PRODUCT OVERVIEW
Forklifts

www.hella.com/forklift
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 develop and construct customised lighting solutions specifically for the requirements of forklifts and reach trucks. We are a leader in the field of LED technology, offering the right LED product for any application. A wide range of electric and electronic products complete our product offering.

**We deliver products that increase occupational safety and effectiveness. Taken from experience – and put into practice.**

**Are you already familiar with our 50 LED Spot module?**

The 50 LED Spot module increases occupational safety and helps to reduce accidents. Other vehicles or pedestrians are visually warned by means of a light spot on the ground. Thanks to its compact dimensions, the 50 LED module is particularly well-suited when little space is available for installation.
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GENIUS CAB CONCEPT
SUCCESS BUILT ON COOPERATION

The CAB Concept Cluster is a collaboration between well-known and established OEM suppliers, as well as renowned scientists in the field. The focus of this was the development of an innovative concept cab under the working title of ‘Genius Cab’, which was presented for the first time in 2016 at the bauma trade fair in Munich.

The aim is to provide OEMs of forklifts and industrial lift trucks with a better understanding of the great potential of efficient system integration. The Genius CAB comprises innovative components from all cooperation partners, who wish to set benchmarks on the international markets when it comes to safety, operability, driver comfort, maintenance, and design.

As the lighting and electronics expert, Hella contributes the LED work lights, the signature light, the interior lighting, the radio remote control to unlock the door, the accelerator pedal, and the rain/light sensor.

Find out more at www.cabconceptcluster.com
INNOVATIVE SAFETY ARCHITECTURE WITH ELECTRONIC AND LIGHT COMPONENTS

As part of the CAB Concept Cluster, ideas were also developed for the innovative and efficient design of environmental recognition for forklifts. For example, radar and camera systems or optical light components – such as the 50 LED Spot module already available – can be connected to a central domain controller.

Reliable safety architecture can be created through the fusion of these various sensor technologies.

More and more driverless transport systems are being used in the manufacturing industry. All integral logistics processes relating to the transport of packaged goods are essentially automatable.
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 HELLA standard 67101. These test procedures are conducted by the HELLA test laboratory in Lippstadt, Germany.

First-class quality by conviction
HELLA provides a long-term guarantee that its products work perfectly and is committed to achieving customer satisfaction 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.

You will find further information on the HELLA quality criteria at: www.hella.com/quality

Before HELLA products are brought onto the market, they undergo rigorous testing:

**Heat, moisture and cold test**

Freezing conditions down to -40°C and at full power up to +100°C, also rapid temperature fluctuations, condensation and decondensation tests at air humidities up to max. 95%.

HELLA LED products withstand rapid temperature fluctuations and changes in air humidity.

**Splash water test**

Environmental conditions such as rain, splash water, hose water and spray are simulated in splash water booths.

HELLA LED products are splash-proof.
Simulation of cleaning in a car wash with extremely high water pressure of up to 120 bar and water temperatures up to +85°C.

- HELLA LED products can be cleaned using a high-pressure cleaner without a problem.

During this test, our products are exposed to powerful vibrations and impacts.

- HELLA LED products offer guaranteed high resistance to vibrations.

Intensive tests guarantee dust tightness, even with the tiniest of dust particles.

- HELLA LED products are exceptionally tight to protect sensitive components from dust.

Underwater pressure testing at depths of up to 6 m guarantees the leak tightness of our products.

- HELLA LED products are leak tight.

DID YOU KNOW?

- The heat and cold tests last up to 48 hours.
- The leak tightness of products is tested by carrying out intermittent and splash water tests at pressures up to 5 bar, and a spray water test at a pressure of up to 10 bar.
- During the vibration test, all products are tested for up to 24 hours when in operation.
- An overpressure test up to 1.6 bar is performed in an immersion tank.
THERMAL MANAGEMENT

The service life of a LED heavily depends on its temperature and the applied current. If the LEDs overheat (usually because the input currents are too high), their service life will be drastically reduced. Effective thermal management is therefore extremely important.

HELLA uses state-of-the-art simulation programs to precisely calculate the heat flow. The task of the developer is to protect the LED from overheating and to ensure heat is removed reliably and efficiently.

Why use thermal management?
→ The basis for effective uniform lighting
→ Keeps the LEDs within the optimum temperature range
→ Increases the service life of the product
→ Reduces the risk of failure

Most important components
→ Cooling fins incorporated into headlamp casing
→ High-quality LEDs (automotive standard)
→ Thermosensors for temperature monitoring
→ Heat-dissipating substances (film, paste, ...)

INSUFFICIENT THERMAL MANAGEMENT

The heat on the PCB is not being sufficiently dissipated by the heat sink, i.e. there is a risk of the LEDs overheating. If they are damaged they could cause a failure.

Disadvantages:
→ Low light output
→ Accelerated wear
→ Reduced service life
→ Overheating = downtimes and repair time

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

Disadvantages:
→ Mechanical stress on the circuit board
→ The adhesive bond on components breaks
→ Breaks in soldering points
→ Cracks in the circuit board
→ Result: Short circuit
Many LED products are impressive due to their powerful light outputs. Many manufacturers also push LEDs to their limits and also far beyond in order to maximise the light outputs. If the operating temperature of LEDs is too high, this has a direct effect on the service life and luminous efficiency of the product. The full potential of the LEDs can then only be exploited if the heat generated is deflected outwards to prevent the LEDs from overheating.

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

**Thermosensors for greater safety**

HELLA LED products are equipped with thermal management which, assisted by temperature sensors, can actively intervene in the system. These sensors monitor the temperature of the LED and respond immediately. If the system identifies excessively high temperatures, it automatically reduces the input current. During this process, the light output of the headlight is dimmed until the temperature of the LEDs is once again within the optimum range. The LEDs are therefore always operated under perfect conditions. This is the only way to achieve a service life of up to 60,000 hours.

**EXAMPLE OF OPTIMUM THERMAL MANAGEMENT BY HELLA USING A BEACON**

The thermal imaging camera clearly shows how HELLA thermal management works:

The high temperatures of the LEDs are distributed uniformly across a large surface area which then transfers this heat to the surroundings.

The heat dissipation, and therefore the thermal conductivity of the housing in headlamps, for example, can be improved by using cooling fins.

HELLA selects heat-conductive materials and arranges components to ensure effective heat flow. Thermal management dissipates heat from the LED. This is why we can guarantee a long service life for our products!

**Advantages:**

- Effective heat flow
- Optimum temperature distribution
- Long service life
- Reliability
Forklift with halogen lighting
The vehicle is fitted with two halogen work lights (H3). The halogen work lights (H3) are characterised by homogenous illumination. However, if you compare the two pictures, you can clearly see the difference between halogen and LED work lights – the light colour.

Halogen bulbs tend to generate less bright light with an obvious yellow cast. With a halogen light, it is quite difficult to detect the cut-off line due to the colour temperature (2,500° Kelvin). The energy consumption of a halogen work light is around 55 watts. This is 18 watts with a comparable LED work light.

HALOGEN LIGHTING
This is a forklift fitted with HELLA LED work lights
Two LED work lights were installed for the conversion. The Power Beam 1000 is an LED work light that is setting new standards with its powerful light output.

The integrated electronics protect the device in the event of polarity inversion and guarantee constant brightness, even when the operating voltage fluctuates between 9 and 33 volts. The light from the 6 high-power LEDs is distributed to the surrounding work area by a specially developed multifaceted reflector.

The Power Beam 1000 can be mounted either upright (0°) or in a pendant position (180°). At 6,500° Kelvin, the light of the LED work light is very similar to daylight. It has a low power consumption of just 18 watts.

Furthermore, the image demonstrates the greatly optimised illumination of the work area thanks to HELLA LED work lights.
Shapeline – Customized light design!
Tech or Style: The HELLA Shapeline series provides design freedom and achieves a consistent light signature for your vehicle at the same time.

Configure worklights recommended for your vehicle now with the FREE HELLA app for smartphones and tablets.
HELLA product recommendation work lights

HELLA worklights are extremely energy efficient. A clear advantage when used on electric forklifts. After all, efficient worklights mean less charging and minimised downtime for the vehicle.

Forklift:
Body front/rear

Q90 compact LED
1GA 996 284-002
- Depending on alignment, either the forklift arm or the rack can be illuminated.
- A combination of two work lights is recommended.

Modul 70 LED Gen. III
1GO 996 276-481
- Compact dimensions, low weight and homogenous light distribution.
- Low energy consumption (13 W).

Modul 50 LED - Color Spot
1GO 996 050-061
- Blue warning sign in front of vehicle for greater safety.

Forklift:
Forklift cab, front

Mega Beam LED Gen. III
1GM 996 136-311
- Excellent light distribution in the close range.
- Stylish, modern design.

Q90 compact LED
1GA 996 284-002
- Depending on alignment, either the forklift arm or the rack can be illuminated.
- A combination of two work lights is recommended.

Ultra Beam LED Gen. I
1GA 995 506-001
- With 2,200 lumen output, the Ultra Beam LED offers sufficient rear light and enables precise working.
Working at night or in the early morning in the dark is no problem – providing you have the right light to work with!

HELLA work lights generate the right illumination of the working area for every application. They are specifically designed and developed to illuminate the largest possible area with a soft transition to the edge areas.

Worklights can be installed in many different areas and environments, whether it be agriculture, construction vehicles, forestry management or when working with forklift trucks.

So that every move counts, even in the dark: see more, work more precisely and safely – HELLA Worklights.
This LED product has the following features:

### Power Beam 1500

- Light output (measured): 1,300 lumens, power requirement: 22 watts, colour temperature: 6,500° Kelvin, multivolt, 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.

#### Close-range illumination
- DT connector
- 1GA 996 288-011
- DT connector, heavy-duty surrounding bracket
- 1GA 996 288-031

#### Long-range illumination
- DT connector
- 1GA 996 288-001
- DT connector, heavy-duty surrounding bracket
- 1GA 996 288-021
- DT connector, orange lens
- 1GA 996 288-041

### Power Beam 1800

- Light output (measured): 1,850 lumens, power requirement: 36 watts, colour temperature: 6,500° Kelvin, single voltage (12 or 24 volts), polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (pressure cleaner-proof/ submersible), ECE-R10-approved, high-quality aluminium housing.

#### Close-range illumination
- 12 V, DT connector, dimmer function
- 1GA 996 388-001
- 24 V, DT connector, dimmer function
- 1GA 996 388-011

#### Long-range illumination
- 12 V, DT connector, dimmer function
- 1GA 996 388-021
- 24 V, DT connector, dimmer function
- 1GA 996 388-031

### Oval 100 LED / Oval 100 LED Thermo Pro

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

#### Close-range illumination
- 1GA 996 661-001

#### Long-range illumination
- 1GA 996 661-011

### Thermo Pro plastic housing

- Lateral mounting, hinge
- 1GA 996 661-031
- Upright or pendant surface mounting
- 1GA 996 661-041
- Upright/pendant mounting, hinge
- 1GA 996 661-501
**Oval 90 LED**

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

<table>
<thead>
<tr>
<th>Close-range illumination</th>
<th>1G9 996 386-001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-range illumination</td>
<td>1G9 996 386-021</td>
</tr>
</tbody>
</table>

**Modul 70 LED Gen. III**

Light output (measured): 800 lumens, power requirement: 13 watts, colour temperature: 6,500° Kelvin, multivolt, reverse polarity protection, overvoltage protection, thermal management, IP 6K9K / IP 6K7 (pressure cleaner-proof / immersible), ECE-R10 approved, high-grade aluminium housing.

<table>
<thead>
<tr>
<th>Close-range illumination</th>
<th>1G9 996 276-077</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-range illumination</td>
<td>1G9 996 276-451</td>
</tr>
</tbody>
</table>

**Modul 70 LED Gen. IV**

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

<table>
<thead>
<tr>
<th>Close-range illumination</th>
<th>1G9 996 476-001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-range illumination</td>
<td>1G9 996 476-031</td>
</tr>
</tbody>
</table>

| Long-range illumination  | 1G9 996 476-011 |
Modul 50 LED / Modul 50 LED Spot

Light output (measured): 800 lumens, power requirement: 15 watts, colour temperature: 6,500° Kelvin, 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/GGV5-tested, DT connector.

Close-range illumination 1G0 995 050-001
Long-range illumination 1G0 995 050-021

Spot illumination
white 1G0 995 050-051
Blue 1G0 995 050-061
green 1G0 995 050-071
Red 1G0 995 050-081

Modul 50 LED Spot
→ Special use as a warning light
→ Punctiform illumination on the ground
→ Increases working safety
→ Available in various colours
WORK LIGHTS

LED Light Bar 350
Light output (measured): 2,200 lumens, power requirement: 25 watts, colour temperature: 5,000° Kelvin, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K/IP 6K8 (pressure cleaner-proof/submersible), ECE-R10-approved, ThermoPro plastic housing, downward 45° illumination as standard, 2,500 mm cable.

Close-range illumination
- Standard holder: 1GA 995 193-001
- Wall-mounted: 1GA 995 193-021
- Lug mounting: 1GA 995 193-031
- Surrounding bracket: 1GA 995 193-041

This LED product has the following features:
- Flat Beam 500
  - Light output (measured): 550 lumens, power requirement: 7 watts, colour temperature: 6,500° Kelvin, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K/IP 6K8 (pressure cleaner-proof/submersible), ECE-R10-approved, impact-resistant plastic housing, downward 45° illumination as standard, 2,000 mm cable.

Ultra Beam LED Gen. I
Light output (measured): 2,200 lumens, power requirement: 30 watts, colour temperature: 6,500° Kelvin, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9/IP 6K8 (pressure cleaner-proof/submersible), ECE-R10-approved, high-quality aluminum housing, ADR/GGVSEB-tested

Close-range illumination
- Standard holder: 1GA 995 506-001
- Long-range illumination: 1GA 995 506-031

This LED product has the following features:
This LED product has the following features:

**Q90 compact LED**

Light output (measured): 1,200 lumens, power requirement: 15 watts, colour temperature: 6,500° Kelvin, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (pressure cleaner-proof / submersible), ECE-R10-approved, Thermo Pro plastic housing.

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

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

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° Kelvin, multivolt, polarity reversal protection, overvoltage protection, thermal management, IP 6K9K / IP 6K8 (pressure cleaner-proof / submersible), ECE-R10-approved, high-quality aluminium housing, 2,000 mm cable.

**Close-range illumination**
- Mounting, upright 1GM 996 136-311
- Mounting, pendant 1GM 996 136-361
- Mounting, upright, 36 – 80 V 1GM 996 136-131

This LED product has the following features:

**Ultra Beam**

Light output: 1,150 / 1,400 lumens (H3) or 1,700 lumen (H9), colour temperature: 2,500° Kelvin (H3) / 3,200° Kelvin (H9), impact-resistant glass-fibre reinforced plastic housing, window pane, IP 5K9K (pressure cleaner-proof), GGSEB / ADR-tested. 12 / 24 V, 55 / 70 W.

**Close-range illumination**
- Upright surface mounting, AMP connector, H3 1GA 007 506-011*
- Upright/pendant mounting, DT connector, H3 1GA 007 506-391*

**Long-range illumination**
- Upright or pendant surface mounting, 12 V, 65 W, 1,700 lm, AMP connector, 4-point attachment, incl. HP bulb 1GA 996 150-081
- Upright surface mounting, AMP connector, H3 1GA 997 506-021*

* Without bulb.
The comprehensive product range of HELLA accessories for plug connections offers solutions for virtually every application area. Unwanted failures are frequently caused by faulty wiring, not the products themselves. The HELLA SUPERSEAL product range enables a waterproof and dustproof connection of the cable ends, therefore offering optimal working conditions in all kinds of weather.

**Connector**

The comprehensive product range of HELLA accessories for plug connections offers solutions for virtually every application area. Unwanted failures are frequently caused by faulty wiring, not the products themselves. The HELLA SUPERSEAL product range enables a waterproof and dustproof connection of the cable ends, therefore offering optimal working conditions in all kinds of weather.

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>GERMAN plug set, 2-pin</td>
<td>8JA 201 022-801</td>
</tr>
<tr>
<td>GERMAN plug set, 6-pin</td>
<td>8JA 201 022-831</td>
</tr>
<tr>
<td>AMP connector set (consisting of AMP connector and installation sleeve)</td>
<td>8JD 990 255-037</td>
</tr>
<tr>
<td>HB3 connector (10x)</td>
<td>8JA 990 295-217</td>
</tr>
<tr>
<td>HP connector (x20)</td>
<td>8JD 158 275-170</td>
</tr>
<tr>
<td>SUPERSEAL, assortment case comprising various SUPERSEAL plug housings, pin/socket contacts, individual conductor seals and blind plugs (780 parts)</td>
<td>8JA 009 256-801</td>
</tr>
</tbody>
</table>

**Cables**

HELLA offers numerous adapter cables for simple setup of the headlamps as an accessory.

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000 mm cable with AMP connector and bare cable heads</td>
<td>8KB 990 299-001</td>
</tr>
<tr>
<td>2,000 mm cable with DEUTSCH connector and bare cable heads</td>
<td>8KB 990 299-011</td>
</tr>
<tr>
<td>2,000 mm cable with HB3 connector and open cable ends and rubber cap</td>
<td>8KB 990 299-031</td>
</tr>
<tr>
<td>2,000 mm cable with HB3 connector and bare cable heads</td>
<td>8KB 990 299-031</td>
</tr>
<tr>
<td>200 mm adapter cable from DEUTSCH to AMP connector</td>
<td>8KB 990 299-361</td>
</tr>
<tr>
<td>230-volt power supply (suitable for headlamps up to max. 45 W)</td>
<td>8EN 332 584-001</td>
</tr>
</tbody>
</table>

**Bulbs**

The HELLA range of bulbs offers light variants specially developed for the various application purposes, such as Light Power with particularly high light output or Lifetime with a very long service life. There are many more to choose from at www.hella.com/bulbs.

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>H3 12 V / 55 W</td>
<td>8GH 002 090-133</td>
</tr>
<tr>
<td>H3 24 V / 70 W</td>
<td>8GH 002 090-251</td>
</tr>
<tr>
<td>HB3 LL 12 V / 60 W</td>
<td>8GH 005 635-181</td>
</tr>
<tr>
<td>H9 12 V / 65 W</td>
<td>8GH 008 357-001</td>
</tr>
<tr>
<td>D1S xenon bulb</td>
<td>8GS 009 028-001</td>
</tr>
</tbody>
</table>
## ACCESSORIES

<table>
<thead>
<tr>
<th>Product photo</th>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
</table>
| **Brackets**  | 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.  | 8HG 990 320-001 |
|               | 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 work lights with standard bracket | 8HG 004 806-001 |
|               | Four-point mounting  
Made from yellow chrome-plated steel  
Model series: All work lights with standard bracket | 9XD 990 298-001 |
|               | Four-point mounting  
Made of stainless steel with oblong holes  
Model series: All work lights 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-fibre reinforced standard bracket for work lights.  
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 flush assembly.  
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 extensions with restricted space to the rear.  
Model series: Ultra Beam, Mega Beam, Oval 100, Double Beam, AS 200, Power Beam,  
Module 90, Q90 LED and AP 1200 LED  
42 mm bracket width | 8HG 994 974-002 |

The complete range of HELLA accessories can be found in the brochure “Electrical vehicle installations”.
No light, no vision

This applies not just to “seeing” but also “being seen”. Due to the fact that the vehicle lighting plays an important role in the safety of all those on the road, HELLA develops innovative lighting systems that offer a high level of driving comfort and also provide optimum illumination of the road ahead.

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: 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 for 1:1 exchange. FEP or DEUTSCH connection. Hardened plastic cover lens. Integrated electronics, robust die-cast aluminium housing, multi-volt 9 - 32 V. Perfectly fitting adjustment screws for Premium and Performance attachment included in the scope of supply.

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 available upon request).
Multi-volt 9 - 32 V.

| Right-hand traffic/USA version, FEP connector | 1BL 012 488-001 |
| Left-hand traffic, FEP connector | 1ML 012 488-011 |
| Right-hand traffic/USA version, DEUTSCH connector | 1BL 012 488-101 |
| Left-hand traffic, DEUTSCH connector | 1ML 012 488-111 |

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

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 available upon request).
Multi-volt 9 - 32 V.

| Right-hand traffic/USA version, FEP connector | 1BL 012 488-021 |
| Left-hand traffic, FEP connector | 1ML 012 488-031 |
| Right-hand traffic/USA version, DEUTSCH connector | 1BL 012 488-121 |
| Left-hand traffic, DEUTSCH connector | 1ML 012 488-131 |

Type approval: 1BL 012 488-021: 3831, 1ML 012 488-031: 4090, 1BL 012 488-121: 3881, 1ML 012 488-131: 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 for 1:1 conversion. Integrated FEP plug and control electronics. Sturdy die-cast aluminium housing, multi-volt 9 - 32 V.

These LED products have the following features:

### L 4060 LED high-beam headlamp
- Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover, (black design cover available upon request).
- Multi-voltage 9 - 32 V.
- Preassembled carrier frame: 1F0 011 988-021
- Performance mount: 1F0 011 988-121
- Type approval: 3831

### 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 available upon request).
- Multi-voltage 9 - 32 V.
- Preassembled carrier frame: 1F0 011 988-031
- Performance mount: 1F0 011 988-131
- Type approval: 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 available upon request).
- Multi-voltage 9 - 32 V.
- Preassembled carrier frame, with pulse generator: 1F0 011 988-081
- Preassembled 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: 3831

Please see the note on page 92 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 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

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-volt 9 - 32 V.

These LED products have the following features:

- **L 4060 LED front fog lamp**
  - Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover, (black design cover available upon request).
  - Multi-voltage 9 - 32 V.
  - Preassembled carrier frame
  - Type test: 3831

- **L 4060 LED front fog lamp, 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 available upon request).
  - Multi-voltage 9 - 32 V.
  - Preassembled carrier frame
  - Type approval: 3831

- **L 4060 LED front fog lamp, with cornering light**
  - Module headlamp with 40 x 60 mm polycarbonate lens, robust aluminium die-cast housing, silver design cover, (black design cover available upon request).
  - Multi-voltage 9 - 32 V.
  - Preassembled carrier frame, right
  - Preassembled carrier frame, left
  - Type approval: 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.
FRONT LIGHTING

90 MM: L 5570 BI-LED MODULE, LOW 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 features:

- 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.

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

Module headlamp with 55 x 70 mm polycarbonate lens, robust aluminium die-cast housing, hardened plastic cover lens, no moving parts, multi-volt 9 – 32 V.

- Right-hand traffic, FEP connector
  1AL 012 758-001
- Left-hand traffic, FEP connector
  1AL 012 758-011
- USA version, FEP connector
  1AL 012 758-021
- 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

Type approval: right-hand traffic: E 4208, left-hand traffic: E 4209, USA versions: SAE

*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 70 BI-LED MODULE, LOW BEAM AND HIGH 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 features:

- Mono LED, right-hand traffic: 1BL 010 820-001
- Mono LED, left-hand traffic: 1ML 010 820-011
- Bi-LED, right-hand traffic: 1AL 010 820-021
- Bi-LED, left-hand traffic: 1LL 010 820-031

Type approval: Mono LED ES 3159 and LES 3160, bi-LED ES 3351 and LES 3352

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

*L 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 743 957-021) 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 PREMIUM LOW BEAM AND HIGH BEAM

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. Pre-assembled adjusting screws. Including light source. For xenon variants splash-proof electronic ballast. Connection using 0.5 m shielded supply cable with detachable plug connection.

Bi-Halogen® HEADLAMP
Low beam and spotlight
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. Inc. 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: 2484 and 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: 2486 and 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.

- Do you want to combine modules from the Premium and Performance series, without having to decide on a vehicle design from the very beginning?

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 mounting 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 spotlight 12 V bulb, Right-hand traffic: 1BL 247 042-217
- 90 mm spotlight 12 V bulb, Left-hand traffic: 1ML 247 042-227

24 V versions available upon request

Premium mounting 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 spotlight 12 V bulb, Right-hand traffic: 1BL 247 042-177
- 90 mm spotlight 12 V bulb, Left-hand traffic: 1ML 247 042-187

24 V versions available upon request
90 MM PERFORMANCE LOW BEAM AND HIGH BEAM


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

**Type approval:** 2397 and 2398

1 With a technical solution for tourists for temporary use in left-hand traffic countries or, for left-hand traffic versions, in right-hand traffic countries.

<table>
<thead>
<tr>
<th>Halogen high-beam headlamp</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Module headlamp with an aluminium free-form reflector and a non-patterned glass cover lens, incl. light source.</td>
<td></td>
</tr>
<tr>
<td>12 V, with position light, H1, for Performance mounting</td>
<td>1K0 247 043-007</td>
</tr>
<tr>
<td>12 V, without position light, H1, for Performance mounting</td>
<td>1K0 247 043-117</td>
</tr>
<tr>
<td>12 V, with position light, H1, for Premium mounting</td>
<td>1K0 247 043-117</td>
</tr>
<tr>
<td>12 V, without position light, H1, for Premium mounting</td>
<td>1K0 247 043-127</td>
</tr>
<tr>
<td>24 V, with position light, H1, for Premium mounting</td>
<td>1K0 247 043-137</td>
</tr>
<tr>
<td>24 V, without position light, H1, for Premium mounting</td>
<td>1K0 247 043-147</td>
</tr>
<tr>
<td>24 V, with position light, H1, for Classic mounting</td>
<td>1K0 247 043-097</td>
</tr>
<tr>
<td>24 V, without position light, H1, for Classic mounting</td>
<td>1K0 247 043-107</td>
</tr>
</tbody>
</table>

**Type approval:** 2397 and 2398
This LED product has the following features:

**C140 LED headlamp**
Combination headlamp with all functions in LED technology. For horizontal or vertical mounting, with aluminium die-cast housing, scratch-proof polycarbonate lens, with 6-pin DT connector, lighting functions: low beam, high beam, position light, and direction indicator.

<table>
<thead>
<tr>
<th>Vertical mounting</th>
<th>1EE 996 374-001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal mounting on the left</td>
<td>1EE 996 374-011</td>
</tr>
<tr>
<td>Horizontal mounting on the right</td>
<td>1EE 996 374-021</td>
</tr>
</tbody>
</table>

**Type approval:** 4079 / SAE

**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 DT connector, light exit 120 mm x 120 mm.

<table>
<thead>
<tr>
<th>Upright mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V, left</td>
</tr>
<tr>
<td>12 V, right</td>
</tr>
<tr>
<td>24 V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Central mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V, left</td>
</tr>
<tr>
<td>12 V, right</td>
</tr>
</tbody>
</table>

**Type approval:** 6556, 11372, and 11373

**Halogen combination headlamp**
For mounting (on vertical surfaces), with H7 low-beam light with integrated direction indicator and position light, housing made from glass-fibre reinforced plastic, lens made from hardened glass, with 4-pin DT connector.

<table>
<thead>
<tr>
<th>12 V</th>
<th>1BR 996 171-101</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V</td>
<td>1BR 996 171-111</td>
</tr>
</tbody>
</table>

**Type approval:** 12666
Micro DE PREMIUM EDITION: FOG LIGHT

Individual fog lamp, with 12 V H3 bulb, aluminium design trim. 1NL 008 090-301

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

Micro DE FOG LIGHT

Fog light with black decorative ring.

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

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

This LED product has the following features:

- Modular LED light, Ø 55 mm
- For front installation, clear lens with optics and a 500 mm connecting cable.
- Indicator light, without pulse
- Indicator light, with pulse
- Position lamp with heat sink

Type approval: 3284 and CCC (BL)

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

**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: 1903 and 1904

**50 mm Premium spotlight**
3-point holder, adjustable using adjustment screw. With ECE and SAE type approval.

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

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

**Accessories**

<table>
<thead>
<tr>
<th>Carrier frame (not for H9 halogen spotlights)</th>
<th>9AH 161 786-017</th>
<th>9AH 161 784-017</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) without HLL holder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) with HLL holder</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plastic cap (rubber cap)</th>
<th>9GH 152 654-007</th>
<th>9GH 147 009-007</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) for halogen low beam headlamps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) for fog lights</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connector plug set</th>
<th>8JD 156 150-807</th>
<th>8JD 158 175-807</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber cap for 20 headlamps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H9 plug for 20 headlamps (not shown)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actuator motors for headlight range adjustment</th>
<th>6NM 007 282-221</th>
<th>6NM 008 299-501</th>
</tr>
</thead>
<tbody>
<tr>
<td>for 12 V Halogen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 V actuator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actuator assembly set</td>
<td>8HG 183 586-001</td>
<td></td>
</tr>
</tbody>
</table>
LEDayFlex II rectangular
Module chain with 5 or 6 modules, cable length: approx. 80 mm between the individual modules, 2 high-power LEDs per individual module.

Module chain with 5 light modules
Daytime running light/position light, 12 V 2PT 980 789-051
Daytime running light/position light, 24 V 2PT 980 789-051*

Module chain with 6 light modules
Daytime running light/position light, 12 V 2PT 980 789-251
Daytime running light/position light, 24 V 2PT 980 789-251*

Type approval: ECE / SAE

Necessary accessories for module chains
12 V control unit with connecting cables 8KA 959 186-901
24 V control unit with connecting cables 8KA 959 186-911
* For 24 V operation, please observe the requirements as per the installation guide: the lamps are wired in series. You must order both articles for this!

LEDayLine 15 and LEDayLine 30 with position light
2 versions for horizontal installation in various vehicle fronts, 8 LEDs per daytime running light.

LEDayLine 15
suitable for vehicles with 15° angle at installation location.
Light module daytime light /position light 12 V 2PT 980 860-001
Light module daytime light /position light 24 V 2PT 980 860-501
Brackets (set right/left) 8HG 980 864-101

LEDayLine 30
suitable for vehicles with 30° angle at installation location.
Light module daytime light /position light 12 V 2PT 980 850-001
Light module daytime light /position light 24 V 2PT 980 850-501
Brackets (set right/left) 8HG 980 854-101

Type approval: ECE / SAE

Control units
12 V with connecting cables 8KA 959 186-801
24 V with connecting cables 8KA 959 186-811

LEDayLine Zero
2 light modules for horizontal installation, suitable for vehicles without sweep angle, 8 high-power LEDs per daytime running light.

12 V daytime running light 2PT 980 970-821
24 V daytime running light 2PT 980 970-871

Type approval: ECE / SAE
This LED product has the following features:

**LED daytime running light set, rectangular design**
- 2 lights incl. harness, universal bracket,
- 3 high-power LEDs per light, multivolt 9-33 V,
- 12 V / max. 5.5 W, current consumption = 2.18 A
- Set for surface mounting
- 2PT 009 496-801
- Individual light without bracket, DRL with PO function
- 2PT 009 496-007

Type approval: 2344

Optional accessories
- Universal carrier frame: 9AH 165 968-001
- Wiring harness, pre-assembled: 8KA 165 959-001

This LED product has the following features:

**LED daytime running lights set, round design**
- 2 lights incl. harness, universal bracket,
- 3 high-power LEDs per light, multivolt 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: 2372

Optional accessories
- Universal carrier frame: 9AH 165 968-001
- Wiring harness, pre-assembled: 8KA 165 959-001

This LED product has the following features:

**LED position light**
- For horizontal surface 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: ECE 5853

This LED product has the following features:

**LED position light**
- For surface mounting, self-adhesive with 6.3 mm contacts and counterplug grommet.
- Current consumption = 0.04 A
- 12 V
- 2PT 009 226-097

Counterplug grommet (order separately): 9GT 186 597-007
This LED product has the following features:

**LED position light**
For horizontal mounting left/right.
Current consumption = 0.02 A
500 mm potted cable, open end 2PG 345 600-401
5,000 mm potted cable, open end 2PG 345 600-411
Type approval: ☑️ 0002

**DuraLED position light**
For horizontal/vertical mounting.
Current consumption = 0.02 A
500 mm cable, black end caps 2PF 959 855-201
2,500 mm cable, black end caps 2PF 959 855-241
500 mm cable, white end caps 2PF 959 855-251
Type approval: ☑️ 5878

**83 mm LED-3 functional light**
Daytime light, position light, and direction indicator, 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: ☑️ 5854 and ☑️ 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.

Type approval: ☑️ 9854

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- **For horizontal mounting left/right.**
- **Current consumption = 0.02 A**
- **500 mm potted cable, open end**
- **2PG 345 600-401**
- **5,000 mm potted cable, open end**
- **2PG 345 600-411**
- **Type approval: ☑️ 0002**

- **For horizontal/vertical mounting.**
- **Current consumption = 0.02 A**
- **500 mm cable, black end caps**
- **2PF 959 855-201**
- **2,500 mm cable, black end caps**
- **2PF 959 855-241**
- **500 mm cable, white end caps**
- **2PF 959 855-251**
- **Type approval: ☑️ 5878**

- **Daytime light, position light, and direction indicator, 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: ☑️ 5854 and ☑️ 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.**
- **Type approval: ☑️ 9854**
More than a combination of 5 functions

These days, LEDs are key: Not only are they taking the automotive industry by storm due to their energy-saving potential, they also offer a level of design versatility that is crucial to developing a vehicle’s typical appearance. For rear combination lamps especially, manufacturers are making ever greater use of the many options available when LEDs are combined with optical systems, creating attractive and distinctive vehicle designs.

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-R68. The lights 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 service life, all HELLA light components have been matched optimally in terms of temperature to prevent overloading the LEDs in high environmental temperatures. The lights are designed for the service life of a vehicle and are therefore an outstanding, economical and environmentally friendly solution.
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 lamp 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 allows us to meet 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 lamps 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 lamps 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!

Design freedom at the click of a mouse

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 end – and see the result directly after, as applied convincingly to a car outline.

www.hella.com/shapeline
The modular HELLA Shapeline product range provides a variety of different light functions that can be combined with each other individually. Here, all lamps 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 features:

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

**Shapeline tail stop lights**
- Tail stop light, Style Design
  - a) Tail stop light
    - 2SB 013 342-XXX*
  - b) Tail stop light, wing
    - 2SB 013 399-XXX*
  - Tail stop light, Tech Design
    - c) Tail stop light
      - 2SB 013 341-XXX*
These LED products have the following features:

### Shapeline direction indicators

**Direction indicators, Style Design**

- a) Direction indicator, yellow 2BA 013 331-XXX*
- b) Direction indicator, clear 2BA 013 331-XXX*
- c) Direction indicator, wing 2BA 013 333-XXX*
- d) Direction indicator, slim 2BA 013 332-XXX*

**Direction indicators, Tech Design**

- e) Direction indicator, yellow 2BA 013 330-XXX*
- f) Direction indicator, clear 2BA 013 330-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 tail light/stop light/direction indicators

**Tail light/stop light/direction indicator, Style Design**

- a) Tail light/stop light/direction indicator 2SD 013 342-XXX*

**Tail light/stop light/direction indicator, Tech Design**

- b) Tail light/stop light/direction indicator 2SD 013 341-XXX*
These LED products have the following features:

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

This LED product has the following features:

**Shapeline warning lights**
Warning light, Style Design
a) Warning light 2XW 013 493-XXX*

**Shapeline design element**
Style Design
a) Design element 2XX 013 349-XXX*
These LED products have the following features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shapeline rear fog lamps</td>
<td></td>
</tr>
<tr>
<td>a) Rear fog lamp</td>
<td>2NE 013 345-XXX*</td>
</tr>
<tr>
<td>b) Rear fog /reverse light</td>
<td>2NR 013 345-XXX*</td>
</tr>
<tr>
<td>c) Rear fog lamp, slim</td>
<td>2NE 013 343-XXX*</td>
</tr>
<tr>
<td>Rear fog lamps, Tech Design</td>
<td></td>
</tr>
<tr>
<td>d) Rear fog lamp</td>
<td>2NE 013 344-XXX*</td>
</tr>
<tr>
<td>e) Rear fog /reverse light</td>
<td>2NR 013 344-XXX*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shapeline reflex reflector</td>
<td></td>
</tr>
<tr>
<td>a) Reflex reflector, wing</td>
<td>8RA 013 402-XXX*</td>
</tr>
<tr>
<td>b) Reflex reflector</td>
<td>2RA 013 347-XXX*</td>
</tr>
<tr>
<td>Reflex reflector, Tech Design</td>
<td></td>
</tr>
<tr>
<td>c) Reflex reflector</td>
<td>8RA 013 403-XXX*</td>
</tr>
</tbody>
</table>

* 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:

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.
12 V/1 W, current consumption = approx. 0.08 A
for 520 x 120 mm licence plates, only 1 light required for illumination
2KA 010 278-321
Type approval: 2609
for 340 x 240 and 280 x 200 mm licence plates
2KA 010 278-421
Type approval: 2911

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: 0032, 10R-047294

LED circular ring module Ø 112 mm
Tail light/stop light, technological further 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.

Tail light/stop light, 12 V, red
2SB 009 362-301
Tail light/stop light, 24 V, red
2SB 009 362-321
Tail light/stop light, 12 V, clear
2SB 009 362-311
Tail light/stop light, 24 V, clear
2SB 009 362-331
Type approval: 7R-025889
**DuraLED Combi multifunction light**

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 2,500 mm cable, stop light = 8 red LEDs (4 LEDs with reduced light output for tail light), direction indicator = 8 yellow LEDs, with reflex reflector.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Catalogue Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V / 24 V DC</td>
<td>2VA 980 710-061</td>
</tr>
<tr>
<td>24 V DC</td>
<td>2VA 980 710-301</td>
</tr>
</tbody>
</table>

*Type approval: 5882, GGVS / ADR*

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**DuraLED Combi multifunction light**

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

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Catalogue Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 / 24 V DC</td>
<td>2SD 980 602-211</td>
</tr>
<tr>
<td>24 V DC</td>
<td>2SD 980 613-211</td>
</tr>
</tbody>
</table>

*Type approval: 5883, GGVS / ADR*

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**DuraLED Combi multifunction light**

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-pin DEUTSCH connector (mating connector to be used DT 06-6S), tail light/stop light = 6 red LEDs, direction indicator = 6 yellow LEDs, reverse light = 6 white LEDs.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Catalogue Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 / 24 V DC</td>
<td>2SK 980 602-501</td>
</tr>
<tr>
<td>24 V DC</td>
<td>2SK 980 602-501</td>
</tr>
</tbody>
</table>

*Type approval: 5894, GGVS / ADR*
This LED product has the following features:

**LED signal light**

For 12 and 24 V, for horizontal and vertical mounting, with 10 LEDs.

<table>
<thead>
<tr>
<th>12 V</th>
<th>24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear direction indicator without pulse for direction indicator failure monitor, with 2,500 mm cable</td>
<td>2BA 980 888-011</td>
</tr>
<tr>
<td>Stop light/tail light, with 300 mm cable</td>
<td>2SB 980 887-011</td>
</tr>
<tr>
<td>Additional stop lamp, with 2,500 mm cable</td>
<td>2DA 980 887-311</td>
</tr>
<tr>
<td>Rear fog lamp, with 2,500 mm cable</td>
<td>2NE 980 889-501</td>
</tr>
<tr>
<td>Reversing light, horizontal mounting, with 2,500 mm cable</td>
<td>2ZR 980 889-011</td>
</tr>
<tr>
<td>Reversing light, vertical mounting, with 2,500 mm cable</td>
<td>2ZR 980 889-111</td>
</tr>
</tbody>
</table>

**Type approval:** ECE, SAE (USA)

This LED product has the following features:

**Q90 Compact LED Reversing Light**

1,000 lumens, power requirement: 15 W, colour temperature: 6,500° Kelvin, 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 DT connector, ADR / GGVSEB-tested | 2ZR 996 284-511 |

**Type approval:** ECE-R23, ECE-R10
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 check.

ECE SAE
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 X

12 / 24 V
2VA 980 720-007 X

With licence plate lighting for 370 x 120 mm and 520 mm x 120 mm plates, for horizontal surface mounting only.

Indicator light at top, licence plate light on left

12 / 24 V, with DT connector
2VB 980 720-401 X

12 / 24 V, with DT connector
2VB 980 720-407 X

Indicator at bottom, licence plate light on left

12 / 24 V, with 500 mm cable
2VB 980 720-501 X

12 / 24 V, with 500 mm cable
2VB 980 720-507 X

Type approval: ECE-R23, ECE-R10

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

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

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

Tail light
Stop light
Direction indicator
Rear fog light
Reverse light
Relex reflector
Side marker light with reflex reflector
Licence plate light
Position light

Please see the note on page 92 regarding LED direction indicators and LED light failure monitor.
This LED product has the following features:

**Full LED combination rear light**

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 DT connector DT 04-4P. With pulse for indicator failure check.

- 12 V/3.3 W, current consumption = approx. 0.28 A
- 24 V/4.5 W, current consumption = approx. 0.19 A

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Part Number</th>
<th>Type Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V</td>
<td>2VA 011 900-001</td>
<td>ISO 5878, 10R 04 6919, EMC</td>
</tr>
<tr>
<td>24 V</td>
<td>2VA 011 900-021</td>
<td>ISO 5878, 10R 04 6919, EMC</td>
</tr>
</tbody>
</table>

**Type approval:** ISO 5878, 10R 04 6919, EMC

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**Full LED combination rear light**

For horizontal surface mounting, tail/stop lamp with 6 red LEDs reduced light output in tail lamp, indicator light with 6 amber LEDs. With integrated 4-pole DT connector DT 04-4P. Without pulse for indicator failure check.

- 12 V/3.3 W, current consumption = approx. 0.28 A
- 24 V/4.5 W, current consumption = approx. 0.19 A

<table>
<thead>
<tr>
<th>Voltage</th>
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</tr>
</thead>
<tbody>
<tr>
<td>12 V</td>
<td>2VA 011 900-011</td>
<td>ISO 5878, 10R 04 6919, EMC</td>
</tr>
<tr>
<td>24 V</td>
<td>2VA 011 900-031</td>
<td>ISO 5878, 10R 04 6919, EMC</td>
</tr>
</tbody>
</table>

**Type approval:** ISO 5878, 10R 04 6919, EMC

---

**Full LED combination rear light**

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 DT connector DT 04-4P. Without pulse for indicator failure check.

- 12 V/5.9 W, current consumption = approx. 0.49 A

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Part Number</th>
<th>Type Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V</td>
<td>2VA 011 900-041</td>
<td>ISO 5878, 10R 04 6919, EMC</td>
</tr>
</tbody>
</table>

**Type approval:** ISO 5878, 10R 04 6919, EMC

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**Usable harness assemblies**

Harness assembly with 4-pole DT connector DT 06-4S for connection to the lamp.

- With 200 mm cable, plus 4-pole AMP-SUPERSEAL connector at other end: 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:

**LED tail light stop light direction indicator**

For horizontal or vertical surface mounting, with 24 LEDs, clear lens, with ECE and EMC type approval.

- 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-pin AMP connector 282 106-1, mating connector to be used AMP 282 088-1

With integrated AMP connector 282 106-1 in the housing

Reflective surface in red, with integrated 4-pin DT connector DT 04-P

**Type approval:** 12393 and 035109

---

**LED tail/stop/indicator/reversing light**

For horizontal or vertical surface mounting, with 24 LEDs, clear lens.

- 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

**Type approval:** 9808

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**LED rear light**

For horizontal mounting, with 2 red LEDs, can be used as a tail light or clearance lamp, 24 V.

- 24 V/1.2 W, current consumption = approx. 0.04 A
- 500 mm cable

**Type approval:** 9808

---

**ECE note:** Turn indicator approval by category

- **D:** ECE approval as twin indicators

**SAE type approval for vehicles**

- **< 2032 mm wide**
- **> 2031 mm wide**

- **Tail light**
- **Stop light**
- **Direction indicator**
- **Rear fog light**
- **Reverse light**
- **Refractive surface in red with integrated 4-pin DT connector DT 04-P**

Please see the note on page 92 regarding LED direction indicators and LED light failure monitor.
This LED product has the following features:

**"Oval" LED combination rear light**

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.

<table>
<thead>
<tr>
<th>ECE</th>
<th>SAE (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>🚗</td>
<td>🚗 🚗 🚗</td>
</tr>
</tbody>
</table>

**2SD 343 390-0111**

- 12 red LEDs for stop light: 12 V/1 W, current consumption = approx. 0.08 A
- 12 red LEDs for tail lamp (reduced output): 12 V/0.2 W, current consumption = approx. 0.02 A
- 12 amber LEDs for indicator light: 12 V/1.5 W, current consumption = approx. 0.13 A

**2BA 343 390-0711**

- 24 amber LEDs for indicator light: 12 V/1.5 W, current consumption = approx. 0.13 A

**2SB 343 390-091**

- Stop light: 12 V/1 W, current consumption = approx. 0.08 A
- Tail lamp: 12 V/0.2 W, current consumption = approx. 0.02 A (reduced power)

**Type approval:** ECE

---

This LED product has the following features:

**"Oval" LED combination rear light**

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

<table>
<thead>
<tr>
<th>ECE</th>
<th>SAE (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>🚗</td>
<td>🚗 🚗 🚗</td>
</tr>
</tbody>
</table>

**2SD 343 390-401/7**

- 12 red LEDs for stop light: 12 V/1 W, current consumption = approx. 0.08 A
- 12 red LEDs for stop light (reduced power): 12 V/0.2 W, current consumption = approx. 0.02 A
- 12 amber LEDs for indicator light: 12 V/1.5 W, current consumption = approx. 0.13 A

**Type approval:** ECE
This LED product has the following features:

**LED clearance light**

For horizontal or vertical recessed mounting, clear lens with 2 red LEDs, can be used as tail lamp or end-outline marker lamp, 8–28 V.

- 12 V/0.5 W, current consumption 0.04 A
- 500 mm cable with caps: 2XA 959 790-401
- 5,000 mm cable with caps: 2XA 959 790-411

Type approval: 7597 and 03 1721

**LED clearance light**

Multivolt, with 2 white LEDs for horizontal and vertical installation, current consumption approx. 0.04 A.

- With 500 mm cable: 2XS 959 855-407
- With 2,500 mm cable: 2XS 959 855-447

Type approval: ECE

**Accessories**

- Stainless steel housing, polished: 9AB 959 685-201
- Cap for screw top, white: 9HD 980 858-018

This LED product has the following features:

**DuraLED clearance lamp**

For horizontal/vertical mounting.

- Current consumption = 0.02 A
- 500 mm cable, black end caps: 2XS 959 855-401
- 2,500 mm cable, black end caps: 2XS 959 855-441
- 500 mm cable, white end caps: 2XS 959 855-451

Type approval: 5878

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**ECE note:** Turn indicator approval by category

- **D:** ECE approval as twin indicators

- ≧: Turn indicator approval by category SAE type approval for vehicles
  - ≦ 2032 mm wide
  - > 2031 mm wide

- ™ © Patent

- © Side marker light with reflex reflector
- © Licence plate light

- © Position light

Please see the note on page 92 regarding LED direction indicators and LED light failure monitor.
DuraLED marker light, clearance lamp

2 LEDs, power consumption <1 W, operating temperature -40°C to +60°C, reverse polarity protection, with 2 screws Ø 4 mm and DT connector.
12 / 24 V

Type approval: 5892, 3195

This LED product has the following features:

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

Type approval: 7597 and 03 1721

This LED product has the following features:

- LED clearance light

For horizontal surface mounting, with 2 LEDs, self-adhesive, with 6.3 mm contacts and counterplug grommet.

Type approval: 2XS 009 226-107

This LED product has the following features:
This LED product has the following features:

**DuraLED, tail/stop light**

With 24 red LEDs and 2,500 mm cable with stripped ends.
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
For vertical mounting: 2SB 980 606-701

Type approval: 5850, EMC, 03 1828

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This LED product has the following features:

**DuraLED, INDICATOR**

With 24 amber LEDs and 2,500 mm cable with stripped ends.
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
For vertical mounting: 2BA 980 607-701

Type approval: 5850, EMC, 03 1830

---

This LED product has the following features:

**DuraLED, BACK-UP LAMP**

With 24 white LEDs and 2,500 mm cable with stripped ends.
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
For vertical mounting: 2ZR 980 605-701

Type approval: 5850, EMC, 03 1828
REAR LIGHTING

This LED product has the following features:

LED rear light/stop light/direction indicator Ø 55 mm
For rear installation, clear lens with optics and 500 mm connecting cable,
12 V / 1.1 W, current consumption = 0.09 A, 24 V / 0.8 W, current consumption = 0.03 A.

12 V, tail light
25A 011 172-041
12 V, stop light
20A 011 172-061
12 V, direction indicator, without pulse
2BA 011 172-021
24 V, direction indicator, without pulse
2BA 011 172-421
12 V, direction indicator, with pulse
2BA 011 172-031
24 V, direction indicator, with pulse
2BA 011 172-431

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

12 V, tail light
25A 011 172-041
12 V, stop light
20A 011 172-061
12 V, direction indicator, without pulse
2BA 011 172-021
24 V, direction indicator, without pulse
2BA 011 172-421
12 V, direction indicator, with pulse
2BA 011 172-031
24 V, direction indicator, with pulse
2BA 011 172-431

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

12 V, tail light
25A 011 172-041
12 V, stop light
20A 011 172-061
12 V, direction indicator, without pulse
2BA 011 172-021
24 V, direction indicator, without pulse
2BA 011 172-421
12 V, direction indicator, with pulse
2BA 011 172-031
24 V, direction indicator, with pulse
2BA 011 172-431

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

12 V, rear fog lamp
2NE 011 172-081
24 V, rear fog lamp
2NE 011 172-481

Type approval: 3286, 10R-036317 and CCC

12 V, reverse light
2ZR 011 172-101
24 V, reverse light
2ZR 011 172-501

Type approval: 3285, 10R-036317 and CCC

LED ring modules Ø 98 mm
12 V, for installation, ideal for combination with light series 011 172 (Ø 55 mm), optionally available with clear or red cover lens.

LEDb) tail clearance lamp, with 12 red LEDs, clear lens
1) 12 V / 1.8 W, current consumption = approx. 0.15 A
2SA 008 405-021
2) 24 V / 1.8 W, current consumption = approx. 0.08 A
2SA 008 405-017

LED tail stop light, with 12 red LEDs, clear lens,
with passive thermal management
1) 12 V / 2.1 W, current consumption = approx. 0.15 A
2SB 008 405-101
2) 24 V / 1.8 W, current consumption = approx. 0.08 A
2SB 008 405-091

1) LED position light
12 V / 1.8 W, current consumption = approx. 0.15 A
2PF 008 405-061
2) Chromium-plated cover
8XU 008 405-031
3) Reflex reflector
8RA 008 405-001

Type approval: 1196, 1197 and 1892

This LED product has the following features:

12 V, for installation, ideal for combination with light series 011 172 (Ø 55 mm), optionally available with clear or red cover lens.

LEDb) tail clearance lamp, with 12 red LEDs, clear lens
1) 12 V / 1.8 W, current consumption = approx. 0.15 A
2SA 008 405-021
2) 24 V / 1.8 W, current consumption = approx. 0.08 A
2SA 008 405-017

LED tail stop light, with 12 red LEDs, clear lens,
with passive thermal management
1) 12 V / 2.1 W, current consumption = approx. 0.15 A
2SB 008 405-101
2) 24 V / 1.8 W, current consumption = approx. 0.08 A
2SB 008 405-091

1) LED position light
12 V / 1.8 W, current consumption = approx. 0.15 A
2PF 008 405-061
2) Chromium-plated cover
8XU 008 405-031
3) Reflex reflector
8RA 008 405-001

Type approval: 1196, 1197 and 1892
This LED product has the following features:

<table>
<thead>
<tr>
<th>LED tail stop light and direction indicator Ø 66 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>With clear lens, 12 LEDs and AMP connector.</td>
</tr>
<tr>
<td>12 V, tail stop light</td>
</tr>
<tr>
<td>2SB 009 001-401</td>
</tr>
<tr>
<td>24 V, tail stop light</td>
</tr>
<tr>
<td>2SB 009 001-501</td>
</tr>
<tr>
<td>12 V, direction indicator, without pulse</td>
</tr>
<tr>
<td>2BA 009 001-411</td>
</tr>
<tr>
<td>24 V, direction indicator, without pulse</td>
</tr>
<tr>
<td>2BA 009 001-511</td>
</tr>
<tr>
<td>12 V, direction indicator, with pulse</td>
</tr>
<tr>
<td>2BA 009 001-431</td>
</tr>
<tr>
<td>24 V, direction indicator, with pulse</td>
</tr>
<tr>
<td>2BA 009 001-531</td>
</tr>
<tr>
<td>Type approval: 12390</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rear combination lamps Ø 66 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>With mounted bulbs 12 V or 24 V, incl. design ring.</td>
</tr>
</tbody>
</table>

**Red lens**

| 24 V, direction indicator with ECE approval for double lights |
| 2NE 009 001-127                                           |
| 12 V, stop light with ECE approval for double lights       |
| 2DA 009 001-057                                           |
| 12 V, tail stop light with ECE approval for double lights  |
| 2SB 009 001-067                                           |
| 12 V, rear fog lamp with SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide |
| 2NE 009 001-027                                           |
| 12 V, macro reflex reflector with SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide |
| 8RA 009 001-037                                           |

**Grey lens**

| 12 V, direction indicator with ECE approval for double lights |
| 2BA 009 001-007                                           |
| 2BA 009 001-017                                           |
| 24 V, direction indicator with ECE approval for double lights |
| 2BA 009 001-07                                           |
| 24 V, tail light with ECE approval for double lights       |
| 25A 009 001-137                                           |
| 24 V, stop light with ECE approval for double lights       |
| 2DA 009 001-147                                           |
| 24 V, tail stop light with ECE approval for double lights  |
| 2SB 009 001-157                                           |
| 12 V, reverse light with SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide |
| 2ZR 009 001-017                                           |
| 24 V, reverse light with SAE type approval for vehicles < 2,032 mm and > 2,031 mm wide |
| 2ZR 009 001-117                                           |

**With Silvevision bulb**

| 12 V, direction indicator with ECE approval for double lights |
| 2BA 009 001-191                                           |

Type approval: 3917, 6564, 7613, 23255, 3189 (reflex reflector)

<table>
<thead>
<tr>
<th>Rear combination lamps design rings Ø 66 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suitable for 66 mm light modules with Ø 71.6 mm (article number ...009 -001,... except LED versions), perfect high-gloss finish with one “click”.</td>
</tr>
</tbody>
</table>

**High-glass chromium plated**

| 9HB 161 122-012 |

**Silver**

| 9HB 161 122-007 |

**Premium silver**

| 9HB 144 168-002 |

**Assembly stop ring (no image)**

| 8HG 162 530-002 |
HELLA beacons with strong warning effect signal to other road users: Please take into consideration – work is being carried out around the 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 through outstanding quality in terms of processing and stability – the long service life proves this!
The RotaLED Compact SAE has been specially developed for use on forklift trucks. It has a multivolt system (10 – 30 V) and integrated reverse polarity protection. Thanks to the compact design (height approx. 12 cm), low weight, and impact-resistant dome, the beacon is well-suited for protection in internal transport or at construction or industrial plants.

Fixed, yellow, flashing, 9-30 V  
2XD 012 480-001

Fixed, red, flashing, 9-30 V  
2XD 012 480-011

Fixed, white, flashing, 9-30 V  
2XD 012 480-021

Flexible pipe socket, yellow, flashing  
2XD 012 480-011

Magnet, yellow, flashing  
2XD 012 480-021

Type approval: ECE-R65, SAE J845 class 2

This LED product has the following features:

- Fixed attachment
- Flexible pipe-socket mounting
- Magnetic attachment

RotaLED Compact

The RotaLED Compact has been specially developed for use on forklift trucks. It has a multivolt system (10 – 30 V) and integrated reverse polarity protection. Thanks to the compact design (height approx. 12 cm), low weight, and impact-resistant dome, the beacon is well-suited for protection in internal transport or at construction or industrial plants.

Fixed, yellow, flashing  
2XD 013 979-001

Flexible pipe socket, yellow, flashing  
2XD 013 979-011

Magnet, yellow, flashing  
2XD 013 979-021

Type approval: ECE-R65, SAE J845 class 2

This LED product has the following features:

- Fixed attachment
- Flexible pipe-socket mounting
- Magnetic attachment

* upon request
BEACONS

The RotaLED with rotating or flashing light function impresses with its high level of efficiency and its flat and compact design. With the shock-absorbing rubber foot, it boasts a high resilience against vibration and is thus perfectly suited for challenging applications.

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

**Type approval:** ECE-R65, SAE 9845, class 2, 035517, ECE-R10

---

**K-LED 2.0**

The 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.

**Specifications:**
- **Fixed, rotating, and flashing:** 2XD 011 557-101
- **Pipe socket, flashing:** 2XD 011 557-201
- **Magnet, flashing:** 2XD 011 557-301

**Type approval:** ECE-R65, SAE 7845, class 1, 036816, ECE-R10: 036816
Rotaflex / Rotafix beacon

The Rotaflex / Rotafix beacon is a compact and resilient rotating beacon. It has a belt drive with maintenance-free bearings for a constant rotation frequency and optimal running smoothness. The beacon is characterised by its modern design with a robust dome that is easy to clean, and has integrated polarity reversal protection.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Model Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V</td>
<td>2RL 008 965-001</td>
</tr>
<tr>
<td>24 V</td>
<td>2RL 008 965-011</td>
</tr>
<tr>
<td>12 V</td>
<td>2RL 006 846-001</td>
</tr>
<tr>
<td>24 V</td>
<td>2RL 006 846-011</td>
</tr>
<tr>
<td>12 V</td>
<td>2RL 007 337-021</td>
</tr>
<tr>
<td>24 V</td>
<td>2RL 007 337-031</td>
</tr>
</tbody>
</table>

Type approval: ECE-R65, SAE 7845, class 2.

KL Junior Plus

The Junior Plus beacon offers optimal light output, concentration, and distribution through its rotating unit comprising a reflector and bulb. It has a belt drive with maintenance-free bearings for a constant rotation frequency and optimal running smoothness. The beacon is characterised by its modern design with a robust dome that is easy to clean, and has integrated polarity reversal protection.

<table>
<thead>
<tr>
<th>Attachment</th>
<th>Model Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>2RL 008 965-001</td>
</tr>
<tr>
<td>Fixed, 24 V</td>
<td>2RL 008 965-011</td>
</tr>
<tr>
<td>Flexible pipe-socket</td>
<td>2RL 008 967-001</td>
</tr>
<tr>
<td>Flexible pipe-socket, 24 V</td>
<td>2RL 008 967-011</td>
</tr>
<tr>
<td>Flexible pipe-socket, 12/24 V</td>
<td>2RL 008 967-021</td>
</tr>
<tr>
<td>Magnet, 12 V</td>
<td>2RL 008 966-001</td>
</tr>
<tr>
<td>Magnet, 12 / 24 V</td>
<td>2RL 008 966-021</td>
</tr>
<tr>
<td>Tail/stop variant with central bolt, 12 V</td>
<td>2RL 008 990-001</td>
</tr>
<tr>
<td>Tail/stop variant with central bolt, 24 V</td>
<td>2RL 008 990-011</td>
</tr>
<tr>
<td>Tail/stop variant with central bolt, 12/24 V</td>
<td>2RL 008 990-021</td>
</tr>
</tbody>
</table>

Flexible pipe-socket mounting

Fixed attachment

Flexible pipe-socket mounting

Magnetic attachment

Tail/stop variant with central bolt

Fixed attachment

Pipe socket mounting

Magnetic attachment
<table>
<thead>
<tr>
<th>Product photo</th>
<th>Description</th>
<th>Part number</th>
<th>VPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Socket pipe to weld on, straight, 100 mm long, with rubber stopper and socket according to DIN 14420</td>
<td>1-pin 8HG 002 365-001, 2-pin 8HG 006 294-101</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Extension tube with base for screwing on, overall height 126 mm, with rubber stopper and socket according to DIN 14420</td>
<td>1-pin 8HG 006 294-011, 2-pin available on request</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Angled extension tube, with base for screwing onto the side, gap 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 in accordance with DIN 14420</td>
<td>1-pin 8HG 006 294-021, 2-pin available on request</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>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 14420</td>
<td>1-pin 8HG 006 294-111, 2-pin available on request</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>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 14420</td>
<td>1-pin 8HG 006 294-031, 2-pin 8HG 006 294-141</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Socket pipe with screw attachment, height approx. 100 mm, with rubber stopper and socket according to DIN 14420</td>
<td>1-pin 8HG 006 294-051, 2-pin 8HG 006 294-091</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Extension tube with 2 screw holes for mounting to the rear of the cab, with telescopic holder, overall height approx. 1,000 mm, option of displacement up to 700 mm, with rubber stopper and socket in accordance with DIN 14420</td>
<td>1-pin 8HG 006 294-041, 2-pin available on request</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Socket pipe to weld on, straight, height 100 mm. Compatible with 8HG 002 365-001 / 8HG 006 294-101</td>
<td>8HG 096 531-007</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Socket pipe, straight, black with M8 thread, approx. 220 mm long. Compatible with 8HG 990 368-001 / 8HG 096 531-107</td>
<td>8HG 331 470-007</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Socket pipe, straight with base, to screwing, total height 126 mm. Compatible with 8HG 006 294-011 / 8HG 006 294-121</td>
<td>8HG 096 531-107</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Angled extension tube, with base for screwing onto the side, gap 90 mm. Compatible with 8HG 006 294-021 / 8HG 006 294-111 / 8HG 096 531-117</td>
<td>8HG 096 531-117</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Angled socket pipe, with base for screwing on from side, clearance 50 mm. Compatible with 8HG 006 294-021 / 8HG 096 531-127</td>
<td>8HG 096 531-127</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Swiveling extension tube, height approx. 105 mm. Compatible with 8HG 06 294-031 / 8HG 096 531-137</td>
<td>8HG 096 531-137</td>
<td>2</td>
</tr>
</tbody>
</table>
## ACCESSORIES

<table>
<thead>
<tr>
<th>Product photo</th>
<th>Description</th>
<th>Part number</th>
<th>VPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-pole socket with cap, with 2 blade couplings 6.3 mm</td>
<td>9JB 004 777-001*&lt;br&gt;9JB 004 777-002*</td>
<td>5&lt;br&gt;1</td>
</tr>
<tr>
<td></td>
<td>2-pole round socket with ground contact, with 2 blade couplings 6.3 mm</td>
<td>8JB 862 757-001*&lt;br&gt;8JB 862 757-007*</td>
<td>1&lt;br&gt;24</td>
</tr>
<tr>
<td></td>
<td>2-pole 6-edge SW20 socket with ground contact, with 2 blade couplings 6.3 mm</td>
<td>8JB 862 757-021*&lt;br&gt;8JB 862 757-027*</td>
<td>1&lt;br&gt;24</td>
</tr>
<tr>
<td></td>
<td>2-pole socket with cap, with 300 mm cable 2.5 mm² and 2 blade couplings 6.3 mm</td>
<td>8JB 001 946-101*</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2-pole aluminum alloy socket with cap and 1 screw connection ground on housing</td>
<td>8JB 001 946-021*</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2-pin socket with cover and 2 blade terminal connections 6.3 mm</td>
<td>8JB 004 123-031*</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1-pin round socket with fillister head screw M4 x 8</td>
<td>8JB 850 434-011*</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>1-pin socket with cap</td>
<td>8JB 001 946-011*</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>12 V, test equipment to monitor the function of rotating beacons and flashing beacons, indicates the failure of a beacon</td>
<td>5KG 011 630-101</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>24 V, test equipment to monitor the function of rotating beacons and flashing beacons, indicates the failure of a beacon</td>
<td>5KG 011 630-111</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Rubber stopper /cap according to DIN 14620</td>
<td>9GH 096 532-001&lt;br&gt;9GH 096 532-007</td>
<td>10&lt;br&gt;200</td>
</tr>
</tbody>
</table>

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

## Installation examples

- Bracket to screw on
- Angle bracket
- Bracket with thread
- Variable bracket
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 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 lamps 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 features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side marker lights, Style Design</td>
<td>2PS 013 305-XXX*</td>
</tr>
<tr>
<td>Side marker lights, yellow, left</td>
<td>2PS 013 306-XXX*</td>
</tr>
<tr>
<td>Side marker lights, red, left</td>
<td>2PS 013 307-XXX*</td>
</tr>
<tr>
<td>Side marker lights, Tech Design</td>
<td></td>
</tr>
<tr>
<td>Side marker lamp, yellow, horizontal</td>
<td>2PS 013 300-XXX*</td>
</tr>
<tr>
<td>Side marker lamp, yellow, vertical</td>
<td>2PS 013 301-XXX*</td>
</tr>
<tr>
<td>Side marker lamp, red, horizontal</td>
<td>2PS 013 302-XXX*</td>
</tr>
<tr>
<td>Side marker lamp, red, vertical</td>
<td>2PS 013 303-XXX*</td>
</tr>
</tbody>
</table>

* 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.
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 features:

**Shapeline reflex reflector**

Reflex reflector, Style Design
- a) Reflex reflector
  - 2RA 013 347-XXX*
- b) Reflex reflector
  - 8RA 013 403-XXX*

Reflex reflector, Tech Design
- a) Reflex reflector
  - 2RA 013 347-XXX*
- b) Reflex reflector
  - 8RA 013 403-XXX*

**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*

**Shapeline clearance lamps**

Clearance lamp, Tech Design
- Clearance lamp
  - 2SX 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:

**LED side marker light**

1 LED, 12 / 24 V, power consumption 0.5 W / 12 V and 1.0 W / 24 V, operating temperature -40°C to +50°C, two-core sheathed cable, 500 mm, cable end open, with 2 screws Ø 4 mm.

Yellow cover lens

Clear cover lens

Type approval: 0004

2PS 959 788-002/7
2PS 959 788-102/7

---

This LED product has the following features:

**DuraLED side marker light**

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

500 mm cable, black end caps

2,500 mm cable, black end caps

Type approval: 0007

2PS 980 868-201
2PS 980 868-211

---

This LED product has the following features:

**LED side marker light**

2 LEDs, 12 / 24 V, power consumption 0.6 W / 12 V and 1.2 W / 24 V, operating temperature -40°C to +50°C.

12 V, 500 mm cable, open end

24 V, 500 mm cable, open end

Type approval: 5881

2PS 345 600-001
2PS 345 600-011
This LED product has the following features:

**DuraLED side marker light**

2 LEDs, power consumption <1 W, operating temperature -40°C to +60°C, reverse polarity protection, with 2 screws Ø 4 mm, DEUTSCH connector.

12 / 24 V, Kat. SM1

Type approval: 5872

**DuraLED marker light (additional side direction indicator)**

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.

12 / 24 V

Type approval: 0367

**LED auxiliary indicator, cat. 5**

12 V, power consumption 0.7 W, operating temperature -40°C to +60°C, screwed, 2-pin EasyConn, rubber housing, AMP-SUPERSEAL, rubber housing, 6.3 mm receptacles, and plastic housing.

Screwed, 2-pin EasyConn
With rubber housing

AMP-SUPERSEAL (AMP 282080-1)
With rubber housing

6.3 mm receptacles
With plastic housing

Type approval: 01 0066
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, 12 V, additional versions available on request.

- 6.3 mm contact pin, white frame
  - 12 V, horizontal: 2PS 344 690-007
  - 12 V, vertical: 2PS 344 690-027
- 6.3 mm contact pin, grey frame
  - 12 V, horizontal: 2PS 344 690-067
  - 12 V, vertical: 2PS 344 690-067
- 6.3 mm contact pin, black frame
  - 12 V, horizontal: 2PS 344 690-067
  - 12 V, vertical: 2PS 344 690-067
- AMP-SUPERSEAL, white frame
  - 12 V, horizontal: 2PS 344 690-017
  - 12 V, vertical: 2PS 344 690-017
- AMP-SUPERSEAL, black frame
  - 12 V, horizontal: 2PS 344 690-017
  - 12 V, vertical: 2PS 344 690-017

**Type approval:** 9853

---

This LED product has the following features:

**This LED product has the following features:**

**LED side marker light**

For horizontal surface mounting, with 250 mm cable, self-adhesive.

- 12 V, horizontal: 2PS 009 226-021/7
- 12 V, vertical: 2PS 009 226-077

For horizontal surface mounting, with 6.3 mm contacts and counterplug grommet, self-adhesive.

- 12 V, horizontal: 2PS 009 226-047
- 2-pin AMP connector, self-adhesive.
  - 24 V, horizontal: 2PS 009 226-017

**Type approval:** 10236

---

This LED product has the following features:

**LED side marker light with reflex reflector**

With 1 yellow LED, for vertical assembly, yellow lens, black housing, ADR-tested.

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

**Type approval:** 1395
HELLA offers a comprehensive range of interior lighting for various vehicle applications and vehicle types.

The product range includes ambient lighting in the form of light guides and LED modules, continuous lighting systems/modules for ceiling systems, service sets (control units), and step lighting.
### Standard LED spotlights, fixed

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Power LEDs</td>
<td>1 white</td>
</tr>
<tr>
<td>Illumination angle</td>
<td>40° or 20°</td>
</tr>
<tr>
<td>Illuminance in 1 m</td>
<td>156 lx (20°), 65 lx (40°)</td>
</tr>
<tr>
<td>IP protection class</td>
<td>3 x</td>
</tr>
<tr>
<td>Power consumption</td>
<td>2 W (0.16 A at 12 V)</td>
</tr>
<tr>
<td>Lens</td>
<td>Clear</td>
</tr>
<tr>
<td>Mounting</td>
<td>Choice between screw or spring-assisted mounting</td>
</tr>
<tr>
<td>Current consumption of spotlight at 12 V/2.5 W</td>
<td>Approx. 0.20 A</td>
</tr>
</tbody>
</table>

**Flush-mounting, fixed, wide illumination (40°)**

<table>
<thead>
<tr>
<th>Finisher colour</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>2JA 344 040-701</td>
</tr>
<tr>
<td>Black</td>
<td>2JA 344 040-711</td>
</tr>
<tr>
<td>Silver</td>
<td>2JA 344 040-721</td>
</tr>
</tbody>
</table>

**Flush-mounting, fixed, spot-type illumination (20°)**

<table>
<thead>
<tr>
<th>Finisher colour</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver</td>
<td>2JA 344 040-761</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round finisher with angled edges</td>
<td>9AB 344 057-061</td>
</tr>
<tr>
<td>Round finisher with rounded edges</td>
<td>9AB 344 057-071</td>
</tr>
<tr>
<td>Stainless metal frame, polished</td>
<td>9AB 959 505-501</td>
</tr>
<tr>
<td>Stainless metal frame, satinated</td>
<td>9AB 959 505-561</td>
</tr>
<tr>
<td>Square finisher with angled edges</td>
<td>9AB 344 058-061</td>
</tr>
<tr>
<td>Square finisher with angled edges</td>
<td>9AB 344 058-071</td>
</tr>
</tbody>
</table>

### Standard LED spotlights, adjustable

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Power LEDs</td>
<td>1 white</td>
</tr>
<tr>
<td>Illumination angle</td>
<td>40° or 20°</td>
</tr>
<tr>
<td>Illuminance in 1 m</td>
<td>156 lx (20°), 65 lx (40°)</td>
</tr>
<tr>
<td>IP protection class</td>
<td>3 x</td>
</tr>
<tr>
<td>Power consumption</td>
<td>2 W (0.16 A at 12 V)</td>
</tr>
<tr>
<td>Lens</td>
<td>Clear</td>
</tr>
<tr>
<td>Mounting</td>
<td>Choice between screw or spring-assisted mounting</td>
</tr>
<tr>
<td>Current consumption of spotlight at 12 V/2.5 W</td>
<td>Approx. 0.20 A</td>
</tr>
</tbody>
</table>

**Flush-mounting, adjustable, wide illumination (40°)**

<table>
<thead>
<tr>
<th>Finisher colour</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>2JA 343 790-301</td>
</tr>
<tr>
<td>Black</td>
<td>2JA 343 790-311</td>
</tr>
<tr>
<td>Silver</td>
<td>2JA 343 790-341</td>
</tr>
</tbody>
</table>

**Flush-mounting, adjustable, spot-type illumination (20°)**

<table>
<thead>
<tr>
<th>Finisher colour</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver</td>
<td>2JA 343 790-661</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round finisher with angled edges</td>
<td>9AB 344 057-061</td>
</tr>
<tr>
<td>Round finisher with rounded edges</td>
<td>9AB 344 057-071</td>
</tr>
<tr>
<td>Stainless metal frame, polished</td>
<td>9AB 959 505-501</td>
</tr>
<tr>
<td>Stainless metal frame, satinated</td>
<td>9AB 959 505-561</td>
</tr>
<tr>
<td>Square finisher with angled edges</td>
<td>9AB 344 058-061</td>
</tr>
<tr>
<td>Square finisher with angled edges</td>
<td>9AB 344 058-071</td>
</tr>
</tbody>
</table>

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

This LED product has the following features:

**LED spotlights round, flat flush-mounting/surface-mounting**

- **Illumination angle**: 35°
- **Illuminance**: 45 lx (Standard), 105 lx (High-Power)
- **IP protection class**: 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**: Recessed 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.

### Installation, fixed Finisher colour

<table>
<thead>
<tr>
<th>Standard LED spotlight 1.5 W</th>
<th>High-Power LED spotlight 2.6 W (double light power with cooling element)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Celis®</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2JA 344 199-001</td>
</tr>
<tr>
<td>Black</td>
<td>2JA 344 599-011</td>
</tr>
<tr>
<td>Silver</td>
<td>2JA 344 599-021</td>
</tr>
<tr>
<td>With Celis® warm-white ambient</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2JA 344 199-201</td>
</tr>
<tr>
<td>Black</td>
<td>2JA 344 599-211</td>
</tr>
<tr>
<td>Silver</td>
<td>2JA 344 599-221</td>
</tr>
<tr>
<td>With Celis® blue ambient</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2JA 344 199-301</td>
</tr>
<tr>
<td>Black</td>
<td>2JA 344 599-311</td>
</tr>
<tr>
<td>Silver</td>
<td>2JA 344 599-321</td>
</tr>
<tr>
<td>With Celis® orange ambient</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2JA 344 199-351</td>
</tr>
<tr>
<td>Black</td>
<td>2JA 344 599-361</td>
</tr>
<tr>
<td>Silver</td>
<td>2JA 344 599-371</td>
</tr>
<tr>
<td>With Celis® red ambient</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2JA 344 199-301</td>
</tr>
<tr>
<td>Black</td>
<td>2JA 344 599-311</td>
</tr>
<tr>
<td>Silver</td>
<td>2JA 344 599-321</td>
</tr>
<tr>
<td>With Celis® orange ambient</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2JA 344 199-351</td>
</tr>
<tr>
<td>Black</td>
<td>2JA 344 599-361</td>
</tr>
<tr>
<td>Silver</td>
<td>2JA 344 599-371</td>
</tr>
</tbody>
</table>

### Accessories

Installation frame, the overall height with frame is 22 mm

- **Chrome**: 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 protection class**: 30
- **Power consumption**: 1 – 16 W
- **Voltage**: Multivolt (9 – 32 VDC)

**For 4 Standard or High-Power spotlights please use**... 5XA 344 150-001

**For 8 Standard or 5 high power spotlights 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.
This LED product has the following features:

### CargoLED

- **Number of LEDs**: 4 white Power LEDs
- **Connection**: Electrical, via a 310 mm long cable
- **Illumination angle**: 44° (wide illumination at close range)
- **Illuminance in 1 m**: 180 lx
- **IP protection class**: 6K9K
- **Power consumption**: 6 W (0.5 A at 12 V)
- **Lens**: Clear
- **Mounting**: 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:

### Ambient LED spotlight

- **Number of LEDs**: 1 LED
- **Illuminance in 1 m**: 5 lx
- **IP protection class**: 20
- **Power consumption**: 0.3 W (0.02 A at 12 V)
- **Lens**: Clear
- **Scope of delivery**: 3 frames (white, grey and black)
- **Mounting**: Surface-mounting via attachment element
- **LED red**: 2JA 344 170-001
- **LED blue**: 2JA 344 170-011
- **LED white**: 2JA 344 170-021
- **LED yellow**: 2JA 344 170-031

#### Variant

- **White LED, with a silver instead of a grey frame**: 2JA 344 170-201

This LED product has the following features:

### 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

For illustrative purposes only
INTERIOR LIGHTING

This LED product has the following features:

**LED step light**

- Number of LEDs: 2 LEDs
- 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 protection class: 6K9K
- Lens: Clear
- Scope of delivery: Seal, fixing screws and screw caps
- Mounting: Installation

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

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

This LED product has the following features:

**Slim LED surface-mounted lamp**

- Number of LEDs: 10 LEDs
- Connection: 2,500 mm cable
- Operating temperature: -40 °C to +60 °C
- IP protection class: 6K7, 6K9K
- Mounting: 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 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 protection class: 67
- Light color: 5,700 K (neutral white)
- Mounting: 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
- With motion detector: 2JA 012 557-001
This LED product has the following features:

### MINI OvalLED

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of LEDs</td>
<td>4 white LEDs, 1 ambient LED</td>
</tr>
<tr>
<td>Illumination angle</td>
<td>50°</td>
</tr>
<tr>
<td>Illumination</td>
<td>Side driver or instrument range</td>
</tr>
<tr>
<td>Illuminance at 1 m</td>
<td>Standard 14.5 lx, Power 54 lx</td>
</tr>
<tr>
<td>Function</td>
<td>Ambient lighting can be switched on</td>
</tr>
<tr>
<td>IP protection class</td>
<td>6K9K (without frame/switch), 40 (with frame/switch)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>Standard 1.7 W (0.14 A at 12 V)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>Power 3.6 W (0.30 A at 12 V)</td>
</tr>
<tr>
<td>Lens</td>
<td>Brilliant and clear</td>
</tr>
<tr>
<td>Mounting</td>
<td>Installation</td>
</tr>
<tr>
<td>Voltage</td>
<td>12 V or 24 V</td>
</tr>
<tr>
<td>Current consumption</td>
<td>12 V: 3.6 W = approx. 0.30 A</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C to +60 °C</td>
</tr>
</tbody>
</table>

#### LED equipment

<table>
<thead>
<tr>
<th>LED equipment</th>
<th>Without frame and switch</th>
<th>With frame and switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 white power LEDs, red</td>
<td>2JA 343 570-011</td>
<td>2JA 343 570-051</td>
</tr>
<tr>
<td>4 white power LEDs, blue</td>
<td>2JA 343 570-117</td>
<td>2JA 343 570-157</td>
</tr>
<tr>
<td>4 white standard LEDs, red</td>
<td>2JA 343 570-031</td>
<td>–</td>
</tr>
</tbody>
</table>

LED reading light, flexibly adjustable arm

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of LEDs</td>
<td>1 white Power LED</td>
</tr>
<tr>
<td>Connection</td>
<td>Electrical, using a cable 150 mm long</td>
</tr>
<tr>
<td>Illumination</td>
<td>Optimal for map-reading</td>
</tr>
<tr>
<td>Illumination angle</td>
<td>38°</td>
</tr>
<tr>
<td>Illuminance at 0.7 m</td>
<td>110 lx</td>
</tr>
<tr>
<td>IP protection class</td>
<td>53</td>
</tr>
<tr>
<td>Power consumption</td>
<td>2.5 W (0.20 A at 12 V)</td>
</tr>
<tr>
<td>Lens</td>
<td>Patterned</td>
</tr>
<tr>
<td>Mounting</td>
<td>Mounting</td>
</tr>
</tbody>
</table>

#### Trim colour white

<table>
<thead>
<tr>
<th>Finisher colour</th>
<th>Trim colour white</th>
<th>Finisher colour black</th>
<th>Finisher colour silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 mm</td>
<td>2JA 343 720-011</td>
<td>2JA 343 720-021</td>
<td>2JA 343 720-291</td>
</tr>
<tr>
<td>400 mm</td>
<td>2JA 343 720-111</td>
<td>2JA 343 720-121</td>
<td>2JA 343 720-191</td>
</tr>
<tr>
<td>With plug for cigarette lighter (150 mm)</td>
<td>2JA 343 720-071</td>
<td>2JA 343 720-081</td>
<td>2JA 343 720-091</td>
</tr>
</tbody>
</table>

1) further finisher colours 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 output are carefully optimised to meet the special requirements of our customers.

The complete range of electronics can be found at www.hella.com/soe-electronics
Energy management

Careful use of energy by appropriately influencing of the consumer:

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

Drive train

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

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

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.

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.
**APPLICATION**

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

The IBS reliably and accurately measures the battery voltage, current and temperature parameters. Information on the state of charge (SOC), state of health (SOH) and state of function (SOF) of the battery is calculated algorithmically using these measurements. The IBS is designed to be used in starter, gel and AGM batteries to monitor in-vehicle starter or consumer batteries. The IBS can be directly integrated into the vehicle’s electrical system with the standardised LIN protocol.

**DESIGN AND FUNCTION**

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

**PRODUCT FEATURES**

- High-accuracy measurement of battery voltage, current and temperature parameters
- Determining the battery condition parameters State of Charge (SOC), State of Health (SOH) and State of Function (SOF)
- Simple electrical and mechanical integration
### Monitoring of different battery states

**Ageing condition (SoH):**
- "Real" capacity
- Changed charging and discharging capability

**Starting capability (SoF):**
- Ability of the battery to deliver high levels of current
- Change in the starting capability throughout the design life

<table>
<thead>
<tr>
<th>Charge state (SoC)</th>
<th>Available capacity</th>
<th>Dischargable capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal capacity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**BATTERY STATUS 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: \( \text{SOC} \% = \frac{\text{dischargeable capacity}}{\text{nominal capacity}} \)

**State of health:** The state of health (SOH) indicates the ageing status of the battery.

The state of health (SOH) is defined as: \( \text{SOH} \% = \frac{\text{available capacity}}{\text{rated capacity}} \)

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 cranking health of the engine on the basis of the currently measured current and the voltage.

**VARIANT OVERVIEW**

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

<table>
<thead>
<tr>
<th>Operating voltage</th>
<th>Type</th>
<th>Mating connector</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 – 16.5 V</td>
<td>Sensor 1</td>
<td>Hirschmann 872-858-565</td>
<td>6PK 010 862-001</td>
</tr>
<tr>
<td>6 – 16.5 V</td>
<td>Sensor 2</td>
<td>Hirschmann 872-858-565</td>
<td>6PK 010 862-011</td>
</tr>
<tr>
<td>7.5 – 32 V</td>
<td></td>
<td>Hirschmann 872-857-561</td>
<td>6PK 013 824-001</td>
</tr>
<tr>
<td>6 – 16.5 V</td>
<td>For motorhomes</td>
<td>Hirschmann 872-858-546</td>
<td>on request</td>
</tr>
<tr>
<td>6 – 16.5 V</td>
<td>For agricultural and construction machinery</td>
<td>Hirschmann 872-858-546</td>
<td>on request</td>
</tr>
</tbody>
</table>
APPLICATION
The accelerator pedals are suitable for driver’s cabs in agricultural and construction machinery. Thanks to the wear-free measuring principle of HELLA’s in-house developed CIPOS® sensors (see description of the design and function of the turning angle sensors) and their extremely low level of mechanical wear, this version is particularly suitable for contact-type accelerator pedals that effect frequent small movements.

PRODUCT FEATURES
- Contact free measuring principle
- Slim and sturdy design
- Simple mechanical connection
- Redundant output signal
- High degree of measuring accuracy, which means no learning process is necessary in the vehicle
- High interference immunity against electrical and magnetic fields

DESIGN AND FUNCTION
Housing and operating lever or pedal plate are made from fully reusable, 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.

VARIANT OVERVIEW

<table>
<thead>
<tr>
<th>Description</th>
<th>Pedal material</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor-mounted accelerator pedal</td>
<td>Plastic</td>
<td>6PV 312 010-107</td>
</tr>
<tr>
<td>Suspended accelerator pedal</td>
<td>Plastic</td>
<td>6PV 009 591-011</td>
</tr>
</tbody>
</table>
Rain/light sensors
Recording environmental properties

PRODUCT FEATURES

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

APPLICATION

The rain/light sensor can be used in its full functional range (five functions: rain sensor, light sensor, solar sensor, humidity measurement and head-up display) only for passenger car applications. This sensor can only be used to a limited extent for vehicles with special windshields (thickness, angle, transmission).

The optics of the second sensor are specially designed for vehicles with steep windshields and combines the rain and light recognition functions (environment and tunnel recognition).

VARIANT OVERVIEW

The sensors must be specially applied for each vehicle. For that reason all part numbers are customer-specific provided.

<table>
<thead>
<tr>
<th>Areas of use</th>
<th>Permissible glass thickness</th>
<th>Permissible glass tilt</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>4–6 mm</td>
<td>22°–32°</td>
<td>on request</td>
</tr>
<tr>
<td>Vehicles with special windshields</td>
<td>6–9 mm</td>
<td>80°–90°</td>
<td>on request</td>
</tr>
</tbody>
</table>
Radio transmitter systems
Switching on and off or opening and locking

**PRODUCT FEATURES**

- Electronic radio transmitter key:
  - Unlocking of cabin doors/flaps
  - Control of lamps/worklights
  - Activating/deactivating an electronic immobiliser via a transponder
  - Robust design

**APPLICATION**

The radio transmitter system was specially developed under hard operating conditions (agricultural, construction machines, commercial vehicles). The system enables the driver to conveniently unlock the cabin door. The remote control can be equipped with one or two buttons, depending on the customer’s requirements. The rugged design has been specially developed for use with agricultural and construction machinery. An additional control unit with up to four output signals also makes it possible to control lights, e.g. worklights or beacons. The HELLA wireless remote system makes it easy to activate the flashers as well as opening and locking of compartments, e.g. the engine compartment and tool containers. The design can be customised on request, e.g. to incorporate customer-specific logos.

**DESIGN AND FUNCTION**

With regard to the electrical function, the transmitter consists of the transmitter electronics and transponder units. The transponder responsible for the immobiliser function does not depend on the transmitter electronics and can be specified by the customer.

The transmitter is mounted to a double-sided populated PCB. In addition to the actual transmitter electronics, the printed circuit board contains the locking/unlocking button and depending on the variant a further button (additional function). The printed circuit board and the battery are electrically connected by the spring contact elements. By pressing a button, the radio remote control sends data packages provided with a roll code and an up-to-date 128 bit encryption. If the data are positively decoded by the receiving control unit of the radio remote control, this will activate the output signal 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.
VARIANT OVERVIEW

There are two variants of the reception control unit available. The basic version and the extended variant. Customer-specific output signal characteristics are available on request. If a customer-specific logo is intended, a new part number will be generated for this purpose. Each unit variant includes two blind plugs made of hard plastic. This enables the radio transmitter to be operated even without a key bit.

<table>
<thead>
<tr>
<th>Variants</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 radio transmitters and receiver basic version</td>
<td>on request</td>
</tr>
<tr>
<td>2 radio transmitters and receiver extended version</td>
<td>5FA 012 485-817</td>
</tr>
</tbody>
</table>

Other variants and configurations available upon request.
Electromotive actuators
Electric locking / unlocking, space-saving, with or without micro-switch, Low Force

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 package space is available.

Examples include:
- Tank modules
- Service flaps
- Glove compartments
- 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.

VARIANT OVERVIEW

<table>
<thead>
<tr>
<th>Function</th>
<th>Voltage</th>
<th>Actuating force</th>
<th>Manual adjustment</th>
<th>Protection level</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward and reverse rotation electrical</td>
<td>12 V</td>
<td>-</td>
<td>Yes</td>
<td>IP 5K4</td>
<td>6NW 011 122-017</td>
</tr>
<tr>
<td>With micro-switch</td>
<td>12 V</td>
<td>-</td>
<td>Yes</td>
<td>IP 5K4</td>
<td>6NW 011 122-027</td>
</tr>
</tbody>
</table>

Electrical forward rotation and reverse rotation via return spring, with soft touch button

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Actuating force</th>
<th>Manual adjustment</th>
<th>Protection level</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V</td>
<td>-</td>
<td>Yes</td>
<td>IP 5K4</td>
<td>6NW 011 122-047</td>
</tr>
</tbody>
</table>
Electromotive actuators
Electrical locking / unlocking and closing
(medium force)

PRODUCT FEATURES
- 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 connecting elements available

APPLICATION
The motor-driven actuator is used for electrical locking and unlocking or closing of locking and flap systems in vehicles and industrial applications.

Examples of applications in mechanisms include:
- Electrical locking and unlocking
- Electrical shutting
- Power opening and closing of all doors (locking systems), flaps, roof windows, seats, covers, hoods, glove boxes, etc.

ACCESSORIES
The comprehensive range of accessories for electromotive actuators comprises numerous different joining elements. These allow the straightforward integration of the actuator in the application without additional development expenditure being necessary.

VARIANT OVERVIEW

<table>
<thead>
<tr>
<th>Function</th>
<th>Voltage</th>
<th>Positioning force*</th>
<th>Manual adjustment</th>
<th>Protection level</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical retraction and extension</td>
<td>12 V</td>
<td>30 – 130 N</td>
<td>Yes</td>
<td>IP 5K0</td>
<td>6NW 009 203-401</td>
</tr>
<tr>
<td></td>
<td>12 V</td>
<td>30 – 140 N</td>
<td>No</td>
<td>IP 5K0</td>
<td>6NW 009 203-411</td>
</tr>
<tr>
<td></td>
<td>12 V</td>
<td>30 – 130 N</td>
<td>Yes</td>
<td>IP 5K4</td>
<td>6NW 009 203-421</td>
</tr>
<tr>
<td></td>
<td>12 V</td>
<td>30 – 140 N</td>
<td>No</td>
<td>IP 5K4</td>
<td>6NW 009 203-431</td>
</tr>
<tr>
<td></td>
<td>24 V</td>
<td>30 – 130 N</td>
<td>Yes</td>
<td>IP 5K4</td>
<td>6NW 009 203-441</td>
</tr>
<tr>
<td></td>
<td>24 V</td>
<td>30 – 140 N</td>
<td>No</td>
<td>IP 5K4</td>
<td>6NW 009 203-451</td>
</tr>
<tr>
<td></td>
<td>12 V</td>
<td>30 – 140 N</td>
<td>Yes</td>
<td>IP 5K4</td>
<td>6NW 009 203-557</td>
</tr>
<tr>
<td>Electrical retraction, extension with clockwork spring</td>
<td>12 V</td>
<td>30 – 170 N</td>
<td>No</td>
<td>IP 5K0</td>
<td>6NW 009 203-461</td>
</tr>
<tr>
<td></td>
<td>12 V</td>
<td>30 – 170 N</td>
<td>No</td>
<td>IP 5K4</td>
<td>6NW 009 203-471</td>
</tr>
<tr>
<td></td>
<td>24 V</td>
<td>30 – 170 N</td>
<td>Yes</td>
<td>IP 5K4</td>
<td>6NW 009 203-541</td>
</tr>
<tr>
<td>Electrical extension, retraction with clockwork spring</td>
<td>12 V</td>
<td>30 – 130 N</td>
<td>No</td>
<td>IP 5K0</td>
<td>6NW 009 203-491</td>
</tr>
<tr>
<td></td>
<td>12 V</td>
<td>30 – 130 N</td>
<td>No</td>
<td>IP 5K4</td>
<td>6NW 009 203-501</td>
</tr>
<tr>
<td></td>
<td>24 V</td>
<td>40 – 150 N</td>
<td>No</td>
<td>IP 5K4</td>
<td>6NW 009 203-521</td>
</tr>
</tbody>
</table>

* Dependent on the operating voltage and ambient temperature
Electromotive actuators
Electrical locking / unlocking and pull/push (high force)

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

Examples include:
- Large locks
- Large flaps
- Seat release

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

Function
This electromotive actuator is an actuator with rotary output driven by a DC motor. The actuator is operated by applying a voltage via a two-pin plug 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.

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

VARIANT OVERVIEW

<table>
<thead>
<tr>
<th>Function</th>
<th>Voltage</th>
<th>Torque</th>
<th>Manual adjustment</th>
<th>Protection level</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retraction with spring, electrical extension</td>
<td>12 V</td>
<td>150 Ncm</td>
<td>No</td>
<td>IP 5K0</td>
<td>6NW 009 424-781</td>
</tr>
<tr>
<td>Electrical retraction and extension</td>
<td>12 V</td>
<td>300 Ncm</td>
<td>No</td>
<td>IP 5K0</td>
<td>6NW 009 424-791</td>
</tr>
</tbody>
</table>
Electromotive actuators
Electrical locking / unlocking and closing
Part number 6NW 011 303-011

APPLICATION
The URA can be used in a broad range of applications involving harsh environmental conditions, and can perform precise and reliable positioning. The insensitivity to magnetic fields and the high level of temperature stability, in particular, are the characteristic qualities of the CIPOS technology employed in the URA. Angles are measured inductively using a non-contact and hence wear-free method, thus guaranteeing a high measuring precision over the whole service life. An error memory records errors and the actuator is able to react differently to different errors.

APPLICATION EXAMPLES
- Seed metering / singling
- Delivery air / exhaust air flaps

Function
The URA monitors the position of the output gear wheel and the integrated electronics continually calculate the position using an ASIC (Application Specific Integrated Circuit). The actuator offers the “true power on” function for angular ranges < 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) for holding the position.

PRODUCT FEATURES
- 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 gearbox; low current consumption (< 25 mA) for holding the position
- Internal fault memory

VARIANT OVERVIEW

<table>
<thead>
<tr>
<th>Function</th>
<th>Voltage</th>
<th>Torque</th>
<th>Manual adjustment</th>
<th>Protection level</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power locking / unlocking and closing, power rotational movement to right and left, with position feedback via CIPOS technology</td>
<td>12 V</td>
<td>up to 300 Ncm</td>
<td>No</td>
<td>IP 6K9K oder IP 6K7 (depends on the connector classification)</td>
<td>on request</td>
</tr>
</tbody>
</table>
Turning angle sensors
Single and double sensors

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

APPLICATION
These CIPOS® angular position sensors (contactless inductive position sensors) can be used in many different applications to return accurate and reliable angular measurements even in tough 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 polyamide housing (PA66), the rotation of the lever arm is transferred to the rotor and measured by induction. An ASIC (Application Specific Integrated Circuit) accurately computes the rotor position. Various mounting positions are possible thanks to the repeating characteristic curve of the output signal (which depends on the structure of the sensor that is used), which increases the flexibility of the sensor.
ANALOGUE OUTPUT
At a supply voltage of 5 V DC, the angle measured is rendered as the ratio of the output voltage ($U_{out}$) and operating voltage ($U_s$) (ratiometric to power supply). This signal is output by a high-side driver (HSD). At a supply voltage between 9 V and 32 V (multivoltage), the angle measured is rendered as a voltage between 0.5 V and 4.5 V.

When the PWM signal is used, the actual position of the angular position sensor is equivalent to the ratio of the low time of the PWM signal ($T_{low}$) and the period ($T_{period}$). The absolute duration of the high or low level is not indicative of the angle. The PWM signal is output by a low-side driver (LSD). You can of course also choose to evaluate the ratio between high time ($T_{high}$) and period ($T_{period}$). This will invert the course with reference to the analogue signal.

### VARIANT OVERVIEW

<table>
<thead>
<tr>
<th>Mechanical connection</th>
<th>Angle range</th>
<th>Supply voltage</th>
<th>Output signal</th>
<th>Zero position</th>
<th>Lever arm</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single sensors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socket</td>
<td>-30° to +30°</td>
<td>5 V</td>
<td>0.5 – 4.5 V ratiometric and PWM</td>
<td>0° / 120° / 240°</td>
<td>50 mm</td>
<td>6PM 008 161-241</td>
</tr>
<tr>
<td>Socket</td>
<td>-51° to +51°</td>
<td>5 V</td>
<td>0.5 – 4.5 V ratiometric and PWM</td>
<td>0° / 120° / 240°</td>
<td>50 mm</td>
<td>6PM 008 161-251</td>
</tr>
<tr>
<td>Socket</td>
<td>-54° to +54°</td>
<td>5 V</td>
<td>0.25 – 4.75 V ratiometric and PWM</td>
<td>0° / 120° / 240°</td>
<td>70 mm</td>
<td>6PM 008 161-121</td>
</tr>
<tr>
<td>Socket</td>
<td>-54° to +54°</td>
<td>5 V or 9 – 32 V</td>
<td>0.5 – 4.5 V ratiometric and PWM</td>
<td>60° / 180° / 300°</td>
<td>70 mm</td>
<td>6PM 008 161-131</td>
</tr>
<tr>
<td>Socket</td>
<td>-54° to +54°</td>
<td>5 V or 9 – 32 V</td>
<td>0.25 – 4.75 V ratiometric and PWM</td>
<td>30° / 150° / 270°</td>
<td>50 mm</td>
<td>6PM 008 161-141</td>
</tr>
<tr>
<td>Socket</td>
<td>-54° to +54°</td>
<td>5 V or 9 – 32 V</td>
<td>0.25 – 4.75 V ratiometric and PWM</td>
<td>90° / 210° / 330°</td>
<td>50 mm</td>
<td>6PM 008 161-151</td>
</tr>
<tr>
<td><strong>Basic sensors - Compact design</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ball, top</td>
<td>-54° to +54°</td>
<td>5 V</td>
<td>0.5 – 4.5 V ratiometric</td>
<td>0° / 120° / 240°</td>
<td>39 mm</td>
<td>6PM 010 200-501</td>
</tr>
<tr>
<td>Ball, top</td>
<td>-54° to +54°</td>
<td>5 V</td>
<td>0.5 – 4.5 V ratiometric</td>
<td>0° / 120° / 240°</td>
<td>39 mm</td>
<td>6PM 010 200-511</td>
</tr>
<tr>
<td>Ball, bottom</td>
<td>-54° to +54°</td>
<td>5 V</td>
<td>0.5 – 4.5 V ratiometric</td>
<td>0° / 120° / 240°</td>
<td>51 mm</td>
<td>6PM 010 200-521</td>
</tr>
<tr>
<td>Ball, top</td>
<td>-54° to +54°</td>
<td>5 V</td>
<td>0.5 – 4.5 V ratiometric</td>
<td>0° / 120° / 240°</td>
<td>64 mm</td>
<td>6PM 010 200-531</td>
</tr>
<tr>
<td><strong>Double sensors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socket</td>
<td>-30° to +30°</td>
<td>5 V or 9 – 32 V</td>
<td>0.5 – 4.5 V ratiometric/ absolute</td>
<td>0° / 120° / 240°</td>
<td>50 mm</td>
<td>6PD 009 583-001</td>
</tr>
<tr>
<td>Socket</td>
<td>-54° to +54°</td>
<td>5 V or 9 – 32 V</td>
<td>0.5 – 4.5 V ratiometric/ absolute</td>
<td>0° / 120° / 240°</td>
<td>50 mm</td>
<td>6PD 009 583-011</td>
</tr>
<tr>
<td>Socket</td>
<td>-54° to +54°</td>
<td>5 V or 9 – 32 V</td>
<td>0.5 – 4.5 V ratiometric/ absolute</td>
<td>0° / 120° / 240°</td>
<td>70 mm</td>
<td>6PD 009 580-017</td>
</tr>
<tr>
<td>Ball, top</td>
<td>-54° to +54°</td>
<td>5 V or 9 – 32 V</td>
<td>0.5 – 4.5 V ratiometric/ absolute</td>
<td>0° / 120° / 240°</td>
<td>90 mm</td>
<td>6PD 009 584-017</td>
</tr>
</tbody>
</table>
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.
Rocker switch, 3100 series

- 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.
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-pin female connector housing 8JA 003 526-001 (not included in the scope of delivery).

12 V, 2+1+1 x 21 W
4DN 008 768-161

Accessories, 9-pin female connector housing
8JA 003 526-001

Type approval: ECE 10R-04149

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

Reversing and warning alarm

Loud, far-reaching alarm tone, protection against reversed polarity 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 – 24 V, 1200 Hz, 102 dB (A) @ 1.2 m
3SL 009 148-061

12 – 24 V, 1200 Hz, 82 – 102 dB (A) @ 1.2 m
3SL 009 148-071

12 – 24 V, 1200 Hz, 97 dB (A) @ 1.2 m
3SL 009 148-101
**Horn B133**
123 mm diameter, 105 – 118 dB (A) @ 2 m, generates a loud noise, robust housing with distinctive grill, high corrosion protection.

- 24 V, 300 ± 20 Hz
- 3AF 005 631-201

- 24 V, 450 ± 20 Hz
- 3AF 005 631-211

**Type approval:** ECE-R28 / ECE-R10

---

**Heavy tone horn DL50**
130 mm diameter, 114 dB (A) @ 2 m, deep and loud acoustic pattern, solid, black painted housing, robust protective grill, 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 01004, CCC

---

**Horn M26**
97 mm diameter, 15 dB (A) @ 2 m, long-life horn with full, high-quality acoustic pattern, zinc-coated housing, installation of a set comprising a high tone and deep tone achieves an optimal acoustic color.

- 12 V, 335 / 400 Hz, with PTFE pill, copper blade terminal (set), drawing connection A
- 3AM 002 952-891

- 12 V, 400 Hz, with PTFE pill, copper blade terminal, drawing connection A
- 3AL 002 952-811

- 12 V, 335 Hz, with PTFE pill, copper blade terminal, drawing connection A
- 3AL 002 952-861

- 24 V, 335 Hz, copper blade terminal, drawing connection A
- 3AL 002 952-871

- 12 V, 335 Hz, with PTFE pill, copper blade terminal, drawing connection B
- 3AL 002 952-841

- 12 V, 400 Hz, blade terminal, galvanically tin-plated, housing color black, drawing connection B
- 3AL 002 952-827

- 12 V, 400 Hz, with PTFE pill, copper blade terminal, front black, drawing connection A
- 3AL 002 952-857

- 12 V, 335 Hz, copper blade terminal, drawing connection B
- 3AL 002 952-917

- 12 V, 400 Hz, with PTFE pill, copper blade terminal, diode, drawing connection A
- 3AL 002 952-907

- 24 V, 400 Hz, with PTFE pill, copper blade terminal, drawing connection A
- 3AL 006 958-821

- 12 V, 400 Hz, blade terminal, galvanically tin-plated, drawing connection A
- 3AL 908 571-021

- 12 V, 335 Hz, blade terminal, galvanically tin-plated, negative connection via housing, drawing connection A
- 3AL 908 571-031

- 24 V, 335 Hz, copper blade terminal, diode, drawing connection A
- 3AL 002 952-927

**Type approval:** ECE-R28 0020011
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. Work lights with this mark are approved for mounting on conveyances that must comply with the provisions of GGVSEB / ADR.

IP PROTECTION CLASSES - BUY WITH CONFIDENCE

How well is a product protected from environmental influences? Worklights are exposed to things such as 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:

Protection class 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 submersed 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
### Overview of Icons

#### Characteristics

| Power consumption of LED lights | Advantages of the LED: Generally, LED lights need less power than bulb lighting. Savings of up to 90% are possible, which also helps to reduce CO₂. |
| Vehicle electrical system voltage | Defines the power supply for the lamp. This can be 12 V, 24 V or a flexible voltage range for multivolt (8 – 33 V). |
| 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 fulfilled for LED lights. This requirement is fulfilled by means of an integrated self-diagnostic unit on the PCB of the LED and an electrical pulse. Since the end of 2011, this HELLA failure monitor with a pulse has been ISO Standard: ISO 13207. |
| Electronic circuit | 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 LEDs through a series resistor. |

#### Comments

- Multivolt is the most flexible: Requires fewer versions, but has more electronic circuit components and is therefore more expensive.
- The higher the protection class, the better the protection against penetrating media. IP 67 maximum value:
  - Completely sealed against dust and water.
- 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.
- 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.
## CHARACTERISTICS

### Thermal management

<table>
<thead>
<tr>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active:</strong></td>
<td>Electronic power control of LEDs in the event of impermissibly high ambient temperatures. This ensures the LEDs are protected against destruction caused by overheating.</td>
</tr>
<tr>
<td><strong>Passive:</strong></td>
<td>Optimum layout of the components for even temperature distribution and temperature spreading.</td>
</tr>
<tr>
<td><strong>Active:</strong></td>
<td>More development overhead with active thermal management and higher parts prices ensure optimal conditions for maximum design life.</td>
</tr>
<tr>
<td><strong>Passive:</strong></td>
<td>The warmer the LED gets through exterior factors or heat generated by its own operation, the shorter the service life.</td>
</tr>
</tbody>
</table>

### Operating temperature

Whether in cold or warm temperatures, our products must always be operational. Thermal management and an optimized housing design guarantee full functionality for all operating temperatures through product tests from -40°C to 100°C.

### Overvoltage protection

Supplement to the electronics for protecting the LED against high voltage / current in the vehicle network as per ISO 7637-2.

Overloading of the LEDs can be caused by voltage peaks in the vehicle because of:
- Jump-starting
- Faulty 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.

### Beacon failure check (DIN 14630 – Blue)

Beacons for preferential road use.

A function monitoring system must be provided.
<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi-polarity of the light</td>
<td>Even if the connecting cable is attached with reverse polarity, the LED functions fully.</td>
<td>The semiconductor in an LED must always be operated with the correct polarity. Inverse polarity damages the LED, so that LED lights are generally equipped with reverse polarity protection (diode). This function only works when “+” and “-” are correctly connected, though. If a lamp has a bi-polar circuit, the functioning is independent of the contact connections. This ensures poka-yoke (avoiding faulty assembly) in connection with indentation clamping technology, for example. However, the additional components on the PCB also increase the costs.</td>
</tr>
<tr>
<td>Polarity reversal protection</td>
<td>Even if the connecting cable is connected the wrong way round, there is still no danger for the electronics.</td>
<td>The semiconductor in an LED must always be operated with the correct polarity. Inverse polarity damages the LED, so that LED lights are generally equipped with reverse polarity protection (diode). This function only works when “+” and “-” are correctly connected, though. If a lamp has a bi-polar circuit, the functioning is independent of the contact connections. This ensures poka-yoke (avoiding faulty assembly) in connection with indentation clamping technology, for example. However, the additional components on the PCB also increase the costs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SAE</th>
<th>Product has SAE type approval.</th>
<th>More information is provided next to the relevant products in the footer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE</td>
<td>Product is licensed according to ECE guidelines.</td>
<td></td>
</tr>
<tr>
<td>ECE-R65</td>
<td>Defines the light values, light distribution, and colour location of beacons that are to be achieved.</td>
<td>Only beacons that fulfill ECE-R65 can be used on public roads.</td>
</tr>
</tbody>
</table>
### Electromagnetic compatibility

**Approval for transport of dangerous goods**

- Lamp approved for transport of dangerous goods according to the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR; in German, GGVS).
- Generally required for truck and trailer lighting. Prerequisite for receiving approval: Damage to the light source must not cause explosive media to ignite.

**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 the radio loudspeaker, impairment of ABS electronics, or failure of the lamp due to sensitivity to interference.

### 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. Thus slight additional costs for the components improve the service life of LED lighting functions.

### Automotive Safety Integrity Level

**Product electronics are developed using the latest methods and according to the ISO 26262 safety guidelines.**

- This applies from July 2011 as “standard technology” are is taken into account during development.

### Corrosion proof Housing

**Product is protected against corrosion.**

- Additional layers of surface coating on the work lights greatly improve their durability. The housing is therefore ideally protected and also well-suited to application areas with a high risk of corrosion.
FIND THE RIGHT PRODUCT WITH EASE

The purpose of our online information is to give you more ways to efficiently and conveniently identify the latest HELLA products and obtain important information about them. No matter what you are looking for, we are sure to have the right part in our range.

→ Product information
→ Product videos
→ 3D animations
→ Configuration tools for many applications
→ Interactive apps for smartphones and tablets
→ Comparisons of lighting technology
→ Fitting recommendations
→ Online catalogues

Forlift website
Special requirements demand special solutions. Find out more about the range of HELLA products for forklifts – informative, compact, interactive.

www.hella.com/forklift

ELIVER – the light comparison tool
This online tool allows you to compare many HELLA work lights and beacons on the basis of their illumination in a realistic environment.

www.hella.com/eliver

Work light configuration tool
Which work light is the right choice for your application? The online configurator from HELLA provides you with matching product recommendations, including all relevant information on the product.

www.hella.com/worklight-configurator
Electronics tool
What electronics products does HELLA offer in the field of special original equipment? 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.

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 end – and see the result directly after, as applied convincingly to a car outline.

www.hella.com/shapeline

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

www.youtube.com/hellagroup

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

www.hella.com/catalogue

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

www.hella.com/upc