PRODUCT OVERVIEW

AGRICULTURAL
CONSTRUCTION
FORESTRY

www.hella.com/agriculture www.hella.com/construction

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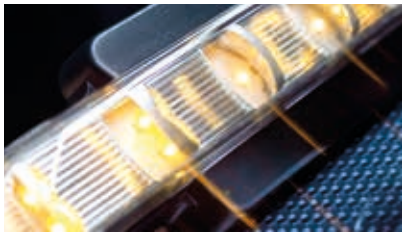

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SHAPELINE
DESIGN YOUR LIGHT
www.hella.com/shapeline

Customised light design!

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

Whether on the front, side or rear end 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 enables us to meet also the demands of vehicle manufacturers with lower numbers of manufactured vehicles.

Along with innovative technology and the familiar high quality of HELLA's products, the variety of shapes of Shapeline lights provide you with nearly infinite design freedom.

The modular HELLA Shapeline product range provides a variety of different light functions that can be combined with each other individually. Here, all lights are available in two different designs: The classic straight-line **Shapeline Tech** design and the dynamic curved **Shapeline Style design**.

Tech or Style: The HELLA Shapeline series provides design freedom for nearly any application and vehicle, and achieves a consistent light signature for your vehicle at the same time.

Design your light – with HELLA Shapeline!

Premium Design

Flexible

Robust

Simple and Safe

ECE and SAE

Multivolt

Design freedom at the click of a mouse

The HELLA Shapeline online configuration tool turns you into a lighting designer: With just a few clicks, make your own vehicle light design for the front, sides, and rear – and see the results immediately, as applied convincingly to a vehicle outline.

www.hella.com/shapeline

Awarded with:

WINNER OF THE: bauma Innovation Award 2016

DESIGN AWARD 2017

Focus Open 2016 Gold

VDBUM Verband der Baubranche, Umwelt- und Maschinentechnik e.V. VDBUM-FÖRDERPREIS FÜR HERAUSRAGENDE PROJEKTE 2016

CAB Concept Cluster
Success built on cooperation

CAB Concept Cluster

The CAB Concept Cluster is a platform founded in 2014 by experienced OEM suppliers, the Dresden University of Technology and various business partners and associations. The Cluster is focused on manufacturers of construction, agricultural, and material handling machinery as well as industrial trucks. It aims at bundling pre-series innovations in joint projects while highlighting the potentials of efficient system integration.

The Genius CAB presented at bauma 2016 showed how, by using a wheel loader cabin, a customer-neutral platform can bundle innovation and added customer value. The concept was received enthusiastically and received multiple awards.

The CAB Concept Cluster with its new Smart Cab has now the same aspirations.

On the basis of a multi-functional cabin for self-driving harvesting machines, the integrated innovations show how requirements of the agricultural engineering industry can be met today and tomorrow. Major trends, such as serial-tested modularity, x2x usability and smart farming are transformed into concrete added values for customers, such as flexibility, future reliability and profitability.

As lighting and electronics expert, HELLA contributes innovative lighting and electronics solutions.

Find out more at www.cabconceptcluster.com

Your tailor-made HELLA lighting system

From the idea ...

... to the design and technical development ...

... through to reliable implementation and production.

Your requirements drive us on: HELLA has been a leading partner of agricultural and construction machinery manufacturers in the realm of vehicle lighting for more than 100 years.

Having a customer focus is not just a catch phrase for us, it's a philosophy that we continue to put into practice each and every day – as our extensive product portfolio and comprehensive services demonstrate.

Do you require products that are precisely tailored to your requirements? Not a problem for us. We design and develop custom lighting solutions specifically for the requirements of agricultural, construction and forestry machinery and special vehicles. A wide range of electrical and electronics products complete our portfolio. We are also a leader in the LED technology field and offer the right LED product for every application.

Are you looking for a partner that is always there for you? Welcome to HELLA! We are wherever our customers need us. Our global network utilises the company-internal synergies and resources to maximum effect. This transfer of knowledge combined with our expertise from large-scale automotive production are clear benefits for new developments. And, most importantly: We actively involve the customer in this process, from idea to finished product.

HELLA – Technology with vision!

We can make dreams come true!

Improvement of workplace safety thanks to innovative projection system by HELLA offering state-of-the-art luminous intensity

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

Our newest innovation is the development of a projection module featuring exceptional luminous intensity for optimal employment in daylight conditions. Thanks to the unique lens optics developed by HELLA, logos according to customer specifications or warning signals are projected onto the ground to visually warn or alert other vehicles or passersby or to visually demarcate certain work areas.

Thus workplace safety and the comfort of daily workplace routines are significantly improved during all times of day and night.

Especially in the construction industry it is vital to demarcate danger zones for other parties during unloading of buckets or mining tippers in a distinctive and uncomplicated way.

This way loading areas for trucks, transportation of handicapped persons or emergency vehicles can be marked clearly and distinctly. The system also provides for numerous applications for agricultural machinery and utility vehicles to improve workplace safety and comfort in daily workplace routines.

Do you want to learn more about our new projection system? We need your ideas, as they are an extremely important input, and we welcome any kind of suggestions. Please contact us if you would like to learn how we can support your business needs.

Hazardous Area

Marking of safety zone

Coming Home function

More application options upon request.

2XA 996 200-101 | Other symbols possible upon request.

Lane tracking

Future Trends

For your next vehicle generation, an integration into your customer-specific headlamps is also possible.
Contact us and and we can work together to create the solutions of tomorrow.

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 using carefully-selected methods throughout the entire manufacturing process. Production quality is ensured by parallel quality monitoring and testing.

Quality products from HELLA are subject to different test procedures in accordance with the HELLA standard 67101. These test procedures are conducted by the HELLA test laboratory in Lippstadt.

First-class quality by conviction
HELLA guarantees the perfect, long-term functioning of its products and stands for satisfied customers in the spare parts, accessories and light sources areas.

As the long-established company from Lippstadt is a partner to the automotive industry, HELLA products are manufactured precisely according to the specified tolerances in each case. This, combined with the use of sophisticated test procedures during product development, means that you can depend on HELLA products in any situation.

HELLA products are subject to the following tests:

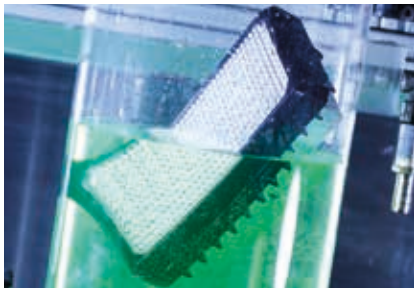
Splash water test
In universal splash water cabins, HELLA products are tested under realistic environmental conditions. The booths are equipped with devices for rain, splash water, water jets and water mist. Here, the test products are tested for tightness by undergoing the intermittent and splash water test at a pressure of up to 5 bar, and the sprayed water test at a pressure of up to 10 bar. (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 cleaning in a carwash or with a pressure cleaner (IP XK9K).

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

The tests are evaluated by determining the photometric value before and after the test (IP 5K). This is the only way that HELLA can ensure that dust will not penetrate the product and can guarantee the long service life 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 1m in water. Another test system can reach a depth of 6m. Also, an overpressure test up to 1.6 bar is conducted in an immersion pool.

All tests are carried out in accordance with the HELLA standard, 67101, as well as the legal requirements (IP 67).

Heat, moisture and cold test
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 600 - 1,000 liters. In addition, condensation and defogging tests are carried out up to max. 95% air humidity and up to 80° C. In the so-called "shock chamber", the temperatures changes within seconds (intervals of max. 6 seconds) between -40° C and +100° C.

These tests signify utmost stress on any material, both for lighting as well as for the individual electronics components. The heat and cold tests last up to 48 hours.

Vibration test
This test simulates the behavior of the products over a “poor stretch of road” and shows, for example, reactions to potholes, gravel tracks, gravel, stones, fields and dirt roads. Special rally profiles are tested for selected products, such as auxiliary driving lights.

The wideband 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. Among others, this checks the ageing process of the plastic. All products are tested for function for up to 24 hours.

A mechanical shock test is also carried out as part of testing and is designed to simulate behavior on impact (for example, boxed products during shipping) at a simulated acceleration of 300 to 500 metres per second squared.

More information on HELLA quality criteria
can be found under: www.hella.com/quality

There’s much to be said for better worklights!

Working faster, more productively and with greater precision in twilight and darkness requires daylight-quality lighting. HELLA worklights turn night into day.

Stronger and better working lights help.
Sleep researchers* in Basel working together with scientists from the Fraunhofer Institute for Work Management and Organisation have discovered that people react strongly to light. For example, the colour temperature of lighting has a considerable influence on responsiveness and performance. Experiments have proven that people get tired quicker if lighting is too weak and colour temperatures dull and yellowish. This is because the body perceives such light as twilight and starts to “switch off”. Optimal working light as produced by HELLA worklights helps you to remain awake longer in the evenings and boosts concentration, thereby raising the night worker’s productivity.

Only quality protects against tiredness.
Scientific studies have shown that the human eye has the capacity to always orient itself to the lightest point of a surface. For relaxed vision, however, balanced illumination is necessary.

HELLA’s lighting technicians therefore develop worklights that reduce the light concentration at close range, where the light is otherwise extremely strong, with steadily increasing illumination further away. This produces a homogenous light distribution. This means eyes do not tire as quickly and the driver can concentrate for longer periods. These worklights are also maintenance-free. Since LEDs have a long lifetime, the installation reduces repairs and downtime to practically zero.

LED worklights: The next generation.
The latest LED developments in the worklight field are already so advanced that they even outperform xenon light. Additionally, LEDs offer high colour temperatures of around 6,500 kelvins, thus guaranteeing illumination levels almost matching daylight. Working under these kinds of lighting conditions is gentle on your eyes, and helps you stay on task for longer.

Advantages of LED worklights:
- → High light output
- → Low power consumption
- → Maintenance-free
- → Extremely long service life
- → Multivolt capable
- → 100% dust and waterproof
- → High vibration resistance
- → Low temperature on the lens

All the advantages of modern LED lighting technology are optimally employed in HELLA worklights.

* Source: „Journal of Applied Physiology“

Halogen worklights:
The established standard.

LED worklights:
The next generation.

Configuration and Effects of Various Types of Illumination

Anyone wishing to work safely and efficiently in the dark fully realizes that high-performance worklights are an absolute must. In addition to a suitable lumen value, it is equally important that the light is evenly distributed throughout the work area. And in order to achieve such a homogenous light distribution, it is advisable to combine worklights that offer different kinds of illuminating features. The HELLA reflector system ensures a smooth distribution of light between the various LED worklights – essential aspects for safe, productive work in the dark.

1. Close-range illumination

- → Usually worklights with a textured cover lens.
- → The lens widens the light beams and distributes them homogeneously across the work area.
- → This allows you to ensure intensive, large-scale lighting of the entire area around the vehicle.
- → And this is just as effective for lighting up equipment in and around the vehicle.
- → For situations where the standard close-range illumination is not sufficient, HELLA offers special, extra-wide-beam worklights.

2. Long-Range Illumination

- → A narrow light pattern where the brightest point shines at the ground at least 30 to 40 m away from the vehicle.
- → This is recommended for fast-moving vehicles so you can work safely at night without worrying about an accident.
- → This enables good long-range visibility.
- → For special applications, extra-wide-beam illumination (spots that reach up to 300 m) is also available.

3. Combination

- → The ideal illumination conditions for work are provided by a combination of these two lighting options.
- → The tilt angle and side alignment of the individual devices must be adjusted accordingly.
- → The lamps must be aligned in such a way that the long-range and close-range illumination work well together and the transition between them is smooth.
- → Dark areas hamper a person's ability to concentrate, and can quickly lead to fatigue. As such, they should be avoided.

What the lumen output says about the brightness and light of a worklight.

The luminous flux emanating from a light source is measured in the physical unit of lumen (lm).

The lumen output of a light indicates how brightly the light it produces is perceived. This makes lumen output a better reference than the wattage, which only indicates the power consumption of a light rather than how much brightness it actually produces. To aid easy comparison, the following overviews therefore list the lumen outputs of individual products. However, the lumen output is not the only factor that determines how well a light can illuminate a work area.

Even more important than lumen: the quality of the illumination
Homogeneous distribution of light is more important for optimum working light than the luminous flux from the light measured in lumen. The true quality of a light can be seen in the overall lighting technology concept which, with HELLA worklights, ensures extremely even illumination of the work area without shadows.

HELLA worklight quality factors.
The interplay and quality of the lighting technology components in a worklight are crucial to achieving ideal light conditions:

1. Quality of the light sources
Stringent tests and selection ensure an extremely long design life, e.g. up to 60,000 hours for LEDs.

2. Quality of the reflector system
For homogenous light distribution, the reflectors are designed to reduce light concentration at close range and ensure a constant increase in illumination as the distance increases.

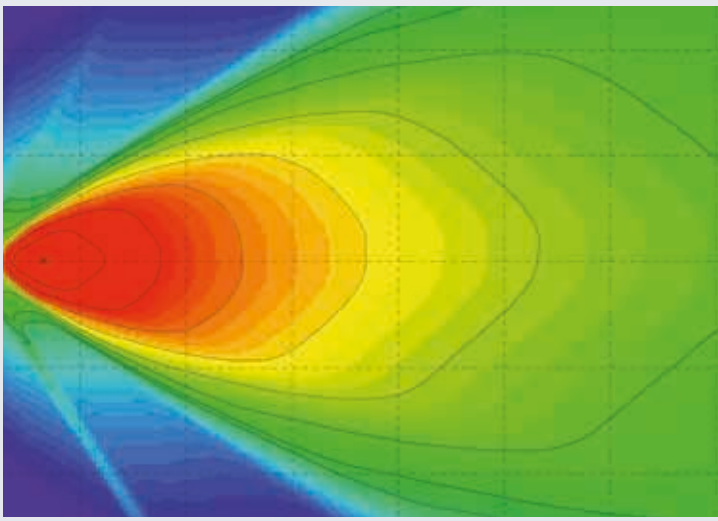
3. Quality of the lens material
Thanks to the use of premium, impact-resistant and scratch-proof synthetic material, the light emitted remains homogeneous, even after colliding with a branch or anything similar.

Note:
Note: HELLA has once more raised the bar in the field of lighting by producing the world's first glare-free worklight. The innovative **ZERO**GLARE technology not only offers excellent close-range lighting – it also represents an immense improvement in safety while performing the work. Find out more on page 37.

The HELLA reflector system: Optimum utilisation of lumen for homogenous illumination of the work area.

The reflector system is at the heart of HELLA's innovative lighting concept. Design is aided by the HELIOS software which tests the light distribution of a new reflector using an average of a million separate, simulated light beams.

This makes it possible for HELLA to ensure that worklights evenly illuminate the work area, prevent the separate lights from causing any interference or shadowing together and produce a harmonious light pattern. This is very important, because the human eye automatically focuses on the brightest point of a surface. That's also why worklights should always be replaced in pairs to prevent uneven illumination of the work area.



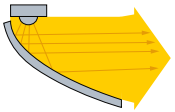
Computer simulation of the superimposed light produced by two Oval 90 LED worklights shows how a harmonious overall pattern is produced.

More design freedom from LEDs

The use of LEDs gives design engineers much greater design freedom. Ergonomic aspects can be implemented more easily.

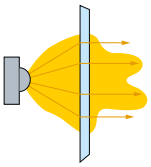
Diverse technical options from LEDs.
Depending on the product or customer requirements, HELLA has been installing LEDs in different optical lighting systems. Here are some examples:

Indirect light



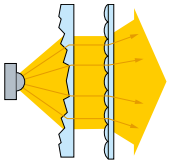
- → Homogenous light pattern
- → Optimal light distribution
- → Contemporary appearance

Direct light



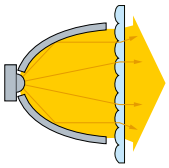
- → Spot-like appearance
- → No optical system necessary

Fresnel Systems



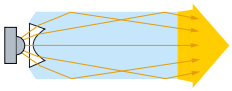
- → Suitable for all functions
- → Homogeneous appearance

Reflector, lens with or without optics



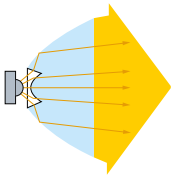
- → High efficiency
- → Brilliant appearance

EDGE Light



- → Unique and distinctive design
- → More design options
- → Enables unmistakable design
- → Gives unmistakable look to vehicle

Lens system



- → Exact light scattering possible
- → Flat design possible

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2 **Rota LED**
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3 **Oval 100 LED**
Page 28

4 Combination example
Shapeline Style (rear)
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5 **90 mm LED modules**
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6 **Modul 70 LED Gen. IV**
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Agricultural

Tractors and harvesters are part of rural traffic. Tractors are becoming ever faster and harvesters ever larger. Illumination performance and reliability must therefore be just right. Especially in agriculture, the targeted use of optimal illumination can significantly increase work safety and efficiency. Those who prefer working at nights or during dusk can now do so at full proficiency – while older machinery can be used more efficiently, thanks to light optimisation.

Product recommendation

1 **K-LED 2.0**
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2 **LED headlamp C140**
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3 Combination example
Shapeline Style (rear)
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4 **Q90 compact LED**
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5 **Ultra Beam LED Gen. II**
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Construction

Work on construction sites is the ultimate test of strength for any material. HELLA lighting systems have passed hardcore tests already at the test labs and in field trials. They are therefore optimally suited for use in the toughest conditions. Among them are test series against the penetration of water and dust, inspections of electromagnetic compatibility, thermal tests, lifetime tests as well as electronic and vibration tests, of course. Any machine passing those will feel right at home at any of the world's toughest construction sites.

Product recommendation

1 **Ultra Beam LED Gen. II**
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2 Combination example
Shapeline Style (rear)
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3 **Power Beam 1800**
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4 **RokLUME 380 N**
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5 **LED headlamp C140**
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Forestry

Your workplace is the open air In the case of forestry management, the vehicle lighting must be 100% operational in windy and inclement weather and at any time of day or night. Tough working environments demand a great deal from the material used. HELLA has therefore been developing and engineering tailor-made product solutions for many years.

The high-quality production and workmanship which is typical of our brand guarantees unparalleled enduring functionality.

Product recommendation

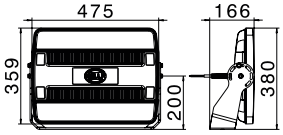
Working at night or in the early morning in the dark is no problem – providing you have the right light to work with!

HELLA worklights illuminate the working area appropriately for all applications. Their development has been specifically aimed at illuminating as large an area as is possible with a soft transition area at the edge.

Worklights can be installed in all sorts of areas and environments. Whether it be agriculture, construction vehicles or forestry management.

So that every move counts, even in the dark:
See more, work more precisely and safely – with HELLA Worklights.

This LED product has the following features:

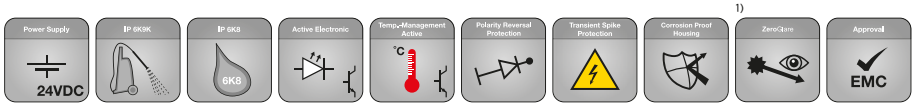


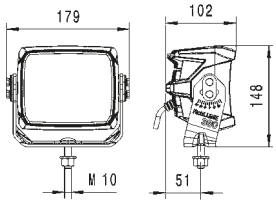
HypaLUME

Light output (measured): more than 24,000 lumens, power requirement: 240 watts, colour temperature: 5,700 kelvins, multivolt, 18.52 VDC, 50 – 60 Hz, 90 – 260 VAC, IP 6K9K / IP 6K7 (high-pressure cleaner proof/ submersible), non-stick coating, 56 high power LEDs, upright/pendant mounting. EMC approvals: ISO 13766, CE, C-tick, FCC.

Ultra-broad illumination	**1GJ 011 872-011**
Close-range illumination	**1GJ 011 872-021**
Long-range illumination	**1GJ 011 872-031**
Extra-wide illumination, fixed	**1GJ 011 872-061**
Close-range illumination, fixed	**1GJ 011 872-071**
Long-range illumination, fixed	**1GJ 011 872-081**

This LED product has the following features:





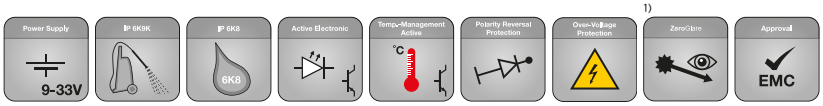
RokLUME 380 N

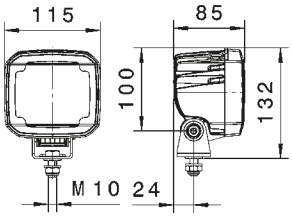
Light output (measured): 7,800 lumens, power requirement: 84 watts, colour temperature: 5,000 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (pressure cleaner-proof/ submersible), ECE-R10-approved, aluminium die-cast housing "NanoSafe non-stick easy to clean" – surface coating, DEUTSCH connector.

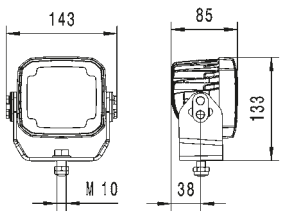
ZEROGLARE	**1GA 996 197-001**
Long-range illumination	**1GA 996 197-021**
Close-range illumination	**1GA 996 197-031**
Spot illumination	**1GA 996 197-041**

▸ More information on **ZERO**GLARE technology on page 39.

This LED product has the following features:







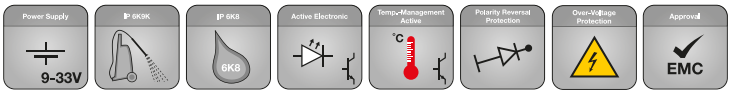
Ultra Beam LED Gen. II

Light output (measured): 4,000 lumens, power requirement: 56 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof / submersible), ECE-R10-approved, high-quality aluminium housing, ADR/ GGVSEB upon request, DEUTSCH connector.

Close-range illumination	
Upright or pendant surface mounting	**1GA 995 606-001**
Heavy duty surrounding bracket	**1GA 995 606-071**
Long-range illumination	
Upright or pendant surface mounting	**1GA 995 606-011**
Heavy duty surrounding bracket	**1GA 995 606-081**
ZEROGLARE **illumination**	
Upright installation	**1GA 995 606-177**[1)]

▸ More information on **ZERO**GLARE technology on page 39.

This LED product has the following features:

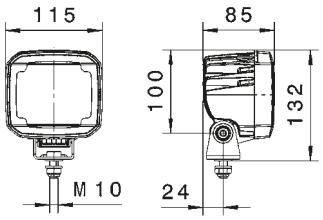


Ultra Beam LED Gen. II – search light with handle and switch

Light output (measured): 4,000 lumens, power requirement: 56 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof / submersible), ECE-R10-approved, high-quality aluminium housing, ADR/ GGVSEB upon request, DEUTSCH connector.

Spot illumination	**1GA 995 606-091**

This LED product has the following features:

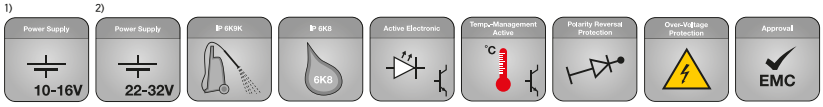


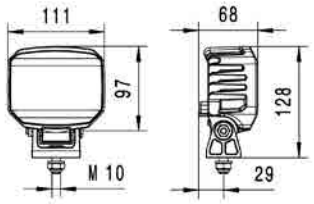
Ultra Beam LED Gen. I

Light output (measured): 2,200 lumens, power requirement: 30 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10 approved, high-quality aluminium housing, DEUTSCH connector, ADR/GGVS-tested.

Close-range illumination	
Upright installation	**1GA 995 506-001**
Pendant surface mounting	**1GA 995 506-011**
Heavy duty surrounding bracket	**1GA 995 506-081**
Long-range illumination	
Upright or pendant surface mounting	**1GA 995 506-031**

This LED product has the following features:





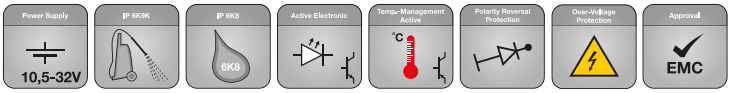
Power Beam 1800

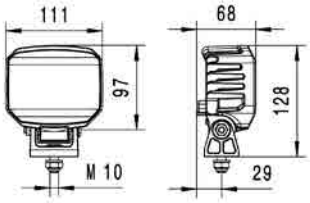
Light output (measured): 1,850 lumens, power requirement: 36 watts, colour temperature: 6,500 kelvins, single-volt (12 or 24 volts), polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, high-quality aluminium housing, upright/ pendant mounting, DEUTSCH connector, dimming function.

Close-range illumination	
12 V	**1GA 996 388-001[1)]**
24 V	**1GA 996 388-011[2)]**
Long-range illumination	
12 V	**1GA 996 388-021[1)]**
24 V	**1GA 996 388-031[2)]**
24 V, CoroSafe*	**1GA 996 388-041[2)]**

▶ * More information on CoroSafe technology on page 38.

This LED product has the following features:



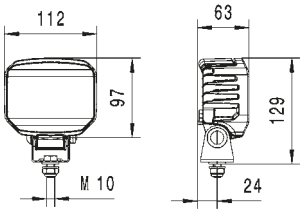


Power Beam 1800 compact

Light output (measured): 1,850 lumens, power requirement: 26 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, heat-conducting plastic housing, total corrosion protection thanks to Thermo Pro technology, DEUTSCH connector.

Close-range illumination	**1GA 996 488-001**
Long-range illumination	**1GA 996 488-011**

This LED product has the following features:



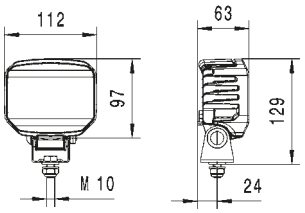
More information on coloured lenses on page 39.

Power Beam 1500

Light output (measured): 1,300 lumens, power requirement: 22 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10 approved, high-quality aluminium housing, ADR/ GGVS-tested, DEUTSCH connector.

Close-range illumination	
Upright or pendant surface mounting	**1GA 996 288-011**
Heavy duty surrounding bracket	**1GA 996 288-031**
Long-range illumination	
Upright or pendant surface mounting	**1GA 996 288-001**
Heavy duty surrounding bracket	**1GA 996 288-021**
Orange lens	**1GA 996 288-041**

This LED product has the following features:

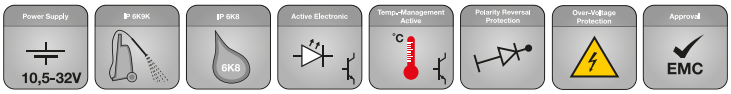


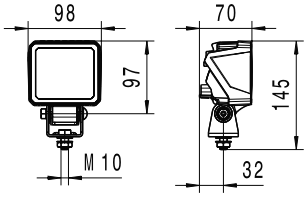
Power Beam 1000 compact

Light output (measured): 1,000 lumens, power requirement: 12 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, plastic housing, ADR / GGVS-tested, upright / pendant mounting, DEUTSCH connector.

Close-range illumination	**1GA 996 188-501**
Long-range illumination	**1GA 996 188-511**
Reverse light	**2ZR 996 188-521**

This LED product has the following features:





ECO18 LED

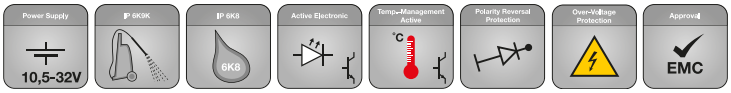
Light output (measured): 1,350 lumens, power requirement: 18 watts, colour temperature: 6,500 / 5,000 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, high-quality aluminium housing,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

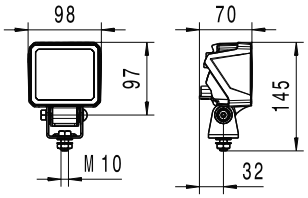
Close-range illumination	
500 mm cable	**1GA 996 479-001**
DEUTSCH connector	**1GA 996 479-021**

Long-range illumination	
500 mm cable	**1GA 996 479-011**
DEUTSCH connector	**1GA 996 479-031**

Reverse light /ECE-R23	
3,000 mm cable, 5,000 kelvins	**2ZR 996 479-501**
DEUTSCH connector, 5,000 kelvins	**2ZR 996 479-511**

This LED product has the following features:





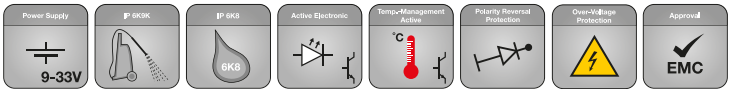
ECO26 LED

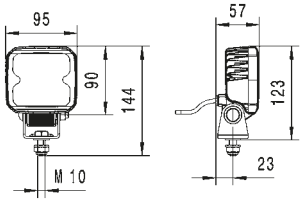
Light output (measured): 2,000 lumens, power requirement: 26 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, high-quality aluminium housing, upright / pendant mounting.

Close-range illumination	
500 mm cable	**1GA 996 579-001**
DEUTSCH connector	**1GA 996 579-021**

Long-range illumination	
500 mm cable	**1GA 996 579-011**
DEUTSCH connector	**1GA 996 579-031**

This LED product has the following features:





Q90 compact LED

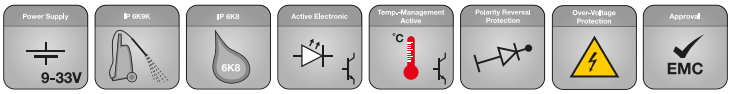
Light output (measured): 1,200 lumens, power requirement: 15 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, upright / pendant mounting.

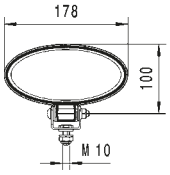
Close-range illumination	
500 mm cable	**1GA 996 284-001**
150 mm cable and DEUTSCH connector, ADR- / GGVSEB-tested	**1GA 996 284-081**

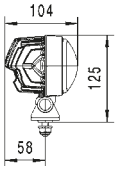
Long-range illumination	
500 mm cable	**1GA 996 284-011**
150 mm cable and DEUTSCH connector, ADR- / GGVSEB-tested	**1GA 996 284-091**

▸ More information on Thermo Pro technology on page 38.

This LED product has the following features:







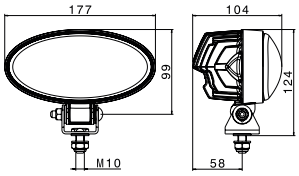
Oval 90 LED Generation II

Light output (measured): 4,300 lumens, power requirement: 60 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, high-quality aluminium housing, ADR/ GGVSEB upon request, DEUTSCH connector

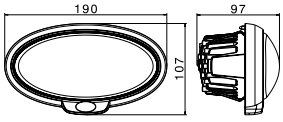
Close-range illumination	**1GB 996 486-001**
Long-range illumination	**1GB 996 486-011**

This LED product has the following features:

Surface mounting



Flush mounting



Oval 90 LED Gen. I

Light output (measured): 2,000 lumens, power requirement: 28 watts, colour temperature: 6,500 kelvins, multivolt, reverse polarity protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10 approved, high-quality aluminium housing, ADR/ GGVS-tested.

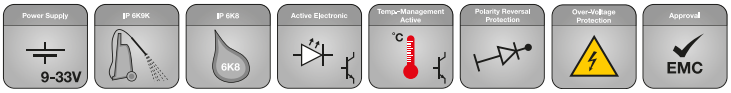
Close-range illumination

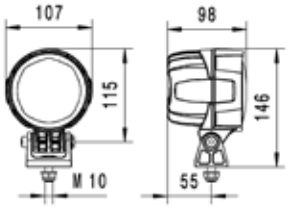
Upright / pendant mounting, DEUTSCH connector	**1GB 996 386-001**
Upright / pendant mounting, HB3 connector	**1GB 996 386-011**
Installation, DEUTSCH connector	**1GB 996 386-031**

Long-range illumination

Upright / pendant mounting, DEUTSCH connector	**1GB 996 386-021**

This LED product has the following features:



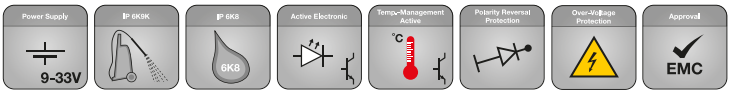


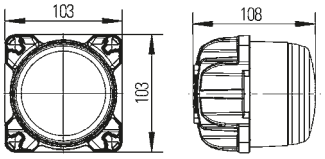
Module 90 LED

Light output (measured): 3,400 lumens, power requirement: 36 watts, colour temperature: 6,500 kelvins, multivolt, reverse polarity protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10 approved, high-quality aluminium housing, upright / pendant mounting, DEUTSCH connector.

Close-range illumination	**1G0 996 263-031**
Long-range illumination	**1G0 996 263-051**

This LED product has the following features:



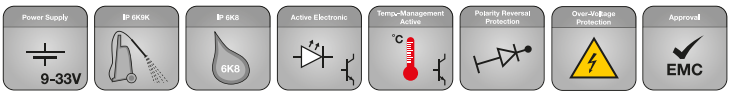


Module 90i LED, flush mounted

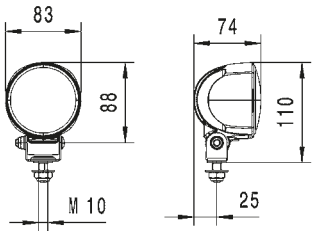
Light output (measured): 3,400 lumens, power requirement: 36 watts, colour temperature: 6,500 kelvins, multivolt, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10 approved, aluminium die-cast housing, DEUTSCH connector.

Close-range illumination	**1G0 996 263-501**
Long-range illumination	**1G0 996 263-511**

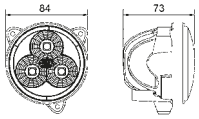
This LED product has the following features:



Surface mounting



Flush mounting

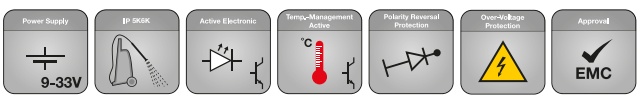


Modul 70 LED Gen. IV

Light output (measured): 2,500 lumens, power requirement: 30 watts, colour temperature: 6,500 kelvins, multivolt, reverse polarity protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10 approved, high-quality aluminium housing, upright / pendant mounting.

Close-range illumination	
2,000 mm cable	**1G0 996 476-001**
Flush mounting	**1G0 996 476-121**
Long-range illumination	
2,000 mm cable	**1G0 996 476-011**
Flush mounting	**1G0 996 476-041**
Extra-wide surface lighting	
2,000 mm cable	**1G0 996 476-031**
Flush mounting	**1G0 996 476-131**

This LED product has the following features:

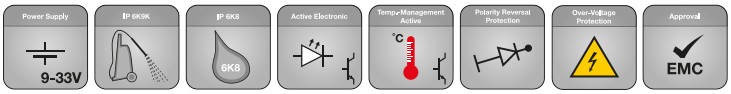


Module 70 LED Gen. IV – searchlights with handle and switch

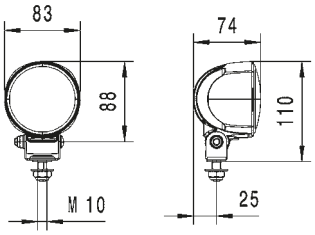
Light output (measured): 2,500 lumens, power requirement: 30 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 5K6K, ECE-R10-approved, high-quality aluminium housing.

Long-range illumination	**1G0 996 476-501**
Close-range illumination	**1G0 996 476-511**

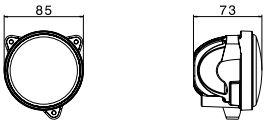
This LED product has the following features:



Surface mounting



Flush mounting



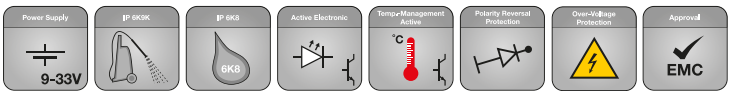
Module 70 LED Gen. III

Light output (measured): 800 lumens, power requirement: 13 watts, colour temperature: 6,500 kelvins, multivolt, reverse polarity protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10 approved, high-quality aluminium housing.

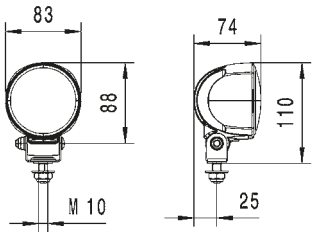
Close-range illumination	
Installation, 2,000 mm cable	**1G0 996 276-431**
Upright mounting, 2,000 mm cable	**1G0 996 276-451**
Plastic housing, 12 V (9 – 16 V), 2,000 mm cable	**1G0 996 376-501**
10 – 100 V, 2,000 mm cable, 600 lm	**1G0 996 276-077**
Long-range spot illumination	
2,000 mm cable, blue diffusing lens	**1G0 996 276-701**[1)]
2,000 mm cable	**1G0 996 376-001**[1)]
Extra-wide surface lighting	
150 mm cable, DEUTSCH connector	**1G0 996 276-481**

1) Possible applications: gritting and spraying vehicles.
More information on page 39.

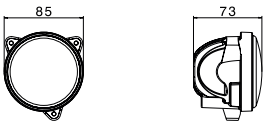
This LED product has the following features:



Surface mounting



Flush mounting

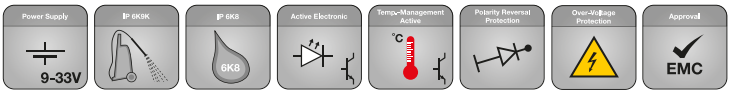


Module 70 LED Gen. 3.2

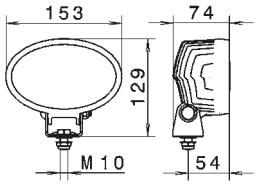
Light output (measured): 1,800 lumens, power requirement: 20 watts, colour temperature: 6,500 kelvins, multivolt, reverse polarity protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10 approved, high-quality aluminium housing.

Close-range illumination	
2,000 mm cable	**1G0 996 576-031**
DEUTSCH connector	**1G0 996 576-041**
Long-range illumination	
2,000 mm cable	**1G0 996 576-001**
DEUTSCH connector	**1G0 996 576-011**

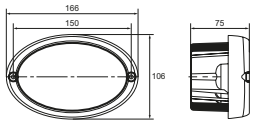
This LED product has the following features:



Surface mounting



Flush mounting



Oval 100 LED Generation II

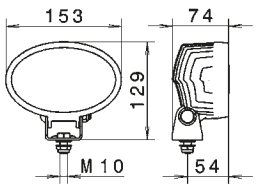
Light output (measured): 4,000 lumens, power requirement: 56 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof / submersible), ECE-R10-approved, high-quality aluminium housing, ADR/ GGVSEB upon request, DEUTSCH connector.

Close-range illumination	
Upright or pendant surface mounting	**1GA 996 761-001**
Flush mounting	**1GA 996 761-021**

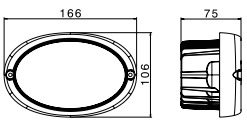
Long-range illumination	
Upright or pendant surface mounting	**1GA 996 761-011**

This LED product has the following features:

Surface mounting



Flush mounting



Oval 100 LED Gen. I

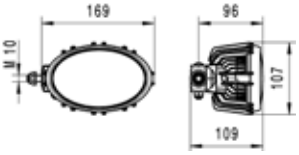
Light output (measured): 1,700 lumens, power requirement: 25 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, ADR / GGVS-tested, DEUTSCH connector.

Close-range illumination	
Upright / pendant mounting, DEUTSCH connector	**1GA 996 661-001**
Flush mounting	**1GA 996 661-021**

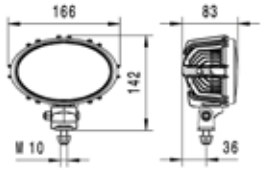
Long-range illumination	
Upright or pendant surface mounting	**1GA 996 661-011**

This LED product has the following features:

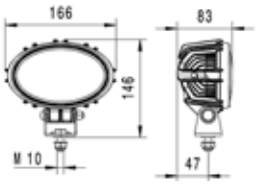
Side mounting



Upright / pendant mounting, hinge



Upright or pendant surface mounting

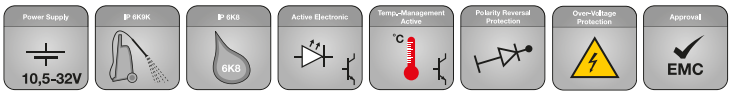


Oval 100 LED Thermo Pro

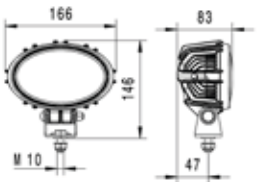
Light output (measured): 1,700 lumens, power requirement: 25 watts, colour temperature: 6,500 kelvins, multi-voltage, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, heat-conducting plastic housing, DEUTSCH connector

Close-range illumination	
Side mounting, hinge	**1GA 996 661-031**
Upright or pendant surface mounting	**1GA 996 661-041**
Upright / pendant mounting, hinge	**1GA 996 661-501**

This LED product has the following features:



Upright or pendant surface mounting

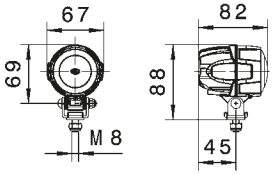


Oval 100 LED compact

Light output (measured): 1,850 lumens, power requirement: 26 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, heat-conducting plastic housing, total corrosion protection thanks to Thermo Pro technology, upright / pendant mounting, DEUTSCH connector.

Close-range illumination	**1GA 996 761-107**
Long-range illumination	**1GA 996 761-117**

This LED product has the following features:

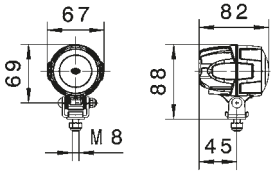


Module 50 LED

Light output (measured): 800 lumens, power requirement: 15 watts, colour temperature: 6,500 kelvins, multivolt 9 – 48 V, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10 approved, high-quality aluminium housing, ADR/GGVS-tested, DEUTSCH connector.

Close-range illumination	
Upright installation	**1G0 995 050-001**
Pendant surface mounting	**1G0 995 050-011**
Long-range illumination	
Upright or pendant surface mounting	**1G0 995 050-021**

This LED product has the following features:



Module 50 Spot LED

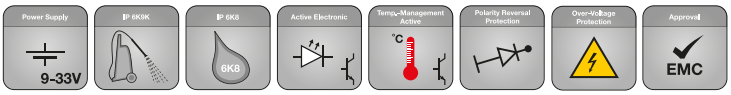
Power requirement: 15 watts, colour temperature: 6,500 kelvins, multivolt 9 – 52 V, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (pressure cleaner-proof/ submersible), ECE-R10 approved, high-quality aluminium housing, ADR/GGVS-tested, DEUTSCH connector.

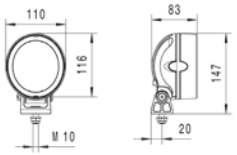
The new Module 50 LED Spot series from HELLA greatly contributes to workplace safety. These spotlamps feature a special lens technology bundling light so strongly as to projecting a circular warning spot on the ground. Depending on the surface, colours white, blue, green or red are preferable.

White	**1G0 995 050-051**
Blue	**1G0 995 050-061**
Green	**1G0 995 050-071**
Red	**1G0 995 050-081**

Spot illumination

This LED product has the following features:



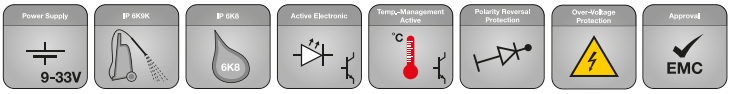


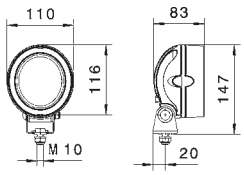
Mega Beam LED Generation IV

Light output (measured): 2,500 lumens, power requirement: 30 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, high-quality aluminium housing, 2,000 mm cable.

Close-range illumination	
Upright installation	**1GM 996 136-501**
Pendant surface mounting	**1GM 996 136-511**
Upright mounting with handle	**1GM 996 136-521**

This LED product has the following features:



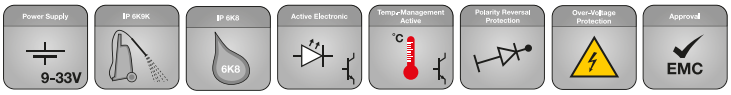


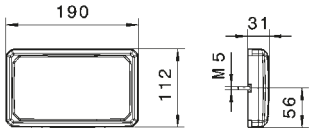
Mega Beam LED Gen. III

Light output (measured): 800 lumens, power requirement: 13 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, high-quality aluminium housing, 2000 mm cable.

Close-range illumination	
Upright installation	**1GM 996 136-311**
Pendant surface mounting	**1GM 996 136-361**

This LED product has the following features:





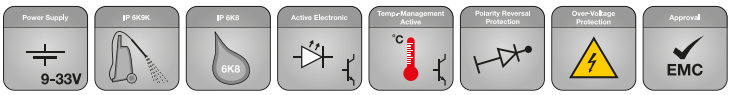
Flat Beam 1000

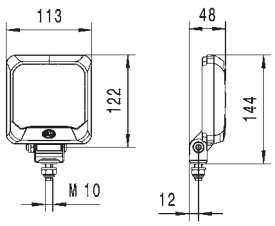
Light output (measured): 1,100 lumens, power requirement: 11 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, impact-resistant plastic housing. Upright mounting, 2,000 mm cable.

Close-range illumination	
Wall-mounted	**1GD 996 193-001**
Wrap-around bracket	**1GD 996 193-011**

45° illumination	
The special lens optics enables perfect light projection into work area also for vertical mounting. The structure refracts the light in a downward 45° angle and thus provides good illumination in the direct near field area.	
Wall-mounted	**1GD 996 193-051**

This LED product has the following features:





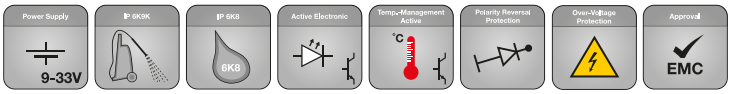
Flat Beam 500

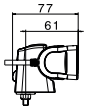
Light output (measured): 550 lumens, power requirement: 7 watts, colour temperature: 6,500 kelvins, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, impact-resistant plastic housing, 2,000 mm cable.

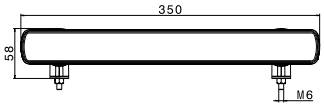
Standard 45° downward illumination. The special lens optics enables perfect light projection into work area also for vertical mounting. The structure refracts the light in a downward 45° angle and thus provides good illumination in the direct near field area.

Close-range illumination	
Upright surface mounting, standard bracket	**1GA 995 193-001**
Pendant surface mounting, standard bracket	**1GA 995 193-011**
Upright surface mounting, wall installation	**1GA 995 193-021**
Upright surface mounting, strap fixing	**1GA 995 193-031**
Upright surface mounting, wrap-around bracket	**1GA 995 193-041**

This LED product has the following features:







LED Light Bar 350

Light output (measured): 2,200 lumens, power requirement: 25 watts, colour volt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K7 (high-pressure cleaner-proof/ submersible), ECE-R10-approved, Thermo Pro plastic housing.

Close-range illumination	
2,500 mm cable	**1GJ 958 040-501**

This LED product has the following features:

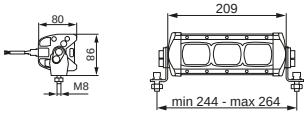
LBX LED-Lightbars

Light output (measured): up to 5,500 lumens, colour temperature: 6,500 kelvins, 9 - 33 volts, polarity reversal protection, overvoltage protection, IP 67 (high-pressure cleaner-proof), ECE-R10-approved, high-quality aluminium housing, DEUTSCH connector, upright / pendant mounting.

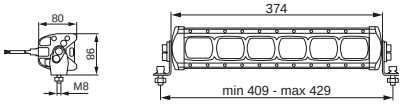
Close-range illumination	
LBX-220 LED, 1,000 lumens, 22 watts	**1GE 360 100-007**
LBX-380 LED, 2,000 lumens, 44 watts	**1GJ 360 101-007**

Long-range illumination	
LBX-540 LED, 3,500 lumens, 66 watts	**1GJ 360 102-007**
LBX-720 LED, 5,500 lumens, 88 watts	**1GJ 360 103-007**

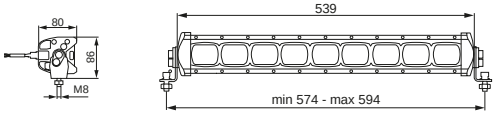
LBX-220 LED



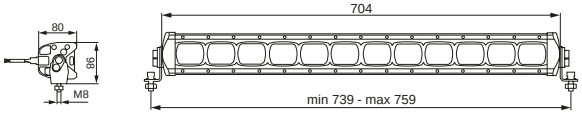
LBX-540 LED

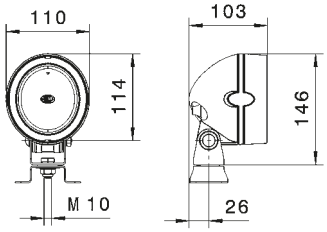


LBX-380 LED



LBX-720 LED

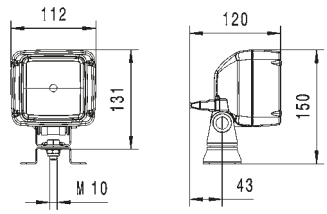




Mega Beam H3

Light output: 2,500 lumens, impact-resistant glass fibre-reinforced synthetic material housing, IP 5K9K (high-pressure cleaner-proof; except version -091), GGVSEB/ADR tested for H3 bulb: 12 / 24 V, 55 / 70 W, 1,150 / 1,400 lumens bulb not included in delivery.

Close-range illumination	
Upright / pendant mounting, AMP connector, H3	**1GM 996 134-171***
Upright mounting, cable inlet with grommet, H3, heavy duty, with handle	**1GM 996 134-241***
Upright / pendant mounting, cable inlet with grommet, H3	**1GM 996 134-321***
Mounted on right, cable inlet with grommet, H3	**1GM 996 134-271***
Mounted on left, cable inlet with grommet, H3	**1GM 996 134-371***
Long-range illumination	
Upright / pendant mounting, cable inlet with grommet, H3	**1GM 996 134-051***
Upright mounting, AMP connector, H3, heavy duty	**1GM 996 134-071***
Terrain illumination	
Upright mounting, cable inlet with grommet, H3	**1GM 996 134-061***
Upright mounting, AMP connector, H3, heavy duty	**1GM 996 134-081***
Flush mounting, cable inlet with grommet, H3	**1GM 996 134-091***

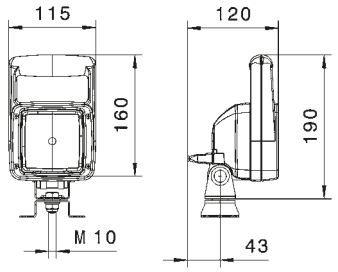


Ultra Beam H3/H9

Colour temperature: 2,500 kelvins (H3) / 3,200 kelvins (H9), impact-resistant glass-fibre reinforced plastic housing, window pane, IP 5K9K (high-pressure cleaner-proof), GGVSEB / ADR-tested, upright / pendant mounting, H3 bulb: 12 / 24 V, 55 / 70 W, 1,150 / 1,400 lm, H9 bulb: 12V/65W/1,700 lm.

Close-range illumination	
AMP connector, 4-point attachment, H3	**1GA 007 506-011***
Mounting, AMP connector, H3	**1GA 007 506-111***
Cable inlet with grommet, H3	**1GA 007 506-081***
DEUTSCH connector, H3	**1GA 007 506-391***
Side mounting, cable inlet with grommet, H3	**1GA 996 083-011***
12 V, 65 W, AMP connector, incl. H9 bulb, 1,700 lm	**1GA 996 150-007**
AMP plug, 4-point attachment, incl. H3 bulb 12 V	**1GA 997 506-171**
AMP plug, 4-point attachment, incl. H3 bulb 24 V	**1GA 997 506-181**
Long-range illumination	
12 V, 65 W, AMP plug, 4 point assembly, incl. H9 bulb	**1GA 996 150-081**
AMP bulb, H3	**1GA 997 506-021***

* Without bulb.

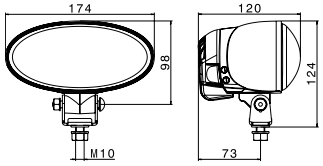


Ultra Beam with handle, H3

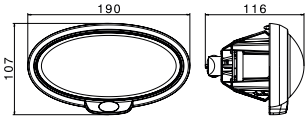
Colour temperature: 2,500 kelvins (H3) / 3,200 kelvins (H9), impact-resistant glass fibre-reinforced synthetic material housing, IP 5K9K (high-pressure cleaner-proof), H3 bulb: 12 / 24 V, 55 / 70 W, 1,150 / 1,400 lm.

Close-range illumination	
Heavy duty, AMP connector, upright mounting, H3	**1GA 007 506-021***
Heavy duty, AMP connector, on/off switch, H3	**1GA 997 506-631***
24 V, 70 W, 1,400 lm, pipe socket fixing, incl. H3 bulb, AMP connector	**1GA 007 506-681**

Surface mounting



Flush mounting

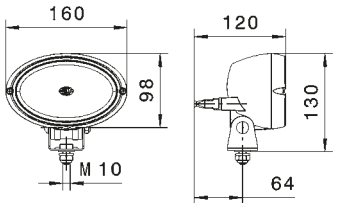


Oval 90 HB3

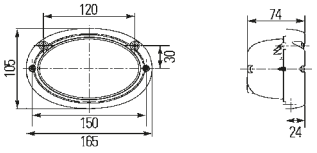
Light output: 1,400 lumens, colour temperature: 3,200 kelvins, impact-resistant glass fibre-reinforced synthetic material housing, IP 6K9K (pressure cleaner-proof), HB3 "long life" bulb. 12 V, 60 W, HB3 plug-type connection.

Close-range illumination	
Upright installation	**1GB 996 186-051**
Flush mounting	**1GB 996 186-061**

Surface mounting



Flush mounting



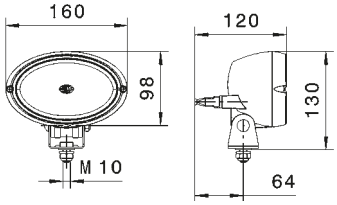
Oval 100 Double Beam

Light output: 2,300 or 2,800 lumens, colour temperature: 2,500 kelvins, extremely powerful light output due to double chamber reflector. IP 5K9K (pressure cleaner-proof), impact-proof, glass fibre-reinforced synthetic material housing. Double beam, incl. 2 x H3 bulbs. Pendant mounting upon request.

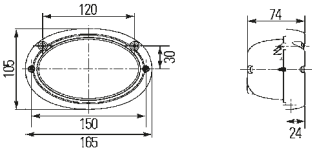
Close-range illumination	
12 V, 110 W, 2,300 lm, upright surface mounting, AMP connector	**1GA 996 161-291**
12 V, 110 W, AMP plug, mounting	**1GA 996 161-111**
Long-range illumination	
12 V, 110 W, 2,300 lm, upright surface mounting	**1GA 996 161-131**
12 V, 110 W, 2,300 lm, surface mounted laterally, AMP connector	**1GA 996 161-331**
24 V, 140 W, 2,800 lm, upright surface mounting	**1GA 996 361-011**

* Without bulb.

Surface mounting



Flush mounting



Oval 100 H3/H9

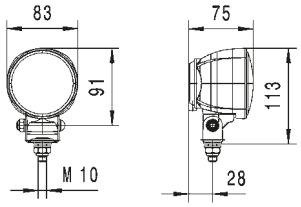
Colour temperature: 2,500 kelvins (H3), 3,200 kelvins (H9), impact-resistant glass fibre-reinforced synthetic material housing, IP 5K9K (high-pressure cleaner-proof).

For H3 bulb: 12 / 24 V, 55 / 70 W, 1,150 / 1,400 lm
For H9 bulb: 12 V, 65 W, 1,700 lm

Close-range illumination	
Upright / pendant mounting, AMP connector, incl. H3 bulb	**1GA 996 161-121**
Upright mounting, 2,000 mm cable, incl. H9 bulb	**1GA 996 161-391**
Upright / pendant mounting, AMP connector, incl. H3 bulb	**1GA 996 161-581**
Upright / pendant mounting, AMP connector, incl. H3 bulb	**1GA 996 361-171**
Upright mounting, cable inlet with grommet, H3	**1GA 996 361-501***
Long-range illumination	
Upright / pendant mounting, AMP connector, incl. H3 bulb	**1GA 996 161-281**
AMP connector, mounting, H3	**1GA 996 161-101**

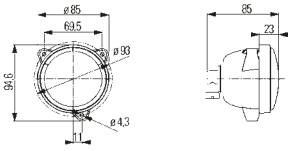
H9

Surface mounting



H3

Flush mounting

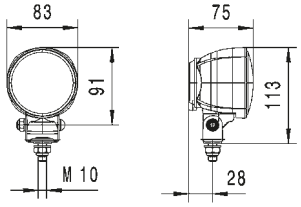


Module 70 H3/H9

Colour temperature: 2,500 kelvins (H3) / 3,200 kelvins (H9) / 3,000 kelvins (GE886), impact-resistant glass fibre-reinforced synthetic material housing, IP 5K9K (high-pressure cleaner-proof).

For H3 bulb: 12 / 24 V, 55 / 70 W, 1,150 / 1,400 lm
For H9 bulb: 12 V, 65 W, 1,700 lm

Close-range illumination	
Upright mounting, cable inlet with grommet, H3	**1G0 996 176-001***
Flush mounting, cable inlet with grommet, 3-point attachment, H3	**1G0 996 176-021***
Upright mounting, incl. H9 bulb	**1G0 996 176-041**
Flush mounting, H9 plug-in connection, incl. H9 bulb	**1G0 996 176-061**
Upright mounting, 12 V, 50 W, incl. GE886 bulb	**1G0 996 176-081**
Flush mounting, 12 V, 50 W, 3-point attachment, incl. GE886 bulb	**1G0 996 176-091**
Upright / pendant mounting, cable inlet with grommet, H3	**1G0 996 176-111***
Upright mounting, 2,000 mm cable, incl. H9 bulb	**1G0 996 176-171**
Pendant mounting, 2,000 mm cable,incl. H9 bulb	**1G0 996 176-181**
Long-range illumination	
Upright mounting, cable inlet with grommet, H3	**1G0 996 176-011***
Flush mounting, cable inlet with grommet, 3-point attachment, H3	**1G0 996 176-031***
Flush mounting, incl. H9 bulb	**1G0 996 176-071**



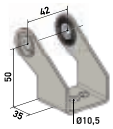
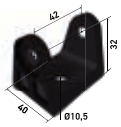
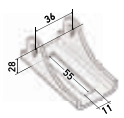
Module 70 Blue, FF 50 Blue

Colour temperature: 3,500 kelvins, impact-resistant glass fibre-reinforced synthetic material housing, IP 5K9K (high-pressure cleaner-proof). Blue lens ensures high-contrast light which penetrates dust, water and fog. Possible applications: gritting and spraying vehicles. More information on page 39.

Long-range illumination	
12 V, 65 W, upright surface mounting, H9 plug-in connection, incl. H9 bulb	**1G0 996 176-671**
12 V, 55 W, upright surface mounting, cable inlet with grommet, incl. H7 bulb	**1FA 008 283-031**

* Without bulb.

Accessories

Product photo	Description	Part number
Bracket		
	**Pipe socket fixing bracket** For combination with socket tubes 8HG 002 365-001. Suitable for 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 or grommet connector **Model series:** LED: Ultra Beam, Oval 100, Power Beam, and Module 90 Halogen: Ultra Beam	**8HG 990 320-011**
	**Mirror bracket attachment** Rotatable universal holder for mounting on tubes/pipes (diameter: 15-25 mm). For replacement on worklights 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, Modul 90, Q90 LED and AP 1200 LED	**8HG 990 263-131**
	**Magnetic mounting bracket** For worklights with U-bracket. Contains 2 magnets and fastening materials. **Model series:** All worklights with standard bracket	**8HG 004 806-001**
	**Four-point mounting** Made from yellow chrome-plated steel **Model series:** All worklights with standard bracket	**9XD 990 298-001**
	**Four-point mounting** Made from stainless steel with oblong holes **Model series:** All worklights with standard bracket	**9XS 130 261-001**
	**Angle bracket** Angle attachment for worklights with 42 mm bracket width. **Model series:** Ultra Beam, Mega Beam, Oval 100, Power Beam, Modul 90, Q90 LED and AP 1200 LED	**9XD 990 298-031**
	**Plastic bracket** Glass fiber-reinforced standard bracket for worklights. **Model series:** Ultra Beam, Mega Beam, Oval 100, Power Beam, Modul 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, Modul 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 eye** Standard bracket for attachments with limited 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**

Accessories

Plugs

The extensive range of accessories for plug connections from HELLA offers solutions for almost any application. Undesired failures are often caused not by the products but by defective cabling or wiring. The HELLA SUPERSEAL product range helps to achieve a water-tight and dust-resistant connection of the cable heads, thereby offering ideal work conditions whatever the weather.

DT plug set, 2-pole	**8JA 201 022-801**
DT plug set, 6-pole	**8JA 201 022-831**
AMP connector set (consisting of AMP connector and installation sleeve)	**8JD 990 295-037**
HB3 connector (10 units)	**8JA 990 295-217**
H9 connector (20 units)	**8JD 158 175-807**
SUPERSEAL, assortment case comprising various SUPERSEAL plug housings, pin/socket contacts, individual conductor seals and blind plugs (780 parts)	**8JA 009 256-801**

Cables

HELLA supplies various adapter cables as accessories for easy installation of headlamps.

2,000 mm cable with AMP connector and bare cable heads	**8KB 990 299-001**
2,000 mm cable with DEUTSCH connector and bare cable heads	**8KB 990 299-011**
2,000 mm cable with H9 connector, bare cable heads and rubber cap	**8KB 990 299-311**
2,000 mm cable with HB3 connector and bare cable heads	**8KB 990 299-331**
200 mm adapter cable from DEUTSCH to AMP connector	**8KB 990 299-361**
230-volt power supply (suitable for worklights up to max. 45 W)	**8EN 332 584-001**

Bulbs

HELLA offers a bulb assortment with a range of bulb types specially developed for different purposes, e.g. Light Power with extremely powerful light output or Lifetime with a very long service life.

For a more comprehensive selection visit www.hella.com/bulbs

H3 12 V / 55 W	**8GH 002 090-133**
H3 24 V / 70 W	**8GH 002 090-251**
HB3 LL 12 V / 60 W	**8GH 005 635-181**
H9 12 V / 65 W	**8GH 008 357-001**
D1S xenon burner	**8GS 009 028-001**

Born to work in the toughest conditions!

Thanks to state-of-the-art technologies developed using our OE know-how, HELLA worklights withstand the most difficult of environmental conditions. Anyone who works in the dark has to rely on a good light for safe and productive work. HELLA work lights have been specially developed to cope with the grueling demands of daily offroad use and, due to the materials used, meet the higher expectations for resistance to dirt and moisture in an exceptional manner. Rugged yet lightweight housing design and reflectors developed specially for their intended purpose ensure high and lasting productivity. The typical HELLA high quality and craftsmanship ensures functionality and longevity at the highest professional level. Here you can find out more about the latest work light innovations from HELLA.

CoroSafe coating

CoroSafe
New process for super resistant worklights
CoroSafe technology is HELLA's new technology behind new super resistant worklights with special coatings to improve salt spray resistance. For our CoroSafe coatings, we have improved our coatings and implemented two more layers to make our worklights more resistant. These two additional layers lead to a much higher and longer resistance against corrosion, and improved prevention against damage of the worklight. To distinguish CoroSafe coatings from our standard worklights, we used grey surface coating for these special versions.
CoroSafe technology will be primarily used in our LED rear driving lamps, which are utilized in extremely tough conditions.

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

Thermo Pro series
A HELLA innovation
The Thermo Pro series impresses with its considerably reduced weight and improved vibration characteristics. Even in the toughest conditions, the omission of vulnerable aluminium and the use of plastic housings ensure a long service life and prevent corrosion.

The innovative plastic material of the Thermo Pro series boasts similar thermal conductivity properties to aluminium.
This means that the LEDs can operate using the full power supply, even in high ambient temperatures.

Video clip – CoroSafe and Thermo Pro
Scan the barcode and watch the video to learn more.

Improving work safety thanks to highly luminous and innovative HELLA projection system
Our most recent development has enabled us for the first time to develop a projection module of such great luminous intensity that it is optimal also during daylight. Thanks to the special HELLA-developed lens optics, it is possible to project a customer-specific logo or warning light onto ground, optically warning, raising attention or delineating certain work areas to other vehicles or pedestrians. This significantly increases work safety and comfort during routine works, both during the day and at night.

Have we aroused your interest? More information on page 8. Contact us and create your personal solution with us.

Optimum working conditions in total darkness

The right light is always important – especially when working at night. The more light and lumens, the better – at least that's what many people believe. But at HELLA, we disagree. Too much light is usually the wrong approach. The high colour temperature of the LED worklights (~ 6,500 kelvins) means that too much light often causes a glare effect. The engineers at HELLA have tackled this problem and come up with two solutions to it.

Video clip – **ZERO**GLARE
Scan the barcode and watch the video to learn more

ZEROGLARE
In order to guarantee the same safety and comfort in the off-highway areas as on the road, HELLA has developed a new optical system for worklights.

The **ZERO**GLARE system ensures that drivers of oncoming vehicles are not dazzled. Unlike the usual LED worklights, the light/dark cut-off line appears very sharp here and the light of the **ZERO**GLARE worklights is targeted specifically onto the area in front of the vehicle.

HELLA's RokLUME 280 and 380 N worklight series is now available with this new **ZERO**GLARE technology. The 5,000 kelvins colour temperature is very similar to that of natural daylight, thus ensuring safer working conditions. The housing is made of corrosion-resistant aluminium protected by a special NanoSafe coating, which safeguards the worklight against external influences. It also has the advantage of easy cleaning. Product details can be found on page 21.

Video clip – Coloured cover lenses
Scan the barcode and watch the video to learn more

Coloured cover lenses:
- → Coloured cover lenses are used in cases where white LED light might dazzle drivers.
- → Generate a comfortable colour temperature and reduce the prevalence of fatigue.
- → Create safe working conditions under a variety of environmental influences.
- → Improve contrast perception.

1. Blue lens:
70 LED module (Part No.: 1G0 996 276-701)
- → Particularly well suited to use on sprayers.
- → The focused light beams penetrate the spray mist and all nozzles are evenly illuminated.

2. Orange lens:
Power Beam 1500 (Part No.: 1GA 996 288-041)
- → The orange light optimizes visibility conditions, particularly in the presence of fog and on surfaces with different textures.

Due to the fact that the vehicle lighting plays an important role for more safety, HELLA develops innovative lighting systems that offer a high level of driving comfort and also provide optimum illumination of the working area.

Also, the issue of "styling" is growing in importance. This is where the LEDs come into their own, as they allow new paths to be taken when designing the vehicle, and also mean that brand-specific appearances can be created.

90 mm brochure and configurator www.hella.com / 90mm-modules

90 mm modules are used in almost all vehicles. They are small, but powerful. They stand for quality, practicality, safety and cost-efficiency. Their modular design allows individual front design.

This tool is aimed at original equipment manufacturers, vehicle fleet operators and end customers in the agricultural sector, sports vehicles, electric cars, mobile homes, bus companies and municipalities.

It offers the following benefits:

Original Equipment
In our 90 mm configurator, you can select and design your own front lighting configuration. This process is aided by a simple menu guide. This results in a parts list which you can then send to HELLA directly from the tool.

Upgrade to LED
HELLA offers you conversion to LED light technology for all 90 mm halogen/xenon single and multifunctional modules. Existing halogen versions can easily be converted to LED modules at any time! Based on the halogen modules currently used, we show you which adaptations are necessary to convert to LED products while retaining the same lighting functions. This is simple with the compatible assembly solutions.

Illumination comparison
You can compare the lighting technologies for selected main light functions. See the difference between halogen and LED with realistic images from Europe's largest light testing facility! Compare light distribution to make the right decision for your application.
You will also receive all the relevant technical data information. The complete range is clearly described in a PDF.

Note: You will find additional information on the 90 mm modules in our separate brochure: 9Z2 999 037-723.

90 mm modules - Product overview

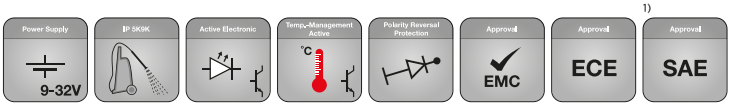
- For diverse applications and the highest demands
- Maximum design and technological freedom thanks to modular system
- Better illumination and safety with innovative LED technology

	LED	**Halogen** (conventional lighting technology)
Main light functions	→ Low beam → High beam → Low beam and high beam → High beam, daytime running light and position light → Low beam and indicator	→ Low beam → High beam → Low beam and high beam → High beam and daytime running light
Auxiliary light functions	→ Fog light → Fog light and cornering light → Fog light, daytime running light and position light → Daytime running lights	→ Fog light → Fog light and cornering light → Fog and daytime running light → Daytime running light and position light → Position light → Indicator and position light → Indicator → Indicator, daytime running light and position light

90 mm: L 4060 LED low beam

Uniform illumination, similar to daylight. Low beam, daytime running light and position light in one module or as a separate low beam. 40 x 60 mm polycarbonate lens for a new design. Mounting points as for Performance module, enabling 1:1 replacement. Optionally FEP or DEUTSCH connector. Hardened plastic cover lens. Integrated electronics, robust die-cast aluminium housing, multi-voltage 9 - 32 V. Perfectly fitting adjustment screws for Premium and Performance attachment included in the scope of supply.

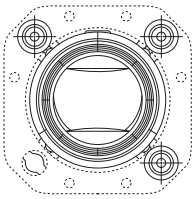
These LED products have the following characteristics:

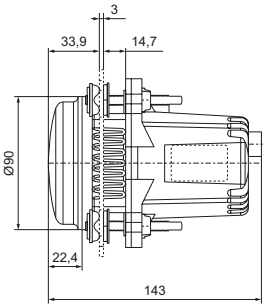


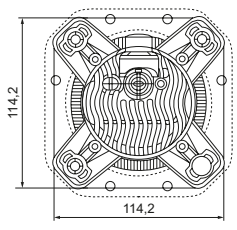
L 4060 LED low beam headlamp*	
Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover (black design cover upon request), multi-voltage 9 – 32 V.	
Right-hand traffic/USA version, FEP connector	**1BL 012 488-001**[1)]
Left-hand traffic, FEP connector	**1ML 012 488-011**
Right-hand traffic/USA version, DT connection	**1BL 012 488-101**[1)]
Left-hand traffic, DEUTSCH connector	**1ML 012 488-111**

Type approval: ECE-R112, ECE-R10, 1BL 012 488-001: E1 3831, 1ML 012 488-011: E1 4090, 1BL 012 488-101: E1 3881, 1ML 012 488-11: E1 4090

Performance module mount for 1:1 conversion of existing halogen versions







L 4060 LED low beam headlamp with daytime running/position light*	
Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover (black design cover upon request), multi-voltage 9 – 32 V.	
Right-hand traffic/USA version, FEP connector	**1BL 012 488-021**[1)]
Left-hand traffic, FEP connector	**1ML 012 488-031**
Right-hand traffic/USA version, DT connection	**1BL 012 488-121**[1)]
Left-hand traffic, DEUTSCH connector	**1ML 012 488-131**

Type approval: ECE-R112, R87, R7, ECE-R10, 1BL 012 488-021: E1 3831, 1ML 012 488-031: E1 4090, 1BL 012 488-121: E1 3881, 1ML 012 488-131: E1 4090

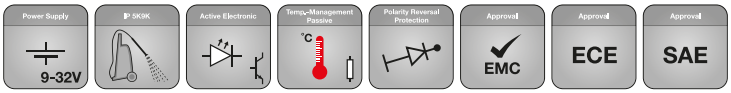
* In areas where the ECE-R48 regulation applies, vehicles registered in accordance with ECE-R48, series 05 must incorporate suitable measures to safeguard active failure monitoring of an LED headlamp in the vehicle electrical system. For vehicles that are registered in accordance with ECE-R48, series 06, the failure monitor is no longer mandatory.

A 3A fuse from HELLA must be used for all LED headlamps. A fuse of >3A is not sufficient to safely interrupt the power supply in the event of a fault.
If the degree of protection is unknown, an external safety switch (e.g. 8JD 743 557-021) must also always be used. If water gets in, incorrect protection can lead to damage ranging from melting to burning of the product.

90 mm: L 4060 LED high beam

High-end illumination. High beam, daytime running and position lights in one module, one high-beam/direction indicator combination or high beam as a separate module. 40 x 60 mm polycarbonate lens for a new design. Pattern-free and hardened plastic cover lens. High-beam headlamp with either pre-mounted carrier frame or as a 90 mm Performance module mount, enabling like-for-like replacement. Integrated FEP connector and driver electronics. Sturdy die-cast aluminium housing, multi-voltage, 9 - 32 V.

These LED products have the following characteristics:



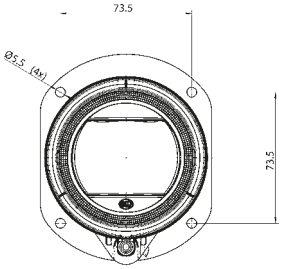
LED high beam L 4060

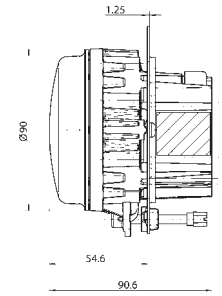
Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover (black design cover upon request), multi-voltage 9 – 32 V.

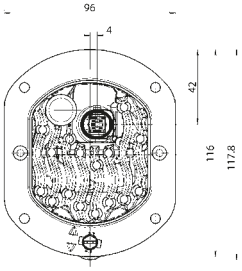
Pre-mounted carrier frame	**1F0 011 988-021**
Performance mount	**1F0 011 988-121**

Type approval: ECE-R112, ECE-R10, E1 3831

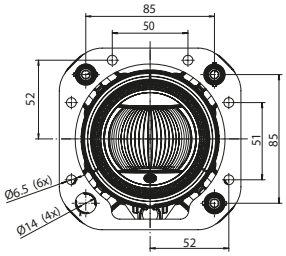
With pre-mounted carrier frame

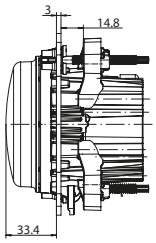


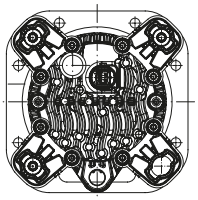




Performance module mount for 1:1 conversion of existing halogen versions







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

Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover (black design cover upon request), multi-voltage 9 – 32 V.

Pre-mounted carrier frame	**1F0 011 988-031**
Performance mount	**1F0 011 988-131**

Type approval: ECE-R112, R87, R7, ECE-R10, E1 3831

L 4060 LED high beam headlamp, with direction indicator

Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover (black design cover upon request), multi-voltage 9 – 32 V.

Pre-assembled carrier frame, with pulse generator*	**1F0 011 988-081**
Pre-assembled carrier frame, without pulse generator*	**1F0 011 988-071**
Performance attachment, with pulse generator*	**1F0 011 988-181**
Performance attachment, without pulse generator*	**1F0 011 988-171**

Type approval: ECE-R112, R6, ECE-R10, E1 3831

* SAE only up to vehicle width of 2,032 mm.

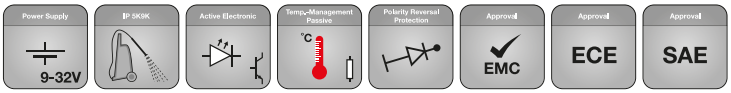
Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

A 3A fuse from HELLA must be used for all LED headlamps. A fuse of >3A is not sufficient to safely interrupt the power supply in the event of a fault.
If the degree of protection is unknown, an external safety switch (e.g. 8JD 743 557-021) must also always be used. If water gets in, incorrect protection can lead to damage ranging from melting to burning of the product.

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

90 mm: L 4060 fog light

These LED products have the following characteristics:



Uniform illumination, similar to daylight. Fog light in various combinations or as a separate module, with daytime running light, position light and cornering light. 40 x 60 mm polycarbonate lens, pattern-free, hardened cover lens made of plastic, integrated FEP connector and driver electronics. Sturdy die-cast aluminium housing, multi-voltage 9 - 32 V.

LED fog light L 4060

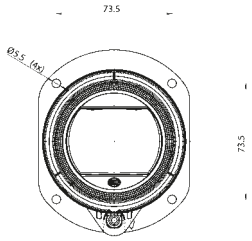
Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover (black design cover upon request), multi-voltage 9 – 32 V.

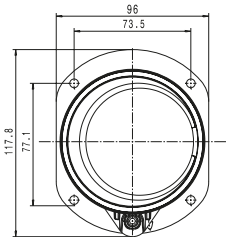
Pre-mounted carrier frame	**1N0 011 988-001**

Type approval: ECE-R19 F3, ECE-R10, E1 3831

With pre-mounted carrier frame
1N0 011 988-001
1N0 011 988-011

With preassembled carrier frame
1N0 011 988-051
1N0 011 988-061



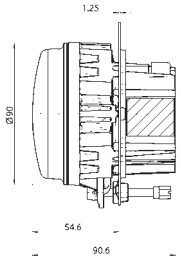


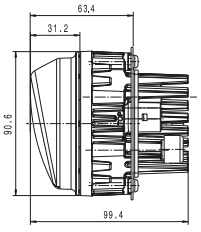
L 4060 LED fog light, with daytime running light and position light

Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover (black design cover upon request), multi-voltage 9 – 32 V.

Pre-mounted carrier frame	**1N0 011 988-011**

Type approval: ECE-R19 F3, R87, R7, ECE-R10, E1 3831



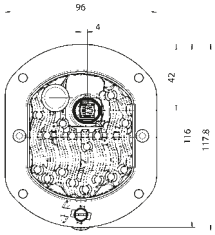


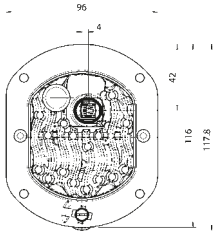
L 4060 LED fog light, with cornering light

Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover (black design cover upon request), multi-voltage 9 – 32 V.

Preassembled carrier frame, right	**1N0 011 988-061**
Preassembled carrier frame, left	**1N0 011 988-051**

Type approval: ECE-R19 F3, R119, ECE-R10, E1 3832





A 3A fuse from HELLA must be used for all LED headlamps. A fuse of >3A is not sufficient to safely interrupt the power supply in the event of a fault.
If the degree of protection is unknown, an external safety switch (e.g. 8JD 743 557-021) must also always be used. If water gets in, incorrect protection can lead to damage ranging from melting to burning of the product.

90 mm: LED accessories (L 4060)

Legend
•) Accessories needed for proper attachment
••) Optional accessories, tailor-made for the headlamps.

Accessory components	Part number	Features
Carrier frame		
Premium carrier frame	**9AH 169 580-011**	black
Performance carrier frame	**9AH 254 228-012**	black
Surplus supply LED AMP SUPERSEAL, 3-pole		
Housing	**8JA 746 184-032**	10 units
Female socket connector	**8KW 744 837-002**	50 units
Strand insulation	**9GD 746 185-002**	50 units
Surplus supply LED: FEP connector, 4-pin		
Housing	**8JA 202 231-002**	10 units
Flat contact	**8KW 863 933-013**	50 units
Strand sealing 0.35 – 0.5 mm²	**9GD 863 952-022**	50 units
Strand sealing 0.75 mm²	**9GD 863 952-012**	50 units
Blind plug	**9GD 863 952-002**	50 units
Surplus supply LED: DT connection, 4-pole (only together with the adapter cable, see 1)		
Male connector housing	**8JA 201 022-042**	10 units
Lock / wedgelock	**9NB 201 024-042**	10 units
Contact sleeve 0.5 - 1.5 mm²	**8KW 201 025-112**	50 units
Blind plug	**9NB 201 026-012**	50 units
Blind plug set (consists of 1 male connector housing, 1 lock, 5 contact sleeves and 3 dummy plugs)	**8JA 201 022-821**	
Headlamp beam throw adjustment system		
Headlamp leveling system, 12 V	**6NM 007 282-221**	
Headlamp leveling system, 24 V	**6NM 008 299-501**	
Bracket for right-side mounting of actuator, 12 V	**8HG 138 619-007**	
Bracket for left-side mounting of actuator, 12 V	**8HG 138 620-007**	
Headlamp cleaning systems		
Headlamp cleaning set with fixed nozzles	**8WS 008 549-011**	4 nozzles
Headlight cleaning system set with telescoping single nozzles	**8WT 008 549-101**	Two single nozzles
Headlight cleaning system set with telescoping double nozzles	**8WT 008 549-201**	Two double nozzles
Bend lighting accessories		
LED Modul connection cable - cornering light control unit	**8KB 163 160-011**	1 unit
Cornering light control unit	**5DF 009 244-007**	24 units
Adapter harness		
1) Adapter from FEP plug to DEUTSCH plug (4-pin)	**8KA 202 117-001**	1 unit
Adapter from FEP plug to Performance module (247 043) or DynaView (009 295)	**8KA 202 117-011**	1 unit

Low beam 012 488-001 / -011	Low beam 012 488-101 / -111	Low beam, daytime running light and position light 012 488-021 / -031	Low beam, daytime running light and position light 012 488-121 / -131	High beam 011 988-021	High beam 011 988-121	High beam, daytime running light and position light 011 988-031	High beam, daytime running light and position light 011 988-131	High beam and direction indicator (with pulse) 011 988-081	High beam and direction indicator (with pulse) 011 988-181	High beam and direction indicator (without pulse) 011 988-071	High beam and direction indicator (without pulse) 011 988-171	Fog light 011 988-001	Fog light, daytime running light and position light 011 988-011	Fog light and cornering light 011 988-051 / -061
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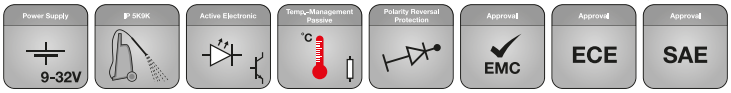
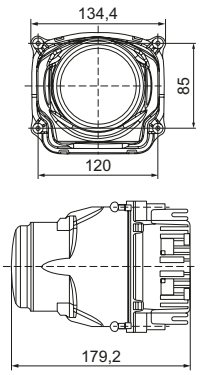
90 mm: Bi-LED low beam and high beam

2nd generation Bi-LED module with enhanced lighting/electronics. 55 x 70 mm polycarbonate lens, pattern-free hardened plastic cover lens, no moving parts, passive cooling. FEP and DEUTSCH connector, USA version available. Integrated function output for failure monitor. Multi-voltage 9- 32 V.

These LED products have the following characteristics:

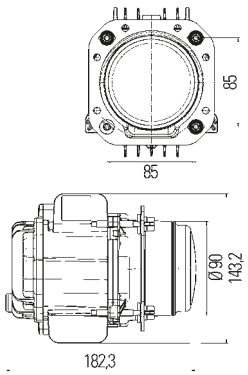




L 5570 Bi-LED low beam and high beam headlamp 2nd generation	
Module headlamp with 55 x 70 mm polycarbonate lens, robust aluminium die-cast housing, hardened plastic cover lens, no moving parts, multivolt 9 – 32 V.	
Right-hand traffic, FEP connector	**1AL 012 758-001**
Left-hand traffic, FEP connector	**1LL 012 758-011**
USA version, FEP connector	**1AL 012 758-021**[1)]
Right-hand traffic, DEUTSCH connector	**1AL 012 758-101**
Left-hand traffic, DEUTSCH connector	**1LL 012 758-111**
USA version, DEUTSCH connector	**1AL 012 758-121**[1)]

Type approval: ECE R112, ECE R10

These LED products have the following characteristics:



L 70 Bi-LED low beam and high beam headlamp* 1st generation	
Right-hand traffic	**1AL 010 820-021****
Left-hand traffic	**1LL 010 820-031****

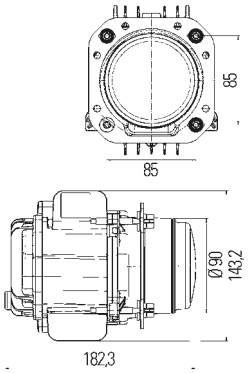
*In areas where the ECE R48 regulation applies, vehicles registered in accordance with ECE R48, series 05, must incorporate suitable measures to safeguard active failure monitoring of an LED headlamp in the vehicle electrical system. For vehicles that are registered in accordance with ECE-R48, series 06, the failure monitor is no longer mandatory.
** Set versions comprising 1 control unit for function monitoring and 1 first-generation LED headlamp available upon request.

A 3A fuse from HELLA must be used for all LED headlamps. A fuse of >3A is not sufficient to safely interrupt the power supply in the event of a fault. If the degree of protection is unknown, an external safety switch (e.g. 8JD 743 557-021) must also always be used. If water gets in, incorrect protection can lead to damage ranging from melting to burning of the product.

90 mm: Mono-LED low beam

The light colour, which is similar to daylight, offers more safety and comfortable, fatigue-free driving. Three white high-power LEDs provide the light source for each lighting function. The light is projected homogeneously onto the road through the 70 mm DE lens. The service life of the headlamp, generally over 15,000* real operating hours, enables high savings on maintenance and workshop costs compared to other lighting systems**. Exclusive vehicles stand out due to their cutting-edge technology.

These LED products have the following characteristics:



90 mm Premium LED module L 70	
Maintenance-free module for generally more than 15,000 operating hours, very homogenous light and quick start time, 35 W power consumption, no moving parts, passive cooling, plastic cover lens, vehicle protection: 5 A, multivolt 9 – 32 V.	
Mono LED, right-hand traffic	**1BL 010 820-001**
Mono LED, left-hand traffic	**1ML 010 820-011**

Type approval: ECE-R112, ECE-R10, E1 ES 3159 and LES 3160

Accessories	
Function monitoring device 12 V, for failure monitor	**5DS 011 630-001**
Carrier frame	**9AH 169 580-011**

* at an ambient temperature of around 50°C.
** In the ECE R48 area of application, under current law, it is necessary to implement failure check for a LED headlamp in the vehicle's electrical system by taking suitable measures. failure check is no longer necessary from 06 / 2014 onwards for vehicles in accordance with ECE-R48 Series 06 Supplement 3.

A 3A fuse from HELLA must be used for all LED headlamps. A fuse of >3A is not sufficient to safely interrupt the power supply in the event of a fault. If the degree of protection is unknown, an external safety switch (e.g. 8JD 743 557-021) must also always be used. If water gets in, incorrect protection can lead to damage ranging from melting to burning of the product.

90 mm: LED accessories

Accessory components	Part number	Features
Carrier frame		
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 units
Female socket connector	**8KW 744 837-002**	50 units
Strand insulation	**9GD 746 185-002**	50 units
Surplus supply LED: FEP connector, 4-pin		
Housing	**8JA 202 231-002**	10 units
Flat contact	**8KW 863 933-013**	50 units
Strand sealing, 0.35 - 0.5 mm² or	**9GD 863 952-022**	50 units
Strand sealing, 0.75 mm²	**9GD 863 952-012**	50 units
Blind plug	**9GD 863 952-002**	50 units
Surplus supply LED: DT 4-pole connector (together with adapter cable, see 1), except for 012 488-1xx and 012 758-1xx)		
Male connector housing	**8JA 201 022-042**	10 pcs. (**1 pc. in set)
Lock / wedgelock	**9NB 201 024-042**	10 pcs. (**1 pc. in set)
Contact sleeve 0.5 - 1.5 mm²	**8KW 201 025-112**	50 pcs. (**5 pcs. in set)
Blind plug	**9NB 201 026-012**	50 pcs. (**3 pcs. in set)
Set packaging	**8JA 201 022-821**	Number, see **
Headlight beam throw adjustment system		
Headlamp leveling system, 12 V	**6NM 007 282-221**	
Headlamp leveling system, 24 V	**6NM 008 299-501**	
Bracket for right-side mounting of actuator	**8HG 138 619-007**	
Bracket for left-side mounting of actuator	**8HG 138 620-007**	
Mounting set for headlamp leveling actuators (bracket and articulated element)	**8HG 183 586-001**	
Left bracket/interface for headlamp leveling actuator for connecting to the module	**8HG 208 791-011**	
Right bracket/interface for headlamp leveling actuator for connecting to the module	**8HG 208 791-001**	
Bend lighting accessories		
LED module connection cable - cornering light control unit	**8KB 163-160-811**	1 unit
Cornering light control unit	**5DF 009 244-007**	24 units
Adapter cable		
[1)] Adapter from FEP plug to DEUTSCH plug (4-pin)	**8KA 202 117-001**	1 unit
Adapter from FEP connector to Performance module (247 043) or DynaView (009 295)	**8KA 202 117-011**	1 unit
Other accessories (only if the vehicle was registered i.a.w. ECE R48, series 05. As of ECE R48, series 06, no more mandatory accessories)		
Function monitoring device, 12 V	**5DS 011 630-001**	1 unit
Function monitoring device, 24 V	**5DS 011 630-011**	1 unit
Function monitoring device, 24 V	**5DS 011 630-211**	1 unit

L 5570		L 70	
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
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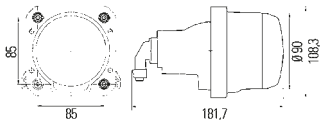
Legend
•) Accessories required for proper connection
••) Optional accessories, custom-developed for headlamps.

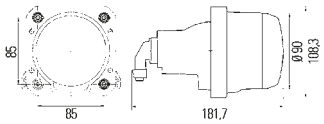
90 mm Premium

High-end illumination. Low beam and high beam from a single headlamp module, choice of xenon or halogen technology. 70 mm DE lens. Pattern-free and hardened glass cover lens. High-quality aluminium reflector. Preassembled adjusting screws. Including light source. For xenon versions splash water-proof electronic ballast. Connection using 0.5 m shielded supply cable with detachable plug connection.



Bi-Halogen® headlamps Low beam and high beam	
Halogen, low beam and high beam in one headlamp, metal reflectors with a clear DE lens. Ideal in combination with the matching spotlights and fog lights. Incl. light source.	
12 V, right-hand traffic, H7, ECE	**1AL 009 998-001**
12 V, left-hand traffic, H7, ECE	**1LL 009 998-011**
12 V, right-hand traffic, H9, SAE	**1AL 009 998-021**
24 V, right-hand traffic, H7, ECE	**1AL 009 998-041**
24 V, left-hand traffic, H7, ECE	**1LL 009 998-051**

Type approval: ECE-R112, E1 2484 and E1 2485



Halogen low beam headlamp	
Metal reflectors with clear DE lens. Ideal in combination with the matching spotlights and fog lights, including light source.	
12 V, right-hand traffic, H7, ECE	**1BL 009 999-001**
12 V, left-hand traffic, H7, ECE	**1ML 009 999-011**
12 V, right-hand traffic, H7, SAE	**1BL 009 999-021**
24 V, right-hand traffic, H7, ECE	**1BL 009 999-041**
24 V, left-hand traffic, H7, ECE	**1ML 009 999-051**

Type approval: ECE-R112, E1 2486 and E1 2487

Information

If you have been using Classic modules so far (except Bi-Xenon®), you can easily upgrade these to Performance modules.

The following Performance modules have the same module attachment as the Classic module and are therefore compatible and easy to replace – without having to modify the existing Classic carrier frame structure first.

Would you like to combine modules from the Premium and Performance series without having to commit yourself right at the start of the vehicle design process?

Then use the tried-and-trusted Premium carrier frame structure as a basis.

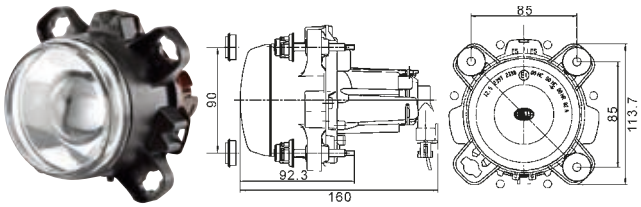
Alongside the complete Premium range, the following modules from the Performance series that are compatible with a Premium carrier frame can also be used.

Classic mountings for Performance headlamps	
90 mm high beam with PO, 12 V light bulb	**1KO 247 043-157**
90 mm high beam with 12 V light bulb	**1KO 247 043-167**
90 mm low beam with 12 V bulb, Right-hand traffic Left-hand traffic	 **1BL 247 042-217** **1ML 247 042-227**
24 V versions on request	

Premium mountings for Performance headlamps	
90 mm high beam with PO, 12 V light bulb	**1KO 247 043-117**
90 mm high beam with 12 V light bulb	**1KO 247 043-127**
90 mm low beam with 12 V bulb, Right-hand traffic Left-hand traffic	 **1BL 247 042-177** **1ML 247 042-187**
24 V versions on request	

90 mm Performance

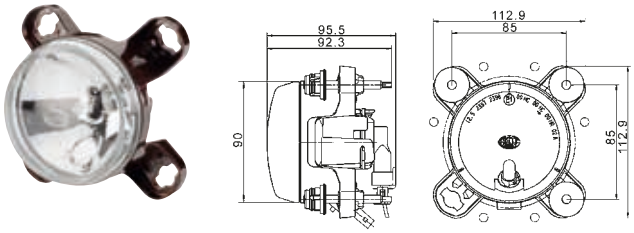
Optimised illumination. Modules in enhanced quality for use on long hauls. Pattern-free and hardened glass cover lens. High-quality aluminium reflector. With splash-water-proof plug connection. Perfectly fitting adjustment screws included in the scope of supply. Including light source. 24 V versions incl. heavy-duty long-life bulbs. Low beam with 50 mm DE lens, high beam with free-form reflector.



Halogen low beam headlamp	
Module headlamp with an aluminum reflector and clear DE lens behind a non-patterned glass cover lens, incl. light source.	
12 V, right-hand traffic, H1, for Performance mounting	**1BL 247 042-007**
12 V, left-hand traffic, H1, for Performance mounting	**1ML 247 042-027**
12 V, right-hand traffic, H1, for Premium mounting	**1BL 247 042-177**
12 V, left-hand traffic, H1, for Premium mounting	**1ML 247 042-187**
24 V, right-hand traffic, H1, for Premium mounting	**1BL 247 042-197**
24 V, left-hand traffic, H1, for Premium mounting	**1ML 247 042-207**
24 V, right-hand traffic, H1, for Classic mounting	**1BL 247 042-157**
24 V, left-hand traffic, H1, for Classic mounting	**1ML 247 042-167**

Type approval: E1 2397 and E1 2398

With a technical solution for the so-called "tourist solution" for temporary use in left-hand traffic countries or, for the left-hand traffic versions in right-hand traffic countries.



Halogen high beam	
Module headlamp with an aluminum free-form reflector and a non-patterned glass cover lens, incl. light source.	
12 V, with position light, H1, for Performance mounting	**1K0 247 043-007**
12 V, without position light, H1, for Performance mounting	**1K0 247 043-117**
12 V, with position light, H1, for Premium mounting	**1K0 247 043-117**
12 V, without position light, H1, for Premium mounting	**1K0 247 043-127**
24 V, with position light, H1, for Premium mounting	**1K0 247 043-137**
24 V, without position light, H1, for Premium mounting	**1K0 247 043-147**
24 V, with position light, H1, for Classic mounting	**1K0 247 043-097**
24 V, without position light, H1, for Classic mounting	**1K0 247 043-107**

Type approval: E1 2397

90 mm: Halogen accessories

Legend
•) Accessory for proper connection, or mandatory accessory
••) Optional accessory
•**) Required for xenon low-beam headlamps, permitted as an option for halogen and LED.
▲Required for xenon low-beam headlamps and, in some countries, in accordance with local approval regulations.
Permitted as an option for halogen and LED.

Accessory components	Part number	Features
Carrier frame		
Premium carrier frame	**9AH 169 580-011**	Black
Classic carrier frame	**9AH 157 659-007**	Silver
Performance carrier frame	**9AH 254 228-012**	Black
Caps		
Flat version for angled connectors		
Vented	**9GH 152 654-007**	
Non-vented	**9GH 152 654-012**	
Deep version for receptacle housing		
Vented	**9GH 145 943-001**	
Non-vented	**9GH 145 943-012**	
Plug (vehicle side)		
Surplus supply H1/H7/xenon	**8JD 156 151-807**	20 systems
Surplus supply H9	**8JD 158 175-807**	20 systems
Parking lights	**8JD 156 150-807**	20 systems
High-beam change-over switch ⊠ AMP SUPERSEAL, 2-pin		
Housing	**8JA 746 184-022**	10 units
Female socket connector	**8KW 744 837-002**	50 units
Strand insulation	**9GD 746 185-002**	50 units
Version with fording capability		
Venting hose	**9GS 190 794-002**	50 m
10 T units for venting hose	**9XL 190 733-002**	10 units
Headlamp range adjustment systems		
For halogen, 12 V	**6NM 007 282-221**	
For xenon versions, 12 V	**6NM 007 282-231**	
For halogen, 24 V	**6NM 008 299-501**	
Mounting set for actuator	**8HG 183 586-001**	1 set
Bracket for right-side mounting of actuator	**8HG 138 619-007**	
Bracket for left-side mounting of actuator	**8HG 138 620-007**	
Automatic headlamp range adjustment •**)	**8XX 010 315-001**	1 sensor
Washing systems ▲)		
Headlight cleaning system set with fixed nozzles, 12 V	**8WS 008 549-001**	4 nozzles
Headlight cleaning system set with fixed nozzles, 24 V	**8WS 008 549-501**	4 nozzles
Headlight cleaning system set with telescoping single nozzles, 12 V	**8WT 008 549-101**	2 single nozzles
Headlight cleaning system set with telescoping single nozzles, 24 V	**8WT 008 549-601**	2 single nozzles
Headlight cleaning system set with telescoping double nozzles, 12 V	**8WT 008 549-201**	2 double nozzles
Headlight cleaning system set with telescoping double nozzles, 24 V	**8WT 008 549-701**	2 double nozzles

Premium					Performance		
Bi-xenon low beam and high beam 009 997	H7 bi-halogen low beam and high beam 009 998	H7 bi-halogen low beam and high beam 009 998 Version with fording capability	H9 bi-halogen low beam and high beam 009 998 USA version	H7 halogen low beam 009 999	Halogen low beam 247 042	Halogen high beam 247 043	H1 halogen high beam with position light 247 043
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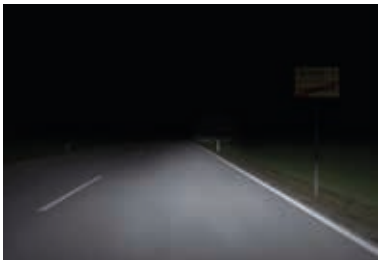
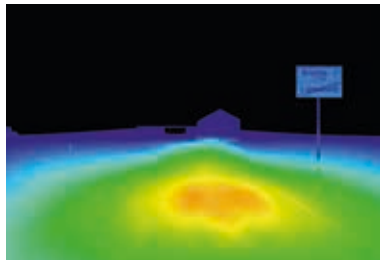
LED low beam comparison

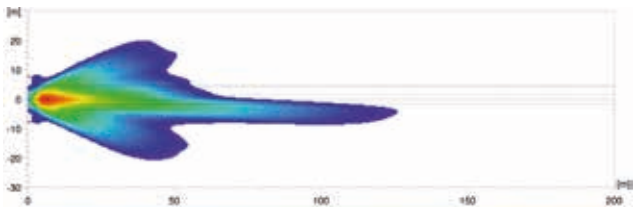
Road simulation

Road simulation – colour

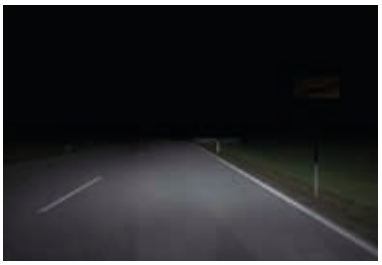
L 4060
(012 488)

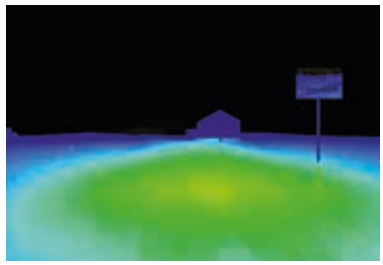


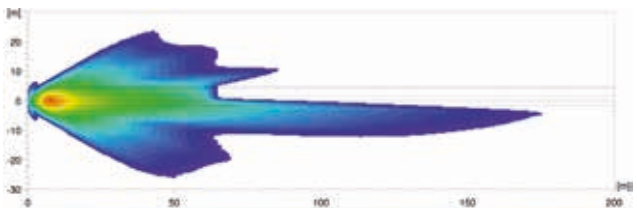




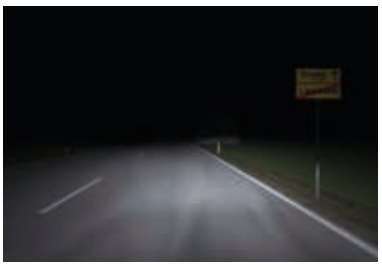
L 5570 2nd generation (Bi-LED)
(012 758)

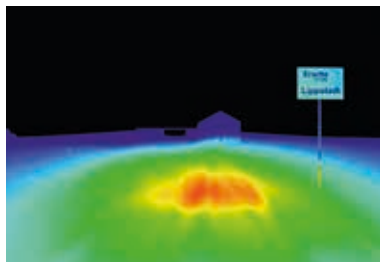


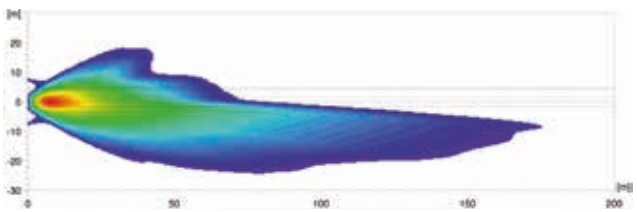




L 70 1st generation
(010 820)







Legend, isolux diagram (1 - 350 lux)

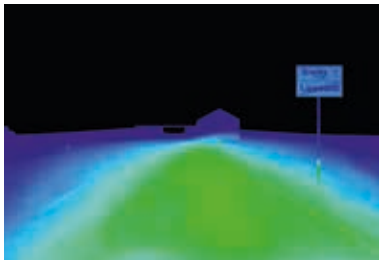
Remarks
Headlamp mounting height: 0.65 m/gap between the headlamps: 1.20 m

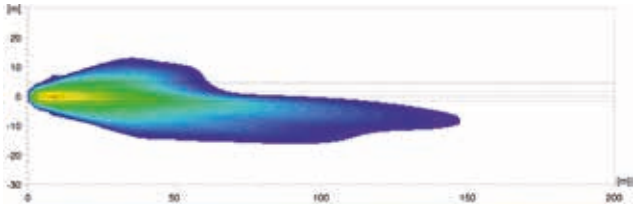
Halogen low beam comparison

Premium halogen (009 999) and Bi-halogen (009 998)

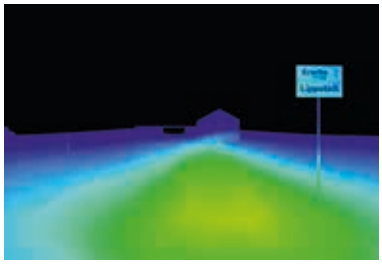
Road simulation

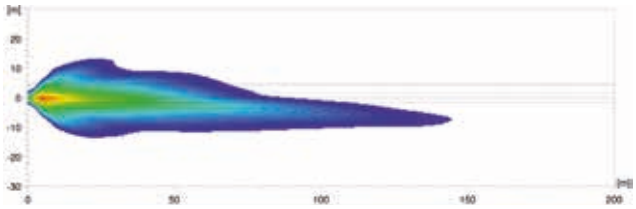
Road simulation – colour





Performance halogen (247 042)



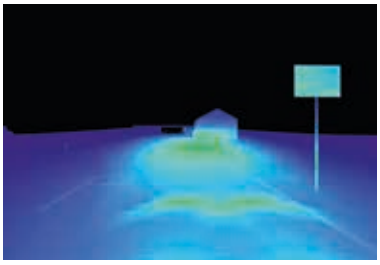


High beam comparison (LED, halogen)

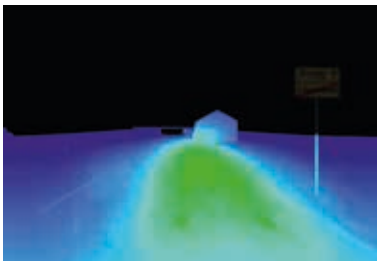
Road simulation

Road simulation – colour

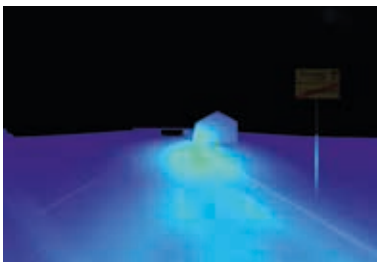
L 4060 LED
(011 988)



Performance halogen
(247 043)



Classic halogen
(008 191)



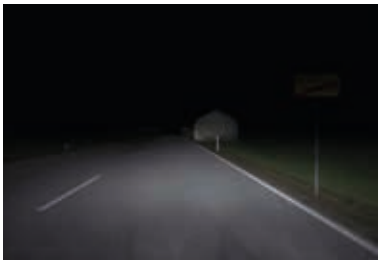
Note
Display of high beam only. When driving, the high beam is augmented by the low beam.

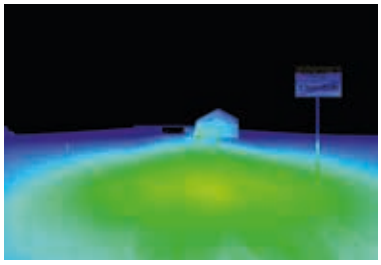
Bi-module comparison

Road simulation

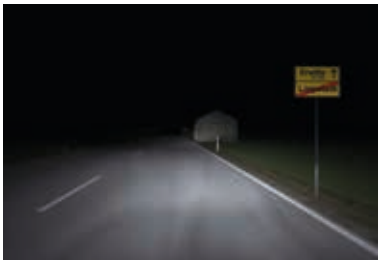
Road simulation – colour

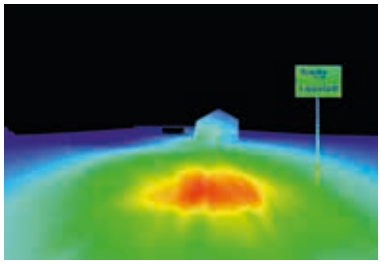
L 5570 Bi-LED, 2nd generation
(012 758)



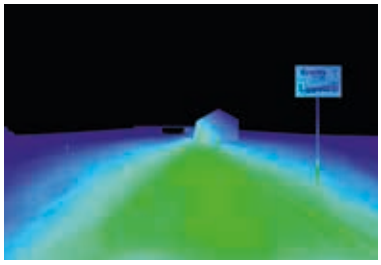


L 70 1st generation
(010 820)



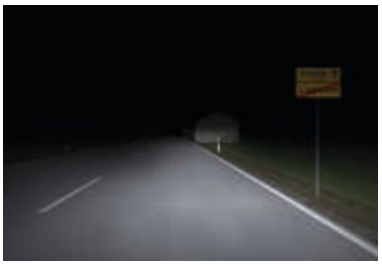
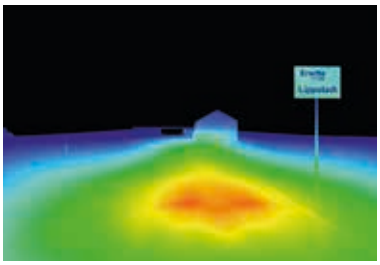
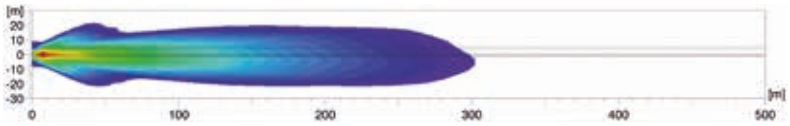
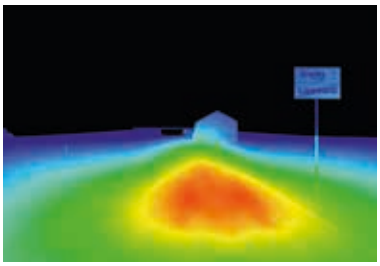
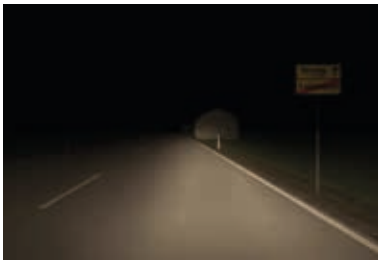
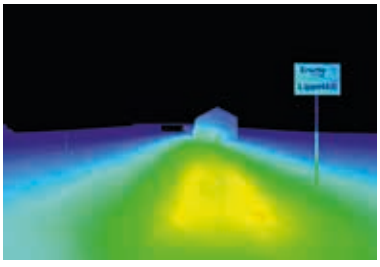


Premium Bi-halogen
(009 998)



Note
Bi-light distributions are generated by switching on low beam and highbeam function. The use of high beam only is not possible

Combination comparison from low beam and high beam modules

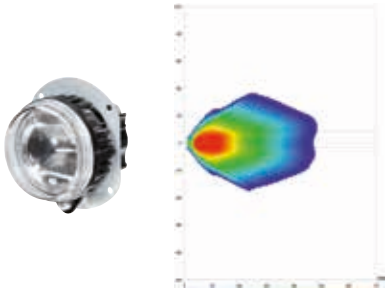
Low beam	High beam	Road simulation	Road simulation – colour
L 4060 LED (012 488)	L 4060 LED (011 988)		
			
L 4060 LED (012 488)	Performance halogen (247 043)		
			
Performance halogen (247 042)	Performance halogen (247 043)		
			

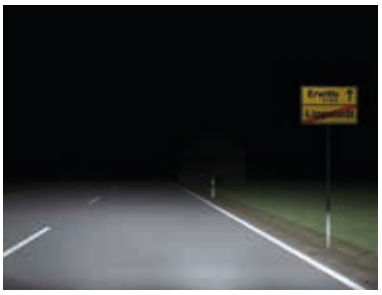
Comparison of fog and cornering lights

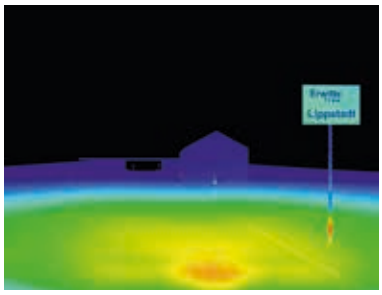
Road simulation

Road simulation – colour

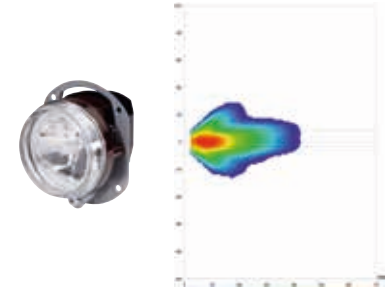
L 4060 LED
fog light (011 988)

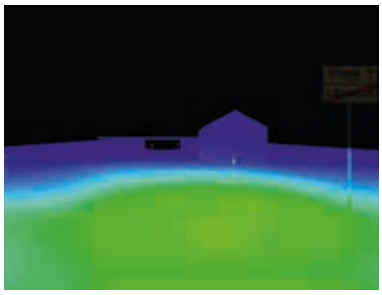




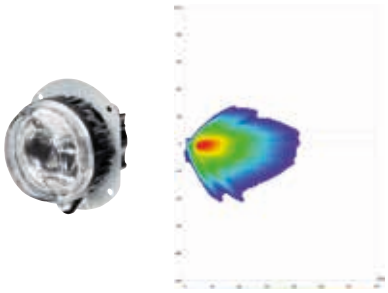


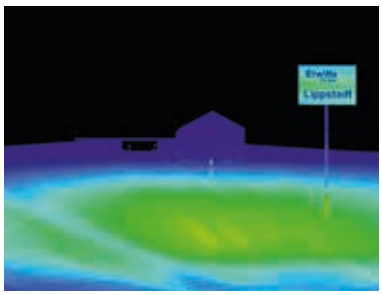
H15 fog lamp,
halogen (010 294)



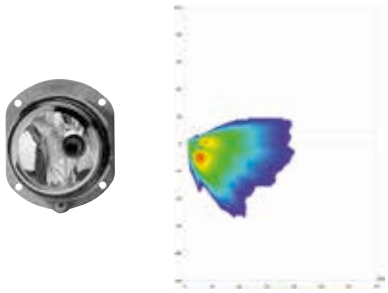


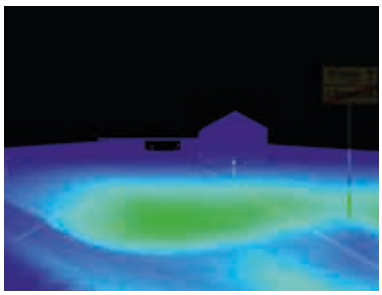
L 4060 LED
cornering light LED (011 988)



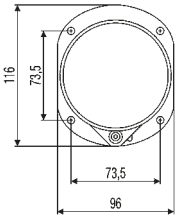


Dyna View EVO 02
cornering light halogen (009 295)





Note
Display of cornering light only. When driving, the cornering light is augmented by the low beam.



Fog light 90 mm

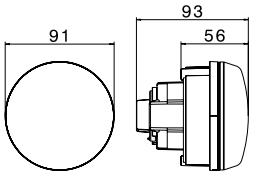
Minimum installation dimensions for a discreetly convincing lighting design. Aluminium reflectors with clear lens. Ideal in combination with the matching 90 mm high beam and low beam headlamp.

12 V, Halogen, ECE, SAE	**1N0 008 582-007**
24 V, Halogen, ECE	**1N0 008 582-017**

Type approval: E1 1342, ECE-R19 B series 02, B series 03

Accessories

Rubber cap	**9GH 158 051-007**

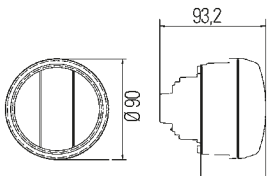


90 mm indicator/position light combination

Module with Kartoval® LED position light and non-patterned glass cover lens.

12 V, indicator/position light, ECE, SAE	**2BE 010 102-001**
24 V, indicator/position light, with a silver-coloured PY21W bulb	**2BE 010 102-011**
24 V, direction indicator / position lights, fording capable for ventilation hose	**2BE 010 102-201**

Type approval: E1 2586, ECE-R6, ECE-R7



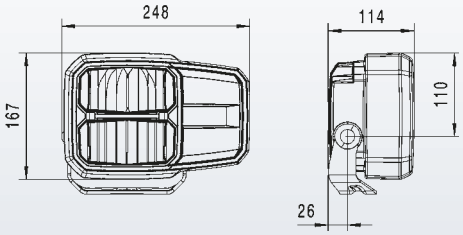
90 mm daytime driving / position light combination

Module with Kartoval® LED position light and non-patterned glass cover lens with a P21W longlife bulb

12 V, with daytime running light/position light, ECE, SAE	**2BE 010 102-101**
24 V, with daytime running/position light	**2PT 010 102-111**
24 V, daytime running light / position light, fording capable for ventilation hose	**2PT 010 102-211**
Connector set, 3-pin	**8JD 162 581-802**
Optional carrier frame with 3 screws	**9AH 165 968-001**

Type approval: E1 2586, ECE-R87, ECE-R7

This LED product has the following features:

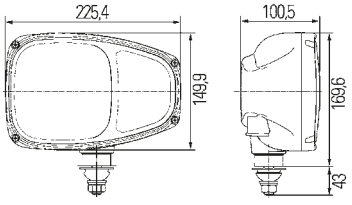


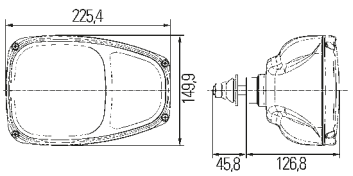
LED combination headlamp C140

Combination headlamp with all functions in LED technology. For horizontal or vertical mounting, with die-cast aluminium housing, lens made of scratch-resistant polycarbonate, with 6-pole DEUTSCH connector, light functions: low and high beam, position light and indicator

Vertical mounting, right-hand traffic	**1EE 996 374-001**
Horizontal mounting left, right-hand traffic	**1EE 996 374-011**
Horizontal mounting right, right-hand traffic	**1EE 996 374-021**
Horizontal mounting left, left-hand traffic	**1LE 996 374-031**
Horizontal mounting right, left-hand traffic	**1LE 996 374-041**

Type approval: Right-hand traffic: E1 4079, ECE-R112, R6 cat. 1a and 5, R7, ECE-R10, R112.01-B;
Left-hand traffic: E1 4080, ECE-R112, R6 cat. 1a and 5, R7, ECE-R10, R112.01-B



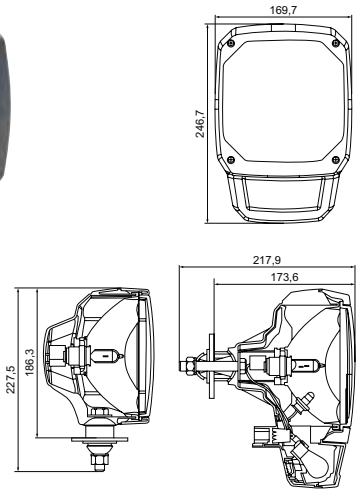


Combination headlamp C 220

For surface mounting with H7 low beam, H3 high beam, position light with integrated indicator light to front and rear (category 1, 1a and 5), with 6-pole DEUTSCH connector, light exit 120 mm x 120 mm.

Vertical mounting	
12 V, right-hand traffic	**1EE 996 174-337**
24 V, right-hand traffic	**1EE 996 174-387**
Horizontal mounting	
12 V, left-hand traffic	**1LE 996 174-211**
12 V, right-hand traffic	**1EE 996 174-221**
24 V, left-hand traffic	**1EE 996 174-227**
24 V, right-hand traffic	**1EE 996 174-287**

Type approval: Right-hand traffic: E9 6556, 11372, R6 cat. 1a and 5, R7, R112.00-B;
Left-hand traffic: E9 6556, 11373, R6 cat. 1a and 5, R7, R112, R112.00-B



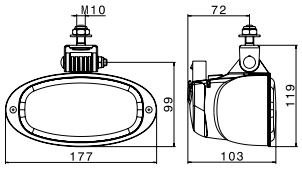
C310 combination headlamp

Halogen combination headlamps with H4 low beams and high beams, P21W direction indicator and side direction indicator lights and T4W position light. For vertical or horizontal mounting with aluminium die-cast housing. Optionally available with DEUTSCH connector or MSSL cable, in 12 V or 24 V versions.

Right-hand traffic	**1EA 328 450-XXX**
Left-hand traffic	**1LA 328 450-XXX**

Type approval: Left-hand traffic: ECE and AIS homologation, E9 16339, R112.01-B, R6, R7;
right-hand traffic: ECE and AIS homologation, E9 16338, R6, R7, R112.00-B

Additional versions upon request.

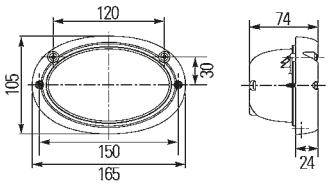


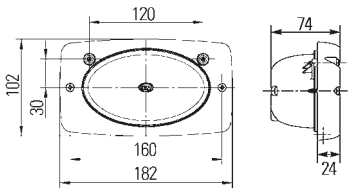
Headlamp Oval 90, 12 V

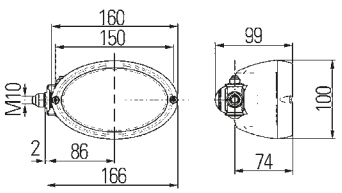
Headlamp for surface mounting with H7 bulb and symmetrical light distribution.

H7 Low beam	**1TB 996 286-021**
H7 High beam	**1KB 996 286-031**

Type approval: E1 ANSI-ASAE 0608





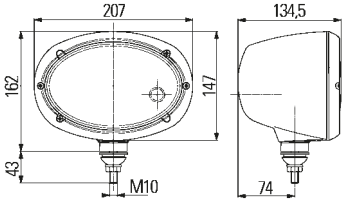


Headlamp Oval 100, 12 V

For flush mounting or surface mounting with H7 bulb, non-patterned glass lens. Light exit 130 x 75 mm. Flush mounting headlamp with lens holder frame adjustable by 6°.

Flush mounting	
H7 low beam with oval lens holder frame	**1BA 996 261-021**
H7 high beam headlamp with oval lens holder frame	**1KA 996 261-091**
H7 low beam with rectangular lens holder frame suitable for other installation openings.	**1BA 996 261-081**
Surface mounting	
H7 low beam right-hand traffic	**1BA 996 261-001**
H7 high beam headlamp with lateral swivel joint	**1AB 996 261-117**
H7 low beam driving on the left	**1MA 996 261-131**

Type approval: Low-beam, right-hand traffic: E4 0004, R112.00-B;
Low-beam, left-hand traffic: E4 0005, R112.00-B;
High beam: E4 10893, R112.00-B

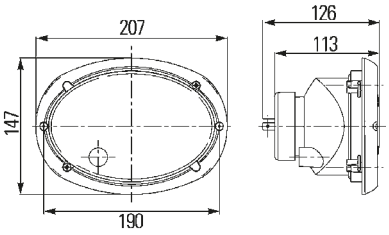


Headlamp Oval 120

For surface mounting with H4 or HB2 bulb, light exit 161 x 100 mm, FMVSS 108 approved.

12 V / HB2, right-hand traffic, SAE, with position light and AMP connector, 4-pole	**1AB 996 157-151**
24 V / H4, right-hand traffic, with position light and AMP connector, 4-pole	**1AB 996 157-161**
12 V / HB2, right-hand traffic, SAE, without position light with grommet	**1AB 996 157-131**
without bulb, left-hand traffic, without position light with grommet	**1AB 996 157-181**
without bulb, left-hand traffic, with position light and grommet	**1AB 996 157-191**

Type approval: Right-hand traffic: E1 1502, R112.00-B, SAE;
Left-hand traffic: E1 1503, R112.00-B

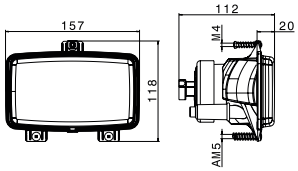


Headlamp Oval 120

For flush mounting with 12 V / HB2 bulb, inclination adjustable through 4°, light exit 161 x 100 mm, FMVSS 108 approved.

With position light	**1AB 996 157-091**
Without position light	**1AB 996 157-081**

Type approval: Right-hand traffic: low beam and high beam: E1 1502, R112.00-B;
Left-hand traffic: low beam and high beam: E1 1503, R112.00-B

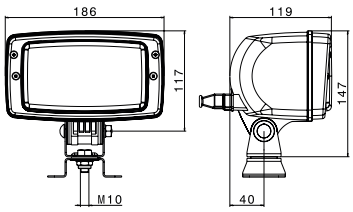


Headlamp Module 6214

For flush mounting with 12 V H4 bulb and clear lens. High beam, low beam and position light. Not usable for vehicle categories N and M.

Left-hand traffic	**1LB 996 214-541**
Right-hand traffic	**1AB 996 214-041**

Type approval: High beam and low beam, right-hand traffic: E4 10869, R112.00-A;
High beam and low beam, left-hand traffic: E4 10906, R112.00-A



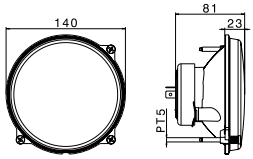
Headlamp Module 6214

For surface mounting with 12 V H4 bulb and clear lens. High beam, low beam and position light. Not usable for vehicle categories N and M.

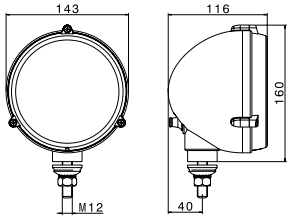
Surface mounting, right-hand traffic	**1AB 996 214-011**
Surface mounting, left-hand traffic	**1LB 996 214-521**
24 V	**Available upon request**

Type approval: High beam and low beam, right-hand traffic: E4 10869, R112.00-A;
High beam and low beam, left-hand traffic: E4 10906, R112.00-A

a)



b)



Headlamp M 133

a) Flush mounting

With H4 bulb and non-patterned glass lens. Light exit Ø 135 mm.

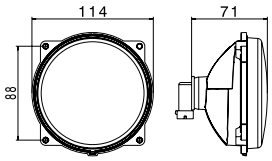
With position light, asymmetric illumination, 12 V bulbs and protective cap, R112 A	**1A3 996 162-021**
Without position light, asymmetric illumination, 12 V bulbs and protective cap, R112 A	**1A3 996 162-091**
With position light, asymmetric illumination, 12 V bulbs and bayonet connector, R112 B	**1A3 996 262-007**
With position light, symmetric illumination, 12 V bulb and bayonet connector, R113 D, FMVSS 108 – Motorcycle DOT-approved	**1A3 996 262-037**
With position light, asymmetric illumination, 24 V bulbs with carrier frame	**1A3 996 162-277**

b) Surface mounted

H4 bulb, non-patterned lens, 300 mm cable with DEUTSCH connector, with M 12 fixing screw, without position light, light exit Ø 135 mm.

Right-hand traffic	**1A3 996 162-621**
Left-hand traffic	**1L3 996 162-631**

Type approval: High beam and low beam, right-hand traffic: E4 10198, R112.00-A and SAE M 03 FL04;
High beam and low beam, left-hand traffic: E4 10238, R112.00-A

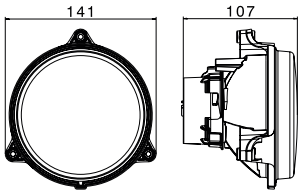


Headlamp PS 95

Headlamp with H11 bulb, symmetrical light distribution, ECE / SAE plastic reflector with non-patterned glass lenses, 12 V.

Low beam symmetric light distribution, ECE / SAE	**1T0 998 583-007**
High beam with position light, ECE / SAE	**1K0 998 583-017**
High beam without position light, ECE / SAE	**1K0 998 583-027**

Type approval: Low beam: E4 13159, R113.01-D, SAE M 09 FL19 H11 Motorcycle DOT, SAE J 1623;
High beam: E4 13154, R113.01-D, SAE HR P 09 FL20 VO H11-W5W DOT, SAE J 1623

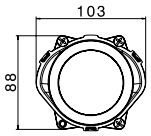


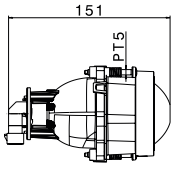
Headlamp PS 120

HS1 headlamp, compact and robust design, sealed bulb holder, plastic reflector, glass lens, 12 V.

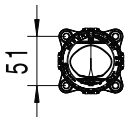
Low beam and high beam	**1S2 998 593-011**

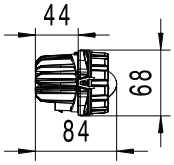
Type approval: E1 3891, ECE-R113.01-B; SAE J 1623 (only for ATVs)





LED versions





Application examples of LED versions.

Module 60, 12 V

Flush mounted headlamps with HB3 bulb. Reflector bonded to lens. Light exit Ø 60 mm. FMVSS 108 – Motorcycle DOT tested.

For existing vehicle permits until 2017

DE®-HB3 low beam headlamp, right-hand traffic	**1BL 998 570-001**
DE®-HB3 high beam headlamp without position light, right-hand traffic	**1KL 998 570-021**
DE®-HB3 high beam headlamp with position light, right-hand traffic	**1KL 998 570-031**
DE®-HB3 low beam headlamp, left-hand traffic	**1ML 998 570-011**
DE®-HB3 low beam headlamp, symmetrical	**1TL 998 570-331**

Type approval: Low beam, right-hand traffic: E4 10894 ECE-R 112.00 Class B;
High beam without position light: E4 10892 ECE-R 112.00 Class B;
High beam without position light: E4 10892 ECE-R 112.00 Class B, ECE-R7;
Low beam, left-hand traffic: E4 10895 ECE-R 112.00 Class B;
Low beam, symmetrical: E4 0004, ECE-R 113.00 Class D

For existing vehicle permits until 2017

DE®-HB3 high beam headlamp without position light	**1KL 998 570-621**
DE®-HB3 high beam headlamp with position light	**1KL 998 570-631**
DE®-HB3 low beam headlamp, symmetrical	**1TL 998 570-641**

Type approval: High beam without position light: E4 24910, ECE-R 112.01 Class B;
High beam with position light: E4 24910, ECE-R 112.01 Class B, ECE-R7;
Low beams, symmetrical: E4 10237, ECE-R 113.01 Class D

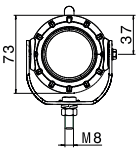
Worklight version

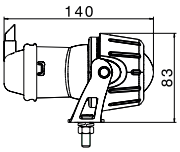
H9	**1GL 998 570-071**

LED versions

Low beam	**1TL 998 670-047**
High beam	**1KL 998 670-057**

Type approval: High beam, symmetrical: E4 010313, ECE-R 113.01 Class D; Low beam, symmetrical: E4 010311, ECE-R 113.01 Class D



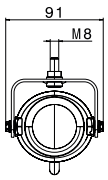


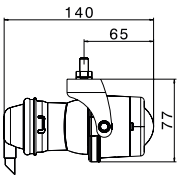
Micro DE Premium Edition: Fog light

Individual fog light
with 12 V H3 bulb, aluminum design finisher

1NL 008 090-301

Type approval: E1 877, ECE-R19 B series 02 and B series 03, SAE F99 TN88





Micro DE fog light

Fog light with black decorative ring.

Set	**1NL 008 090-821**
Individual	**1NL 008 090-031**

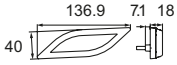
Type approval: E1 877, ECE-R19 B series 02, B series 03, SAE F99 TN88

Shapeline product overview

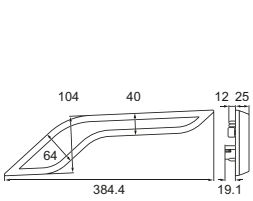
The modular HELLA Shapeline product range provides a variety of different light functions that can be combined with each other individually. All lights are available in two different designs: The classic straight-line Shapeline Tech design and the dynamic curved Shapeline Style design.

Tech or Style: The HELLA Shapeline series provides design freedom for nearly any application and vehicle, and achieves a consistent light signature for your vehicle at the same time.

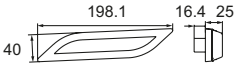
a)



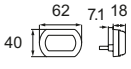
b)



c)



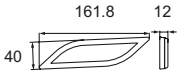
d)



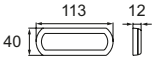
These LED products have the following characteristics:

Shapeline position lights	
Position lights, Style design	
a) Position light, small	**2PF 013 324-XXX***
b) Position light, wing	**2PF 013 325-XXX***
c) Position light, slim	**2PF 013 326-XXX***
Position light, Tech design	
a) Position light, small	**2PF 013 323-XXX***

a)



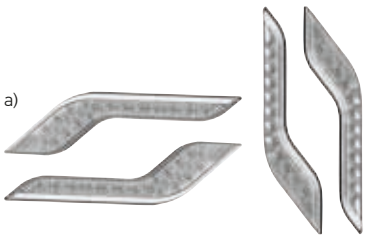
b)

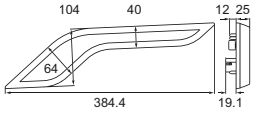


Shapeline reflex reflector	
a) Reflex reflector, Style design, ECE / SAE	**2RA 013 347-XXX***
b) Reflex reflector, Tech design, ECE / SAE	**8RA 013 403-XXX***

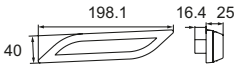
These LED products have the following characteristics:

a)

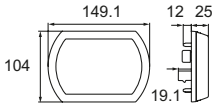




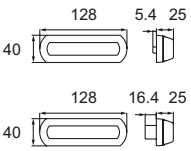
b)



c)

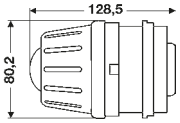


d)



Shapeline direction indicators	
Direction indicators, Style design	
a) Direction indicator, wing	**2BA 013 334-XXX***
b) Direction indicator, slim	**2BA 013 335-XXX***
Direction indicators, Tech design	
c) Direction indicator, clear	**2BA 013 330-XXX***
d) Direction indicator, small	**2BA 013 398-XXX***

* Please see our Shapeline brochure for a detailed overview of all part numbers and versions. Alternatively, with the HELLA Shapeline online configuration tool you are just a few clicks away from your own fully customised vehicle light design for the front, sides, and rear end: www.hella.com/shapeline.

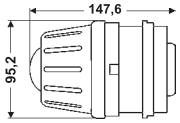


50 mm Premium low beam headlamp

Installation frame for 3-point attachment, adjustable from the front and rear.

12 V, right-hand traffic, H7	**1BL 009 071-007**
12 V, left-hand traffic, H7	**1ML 009 071-017**
24 V, right-hand traffic, H7	**1BL 009 071-027**
24 V, left-hand traffic, H7	**1ML 009 071-037**

Type approval: E1 1903 and E1 1904

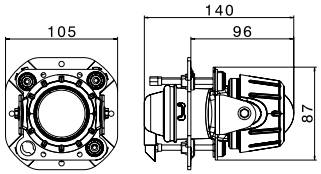


50 mm Premium high beam

3-point holder, adjustable using adjustment screw. With ECE and SAE type approval.

12 V, H9	**1KL 009 486-001**

Type approval: E1 2198



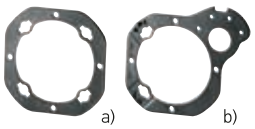
50 mm Premium fog light

3-point holder, adjustable using adjustment screw, back carrier frame not included in delivery (see Accessories). With ECE and SAE type approval.

12 V, H7	**1NL 008 090-317**
24 V, H7	**1NL 008 090-327**

Type approval: E1 877, ECE-R19 B series 02, B series 03

Accessories



Carrier frame (not for H9 halogen spotlights)

a) without headlamp range adjustment holder	**9AH 161 786-017**
b) with headlamp range adjustment holder	**9AH 161 784-017**

Plastic cap (rubber cap)

a) for halogen low beam headlamps	**9GH 152 654-007**
b) for fog lights	**9GH 147 009-007**

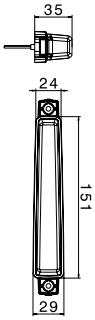
Connector plug set

Rubber cap for 20 headlamps	**8JD 156 150-807**
H9 plug for 20 headlights (not shown)	**8JD 158 175-807**

Actuator motors for headlight range adjustment

for 12 V Halogen	**6NM 007 282-221**
24 V actuator	**6NM 008 299-501**
Actuator assembly set	**8HG 183 586-001**

This LED product has the following features:



LED direction indicator and position light in striped look

Six high-powered LEDs together with the special optics of the lens create a homogeneous light pattern. The light is also reverse-polarity protected and complies with the test specification of the HELLA Standard 67101, Class 7.2. Therefore it lends itself ideally for application in tough conditions. IP 6K7, IP 6K9K, 12 V and 24 V, mounting: horizontal or vertical.

LED indicator

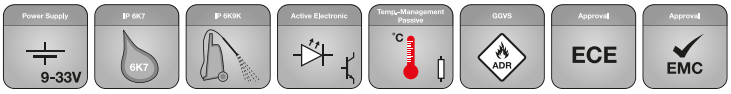
12 V, mounting: horizontal, with pulse, VPE: 1	**2BA 012 846-001**[1)]
12 V, mounting: horizontal, with pulse, VPE: 54	**2BA 012 846-007**[1)]
12 V, mounting: vertical, with pulse, VPE: 1	**2BA 012 846-011**[1)]
12 V, mounting: vertical, with pulse, VPE: 54	**2BA 012 846-017**[1)]
12 V, mounting: horizontal, VPE: 1	**2BA 012 846-021**
12 V, mounting: horizontal, VPE: 54	**2BA 012 846-027**
12 V, mounting: vertical, VPE: 1	**2BA 012 846-031**
12 V, mounting: vertical, VPE: 54	**2BA 012 846-037**
24 V, mounting: horizontal, with pulse, VPE: 1	**2BA 012 846-201**[1)]
24 V, mounting: horizontal, with pulse, VPE: 54	**2BA 012 846-207**[1)]
24 V, mounting: vertical, with pulse, VPE: 1	**2BA 012 846-211**[1)]
24 V, mounting: vertical, with pulse, VPE: 54	**2BA 012 846-217**[1)]
24 V, mounting: horizontal, VPE: 1	**2BA 012 846-221**
24 V, mounting: horizontal, VPE: 54	**2BA 012 846-227**
24 V, mounting: vertical, VPE: 1	**2BA 012 846-231**
24 V, mounting: vertical VPE: 54	**2BA 012 846-237**

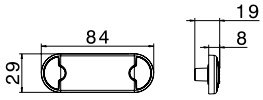
LED position light

12 V, mounting: horizontal, VPE: 1	**2PF 012 846-401**
12 V, mounting: horizontal, VPE: 54	**2PF 012 846-407**
12 V, mounting: vertical, VPE: 1	**2PF 012 846-411**
12 V, mounting: vertical, VPE: 54	**2PF 012 846-417**
24 V, mounting: horizontal, VPE: 1	**2PF 012 846-601**
24 V, mounting: horizontal, VPE: 54	**2PF 012 846-607**
24 V, mounting: vertical, VPE: 1	**2PF 012 846-611**
24 V, mounting: vertical VPE: 54	**2PF 012 846-617**

VPE = packaging unit

This LED product has the following features:





DuraLED position light

Position light (front), surface mounting with 2 LEDs, IP 6K7, IP 6K9K, 12 V and 24 V, mounting: horizontal or vertical, new lean design: 9 mm profile.

500 mm cable, VPE: 1	**2PF 959 855-201**
500 mm cab le, VPE: 24	**2PF 959 855-207**
2,500 mm cable, VPE: 1	**2PF 959 855-241**
2,500 mm cable, VPE: 16	**2PF 959 855-247**
500 mm cable, VPE: 1	**2PF 959 855-251**
500 mm cab le, VPE: 24	**2PF 959 855-257**

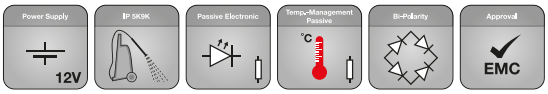
Type approval: ECE e24 5878

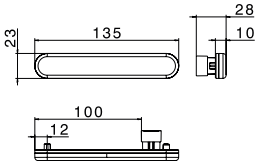
Accessories and spare parts

Polished stainless steel decorative ring, ECE graving	**9AB 959 685-201**
White end caps	**9HD 980 858-018**

VPE = packaging unit

This LED product has the following features:





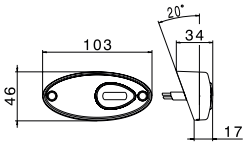
LED position light

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**
Counterplug grommet (order separately)	**9GT 186 597-007**

Type approval: E11 3016, ECE

This LED product has the following features:



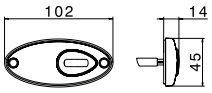
LED position light

For horizontal mounting, with 20° adapter base supplied loose.

12 V/0.3 W, current consumption = approx. 0.03 A	**2PF 964 295-257**

Type approval: E17 817

This LED product has the following features:



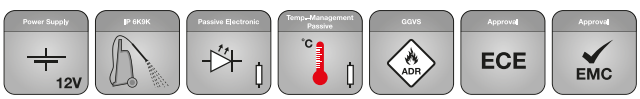
LED position light with reflector

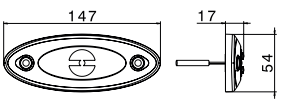
For horizontal mounting, with 2 LEDs.

12 V/0.3 W, current consumption = approx. 0.03 A	**2PG 964 295-121**

Type approval: E17 0301

This LED product has the following features:



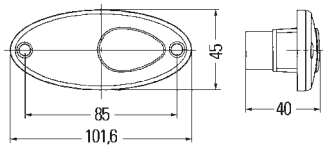


LED position light

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

12 V	**2PG 344 690-307**

Type approval: E24 5853



Position light with reflector

For horizontal flush mounting, with pre-fitted 12 V / 5 W bulb and seal.

12 V	**2PG 964 295-011**

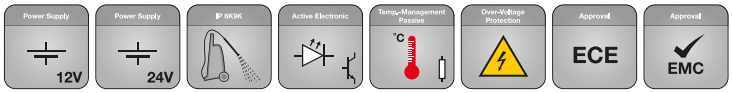
Position light without reflector (not shown)

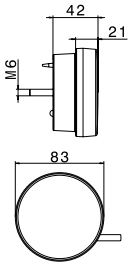
For horizontal or vertical flush mounting.

12 V	**2PF 964 295-021**

Type approval: E17 9806 and E17 811

This LED product has the following features:





83 mm LED-3 functional light

Pre-wired with 2,500 mm sheathed four-core cable.

12 V, single lamp	**2BE 980 691-101**
24 V, single lamp	**2BE 980 690-101**

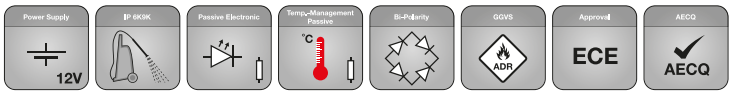
Type approval: ECE-R10, E24 5854 and e4 03 1962
Direction indicator ECE reg. no. 6
Position light ECE reg. no. 7
Daytime running light ECE reg. no. 87

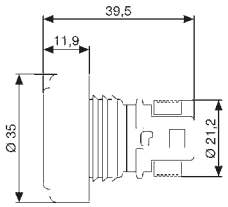
Optional accessory: Adapter ring 90 mm

The adapter ring is used to replace a 90 mm light with the 83 mm light. This means that vehicles already equipped with a HELLA 90 mm light can be easily converted for the 83 mm light.

9GD 980 696-001

This LED product has the following features:





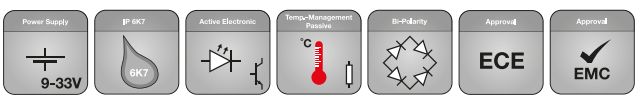
LED position light without reflector

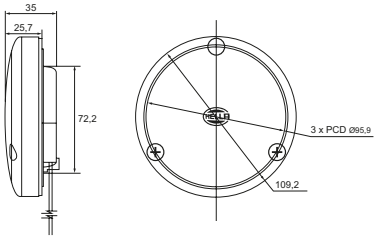
For installation, clear lens, black plastic housing with adhesive film for attaching to the body. 2-pin cable, 150 mm, open cable ends, with 2 white LEDs.

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

Type approval: E4 11371

This LED product has the following features:



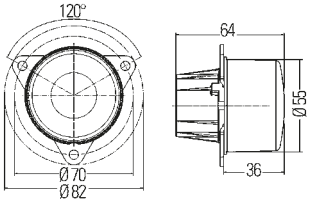


LED indicator

200 mm cable with open cable head, multivolt, distance to low-beam headlamp > 100 mm. Homologated according to SAE I608DOT. For front and rear surface mounting.

2BA 959 932-401

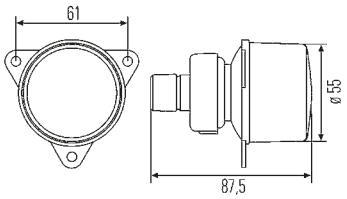
This LED product has the following features:



Modular LED light, Ø 55 mm

For front installation, clear lens with pattern and a 500 mm connecting cable.		ECE	SAE (USA)
Direction indicator, without pulse, 12 V	**2BA 011 172-001/7**	**X 1a**	
Direction indicator, with pulse, 12 V	**2BA 011 172-011/7**[1)]	**X 1a**	
Direction indicator, without pulse, 24 V	**2BA 011 172-401**	**X 1a**	
Direction indicator, with pulse, 24 V	**2BA 011 172-411**[1)]	**X 1a**	
Position lamp with heat sink	**in progress**		

Type approval: BL E1 3284 and CCC



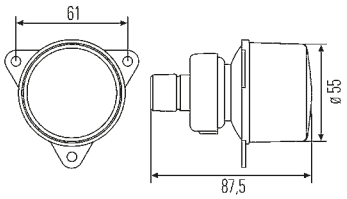
Indicator

For flush mounting with white lens, for surface mounting at the front.		ECE	SAE (USA)
With mounted, amber 12 V / 21 W light bulb	**2BA 008 221-107**	**X**	
With PY21W bulb, 24 V	**2BA 008 221-217**	**X**	
Without bulb, 12 / 24 V	**2BA 008 221-047**	**X**	

Type approval: E1 878

Accessories

Harness with grommet	**8KA 152 134-007**
Grommet separate	**9GT 137 236-007**



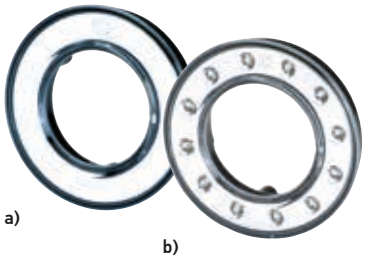
Position light

For 12 / 24 V / R5W bulb.	**2PF 008 221-011**

Type approval: E1 879

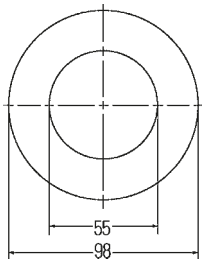
Accessories

Harness with grommet	**8KA 152 134-007**
Grommet separate	**9GT 137 236-007**



a)

b)



a) Chrome-plated circular finisher

Suitable for light series 008 221-... and 011 172-...	
Surface mounted	**8XU 008 405-031**

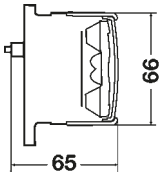
b) LED position light

For surface mounting, suitable for light series 008 221-... and 011 172-...
12 V / 1.8 W, current consumption = approx. 0.15 A
24 V / 1.8 W, current consumption = approx. 0.08 A

12 V, with 12 LEDs	**2PF 008 405-061**
24 V, with 12 LEDs	**2PF 008 405-051**

Type approval: E1 1696 F1 2295

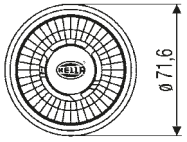
This LED product has the following features:

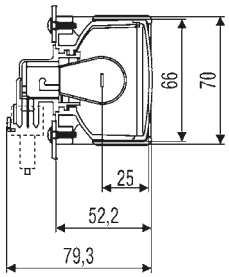


Premium LED lamp Ø 60 mm

Position light, for installation, with 12 LEDs		ECE	SAE (USA)
12 V	**2PF 009 001-421**	X	■
24 V	**2PF 009 001-521**	X	■

Type approval: E4 12390



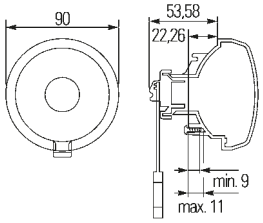


Premium lights Ø 60 mm

Direction indicator, 12 V / 21 W, with clear lens.		ECE	SAE (USA)
yellow bulb	**2BA 009 001-071**	X 1 1a 1b	
yellow bulb	**2BA 009 001-091**		■[1)]
silver bulb	**2BA 009 001-201**	X 1 1a 1b	

Position light.		ECE	SAE (USA)
With bulb P21/5 W	**2PF 009 001-081**	X	■

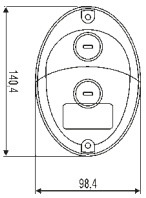
Type approval: E4 6546 and E4 7613

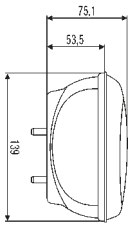


Indicator/position light, Ø 90 mm

Indicator light with yellow bulb.		ECE	SAE (USA)
12 V	**2BA 965 039-061**	X	■
24 V	**2BA 965 039-101**	X	

Type approval: E4 10215





Oval light series

12 / 24 V, for horizontal or vertical surface mounting, with grommet. **Note:** depending on the mounting position, the water drain opening must be detached.		ECE	SAE (USA)
Indicator light, without bulb	**2BA 343 130-057**	X 1	●[1)]
Indicator/position light, without bulb	**2BE 343 130-007**	X 1a	

Type approval: E4 6550 and E4 10202

ECE note: Turn indicator approval by category

1 Distance > 40 mm to low beam headlamp/fog lamp
1a Distance < 40 mm to low beam headlamp/fog lamp
1b Distance < 20 mm to low beam headlamp/fog lamp

SAE type approval for vehicles

■ < 2032 mm wide
■[1)] < 2032 mm wide, distance to low beam headlamp > 75 – 100 mm
● > 2031 mm wide
●[1)] >2,031 mm wide, distance to low beam headlamp > 100 mm

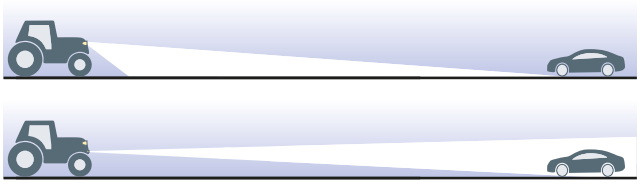
Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

Daytime running lights

Benefits of the daytime running light
The daytime running light provides a decisive safety advantage in road traffic and reduces the number of accidents which result in serious injuries by 58%.*

For this reason, and long before the introduction of any legal requirement, HELLA developed daytime running lights to increase driving safety.

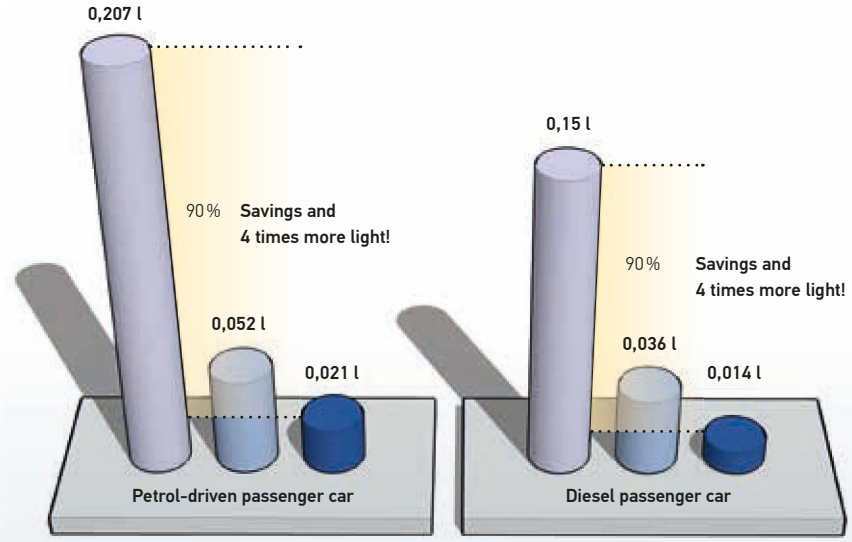
Daytime running lights for more safety
The HELLA daytime running lights generate a passively radiating white signal light.



* Study carried out by the SWOV-Institute for Road Safety Research on behalf of the EU.

The vehicle is visible to other road-users more easily and sooner. HELLA thus ensures extra reaction time and offers a noticeable safety advantage.

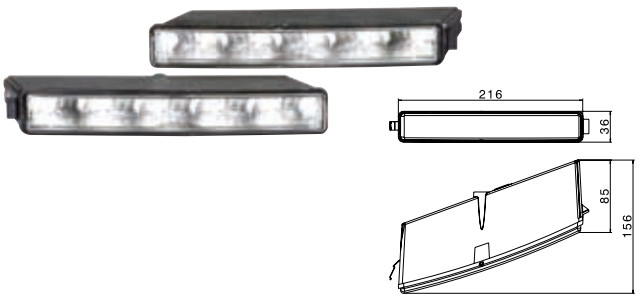
Comparison of performance between low beam and daytime running light



Source: BAST (Bundesanstalt für Straßenwesen = German Road Traffic Authority)

- Low beam during the day
- Daytime running light with bulbs
- Daytime running lights with LEDs

The trend shows that more and more daytime running lights are being installed by leading manufacturers of agricultural machinery.



This LED product has the following features:

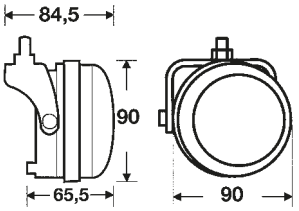
LED daytime running light set LEDayLine® with position light function*

2 lights with five LEDs per light and integrated relay for fully automatic switch-on, incl. professional harness and fixing material, multi-voltage 9 – 32 V, 12 V max. 5.5 W.

Set for surface mounting, 12 V	**2PT 010 043-801**
12 V, left	**2PT 010 043-011**
12 V, right	**2PT 010 043-021**

Type approval: E1 2578

This LED product has the following features:



LED daytime running lights set, round design

2 lights incl. wiring harness, universal bracket, 3 high-output LEDs per light, multi-voltage 9 - 33 V, 12 V / max. 5.5 W, current consumption = 2.18 A

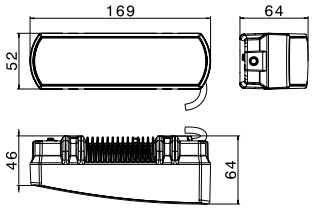
Set for surface mounting	**2PT 009 599-811**
Daytime running light with position light, left	**2PT 009 559-131**
Daytime running light with position light, right	**2PT 009 599-141**

Type approval: ECE-R87, R7, ECE-R10, E1 2372, SAE

Optional accessories

Universal carrier frame	**9AH 165 968-001**
Harness, pre-assembled	**8KA 165 959-001**

This LED product has the following features:



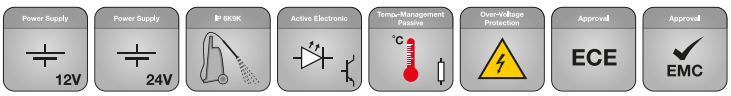
LED daytime running light set, rectangular design

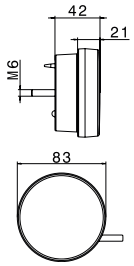
2 lights incl. wiring harness, universal bracket, 3 high-output LEDs per light, multi-voltage 9 - 33 V, 12 V / max. 5.5 W, current consumption = 2.18 A

Set for surface mounting	**2PT 009 496-801**
Individual lamp without holder, daytime running light with position light function	**2PT 009 496-007**

Type approval: ECE-R87, R7, ECE-R10, E1 2344, SAE

This LED product has the following features:





83 mm LED-3 functional light

Pre-wired with 2.5 m sheathed four-core cable.

12 V, single lamp	**2BE 980 691-101****
24 V, single lamp	**2BE 980 690-101****

Type approval: E24 5854 and e4 03 1962
Direction indicator ECE reg. no. 6
Position light ECE reg. no. 7
Daytime running light ECE reg. no. 87

Optional accessory: Adapter ring 90 mm

The adapter ring is used to replace a 90 mm light with the 83 mm light. This means that vehicles already equipped with a HELLA 90 mm light can be easily converted for the 83 mm light.

9GD 980 696-001

Type approval: ECE-R10

You can find out more about further variants, legal requirements and fitting regulations at www.daytime-running-light.com or www.hella.com/lightshow.
* When using the position light, the standard position light must be disabled permanently in accordance with ECE-R48.
** No integrated pulse, deactivation of daytime running light during operation of direction indicator.

LEDs are not only taking the automotive industry by storm thanks to their energy-saving potential, they also offer a design versatility that plays a decisive role in developing the typical appearance of a car. With respect to the combination rear lights in particular, the many possibilities offered by combining the LEDs with optical systems are being utilised to underscore the specific vehicle design by means of an attractive styling.

The HELLA patented system for monitoring the turn indicator gives HELLA lights the ability to be used in conjunction with the HELLA ballast in accordance with ECE-R48. The lamps are currently designed so that no error message is displayed in the vehicle's electrical system. Inverse-polarity protection ensures that the light is not damaged due to accidental contact of the poles. In order to lengthen the lifetime, all HELLA light components have been matched optimally in terms of temperature to prevent overloading the LEDs in high ambient temperatures. The lights are designed for the design life of a vehicle, therefore providing an impressive, economical and environmentally-friendly solution.

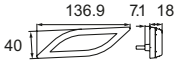
Shapeline product overview

The modular HELLA Shapeline product range provides a variety of different light functions that can be combined with each other individually. Here, all lights are available in two different designs: The classic straight-line Shapeline Tech design and the dynamic curved Shapeline Style design.

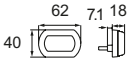
Tech or Style: The HELLA Shapeline series provides design freedom for nearly any application and vehicle, and achieves a consistent light signature for your vehicle at the same time.

These LED products have the following characteristics:

a)



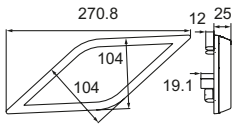
b)



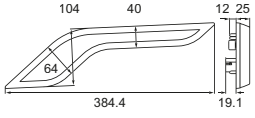
Shapeline position lights	
Position lights, Style design	
a) Position light, small Style	**2SA 013 324-XXX***
Position light, Tech design	
b) Position light, small Tech	**2SA 013 323-XXX***

These LED products have the following characteristics:

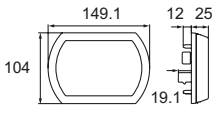
a)



b)



c)

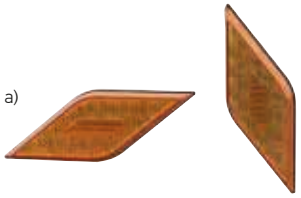


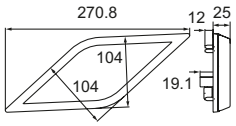
Shapeline tail stop lights	
Tail stop lights, Style design	
a) Tail stop light Style	**2SB 013 342-XXX***
b) Tail stop light wing Style	**2SB 013 399-XXX***
Tail stop lights, Tech design	
c) Tail stop light Tech	**2SB 013 341-XXX***

* Please see our Shapeline brochure for a detailed overview of all part numbers and versions. Alternatively, with the HELLA Shapeline online configuration tool you are just a few clicks away from your own fully customised vehicle light design for the front, sides, and rear end: www.hella.com/shapeline.

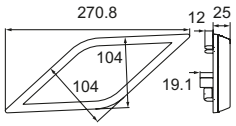
SHAPELINE
DESIGN YOUR LIGHT

a)

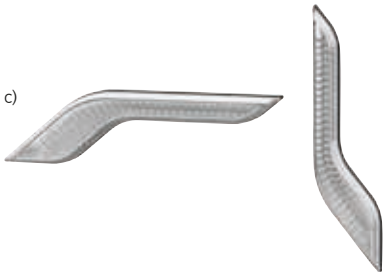


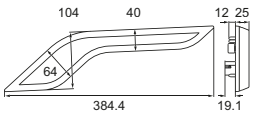


b)

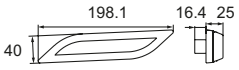


c)



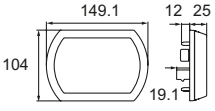


d)



e)

f)

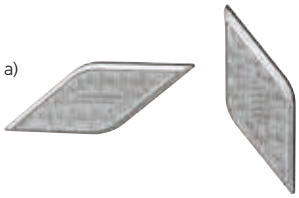


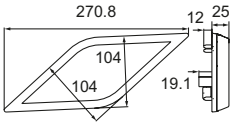
These LED products have the following characteristics:

Shapeline direction indicators	
Direction indicators, Style design	
a) Direction indicator yellow Style, ECE	**2BA 013 331-XXX***
b) Direction indicator clear style, ECE	**2BA 013 331-XXX***
c) Direction indicator clear wing Style, ECE	**2BA 013 333-XXX***
c) Direction indicator clear wing Style, ECE / SAE	**2BA 013 334-XXX***
d) Direction indicator clear slim Style, ECE	**2BA 013 332-XXX***
Direction indicators, Tech design	
e) Direction indicator yellow tech, ECE	**2BA 013 330-XXX***
f) Direction indicator clear tech, ECE	**2BA 013 330-XXX***
f) Direction indicator clear tech, ECE / SAE	**2BA 013 330-XXX***

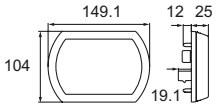
These LED products have the following characteristics:

a)





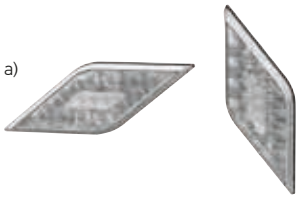
b)

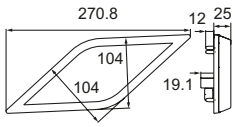


Shapeline tail light/stop light/direction indicators	
Tail light/stop light/direction indicator, Style design	
a) Tail light/stop light/direction light style	**2SD 013 342-XXX***
Tail light/stop light/direction indicator, Tech design	
b) Tail light/stop light/direction indicator Tech	**2SD 013 341-XXX***

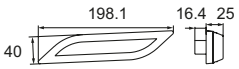
These LED products have the following characteristics:

a)

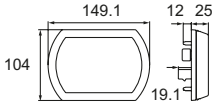




b)



c)



Shapeline reverse lights	
Reverse lights, Style design	
a) Reverse light Style	**2ZR 013 345-XXX***
b) Reverse light slim Style	**2ZR 013 401-XXX***
Reverse light, Tech design	
c) Reverse light Tech	**2ZR 013 344-XXX***

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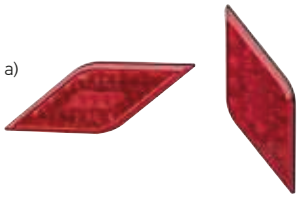
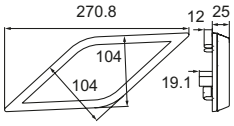
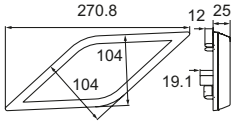
SHAPELINE
DESIGN YOUR LIGHT

a)

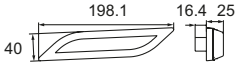




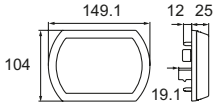
b)



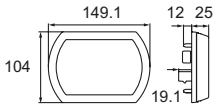
c)



d)



e)



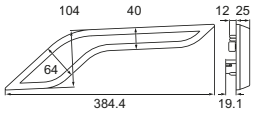
These LED products have the following characteristics:

Shapeline rear fog lamps	
Rear fog lamps, Style design	
a) Rear fog lamp Style	**2NE 013 345-XXX***
b) Rear fog / reverse light Style	**2NR 013 345-XXX***
c) Rear fog lamp slim Style	**2NE 013 343-XXX***
Rear fog lamps, Tech design	
d) Rear fog lamp Tech	**2NE 013 344-XXX***
e) Rear fog / reverse light Tech	**2NR 013 344-XXX***

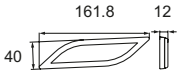
These LED products have the following characteristics:

Operating Temperature °C -40°C - +60°C | Approval ECE | Approval SAE

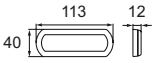
a)



b)



c)

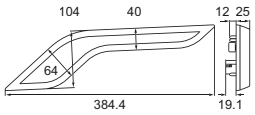


Shapeline reflex reflector	
Reflex reflector, Style design	
a) Reflex reflector wing Style	**8RA 013 402-XXX***
b) Reflex reflector Style	**8RA 013 347-XXX***
Reflex reflector, Tech design	
c) Reflex reflector Tech	**8RA 013 403-XXX***

This LED product has the following features:

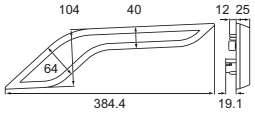
Operating Temperature °C -40°C - +60°C | EMC EMC 5 | Approval ECE | Approval SAE

a)



Shapeline warning lamp	
Acc. to SAE J974	
a) Amber warning lamp	**2XW 013 493-XXX***

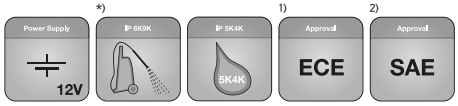
a)

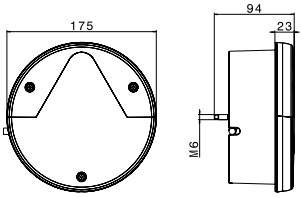


Shapeline design element	
Style Design	
a) Design element wing Style	**2XX 013 349-XXX***

* Please see our Shapeline brochure for a detailed overview of all part numbers and versions. Alternatively, with the HELLA Shapeline online configuration tool you are just a few clicks away from your own fully customised vehicle light design for the front, sides, and rear end: www.hella.com/shapeline.

These LED products have the following characteristics:



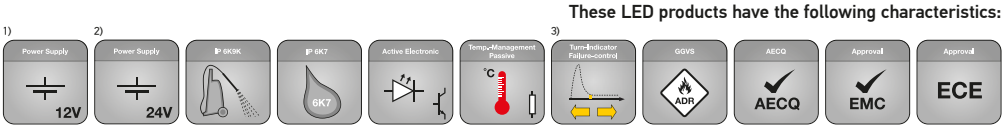


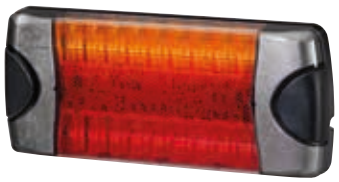
Ø 175 mm multi-function light				
Tail/stop/direction indicator light with triangular or standard reflex reflector, bulbs and LED hybrid version, ECE and SAE approvals, simple retrofitting of bulbs to LED for rear / stop light functions.			ECE	SAE (USA)
Bulb version, triangular reflex reflector				
6.3 mm flat receptacles, 800 mm cable	**2VA 012 497-001**[1)]	①②③⑥	X	
4-pole Amphenol AT connector, 250 mm cable	**2VA 012 497-011**[1)]	①②③⑥	X	
LED hybrid version, triangular reflex reflector				
6.3 mm flat receptacles, 800 mm cable	**2VA 012 497-051**[1)]	①②③⑥	X	
4-pole Amphenol AT connector, 250 mm cable	**2VA 012 497-061**[1)]	①②③⑥	X	
Bulb version, standard reflex reflector				
6.3 mm flat receptacles, 800 mm cable	**2VA 012 497-101**[1)]	①②③⑥	X	
4-pole Amphenol AT connector, 250 mm cable	**2VA 012 497-111**[1)]	①②③⑥	X	
6.3 mm flat receptacles, 800 mm cable	**2VA 012 497-201**[2)]	①②③⑥		X
4-pole Amphenol AT connector, 250 mm cable	**2VA 012 497-211**[2)]	①②③⑥		X
LED hybrid version, standard reflex reflector				
6.3 mm flat receptacles, 800 mm cable	**2VA 012 497-151**[1)]	①②③⑥	X	
4-pole Amphenol AT connector, 250 mm cable	**2VA 012 497-161**[1)]	①②③⑥	X	
6.3 mm flat receptacles, 800 mm cable	**2VA 012 497-251**[2)]	①②③⑥		X
4-pole Amphenol AT connector, 250 mm cable	**2VA 012 497-261**[2)]	①②③⑥		X

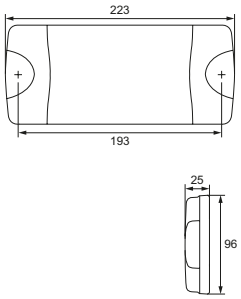
Type approval: ECE E24 5888 (hybrid), E24 5887 (bulb)
SAE THK 267 SAE AIST 14 DOT

* LED module

These LED products have the following characteristics:





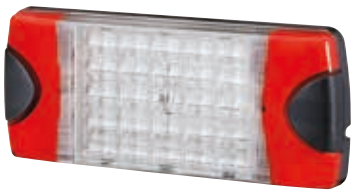


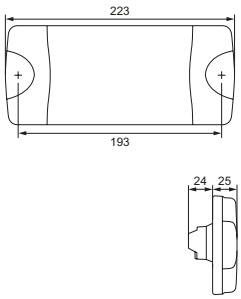
LED multi-function rear lamp DuraLED Combi

Multi-function lamp DuraLED Combi – program extension, maintenance-free, hermetically fully sealed, impact-resistant and long-time UV resistance, slim design with an installation height of just 25 mm, dual volt 12 / 24 V, with 2,500 mm cable.			ECE	SAE (USA)
Stop light: 8 red LEDs (4 LEDs with reduced light performance for tail light) Direction indicator: 8 yellow LEDs, with reflex reflector				
12 V	**2VA 980 710-061**[1)]	①②③⑥	X	
24 V, with pulse for direction indicator failure monitor	**2VA 980 710-301**[2) 3)]	①②③⑥	X	

Type approval: ECE E24 5882, GGVS / ADR

These LED products have the following characteristics:



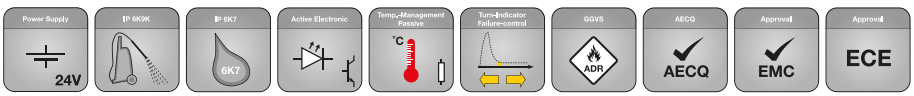


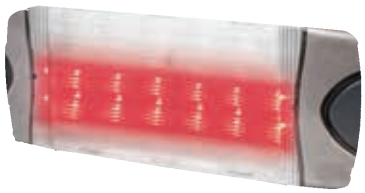
LED multi-function rear lamp DuraLED Combi

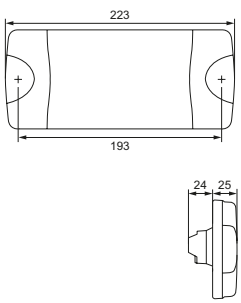
Multi-function light DuraLED Combi – program extension, maintenance-free, hermetically fully sealed, impact-resistant and long-time UV resistance, slim design with an installation height of just 25 mm, dual volt 12 / 24 V, with integrated 6-pole DEUTSCH connector (mating connector to be used DT 06-6S).			ECE	SAE (USA)
Stop light: 18 red LEDs (6 LEDs with reduced light performance for tail light) Direction indicator*: 12 yellow LEDs (additional parking light)				
12V, 24V	**2SD 980 602-211**	①②③	X	

Type approval: ECE E24 5883, GGVS / ADR

These LED products have the following characteristics:







LED multi-function rear lamp DuraLED Combi

Multi-function light DuraLED Combi – program extension, maintenance-free, hermetically fully sealed, impact-resistant and long-time UV resistance, slim design with an installation height of just 25 mm, with integrated 6-pole DEUTSCH connector (mating connector to be used DT 06-6S).			ECE	SAE (USA)
Tail/Stop light: 6 yellow LEDs Direction indicator: 6 yellow LEDs Reversing light: 6 white LEDs				
24 V DC	**2SK 980 602-501**	①②③⑤	X	

Type approval: ECE E24 5894, GGVS / ADR

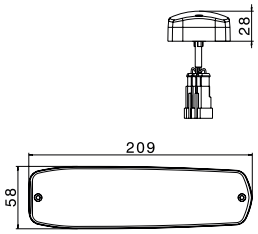
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

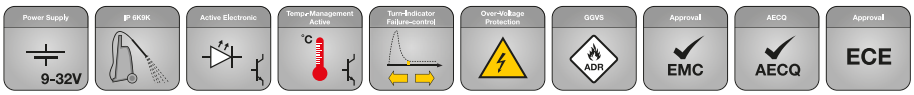
These LED products have the following characteristics:

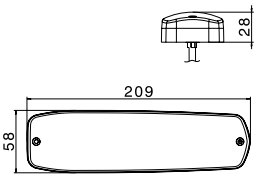


LeanLED				
LED tail/stop lamp for horizontal or vertical surface mounting, with 24 LEDs, clear lens, with ECE and EMC type approval			ECE	SAE (USA)
Tail lamp: 12 V/0.5 W, current consumption = approx. 0.04 A Stop light: 12 V / 1 W, current consumption = approx. 0.08 A Indicator light: 12 V/1.5 W, current consumption = approx. 0.125 A				
Multivolt 9 – 32 V, with 200 mm cable and 4-pole AMP connector 282 106-1, mating connector to be used AMP 282 088-1	**2SD 343 910-017**	①②③	X	
With integrated AMP plug 282 106-1 in the housing	**2SD 343 910-027**	①②③	X	

Type approval: E4 12393 and e1 035109

These LED products have the following characteristics:

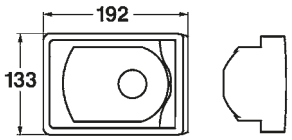




LeanLED				
LED tail/stop lamp for horizontal or vertical surface mounting, with 24 LEDs, clear lens, reflector surface in red, with ECE and EMC type approval.			ECE	SAE (USA)
Tail lamp: 12 V/0.5 W, current consumption = approx. 0.04 A Stop light: 12 V / 1 W, current consumption = approx. 0.08 A Indicator light: 12 V/1.5 W, current consumption = approx. 0.125 A				
• With integrated 4-pole DEUTSCH connector DT 04-P	**2SD 343 910-057**	①②③	X	

Type approval: E4 12393 and e1 035109

These LED products have the following characteristics:

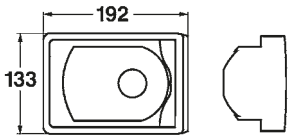


LED tail/stop light

For horizontal installation, with brilliant-finish clear lens.			ECE	SAE (USA)
12 V / 3 W, current consumption = approx. 0.25 A	**2SB 008 982-367**	①②	X	
24 V/3 W, current consumption = approx. 0.13 A	**2SB 008 982-007**	①②	X	

Type approval: E17 10880

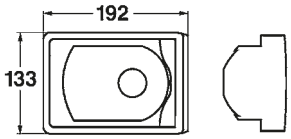
These LED products have the following characteristics:



LED indicator

For horizontal installation, with brilliant-finish clear lens.			ECE	SAE (USA)
12 V / 2 W, current consumption = approx. 0.17 A	**2BA 008 982-347**	③	X	
24 V/2 W, current consumption = approx. 0.17 A	**2BA 008 982-047**	③	X	

Type approval: E17 10880 and e1 03 4046



Rear light

12 V, for horizontal flush mounting, brilliant finish.			ECE	SAE (USA)
	2SA 008 805-007	①	X	■ ●
For double mounting	**2DA 008 805-017**	②	X D	■ ●
For double mounting	**2SB 008 805-027**	①②	X D	■ ●
	2NE 008 805-037	④	X	■ ●
With clear lens	**2ZR 008 805-047**	⑤	X	■ ●
For double mounting, with clear lens	**2BA 008 805-057**	③	X D	■ ●

Type approval: E4 10151

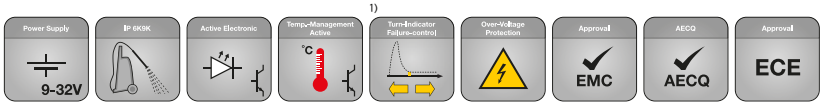
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

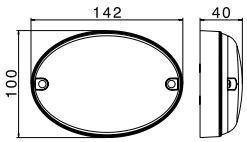
SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

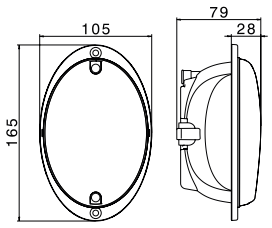
This LED product has the following features:





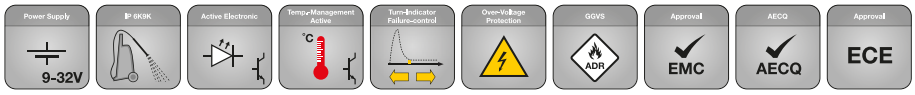
Agroluna LED			ECE	SAE (USA)
For horizontal and vertical surface mounting, clear lens, 24 LEDs, can be used on the right and left, can be turned through 180°, 2 bodywork fastening screws (diagonal arrangement) with 100 mm harness, multivolt 9–32 V.				
Stop light: 9 V / 0.9 W, 32 V / 1.2 W Stop light: 9 V / 1.2 W, 32 V / 2.1 W Tail light: 9 V / 0.2 W, 32 V / 0.3 W				
Stop light: 12 red LEDs, tail light: 12 red LEDs (reduced performance), direction indicator: 12 yellow LEDs	**2SD 343 390-011**[1)]	①②③	X	
Direction indicator: 24 yellow LEDs	**2BA 343 390-071**[1)]	③	X	
Stop light: 12 red LEDs, tail light: 12 red LEDs (reduced performance)	**2SB 343 390-091**	①②	X	

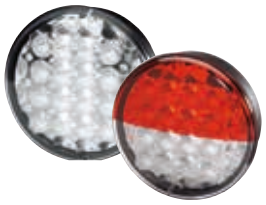
This LED product has the following features:

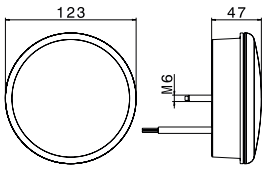


Agroluna LED			ECE	SAE (USA)
Only for vertical mounting, with 24 LEDs, with 4-pole DEUTSCH connector integrated in the housing.				
Tail light: 9 V / 0.2 W, 32 V / 0.3 W Stop light: 9 V / 0.9 W, 32 V / 1.2 W Direction indicator: 9 V / 1.2 W, 32 V / 2.1 W				
Stop light: 12 red LEDs, direction indicator: 12 yellow LEDs	**2SD 343 390-401**	①②③	X	

This LED product has the following features:



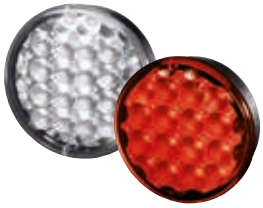


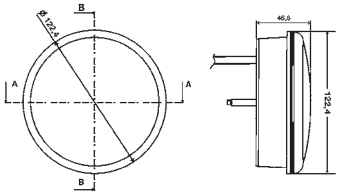


LED tail light/stop light/direction indicator			ECE	SAE (USA)
For surface mounting, redesign of series 964 169, 24 LEDs.				
Tail lamp: 12 V/1 W, current consumption = approx. 0.08 A Stop light: 12 V / 2 W, current consumption = approx. 0.17 A Direction indicator: 12 V / 2 W, current consumption = approx. 0.17 A				
With clear lens	**2SD 344 200-001**	①②③	X	
With red/ clear lens	**2SD 344 200-071**	①②③	X	

Type approval: E4 12371, E4 12658 and e1 03 4895

This LED product has the following features:



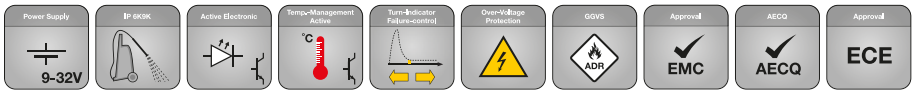


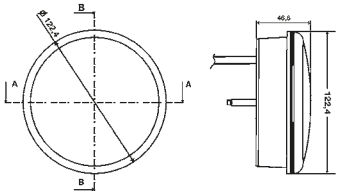
LED tail/stop light

For surface mounting.			ECE	SAE (USA)
Tail lamp: 12 V/1 W, current consumption = approx. 0.08 A Stop light: 12 V / 3 W, current consumption = approx. 0.25 A				
With clear lens	**2SB 344 200-027**	①②	X	
With red lens	**2SB 344 200-081**	①②	X	

Type approval: E4 12658 and e1 03 4895

This LED product has the following features:



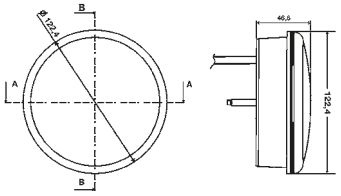


LED indicator

For rear mounting.			ECE	SAE (USA)
Direction indicator: 3 W				
With clear lens	**2BA 344 200-037**	③	X	

Type approval: E4 12658 and e1 03 4895

This LED product has the following features:



LED rear fog light

For surface mounting.			ECE	SAE (USA)
Rear fog light: 12 V / 2 W, current consumption = approx. 0.17 A				
With clear lens	**2NE 344 200-061**	④	X	
With red lens	**2NE 344 200-091**	④	X	

Type approval: E4 14198 and e1 03 4895

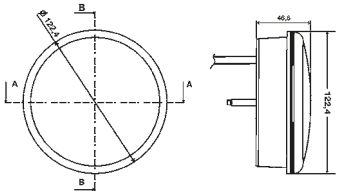
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

This LED product has the following features:



LED reverse light

For surface mounting.			ECE	SAE (USA)
Reverse light: 12 V / 2 W, current consumption = approx. 0.17 A				
	2ZR 344 200-051	⑤	X	

Type approval: E4 14198 and e1 03 4895

This LED product has the following features:

LED tail light/stop light/direction indicator

			ECE	SAE (USA)
With clear lens	**2SD 344 200-201**	①② ③	X	
With red / clear lens	**2SD 344 200-211**	①② ③	X	
With red / yellow lens	**2SD 344 200-251**	①② ③	X	

Type approval: E4 12371 and e17 03 0235

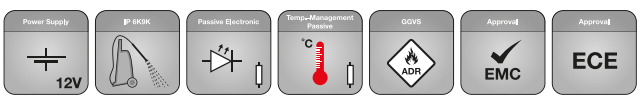
This LED product has the following features:

LED tail/stop light

			ECE	SAE (USA)
With clear lens	**2SB 344 200-221**	①②	X	
With red lens	**2SB 344 200-231**	①②	X	

Type approval: E4 12658 and e17 03 0235

This LED product has the following features:

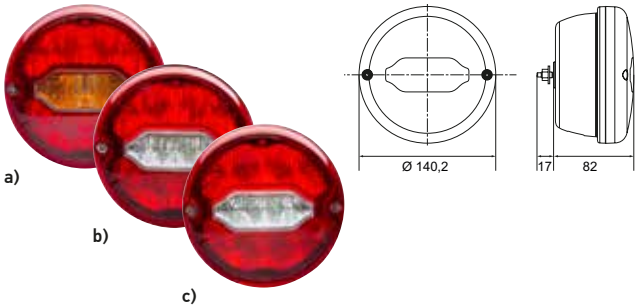


LED indicator

			ECE	SAE (USA)
With clear lens	**2BA 344 200-241**	③	X	

Type approval: E4 12658 and e17 03 0235

This LED product has the following features:



Hybrid and full-LED round lights

For surface mounting.			ECE	SAE (USA)
Hybrid **a) Tail light, stop light (LED) and direction indicator (bulb)**				
300 mm cable, Y-adapter on 7-pole DIN bayonet connector and 7-pole DIN bayonet plug housing				
With integrated resistor for stop light function	**2SD 013 155-001**	①②③	**X D**	
Without resistance	**2SD 013 155-011**	①②③	**X D**	
3,000 mm cable with 6.3 mm blade receptacle connector				
With integrated resistor for stop light function	**2SD 013 155-021**	①②③	**X D**	
Without resistance	**2SD 013 155-031**	①②③	**X D**	
Full-LED **b) Tail light, stop light and direction indicator (LED), with GGVS/ADR approval**				
300 mm cable, Y-adapter on 7-pole DIN bayonet connector and 7-pole DIN bayonet plug housing, without resistance	**2SD 013 155-101**	①②③	**X D**	
3,000 mm cable with 6.3 mm blade receptacle connector, without resistor	**2SD 013 155-111**	①②③	**X D**	
c) Rear fog light, reversing light (LED) with GGVS/ADR approval				
300 mm cable, Y-adapter on 7-pole DIN bayonet connector and separate outflow 2-pole AMP SUPERSEAL (for connection of addition lighting functions)	**2NR 013 155-201**	④⑤	**X**	
300 mm cable with 7-pole DIN bayonet connector	**2NR 013 155-211**	④⑤	**X**	
3,000 mm cable with 6.3 mm blade receptacle connector	**2NR 013 155-221**	④⑤	**X**	

Type approval: ECE-R10

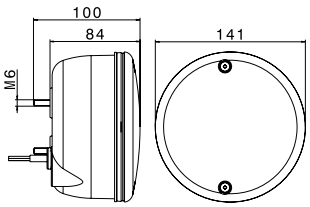
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

This LED product has the following features:



LED tail light/stop light/direction indicator

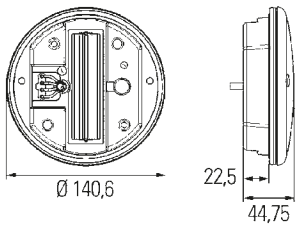
For horizontal mounting, with red/yellow/red lens and black housing, 2 LEDs for direction indicator, 1 LED for tail light, 1 LED for stop light.		ECE	SAE (USA)
12 V/9 W, current consumption = approx. 0.75 A 24 V/9 W, current consumption = approx. 0.38 A			
2SD 344 100-101	①②③	X	

Type approval: E4 13136 and e17 03 0203

Accessories

Chrome-design ring with attachment bracket for flush mounting	**9XD 997 909-801**

This LED product has the following features:

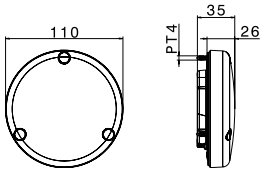


LED tail light stop light direction indicator

For horizontal installation, slim design option as flush mount version, also usable in bulb housing of versions 001 685-211, -231 and –301.		ECE	SAE (USA)
12 V/9 W, current consumption = approx. 0.75 A 24 V/9 W, current consumption = approx. 0.38 A			
2SD 344 100-001	①②③	X	

Type approval: E4 13136 and e17 03 0203

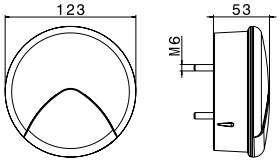
This LED product has the following features:



LED indicator

200 mm cable with open cable head, multivolt, distance to low-beam headlamp > 100 mm. Homologised according to SAE I608DOT. For front and rear surface mounting.		ECE	SAE (USA)
2BA 959 932-401	③		●

This LED product has the following features:



LED LIGHT

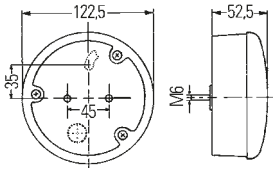
For surface mounting and flush mounting, with 37 red LEDs, red lens, 500 mm cable, without connector.			ECE	SAE (USA)
24 V/6.8 W, current consumption = approx. 0.28 A				
Combined tail/stop light	**2SB 964 169-301/7**	①②	X	

Type approval: E17 814 and e17 02 0047

24 V/3.7 W, current consumption = approx. 0.15 A				
Rear fog light	**2NE 964 169-341**	④	X	

Type approval: E17 3810 and e17 02 0050

This LED product has the following features:

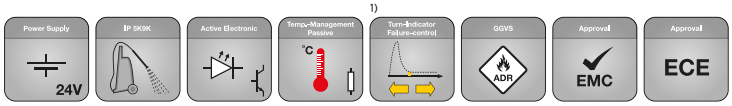


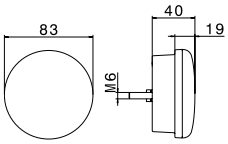
LED tail/stop light

For surface mounting and flush mounting, with 37 white LEDs, clear glass lens, 500 mm cable, without connector.			ECE	SAE (USA)
24 V/5.7 W, current consumption = approx. 0.24 A				
Left	**2ZR 964 169-351**	①②	X	
Right	**2ZR 964 169-361**	①②	X	

Type approval: E4 23254

This LED product has the following features:





LED tail/stop light / direction indicator

For flush mounting, with red lens, 2,500 mm cable, ECE and EMC type approval.			ECE	SAE (USA)
12 LEDs, 24 V	**2SB 959 010-301**	①②	X	
Red / Yellow, 16 LEDs, 24 V / 5 W, current consumption = approx. 0.21 A	**2SD 959 010-401**[1)]	①②③	X	

Type approval: E4 12373, E7 1538 and e4 03 1671

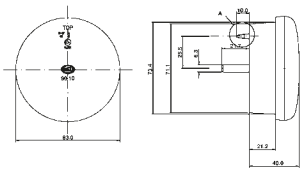
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

This LED product has the following features:

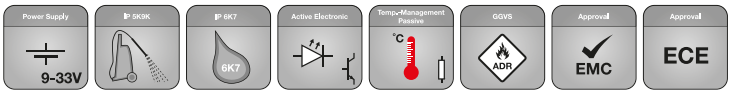


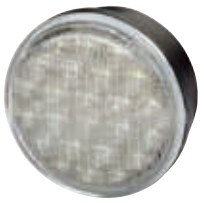
LED indicator

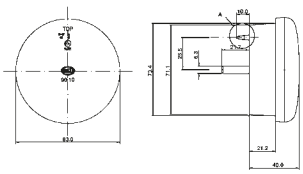
For flush mounting, with yellow lens, 12 LEDs and 2,500 mm cable, with pulse for direction indicator failure check, with ECE and EMC type approval. 24 V/3 W, current consumption = approx. 0.13 A			ECE	SAE (USA)
1 unit	**2BA 959 011-301**	③	X	
10 units	**2BA 959 011-307**	③	X	

Type approval: E4 12373 and e4 03 1671

This LED product has the following features:





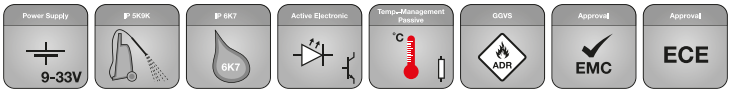


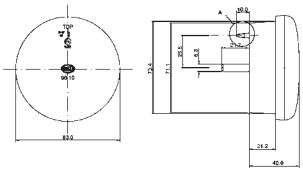
LED reverse light

For flush mounting with clear lens, with 24 LEDs, 2,500 mm cable, ECE and EMC type approval.			ECE	SAE (USA)
12 V/4 W, current consumption = approx. 0.33 A 24 V/4 W, current consumption = approx. 0.17 A				
1 unit	**2ZR 959 010-501**	⑤	X	
10 units	**2ZR 959 010-507**	⑤	X	

Type approval: E4 11391 and e4 03 1671

This LED product has the following features:





LED rear fog light

For flush mounting with clear lens, with 24 LEDs, 2,500 mm cable, ECE and EMC type approval.			ECE	SAE (USA)
12 V/3 W, current consumption = approx. 0.25 A 24 V/3 W, current consumption = approx. 0.13 A				
1 unit	**2NE 959 011-501**	④	X	
10 units	**2NE 959 011-507**	④	X	

Type approval: E4 11391 and e4 03 1671

ECE note: Turn indicator approval by category
D ECE approval as twin indicators

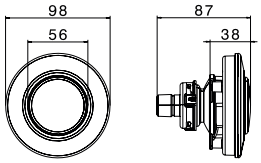
SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

a), c)

b), d)



Modular 55 mm ring modules

a) For flush mounting with red lens			ECE	SAE (USA)
with mounted 12 V / 5 W bulb	**2SA 008 221-127**	①	X	
12 / 24 V / 21 W*	**2XA 008 221-021**	①②	X	
With mounted 12 V / 21 W bulb	**2DA 008 221-167**	②	X	

Type approval: E1 1048 and E1 1049

b) For flush mounting with grey lens				
12 / 24 V / 21 W, yellow bulb*	**2BA 008 221-041**	③	X	
With mounted, yellow 12 V / 21 W light bulb*	**2BA 008 221-147**	③	X	

Type approval: E1 1051

c) For flush mounting with red lens				
12 / 24 V / 21 W*	**2NE 008 221-031**	④	X	
With mounted 12 V / 21 W bulb	**2NE 008 221-137**	④	X	

Type approval: E1 1050

d) For flush mounting with grey lens				
12 / 24 V / 21 W*	**2ZR 008 221-051**	⑤		■ ●
With mounted 12 V / 21 W bulb	**2ZR 008 221-157**	⑤		■ ●

Type approval: E1 1052, TR31 SAE R 02 DOT

Combination examples:

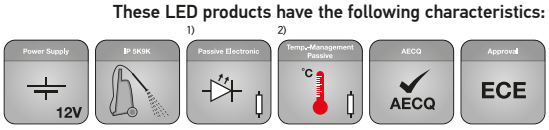
Direction indicator (2BA 008 221-041) with circular ring "LED tail / clearance light" (2SA 008 405-021)

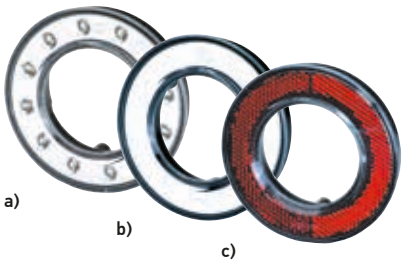
Rail light (2XA 008 221-02) with circular ring "reflex reflector" (8RA 008 405-001)

Accessories for light series 008 221-...	
Harness with grommet	**8KA 152 134-007**
Grommet separate	**9GT 137 236-007**
Heat-conducting shield (necessary at > 50 °C ambient temperature)	**9XB 161 749-007**

* Not included in delivery.

These LED products have the following characteristics:

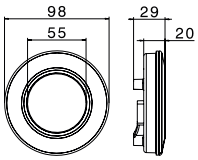




a)

b)

c)



Modular 55 mm ring modules

Ideal for combining with lamp series 011 172 (Ø 55 mm) and 008 221(Ø 55 mm).			ECE	SAE (USA)
a) LED tail/end-outline marker lamp, for surface mounting, with 12 red LEDs, clear lens.				
12 V / 1,8 W	**2SA 008 405-021**[1)]	①	X	
24 V / 1,8 W	**2SA 008 405-011**[1)]	①	X	

Type approval: E1 1197

a) LED position light				
12 V / 1,8 W	**2PF 008 405-061**[1)]	⑨	X	
24 V / 1,8 W	**2PF 008 405-051**[1)]	⑨	X	

Type approval: E1 1696 and E1 2295

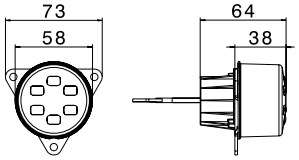
a) LED tail/stop light, for flush mounting, with 12 red LEDs, clear lens, ECE type approval.				
12 V / 1,8 W	**2SB 008 405-101**[2)]	①②	X	
24 V / 2,1 W	**2SB 008 405-091**[1)]	①②	X	

Type approval: E1 1892

b) Chrome-plated trim	**8XU 008 405-031**			
c) Reflex reflector, with ECE type approval	**8RA 008 405-001**[2)]	①②	X	

Type approval: E1 1196

This LED product has the following features:

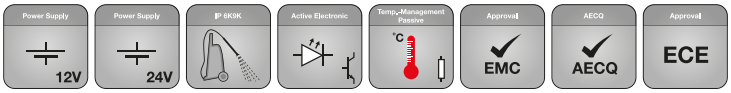


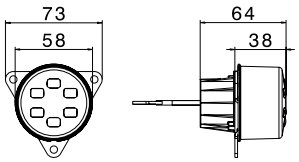
Modular LED light, Ø 55 mm

For rear flush mounting, clear lens with optics, 500 mm connecting cable, ECE and EMC type approval.			ECE	SAE (USA)
Direction indicator, without pulse, 12 V / 1.1 W, current consumption = 0.09 A	**2BA 011 172-021**	③	X	
Direction indicator, with pulse, 12 V / 4.8 W, current consumption = 0.4 A	**2BA 011 172-031**	③	X	
Tail light: 12 V/0.2 W, current consumption = 0.02 A	**2SA 011 172-041**	①	X	
Stop light, 12 V / 0.9 W, current consumption = 0.08 A	**2DA 011 172-061**	②	X	
Direction indicator, without pulse, 24 V / 0.8 W, current consumption = 0.004 A	**2BA 011 172-421**	③	X	
Direction indicator, with pulse, 24 V / 0.8 W, current consumption = 0.004 A	**2BA 011 172-431**	③	X	
Tail light: 24 V/0.08 W, current consumption = 0.003 A	**2SA 011 172-441**	①	X	
Stop light: 24 V/0.7 W, current consumption = 0.03 A	**2DA 011 172-461**	②	X	

Type approval: E1 3283, CCC and E1 10R-03 6317

This LED product has the following features:



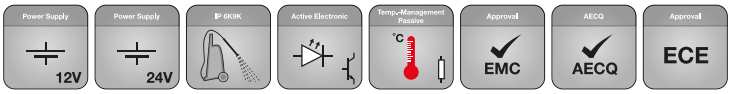


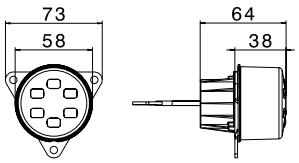
Modular LED lights Ø 55 mm, rear fog light

For rear flush mounting, clear lens with optics, 500 mm connecting cable, ECE and EMC type approval.			ECE	SAE (USA)
12 V/2.5 W, current consumption = approx. 0.21 A	**2NE 011 172-081**	④	X	
24 V/1.9 W, current consumption = 0.08 A	**2NE 011 172-481**	④	X	

Type approval: E1 3286, CCC and E1 10R-03 6317

This LED product has the following features:





Modular LED light, Ø 55 mm, reversing light

For rear flush mounting, reversing light, clear lens with optics, 500 mm connection cable, ECE and EMC type approval.			ECE	SAE (USA)
12 V/2.5 W, current consumption = approx. 0.21 A	**2ZR 011 172-101**	⑤	X	■ ●*
24 V/1.1 W, current consumption = 0.05 A	**2ZR 011 072-501**	⑤	X	■ ●*

Type approval: E1 3285, CCC and E1 10R-03 6317

* only when mounting 2 lamps (right and left)

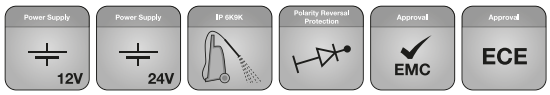
Combination example:
Rear lamp (... 009 001-...) with design ring Ø 71.6 mm high-sheen chrome-plated (9HB 161 122-012)

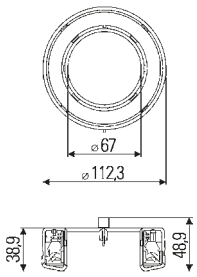
Design ring

Suitable for 60 mm light modules with Ø 71.6 mm (part number ...009 001-... except LED versions), perfect high-gloss finish with one "click".

High-sheen chrome-plated, Ø 71.6 mm	**9HB 161 122-012**
Silver, Ø 71.6 mm	**9HB 161 122-007**
Premium silver, Ø 78.9 mm	**9HB 164 168-002**

These LED products have the following characteristics:



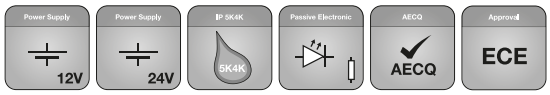


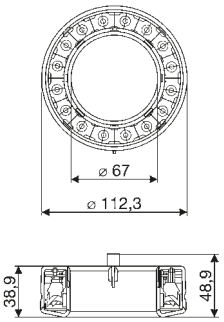
LED circular ring module Ø 112 mm

Tail light/stop light, further technological development: LED edge light technology, ECE approval, ideal for combinations with light series 009 001 (Ø 66 mm), 1:1 replacement with light series 009 362, 12 V or 24 V.			ECE	SAE (USA)
Tail light/Stop light, 12 V, red	**2SB 009 362-301**	①②	X	
Tail light/Stop light, 24 V, red	**2SB 009 362-321**	①②	X	
Tail light/Stop light, 12 V, clear	**2SB 009 362-311**	①②	X	
Tail light/Stop light, 24 V, clear	**2SB 009 362-331**	①②	X	

Type approval: E24 7R-025889, ECE

This LED product has the following features:





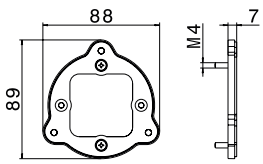
LED circular modules

With 250 mm cable, with 3-pole AMP connector, available with a choice of clear or red cover lenses.			ECE	SAE (USA)
12 V/2.4 W, current consumption = 0.2 A 24 V/2.3 W, current consumption = 0.1 A				
Red lens, 24 V	**2SB 009 362-011**	①②	X D	
Clear lens, 12 V	**2SB 009 362-021**	①②	X D	
Red lens, 12 V	**2SB 009 362-041**	①②	X D	
Red lens	**8RA 009 362-001**	⑥	X	

Type approval: E24 7747 and E24 7748

Design ring Ø 118 mm

Suitable for circular module ... 009 362 ..., perfect high-sheen finish with one “click”.	
High-sheen chrome-plated, Ø 117.9 mm	**9HB 163 085-012**
Silver, Ø 117.9 mm	**9HB 163 085-001**



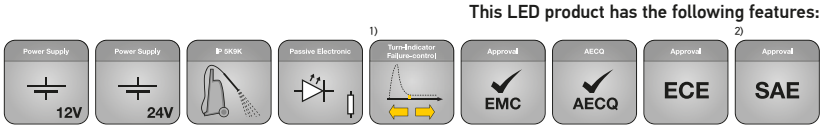
Accessories for 60 mm combination rear lights

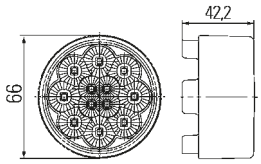
Adapter ring	
For mounting of bulb versions in circular module series 009 362-... and series 009 001-...	**9XD 161 119-007**

Adapter ring	
For mounting LED lights or the reflector in the circular module series 009 362-..., black (not shown)	**9XD 161 119-017**

Footer see page 99

This LED product has the following features:





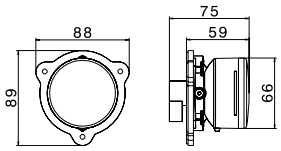
Premium LED lamp Ø 60 mm

With transparent lens, 12 LEDs, with EMC type approval, AMP connector.			ECE	SAE (USA)
Tail stop light: 12 V/3 W, current consumption = 0.25 A Direction indicator, without pulse: 12 V/1.5 W, current consumption = approx. 0.13 A Direction indicator, with pulse: 12 V / 3.5 W, current consumption = 0.29 A				
12 V, 3-pole central connector	**2SB 009 001-401**[2)]	①②	X	■
12 V, 2-pole central connector, without pulse	**2BA 009 001-411**[1)]	③	X	
12 V, 2-pole central connector, with pulse	**2BA 009 001-431**[1)]	③	X	
24 V, 3-pole central connector	**2SB 009 001-501**	①②	X	

Type approval: E4 12390 and e1 03 5916

Accessories

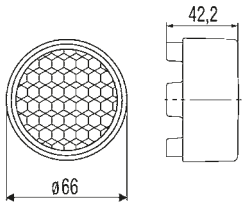
2-pole mating connector	**8JD 156 150-807**
3-pole mating connector	**8JD 162 581-802**



Premium lights Ø 60 mm

With mounted bulbs, 12 V, incl. design ring			ECE	SAE (USA)
Red lens	**2SA 009 001-047**	①	X D	
Red lens	**2DA 009 001-057**	②	X D	
Red lens	**2SB 009 001-067**	①②	X D	
Grey lens	**2BA 009 001-007**	③	X D	
With Silver Vision bulb	**2BA 009 001-191**	③	X D	
Red lens	**2NE 009 001-027**	④	X	■ ●
Grey lens	**2ZR 009 001-017**	⑤	X	■ ●

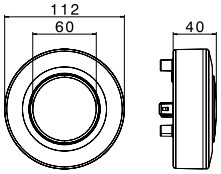
Type approval: E4 3917, E4 6546, E4 7613 and E4 23255



Reflex reflector, 12 V, red	**8RA 009 001-037**	⑥	X	■ ●

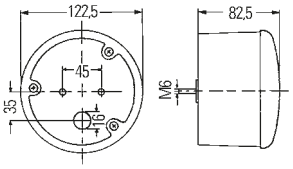
Type approval: E4 3189

This LED product has the following features:



Combined LED tail light / stop light / indicator

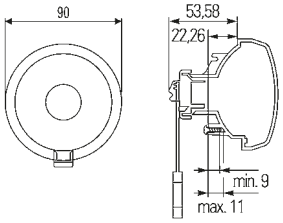
Without pulse for direction indicator failure check, for rear flush mounting, clear lens, with 24 red LEDs, suitable for the light series 009 001 and 009 362, with 3-pole AMP connector.			ECE	SAE (USA)
12 V/4.8 W, current consumption = approx. 0.4 A				
	2SD 009 362-201	①②③		■ ●



Rear light

12 V/ 24 V flush or surface mounting, depending on the mounting position, remove water drain.			ECE	SAE (USA)
Stop light	**2DA 964 169-001/7**	②	X D	X ■ ●
Indicator	**2BA 964 169-011/7**	③	X D	X ■ ●
Rear fog light	**2NE 964 169-021/7**	④	X	X ■ ●
Reversing light	**2ZR 964 169-031/7**	⑤	X	X ■ ●
Direction indicator and rear fog light	**2BA 964 169-041/7**	③④	X	
Indicator and reversing light	**2BN 964 169-051/7**	③⑤	X	X ■
Tail / Stop lights and reflex reflectors	**2TA 964 169-061/7**	①② ⑥	X	
Indicator and position light	**2BE 964 169-071/7***	③⑨	X	
Tail light and direction indicator	**2SW 964 169-081/7**	①③	X	
Tail lamp	**2SA 964 169-091/7**	①	X	X ■ ●
Tail light, stop light and direction indicator	**2SD 964 169-111/7**	①② ③	X	
Tail / Stop lights and reflex reflectors	**2TA 964 169-147**	①② ⑥		■ ●
Tail and stop lights	**2SB 964 169-287**	①②	X	X ■ ●

* Direction indicator/ position light for front mounting, category 1a



Combination rear light Ø 90 mm

Reversing lamp and rear direction indicators with smoked glass lens, also available as daytime running light. With mounted bulb.			ECE	SAE (USA)
Attachment possible from the front using the enclosed clips or from the rear using screws				
12 V / 5 W	**2SA 965 039-001**	①	X	X ■ ●
24 V / 5 W	**2SA 965 039-081**	①	X	X ■ ●
12 V / PY21W	**2BA 965 039-021**	③	X	X ■
24 V / PY21W	**2BA 965 039-101**	③	X	X ■
12 V / P21W	**2ZR 965 039-041**	⑤	X	X ■ ●
24 V / P21W	**2ZR 965 039-121**	⑤	X	X ■ ●
12 V / P21 / 5 W	**2SB 965 039-051**	①②	X	X ■
24 V / P21 / 5 W	**2SB 965 039-131**	①②	X	X ■
With mounted attachment clips				
12 V / 5 W	**2SA 965 039-307**	①	X	X ■ ●
12 V / 21 W	**2DA 965 039-317**	②	X	X ■
12 V / P4 21 W	**2BA 965 039-347**	③	X	X ■
12 V / 21 W	**2NE 965 039-327**	④	X	X ■ ●
12 V / 21 W	**2ZR 965 039-337**	⑤	X	X ■ ●
12 V / 21 W / 5 W	**2SB 965 039-357**	①②	X	X ■

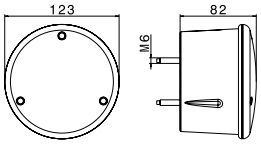
Type approval: E4 10215

ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

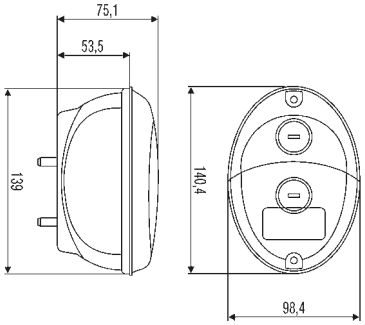
① Tail lamp ② Stop light ③ Indicator ④ Rear fog light ⑤ Reverse lamp
⑥ Reflex reflector ⑦ Side marker light with reflex reflector ⑧ Licence plate light ⑨ Position light

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.



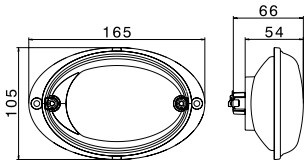
Rear light

12 V / 24 V, for surface or flush mounting, brilliant finish.			ECE	SAE (USA)
E17 653	**2BA 964 169-507/1**	③	X D	■ ●
E17 816	**2SB 964 169-537/1**	①②	X	■ ●
E17 2312	**2ZR 964 169-517/1**	⑤	X	■ ●
E17 3809	**2NE 964 169-527/1**	④	X	■ ●



"Oval" combination rear light

Suitable for horizontal and vertical flush mounting and surface mounting, on the right or left (rotate light through 180°), can be used for 12 V and 24 V operation, punch out the water drain hole before installation and insert the seal, black clear cover lens, brilliant appearance.			ECE	SAE (USA)
E4 7698	**2SB 343 130-021/7**	①②	X	■ ●
E4 6550	**2BA 343 130-051/7**	③	X	■ ●
E4 3919	**2NE 343 130-031/7**	④	X	
E4 23257	**2ZR 343 130-041/7**	⑤	X	■ ●

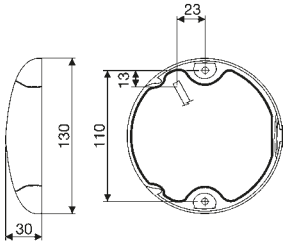


"Oval Light" combination rear light

For horizontal and vertical installation, lens with stripe design, housing with circumferential black rim, fully pre-assembled, with 100 mm cable and pre-fitted 12 V bulb.			ECE	SAE (USA)
Left, E17 823	**2SA 343 400-217**	①	X	
Right, E17 823	**2SA 343 400-227**	①	X	
Left, E17 821	**2DA 343 400-237**	②	X	
Right, E17 821	**2DA 343 400-247**	②	X	
Left, E17 2314	**2ZR 343 400-297**	⑤	X	
Right, E17 2314	**2ZR 343 400-307**	⑤	X	
Left, E17 3812	**2NE 343 400-277**	④	X	
Right, E17 3812	**2NE 343 400-287**	④	X	
Left, E17 655	**2BA 343 400-257**[1)]	③	X	
Right, E17 655	**2BA 343 400-267**[1)]	③	X	
Left, E17 822	**2SB 343 400-317**	①②	X	
Right, E17 822	**2SB 343 400-327**	①②	X	

[1)] Can also be used as a front indicator in accordance with category 1 (distance > 40 mm to low-beam /front fog lamp).

This LED product has the following features:

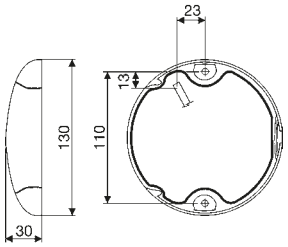


EuroLED

1 Power LED for surface mounting, permanently bonded to black base plate, electrical connection via 2,500 mm cable.			ECE	SAE (USA)
12 V/2.5 W, current consumption = approx. 0.21 A 24 V/2.5 W, current consumption = approx. 0.11 A (SAE versions on request)				
Red lens	**2SB 959 821-601**	①②	X	
12 V/4 W, current consumption = approx. 0.33 A 24 V/4 W, current consumption = approx. 0.17 A				
Clear lens	**2NE 959 821-201**	④	X	

Type approval: E4 10208 and e4 03 1135

This LED product has the following features:

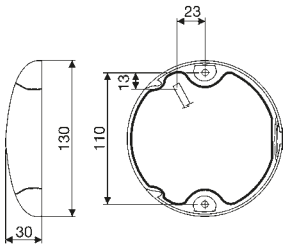


EuroLED

1 Power LED for surface mounting, permanently bonded to black base plate, electrical connection via 2,500 mm cable.			ECE	SAE (USA)
12 V/2.5 W, current consumption = approx. 0.21 A 24 V/2.5 W, current consumption = approx. 0.11 A				
Clear lens	**2ZR 959 820-601**	⑤	X	

Type approval: E4 10208 and e4 03 1135

This LED product has the following features:



EuroLED

1 Power LED for surface mounting, permanently bonded to black base plate, electrical connection via 2,500 mm cable.			ECE	SAE (USA)
12 V/3 W, current consumption = approx. 0.25 A 24 V/3 W, current consumption = approx. 0.13 A (SAE versions on request)				
With pulse	**2BA 959 822-601**	③	X	

Type approval: E4 10208 and e4 03 1728

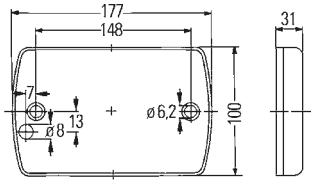
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

This LED product has the following features:

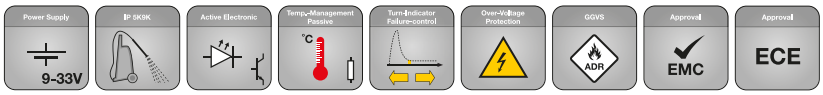


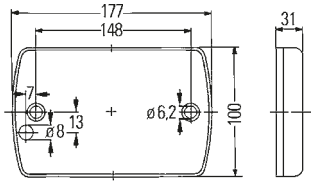
DuraLED, tail/stop light

With 24 red LEDs and 2,500 mm cable with stripped ends.			ECE	SAE (USA)
12 V/8.5 W, current consumption = 0.71 A 24 V/8.5 W, current consumption = 0.35 A				
For horizontal mounting	**2SB 980 606-201**	①②	X	
For vertical mounting	**2SB 980 606-701**	①②	X	

Type approval: ECE, E24 5850, EMC, e4 03 1828

This LED product has the following features:



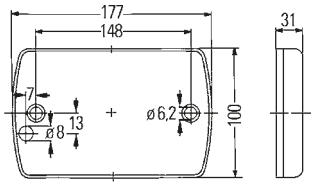


DuraLED, direction indicator

With 24 yellow LEDs and 2,500 mm cable with stripped ends.			ECE	SAE (USA)
12 V/4 W, current consumption = 0.33 A 24 V/4 W, current consumption = 0.17 A				
For horizontal mounting	**2BA 980 607-201**	③	X	
For vertical mounting	**2BA 980 607-701**	③	X	

Type approval: ECE, E24 5850, EMC, e4 03 1830

This LED product has the following features:

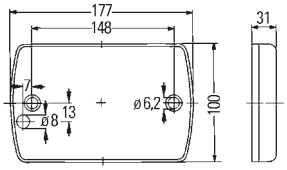


DuraLED, reversing lamp

With 24 white LEDs and 2,500 mm cable with stripped ends.			ECE	SAE (USA)
12 V/4 W, current consumption = 0.33 A 24 V/4 W, current consumption = 0.17 A				
For horizontal mounting	**2ZR 980 605-201**	⑤	X	
For vertical mounting	**2ZR 980 605-701**	⑤	X	

Type approval: ECE, E24 5850, EMC, e4 03 1828

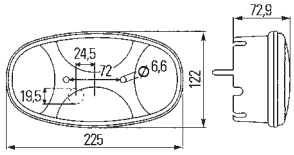
This LED product has the following features:



Tail, stop, direction indicator light with reflex reflector				
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 reflector. Detachable black retaining frame with 4 holes Ø 4.2 mm and 2 holes Ø 5.0 mm for fixing screws. Without pulse for indicator failure monitor.			ECE	SAE (USA)
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 x 120 mm and 520 mm x 120 mm plates, for horizontal surface mounting only.				
Direction indicator above, 12 / 24 V, with 500 mm and with open cable ends	**2VB 980 720-401/7**	①②③⑥⑧	X	
Direction indicator below, 12 / 24 V, with 500 mm and with open cable ends	**2VB 980 720-501/7**	①②③⑥⑧	X	

Type approval: E24 5860, E4 10R -05 3262, EMC

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



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

Type approval: E17 0303

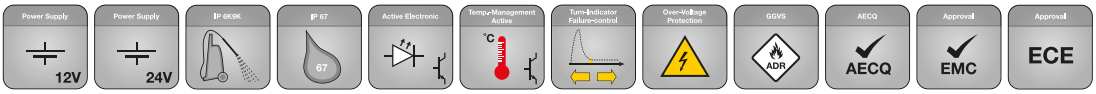
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

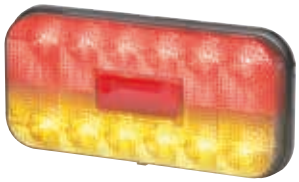
SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

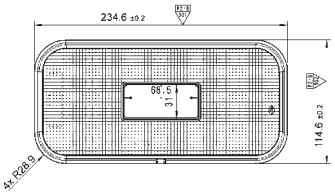
① Tail lamp ② Stop light ③ Indicator ④ Rear fog light ⑤ Reverse lamp
⑥ Reflex reflector ⑦ Side marker light with reflex reflector ⑧ Licence plate light ⑨ Position light

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

This LED product has the following features:



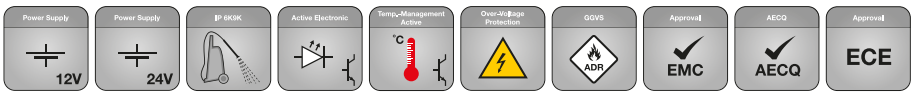




LED combination rear lamp for agricultural and construction machinery				
For horizontal surface mounting, tail/stop light with 6 red LEDs reduced light output of tail lamp, indicator light with 6 amber LEDs. With integrated 4-pole DEUTSCH connector DT 04-4P With pulse for direction indicator failure monitor.			ECE	SAE (USA)
12 V/3.3 W, current consumption = approx. 0.28 A 24 V/4.5 W, current consumption = approx. 0.19 A				
12 V	**2VA 011 900-001**	①②③⑥	X	
24 V	**2VA 011 900-021**	①②③⑥	X	

Type approval: E24 5878, E1 10R 04 6919, EMC

This LED product has the following features:



LED combination rear lamp for agricultural and construction machinery				
For horizontal surface mounting, tail/stop light with 6 red LEDs reduced light output of tail lamp, indicator light with 6 amber LEDs. With integrated 4-pole DEUTSCH connector DT 04-4P Without pulse for indicator failure monitor.			ECE	SAE (USA)
12 V/3.3 W, current consumption = approx. 0.28 A 24 V/4.5 W, current consumption = approx. 0.19 A				
12 V	**2VA 011 900-011**	①②③⑥	X	
24 V	**2VA 011 900-031**	①②③⑥	X	

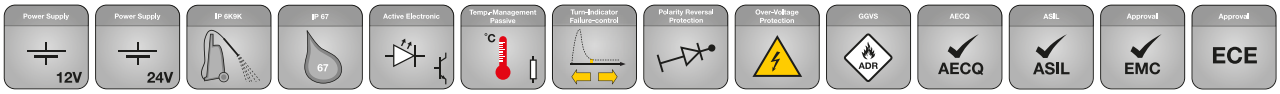
Type approval: E24 5878, E1 10R 04 6919, EMC

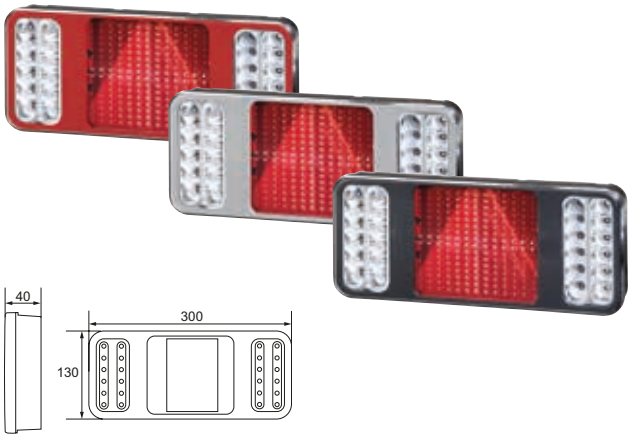
This LED product has the following features:

LED combination rear lamp for agricultural and construction machinery				
For horizontal surface mounting, tail/stop lamp with 6 red LEDs, reduced light output in tail lamp, indicator light with 6 red LEDs. With integrated 4-pole DEUTSCH connector DT 04-4P Without pulse for indicator failure monitor.			ECE	SAE (USA)
12 V/5.9 W, current consumption = approx. 0.49 A				
12 V	**2VA 011 900-041**	①②③⑥		●

Usable harness assemblies	
Harness assembly with 4-pole DEUTSCH connector DT 06-4S for connection to lamp.	
With 200 mm cable, with 4-pole AMP-SUPERSEAL connector	**8KA 197 041-001**
With 500 mm cable, bare cable ends at other end	**8KA 197 041-011**

This LED product has the following features:

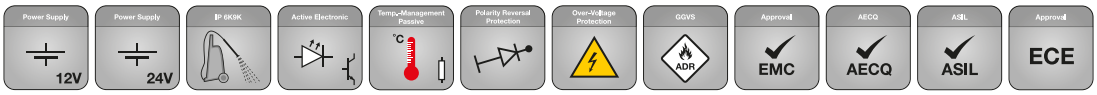




Coluna			ECE	SAE (USA)
Full-LED combination rear lamp, tail/stop/indicator/reversing and rear fog light with reflector, 345 900 series. With black frame colour. With 36 LEDs. With rectangular reflector for horizontal and vertical surface mounting. With 500 mm cable with bare ends. Can be used on the left and right. With pulse for indicator failure check.				
12 V/13.7 W, current consumption = approx. 1.14 A 24V/16.6 W, current consumption = approx. 0.69 A				
Mounted by inserting fixing screws from the front				
12 V	**2VP 345 900-401**	①②③④⑤⑥	X	
24 V	**2VP 345 900-201**	①②③④⑤⑥	X	
Fixing bolts inserted from the rear				
12 V	**2VP 345 900-421**	①②③④⑤⑥	X	
24 V	**2VP 345 900-221**	①②③④⑤⑥	X	

Type approval: E24 5879, E17 10R 04 0071, EMC

This LED product has the following features:



Coluna			ECE	SAE (USA)
Full-LED combination rear lamp, tail/stop/indicator/reversing and rear fog light with reflector, 345 900 series. With black frame colour. With 36 LEDs. With rectangular reflector for horizontal and vertical surface mounting. With 500 mm open-ended cable. Can be used on the left and right. Without pulse for indicator failure check.				
12 V/13.7 W, current consumption = approx. 1.14 A 24V/16.6W, current consumption = approx. 0.69 A				
Mounted by inserting fixing screws from the front				
12 V	**2VP 345 900-411**	①②③④⑤⑥	X	
24 V	**2VP 345 900-211**	①②③④⑤⑥	X	
Fixing bolts inserted from the rear				
12 V	**2VP 345 900-431**	①②③④⑤⑥	X	
24 V	**2VP 345 900-231**	①②③④⑤⑥	X	

Type approval: E24 5879, E17 10R 04 0071, EMC

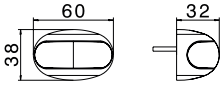
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

This LED product has the following features:

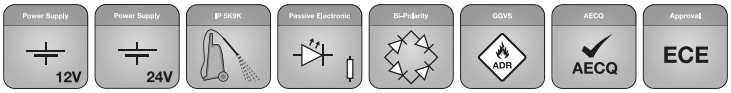


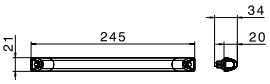
LED clearance light

For horizontal 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: E4 7574 and e1 03 1721

This LED product has the following features:



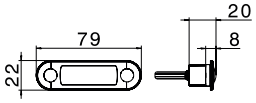


LED clearance light

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

Type approval: E9 0515

This LED product has the following features:

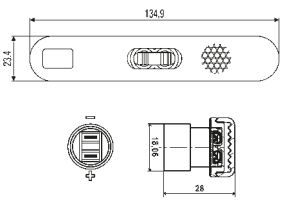


LED clearance light

For horizontal or vertical installation, clear lens with 2 red LEDs, can be used as tail light or clearance light, 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

This LED product has the following features:

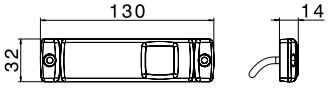


LED clearance light

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

Type approval: E1 4010

This LED product has the following features:

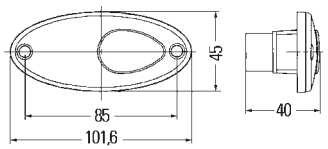


LED clearance light

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

			ECE	SAE (USA)
12 V / 0,6 W, 24 V / 1,1 W				
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



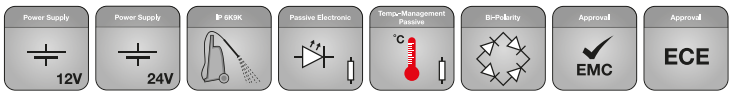
Clearance light

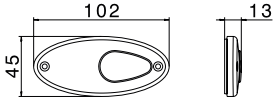
With mounted 12 V bulb and seal, for horizontal or vertical flush mounting.

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

Type approval: E17 812

This LED product has the following features:





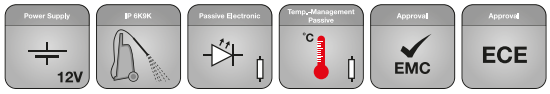
LED clearance light

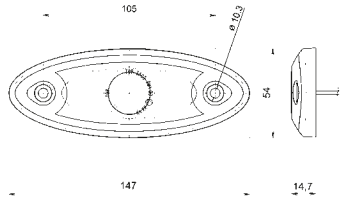
For horizontal surface mounting, 2 LEDs, with seal and cable 5,000 mm long.

			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

This LED product has the following features:





LED clearance light

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

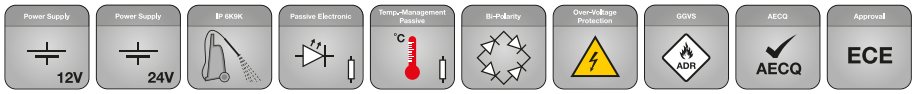
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

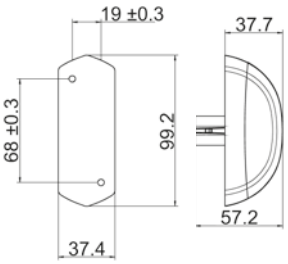
SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

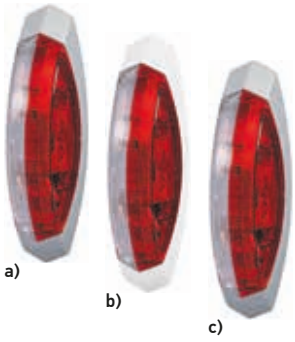
This LED product has the following features:

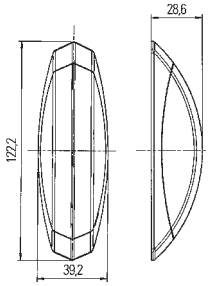




LED clearance light

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



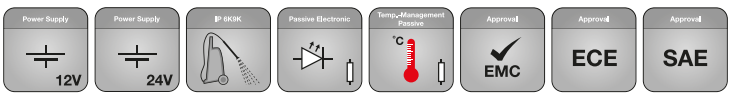


Clearance light

For vertical 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: Ⓔ1 1201

This LED product has the following features:

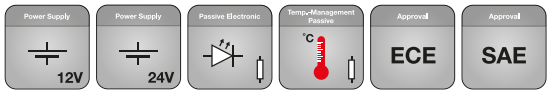


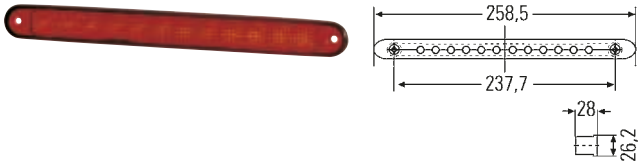
LED auxiliary stop light

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: Ⓔ4 7715

This LED product has the following features:



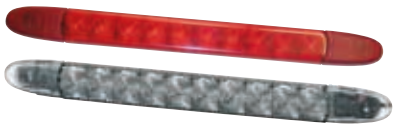


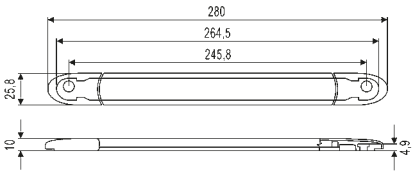
LED auxiliary stop light

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: E4 7547

This LED product has the following features:

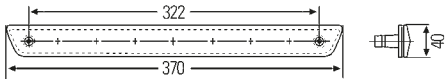




LED auxiliary stop light

For horizontal or vertical 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 attachment	**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 attachment	**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 attachment	**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 attachment	**2DA 343 106-031**	②	X	
24 V, self-adhesive, for smooth and clean surfaces	**2DA 343 106-231**	②	X	

Type approval: E4 7696



Auxiliary stop light

For horizontal 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 attachment from the front through the lens (screws are not included)	**2DA 008 136-017**	②	X	

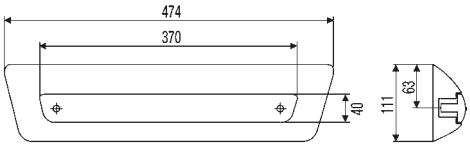
Type approval: E13 02799

ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.



Auxiliary stop light

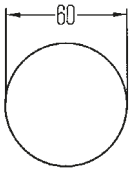
For horizontal mounting, with 12 V bulbs, 2.3 W, cable 146 751-00 included loose.			ECE	SAE (USA)
	2DA 008 136-031	②	X	

Type approval: E1 02799

Accessories (order separately)

Cable with grommet	**8KA 146 751-007**
Cable without grommet	**8KA 144 707-007**
Only grommet	**9GT 146 757-007**

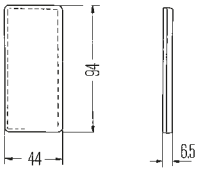
Illustrations similar



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	

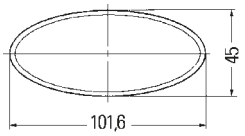
Type approval: E13 023535



Reflex reflector

For horizontal or vertical 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	■

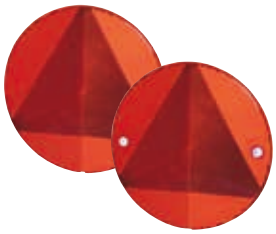
Type approval: E2 0292031

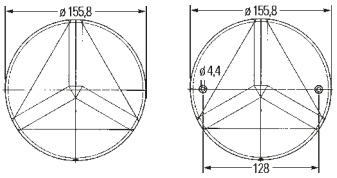


Reflex reflector

For horizontal or vertical surface mounting, suitable for light 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

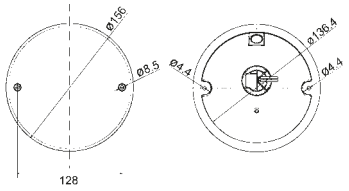




Reflex reflector

			ECE	SAE (USA)
Self-adhesive, red	**8RA 343 220-007**	⑥	X	
With 2 holes for fastening screws, red	**8RA 343 220-017**	⑥	X	

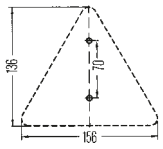
Type approval: E24 023191



Rear fog light

With integrated reflex reflector.			ECE	SAE (USA)
12 V, incl. bulb	**2NE 344 610-007**	④⑥	X	
12 V, without bulb	**8RA 344 610-017**	⑥	X	

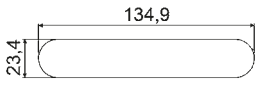
Type approval: E24 5857



Reflex reflector

2 holes, Ø 6 mm, for fixing screws.			ECE	SAE (USA)
Red	**8RA 002 020-001**	⑥	X	

Type approval: E17 02346



Reflex reflector

For horizontal or vertical 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	

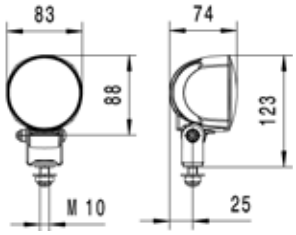
ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide

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

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

This LED product has the following features:



Module 70 LED reverse light

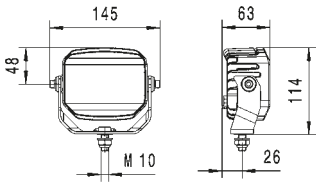
800 lumens, power requirement 13 W, colour temperature 6,500 kelvins, extra-wide close-range illumination, upright/pendant mounting, high-quality aluminium housing with CoroSafe coating.

2,000 mm cable	**2ZR 996 376-091**

Approvals: ECE-R23, ECE-R10

▸ More information on the CoroSafe technology on page 38.

This LED product has the following features:



Power Beam 1000 reverse light

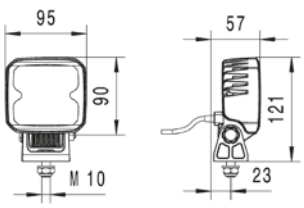
850 lumens, power requirement 15 W, colour temperature 6,500 kelvins, extra-wide close-range illumination, highly vibration-resistant thanks to heavy-duty surrounding bracket, upright/pendant mounting, high-quality aluminium housing, with CoroSafe coating.

DEUTSCH connector	**2ZR 996 188-121**

Type approval: ECE-R23, ECE-R10

▸ More information on the CoroSafe technology on page 38.

This LED product has the following features:



Q90 compact LED reverse light

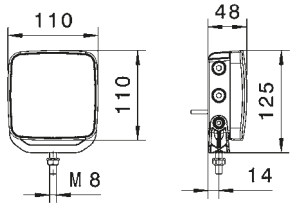
1,000 lumens, power requirement: 15 W, colour temperature: 5,000 kelvins, heat-conducting plastic housing, total corrosion protection thanks to Thermo Pro technology, mounting upright/pendant.

2,000 mm cable	**2ZR 996 284-501**
500 mm cable and DEUTSCH connector, ADR- / GGVSEB-tested	**2ZR 996 284-511**

Type approval: ECE-R23, ECE-R10

▸ More information on Thermo Pro technology on page 38.

This LED product has the following features:



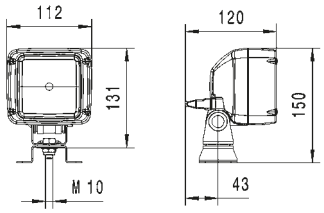
More information on Thermo Pro technology on page 38.

Repulse Pro reverse light

870 lumens, power requirement: 11 W, colour temperature: 5,500 kelvins, heat-conducting plastic housing, total corrosion protection thanks to Thermo Pro technology, mounting upright/pendant.

AMP-SUPERSEAL connector (2-pole) with 2,000 mm cable	**2ZR 012 456-201**
EasyConn connector (2-pole) with 1,000 mm cable	**2ZR 012 456-211**
6.3 mm flat receptacles with 3,000 mm cable	**2ZR 012 456-221**

Type approval: ECE-R23, ECE-R10

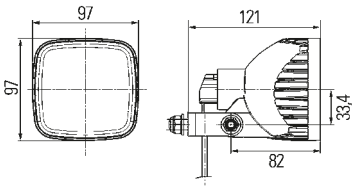


Ultra Beam H3 reverse light

Colour temperature: 2,300 kelvins, 24 V, halogen reversing lights, impact-resistant glass fibre-reinforced plastic housing, IP 5K9K, with AMP connector

Terrain illumination	**2ZR 996 506-501**
Close-range illumination	**2ZR 997 506-391**
Long-range illumination	**2ZR 997 506-621**

Type approval: ECE-R23



Eco 21 reverse light

400 lumens, power requirement: 21 W, colour temperature: 2,300 kelvins, 24 V, reversing spotlight with low current draw and reduced lighting performance, tool-free bulb replacement (bayonet closure), with impact-proof plastic housing.

500 mm cable	**2ZR 996 179-701**

Type approval: ECE-R23

The marking makes the difference

Not every worklight can be used as a reversing light. The devices must meet specific criteria to pass ECE-R23 homologation of the reversing light.

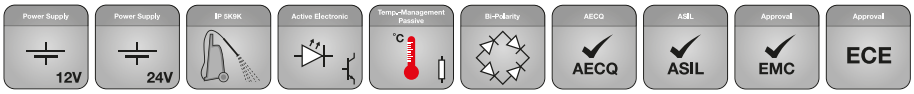
Compliance with exact light values on the ground, strict LED failure criteria and a light value with an upper limit are crucial to obtaining approval. Reversing lights from HELLA meet these criteria and are thus TÜV approved.

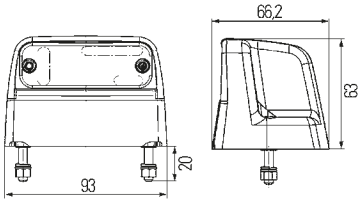
Our special cover lenses direct the light beams to the sides specifically to enable optimum visibility when reversing. This makes safe manoeuvring of the vehicle child's play, even at night.

Make sure your device has a type approval number when purchasing. Only devices with a type approval number (e.g. R23-003902), are approved for mounting as a reversing light.

IMPORTANT:
Accidents caused by the use of non-approved worklights will void your warranty. In such cases, the driver is fully liable for all damages.

This LED product has the following features:





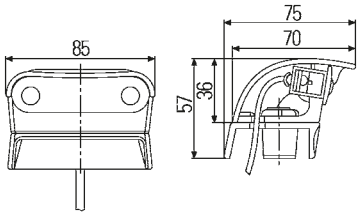
LED licence plate light

2 LEDs, for mounting on left and right, power consumption 0.3 – 0.5 W, service life 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

This LED product has the following features:



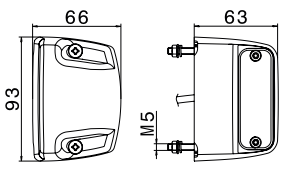
LED licence plate light

For mounting to the left and right of the licence plate 520 x 120 mm, with 2.5 m cable, bracket for mounting the light to the body, cover, fastening screws, cover caps for screws as well as a spacer for different 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	**2KA 959 640-607**

Type approval: E24 4068 and e1 03 1721

This LED product has the following features:



LED licence plate light

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

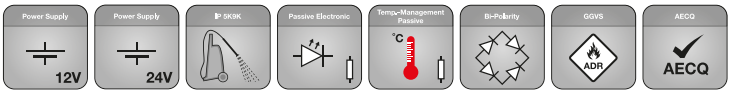
For 520 x 120 mm licence plates, only 1 light required for illumination	
12 V/1 W, current consumption = approx. 0.08 A	**2KA 010 278-321**
24 V / 1 W, current consumption = 0.04 A	**2KA 010 278-021**

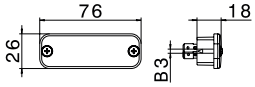
Type approval: E1 2609

For 340 x 240 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

This LED product has the following features:





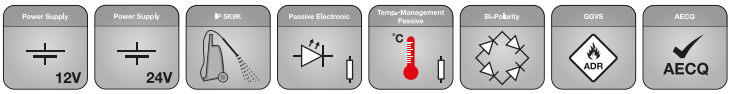
LED licence plate light

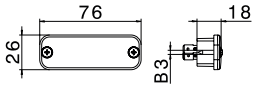
For flush mounting above the licence plate, with frame, with blade terminal 6.3 x 0.8, for 340 x 240 mm and 280 x 200 mm license plates, only one light required for illumination.

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

Type approval: E1 2911

This LED product has the following features:



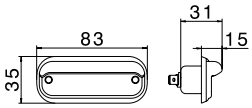


LED licence plate light

For flush mounting above the licence plate 520 x 120 mm, 2 lights required for illumination, with black plastic frame, with blade terminal 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

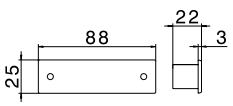


Licence plate light

For flush mounting above or below the licence plates 520 x 120 mm (2 or 3 lights) and 340 x 240 mm (2 lights), 2 x M4 fixing 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 light

For flush mounting above or below (2 lights) the licence plate 520 x 120 mm, 2 holes for fixing 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**

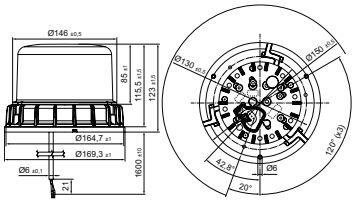
Type approval: E1 22890, SAE L82

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

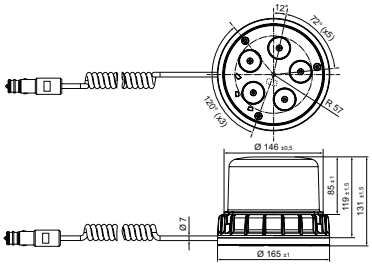
They enable maximum own- and third-party safety by means of an intensive warning effect. This safety is achieved by the optimum light bundling and distribution, the resulting high range as well as the very high light intensity.

You can rely 100% on our beacons: HELLA beacons are characterised by outstanding quality in terms of processing and stability – the long service life proves this!

This LED product has the following features:



Fixed attachment



Magnetic attachment

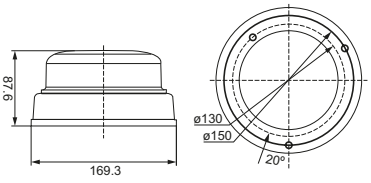
K-LED 1.2

The K-LED 1.2 is an innovative expansion to the K-LED family. It is available in rotating and flashing versions. The dual lighting system in the K-LED 1.2 provides for a larger light exit area, making it especially effective at providing a warning function. And the K-LED 1.2 needs no moving parts – replacement of wearing parts is unnecessary. As a result, the beacon features a long service life. The shock-resistant dome made of polycarbonate guarantees particularly reliable protection against impacts (e.g. from branches). Wireless signals are not disrupted by the K-LED 1.2 because it has a high resistance to electromagnetic interference and therefore EMC.

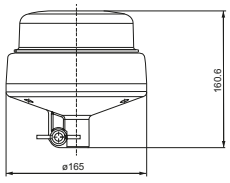
Fixed, rotating	**2RL 012 983-301**
Magnet, rotating	**Available upon request**
Fixed, flashing	**2XD 012 984-301**
Magnet, flashing	**Available upon request**

Type approval: ECE-R65, ECE-R10, SAE J845 Class 2

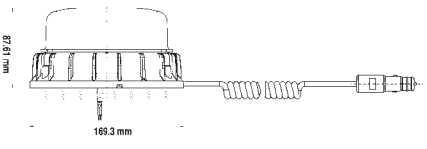
This LED product has the following features:



Fixed attachment



Pipe socket mounting



Magnetic attachment

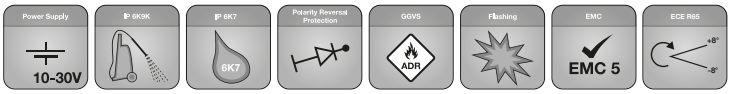
K-LED 2.0

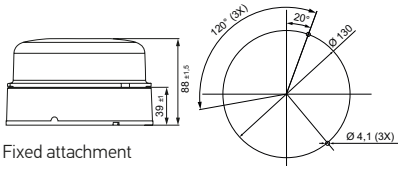
The K-LED 2.0 is the innovative successor to the popular beacon K-LED FO - first HELLA beacons where you can choose between rotating or flashing warning signals. Thanks to an integrated light sensor, switching between day and night mode happens automatically. This guarantees you the greatest warning effectiveness. Extremely flat design and impact-resistant dome. Radio signals are not disrupted by the K-LED 2.0.

Fixed	**2XD 011 557-101**
Pipe socket mounting	**2XD 011 557-201**
Magnet	**2XD 011 557-301**

Type approval: ECE-R65, ECE-R10, SAE J845 Class 1

This LED product has the following features:





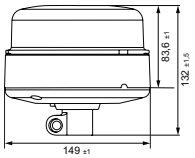
Fixed attachment

K-LED Blizzard

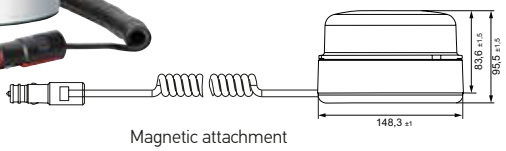
The K-LED Blizzard is the successor generation to the popular and widespread K-LED F0. These can be replaced 1:1 The new generation combines its predecessor's popular design with the latest LED technology. Alongside functional control, this beacon boasts the option of synchronizing up to 4 beacons with one another. The beacon is available in 3 different mounting versions and has a flashing light function.

Fixed, flashing	**2XD 012 980-001**
Pipe sockets Flex, flashing	**2XD 012 980-011**
Magnet, flashing	**2XD 012 980-021**

Type approval: ECE-R65, ECE-R10

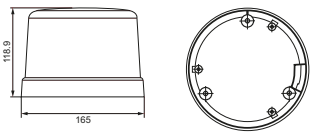


Pipe socket mounting Flex



Magnetic attachment

This LED product has the following features:



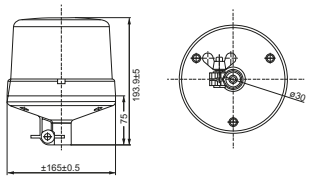
Fixed attachment

KL 7000 LED

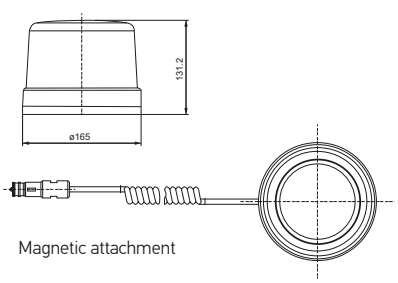
The KL 7000 LED is the logical development of the popular KL 700 and KL 7000 series. The beacon is characterised by its flat and compact design, long service life, and a high degree of efficiency in converting electric power into light. It allows an easy changeover from halogen to LED.

Fixed, rotating	**2RL 011 484-001**
Pipe socket, rotating	**2RL 011 484-011**
Magnet, rotating	**2RL 011 484-021**
Fixed, flashing	**2XD 012 972-001**
Pipe socket, flashing	**2XD 012 972-011**
Magnet, flashing	**2XD 012 972-021**

Type approval: ECE-R65, ECE-R10, SAE J845 Class 2

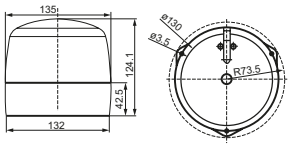


Pipe socket mounting

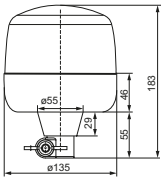


Magnetic attachment

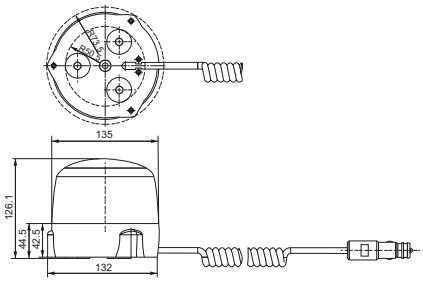
This LED product has the following features:



Fixed attachment



Pipe socket mounting Flex



Magnetic attachment

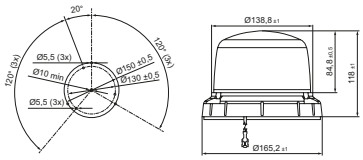
Rota LED

The HELLA Rota LED with rotating LED light function is impressive due to its high efficiency, flat compact design and rotating LED light function. Due to the shock-absorbing rubber foot, it boasts a high resilience against vibration and is thus perfectly suited for challenging applications.

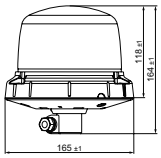
Fixed, rotating	**2RL 010 979-001**
Pipe socket Flex, rotating	**2RL 010 979-011**
Magnet, rotating	**2RL 010 979-021**
Fixed, flashing	**2XD 012 878-001**
Pipe sockets Flex, flashing	**2XD 012 878-011**
Magnet, flashing	**2XD 012 878-021**

Type approval: ECE-R65, ECE-R10, SAE J845 Class 2

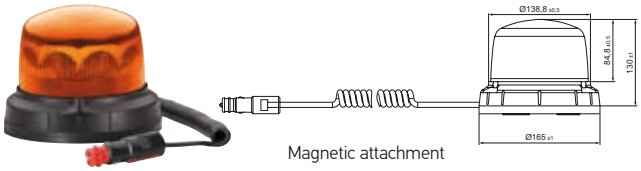
This LED product has the following features:



Fixed attachment



Pipe socket mounting Flex



Magnetic attachment

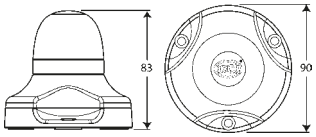
RotaLED Compact

The RotaLED Compact is the LED successor to the existing Rotafix, Rotaflex and Rota Compact halogen beacon series. These can be replaced 1:1 No moving parts are required for the LED functions – so no wear and maximum reliability. Since LEDs are maintenance-free, they do not cause any additional costs for spare parts or maintenance. Standstill time is reduced to a minimum. The beacon is available in three different mounting versions. Flexible base protects from branch impact: The beacon bends and always returns to its original position.

Fixed, flashing,10 – 30 V	**2XD 013 979-001**
Pipe socket Flex, flashing, 10 – 30 V	**2XD 013 979-011**
Magnet, flashing, 10 – 30 V	**2XD 013 979-021**

Type approval: ECE-R65, ECE-R10, SAE J845 Class 2

This LED product has the following features:

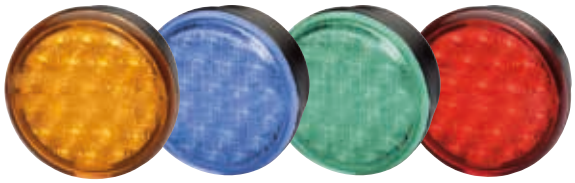


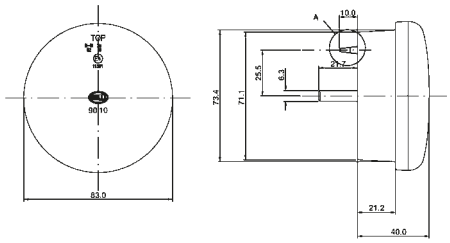
LED strobe-type beacon NaviLED 360°

For surface mounting, with one LED, 10 different flash frequencies programmable, includes 2,500 mm connecting cable, mounting with 3 screws, power consumption less than 5 W. More light colors available upon request.

Light colour amber	**2XD 980 911-601***

This LED product has the following features:





LED Permanent Signal Lights Ø 83 mm

Flush mount, with 24 LEDs, low power consumption, extremely long service life, high-pressure cleaner-proof, vibration and impact-proof, mounting via stainless steel single bolt fastener

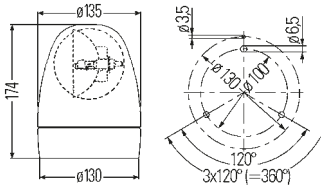
Yellow	**2XD 959 011-021***
Blue	**2XD 959 010-711***
Red	**2XD 959 010-021***
Green	**2XD 959 010-721***

10 different flash frequencies programmable

Yellow	**2XD 959 011-451**

Type approval: e4 031671

* No ECE approval – use as far as permitted by legislation. Not approved for road traffic in Germany, Austria and Switzerland.

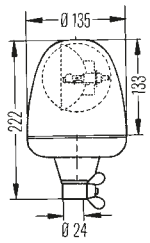


Fixed attachment

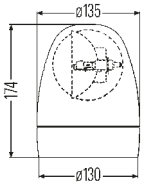
KL Rotaflex / Rotafix

The Rotaflex / Rotafix beacon is a compact and resilient rotating beacon. It is characterised by excellent lighting output, an impact-proof light dome, and extremely high resilience to vibration.

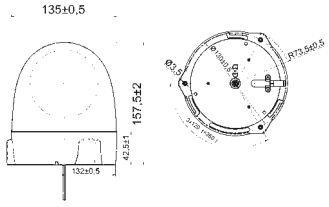
12 V, fixed	**2RL 007 337-001**
24 V, fixed	**2RL 007 337-011**
12 V, pipe socket Flex	**2RL 006 846-001**
24 V, pipe socket Flex	**2RL 006 846-011**
12 V, Magnet	**2RL 007 337-021**
24 V, Magnet	**2RL 007 337-031**



Pipe socket mounting Flex



Magnetic attachment

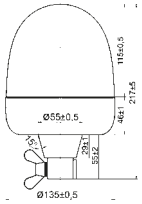


Fixed attachment

KL Rota Compact

The KL Rota Compact beacon impresses with premium quality engineering, excellent robustness and light values. Its elastic, impact-absorbing base minimises the danger of damage.

12 V, fixed	**2RL 009 506-201**
24 V, fixed	**2RL 009 506-211**
12 V, pipe socket Flex	**2RL 009 506-001**
24 V, pipe socket Flex	**2RL 009 506-011**



Pipe socket mounting Flex

Accessories

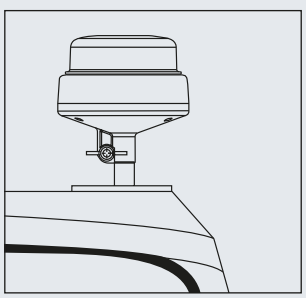
Product photo	Description	Part number	PU
	Socket pipe to weld on, straight, 100 mm long, with rubber stopper and socket according to DIN 14620	1-pin **8HG 002 365-001** 2-pole **8HG 006 294-101**	1
	Extension tube with base for screwing on, overall height 126 mm, with rubber stopper and socket according to DIN 14620	1-pin **8HG 006 294-011** 2-pole **possible on request**	1
	Angled socket pipe with base for screwing on from side, clearance 90 mm, height 100 mm incl. 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 006 294-021** 2-pole **possible on request**	1
	Angled socket pipe with base for screwing on from side, clearance 50 mm, height 100 mm incl. 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 006 294-111** 2-pole **possible on request**	1
	Rotatable socket pipe, height approx. 105 mm incl. 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-pole **8HG 006 294-141**	1
	Socket pipe with screw attachment, height approx. 100 mm, with rubber stopper and socket according to DIN 14620	1-pin **8HG 006 294-051** 2-pole **8HG 006 294-091**	1
	Socket pipe with 2 screw holes for attaching to the rear of the cab, with telescope holder, total height approx. 1,000 mm, Can be shifted up to 700 mm, with rubber stopper and socket according to DIN 14620	1-pin **8HG 006 294-041** 2-pole **possible 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, black with M8 thread, approx. 220 mm long Compatible with 8HG 990 368-001 / -007	**8HG 331 470-007**	2
	Socket pipe, straight with base, to screwing, total height 126 mm compatible with 8HG 006 294-011 / -121	**8HG 096 531-107**	2
	Angled socket pipe, with base to screw on side, clearance 90 mm Compatible with 8HG 006 294-021 / -221	**8HG 096 531-117**	2
	Angled socket pipe, with base for screwing on from side, clearance 50 mm Compatible with 8HG 006 294-111 / -211	**8HG 096 531-127**	2
	Swiveling extension tube, height approx. 105 mm compatible with 8HG 06 294-031 / -141	**8HG 096 531-137**	2

Accessories

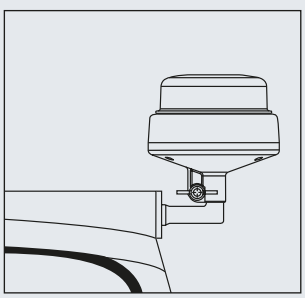
Product photo	Description	Part number	PU
	2-pole socket with cap, with 2 blade couplings 6.3 mm	**9JB 004 777-001*** **9JB 004 777-002***	5 1
	2-pole round socket with ground contact, with 2 blade couplings 6.3 mm	**8JB 862 757-001*** **8JB 862 757-007***	1 24
	2-pole 6-edge SW20 socket with ground contact, with 2 blade couplings 6.3 mm	**8JB 862 757-021*** **8JB 862 757-027***	1 24
	2-pole socket with cap, with 300 mm cable 2.5 mm² and 2 blade couplings 6.3 mm	**8JB 001 946-101***	1
	2-pole aluminum alloy socket with cap and 1 screw connection ground on housing	**8JB 001 946-021***	10
	2-pole socket with cap and 2 blade couplings 6.3 mm	**8JB 004 123-031***	1
	1-pin round socket with fillister head screw M4 x 8	**8JB 850 434-011***	10
	1-pin socket with cap	**8JB 001 946-011***	10
	12 V, test equipment to monitor the function of rotating beacons and flashing beacons, indicates the failure of a beacon	**5KG 011 630-101**	1
	24 V, test equipment to monitor the function of rotating beacons and flashing beacons, indicates the failure of a beacon	**5KG 011 630-111**	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: Ø 18.5 mm, control panel thickness max. 7 mm.

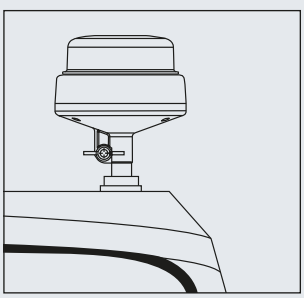
Installation examples



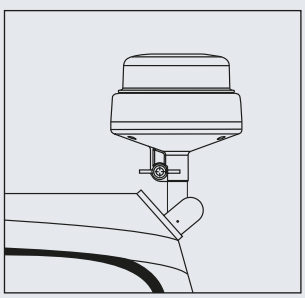
Socket pipe with base for screw attachment



Angled extension tube, with base for screwing onto the side



Socket pipe for screw attachment



Support pipe, pivoting

Additional indicators and side marker lamps contribute daily to road safety.

As it is only these markings that make the entire vehicle easy to see - even in the dark. HELLA also offers ideal versions of both products with LED technology.

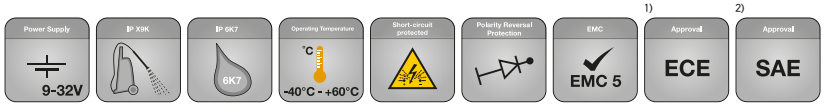
Durability, high luminosity and quick installation – these features are characteristic of HELLA products.

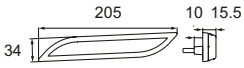
Shapeline product overview

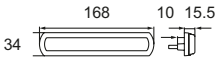
The modular HELLA Shapeline product range provides a variety of different light functions that can be combined with each other individually. Here, all lights are available in two different designs: The classic straight-line Shapeline Tech design and the dynamic curved Shapeline Style design.

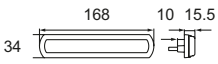
Tech or Style: The HELLA Shapeline series provides design freedom for nearly any application and vehicle, and achieves a consistent light signature for your vehicle at the same time.

These LED products have the following characteristics:







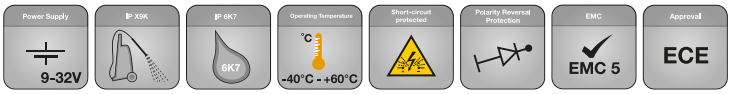


Shapeline side marker lights	
Side marker lights, Style design incl. reflex reflector	
Side marker light with reflex reflector, yellow, left.	**2PS 013 305-XXX*1)2)**
Side marker light with reflex reflector, yellow, right	**2PS 013 306-XXX*1)2)**
Side marker light with reflex reflector, red, left	**2PS 013 307-XXX*2)**
Side marker lights, Tech design	
Side marker light with reflex reflector, yellow, horizontal	**2PS 013 300-XXX*1)2)**
Side marker light with reflex reflector, yellow, vertical	**2PS 013 301/2-XXX*1)2)**
Side marker light with reflex reflector, red, horizontal	**2PS 013 303-XXX*2)**
Side marker light with reflex reflector, red, vertical	**2PS 013 304-XXX*2)**

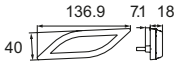
* Please see our Shapeline brochure for a detailed overview of all part numbers and versions. Alternatively, with the HELLA Shapeline online configuration tool you are just a few clicks away from your own fully customised vehicle light design for the front, sides, and rear end: www.hella.com/shapeline.

SHAPELINE
DESIGN YOUR LIGHT

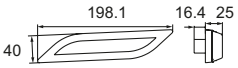
These LED products have the following characteristics:



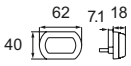
a)



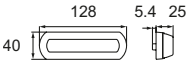
b)



c)

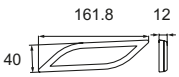


d)

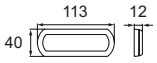


Shapeline direction indicators	
Direction indicators, Style design	
a) Direction indicator, side, cat. 5	**2BM 013 338-XXX***
b) Direction indicator, side, cat. 6	**2BM 013 339-XXX***
Direction indicators, Tech design	
c) Direction indicator, side, cat. 5	**2BM 013 336-XXX***
d) Direction indicator, side, cat. 6	**2BM 013 337-XXX***

a)

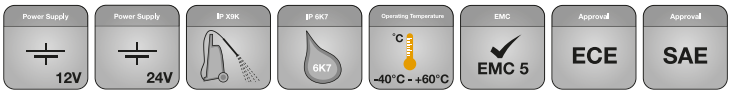


b)



Shapeline reflex reflector	
Reflex reflector Style design, Protection class IP X9K and IP 6K7	
a) Reflex reflector side, yellow	**2RA 013 347-XXX***
Reflex reflector, Tech design	
b) Reflex reflector side, yellow	**8RA 013 403-XXX***

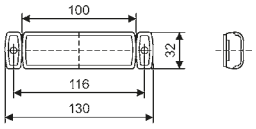
This LED product has the following features:



Shapeline clearance lamps	
Clearance lamp, Tech design	
Clearance light	**2XS 013 327-XXX***

* Please see our Shapeline brochure for a detailed overview of all part numbers and versions. Alternatively, with the HELLA Shapeline online configuration tool you are just a few clicks away from your own fully customised vehicle light design for the front, sides, and rear end: www.hella.com/shapeline.

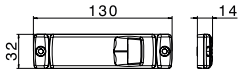
This LED product has the following features:



Side marker light with reflector

LED, mounting option, power consumption 1 W, 1,500 mm cable		ECE	SAE (USA)
24 V, horizontal mounting	**2PS 008 645-007**	X	■
Type approval: E1 021395, E1 001396, SAE AP2 01			
24 V, mounting: vertical	**2PS 008 645-997**	X	■
Type approval: E1 021397, E1 001397, SAE AP2 01			

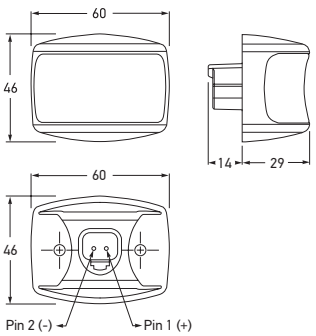
This LED product has the following features:



side marker light with additional direction indicator and reflex reflector

Light source 4 x LED, yellow (2 x Side marker light with reflex reflector and 2 x auxiliary direction indicator cat. 5), mounting horizontal, housing color: orange, power consumption 0.8 W.		ECE	SAE (USA)
24 V, 2,000 mm cable with EasyConn connector	**2PS 012 845-007**	X	
24 V, 2,000 mm cable, with AMP-SUPERSEAL connector	**2PS 012 845-017**	X	
24 V, 1,300 mm cable, with QuickLink connector	**2PS 012 845-027**	X	
Type approval: E1 021395, E1 004328			

This LED product has the following features:



DuraLED marker light

2 LEDs, power consumption < 1 W, operating temperature -40°C to +60°C, reverse polarity protection, mounting with 2 screws Ø 4 mm, DEUTSCH connector.		ECE	SAE (USA)
12 / 24 V, side marker light (cat. SM1)	**2PS 980 990-301**	X	
Type approval: 5m1 00 E24 5892, 10R-05 E24 3195			

ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide
X < 12 m overall length

Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

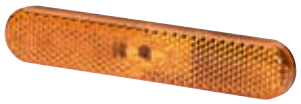
This LED product has the following features:

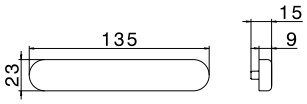
DuraLED side marker light

2 LEDs, power consumption 0.5 W, operating temperature -40°C to +60°C, reverse polarity protection, horizontal mounting with screw connection and 2 mounting elements Ø 0.5 mm.		ECE	SAE (USA)
12 / 24 V, 500 mm cable	**2PS 980 868-201/7**	X	
12 / 24 V, 2,500 mm cable	**2PS 980 868-211/7**	X	

Type approval: E24 0007, E4 10R-042899

This LED product has the following features:



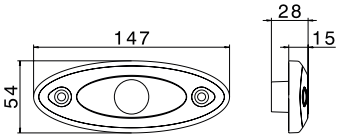


LED side marker light

For horizontal mounting, with 250 mm cable, self-adhesive.		ECE	SAE (USA)
12 V, horizontal	**2PS 009 226-021/7**	X	
12 V, vertical	**2PS 009 226-077**	X	
For horizontal surface mounting, with 6.3 mm contacts and counter-plug grommet, self-adhesive.			
12 V, horizontal	**2PS 009 226-067**	X	
2-pole AMP connector, self-adhesive.			
24 V, horizontal	**2PS 009 226-017**	X	

Type approval: E24 10236

This LED product has the following features:

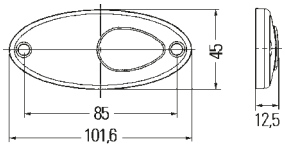


LED side marker light

For surface mounting, modern night-time design and high level of safety thanks to maximum illumination area, additional versions available upon request.		ECE	SAE (USA)
12 V, 6.3 mm contact pin, white frame	**2PS 344 690-007**	X	
12 V, 6.3 mm contact pin, grey frame	**2PS 344 690-027**	X	
12 V, 6.3 mm contact pin, black frame	**2PS 344 690-067**	X	
12 V, AMP-SUPERSEAL, white frame	**2PS 344 690-607**	X	
12 V, AMP-SUPERSEAL, black frame	**2PS 344 690-617**	X	
24 V, 6.3 mm contact pin, black frame	**2PS 344 690-031**	X	
24 V, AMP-SUPERSEAL, black frame	**2PS 344 690-621**	X	

Type approval: E24 5853

This LED product has the following features:

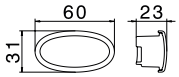


LED side marker light

For horizontal mounting, with 2 LEDs, with reflex reflector, with seal and two cables 500 mm long, with ECE and SAE type approval.		ECE	SAE (USA)
12 V/0.5 W, current consumption = approx. 0.04 A 24 V/1 W, current consumption = 0.04 A			
12 V, with fastening screws	**2PS 964 295-067**	X	■ ●
12 V, self-adhesive, without seal, with caps for the screw holes	**2PS 964 295-081**	X	■ ●
24 V, with fastening screws, and seal, 500 mm cable	**2PS 964 295-057**	X	■ ●
24 V, with fastening screws, and seal, 500 mm cable, AMP-SUPERSEAL connector	**2PS 964 295-357**	X	■ ●
24 V, with fastening screws, and seal, 600 mm cable, AMP-SUPERSEAL connector	**2PS 964 295-347**	X	■ ●

Type approval: E17 0202

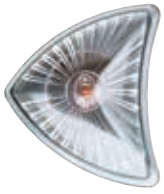
This LED product has the following features:

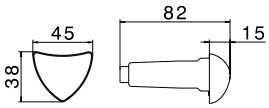


LED side marker light set

For horizontal mounting, 4 units each, with LED technology		ECE	SAE (USA)
12 V / 0.7 W, current consumption = approx. 0.06 A			
Amber lenses, silver-grey finishers	**2PS 008 138-801**	X	
Grey lenses, black finishers	**2PS 008 138-811**	X	
Grey lenses, silver-grey finishers	**2PS 008 138-821**	X	

Type approval: E4 9110





Side marker light set

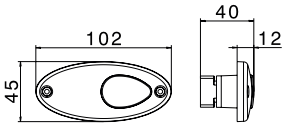
For horizontal and vertical flush mounting, 4 units each, with yellow 12 V / 5 W bulb.		ECE	SAE (USA)
arrow design	**2PS 008 541-801**	X	

Type approval: E1 1223

ECE note: Turn indicator approval by category
D ECE approval as twin indicators

SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide
X < 12 m overall length

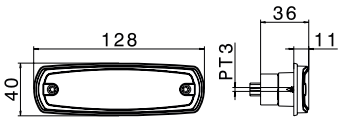
Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.



Side marker light

For horizontal flush mounting, with reflex reflector, seal.		ECE	SAE (USA)
12 V/5 W, amber	**2PS 964 295-001**	X	■ ●
12 V / 5 W, red SMLR acc. to SAE	**2XS 964 295-031**		■ ●
24 V/1 W, yellow	**2PS 964 295-051**	X	■ ●

Type approval: SMLR E17 9807, UR E17 812

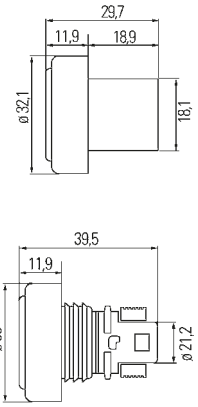


Side marker light

For horizontal or vertical flush mounting, with reflex reflector, 12 V or 24 V bulb, white base plate.		ECE	SAE (USA)
12 V / 3 W	**2PS 962 964-037**	X	■ ●
24 V / 3 W	**2PS 962 964-012/8**	X	■ ●
Seal (order separately)	**9GD 963 281-001**		
Grommet (order separately)	**9GT 963 129-001**		

Type approval: E24 10236

This LED product has the following features:

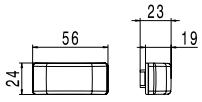


Auxiliary direction indicator cat. 5

LED, 12 V, power consumption: 0.7 W, operating temperature -40°C to +60°C, screwed, 2-pole EasyConn, rubber housing, AMP-SUPERSEAL, rubber housing, 6.3 mm receptacles, and plastic housing.		ECE	SAE (USA)
Screwed on, 2-pole EasyConn connector, rubber housing	**2BM 340 825-201**	X	
AMP-SUPERSEAL connector, AMP 282080-1, rubber housing	**2BM 340 825-211**	X	
6.3 mm receptacles, plastic housing	**2BM 340 825-301**	X	
AMP-SUPERSEAL seal, AMP 282080-1, plastic housing	**2BM 340 825-311**	X	

Type approval: E24 01 0066

This LED product has the following features:



LED auxiliary indicator

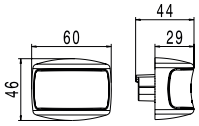
For horizontal flush mounting, category 5, simple gluing into prepared mirror, can also be used as a universal auxiliary direction indicator.		ECE	SAE (USA)
12 V / 0.7 W, current consumption = approx. 0.06 A	**2BM 008 771-001**	X	X

Type approval: E1 011423

Information

For vehicles < 6 m in length and/or < 3.5 t, auxiliary indicators of category 5 are prescribed, and for vehicles > 6 m in length and/or > 3.5 t, auxiliary indicators of category 6 are prescribed.

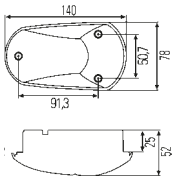
This LED product has the following features:



DuraLED marker light

2 LEDs, power consumption <1 W, operating temperature -40°C to +60°C, reverse polarity protection, with 2 screws Ø 4 mm and DEUTSCH connector.		ECE	SAE (USA)
12 / 24 V, cat. 5	**2BM 980 990-121/7**	X	

Type approval: E24 0067, E4 10 R-05 3195



Auxiliary indicator

For surface mounting on the side, category 6 for 24 V/21 W, without bulb, extremely flat design.		ECE	SAE (USA)
Amber Lens	**2BM 008 355-001**	X	

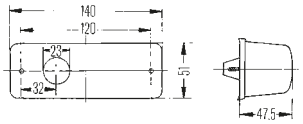
Type approval: E1 1059

Crystal-clear lens	**2BM 008 355-017**	X	

Type approval: E1 1848

Accessories

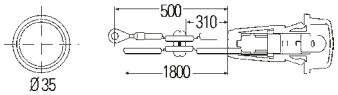
Harness for non splashwater-proof area	**8KA 157 425-007**		



Auxiliary indicator

For surface mounting on the side, category 5 and 6 for 12 V and 24 V / 21 W, with bulb, GGVS / ADR-compliant.		ECE	SAE (USA)
Left	**2BM 006 692-017**	X	
Right	**2BM 006 692-027**	X	

Type approval: E1 0152621



Auxiliary indicator

For flush mounting on the side, category 5 for 12 V, with bulb.		ECE	SAE (USA)
Small, space-saving	**2BM 003 563-111**	X	

Type approval: E1 42621

ECE note: Turn indicator approval by category
D ECE approval as twin indicators

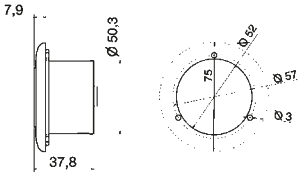
SAE type approval for vehicles
■ < 2032 mm wide
● > 2031 mm wide
X < 12 m overall length

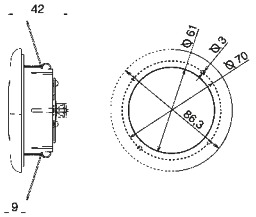
Please see the note on page 187 regarding LED direction indicators and LED light failure monitor.

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

The range covers ambient lighting in the shape of light hues and LED modules, continuous lighting systems/modules for ceiling systems, service sets (operating units) and stair lighting.

These LED products have the following characteristics:





Standard LED spotlights, fixed

Number of Power LEDs	1 white
Illumination angle	40° or 20°
Illuminance in 1 m	156 lx (20°), 65 lx (40°)
IP Class (Protection)	IP 3X
Power consumption	2 W (0.16 A at 12 V)
Lens	Clear
Installation	choice between screw or spring-assisted mounting
Current consumption of spotlight at 12 V/2.5 W	approx. 0.20 A

Flush mounting, fixed, wide illumination (40°)
Finisher colour[1)]

White	**2JA 344 040-701**
Black	**2JA 344 040-711**
Silver	**2JA 344 040-721**

Flush mounting, fixed, spot-type illumination (20°)
Finisher colour[1)]

Silver	**2JA 344 040-761**

Accessories
Round finisher with angled edges

Chromium	**9AB 344 057-061**
Gold	**9AB 344 057-071**

Round finisher with rounded edges

Chromium	**9AB 344 045-061**
Gold	**9AB 344 045-071**
Stainless metal frame, polished	**9AB 959 505-501**
Stainless metal frame, satined	**9AB 959 505-561**

Square finisher with angled edges

Chromium	**9AB 344 058-061**
Gold	**9AB 344 058-071**

[1)] Further finisher colours (e.g. real-wood look) or ambient Celis® light guide ring (e.g. blue, red) on request.

Standard LED spotlights, adjustable

Number of Power LEDs	1 white
Illumination angle	40° or 20°
Illuminance in 1 m	156 lx (20°), 65 lx (40°)
IP Class (Protection)	IP 3X
Power consumption	2 W (0.16 A at 12 V)
Lens	Clear
Installation	choice between screw or spring-assisted mounting
Current consumption of spotlight at 12 V/2.5 W	approx. 0.20 A

Flush mounting, adjustable, wide illumination (40°)
Finisher colour[1)]

White	**2JA 343 790-301**
Black	**2JA 343 790-311**
Silver	**2JA 343 790-341**

Flush mounting, adjustable, spot-type illumination (20°)
Finisher colour[1)]

Silver	**2JA 343 790-441**

[1)] also with white, ambient Celis® light guide ring, current consumption of the Celis® light guide ring at 12 V / 0.5 W = approx. 0.04 A.

Flush mounting, adjustable, wide illumination (40°)
Finisher colour[1)]

White	**2JA 343 790-701**
Black	**2JA 343 790-711**
Silver	**2JA 343 790-741**

Flush mounting, adjustable, spot-type illumination (20°)
Finisher colour[1)]

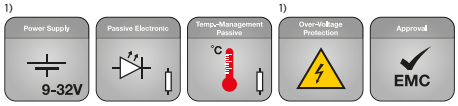
Black	**2JA 343 790-611**

[1)] Further finisher colours (e.g. real-wood look) or ambient Celis® light guide ring (e.g. blue, red) on request.

Accessories

Finisher chrome	**9AB 343 792-061**
Finisher gold	**9AB 343 792-071**

This LED product has the following features:

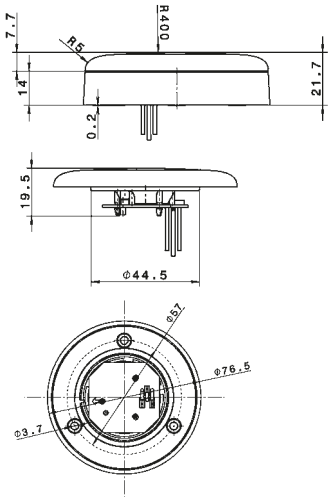


LED spotlights round, flat flush mounting/surface mounting

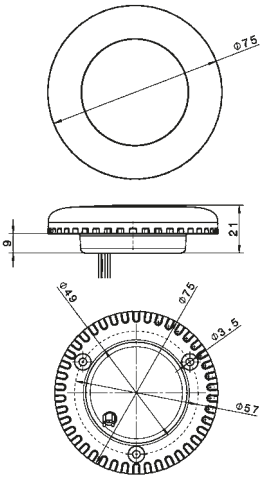
Illumination angle	35°
Illuminance at 1 m	45 lx (Standard), 105 lx (High-Power)
IP Class (Protection)	IP 20
Power consumption	Standard 1.5 W (0.12 A at 12 V) High power 2.6 W (0.21 A at 12 V)
Dimensions	Flush mounting version only 14 mm Surface mounting version only 22 mm
Voltage	5 VDC (connection possible only with control unit)

Individual packaging
comprising 1 LED spotlight, 1 coloured light frame, 1 coloured installation frame, 1 sealing ring for installation

Standard LED spotlight



High-power LED spotlight

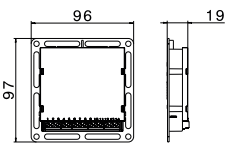


Flush mounting, fixed Finisher colour[2]	**Standard LED Spot 1.5 W, white**	**High-Power LED spotlight 2.6 W (double light power with cooling element)**
Without Celis®		
White	**2JA 344 199-001**	**2JA 344 599-001**
Black		**2JA 344 599-011**
Silver		**2JA 344 599-021**
With Celis® warm-white ambient*		
White		**2JA 344 599-101**
Black		**2JA 344 599-111**
Silver	**2JA 344 199-121**	**2JA 344 599-121**
With Celis® blue ambient*		
White	**2JA 344 199-201**	**2JA 344 599-201**
Black	**2JA 344 199-211**	**2JA 344 599-211**
Silver	**2JA 344 199-221**	**2JA 344 599-221**
With Celis® red ambient		
White		**2JA 344 599-301**
Black	**2JA 344 199-311**	**2JA 344 599-311**
Silver		**2JA 344 599-321**
With Celis® orange ambient		
White	**2JA 344 199-351**	**2JA 344 599-351**
Black		**2JA 344 599-361**
Silver	**2JA 344 199-371**	**2JA 344 599-371**

Accessories
Installation frame, the overall height with frame is 22 mm

Chromium	**9AB 344 192-061**
Gold	**9AB 344 192-071**

A control unit is required in order to use more than one spotlight.

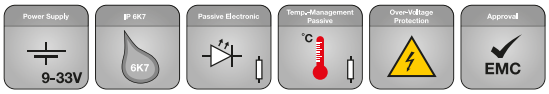


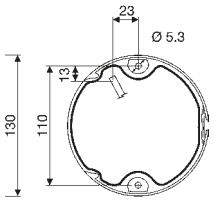
Number of circuits	max. 8 LED spotlights in 1 or 2 dimming circuits
IP Class (Protection)	30
Power consumption	1 – 16 W
Voltage	Multivolt (9 – 32 VDC)
For 4 standard or high-power spots please use ...	**5XA 344 150-001**
For 8 standard or 5 high-power spots please use ...	**5XA 344 150-011**

[1] Connection possible only with control unit (5XA 344 150-001/-011).
[2] Further finisher colours (e.g. real-wood look) available on request.

* Celis® light guide ring: this technology, which is used exclusively by Hella, stands out through the special design for indirect ambient lighting. This creates a relaxed atmosphere inside the vehicle. The Celis® light guide ring is available in the colors warm-white, blue, red and orange.

This LED product has the following features:



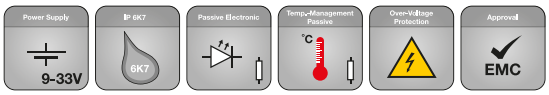


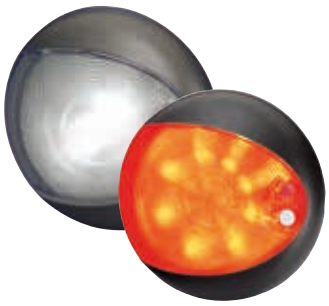
EuroLED

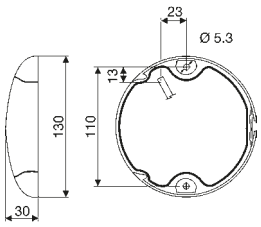
Number of LEDs	1 white Power LED
Electrical connection	electrical connection through a cable 2,500 mm long
IP Class (Protection)	IP 6K7
Lens	white
Power consumption	white 4 W (0.33 A at 12 V) red <2.5 W (0.20 A at 12 V)
Installation	Surface mounting, permanently bonded with base plate

12 V/4 W, current consumption = approx. 0.33 A	**2JA 959 820-501**

This LED product has the following features:





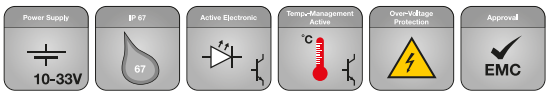


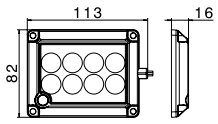
EuroLED Touch

Number of LEDs	1 white and 8 red
Electrical connection	electrical connection via a cable 2,500 mm long
IP Class (Protection)	IP 6K7
Lens	white
Power consumption	white 4 W (0.33 A at 12 V) red <2.5 W (0.20 A at 12 V)
Installation	Surface mounting, permanently bonded with base plate
Function	with sensitive switch, for ON/OFF and dimming as well as switching between red and white light

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

This LED product has the following features:

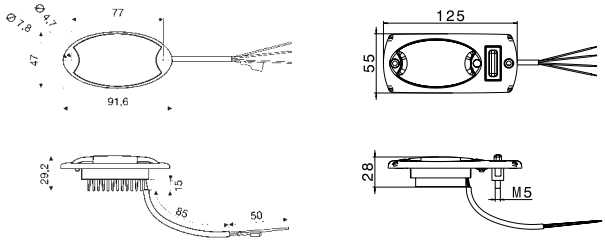




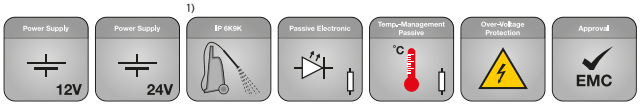
LED ceiling light

Number of LEDs	8 LEDs
Illuminance in 1 m	approx. 240 lx
Dimensions of light	105 x 82 x 16 mm (L x B x H)
IP Class (Protection)	IP 67
Light colour	5,700 K (neutral white)
Installation	Surface mounting
Illumination angle	approx. 65°
Nominal output	approx. 3.3 W
Current consumption	approx. 0.28 A at 12 V approx. 0.14 A at 24 V

Without motion detector	**2JA 012 557-011**



This LED product has the following features:

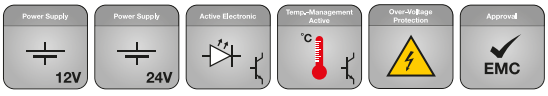


Mini OvalLED

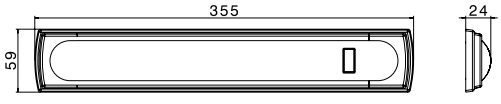
Number of LEDs	4 white LEDs, 1 ambient LED
Illumination angle	50°
Illumination	side area of driver or instrument panel area
Illuminance at 1 m	Standard 14.5 lx, Power 54 lx
Function	ambient lighting can be switched on
IP Class (Protection)	IP 6K9K (without frame/switch), IP 40 (with frame/switch)
Power consumption	Standard 1.7 W (0.14 A at 12 V) Power 3.6 W (0.30 A at 12 V)
Lens	brilliant and clear
Installation	Flush mounting
Voltage	12 V or 24 V
Current consumption	3.6 watts (approx. 0.3 A at 12 V, approx. 0.15 A at 24 V)
Temperature range	-40 °C to +60 °C

LED equipment	without frame and switch[1)]	with frame and switch
12 V, 4 white power LEDs, red	**2JA 343 570-011**	**2JA 343 570-051**
12 V, 4 white power LEDs, blue	**2JA 343 570-117**	**2JA 343 570-157**
12 V, 4 white standard LEDs, red	**2JA 343 570-031**	–
24 V, 4 white power LEDs, red	**2JA 343 570-001**	**2JA 343 570-041**
24V, 4 white power LEDs, blue	–	**2JA 343 570-141**
24 V, 4 white standard LEDs, red	**2JA 343 570-021**	**2JA 343 570-061**

This LED product has the following features:



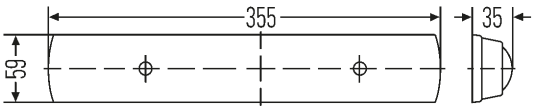
For illustrative purposes only



LED surface mounted light with integrated switch

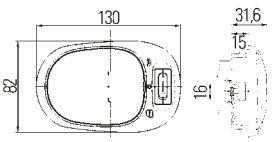
Number of LEDs	24 LEDs
Illuminance in 1 m	approx. 200 lx
Length	355 mm
Light colour	4,000 K (neutral white)
Nominal output	4,8 W
Current consumption	approx. 0.40 A at 12 V approx. 0.20 A at 24 V
12 V	**2JA 007 373-301**
24 V	**2JA 007 373-311**

This LED product has the following features:



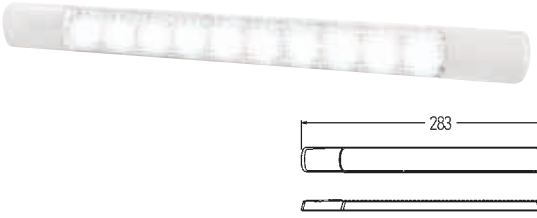
LED lights with switch	
Number of LEDs	12 LEDs
Illuminance in 1 m	approx. 100 lx
Length	355 mm
Light colour	4,000 K (neutral white)
Material description	Lens and frame made of impact-resistant material
Installation	Surface mounting
Nominal output	3,5 W
Current consumption	approx. 0.30 A at 12 V approx. 0.15 A at 24 V
	2JA 007 373-151

Number of LEDs	24 LEDs
Illuminance in 1 m	approx. 200 lx
Length	355 mm
Light colour	4,000 K (neutral white)
Material description	Lens and frame made of impact-resistant material
Installation	Surface mounting
Nominal output	7 W
Current consumption	approx. 0.58 A at 12 V approx. 0.29 A at 24 V
	2JA 007 373-161



Ceiling light	
Number of light sources	1 C10W 12 V bulb
Electrical connection	via harness assembly with AMP connector and 6.3 mm blade couplings
Functions	On/ Off/ Door contact, passive thermal management
Housing	transparent or black
IP Class (Protection)	IP 6K9K
Power consumption	10 W (0.83 A at 12 V)
Lens	Clear
Installation	Installation, either screw-type or snap-on fastening
Switches	grey or black
Voltage	12 V
Transparent housing, grey switch	**2JA 964 916-001**
Black housing, black switch	**2JA 964 916-011**
C10W 12 V bulb	**8GM 002 091-131**

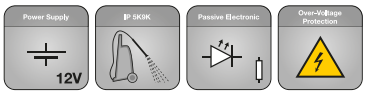
This LED product has the following features:

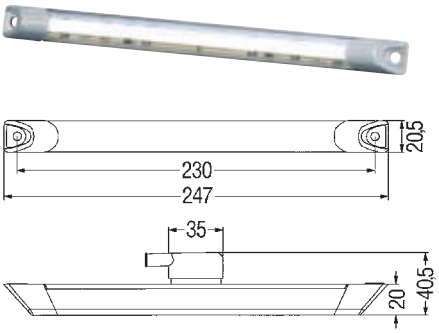


Slim LED surface mounted lamp

Number of LEDs	10 LEDs
Electrical connection	2,500 mm cable
Operating temperature	-40°C to +60°C
Illuminance in 1 m	approx. 160 lx
IP Class (Protection)	IP 6K9K, IP 6K7
Installation	horizontal or vertical
Nominal output	3 W
Voltage	12 V and 24 V
12 V, white	**2JA 980 879-011**
24 V, white	**2JA 980 879-111**
12 V, warm white	**2JA 980 879-201**
24 V, warm white	**2JA 980 879-301**

This LED product has the following features:

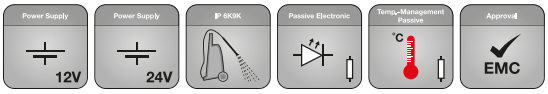


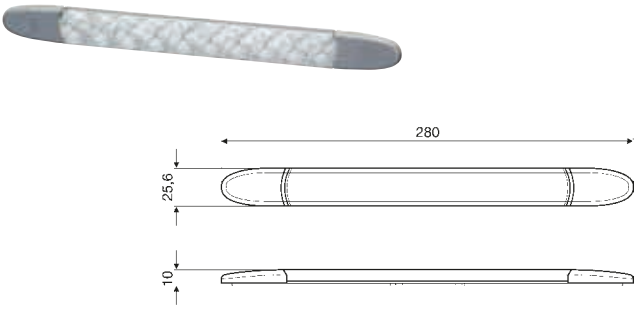


LED step light

Number of LEDs	2 white LEDs
Electrical connection	electrical, using blade terminal and grommet
Feature	with prism rod as a light aperture body
Colouring	Grey housing
IP Class (Protection)	IP 5K9K
Power consumption	0.7 W (0.05 A at 12 V)
Lens	Clear
Installation	Surface mounted (horizontally or vertically)
	2JA 008 078-031

This LED product has the following features:

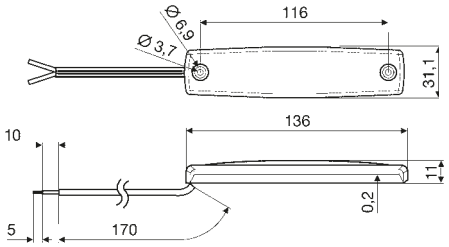




Flat LED surface mounted light

Number of LEDs	10 white LEDs
Electrical connection	electrical, using a cable 500 mm long
Illumination angle	38°
Illuminance in 1 m	32 lx
Power consumption	1.8 W (0.15 A at 12 V) 3.6 W (0.15 A at 24 V)
Lens	Clear
Installation	Surface mounting, permanently bonded to gray base plate
Temperature range	- 40 °C to + 60 °C
12 V, white LEDs	**2JA 343 606-001**
12 V, blue LEDs	**2JA 343 606-201**
24 V, white LEDs	**2JA 343 606-011**
24 V, blue LEDs	**2JA 343 606-217**

This LED product has the following features:

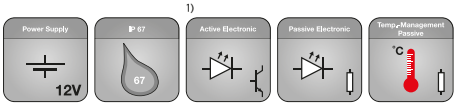


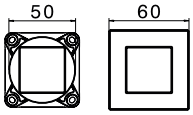
Mini Thin LED

Number of LEDs	5 white or 3 blue LEDs
Electrical connection	electrical, using a cable 170 mm long
Illumination angle	34° (wide at close range)
Illuminance in 1 m	7,2 lx
IP Class (Protection)	IP 6K9K
Power consumption	2.8 W (0.23 A at 12 V)
Lens	Clear
Installation	Surface mounting, permanently bonded to gray base plate
Temperature range	Temperature range – 40 °C to + 60 °C

12 V, 5 white LEDs	**2JA 343 660-101/7**
12 V, 3 blue LEDs	**2JA 343 660-021**
24 V, 5 white LEDs	**2JA 343 660-117**

This LED product has the following features:



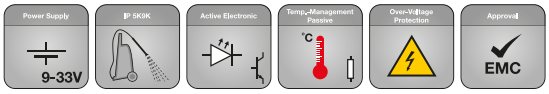


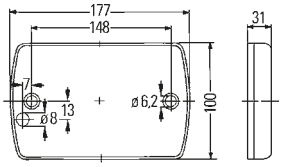
LED step light

Number of LEDs	4 white LEDs
Feature	with square white frame
IP Class (Protection)	IP 67
Power consumption	0.5 W (0.04 A at 12 V)
Lens	white
Installation	Flush mounting

12 V	**2XT 980 580-052**
12 V, High Power	**2XT 980 596-002**[1)]

This LED product has the following features:



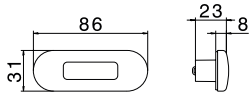


DuraLED

Number of LEDs	36 white LEDs
Electrical connection	electrical via a 2,500 mm cable
Illumination angle	70°, wide horizontal and narrow vertical illumination
Illuminance	720 lx
IP Class (Protection)	IP 5K9K
Power consumption	9 W (0.75 A at 12 V)
Lens	Clear
Material description	Impact-resistant plastic, UV-resistant
Installation	Surface mounting, permanently bonded with white base plate

	2JA 959 037-511

This LED product has the following features:

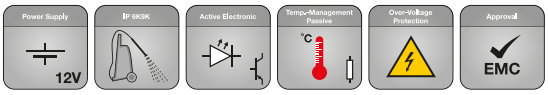


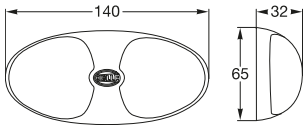
LED step light

Number of LEDs	1 LED
Feature	with polished steel frame
IP Class (Protection)	IP 5K9K
Installation	Flush mounting

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

This LED product has the following features:



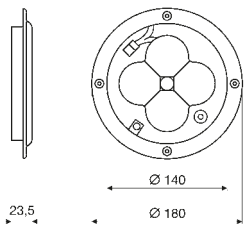


DuraLED, oval

Number of LEDs	12
LED angle of radiation	120°
Orientation of light source	fix
Illuminance in 1 m	60 lx
Electrical connection	via cables (2 x 0.5 mm²; length 0.5 m)
Housing	White
IP Class (Protection)	IP 6K9K
Power consumption	3 W (0.25 A at 12 V)
Light source	Cold white LEDs
Lens	white
Voltage	12 V

	2JA 959 700-102

This LED product has the following features:



CARGOLED

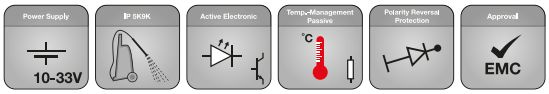
Number of LEDs	4 white Power LEDs
Electrical connection	electrical, via a 310 mm long cable
Illumination angle	44° (wide illumination at close range)
Illuminance in 1 m	180 lx
IP Class (Protection)	IP 6K9K
Power consumption	6 W (0.5 A at 12 V)
Lens	Clear
Installation	Flush mounting (aluminium installation frame)
Temperature range	-40 °C to +60 °C

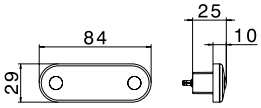
Cold white	**2JB 343 227-001**
Warm white	**2JB 343 227-041**

Accessories

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

This LED product has the following features:



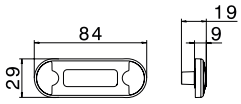


LED step light

Number of LEDs	2 LEDs
Electrical connection	electrical, using a cable 120 mm long
Illumination angle	30°
Illuminance in 1 m	15 lx
Feature	with reverse polarity protection
IP Class (Protection)	5K9K
Power consumption	0.5 W (0.04 A at 12 V)
Lens	Clear
Scope of supply	Seal, fixing screws and screw caps
Installation	Flush mounting

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

This LED product has the following features:

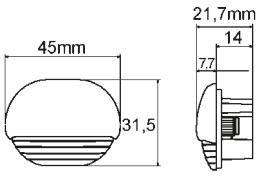


LED step light

Number of LEDs	2 LEDs
Electrical connection	electrical, using a cable 500 mm long
Connecting bracket	30°
Illuminance in 1 m	15 lx
Feature	with polarity reversal protection
Power consumption	0.5 W (0.04 A at 12 V)
IP Class (Protection)	IP 6K9K, IP 6K7
Lens	Clear
Scope of supply	Seal, fastening screws and screw caps
Installation	Flush mounting

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

This LED product has the following features:

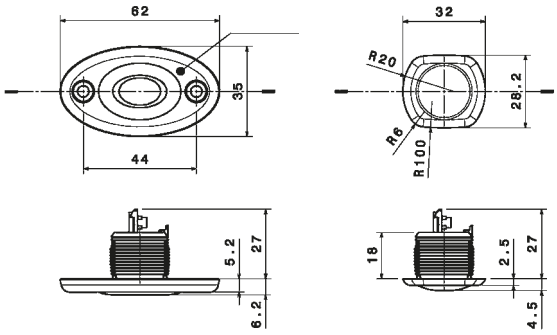


LED step light

Number of LEDs	1 LED
Electrical connection	electrical, using a sealed 100 mm cable
Illumination	wide in close range areas
Illuminance in 1 m	< 10 lux
Colouring	White cover cap
IP Class (Protection)	IP 5K9K
Power consumption	0.5 W (0.04 A at 12 V)
Lens	Clear
Scope of supply	with seal
Installation	Flush mounting, choice with 2 screws or with snap-on fastening

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

This LED product has the following features:

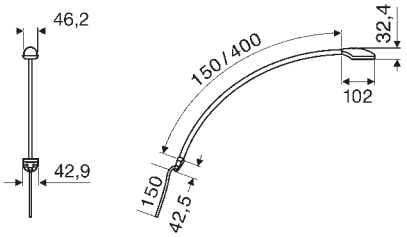


Ambient LED spotlight	
Number of LEDs	1 LED
Illuminance in 1 m	5 lx
IP Class (Protection)	IP 20
Power consumption	0.3 W (0.02 A at 12 V) 0.6 W/approx. 0.025 A (at 24 V)
Lens	Clear
Scope of supply	3 frames (white, grey and black)
Installation	Surface mounting via attachment element

12 V, LED red	**2JA 344 170-001**
12 V, LED blue	**2JA 344 170-011**
12 V, LED white	**2JA 344 170-021**
12 V, LED amber	**2JA 344 170-031**
24 V, LED red	**2JA 344 170-101**
24 V, LED blue	**2JA 344 170-111**
24 V, LED white	**2JA 344 170-121**
24 V, LED yellow	**2JA 344 170-131**

Variant	
12 V, white LED, with a silver instead of a grey frame	**2JA 344 170-201**
12 V, white LED, with a black instead of a grey frame	**9AB 344 173-011**

This LED product has the following features:



LED reading light, flexibly adjustable arm	
Number of LEDs	1 white Power LED
Electrical connection	electrical, using a cable 150 mm long
Illumination	optimal for map-reading
Illumination angle	38°
Illuminance at 0.7 m	110 lx
IP Class (Protection)	IP 53
Power consumption	2.5 W (0.20 A at 12 V)
Lens	patterned
Installation	Surface mounting

Finisher colour white1)	
150 mm	**2JA 343 720-011**
400 mm	**2JA 343 720-111**

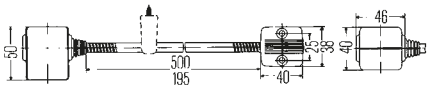
Finisher colour black[1)]	
150 mm	**2JA 343 720-021**
400 mm	**2JA 343 720-121**

Finisher colour silver[1)]	
400 mm	**2JA 343 720-191**

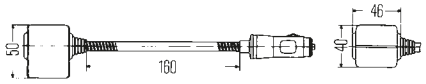
with plug for cigarette lighter (150 mm)	
Finisher colour black	**2JA 343 720-081**

[1)] further finisher colors available on request.

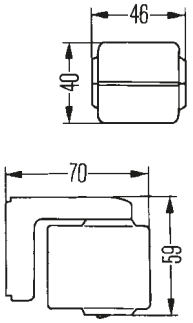
a)



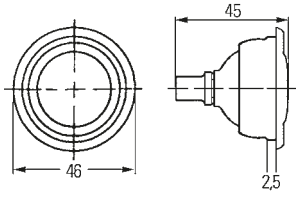
b)



Spotlight reading light	
Number of light sources	1 halogen bulb 12 V / 5 W
Feature	with flexible metal arm
Light source	strong and glare-free
Power consumption	5 W (0.50 A at 12 V)
Lens	Clear
Scope of supply	with bracket for permanent surface mounting
Installation	Surface mounting
Voltage	12 V
a) For fixed installation	
500 mm	**2AB 004 532-001**
195 mm	**2AB 004 532-011**
b) With plug for cigarette lighter	
160 mm	**2AB 004 532-021**
Accessories	
Lens, red	**9EL 128 922-011**
Spare parts	
Bracket	**9XB 136 202-005**



Reading light	
Number of light sources	1 halogen bulb
Electrical connection	250 mm long cable
Feature	integrated ON/OFF switch in light head, rotatable (340°), swivellable (330°)
Housing	black
Power consumption	5 W (0.42 A at 12 V)
Lens	red or white replaceable
Installation	Surface mounting
Voltage	12 V
	2AB 004 532-102



Reading light	
Number of light sources	1 bulb WY5W 12 V, amber
Electrical connection	via cables with tin-plated cable ends, 130 mm length
Housing	black[1)]
Power consumption	5 W (0.41 A at 12 V)
Lens	Clear
Installation	Installation, snap-on fitting
Voltage	12 V
	2AB 004 074-027
Bulb WY5W 12 V	**8GB 003 594-541**

[1)] variant with grey housing and black switch available on request.

Electronic components – benefit from our unique experience and innovative power.

HELLA is one of the first ports of call for the international supplier industry not just in lighting technology but also in electronic components.

One thing all our products have in common is that their quality and performance are carefully optimised to match our customers' special requirements.

Product ranges, Special OE Electronics

Energy Management

Careful use of energy by appropriately influencing the consumer:

These electronic systems make it possible to monitor and plan the energy budget and maintain the power supply.

Intelligent Battery Sensors

Voltage stabilisers

Drive Train

Increasing safety and efficiency of the overall system and preventing failures:

These electronic systems make it possible to precisely measure and record measured value in the engine compartment and drive train.

Oil pressure sensors

Oil level sensors

Accelerator pedal sensors

Accelerator pedal sensors

Components

Provide added convenience with compact solutions in a variety of areas:

These electronic systems are generally invisible little helpers for the various automatic processes within the vehicle.

Turning angle sensors

Remote controls

Rain light sensors

Actuators

Temperature sensors

Lighting Electronics

Provide added convenience with compact solutions in a variety of areas:

These electronic systems are generally invisible little helpers for the various automatic processes within the vehicle.

LED flasher units for towing vehicles

LED light control unit

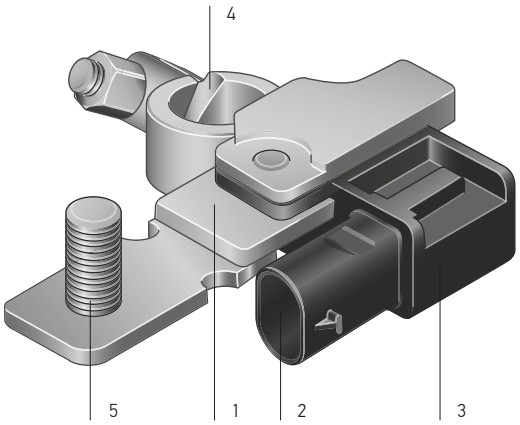
Control unit for flashing side marker lights

Current monitoring control unit

Intelligent Battery Sensors

Product characteristics

- → Accurate measurement of voltage, current and temperature battery parameters
- → Determination of battery charging parameter State of Charge (SoC), State of Health (SoH) and State of Function (SoF)
- → Simple electrical and mechanical integration



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

The IBS reliably and accurately measures the battery parameters: voltage, current, and temperature. Information about the battery's state of charge (SoC), state of health (SoH) and predicted state of function (SoF) is calculated algorithmically from the measurements. The IBS is designed for use in starter, gel and AGM batteries to monitor in-vehicle starter or consumer batteries. The IBS can be directly integrated into the vehicle electrical system with the standardised LIN protocol.

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

In addition to the terminal, the mechanical portion of the battery sensor consists of shunt **(1)** and ground bolt **(5)** components. The shunt is attached to the vehicle's load path and is used as a measuring resistor for indirect current measurement. On the ground bolt **(5)**, the existing ground cable can be conveniently attached, for example, to the optionally available battery pole adapter.

The electronics are located in a molded housing **(3)** with plug connector **(2)**, functioning as the interface to the energy management system. The communication interface to the higher-level control unit is the LIN protocol. 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 main electronics component for recording measured values and processing them further is the ASIC. Measured value recording in the ASIC is a precision sensor system that represents the central function of the intelligent battery sensor and is used to record physical variables such as current, voltage and temperature.

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

State of charge: The state of charge (SoC) describes the current charge status of the battery.

The SoC is defined as: SOC [%] = dischargeable capacity/ nominal capacity

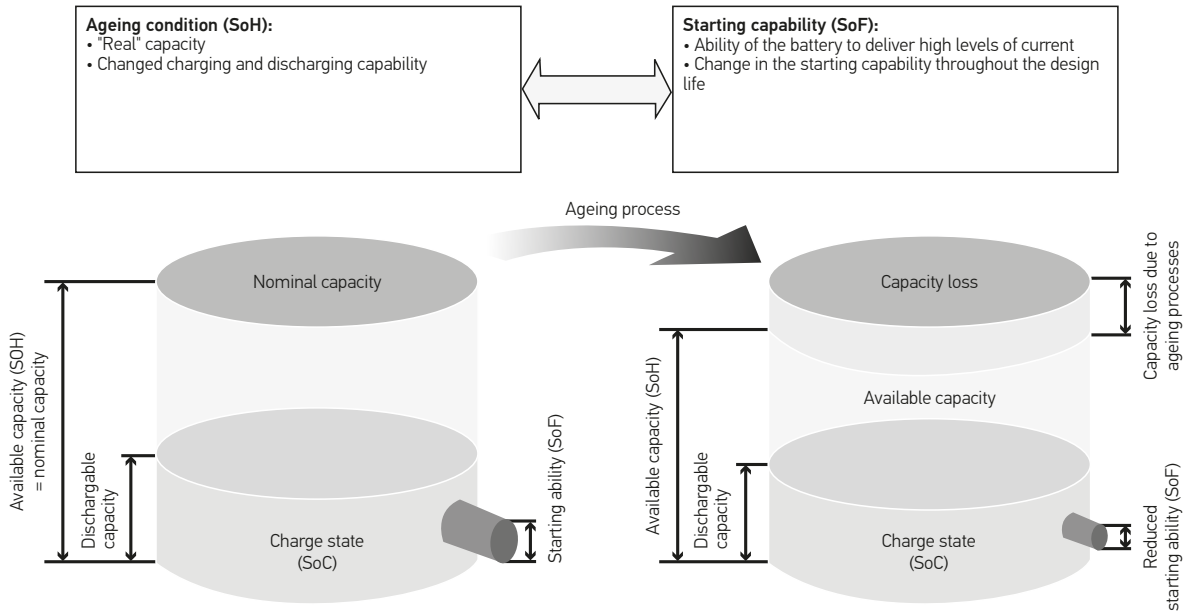
State of Health: the State of Health (SoH) indicates the battery's usage condition.

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 through lengthy use.

State of Function: The State of Function (SoF) describes the future starting ability of the motor based on the actual measured current and the voltage.

Monitoring of different battery states



Intelligent Battery Sensors

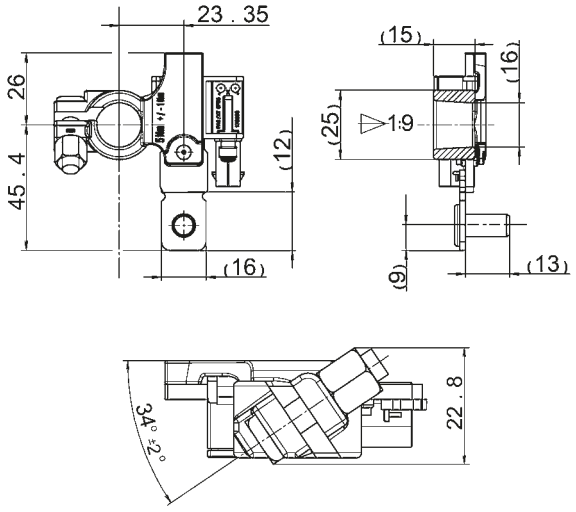
Part number 6PK 010 842-001

Technical data

Operating voltage	6 – 16,5 V
Reverse-polarity voltage	- 16,5 V / 60 s
Test voltage	13,8 – 14,2 V
Operating current1)	≤ 15 mA (normal mode)
Idle current1)	≤ 120 µA (sleep mode)
Nominal resistance (shunt)	100 µΩ
Permanent load current2)	± 155 A
Maximum current2)	± 1.500 A (500 ms)
Operating temperature	- 40°C to + 115°C
Re-heating temperature	+ 105°C to + 120°C
Storage temperature	- 20°C to + 55°C
Defined charge controller	18 V / 60 min
Jump start	27 V / 1 min
Load Dump	35 V / 400 ms
Output signal	LIN 2.0 or higher
Protection class	IP 6K7
Permissible pole terminal tightening torque	5 Nm +/- 1 Nm
Threaded bolt, ground connection	M8
Weight	125 g
Max. battery capacity3)	249 Ah
Mating connector4)	Hirschmann 872-858-565

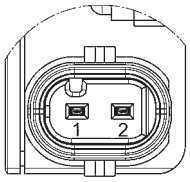
1) Condition: $T_a \leq 40°C$; $U_b = 14$ V
2) Typical condition: $T_a \leq 105°C$; $U_b = 14$ V
Typical ground cable: 35 mm2
Approved for max. 500 ms.
Other configurations upon request.
3) Expandable upon request.
4) This accessory is not included.
It may be purchased from Hirschmann Automotive and/or TE Connectivity.

Technical drawing



Bolt tightening torque (terminal) 5 ± 1 Nm

Pin assignment



Pin 1: supply voltage
Pin 2: connection for LIN bus

Intelligent battery sensors 24 V

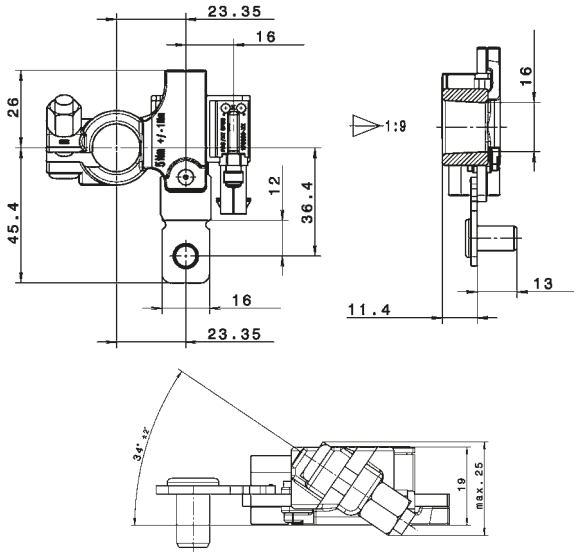
Part number 6PK 011 700-001

Technical data

Operating voltage	7,5 – 32 V
Reverse-polarity voltage	- 28 V / 60 s
Test voltage	27,8 – 28,2 V
Operating current1)	≤ 16 mA (normal mode)
Idle current1)	≤ 255 µA (sleep mode)
Nominal resistance (shunt)	68 µΩ
Permanent load current2)	± 200 A
Maximum current2)	± 2.000 A (20 ms)
Operating temperature	- 40°C to + 80°C
Re-heating temperature	+ 105°C to + 120°C
Storage temperature	- 20°C to + 50°C
Defined charge controller	36 V / 120 min
Jump start	48 V / 2 min
Load Dump	58 V / 500 ms
Output signal	LIN 2.0 or higher
Protection class	IP 6K7
Permissible pole terminal tightening torque	5 Nm +/- 1 Nm
Threaded bolt, ground connection	M8
Weight	119 g
Max. battery capacity3)	255 Ah
Mating connector4)	Hirschmann 872-858-546

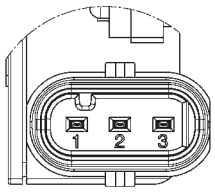
1) Condition: $T_a \leq 40°C$; $U_{bg} = 24$ V; $U_{brun} = 28$ V
2) Typical condition: $T_a \leq 80°C$; $U_b = 24$ V
Typical ground cable: ≥ 70 mm2
Approved for max. 500 ms.
Other configurations upon request
3) Expandable upon request.
4) This accessory is not included.
It may be purchased from Hirschmann Automotive.

Technical drawing



Bolt tightening torque (terminal) 5 ± 1 Nm

Pin assignment



Pin 1: partial voltage 12 V
Pin 2: connection for LIN bus
Pin 3: supply voltage 24 V.

DC/DC voltage stabiliser

Product characteristics

- For 12 V Systems
- Output power: 400 W
- System stabiliser with temporary voltage drop

Application

The DC/DC converter is also referred to as voltage stabiliser. In the event of a temporary voltage drop (when the engine starts), it maintains the output voltage to the electrical subsystem (e.g. with start/stop system).

This primarily affects the elements of the vehicle electrical system that are noticeable by the driver but are not critical from a safety perspective. Included are the radio and navigation system (infotainment systems) as well as various terminals (e.g. for agricultural and construction machinery) and information systems (e.g. in buses).

Basic design and function

The voltage stabiliser is activated by the ignition. The subsystem of the vehicle electrical system is coupled via a low-impedance line with the main system as long as stabilisation is not required.

The voltage drop that occurs at engine startup is signaled by the start signal. The subsystem and main system are then decoupled from each other and stabilisation is carried out.

Optionally, the device can be equipped with a LIN diagnostic interface.

DC/DC voltage stabiliser 400 W

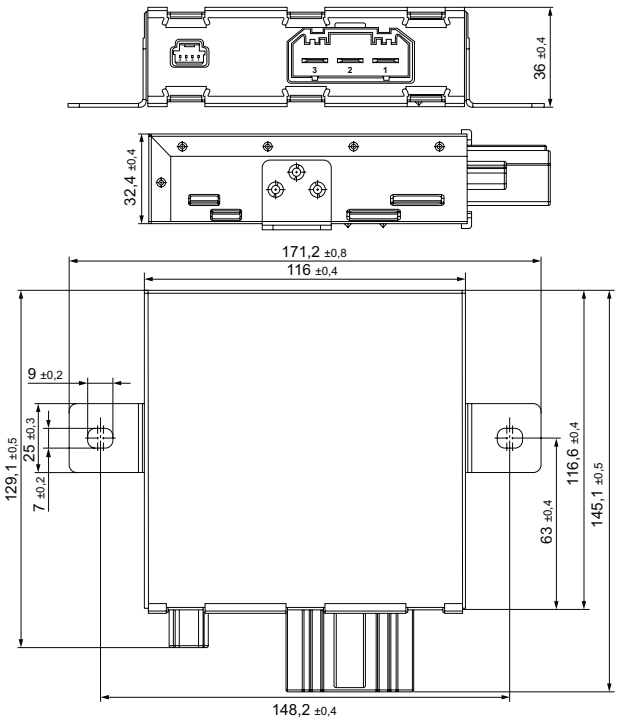
Part number 8ES 312 331-101

Technical data

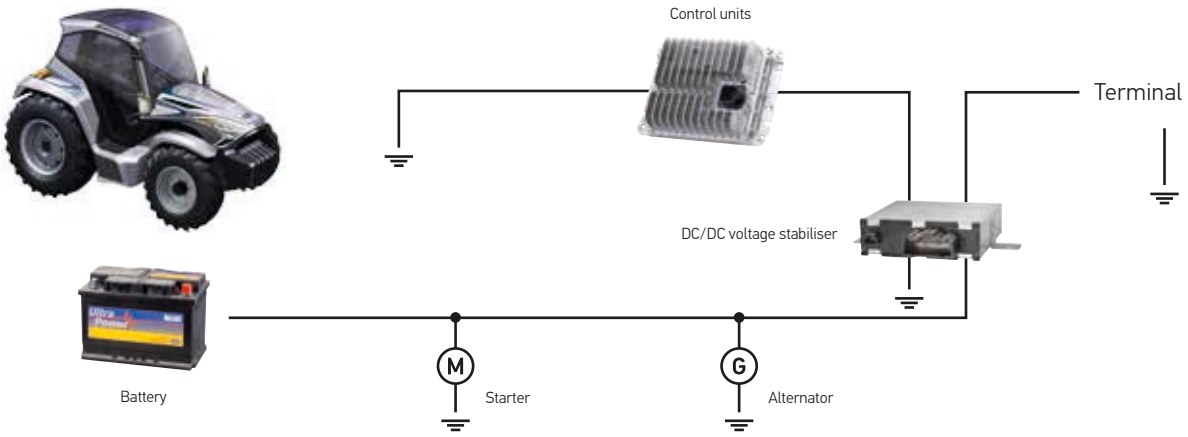
Operating temperature	-40 to + 85°C (- 40 °C to -20 °C bypass mode)
Supply voltage	+ 6.0 V to +18 V
Stabilization range	+ 6.0 V to +12 V
Output voltage	(boost mode) 12 V +/- 0.5 V Ripple < 200 mV
Power	400 W
Storage temperature	-40 to +105 °C
Cooling	Convection
Weight	approx. 370 g
Mating connector1)	Mating connector 1: 1473672-1 Mating connector 2: 1897519-1
Output current	34 A
Efficiency	boost mode 85 % @ U >8 V bypass mode > 99 %
Protection class	IP 5K0

1) This accessory is not included.
May be purchased from TE Connectivity.

Technical drawing



Functional diagram



Level sensors

Recording the liquid level (static and dynamic)

Product characteristics

- → Continual measurement of the engine oil level in the static and dynamic range
- → Compact sensor architecture with a multi-chip module
- → Integrated temperature sensor
- → Immediate measurement after switch-on

Application

Oil sensors in vehicles ensure that the engine cannot run with too little oil without this being noticed. The tried-and-trusted technology of ultrasonic sensors works on the running-time principle and records the filling level continuously during the trip. When the engine is running (dynamic measuring range), the filling level is significantly lower than the filling level when the engine is at a standstill (static measuring range). In a mobile engine the dipstick can record the oil level only statically. This oil-level sensor is able to measure the oil level continuously, i.e., both, in dynamic and static area. It thus provides information about the oil level over the entire period of engine operation, which will often be several hours in the case of construction machinery, tractors and fork-lifts.

The sensor monitors the oil level continuously during the entire engine operation, thus preventing the oil level from falling below its minimum, which in turn means that the oil film is never broken (which would lead to engine damage).

Marginal influences such as an inclined position of the vehicle and lateral and longitudinal acceleration are compensated by an averaging out in the vehicle's electronic control unit.

Use of the oil level sensor with special media, e.g. transmission and hydraulic oils require prior testing and approval by HELLA.

Basic design and function

The sensor architecture of the PULS (Packed Ultrasonic Level Sensor) oil level sensor consists of one single multi-chip module that integrates the ultrasonic sensor, the temperature sensor and an ASIC (Application Specific Integrated Circuit). The compactness of our sensors increases their impact and vibration resistance compared with sensors that are fitted with numerous electronic components. The ultrasonic sensor integrated into the multi-chip module emits a signal that is reflected by the interface between the engine oil and the air.

The time taken by the signal is measured and the filling level is then calculated using the speed of sound in the medium. The damping cup attached above the multi-chip module serves to calm the medium (particularly) in the dynamic measuring range. The damping cup has openings at the base and at the tip, which allow permanent oil flow.

Flush mounting

The sensor is designed to be vertically flush mounted from below into the bottom of the oil pan. The oil level sensor is usually located on a ledge in the oil pan to protect the sensor sub-structure. This installation position, combined with the openings which make a permanent flow of oil possible, prevent sludge forming within the damping cup.

Level sensors

Recording the liquid level (static and dynamic)
Part number 6PR 010 497-501

Technical data	
Operating voltage (for oil level measurement)	9 – 16 V
Operating voltage (for temperature measurement)	6 – 16 V
Reverse-polarity voltage	- 14 V / 60 s
Overvoltage	15 s at 28 V 250 ms at 32 V
Measuring range (static and dynamic)	18 – 118,8 mm
Operating temperature	- 40 °C to + 160 °C
Operating temperature (for oil level measurement)1)	- 10°C to + 150°C
Re-heating temperature	Max. 5,700 h at 125 °C Max. 240 h at 145 °C Max. 60 h at 160 °C
Storage temperature	- 40°C to + 150°C
Current consumption	4 mA
Max. power consumption during measurement	50 mA
Report2)	PWM
Mating connector3)	09 44 13 82
Protection class	IP 6K9K
Weight	76 g ± 3 %
Viscosities	1 mm2/s to 1,300 mm2/s

1) Level output above - 10 °C. At temperatures below -10 °C, an "empty" signal is sent (18 mm) together with the diagnostic signal "out of tolerance".
2) LIN available upon request.
3) This accessory is not included. It can be purchased from Kostal.

New generation sensor

This sensor features an improved meander structure for optimised behaviour under dynamic conditions in oil as well as improved response times.

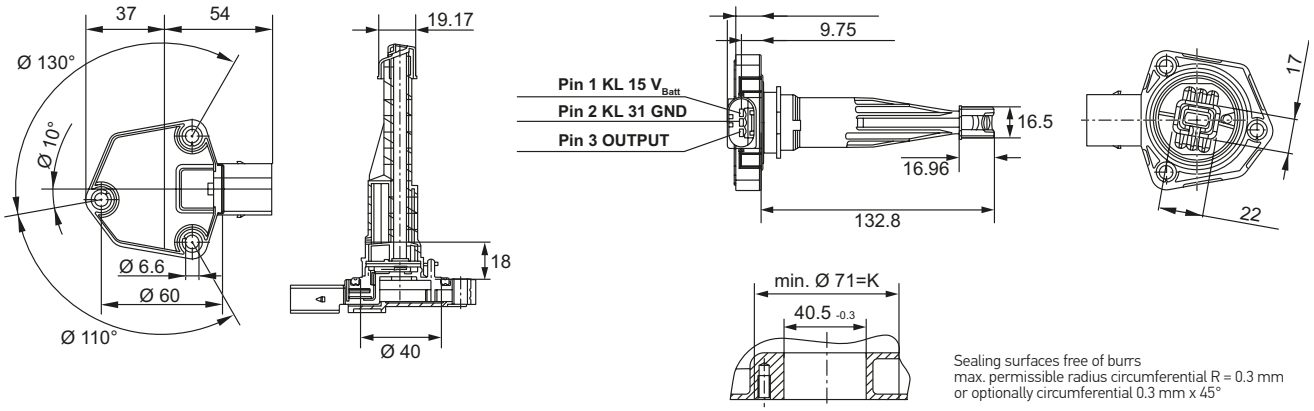
Tolerance of level measurement

Oil level	Temperature range	Operating voltage	Tolerance
18 to 118.8 mm	-10°C ≤ T <30°C	9 to 16 V	± 4 mm
18 to 118.8 mm	30°C ≤ T <150°C	9 to 16 V	+ 2 mm

Tolerance of temperature measurement

Oil level	Temperature range	Operating voltage	Tolerance
All	60°C ≤ T <120°C	6 to 16 V	± 4 K
All	-40°C ≤ T <60°C	6 to 16 V	± 3 K
All	120°C ≤ T <160°C	6 to 16 V	± 3 K

Technical drawing



Sealing surfaces free of burrs
max. permissible radius circumferential R = 0.3 mm
or optionally circumferential 0.3 mm x 45°

Oil pressure and temperature sensors

Measuring the oil pressure and oil temperature

Product characteristics

- → Continuous measurement of oil pressure
- → Continuous measurement of the oil temperature
- → Robust and reliable design

Application

The oil pressure and temperature sensor OPS+T is used to measure the absolute oil pressure and the oil temperature directly in the main oil channel behind the oil filter.

It uses the pressure value for demand-responsive control of mechanical or electrical oil pumps. This minimises CO_2 emissions and reduces fuel consumption.

Recording the temperature is used as input data for thermal management of the engine. The two signals are evaluated in the higher-level control unit.

Usable in harsh environments thanks to the integration of the multi-chip module.

Basic design and function

The OPS+T is based on a multi-chip module (MCM), consisting a piezo-resistive cell for measuring the absolute pressure as well as an ASIC for the digital evaluation and further processing of the information. The oil temperature can also be established using a diode which is integrated in the MCM. The PWM output signal is used to transmit both the oil pressure as well as the oil temperature. The engine control unit (ECU) evaluates the PWM output signal from the sensor. The patented technology guarantees leak tightness in view of oils.

Oil pressure and temperature sensors

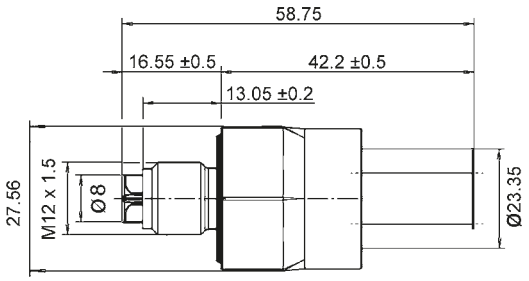
Measuring the oil pressure and oil temperature
Part number 6PR 010 378-101

Technical data

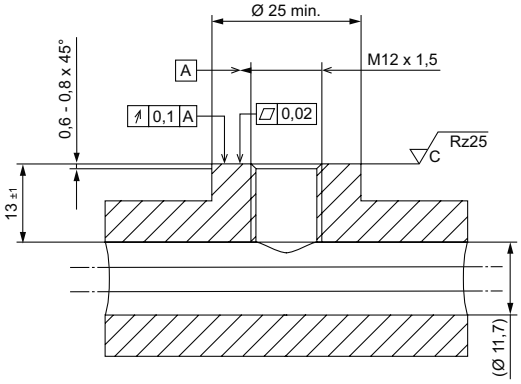
Temperature range	-40°C to +150°C
Max. temperature	160°C (max. 100 h)
Supply voltage	4,75 – 5,25 V
Output signal	PWM
Response time	2 ms
Sampling frequency	< 3 kHz
Max. operating pressure	40 bar
Overpressure	60 bar
Pressure measuring range	0.5 to 10.5 bar
Temperature measuring range	-40 °C to +160 °C
Protection class	IP 69K
Mating connector1)	872-597-501, 872-597-506, Coding A

1) This accessory is not included.
It may be purchased from Hirschmann Automotive.

Technical drawing



Installation space



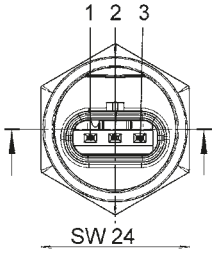
Tolerance band for pressure measurement

Temperature	0,50 – 3,00 bar	3,00 – 5,50 bar	5,50 – 10,50 bar
70 to 160 °C	+/- 0,15 bar	+/- 0,20 bar	+/- 0,30 bar
20 to 70 °C	+/- 0,15 bar	+/- 0,20 bar	+/- 0,30 bar
0 to 20 °C	+/- 0,20 bar	+/- 0,25 bar	+/- 0,35 bar
-40 to 0°C	+/- 0,40 bar	+/- 0,40 bar	+/- 0,50 bar

Tolerance band for temperature measurement

Temperature	Accuracy
135 to 160 °C	+/- 1 K
20 to 135 °C	+/- 2 K
-40 to 20°C	+/- 3 K

Pin assignment



Pin 1: supply
Pin 2: ground
Pin 3: exit

Floor-mounted pedals

Product characteristics

- → Contact-free measuring principle
- → Slim and 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

Application

The floor-mounted pedal is suitable for the driver cabins of agricultural and construction vehicles. Thanks to the wear-free measurement principle of HELLA's in-house developed CIPOS ® sensors (see description of the design and function of the angular rotation sensors) and their extremely low level of mechanical wear, this version is particularly suitable for contact-type pedals that effect frequent small movements.

Basic design and function

Housing and the pedal plate are made completely of recyclable glass fibre reinforced plastic. The sensor is completely waterproof, enclosed in housing within the overall dimensions of the device. The actuation force is generated by two springs, which both return separately. The electric output signal is extracted using the CIPOS® measuring principle. For this purpose, a sheet metal cursor is routed from the pedal arm to a guide rod via sensor conductor paths on the measuring board. There, two galvanically separated sensors each generate an output signal.

Floor-mounted pedals

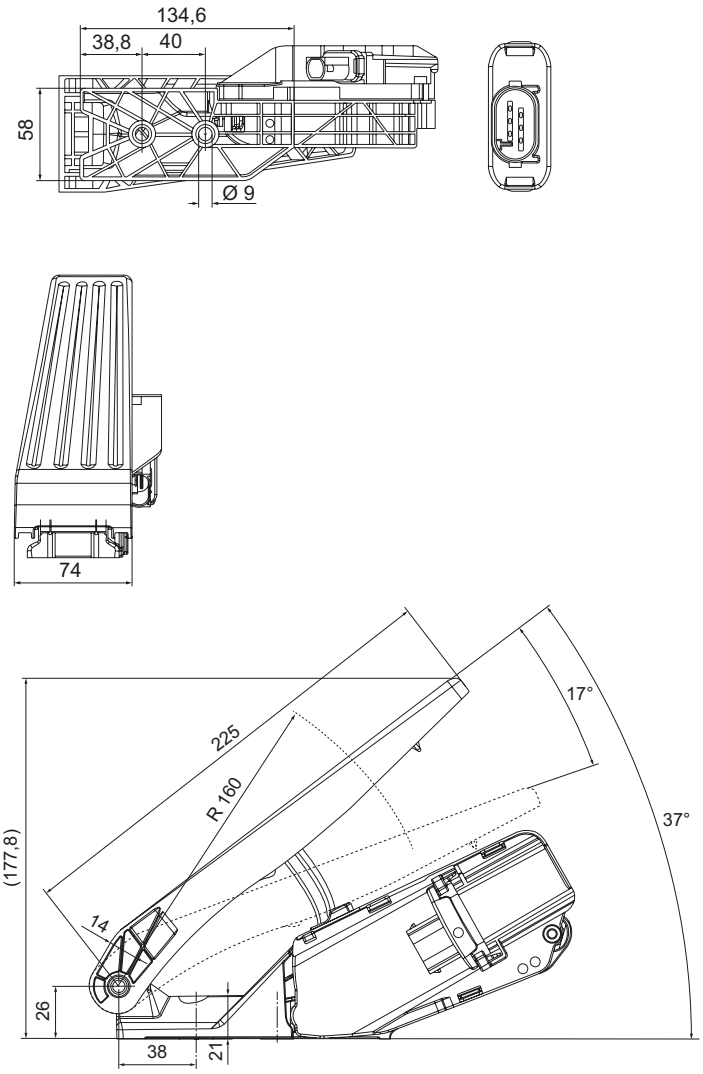
Part number 6PV 312 010-107

Technical data

Operating voltage	5 V ± 6 %
Power consumption per channel	max. 10 mA
Overvoltage resistance, duration t → ∞	16 V
Initial force	15 N
Final force	25 N
Actuation angle	17°
Resolution	0,04°
Output signal	2 x analog ratiometric, 2nd channel half pitch
Linearity	≤ 1,5 %
Synchronisation	≤ 3 %
Idling voltage	15 % / 7,5 %
Full throttle voltage	80 % / 40 %
Load resistor	typ. 10 kΩ to 100 kΩ
Load capacity	max. 100 nF
Filter constant in the control unit	1 ms ± 5 %
Signal output current	max. 1 mA
Operating temperature	-40°C to +85°C
Storage temperature	-40°C to +105°C
Degree of protection (electronic)	IP 6K9K
Housing material	PBT, PP GF30; PA, GF 40
Mating connector1)	1-967616-1
Weight	≤ 500 g
Vibration resistance	4,4 g
Actuations	at least 3.5 m.
EMV	CISPR 25, Class 5; electrical and magnetic fields
ESD	4 kV, 8 kV, 15 kV

1) This accessory is not included.
May be purchased from TE Connectivity.
Gold-plated contacts and the individual wire seal are required.

Technical drawing



Pendant pedals

Product characteristics

- → Contact-free measuring principle
- → Slim and 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

Application

The floor-mounted pedal is suitable for the driver cabins of agricultural and construction vehicles. Thanks to the wear-free measurement principle of HELLA's in-house developed CIPOS ® sensors (see description of the design and function of the angular rotation sensors) and their extremely low level of mechanical wear, this version is particularly suitable for contact-type pedals that effect frequent small movements.

Basic design and function

Housing and the operating lever are made completely of recyclable glass fibre reinforced plastic. The sensor is inserted into a slot of the device, fully waterproof, and does not protrude from the package space. The actuation force is generated by two springs, which both return separately. The electric output signal is extracted using the CIPOS® measuring principle. For this, a cursor plate is guided from the pedal arm to the measuring board via sensor conducting paths. There, two galvanically separated sensors each generate an output signal. Different output signals can be generated depending on the measuring board used. Furthermore, it is possible to program individual characteristic curves upon request.

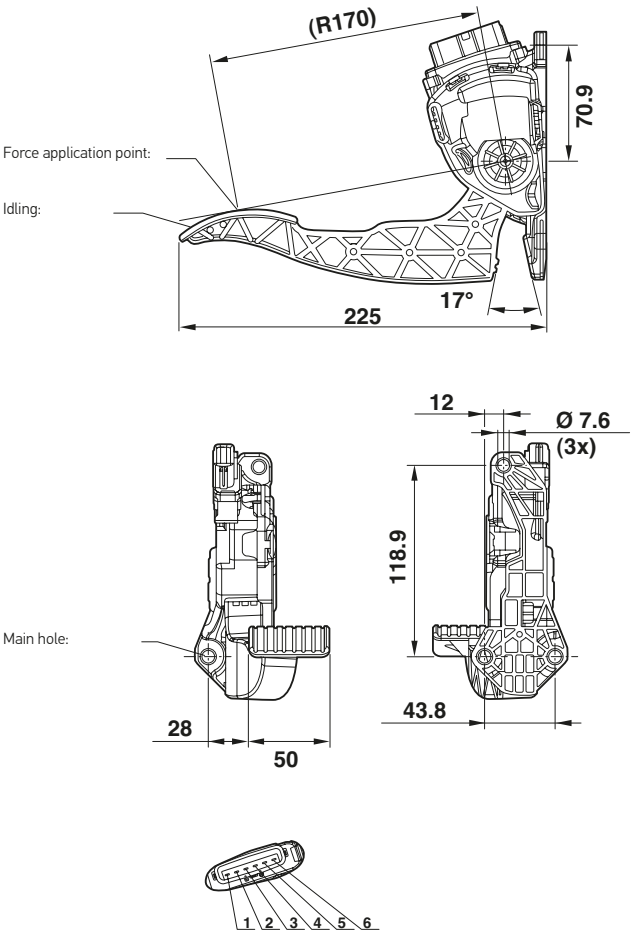
Pendant pedals

Part number 6PV 009 591-011

Technical data	
Operating voltage	5 V ± 6 %
Power consumption per channel	max. 10 mA
Overvoltage resistance, duration t → ∞	16 V
Initial force	24 N
Final force	42 N
Actuation angle	17°
Resolution	0,04°
Output signal	2 x analog ratiometric, 2nd channel half pitch
Linearity	≤ 1,5 %
Synchronisation	≤ 3 %
Idling voltage	10 % / 5 %
Full throttle voltage	90 % / 45 %
Load resistor	typ. 10 kΩ to 100 kΩ
Load capacity	max. 100 nF
Filter constant in the control unit	1 ms ± 5 %
Signal output current	max. 1 mA
Operating temperature	-40°C to +85°C
Storage temperature	-40°C to +105°C
Degree of protection (electronic)	IP 6K9K
Housing material	PA; PBT; GF30 to GF 50
Mating connector1)	7283-1968-30
Weight	≤ 400 g
Vibration resistance	4,4 g
Actuations	at least 3.5 m.
EMV	CISPR 25, Class 5; electrical and magnetic fields
ESD	4 kV, 8 kV, 15 kV

1) This accessory is not included.
It may be purchased from Yazaki.
Gold-plated contacts and the individual wire seal are required.

Technical drawing



Radio-controlled systems

Switching on and off and/or opening and locking

Product characteristics

Electronic radio transmitter key:
- → Unlocking cab doors /covers
- → Controlling lamps/worklights
- → Activation/deactivation of an electronic immobiliser via transponder
- → Robust design

Application

The radio control system has been specially developed for use in tough operating conditions (agricultural and construction machinery, trucks). 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 the customer's requirements. The robust design has been specially developed for use in agricultural and construction vehicles. An additional control unit which sends up to four output signals enables lamps to be activated, e.g. worklights or beacons. HELLA's radio control system can easily be used to activate direction indicators and to release or lock covers to engine compartments or toolboxes, for example. The design can be customised on request, such as by incorporating customised emblems.

Basic design and function

In terms of its electronic function, the radio transmitter consists of the "radio transmitter electronics" and the "transponder." The transponder responsible for the immobiliser function is independent from the radio transmitter electronics and can be customised.

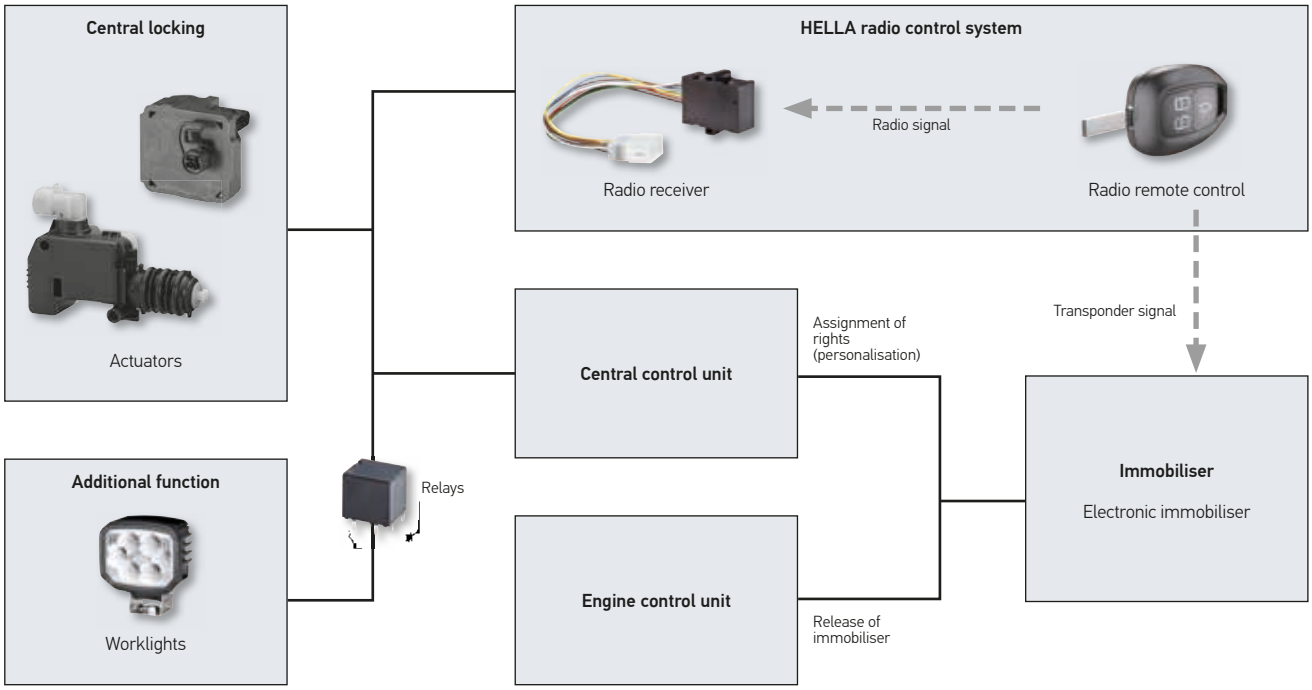
The radio transmitter electronics are mounted on a double-sided printed circuit board. In addition to the radio transmitter electronics themselves, the printed circuit board also contains the "Lock/Unlock" button and, depending on the variant, another button (additional function). Spring contact elements 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 and updated 128 bit encryption. If the receiver control unit of the radio remote control positively decrypts the data, it activates the output signals of the control unit.

The radio control system can be used in every European country and also in North America (USA + 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 scope of delivery for the radio transmitter electronics. The key bit is usually mounted (by using a special mounting device) either at the customer's premises or at the manufacturer's.

Two radio transmitter keys are "taught-in" and assigned to the device during production of the radio receiver. Teaching additional radio transmitter keys in the field requires at least one functioning, taught-in key. Up to 7 radio transmitter keys can be taught in. If the maximum number of radio transmitter keys has already been taught in, the last key place is overwritten when teaching in another key.

Functional diagram



Radio-controlled systems

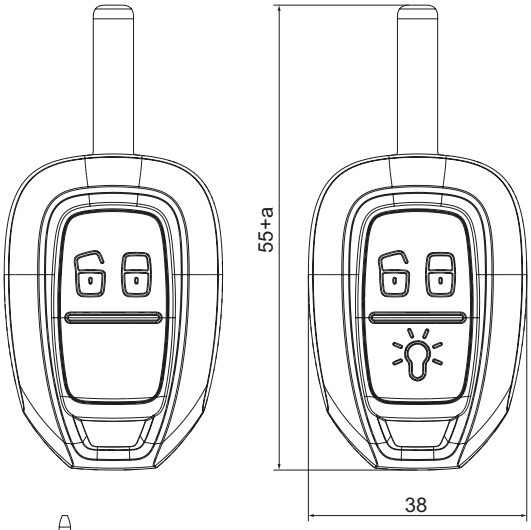
Switching on and off and/or opening and locking
Basic version Part number upon request
Extended version Part number 5FA 012 485-817

Technical data for radio transmitter

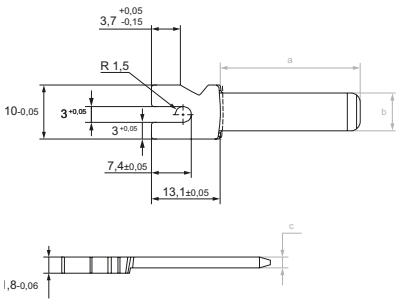
Key bit – joining force	max. 350 N
Key bit – extraction force	> 180 N
Torque around the key roll axis	3 Nm
Torque around key width axis	4 Nm
Separation of housing parts, joining/ separating force:	110 N (in new condition)
Housing cover	PA66+PA6I/X-GF50 and TPU
Housing base	PA6-GF30
Contact elements	X10CrNi 18-8
Customer emblem	PU emblem, customized
Button field	Hytrel black
Transmission frequency	434,42 MHz
Transmission power	30 µW ERP
Battery type1)	CR2032
Service life of battery	100,000 clicks (approx. 3 years)
Max. range2)	119 m
Min. range2)	51 m
Average range2)	70,5 m
Operating temperature	- 20°C to + 60°C
Storage temperature	- 20°C to + 60°C
Protection class	IP 6K7 and IP X5

1) A battery is included as part of the radio transmitter.
2) Ranges are dependent on installation position and interference factors. The values specified are merely examples and must be validated for each new application.

Technical drawing



Interface to key bit
(a, b and c dimensions are customer-specific)



Blind plug

Receiver control unit

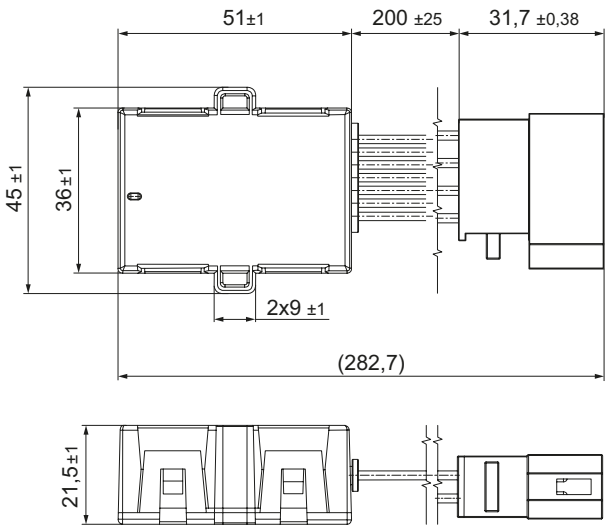
Part number upon request

Technical data for radio receiver	
Operating voltage	6 – 32 V
Power consumption	11 mA (signal output not activated)
Idling current	< 2 mA
Min. voltage:	6 V
Max. voltage	58 V for 250 ms
Rated voltage	12 / 24 V
Test voltage	27,6 ± 0,4 V
Overvoltage	36 V (at 40 °C, 1 hour)
Housing cover	Recycled PC
Housing base	Recycled PC
Male connector housing	PBT-GF20, V0
Operating temperature	-40°C to +80°C
Storage temperature	-40°C to +90°C
Protection class	IP 5K0
Length	51 mm
Width	45 mm
Height	21,5 mm
Mating connector1)	17848 000 000

1) This accessory is not included.
It may be purchased from Lear.

Technical drawing

Receiver control unit



Basic variant

Pin configuration	Function	Description
1 Positive pole	Input	Power supply (+ 12/24 V)
2 GND	Input	Power supply (ground)
3 Door control module	Output	low active (<300 mA), signal duration of 3.5 s if button 1 is pressed
4		Not assigned
5 Reserve	Output	High active (<300 mA), signal duration of 0.5 s if button 2 is pressed
6		Not assigned
7		Not assigned
8		Not assigned

Extended variant

Pin configuration	Function	Description
1 Positive pole	Input	Power supply (+ 12/24 V)
2 GND	Input	Power supply (ground)
3 Mode:	Input signal	mode = low or mode = high (high at 70% of vehicle electrical system voltage)
4		Not assigned
5 Door 1	Output	high active (< 300 mA) when pressing button 1; mode = low: signal duration 3 s, mode = high: signal duration 0.5 s
6 door 2	Output	High active (< 300 mA) when pressing button 2; Mode = low: signal duration 3 s, Mode = high: signal duration 0.5 s
7 Wake-up function	Output	High active, (<300 mA), signal duration of 3.5 s
8 Reserve	Output	High active (<300 mA), signal duration of 3 s if button 2 is pressed

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 blind plugs made from hard plastic. This enables the radio transmitters to also be operated without a key bit.

Rain/light sensor for vehicles with steeply raked windshields

Product characteristics

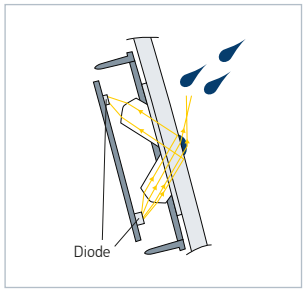
- → The fourth generation in a long line of rain sensors from HELLA
- → Optics specially designed for vehicles with steeply raked windshields (e.g. agricultural machinery, construction machinery)
- → Dual function: Rain and light detection (surroundings and tunnel detection)
- → Optimised design – extremely compact package space

Basic design and function
This new sensor offers the user five functions in one product:

Rain sensor
The rain sensor is used to recognise different rain situations in the sensor range and activates the front windshield wiper accordingly. Thus, manual intervention by the driver is now more or less unnecessary.

Light sensor
As a light sensor, it activates the switching on and off of the dimmed headlights in different light conditions or in special situations e.g. in tunnels.

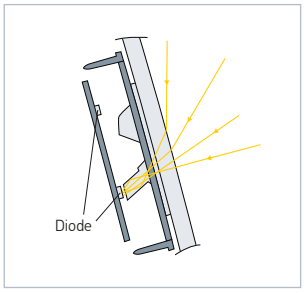
Operating principle of rain detection:



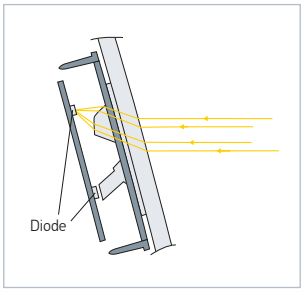
Rain sensor

Use of the successfully field-proven principle of total reflection. The large, homogenous measuring section guarantees good starting behaviour and comfortable wiper performance. The sensor also has enhanced functions for detecting streaks and dirt.

Operating principle of light detection:



Ambient light sensor

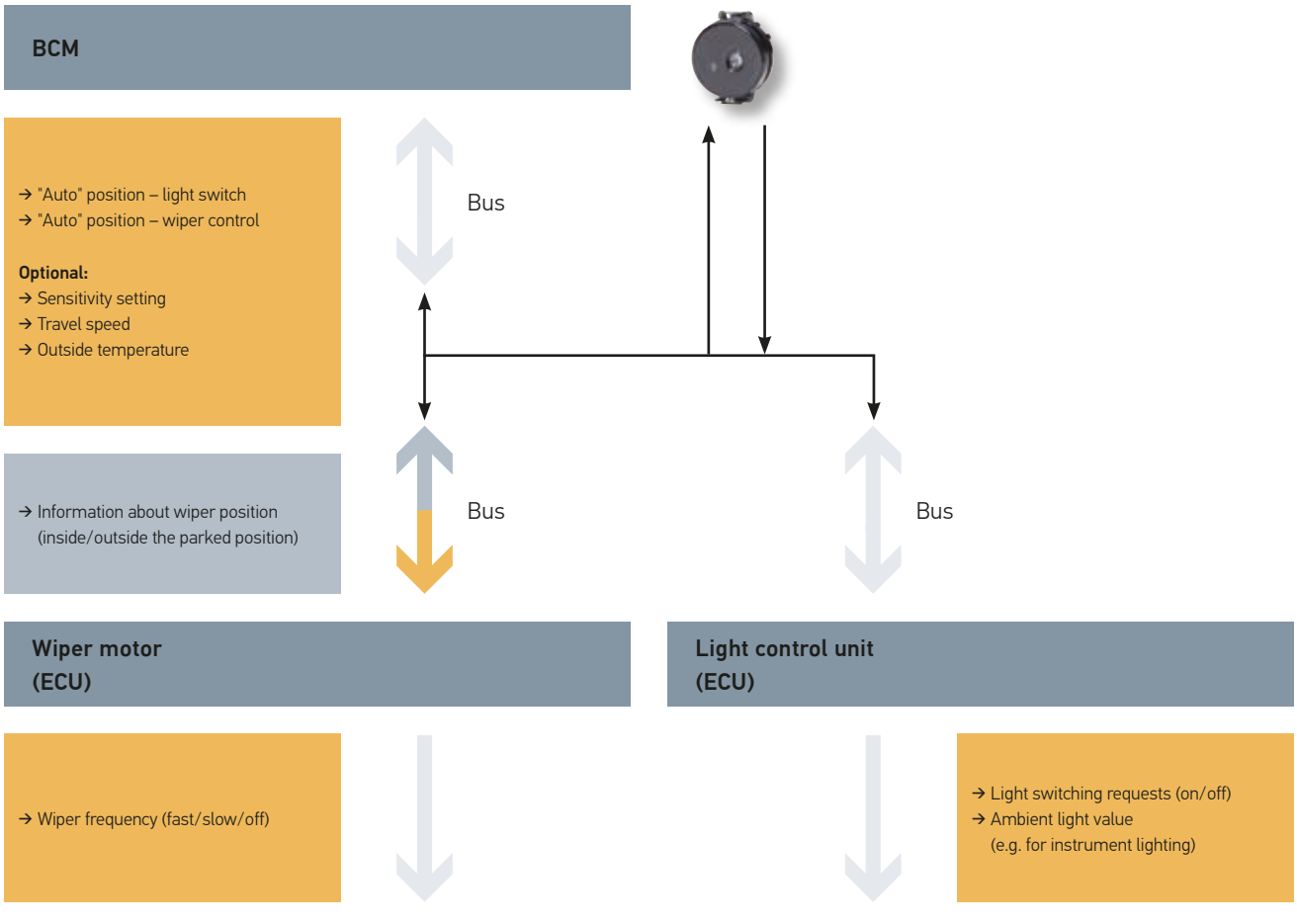


Front light sensor

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

Interfaces / functional description

The following overview illustrates an option for how the sensor communicates with other system components in the vehicle via the LIN interface. Here the sensor is switched on by the overriding control unit and supplied with voltage. It thus provides the system with information, however does not have direct access to the system itself.



Wiper function control

Main/Worklights

Rain/light sensor for vehicles with steeply raked windshields

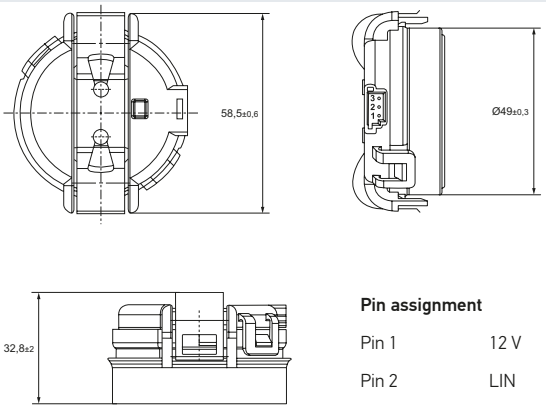
Recording environmental properties
Part number upon request

Technical data

Operating temperature	-40 to +85 °C
Storage temperature	-40 to +100 °C
Protection class	IP 50
Operating voltage	9 – 16 V
Rated voltage	12 V
Overvoltage	24 V
Rated current consumption	< 50 mA
Communication interface	LIN 2.1
Weight	≤ 42 g
Mating connector1)	114 18063-18, coding A
Windshield requirements2)	
Spectral working range	400 – 1.050 nm
Permissible transmission of the windshield	23 – 80 % (at 800 – 1,100 nm)
Permitted windshield thickness	6 – 9 mm
Permitted windshield angle	80° – 90°
Permissible windshield radius in the area of the sensor	R => 1.400 mm
Diameter of the black print section	40 +/- 0,2 mm

1) This accessory is not included.
May be purchased from TE Connectivity.
2) Other windshield configurations available upon request.

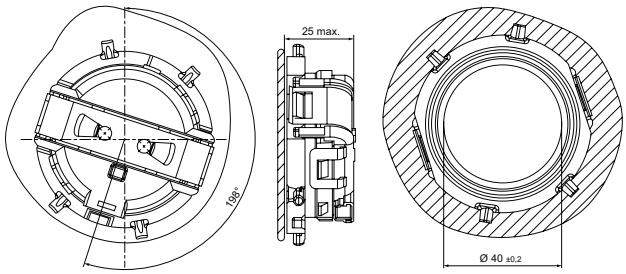
Technical drawing



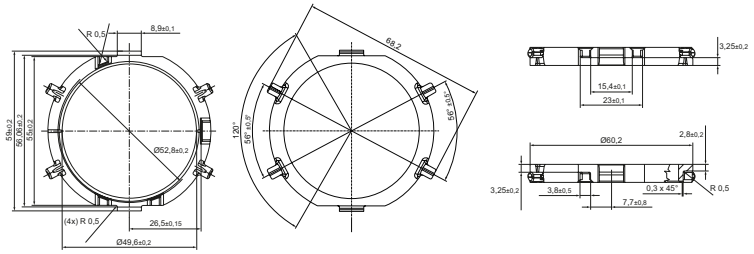
Pin assignment

Pin 1	12 V
Pin 2	LIN
Pin 3	GND

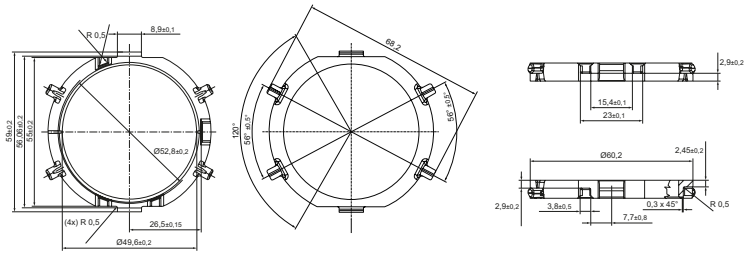
Illustration of installation on the windshield



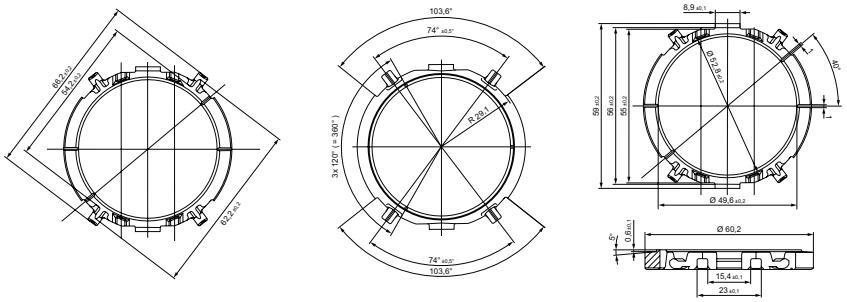
Accessories



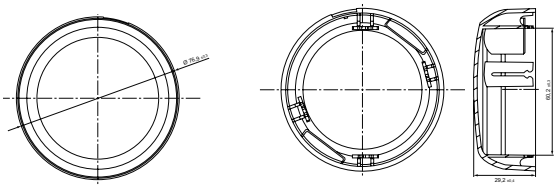
Part number	Description
Available upon request	For mounting with PUR liquid adhesive sintered metal



Part number	Description
Available upon request	For mounting with 3M adhesive tape sintered metal



Part number	Description
9XD 748 921-017	For mounting with PUR liquid adhesive sintered metal This bracket can be used together with a design cover (9HB 748 851-107).



Part number	Description
9HB 748 851-107	Design cover

Low-force actuators

Part number 6NW 011 122-017
6NW 011 122-027
6NW 011 122-047

Product characteristics

- → Compact, space-saving design
- → Electrical resetting or automatic resetting (without current)
- → Easy to fix in place thanks to snap-fit mounting
- → Spray water protected
- → With or without micro-switch
- → Explosion report for tank modules

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

* The Technical data here represents the entire actuator group. It varies depending on the product or version.

Application

As a result of the very space-saving design, this actuator is well suited to locking and unlocking applications in dry and humid areas (e.g. including via remote actuation) in which only minimal packaging space is available. Example include: tank modules, service doors, glove compartments and locking of the charging plug (e-mobility).

Function

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

Two product versions are available in the product range. The first actuator version with power locking and unlocking function is particularly well suited to conventional applications in which the locking lever locks a hinge arm connected to the locking system by applying voltage and unlocks it when polarity is reversed. The stability of the open/closed locking positions is achieved after short-circuiting the motor following successful actuation. The position of the locking element can also be defined via an integrated micro-switch.

A return spring and a micro-switch are integrated in the second actuator version. Lightly move the locking lever e.g. by pressing a service door to actuate the micro-switch. The actuator is then energised by a control unit. The locking lever is subsequently fully retracted so that the locking system is open and the service door also opens via a spring action. The actuator is then switched off and the locking lever returns to the locking position de-energised via the integrated return spring. Press the service door shut to lock it; the hinge arm of the door then engages in the locking lever of the actuator.

Medium-force actuators

Part number 6NW 009 203-4XX
6NW 009 203-5XX

Product characteristics

- → High actuating force
- → High-accuracy, laser-welded housing
- → Three versions
- → Dust- and waterproof
- → With or without manual adjustment
- → Thermal overload protection through PTC (PolySwitch)
- → Multifunctional
- → Various connection elements available

Technical data*		
Rated voltage	12 V	24 V
Voltage range	9 – 15 V	18 – 30 V
Position on delivery	Retracted or extended	
Mainspring reset	None, retract/extend	
Positioning force at the positioning mechanism	From 30 up to 170 N	
Manual adjustment	None to < 35 N	
Operating temperature	- 40 °C to + 80 °C	
Functional stroke	≤ 18 mm	
Protection class	IP 5K0 and IP 5K4	
Service life	50,000 / 100,000 operation cycles (depending on version)	

* The Technical data here represents the entire actuator group. It varies depending on the product or version.

Application

The motorised actuator electrically locks, unlocks or shuts locking and door systems in automotive and industrial areas. Sample applications in mechanisms include: electrical locking and unlocking, electrical pull/push function, electrical opening and closing of all kinds of doors (closing systems), tank doors, sunroofs, seats, covers, hoods, glove compartments, etc.

Function

An electric motor is installed in the two laser-welded polyamide housing halves. Energized by pins 1 and 2, the electric motor moves a spindle gear that extends or retracts a tappet, depending on the direction of rotation. The tappet is extended with plus at pin 1 and minus at pin 2. The tappet is retracted with minus at pin 1 and plus at pin 2. The stability of the retracted/extended locking positions is achieved by the short-circuited motor following successful actuation. A PolySwitch (PTC) is integrated in the motor for thermal overload protection. It is also possible to equip the actuators with an automatic reset function (retract or extend) by way of a mainspring.

High-force actuators

Part number 6NW 009 424-781
6NW 009 424-791

Product characteristics

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

Technical data*	
Rated voltage	12 V
Voltage range	9 – 16 V
Nominal torque	150 / 300 Ncm
Function	Retraction via spring, power extension, electric extension
Mainspring reset	Available/not available
Functional angle	0° to 198°
Manual adjustment	none
Operating temperature	- 40 °C to + 85 °C
Functional stroke	≤ 18 mm
Protection class	IP 5K0
Service life	8,000 / 50,000 operation cycles (depending on version)

* The Technical data here represents the entire actuator group. It varies depending on the product or version.

Application

The actuator is particularly well-suited for locking and pull/push applications requiring high forces. Examples include: large locks and doors, seat release.

When a bowden cable is used, the actuator can also operate without being attached to the body as it is attached to the application via the bowden cable sheath and can be embedded in a foam body for noise dampening.

Function

This electromotive actuator is an actuator with rotary output driven by a DC motor. The actuator is operated by applying a voltage via a 2-pin connector with contacts "+" and "ground". The return action is carried out by simply reversing the polarity or automatically via a spring. The direction of rotation and runtime are defined by the control unit. The actuator can be attached to three connecting points.

Application requirements:

No mechanical restriction or limitation of the actuator by the application is permitted. The high impact pulse (approx. 7 to 8 Nm) can damage the application, bracket or bowden cable.

The customer application must ensure that in the rest position (end position following ccw rotation), no load is acting on the actuator to avoid damaging the internal limit stop.

A motor short circuit is necessary during mainspring return (only 6CSA 009 424-781). This short circuit takes place using an 1N 4005 diode during the service life test. The short-circuited motor has a braking effect that protects the internal limit stop. Without this, the dynamism in the system can damage the limit stop during the return action, which can cause the device to become blocked.

Universal Rotary Actuator (URA)

Part number 6NW 011 303-701

Product characteristics

- → Flexible operating angle range
- → Fast response time
- → Precise position control
- → CIPOS position sensor integrated directly at driven gear
- → "True power on" function for angular ranges < 180°
- → Controlled motion up to limit stop
- → Self-blocking transmissions

Technical data*

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

* The Technical data here represents the entire actuator group. It varies depending on the product or version.

Application

The URA can be used in a broad range of applications involving harsh environmental conditions. High torque and CIPOS technology enable precise and reliable position control. Examples include: seed metering/ singling, fresh air / used air doors.

Function

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

Angle of rotation sensors

Single and double sensors

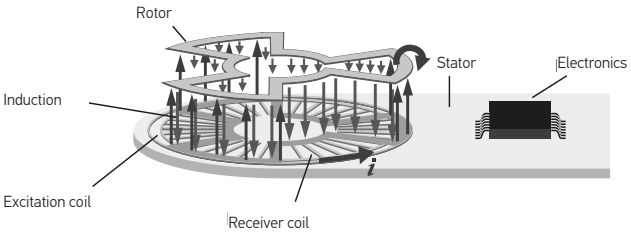
Product characteristics

- → Single or redundant 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 connection 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 environments. In particular, insensitivity to magnetic fields and a high degree of thermal stability are characteristic of the CIPOS ® technology used in all these angular position sensors. Angles are measured inductively using a contact-free and hence wear-free method. This guarantees a high degree of precision throughout the entire life of the sensor. The redundant sensors (double sensors) are especially designed for failure detection, thus improving the reliability of the overall system.

Function

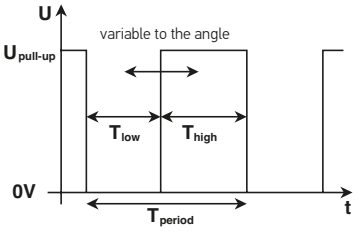


Inside the laser-welded housing from polyamide PA66 , the lever arm torque above the rotor is determined via induction method. An ASIC (Application Specific Integrated Circuit) accurately computes the rotor position. Various mounting positions are possible via the repetitive characteristic curve of the output signal path (depending on used sensor structure) It 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 turning angle 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). Of course, it is also possible 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 analog signal.

Summary of versions

Mechanical connection	Angle range	Supply voltage	Output signal	Zero position	Lever arm	Part number
Single sensors						
Socket	-30° to +30°	5 V	0.5 – 4.5 V ratiometric and PWM	0° / 120° / 240°	50 mm	**6PM 008 161-241**
Socket	-51° to +51°	5 V	0.5 – 4.5 V ratiometric and PWM	0° / 120° / 240°	50 mm	**6PM 008 161-251**
Socket	-54° to +54°	5 V	0.25 - 4.75 V ratiometric and PWM	0° / 120° / 240°	70 mm	**6PM 008 161-121**
Socket	-54° to +54°	5 V	0.25 - 4.75 V ratiometric and PWM	60° / 180° / 300°	70 mm	**6PM 008 161-131**
Socket	-54° to +54°	5 V	0.25 - 4.75 V ratiometric and PWM	30° / 150° / 270°	50 mm	**6PM 008 161-141**
Socket	-54° to +54°	5 V	0.25 - 4.75 V ratiometric and PWM	90° / 210° / 330°	50 mm	**6PM 008 161-151**
Basic 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°	64 mm	**6PM 010 200-531**
Double sensors						
Socket	-30° to +30°	5 V or 9 - 32 V	0.5 – 4.5 V ratiometric/ absolute	0° / 120° / 240°	50 mm	**6PD 009 583-001**
Socket	-54 to +54°	5 V or 9 - 32 V	0.5 – 4.5 V ratiometric/ absolute	0° / 120° / 240°	50 mm	**6PD 009 583-011**
Socket	-54 to +54°	5 V	0.5 - 4.5 V ratiometric	0° / 120° / 240°	70 mm	**6PD 009 580-017**
Ball, top	-54 to +54°	5 V or 9 - 32 V	0.5 – 4.5 V ratiometric/ absolute	0° / 120° / 240°	90 mm	**6PD 009 584-017**

Temperature sensors

Measurement of air temperatures

Product characteristics

- → Various designs
- → EMC stable
- → Quick response times

Application

The air temperature sensors measure temperatures in the air current of the air conditioning system. Furthermore, other corresponding versions for measuring outside and inside temperature can be implemented, keeping in mind their respective response times and protection classes in different industrial areas.

Examples include air-conditioning systems in:

- → Vehicles
- → Heating and sanitary equipment and facilities
- → Refrigerators
- → Buildings

Basic design and function

The basic design of each sensor version consists of an NTC resistor. NTC resistors have a negative temperature coefficient and increase in conductivity as temperatures increase. Some of the product range versions consists of an exposed NTC resistor covered by a protective glass layer. These sensor versions are characterised in particular by fast response times of up to six seconds (τ acc. to DIN EN 60539). Covered sensor versions have longer response times but better protect the NTC elements against outside environmental conditions.

The general circuit diagram consists of the sensor and a constant resistor wired in series. Based on the resistance or the voltage drop by the sensor, it is possible to apply the voltage divider law for calculating the resistance of the NTC temperature sensor. The resistance curve can be used to attribute the temperature to the NTC sensor resistance.
Four air temperature sensors are available.

Variants

The first version (Part no.: 6PT 007 843-131) is an integral sensor that can record the average temperature in an air flow thanks to its structural design.

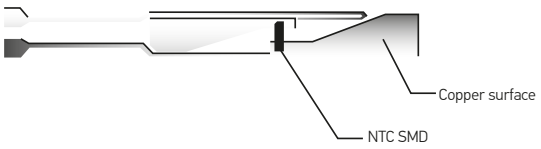
A parallel capacitor improves the electromagnetic compatibility. Despite this improvement, the electromagnetic compatibility in this version must still be checked in each of these application versions.

The second version (Part no.: 6PT 005 855-121) is designed to monitor evaporator temperatures. The structural design provides good resistance to humidity and is very rugged.

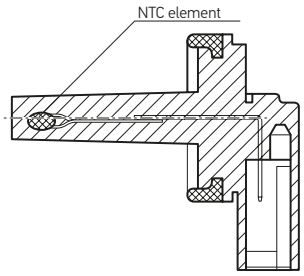
The third version (Part no.: 6PT 965 419-011) is the latest product designed to monitor evaporator temperatures. The structured design ensures very fast response times and high measurement precision at operating temperatures.

The fourth version (Part no.: 6PT 009 522-011) has been designed as an outdoor temperature sensor and is protected against splashing water. The use of a parallel resistor linearises the temperature characteristic curve. A parallel capacitor improves the electromagnetic compatibility of this version.

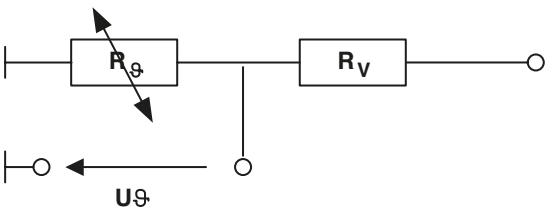
Schematic sensor design (not encased), first version



Schematic sensor design (encased), second version



Equivalent circuit diagram



Lighting Electronics

The focus here is on the control of the lighting function.

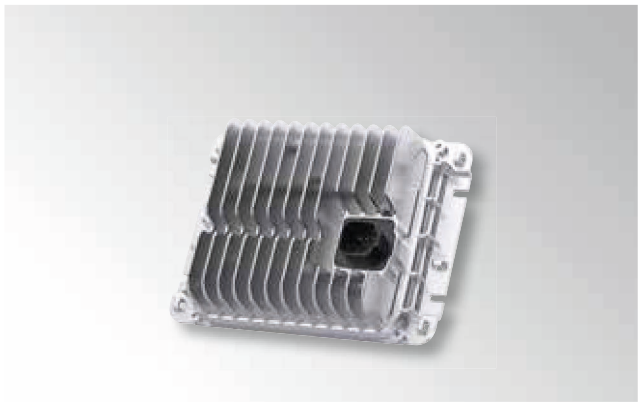
These electronic products offer solutions for "communication" between the LED lamps and the vehicle and for monitoring the function. They ensure that the lighting electronics or the flasher unit can be matched to the connected lighting.

LED lighting

Failure monitor and electrical connection
LED flasher unit: towing vehicle

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

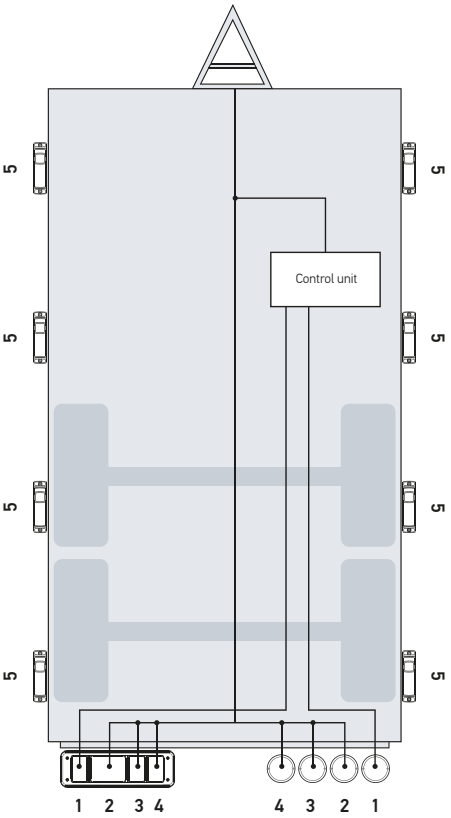
Benefit: Bulbs and ISO LED lights can be operated in any combination on an ISO 13207-compliant flasher unit. This is relevant both for vehicles that are frequently operated with different trailers and for manufacturers who wish to offer several variants of the lighting system without having to modify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



LED lighting

Failure monitor and electrical connection
LED light control unit
Example: Seed trailer

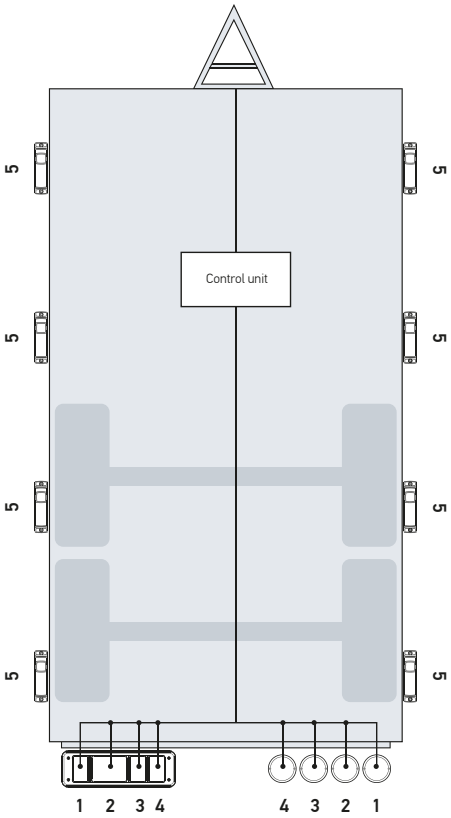
System representation: Basic
Control unit is responsible **only** for monitoring the direction indicators.



Legend

1 – Direction indicator
2 – Stop/tail 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, reversing light and rear fog light).



Legend

1 – Direction indicator
2 – Stop/tail light
3 – Reverse light
4 – Rear fog light
5 – Side marker light

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

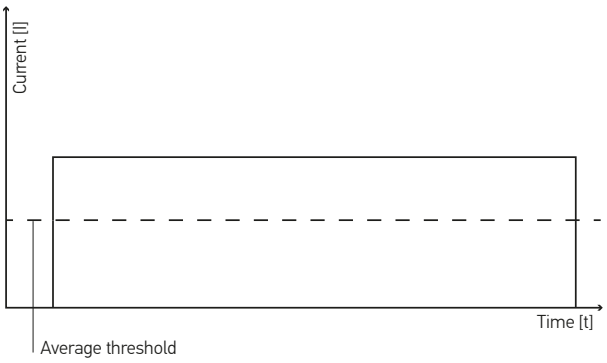
Failure monitor and electrical connection
Control unit for current monitoring

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

Variant	Voltage	Threshold
5DS 011 630-001	12 V	500 mA
5DS 011 630-011	24 V	500 mA
5DS 011 630-211	24 V	350 mA

Control unit for current monitoring
Direct measurement
Example 90 mm LED module headlight L 4060

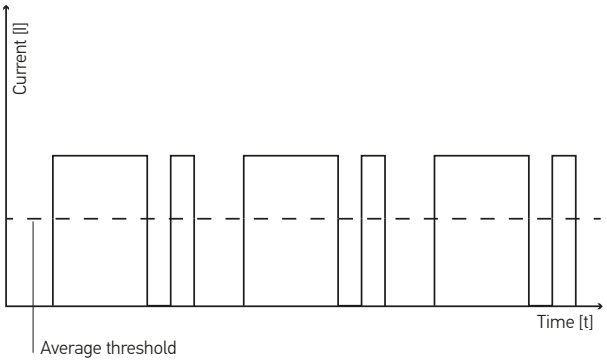
Block diagram



Variant	Voltage
5DS 011 630-101	12 V
5DS 011 630-111	24 V

Control unit for current monitoring
Integrated measurement over time
Example K-LED 2.0 beacon

Block diagram



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

This is why the electrics range from HELLA is so extensive: From A for "Acoustic signaling device" to W for "Washer pumps".

Through constant expansion and optimisation, we offer a wide range of relays and relay devices.

Module switch series 3100

- → Waterproof module switch series
- → Also suitable for outdoor applications!
- → For electrical systems
- → Protection class IP 68: Completely waterproof
- → LED lighting of the lasered symbols through integrated LEDs
- → Symbol illumination green, function display red (unless specified otherwise)

Configure your individual switches
www.hella.com/switch

Module switch series 4100

- → Module switch series with self-cleaning switch
- → Safe switching of small currents without contaminating the contacts
- → Suitable for electric and electronic systems
- → Protection class IP 54
- → LED lighting of the symbols
- → Symbol illumination green, function display red (unless specified otherwise)

Configure your individual switches
www.hella.com/switch

Module switch series 4570 / 7832

- → Proven for simple electrical systems
- → For price-sensitive applications
- → Symbol plates in accordance with DIN or in different colours upon customer request
- → Lighting through bulb or LED (must be ordered separately)

Configuration of the Part numbers following consultation with your sales partner.

Relay types

Micro relay
Micro relays according to ISO 7588-3 (1988), blade terminals according to ISO 8092-1.

Contact arrangements: make contact, change-over contact, max. 20 A switching power (make contact), Rated voltage: 12 V, 24 V

Areas of application include: fuel pumps, air conditioning systems, windshield washer systems, wiper engine.

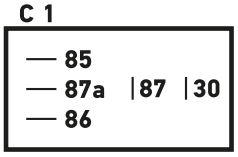
Mini relays
Mini relays according to ISO 7588-1, blade terminals according to ISO 8092-1.

Contact arrangements: make contact, change-over contact, max. 40 A switching power (make contact), Rated voltage: 12 V, 24 V

Areas of application include: headlights, starters, fuel pumps, fan motors, horns and fanfares.

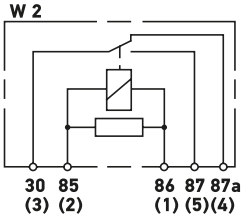
Pin arrangement

C 1



Circuit diagram

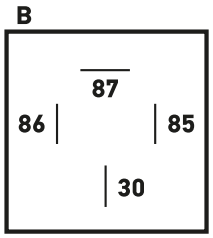
W 2



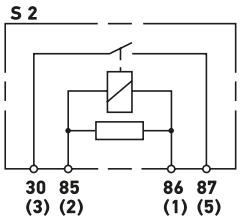
Micro relay, 12 V	
Resistive load	
N/O contact	● 35 ▲ 100
Break contact	● 20 ▲ 100
Inductive load	
N/O contact	● 30 ▲ 100
Break contact	● 10 ▲ 100
Bulb load	
N/O contact	● 30 ▲ 100
Break contact	● 10 ▲ 100
Pin arrangement	C1
Circuit diagram	W2
Coil resistance	140 Ohm
Parallel resistance	1.000 Ohm
With locking tabs	**4RD 933 319-007**

● Rated switching current (A) at 80°C ambient temperature
▲ Number of switching operations (thousands)

Pin arrangement



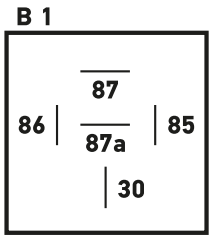
Circuit diagram



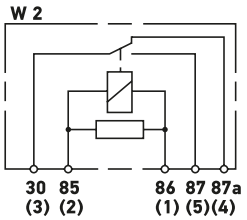
Mini relays 12 V / Mini relays 24 V		
	12 V	**24 V**
Resistive load		
N/O contact	● 40 ▲ 100	● 20 ▲ 150
Inductive load		
N/O contact	● 35 ▲ 100	● 16 ▲ 100
Bulb load		
N/O contact	● 30 ▲ 100	● 16 ▲ 135
Pin arrangement	B	
Circuit diagram	S2	
Coil resistance	100 Ohm	305 Ohm
Parallel resistance	680 Ohm	1.200 Ohm
12 V	**4RA 007 791-021**	
24 V	**4RA 007 957-011**	

● Rated switching current (A) at 80°C ambient temperature
▲ Number of switching operations (thousands)

Pin arrangement



Circuit diagram

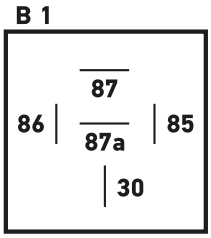


Mini 12 V relay	
Resistive load	
N/O contact	● 30 ▲ 100
Break contact	● 20 ▲ 100
Inductive load	
N/O contact	● 20 ▲ 100
Break contact	● 6 ▲ 60
Bulb load	
N/O contact	● 20 ▲ 100
Break contact	● 10 ▲ 100
Pin arrangement	B1
Circuit diagram	W2
Coil resistance	85
Parallel resistance	560
Dust and waterproof, IP 6K7 / IP 6K9K*	**4RD 933 332-031**

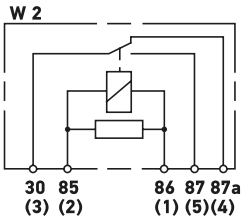
● Rated switching current (A) at 80°C ambient temperature
▲ Number of switching operations (thousands)

* in conjunction with mating connector 8JD 745 801-001/-011

Pin arrangement



Circuit diagram

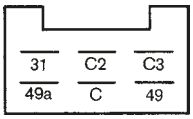


Mini 24 V relay	
Resistive load	
N/O contact	● 20 ▲ 100
Break contact	● 10 ▲ 100
Inductive load	
N/O contact	● 16 ▲ 100
Break contact	● 8 ▲ 100
Bulb load	
N/O contact	● 15 ▲ 135
Break contact	● 5 ▲ 135
Pin arrangement	B1
Circuit diagram	W2
Coil resistance	350
Parallel resistance	1.200
	4RD 933 332-201

● Rated switching current (A) at 80°C ambient temperature
▲ Number of switching operations (thousands)

Pin arrangement

BG7

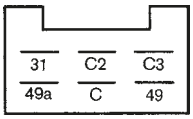


Flasher unit 12 V, 5-pole/6-pole	
Load case/rated power	
Direction indicators	2 + 1 + 1 x 21 W
Warning lights	8 x 21 W
Flashing frequency [min-1]*	90 ± 15
Bright-light time [%]*	50 ± 5
Failure monitor	
Towcar	E
1st trailer	P
2nd trailer	P
Pin arrangement	BG7
Voltage range	9 – 16 V
Temperature range	-40°C to +85°C
Bracket	Yes
	4DN 008 768-121

* * at room temperature and test voltage

Pin arrangement

BG7



Flasher unit 12 V, 6-pole/7-pole	
Load case/rated power	
Direction indicators	2 + 1 + 1 x 21 W
Warning lights	8 x 21 W
Flashing frequency [min-1]*	90 ± 15
Bright-light time [%]*	50 ± 5
Failure monitor	
Towcar	E
1st trailer	P
2nd trailer	P
Pin arrangement	BG7
Voltage range	9 – 16 V
Temperature range	-40°C to +85°C
Bracket	Yes
Holder angled at 90°	**4DN 008 768-131**
Holder angled at 90°, with vibration damper	**4DN 008 768-141**

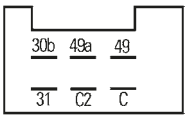
* * at room temperature and test voltage

-071

-091

Pin arrangement

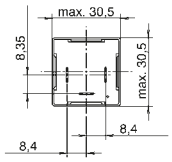
BG9

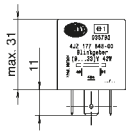


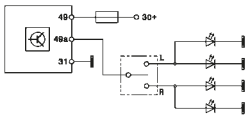
Flasher unit 24 V, 6-pole/7-pole

	-071	-091
Load case/rated power		
Direction indicators	3 + 1 x 21 W	2 + 1 x 21 W + 5 W
Warning lights	8 x 21 W	6 x 21 W + 2 x 5 W
Flashing frequency [min-1]*	90 ± 15	90 ± 15
Bright-light time [%]*	53,5 ± 8,5	48,5 ± 8,5
Failure monitor		
Towcar	P	
1st trailer	P	
2nd trailer	–	
Pin arrangement	BG9	
Voltage range	21,6 – 30 V	
Temperature range	- 40°C to + 85°C	
Bracket	Yes	
	4DW 003 944-071	
	4DM 003 944-091	

* * at room temperature and test voltage





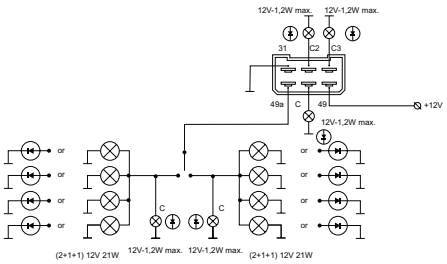


LED flasher unit 4JZ

Universal connection of LED direction indicators for 12 V and 24 V applications, with a maximum load-carrying capacity of 42 watts, black plastic housing with bracket and with blade terminals, mounting on 9-pin female connector housing 8JA 003 526-001 (not included in the scope of delivery).

9 – 33 V, max 42 V	**4JZ 177 846-001**
Accessories, 9-pole female connector housing	**8JA 003 526-001**

Type approval: E1 03 5793



LED flasher unit 4DN

Universal connection of LED direction indicators for 12 V applications, with a maximum load-carrying capacity of 4 x 21 W, directional flashing or 8 x 21 W, warning flashing, failure monitor according to ISO 13207, black plastic housing with bracket and with blade terminals, mounting on 9-pole female connector housing 8JA 003 526-001 (not included in the scope of delivery).

12 V, 2+1+1x 21 W	**4DN 008 768-161**
Accessories, 9-pole female connector housing	**8JA 003 526-001**

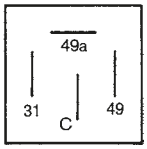
Type approval: E24 10R-041494

-001

-011

Pin arrangement

BG2



LED flasher unit 24 V, 4-pole		
	-001	**-011**
Load case/rated power		
Direction indicators	2 + 1 x 21 W	3 + 1 x 21 W
Warning lights	6 x 21 W	8 x 21 W
Flashing frequency [min-1]*	90 ± 30	90 ± 30
Bright-light time [%]*	57,5 ± 17,5	57,5 ± 17,5
Failure monitor		
Towcar	E	
1st trailer	P	
2nd trailer	–	
Pin arrangement	BG2	
Voltage range	18 – 32 V	
Temperature range	- 40°C to + 85°C	
Bracket	Included	
	4DM 009 492-001	
	4DW 009 492-011	

** at room temperature and test voltage

Accessories relays and flasher units

Product photo	Product name	Suitable accessories	Part number
	Female connector housing, 5-pole	Blade terminal sleeves: 8KW 744 819-003, 8KW 701 235-..., 8KW 744 820-003, 8KW 733 815-003	**8JD 733 767-001**
	Female connector housing, 5-pole	With pre-fitted cable assembly	**8JD 745 801-001**
	Female pin housing, 9-pole, for use side-by-side	Blade terminal sleeves: 8KW 744 819-003, 8KW 701 235-..., 8KW 744 820-003	**8JA 003 526-001**

LED indicators and failure control from HELLA

Legal requirement in all ECE states
In the case of vehicles approved for use on public roads, the direction indicators must be monitored: The failure of a direction indicator must be indicated visually or acoustically in the vehicle. This applies to all ECE states in which regulation ECE R48 is in effect. This means possible direction indicator failure must be monitored by the vehicle. Manufacturers use different procedures for this.

The failure monitors currently in use cannot detect simple LED lights and indicate a fault. Many HELLA LED indicators have integrated failure control electronics. The indicator lights are self-monitoring. When functioning correctly, they create a pulse according to ISO 13207-1 which can be evaluated by the vehicle electronics. If the available vehicle electronics cannot evaluate the pulse themselves, HELLA provides various solutions for evaluating this pulse, shown below.

As soon as one single LED fails, the light can be considered faulty, the pulse is not generated. In this case, for instance, the ballast switches off the bulb simulation and the flasher unit reports the error to the driver.

Safe conversion to LED indicators using HELLA electronics according to ISO 13207-1
As indicators must be checked by law, we recommend operating the lights only in conjunction with a failure control according to ISO 13207-1.

For LED indicators with a control pulse, HELLA offers electronic ballasts which make it possible to display indicator failure for various vehicle assemblies and modifications. This is necessary if the vehicle manufacturer does not guarantee indicator bulb failure control via the vehicle electric system.

There are three different ballasts and several different LED indicators available:

As a new solution, HELLA recommends detecting the electrical pulse directly in the vehicle manufacturer's vehicle electric system. It is merely necessary to integrate the check according to ISO 13207-1. This obviates the need for interim solutions via the indicator control units.

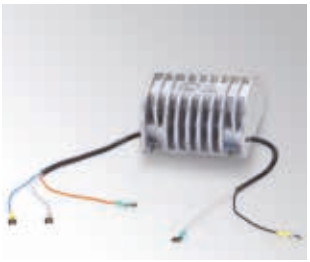
LED-light failure check and correct electrical connection

Operation of the LED light with AC voltage or synchronised DC voltage is not permitted. The individual light functions may only be operated with a vehicle fuse of max. 3 A.

Due to the low watt output of LED lights, which are distinctly different from a bulb version, problems can arise in the bulb failure monitor when operating various traction vehicles. As checking of the indicators is required by law, we recommend operating the light only in conjunction with the indicator control unit, HELLA part no. 5DS 009 552-xxx.

Some traction vehicles also detect other light functions. This is a vehicle convenience function that is not required by law and does not exempt the driver from his or her obligation to visually inspect the lighting equipment. Even in this case, low outputs can lead to misdiagnoses (instrument panel in the cab shows a light failure even though it is working fine).

Should misdiagnosis occur, as described above, while operating your traction vehicle, please contact the traction vehicle manufacturer.


LED direction indicator control unit


LED flasher unit


Simulation device for the check control


Vehicle electric system check according to ISO 13207-1

The right solution for your vehicle electronics

Start

Is a flasher relay installed in the vehicle? **Yes**

No Turn on the vehicle ignition and remove the bulb of a direction indicator without pressing the signal switch.

Any failure of the flasher unit is displayed. **Yes**

No Press the signal switch

Any failure of the flasher unit is displayed. **Yes**

No Vehicle not ECE-compliant

Universal solution
for 24 V vehicle electrical systems

ISO 13207-1 solution
for 24 V vehicle electrical systems

Solution 1:
LED flasher unit

	12 V	24 V
Operating voltage	10 – 15 V	18 – 32 V
Functional voltage	11 – 14 V	20 – 28 V
Operating temperature	-40°C to +85°C	-40°C to +85°C
Protection class	IP 53 (contacts underneath)	IP 53 (contacts underneath)
	LED flasher unit 3+1	
	4DW 009 492-111	4DW 009 492-011
	LED flasher unit 2+1	
	–	4DM 009 492-001
	LED flasher unit 2+1+1	
	4DM 009 492-101	–

Solution 2:
Simulation device for the check control

	12 V	24 V
Operating voltage	9 – 16 V	18 – 32 V
Rated current	1,5 A	1,5 A
Operating temperature	-40°C to +85°C	-40°C to +85°C
Protection class	IP 54 (contacts underneath)	IP 54 (contacts underneath)
	Simulation device	
	5DS 009 602-011	**5DS 009 602-001**

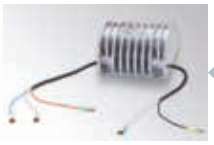
Solution 1:
Replace the existing indicator unit with an
LED indicator unit from HELLA with an ISO pin basis

One flasher unit per vehicle required. Any possible combination of bulbs and HELLA LED direction indicators is permitted: from a full package with bulbs through mixed versions to a full package with LED lights. Bulbs or HELLA LED direction indicators are also permitted on trailers.

Solution 2:
Through simulation unit for cold check

One simulation device is required per LED light.

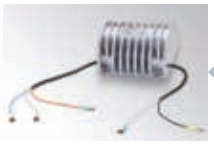
Solution 3:
By LED indicator control unit



Two LED indicators can be monitored per vehicle using one simulation device.

(Only one simulation device per vehicle can be used.)

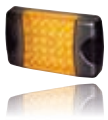
Solution 3:
By LED indicator control unit



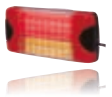
Solution 4:
By monitoring in compliance with ISO 13207-1 in the vehicle manufacturer's vehicle electric system.

Failure pulse in accordance with ISO 13207-1

2BA 959 070-631



2BA 959 050-401



2BA 959 822-601

2BA 344.200-...

2BA 343 390-...

2SD 343 910-...

Solution 3:
Indicator control unit
Universal solution

24 V	
Operating voltage	18 – 32 V
Reverse-polarity protection voltage	- 28 V
On-board voltage input Flasher unit left / right	24 V
Operating temperature	- 40 °C up to + 50 °C
Extended operating temperature*	- 40°C to + 80°C
Storage temperature	- 40°C to + 90°C

With female blade connectors	**5DS 009 552-011**
For EasyConn connectors	**5DS 009 552-001**

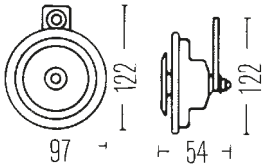
* At temperatures of 50 °C or higher, the light bulb simulation is deactivated due to thermal factors.

Solution 4:
Light ECU with integrated monitoring of the failure pulse according to ISO 13207-1

In future, vehicle manufacturers' light control units will be able to check the failure pulse in a standardised and unified manner in accordance with ISO 13207-1.

Interim solutions 1 to 3 are therefore unnecessary, as communication takes place directly with the direction indicators. HELLA recommends this solution.

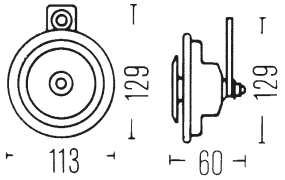
Since not every vehicle currently has its own vehicle electrical system, this solution must be integrated.



Sharp Tone Horn set M26S

108 mm diameter, 415 / 350 Hz, 115 dB (A) @ 2 m, sporty design with stable yellow grill guard, pervasive tone for more safety on the road, ideal for tough off-road use.

12 V	**3BB 922 000-731**

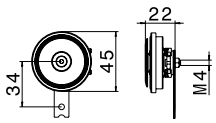


Full Tone horn B36

113 mm diameter, 335 / 400 Hz, 116 dB (A) @ 2 m, membranes for the protection against humidity ingress, full harmonious sound across large distances in road traffic, optimal timbre when a set of high-frequency and low-frequency horns is installed, timeless industrial design.

12 V, 335 / 400 Hz, set	**3BB 002 768-661**
12 V, 335 Hz	**3BA 002 768-082**
12 V, 400 Hz	**3BA 002 768-551**
24 V, 335 Hz	**3BA 002 768-382**
24 V, 400 Hz	**3BA 002 768-431**
12 V, 335 / 400 Hz, Teflon pill, set	**3BB 002 768-151**
24 V, 335 Hz, Teflon pill	**3BA 002 768-651**
24 V, 400 Hz, Teflon pill	**3BA 002 768-201**
48 V, 335 Hz, Teflon pill, condenser	**3BA 002 768-777**
80 V, 335 Hz, Teflon pill, condenser	**3BA 002 768-001**
24 V, 400 Hz	**3BA 922 200-817**
24 V, 335 Hz	**3BA 922 200-827**

Type approval: ECE-R28, E1 20024 for versions 12 V and 24 V

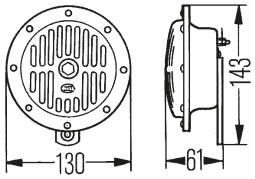


Strong tone horn set S90

90 mm diameter, 350 / 415 Hz, 113 dB (A) @ 2 m, fully shaped oscillator for optimal sound propagation, optimal ratio of size and power, slim matt-black design with a red diaphragm.

12 V	**3AM 922 000-971**

Type approval: ECE-R28

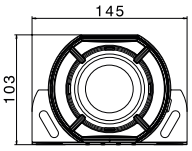


Heavy tone horn DL50

130 mm diameter, 114 dB (A) @ 2 m, deep and loud acoustic pattern, solid, black painted housing, robust protective grille, extremely durable.

12 V, 310 / 380 Hz SET	**3CB 004 811-042**
12 V, 310 Hz	**3CA 004 811-001**
12 V, 380 Hz	**3CA 004 811-011**
24 V, 310 Hz	**3CA 004 811-021**
24 V, 380 Hz	**3CA 004 811-031**

Type approval: ECE-R28 E1 01004, CCC



Reversing and warning alarm

Loud, far-reaching alarm tone, protection against reversed polarity and voltage peaks, optionally with automatic adaptation to surroundings with changing sound levels.

12 – 24 V, 1200 Hz, 87 – 112 dB (A) @ 1,2 m	**3SL 996 139-001**
12 – 36 V, 1300 Hz, 107 dB (A) @ 1,2 m	**3SL 996 139-101**
12 – 36 V, 1250 Hz, 112 dB (A) @ 1,2 m	**3SL 996 139-111**
12 – 24 V, 1200 Hz, 87 – 112 dB (A) @ 1,2 m	**3SL 996 139-202**
12 – 24 V, 1200 Hz, 90 dB (A) @ 1,2 m	**3SL 009 148-001**
12 – 24 V, 1200 Hz, 97 dB (A) @ 1,2 m	**3SL 009 148-011**
12 – 24 V, 1200 Hz, 107 dB (A) @ 1,2 m	**3SL 009 148-021**
12 – 48 V, 1200 Hz, 97 dB (A) @ 1,2 m	**3SL 009 148-061**
12 – 24 V, 1200 Hz, 102 dB (A) @ 1,2 m	**3SL 009 148-071**
12 – 24 V, 1200 Hz, 82 – 102 dB (A) @ 1,2 m	**3SL 009 148-101**

FURTHER INFORMATION

Worklights product brochure
In our over 100-page brochure you can find product information, fitting recommendations and much more. Now available as a PDF to download at

www.hella.com/worklights

Microsite agriculture
Informative, compact, interactive. Here, you can find everything you need to know about products and technologies for agricultural machinery.

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

www.hella.com/construction

ELIVER – The online light comparison tool
This online tool enables you to compare many HELLA worklights on the basis of their illumination in a realistic appealing environment.

www.hella.com/eliver

Module Switch Configurator
Assemble your own customised switches quickly and easily using our module switch configurator. The modular assortment of switches from HELLA offers a wide range of combination potential.

www.hella.com/switch

Electronics tool
Which electronics products does HELLA offer? You can find the answer in our electronics tool. After selecting the corresponding product at the click of a mouse, you are given additional information. Experience our electronics products for agricultural and construction machinery online and interactively.

www.hella.com/MicroSite/electronic_tool

Shapeline Configuration Tool
The HELLA Shapeline online configuration tool turns you into a lighting designer: With a few clicks, make your own vehicle light design for the front, sides, and rear – and see the result directly after, as applied convincingly to a vehicle outline.

www.hella.com/shapeline

90 mm Configuration Tool
In our 90 mm configurator, you can design and put together your own front lighting. This process is aided by a simple menu guide. This results in a parts list which you can then send to HELLA directly from the tool.

www.hella.com/90mm-modules

Worklight configuration tool
Which worklight is the correct one for your application? The HELLA online configurator will provide you with suitable product suggestions including all the relevant information about the product.

www.hella.com/worklight-configurator

Worklights mobile app
Let yourself be drawn into the interactive world of worklights and experience the variety of lighting technologies, explosion animations and much more. Simply download the app from iTunes or Google Play!

www.hella.com/apps

Hazardous goods ordinance

GGVSEB (previously GGVS) refers to the hazardous goods ordinance for roads, railways, and inland waterways. This ordinance implements the European Parliament and Council Directive 2008 / 68 / EC of September 24,2008 on the inland transport of hazardous goods. Worklights with this mark are approved for mounting on conveyances that must comply with the provisions ADR (in German: GGVSEB).

IP protection classes – Buy with confidence

How well is a product protected from environmental influences? Worklights are exposed to e.g. dust and water.
The IP protection class states how resilient the product is. The classes are determined by DIN 40 050 Part 9.
HELLA worklights are designed for various protection classes:

Protective category IP 5K4K
Dust may only penetrate to such an extent that function and safety are not impaired. Water that is sprayed from every direction at increased pressure against the housing must not have any damaging effect: water pressure approx. 4 bar.

Protection class IP 5K9K
Dust may only penetrate to such an extent that function and safety are not impaired. Water that is directed against the housing during high-pressure/steam-jet cleaning must not have any damaging effect; water pressure approx. 100 bar.

Protection class IP 6K4K
Dust must not penetrate. Water that is sprayed from every direction at increased pressure against the housing must not have any damaging effect: water pressure approx. 4 bar.

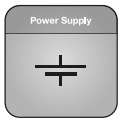
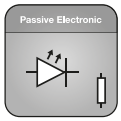
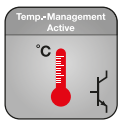
Protection class IP 67 / IP 6K7
Dust must not penetrate. No water may penetrate, even if the device is submerged for some time.

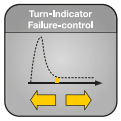
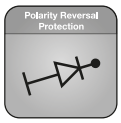
Protection class IP 6K8
Dust must not penetrate. Protection against continuous immersion.

Protection class IP 6K9K
Dust must not penetrate. Water that is directed against the housing during high-pressure/steam-jet cleaning must not have any damaging effect; water pressure approx. 100 bar.

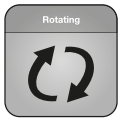
You can find further information about
the HELLA quality criteria at: www.hella.com/quality

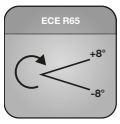

HELLA

Features	Description	Comments
Power consumption of LED lights	**Advantages of the LED:** Generally, LED lights consume less power than a light with an incandescent lamp. Savings of up to 90 % are possible, which also helps to reduce CO_2.	
Vehicle electrical system voltage 	Defines the power supply for the light. This can be 12 V, 24 V or a flexible voltage range for multivolt (e.g.: 8 – 33 V).	Multivolt is the most flexible: Requires fewer versions, but has more electronic circuit components and is therefore more expensive.
Dust and water protection IP 	International Protection (IP) as per DIN 40050, Part 9. Specific definition for road vehicles. See IP protection classes on page 194.	The higher the protective category, the better the protection against penetrating media. IP 68 maximum value → Completely sealed against dust and water.
  	Resistant to high-pressure jet cleaners	
Operating temperature (-40 °C to + +60 °C) 	Thermal management and an optimised housing design guarantee full functionality for all operating temperatures through product tests from -40°C to 60°C.	
Electronic circuit  **Active**  **Passive**	Basically, two different circuits are possible for LED lamps: **Active:** LED current regulation through active electronics **Passive:** A specific voltage range is preset for the LED by a dropping resistor.	**Active:** Higher expenditure during development because of complex circuit and necessary EMC approval. Higher price because of electronic components, but optimal current regulation allows maximum LED design life. **Passive:** Cost-effective solution without complex protection measures.
Thermo Management  **Active**  **Passive**	**Active:** Electronic power control of the LEDs in the case of impermissibly high ambient temperatures. This ensures the LEDs are protected against destruction caused by overheating. **Passive:** Optimum layout of the components for even temperature distribution and temperature spreading.	**Active:** Higher expenditures with active thermal management for development and higher parts prices ensure optimal conditions for maximum service life. **Passive:** The warmer the LED gets through exterior factors or heat generated by its own operation, the shorter the service life.

Features	Description	Comments
Indicator failure check according to ECE-R48 	**Regulation according to ECE-R48:** The driver must be informed if the indicator function fails. To remain legally compliant, this requirement must also be met for LED lights. This requirement is met by an integrated self-diagnostic unit on the PCB of the LED and an electrical pulse. Since the end of 2011, this HELLA failure check with a pulse has been ISO Standard: ISO 13207. For more information, see page 187.	If the indicator failure check is not ensured, the general vehicle type approval becomes void. This means it is illegal to operate vehicles without indicator failure check in countries affiliated to ECE-R48. The indicator failure check is ensured in combination with ballasts HELLA part no. 5DS 009 552.
Protection against short-circuits 	Short-circuit protection	
Bi-polarity of the light 	Even if the connecting cable is attached with reverse polarity, the LED functions fully.	The semi-conductor in an LED must always be operated with the correct polarity. Inverse polarity damages the LED, so that LED lamps are generally equipped with reverse polarity protection (diode). However this function only works if "+" and "-" are correctly connected. If a lamp has a bi-polar circuit, then it will work independently of the contact connections. This ensures poka-yoke (avoiding faulty installations) in connection with indentation clamping technology, for example. However, the additional components on the PCB also increase the costs.
Reverse polarity protection 	Even if the connecting cable is connected the wrong way round, there is still no danger to the electronics.	The semi-conductor in an LED must always be operated with the correct polarity. Inverse polarity damages the LED, so that LED lamps are generally equipped with reverse polarity protection (diode). However this function only works if "+" and "-" are correctly connected. If a lamp has a bi-polar circuit, then it will work independently of the contact connections. This ensures poka-yoke (avoiding faulty installations) in connection with indentation clamping technology, for example. However, the additional components on the PCB also increase the costs.
Overvoltage protection 	Supplement to the electronics for protecting the LEDs against high voltages / currents in the vehicle electrical system as per ISO 7637-2.	Overloading of the LEDs can be caused by voltage peaks in the vehicle because of: → Jump-starting → Defective control units → Load-Dump Impulse (incorrect battery contact) They stress / damage the LEDs, which can cause the function to fail or the service life to be reduced. Adding additional components to the circuit protects the circuit and can extend the service life or even prevent an outage.

OVERVIEW OF ICONS

Features	Description	Comments
Approved for dangerous goods transports 	Lamp approved for transport of dangerous goods according to the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR; in DT: GGVSEB).	Generally required for truck and trailer lighting. Prerequisite for receiving approval: Damage to the light source must not cause explosive media to ignite.
Lighting function beacons 	Rotating light function	
	Flashing light function	
Corrosion proof Housing 	Product is specially protected against corrosion.	Additional layers of surface coating on the worklights greatly improve their durability. The housing is therefore ideally protected and also well-suited to application areas with a high risk of corrosion.
ZEROGLARE **Technology** 	**ZERO**GLARE illumination	The **ZERO**GLARE system ensures that drivers of oncoming vehicles are not dazzled. Unlike the usual LED worklights, the light/dark cut-off line appears very sharp here and the light of the **ZERO**GLARE worklights is targeted specifically onto the area in front of the vehicle.
Automotive Electronic Council 	Components qualified according to automotive standard.	Electronic components (LEDs, diodes, ...) are more robust and safer than electronic components for industry thanks to automotive specifications. By using certified suppliers, a more robust design of the circuit is possible - even for longer periods of time with consistent quality. Slight additional costs for the components therefore improve the service life of LED light functions.

Features	Description	Comments
Automotive Safety Integrity Level 	The products are developed using the latest methods and according to the ISO 26262 safety guidelines.	This provision applies as "state-of-the-art" that HELLA will take into account during development.
Electromagnetic compatibility 	Electromagnetic compatibility (EMC) tested and EU type approval issued.	If the light is not constructed according to EMC specifications, and thus is not certified, then interaction between it and other safety-relevant electronic systems may occur. **Examples:** Interference in a radio loudspeaker, impairment of ABS electronics, or failure of the lamp due to sensitivity to interference.
ECE-R65 	Defines the light values, light distribution and colour location of beacons that are to be achieved.	Only beacons that fulfil ECE-R65 can be used on public roads.
ECE 	Product is licensed according to ECE guidelines.	
SAE 	Product has SAE type approval.	More information is provided next to the relevant products in the footer.

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