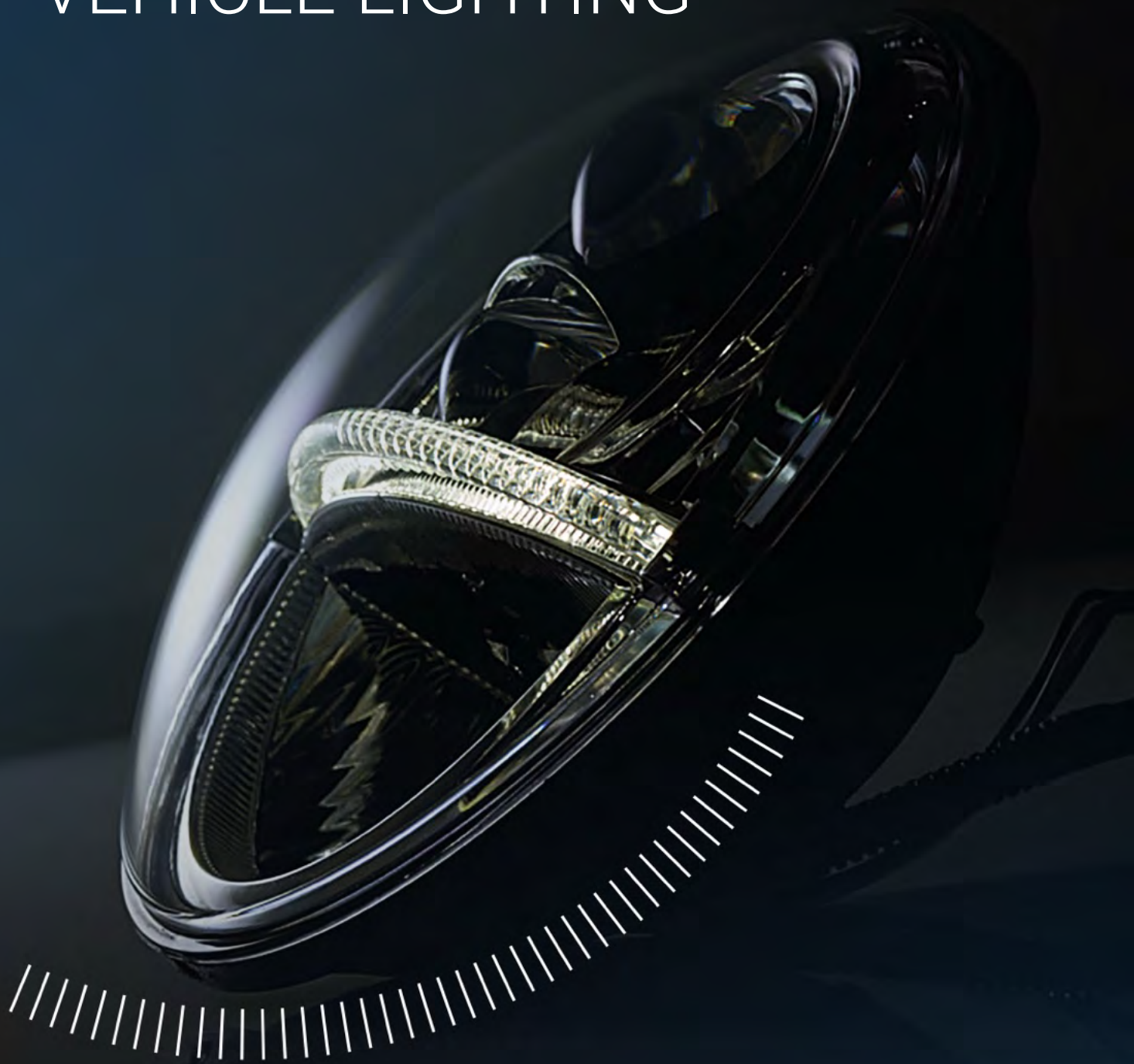


# PRODUCT CATALOGUE

## VEHICLE LIGHTING



**NOLDEN**  
cars & concepts

Your Vision is our Mission



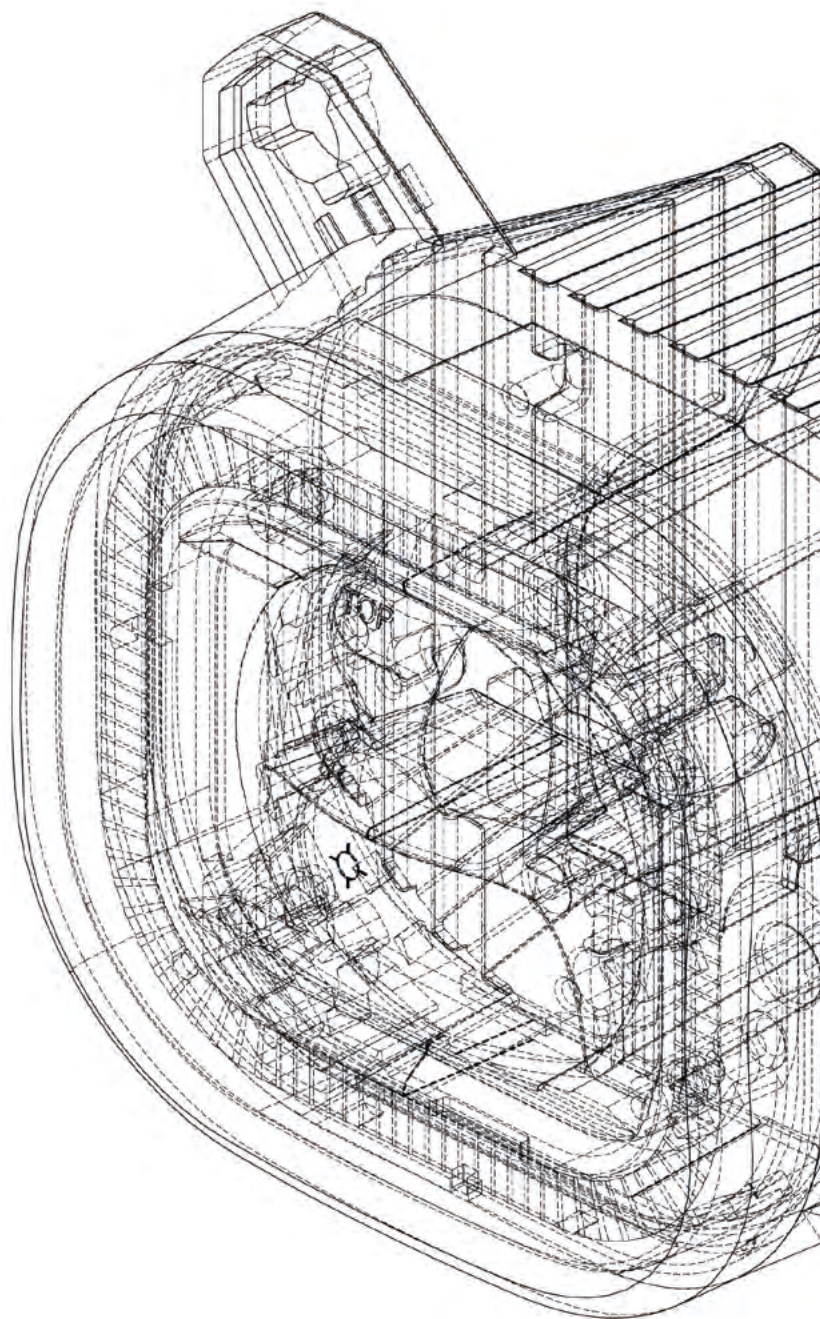




JAHRE

**NOLDEN**  
cars & concepts

Premium LED Lights



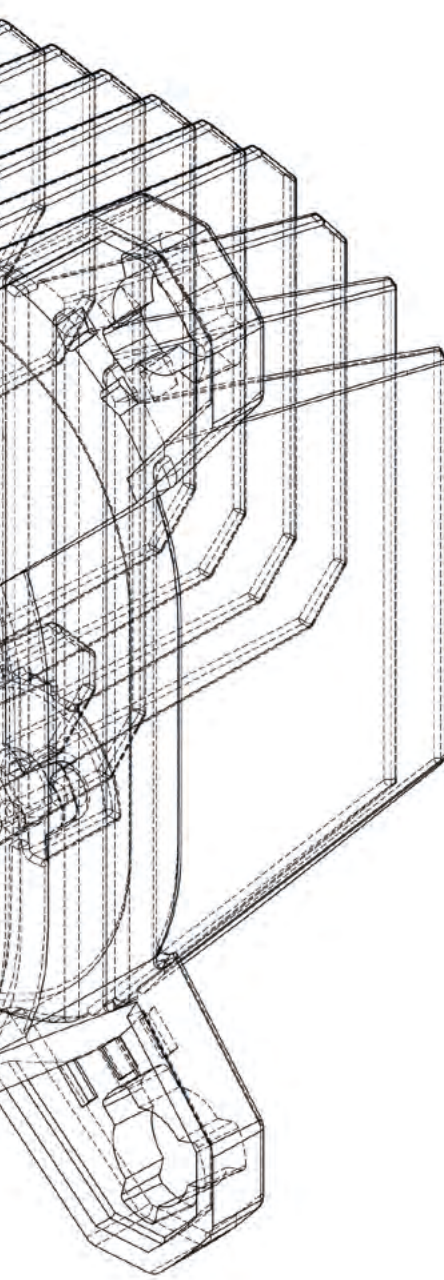


## Everything in view: The NCC Product Catalogue

Dear Customers.

We are pleased to introduce the new **NOLDEN Product Catalogue** where you will find all our innovative LED lights, crowned by the world's first NCC AVEGO and NCC ARTON square modular light units - your new and exciting lighting option.

What other new and innovative highlights are waiting for you in our comprehensive range? Well, first and foremost then, our two unique world firsts:

- 
- // **NCC ARTON**, the first rectangular modular lighting system, whether in the 'Competition' or 'Performance' form, guarantees excellent lighting performance together with the exclusive design
  - // **NCC AVEGO** also ground breaking with its original design and technical innovation. These multifunctional headlamps with their quasi square design are available with 'O' or 'U' shape light guides. They work as multifunctional lights and so, with only two modules per side of the vehicle, all legally required lighting functions are met
  - // The third generation of our popular **LED 90 mm range** is now available. Further development and improvements have been made to both our low beam and high beam LED lights, the Bi-LED headlight and the LED multifunctional lights. The 90 mm range now also includes the **NCC VEOS** LED Fog Light with integrated light guide ring that works as daytime running light
  - // We have widened the range of our **LED 90 mm multifunctional lights** with a further 4 lighting functions – daytime running light, position and indicator light with added fog light
  - // Finally, our **LED tail light range**. Here, in addition to the patented **NCC TL1** tail light with SIC technology for dynamic flashing, there is now the **NCC TL2** available as a basic version as well as our **NCC 3D Modular** variant with light guide technology.

**NOLDEN:** The combination of design, innovation and reliability and you, our customers, are the first to benefit.

**We look forward to working with you!**

Sincerely,

David Rautenberg  
Head of Sales



# OVERVIEW

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## 40 Years Nolden – 40 Years Tradition with Innovation

At NOLDEN we make everything easy for ourselves as we simply accept just one standard, the best. The latest technology, best ideas, best design, best construction, best components, best production controls. Without exception these standards apply to the creation and production of all our products and we have been doing so for 40 years. So, after decades, **innovation has become a tradition with us.**

To achieve this, we work together with our partners helping both us and you to become leading designers in the industry and importantly listen to our most important innovation drivers - our customers. By applying the strictest standards and controls to the finished product through rigorous testing and elaborate inspections our customers and end users have the certainty of receiving absolutely safe and proven high quality innovative lighting solutions.

But that is still not all: As it is a matter of course to ensure the supply of the highest quality products to our customers it is just the beginning as **we intend to become your trusted choice for lighting solutions** in decades to come.

**NOLDEN: Your Vision is our Mission**





NOLDEN: 0 MINUTES LATE

## We do what we believe in – we believe in what we do

**Continuous innovation and uncompromising high quality for 40 years.** This is how long NOLDEN has been dedicated to the demanding automotive aftermarket in general and high quality technical lighting solutions in particular. We develop and market LED lights, which make the difference to any vehicle, as well as a range of halogen lights.

**NOLDEN means quality and reliability.** We have one premium standard, which is applied to every aspect of our business and in every detail of our products. Anything other than the best is out of the question for us.

It is imperative for us that not only should our technology be 'state of the art' we attach just as much importance to the design of our products and assemblies. To achieve this, we work together with renowned designers and orient ourselves in line with the wishes and ideas of our customers. Innovation is not a buzzword for us, it is the daily practice of a technology driven company.

In addition we have an advantage due to the ideal size of our company. Although NOLDEN is large enough to independently design, develop and market high-quality products we are not too big to be able to react quickly and flexibly to customers specific requirements. We have the ability and capability to offer customer specific design and technological lighting solutions.

**NOLDEN: Focused on innovation for 40 years and even more so for the future.**



# You can have complete **confidence**

10Y

## LIFETIME

Even with a very demanding application we anticipate a lifetime of at least 10 years for all our LED lights. With you, we can establish your specific operation profile and agree on an appropriate product concept. Together with the anticipated lifetime requirement costs can be optimised whilst meeting all technical and legal legislation.

IP6K9K  
IP67

## CLASS OF PROTECTION

NCC® headlights and all ancillary lighting products have to operate in hostile environments. So therefore most of our lights meet the highest protection class IP6K9K or IP69 with complete protection from high pressure water ingress, submersion and dust.

CISPR25

## RADIO NOISE INTERFERENCE

Electronics are found everywhere in modern vehicles and these components must not be electromagnetically disturbed or suffer interference. The automotive industry's benchmark standard in this regard is CISPR25 and this is the minimum standard we design to and, in some cases, NCC® lights actually meet higher standards.

SAE  
J2139

## ENVIRONMENTAL TESTS

The standards organisation SAE was established in 1905 creating test and performance criteria within the automotive industry and accepted worldwide. The current SAE J2139 laboratory, environmental and performance test standard applies to all vehicle signal and marking devices. All our products are certified to SAE J2139

ECE  
SAE

## HOMOLOGATION

NCC® lights comply with all legal requirements and regulations. This is documented by the statutory approval of our products with the European ECE test mark and outside Europe with SAE approval. Further approvals according to CCC or similar are possible.

3 JAHRE

## GUARANTEE

EU legislation requires manufacturers to offer a minimum 2 year guarantee for their products and most do just that. However as we design, manufacture and control to the highest standards we guarantee our products against fault or failure for three years.

MIL-STD

## MILITARY STANDARDS (MIL)

Some NOLDEN lights are tested and certified according to MIL-STD. It does not matter whether our products are used for civil or military applications as this designation indicates the highest standard.



# NOLDEN Daytime Running Lights:

## We got the hang of it

"In the beginning it was just a stick". This is how it all began at NOLDEN in 2007. We were one of the first suppliers to offer LED Daytime Running Lights for retrofitting. However, as the front mounting options for most vehicles are never flat or at the right angle, we have developed a range of DRLs which compliment most vehicles. Only with a sympathetic contour will the lights look like an original equipment installation. The following Daytime Running Light variants compliment 95% of all current front vehicle contours:



Example: VW T5 Multivan with matching NCC® Daytime Running Light

- // Daytime Running Light „NCC® Universal“
- // Daytime Running Light „NCC® Classic“
- // Daytime Running Light „NCC® Slim“
- // Daytime Running Light „NCC® Slim 500“
- // Daytime Running Light „NCC® Short 3“

All variants have the latest light guide technology, powder-coated die-cast aluminium housings and ECE and EMC approvals.

### Mounting position of the DRL

A brief technical note: Determining the correct installation position for a Daytime Running Light is not difficult. The vehicle's X-axis determines the correct installation. The reference surface for NCC® LED Daytime Running Lights is always the rear heat sink so if this is flush or parallel with the X-axis, the alignment is correct. This does not apply to the installation of round DRLs where the light's lens is marked "Top" and this must be adhered to.

### Rotation about X-axis

The maximum angle allowed from the horizontal is given in degrees. This rotation must be observed and recorded in the light installation documentation.





# NCC® UNIVERSAL LIGHT GUIDE

NCC® "Universal" Light Guide Daytime Running and Position Light with light guide technology. A very homogeneous and bright light. Inner bezel available in chrome or black. With ECE approval. 2D drawings, 3D CAD data and other data available on request.



Technical Data			
Type	ML-029		
Dimensions (L x W)	211 mm x 33 mm		
Quantity LEDs / Type	2 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	Daytime Running Light: 18 W Position Light: 3 W		
Rotation around X-axis	+/- 8°		
Mounting Points	4 (Tap Hole M6 )		
Weight	222 g		
Homologation	ECE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	PMMA		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP67, IPX9K		
Wire and Length	FLRY 0,75 mm²	l = 140 mm	
Connector	2-Pin connector, AS02FWT		
Description		Part Number	
LED DRL „Universal“, chrome	2700.0	Set	Incl. cable and driver
LED DRL „Universal“, black	2700-S.0	Set	
Spare Parts and Accessories			
LED DRL stick „Universal“, chrome	2700	Piece	2x per Set
LED DRL stick „Universal“, black	2700-S	Piece	2x per Set
Driver for Light Guide DRL	27DRIVER	Piece	1x per Set
Power supply cable for driver	2117	Piece	1x per Set
Connection cable Lights ⇌ Driver	1910	Piece	1x per Set
Extension Cable	1911	Piece	1x per Set
Fuse	3378	Piece	1x per Set
Fuse Holder	1042	Piece	1x per Set





## NCC® SLIM LIGHT GUIDE

NCC® "Slim" Light Guide Daytime Running Light and Position Light. Latest light guide technology. Slim and discreet design. Inner bezel available in chrome or black. With ECE approval. 2D drawings, 3D CAD data and other data available on request.

Technical Data			
Type	ML-027		
Dimensions (L x W)	200 mm x 20 mm		
Quantity LEDs / Type	2 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	Daytime Running Light: 16 W Position Light: 4 W		
Rotation around X-axis	+/- 8°		
Mounting Points	4 (Tap Hole M6 )		
Weight	180 g		
Homologation	ECE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	PMMA		
Specification	On request		
Temperature	-40° C - +80 °C		
Protection Class	IP67, IPX9K		
Wire and Length	FLRY 0,75 mm²	l = 200 mm	
Connector	AMP Superseal		
Description		Part Number	
LED DRL „Slim“, chrome	2710.0	Set	Incl. cable and driver
LED DRL „Slim“, black	2710-S.0	Set	
Spare Parts and Accessories			
LED DRL stick „Slim“, chrome	2710	Piece	2x per Set
LED DRL stick „Slim“, black	2700-S	Piece	2x per Set
Driver for Light Guide DRL	27DRIVER	Piece	1x per Set
Power supply cable for driver	2117	Piece	1x per Set
Connection cable Lights ⇌ Driver	1910	Piece	1x per Set
Extension Cable	1911	Piece	1x per Set
Fuse	3378	Piece	1x per Set
Fuse Holder	1042	Piece	1x per Set



# NCC® CLASSIC LIGHT GUIDE

NCC® "Classic" Light Guide Daytime Running Light and Position Light. The latest light guide technology. Slim and straight design. Inner bezel available in chrome or black. With ECE approval. 2D drawings, 3D CAD data and other data available on request.



Technical Data			
Type	ML-030		
Dimensions (L x W)	227 mm x 20 mm		
Quantity LEDs / Type	2 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	Daytime Running Light: 18 W Position Light: 4 W		
Rotation around X-axis	+/- 8°		
Mounting Points	4 (Tap Hole M6)		
Weight	170 g		
Homologation	ECE		
Ventilation	Membrane		
Material Housing	ADC		
Material Outer Lens	PMMA		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP67, IPX9K		
Wire and Length	FLRY 0,75 mm²	l = 135 mm	
Connector	2-Pin connector, AS02FWT		
Description		Part Number	
LED DRL „Classic“, chrome	2730.0	Set	Incl. cable and driver
LED DRL „Classic“, black	2730-S.0	Set	
Spare Parts and Accessories			
LED DRL stick „Classic“, chrome	2730	Piece	2x per Set
LED DRL stick „Classic“, black	2730-S	Piece	2x per Set
Driver for Light Guide DRL	27DRIVER	Piece	1x per Set
Power supply cable for driver	2117	Piece	1x per Set
Connection cable Lights ⇌ Driver	1910	Piece	1x per Set
Extension Cable	1911	Piece	1x per Set
Fuse	3378	Piece	1x per Set
Fuse Holder	1042	Piece	1x per Set





## NCC® SLIM 500 LIGHT GUIDE

NCC® "SLIM 500" Light Guide Daytime Running Light and Position Light with latest light guide technology. Heavily curved and narrow light. Inner bezel available in chrome or black. With ECE approval. 2D drawings, 3D CAD data and other data available on request.

Technical Data			
Type	ML-028		
Dimensions (L x W)	200 mm x 20 mm		
Quantity LEDs / Type	2 / PHILIPS		
Voltage	12 V and 24 V		
Power @ 12 V	Daytime Running Light: 16 W Position Light: 4 W		
Rotation around X-axis	+/- 8°		
Mounting Points	4 (Tap Hole M6)		
Weight	235 g		
Homologation	ECE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	PMMA		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP67, IPX9K		
Wire and Length	FLRY 0,75 mm²	l = 200 mm	
Connector	Delphi 150 2-Pin connector, with sealing		
Description		Part Number	
LED DRL „Slim 500“, chrome	2720.0	Set	Incl. cable and driver
LED DRL „Slim 500“, black	2720-S.0	Set	
Spare Parts and Accessories			
LED DRL stick „Slim 500“, chrome	2720	Piece	2x per Set
LED DRL stick „Slim 500“, black	2720-S	Piece	2x per Set
Driver for Light Guide DRL	27DRIVER	Piece	1x per Set
Power supply cable for driver	2117	Piece	1x per Set
Connection cable Lights ⇔ Driver	1910	Piece	1x per Set
Extension Cable	1911	Piece	1x per Set
Fuse	3378	Piece	1x per Set
Fuse Holder	1042	Piece	1x per Set



# NCC® X-LINE LIGHT GUIDE

The NCC® "X-LINE" Light Guide a multifunctional and impressively compact light. With the latest LED light guide technology the Daytime Running Light and Position Light functions guarantee very homogeneous illumination. 2D drawings, 3D CAD data and other data available on request.



Technical Data			
Type	M256		
Dimensions (L x W)	369 mm x 22 mm		
Quantity LEDs / Type	2 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	Daytime Running Light: 18 W Position Light: 3 W		
Mounting Points	4 (Tap Hole M6)		
Weight	297 g		
Homologation	ECE, SAE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	PMMA		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	Water spray test and immersion test		
Wire and Length	FLRY 0,75 mm²	l = 290 mm	
Connector	2-Pin connector, AS02FWT		
Description		Part Number	
LED DRL „Universal“, chrome	4260-C.0	Set	Incl. cable and driver
LED DRL „Universal“, black	4260-S.0	Set	
Spare Parts and Accessories			
LED DRL stick „X-Line“, chrome	4260-C	Piece	2x per Set
LED DRL stick „X-Line“, black	4260-S	Piece	1x per Set
Driver	27DRIVER	Piece	1x per Set
Connection cable Lights ⇔ Driver	1910	Piece	1x per Set
Power supply cable for driver	2117	Piece	1x per Set





**NCC® AVEGO**

ANGULAR IS THE NEW DIMENSION





## NCC® AVEGO: Angular is the new Dimension – Angular Modular multifunction LED

The NCC® AVEGO LED lights in two versions "U" and "O" offer unimagined design possibilities for your new vehicles. A light guide provides the daytime running light, position light and indicator functions and all this latest LED technology in a sensationally small housing enabling installation in the most restricted or difficult locations. Ex works with the DEUTSCH housing connector, adapters for other plug configurations are, of course, available. Versions for ECE LHD and ECE RHD and for SAE are available. Inner bezel only available in black. Optional fitting via lamp body or mounting frame.

### Technological highlights:

The NCC® AVEGO driving lamp is also available with integrated indicator failure control or ISO impulse. The "anti-flicker function", for fitment in vehicles with PWM power supplies, is already integrated in all versions of both the low beam and high beam lights.



Version „O“



Version „U“



Video





#### Technical Data

Name	Description	Part Number
LED Low Beam „O“	Low Beam+DRL+PO, black-glossy, LHD	6AA 1A0 010
LED Low Beam „O“	Low Beam+DRL+PO, black-glossy, RHD	6AA 1A1 010
LED High Beam „O“	High Beam+IND+PO, black-glossy, ECE, Mode A, with Mounting Ears	6AB 1A1 020
LED High Beam „O“	High Beam+IND+PO, black-glossy, ECE, Mode A, with Mounting Frame	6AB 1A0 020
LED Low Beam „U“	Low Beam+DRL+PO, black-glossy, LHD, ECE	6AA 1B0 010
LED Low Beam „U“	Low Beam+DRL+PO, black-glossy, RHD, ECE	6AA 1B1 010
LED High Beam „U“	High Beam+IND+PO, black-glossy, ECE, Mode A, with Mounting Frame	6AB 1B0 020
LED High Beam „U“	High Beam+IND+PO, black-glossy, ECE, Mode A, with Mounting Ears	6AB 1B1 020
Mono LED Low Beam „O“	Low Beam only (Light Guide without function), LHD	6AD 1A0 000
Mono LED High Beam „O“	High Beam only, with Mounting Ears (Light Guide without function)	6AE 1A1 000
Mono LED Low Beam „U“	Low Beam only (Light Guide without function), LHD	6AD 1B1 000
Mono LED High Beam „U“	High Beam only, with Mounting Ears (Light Guide without function)	6AE 1B1 000

\*Table gives information about the most common part numbers. Further part numbers or product configurations are available on request.

Caption: DRL = Daytime Running Light; PO = Position Light; IND = Indicator





## NCC® AVEGO

Technical Data				
Description	Low Beam „O“ *	High Beam „O“ *	Low Beam „U“ *	High Beam „U“ *
Type	M335	M335	M335	M335
Dimensions (L x W x H)	88 mm x 101 mm x 94 mm	88 mm x 101 mm x 104 mm	88 mm x 101 mm x 94 mm	88 mm x 101 mm x 104 mm
LEDs and Type	OSRAM	OSRAM	OSRAM	OSRAM
Voltage	12 V and 24 V	12 V and 24 V	12 V and 24 V	12 V and 24 V
Power @ 12 V	Low Beam: 25 W Position Light: 1 W Daytime Running Light: 11 W	High Beam: 22 W Position Light: 1 W Indicator ( Mode A): 29 W Indicator ( Mode B/C): 9 W	Low Beam: 25 W Position Light: 1 W Daytime Running Light: 11 W	High Beam: 22 W Position Light: 1 W Indicator ( Mode A): 29 W Indicator ( Mode B/C): 9 W
Mounting Points	4	4	4	4
Mounting Method	Mounting Ears	Mounting Ears / Mounting Frame	Mounting Ears	Mounting Ears / Mounting Frame
Homologation	ECE, SAE	ECE, SAE	ECE, SAE	ECE, SAE
Ventilation	Nitto Denko Air Cap	Nitto Denko Air Cap	Nitto Denko Air Cap	Nitto Denko Air Cap
Material Housing	ADC	ADC	ADC	ADC
Material Outer Lens	PC	PC	PC	PC
Temperature	-40 °C - +80 °C	-40 °C - +80 °C	-40 °C - +80 °C	-40 °C - +80 °C
Connector	DEUTSCH DT04	DEUTSCH DT04	DEUTSCH DT04	DEUTSCH DT04
Weight	621 g	618 g – 707 g	626 g	623 g – 712 g
Radio Noise Interference	CISPR25: 2016 Level 3	CISPR25: 2016 Level 3	CISPR25: 2016 Level 3	CISPR25: 2016 Level 3
Reference Value / High Beam	-/-	12,5	-/-	12,5
Protection Class	IP6K9K / IP68	IP6K9K / IP68	IP6K9K / IP68	IP6K9K / IP68

\* At Mono Modules, the power consumption data apply only to the Low Beam and High Beam lighting functions.

Note:      Mode A = Internal Resistor      Mode B = ISO-Impulse      Mode C = without Resistor and without ISO-Impulse



**NCC® ARTON**

THE NEW ANGULAR CONCEPT



Product Flyer





## NCC® ARTON: Angular is the latest Dimension

### The world's first rectangular modular LED headlights

In 2019, at the Düsseldorf Caravan Salon, we presented a world first design concept: the NCC® ARTON LED headlamp, a system offering completely new styling possibilities for your next generation of vehicles. The NCC® ARTON is available in either "Performance" format with three LED Low Beams and two LED High Beams, or to high performance "Competition" standard with four LED Low Beam and three LED High Beam modules. The inner bezel design is only available in a combination of glossy black and matt black.

As with all NOLDEN products, the new NCC® ARTON LED headlamp not only convinces with its excellent design, but it offers sophisticated electronics. If required all versions are available with integrated anti-flicker technology, so no additional components are required to operate these LED headlights in vehicles with PWM controlled circuitry.



NCC® ARTON LED Low Beam  
with 4 LEDs „Competition“



NCC® ARTON LED High Beam  
with 3 LEDs „Competition“



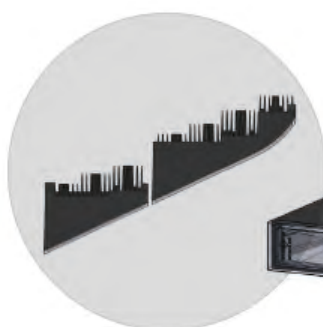
NCC® ARTON LED High Beam  
with 2 LEDs "Performance"





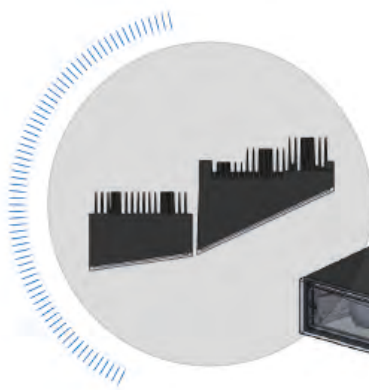
### 4 LED Low Beam, 3 LED High Beam

"**Competition**" combination option.  
Low Beam with 4 LEDs + High Beam with 3 LEDs.



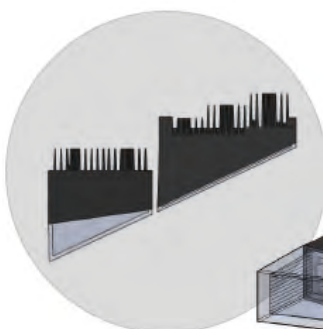
### 3 LED Low Beam, 2 LED High Beam

"**Performance**" combination option.  
Low Beam with 3 LEDs + High Beam with 2 LEDs.



### 3 LED Low Beam, 2 LED High Beam

"**Performance**" combination option. Low Beam with 3 LEDs + High Beam with 2 LEDs.







Technical Data					
Description	Low Beam „Competition“	Low Beam „Performance“	High Beam „Competition“	High Beam „Performance“	High Beam „Performance“
Type	M331	M331	M331	M331	M331
Inclination	25°	25°	25°	8°	25°
Dimensions (L x W x H)	220 mm x 40 mm x 166 mm	160 mm x 40 mm x 136 mm	160 mm x 40 mm x 136 mm	120 mm x 40 mm x 102 mm	120 mm x 40 mm x 140 mm
LEDs and Type	4 / OSRAM	3 / OSRAM	3 / OSRAM	2 / OSRAM	2 / OSRAM
Voltage	12 V and 24 V	12 V and 24 V	12 V and 24 V	12 V and 24 V	12 V and 24 V
Power @ 12 V	Low Beam: 32 W	Low Beam: 26 W	High Beam: 28 W	High Beam: 19 W	High Beam: 19 W
Mounting Points	2 (Tapped Hole M6)	2 (Tapped Hole M6)	2 (Tapped Hole M6)	2 (Tapped Hole M6)	2 (Tapped Hole M6)
Homologation	ECE	ECE, SAE	ECE, SAE	ECE	ECE
Ventilation	Gore-Tex	Gore-Tex	Gore-Tex	Gore-Tex	Gore-Tex
Material Housing	ADC	ADC	ADC	ADC	ADC
Material Outer Lens	PC, hardened	PC, hardened	PC, hardened	PC, hardened	PC, hardened
Temperature	-40 °C - +80 °C	-40 °C - +80 °C	-40 °C - +80 °C	-40 °C - +80 °C	-40 °C - +80 °C
Connector	DEUTSCH DT04	DEUTSCH DT04	DEUTSCH DT04	DEUTSCH DT04	DEUTSCH DT04
Weight	758 g	566 g	570 g	430 g	473 g
Radio Noise Interference	CISPR25: Level 3	CISPR25: Level 3	CISPR25: Level 3	CISPR25: Level 3	CISPR25: Level 3
Reference Value / High Beam	-/-	-/-	12,5	12,5	12,5
Protection Class	IP6KX / IPX8	IP6KX / IPX8	IP6KX / IPX8	IP6KX / IPX8	IP6KX / IPX8

Note: 2D drawings, 3D CAD data and further information are available on request.





Part Number								
Description	Part Number	Left Side	Right Side	ECE	SAE	LHD	RHD	Anti-Flicker
Low Beam „Competition“ (4 LEDs)	2204025L-A-1SL	●		●		●		
Low Beam „Competition“ (4 LEDs)	2204025L-A-1SR		●	●		●		
Low Beam „Competition“ (4 LEDs)	2204025L-A-3SL	●		●			●	
Low Beam „Competition“ (4 LEDs)	2204025L-A-3SR		●	●			●	
Low Beam „Competition“ (4 LEDs)	22204025L-A-1SL.1	●		●		●		●
Low Beam „Competition“ (4 LEDs)	2204025L-A-1SR.1		●	●		●		●
Low Beam „Competition“ (4 LEDs)	2204025L-A-3SL.1	●		●			●	●
Low Beam „Competition“ (4 LEDs)	2204025L-A-3SR.1		●	●			●	●
Low Beam „Performance“ (3 LEDs)	1604025L-A-4SL	●		●	●	●		
Low Beam „Performance“ (3 LEDs)	1604025L-A-4SR		●	●	●	●		
Low Beam „Performance“ (3 LEDs)	1604025L-A-3SL	●		●			●	
Low Beam „Performance“ (3 LEDs)	1604025L-A-3SR		●	●			●	
Low Beam „Performance“ (3 LEDs)	1604025L-A-4SL.1	●		●	●	●		●
Low Beam „Performance“ (3 LEDs)	1604025L-A-4SR.1		●	●	●	●		●
Low Beam „Performance“ (3 LEDs)	1604025L-A-3SL.1	●		●			●	●
Low Beam „Performance“ (3 LEDs)	1604025L-A-3SR.1		●	●			●	●





Part Number								
Description	Part Number	Left Side	Right Side	ECE	SAE	LHD	RHD	Anti-Flicker
High Beam (3 LEDs, Outer Lens with 25° Inclination)	1604025L-F-4SL	●		●	●			
High Beam (3 LEDs, Outer Lens with 25° Inclination)	1604025L-F-4SR		●	●	●			
High Beam (3 LEDs, Outer Lens with 25° Inclination)	1604025L-F-4SL.1	●		●	●			●
High Beam (3 LEDs, Outer Lens with 25° Inclination)	1604025L-F-4SR.1		●	●	●			●
High Beam (2 LEDs, Outer Lens with 25° Inclination)	1204025L-F-1SL	●		●				
High Beam (2 LEDs, Outer Lens with 25° Inclination)	1204025L-F-1SR		●	●				
High Beam (2 LEDs, Outer Lens with 8° Inclination)	1204008L-F-1SL	●		●				
High Beam (2 LEDs, Outer Lens with 8° Inclination)	1204008L-F-1SR		●	●				
High Beam (2 LEDs, Outer Lens with 25° Inclination)	1204025L-F-1SL.1	●		●				●
High Beam (2 LEDs, Outer Lens with 25° Inclination)	1204025L-F-1SR.1		●	●				●
High Beam (2 LEDs, Outer Lens with 8° Inclination)	1204008L-F-1SL.1	●		●				●
High Beam (2 LEDs, Outer Lens with 8° Inclination)	1204008L-F-1SR.1		●	●				●



# NCC® LED FOG CORNERING LIGHT RECTANGULAR





To complement the NCC® ARTON LED headlamp system, we have developed the rectangular LED fog cornering light "ML-033" providing optimum illumination to the left and right side of the road. Available only in black with or without an inclined lens. The lamp requires a separate control unit which is not included. This light has an integrated driver and internal adjustment.

**Low Angle "LO"** (Outer lens of the module has no inclination)

**High Angle "HI"** (Strongly inclined outer lens with 17° inclination)

Technical Data			
Type	ML-033		
Dimensions (L x W)	121 mm x 43 mm		
Quantity LEDs / Type	2 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	Fog Cornering Light: 10 W		
Mounting Points	2 (Tap Hole M6)		
Weight	Flat outer lens: 269 g Steep outer lens: 282 g		
Homologation	ECE		
Rotation around X-axis	+/- 4°		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	PC, hardened		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP6K9K, IP68		
Radio Noise Interference	CISPR25: Level 5		
Wire and Length	FLRY 0,75 mm²	l = 180 mm	
Connector	H8 / H11		
Description		Part Number	
LED Fog Cornering Light, rectangular, left side, LO, black		120900L-NAB-S-LH	
LED Fog Cornering Light, rectangular, right side, LO, black		120900L-NAB-S-RH	
LED Fog Cornering Light, rectangular, left side, HI, black		120910L-NAB-S-LH	
LED Fog Cornering Light, rectangular, right side, HI, black		120910L-NAB-S-RH	
Spare Parts and Accessories			
Adapter H8 / H11	2415	Piece	600 mm, H8 / H11 Connector
Adapter H8 / H11	9941	Piece	120 mm, Open Cable Ends
Switch for Fog Light, round, with status light	1772	Piece	





**NCC® 90 mm LED MODULES**

DRIVING AND  
MULTIFUNCTIONAL LIGHTS





## Anything but standard: NOLDEN 90 mm Modules

**The NOLDEN name is associated with excellence in the automotive lighting sector** and not least due to the development of this very comprehensive range of modular 90 mm lights. Technical excellence and innovation are clearly reflected in this range of single and multifunction lamps, designed to satisfy varying and specific applications.

Having identified the potential of this sector very early on, NOLDEN is now at the forefront of this sector. 90 mm LED lighting has fast become the popular choice for vehicle manufactures and aftermarket fitment so is close to being a standard installation choice.

The NOLDEN 90 mm range offers the greatest possible freedom of choice ensuring engineers and designers will find a perfect solution with the certainty of uncompromising high quality and reliability guaranteed with ECE, (SAE) and EMC approvals.

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## NCC® 90 mm LED Low Beam G2

The **second generation** of the powerful 90 mm LED low beam headlight from the 901 series, well proven in serial vehicle production. Innovative optics with excellent illumination, long life operation and integrated driver. Modular design and compatible with all other 90 mm LED and halogen modules. Available in chrome or black. Also available as RHD and SAE versions. 2D drawings, 3D CAD data and other data available on request.

### Technical Data

Type	<b>M293</b>	
Dimensions (L x W)	90 mm x 150 mm	
Quantity LEDs / Type	2 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Low Beam: 25 W	
Mounting Points	4 (Mounting Ears)	
Weight	1010 g	
Homologation	ECE, SAE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	Glas, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 200 mm
Connector	AMP Superseal	

### Description

### Part Number

90 mm LED Low Beam, chrome, ECE	90901L-AC	Piece
90 mm LED Low Beam, black, ECE	90901L-AS	Piece
90 mm LED Low Beam, chrome, ECE, RHD	90901L-AC-RHD	Piece
90 mm LED Low Beam, black, ECE, RHD	90901L-AS-RHD	Piece
90 mm LED Low Beam, chrome, SAE	90901L-AC02	Piece
90 mm LED Low Beam, black, SAE	90901L-AS02	Piece

### Spare Parts and Accessories

Fixings „Standard“	3130	Set	for one Module
Fixings „Heavy Duty“	3132	Set	for one Module
Clip for 8 mm Ball Head	3127	Piece	



# NCC® 90 mm

## LED High Beam G2

The **second generation** of the powerful LED high beam headlight from the 901 series well proven in serial vehicle production. Integrated driver, modular design and compatible with all other 90 mm LED and halogen modules. Versions with or without position light, Available in chrome or black. 2D drawings, 3D CAD data and other data available on request.



Technical Data			
Type	M293H / M293HP		
Dimensions (L x W)	90 x 108	mm	
Quantity LEDs / Type	1 or 3 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	High Beam: 18 W Position Light: 2 W		
Mounting Points	4 (Mounting Ears)		
Weight	640 g		
Homologation	ECE, SAE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	Glas		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP6K9K		
Reference Value / High Beam	12,5		
Wire and Length	FLRY 0,75 mm <sup>2</sup>	I = 200 mm	
Connector	AMP Superseal		
Description	Part Number		
90 mm LED High Beam, chrome, ECE	90901L-FC	Piece	
90 mm LED High Beam, black, ECE	90901L-FS	Piece	
90 mm LED High Beam and Position Light, chrome, ECE	90901L-FPC	Piece	
90 mm LED High Beam and Position Light, black, ECE	90901L-FPS	Piece	
90 mm LED High Beam, chrome, SAE	90901L-FC02	Piece	
90 mm LED High Beam, black, SAE	90901L-FS02	Piece	
Spare Parts and Accessories			
Fixings „Standard“	3130	Set	for one Module
Fixings „Heavy Duty“	3132	Set	for one Module





## NCC® 90 mm Bi-LED Headlight G2

The more compact **second generation** of the powerful 90 mm Bi-LED headlamp of the 901 series with integrated driver. Already proven in serial vehicle production and compatible with all other 90 mm LED and halogen modules, the lamps are supplied with halogen-free cable, "Terminal 30" connection, integrated anti-flicker technology and available in chrome or black finish. Versions for railway applications are available with specific cabling and symmetrical illumination. Further customer specific versions are available on request. 2D drawings, 3D CAD data and further data available on request.

Technical Data			
Type	M318		
Dimensions (L x W)	90 mm x 167 mm		
Quantity LEDs / Type	5 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	Low Beam: 35 W High Beam: 58 W		
Mounting Points	4 (Mounting Ears)		
Weight	1270 g		
Homologation	ECE, SAE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	Glas, hardened		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP6K9K / IP68		
Reference Value / High Beam	12,5		
Wire and Length	FLR2X-A 0,75 mm²	l = 200 mm	
Connector	AMP Superseal		
Description		Part Number	
90 mm Bi-LED, chrome, ECE	90901L-AF-C	Piece	
90 mm Bi-LED, black, ECE	90901L-AF-S	Piece	
90 mm Bi-LED, chrome, ECE, RHD	90901L-AF-C-RHD	Piece	
90 mm Bi-LED, black, ECE, RHD	90901L-AF-S-RHD	Piece	
90 mm Bi-LED, chrome, SAE	90901L-AF-C-02	Piece	
90 mm Bi-LED, black, SAE	90901L-AF-S-02	Piece	
Spare Parts and Accessories			
Fixings „Standard“	3130	Set	for one Module
Fixings „Heavy Duty“	3132	Set	for one Module
Clip for 8 mm Ball Head	3127	Piece	



# NCC® 90 mm

## LED Low Beam G3

The **third generation** of the 90 mm **LED low beam** headlight. Available as either a single function or multifunction module. In the multifunction version the daytime running and position light is created by a homogeneous light guide. With the latest LED technology and very compact dimensions, the 90 mm G3 enables fitment in the most restricted locations. Ex works with DEUTSCH housing connector, adapters for other plug configurations are available on request. 2D drawings, 3D CAD data and other data available on request. This headlamp is only available in chrome.



Technical Data			
Type	<b>M326</b>		
Dimensions (L x W)	90 mm x 90 mm		
Quantity LEDs / Type	2 or 4 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	Low Beam: 25 W Daytime Running Light: 11 W Position Light: 1 W		
Mounting Points	4 (Mounting Ears)		
Weight	559 g		
Homologation	ECE, SAE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	PC, hardened		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP6K9K, IP68		
Connector	DEUTSCH DT15-04		
Description	Part Number		
90 mm LED Low Beam, G3, ECE & SAE, Monomodule	90903L-A-C	Piece	
90 mm LED Low Beam, G3, ECE & SAE, with Daytime Running and Position Light	90903L-ATP-C	Piece	
90 mm LED Low Beam, G3, ECE & SAE, with Daytime Running and Position Light, RHD	90903L-ATP-C-RHD	Piece	
90 mm LED Low Beam, G3, ECE & SAE, Monomodule, RHD	90903L-A-C-RHD	Piece	
Spare Parts and Accessories			
Fixings „Standard“	3130	Set	for one Module
Fixings „Heavy Duty“	3132	Set	for one Module
Clip for 8 mm Ball Head	3127	Piece	





## NCC® 90 mm LED High Beam G3

The **third generation LED high beam** headlight is perfect for combination with our third generation LED multifunction low beam. Here, too, a light guide provides the additional indicator and position light functions. This multifunction lamp is available with integrated load resistor or ISO impulse for indicator failure detection options. DEUTSCH connection ex works, other plug configurations are available on request. 2D drawings, 3D CAD data and other data available on request. The third generation 90 mm LED high beam is only available in chrome.

Technical Data			
Type	<b>M326</b>		
Dimensions (L x W)	90 mm x 103 mm		
Quantity LEDs / Type	2 - 4 / OSRAM, CREE		
Voltage	12 V and 24 V		
Power @ 12 V	High Beam: 22 W		
Mounting Points	4 (Mounting Ears)		
Weight	538 g - 589 g		
Homologation	ECE, SAE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	PC, hardened		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP6K9K, IPX8		
Reference Value / High Beam	12,5		
Connector	DEUTSCH DT15-04		
Description	Part Number		
90 mm LED High Beam G3, with Indicator and Position Light, Mode A (Resistor), with Mounting Ears	90903L-FPB-1-C-A	Piece	
90 mm LED High Beam G3, with Indicator and Position Light, Mode B (ISO-Impulse), with Mounting Ears	90903L-FPB-1-C-B	Piece	
90 mm LED High Beam G3, with Indicator and Position Light, Mode C (without Resistor / ISO-Impulse), with Mounting Ears	90903L-FPB-1-C-C	Piece	
90 mm LED High Beam G3, with Indicator and Position Light, Mode A (Resistor), with Blank Holder	90903L-FPB-2-C-A	Piece	
90 mm LED High Beam, with Indicator and Position Light, Mode B (ISO-Impulse), with Blank Holder	90903L-FPB-2-C-B	Piece	
90 mm LED High Beam G3, with Indicator and Position Light, Mode C (without Resistor / ISO-Impulse), with Blank Holder	90903L-FPB-2-C-C	Piece	
90 mm LED Mono High Beam, with Mounting Ears	90903L-F-1-C	Piece	
90 mm LED Mono High Beam, with Blank Holder	90903L-F-2-C	Piece	
Spare Parts and Accessories			
Fixings „Standard“	3130	Set	for one Module
Fixings „Heavy Duty“	3132	Set	for one Module
Holding Frame for 90 mm LED High Beam G3	90903L-H	Set	for one Module
Mounting Ears for 90 mm LED High Beam G3	90903L-ME	Set	for one Module
Clip for 8 mm Ball Head	3127	Piece	



# NCC® 90 mm LED Fog Light



The compact **90 mm LED modular fog light** compliments the other 90 mm LED and halogen lights in the 900 series. With integrated driver. The light delivers excellent illumination with a sharp cut-off. Complete with mounting plate, adjustment possible at top or bottom. Proven in serial vehicle production. 2D drawings, 3D CAD data and other data available on request.

Technical Data		
Type	<b>M192A</b>	
Dimensions (L x W)	90 mm x 74 mm	
Quantity LEDs / Type	1 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Fog Light: 13 W	
Mounting Points	4 (Blank Holder)	
Weight	350 g	
Homologation	ECE	
Ventilation	Membrane	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP67	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 200 mm
Connector	H8 / H11	
Description	Part Number	
90 mm LED Fog Light, chrome	90900L-NC	Piece
90 mm LED Fog Light, black	90900L-NS	Piece
90 mm LED Fog Light, chrome, Adjustment Screw top	90900L-NC1	Piece
90 mm LED Fog Light, black, Adjustment Screw top	90900L-NS1	Piece





## NCC® 90 mm LED Fog Cornering Light

Compact LED cornering fog light with a mounting depth of only 74 mm. Optimum illumination to the right and left side of the road. As a cornering light, a separate driver is required but not included. Suitable for installation with all 90 mm LED and halogen lights of the 900 series. Supplied with a mounting plate and adjustment possible top or bottom. Proven in serial vehicle production. 2D drawings, 3D CAD data and further data available on request.

Technical Data		
Type	<b>M192C</b>	
Dimensions (L x W)	90 mm x 74 mm	
Quantity LEDs / Type	1 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Fog Light: 12 W	
Mounting Points	4 (Blank Holder)	
Weight	294 g	
Homologation	ECE	
Ventilation	Membrane	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP67	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 200 mm
Connector	H8 / H11	
Description	Part Number	
90 mm LED Fog Cornering Light, chrome, left	90901L-NABC-LH	Piece
90 mm LED Fog Cornering Light, chrome, right	90901L-NABC-RH	Piece
90 mm LED Fog Cornering Light, black, left	90901L-NABS-LH	Piece
90 mm LED Fog Cornering Light, black, right	90901L-NABS-RH	Piece
90 mm LED Fog Cornering Light, chrome, left, Adjustment Screw top	90901L-NABC1-LH	Piece
90 mm LED Fog Cornering Light, chrome, right, Adjustment Screw top	90901L-NABC1-RH	Piece
90 mm LED Fog Cornering Light, black, left, Adjustment Screw top	90901L-NABS1-LH	Piece
90 mm LED Fog Cornering Light, black, right, Adjustment Screw top	90901L-NABS1-RH	Piece



# NCC® 90 mm LED Fog Light

This lamp with clear lens and integrated internal adjustment requires no further brackets or adjustment elements. Integrated driver, proven in serial vehicle production. Available in chrome or black. 2D drawings, 3D CAD data and further data available on request.



## Technical Data

Type	<b>M184</b>	
Dimensions (L x W)	90 mm x 84 mm	
Quantity LEDs / Type	1 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Fog Light: 16 W	
Mounting Points	4 (Mounting Ears)	
Weight	400 g	
Homologation	ECE, SAE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K	
Wire and Length	FLRY 0,75 mm²	l = 110 mm
Connector	AMP Superseal	
Description	Part Number	
90 mm LED Fog Light Series 910, chrome	90910L-NC	Piece
90 mm LED Fog Light Series 910, black	90910L-NS	Piece





## NCC® 90 mm LED Fog Light

An angled lens lamp with integrated internal adjustment requires no further brackets or adjustment elements. Integrated driver. Proven in serial vehicle production. Available in chrome or black. 2D drawings, 3D CAD data and further data available on request.

### Technical Data

Type	<b>M192A</b>	
Dimensions (L x W)	94 mm x 100 mm	
Quantity LEDs / Type	1 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Fog Light: 13 W	
Mounting Points	4 (Mounting Ears)	
Weight	294 g	
Homologation	ECE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 200 mm
Connector	H8 / H11	
Description	Part Number	
90 mm LED Fog Light Series 920, chrome, left	90920L-NC-LH	Piece
90 mm LED Fog Light Series 920, chrome, right	90920L-NC-RH	Piece
90 mm LED Fog Light Series 920, black, left	90920L-NS-LH	Piece
90 mm LED Fog Light Series 920, black, right	90920L-NS-RH	Piece



# NCC® LED Fog Light

GREAT ILLUMINATION  
IN POOR VISIBILITY







## NCC® 90 mm LED Multifunction Fog Light

LED multifunctional fog lamp combined with daytime running light. Flat lens with internal adjustment and integrated driver. Only available in chrome. 2D drawings, 3D CAD data and other data available on request.

Technical Data		
Type	<b>GL-132</b>	
Dimensions (L x W)	90 mm x 74 mm	
Quantity LEDs / Type	3 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Daytime Running Light: 8 W Fog Light: 9 W	
Mounting Points	4 (Mounting Ears)	
Weight	350 g	
Homologation	ECE, SAE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K, IP67	
Wire and Length	FLRY 0,75 mm²	l = 200 mm
Connector	H8 / H11	
Description	Part Number	
90 mm LED Multifunctional Light, chrome	90910L-TN-C	Piece
90 mm LED Multifunctional Light, chrome	90910L-TN-C.0	Set





## NCC® 90 mm LED Multifunction Fog Light

LED multifunction fog and **daytime running light** from the 920 series. With integrated driver. Only available in chrome. 2D drawings, 3D CAD data and other data available on request.

Technical Data		
Type	<b>M185</b>	
Dimensions (L x W)	94 mm x 100 mm	
Quantity LEDs / Type	3 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Daytime Running Light: 4 W Fog Light: 9 W	
Mounting Points	4 (Mounting Ears)	
Weight	350 g	
Homologation	ECE, SAE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K, IP67	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 110 mm
Connector	H8 / H11, AMP Superseal and PS19W	
Description	Part Number	
90 mm LED Multifunctional Light, chrome, left	90920L-TNC-LH	Piece
90 mm LED Multifunctional Light, chrome, right	90920L-TNC-RH	Piece





## NCC® 90 mm LED Multifunction

90 mm LED fog light combined with daytime running and position light with mounting plate enabling top or bottom adjustment. Integrated driver. 2D drawings, 3D CAD data and other data available on request.

Technical Data		
Type	<b>GL-169</b>	
Dimensions (L x W)	90 mm x 63 mm	
Quantity LEDs / Type	2 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Daytime Running Light: 4 W Position Light: 1 W Fog Light: 12 W	
Mounting Points	4 (Blank Holder)	
Weight	400 g	
Homologation	ECE, SAE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K, IP67	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 200 mm
Connector	H8 / H11 and AMP Superseal	
Description	Part Number	
90 mm LED Multifunctional Light, chrome	90900L-TPN-C	Piece
90 mm LED Multifunctional Light, black	90900L-TPN-S	Piece
90 mm LED Multifunctional Light, chrome, Adjustment Screw top	90900L-TPN-C1	Piece
90 mm LED Multifunctional Light, black, Adjustment Screw top	90900L-TPN-S1	Piece





## NCC® 90 mm LED Multifunction

90 mm LED daytime running light combined with position and indicator light. Integrated driver. The mounting plate enabling top or bottom adjustment. 2D drawings, 3D CAD data and other data available on request.

### Technical Data

Type	<b>M240</b>	
Dimensions (L x W)	90 mm x 63 mm	
Quantity LEDs / Type	2 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Daytime Running Light: 4 W Position Light: 1 W Indicator: 4 W	
Mounting Points	4 (Blank Holder)	
Weight	400 g	
Homologation	ECE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K, IP67	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 230 mm
Connector	AMP Superseal	
Description	Part Number	
90 mm LED Multifunctional Light, chrome	90900L-TPB-1-2-C	Piece
90 mm LED Multifunctional Light, black	90900L-TPB-1-2-S	Piece
90 mm LED Multifunctional Light, chrome, Adjustment Screw top	90900L-TPB-1-1-C	Piece
90 mm LED Multifunctional Light, black, Adjustment Screw top	90900L-TPB-1-1-S	Piece





## NCC® 90 mm LED Daytime Running Light

**Economical** daytime running light with only 2 watts power consumption. Perfect in combination with NCC 90 mm LED high and low beam lights. Integrated driver and mounting plate option with top or bottom adjustment. ECE and SAE approvals. 2D drawings, 3D CAD data and other data available on request.

### Technical Data

Type	M192B	
Dimensions (L x W)	90 mm x 74 mm	
Quantity LEDs / Type	1 / PHILIPS	
Voltage	12 V and 24 V	
Power @ 12 V	Daytime Running Light: 2 W	
Mounting Points	4 (Blank Holder)	
Weight	350 g	
Homologation	ECE, SAE	
Ventilation	Membrane	
Material Housing	ADC	
Material Outer Lens	PMMA	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP67	
Wire and Length	FLRY 0,75 mm²	l = 200 mm
Connector	AMP Superseal	
Description	Part Number	
90 mm LED Daytime Running Light, chrome	90900L-TC	Piece
90 mm LED Daytime Running Light, black	90900L-TS	Piece





## NCC® 90 mm

### LED Daytime Running and Position Light

The **900 series** daytime running and position light with integrated driver. Perfect in combination with the NCC 90 mm LED high and low beam lights. Supplied with or without mounting plate with top or bottom adjustment. ECE and SAE approvals. 2D drawings, 3D CAD data and other data available on request.

#### Technical Data

Type	<b>M192B</b>	
Dimensions (L x W)	90 mm x 74 mm	
Quantity LEDs / Type	1 / PHILIPS	
Voltage	12 V and 24 V	
Power @ 12 V	Daytime Running Light: 2 W Position Light: 1 W	
Mounting Points	4 (Blank Holder)	
Weight	348 g	
Homologation	ECE, SAE	
Ventilation	Membrane	
Material Housing	ADC	
Material Outer Lens	PMMA	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP67	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 200 mm
Connector	AMP Superseal	

#### Description

#### Part Number

90 mm LED Daytime Running and Position Light, chrome	90900L-TPC	Piece
90 mm LED Daytime Running and Position Light, black	90900L-TPS	Piece
90 mm LED Daytime Running and Position Light, chrome, Adjustment Screw top	90900L-TPC1	Piece
90 mm LED Daytime Running and Position Light, black, Adjustment Screw top	90900L-TPS1	Piece





**NCC® VEOS**

LED FOG LIGHT  
WITH DAYTIME RUNNING LIGHT





## NCC® VEOS: LED Fog Light with Daytime Running Light

LED daytime running light and LED fog light combined in one light with light guide technology for the daytime running light. Integrated driver. ECE and SAE approvals.

Technical Data		
Type	<b>ML-037</b>	
Dimensions (L x W)	90 mm x 74 mm	
Quantity LEDs / Type	3 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Daytime Running Light: 8 W Fog Light: 9 W	
Mounting Points	4 (Blank Holder)	
Weight	350 g	
Homologation	ECE, SAE	
Ventilation	Membrane	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	JIS D0203 S2 Standard	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 200 mm
Connector	AMP Superseal and H8 / H11	
Description	Part Number	
90 mm LED Daytime Running Light, chrome	90911L-TN-C	Piece



# LED MULTIFUNCTION MODULE

WITH 4 LIGHT FUNCTIONS





# NCC® 90 mm TPBN Multifunctional Light With 4 Light Functions

**A real innovation among the 90 mm LED multifunction lights**, now a fog lamp as well as daytime running light, position light and indicator. Integrated driver and height adjustment with pre-mounted stainless steel bracket. Together with the NCC® 90 mm Bi-LED module, not only are all prescribed front lighting functions met but with an additional fog lamp as well. 2D drawings, 3D CAD data and other data available on request.

## Technical Data

Type	<b>M324</b>	
Dimensions (L x W)	90 mm x 66 mm	
Quantity LEDs / Type	5 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Daytime Running Light: 4 W Position Light: 1 W Indicator: 4 W Fog Light: 8 W	
Mounting Points	4 (Stainless Steel Bracket)	
Weight	450 g	
Homologation	ECE, SAE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	JIS D0203: 1992 S2	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 550 mm
Connector	AMP SuperSeal 2P and AMP SuperSeal 5P	
Description	Part Number	
90 mm LED TPBN Multifunctional Light, chrome, Adjustment screw bottom	90901L-TPBN-1-2-C	Piece
90 mm LED TPBN Multifunctional Light, black, Adjustment Screw bottom	90901L-TPBN-1-2-S	Piece
90 mm LED TPBN Multifunctional Light, chrome, Adjustment Screw top	90901L-TPBN-1-1-C	Piece
90 mm LED TPBN Multifunctional Light, black, Adjustment Screw top	90901L-TPBN-1-1-S	Piece



# NCC® 70 mm Modules

LED MODULES







## The Bestseller 70 mm Modules

In all modesty we have enriched the industry with the 70 mm range. More than 15 years ago Nolden was the first to market 70 mm modular lights and, even today, we are still the only supplier of these popular and versatile lights. Having now supplied tens of thousands for seemingly endless applications is proof we have obviously satisfied numerous customers and manufacturers. As the creator and sole supplier of this 70 mm lamp sector, it is our obligation to offer a wide range of these original lights either in chrome or black all with ECE and SAE approval and EMC to the highest standard. A wide range of attractive design solutions are available for virtually every vehicle segment.

**So much too choose from!**



Several Mounting Kits available



### Versions

- // LED Daytime Running Light
- // LED Fog Light
- // LED Fog Cornering Light

- // LED High Beam
- // LED Indicator

- // Halogen High Beam
- // Halogen Daytime Running Light

In the following you will find our LED lights from the 70 mm segment. Halogen versions can be found in the separate section for halogen lights in this catalogue.





## NCC® 70 mm LED Daytime Running Light

**Economical** LED daytime running light with only 3 watts power consumption and integrated driver. Perfect in combination with NCC® 70 mm LED fog or high beam. Very small installation depth of only 55 mm, particularly suitable for vehicle types such as motorbike, ATV, SSV. This light is homologated for ECE and SAE applications. 2D drawings, 3D CAD data and other data available on request.

Technical Data			
Type	ML-023		
Dimensions (L x W)	69 mm x 55 mm		
Quantity LEDs / Type	1 / PHILIPS		
Voltage	12 V and 24 V		
Power @ 12 V	Daytime Running Light: 3 W		
Mounting Points	2 (Tap Hole M6)		
Weight	164 g		
Homologation	ECE, SAE		
Ventilation	Membrane		
Material Housing	ADC		
Material Outer Lens	PMMA		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP69		
Wire and Length	FLRY 0,75 mm²	l = 150 mm	
Connector	AMP Superseal		
Description		Part Number	
70 mm LED Daytime Running Light, black	69070	Piece	Without Bracket
70 mm LED Daytime Running Light, chrome	68070	Piece	Without Bracket
Spare Parts and Accessories			
Bracket for 70 mm Modules	70	Piece	
Universal wiring harness	2487.1	Piece	
70 mm LED Daytime Running Light, chrome	68070.1	Set	With Bracket
70 mm LED Daytime Running Light, black	69070.1	Set	With Bracket



# NCC® 70 mm Fog Light G2

A 70 mm LED fog light of the 2nd generation with the latest LED technology and proven in serial production. Integrated driver with a low power consumption of only 6 W. A very homogeneous light with a light colour of 5950 K and perfect cut-off line together with a very shallow installation depth of only 55 mm. This fog light is homologated for ECE, SAE, CCC and VSCC applications. 2D drawings, 3D CAD data and other data available on request.



Technical Data			
Type	M275A		
Dimensions (L x W)	69 mm x 55 mm		
Quantity LEDs / Type	1 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	Fog Light: 6 W		
Mounting Points	2 (Tap Hole M6)		
Weight	175 g		
Homologation	ECE, SAE, CCC, VSCC		
Ventilation	Nitto Denko Air Cap		
Material Housing	PC, hardened		
Material Outer Lens	PMMA		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP6K9K, IPX8		
Wire and Length	FLRY 0,75 mm²	l = 200 mm	
Connector	H8 / H11		
Description		Part Number	
70 mm LED Fog Light, chrome	70700L-NC	Piece	
70 mm LED Fog Light, black	70700L-NS	Piece	
70 mm LED Fog Light, chrome	70700L-NC.0	Set	
70 mm LED Fog Light, black	70700L-NS.0	Set	
Spare Parts and Accessories			
Adapter for H8 / H11	2415	Piece	600 mm, Connector H8 / H11
Adapter for H8 / H11	9941	Piece	120 mm, Open Cable Ends





## NCC® 70 mm LED Fog Cornering Light G2

Innovative 70 mm LED fog cornering light, with symmetrical illumination. Only available with inner bezel in chrome. Optimum illumination of the right and left side of the road. Very shallow installation depth of only 55 mm, therefore especially suitable for vehicle types such as motorbikes, ATV, SSV. With integrated driver and a low power consumption of only 10 W. Very homogeneous light with a light colour of 5950 K and a perfect cut-off line. A separate cornering light driver is required for use as a cornering light (not included!). This light is homologated for ECE and SAE applications. 2D drawings, 3D CAD data and other data available on request.

Technical Data			
Type	ML-040		
Dimensions (L x W)	69 mm x 55 mm		
Quantity LEDs / Type	1 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	Fog Cornering Light: 10 W		
Mounting Points	2 (Tap Hole M6)		
Weight	178 g		
Homologation	ECE, SAE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	PC, hardened		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP6K9K, IPX8		
Wire and Length	FLRY 0,75 mm²	l = 200 mm	
Connector	H8 / H11		
Description		Part Number	
70 mm LED Fog Cornering Light, chrome	70700L-NABC	Piece	
70 mm LED Fog Cornering Light, chrome, with blank holder 1081.0	70700L-NABC.1	Set	
Spare Parts and Accessories			
Bracket	70	Piece	
Universal Wire Harness	1218.2	Piece	
Adapter for H8 / H11	2415	Piece	600 mm, Connector H8 / H11
Adapter for H8 / H11	9941	Piece	120 mm, Open Cable Ends
Switch Fog Light, round, with Status Light	1772	Piece	



# NCC® 70 mm LED High Beam



Compact 70 mm LED high beam with a luminous flux measured at 520 lumens and a light colour of 5600 K. Proven in serial applications and perfect in combination with all the 70 mm range. Very shallow installation depth of only 55 mm, therefore particularly suitable for motorbike application, ATV, SSV. This compact high beam has an external driver. 2D drawings, 3D CAD data and other data available on request.

Technical Data			
Type	ML-023D		
Dimensions (L x W)	69 mm x 55 mm		
Quantity LEDs / Type	1 / OSRAM		
Voltage	12 V and 24 V		
Power @ 12 V	High Beam: 13 W		
Mounting Points	2 (Tap Hole M6)		
Weight	Light: 166 g Driver: 68 g		
Homologation	ECE, SAE		
Ventilation	Membrane		
Material Housing	ADC		
Material Outer Lens	PC		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IP67		
Reference Value / High Beam	12,5		
Wire and Length	FLRY 0,75 mm²	l = 600 mm	
Connector	2-Pin Delphi Stecker		
Description		Part Number	
70 mm LED-Fernscheinwerfer, chrom	66070	Piece	
70 mm LED-Fernscheinwerfer, schwarz	67070	Piece	
70 mm LED-Fernscheinwerfer, chrom	66070.2	Set	
70 mm LED-Fernscheinwerfer, schwarz	67070.2	Set	
Spare Parts and Accessories			
Driver	1802	Piece	
Bracket	70	Piece	
Universal Wire Harness	1218.2	Piece	
Adapter for H8 / H11	2415	Piece	600 mm, Connector H8 / H11
Adapter for H8 / H11	9941	Piece	120 mm, Open Cable Ends
Switch For Light, round, with Status Light	1772	Piece	





# **LIGHTING TECHNOLOGY**

## OFF ROAD VEHICLES



# NCC® 7" Bi-LED HEADLIGHT G2

This second generation 7" Bi-LED low and high beam headlamp with LED light guide daytime running and position lights is the latest LED technology in the one lamp. The high beam can now be switched on simultaneously with the low beam thus providing very homogeneous and long range illumination, the new LEDs creating a very white and bright light to the front of the vehicle. Plug and play H4 connection, LHD and RHD versions in chrome, black chrome or matt black.



## Mounting Position



## Technical Data

- // Dimensions: 177×99 mm
- // 12 V and 24 V Voltage
- // Power Consumption:
  - Low Beam: 23 W
  - High Beam: 31 W
  - Daytime Running Light: 8 W
  - Position Light: 1 W
- // More than 10 years lifetime of the LED
- // White illumination of the road
- // H4-Connector for Plug & Play
- // Standard 7" Mounting (PAR56)
- // Small mounting depth for multiple installation situations
- // Aluminium-Die-Cast Housing
- // 480 h Salt Spray compliant
- // Available in chrome, black-chrome and black-matt

**Various retrofit sets available!**





## NCC® 7" Bi-LED Headlight G2



### Technical Data

Type	<b>M294</b>	
Dimensions (L x W)	177 mm x 99 mm	
Quantity LEDs / Type	7 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Low Beam: 23 W High Beam: 31 W	
Weight	1030 g	
Homologation	ECE, SAE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K, IPX8	
Reference Value / High Beam	12,5	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 200 mm
Connector	H4 and AMP Superseal	
Description	Part Number	
7" Bi-LED Headlight, chrome	7ZG2-AFTP-C (RHD: 7ZG2-AFTP-C-RHD)	Piece
7" Bi-LED Headlight, black-chrome	7ZG2-AFTP-SC (RHD: 7ZG2-AFTP-SC-RHD)	Piece
7" Bi-LED Headlight, black-matt	7ZG2-AFTP-SM (RHD: 7ZG2-AFTP-SM-RHD)	Piece





## NCC® 5.75" Bi-LED Headlight

The 5.75" LED headlamp with low and high beam together with light guide LED daytime running and position lights, is the "little brother" of our 7" Bi-LED headlamp. Having the same appearance it looks just like the 7" unit relying on the same technology. For its format the 5.75" Bi-LED headlamp has a remarkable light output and, due to its size, can be used in a wider range of applications. This lamp also has H4 plug & play connection and is available as either LHD or RHD in a choice of chrome, black- chrome and matt-black finishes.

Technical Data		
Type	<b>M317</b>	
Dimensions (L x W)	143 mm x 107 mm	
Quantity LEDs / Type	6 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Low Beam: 22 W	
Weight	740 g	
Homologation	ECE, SAE	
Ventilation	Membrane	
Material Housing	ADC	
Material Outer Lens	PC, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6KX, IPX8	
Reference Value / High Beam	12,5	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 200 mm
Connector	H4 and AMP Superseal	
Description	Part Number	
5.75" Bi-LED Headlight, chrome	5Z-AFTP-C (RHD: 5Z-AFTP-C-RHD)	Piece
5.75" Bi-LED Headlight, black-chrome	5Z-AFTP-SC (RHD: 5Z-AFTP-SC-RHD)	Piece
5.75" Bi-LED Headlight, black-matt	5Z-AFTP-SM (RHD: 5Z-AFTP-SM-RHD)	Piece





## LED Multifunctional Lights from NOLDEN

Our LED multifunction lights deliver high performance in very limited space with up to three different lighting functions in just one module. As a result of the continual development together with the latest LED technology, our ECE compliant lighting modules are being adopted and proven in all sectors of the motor industry. Not least 'off road', where quality and reliability are a necessity.

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Transformer PRO .....	P. 60
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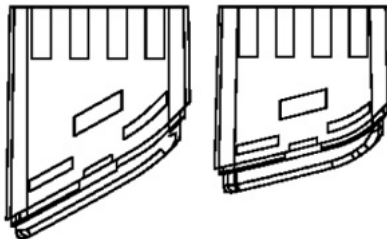


# NCC® Transformer

Versatile LED daytime running light system. The rectangular shape of the individual modules enables unlimited installation options. The internal bezel of each module is available in chrome or black as are the outer covers. Two different lenses are available to ensure the most compatible vehicle positioning:

**Low Angle** (with slightly inclined lens)

**High Angle** (lens with greater inclination)

Technical Data				
Type	M200			
Dimensions (L x B x W)	41 mm x 39 mm x 29 mm 50 mm x 39 mm x 29 mm	Low Angle High Angle		
Quantity LEDs / Type	5 - 8 / OSRAM			
Voltage	12 V and 24 V			
Anzahl Module	5	6	7	8
Power Daytime Running Light @ 12 V	9 W	7 W	8 W	9 W
Power Position Light @ 12 V	1 W	1 W	1 W	1 W
Mounting Points	2 (Tap Hole M6)			
Weight	55 g per Module			
Homologation	ECE, SAE			
Ventilation of Driver	Membrane			
Material Housing	ADC			
Material Outer Lens	PMMA			
Specification	On request			
Temperature	-40 °C - +80 °C			
Protection Class	IPX9K, IPX8K			
Wire and Length	FLRY 0,35 mm²	l = 400 mm		
Connector	AMP Superseal 1.5			
Description	Part Number			
Quantity Modules	5	6	7	8
NCC Transformer®, chrome, Low Angle	91000LO-5C.0	91000LO-6C.0	91000LO-7C.0	91000LO-8C.0
NCC Transformer®, black, Low Angle	91000LO-5S.0	91000LO-6S.0	91000LO-7S.0	91000LO-8S.0
NCC Transformer®, chrome, High Angle	91000HI-5C.0	91000HI-6C.0	91000HI-7C.0	91000HI-8C.0
NCC Transformer®, black, High Angle	91000HI-5S.0	91000HI-6S.0	91000HI-7S.0	91000HI-8S.0
Spare Parts and Accessories				
Cover Lens, chrome, for Low Angle	3119	Piece	<div>HI-Angle</div> <div>LO-Angle</div> 	
Cover Lens, black, for Low Angle	3473	Piece		
Cover Lens, chrome, for High Angle	3117	Piece		
Cover Lens, black, for High Angle	3472	Piece		
Driver	3176	Piece		
Conn. Kabel ⇌ Driver 1600 mm	2278	Piece		
Main Wire Harness	2117.2	Piece		
Relais 12V/30A	298184	Piece		
Fuse 3A	3378	Piece		
Fuse Holder	1042	Piece		



# NCC® TRANSFORMER PRO



A very versatile LED daytime running light system. With the rectangular modules even more installation options are achievable. Inner bezel of each module only available in chrome.

**Low Angle** (with slightly inclined lens)

**High Angle** (lens with greater inclination)

## Technical Data

Type	M200D			
Dimensions (L x B x W)	41 mm x 39 mm x 29 mm 49 mm x 39 mm x 29 mm	Low Angle High Angle		
Quantity LEDs / Type	6 - 9 / OSRAM			
Voltage	12 V and 24 V			
Quantity Modules	6	7	8	9
Power Daytime Running Light @ 12 V	9 W	7 W	8 W	9 W
Power Position Light @ 12 V	1 W	1 W	1 W	1 W
Power Indicator @ 12 V	7 W	7 W	7 W	7 W
Mounting Points	2 (Tap Hole M6)			
Weight	55 g per Module			
Homologation	ECE, SAE			
Ventilation of Driver	Membrane			
Material Housing	ADC			
Material Outer Lens	PMMA			
Specification	On request			
Temperature	-40 °C - +80 °C			
Protection Class	IPX9K, IPX8K			
Wire and Length	FLRY 0,35 mm²	l = 200 mm		
Connector	AMP Superseal 1.5			

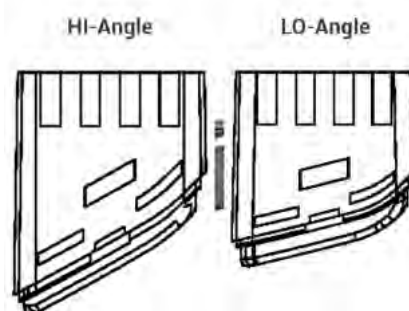
## Description

## Part Number

Quantity Modules	6	7	8	9
NCC Transformer Pro®, chrome, Low Angle	92LO-6C.0	92LO-7C.0	92LO-8C.0	92LO-9C.0
NCC Transformer Pro®, chrome, High Angle	92HI-6C.0	92HI-7C.0	92HI-8C.0	92HI-9C.0

## Spare Parts and Accessories

Cover Lens, chrome, for Low Angle	3119	Piece
Cover Lens, black, for Low Angle	3473	Piece
Cover Lens, chrome, for High Angle	3117	Piece
Cover Lens, black, for High Angle	3472	Piece
Driver	92DRIVER.1	Piece
Connection Cable 500 mm	3893	Piece
Main Wire Harness	4/1/2117	Piece
Relais 12V/30A	298184	Piece
Fuse 3A	3378	Piece
Fuse Holder	1042	Piece





# NCC® Short Line 3

## Multifunction

**A daytime running and position light or pure indicator,** this all rounder has been very popular with our customers for many years. With light guide technology, 360° functional rotation and compact dimensions, this light has universal application and installation potential. The inner bezel is available in chrome or black-chrome.



### Technical Data

Type	<b>ML-031</b>	
Dimensions (L x W)	140 mm x 35 mm	
Quantity LEDs / Type	4 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Daytime Running Light: 8 W Position Light: 1 W Indicator: 5 W	
Weight	168 g	
Homologation	ECE, SAE	
Ventilation	Membrane	
Material Housing	ADC	
Material Outer Lens	PMMA	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K, IP68	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 550 mm
Connector	AMP Superseal	
Description	Part Number	
Daytime Running and Position Light, chrome	14030L-TP-C	Piece
Daytime Running and Position Light, black-chrome	14030L-TP-S	Piece
Daytime Running, Position Light and Indicator, chrome	14030L-TPB-C	Piece
Daytime Running, Position Light and Indicator, black-chrome	14030L-TPB-S	Piece
Indicator, chrome	14030L-B-C	Piece
Indicator, black-chrome	14030L-B-S	Piece
Daytime Running and Position Light, chrome	14030L-TP-C.0	Set
Daytime Running and Position Light, black-chrome	14030L-TP-S.0	Set
Daytime Running, Position Light and Indicator, chrome	14030L-TPB-C.1	Set
Daytime Running, Position Light and Indicator, black-chrome	14030L-TPB-S.1	Set





# LED INDICATOR LIGHTS AND SIDE MARKER LIGHTS

In addition to our large range of modules combining indicator lights, we also offer stand alone LED indicator lights. Our developments of side indicator and side marker lights have set new benchmarks for both, the lighting and product designs.

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SML LED Side Marker Light .....	P. 64
M329 LED Indicator.....	P. 65
70 mm LED Indicator .....	P. 66



## NCC® SIL: LED Side Indicator

Our aim, together with ECE approval for this light, was to combine LED technology with an appropriate housing. The lamp was therefore specially designed for local public transport and thus suitable for use on all road and rail vehicles. With an economical 5W power consumption the result is a well thought-out concept with no visible fixings, a moulded rubber base married with latest light guide technology. Fitted in combination with the NCC® SML side marker light it's a perfect match.

**An ideal mounting solution for original equipment and retrofitting.  
Only available with a chrome inner bezel.**



Technical Data		
Type	<b>M309</b>	
Dimensions (L x W x H)	205 mm x 33 mm x 34 mm	
Quantity LEDs / Type	1 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Side Indicator: 3 W	
Weight	150 g	
Mounting Points	4 (M6 Tap Hole)	
Homologation	ECE, SAE, DIN EN 50155, EN EN 45545-2	
EMC	DIN EN 50121-3-2, VDE 0115-121-3-2:2007-07	
Ventilation	Membrane	
Material Housing	ABS	
Material Outer Lens	PMMA	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K, IP68	
Wire and Length	Halogenfree, RADOX® EN 50264-3-1 600V M 1.0mm <sup>2</sup> - 500mm	
Connector	Open cable Ends	
Description	Part Number	
LED Side Indicator SIL	20028L-SIL	Piece



# NCC® SML: LED Side Marker Light

As with the side marker lamp, ECE approval was given for the light combining LED technology with an appropriate housing. Designed specifically for local public transport, the light is therefore suitable for use on all road and rail vehicles. With economical 5 W power consumption, the result is a well thought out design with no visible fixings, a moulded rubber base together with latest light guide technology. This side marker light with the NCC® SIL side indicator makes a perfect fitted combination.

**An ideal mounting solution for original equipment and retrofitting.**



Technical Data		
Type	<b>M309</b>	
Dimensions (L x W x H)	205 mm x 33 mm x 34 mm	
Quantity LEDs / Type	1 / OSRAM	
Voltage	12 V and 24 V	
Power @ 12 V	Side Marker: 2 W	
Weight	150 g	
Mounting Points	4 (M6 Tap Hole)	
Homologation	ECE, SAE, DIN EN 50155, EN EN 45545-2	
EMC	DIN EN 50121-3-2, VDE 0115-121-3-2:2007-07	
Ventilation	Membrane	
Material Housing	ABS	
Material Outer Lens	PMMA	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K, IP68	
Wire and Length	Halogenfree, RADOX® EN 50264-3-1 600V M 1.0mm² - 500mm	
Connector	Open Cable Ends	
Description	Part Number	
LED Side Indicator SIL	20028L-SML	Piece



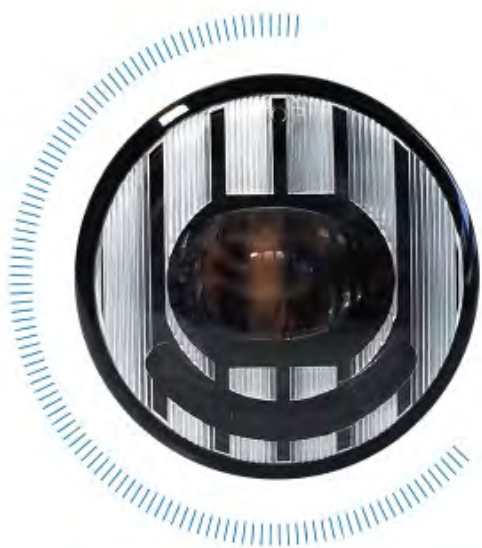
# NCC® LED Light guide Indicator

The new LED side indicator with light guide technology. A modern design category 5 and 6 indicator for buses, motorhomes or similar vehicles. On request the clip-on chrome trim can be supplied with a customised logo. Front or rear mounting and supplied with all fixings (M5 and self-tapping screws). Available in chrome only.



Technical Data			
Type	M329		
Dimensions (L x W)	109 mm x 65 mm		
Quantity LEDs / Type	Everlight		
Voltage	12 V and 24 V		
Power @ 12 V	Indicator: 3 W		
Mounting Points	2 (Tap Hole M5)		
Weight	116 g		
Homologation	ECE		
Material Housing	ABS		
Material Outer Lens	PMMA		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class	IPX6, IPX8		
Wire and Length	FLRY 0,75 mm²	l = 300 mm	
Connector	Open Cable Ends		
Description		Part Number	
LED Side Indicator M329	6BC 1B0 000	Piece	incl. Mounting Screws





## NCC® 70 mm LED Indicator

LED indicator light in 70 mm format. Very high light output with small installation dimensions. Suitable for all 70 mm LED and halogen holders. Separate indicator failure control available on request (LMSA). Versions available in amber, clear and black.

### Technical Data

Type	<b>ML-023FT</b>	
Abmessungen (L x W)	69 mm x 55 mm	
Quantity LEDs / Type	1 / PHILIPS	
Voltage	12 V and 24 V	
Power @ 12 V	Indicator: 3 W	
Mounting Points	2 (Tap Hole M5)	
Weight	150 g	
Homologation	ECE, SAE	
Ventilation	Membrane	
Material Housing	ADC	
Material Outer Lens	PMMA	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IPX9X, IP68	
Wire and Length	FLRY 0,75 mm <sup>2</sup>	l = 140 mm
Connector	AMP Superseal	

### Description

### Part Number

LED Indicator 70 mm, amber	70020	Piece
LED Indicator 70 mm, clear	70021	Piece
LED Indicator 70 mm, black	70022	Piece

### Spare Parts and Accessories

Bracket	70	Piece
Adapter for H8 / H11 Connector	9941	Piece



A photograph of two trams on a track at night. The tram on the left has its headlights on, and a diagram of light beams is shown above it. The tram on the right also has its headlights on, and a similar diagram is shown above it. The background is dark with some streetlights visible.

# **NCC® LED LIGHTS**

## LIGHTING SOLUTIONS FOR RAIL VEHICLES





## LED Tail Lights from NOLDEN

Now let your creativity run free, open up new horizons for rear vehicle design. NCC lights that have already created a revelation in limousine and sports car design are now influencing the appearance of motorhomes, caravans, minibuses and many other special vehicles.

### **NCC® TL1 and TL2**

An innovative and very impressive tail light design. Creating an attractive and impressive impact with latest light guide technology and total reliability - patented modernity without compromise.

NCC® TL2 is the cost effective "basic" version of the two lights.

### **NCC® 3D Modular.**

Innovative circular light guide technology with 3D effect that will compliment the rear of any vehicle.



TL1 LED Tail Light.....P. 69

TL2 LED Tail Light .....P. 75

3D Modular .....P. 77





## **FULL LED TAIL LIGHT**

NCC® TL1 AND ADDITIONAL  
MODULES





## NCC® TL1: LED Tail Light with the latest Light Guide Technology

Unleash your creativity: Modern technology without compromise, offering greater freedom of design and still further potential applications. The NCC® TL1's state-of-the-art light guide technology not only has a striking appearance by day, it is even more impressive by night with its unique lighting combination. Importantly it can, of course, be installed together with our patented NCC® LMS lighting failure control system.

**Patented uncompromising modernity.**

### Technical Data

- // 12 V and 24 V
- // ECE- Homologation
- // EMC- Homologation
- // SAE J2139
- // Temperature: -40 °C - +80 °C
- // With AMP Connector
- // ROHS & REACH compliant
- // Suitable for: Automotive, Motorhome, Bus, Special Vehicle



Video

### Special Characteristics

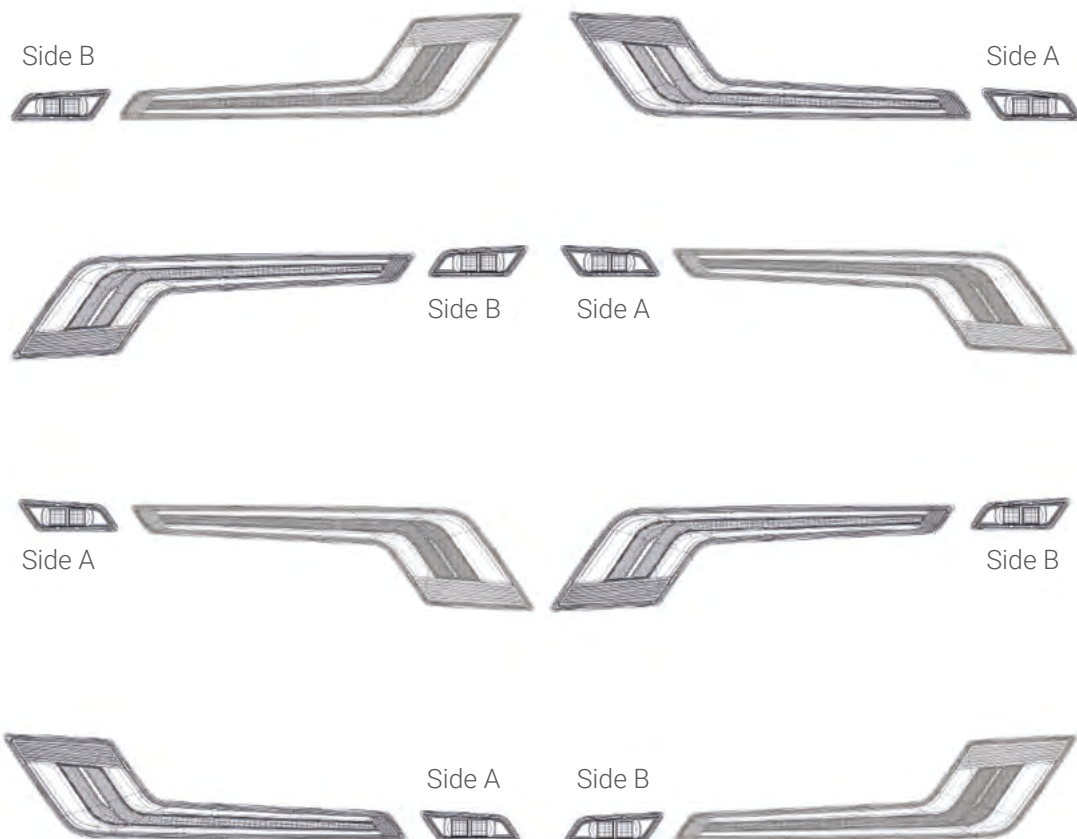
- // 360° rotation of the tail light possible in 90° steps
- // Rear Light with light guide technology
- // Stop Light with light guide technology
- // Horizontal and vertical installation possible
- // Dynamic Indicator (SIC Technology)





## Installation Options: Combination with Additional Modules Horizontal Configuration

Dynamic Indicator light only possible in horizontal installation!

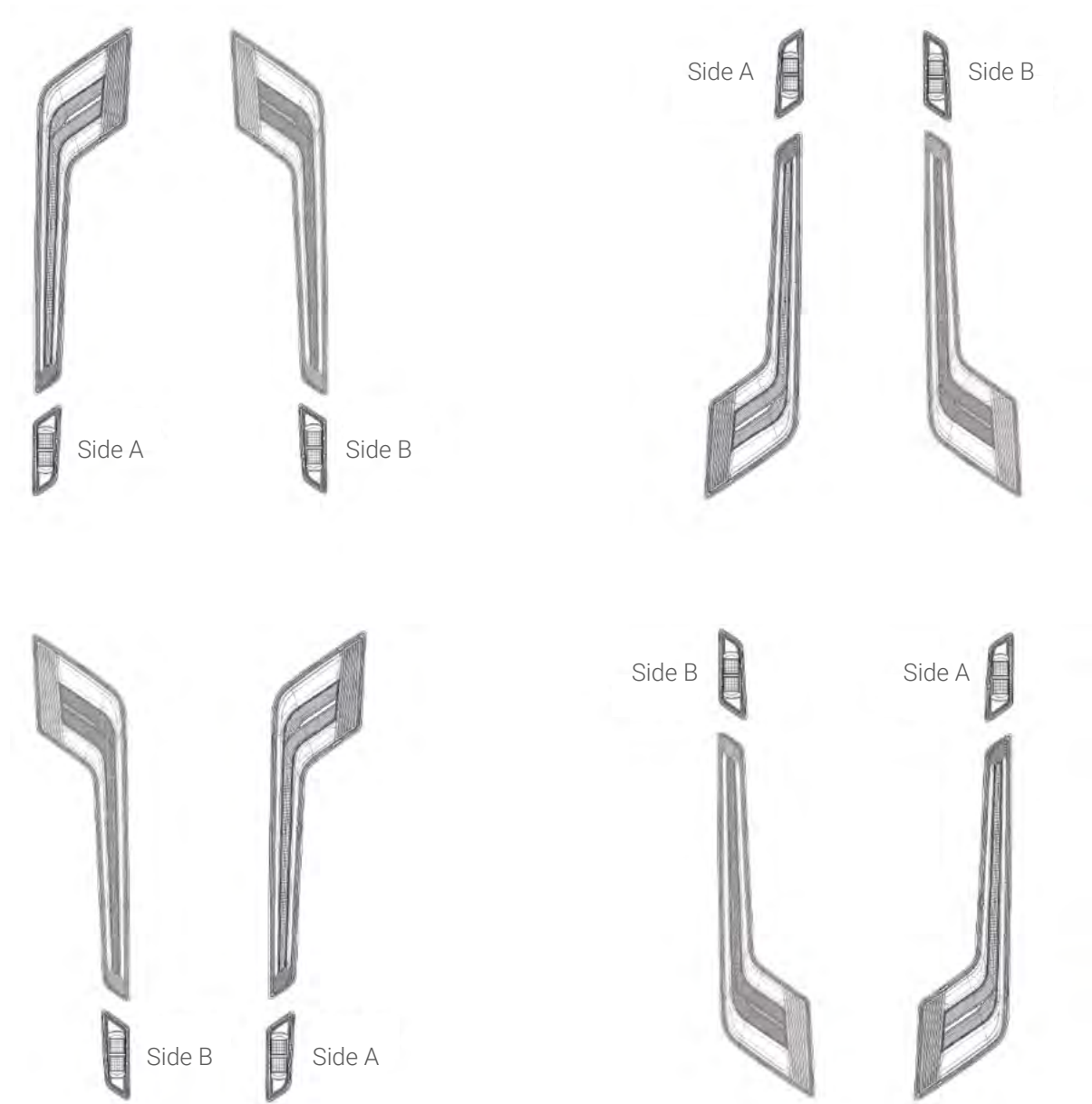






## Vertical Configuration


Dynamic indicator is not possible in vertical installation! Here, only all LEDs for the indicator function can be switched on and off simultaneously.




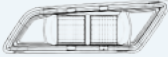




## Part Numbers: NCC® TL1 and Additional Modules

Tail Light	Part Number	Description Tail Light TL1
	570150L-RSB-CA	LED Tail Light TL1 - LED Tail Light / Stop Light / Indicator, Clear Lens, Side A, Non-Dynamic
	570150L-RSB-CA-10	LED Tail Light TL1 - LED Tail Light / Stop Light / Indicator, Clear Lens, Side A, Dynamic from A to B
	570150L-RSB-CB	LED Tail Light TL1 - LED Tail Light / Stop Light / Indicator, Clear Lens, Side B, Non-Dynamic
	570150L-RSB-CB-10	LED Tail Light TL1 - LED Tail Light / Stop Light / Indicator, Clear Lens, Side B, Dynamic from A to B
	570150L-RSB-RA	LED Tail Light TL1 - LED Tail Light / Stop Light / Indicator, Red/ Clear Lens, Side A, Non-Dynamic
	570150L-RSB-RA-10	LED Tail Light TL1 - LED Tail Light / Stop Light / Indicator, Red/ Clear Lens, Side A, Dynamic from A to B
	570150L-RSB-RB	LED Tail Light TL1 - LED Tail Light / Stop Light / Indicator, Red/ Clear Lens, Side B, Non-Dynamic
	570150L-RSB-RB-10	LED Tail Light TL1 - LED Tail Light / Stop Light / Indicator, Red/ Clear Lens, Side B, Dynamic from A to B



Reversing	Part Number	Description Reversing TL1
	128040L-RFS-A	LED Reversing TL1, Side A
	128040L-RFS-B	LED Reversing TL1, Side B



Rear Fog Light	Part Number	Description Rear Fog Light TL1
	128040L-NSL-A	LED Rear Fog Light TL1, Side A
	128040L-NSL-B	LED Rear Fog Light TL1, Side B



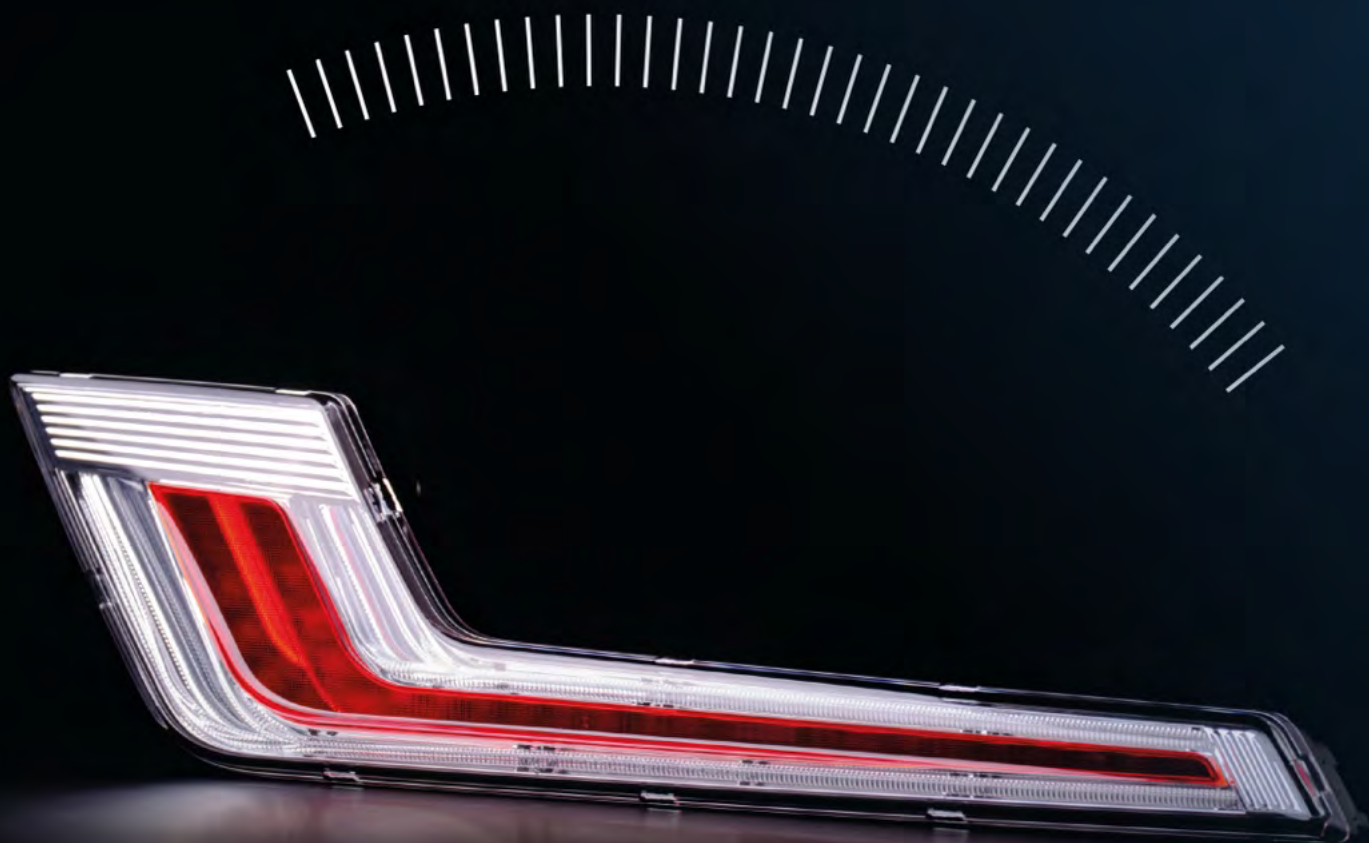
# NCC® TL1: LED Tail Light in Light Guide Technology



**You have additional possibilities:** The NCC® TL1 can be supplemented with the "TL1 reversing light" and "TL1 rear fog light" modules in the same complimentary design. A harmonious overall solution is created by combining all modules. There are almost no limits to the placement and arrangement.

New solutions and alternative installations.





# FULL LED TAIL LIGHT

NCC® TL2



# Full LED Tail Light NCC® TL2



The **NCC® TL2** is an alternative cost effective version of the **NCC® TL1**. If sequential indicators and vertical mounting are not a requirement in your design, you have the equally attractive option in the **NCC® TL2**, where indicator, tail and stop lights are combined in a tail light for horizontal mounting only. All three light functions are created by the latest LED light guide technology.



Tail Light	Part Number	Description Tail Light TL2
	570150L-TL2-A	LED Tail Light TL2 - LED Tail Light / Stop Light / Indicator, Clear Lens, Side A
	570150L-TL2-B	LED Tail Light TL2 - LED Tail Light / Stop Light / Indicator, Clear Lens, Side B
	570150L-TL2-L.1	LED Tail Light TL2 - LED Tail Light / Stop Light / Indicator, Clear Lens, Side A, Snaploc-System pre-mounted
	570150L-TL2-R.1	LED Tail Light TL2 - LED Tail Light / Stop Light / Indicator, Clear Lens, Side B, Snaploc-System pre-mounted
Reversing	Part Number	Description Reversing TL1 / TL2
	128040L-RFS-A	LED Reversing TL1 / TL2, Side A
	128040L-RFS-B	LED Reversing TL1 / TL2, Side B
Rear Fog Light	Part Number	Description Rear Fog Light TL1 / TL2
	128040L-NSL-A	LED Rear Fog Light TL1 / TL2, Side A
	128040L-NSL-B	LED Rear Fog Light TL1 / TL2, Side B



# ALL LED TAIL LIGHTS

## NCC® 3D MODULAR







## Product Information

### NCC® 3D Modular

**At NOLDEN we continually break new ground.** We look for creative approaches from different perspectives, leaving well-trodden paths as we apply the latest technologies in our products' design and styling. All this contributes to our success which in turn drives us on time and again to new products.

**The NCC® 3D Modular tail light range is one of these latest innovations. Multifunctional circular modules for cars, trucks, caravans and motorhomes.**

Why the 3D? Because the special light guides are arranged in three different planes creating a clearly defined and new 'optical depth' to vehicle rear lighting.

State of the art LED light guide technology combining stop light, tail light, and indicator in one unit which can, on request, can be complimented further with a reversing light and fog light. A truly ultra modern all rounder.

#### Technical Data

- |  |  |
|--|--|
| // LED Light Guide Technology                  | // 12 V and 24 V   |
| // Diametre: 112 mm                            | // 10 years Lifetime of the LEDs                                 |
| // Wire length: 150 mm                         | // ECE- and SAE-Homologation                                     |
| // AMP-Connector                               | // EMC Homologation  |
| // Up to four lighting functions in one module | // Double or triple solution                                     |
| // 3D Effect due to interlaced Light Guides    | // Suitable for: Truck, Motorhome, Caravan, Bus, Special Vehicle |

**Please contact us for a suitable configuration and the correct part numbers.**





## Overview of Modules: NCC® 3D Modular Tail Lights

All these 112 mm modules designed for combination with each other.  
(Please observe installation instructions according to ECE R48!)

	<p>Module #1    <b>112050L-RBLB</b>  Version: Tail Light / Indicator / Stop Light  Outer Ring: Tail Light  Inner Ring: Indicator  Center: Stop Light</p>
	<p>Module #2    <b>112050L-RBLN</b>  Version: Tail Light / Indicator / Rear Fog Light  Outer Ring: Tail Light  Inner Ring: Indicator  Center: Rear Fog Light</p> <p>Module #2-1    <b>112050L-RBLRS</b>  Version: Tail Light / Indicator / Reversing  Outer Ring: Tail Light  Inner Ring: Indicator  Center: Reversing</p>
	<p>Module #3    <b>112050L-RXRS</b>  Version: Reflector / Reversing  Outer Ring: Reflector  Inner Ring: –  Center: Reversing</p>
	<p>Module #4    <b>112050L-RXN</b>  Version: Reflector / Rear Fog Light  Outer Ring: Reflector  Inner Ring: –  Center: Rear Fog Light</p>
	<p>Module #5    <b>112050L-RBBLRS</b>  Version: Tail Light / Stop Light / Indicator / Reversing  Outer Ring: Tail Light / Stop Light  Inner Ring: Indicator  Center: Reversing</p>
	<p>Module #6    <b>112050L-RBBL</b>  Version: Tail Light / Stop Light / Indicator  Outer Ring: Tail Light / Stop Light  Inner Ring: Indicator  Center: –</p>



A white pickup truck is parked on the left side of a dirt path in a dark forest at night. A bright work light mounted on the truck's roof illuminates the path ahead, casting a long, bright beam of light. The surrounding trees are dark and silhouetted against the night sky. The ground is covered with fallen leaves. The overall scene is dark, emphasizing the power of the work light.

# **PREMIUM LED WORK LIGHTS**

WE BRING LIGHT TO THE DARK!





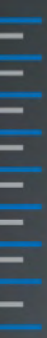
## LED Work Lights and Auxiliary Lights from NOLDEN

We have applied the same quality and performance standards demanded by the automotive industry, to the design and manufacture of our performance work lights. NOLDEN LED work lights are not to be compared with the quality and performance generally found in this overcrowded but specific light market. We do not offer a confusing range of lights for you to have to choose from, as all the lamps have wide application capability. We offer you a limited selection of LED work lights which satisfy the complete spectrum of work light applications.

Innovation, performance, quality and reliability with service.

LED Work Light Type A115-4500 .....	P. 82
LED Work Light Type AR116 .....	P. 86
LED Work Light Type AR83.....	P. 88
LED Work Light Type A99 .....	P. 89
H160 Bi-LED Headlight (Insert).....	P. 90





**NCC® A115**

PROFESSIONAL MULTI PURPOSE  
LED WORK LIGHT





## NCC® A115: LED Work Light

The NCC® LED work light 115-4500 is a compact and powerful 16 LED work light and has been designed for professional heavy-duty use. A high strength aluminium housing, a hardened impact resistant polycarbonate lens and stainless steel bracket ensure maximum durability. Its innovative design enables the replacement of the LED board, front screen and power lead in the event of damage. Near or wide field illumination is simply achieved by selecting either of the two lens' included. A further lens combining both near and wide field illumination is also available, as is a heavy duty stainless steel bracket and a separate handle. If required an alternative black frame to the front of the lamp is also available. Separate detailed technical information supplied on request.

### Technical Data

Type	<b>M258</b>
Dimensions (L x W x H)	115 mm x 88 mm x 100 mm
Quantity LEDs / Type	4 / CREE
Voltage	12 V and 24 V
Power @ 12 V	Work Light: 45 W
Mounting Points	1 - 6 (Tap Hole M6 / Threaded Bolt M10)
Weight	1180 g
Homologation	ECE
Ventilation	None
Material Housing	ADC
Material Outer Lens	PC
Specification	On request
Temperature	-40 °C - +80 °C
Protection Class	IP6K9K, IP68
Connector	DEUTSCH DT15-2P

### Description

Description	Part Number		
LED Work Light 115-4500	1154500L	Piece	incl. Outer Lens for near and wide field illumination

### Spare Parts and Accessories

Heavy-duty Holding Frame	1154500L-HDB	Piece
Connection Cable DEUTSCH, 3 m	3936	Piece
Outer Lens for near-field illumination, incl. O-Ring	1154500L-SN	Piece
Outer Lens for wide-field illumination, incl. O-Ring	1154500L-SW	Piece
Combination Lens for near- and wide-field	1154500L-SNW	Piece
Handle Set for Work Light	115ASW-HG	Piece
Front Frame, black	1154500L-F-S	Piece



**NCC® A115**

MOBILE LED WORK LIGHT



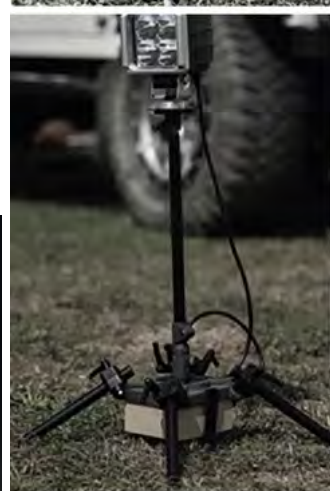


# NCC® A115-4500: Mobile LED Work Light

The NCC® A115-4500 was designed specifically to provide illumination in difficult or testing conditions and therefore ideal for rescue, fire-fighting, field repair, maintenance or military operations. Compact and easy to transport with a short set-up time it is quick and easy to deploy. Its sturdy construction with unlimited mounting options, whether by magnet to vehicle, site steelwork or to its fully adjustable base plate, insures stable and targeted illumination. Power can be provided from vehicle, rechargeable batteries or fuel cells. An optional remote control for on and off switching completes a great package.

Various Lindnerhof and MIL-TEC backpacks are available as is an interchangeable lens for near-field illumination. As a special version, the system is also available as mobile LED infrared work light or green light. Detailed technical information can be requested separately.

With the "Professional" version, the popular battery type BB-2590 can be used and for the "Military" version a holder is available for battery types P3-350, P3 14/25, BB2013 and BT-70884BE. No batteries are included with A115-4500 but can be obtained from our partners.





# NCC® AR116

## LED WORK LIGHT OR REVERSING LIGHT







## NCC® AR116: LED Work Light or Reversing Light

An extremely flat and compact LED work light with an installation depth of only 32 mm. Due to its compact design, the work light offers a solution for almost any lighting situation. With the option of either bottom or pendant mounting, the light can be mounted to the rear of a vehicle with mounting bracket or directly to a vertical panel. Ideal for vehicle off road use.

The A116/1000 with 24 Cree LEDs and has a measured output of 1000 lumens and the A116/500 with 12 Cree LEDs is measured at 500 lumens. Both have a light temperature of 5600 K and can be used as reversing or work light.

### Installation Example



Technical Data		
Type	<b>M285</b>	
Dimensions (L x W)	117 mm x 32 mm	
Quantity LEDs / Type	12 or 24 / CREE	
Voltage	12 V and 24 V	
Power @ 12 V	Work Light 116/500: 8 W Work Light 116/1000: 12 W	
Mounting Points	1 - 6 (Tap Hole M6 / Threaded Bolt M10)	
Homologation	ECE	
Ventilation	None	
Material Housing	PC	
Material Outer Lens	PC	
Specification	On request	
Temperature	-40 °C - +50 °C	
Protection Class	IP6K9K, IP68	
Connector	Open Cable Ends, 2 m	
Weight	116/500: 345 g 116/1000: 360 g	
Description	Part Number	
LED Work Light/ Reversing A116/500	A1160500L-R	Piece
LED Work Light/ Reversing A116/1000	A1161000L-R	Piece



## NCC® AR83: LED Work Light or Reversing



Powerful work lights do not need to be big and bulky. Our compact AR83 LED work light has a diameter of only 83 mm and designed for both surface mounting and recessed installation. At 1800 lumen the AR83 is beyond any doubt a very powerful supplement to normal driving light (Note: work lights may only be operated while driving off-road). With an (measured) output of either 900 or 1800 lumen, both lamps are available as near or wide field illumination options. The versions for near field illumination can be used as reversing.

### Installation Example



#### Technical Data

Type	<b>ML-036A / ML-036B</b>	
Dimensions (L x W)	83 mm x 75 mm	
Quantity LEDs / Type	12 or 24 / CREE	
Voltage	12 V and 24 V	
Power @ 12 V	Work Light A83/900: 11 W Work Light A83/1800: 20 W	
Mounting Points	1 - 4 (Tap Hole M6 / Threaded Bolt M10)	
Homologation	ECE	
Ventilation	None	
Material Housing	ADC	
Material Outer Lens	PC (1800 lm Version)	PMMA (900 lm Version)
Specification	On request	
Temperature	-40 °C - +50 °C	
Protection Class	IP6K9K, IP68	
Connector	Integrated DEUTSCH-Connector DT15-2P	
Weight	A83, open Cable Ends: 545 g A83, with DEUTSCH-Connector: 452 g	

Description	Part Number	
LED Work Light/ Reversing AR83/900, near-field illumination	A83900L-RN-DT	Piece
LED Work Light AR83/900, wide-field illumination	A83900L-AW-DT	Piece
LED Work Light/ Reversing AR83/1800, near-field illumination	A831800L-RN-DT	Piece
LED Work Light AR83/1800, wide-field illumination	A831800L-AW-DT	Piece
Universal Holder Set for AR83 on Tube (19, 20, 22 mm)	A83L-HR	Set
Connection Cable DEUTSCH, 3 m	3936	Piece





## NCC® A99: LED Work Light

A light for testing and unforgiving operating conditions: This compact and angular all rounder provides powerful 2700 lumen illumination with a power consumption of 31 watts at 12 V. Shock resistant up to 100 G, water and dust proof to IP6K9K / IP67 and operational at temperatures between -40 °C to +50 °C. The lamp includes a metal bracket and fixings. A separate yellow clip-on plastic cover can be ordered as an option.

### Installation Example



Technical Data		
Type	<b>M327</b>	
Dimensions (L x W x H)	96 mm x 92 mm x 67 mm	
Quantity LEDs / Type	2 / CREE	
Voltage	12 V and 24 V	
Power @ 12 V	Work Light A99/1300: 18 W Work Light A99/2700: 26 W	
Mounting Points	1 - 4 (Tap Hole M6 / Threaded Bolt M10)	
Homologation	Meets ECE R10 requirements*	
Ventilation	None	
Material Housing	ADC	
Material Outer Lens	PMMA	
Specification	On request	
Temperature	-40 °C - +80 °C	
Protection Class	IP6K9K, IPX7	
Connector	DEUTSCH-Connector in Housing	
Weight	A99/1300: 429 g A99/2700: 489 g	
Description	Part Number	
LED Work Light A99/1300	A991300L	Piece
LED Work Light A99/2700	A992700L	Piece
Clip-on Front Lens, yellow	A99YCAP	Piece

\* Formal homologation not yet completed





## NCC® H160

### LED Additional Headlight

A supplementary and truly universal main lighting unit that can be configured to individual requirement. The LED high, low beam and position light housing is designed for the additional mounting of individual LED daytime running light or indicator modules.



#### Versions

- // Headlamp insert with LED low beam, high beam and LED position light
- // Optionally available with additional LED daytime running light module
- // Optionally available with additional LED indicator module
- // DEUTSCH housing connector
- // Further configuration options on request
- // Variants of both LH and RH Drive available



## Technical Data

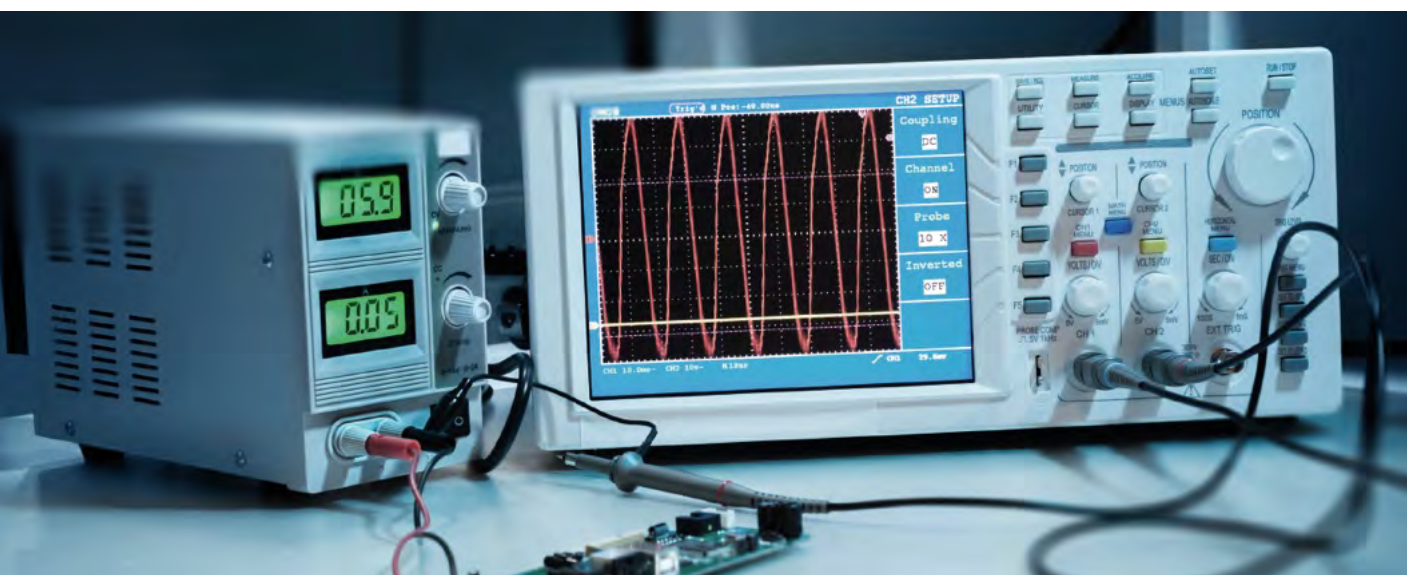
Type	<b>M287</b>
Dimensions (L x W) in Housing	156 mm x 162 mm
Dimensions (L x W) with Housing and Additional Module	242 mm x 162 mm
Quantity LEDs / Type	8 / OSRAM
Voltage	12 V and 24 V
Power @ 12 V	Low Beam: 15 W High Beam: 23 W Position Light: 1 W
Power @ 12 V for Additional Module	Indicator: 7 W Daytime Running Light: 6 W
Weight	ca. 1700 g (Specification for the complete Headlamp with Housing including Additional Module)
Homologation	ECE, SAE
Ventilation	Nitto Denko Air Cap
Material Housing (Additional Module)	ADC (ADC)
Material Outer Lens (Additional Module)	PC, hardened (PMMA)
Specification	On request
Temperature	-40 °C - +50 °C
Protection Class	IP6K9K, IPX8
Reference Value / High Beam	12,5
Wire	FLRY
Connector	DEUTSCH DT15-06 (in Housing of Headlight)
Description	Part Number
H160 Headlight, Insert only, chrome	160140L-AFP-C
H160 Bi-LED Headlight with Additional Module left, Fixing Screw rear	160140L-AFP-TB26-LHD
H160 Bi-LED Headlight with Additional Module right, Fixing Screw rear	160140L-AFP-TB36-LHD
H160 Bi-LED Headlight with Additional Module left, Fixing Screw below	160140L-AFP-TB25-LHD
H160 Bi-LED Headlight with Additional Module right, Fixing Screw below	160140L-AFP-TB35-LHD
H160 Bi-LED Headlight with Additional Module top, Fixing Screw below	160140L-AFP-TB45-LHD



# Lighting Failure and Control Systems from NOLDEN

**Technical innovations and electronic solutions have long been a NOLDEN trademark.** A perfect example of this is the patented NCC<sup>®</sup> LMS Load Monitoring System to diagnose LED light failure.

In order to adapt our lights to a vehicle's headlight levelling system we offer the world's first retrofit waterproof levelling motor. Satisfactory connection is further guaranteed by the appropriate adaption electronics, the NCC<sup>®</sup> Servo Converter.



LMS Lighting Failure Control .....	P. 94
FSS.4 Antiflicker System .....	P. 95
Levelling Motor.....	P. 96
Servo Converter .....	P. 97



# FAILURE CONTROL SYSTEMS

## SAFETY BY DAY AND NIGHT

For a vehicle to be driven legally on European public roads, it must have ECE approval which includes a lighting failure warning system. In the event of an indicator or low beam failure, the electronics system must warn the driver by an audible or visual message.

However, most vehicle electronics and diagnostic systems have been designed for conventional lights (halogen indicators or headlights) and this creates a problem. Modern LED lights are not only highly efficient and reliable, they consume far less energy. As a result, most vehicle electronics have a tendency to wrongly identify the low LED power consumption as a "malfunction" as would previously have been the case with a halogen or xenon light failure.

To overcome the problem it is possible to install resistors in the vehicle harness, but even in the best case, this would lead to unnecessary power consumption. In the worst case any saving achieved by adopting an LED alternative would be lost and any resistor/harness changes could create a fire risk. That is why this unsafe solution is rightly prohibited.

**NOLDEN has developed an electronic solution with the NCC® LMS.**







## NCC® LMS

### Lighting Failure Control

The **NCC® LMS** is required to identify side light failure following the retrofit of LED headlamps, combination rear lamps and indicators. Two functions are combined in one module:

- // Simulation of a conventional halogen light with typical switch-on impulse and programmable load
- // Failure detection of a defective LED light when current falls below a defined threshold

Technical Data	
Dimensions (L x W)	124 mm x 95 mm
Voltage	8 V - 33 V
Permissible load	2.4 A (permanent)
Failure Detection	15 mA
Load Capacity switching Output	100 mA
Weight	90 - 120 g (depending on version)
Homologation	EN 50 155
Material Housing	PA6GF
Protection Class	IP67 / IPX9K for 2K and 3K version only with Additional Cover for Connectors
Specification	On request
Temperature	-40 °C - +80 °C
Connections	Tyco Superseal 2-Pol and 3-Pol (1C Version) Tyco Junior Timer 16-Pol (2K and 3C Version) Tyco Junior Timer 16-Pol (2K and 3C Version)
Description	Part Number
1 Channel	LMS-1K
2 Channel	LMS-2KU
3 Channel	LMS-6KU

Attention: Please contact us for further product information



# NCC® FSS.4

## Antiflicker System

The **patented FSS.4 system** necessary to operate LED headlights in PWM controlled vehicle electrical systems.

- // No on/off time differences between left and right headlamps
- // Significantly longer life compared to permanently loaded electrolytic capacitors
- // No negative influence on the LED light electronics (e.g. switch-off due to overload detection)
- // No negative influence on vehicle electronics due to high charge and discharge current peaks of capacitors



Technical Data	
Dimensions (L x W xH)	30 mm x 30 mm x 40 mm
Voltage	9 V - 30 V
Standby Current	< 1 mA
Contact Voltage Drop	0.5 V - 2.0 V
Tolerance	5.0 %
Test Voltage	24 V
Weight	60 g
Interference Immunity	95/54 EG and DIN 40839
Material Housing	PA6GF
Protection Class	IP67
Specification	On request
Temperature	-40 °C - +80 °C
Wire and Length	Customer Specific
Description	Part Number
NCC FSS.4 Antiflicker System	On request

Attention: Please contact us for further product information



## NCC® Levelling Motor for Headlamp Levelling



**Nolden Cars & Concepts offers another world first.** The NCC® headlamp levelling motor which, unlike other retrofit market solutions, is completely waterproof due to a specially designed seal to the frontal area. Various options for connection or attachment are possible but with the NCC® Servo Converter you have the complete answer for the integration of our headlights.

Please contact us for any further documented information to develop an individual concept or installation.



## NCC® Servo Converter

Various infrastructures in vehicle lighting e.g. automatic and manual headlamp levelling systems ( and the associated voltage range adjustments) cause problems with the installation of LED headlamps, as the adjustment of a levelling motor to different specific headlamp vehicle parameters does not always work smoothly.

With the NCC® Servo Converter, it is no longer necessary to use a servomotor with voltage/stroke characteristics for a specific vehicle. Individual servomotors not only cost much more, it also does not protect against the effects of electronic changes made by vehicle manufacturers, which could ruin such a concept. **"Like a gear box"**, the NCC® Servo Converter works as an electronic matching device between the headlamp levelling actuator and the vehicle's control unit. Thanks to the NCC® Servo Converter, one levelling motor can be used in different vehicles.



### The NCC® Servo Converter allows:

- // A variable offset of the voltage signal
- // A variable amplification of the voltage signal
- // A reversal of the direction of the voltage range

A prerequisite for the designs of the levelling motor and the NCC® Servo Converter is that two conditions must be fulfilled for each vehicle installation:

- // The voltage range of the servo controller in relation to the supply voltage with the vehicle unladen and maximum laden
- // The required change in the headlamp angle between unladen and maximum laden conditions

**If you need to use the NCC® Servo Converter as a solution for your particular project and require further information, please contact us.**





# HALOGEN LIGHTS

## FROM NOLDEN

Halogen lights from NOLDEN: These are modern halogen lights with free-form reflectors, which combine excellent illumination with a low installation depth and a favourable price-performance ratio. They are the entry into the high quality lighting world that is Nolden.

90 mm Halogen Low Beam asymmetric .....	P. 99
90 mm Halogen High Beam .....	P. 101
90 mm Halogen Fog Light.....	P. 102
70 mm Halogen High Beam .....	P. 103
70 mm Halogen Fog Light.....	P. 104
70 mm Halogen Daytime Running Light .....	P. 105



# NCC® 90 mm

## Halogen Low Beam

A powerful 90 mm halogen low beam with innovative free-form optics and **asymmetrical illumination**. Low beam lamp of modular design totally compatible with all other 90 mm LED and halogen high beams. Standard mounting brackets and bulb included.



Technical Data		
Type	M079	
Dimensions (L x W)	90 mm x 157 mm	
Quantity Bulbs/ Type	1 / PHILIPS H11	
Voltage	12 V and 24 V	
Power @ 12 V	Low Beam: 55 W	
Mounting Points	4 (Mounting Ears)	
Weight	515 g	
Homologation	ECE	
Ventilation	Nitto Denko Air Cap	
Material Housing	ADC	
Material Outer Lens	Glas, hardened	
Specification	On request	
Temperature	-40 °C - +80 °C	
Connector	H8 / H11	
Description	Part Number	
90 mm Halogen Low Beam, 12 V	90901HA	Piece
90 mm Halogen Low Beam, 12 V, RHD	90901HA-RHD	Piece
90 mm Halogen Low Beam, 24 V	90901HA-24V	Piece
90 mm Halogen Low Beam, 24 V, RHD	90901HA-24V-RHD	Piece
Spare Parts and Accessories		
Philips Blue Vision Bulb 12 V (H11 / 55 W)	9991	Piece





**NCC® 90 mm**

HALOGEN LOW BEAM



# NCC® 90 mm

## Halogen High Beam

A 90 mm modular design halogen high beam with very good performance and ECE approval. Reinforced die-cast aluminium housing. Standard mounting brackets and bulb included. If required, alternative Philips H11 Blue Vision can be supplied. Available in 12 V or 24 V versions, with or without position light.



### Technical Data

Type	<b>KY-130E</b>
Dimensions (L x W)	90 mm x 86 mm
Illuminant/ Type	1 / PHILIPS H11
Voltage	12 V and 24 V
Power @ 12 V	High Beam: 55 W
Mounting Points	4 (Mounting Ears)
Weight	270 g
Homologation	ECE
Ventilation	Membrane
Material Housing	ADC
Material Outer Lens	Glas, hardened
Reference Value / High Beam	10
Specification	On request
Temperature	-40 °C - +80 °C
Connector	H8 / H11

### Description

### Part Number

90 mm Halogen High Beam, 12 V	90900HF	Piece
90 mm Halogen High Beam, 24 V	90900HF-24V	Piece

### Spare Parts and Accessories

Philips Blue Vision Bulb 12 V H11 / 55 W	9991	Piece
90 mm Halogen High Beam with Position Light, 12 V	90900HFP-12V	Piece
90 mm Halogen High Beam with Position Light, 24 V	90900HFP-24V	Piece





## NCC® 90 mm Halogen Fog Light

Compact 90 mm halogen fog light of the second generation in the familiar modular design and therefore compatible with all common 90 mm light mounts. Including long-life bulb, standard adjustment elements and holding frame.

### Technical Data

Type	<b>GL-101-F</b>
Dimensions (L x W)	90 mm x 98 mm
Illuminant/ Type	1 / PHILIPS H11
Voltage	12 V and 24 V
Power @ 12 V	Fog Light: 55 W
Mounting Points	4 (Holding Frame)
Weight	290 g
Homologation	ECE
Ventilation	Nitto Denko Air Cap
Material Housing	ADC
Material Outer Lens	Glas, hardened
Specification	On request
Temperature	-40 °C - +80 °C
Connector	H11

### Description Part Number

90 mm Halogen Fog Light, 12 V	90901HN	Piece
90 mm Halogen Fog Light, 24 V	90901HN-24V	Piece

### Spare Parts and Accessories

Philips Blue Vision Bulb 12 V H11 / 55 W	9991	Piece
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# NCC® 70 mm

## Halogen High Beam

Very compact 70 mm halogen high beam with open area optics. Mounting depth only 75 mm. With Philips H11 long-life bulb. This high beam is available with and without bracket. Optionally also available with Philips Blue Vision bulb.



Technical Data			
Type	<b>ML-015D</b>		
Dimensions (L x W)	70 mm x 75 mm		
Illuminant/ Type	1 / PHILIPS H11		
Voltage	12 V		
Power @ 12 V	High Beam: 55 W		
Mounting Points	2 (Tap Hole M6)		
Weight	130 g		
Homologation	ECE, SAE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	Glas, hardened		
Specification	On request		
Temperature	-40 °C - +80 °C		
Protection Class			
Reference Value / High Beam			
Connector	H11		
Description	Part Number		
70 mm Halogen High Beam, 12 V	63070.1	Piece	without Bracket
70 mm Halogen High Beam, 12 V	63070	Piece	with Bracket
Spare Parts and Accessories			
Bracket	70	Piece	
Universal Wire Harness	1218.2	Piece	
Adapter for H8 / H11	9941	Piece	
Switch, round, with Status Light	1772	Piece	
Philips Blue Vision Bulb H11 / 55 W	9991	Piece	



NCC® 70 mm  
HALOGENMODULES





# NCC® 70 mm

## Halogen Daytime Running Light

A compact halogen daytime running light with a hardened outer lens and die-cast aluminium housing. Supplied with Philips PS19W bulb this daytime running light is available with or without bracket.



Technical Data			
Type	<b>ML-15DR</b>		
Dimensions (L x W)	70 mm x 60 mm		
Illuminant/ Type	1 / PHILIPS PS19W		
Voltage	12 V		
Power @ 12 V	Daytime Running Light: 19 W		
Mounting Points	2 (Tap Hole M6)		
Weight	120 g		
Homologation	ECE, SAE		
Ventilation	Nitto Denko Air Cap		
Material Housing	ADC		
Material Outer Lens	Glas, hardened		
Specification	On request		
Temperature	-40 °C - +80 °C		
Connector	PS19W		
Description		Part Number	
70 mm Halogen Daytime Running Light, 12 V	60070	Piece	with Holding Frame
70 mm Halogen Daytime Running Light, 12 V	60070.1	Piece	without Bracket
70 mm Halogen Daytime Running Light, 12 V	60070.2	Set	with Bracket
Spare Parts and Accessories			
Bracket	70	Piece	
Universal Wire Harness for PS19 W	1221.1	Piece	
Mounting Frame	64015	Piece	





# **FACTS ABOUT LED LIGHTING**

WHAT YOU ALWAYS WANTED  
TO KNOW



## Dear Reader,

We hope the following information will give you a basic understanding of the most important aspects of LED lighting. The basic terminology and subjects are intended to help you find your way around the comprehensive world of LED lighting enabling you to select the right lights whatever the application. In addition it will hopefully introduce you to further interesting aspects of LED technology, providing a comprehensive overview of everything you should consider in the future.

**We are at your disposal should you have any questions.**

## Why LED Lights?

### The advantages of LED lighting are considerable

The performance of LED lights is so much better than that of incandescent halogen or xenon lights. Dependant upon type, LED lights produce a much whiter homogeneous and brighter light contributing to safer and pleasant fatigue free driving. Increased safety is the very definite advantage of LED lighting.



LED lights have further technological advantages. Due to the significantly lower power consumption, a vehicle needs less generated electricity and therefore less fuel saving you money whilst benefiting the environment. LED lights have a much longer life expectancy than conventional light sources. NOLDEN LED lights have an average service life of approximately 10 years whereas xenon, for example, achieves less than 10% of that service life. Halogen lights fair even worse with an average service life of 2-4% of a comparable LED unit.

In addition to the disadvantages of higher service failures, incandescent lamps generate much more heat further ageing the lamp's operational life. In most cases xenon headlight installations require additional lens cleaning and headlamp levelling equipment (see below), that significantly increase the overall cost of the installation.

The service life and associated cost savings of LED lights are particularly advantageous when applied to commercial operation such as public transport. Here, for health and safety reasons, defective lights usually have to be replaced immediately. Besides the ongoing commercial service being impaired the costs associated with onsite servicing are very high.

On request Nolden Cars & Concepts will prepare an individual amortisation calculation for commercial customers planning a fleet change to LED lighting.



## Application, Installation, Registration and Part Certificates

**Any lighting on a vehicle in the EU must comply with ECE R48 which is regulated:**



Example: VW T5 Multivan with matching NCC® daytime running light and bezel

- // Number of headlamps (e.g. two low beam front lamps)
- // Allowed mounting location (e.g. distance to the side and height)
- // Required angles of visibility (from which angles e.g. turn signals must be visible)
- // Required beam angle (e.g. a fog light must illuminate 45° outwards)
- // Driving and turn indicator lamp failure sensing



Detailed  
Informationen  
for ECE R48

If we consider say the replacement of existing halogen headlights with LED lights (e.g. Defender, Wrangler, Mercedes G, etc.), the original installation met all the ECE R48 requirements and these were established with the vehicle conformity. If you now replace the halogen lights, none of the above criteria usually change and therefore the installed LED headlights still comply with ECE R48.

If a complete LED vehicle conversion is undertaken, other than just a simple headlight change, compliance with ECE R48 is necessary and this must be proven in case of doubt. This can actually only be done by a specialist and, importantly, the obligation to comply with ECE R48 lies with the installer of a light and not with the manufacturer.





## Formation of Condensate

**Every light accumulates moisture over time.** The moisture gets into the light through seals, cables or any plastic elements and the less the light is used, the more moisture accumulates. For example motorhomes stored over the winter are particularly vulnerable so after a while, visible condensation can form on the inside of the lens. When a conventional headlight is switched on, heat is generated and the condensate evaporates in the warmer environment. The increased pressure in the assembly drives the moisture out of the headlamp and the condensate is gone.

LED lights have ventilation elements for this purpose as LEDs generate considerably less heat than halogen bulbs. LED lights therefore need considerably longer to drive off any condensation that may have formed. In principle, condensation in a light is normal and not critical as long as "drop formation" does not occur as the condensate will disappear after a period of operation. All original equipment manufacturers now refer to this phenomenon in their manuals.



## Ice and Snow

Everyone has experienced when, driving in a snow flurry, that headlights can "clog" up with wet snow when temperatures are around freezing point. LED lights are more susceptible to this problem than halogen or xenon lights which have much higher operation temperatures.

**Potential for the clogging of an LED lamp can also be dependant on the area around the lamp should the design encourage snow to collect.**

It is also possible, if present, for condensate to freeze in LED lights as they generate hardly any heat at the lens but, despite this, the advantages LED lights have with their superior performance and service life clearly outweigh any of the disadvantages.





## Replacing a Halogen Light with an LED Light

**Everybody is aware there are numerous LED lights available** which will fit standard halogen bulb holders H4, H7 etc. It sounds like a good, cheap and quick solution but be aware as this is almost always illegal actually risking the complete vehicle ECE certification.

Every light is marked with an approval relating to the fitment of a specific bulb. This means that the approval is no longer valid if a replacement LED bulb is fitted. However irrespective of this, the light distribution will often differ greatly from the original illumination approval. Furthermore, the potential glare and thus danger to other road users cannot be excluded.



Illustration shows a simulation of a defective light guide

## Failure of individual LEDs in an LED Light

In most cases LED lights use multiple LEDs and due to the high life expectancy and associated reliability are not designed for the replacement of individual components. To design for this would not only increase cost but risk the design integrity with the necessary introduction of additional seals etc.

If an LED light unit suffers a partial failure the entire light usually has to be replaced.



## Compulsory Approval and Marking of Lights / Electronics

Within the scope of the ECE vehicle type approval all lights (except work lamps) must be approved and the relevant approval marks are required to be visible on the light. Each light function has its own approval mark.

If a light has both a low and a high beam ("Bi-LED") there must be two approval marks for those functions and the same applies to any electronics that are connected with a vehicle's electrical system. Every LED light has electronics so therefore must have an approval mark for electromagnetic compatibility (EMC). This confirms the light does not cause any disturbance with the vehicle power supply system and will not create interference with a vehicle's radio, GPS, GSM, etc. Consequently, every LED light must have at least two approval marks (lighting and electronics compliance).

Unfortunately there manufacturers whose products are only marked with EMC approval and this is often wrongly construed as the lamp approval. In the case where a vehicle is fitted with non approved lights the complete vehicle type approval and insurance cover may become invalid.

Work lights do not require ECE approval but must have an EMC approval.



The picture on the left shows typical approval features:

- // A = Position Light
- // RL = Daytime Running Light
- // 02 00 = Revision Number
- // E4 = Country of Origin  
(here: Netherlands)
- // 13677 = Type Approval Number



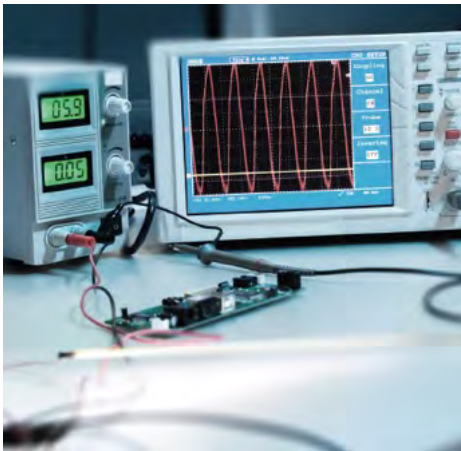
Picture shows a forgery of the ECE homologation markings

## Counterfeit Registration Marks

**Fake approvals are difficult for the layperson to recognise, but they do occur frequently.**

Registration marks are often invented or the same markings are used for different light functions. Every ECE approval is registered and therefore verifiable so if in doubt, ask the approving authority to send you the approval certificate. However, this said, it can be quite complicated and not often very promising.





## Lighting Failure Control Systems

For a vehicle to be driven legally on European public roads it must have ECE approval which includes a lighting failure warning system. In the event of an indicator or low beam failure the electronics system must warn the driver by an audible or visual message.

However, most vehicle electronics and diagnostic systems have been designed for conventional lights (halogen indicators or headlights) and this creates a problem. Modern LED lights are not only highly efficient and reliable, they consume far less energy. Therefore, most vehicle electronics have a tendency to wrongly identify the low LED power consumption as a "malfunction" as would have previously been the case with a halogen or xenon light failure. To overcome the problem it is possible to install resistors in the vehicle harness, but in the best case, this would lead to unnecessary power consumption. In the worst case any saving achieved by adopting an LED alternative would be lost and, any resistor/harness changes could create fire risk.

**That is why this emergency solution is rightly prohibited.**

## Failure Control of LED Low Beam

**This is mandatory in the ECE.** A vehicle which does not meet this requirement may be without insurance cover. The ECE requires, that either the driver is informed of a defective light (e.g. indicator lamp), or the light must switch off completely, even in the event of a partial defect (e.g. failure of a single LED). Nolden LED low beam headlights have an integrated diagnostic system and switch off in the event of a partial defect.



## Antiflicker Modules (PWM smoothing)

All NCC headlights have integrated electronic damping elements, preventing or greatly reducing flickering caused by PWM or vehicle diagnostic system test pulses. However, if the vehicle electrical system is unable to supply sufficient energy to drive the headlight in a stable manner, flicker cannot be prevented. If flickering does occur, a separate module can help and is available from Nolden.

In addition to the Antiflicker module, Nolden Cars & Concepts also offers a combination module with both Antiflicker and "LMS" (Load Monitoring System) circuitry. This patented solution cannot be compared with marketed capacitor solutions as they are not only very inexpensive, but often associated with headlight failures due to high current surges during charging and discharging. This behavior often is interpreted as a fault by either the headlight control unit, the vehicle electronics or both.

To overcome the potential problem, the new 90 mm Bi-LED headlight in the Nolden range has an additional battery plus connection preventing flicker without the need for additional modules.



Figure shows "cooling fins" of an LED light

## Thermal Management / Airflow

**Both the luminous efficacy and the service life of an LED module depend crucially on thermal management.**

The targeted use of heat sinks makes a fundamental contribution to thermal management. The most important factor in ensuring the correct operating temperature of an LED, is good thermal management. Temperatures that are too high, have been shown to have a direct influence on service life and luminous flux.

For this reason, it is necessary to dissipate the heat from the semiconductor chip by constructive measures (e.g. heat sink). Basically, it can be said that the cooler the LED is operated, the longer its service life and the higher its light output. The ambient temperature is also crucial. As the warmer it is, the more important efficient heat dissipation in the light is. Unlike many OEM LED headlights, the premium LED modules from Nolden Cars & Concepts do not require active cooling, as excellent results are achieved with passive cooling alone.

Responsible manufacturers advise the appropriate ambient temperature on their products or in the product description. Only in this way can the optimum luminous flux and service life of LEDs be achieved. When installing LED lights in vehicles, the manufacturer's fitting instructions must be strictly adhered to with sufficient cooling air present. Under no circumstances should the heat sinks be in direct contact with vehicle components. The installation clearance dimensions specified by the manufacturer must be observed.



# Legal Regulations



Low Beam	
ECE-Regulation	ECE-R48 §6.2
Mounting	Mandatory for all motor vehicle classes
Colour	White
Quantity	2
Mounting Weidth	Max. 400 mm from the outermost point of the vehicle weidth. Min. 600 mm between both low beam headlights. Min. 400 mm if the total vehicle weidth is < 1,300 mm (does not apply to M1 and N1 vehicles)
Mounting Height	Min. 500 mm Max. 1.200 mm Max. 1.500 mm at N3G-Vh
Geom. Angles	Horizontal 10° inwards and 45° outward Vertical 15° upwards and 10° downwards
Electrical Circuit	When switching on the high beam, the low beam may remain on
Switch-on Control	Allowed
Other	For LED headlights, an automatic headlight range control and headlight cleaning system must be installed if the light source is > 2,000 lumens

High Beam	
ECE-Regulation	ECE-R48 §6.1, R98, R112
Mounting	Mandatory for all motor vehicle classes
Colour	White
Quantity	2 or 4. At N3 vehicle class max. 6
Mounting Weidth	Installation according to choice. Driver must not be disturbed by reflection
Mounting Height	No special regulations
Geom. Angles	5° in each direction
Electrical Circuit	Driving lamps may only be switched on in pairs or simultaneously. If additional driving lamps are installed, no more than 2 pairs may be lit at the same time. When dimming, all driving lamps must go out at the same time. At least 1 pair must be switched on during the transition from high beam to low beam
Switch-on Control	Mandatory
Other	Luminous intensity must not exceed 430,000 cd. Reference number in total must not be higher than 100

Note: All dimensions refer to the illuminating surface of the headlamp and not to the light's edge.

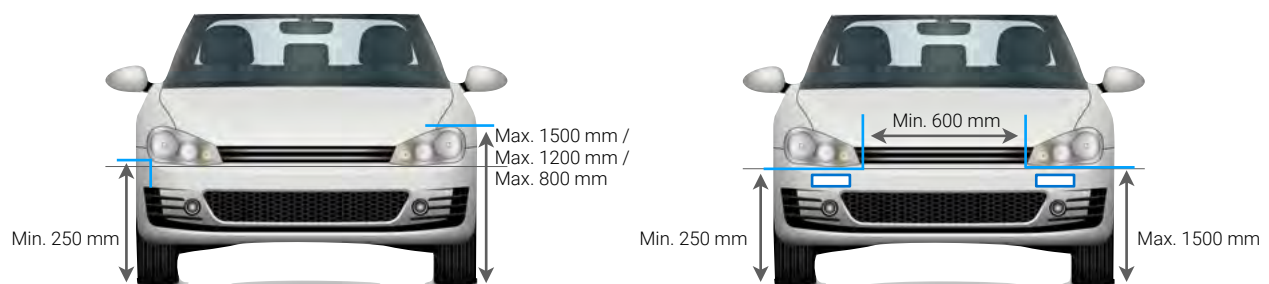
**Attention:** The regulations of the respective valid ECE R48 apply.



Technical changes and errors excepted. As per 07-2020







Fog Light	
ECE-Regulation	ECE-R48 §6.3, R19
Mounting	Mandatory for all motor vehicle classes
Colour	White or light yellow
Quantity	2
Mounting Weidth	Max. 400 mm from the outermost point of the weidth of the vehicle
Mounting Height	Min. 250 mm Max. 800 mm at M <sub>1</sub> -Vh Max. 1.500 mm at N <sub>3</sub> G-Vh Max. 1200 mm at all other vehicles classes
Geom. Angles	Horizontal 10° inwards and 45° outward. Vertical +/- 5°
Electrical Circuit	Independent switching of low beam and high beam headlights
Switch-on Control	Legally required. An independent and non-flashing warning light
Other	Reference to special regulation in connection with R123 headlights

Daytime Running Lights	
ECE-Regulation	ECE-R48 § 6.19, ECE R87
Mounting	Mandatory for all motor vehicle classes
Colour	White
Quantity	2
Mounting Weidth	A minimum of 600 mm is required between the two daytime running lights. But at least 400 mm for vehicles with a weidth of less than 1300 mm
Mounting Height	Min. 250 mm Max. 1.500 mm
Geom. Angles	Horizontal +/- 20°, vertical +/- 10°
Electrical Circuit	Automatic switch-on when the engine is started. Daytime running lights must switch off automatically when fog lights or low beam headlights are switched on
Switch-on Control	Allowed

Note: All dimensions refer to the illuminating surface of the headlamp and not to the light's edge.

**Attention:** The regulations of the respective valid ECE R48 apply.

//

Technical changes and errors excepted. As per 07-2020

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# Legal Regulations



Position Lights	
ECE-Regulation	ECE-R48 § 6.12, ECE R7
Mounting	Permitted for motor vehicles up to and including 6 m in length and 2 m in width. Not allowed for other motor vehicles
Colour	White
Quantity	2
Mounting Weidth	Max. 400 mm from the outermost point of the vehicle weidth. If there are only 2 lights on the vehicle, they must be mounted on the sides of the vehicle
Mounting Height	Min. 350 mm Max. 1,500 mm Exceptional cases up to 2100 mm possible
Geom. Angles	Horizontal +/- 45°, vertical +/- 15°. For mounting heights up to 750 mm, 5° downwards is permissible
Electrical Circuit	Independent switch-on option from all other lights
Switch-on Control	Allowed
Other	Position lights and tail lights usually take over the role of the parking light

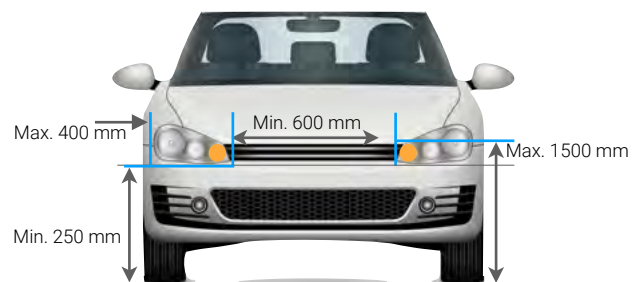
Work Lights	
ECE-Regulation	No separate regulation
Mounting	Permitted for motor vehicles up to and including 6 m in length and 2 m in width. Not allowed for other motor vehicles
Colour	White
Quantity	Any
Mounting Weidth	No special regulation
Mounting Height	No special regulation
Geom. Angles	No special regulation
Electrical Circuit	Switch on separately
Switch-on Control	Legally required. Work lights must not be coupled with actuating devices for limiting/low and/or high beam
Other	May not be operated on roads

Note: All dimensions refer to the illuminating surface of the headlamp and not to the light's edge.

**Attention:** The regulations of the respective valid ECE R48 apply.







Reversing	
ECE-Regulation	ECE-R48 § 6.4
Mounting	Mandatory for all motor vehicle classes
Colour	White
Quantity	At least 1, 2 are permissible for M1 vehicles and vehicles up to 6 m
Mounting Weidth	No special regulation
Mounting Height	Min. 250 mm Max. 1.200 mm
Geom. Angles	For 1 light: Horizontal +/- 45° With 2 lights: Horizontal 30° in and 45° out Vertical 15° up and 5° down
Electrical Circuit	Only with reverse gear engaged when vehicle is ready to drive. Special conditions apply to optional reversing lights in §6.4.7.2
Switch-on Control	Allowed
Other	Position lights and tail lights usually take over the role of the parking light

Front Indicator	
ECE-Regulation	ECE-R48 § 6.5 and ECE R6
Mounting	Mandatory for all vehicle classes (categories 1, 1a or 1b)
Colour	Yellow
Quantity	2
Mounting Weidth	Min. 600 mm between both turn signal lamps, Max. 400 mm from the outermost point of the vehicle weidth. For vehicle weidths < 1,300 mm: Min. 400 mm
Mounting Height	Min. 350 mm, Max. 1,500 mm (Exception: 2.100 mm if vehicle geometry does not allow regular attachment)
Geom. Angles	Horizontal: 45° inside, 80° outside Vertical: ±15° (for mounting height < 750 mm also 5° downwards). For classes M1-veh. and N1-veh. 20° inwards
Electrical Circuit	Flashing must occur independently of other light functions. Flashing lights must flash synchronously and must be activated and deactivated on the same side of the vehicle by the same actuator
Switch-on Control	Mandatory
Other	Defective direction indicator must be signaled acoustically and visually in the vehicle

Note: All dimensions refer to the illuminating surface of the headlamp and not to the light's edge.

**Attention:** The regulations of the respective valid ECE R48 apply.



# Technical Jargon

Terms such as LUX, Candela, etc. are frequently used. What is it all about?

## Illuminance (lux)

- // Describes the light intensity, perceived on a surface
- // It is a „receiver unit“
- // This is relevant for working conditions

## Luminous Flux (Lumen)

- // Describes the total amount of light, emitted by a light source in all directions
- // Lumen is a "transmission unit"
- // There is a difference between measured lumen and theoretical/ calculated lumen
- // Towards Nolden customers, we always state the measured lumen values that are truly emitted by our lights

## Light Intensity (Candela)

- // Candela refers to the intensity of light emitted by a source in a particular direction
- // Candela is a "transmission unit"
- // The Candela value can be used to evaluate the glare that an illuminated surface causes for the human eye

## Light Colour (Kelvin)

- // The perceived light colour is subjective and depends on the ambient light conditions
- // Light colour is often expressed as a light temperature (Kelvin)
- // The colour impression of the light from illuminating lighting functions must be white
- // Light temperature has an impact on the impression of brightness
- // Nolden lights produce neutral white to cool white light colour, which makes the light appear brighter

Warm White   Daylight White   Cold White



## Geometric Visibility

- // The visibly illuminated surface of a light must be visible at least within the area defined by the angles of geometric visibility
- // Within this area there shall be no obstacles for the emitted light cone (vehicle parts or add-on parts, e.g. grilles in front of the headlamp). Exceptions are possible under special circumstances
- // Further information can be found in Regulation ECE R48, paragraph 6 „Individual Specifications“ for each type of light

## Regulation concerning Headlight Cleaning Devices

- // All vehicles with low beam modules exceeding 2000 lumen must be fitted with a headlight cleaning device
- // NCC® lights are just below this limit

## Regulation regarding automatic Headlight Levelling

- // An automatic or manual headlight levelling system is compulsory, if otherwise, the cut off requirements cannot be met under all load condition
- // Also, in case the objective luminous flux exceeds 2000 lumen, an automatic levelling system is required
- // All NCC® low beam modules are just below 2000 lumen, therefore automatic leveling systems are not mandatory for our low beam modules

## Regulation concerning Electromagnetic Compatibility (EMC)

- // All active electronic components on a vehicle must comply with ECE R10 and are therefore tested for electromagnetic compatibility
- // All NCC® products comply with ECE R10
- // Without EMC, a total vehicle approval can be withdrawn

LHD = Left Hand Drive

RHD = Right Hand Drive





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