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LED LIGHTING TECHNOLOGY - ENERGY EFFICIENT ILLUMINATION

HELLA LED based luminaires are sophisticated opto-electronic devices designed to enhance an interior by adding functionality, increased energy efficiency and offer long term durability.

LED based lighting has many advantages over traditional incandescent bulbs including significantly reduced power consumption, increased reliability, a reduction in radiated heat, longer life and less maintenance.

But it's important to know not all LEDs are created equal

When comparing one LED product to another it is important to not just look at the initial purchase price but consider the full life time cost and what attributes combine to make a quality LED product. Most owners will agree that purchasing products that do not fit the purpose, or that need to be replaced, is a waste of time and money.

To design efficient and reliable LED luminaires, many factors need to be considered. Light output, beam pattern, material choices and lamp protection can all make a significant difference in the performance and life of a lamp. It is also important to consider the application where the lamp is likely to be used and what sort of illumination

you desire. Corrosive moisture, heat, vibration and voltage fluctuations can all affect an LED device so these factors need to be managed.

HELLA LED lamps use the latest LED technology, quality components and materials to provide the best efficacy (lumens per watt), consistent colour and light output with long term reliability, even in the most demanding conditions.

With so many LED options available it is important to understand the differences and what aspects to consider when comparing LED products.

- → Actual Light Output
- → Colour Temperature and Colour Rendering Index (CRI)
- Thermal Management and Sealing for reliability
- → Electrical Interference and Flicker





Light Output and Beam Patterns

The term 'Lumen' is commonly used to describe the light output of LED lights. Over the last decade Lumen ratings have increased significantly as the technology has developed. However this can be confusing as many companies choose to list 'Raw' lumen figures rather than the more realistic 'Effective' lumens.

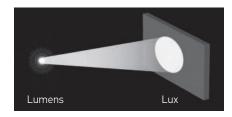
Raw Lumens are a measure of the theoretical output of a light and is calculated by multiplying the theoretical rated output of the LEDs by the number of LEDs in the lamp.

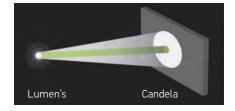
Example: 8 LEDs rated at 100 Lumens per watt 8 x 100 = 800 Raw Lumens

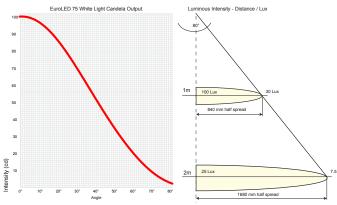
Factors such as the power used to drive the lamp, thermal losses and optical losses all contribute to a possible 20-50% decrease of the light lumens emitted by the LED.

Effective Lumens is a measure of the actual output from a light after taking into consideration real world losses (e.g. thermal, optical, and assembly). Therefore it is a much more accurate representation of the light being produced.

Example: Raw lumens may = 800 but when light decreases due to thermal, optical and assembly losses this can result in up to 50% decrease in actual output and usable light. 800 raw lumens minus 50% losses = 400 Effective Lumens.







Lux and candela diagrams to illustrate accurate light output and beam angles.

Thermal Losses can equate for 20-30% decrease in light output

LEDs produce a tremendous amount of power in a relatively small area and some of this power is converted to heat. However unlike incandescent lamps LEDs do not like heat. As the LEDs increase in temperature the actual light output diminishes.

LED manufacturers typically measure the Raw Lumen output produced by their LEDs after 25 milliseconds (ms). That is equivalent to a flash bulb, giving a Lumen number that is the absolute maximum value. However real world applications require the lamp to run much longer meaning potential losses of up to 30%.

All HELLA LED lamps are designed to dissipate heat away from LEDs through effective thermal management. HELLA also uses sophisticated photometric equipment to measure the lamps and only after 30 minutes of operation so the LED temperature has stabilised, ensuring you always get a more accurate 'effective' lumens measure.

Optical & Assembly losses can equate to 10-20% decrease in light

These losses are present whether the light source is an LED or a bulb. As light travels through an object (such as a lens), it loses intensity depending on the clarity of the material. This is due to inherent losses internal to the material and also to losses at the boundary of the part as the light travels from air, through the lens, and back to air.

There are also losses associated with assembly and manufacturing variation. The LED output varies as the assembly tolerances may diminish the overall performance from theoretical LED maximums.

Simply adding the expected values of the LED light sources together will never result in a lamp that shines that amount of light on the ground.

To accurately measure light performance and beam angles compare Lux Charts

Lumens are not the only measurement that is important – Another, more useful measurement of actual light output is Lux. Lux and candela ratings refer to the actual light intensity from the lamp at given distances and direction. This way you know what light levels to expect when designing your lighting layout.

Quality lighting manufacturers using state of the art photometric equipment, are able to provide accurate lux or candela charts so consumers get a fair representation of the expected Luminaire performance.

Another aspect to consider when reviewing luminaire performance is the evenness of illumination. Expressed as 'beam angle' this gives the user an idea of how spread or narrow the luminaire will be. Down lights will often have a wide spread optic to fill a room. By overlapping the wide spread beams from several luminaires, shadows are reduced. Other lamps like spotlights or courtesy lighting may be designed to focus or direct the light in a certain direction to achieve a specific effect. Make sure you select a luminaire with a lens and optical design to suit your application.

COLOUR TEMPERATURE AND COLOUR RENDERING INDEX (CRI)

When white LED lighting first became available it gained a reputation for appearing 'cold' and 'blue' due to the phosphorous coating technology. However today's devices can rival traditional incandescent light sources for colour and ambience.

LED colours set the tone and feel so choosing Luminaires that complement your interior or exterior is important.

Colour temperature is measured in Kelvin and is a sliding scale of light that appears bluer or more orange at each end. HELLA describes higher colour temperatures (5000K) as 'cool white' and lower colour temperatures (3000K) as 'warm white'.

Cool white is recommended for visual tasks, work areas and exterior lighting, as it is known to reduce fatigue and increase alertness over long periods of time.

Warm white is suggested for interior spaces as it adds life and vibrancy to people and objects. It is considered more flattering to skin tones or fabrics and makes food look fresh and attractive.

1850K	Candle
2800K	Halogen Bulb (Incandescent Lamp)
3000K~	Warm White LED
5000K~	Cool White LED
5700K~	Daylight

When selecting LED interior lighting look for lamps with a high colour rendering index (CRI)

The higher the CRI rating the better and truer colour reproduction you will get of various objects. For example sunlight has the highest CRI rating of 100. LED lamps with a CRI rating of 80 or higher will reproduce the colour scheme of the interior with good accuracy.

All HELLA LED chips are selected from tight specification bins to ensure that lamps are the same brightness and colour temperature grade. This ensures a room full of lights will all have the same appearance e.g. colour temperature and intensity.

Colour Rendering Index - CRI



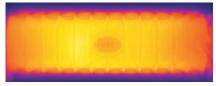




CRI ratings >80 produce natural colours

Thermal Management and Sealing for Reliability

Although LED lamps run much cooler than incandescent lamps, LEDs and the electronics inside a lamp do heat up and if not cooled effectively can affect the light performance and the expected life span of the lamp. It is important lamp housings are designed to efficiently transport this heat away from the LED itself.



HELLA thermally conductive plastics are 30 times more thermally conductive than conventional plastic.

LEDs that overheat, meaning the junction temperature of the LED rises above a set threshold, will permanently degrade, significantly reducing their output. A very hot running Luminaire can also cause issues when interacting with the surrounding materials.

HELLA lamps are designed within stringent heat thresholds that ensures lamps will not overheat, meaning longer life.

Reliable Design and Quality Construction

Manufacturers of raw LEDs quote the lifetime of the LED chip as '50,000 hours'. This period of time is then often used to promote the expected life of the complete lamp. However to achieve this life expectancy, LEDs require precise current control, overvoltage/spike protection and temperature control to avoid any premature failure. For LED luminaire designers and manufacturers, in-depth design and engineering is required to produce such durable products. Sadly, most do not make the cut, despite their claims.

LED reliability is compromised if dust, moisture and other contaminants find their way inside the lamp. So the most effective way to protect the lamp is by completely sealing it from the elements. Sealed housings and cable entries, along with components designed to withstand shock, vibration and impacts all contribute towards exceptional life expectancy.

All HELLA LED lamps are at least IP 67 rated, meaning they can be washed and cleaned on the exterior of vehicles. If used for interior applications moisture and condensation from bathrooms and kitchens will not affect the lamp.

Electrical Interference and Flicker

Some LED products can demonstrate a flickering effect, usually when dimmed or if the lamps use low frequency components or dimmers. Not only is a flicker annoying and uncomfortable, it can also be harmful to those susceptible.

A recent US Department of Energy (DOE) report warns of poorly designed LED luminaires, associating low frequency 'Flicker' with the possibility to trigger epileptic attacks in parts of the population that are susceptible.

Electromagnetic Compatibility (EMC)

This is another safety concern, especially for emergency and industrial applications. Electromagnetic interference (EMI) can disrupt radio signals especially when in remote locations or areas with low reception. As electronic devices such as LED lamps become more common, so does the risk of unintended EMI that can have adverse effects on sensitive devices such as radios or communication equipment.

All HELLA LED products use quality components to prevent any possible flickering and are tested and certified to international standards for electromagnetic interference.

Examples of different LED manufacturers and methods of sealing lamps.







DIMMABLE LOGOSWHAT DO THEY MEAN?

Logos used throughout the Interior/Exterior section to help quick referencing of important product features are explained below.



Light intensity is reduced as the DC input voltage is reduced below the lamps specified operating voltage.



Light intensity is controlled through the lamp's own internal circuitry via in-built buttons, an external DC power source and a standard switch. See specific lamp instructions for further information.



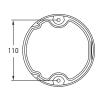
Light intensity is adjusted between 10-100% using a high frequency PWM (pulse width modulation) DC power supply, with adjustable duty cycle control.

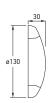


Light intensity can be switched between 100% and a lower level factory pre-set value, usually via an additional cable input supplied with the lamp using a positive feed from the DC power supply within the lamps operating voltage range.

EuroLED® White Touch Lamp

White LED lamp with touch switching and clear lens. Touch the white pad to turn on and the black pad to turn off. Provides ultra long service life and is shock and vibration proof.











P/N 2JA 959 950-561

Part Number	BLACK SHROUD		WHITE SHROUD	
Part Number	2JA 959 950-55	1	2JA 959 950-561	WHITE
Mounting	Two hole surface m	nount with m	nounting bushes supplied.	
Voltage	Multivolt [™] for optim	num brightn	ess at input voltage from 9 to 33	volts.
Power Consumption	4W			
Protection	Reverse polarity and transient spike circuit protection. IP 6K6 (Protection against dust and high-pressure water jets) IP 6K7 (Protection against dust and temporary water immersion)			
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.			
Accessories	8HG 959 952-002 Mounting spacer - Black 8HG 959 952-012 Mounting spacer - White 9.2366.08 EuroLED*Cover - Black 9.2366.11 EuroLED*Cover - White 9.2366.17 Screw boss kit - Pack of 4			
Compliance	C€			<u>&</u>

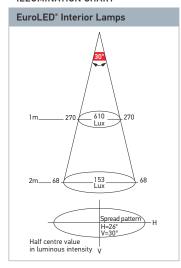
EuroLED® Lamp

White LED lamp with clear lens. Provides ultra long service life and is shock and vibration proof. Includes a black and a white rim. No switching or dimming.





Part Number	95982050		WHITE
Mounting	Two hole surface m	nount with mounting bushes supplied.	
Voltage	Multivolt™ for optim	num brightness at input voltage from 9 to 33	volts.
Power Consumption	4W		
Protection	Reverse polarity and transient spike circuit protection. IP 6K6 (Protection against dust and high-pressure water jets) IP 6K7 (Protection against dust and temporary water immersion)		
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.		
Accessories	8HG 959 952-002 8HG 959 952-012 9.2366.08 9.2366.11 9.2366.17	Mounting spacer - Black Mounting spacer - White EuroLED® Cover - Black EuroLED® Cover - White Screw boss kit - Pack of 4	
Compliance	CE		<u> </u>



WHITE PLASTIC RIM

2JA 980 631-501

2JA 980 631-601

(€



Part Number

Power Consumption

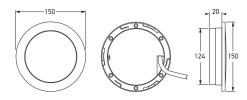
Mounting

Voltage

Protection

Cable Length

Compliance



WHITE

WARM WHITE

POLISHED STAINLESS STEEL RIM

2JA 980 631-511

2JA 980 631-611

Recess mount, 124mm diameter hole. Surface mount via optional spacer.

Multivolt™ for optimum brightness at input voltage from 9 to 33 volts.

Reverse polarity and transient spike circuit protection.

Pre-wired with 0.5m of sheathed multi-core tinned cable.

Sealed against dust and water ingress.

EuroLED® 150 Down Lights

White or Warm White LED lamp with clear lens. Provides ultra long service life and is shock and vibration proof.







P/N 2JA 980 631-601

Packaging



	WHITE PLASTIC RIM POLISHED STAINLESS STEEL RIM		RIM
Part Number	2JA 980 630-501	2JA 980 630-511	WHITE
	2JA 980 630-601	2JA 980 630-611	WARM WHITE
Mounting	Recess mount, 124mm diameter hole. Surface mount via optional spacer.		
Voltage	Multivolt™ for optimum brightness at input voltage from 9 to 33 volts.		
Power Consumption	4W		
Protection	Reverse polarity and transient spike circuit protection. Sealed against dust and water ingress.		
Cable Length	Pre-wired with 0.5m of sheathed multi-core tinned cable.		
Compliance	((

EuroLED® Touch 150 Down Lights - Single Colour

White or Warm White LED lamp with touch switching and clear lens. Touch the white pad to turn on and the black pad to turn off. Provides ultra long service life and is shock and vibration proof.



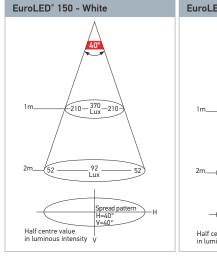


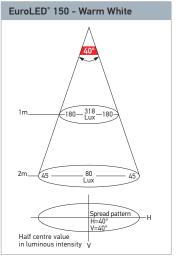


P/N 2JA 980 630-601 Packaging



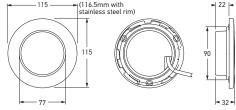
Sealed cable entry





EuroLED® 115 Down Lights - With White Spacer

Round LED high intensity down lights offering class leading efficiency and durability. Supplied with white or polished stainless steel rim to suit.





Dimmable:









P/N 2JA 980 820-101 Sealed cable entry

	WHITE PLASTIC RIM	POLISHED STAINLESS STEEL RIM	
Part Number	2JA 980 820-001	2JA 980 820-011	WHITE
	2JA 980 820-101	2JA 980 820-111	WARM WHITE
Mounting	Recess mount, 90mm diameter hole. Surface mount via optional spacer.		
Voltage	Multivolt™ for optimum brightness at input voltage from 10 to 33 volts.		
Power Consumption	4.5W		
Protection	Reverse polarity and transient spike circuit protection. Sealed against dust and water ingress.		
Cable Length	Pre-wired with 0.5m of sheathed multi-core tinned cable.		
Compliance	(€		

EuroLED® 115 Down Lights - With White Spacer and Switch

Round LED high intensity down lights offering class leading efficiency and durability. Supplied with white or polished stainless steel rim to suit.





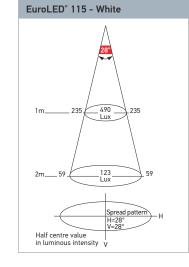


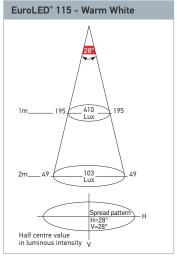
P/N 2JA 980 828-111 Packaging

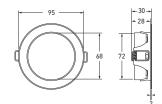
	WHITE PLASTIC RIM	POLISHED STAINLESS STEEL RIM	
Part Number	2JA 980 828-001	2JA 980 828-011	WHITE
	2JA 980 828-101	2JA 980 828-111	WARM WHITE
Mounting	Recess mount, 90mm diameter hole. Surface mount via spacer.		
Voltage	Multivolt™ for optimum brightness at input voltage from 10 to 33 volts.		
Power Consumption	4.5W		
Protection	Reverse polarity and transient spike circuit protection. Sealed against dust and water ingress.		
Cable Length	Pre-wired with 0.5m of sheathed multi-core tinned cable.		
Compliance	((



EuroLED® 115 Down Lights with switch, expanded view.







MULTI VOLT Dimmable: PWM 10-100%

	2JA 958 340-011	WHITE	
Part Number	2JA 958 340-101	WHITE/RED	
	2JA 958 340-111	WHITE/BLUE	
	2JA 958 340-021	WARM WHITE	
	2JA 958 340-121	WARM WHITE/RED	
	2JA 958 340-131	WARM WHITE/BLUE	
Mounting	Recess mount, 76mm diameter hole. Spring clip.		
Voltage	Multivolt™ for optimum brightness at input voltage from 9 to 33 volts.		
Power Consumption	6W		
Protection	IP 6K9K (Protection against dust and high pressure/steam jet cleaning)		
Cable Length	Pre-wired with 120mm of cable.		
Compliance	(€		

EuroLED® 95 Gen 2 Round Down Lights - Recess Mount With Spring Clip

The next generation of LED high intensity down lights offers an improved class leading efficiency and durability. The smooth diffused lens creates a comfortable and uniform appearance with over 420 lumens of actual light in a broad and even illumination.



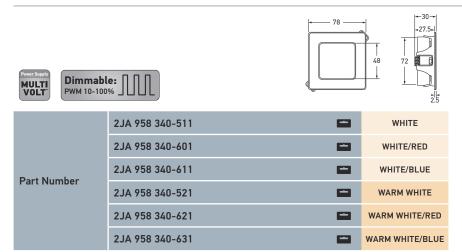


Warm White

Red - Secondary colour



Blue - Secondary colour



Specifications as per P/N 2JA 958 340-011 above.

- Recess Mount With Spring Clip

EuroLED® 95 Gen 2 Square Down Lights

The next generation of LED high intensity down lights offers an improved class leading efficiency and durability. The smooth diffused lens creates a comfortable and uniform appearance with over 420 lumens of actual light in a broad and even illumination.



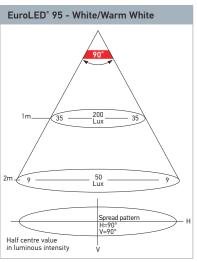


Warm White

Red - Secondary colour

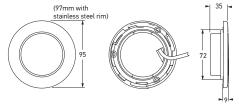


Blue - Secondary colour



EuroLED® 95 Down Lights - Recess Mount

Round LED high intensity down lights offering class leading efficiency and durability. Supplied with white or polished stainless steel rim to suit.





Dimmable:







P/N 2JA 980 940-111 Packaging

P/N 2 IA 980 9/0-111	Packaging

	WHITE PLASTIC RIM	POLISHED STAINLESS STEEL RIM	
Part Number	2JA 980 940-001	2JA 980 940-011	WHITE
	2JA 980 940-101	2JA 980 940-111	WARM WHITE
Mounting	Recess mount, 72mm diameter hole. Screw mount.		
Voltage	Multivolt™ for optimum brightness at input voltage from 9 to 33 volts.		
Power Consumption	4W		
Protection	Reverse polarity and transient spike circuit protection. Sealed against dust and water ingress.		
Cable Length	Pre-wired with 0.5m of sheathed multi-core tinned cable.		
Compliance	CE		<u>&</u>

EuroLED® 95 Down Lights - Recess Mount With Spring Clip

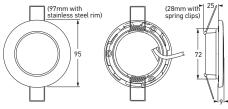
Round LED high intensity down lights offering class leading efficiency and durability. Supplied with white or polished stainless steel rim to suit.

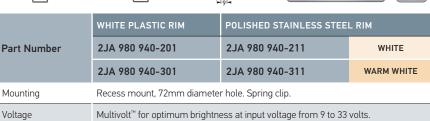






P/N 2JA 980 940-311 Packaging





Voltage Power Consumption 4W

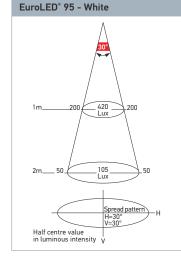
Protection Reverse polarity and transient spike circuit protection.

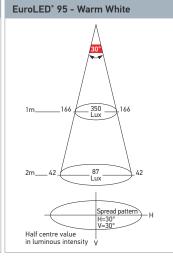
Pre-wired with 0.5m of sheathed multi-core tinned cable. Cable Length

Sealed against dust and water ingress.

Compliance (€



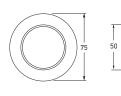












	12 VOLT DC	24 VOLT DC		
Part Number	2JA 958 110-031	2JA 958 110-131	WHITE	
	2JA 958 109-031	2JA 958 109-131	WARM WHITE	
Mounting	Recess mount, 50mm diamet	Recess mount, 50mm diameter hole.		
Voltage	12V DC or 24V DC			
Power Consumption	<3W			
Protection	IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high pressure/steam jet cleaning)			
Cable Length	Pre-wired with 130mm of cable			
Supplied Rims	95950590 Black plastic rim - EuroLED® 95 95950585 White plastic rim - EuroLED® 95			
Compliance	<u>&</u>			
Additional rims and housings are available see page 227.				

EuroLED® 75 Down Lights - Recess Mount

This down light features the latest in LED technology and is available in two white colour temperatures. Both the cool white and the warm white option feature a smooth, evenly distributed illumination and an optic specifically designed to reduce individual light source glare, which can lead to discomfort and eye strain. Each down light includes a black and a white plastic rim.



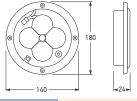




P/N 2JA 958 109-031

Black and white supplied plastic rims



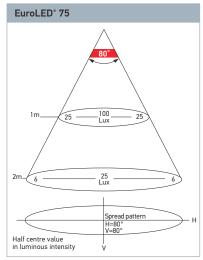


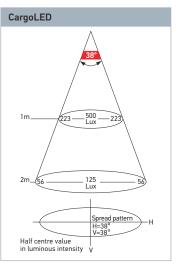
Part Number	2604	WHITE	
Mounting	Flush Mount		
Voltage	Multivolt™ for optimum brightness at input voltage from 9 to 32	volts.	
Power Consumption	6W		
Temperature Range	-40°C to + 60°C		
Protection	Fully sealed against dust and moisture to IP 69		
Cable Length	Pre-wired with 310mm of sheathed multi-core cable.		
Accessories	9.2604.05 CargoLED mounting spacer		
Compliance	△		

CargoLED Interior Lamp - Recess Mount

CargoLED interior lamp features dust-proof housing that is made from high quality aluminium and ABS ensuring maximum durability and long service life, even in extremely cold or humid environments. Fully sealed to withstand high-pressure washing.

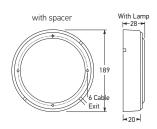








P/N 9.2604.05 CargoLED mounting spacer



MULTI

DuraLED® Combi-S 50 White LED Lamp

DuraLED® Combi-S white 50 LED lamps are an extremely powerful source of white light and are available in two light patterns, Spread and Wide Spread, to suit a variety of uses including engine rooms, storage lockers or other heavy duty applications where reliability cannot be compromised. Each lamp is completely sealed, UV, impact and shock resistant ensuring an ultra-long service life.





2JA 980 629-001





|--|

Part Number	2JA 980 629-501	WIDE SPREAD	
Part Number	2JA 980 629-001	SPREAD	
Mounting	Two hole surface mount with mounting bushes supplied.		
Voltage	Multivolt™ for optimum brightness at input voltages from 9 to 3	3 volts.	
Power Consumption	<12W		
Protection	Reverse polarity and transient spike circuit protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high pressure/steam jet cleaning)		
Cable Length	Pre-wired with 2.5m of cable.		
Compliance			



Ultra slim height of only 25mm.

DuraLED® Combi-S 50 White LED Lamp - Charcoal

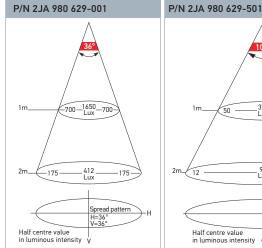
DuraLED® Combi-S white 50 LED charcoal lens is an extremely powerful source of white light offering a safe, energy efficient and reliable alternative to incandescent and fluorescent lighting. Lens manufactured from Grilamid® clear nylon which features high UV and chemical resistance, and high impact strength. The lamp is fully sealed against dust and moisture ingress.

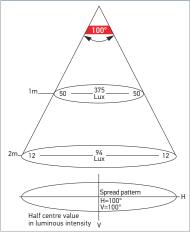


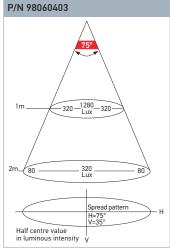
Part Number	98060403	WIDE SPREAD	
Mounting	Two hole surface mount with mounting bushes supplied.		
Voltage	Multivolt™ for optimum brightness at input voltages from 9 to 33	3 volts.	
Power Consumption	<12W		
Protection	As per P/N 2JA 980 629-501 above.		
Cable Length	Pre-wired with 2.5m of cable.		
Lens Material	High impact and chemical resistant Grilamid® lens		
Compliance	<u>&</u>		



Ultra slim height of only 25mm.

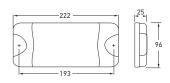












Part Number	2JA 980 629-601		SPREAD
Mounting	Two hole surface mount with	mounting bushes supplied.	
Voltage	Multivolt™ for optimum bright	ness at input voltages from 9 to 33	3 volts.
Power Consumption	<12W		
Protection	Reverse polarity and transient spike circuit protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high pressure/steam jet cleaning)		
Cable Length	Pre-wired with 130mm of cable with DT connector.		
Lens Material	High impact and chemical resistant Grilamid® lens		
Accessories	8KA 958 360-001 2 Pole Switch plug and socket (300mm) 8KA 958 361-001 2 Pole Y-splitter joint plug and socket (300mm) 8KA 958 363-001 2 Pole DT extension plug and socket (2.5m)		00mm)
Compliance	&		

DuraLED® Combi-S 50 White LED Lamp with DT Connector

DuraLED® Combi-S white 50 LED is an extremely powerful source of white light offering a safe, energy efficient and reliable alternative to incandescent and fluorescent lighting. Lens manufactured from Grilamid® clear nylon which features high UV and chemical resistance, and high impact strength. The lamp is fully sealed against dust and moisture ingress.





Ultra slim height of only 25mm.

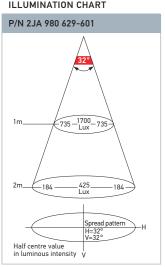


Rear view showing DT Connector

8KA 958 360-001 (Switch) 1.5MM² Part Number 8KA 958 361-001 (Y-Splitter Joint) CABLE SIZE 8KA 958 363-001 (Extension Cable)

DT Connectors - 2 Pole Plug, Socket and Switch Accessories





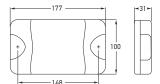
DuraLED® White 36 LED Lamp

White high brightness LED lamp with Grilamid® lens. Exceptional light output, incorporating high efficacy electronics and LEDs resulting in low power consumption (<9 watts) and low heat. Lens manufactured from Grilamid® clear nylon which features high UV and chemical resistance, and high impact strength. The lamp is fully sealed against dust and moisture ingress.





P/N 9593721





Part Number	WHITE LENS	CHARCOAL LENS		
Part Number	95903720	95903721	SPREAD	
Mounting	Two hole surface mount with m	nounting bushes supplied.		
Voltage	Multivolt™ for optimum brightne	ess at input voltages from 9 to 3	3 volts.	
Power Consumption	<9W			
Protection	Reverse polarity and transient spike circuit protection. IP 6K6 (Protection against dust and high-pressure water jets) IP 6K7 (Protection against dust and temporary water immersion)			
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.			
Lens Material	High impact and chemical resis	stant Grilamid® lens		
Compliance	CE		<u>&</u>	
See page 80 for DuraLED® accessories.				

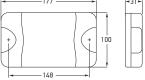
DuraLED® White 36 LED Lamp

White LED interior lamp with either a diffusion or clear acrylic lens. The lamps are shock and vibration proof and are fully sealed against dust and moisture ingress.



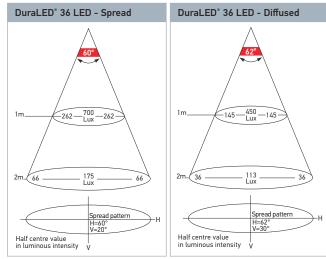


P/N 2JA 959 037-511

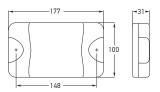


	M
2JA 959 037-501	DIFFUSE

Part Number	ZJA 757 U57-501	DIFFUSED	
rait Number	2JA 959 037-511	SPREAD	
Mounting	Two hole surface mount with mounting bushes supplied.		
Voltage	Multivolt™ for optimum brightness at input voltages from 9 to 33	3 volts.	
Power Consumption	<9W		
Protection	See DuraLED® White 36 LED Lamp above.		
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.		
Lens Material	Acrylic		
Compliance	C€	<u> </u>	







Part Number	98060801	SPREAD	
Mounting	Two hole surface mount with mounting bushes supplied.		
Voltage	Multivolt™ for optimum brightness at input voltages from 9 to 3	3 volts.	
Power Consumption	5W		
Protection	Reverse polarity and transient spike circuit protection. IP 6K6 (Protection against dust and high-pressure water jets) IP 6K7 (Protection against dust and temporary water immersion	n)	
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.		
Compliance	C€	&	
See page 80 for DuraLED® accessories.			

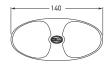
DuraLED® White 20 LED Lamp

White high brightness LED lamp. Exceptional light output, incorporating high efficacy electronics and LEDs resulting in low power consumption (<5 watts) and low heat. The lamp is fully sealed against dust and moisture ingress.









—140 ———	32
	65

	95970010	
Part Number	95970400 (Includes switch)	WIDE SPREAD
Mounting	Two hole surface mount with mounting bushes supplied.	
Voltage	Multivolt™ for optimum brightness in 12 and 24 volt systems.	
Power Consumption	<3W	
Protection	Reverse polarity and transient spike circuit protection. Fully sealed against dust, high-pressure washing and temporary	y water immersion.
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.	
Compliance	(€	<u>&</u>

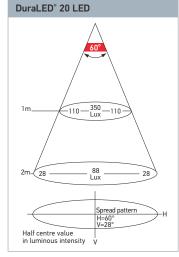
DuraLED® White 12 LED Lamp

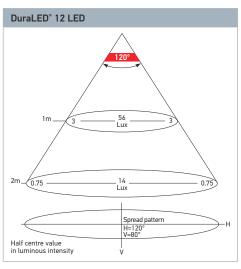
White high brightness LED lamp. Exceptional light output, incorporating high efficacy electronics and LEDs resulting in low power consumption (<3 watts) and low heat. The lamp is fully sealed against dust and moisture ingress.





P/N 95970400





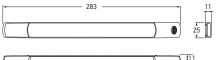
LED Interior/Exterior Strip Lamp - Surface Mount

LED interior surface mount strip lamps feature a shallow 11mm profile, completely sealed housing and class leading efficiency. The range is an ideal replacement for bulky fluorescent lighting and a wide range of wet or dry interior or exterior applications.





Ultra slim height of only 11mm.







Part Number	12 VOLT DC		24 VOLT DC	
Part Number	2652		2652-24V	WHITE
Mounting	Surface mount.			
Power Consumption	<3W	<3W		
Protection	Reverse polarity protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high-pressure/steam jet cleaning)			
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.			
Spare Parts	9.2652.09 White screw caps (MOQ 4) 9.1009.09 Charcoal screw caps (MOQ 4) 9.1009.10 Chrome plated screw caps (MOQ 4)			

LED Interior/Exterior Strip Lamp with Sealed Switch - Surface Mount

These LED interior surface mount strip lamps with sealed waterproof switch feature a shallow 11mm profile, completely sealed housings and class leading efficiency. The range is ideal for a wide range of interior or exterior applications.





2JA 958 121-011 White/Blue

2JA 958 121-001 White/Red



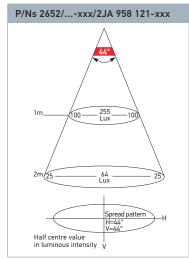
Ultra slim height of only 11mm.







	12 VOLT DC	24 VOLT DC	
	2652-SW	2652-SW24V	WHITE
Part Number	2JA 958 121-011	2JA 958 121-411	WHITE/BLUE
	2JA 958 121-001	2JA 958 121-401	WHITE/RED
Mounting	Surface mount.		
Power Consumption	White function: <3W	Colour function: <1W	
Protection	As per P/N 2652		
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable. Dual colour lamps are pre-wired with 0.5m of twin core cable.		
Spare Parts	9.2652SW.09 1 White switch screw cap + 1 white standard screw cap 9.2652SW.10 1 Charcoal switch screw cap + 1 charcoal standard screw cap		
Note: P/N 2652-SW/24V includes charcoal and white screw caps. 2JA 958 121-xxx include white screw caps only.			



Light output directed downwards 283 283 11 200 CommSafe ((a)) CommSafe Analog DC Input

Part Number	12 VOLT DC	24 VOLT DC	
rait Number	98087900	98087910	WHITE
Mounting	Mounting Two hole surface mount.		
Power Consumption	<3W		
Protection	Reverse polarity protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high-pressure/steam jet cleaning)		
Cable Length	Pre-wired with 2.5m of twin core cable.		
Lens Material	High impact and chemical resistant Grilamid® lens		
Spare Part	9.2652.09 White screw caps (MOQ 4) 9.1009.09 Charcoal screw caps (MOQ 4) 9.1009.10 Chrome plated screw caps (MOQ 4) 8HG 958 000-021 Mounting bracket 45° - Charcoal 8HG 958 000-011 Mounting bracket 45° - White		

See page 85 for surface mount strip lamp screw caps.

LED Awning Lamp - Surface Mount

LED awning lamp with an ultra slim profile of only 11mm, a heavy duty Grilamid® lens and low power consumption of less than 3W, HELLA's LED Awning Lamp is ideal for interior and exterior use. It comes complete with charcoal as well as white end caps and can be accessorised with a matching 45° mounting bracket to angle the beam further. Combining state of the art technology with sophisticated looks, this new low profile LED Awning Lamp is a lighting solution which will fit many applications. The precision optic, with a 15° downwards spread pattern, is designed to cause minimum glare.





P/N 8HG 958 000-021

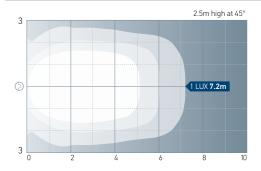
P/N 8HG 958 000-011



Ultra slim height of only 11mm.

ILLUMINATION CHART

P/Ns 98087900/...10



Illumination Charts Explained

HELLA light performance charts show illuminance and spread in an easy to read format. At the top is the horizontal spread angle, with the boundary threshold being defined as half of the peak luminous intensity. While there is light beyond the indicated angles, the majority of light will be inside the cone shown. Luminous intensity is the measure of light emanating from a source in a specific direction.

The difference between lux (illuminance) and lumen (luminous flux) is that lux takes into account the area over which the luminous flux is spread. Accordingly the lux value decreases with distance. Most interior lamps will be installed at around the 2 - 2.5 metre height.

As a guideline, some 40 – 100 lux is required for corridors and passageways, around 300 lux for reading and 500 – 800 lux for offices. The spread pattern may not always be designed as symmetrical so the spread horizontally (H) and vertically (V) are given.

Luminance and Illuminance is additive, meaning overlapping light patterns or multiple lamps lighting the same surface add their luminance.

One Lux represents the intensity of the light of a full moon (under clear atmospheric conditions) or just sufficient light by which to read a newspaper.

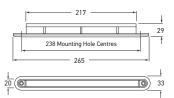
NTERIOR/EXTERIOR

LED White Interior/Exterior Strip Lamp - Recess Mount

White LED interior lamp with clear UV resistant acrylic lens. Ideal for steps, interior or exterior courtesy lighting and storage areas.











	12 VOLT DC	24 VOLT DC	
Part Number	2641-12V	2641-24V	WHITE
	2641HB	2641HB-24V	HIGH BRIGHTNESS WHITE
Mounting	Recess mount.		
Power Consumption	<2W		
Protection	Reverse polarity protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high-pressure/steam jet cleaning)		
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.		
Spare Part	9GD 959 155-507	Gasket	

LED Courtesy Strip Lamp - Surface Mount

These LED courtesy surface mount strip lamps feature a shallow 11mm profile and completely sealed housings. Available in blue, red and green colour variants.





P/N 2JA 980 881-602 P/N 2JA 980 881-802



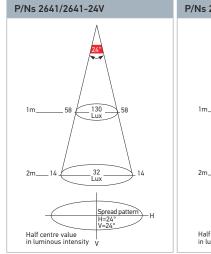
Ultra slim height of only 11mm.

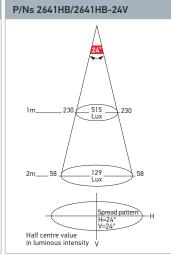






	12 VOLI DC	24 VOLI DC	
Part Number	2JA 980 881-402	2JA 980 881-502	BLUE
	2JA 980 881-602	2JA 980 881-702	RED
	2JA 980 881-802	2JA 980 881-902	GREEN
Mounting	Surface mount.		
Power Consumption	<2W		
Protection	Reverse polarity protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high-pressure/steam jet cleaning)		
Cable Length	Pre-wired with 0.5m of sheathed multi-core tinned cable.		
Spare Parts	9.2652.09 White screw caps (MOQ 4) 9.1009.09 Charcoal screw caps (MOQ 4) 9.1009.10 Chrome plated screw caps (MOQ 4)		
See page 85 for surface mount strip lamp screw caps.			









HELLA LED Luminaires provide superior quality lighting solutions for Interior/Exterior lighting.



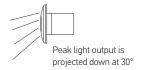
LED Wide Rim Rectangular **Courtesy Step Lamp**

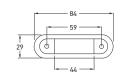
Wide rim, flush mount, courtesy step lamp with either white, red, green or blue LEDs. Optic appears clear until illuminated.





P/N 95968060









	12/24 VOLT (CLEAR LENS)			
Part Number	95968080	WHITE		
	95968070	RED		
	95968090	GREEN		
	95968060	BLUE		
Mounting	Recess mount.			
Voltage	Multivolt™ for optimum brightness in 12 and 24 volt systems.			
Power Consumption	<1W			
Protection	Reverse polarity protection. IP 6K6 (Protection against dust and high-pressure water jets) IP 6K7 (Protection against dust and temporary water immersion)			
Cable Length	Pre-wired with 120mm of cable.			
Compliance	C€	&		

See page 81 and 86 for spare parts and accessories.

DuraLED® Surface Mount **Courtesy Lamp**

Blue, white or green LED courtesy lamps. Optic appears clear until illuminated.













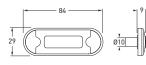


	95963046	WHITE	
Part Number	95963025	BLUE	
	95963055	GREEN	
Mounting	Two hole surface mount.		
Voltage	Multivolt™ for optimum brightness in 12 and 24 volt systems.		
Power Consumption	<1W		
Protection	Reverse polarity protection. IP 6K6 (Protection against dust and high-pressure water jets) IP 6K7 (Protection against dust and temporary water immersion)		
Cable Length	Pre-wired with 0.5m of cable.		
Compliance	C€	&	
See page 81 for spare parts and accessories.			









Part Number	98085510	WHITE	
	98085515	WARM WHITE	
	98085525	AMBER	
	98085535	RED	
	98085540	BLUE	
	98085550	GREEN	
Mounting	Two hole flush mount.		
Voltage	Multivolt™ for optimum brightness in 12 and 24 volt systems.		
Power Consumption	<1W		
Protection	Reverse polarity protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high-pressure/steam jet cleaning)		
Cable Length	Pre-wired with 0.5m of sheathed multi-core cable.		
Lens Material	High impact and chemical resistant Grilamid® lens		
Compliance	<u></u>		

DuraLED° Flush Mount Courtesy Lamp - Low Profile

These LED courtesy lamps feature a shallow 9mm profile and completely sealed housing. Available in a range of colours. Optic appears clear until illuminated.





P/N 98085515 P/N 98085525





P/N 98085540



P/N 98085550

P/N 98085535

RIMS		
Part Number	Colour	Material
95968600	BLACK	DI ACTIO
95968601	WHITE	PLASTIC
95968500	POLISHED	316 STAINLESS
95968506	SATIN CHROME PLATED	STEEL

SCREW CAPS		
Part Number	Colour	Quantity
9.2310.09-BULK	BLACK	
9.2310.10-BULK	RED	
9.2310.11-BULK	WHITE	PACK OF 4
9.2310.12-BULK	BLUE	
9.2310.13-BULK	GREEN	PACK OF 4
9.2310.14-BULK	YELLOW	
9.2310.15-BULK	AMBER	
9.2310.16-BULK	GREY	



DuraLED® Flush Mount Courtesy Lamp Accessories

Accessory rims and screw caps for the LED flush mount courtesy lamp family.





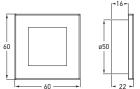
LED Square Courtesy Lamps

Attractive, energy efficient square LED courtesy lamps for interior and exterior use. Available in either white, warm white, red or blue and supplied with a white and black rim. Optic appears clear until illuminated.



P/N 98059604





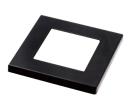


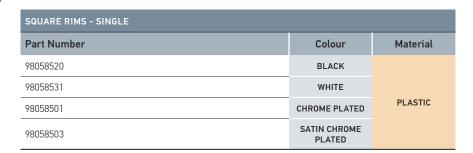


	12 VOLT DC	24 VOLT DC	
Part Number	98059604	98059614	WHITE
	98059704	98059714	WARM WHITE
	98058721	98058821	RED
	98058221	98058321	BLUE
Mounting	Recess mount, 50mm diameter hole.		
Power Consumption	<1W		
Protection	Reverse polarity protection. Fully sealed against dust, high-pressure washing and temporary water immersion.		
Cable Length	Pre-wired with 120mm of cable.		
Each lamp includes a black and a white plastic rim. See other available colours below			

Square Courtesy Lamp Accessories

Spare rims and housings for the square courtesy lamp family. One rim is required per lamp.









SQUARE HOUSING		
Part Number	Colour	Material
95999360	BLACK	PLASTIC
95999354	WHITE	PLASTIC









	12 VOLT DC	24 VOLT DC	
Part Number	98050051	98050151	WHITE
	98050071	98050171	WARM WHITE
	98050721	98050821	RED
	98050221	98050321	BLUE
Mounting	Recess mount with 50mm diameter hole.		
Power Consumption	1W		
Protection	Reverse polarity protection. Fully sealed against dust, high-pressure washing and temporary water immersion.		
Cable Length	Pre-wired with 120mm of cable.		
Each lamp includes a black and a white plastic rim. See other available colours below			

LED Round Courtesy Lamps - Clear Lens

Attractive, energy efficient square LED courtesy lamps for interior and exterior use. Available in either white, warm white, red or blue and supplied with a white and black rim. Optic appears clear until illuminated.



P/N 98050051







P/N 98050071

P/N 98050721

P/N 98050221

ROUND RIMS - SINGLE			
Part Number	Colour	Material	
95950501	CHROME PLATED	PLASTIC	
95950520	BLACK	PLASTIC	
95950550	POLISHED	316 STAINLESS	
95950556	SATIN CHROME PLATED	STEEL	

ROUND HOUSING		
Part Number	Colour	Material
95999310	BLACK	PLASTIC
95999311	WHITE	PLASTIC



Round Courtesy Lamp Accessories

Spare rims and housings for the round courtesy lamp family. One rim is required per lamp.





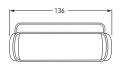




DuraLED® WL200 Work Lamp - Close Range

LED universal work lamp with low profile stainless steel bracket. Lamp may be mounted upright or pendant and may be adjusted vertically up or down. Totally sealed against dust and moisture and with a tough, chemical resistant Grilamid® lens.















8067030	WHITE
oright or pendant.	
ultivolt™ for optimum brightness at input voltages from 9 to 33	3 volts.
V	
00 lumen	
everse polarity and voltage spike protection. 6K7 (Protection against dust and temporary water immersior 6K9K (Protection against dust and high-pressure/steam jet c	,
re-wired with 2.5m of sheathed multi-core cable.	
gh impact and chemical resistant Grilamid® lens	
€	<u>&</u>
0 0	right or pendant. Illtivolt™ for optimum brightness at input voltages from 9 to 33 D lumen Verse polarity and voltage spike protection. SK7 (Protection against dust and temporary water immersion SK9K (Protection against dust and high-pressure/steam jet of e-wired with 2.5m of sheathed multi-core cable. Style impact and chemical resistant Grilamid® lens

DuraLED® WL200 RFCommSafe™ Work Lamp - Close Range

LED universal work lamp with low profile stainless steel bracket developed with RFCommSafe™ technology. RFCommsafe™ products offer superior electromagnetic compatibility (EMC) dramatically removing the risk of unintended electromagnetic inference (EMI) on sensitive devices such as radios or communication equipment well beyond the requirement of international standards. Lamp may be mounted upright or pendant and may be adjusted vertically up or down. Hermetically sealed against dust and moisture. Featuring a tough, chemical resistant Grilamid® lens.









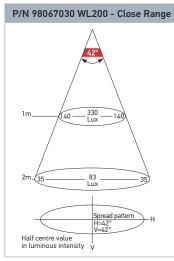








Part Number	12 VOLT	24 VOLT	
	98067038	98067062	WHITE
Mounting	Upright or pendant.		
Power Consumption	4W		
Actual Light Output	150 lumen		
Protection	Reverse polarity and voltage spike protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high-pressure/steam jet cleaning)		
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.		
Lens Material	High impact and chemical resistant Grilamid® lens		
Compliance	(€		















Part Number	CLOSE RANGE	FLOOD	
	98057310	98057300	WHITE
Mounting	Upright or pendant.		
Voltage	Multivolt™ for optimum brightness at input voltages from 9 to 33 volts.		
Power Consumption	7W		
Actual Light Output	550 lumen		
Protection	Reverse polarity and voltage spike protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high-pressure/steam jet cleaning)		
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.		
Lens Material	High impact and chemical resistant Grilamid® lens		
Compliance	CE		<u>&</u>

DuraLED® WL550 Work Lamp

LED universal work lamp with low profile stainless steel bracket. Lamp may be mounted upright or pendant and may be adjusted vertically up or down. Totally sealed against dust and moisture and with a tough, chemical resistant Grilamid® lens. Option of two light patterns, close range or flood.



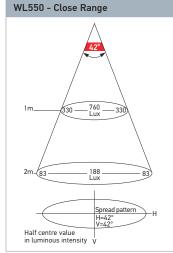


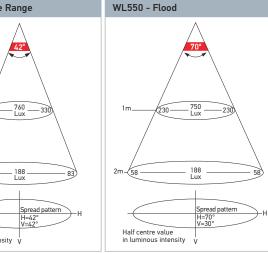
Part Number	98095003	WHITE
Mounting	Upright or pendant.	
Voltage	Multivolt™ for optimum brightness at input voltages from 9 to 33 volts.	
Power Consumption	High intensity mode: 12W (1A@12V DC/0.50A@24V DC) Low intensity mode: 2W (0.17A@12V DC/0.08A@24V DC)	
Actual Light Output	750 lumen	
Protection	Reverse polarity and voltage spike protection. IP 6K7 (Protection against dust and temporary water immersion) IP 6K9K (Protection against dust and high-pressure/steam jet cleaning)	
Cable Length	Pre-wired with 2.5m of sheathed multi-core cable.	
Lens Material	High impact and chemical resistant Grilamid® lens	
Compliance	CE	<u>&</u>

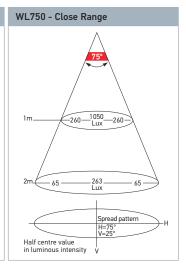
DuraLED® WL750 Work Lamp - Close Range

Featuring an integrated dual intensity circuit, a high level of spike protection and energy efficient Multivolt™ technology, the innovative DuraLED® WL750 will appeal for applications where energy efficiency and reliability is a must. Features a tough, chemical resistant Grilamid® lens, a highly impact resistant Swiss-made crystal clear polyamide with superior tolerance to chemical and long term harsh UV exposure, as well as technologically advanced thermally conductive non-metal housing.











Friction mounts; easy adjustment without



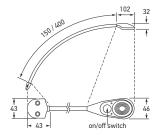
Completely sealed lamp/ cable entry. Marine grade stainless steel bracket

LED Flexible Map Reading Lamp

LED map reading light featuring a strong flexible shaft and an on/off switch on the lamp head.

Low power consumption.







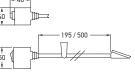
Part Number	2638	150MM ARM SIZE	
	2639	400MM ARIM SIZE	
Mounting	Screw mount.		
Voltage	Multivolt [™] for optimum brightness at input voltage from 9 to 31	volts.	
Power Consumption	2.4W		
Protection	Reverse polarity protection. IP 53 (Protection against dust and water spray)		
Cable Length	Pre-wired with 150mm of cable.		
Compliance	C€		
Suitable for interior use only.			

Map Reading Lamp

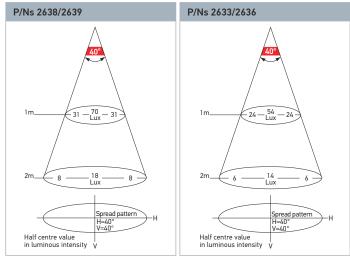
Flexible black arm. Lamp head has an integral rocker on/off switch and is fitted with a clear diffuser lens for glare-free illumination.

Pillar or dash mounting. Includes additional red lens.





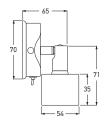












	12 VOLT DC	24 VOLT DC	
Part Number	2JA 958 358-001	2JA 958 358-201	WHITE
	2JA 958 358-011	2JA 958 358-211	WARM WHITE
Mounting	Wall mount.		
Voltage	12V DC or 24V DC		
Power Consumption	<3W		
Protection	Electronics are completely sealed from moisture and dust ingress.		
Cable Length	Pre-wired with 100mm of cable		
Compliance			

LED Ponui Gen 2 Wall Mount Lamp

LED Ponui Gen 2 wall mount interior lamp is an energy efficient and high quality wall light offering an attractive and modern design in a chrome plated housing. Both the cool white and the warm white option feature a smooth, evenly distributed illumination and an optic specifically designed to reduce individual light source glare, which can lead to discomfort and eye strain.





P/N 2JA 958 358-011

