehicles) as well as those with higher ground cable cross sections (> 70 mm²).

Operating voltage	Type	Mating connector	Part number
6 – 16.5 V	Sensor 1	Hirschmann 872-858-565	**6PK 010 842-001**
6 – 16.5 V	Sensor 2	Hirschmann 872-858-565	**6PK 010 842-011**
7.5 – 32 V	Cable lug, straight	Hirschmann 872-858-546	**6PK 011 700-001**
7.5 – 32 V	Cable lug, right-angled	Hirschmann 872-858-546	**6PK 011 700-317**
6 – 16.5 V	For motor homes	Hirschmann 872-857-561	**6PK 013 824-001**
6 – 16.5 V	For agricultural and construction vehicles	Hirschmann 872-858-546	**On request**

Floor-mounted/suspended accelerator pedals

Product features

- → Contactless measuring principle
- → Slim yet sturdy design
- → Simple mechanical connection
- → Redundant output signal
- → High degree of measurement accuracy; programming in the vehicle is not necessary
- → High interference immunity against electrical and magnetic fields

Design and function

Housing and operating lever or pedal plate are made entirely of reusable, glass-fibre reinforced plastic. Encased in the device, the sensor is completely waterproof and does not extend beyond the package space. Two springs on the pedal ensure, independently of one another, a secure reset as soon as the foot is taken off the accelerator. The electrical output signal is obtained via the CIPOS® measuring principle. For this purpose, a sheet metal cursor is routed from the pedal arm via sensor paths on the measuring board. There, two galvanically separated sensors each generate an output signal. Different output signals can be generated depending on the measuring board used. In addition, individual characteristic curves can be programmed on request.

Application

HELLA accelerator pedals, designed for floor-mounted or suspended installation, can be used in a wide variety of vehicles: ranging from automotive sector applications, such as sports cars and electric vehicles, to robust applications in agricultural and construction vehicles. The accelerator pedals are suitable for driver's cabs in agricultural and construction vehicles. Thanks to the wear-free measuring principle of the CIPOS ® sensor developed in-house at HELLA (see description of design and function of the angular position sensors) and its extremely low level of mechanical wear, this version is particularly preferred over contact-type accelerator pedals for frequent small movements.

Overview of variants

Description	Accelerator pedal material	Part number
Floor-mounted accelerator pedal	Plastic	**On request**
Suspended accelerator pedal	Plastic	**On request**

Rain-light sensors
Recording environmental properties

Product features

- → The fourth generation in a long established line of rain sensors from HELLA
- → Up to five functions in one product: Rain, light, solar, and humidity measurement as well as adjustment of the light intensity on the head-up display
- → Optimised design – extremely compact package space

Application

The full range of functions of the rain-light sensor (five functions: rain sensor, light sensor, solar sensor, humidity measurement, and head-up display) can only be used for passenger vehicle applications. This sensor can only be used to a limited extent in vehicles with special windshields (thick, slanted, transmission).

The optics of the second sensor are specifically designed for vehicles with steeply sloping windshields and combine the functions of rain and light detection (environment and tunnel detection).

Design and function

This new sensor offers the user five functions in one product:

- → Rain sensor
  The rain sensor is used to detect different rain situations in the sensor area and controls the front windshield wiper accordingly, meaning that manual intervention by the driver is now more or less unnecessary.
- → Light sensor
  As a light sensor, it causes the low beam to be switched on and off in varying light conditions or in special situations e.g. in tunnels.
- → Head-up display
  When used for the head-up display, the sensor records the brightness immediately surrounding the vehicle and adjusts the light intensity on the display depending on the current light conditions.
- → Solar sensor
  As a solar sensor, it measures the insolation, therefore supporting the air conditioning control system.
- → Humidity measurement
  The humidity measurement is used to control the air conditioning control unit for the air conditioning in the vehicle interior, such as automatic ventilation of the windshield.

Overview of variants

The sensors must be specifically applied for each vehicle. All part numbers are therefore assigned on a customer-specific basis.

Areas of application	Permissible windshield thickness	Permissible windshield tilt	Part number
Passenger cars	4 – 6 mm	22° – 32°	**On request**
Passenger cars (van)	4 – 6 mm	32° – 54°	**On request**
Vehicles with special windshields	6 – 9 mm	80° – 90°	**On request**

Remote control systems
Switching on and off and/or opening and locking

Product features

Electronic remote key:
- → Unlocking cab doors /covers
- → Controlling lamps/work lamps
- → Activating/deactivating an electronic immobiliser via transponder
- → Robust design

Application
The remote control system has been specifically developed for use in tough operating conditions (agricultural and construction vehicles, lorries). The system enables the vehicle operator to comfortably unlock the cab door. The remote control can be equipped with one or two buttons, depending on customer requirements. The robust design has been specifically developed for use in agricultural and construction vehicles. An additional control unit, which sends up to four output signals, also enables the controlling of lamps, e.g. work lamps or beacons. HELLA's remote control system can easily be used to activate direction indicator lights and to release or lock covers to engine compartments or toolboxes, for example. The design can be customised on request, e.g. to include customer-specific emblems.

Design and function
In terms of its electric function, the remote control transmitter consists of two units: the remote control transmitter electronics and the transponder.
The transponder responsible for the immobiliser function is independent of the remote control transmitter electronics and can be customised.

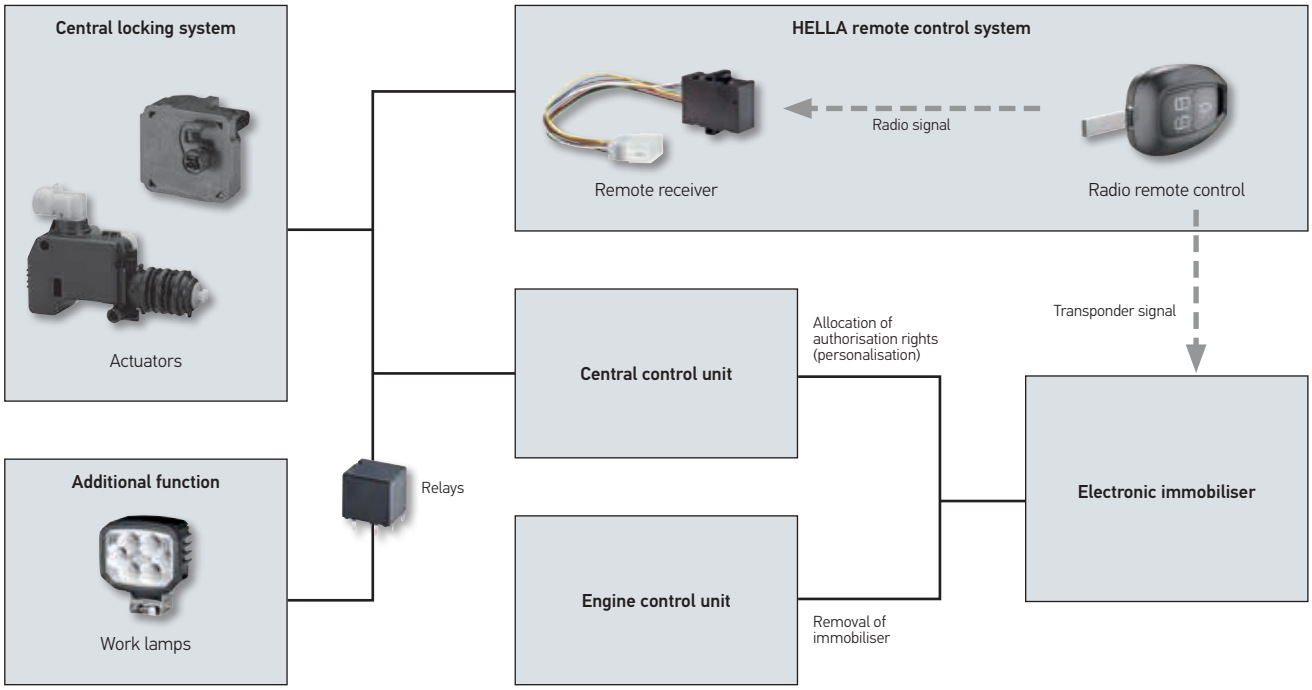
The remote control transmitter electronics are mounted on a double-sided printed circuit board. In addition to the remote control transmitter electronics themselves, the printed circuit board also contains the "Lock/Unlock" button and, depending on the variant, another button (additional function). Spring contact elements are used to provide the electrical connection between the printed circuit board and the battery. When a button is pressed, the radio remote control sends data packages with a rolling code in an updated 128 bit encryption. If the receiver of the radio remote control positively decrypts the data, it activates the output signals of the control unit.

The remote control system can be used in every European country as well as in North America (USA and Canada) and India without limitations. System radio approvals outside Europe can be carried out in consultation with HELLA.

The radio remote control is equipped with a holder for a mechanical key bit. The mechanical key bit is not included in the remote control transmitter's scope of delivery. The key bit is usually mounted (by using a special mounting device) either at the customer's premises or at those of the key bit manufacturer.

Two remote keys are "taught-in" and assigned to the device when the remote receiver is produced. Teaching additional remote keys in the field requires at least one functioning, taught-in key. A maximum of 7 remote keys can be taught in. If the maximum number of remote keys has already been taught in, the last key position is overwritten when programming an additional key.

Functional diagram



Overview of variants

There are two variants of the receiver control unit available: The basic variant and the enhanced variant. Customer-specific output signal characteristics are available upon request. If a customer-specific emblem is to be included, a new part number is created for this. Each device variant includes two dummy plugs made from hard plastic. This also enables the remote control transmitters to be operated without a key bit.

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

Further variants and configurations available on request.

Electromotive actuators

Electric locking/unlocking, space-saving, with or without micro switch
(Low Force)

Product features

- → Compact, space-saving design
- → Electromotive reset or automatic (non-electric) reset
- → Easy to mount thanks to snap-fit mounting
- → Splash-proof
- → With or without micro switch
- → Explosion report for tank modules

Application

The extremely space-saving design of this actuator makes it especially suitable for locking and unlocking applications in dry and wet areas (even via remote control, for example) where space is limited.

Examples include:

- → Tank modules
- → Service flaps
- → Glove compartments
- → Charging plug locking (e-mobility)

Function

When a voltage is applied, the motor integrated in the electromotive actuator moves the locking lever attached to the motor shaft.

Overview of variants

Function	Voltage	Manual adjustment	Protection class	Part number
Electrical open and return rotation				
	12 V	Yes	IP 5K4	**6NW 011 122-017**
With micro switch	12 V	Yes	IP 5K4	**6NW 011 122-027**
With micro switch, without operating element, without locking element	12 V	Yes	IP 5K4	**6NW 011 122-031**
With micro switch, with operating element, without locking element	12 V	Yes	IP 5K4	**6NW 011 122-051**
Electrical open rotation and return rotation via return spring with soft touch button				
	12 V	Yes	IP 5K4	**6NW 011 122-047**

Electromotive actuators

Electrical locking/unlocking and shutting (medium force)

Product features

- → High actuating force
- → High-accuracy laser-welded housing
- → Three versions
- → Dustproof and waterproof
- → With or without manual adjustment
- → Thermal overload protection through PTC (PolySwitch)
- → Multi-purpose usage
- → Various connecting elements available

Application

The motor-driven actuator is used for the electrical locking, unlocking or shutting function of the closing and flap systems in automotive and industrial applications.

Examples of applications in mechanisms include:

- → Electrical locking/unlocking
- → Electrical shutting
- → Electrical opening and closing of all doors (closing systems), flaps, roof windows, seats, covers, hoods, glove compartments, etc.

Accessories

The comprehensive range of accessories for the electromotive actuator includes a wide variety of different connecting elements, which enable the actuator to be integrated into your application easily without additional development costs.

Overview of variants

Function	Voltage	Actuating force*	Manual adjustment	Protection class	Part number
Electrical retraction and extension					
	12 V	30 – 130 N	Yes	IP 5K0	**6NW 009 203-401**
	12 V	30 – 140 N	No	IP 5K0	**6NW 009 203-411**
	12 V	20 – 130 N	Yes	IP 5K4	**6NW 009 203-627**
	12 V	30 – 160 N	No	IP 5K4	**6NW 009 203-637**
	24 V	30 – 130 N	Yes	IP 5K4	**6NW 009 203-441**
	12 V	30 – 140 N	No	IP 5K4	**6NW 009 203-557**
Electrical retraction and extension with mainspring					
	12 V	30 – 170 N	No	IP 5K0	**6NW 009 203-461**
	12 V	30 – 170 N	No	IP 5K4	**6NW 009 203-471**
	24 V	15 – 90 N	Yes	IP 5K4	**6NW 009 203-547**
Electrical extension and retraction with mainspring					
	12 V	30 –170 N	No	IP 5K0	**6NW 009 203-491**
	12 V	30 –170 N	No	IP 5K4	**6NW 009 203-501**
	24 V	20 – 140 N	No	IP 5K4	**6NW 009 203-521**

* Depends on the operating voltage and ambient temperature

Electromotive actuators

Electrical locking/unlocking and shutting (high force)

Product features

- → Very high positioning forces
- → Robust and compact design
- → Interference suppression class 3
- → Universal interface for Bowden cable
- → For universal use

Application

The actuator is particularly suitable for locking and pull/push applications where high forces are required.

Examples include:

- → Large locks
- → Large flaps
- → Seat release

Where a Bowden cable is used, the actuator can also work without being attached to the vehicle body, since it is fixed to the application through the Bowden cable sleeve and can be embedded in foam for noise insulation.

Function

This electromotive actuator is driven by a DC motor with rotary output. The actuator is operated by applying a voltage via a 2-pin connector with contacts "+" and "ground". It is reset by simply reversing the polarity or, alternatively, automatically via a spring. Direction of rotation and running time are defined by the control unit. The actuator can be fastened to three connection points.

Overview of variants

Function	Voltage	Torque	Manual adjustment	Protection class	Part number
Retraction via spring, electric extension	12 V	150 Ncm	No	IP 5K0	**6NW 009 424-781**
Electric extension and retraction	12 V	300 Ncm	No	IP 5K0	**6NW 009 424-791**
Electric extension and retraction, without shaft, without cable sheave and without metal clip	12 V	300 Ncm	No	IP 5K0	**6NW 009 424-777**

Electromotive actuators

Electric locking/unlocking and shutting
Part number 6NW 011 303-017

Product features

- → Flexible operating angle range
- → Rapid response time
- → Precise position control
- → Integrated CIPOS® position sensor directly on driven gear
- → "True power on" function for angular ranges < 180°
- → Controlled motion up to limit stop
- → Self-blocking transmission; lower current consumption (< 25 mA) for holding the position
- → Internal fault memory

Application

The URA can be used in a broad range of applications involving harsh environmental conditions, and can perform precise and reliable positionings. The insensitivity to magnetic fields and the high level of temperature stability, in particular, are the characteristic qualities of the CIPOS® technology used in conjunction with the URA. Angles are measured inductively using a non-contact and, therefore, wear-free method, which guarantees a high measuring precision throughout the entire lifetime. An error memory records errors and the actuator is able to react differently to all the various kinds of errors.

Application examples

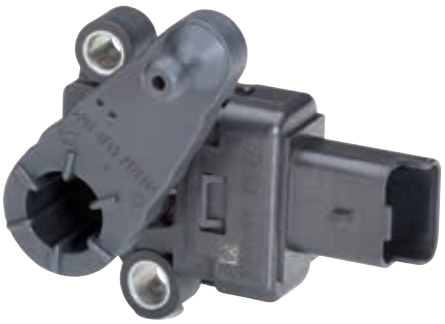
- → Seed metering/singling
- → Delivery air/exhaust air flaps

Function

The URA monitors the position of the output gear wheel and the integrated electronics continually calculate the position using an ASIC (Application Specific Integrated Circuit). The actuator offers the "true power on" function for angles under 180°, i.e. it enables direct startup without calibration. In operation, the actuator carries out controlled movement to the programmable "soft stops". The self-blocking transmission minimises current consumption (< 25 mA), which is required to maintain a defined position.

Overview of variants

Function	Voltage	Torque	Manual adjustment	Protection class	Part number
Electric locking/unlocking and shutting, electrical rotational movement to right and left, with position feedback via CIPOS® technology	12 V	Up to 300 Ncm	No	IP 6K9K or IP 6K7[1] (depends on connector classification)	**6NW 011 303-701**



Angular position sensors

Single sensors, compact design

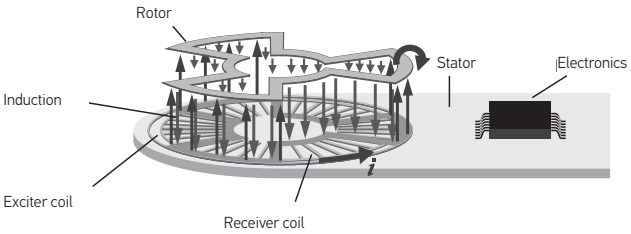
Product features

- → Single sensors
- → High precision due to internal 14 bit resolution
- → High thermal stability and linearity
- → High insensitivity to magnetic fields
- → Zero position can be individually programmed
- → Various connecting elements available

Application

These CIPOS® angular position sensors (contactless inductive position sensors) can be used in many different applications to return accurate and reliable angular measurements even in tough environmental conditions. Its insensitivity to magnetic fields and the high level of temperature stability, in particular, are the characteristic qualities of the CIPOS® technology used with all angular position sensors. Angles are measured inductively using a non-contact and, therefore, wear-free method. A high degree of measuring precision is therefore guaranteed throughout the sensor's entire lifetime.

Function

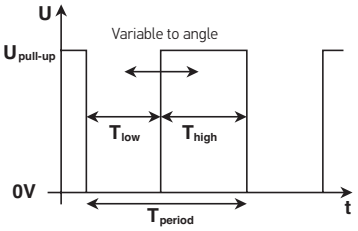


Inside the laser-welded housing made of polyamide PA66, the lever arm torque above the rotor is determined via induction method. An ASIC (Application Specific Integrated Circuit) calculates the rotor position precisely. Various mounting positions are possible via the repetitive characteristic curve of the output signal path (depending on the sensor structure used). This increases the flexible sensor application options.

Analogue output

At a supply voltage of 5 V DC, the measured angle is reflected through the ratio of the output voltage (U_{out}) to the operating voltage (U_S) (ratiometrically to the supply voltage). This signal is output via a high side driver (HSD). At a supply voltage of 9 V to 32 V (multi-voltage), the measured angle is reflected through a voltage of 0.5 V to 4.5 V.

PWM output (digital)



When using the PWM signal, the angular position of the angular position sensor results from the ratio between the low time (T_{low}) of the PWM signal and the period time (T_{period}). The absolute time of the high or low level is not a measure of the angle. The PWM signal is output via a low side driver (LSD). It is also possible, of course, to evaluate the ratio of high time (T_{high}) to period time (T_{period}). This results in a characteristic curve that is inverse to the analogue signal.

Overview of variants

Mechanical connection	Angle range	Supply voltage	Output signal*	Zero position	Lever arm	Part number
Single sensors – compact design						
Ball, top	- 54° to + 54°	5 V	0.5 – 4.5 V ratiometric	0° / 120° / 240°	39 mm	**6PM 010 200-501**
Ball, bottom	- 54° to + 54°	5 V	0.5 – 4.5 V ratiometric	0° / 120° / 240°	39 mm	**6PM 010 200-511**
Ball, bottom	- 54° to + 54°	5 V	0.5 – 4.5 V ratiometric	0° / 120° / 240°	51 mm	**6PM 010 200-521**
Ball, top	- 54° to + 54°	5 V	0.5 – 4.5 V ratiometric	0° / 120° / 240°	70 mm	**6PM 010 200-531**

* PWM on request.

Switch series 3100

The new waterproof series of rocker switches for electrical systems. It meets the requirements of protection class IP 68. The lasered symbols are illuminated by integrated LEDs.

Variety of lasered symbol discs

- → IP 68 according to 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 custom-specific laser symbols
- → Up to 2 LED light sources enable direct symbol illumination
- → Easy to install, either directly in the mounting hole or using modular mounting frames
- → Display lamp in the same design for safety-related feedback

The HELLA switch configurator
Configure your custom switches at www.hella.com/switch.

Select switching functions, symbol combinations and accessories in just a few clicks.

Technical data	
Mounting hole	21.1 mm x 37.0 mm
Rocker material	PC transparent, lacquer finish
Base plate material	PBT
Connecting contacts	6.3 mm x 0.8 mm
Coating of switch contacts	CuZn, silver-plated
Light source	max. 2 LEDs 1 x orientation lighting, green 1 x functional light, red Warning lamps available in amber and green
Symbol type	Lasered
Lifetime	150,000 switching cycles at 6 A/24 V
Leak tightness	IP 66 terminal side, IP 68
Operating temperature	-40°C to +85°C
Storage temperature	-40°C to +85°C
Dashboard thickness	For directly installed switches, 2 mm

Switch series 4100

The modular switch series with self-cleaning micro switch is suitable for modern electrical and electronic systems. This ensures 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/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 up to 4 LED light sources
- → Easy to install, either directly in the mounting hole or using a modular mounting frame
- → Warning lamps in the same design for safety-related feedback
- → Modern and timeless design
- → Pleasant to the touch

The HELLA switch configurator
You can configure your own switches individually at www.hella.com/switch.

Select switching functions, symbol combinations and accessories in just a few clicks.

Technical data	
Mounting hole	19.8 mm x 41.8 mm
Rocker material	PC transparent, lacquer finish
Base plate material	PA white, housing PA black
Connecting contacts	3 mm Junior Power Timer
Coating of switch contacts	AgNi
Light source	max. 4 LEDs 2 x orientation lighting, green 2 x functional light, red Warning lamps also available in blue and amber
Symbol type	Lasered
Lifetime	450,000 cycles at 5 mA 270,000 cycles at 5 A / 24 V inductive 90,000 cycles at 4 A / 24 V lamps (75 W) 80,000 cycles at 10 A / 24 V resistive
Leak tightness	IP 54
Operating temperature	-40°C to +85°C
Storage temperature	-40°C to +100°C
Dashboard thickness	For directly installed switches, 2 mm

Comprehensive electrics range that has grown over the years

As a global partner to the automotive industry, HELLA offers system expertise, experience with large volume production and also process know-how for fast implementation of innovative concepts in efficient and reliable serial products.

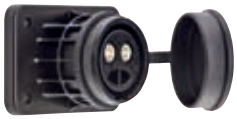
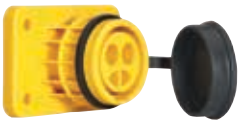
This is why the HELLA electrics range is particularly broad: from A (acoustic signalling device) to W (washer pumps). By continuously expanding and optimising, we offer a wide range of electrical plug connectors.

At HELLA, you will find everything that connects: short or super-short, made of plastic or metal. HELLA even makes standard parts special: they are simple to install or retrofit, in certified quality, in all variations, and suited to almost every special case.

Plug connections

2-pin socket according to VG 96 917
The 2-pin sockets in accordance with VG 96 917 are designed to withstand large currents and ensure a high degree of safety while being easy to use. The system is used to charge batteries and as a starting aid. This involves the transfer of high to very high currents. The 2-pin 24 V system can be used for temporary currents up to a maximum of 2,500 A (temporary load up to 10 s).

Advantages of the range
- → Permissible operating temperature: - 40°C to + 85°C
- → Protection class: IP X4
- → Contacts: CuZn, silver-plated

Product photo	Description	Part number	PU in pieces
	**Socket, aluminium** 2-pin, green, with screw cap (VG 96 917-3 Form A). Seal in the screw-on cover, additional sealing ring between thread and screw-type cover.		
	2 crimped/solder socket contacts for cables up to 50 mm²	**8JB 001 935-031**	1
	2 crimped/solder socket contacts for cables up to 35 mm²	**8JB 001 935-051**	1
	**Socket, metal** Yellow, 2-pin with black rubber cap (insertion compatible with VG 96 917) 2 crimped/solder socket contacts for cables up to 50 mm²	**8JB 010 806-001**	1
	**Socket, plastic** 2-pin with rubber cap (insertion compatible with VG 96 917) 2 crimped/solder socket contacts for cables up to 35 mm²		
	Black	**8JB 001 935-041**	1
	Yellow	**8JB 001 935-061**	1
	**Grommet accessories** For 2-pin sockets: 8JB 001 935-031 8JB 001 935-041 8JB 001 935-051 8JB 001 935-061	**9GD 735 641-062**	1

Plug connections

2-pin plug system in accordance with DIN 14 690

This plug system is mainly used for charging batteries.

- → Permissible operating temperature: -40°C to +100°C
- → Rated capacity: 6 – 42 V
- → Amperage: max. 16 A

Advantages of the range:

- → Complete range comprising connector, socket and coupling box
- → Socket and coupling box with secured screw cover

Product photo	Description	Part number	PU in pieces
	**Socket, light alloy** With secured screw-on cap, Form A With seal in screw-on cap With rubber base for cables of diameter 6 – 8 mm	**8JB 002 281-001**	1
	**Coupling box, light alloy** With secured screw-on cap, Form B Seal in the screw-on cap with cable protection sleeve For cables of diameter 6 – 10 mm	**8JB 002 281-011**	1
	**Connector, light alloy** With union nut, Form C For cables of diameter 6 – 10 mm	**8JA 001 925-001**	1

13-pin plug system in accordance with ISO 11446

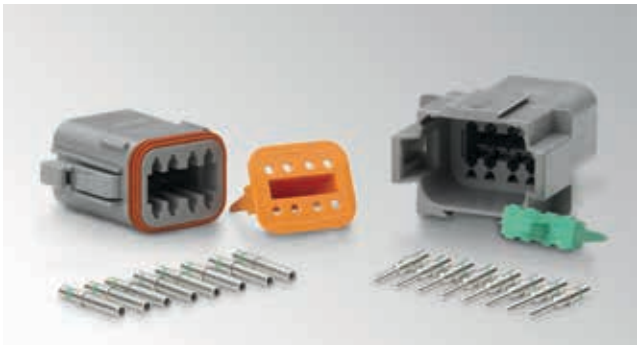
Compared to 7-pin systems, the 13-pin plug systems in accordance with ISO 11446 allow all the lighting and auxiliary functions to be transferred using only one connector. The system is increasingly replacing the older plug connector generations on account of its benefits, particularly with regard to water tightness, stability, contact reliability and easy handling thanks to the bayonet closure.

- → Permissible operating temperature: - 40°C to + 85°C
- → Tightness in accordance with protection class IP 54K
- → Sockets with rear fog light switch-off available

Product photo	Description	Part number	PU in pieces
	**Socket** 13 screw connections with rubber base	**8JB 005 949-001**	1
	Socket 13 screw connections with rubber base With switch-off contact for the rear fog lamp on the motor vehicle	**8JB 005 949-011**	1
	Socket 13 screw connections with rubber base With micro switch, changeover contact on left	**8JB 005 949-041**	1

DEUTSCH "DT series" plug connections

The concept combines high-quality materials with a connecting system characterised by reliability and easy handling. Thanks to these qualities, the range is particularly suited to applications where maximum output is required with a minimum number of disruptions, despite tough environmental conditions. The symmetrical star crimp process allows a gas-tight connection which is characterised by high resistance to temperature and oxidation-based fluctuations in resistance. The housing locking mechanism with integrated click-in function guarantees a quick and secure connection with a strong grip. The "wedgelocks" used for secondary locking facilitate precise, strain-resistant alignment of the contacts and are "clicked" into position on the contact side of the DT housing.



Advantages of the range

- → Environmental sealing – maximum protection from external influences
- → High-quality housing material
- → Strong, gas-tight crimp connections

Description	Design	Part number	PU in pieces
DT housing	2-pin	**8JA 201 021-022**	10
DT connector	2-pin	**8JA 201 022-022**	10
DT "wedgelock" for housing	2-pin	**9NB 201 023-022**	10
DT "wedgelock" for connector	2-pin	**9NB 201 024-022**	10
DT housing	3-pin	**8JA 201 021-032**	10
DT connector	3-pin	**8JA 201 022-032**	10
DT "wedgelock" for housing	3-pin	**9NB 201 023-032**	10
DT "wedgelock" for connector	3-pin	**9NB 201 024-032**	10
DT housing	4-pin	**8JA 201 021-042**	10
DT connector	4-pin	**8JA 201 022-042**	10
DT "wedgelock" for housing	4-pin	**9NB 201 023-042**	10
DT "wedgelock" for connector	4-pin	**9NB 201 024-042**	10
DT housing	6-pin	**8JA 201 021-062**	10
DT connector	6-pin	**8JA 201 022-062**	10
DT "wedgelock" for housing	6-pin	**9NB 201 023-062**	10
DT "wedgelock" for connector	6-pin	**9NB 201 024-062**	10
DT housing, coding "A"	8-pin	**8JA 201 021-082**	10
DT connector, coding "A"	8-pin	**8JA 201 022-082**	10
DT "wedgelock" for housing	8-pin	**9NB 201 023-082**	10
DT "wedgelock" for connector	8-pin	**9NB 201 024-082**	10
DT housing, coding "A"	12-pin	**8JA 201 021-122**	10
DT connector, coding "A"	12-pin	**8JA 201 022-122**	10
DT "wedgelock" for housing	12-pin	**9NB 201 023-122**	10
DT "wedgelock" for connector	12-pin	**9NB 201 024-122**	10
Contact sleeve	2 mm^2	**8KW 201 025-012**	50
Contact pin	2 mm^2	**8KW 201 025-022**	50
Contact sleeve	0.5 – 1.5 mm^2	**8KW 201 025-112**	50
Contact pin	0.5 – 1.5 mm^2	**8KW 201 025-122**	50
Dummy plug	–	**9NB 201 026-012**	50

SUPERSEAL plug connections

Comply with the guidelines in IEC 529 as well as DIN ISO 40050 and have protection rating IP class 67, which guarantees maximum protection from water and dust penetration. The quality of the SUPERSEALS makes them ideal wherever other interconnection systems reach their limits due to adverse pressure or humidity conditions.

Advantages of the range

- → OEM quality
- → Reliable electrical connection
- → Maximum protection from external influences

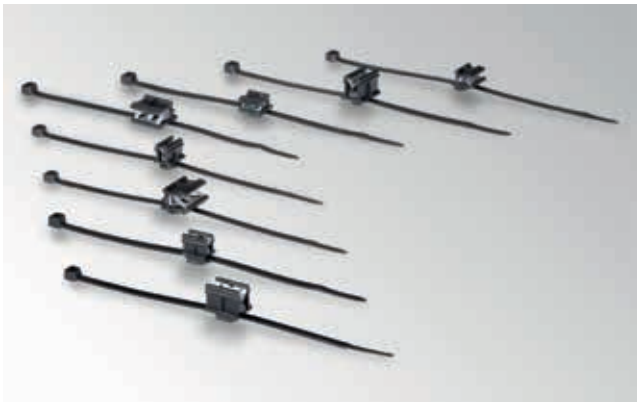
Description	Design	Part number	PU in pieces
SUPERSEAL pin housing	1-pin	**8JA 746 183-012**	10
SUPERSEAL socket housing	1-pin	**8JA 746 184-012**	10
SUPERSEAL pin housing	2-pin	**8JA 746 183-022**	10
SUPERSEAL socket housing	2-pin	**8JA 746 184-022**	10
SUPERSEAL pin housing	3-pin	**8JA 746 183-032**	10
SUPERSEAL socket housing	3-pin	**8JA 746 184-032**	10
SUPERSEAL pin housing	4-pin	**8JA 746 183-042**	10
SUPERSEAL socket housing	4-pin	**8JA 746 184-042**	10
SUPERSEAL pin housing	5-pin	**8JA 746 183-052**	10
SUPERSEAL socket housing	5-pin	**8JA 746 184-052**	10
SUPERSEAL pin housing	6-pin	**8JA 746 183-062**	10
SUPERSEAL socket housing	6-pin	**8JA 746 184-062**	10
Pin contact, B 143	1.0 – 1.5 mm^2	**8KW 744 836-002**	50
Socket contact, B 144	1.0 – 1.5 mm^2	**8KW 744 837-002**	50
Single conductor insulation, B 145	Diameter 1.8 – 2.4 mm	**9GD 746 185-002**	50
Single conductor insulation, B 146	Diameter 2.6 – 3.3 mm	**9GD 746 186-002**	50
Dummy plug, B 147	–	**9GD 746 187-002**	50

Cable straps with edge clips

Properly fastening a cable bundle often requires more than the cable tie itself. Our cable ties with integrated edge clips offer a quick and easy to use complete solution with strong holding power. They are weatherproof, flame-resistant and resistant to diluted organic acids, oils, gasoline, salt water, solvents and greases. They even offer perfect support for extremely small bundled diameters such that no cable lining or other attachment aids are required.

Advantages of the range

- → Complete mounting solution in a single product
- → Suitable for numerous different positions and edge thicknesses
- → High-performance specification with original equipment references



Description	Profile thickness	Capacity	Part number	VPE in pieces
Cable tie, black 200 x 4.8 mm	0.7 – 3.0 mm	Ø 48 mm	**8HL 185 549-001**	100
Cable tie, black 200 x 4.8 mm	0.7 – 3.0 mm	Ø 48 mm	**8HL 185 549-011**	100
Cable tie, black 200 x 4.8 mm	0.7 – 3.0 mm	Ø 48 mm	**8HL 185 549-021**	100
Cable tie, black 200 x 4.8 mm	0.7 – 3.0 mm	Ø 48 mm	**8HL 185 549-031**	100
Cable tie, black 200 x 4.8 mm	3.0 – 6.0 mm	Ø 48 mm	**8HL 185 549-041**	100
Cable tie, black 200 x 4.8 mm	3.0 – 6.0 mm	Ø 48 mm	**8HL 185 549-051**	100
Cable tie, black 200 x 4.8 mm	3.0 – 6.0 mm	Ø 48 mm	**8HL 185 549-061**	100
Cable tie, black 200 x 4.8 mm	3.0 – 6.0 mm	Ø 48 mm	**8HL 185 549-071**	100

Good product ideas are the answer to real problems that occur in practice. Quality, practicability, safety and cost effectiveness are the objectives and criteria for every new development and the comprehensive range of HELLA products already fulfil them.

You can save costs on a reliable and long-term basis with LED products from HELLA. Vehicle pool managers and drivers expect functional safety without any ifs, ands or buts. In other words, vehicle components with a high quality standard and long lifetime. HELLA LED lamps meet these requirements. They have been developed and produced according to the strictest quality standards.

Using sample calculations drawn from practice, on the following pages we would like to demonstrate the vast potential for saving material costs and wage costs. As well as reducing repair hours spent on maintenance work by systematically and consistently using of LED lighting from HELLA. For design reasons the maximum expected lifetime of the light sources installed is specified. Malfunctions of light sources are therefore much lower when converting to LED lighting and this in turn means that maintenance work can be reduced to a minimum. Using LED products from HELLA also considerably reduces energy consumption: fuel consumption and exhaust emissions drop as a result.

Cost comparison: Halogen versus LED technology for waste collection vehicles

Enjoy the benefits of HELLA LED technology in your vehicle fleet. Save time and money, and be ahead of the game in CO_2 reduction. See for yourself:

The example calculations below show the potential savings that can be achieved for the work lamp and beacon product groups over various time periods: you'll be amazed by the savings available even to small fleets.

1. Output data of the sample calculation

The sample calculations are based on the following data:

- → Workshop labour costs per hour: € 50
- → Repair times for work lamps and beacons:
  Replacement time for work lamps/ beacons: 30 minutes (0.5 h),
  Changing light source on work lamps/beacons: 15 minutes (0.25 h)
- → Average replacement rates for work lamps/beacons per vehicle (p.a.)

Experience has shown that light sources and products have the following replacement rates on an annual basis:
Light sources: 2 x per year
Work lamps: 1 x per year, beacons: 1 x per year
(assuming an average use of 6 hours per day and no mechanical damage)

- → Number of work lamps/ beacons per vehicle:
  2 work lamps, 2 beacons

The average product costs are assumed as follows:

	Halogen	LED
Work lamps	20 €	80 €
Rotating beacons	60 €	120 €
Bulb	3 €	–

2. Sample calculation for halogen

For 1 vehicle with halogen work lamps/beacons

A) Labour costs (per vehicle)

Replacement costs for work lamps (1 work lamp x 0.5h x € 50/h)	**25 €**
Replacement costs for beacons (2 beacons x 0.5h x € 50 /h)	**50 €**
Light source replacement for work lamps (2 work lamps x 0.25h x 2 replacements per year x € 50/h)	**50 €**
Light source replacement for beacons (2 beacons x 0.25h x 2 replacements per year x € 50/h)	**50 €**
Annual total labour costs (per vehicle)	**175 €**

B) Material costs (per vehicle)

Work lamp costs (€ 40 product costs + € 12 light source costs)	**52 €**
Cost of beacons (€ 120 product costs + € 12 light source costs)	**132 €**
Annual total material costs (per vehicle)	**184 €**

Total costs:

A) Labour costs	**175 €**
B) Material costs	**184 €**
Halogen work lamps/beacons **Important:** **Recurring, annual costs per vehicle!**	**359 €**

3. Sample calculation for LED

For 1 vehicle with LED work lamps/beacons

A) Labour costs (per vehicle)

In the case of LED work lamps and beacons, labour costs are incurred only when converting the existing vehicle fleet. You should specify the direct installation of HELLA LED products in new vehicles in order to benefit from the potential savings in full from the outset.

Replacement costs for work lamps (2 work lamp x 0.5h x € 50/h)	**50 €**
Replacement costs for beacons (2 beacons x 0.5h x € 50 /h)	**50 €**
Total labour costs (per vehicle)	**100 €**

B) Procurement costs (per vehicle)

LED work lamps (2 work lamps x € 80)	**160 €**
LED beacons (2 beacons x € 120)	**240 €**
One-off procurement costs (per vehicle)	**400 €**

Total costs:

A) Labour costs	**100 €**
B) Procurement costs	**400 €**
LED work lamps/beacons **Important:** **One-off costs per vehicle!**	**500 €**

Comparison of total costs for halogen compared to LED over a vehicle lifetime of 8 years.

	1.	2.	3.	4.	5.	6.	7.	8.	Total
Costs of halogen Per year	359 €	359 €	359 €	359 €	359 €	359 €	359 €	359 €	**€ 2,872**
Costs of LED Every year	500 €	0 €	0 €	0 €	0 €	0 €	0 €	0 €	**500 €**
Savings On maintenance costs Per vehicle per year	-141 €	359 €	359 €	359 €	359 €	359 €	359 €	359 €	**€ 2,372**

The higher expenses for LED products have paid off after just 24 months.

A total of € 2,372 can be saved over a vehicle lifetime of 8 years.

4. Fuel savings by using LED technology

Savings per vehicle per year Light functions are activated 200 days a year, 6 hours a day.	Halogen (24 V)	LED
Power consumption of 2 beacons	**140 Watt**	**30 Watt**
Power consumption of 2 work lamps	**140 Watt**	**50 Watt**
Total power consumption	**280 Watt**	**80 Watt**
Savings in kWh per vehicle per year (280 W - 80 W) x 6 x 200 / 1.000	**240 kWh**	
Potential savings with a diesel engine		
Degree of efficiency of a diesel engine	**45 %**	
Degree of efficiency of alternator	**80 %**	
Fuel value of diesel 1 litre of diesel generates 3.6 kWh electrical energy	**10 kWh / Liter**	
Diesel savings in litres per vehicle per year 240 kWh / 3.6 kWh/litre	**67 Liter**	

5. Savings potential for a fleet of 10 vehicles over 8 years

The following table applies the potential savings calculated above to a fleet of 10 vehicles over an 8-year period and intends to show just how much can be saved by choosing the right lighting from the right manufacturer.
It is assumed that the average vehicle is driven for 200 days.

	1.	2.	3.	4.	5.	6.	7.	8.	Total
Costs of halogen (€)	€ 3,590	€ 3,590	€ 3,590	€ 3,590	€ 3,590	€ 3,590	€ 3,590	€ 3,590	**€ 28,720**
Costs of LED (€)	€ 5,000	0 €	0 €	0 €	0 €	0 €	0 €	0 €	**€ 5,000**
Savings On maintenance costs	€ -1,410	€ 3,590	€ 3,590	€ 3,590	€ 3,590	€ 3,590	€ 3,590	€ 3,590	**€ 23,720**
Fuel savings	670 l	670 l	670 l	670 l	670 l	670 l	670 l	670 l	**5,360 l**
CO_2 reduction	1,742 kg	1,742 kg	1,742 kg	1,742 kg	1,742 kg	1,742 kg	1,742 kg	1,742 kg	**13,936 kg**

These non-binding figures are based on average values and general technical assumptions; they are provided purely as information for your support.
We accept no liability for the correctness of the details.

Conclusions:

The results speak volumes for LED from HELLA:
Maintenance cost savings = € 23,720
Fuel savings = 5,360 litres
Reduction of CO_2 emissions by 13.9 t

These calculations can, of course, be applied to fleets of other sizes. If you are not convinced by these figures, just carry out the test and see for yourself, or contact us directly.

Find the right product with ease

Our online information is designed to let you efficiently and conveniently identify the latest HELLA products and find out all the important details. No matter what you are looking for, we are sure to have the right part in our range.

- → Product information
- → Product videos
- → 3D animations
- → Configuration tools for many applications
- → Interactive apps for smartphones and tablets
- → Light technology comparisons
- → Mounting recommendations
- → Online catalogues

Website for municipal vehicles and special vehicles
Informative, compact, interactive. Here, you can find everything you need to know about products and technologies for municipal use.

www.hella.com/municipal

ELIVER – The light comparison tool
This online tool allows you to compare many HELLA work lamps and beacons on the basis of their illumination in a real-world environment.

www.hella.com/eliver

Shapeline configurator
The HELLA Shapeline online configuration tool turns you into a light designer: with just a few clicks, you can create your own personalised lighting design for the front, sides, and rear of your vehicle. Then you can take a look at the results, where your design is realistically applied to the outline of a car.

www.hella.com/shapeline

Installation video for LED BST warning lamp
From the functional test to correct installation and wiring:
In this video, you will learn in just a few minutes what is important when it comes to installing the HELLA BST warning lamp.
Our experts guide you step-by-step to success using clear and easy-to-understand descriptions.

www.hella.com/municipal

HELLA YouTube channel
On the HELLA YouTube channel, in addition to informative product and application videos, you can also find many helpful tips and advice on our comprehensive HELLA product range.

www.youtube.com/HELLAKonzern

HELLA online catalogue
Helps you to search for vehicle-specific products. Regardless of where you are beginning your search, the search system helps you find the right solution very quickly.

www.hella.com/catalogue

The online universal parts catalogue also offers a quick and up-to-date overview of products in the categories of lighting, electrics and thermal management for a wide range of vehicles.

www.hella.com/upc

IP protection class

What is an IP protection class?

IP stands for International Protection. The IP protection classes are determined according to DIN 40 050, Part 9. The purpose of the standard is to provide an exact definition of the electrical equipment of vehicles against the ingress of solid foreign objects including dust, and against the ingress of 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 the function and safety are not impaired. Water that is sprayed against the housing from every direction at increased pressure must not have any damaging effect: the water pressure is approx. 4 bar.

Protection class IP 9K

Water that is directed onto the housing during high pressure/ steamjet cleaning must not have any harmful effects: the water pressure is approx. 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.

Features	Description
Power consumption of LED lamps	**Benefits of LEDs:** Generally, LEDs have a lower power consumption than bulbs. Savings of up to 90 % are possible, therefore helping to reduce carbon dioxide emissions.
Vehicle electrical system voltage 	Defines the power supply of the lamp. This can be 12 V, 24 V or a flexible voltage range for multi-voltage (8 – 33 V). Multi-voltage is the most flexible: it requires fewer versions, but has more electronic components and is therefore more expensive.
Dust and water protection IP  	High-pressure jet cleaner resistant International Protection (IP) according to DIN 40050 Part 9. Specific definition for road vehicles. 5K = Dust protected 6K = Dustproof 9K = Protection against water during high-pressure /steamjet cleaning
Electronic circuit  **Active**  **Passive**	Basically, two different circuits are possible for LED lamps: **Active:** LED current regulation via active electronics. **Passive:** Setting a specific voltage range for the LED by means of a series resistor.
Thermal management  **Active**  **Passive**	**Active:** Electronic power control of the LEDs when high ambient temperatures exceed permitted levels. This ensures that LEDs are protected against destruction caused by overheating. **Passive:** Optimised layout of the components for even temperature distribution and temperature spread.

Features	Description
Direction indicator failure control according to ECE R48 	**Regulation according to ECE R48:** The driver must be informed if the vehicle's direction indicator function fails. To remain legally compliant, this requirement must also be fulfilled with LED lamps. This requirement is met thanks to an integrated self-diagnosis system on the printed circuit board of the LEDs and an electrical pulse. Since the end of 2011, this HELLA failure control with pulse has been an ISO standard: ISO 13207.
Bipolarity of the lamps 	Even if the connecting cable is attached with reverse polarity, the LED functions fully.
Polarity reversal protection 	Even if the connecting cable is connected with reverse polarity, there is still no danger to the electronics.
Overvoltage protection 	Supplement to the electronics for protecting the LED against high voltage/current in the vehicle network as per ISO 7637-2.
Approved for dangerous goods transport 	Lamp approved for dangerous goods transport according to the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR; in German: GGVS).
Automotive Electronic Council 	Components qualified according to automotive standard.
Electromagnetic compatibility 	Electromagnetic compatibility (EMC) tested and EC type approval issued.
ECE-R65 	Defines the light values, light distribution and colour location of beacons. Only beacons that fulfil ECE R65 can be used on public roads.
ECE 	This product is approved according to ECE guidelines.
Asymmetrical light distribution R112 	The product complies with ECE Directive R112, which regulates asymmetrical low beam for passenger cars, buses, commercial vehicles and most larger vehicles.
Symmetrical light distribution R113 	The product complies with ECE guideline R113, which regulates the symmetrical low beam for many slow and lighter vehicles (2, 3 or 4-wheeled).

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