

# Lightbar systems



# Lightbar systems

- **Highest safety through perfection**

Today, the lightbar systems produced by Hänsch are an indispensable addition to the vehicles of any road maintenance agency, construction site or other municipal authority. A maximum warning effect is achieved by using the latest lighting technology, thus increasing safety for all traffic users. All lightbar systems are available in a variety of lengths and designs. They are modular and feature a wide range of functions.



reddot award 2017  
winner

**DBW 5000**



reddot design award  
winner 2013

**DBW 4000**



**DBW 2000**

The DBW 5000 warning system combines modern design, a versatile range of functions and high-performance LED lighting technology. A highly effective warning effect attracts the attention of road users and ensures additional safety when in operation in road traffic. The low-profile design not only ensures low air resistance and reduced noise, but also makes it possible to pass sites where clearance height is an issue.



red dot award 2017  
winner

### Configured to customer requirements

- Mounted using a modular system
- Easily adaptable to individual needs

### Aerodynamic housing

- Low wind resistance and reduced noise levels
- Low-profile design height

### Variety of mounting options

- Fast and easy mounting options for flat or curved vehicle roofs
- Vehicle-specific carrier systems offer additional mounting options

### Maximum warning effect

- State-of-the-art lighting technology
- Automatic day/night switching

### Easy operation

- Digital control using the CANBus protocol, based on the CANopen Standard 447
- Converters for analogue control available

### Variety of lengths

- Lengths: 700, 1100, 1200, 1400, 1600 or 1800 mm

# DBW 5000



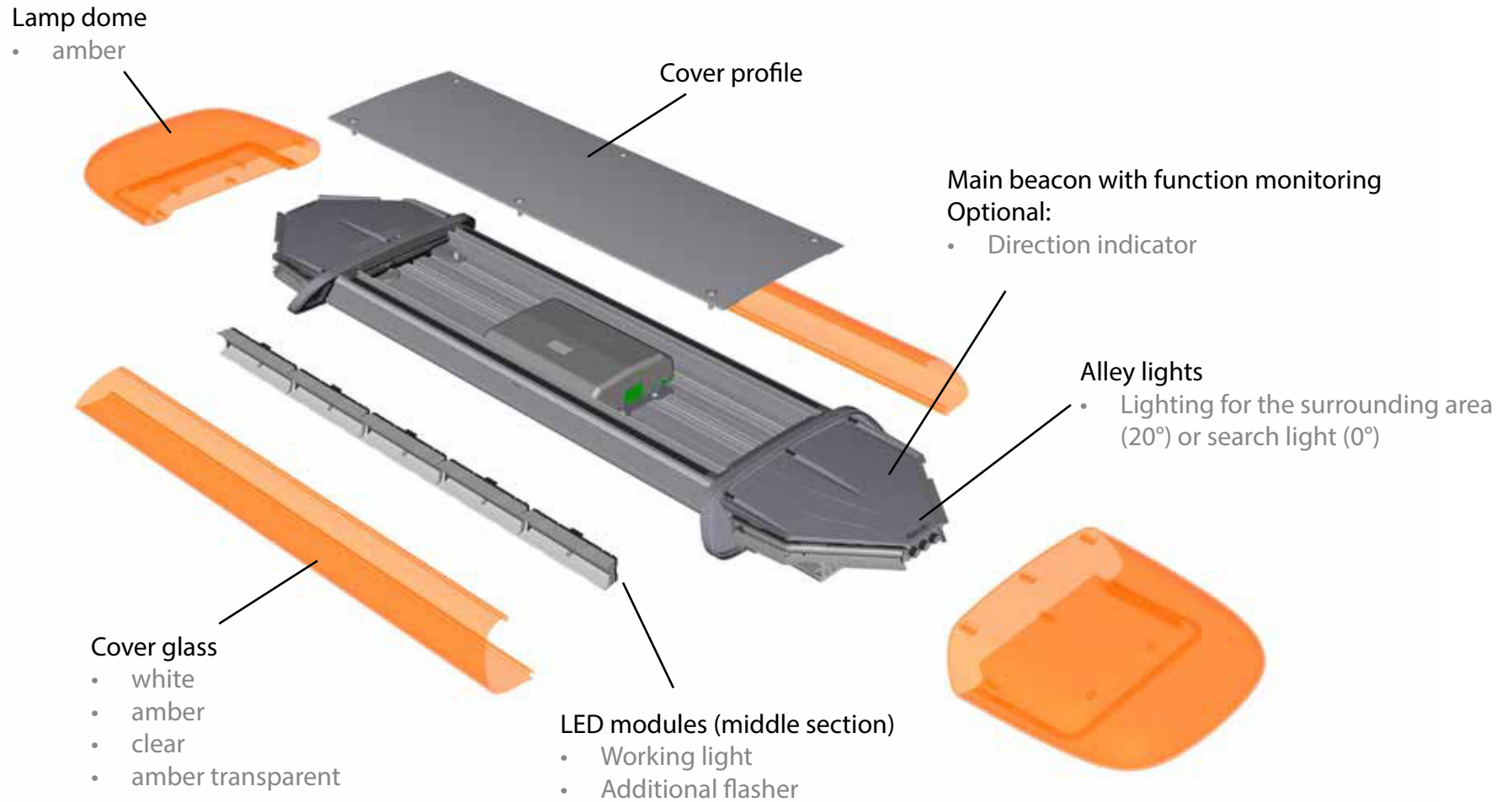
## RANGE OF FUNCTIONS AVAILABLE

- Working light
- Light sensor for reducing beacons at night-time
- Alley lights: 0° or 20° tilt
- Acoustics (undercarriage loudspeaker for public address)
- Additional flasher
- Direction indicator (turning light)\*
- Traffic advisor (special approval required)

\*For the CAN447, an I/O box to read the signals is required.

Also available with examination in accordance with ICAO Type C.  
Further information can be found on page 70.

<b>Technical data:</b>	
Designation:	DBW 5000
Voltage:	12 V / 24 V
Flash frequency:	> 2 Hz (beacon)
Average power consumption:	from 4 A (at 12 V)
Lengths:	700, 1100, 1200, 1400, 1600, 1800 mm
Depth:	285 mm
Height:	63 mm
Weight:	from 5.1 kg
Material:	Lamp dome: PC / cover glass: PMMA housing: Aluminium
Type of protection:	IP5K4K/IPX9K
<b>Homologation: (Germany and international)</b>	
Light in accordance with ECE-R65:	TA2(E)00 4448
EMC in accordance with ECE-R 10:	(E)10R-05 7981
Direction indicator: Light in accordance with ECE-R 6	1 01(E)4453 (front), 2a 01(E)4453 (rear)





# DBW 5000

## Basic lightbars

<b>Possible lengths</b>	
700, 1100, 1200, 1400, 1600, 1800 mm	

<b>Main beacon (HKL)</b>	
Function	
Main beacon (amber)	<ul style="list-style-type: none"> <li>• High-power LEDs with wide angle lenses</li> <li>• K2 homologation with day/night switching</li> <li>• Integrated function monitoring</li> <li>• Flash pattern: Strobe flash</li> <li>• Optional: Direction indicator, front and rear, in the main beacons*</li> </ul>

<b>Control module (KM)</b>	
Function	
Digital control	<ul style="list-style-type: none"> <li>• Serial control by 2-wire cable</li> <li>• for CAN447 control units (e.g. BE 300, HBE 300, BE 304)</li> <li>• Compatibility of other control units on request</li> </ul>
Analogue control	<ul style="list-style-type: none"> <li>• Converters for analogue control available</li> <li>• Analogue control via signal line</li> <li>• For limited range of functions (compatibility on request)</li> </ul>



<b>Roof mounting</b>		
Function		
	Rubber mouldings	<ul style="list-style-type: none"> <li>• For flat or curved vehicle roofs</li> </ul>
	Mounting brackets	<ul style="list-style-type: none"> <li>• Universal and various vehicle-specific models available</li> </ul>

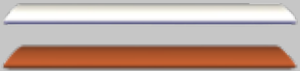
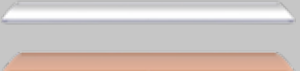
\*CAN447 requires an I/O-Box to feed in the signals.

Electrical connection	
Function	
Cable outlet	<ul style="list-style-type: none"> <li>• Cable outlet, passenger side: Standard</li> <li>• Cable outlet, driver side</li> <li>• Separate cable outlet (power supply and signal line are laid separately)</li> <li>• Vehicle-specific electrical connections on request</li> </ul>

## Options

Acoustics (undercarriage loudspeaker for public address)		
Function		Possible for
Undercarriage loudspeaker	<ul style="list-style-type: none"> <li>• Undercarriage loudspeaker directed towards the rear and/or the front for public address</li> <li>• Exterior amplifier and cable harness required</li> </ul>	<ul style="list-style-type: none"> <li>• 12 V</li> <li>• 24 V</li> </ul>

Alley lights (side lights)			
Function			Possible for
	Lighting for surrounding area	<ul style="list-style-type: none"> <li>• Tilt angle: 20°</li> <li>• Mounted in pairs (left and right)</li> </ul>	<ul style="list-style-type: none"> <li>• 12 V</li> <li>• 24 V</li> </ul>
	Search lights	<ul style="list-style-type: none"> <li>• Without tilt</li> <li>• Mounted in pairs (left and right)</li> </ul>	<ul style="list-style-type: none"> <li>• 12 V</li> <li>• 24 V</li> </ul>

Cover glass		
Description		
	Cover glass in full colour: <ul style="list-style-type: none"> <li>• White (RAL 9010)</li> <li>• Amber (RAL 2004)</li> </ul>	
	Cover glass, transparent: <ul style="list-style-type: none"> <li>• Clear</li> <li>• Amber transparent</li> </ul>	<ul style="list-style-type: none"> <li>• Clear or tinted transparent cover glass</li> <li>• Required when middle modules are mounted</li> </ul>

# DBW 5000

## Middle modules

### Options - forward mounting

Configuration example



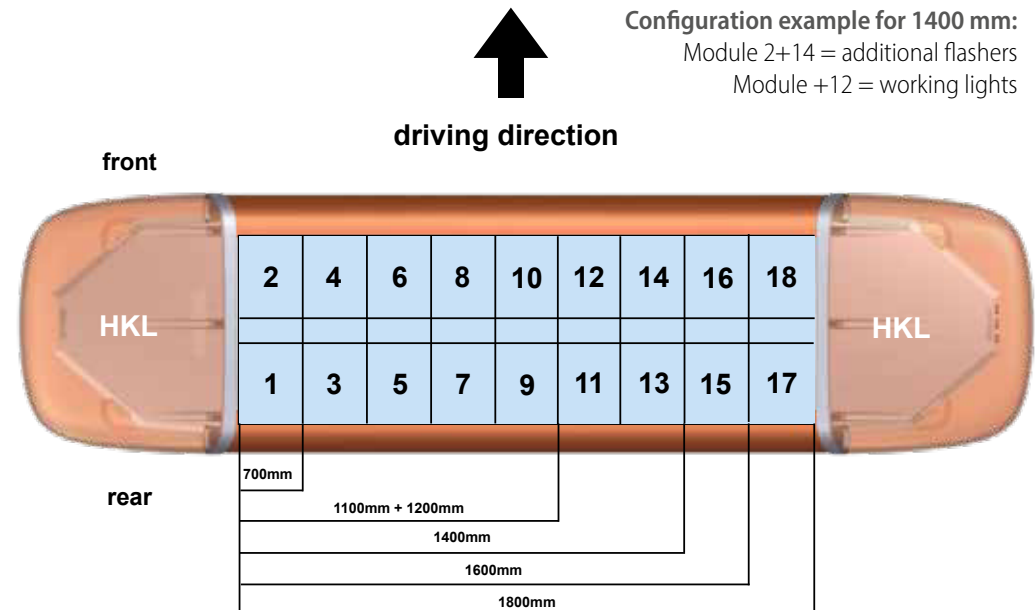
Additional flasher (ZB) and working light (ASW)*	
Function	
Additional flashers (pair) max. 3 pairs, depending on the length	<ul style="list-style-type: none"> <li>• Consist of 9 amber LEDs in the reflector housing</li> <li>• Directional</li> <li>• Synchronisation with respective main flasher</li> <li>• Reduced in night mode</li> </ul>
Working light (0°) max. 4 per lightbar	<ul style="list-style-type: none"> <li>• 9 white LEDs in the reflector housing</li> <li>• Selectable mounting position</li> <li>• 1500 lumens</li> </ul>
*Max. 6 modules homologated	

### Overview of module slots

Configuration example for 1400 mm:

Module 2+14 = additional flashers

Module +12 = working lights





## Middle modules

### Options - rear mounting

Configuration example



### Overview of module slots

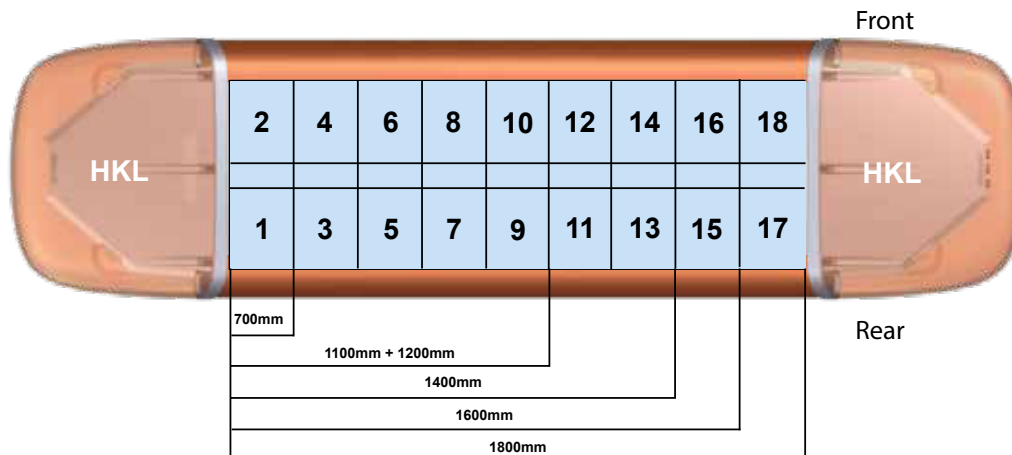
Configuration example for 1400 mm:

Module 1+13 = additional flashers

Module 3+11 = working lights



driving direction



Additional flasher (ZB), working light (ASW) and rear warning system (VLE)*	
Function	
Additional flashers (pair) max. 3 pairs, depending on the length	<ul style="list-style-type: none"> <li>Consist of 9 amber LEDs in the reflector housing</li> <li>Directional</li> <li>Synchronisation with respective main flasher</li> <li>Reduced in night mode</li> </ul>
Working light (0°) max. 4 per lightbar	<ul style="list-style-type: none"> <li>9 white LEDs in the reflector housing</li> <li>Selectable mounting position</li> <li>1500 lumens</li> </ul>
Traffic advisor (special approval required)	<ul style="list-style-type: none"> <li>Consist of 5 or 6 middle modules with 9 amber LEDs each</li> <li>Directional flashing sequences possible</li> <li>Including flash pattern for rear warning system</li> </ul>
*max. 6 modules homologated	

# DBS 5000

## Can switch between blue and amber

The bicoloured lightbar system DBS 5000 can switch between blue and amber.

The blue warning signal is used to clear a path on the way to the destination.

The beacon can switch to amber at the destination in order to act as a warning signal to secure the area.



### PRODUCT FEATURES:

- Can switch between blue and amber
- Both colours are homologated in accordance with ECE-R65

### RANGE OF FUNCTIONS AVAILABLE

- Blue: can be used to indicate the right-of-way while driving
- Amber: can be used as a warning signal at the destination
- Blue additional flasher
- Amber additional flasher
- Direction indicator\*
- Working light
- Alley lights
- Rear warning system (amber)
- Power flash (blue)
- Day/night switching

\*CAN447 requires an I/O-Box to feed in the signals.

Also available with examination in accordance with ICAO Type C.  
Further information can be found on page 70.

<b>Technical data:</b>	
Designation:	DBS 5000
Voltage:	12 V / 24 V
Flash frequency:	> 2 Hz (beacon)
Average power consumption:	from 4 A (at 12 V)
Lengths:	700, 1100, 1200, 1400, 1600, 1800 mm
Depth:	285 mm
Height:	63 mm
Weight:	from 5.1 kg
Material:	Lamp dome: PC / cover glass: PMMA housing: Aluminium
Type of protection:	IP5K4K/IPX9K
<b>Homologation: (Germany and international)</b>	
Light in accordance with ECE-R65:	TB2(E)00 4446/ TA2(E)00 4447
EMC in accordance with ECE-R10:	(E)10R-05 7981
Direction indicator: Light in accordance with ECE-R 6:	1 01(E)4453 (front), 2a 01(E)4453 (rear)
Rear warning system: Light in accordance with ECE-R65:	XA1(E)00 4471
Power flash: Light in accordance with to TA 13a:	~K 1427

# DBW 4000

The DBW 4000 warning system combines modern design, a versatile range of functions and high-performance LED lighting technology. A highly effective warning effect attracts the attention of road users and ensures additional safety when in operation in road traffic. Thanks to this wide range of selectable functions, the DBW 4000 can be adapted to suit any application.



reddot design award  
winner 2013

## Configured to customer requirements

- Mounted using a modular system
- Easily adaptable to individual needs

## Aerodynamic housing

- Low wind resistance and reduced noise levels

## Variety of mounting options

- Fast and easy mounting options for flat or curved vehicle roofs
- Vehicle-specific carrier systems offer additional mounting options

## Maximum warning effect

- State-of-the-art lighting technology
- Automatic day/night switching

## Easy operation

- Analogue or digital control using the CANBus protocol, based on the CANopen Standard 447 or fireCAN

## Variety of lengths

- Lengths: 1100, 1200, 1400, 1600, 1800 or 2000 mm

# DBW 4000



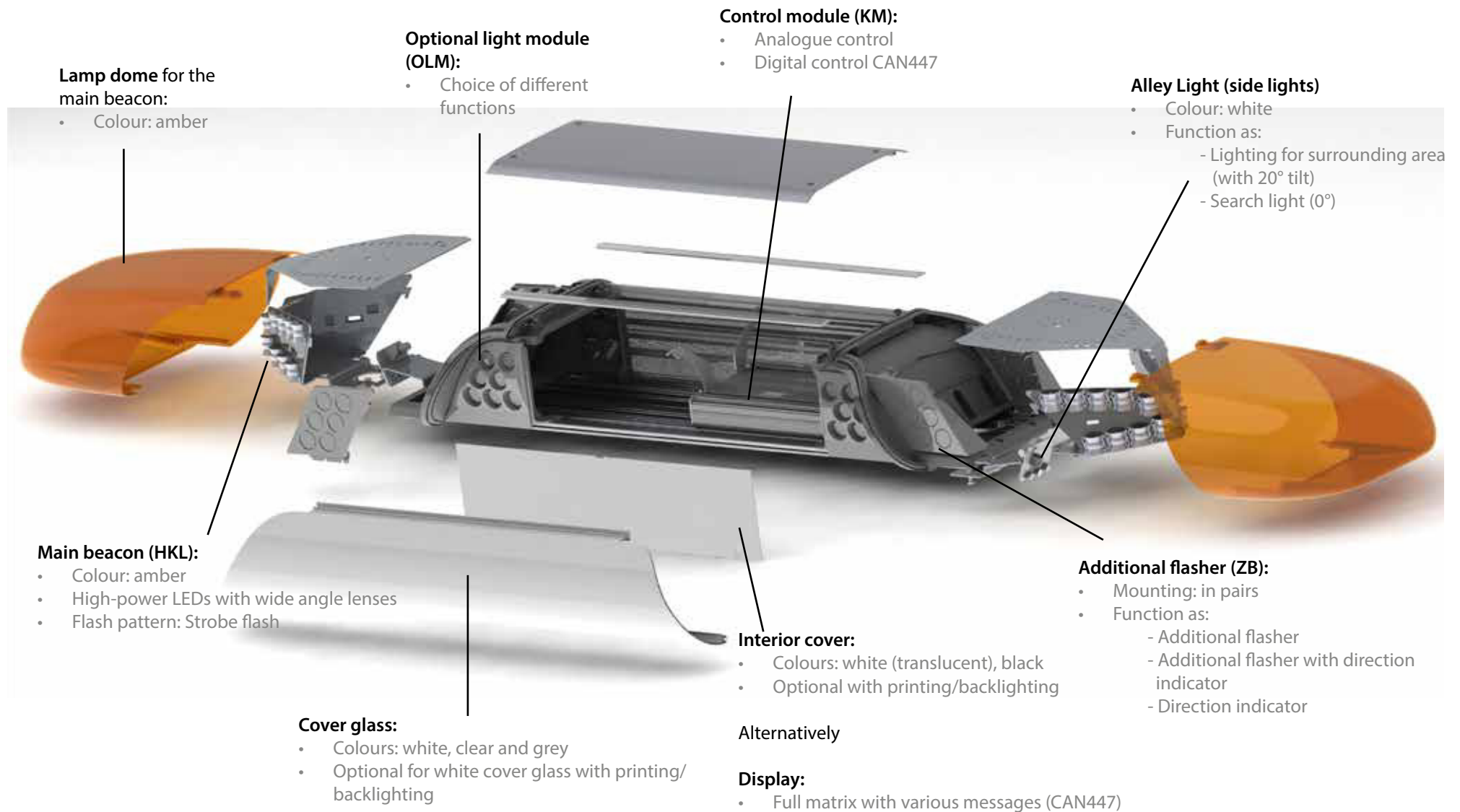
## RANGE OF FUNCTIONS AVAILABLE

- Traffic controller unit
- Direction indicator (turning light)\*
- Working light
- Additional flashers
- Alley lights: 0° or 20° tilt
- Undercarriage loudspeaker for public address
- Full matrix display
- Rear warning system
- Cover glass printing
- Day/night switching (automatic)

\*CAN447 requires an I/O-Box to feed in the signals.

Also available as CAN variation with examination in accordance with ICAO type C.  
Further information can be found on page 62.

<b>Technical data:</b>	
Designation:	DBW 4000
Voltage:	12 V / 24 V
Flash frequency:	> 2 Hz (beacon)
Average power consumption:	from 4 A (at 12 V)
Lengths:	1100, 1200, 1400, 1600, 1800, 2000 mm
Depth:	300 mm
Height:	135 mm
Weight:	from 9.0 kg
Material:	Lamp dome: PC / cover glass: PMMA housing: Aluminium
Type of protection:	IP5K4K/IPX9K
<b>Homologation: (Germany and international)</b>	
Light in accordance with ECE-R65:	TA2(E)00 3111
EMC in accordance with ECE-R10:	(E)10R-05 6209
Direction indicator: Light in accordance with ECE-R 6	2a 01(E)3800 (rear); 101(E)3822 (front)
RWS: Light in accordance with TA 20:	~K 810



# DBW 4000

## Basic lightbar

### Possible lengths

1100, 1200, 1400, 1600, 1800 and 2000 mm

### Main beacon (HKL)

Function

Main beacon (amber)	<ul style="list-style-type: none"><li>• High-power LEDs with wide angle lenses</li><li>• K2 homologation with day/night switching</li><li>• Integrated function monitoring</li><li>• Flash pattern: Strobe flash</li></ul>
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### Control module (KM)

Function

Analogue control	<ul style="list-style-type: none"><li>• For single switch and various common analogue control units (e.g. BE 200 or BE 600)</li></ul>
Digital control	<ul style="list-style-type: none"><li>• Serial control by 2-wire cable</li><li>• for CAN447 control units (e.g. BE 300, HBE 300, BE 304)</li><li>• Compatibility of other control units on request</li></ul>

Rubber mouldings	<ul style="list-style-type: none"><li>• For flat or curved vehicle roofs</li></ul>
Mounting brackets	<ul style="list-style-type: none"><li>• Universal and various vehicle-specific models available</li></ul>
Flat sealing	<ul style="list-style-type: none"><li>• For flat vehicle roofs</li></ul>



### Electrical connection

Function

Cable outlet	<ul style="list-style-type: none"><li>• Cable outlet, passenger side: Standard</li><li>• Cable outlet, driver side</li><li>• Separate cable outlet (power supply and signal line are laid separately)</li></ul>
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## Options

Acoustics		
Function		Possible for
Undercarriage loudspeaker	<ul style="list-style-type: none"> <li>Undercarriage loudspeaker directed towards the front/rear for support for public address</li> <li>With integrated or external amplifier (combination with TFA 624 only in CAN447)</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> <li>24 V</li> </ul>

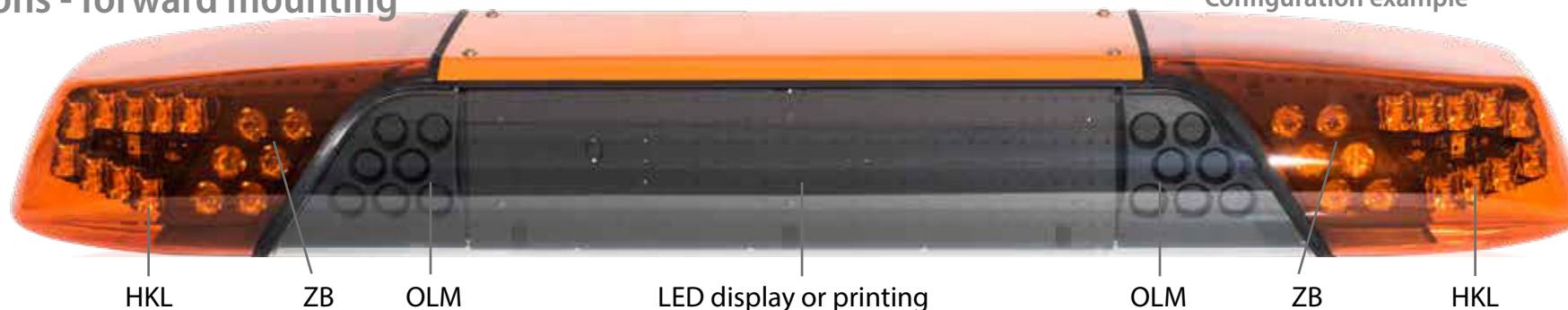
Alley lights (side lights)		
Function		Possible for
	lighting for surrounding area <ul style="list-style-type: none"> <li>Colour: white</li> <li>Tilt angle: 20°</li> <li>Mounted in pairs (left and right)</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> <li>24 V</li> </ul>
	Search lights <ul style="list-style-type: none"> <li>Colour: white</li> <li>Without tilt angle</li> <li>Mounted in pairs (left and right)</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> <li>24 V</li> </ul>

Display and printing	
Function	
Cover glass (colours: white, clear and grey)	<ul style="list-style-type: none"> <li>Standard: white without printing</li> <li>Optional: white with printing (backlighting possible)</li> <li>Optional: clear without printing (interior cover or display required). A clear glass cover is mandatory when OLMs are used</li> </ul>
Interior cover (colours: white and black)	<ul style="list-style-type: none"> <li>Standard: white without printing</li> <li>Optional: white with printing</li> <li>Optional: black without printing</li> <li>Optional: black with printing</li> </ul>
Display	<ul style="list-style-type: none"> <li>Various messages possible for digital control module</li> </ul>

# DBW 4000

## Options - forward mounting

Configuration example

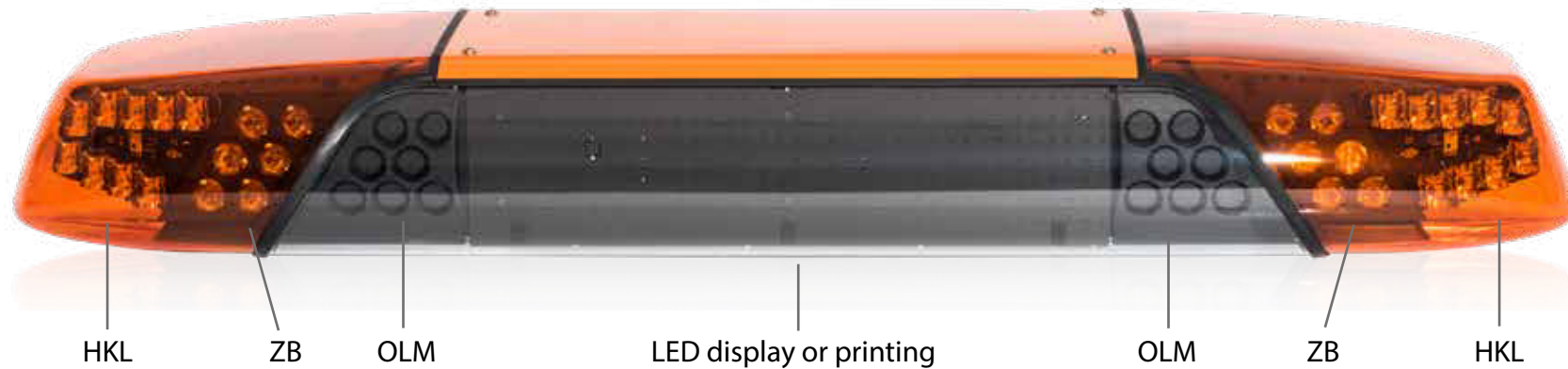


Additional flashers			
Function			Possible for
ZB	<ul style="list-style-type: none"> <li>Additional flashers (pair)</li> </ul>	<ul style="list-style-type: none"> <li>Consists of 12 amber LEDs</li> <li>Directional</li> <li>Synchronisation with respective main flasher</li> <li>Deactivated in night mode</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> <li>24 V</li> </ul>
ZB	<ul style="list-style-type: none"> <li>Additional flashers with direction indicator (pair),</li> </ul>	<ul style="list-style-type: none"> <li>Consist of 6 amber LEDs (additional flashers) and 8 amber LEDs (direction indicator)</li> <li>Directional</li> <li>Additional flasher: deactivated in night mode; synchronisation with respective main flasher</li> <li>Direction indicator: Function as direction indicator or hazard warning light (synchronisation with vehicle direction indicator required)</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> </ul>
ZB	<ul style="list-style-type: none"> <li>Direction indicators (pair)*</li> </ul>	<ul style="list-style-type: none"> <li>Consist of 8 amber LEDs</li> <li>Directional</li> <li>Function as direction indicator or hazard warning light (synchronisation with vehicle direction indicator required)</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> </ul>
Optional light module (OLM)			
Function			Possible for
OLM	<ul style="list-style-type: none"> <li>Working light (ASW)</li> </ul>	<ul style="list-style-type: none"> <li>Consists of 3 white LEDs per module</li> <li>Standard: mounted right (passenger side)</li> <li>An additional unit may be mounted on the left side (driver side) as an option</li> <li>Light value:                             <ul style="list-style-type: none"> <li>- 600 lumens</li> <li>- 1000 lumens</li> <li>- 1500 lumens</li> </ul>                             (with a 15° tilt angle in each case)                         </li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> <li>24 V</li> <li>12 V</li> </ul>



## Options - rear mounting

Configuration example



Additional flashers			
Function			Possible for
ZB	<ul style="list-style-type: none"> <li>Additional flashers (pair)</li> </ul>	<ul style="list-style-type: none"> <li>Consists of 8 amber LEDs</li> <li>Directional</li> <li>Synchronisation with respective main flasher</li> <li>Deactivated in night mode</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> <li>24 V</li> </ul>
ZB	<ul style="list-style-type: none"> <li>Additional flashers with direction indicator (pair),</li> </ul>	<ul style="list-style-type: none"> <li>Consist of 6 amber LEDs (additional flashers) and 8 amber LEDs (direction indicator)</li> <li>Directional</li> <li>Additional flasher: deactivated in night mode; synchronisation with respective main flasher</li> <li>Direction indicator: Function as direction indicator or hazard warning light (synchronisation with vehicle direction indicator required)</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> </ul>
ZB	<ul style="list-style-type: none"> <li>Direction indicators (pair)*</li> </ul>	<ul style="list-style-type: none"> <li>Consist of 8 amber LEDs</li> <li>Directional</li> <li>Function as direction indicator or hazard warning light (synchronisation with vehicle direction indicator required)</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> </ul>

\*CAN447 requires an I/O-Box to feed in the signals.

# DBW 4000

## Options - rear mounting

Optional light module (OLM)			
Function		Possible for	
OLM	<ul style="list-style-type: none"> <li>Working light (ASW)*</li> </ul>	<ul style="list-style-type: none"> <li>Consists of 3 white LEDs per module</li> <li>Standard: mounted right (passenger side)</li> <li>An additional unit may be mounted on the left side (driver side) as an option</li> <li>Light value:                             <ul style="list-style-type: none"> <li>- 600 lumens</li> <li>- 1000 lumens</li> <li>- 1500 lumens</li> </ul>                             (with a 15° tilt angle in each case)                         </li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> <li>24 V</li> <li>12 V</li> </ul>
OLM	<ul style="list-style-type: none"> <li>Rear warning system (RWS)</li> </ul>	<ul style="list-style-type: none"> <li>Consists of 6 amber lenses</li> <li>Available only in pairs (mounted left and right)</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> <li>24 V</li> </ul>

\* A combination of both OLM options is not possible. If the working lights have to be combined with the LED rear warning system, they can only be combined with the type 40 pico LED.

RWS type 40 pico LED		
Function		Possible for
RWS 40 Pico LED*	<ul style="list-style-type: none"> <li>One lamp module consists of 8 LEDs</li> <li>Lamp body:                             <ul style="list-style-type: none"> <li>- 1100 mm: 2 lamp bodies</li> <li>- 1200 mm: 2 lamp bodies</li> <li>- 1400 mm: 3 lamp bodies</li> <li>- 1600 mm: 4 lamp bodies</li> <li>- 1800 mm: 5 lamp bodies</li> <li>- 2000 mm: 5 lamp bodies:</li> </ul> </li> <li>Rear-facing lights can also be integrated as OLMs</li> </ul>	<ul style="list-style-type: none"> <li>12 V</li> <li>24 V</li> </ul>

\* Not combinable with OLM RWS

Special functions		
Traffic advisor*	<ul style="list-style-type: none"> <li>Consists of 6 amber LED modules with 3 LEDs each</li> <li>For rear mounting</li> <li>Choice of different flash patterns (warning function, RWS function) or traffic advisor function (arrow stick function)</li> </ul>	
Convoy	<ul style="list-style-type: none"> <li>"Convoy front" switches HKL ZBs off in the rear in order not to blind the following traffic</li> <li>"Convoy front" switches HKL ZBs off in front in order not to blind the traffic ahead</li> </ul>	

\* Not approved as RWS. Special approval required for traffic advisor.

Can switch between blue and amber

The bicoloured lightbar system DBS 4000 LED can switch between blue and amber.

The blue warning signal is used to clear a path on the way to the destination.

The beacon can be switched to amber at the destination in order to act as a warning signal to secure the area.



## PRODUCT FEATURES:

- Can switch between blue and amber
- Both colours are homologated in accordance with ECE-R65
- Blue: can be used to indicate the right-of-way while driving
- Amber: can be used as a warning signal at the destination
- Optional: Integration of additional flashers to reinforce the respective warning effect
- Blue additional flasher directed towards the front and/or the rear possible
- Amber additional flasher directed towards the front and/or the rear possible
- Mounting of undercarriage loudspeakers possible

Also available as CAN variation with examination in accordance with ICAO Type C.  
Further information can be found on page 62.

<b>Technical data:</b>	
Designation:	DBS 4000
Voltage:	12 V / 24 V
Flash frequency:	> 2 Hz (beacon)
Average power consumption:	from 4 A (at 12 V)
Lengths:	1100, 1200, 1400, 1600, 1800, 2000 mm
Depth:	300 mm
Height:	135 mm
Weight:	from 9 kg
Material:	Lamp dome: PC / cover glass: PMMA housing: Aluminium
Type of protection:	IP5K4K/IPX9K
<b>Homologation: (Germany and international)</b>	
Light in accordance with ECE-R65:	TB2(E1)00 3111 / TA2(E1)00 3111
EMC in accordance with ECE-R10:	(E1)10R - 05 6209

# DBW 2000

The DBW 2000 warning system offers a range of selectable functions in a solid housing. A maximum warning effect attracts the attention of road users and ensures additional safety when in operation in road traffic.



## Configured to customer requirements

- Mounted using a modular system
- Easily adaptable to individual needs

## Variety of mounting options

- Quick and easy mounting options for flat or curved roofs
- Vehicle-specific carrier systems offer further mounting options

## Maximum warning effect

- Proven lighting technology

## Easy operation

- Analogue control

## Variety of lengths

- Lengths: 920, 1090, 1250, 1370, 1400, 1600, 1800 and 2000 mm



## RANGE OF FUNCTIONS AVAILABLE

- Rear warning system
- Working lights
- Custom cover glass printing

<i>Technical data:</i>	
Designation:	DBW 2000 LED (flash technology)
Voltage:	12 V / 24 V
Flash frequency:	> 2 Hz (double flash)
Average power consumption:	12 V: approx. 6 A / 24 V: approx. 3 A
Lengths:	920, 1090, 1250, 1370, 1400, 1600, 1800, 2000 mm
Depth:	230 mm
Height:	155 mm
Material:	Lamp dome: PC / housing: Aluminium
Weight:	from 9.0 kg
Type of protection:	IP5K4K/IPX9K
<i>Homologation: (Germany and international)</i>	
Light in accordance with ECE-R65:	A1 E1 00 707
EMC in accordance with 72/245/EEC:	e1 03 1343

# DBW 2000

## Basic lightbars

### Possible lengths

920, 1090, 250, 1370, 1400, 1600, 1800 and 2000 mm

### Main beacon (HKL)

#### Function

Main beacon (amber)	<ul style="list-style-type: none"><li>• Xenon double flash technology (homologation in accordance with ECE-R 65)</li><li>• Amber lamp dome made of polycarbonate; housing made of aluminium</li><li>• With function monitoring output</li></ul>
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### Roof mounting

#### Function

Rubber mouldings	<ul style="list-style-type: none"><li>• For flat or curved vehicle roofs</li></ul>
Mounting brackets	<ul style="list-style-type: none"><li>• Various vehicle-specific versions available</li></ul>
Flat sealing	<ul style="list-style-type: none"><li>• For flat vehicle roofs</li></ul>

## Options

### Rear warning system (RWS)

#### Function

- consists of 2 type 40 pico (12 V) lamp bodies
- For rear protection
- Flash pattern: Double flash
- Flash sequence: synchronous

### Display and printing

#### Function

- Standard: white housing with white front and rear panels
- Optional: Coating in accordance with customer request
- Optional: printing in accordance with customer request (please indicate text!)