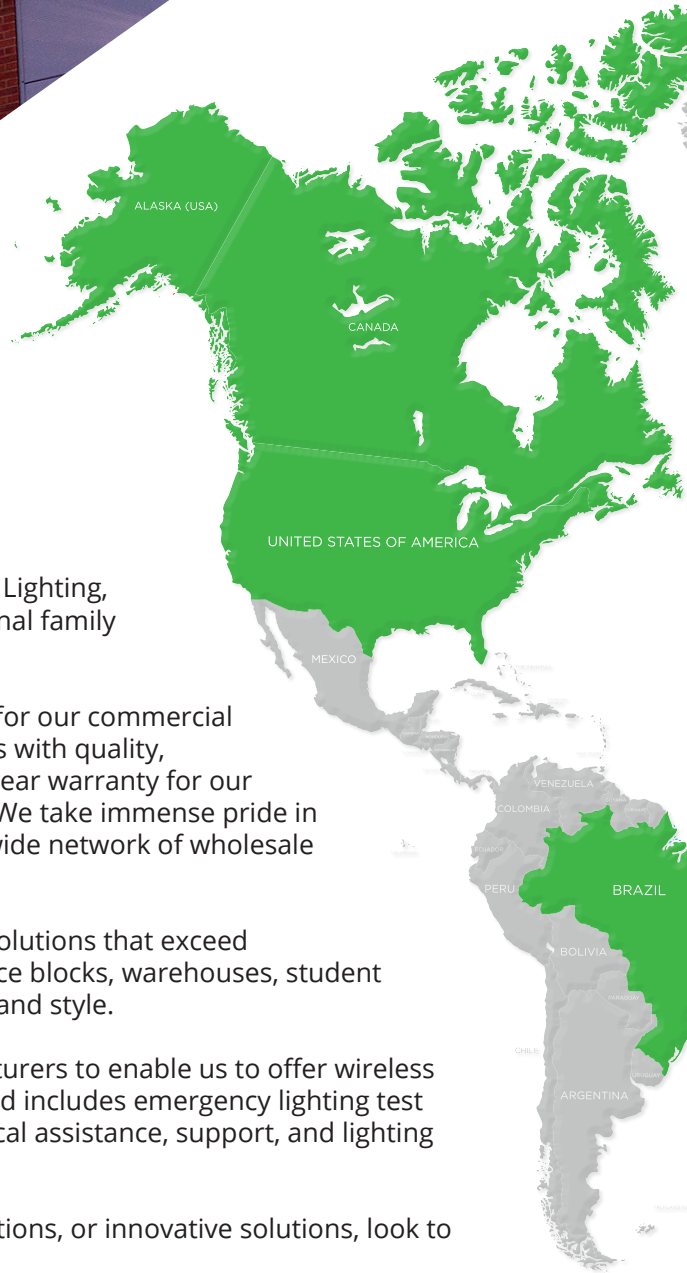


The Brighter Choice

2024

NVC LIGHTING CATALOGUE

www.nvcuk.com



Discover NVC Lighting

Your Trusted Lighting Partner

Forming part of NVC International, we proudly operate as NVC Lighting, serving the EMEA markets. As a member of the NVC International family we bring lighting solutions to customers worldwide.

Since 2007, we've established ourselves as leaders, renowned for our commercial and industrial lighting solutions. Our products are synonymous with quality, reliability, and prompt availability, backed by an impressive 7-year warranty for our PRO and newly rebranded LiFe emergency range of products. We take immense pride in delivering unrivalled customer service, supported by a nationwide network of wholesale distribution partners.

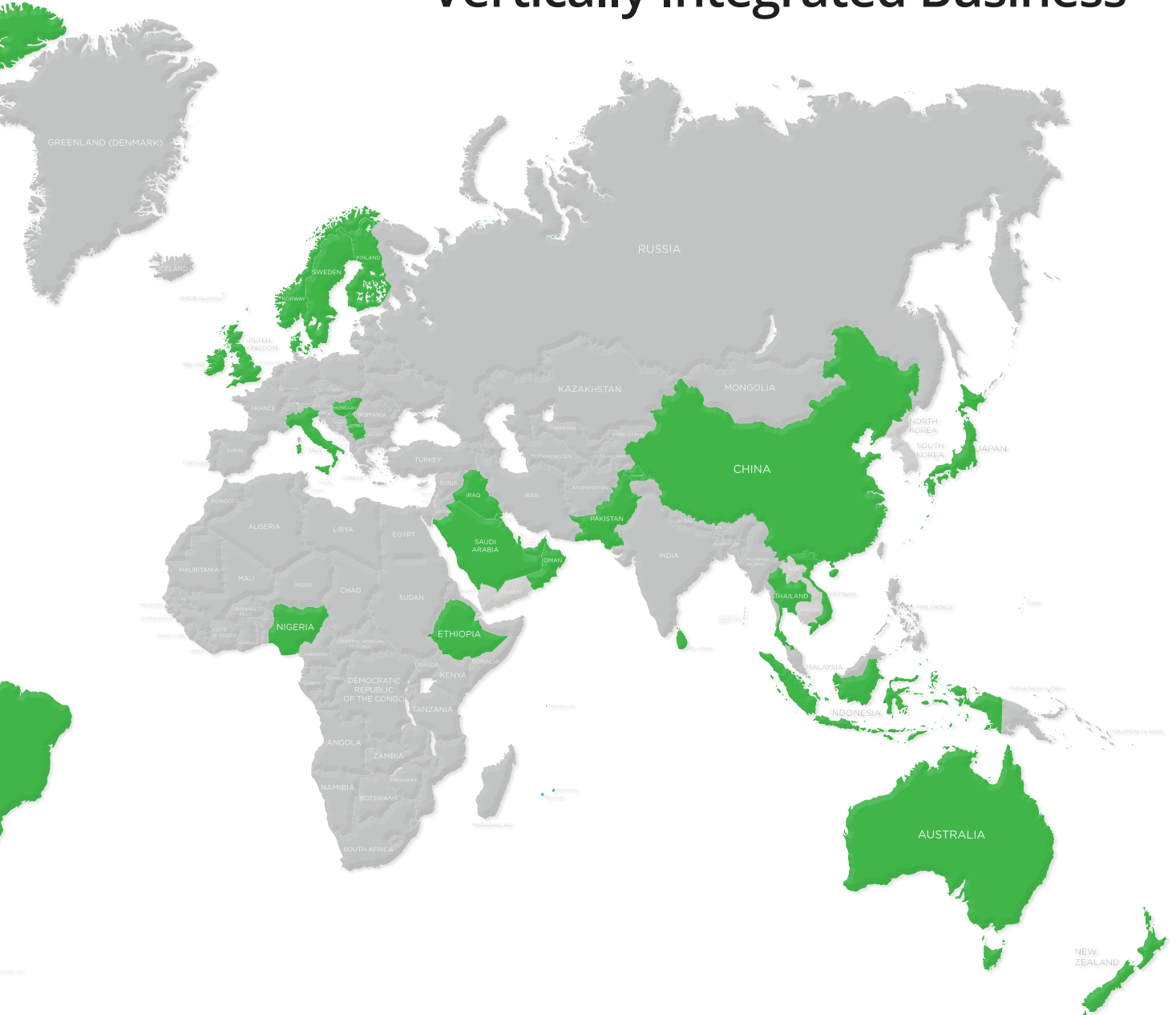
Specifiers and installers consistently choose NVC Lighting for solutions that exceed expectations. Our products brighten up schools, hospitals, office blocks, warehouses, student accommodation, and social housing and more, with efficiency and style.

At NVC Lighting, we collaborate with leading controls manufacturers to enable us to offer wireless lighting solutions. Our holistic support goes beyond lighting and includes emergency lighting test systems. Additionally, we provide an extensive range of technical assistance, support, and lighting design services to guarantee the success of your project.

Whether you seek high-performance lighting, cost-effective options, or innovative solutions, look to NVC Lighting as your preferred partner.



NVC Lighting, part of a Global and Vertically Integrated Business



Our Commitment to Industry and People

At NVC Lighting, we don't just offer exceptional products; we go above and beyond to provide an experience. Our commitment to quality, the environment and the well-being of our employees and customers is of utmost importance. That's why we proudly hold certifications in five globally recognised standards: ISO9001, ISO14001, ISO45001 and the recently approved ISO22301 and ISO 50001.



Discover NVC Lighting

The Brighter Choice for Lighting Solutions

Core Selection

Our widely stocked **core** range offers popular items with excellent ratings and a 5-year warranty. These products are perfect for your everyday lighting needs.



PRO Range

Our high-performing products provide countless options and features. With impressive ratings and a 7-year warranty, you can trust in their longevity and reliability.

LiFe Emergency Range

We've rebranded our emergency lighting product range to **LiFe**, now featuring lithium battery technology (LiFePO₄) as standard, offering longer life, greater efficiency, and a greener alternative. Enjoy the benefits of reduced waste and a 7-year warranty, including battery coverage, from the date of installation.



Partnering with Industry Bodies and Organisations for Lighting Excellence

At NVC Lighting, we understand that our customers rely on us for lighting solutions that not only brighten up spaces but also comply with industry guidelines and regulations. That's why we actively participate with multiple industry bodies and initiatives. By staying connected with these organisations, we remain at the forefront of evolving trends and requirements in the market.

Our membership of these industry bodies ensures that we are well-informed about the latest advances in lighting technology, energy efficiency standards, and sustainability practices. We take this knowledge and apply it to every product and service we offer, delivering solutions that exceed expectations.

Our continuous engagement with industry leaders and initiatives allows us to anticipate and adapt to changing market demands, ensuring that we provide lighting solutions that are relevant, innovative, and future-proof.

Accreditations



LIAQA – we are an LIA Quality Assured Company. Developed by industry experts at the LIA, this quality assurance scheme meticulously evaluates our quality systems and product compliance. It serves as a crucial mechanism to guarantee that we consistently meet and exceed the rigorous standards set for LIA membership.



LIA – as members of the LIA, we have access to their technical knowledge and training facilities ensuring we keep abreast of developments in standards and regulations.



LIA LAB – Our photometric laboratory is LIA certified - meaning that it has been independently assessed to deliver accurate and consistent results, presented in line with best industry practice.



ICEL – the Industry Committee for Emergency Lighting (ICEL) is a division of the LIA. It provides specialist input to standards bodies in the UK and internationally. Through our representative on the ICEL Technical Committee, we keep abreast of the latest developments in this safety critical field.

ICEL Endorsed – our LiFe range of emergency lighting products carry the ICEL Endorsed mark.



EDA – we are members of the EDA, the premier organisation representing and working with the electrical distribution sector. We play an active part in their training initiatives, spreading our lighting knowledge to their members.



ECA – as members of the Electrical Contractors Association, we can stay connected with the needs of our customers and installers.



RELUX - NVC Lighting is a member of RELUX who are specialists in lighting planning and product presentation software. NVC Lighting photometric data is available through RELUX.



Lumicom – as members of the Lumicom compliance scheme for the recycling of lamps, light fittings and batteries, any NVC Lighting product can be collected and recycled at no cost to the contractor or end-user.



EData Gold – all our product data is available in the EDA's own data format, making our products easier to find, source and compare.



FORS – Our membership of FORS shows that we are achieving exemplary levels of best-practice in safety, efficiency and environmental protection.



Luckins – all our product pricing data is available through Luckins, a reference source for distributors, contractors and engineers who need a one-stop shop for product information.



Carbon Neutral – NVC Lighting has been certified as carbon neutral.



Ecovadis – NVC Lighting carries the Ecovadis Gold sustainability rating.

NVC Lighting's Photometric Lab

At NVC Lighting, we hold the conviction that genuine innovation originates from within. That's why we take pride in housing our photometric lab at the core of our operations. Through this facility, we reinforce our commitment to industry standards, ensuring the excellence and precision of each product we provide.



Proudly since 2023, our UK photometric laboratory has received official recognition and registration from the Lighting Industry Association (LIA). This acknowledgement underscores our commitment to the highest standards in lighting testing and certification. It guarantees that our customers receive accurate and reliable performance data for our products.



Experience the Support of NVC Lighting's Partnership



We are committed to helping you succeed. When you join us as an NVC Lighting distribution partner you gain access to a comprehensive range of support services and materials.

- **Point of Sale (POS) Materials**
- **Comprehensive Product Catalogue**
- **Branded Merchandise**
- **Lighting Design Expertise:** As an NVC Lighting distribution partner, you and your clients receive priority access to our complimentary design service.
- **On-Site Support:** Benefit from our highly qualified and experienced team of lighting sales engineers who prioritise the needs of our distribution partners and customers.
- **Project Support:** Our dedicated project support team at our head office is here to guide you through the management of larger projects, from quotation to delivery.
- **Vertical Marketing Support:** If you are targeting specific vertical markets such as schools, warehouses, or offices, we provide a range of marketing materials to help you propose tailored lighting solutions.



SUSTAIN

Making a Positive Impact

Carbon Neutral: Partnering for a Greener Future

NVC Lighting is proud to be Carbon Neutral Certified, emphasising our commitment to the environment. We've taken steps to offset our carbon footprint, making our lighting solutions a responsible choice. By choosing NVC Lighting, you're choosing a brand that prioritises sustainability and makes a positive impact on the environment with our carbon-neutral approach



Reducing Environmental Impact: Packaging Optimisation

We believe in minimising our environmental footprint at every step. One area we are focusing on is packaging. By reducing packaging volume, we can significantly decrease transportation emissions. For example, our efforts have led to the elimination of plastic bags and polystyrene packaging across our entire product range. These changes not only promote sustainability but also continue the safe transit of our products without any increase in breakages or damage.



Sustainable Practices: Supporting our Customers

Sustainability is a collective effort. We want to make it easy for our customers to embrace sustainable practices too. As an example, we have reimagined our packaging for small downlights (60-80mm cut out). Instead of individually packed units, we offer contractor packs of 10, reducing packaging weight by over 75% and volume by more than 80%. To access the instruction leaflet, customers can simply scan a QR code, reducing paper waste and on-site disposal concerns. With these changes, we are empowering our customers to contribute to a sustainable future.

ABILITY



Recognised for Sustainability Excellence: EcoVadis Gold Standard 2023

NVC Lighting are proud to have achieved the prestigious EcoVadis Gold Standard 2023 sustainability rating. EcoVadis, the world's largest sustainability ratings company, rigorously evaluates companies based on supply chain employment practices, environmental policies, and energy efficiency standards. Our Gold Standard rating reflects our commitment to sustainable business practices and can serve as your assurance of our dedication to the environment.

Compliant with WEEE Regulations: Lumicom Membership

At NVC Lighting, we prioritise compliance with the Waste Electrical and Electronic Equipment (WEEE) regulations. To ensure that WEEE compliance is effortless for our customers we are members of Lumicom. If you choose our fittings to replace existing fixtures, Lumicom will collect and recycle the old fittings, regardless of the brand, at no additional cost to you. Through their Approved Authorised Treatment Facility (AATF), Lumicom expertly disassembles luminaires, sorting and recycling materials responsibly. By partnering with Lumicom, we make WEEE compliance effortless for everyone involved.



Choose NVC Lighting for Sustainable Solutions

By selecting NVC Lighting, you are choosing a supplier that prioritises sustainability and actively works to reduce environmental impact. Our commitment to carbon neutrality, packaging optimisation and effortless compliance with regulations sets us apart.

WHAT'S NEW?

Explore our latest lighting products, delivering top-tier efficiency and reliability for your evolving needs.

KELSO

Completely re-engineered to be easier to install (more compact and lighter weight), and the efficiency has increased by nearly 20% up to 151 l.lm/c.W

See page 80



YALE PRO

Our highly regarded YALE has been re-engineered with a two-part sliding endcap for easy installation, power selectability with 4 wattages and increased lighting efficiency up to 137 l.lm/c.W

See page 18



PUMA

Residential and light-commercial floodlight, available in 4 wattages (10W, 20W, 30W and 50W) with optional sensor

See page 86



We led the way introducing lithium batteries and we are leading the way phasing-out NiCd batteries. NiCd batteries are now only available while stocks last, so from early in 2024 our entire emergency range will have lithium batteries.



ADDISON PRO

Now with two wattages it has an even higher output (28W, 3,565 lm), and is CCT selectable (3000K, 4000K and 5000K).

See page 48



PASCO

Decorative bulkhead.
9 products in 1, with selectable wattage (9W, 14W, and 18W) and CCT (3000K, 4000K and 6500K).
See page 47



NEPTUNE

Industrial high-bay. Choice of 3 wattages and 3 beam angles (120°, 90° and 60°).
See page 81

100W

150W

200W



NEW SMART CONTROLS INCLUDING ADDRESSABLE EMERGENCY TEST

We now offer 3 smart, wireless lighting control options:



- **Philips MasterConnect**
all the lighting control features you need on most small projects

CASAMBI

- **Casambi**
Casambi is an ecosystem of connectable lighting and lighting control devices

inventronics HUBSENSE

- **Inventronics HubSense**
Great lighting control features, and a fully wirefree addressable emergency test system too

These all use wireless (mesh) technology to offer a lower cost alternative to more expensive DALI wired solutions.



Smart/wireless symbol – wherever you see this symbol, smart wireless solutions are available, and our technical team has the details.

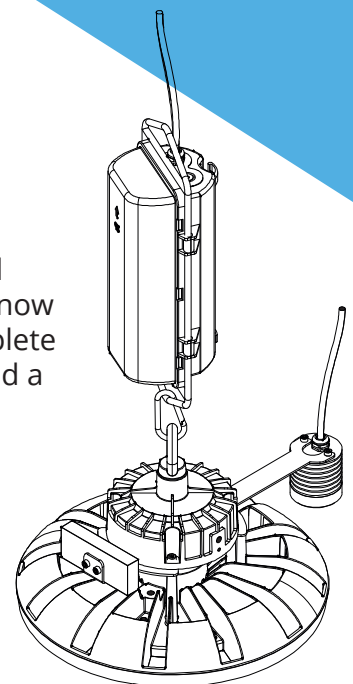
For more details of all our smart wireless options, see pages 100-103.

FLORIDA

Recessed back-lit panel with opal diffuser or UGR<19 micro-prismatic controller
See page 29

HIGH-BAY EMERGENCY CONVERSION KIT

A high-bay emergency conversion kit in manual and self-test versions is now available, supplied complete with lithium batteries and a 7-year warranty
See page 68



SURFACE & SUSPENDED LIGHTING



P16

DALLAS



P18

YALE PRO



P20

PHOENIX



P22

TEXAS PRO



P23

TEXAS

LED PANELS



P26

LINCOLN



P27

STERLING



P28

FULTON



P29

FLORIDA



P30

BISMARCK

RECESSED DOWNLIGHTS



P34

WESTMINSTER



P35

WASHINGTON



P36

HARSTED



P40

MIAMI



P41

VENUS



P42

MERCURY

AMENITY LIGHTING



P46

PORTLAND



P47

PASCO



P48

ADDISON PRO



P49

PRESTON



P50

DENALI



P51

SPARTAN



P52

BRONX SLIM



P53

REBUS



P54

RENO

EMERGENCY LIGHTING



P60

NEBRASKA LiFe



P61

LEXINGTON LiFe



P62

ARLINGTON LiFe



P64

SENECA LiFe RECESSED



P65

SENECA LiFe SURFACE



P66

SYRACUSE LiFe



P67

KANSAS LiFe



P68

HIGH-BAY EMERGENCY CONVERSION KIT



P69

RECESSED EMERGENCY CONVERSION KIT

INDUSTRIAL LIGHTING



P72

GREENLAND



P74

CLEVELAND



P76

OREGON



P78

JUPITER



P80

KELSO



P81

NEPTUNE

FLOODLIGHTING



P84

LYNX



P85

COUGAR



P86

PUMA

STREET LIGHTING & POST-TOP



P90

BELFRY



P92

JASPER



P93

FREMONT



P94

EDMONTON

LIGHTING CONTROLS



LEVEL

1

P98

ONE SENSOR
PER FITTING



LEVEL

2

P99

MASTER /
SERVANT



LEVEL

3

P100

WIRELESS
CONTROLS



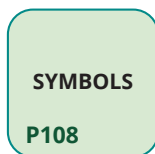
LEVEL

4

P104

WIRED DALI

TECHNICAL SECTION



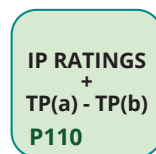
SYMBOLS

P108

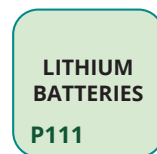


WARRANTY

P109



IP RATINGS
+ TP(a) - TP(b)
P110



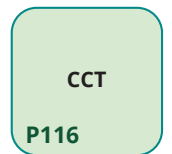
LITHIUM
BATTERIES

P111



DIMMING

P112



CCT

P116



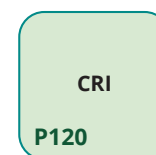
CIRCADIAN
LIGHTING

P117



TUNEABLE
WHITE
LIGHTING

P118



CRI

P120



INDEX

P122

An improved range of solutions for offices, schools, hospitals and workshops

The long-established and highly regarded YALE range has received a thorough upgrade, and is now replaced by the YALE PRO. While retaining the high quality and robust construction for which it was famed, the YALE PRO is now easier to fit, with the end-cap held captive on a single-screw fixing, and efficiency has been increased by over 33%.

RANGE NAME	INSTALLATION		LENGTH FT	WATTAGE W	DIMMING	EMERGENCY	OPTIONAL SENSOR		COLOUR TEMP		IP RATING
	SURFACE	SUSPENDED					INTERNAL	EXTERNAL	4K	5K	
PRO											
DALLAS	✓	✓	4	36 & 50	✓	✓			✓		IP20
	✓	✓	5	42 & 60	✓	✓			✓		IP20
YALE PRO	✓	✓	4	20-37	✓	✓	MW	PIR	✓		IP40
	✓	✓	5	27-44	✓	✓	MW	PIR	✓		IP40
	✓	✓	6	36-58	✓	✓	MW	PIR	✓		IP40
PHOENIX	✓	✓*	4	30	✓	✓		PIR or MW	✓	✓	IP20
	✓	✓*	5	40 & 65	✓	✓		PIR or MW	✓	✓	IP20
	✓	✓*	6	50 & 75	✓	✓		PIR or MW	✓	✓	IP20
TEXAS PRO	✓	✓*	4	22 & 37	✓	✓		PIR or MW	✓	✓	IP20
	✓	✓*	5	36 & 54	✓	✓		PIR or MW	✓	✓	IP20
	✓	✓*	6	44 & 71	✓	✓		PIR or MW	✓	✓	IP20
core											
TEXAS	✓	✓*	4	24 & 46		✓		PIR or MW	✓		IP20
	✓	✓*	5	40 & 64		✓		PIR or MW	✓		IP20
	✓	✓*	6	49 & 77		✓		PIR or MW	✓		IP20

* Can be suspended - suspension kit to be supplied by installer



SURFACE & SUSPENDED LIGHTING



P16

DALLAS



P18

YALE PRO



P20

PHOENIX



P22

TEXAS PRO



P23

TEXAS

DALLAS

Surface and/or suspended fittings are a versatile solution, especially in buildings with high ceilings, or with a range of different ceiling heights and styles



LED STRIP ON REAR PROVIDES 30% UPLIGHT ON BI-DIRECTIONAL VERSIONS



APPLICATIONS

- Corridors and communal areas in schools, colleges and public buildings
- For surface or suspended installation

TECHNICAL DETAILS

- 165 lm/W
- DOWNLIGHT ONLY**, for surface or suspended installation, in 2 lengths, each with opal diffuser or aluminium reflector
 - 4ft (36W) opal, 4,450 lm, 121 l.lm/c.W
 - 4ft (36W) reflector, 4,240 lm, 117 l.lm/c.W
 - 5ft (42W), opal, 4,620 lm, 109 l.lm/c.W
 - 5ft (42W), reflector, 4,420 lm, 106 l.lm/c.W
- BI-DIRECTIONAL** (70% down & 30% up), for suspended installation only, in 2 lengths, each with opal diffuser or aluminium reflector
 - 4ft (50W) opal, 5,780 lm, 115 l.lm/c.W
 - 4ft (50W) reflector, 5,495 lm, 113 l.lm/c.W
 - 5ft (60W), opal, 6,890 lm, 115 l.lm/c.W
 - 5ft (60W), reflector, 6,765 lm, 114 l.lm/c.W
- CCT 4000K

- CRI >80
- Branded ENEC approved flicker free driver
- Emergency maintained 3 hr versions available as listed (suffix M3)

CONSTRUCTION

- Aluminium and polycarbonate construction
- White powder coated finish - RAL9016
- UV stable opal polycarbonate diffuser
- LEDs on metal core PCB
- Coupling kits available to extend system

OPTIONS

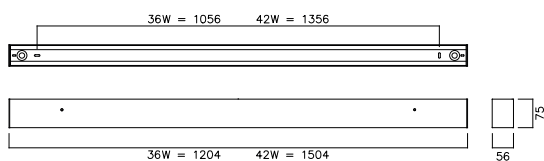
SPECIALIST EMERGENCY
Self-Test Emergency (Suffix STM3) or DALI Addressable Emergency (Suffix DAM3) options available

DIMMING DD (DALI or Switch Dim) or CF (Corridor Function) available. Add suffix DD or CF as required

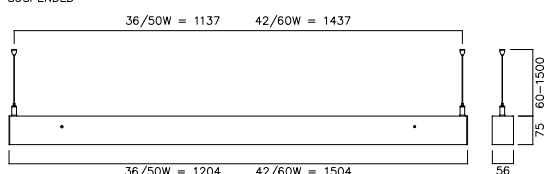
SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details

ORDER CODE	DESCRIPTION	DOWNLIGHT ONLY
NDL36/O/DO/840	Dallas 36W Opal LED 4Ft Surf Suspended Down Only 840	
NDL36/O/DO/M3/840	Dallas 36W Opal LED 4Ft Surf Suspended Down Only M3 Lithium 840	
NDL42/O/DO/840	Dallas 42W Opal LED 5Ft Surf Suspended Down Only 840	
NDL42/O/DO/M3/840	Dallas 42W Opal LED 5Ft Surf Suspended Down Only M3 Lithium 840	
NDL36/R/DO/840	Dallas 36W Reflector LED 4Ft Surf/Susp Down Only 840	
NDL36/R/DO/M3/840	Dallas 36W Reflector LED 4Ft Surf/Susp Down Only M3 Lithium 840	
NDL42/R/DO/840	Dallas 42W Reflector LED 5Ft Surf/Susp Down Only 840	
NDL42/R/DO/M3/840	Dallas 42W Reflector LED 5Ft Surf/Susp Down Only M3 Lithium 840	
BI-DIRECTIONAL		
NDL50/O/BD/840	Dallas 50W Opal LED 4Ft Suspended Bi-Direct 840	
NDL50/O/BD/M3/840	Dallas 50W Opal LED 4Ft Suspended Bi-Direct M3 Lithium 840	
NDL60/O/BD/840	Dallas 60W Opal LED 5Ft Suspended Bi-Direct 840	
NDL60/O/BD/M3/840	Dallas 60W Opal LED 5Ft Suspended Bi-Direct M3 Lithium 840	
NDL50/R/BD/840	Dallas 50W Reflector LED 4Ft Suspended Bi-Direct 840	
NDL50/R/BD/M3/840	Dallas 50W Reflector LED 4Ft Suspended Bi-Direct M3 Lithium 840	
NDL60/R/BD/840	Dallas 60W Reflector LED 5Ft Suspended Bi-Direct 840	
NDL60/R/BD/M3/840	Dallas 60W Reflector LED 5Ft Suspended Bi-Direct M3 Lithium 840	

SURFACE MOUNT

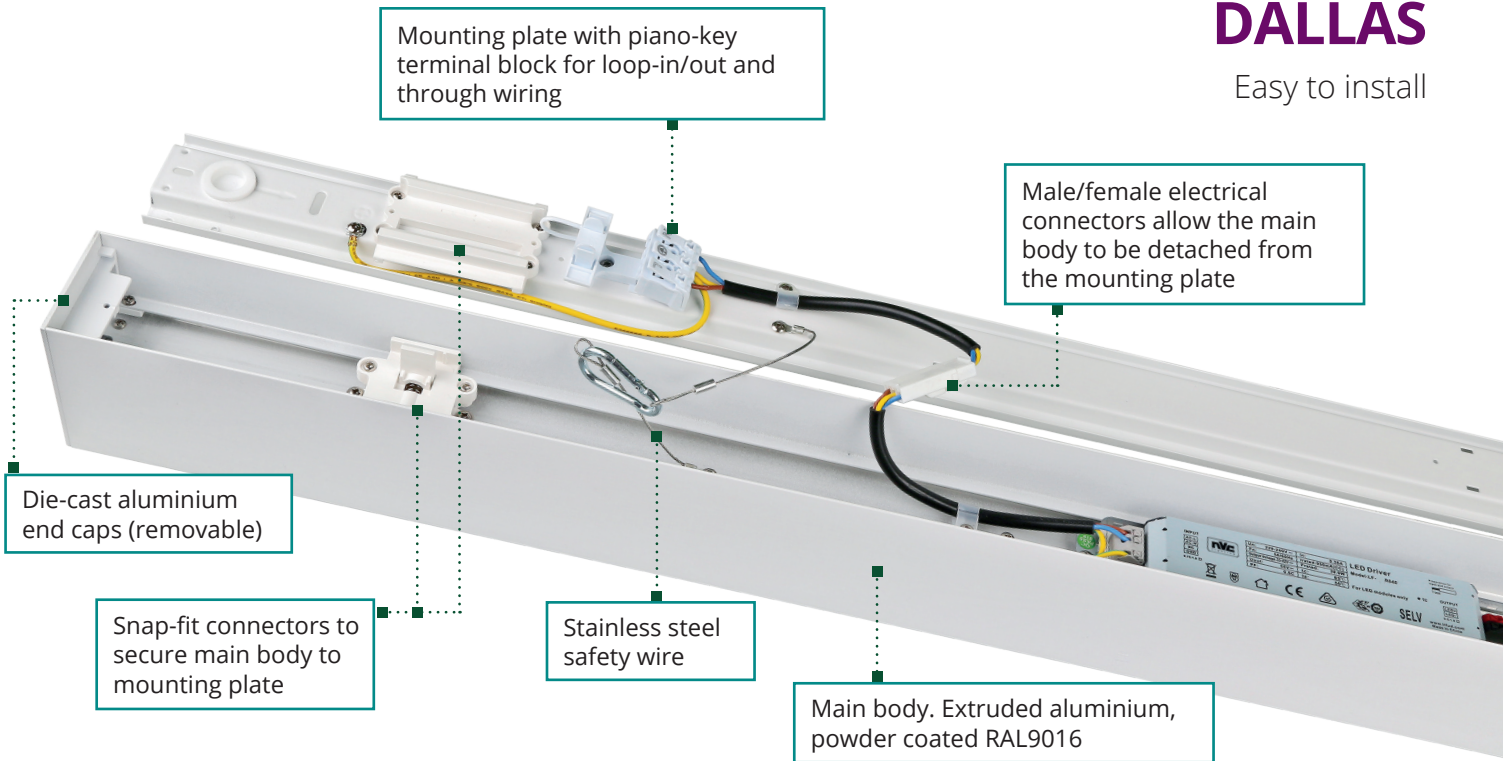


SUSPENDED



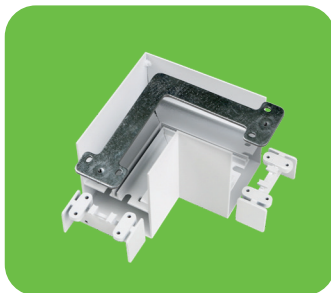
DALLAS

Easy to install

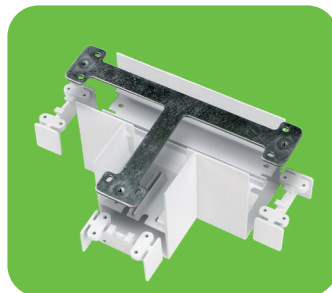


Fittings can be installed individually or as continuous runs in straight-line, L, T or X configurations and the suspended versions can deliver 100% downlight, or a mix of 70% downlight and 30% uplight.

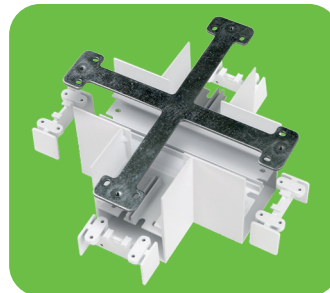
DALLAS ACCESSORIES



"L" COUPLING KIT



"T" COUPLING KIT

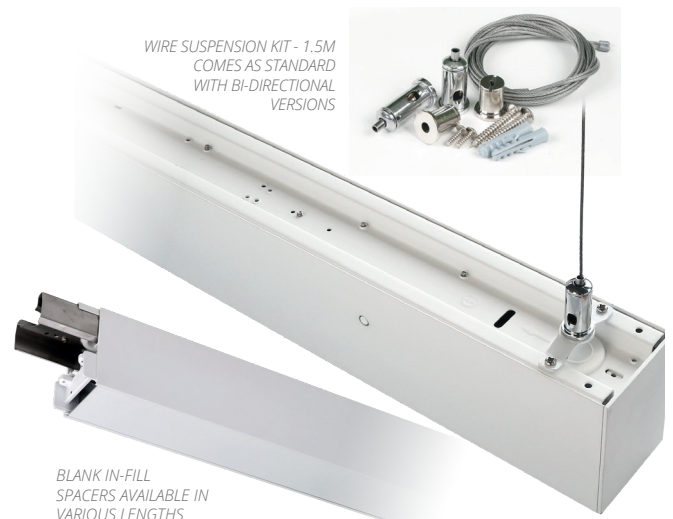


"X" COUPLING KIT



STRAIGHT COUPLING KIT

ORDER CODE	DESCRIPTION	ACCESSORIES
NDL/O/L	Dallas Opal L Joiner	
NDL/O/T	Dallas Opal T Joiner	
NDL/O/X	Dallas Opal X Joiner	
NDL/O/STRAIGHT	Dallas Opal Straight Joiner	
NDL/R/L	Dallas Reflector L Joiner	
NDL/R/T	Dallas Reflector T Joiner	
NDL/R/X	Dallas Reflector X Joiner	
NDL/R/STRAIGHT	Dallas Reflector Straight Joiner	
NDL/O/1200/BLANK/SPACER	Dallas Opal 4Ft Blank Spacer c/w Straight Coupling Kits	
NDL/O/1500/BLANK/SPACER	Dallas Opal 5Ft Blank Spacer c/w Straight Coupling Kits	
NDL/R/1200/BLANK/SPACER	Dallas Reflector 4Ft Blank Spacer + Straight Coupling Kit	
NDL/R/1500/BLANK/SPACER	Dallas Reflector 5Ft Blank Spacer + Straight Coupling Kit	
NDL/WSK	Dallas Wire Suspension Kit 1.5m	



YALE PRO

UPGRADED AND IMPROVED

A robust, low glare, multi-wattage fitting for surface or suspended use



PRO FEATURES

UGR<19

Clear prismatic controller for good glare control, assisting compliance where UGR<19 is required

POWER SELECTABLE

Choice of 4 different outputs in each size for flexibility

HIGHER EFFICACY

Now up to 137 luminaire lumens per circuit watt

EMERGENCY SOLUTIONS

Using lithium iron phosphate (LiFePO₄) batteries, covered by our 7-year warranty

EASY INSTALLATION

Sliding end-cap can't fall to the ground during installation. Quick release gear tray and piano key terminals make wiring easier



APPLICATIONS

- Corridors and communal areas in schools, colleges and public buildings
- For surface or suspended installation

CONSTRUCTION

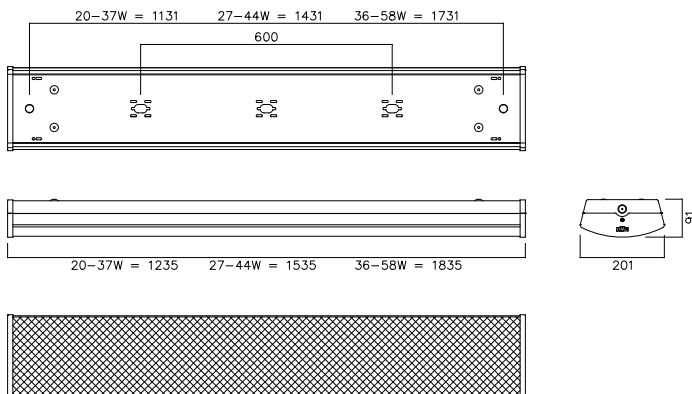
- Steel body, powder coat painted in white RAL9016, with single securing screw and drill points for conduit entry
- Opal PC micro-prismatic controller, for UGR<19 compliant lighting schemes
- 2-part PC end-cap in white RAL9016, with securing screw with drill out points for end conduit entry
- LEDs on metal core PCB, mounted on quick release steel gear tray
- Loop-in/loop-out piano key terminal block for quick and easy wiring

TECHNICAL DETAILS

- 180 lm/W
- 3 sizes available, each with 4 power settings
 - 4Ft - 20-35W, 2600-4455 lm, 127-130lm/cW
 - 5Ft - 27-44W, 3673-5710 lm, 133-137lm/cW
 - 6Ft - 36-58W, 5078-7648 lm, 132-137lm/cW
- CRI >80
- CCT 4000K
- 12% uplight, 88% downlight
- Branded ENEC approved flicker free driver
- Emergency maintained 3 hr versions available as listed (suffix M3L)

OPTIONS

- SPECIALIST EMERGENCY** Self-Test Emergency (Suffix STM3L) or DALI Addressable Emergency (Suffix DAM3L) options available
- DIMMING** DD (DALI or Switch Dim) or CF (Corridor Function) available. Add suffix DD or CF as required
- SENSORS** Available with microwave sensor fitted to gear tray. Add suffix MW. A PIR sensor (ordered separately) can also be fitted to the end cap during installation
- ACCESSORIES** Wire suspension kits available to be ordered as separate items as listed
- SMART WIRELESS** lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



ORDER CODE	DESCRIPTION
NYA/4/20-37/840	Yale Pro 20-37W LED 4Ft Surface Mount 840
NYA/4/20-37/M3L/840	Yale Pro 20-37W LED 4Ft Surface Mount M3 Lithium 840
NYA/5/27-44/840	Yale Pro 27-44W LED 5Ft Surface Mount 840
NYA/5/27-44/M3L/840	Yale Pro 27-44W LED 5Ft Surface Mount M3 Lithium 840
NYA/6/36-58/840	Yale Pro 36-58W LED 6Ft Surface Mount 840
NYA/6/36-58/M3L/840	Yale Pro 36-58W LED 6Ft Surface Mount M3 Lithium 840
ACCESSORIES	
NYA/WIRE/SUSP/KIT	Yale Wire Suspension Kit 1.5m

YALE PRO

MICRO PRISMS provide excellent glare control and 12% uplight, preventing dark ceilings

Microwave SENSOR can be fitted here. To order, add suffix MW

SINGLE STAINLESS STEEL screw holds each end-cap in place

DRILL POINT for conduit entry or for attaching an external sensor

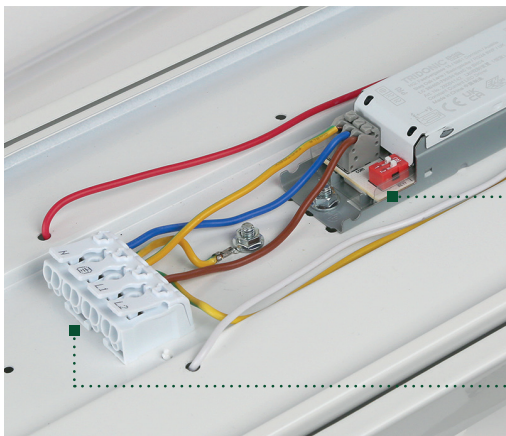
DURING INSTALLATION the end-caps slide outwards (without falling away) to release the controller

DETACHABLE GEAR TRAY secured on spring clips with safety retaining straps to make installation safer and easier

IK10 IMPACT RESISTANCE and a smooth wipe-clean external surface

DIP SWITCHES on the driver allow 4 different power settings to be selected

PIANO KEY TERMINALS with loop-in/loop-out for quick and easy wiring



Ideal for school corridors

YALE PRO is IK10 rated. The end caps are secured to the heavy-duty steel body with stainless steel screws and the controller is made of high-impact polycarbonate.

PHOENIX

Superior batten available in 4', 5' and 6', standard and high-output with additional options



CONSTRUCTION DETAIL LED'S ON MCPCB WITH OPAL DIFFUSER



APPLICATIONS

- Garages, workshops and store rooms
- Corridors and communal areas

CONSTRUCTION

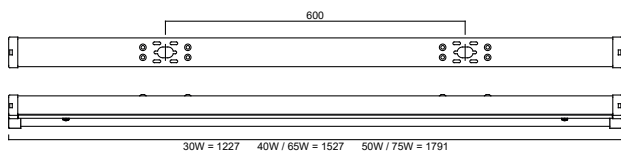
- Conventional batten width steel body
- LEDs on metal-core PCB
- White gloss powder coated finish
- Opal polycarbonate LED diffuser
- BESA fixing points on rear

TECHNICAL DETAILS

- 165 lm/W
- **SIZE** Standard and high-output versions available in 3 sizes:
 - 4', 30W, 3,810 lm, 127 l.lm/c.W
 - 5', 40W, 4,955 lm, 130 l.lm/c.W
 - 5', 65W, 8,350 lm, 127 l.lm/c.W
 - 6', 50W, 6,070 lm, 126 l.lm/c.W
 - 6', 75W, 9,165 lm, 123 l.lm/c.W
- CRI >80
- CCT 4000K or 5000K
- Branded ENEC approved flicker free driver

OPTIONS

- EMERGENCY** Maintained 3 hrs available on all variants (add suffix M3L)
- SPECIALIST EMERGENCY** Self-Test Emergency (Suffix STM3) or DALI Addressable Emergency (Suffix DAM3) options available
- DIMMING** DD (DALI or Switch Dim) or CF (Corridor Function) available. Add suffix DD or CF as required
- ATTACHMENTS** Full range available. Page 21
- SENSORS** MW or PIR end mount sensors available, see page 98
- SMART WIRELESS** lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



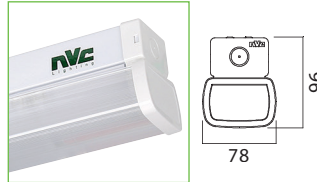
ORDER CODE	DESCRIPTION	4000K
NPH30/LED/840	Phoenix LED 30W 4Ft 840	
NPH40/LED/840	Phoenix LED 40W 5Ft 840	
NPH50/LED/840	Phoenix LED 50W 6Ft 840	
NPH65/LED/840	Phoenix LED 65W 5Ft High Output 840	
NPH75/LED/840	Phoenix LED 75W 6Ft High Output 840	
ORDER CODE	DESCRIPTION	5000K
NPH30/LED/850	Phoenix LED 30W 4Ft 850	
NPH40/LED/850	Phoenix LED 40W 5Ft 850	
NPH50/LED/850	Phoenix LED 50W 6Ft 850	
NPH65/LED/850	Phoenix LED 65W 5Ft High Output 850	
NPH75/LED/850	Phoenix LED 75W 6Ft High Output 850	

PHOENIX ATTACHMENTS

CONTROLLER

Made from polycarbonate, the controller is shatter proof and virtually indestructible. The smooth exterior gives an easily cleaned surface while the ribbed interior gives an attractive appearance and good glare control. Supplied complete with the necessary support clips.

ORDER CODE	DESCRIPTION
NPH/CNTR/LED/30	Phoenix Controller LED 30W 4Ft
NPH/CNTR/LED/40	Phoenix Controller LED 40/65W 5Ft
NPH/CNTR/LED/50	Phoenix Controller LED 50/75W 6Ft
NPH/CNTR/CLIP/PK4	Phoenix Controller LED Support Clip Pack Of 4

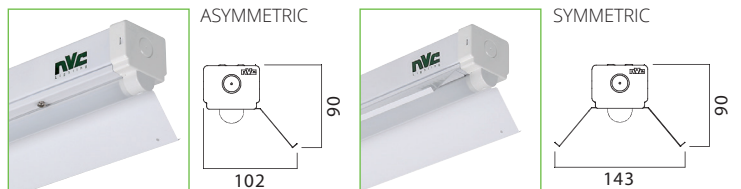


STEEL REFLECTOR

Made from steel with white gloss powder coated finish. Order as required to create a symmetric or an asymmetric distribution:

- When fitted as a pair, these will give a symmetric distribution
- When fitted singly, these will give an asymmetric light distribution

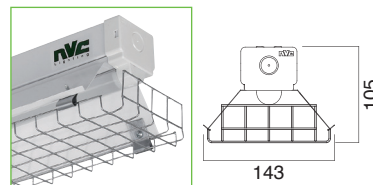
ORDER CODE	DESCRIPTION
NPH/REFL/LED/30/ST	Phoenix Reflector Steel LED 30W 4Ft 1-Side
NPH/REFL/LED/40/ST	Phoenix Reflector Steel LED 40/65W 5Ft 1-Side
NPH/REFL/LED/50/ST	Phoenix Reflector Steel LED 50/75W 6Ft 1-Side



WIRE GUARD

Made from zinc coated steel mesh. Each wire guard attaches to a pair of steel reflectors with the fixing kit supplied

ORDER CODE	DESCRIPTION
NPH/WG/LED/40	Phoenix Wire Guard LED 40/65W 5Ft
NPH/WG/LED/50	Phoenix Wire Guard LED 50/75W 6Ft



BATTEN-MOUNT SENSORS

These sensors all have a 20mm threaded entry and are suitable (subject to their IP rating) for fitting to battens and non-corrosive fittings. They are both to be ordered as separate items to be fitted to the luminaire during installation.



See our CONTROLS section, page 98 for more details

TEXAS PRO

High performance batten available in 4', 5' and 6' sizes in standard and high-output



PRO FEATURES

LOWER POWER CONSUMPTION
The power consumption of **TEXAS PRO** is up to 19% less than TEXAS

HIGHER LIGHT OUTPUT
Every **PRO** fitting has a higher light output than the equivalent **core** fitting - up to 15% more

CHOICE OF COLOUR TEMPERATURE
4000K or 5000K

DIMMING
DALI, switch-dim or corridor function

EMERGENCY SOLUTIONS
Using lithium iron phosphate (LiFePO₄) batteries, covered by our 7-year warranty

APPLICATIONS

- Suitable for commercial or domestic applications

CONSTRUCTION

- Conventional batten width steel body
- White RAL9016 powder coated finish
- Opal polycarbonate LED diffuser
- BESA fixing points on rear
- LEDs on metal core PCB
- Central cable entry point
- Piano key terminal block for speed of installation and loop-in / loop-out wiring
- Provided with security screws to stop removal of front cover from the body

TECHNICAL DETAILS

- 180 lm/W
- Available in 3 sizes:
 - 1x4', 22W, 3,211 lm, 145 l.lm/c.W
 - 2x4', 37W, 5,254 lm, 142 l.lm/c.W
 - 1x5', 36W, 5,161 lm, 143 l.lm/c.W
 - 2x5', 54W, 7,722 lm, 143 l.lm/c.W
 - 1x6', 44W, 6,139 lm, 140 l.lm/c.W
 - 2x6', 71W, 10,011 lm, 141 l.lm/c.W
- CRI>80
- CCT 4000K or 5000K
- Branded ENEC approved flicker free driver

OPTIONS

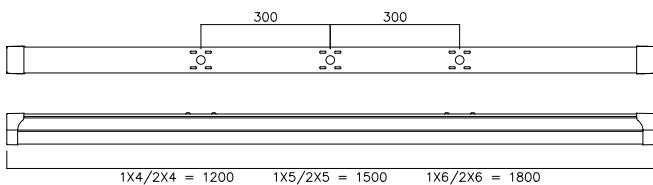
TEXAS PRO can be fitted with either of the batten-mount sensors listed on page 98, which are to be purchased separately

EMERGENCY Maintained 3 hrs available on all variants (add suffix M3L)

SPECIALIST EMERGENCY Self-Test Emergency (Suffix STM3) or DALI Addressable Emergency (Suffix DAM3) options available

DIMMING DD (DALI or Switch Dim) or CF (Corridor Function) available. Add suffix DD or CF as required

SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



ORDER CODE	DESCRIPTION	4000K
NTE1X4/PRO/840	Texas Pro LED Single 4Ft Batten 840	
NTE1X5/PRO/840	Texas Pro LED Single 5Ft Batten 840	
NTE1X6/PRO/840	Texas Pro LED Single 6Ft Batten 840	
NTE2X4/PRO/840	Texas Pro LED Twin 4Ft Batten 840	
NTE2X5/PRO/840	Texas Pro LED Twin 5Ft Batten 840	
NTE2X6/PRO/840	Texas Pro LED Twin 6Ft Batten 840	
ORDER CODE	DESCRIPTION	5000K
NTE1X4/PRO/850	Texas Pro LED Single 4Ft Batten 850	
NTE1X5/PRO/850	Texas Pro LED Single 5Ft Batten 850	
NTE1X6/PRO/850	Texas Pro LED Single 6Ft Batten 850	
NTE2X4/PRO/850	Texas Pro LED Twin 4Ft Batten 850	
NTE2X5/PRO/850	Texas Pro LED Twin 5Ft Batten 850	
NTE2X6/PRO/850	Texas Pro LED Twin 6Ft Batten 850	

TEXAS

Batten available in 4', 5' and 6' sizes in standard and high-output



APPLICATIONS

- Suitable for commercial or domestic applications

CONSTRUCTION

- Conventional batten width steel body
- White RAL9016 powder coated finish
- Opal polycarbonate LED diffuser
- BESA fixing points on rear
- LEDs on metal core PCB
- Central cable entry point
- Piano key terminal block for speed of installation and loop-in / loop-out wiring
- Provided with security screws to stop removal of front cover from the body

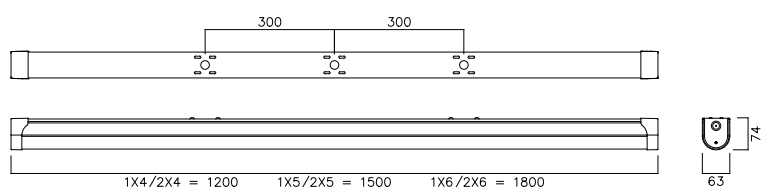
TECHNICAL DETAILS

- 160 lm/W
- Available in 3 sizes:
 - 1x4', 24W, 2,970 lm, 126 l.lm/c.W
 - 2x4', 46W, 5,700 lm, 125 l.lm/c.W
 - 1x5', 40W, 4,760 lm, 120 l.lm/c.W
 - 2x5', 64W, 7,620 lm, 119 l.lm/c.W
 - 1x6', 49W, 6,040 lm, 124 l.lm/c.W
 - 2x6', 77W, 8,715 lm, 113 l.lm/c.W
- CRI>80
- CCT 4000K
- Branded ENEC approved flicker free driver
- Emergency maintained 3 hr versions available as listed (suffix M3L)

OPTIONS

TEXAS can be fitted with either of the batten-mount sensors listed on page 98, which are to be purchased separately

ORDER CODE	DESCRIPTION
NTE1X4/840	Texas LED Single 4Ft Batten 840
NTE1X4/M3L/840	Texas LED Single 4Ft Batten M3 Lithium 840
NTE2X4/840	Texas LED Twin 4Ft Batten 840
NTE2X4/M3L/840	Texas LED Twin 4Ft Batten M3 Lithium 840
NTE1X5/840	Texas LED Single 5Ft Batten 840
NTE1X5/M3L/840	Texas LED Single 5Ft Batten M3 Lithium 840
NTE2X5/840	Texas LED Twin 5Ft Batten 840
NTE2X5/M3L/840	Texas LED Twin 5Ft Batten M3 Lithium 840
NTE1X6/840	Texas LED Single 6Ft Batten 840
NTE1X6/M3L/840	Texas LED Single 6Ft Batten M3 Lithium 840
NTE2X6/840	Texas LED Twin 6Ft Batten 840
NTE2X6/M3L/840	Texas LED Twin 6Ft Batten M3 Lithium 840



We offer a wide range of LED panels to suit almost any project and budget

- LINCOLN, STERLING and BISMARCK are in our PRO range and offer a range of specialist features
- FULTON and FLORIDA are in our core range. These popular panels, are stocked by our wholesale partners

For many people the choice of which panel to buy will be driven by price, availability or light output. For others, the choice will be driven by more technical issues such as the Unified Glare Ratio (UGR), the TP(a) or TP(b) rating and if the panel is edge-lit or back lit. For further guidance, please visit the Technical Support section of our website.

All our panels can be fitted with our plug-in emergency conversion kit which comes complete with the latest lithium batteries for energy efficiency and long life.

RANGE NAME	INSTALLATION				CONSTRUCTION				DIFFUSER		DIMMING		COL. TEMP		IP RATING
	15-24mm LAY-IN	SURFACE	SUSPENDED	PULL-UP	FRONT COVER		LEDs	DIRECT/INDIRECT	TP(a)	TP(b)			4K	5K	
					OPAL	UGR<19	BACK-LIT	EDGE-LIT							
PRO															
LINCOLN	✓					✓		✓	✓			✓	✓		IP40
STERLING	✓	✓	✓			✓		✓				✓	✓	✓	IP44
BISMARCK	✓			✓		✓		✓				✓	✓	✓	IP54
core															
FULTON	✓	✓	✓			✓	✓	✓				✓	✓	✓	IP40
FLORIDA	✓					✓	✓	✓				✓	✓	✓	IP44





LED PANELS



P26

LINCOLN



P27

STERLING



P28

FULTON



P29

FLORIDA



P30

BISMARCK

LINCOLN

A TP(a) rated, feature-rich fitting offering an alternative aesthetic to more common 600x600 panels



STANDARD OR SELF-TEST EMERGENCY CONVERSION PACK WITH LITHIUM (LiFePO₄) BATTERY - SEE PAGE 69



APPLICATIONS

- General commercial use

CONSTRUCTION

- Aluminium/steel construction
- Painted white RAL9016 finish
- TP(a) rated micro-prismatic controller for UGR<19 compliant lighting schemes
- Supplied complete with loop-in / loop-out connection block for quick installation
- For 15-24mm exposed T ceilings

TECHNICAL DETAILS

- 150 lm/W
- Available in 3 wattages
 - 18.3W, 2,130 lm, 116 l.lm/c.W (Suffix LO)
 - 27.5W, 3,200 lm, 116 l.lm/c.W
 - 34.8W, 3,830 lm, 110 l.lm/c.W (Suffix HO)
- CRI >80
- CCT 4000K
- Branded ENEC approved, flicker free, remote mounted LED driver

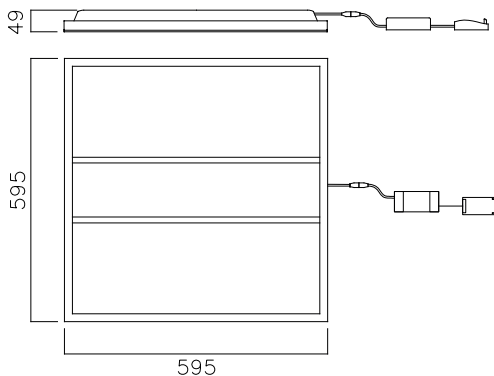
OPTIONS

EMERGENCY Plug-in lithium emergency conversion packs. To be ordered separately, as listed below

SPECIALIST EMERGENCY DALI Addressable Emergency (Suffix DAM3) options available

DIMMING DD (DALI or Switch Dim) or CF (Corridor Function) available. Add suffix DD or CF as required

SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



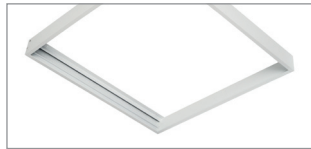
ORDER CODE	DESCRIPTION
NLN/66/840	Lincoln LED UGR<19 TP(a) Recessed Modular 600x600 840
NLN/66/LO/840	Lincoln LED UGR<19 TP(a) Recessed Modular 600x600 LO 840
NLN/66/HO/840	Lincoln LED UGR<19 TP(a) Recessed Modular 600x600 HO 840
ACCESSORIES	
N/REC/M3/PACK/V2	M3 Pack V2 LiFePO4 for Recessed Product Ranges
N/REC/STM3/PACK/V2	M3 Pack V2 Self-Test LiFePO4 for Recessed Product Ranges

STERLING

Recessed edge-lit TP(a) rated panel with opal diffuser or UGR<19 micro-prismatic controller



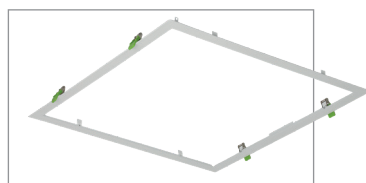
STANDARD OR SELF-TEST EMERGENCY CONVERSION PACK WITH LITHIUM (LiFePO₄) BATTERY - SEE PAGE 69



SURFACE MOUNT KIT AVAILABLE



SUSPENSION KIT AVAILABLE



RECESSED MOUNT FRAME AVAILABLE



APPLICATIONS

- General commercial use

CONSTRUCTION

- Edge-lit design with LEDs housed in frame
- Two TP(a) rated UV stable PC front cover options:
 - **Opal diffuser**
 - **Micro-prismatic controller** for UGR<19 compliant lighting schemes
- PMMA light guide plate
- Supplied complete with loop-in/loop-out connection block for quick installation

TECHNICAL DETAILS

- 165 lm/W
- Available in 3 wattages:
 - 19.4W, 2,395 lm, 123 l.m/c.W (Opal/LO)
 - 28.9W, 3,465 lm, 120 l.m/c.W (Opal)
 - 37W, 4,688 lm, 127 l.m/c.W (Opal/HO)
- CRI >80
- CCT choice of 4000K or 5000K
- Branded ENEC approved, flicker free, remote mounted LED driver

OPTIONS

EMERGENCY Plug-in lithium emergency conversion packs. To be ordered separately, as listed below

SPECIALIST EMERGENCY DALI Addressable Emergency (Suffix DAM3) options available

DIMMING DD (DALI or Switch Dim) or CF (Corridor Function) available. Add suffix DD or CF as required

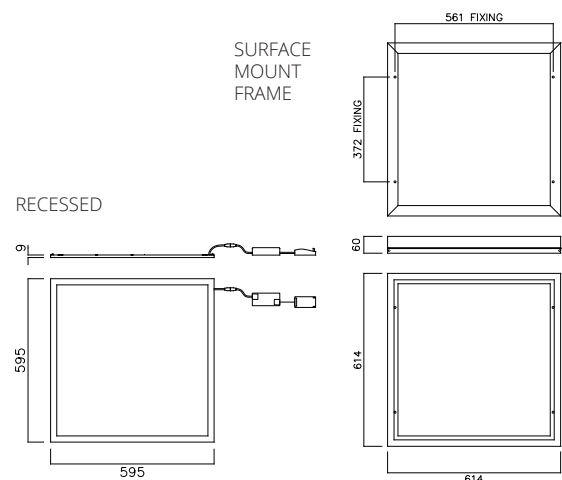
INSTALLATION KITS for surface, suspended (2m) and recessed (for plasterboard) mounting are available, listed below

SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details

ORDER CODE	DESCRIPTION
NST/O/66/840	Sterling Opal LED Panel 600x600 TPA Rated 840
NST/O/66/LO/840	Sterling Opal LED Panel 600x600 TPA Rated LO 840
NST/O/66/HO/840	Sterling Opal LED Panel 600x600 TPA Rated HO 840
NST/UGR19/66/840	Sterling UGR<19 LED Panel 600x600 TPA Rated 840
NST/UGR19/66/LO/840	Sterling UGR<19 LED Panel 600x600 TPA Rated LO 840
NST/UGR19/66/HO/840	Sterling UGR<19 LED Panel 600x600 TPA Rated HO 840
NST/O/66/850	Sterling Opal LED Panel 600x600 TPA Rated 850
NST/UGR19/66/850	Sterling UGR<19 LED Panel 600x600 TPA Rated 850

ACCESSORIES

N/REC/M3/PACK/V2	M3 Pack V2 LiFePO ₄ For Recessed Product Ranges
N/REC/STM3/PACK/V2	M3 Pack V2 LiFePO ₄ Self Test For Recessed Product Ranges
NST/SMK/66	Sterling Surface Mount Kit White For 600x600 Panel
NFU/WIRE/SUSP/KIT	Fulton Wire Suspension Kit
NFU/RMF/66	Fulton Recessed Mount Frame For 600x600 Panels

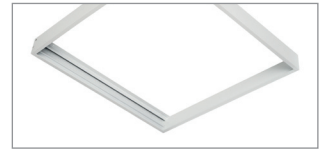


FULTON

Recessed edge-lit panel with opal diffuser or UGR<19 micro-prismatic controller



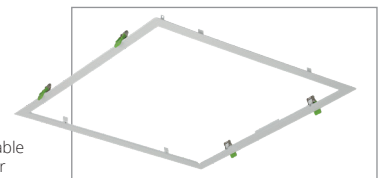
STANDARD OR SELF-TEST EMERGENCY CONVERSION PACK WITH LITHIUM (LiFePO₄) BATTERY - SEE PAGE 69



SURFACE MOUNT KIT AVAILABLE



SUSPENSION KIT AVAILABLE



RECESSED MOUNT FRAME AVAILABLE



SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details

APPLICATIONS

- General commercial use

CONSTRUCTION

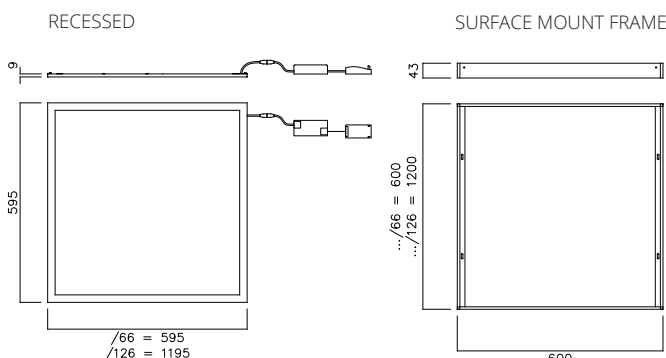
- Edge-lit design with LEDs housed in frame
- PMMA light guide plate
- Two TP(b) rated UV stable PS front cover options:
 - Opal diffuser
 - Micro-prismatic controller for UGR<19 compliant lighting schemes
- Supplied complete with loop-in/loop-out connection block for quick installation

TECHNICAL DETAILS

- 160 lm/W
- Choice of 600x600 or 1200x600
- Opal**
 - 600x600, 29W, 3,540 lm, 122 l.lm/c.w
 - 1200x600, 54.7W, 6,780, 124 l.lm/c.w
- Micro-prismatic**
 - 600x600, 29W, 3,475 lm, 120 l.lm/c.w
 - CRI>80
 - CCT 4000K
 - CCT choice of 4000K or 5000K on opal 600x600 only
 - Branded ENEC approved, flicker free, remote mounted LED driver

OPTIONS

- EMERGENCY** Plug-in lithium emergency conversion packs. To be ordered separately, as listed below
- DIMMING** DD (DALI or Switch Dim) available as listed.
- SURFACE MOUNTING** A surface mounting kit is available
- SUSPENDED INSTALLATION** A wire suspension kit allows up to 2m suspension
- RECESSED INSTALLATION** A recessed mount frame is available for fixing into plasterboard or false ceilings



ORDER CODE	DESCRIPTION
NFU/O/66/840	Fulton Opal LED Panel 600X600 840
NFU/O/66/850	Fulton Opal LED Panel 600x600 850
NFU/O/126/840	Fulton Opal LED Panel 1200X600 840
NFU/UGR19/66/840	Fulton UGR<19 LED Panel 600X600 840
NFU/O/66/DD/840	Fulton Opal LED Panel 600X600 DD Dim 840
NFU/UGR19/66/DD/840	Fulton UGR<19 LED Panel 600X600 DD Dim 840
ACCESSORIES	
NFU/SMK/66	Fulton Surface Mount Kit for 600X600 Panel
NFU/SMK/126	Fulton Surface Mount Kit White For 1200X600 Panel
NFU/WIRE/SUSP/KIT	Fulton Wire Suspension Kit
NFU/RMF/66	Fulton Recessed Mount Frame For 600X600 Panel
N/REC/M3/PACK/V2	M3 Pack V2 LiFePO ₄ for Recessed Product Ranges
N/REC/STM3/PACK/V2	M3 Pack V2 Self-test LiFePO ₄ for Recessed Product Ranges

NEW

FLORIDA

Recessed back-lit panel with opal diffuser or UGR<19 micro-prismatic controller



STANDARD OR SELF-TEST EMERGENCY CONVERSION PACK WITH LITHIUM (LiFePO₄) BATTERY - SEE PAGE 69



APPLICATIONS

- General commercial use

CONSTRUCTION

- Back-lit design with LEDs mounted on rear
- Rear panel made of steel
- Aluminium frame, painted white, RAL9003
- Two TP(b) rated UV stable PS front cover options:
 - **Opal diffuser**
 - **Micro-prismatic controller** for lighting schemes requiring UGR<19
- Supplied complete with loop-in/loop-out connection block for quick installation

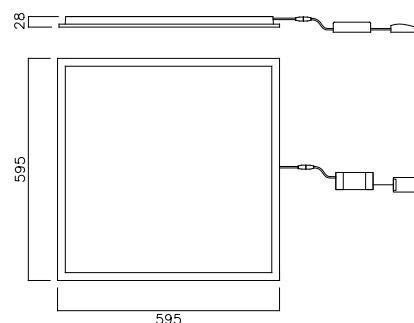
TECHNICAL DETAILS

- 155 lm/W
- **Opal**
 - 27W, 3,369 lm, 125 l.lm/c.W
- **Micro-prismatic**
 - 27W, 3,595 lm, 133 l.lm/c.W
- CRI>80
- CCT 4000K
- Branded ENEC approved flicker free driver

OPTIONS

EMERGENCY Plug-in lithium emergency conversion packs for manual or self-test. To be ordered separately as listed below

ORDER CODE	DESCRIPTION
NFL/O/66/840	Florida Opal Backlit LED Panel 600x600 840
NFL/UGR19/66/840	Florida UGR<19 Backlit LED Panel 600x600 840
ACCESSORIES	
N/REC/M3/PACK/V2	M3 Pack V2 LiFePO ₄ for Recessed Product Ranges
N/REC/STM3/PACK/V2	M3 Pack V2 Self-test LiFePO ₄ for Recessed Product Ranges



BISMARCK

TP(a) rated IP54 rated recessed modular fitting



STANDARD OR SELF-TEST EMERGENCY CONVERSION PACK WITH LITHIUM (LiFePO₄) BATTERY - SEE PAGE 69



SUPPLIED COMPLETE WITH SIDE-ARM SUPPORT BRACKETS



APPLICATIONS

- Health centres and hospitals
- Food preparation areas
- Laboratories and clean rooms

CONSTRUCTION

- Robust steel body
- White semi-gloss powder coated finish
- IP54 rated to the front of the fitting
- Supplied with opal TP(a) rated front panel
- For 15-24mm exposed T, plasterboard and some concealed grid ceilings

TECHNICAL DETAILS

- 155 lm/W
- 30W, 3375 lm, 112 l.lm/cW
- CRI >80
- CCT 4000K
- Branded ENEC approved flicker free driver

OPTIONS

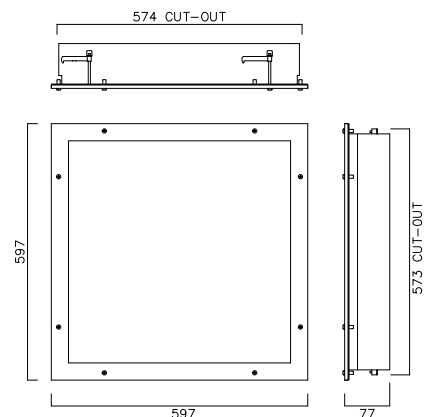
EMERGENCY Plug-in lithium emergency conversion packs. To be ordered separately, as listed below

DALI ADDRESSABLE EMERGENCY

Emergency (Suffix DAM3) options available

DIMMING DD (DALI or Switch Dim) or CF (Corridor Function) available. Add suffix DD or CF as required

SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



ORDER CODE	DESCRIPTION
NBI30/840/TPA	Bismarck 30W LED Rec Mod IP54 TPA 840
ACCESSORIES	
N/REC/M3/PACK/V2	M3 Pack V2 LiFePO ₄ for Recessed Product Ranges
N/REC/STM3/PACK/V2	M3 Pack V2 Self-Test LiFePO ₄ for Recessed Product Ranges



Our downlights section is in two parts

First, we have 3 large downlights for commercial projects, with cut-out of 195-200mm. With IP ratings of IP44 and IP54 these are all suitable for a wide range of applications, including toilets, changing rooms and under-canopy projects.

RANGE NAME	CUT-OUT	OPTIC	WATTAGE	DIMMING	EMERGENCY	TP(a)/(b)	COLOUR TEMP		BEAM ANGLE	IP RATING
	MM		W				SELECTABLE	4K		
PRO										
WESTMINSTER	200	Opal	12, 20, 30	✓	✓	TP(a)		✓	60° Low Glare	IP54
WASHINGTON	200	Low Glare	12, 20, 30	✓	✓	TP(a)		✓	100°	IP54
core										
HARSTED	195	Opal	14		✓	TP(a)		✓	112°	IP44

Then, we have a range of 3 standard downlights, MIAMI, VENUS and MERCURY, with cut-outs 68-80mm. These have all been designed around the needs of the contractor for fast installation and the lowest possible labour costs on projects such as student accommodation, care homes and hotels.

All 3 of these products feature:

- Loop-in/loop-out terminal block
- Piano-key (tool-free) terminals
- Plug/socket for rapid disconnect and re-connect for testing and maintenance
- Supplied in contractor packs of 10. Less packaging waste to dispose of

See pages 38-42 for full details.



RECESSED DOWNLIGHTS



P34

WESTMINSTER



P35

WASHINGTON



P36

HARSTED



P40

MIAMI



P41

VENUS



P42

MERCURY

WESTMINSTER

IP54 rated low-glare commercial downlight with medium-beam light distribution



STANDARD OR SELF-TEST EMERGENCY CONVERSION PACK WITH LITHIUM (LiFePO4) BATTERY - SEE PAGE 69



ENEC APPROVED DRIVER AND 3-POLE CONNECTOR BLOCK



APPLICATIONS

- Corridors and communal areas
- Changing rooms, toilets and under-canopy
- General lighting in areas with higher ceilings

CONSTRUCTION

- Die-cast aluminium bezel, painted white
- Die-cast aluminium heat sink & body, painted black
- Specular aluminium reflector
- Polycarbonate opal diffuser TP(a) rated, deep recessed
- Remote driver with male/female connector for easy installation and maintenance
- 3-pole connection block with piano keys and loop-in/loop-out terminals for quick and toolless wiring

TECHNICAL DETAILS

- 165 lm/W
- Available in 3 wattages:
 - 12W nom, 12.1W act., 1,462 lm, 121 l.lm/c.W
 - 20W nom, 17.2W act., 2,097 lm, 122 l.lm/c.W
 - 30W nom, 31W act., 3,466 lm, 112 l.lm/c.W
- CRI>85
- Medium angle, 60° light distribution
- Low glare, UGR<21 in any typical application
- CCT 4000K

OPTIONS

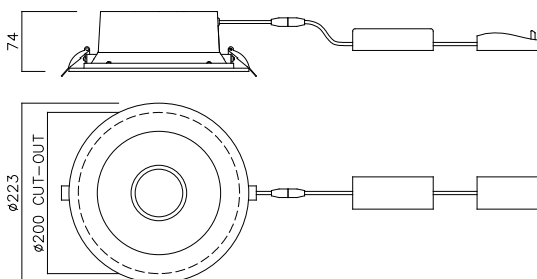
EMERGENCY: Plug-in lithium emergency conversion pack. To be ordered separately, as listed below

SPECIALIST EMERGENCY: DALI Addressable Emergency (Suffix DAM3) options available

DIMMING: DD (DALI or switch -dim) or CF (corridor function) available. Add suffix DD or CF as required

MOUNTING DISC. A mounting disc is available to assist installation where WESTMINSTER is being retro-fitted in an aperture up to 235mm dia., listed below

SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



ORDER CODE	DESCRIPTION
NWM12/840	Westminster 12W LED Recessed Low Glare Deep Downlight 840
NWM20/840	Westminster 20W LED Recessed Low Glare Deep Downlight 840
NWM30/840	Westminster 30W LED Recessed Low Glare Deep Downlight 840
ACCESSORIES	
N/REC/M3/PACK/V2	M3 Pack V2 LiFePO4 for Recessed Product Ranges
N/REC/STM3/PACK/V2	M3 Pack V2 Self-Test LiFePO4 for Recessed Product Ranges
NWM-NWA/MOUNTING/DISC	Westminster & Washington Mounting Disc for 235mm Cutouts

WASHINGTON

IP54 rated commercial downlight with wide-beam light distribution



STANDARD OR SELF-TEST EMERGENCY CONVERSION PACK WITH LITHIUM (LiFePO₄) BATTERY - SEE PAGE 69



ENEC APPROVED DRIVER AND 3-POLE CONNECTOR BLOCK



APPLICATIONS

- Corridors and communal areas
- Changing rooms, toilets and under-canopy

CONSTRUCTION

- Die-cast aluminium bezel, painted white
- Die-cast aluminium heat sink and body, painted black
- Polycarbonate opal diffuser TP(a) rated
- Remote driver with male/female connector for easy installation and maintenance
- 3-pole connection block with piano keys and loop-in/loop-out terminals for quick and toolless wiring

TECHNICAL DETAILS

- 175 lm/W
- Available in 3 wattages:
 - 12W nom., 12.1W act., 1,675 lm, 138 l.lm/c.W
 - 20W nom., 19.4W act., 2,531 lm, 130 l.lm/c.W
 - 30W nom., 34.7W act., 4,505 lm, 130 l.lm/c.W
- CRI>85
- Wide angle, 100° light distribution
- CCT 4000K

OPTIONS

EMERGENCY: Plug-in lithium emergency conversion pack. To be ordered separately, as listed below

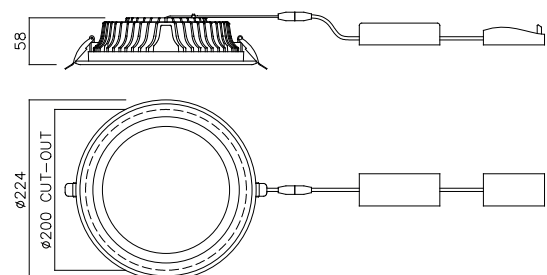
SPECIALIST EMERGENCY: DALI Addressable Emergency (Suffix DAM3) options available

DIMMING: DD (DALI or switch -dim) or CF (corridor function) available. Add suffix DD or CF as required

MOUNTING DISC. A mounting disc is available to assist installation where WASHINGTON is being retro-fitted in an aperture up to 235mm dia., listed below

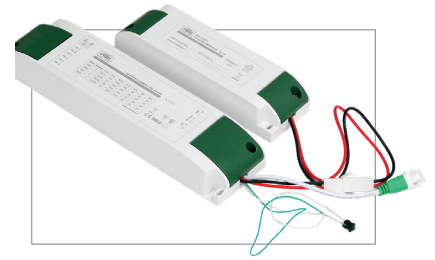
SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details

ORDER CODE	DESCRIPTION
NWA12/840	Washington 12W LED Recessed Opal Shallow Downlight 840
NWA20/840	Washington 20W LED Recessed Opal Shallow Downlight 840
NWA30/840	Washington 30W LED Recessed Opal Shallow Downlight 840
ACCESSORIES	
N/REC/M3/PACK/V2	M3 Pack V2 LiFePO ₄ for Recessed Product Ranges
N/REC/STM3/PACK/V2	M3 Pack V2 Self-Test LiFePO ₄ for Recessed Product Ranges
NWM-NWA/MOUNTING/DISC	Westminster & Washington Mounting Disc for 235mm Cutouts



HARSTED

TP(a) rated recessed circular shallow depth fixed downlight with opal PC diffuser



EMERGENCY PACK AVAILABLE SEPARATELY AS AN OPTION - SEE BELOW



REMOTE MOUNTED OSRAM OR TRIDONIC DRIVER



APPLICATIONS

- Meeting rooms
- Reception areas
- Hotel and office corridors

CONSTRUCTION

- Opal PC TP(a) rated diffuser
- Die-cast aluminium bezel and body painted white, RAL9016
- Back-lit design, with LEDs mounted on metal core PCB fixed to inside of die-cast body

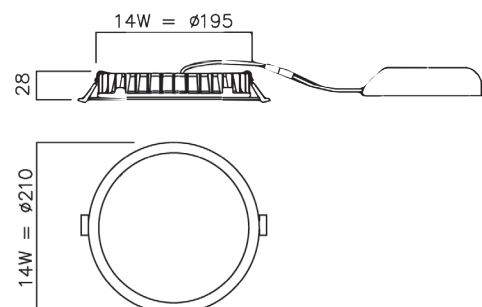
TECHNICAL DETAILS

- 150 lm/W
- 14W, 1,320 lm, 96 l.lm/c.W
- CRI>80
- CCT 4000K
- Branded ENEC approved, flicker free, remote mounted LED driver

OPTIONS

EMERGENCY Plug-in emergency conversion pack. To be ordered separately, as listed below

ORDER CODE	DESCRIPTION
NHR14/840	Harsted V2 14W LED Recessed Downlight Panel 840
ACCESSORIES	
NHR/M3/PACK	Harsted V2 Plug In Emergency Pack





Downlights for commercial and large residential projects


MIAMI, VENUS & MERCURY



MIAMI
SEE PAGE 40



VENUS
SEE PAGE 41

GU10 or integrated LED	GU10 LAMPHOLDER (NO LAMP)	GU10 LAMPHOLDER (NO LAMP)
Colour selectable	N/A	N/A
Wattage & Lumens	N/A	N/A
Beam angle	N/A	N/A
Fire rated	NO	
IP rating	IP20 & IP65	IP65
Cut-out (mm)	72 (IP20) & 68 (IP65)	68
Height (mm)	80 (IP20) & 83 (IP65)	83
Connection	4-POLE IN/OUT PIANO KEY	4-POLE IN/OUT PIANO KEY
Plug / socket for test disconnect	YES	YES
Bezel finish	WHITE	WHITE, BLACK, CHROME, SATIN-CHROME

GU10 LAMPHOLDER

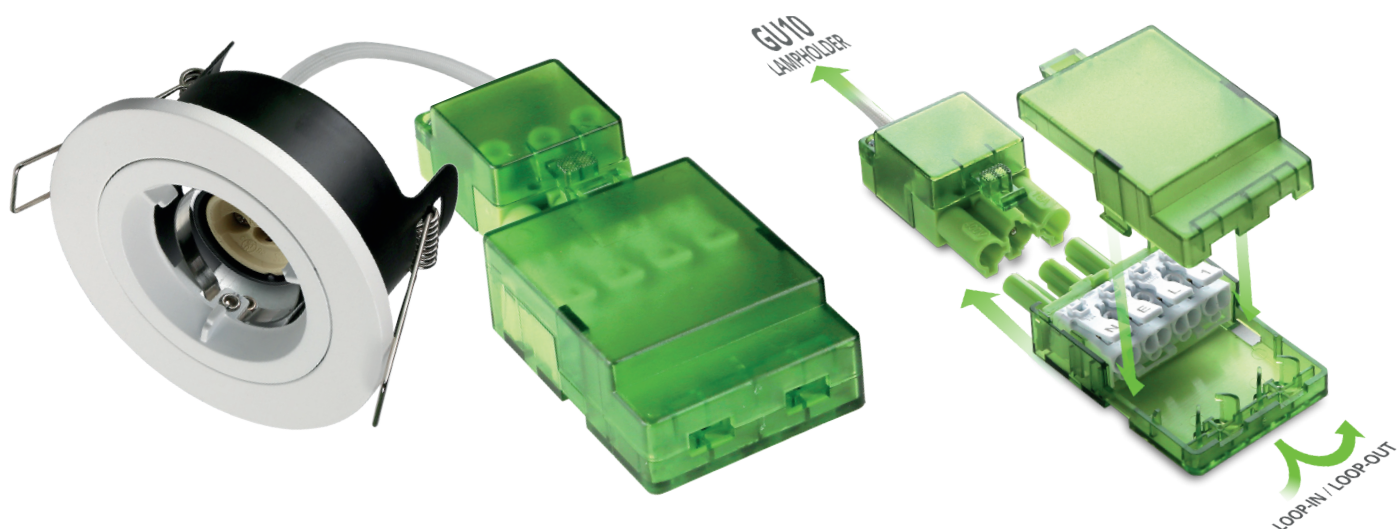
- Supplied with ceramic GU10 lampholder, excluding lamp
- Accepts lamps 50mm diameter, max 50W
- Choose the lamp colour, beam angle & wattage to suit the project
- At end of life, just change the lamp. No need to change the fitting

PLUG/SOCKET FOR EASY TESTING

- This makes high-voltage testing quicker & easier
- Step 1. Install and make connections using piano key terminals
 - Step 2. Insert lamp and check operation
 - Step 3. Unplug
 - Step 3. Perform high-voltage test. The lamp is disconnected, so it will come to no harm
 - Step 4. Re-connect. No skilled labour required

NO TOOLS, NO JUNCTION BOX, 4-POLES

- Tool free connection is fast and convenient
- Piano-key terminals – no screwdriver needed
 - Loop-in / loop-out – no junction box needed
 - 4-poles – if there are emergency fittings on the same circuit, this gives a convenient place to park the permanent live





MERCURY
SEE PAGE 42



- Helping you to be more sustainable
- Contractor packs of 10 available as an option to minimise waste
- Less time wasted unpacking and disposing of waste

INTEGRATED LED

YES, 3K / 4K / 6K

6W, 765 LM

40°



IP65

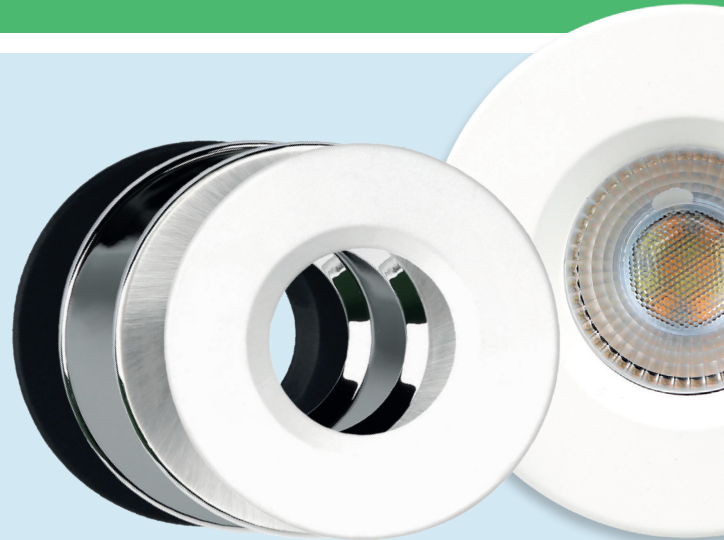
68

32

3-POLE IN/OUT
PIANO KEY

YES

WHITE, BLACK, CHROME, SATIN-CHROME



VENUS AND MERCURY – CHOICE OF BEZELS AVAILABLE

INTEGRAL LED

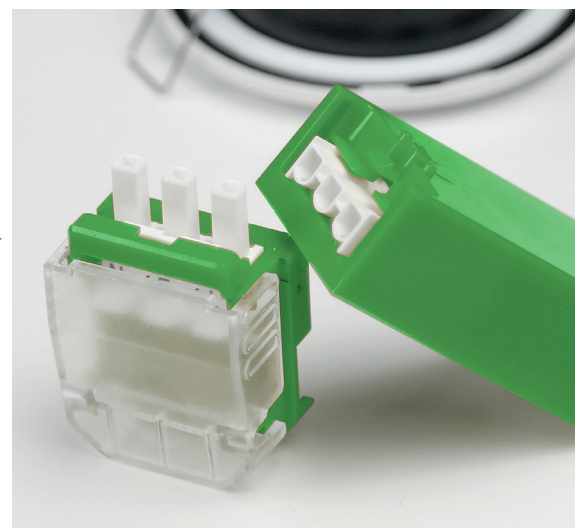
- 6W LED
- Remote driver included
- Flicker free and mains dimmable
- 40° beam angle, ideal for general lighting applications

LOW-PROFILE

- Suitable for shallow voids
- Only 32-43mm total height
- OK for installation under thermal insulation

NO TOOLS, NO JUNCTION BOX, EASY TESTING

- Tool free connection is fast and convenient
- Piano-key terminals – no screwdriver needed
 - Loop-in / loop-out – no junction box needed
 - Plug/socket for easy testing. No risk to driver during high voltage testing



MIAMI

IP20 or IP65 rated GU10 downlight



MIAMI GU10 IP20

MIAMI GU10 IP65



APPLICATIONS

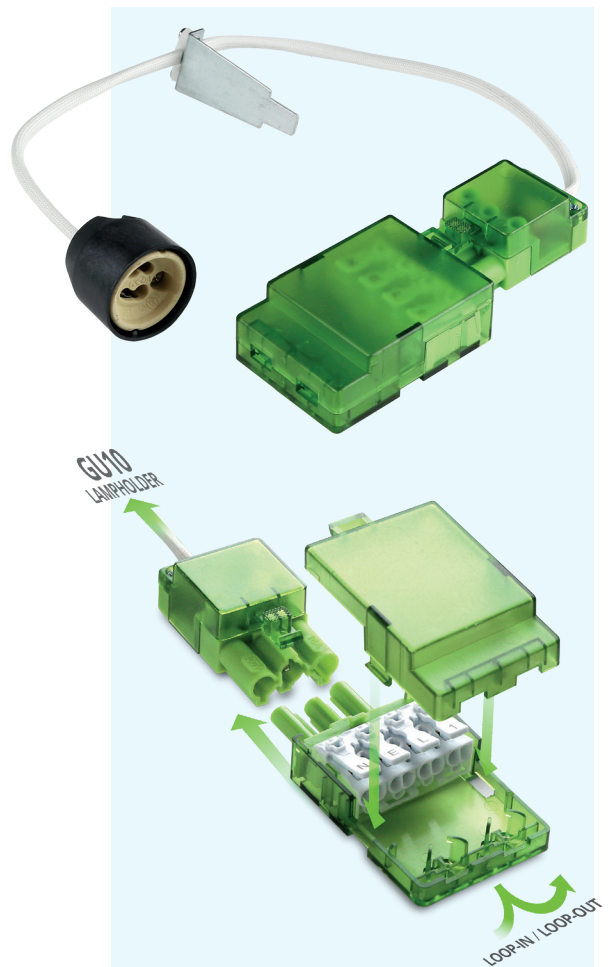
- Care homes
- Student accommodation
- Meeting rooms and corridors

CONSTRUCTION

- Available as singles or in contractor packs (10pcs), as listed below
- Steel body
- Supplied with twist and lock white painted bezel in aluminium (IP20) or steel (IP65)
- Supplied with GU10 lamp-holder, excluding lamp
- Suitable for use with lamps with a GU10 base, up to 50mm diameter and 50W maximum power

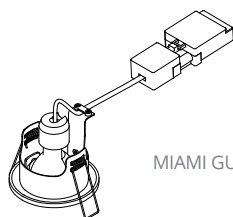
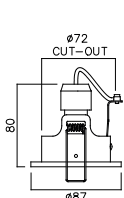
OPTIONS

- Two versions available, IP20 and IP65

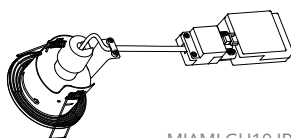
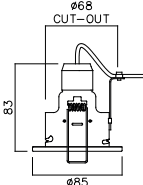


DESIGNED FOR FAST INSTALLATION

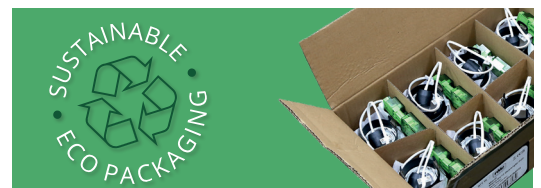
- Piano key terminals for tool-free installation
- Loop-in / loop-out – no junction box required
- 4-poles. If there are emergency fittings on the same circuit the 4th pole gives the installer a convenient place to park the permanent live
- Male/female connector for easy isolation of fitting
 - Makes high-voltage testing quicker and easier. Skilled labour not required to remake connections after testing
 - Convenient for cleaning or re-lamping



MIAMI GU10 IP20



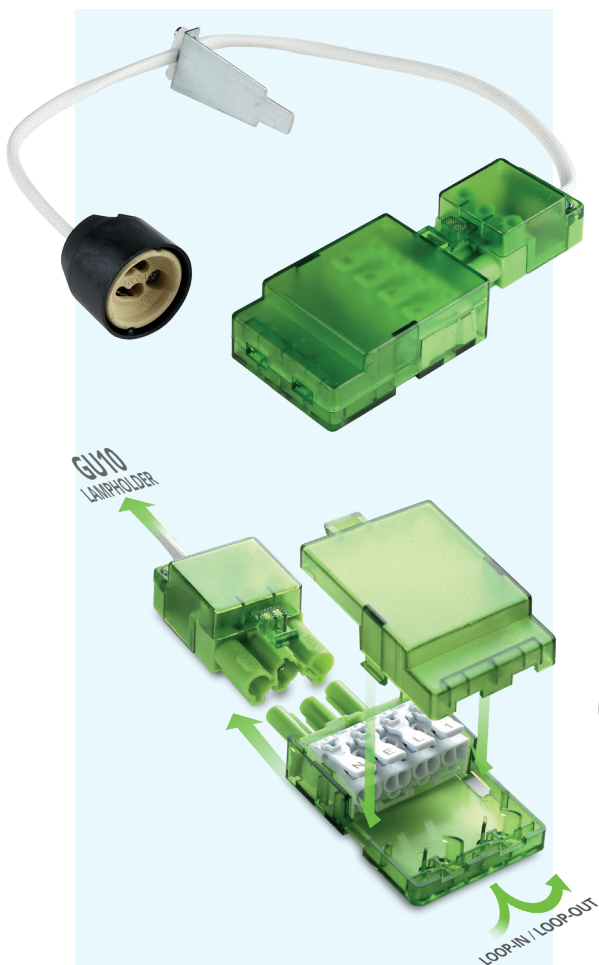
MIAMI GU10 IP65



ORDER CODE	DESCRIPTION
NMA/GU10/WH/IP20/CB4P	Miami GU10 Downlight IP20 White Bezel
NMA/GU10/WH/IP65/CB4P	Miami GU10 Downlight IP65 White Bezel
NMA/GU10/WH/IP20/CB4P/10	Miami GU10 Downlight IP20 White Bezel 10 Pack
NMA/GU10/WH/IP65/CB4P/10	Miami GU10 Downlight IP65 White Bezel 10 Pack

VENUS

IP65 rated GU10 fire-rated downlight



BLACK / CHROME / SATIN-CHROME / WHITE
CHOICE OF BEZELS AVAILABLE



DESIGNED FOR FAST INSTALLATION

- Piano key terminals for tool-free installation
- Loop-in / loop-out – no junction box required
- 4-poles. If there are emergency fittings on the same circuit the 4th pole gives the installer a convenient place to park the permanent live
- Male/female connector for easy isolation of fitting
 - Makes high-voltage testing quicker and easier. Skilled labour not required to remake connections after testing
 - Convenient for cleaning or re-lamping

APPLICATIONS

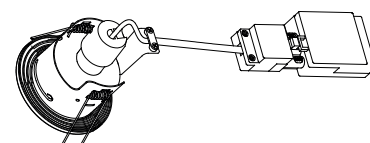
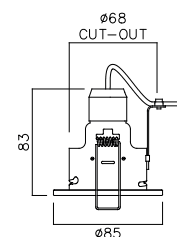
- Care homes
- Student accommodation
- Meeting rooms and corridors

CONSTRUCTION

- Available as singles or in contractor packs (10pcs), as listed below.
- Twist and lock bezel in a choice of 4 finishes: white, black, chrome and satin chrome
- Supplied with GU10 lamp-holder, excluding lamp
- Suitable for use with lamps with a GU10 base, up to 50mm diameter and 50W maximum power
- 30, 60 and 90 minutes fire rated in solid wood beam and I-beam ceilings

OPTIONS

- Spare round bezels available with black (BK) chrome (CH) and satin chrome (SCH) finishes



OPTIONAL VENUS BEZELS

ORDER CODE	DESCRIPTION	ROUND
NVS/BK/RO/BEZEL/10	Venus Black Round Bezel 10 Pack	
NVS/CH/RO/BEZEL/10	Venus Chrome Round Bezel 10 Pack	
NVS/SCH/RO/BEZEL/10	Venus Satin Chrome Round Bezel 10 Pack	

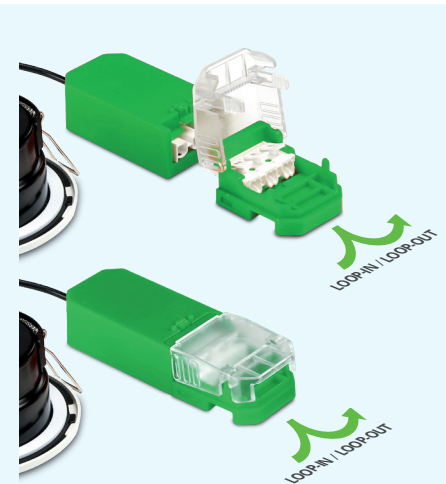
ORDER CODE	DESCRIPTION
NVS/GU10/WH	Venus GU10 Fire Rated Downlight IP65 White Bezel No Lamp
NVS/GU10/BK	Venus GU10 Fire Rated Downlight IP65 Black Bezel No Lamp
NVS/GU10/CH	Venus GU10 Fire Rated Downlight IP65 Chrome Bezel No Lamp
NVS/GU10/SCH	Venus GU10 Fire Rated Downlight IP65 Satin Chrome Bezel No Lamp
NVS/GU10/WH/10	Venus GU10 Fire Rated Downlight IP65 White Bezel No Lamp 10 Pack
NVS/GU10/BK/10	Venus GU10 Fire Rated Downlight IP65 Black Bezel No Lamp 10 Pack
NVS/GU10/CH/10	Venus GU10 Fire Rated Downlight IP65 Chrome Bezel No Lamp 10 Pack
NVS/GU10/SCH/10	Venus GU10 Fire Rated Downlight IP65 Satin Chrome Bezel No Lamp 10 Pack

MERCURY

IP65 fire-rated integral LED downlight



CCT SELECTION SWITCH UNDER BEZEL – ACCESSIBLE FROM THE FRONT



DESIGNED FOR FAST INSTALLATION

- Piano key terminals for tool-free installation
- Loop-in/loop-out – no junction box required
- Male/female connector for easy isolation of fitting
- Makes high-voltage testing quicker and easier. Skilled labour not required to remake connections after testing
- Convenient for cleaning



APPLICATIONS

- Care homes
- Student accommodation
- Meeting rooms and corridors

CONSTRUCTION

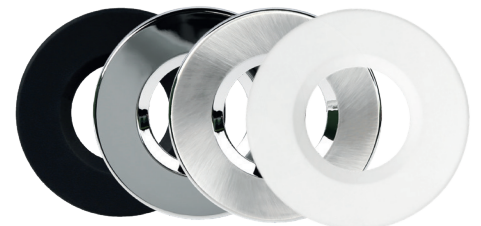
- Available as singles or in contractor packs (10pcs), as listed below.
- Steel body
- Supplied with twist and lock white polycarbonate bezel
- 30, 60 and 90 minutes fire rated in solid wood beam and I beam ceilings

TECHNICAL DETAILS

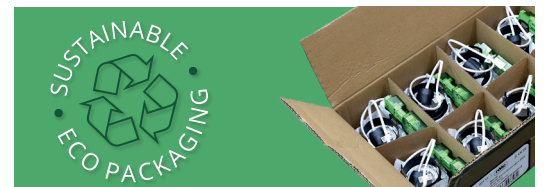
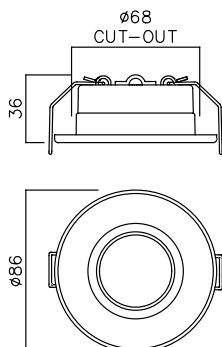
- 170 lm/W
- 6W, 765 lm, 130 l.lm/c.W
- Mains dimmable with many leading brands of leading and trailing edge dimmers. Call us for details and advice
- Colour temperature selectable with switch under bezel for 3000K, 4000K or 6000K
- 40° beam angle

OPTIONS

- Spare round bezels available, with black (BK), chrome (CH) and satin-chrome (SCH) finishes



BLACK / CHROME / SATIN-CHROME / WHITE
CHOICE OF BEZELS AVAILABLE



ORDER CODE	DESCRIPTION
NMR/MD/WH/830-40-60	Mercury MD Fire Rated D/light IP65 White Bezel Fixed 830-840-860
NMR/MD/WH/830-40-60/10	Mercury MD Fire Rated D/light IP65 White Bezel Fixed 830-840-860 10 Pk

ORDER CODE	DESCRIPTION	ROUND BEZELS
NMR/BK/RO/BEZEL/10	Mercury Black Round Bezel 10 Pack	
NMR/CH/RO/BEZEL/10	Mercury Chrome Round Bezel 10 Pack	
NMR/SCH/RO/BEZEL/10	Mercury Satin Chrome Round Bezel 10 Pack	



Our comprehensive range of amenity products will meet the needs of projects across many applications, both internal and external

Microwave presence detectors are available on most products and are a tried and tested energy saving option. They can be fitted either on the basis of one-per-fitting or in a master/servant configuration.

RANGE NAME	DIAMETER	WATTAGE	EMERGENCY	DIMMING	OPTIONAL SENSOR	RATINGS		COLOUR TEMP (CCT)		FINISH OPTIONS
	MM	W				IK	IP	SELECTABLE	FIXED	
PRO										
PORTLAND	325	15, 18	M3L, STM3, DAM3	CF	MW		IP54	4K-5K		WHITE / CHROME
ADDISON PRO	400	20, 28	M3L, STM3, DAM3	DD, CF	MW		IP40	3K-4K-5K		WHITE / CHROME / SATIN-CHROME
PRESTON	360, 430	21, 32	M3L, STM3, DAM3	DD, CF	MW	IK10	IP65	3K-4K		WHITE
BRONX	264 x 300	30	M3L, STM3, DAM3		PEC	IK10	IP65		✔	BLACK
DENALI	275	17	M3L, STM3, DAM3	CF	MW	IK10	IP65		✔	BLACK ROUND / EYELID
core										
SPARTAN	278	11, 17	M3	CF	MW or PEC	IK10	IP65	3K-4K-5K		BLACK ROUND / EYELID
PASCO	315	9, 14, 18	M3L				IP65	3K-4K-6.5K		WHITE

KEY

- M3/M3L - Maintained 3 hrs with lithium batteries
- STM3 - Self-test emergency with lithium batteries
- DAM3 - DALI addressable emergency test with lithium batteries
- CF - Corridor function (dim-to-10%)
- DD - Digital dimming (DALI and switch-dim)



AMENITY LIGHTING



P46

PORTLAND



P47

PASCO



P48

ADDISON PRO



P49

PRESTON



P50

DENALI



P51

SPARTAN



P52

BRONX SLIM



P53

REBUS

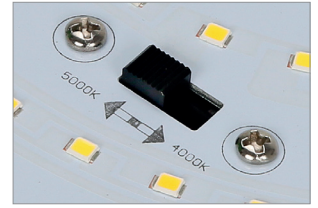


P54

RENO

PORTLAND

CCT selectable IP54 decorative bulkhead fitting for commercial indoor areas



CCT SELECTABLE
4000K/5000K



AVAILABLE WITH MICROWAVE
SENSOR FITTED



APPLICATIONS

- For commercial interior use in corridors, stairwells, toilets and changing rooms

CONSTRUCTION

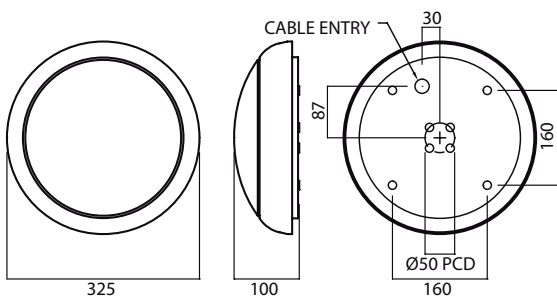
- Polycarbonate base and bezel
- Opal polycarbonate diffuser
- Available with either a white bezel (WH) or chrome bezel (CH), as listed

TECHNICAL DETAILS

- 155 lm/W
- 2 wattages available:
 - 15W nom., 16.7W act., 1,739 lm, 104 l.lm/c.W
 - 18W nom., 20W act., 2,057 lm, 103 l.lm/c.W
- CRI>80
- CCT selectable 4000K/5000K
- Branded ENEC approved, flicker free, LED driver
- Emergency maintained 3 hr versions available, as listed (suffix M3). Self-test (STM3) and DALI addressable test (DAM3) also available

TECHNICAL DETAILS (contd.)

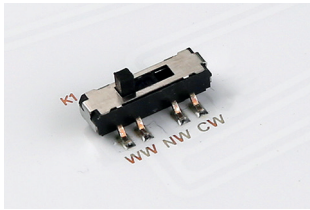
- DIMMING** Dim-to-10% (Corridor Function) available on all variants. Suffix CF, as listed
- SENSOR** Available with built in microwave sensor. Suffix MW, as listed
- DIMMING & SENSOR** A popular combination is corridor function & microwave sensor. Suffix CFMW as listed
- SMART WIRELESS** lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



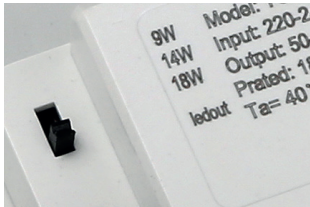
ORDER CODE	DESCRIPTION
NPO15/WH/O/840-850	Portland 15W LED IP54 White Opal 840-850
NPO15/WH/M3/840-850	Portland 15W LED IP54 White Opal M3 Lithium 840-850
NPO15/WH/O/MW/840-850	Portland 15W LED IP54 White Opal MW 840-850
NPO15/WH/MW/M3/840-850	Portland 15W LED IP54 White Opal MW M3 Lithium 840-850
NPO15/CF/MW/WH/O/840-850	Portland 15W LED IP54 White Opal CF MW 840-850
NPO15/WH/CFMW/M3/840-850	Portland 15W LED IP54 White Opal CF MW M3 Lithium 840-850
NPO15/CH/O/840-850	Portland 15W LED IP54 Chrome Opal 840-850
NPO15/CH/M3/840-850	Portland 15W LED IP54 Chrome Opal M3 Lithium 840-850
NPO18/WH/O/840-850	Portland 18W LED IP54 White Opal 840-850
NPO18/WH/M3/840-850	Portland 18W LED IP54 White Opal M3 Lithium 840-850
NPO18/WH/O/MW/840-850	Portland 18W LED IP54 White Opal MW 840-850
NPO18/WH/MW/M3/840-850	Portland 18W LED IP54 White Opal MW M3 Lithium 840-850

NEW
PASCO

IP65 multi-wattage / multi-CCT bulkhead fitting for commercial indoor areas



MULTI-CCT SELECTABLE
3000K / 4000K / 6500K



WATTAGE SELECTABLE
9W / 14W / 18W



APPLICATIONS

- For commercial interior use in corridors, stairwells, toilets and changing rooms

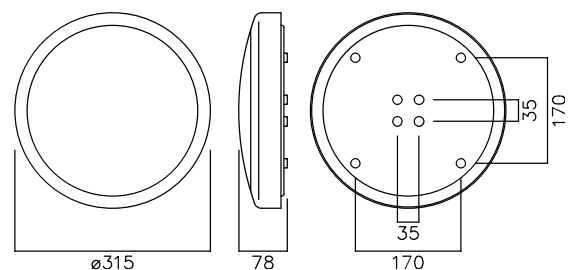
CONSTRUCTION

- Polycarbonate base and bezel
- Opal polycarbonate diffuser

TECHNICAL DETAILS

- 155 lm/W
- 3 wattages are selectable:
 - 9W nom., 1,057 lm, 119 l.lm/c.W
 - 14W nom., 1,518 lm, 113 l.lm/c.W
 - 18W nom., 1,858 lm, 111 l.lm/c.W
- CRI>80
- CCT selectable 3000K/4000K/6500K
- Emergency maintained 3 hr version available as listed

ORDER CODE	DESCRIPTION
NPC/WH/830-40-65	Pasco 9-14-18W LED Bulkhead IP65 White Opal 830-40-65
NPC/WH/M3L/830-40-65	Pasco 9-14-18W LED Bulkhead IP65 White Opal M3L 830-40-65



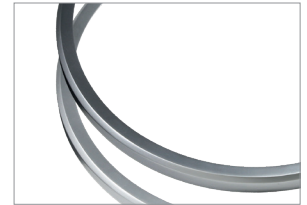
ADDISON PRO

IMPROVED VERSION

CCT selectable IP40 decorative circular fitting for commercial indoor areas



AVAILABLE WITH MICROWAVE SENSOR FITTED



OPTIONAL TRIM AVAILABLE IN CHROME AND SATIN-CHROME

WHAT'S CHANGED

ADDISON's high output make it a firm favourite for lighting stairwells – and it just keeps getting better:

- Higher output and a choice of 2 wattages:
 - 20W - 2,620 lm – 7% increase
 - 28W - 3,563 lm – new high-output option
- CCT selectable – choice now increased to 3000K/4000K/5000K
- 15% increase in efficiency, from 116 to 133 l.lm/c.W
- New all-polycarbonate body. Lighter, stronger, corrosion-free
- Decorative trims: chrome and satin-chrome
- Smart wireless options available



APPLICATIONS

- For commercial interior use
- Particularly suitable for emergency lighting in corridors and stairwells

CONSTRUCTION

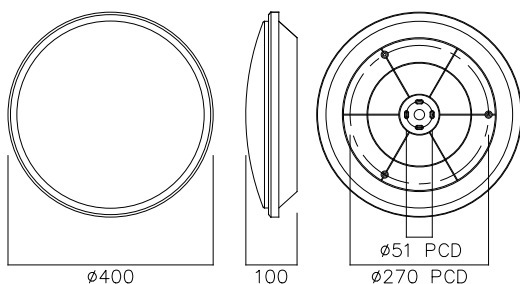
- White polycarbonate base
- Opal polycarbonate diffuser
- White polycarbonate trim
- LEDs on metal core PCB

TECHNICAL DETAILS

- 165 lm/W
- Available in 2 wattages:
 - **20W** nom., 19.8W act., 2,620 lm, 132 l.lm/c.W
 - **28W** nom., 26.8W act., 3,565 lm, 133 l.lm/c.W
- CRI>80
- CCT selectable 3000K/4000K/5000K
- Branded ENEC approved, flicker free, LED driver
- Emergency maintained 3 hr versions available, as listed (suffix M3L)

OPTIONS

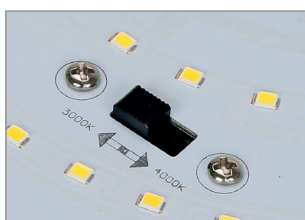
- DIMMING** DD (DALI or Switch Dim) or CF (Corridor Function) available. Add suffix DD or CF as required
- SENSOR** Available with built in microwave sensor. Add suffix MW
- DIMMING AND SENSOR** A popular combination is corridor function and microwave sensor. Add suffix CFMW
- SPECIALIST EMERGENCY** Self-test emergency (STM3) and DALI addressable emergency (DAM3) options available
- TRIM** Optional snap-on trims available in chrome & satin chrome, as listed
- SMART WIRELESS** lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



ORDER CODE	DESCRIPTION	
NAD20/WH/830-40-50	Addison Pro 20W LED IP40 White PC Base 830-840-850	
NAD20/WH/M3L/830-40-50	Addison Pro 20W LED IP40 White PC Base M3 Lithium 830-840-850	
NAD28/WH/830-40-50	Addison Pro 28W LED IP40 White PC Base 830-840-850	
NAD28/WH/M3L/830-40-50	Addison Pro 28W LED IP40 White PC Base M3 Lithium 830-840-850	
ORDER CODE	DESCRIPTION	TRIM
NAD/CH/TRIM	Addison Pro Chrome Trim	
NAD/SCH/TRIM	Addison Pro Satin Chrome Trim	

PRESTON

CCT selectable halo effect IP65 circular polycarbonate fitting for commercial indoor areas



CCT SELECTABLE
3000K/4000K



AVAILABLE WITH MICROWAVE
SENSOR FITTED



APPLICATIONS

- For commercial interior use in corridors, stairwells, toilets and changing rooms

CONSTRUCTION

- Polycarbonate base and front trim
- Base allows side conduit entry
- Opal polycarbonate diffuser
- Hinged gear tray for easy access to terminal block and fixing points
- Piano key terminal block for easy installation and allows loop-in/loop-out wiring

TECHNICAL DETAILS

- 160 lm/W
- Available in 2 sizes:
 - 21W nom., 18.9W act., 2,083 lm, 110 l.lm/cW
 - 32W nom., 28.3W act., 2,900 lm, 102 l.lm/cW
- CRI>80
- CCT Selectable between 3000K/4000K
- Branded ENEC approved, flicker free, LED driver
- Emergency maintained 3 hr versions available, as listed (suffix M3L)

OPTIONS

DIMMING DD (DALI or Switch Dim) or CF (Corridor Function) available. Add suffix DD or CF as required

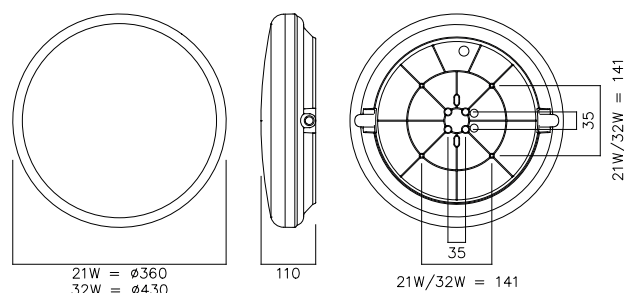
SPECIALIST EMERGENCY Self-test emergency (Suffix STM3) or DALI addressable emergency (Suffix DAM3) options available

SENSOR Available with built in microwave sensor. Suffix MW

DIMMING & SENSOR A popular combination is corridor function & microwave sensor. Suffix CFMW

SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details

ORDER CODE	DESCRIPTION
NPE21/830-840	Preston 21W LED IP65 White Bezel 830-840
NPE21/M3L/830-840	Preston 21W LED IP65 White Bezel M3 Lithium 830-840
NPE32/830-840	Preston 32W LED IP65 White Bezel 830-840
NPE32/M3L/830-840	Preston 32W LED IP65 White Bezel M3 Lithium 830-840



DENALI

Aluminium bulkhead for commercial outdoor areas



DENALI WITH THE STANDARD CIRCULAR BEZEL

DENALI WITH THE EYELID BEZEL



APPLICATIONS

- Exterior walkways and stairs
- Building perimeters

CONSTRUCTION

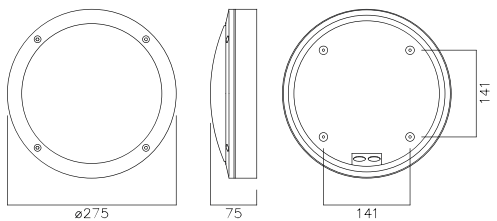
- Die-cast aluminium base and bezel, with light-textured UV stable dark grey paint finish to RAL7010
- Polycarbonate opal diffuser
- Piano-key terminal block with capacity for 2 x 1.5mm² cable for loop-in/loop-out
- Twin cable entry points with grommets

TECHNICAL DETAILS

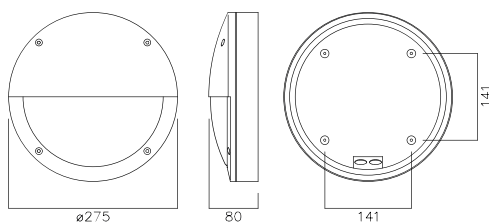
- 140 lm/W
- LEDs on metal core PCB
- **Circular bezel**
15W nom., 18.3W act., 1,759 lm, 96 l.lm/c.W
- **Eyelid bezel**
15W nom., 17W act., 1,295 lm, 76 l.lm/c.W
- CRI>80
- CCT 4000K
- Branded ENEC approved, flicker free, LED driver
- Emergency maintained 3 hr versions available, as listed (suffix M3L)

OPTIONS

- DIMMING** Dim-to-10% (corridor function) available on all variants. Add suffix CF
- SENSOR** Available with microwave occupancy sensor fitted on all versions (except Eyelid M3L) Add suffix MW
- SPECIALIST EMERGENCY** Self-test emergency (STM3) and DALI addressable emergency (DAM3) options available
- SMART WIRELESS** lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



PLAIN TRIM



EYELID TRIM

ORDER CODE	DESCRIPTION
NDE15/840	Denali 15W LED IP65 Ali Bulkhead 840
NDE15/M3L/840	Denali 15W LED IP65 Ali Bulkhead M3 Lithium 840
NDE15/ELID/840	Denali 15W LED IP65 Eyelid Ali Bulkhead 840
NDE15/ELID/M3L/840	Denali 15W LED IP65 Eyelid Ali Bulkhead M3 Lithium 840

SPARTAN

IP65 polycarbonate 3 CCT selectable bulkhead fittings for commercial indoor and outdoor areas



OPTIONAL SNAP-ON PLAIN OR EYELID BEZELS
WHITE OR BLACK AVAILABLE SEPARATELY



APPLICATIONS

- For commercial interior or exterior use in corridors, entrances, porches, steps and building perimeters

CONSTRUCTION

- Polycarbonate base, available in black (suffix BK) or white (suffix WH)
- Polycarbonate opal diffuser
- Gasket between base and diffuser to ensure IP65 rating
- Gear tray retained on strap for easy installation

TECHNICAL DETAILS

- 165 lm/W
- Available in 2 wattages:
 - 11.2W, 1,220 lm, 109 l.m/cW
 - 16.8W, 2,186 lm, 130 l.m/cW (Suffix HO)
- CRI>80
- CCT selectable between 3000K, 4000K and 5000K
- LEDs on metal core PCB
- Emergency maintained 3 hr versions available, as listed

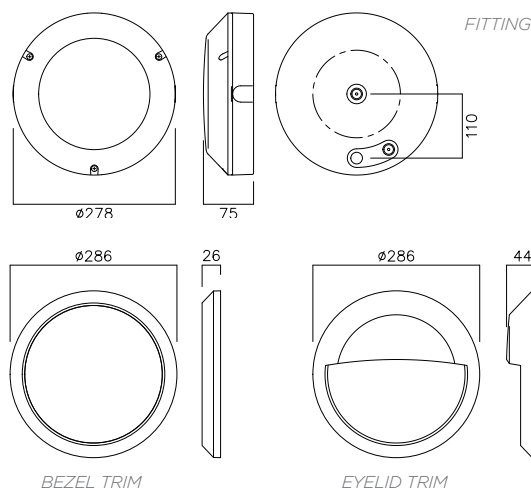
OPTIONS

- SENSORS** Available with built in microwave sensor. Add suffix MW
- PE CELL** Available with built in photo-electric cell for dusk to dawn operation. Add suffix PEC
- DIMMING** Available with corridor function (dim-to-10%), add suffix CF. A popular combination is corridor function with a microwave sensor, add suffix CFMW

ACCESSORIES

- TRIMS** Optional bezel or eyelid trims that snap fit to fitting, as listed

ORDER CODE	DESCRIPTION
NSP/WH/830-40-50	Spartan LED IP65 White Base 830-40-50
NSP/WH/M3/830-40-50	Spartan LED IP65 White Base M3 Lithium 830-40-50
NSP/BK/830-40-50	Spartan LED IP65 Black Base 830-40-50
NSP/BK/M3/830-40-50	Spartan LED IP65 Black Base M3 Lithium 830-40-50
HIGH OUTPUT	
NSP/WH/HO/830-40-50	Spartan LED IP65 White Base HO 830-40-50
NSP/WH/HO/M3/830-40-50	Spartan LED IP65 White Base HO M3 Lithium 830-40-50
NSP/BK/HO/830-40-50	Spartan LED IP65 Black Base HO 830-40-50
NSP/BK/HO/M3/830-40-50	Spartan LED IP65 Black Base HO M3 Lithium 830-40-50
ACCESSORIES	
NSP/WH/BEZEL/3CCT	Spartan White Bezel Trim 3CCT
NSP/BK/BEZEL/3CCT	Spartan Black Bezel Trim 3CCT
NSP/WH/EYELID/3CCT	Spartan White Eyelid Trim 3CCT
NSP/BK/EYELID/3CCT	Spartan Black Eyelid Trim 3CCT



BRONX SLIM

IP65 die-cast aluminium and polycarbonate wall pack for commercial outdoor areas



APPLICATIONS

- For commercial exterior use on walkways, entrances and building perimeters

CONSTRUCTION

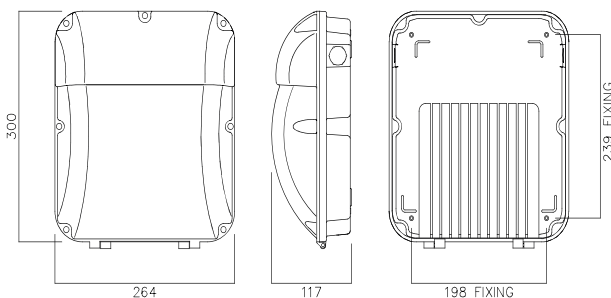
- Die-cast aluminium base with side or rear entry points for mains cabling
- Supplied with IP65 rated cable gland
- Polycarbonate cover, hinged and retained with stainless steel screws

TECHNICAL DETAILS

- 155 lm/W
- 30W nom., 29.4W act., 2,584 lm, 88 l.lm/c.W
- CRI>80
- CCT 4000K
- Emergency maintained 3 hr version available as listed
- PE CELL available with built in photo-electric cell for dusk to dawn operation (Suffix PEC as listed)

OPTIONS

SPECIALIST EMERGENCY Self-Test Emergency (Suffix STM3) or DALI Addressable Emergency (Suffix DAM3) options available



ORDER CODE	DESCRIPTION
NBX30SL/LED/840	Bronx Slim 30W LED Wall Pack 840
NBX30SL/LED/M3L/840	Bronx Slim 30W LED Wall Pack M3 Lithium 840 TA20C
NBX30SL/LED/PEC/840	Bronx Slim 30W LED Wall Pack PE Cell 840
NBX30SL/LED/PEC/M3L/840	Bronx Slim 30W LED Wall Pack PE Cell M3 Lithium 840 TA20C

REBUS

IP65 rated bollard



APPLICATIONS

- Paths
- Car parks
- Urban amenity areas

TECHNICAL DETAILS

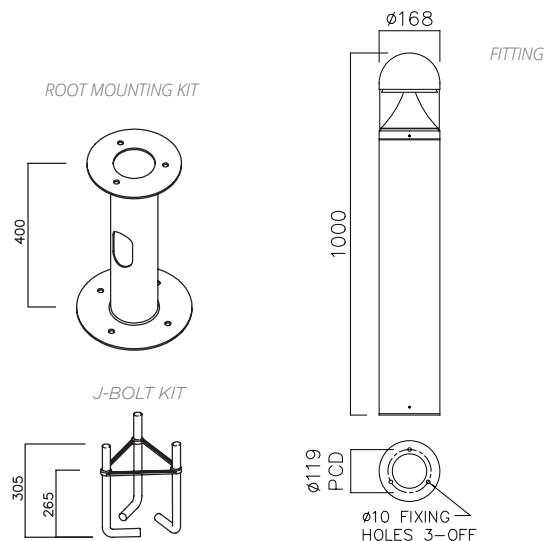
- 26W, 2,220 lumens, 85 l.lm/cw
- CRI>70
- CCT 4000K

ACCESSORIES

- ROOT MOUNTING KIT** Available as listed. To be ordered as a separate item
- J BOLT MOUNTING KIT** Available as listed. To be ordered as a separate item

CONSTRUCTION

- Heavy gauge extruded aluminium body
- Domed head



ORDER CODE	DESCRIPTION
NRB25/LED/BK/740	Rebus 25W LED 1M Bollard Black Dome Top
ACCESSORIES	
NRB/JBOLTKIT/12	Rebus J Bolt Kit 12 Inch
NRB/RMKIT	Rebus Root Mounting Kit

RENO

IP65 rated bollard



APPLICATIONS

- Paths
- Car parks
- Urban amenity areas

TECHNICAL DETAILS

- 13.3W, 950 lumens, 71 l.lm/cW
- CRI>70
- CCT 4000K

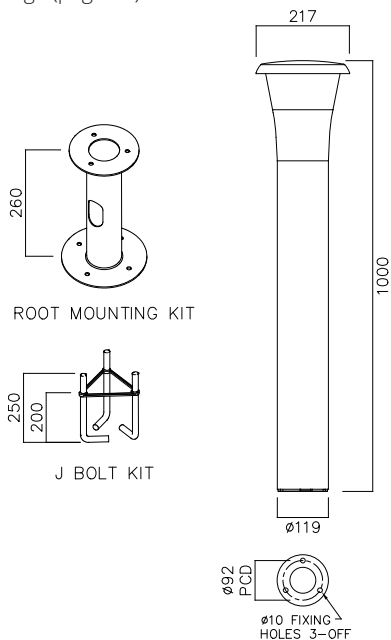
ACCESSORIES

ROOT MOUNTING KIT Available as listed. To be ordered as a separate item

J BOLT MOUNTING KIT Available as listed. To be ordered as a separate item

CONSTRUCTION

- Heavy gauge extruded aluminium body
- Canopy style head
- Designed to compliment the FREMONT range (page 93)



ORDER CODE	DESCRIPTION
NRN/GRY/740	Reno 13W LED Grey 1M Bollard
ACCESSORIES	
NRN/JBOLTKIT/12	Reno J Bolt Kit 12 Inch
NRN/RMKIT	Reno Root Mounting Kit





Emergency lighting without compromise

All our emergency lighting products are now branded **LiFe**, bringing together the best battery chemistry, the latest testing technology and the most comprehensive warranty terms.

LITHIUM

LITHIUM only. LiFePO₄ is the best battery technology available today, so all our **LiFe** products feature lithium batteries.



7-YEAR WARRANTY. All **LiFe** products carry a 7-year warranty, from the date of installation, and that includes the batteries.



ICEL ENDORSED. Many **LiFe** products are already ICEL endorsed, so they have been independently tested to the highest standards, and our factories are regularly audited to ensure ongoing compliance. ICEL endorsement of the remaining **LiFe** products is ongoing.

AUTOMATED TESTING, RECORDING & REPORTING. Technology that removes the costs and uncertainty of manual testing, recording and reporting is now more cost-effective and easier to install than ever. Manual testing and self-testing (which are great for some projects) are still available, but on page 59 you will find details of Casambi and HubSense - systems that provide addressable emergency testing without the costs of a DALI network.

EURO LEGENDS AS STANDARD. Unless otherwise stated, all signs are Euro style. ISO legends are available and are identified with ISO in the part number.



*Euro style
"straight ahead" legend. Arrow down, man running to door*



*ISO7010/BS5266 style
"straight ahead" legend. Arrow up, man running through door*



EMERGENCY LIGHTING



P60

NEBRASKA LiFe



P61

LEXINGTON LiFe



P62

ARLINGTON LiFe



P64

**SENECA LiFe
RECESSED**



P65

**SENECA LiFe
SURFACE**



P66

SYRACUSE LiFe



P67

KANSAS LiFe



P68

**HIGH-BAY
EMERGENCY
CONVERSION KIT**



P69

**RECESSED
EMERGENCY
CONVERSION KIT**

Manual test, self-test, addressable test Which is best for my project?

Emergency light fittings need to be tested every month with a short functional test and annually with a full discharge test.

We offer four different ways to do this, and when deciding which is most suitable the key concept is System Integrity:

- Have the tests been done?
- Have the results been recorded?
- Have faults been reported to the appropriate person?

1 MANUAL TEST – suitable on some small projects only

- Monthly testing is expensive. In <2 years the small extra cost of self-test will be recovered
- Manual testing is potentially impractical where emergency lighting is installed in bedrooms and bathrooms
- Overall System Integrity is LOW. Testing, recording and reporting are all manual, so easily overlooked

2 SELF-TEST – suitable on many small and medium sized small projects

- Great value – payback is typically in <2 years
- Testing cannot be scheduled (so it could happen at any time) – not suitable in classrooms, bedrooms etc.
- Overall system integrity is MEDIUM. Testing is automatic, but recording and reporting are still manual

3 SMART WIRELESS ADDRESSABLE TEST – perfect for many medium and large projects

- Great value – installation is simple, so costs are low
- Testing can be scheduled, so this is suitable in schools, care homes, cinemas etc
- Overall system integrity is HIGH. Testing & recording are automatic. Reporting is direct to the responsible person's mobile phone

4 WIRED DALI ADDRESSABLE TEST – designed for larger projects

- More expensive to install than an equivalent wireless system
- Testing can be scheduled, so this is suitable for any application
- Overall system integrity is HIGH. Testing is automatic, recording is automatic and reporting can be direct to the responsible person's phone

	Manual test	Self-test	Wireless Addressable test	DALI Wired Addressable test
Initial purchase cost	Lowest	Low/Medium	Medium	Highest
£ Pay-back	Worst value	Excellent value	Excellent value	Medium value
Installation cost	Medium 2 x Live and key-switches required	Low. 2 x Live required, but no key-switches, DALI bus or commissioning needed	Medium. 2 x Live required, but no key-switches or DALI bus. Simple commissioning	Highest cost. DALI bus & control panel required. Specialist commissioning
Running cost	Highest cost Monthly & annual tests	Low cost Fully automated	Low cost Fully automated	Low cost Fully automated
SYSTEM INTEGRITY Testing	Low Testing easily omitted	High Fully automated	High Fully automated	High Fully automated
SYSTEM INTEGRITY Recording	Low 100% manual	Low 100% manual	High Fully automated recording of test results	High Fully automated recording of test results
SYSTEM INTEGRITY Reporting	Low 100% manual	Low 100% manual	High Results reported to engineer's phone	High Results reported to engineer's phone

Addressable test: Smart wireless v Wired DALI

What's the difference?



For emergency addressable test we offer a choice of:

- Smart wireless - Casambi or HubSense
- Wired – DALI LightBox

The main differences are:

COMMUNICATION

- Smart wireless uses bluetooth to create a wireless mesh network.
- LightBox uses a pair of DALI wires and ethernet

WHERE THE DATA IS STORED

- Smart wireless uses distributed intelligence – the network knows what has to be tested and when. There is no specialist hardware or single point of failure
- LightBox uses a DALI hub and a LightBox control panel

COMMISSIONING

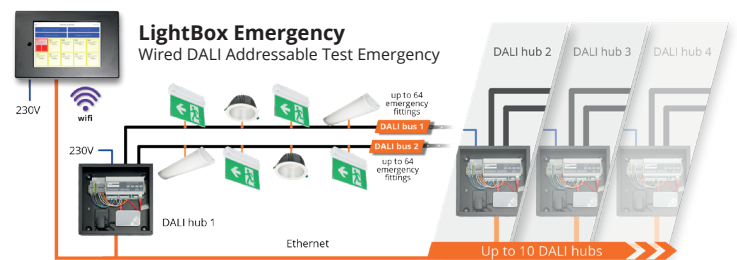
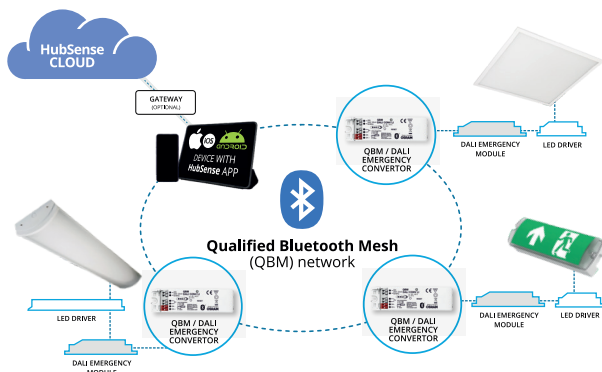
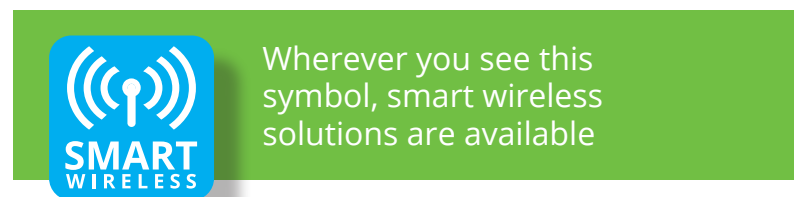
- Smart wireless commissioning is via a (free) app on your phone or tablet. It's very intuitive
- LightBox commissioning is via the control panel. This entails DALI addressing which some people find complex

REPORTING TEST RESULTS

- Smart wireless reports to the app on the responsible person's mobile phone whenever they are in bluetooth range
- LightBox reports to a control panel

REMOTE MONITORING

- Smart wireless and LightBox all offer remote monitoring (so test results can be checked from anywhere), but extra hardware is required for this



HubSense addressable emergency test system. The Casambi architecture is similar – no DALI wires, no specialist hardware and no single point of failure

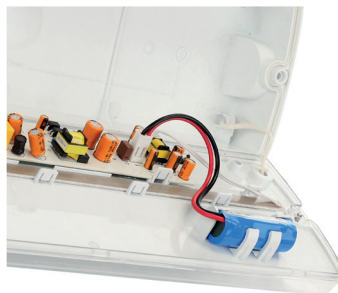
LightBox requires DALI wires, an ethernet connection and dedicated hardware, but can be more practical in widely dispersed estates such as a hospital or university campus

The advantages of Smart wireless v wired DALI addressable test systems

- Low installation cost – no DALI wires required
- Simple, intuitive commissioning – no specialist skill needed
 - No ethernet connection – no need for IT to be involved
- Long-term flexibility – easy to expand and modify in the future

NEBRASKA LiFe

IP65 emergency bulkhead available in self-test and addressable test versions, with a range of attachments



GEAR TRAY FIXED TO COVER FOR FASTER INSTALLATION

LiFe BENEFITS

Lithium batteries supplied as standard

- **Longer-lasting** – lithium batteries are warranted for 7-years from the data of installation
- **80% more efficient** – lithium batteries only lose c.4% of their charge every month, compared with 20% loss with NiCd
- **50% less waste** – lithium batteries last twice as long as NiCd, so there is 50% less waste

Installation is easy

- The gear tray is attached to the cover
- Removing the cover also exposes the terminal block for immediate cable insertion



APPLICATIONS

- Exits and escape routes

CONSTRUCTION

- Polycarbonate base and cover
- Gear tray and cover in one piece for faster installation
- Supplied with EURO or ISO legend pack
- Lithium batteries included as standard

TECHNICAL DETAILS

- 2.1W, 195 lm on mains supply
- 133 lm on battery supply
- 3-hour operation on battery power after mains failure
- Can be installed as maintained or non-maintained – details in instructions
- 20m maximum viewing distance with standard legends, 30m with drop-down attachment

- Self-test (STM3) and DALI addressable test (DAM3) versions available as listed

OPTIONS

SMART WIRELESS addressable test options are available. See pages 100-103 or contact our technical team for details

ATTACHMENTS

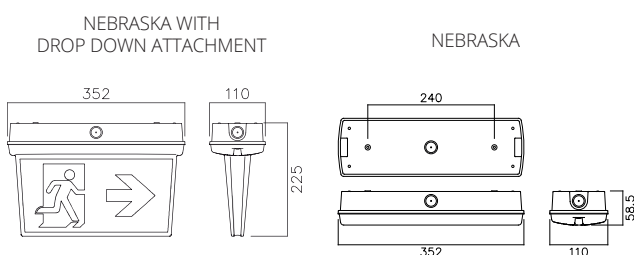
DROP DOWN ATTACHMENT Polycarbonate drop down signage attachment available supplied with legends. Order as separate item

RECESSED MOUNTING KIT Semi-recessed mounting kit available. Cut-out 360 x 120mm Order as a separate item

LEGENDS Spare legend packs available as listed



AVAILABLE WITH EITHER "MAN RUNNING THROUGH A DOOR" (ISO7010/BS5266) OR WITH "MAN RUNNING TOWARDS A DOOR" (EURO) LEGENDS



ORDER CODE	DESCRIPTION
NNE/M3	Nebraska LiFe LED IP65 Maint. Bulkhead Euro Legend Pack
NNE/M3/ISO	Nebraska LiFe LED IP65 Maint. Bulkhead ISO Legend Pack
NNE/STM3	Nebraska LiFe LED IP65 Maint. Bulkhead Euro Legend Pack Self Test
NNE/STM3/ISO	Nebraska LiFe LED IP65 Maint. Bulkhead ISO Legend Pack Self Test
NNE/DAM3	Nebraska LiFe LED IP65 Maint. Bulkhead Euro Legend Pack DALI M3
NNE/DAM3/ISO	Nebraska LiFe LED IP65 Maint. Bulkhead ISO Legend Pack ISO M3
ATTACHMENTS	
NNELEP4	Nebraska LiFe Euro Legend Pack Of Up Down Left Right
NNE/ISO/LEP4	Nebraska LiFe ISO Legend Pack Of Up Down Left Right
NNE/RMK	Nebraska LiFe Recessed Mounting Kit
NNE/DDA	Nebraska LiFe Drop Down Attachment c/w Legend Packs

LiFe *BENEFITS*

Lithium batteries supplied as standard

- **Longer-lasting** – lithium batteries are warranted for 7-years from the data of installation
- **80% more efficient** – lithium batteries only lose c.4% of their charge every month, compared with 20% loss with NiCd
- **50% less waste** – lithium batteries last twice as long as NiCd, so there is 50% less waste

Flexible installation

- Side cable entry – 20mm knock-out provided, or
- Rear cable entry – BESA fixings provided

LEXINGTON LiFe

3-hour maintained/non-maintained exit box



APPLICATIONS

- Corridors, exits and escape routes

TECHNICAL DETAILS

- 3 hr operation on battery power after mains failure
- Can be installed as maintained or non-maintained. Details in instructions
- 30m maximum viewing distance

- Self-test (STM3) and DALI addressable test (DAM3) versions available as listed

CONSTRUCTION

- Robust steel body
- White gloss powder coated finish
- Polycarbonate legend panel
- Supplied complete with either EURO legend "DOWN" arrow or ISO legend "UP" arrow (ahead)

CONSTRUCTION

- Lithium batteries included as standard
- Enclosure allows for side conduit entry

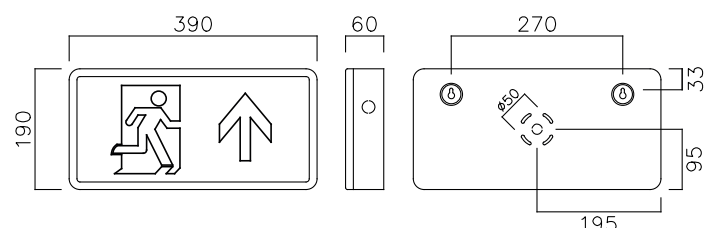
OPTIONS

SMART WIRELESS addressable test options are available. See pages 100-103 or contact our technical team for details

ATTACHMENTS

LEGENDS. Alternative legends available as listed

ORDER CODE	DESCRIPTION
NLE/M3	Lexington LiFe LED Exit Box Maint. Euro Down Legend
NLE/M3/ISO-U	Lexington LiFe LED Exit Box Maint. ISO Up Legend
NLE/STM3	Lexington LiFe LED Exit Box Maint. Euro Down Legend Self Test
NLE/STM3/ISO-U	Lexington LiFe LED Exit Box Maint. ISO Up Legend Self Test
NLE/DAM3	Lexington LiFe LED Exit Box Maint. Euro Down Legend DALI M3
NLE/DAM3/ISO-U	Lexington LiFe LED Exit Box Maint. ISO Up Legend DALI M3
ATTACHMENTS	
NLE/LE/UP	Lexington LiFe Euro Legend Up
NLE/LE/DOWN	Lexington LiFe Euro Legend Down
NLE/LE/LEFT	Lexington LiFe Euro Legend Left
NLE/LE/RIGHT	Lexington LiFe Euro Legend Right
NLE/ISO/LE/UP	Lexington LiFe ISO Legend Up
NLE/ISO/LE/DOWN	Lexington LiFe ISO Legend Down
NLE/ISO/LE/LEFT	Lexington LiFe ISO Legend Left
NLE/ISO/LE/RIGHT	Lexington LiFe ISO Legend Right



ARLINGTON LiFe

Versatile exit sign with drop blade with multitude of fixing options, for 3 hr maintained operation



APPLICATIONS

- Corridors
- Exits
- Escape routes

TECHNICAL DETAILS

- 3 hr operation on battery power after mains power failure
- Can be installed as maintained or non-maintained. Details in instructions
- Charge indicator lamp fitted
- 30m maximum viewing distance
- Self-test (STM3) and DALI addressable test (DAM3) versions available as listed

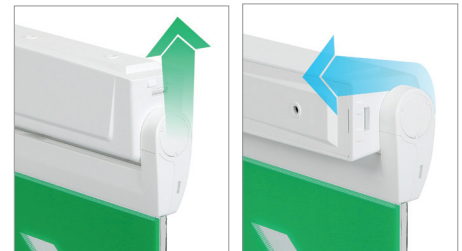
CONSTRUCTION

- Injection moulded white polycarbonate body
- Main body rotates 90° to allow direct fixing to ceiling or a wall
- 5mm thick clear acrylic blade
- Changeable 0.25mm thick acrylic screen printed exit legends
- Supplied complete with either EURO legend "DOWN" arrow or ISO legend "UP" arrow (ahead)
- Lithium batteries included as standard

LiFe BENEFITS

Lithium batteries supplied as standard

- Longer-lasting – lithium batteries are warranted for 7-years from the data of installation
- 80% more efficient – lithium batteries only lose c.4% of their charge every month, compared with 20% loss with NiCd
- 50% less waste – lithium batteries last twice as long as NiCd, so there is 50% less waste



HEAD POSITIONED SO IT CAN BE MOUNTED ON THE CEILING

HEAD ROTATED 90° SO IT CAN BE MOUNTED ON THE WALL

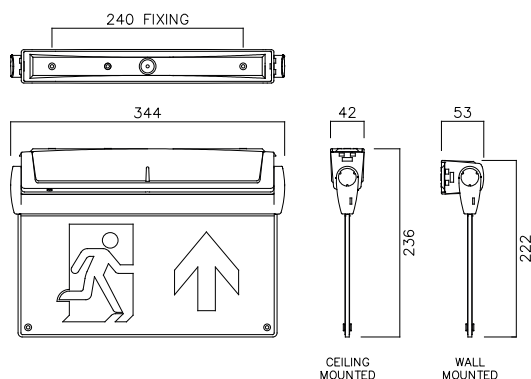
ATTACHMENTS

LEGENDS Alternative legends available as listed

FIXING ATTACHMENTS Optional fixing attachments to allow:

- Recessed fixing
- Wire Suspension
- Side wall mounting

See page 63



ORDER CODE	DESCRIPTION
NAL/M3	Arlington LiFe LED Maint. Blade Exit Sign Euro Down Legend
NAL/M3/ISO-U	Arlington LiFe LED Maint. Blade Exit Sign ISO Up Legend
NAL/STM3	Arlington LiFe LED Maint. Blade Exit Sign Euro Down Legend Self Test
NAL/STM3/ISO-U	Arlington LiFe LED Maint. Blade Exit Sign ISO Up Legend Self Test
NAL/DAM3	Arlington LiFe LED Maint. Blade Exit Sign Euro Down Legend DALI
NAL/DAM3/ISO-U	Arlington LiFe LED Maint. Blade Exit Sign ISO Up Legend DALI



ARLINGTON LiFe ATTACHMENTS

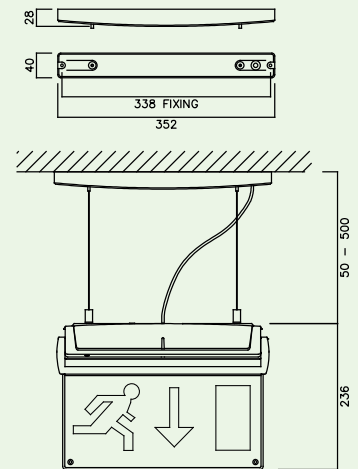
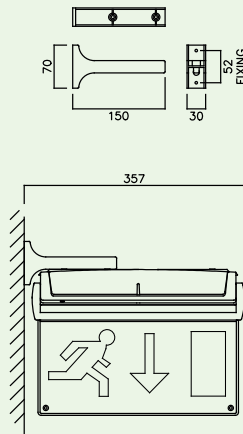
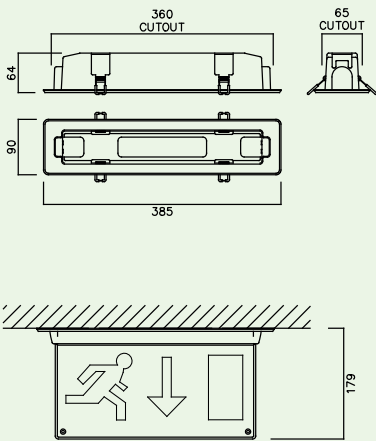
Range of optional attachments



RECESSED CEILING KIT

SIDE WALL MOUNTED BRACKET

WIRE SUSPENSION KIT



ATTACHMENTS	
NAL/RMK	Arlington LiFe Recessed Mounting Kit
NAL/SWMK	Arlington LiFe Side Wall Mounting Kit
NAL/WSK	Arlington LiFe Wire Suspension Kit
LEGENDS	
NAL/LE/UP	Arlington LiFe Euro Legend Up Pack
NAL/LE/LR	Arlington LiFe Euro Legend Left Right Pack
NAL/ISO/LE/UP	Arlington LiFe ISO Legend Up Pack
NAL/ISO/LE/LR	Arlington LiFe ISO Legend Left Right Pack
NAL/ISO/LE/DOWN	Arlington LiFe ISO Legend Down Pack

LEGENDS

Legends available as listed - to be ordered as separate items.



NAL/LE/UP



NAL/LE/LR



NAL/LE/DOWN/ISO



NAL/LE/UP/ISO



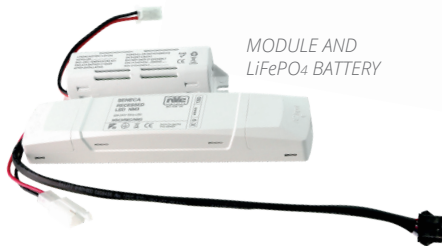
NAL/LE/LR/ISO

SENECA LiFe

Dedicated 3W emergency fittings for recessed mounting



CHANGEABLE LENS - COMES WITH BOTH WIDE AND OVAL DISTRIBUTION OPTIONS



MODULE AND LiFePO₄ BATTERY



SENECA LIFE BLANK IN-FILL RING



IP 40



SEVEN YEAR WARRANTY

LITHIUM



LiFe BENEFITS

- **Lithium batteries supplied as standard**
 - **Long lasting.** Our lithium batteries are warranted for 7 years from the date of installation
 - **Durable.** Lithium batteries last longer than NiCd so they are the more sought after solution
 - **More efficient.** Lithium batteries lose only 3-5% of their charge per month
 - **Greener.** Less toxic than cadmium and fully recyclable
 - **Less waste.** Because lithium batteries last at least twice as long as NiCd there is 50% less waste
- **Self-test is an option**
 - Automatically performs the tests required by BS5266, monthly and annually
 - Reports its test status with multi-colour indicator LEDs and audible buzzer

APPLICATIONS

- Corridors
- Escape routes

CONSTRUCTION

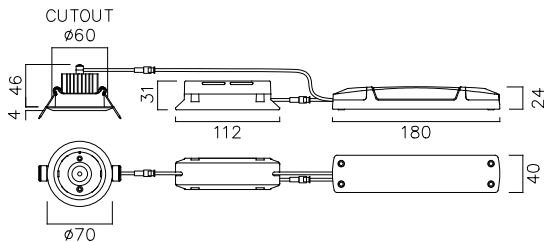
- Moulded polycarbonate body
- Acrylic lens
- Lithium batteries included as standard

TECHNICAL DETAILS

- 213 lumens
- 3 hrs operation on battery power after mains power failure
- Non-maintained operation
- Supplied complete with two lenses for different light distributions:
 - **Wide**, giving a circular light distribution
 - **Oval**, giving an oval light distribution
- Momentary manual test button fitted
- Self-test version compliant with BS5266 available. Suffix STNM3 as listed

OPTIONS

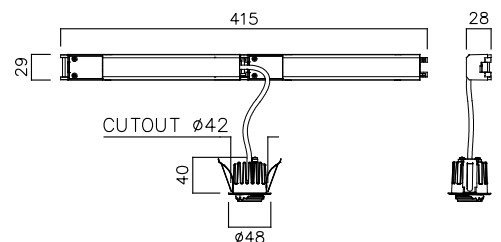
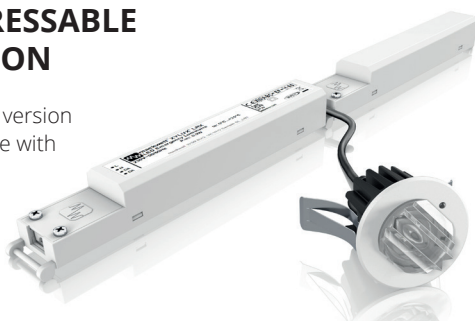
ATTACHMENTS In-fill ring to allow mounting into pre-cut apertures up to 110mm diameter



ORDER CODE	DESCRIPTION
NSC3/REC/NM3	Seneca LiFe 3W LED Non-Maintained Recessed
NSC3/REC/STNM3	Seneca LiFe 3W LED Non-Maintained Recessed Self Test
NSC3/BLANK-FILL/RING	Seneca LiFe Blank Fill-In Ring

DALI ADDRESSABLE TEST VERSION

Recessed round version supplied complete with 3 lenses for open area, corridor and emphasis applications



ORDER CODE	DESCRIPTION
NSC/REC/DA/NM3	Seneca LiFe LED Non-Maint. Recessed Downlight DALI 3xLens

LiFe *BENEFITS*

• Lithium batteries supplied as standard

- **Long lasting.** Our lithium batteries are warranted for 7 years from the date of installation
- **Durable.** Lithium batteries last longer than NiCd so they are the more sought after solution
- **More efficient.** Lithium batteries lose only 3-5% of their charge per month
- **Greener.** Less toxic than cadmium and fully recyclable
- **Less waste.** Because lithium batteries last at least twice as long as NiCd there is 50% less waste

• Self-test is an option

- Automatically performs the tests required by BS5266, monthly and annually
- Reports its test status with multi-colour indicator LEDs and audible buzzer

*SURFACE ROUND
AVAILABLE WITH
ADDRESSABLE
TEST VARIANTS*



SENECA SURFACE COMES WITH BOTH WIDE AND OVAL LENSES WHICH TWIST AND LOCK IN POSITION



APPLICATIONS

- Corridors, escape routes

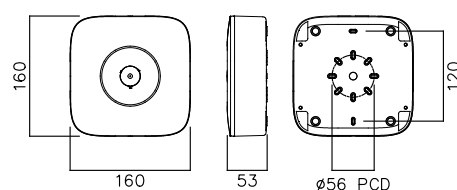
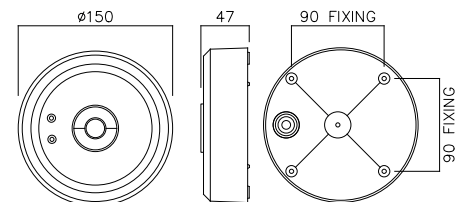
CONSTRUCTION

- Moulded polycarbonate body
- Acrylic lens
- Lithium batteries included as standard

TECHNICAL DETAILS

- 213 lumens
- 3 hrs operation on battery power after mains power failure
- Non-maintained operation
- Supplied complete with two lenses for different light distributions:
 - **Wide**, giving a circular light distribution
 - **Oval**, giving an oval light distribution
- Momentary manual test button fitted
- Self-test version compliant with BS5266 available. Suffix STNM3 as listed

ORDER CODE	DESCRIPTION
NSC/SURF/NM3	Seneca LiFe LED Non-Maint. Surface Mount Downlight
NSC/SURF/STNM3	Seneca LiFe LED Non-Maint. Surface Mount Downlight Self Test



ORDER CODE	DESCRIPTION
NSC/SURF-W/DA/NM3	Seneca LiFe LED Non-Maint. Surf Mount DALI Wide Lens
NSC/SURF-O/DA/NM3	Seneca LiFe LED Non-Maint. Surf Mount DALI Oval Lens



DALI ADDRESSABLE TEST VERSION

Surface square version to be ordered with either wide area lens (W) or oval lens (O) for corridor applications, as listed

SYRACUSE LiFe

Dedicated 1W emergency fitting for recessed mounting



CHANGEABLE LENS - COMES WITH BOTH WIDE & OVAL DISTRIBUTION OPTIONS

MODULE AND LiFePO₄ BATTERY

LiFe BENEFITS

Lithium batteries supplied as standard

- Longer-lasting – lithium batteries are warranted for 7-years from the date of installation
- 80% more efficient – lithium batteries only lose c.4% of their charge every month, compared with 20% loss with NiCd
- 50% less waste – lithium batteries last twice as long as NiCd, so there is 50% less waste



APPLICATIONS

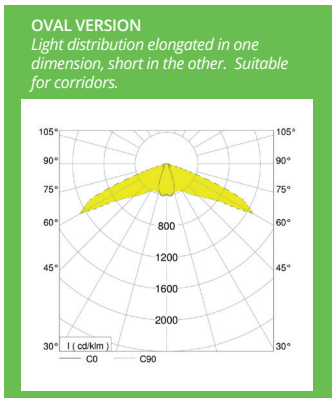
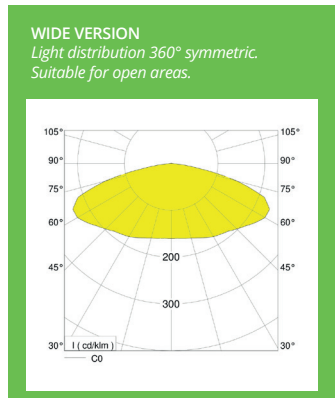
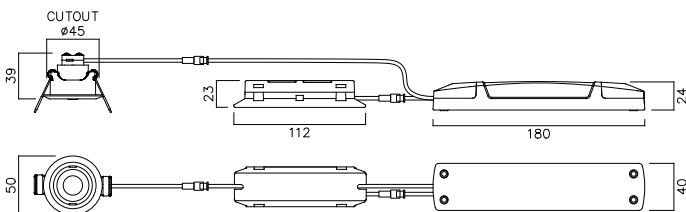
- Corridors
- Escape routes

CONSTRUCTION

- Moulded polycarbonate body
- Acrylic lens
- Supplied with push-fit connectors between body and module/batteries, for easier installation and maintenance

TECHNICAL DETAILS

- 119 lumens
- 3 hr operation on battery power after mains power failure
- Non-maintained operation
- Supplied complete with two lenses for different light distributions:
 - **Wide**, giving a circular light distribution
 - **Oval**, giving an oval light distribution



ORDER CODE	DESCRIPTION
NSY1/NM3	Syracuse LiFe 1W LED Non-Maint. Recessed Downlighter

LiFe BENEFITS

• Lithium batteries supplied as standard

- **Long lasting.** Our lithium batteries are warranted for 7 years from the date of installation
- **Durable.** Lithium batteries last longer than NiCd so they are the more sought after solution
- **More efficient.** Lithium batteries lose only 3-5% of their charge per month
- **Greener.** Less toxic than cadmium and fully recyclable
- **Less waste.** Because lithium batteries last at least twice as long as NiCd there is 50% less waste

• Self-test is an option

- Automatically performs the tests required by BS5266, monthly and annually
- Reports its test status with multi-colour indicator LEDs and audible buzzer

KANSAS LiFe

A range of IP20 and IP65 emergency twinspots



APPLICATIONS

- Suitable for general industrial use

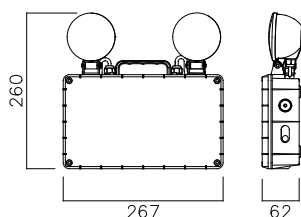
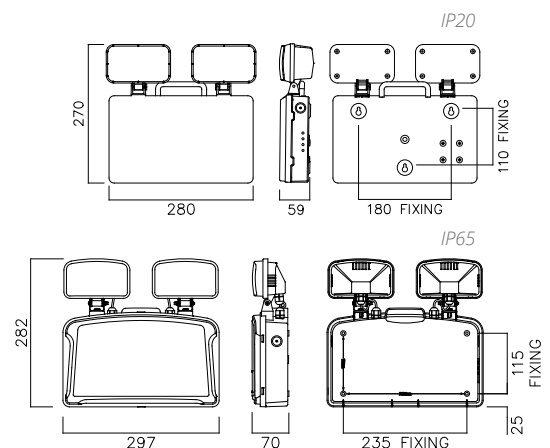
CONSTRUCTION

- Injection moulded polycarbonate body
- Polycarbonate heads, including lens, which can be rotated and tilted
- Suitable for mounting in any orientation
- Piano-key terminal block for ease of installation

TECHNICAL DETAILS

- 3 hr operation on battery power after mains power failure
- Lumen outputs:
 - IP20 version – 300 lm
 - IP65 versions – 380 lm (standard and self-test),
- LED indicators on side of body indicate the status of the fitting

ORDER CODE	DESCRIPTION
NKS/NM3	Kansas LiFe Twinspot IP20 LED Non-Maint.
NKS/IP65/NM3	Kansas LiFe Twinspot IP65 LED Non-Maint.
NKS/IP65/STNM3	Kansas LiFe Twinspot IP65 LED Non-Maint. Self Test



ORDER CODE	DESCRIPTION
NKS/IP65/DA/NM3	Kansas LiFe Twinspot IP65 LED Non-Maint. DALI



DALI ADDRESSABLE TEST VERSION

IP65 rated non-maintained 3 hr, with DALI addressable testing capability.

Lumen output – 750 lm

EMERGENCY CONVERSION KITS

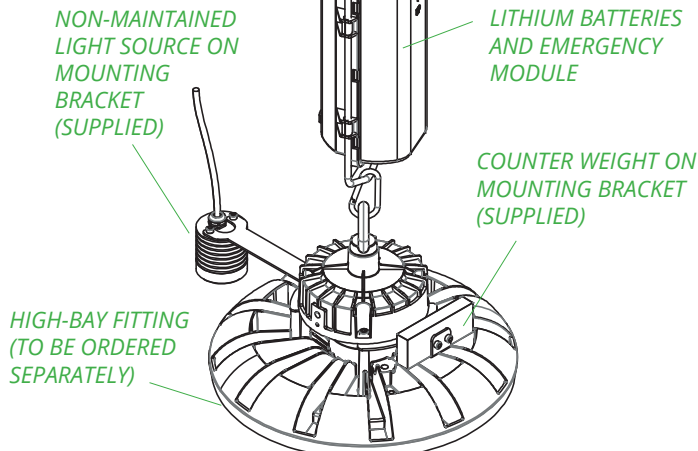
COMBINED LiFePO₄
BATTERY AND
EMERGENCY MODULE

NEW

Our plug and play emergency solution for high-bays



Emergency conversion kit for high-bay, as typically installed



Either of our high-bay fittings (JUPITER, page 78 and NEPTUNE, page 81) can be converted to 3 hr emergency operation with these plug and play conversion kits. This can also be installed as a stand alone emergency luminaire.

Each conversion kit includes:

- Lithium batteries and emergency module in IP65 rated enclosure
- IP65 rated cable glands
- Emergency light source for non-maintained operation
- Counter-weight and mounting bracket to counteract the weight of the emergency light source – so the main fitting always hangs straight
- Complete suspension kit with V bracket, suspension wire and carabiner

A practical and cost-effective alternative to twin-spots in industrial projects

A traditional way to light industrial premises is with twin spots. This emergency conversion kit is a practical and cost-effective alternative.

- Easier to install because there is no extra wiring - it makes use of the existing high-bay lighting points
- Better light distribution – puts the light directly onto the floor below
- Less glare – it lights from above, not from a low angle – so people will find their way out safely
- Can be installed as a stand alone, non-maintained, emergency luminaire

Two versions – standard and self-test

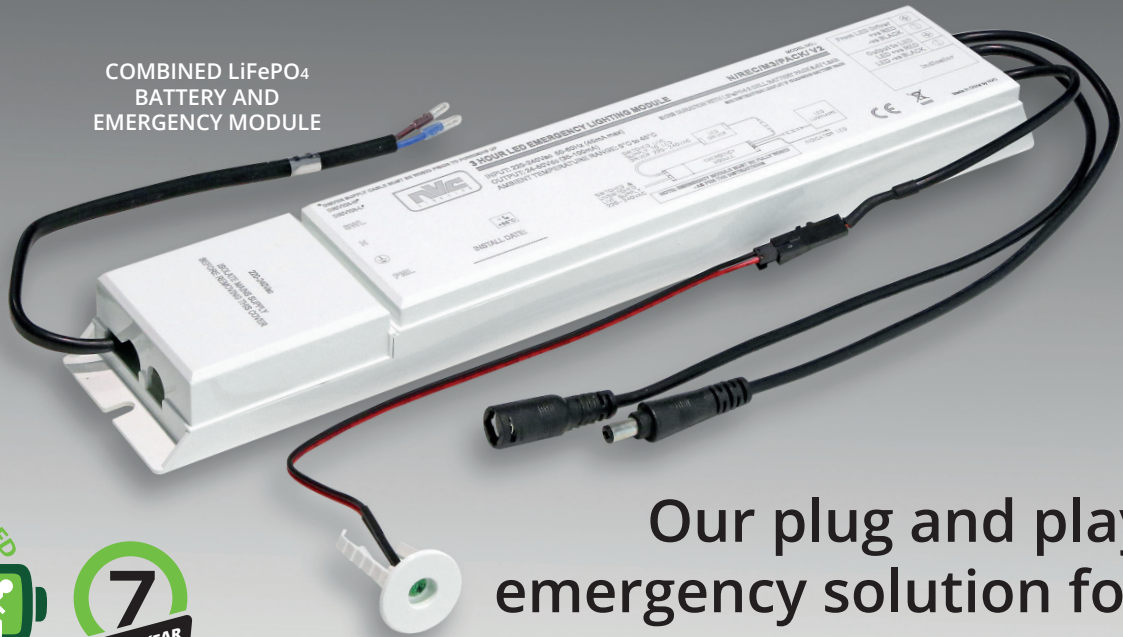
To test the standard version you should isolate the live supply (typically with a key switch) for a short duration every month, plus for a full 3 hrs once a year.

Following recent publicity, we are all more conscious than ever of the need to conduct emergency lighting tests correctly. Our self-test emergency conversion kits are a cost-effective way to assist compliance.

The self-test version commissions itself and then starts a test sequence compliant with BS 5266, comprised of a short test every month and a full 3 hr test every year. After each test the system status is indicated with a tri-colour LED and a bleeper. Battery faults are indicated with a red LED and bleep, luminaire faults with a yellow LED and bleep, all OK is indicated with a green LED and silence.

ORDER CODE	DESCRIPTION
N/HB/NM3L/PACK	LiFe High Bay IP65 NM3 Emergency Pack
N/HB/STNM3L/PACK	LiFe High Bay IP65 Self Test NM3 Emergency Pack

COMBINED LiFePO₄
BATTERY AND
EMERGENCY MODULE



Our plug and play emergency solution for panels and downlights

RECESSED EMERGENCY CONVERSION KIT FOR PANELS AND DOWNLIGHTS

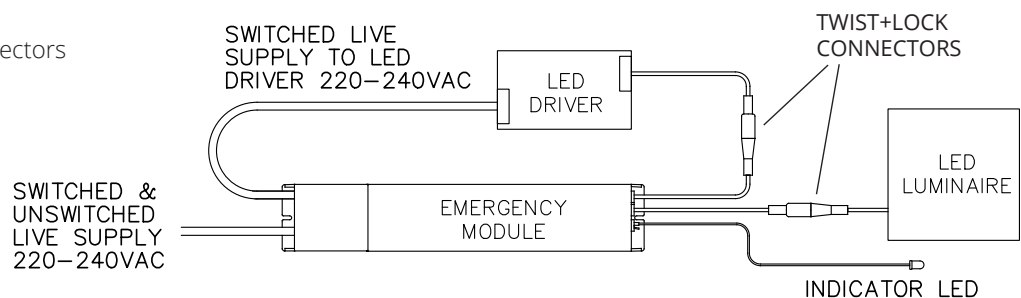
Any of our panels and most of our downlights can be converted to emergency maintained 3 hr with these plug and play conversion kits.



No need to calculate in advance how many emergency fittings you will need, just keep a few of our emergency conversion kits handy to convert panels and downlights as you need them.

Each conversion kit includes:

- Emergency module unit with built-in lithium battery
- Indicator LED
- Plug and play cables and connectors



Convert to emergency maintained M3 in 3 easy steps:

All our panels and most of our downlights have twist and lock connectors between the driver and the fitting which mate with the same connectors on the conversion kits.

- To convert – unplug the luminaire driver from the panel/downlight and disconnect it from the mains supply
- Reconnect the mains supply to the emergency module
- Connect the emergency module to the luminaire driver and the panel/downlight using the twist and lock connectors

Two versions – standard and self-test

To test the standard version you should isolate the live supply (typically with a key switch) for a short duration every month, plus for a full 3 hrs once a year.

Following recent publicity, we are all more conscious than ever of the need to conduct emergency lighting tests correctly. Our self-test emergency conversion kits are a cost-effective way to assist compliance.

The self-test version commissions itself and then starts a test sequence compliant with BS 5266, comprised of a short test every month and a full 3 hour test every year. After each test the system status is indicated with a tri-colour LED and a bleeper. Battery faults are indicated with a red LED and bleep, luminaire faults with a yellow LED and bleep, all OK is indicated with a green LED and silence.

ORDER CODE	DESCRIPTION
N/REC/M3/PACK/V2	LiFe M3 Emergency Pack For Recessed Product Ranges
N/REC/STM3/PACK/V2	LiFe Self Test M3 Emergency Pack For Recessed Product Ranges

Our range of industrial products meets the needs of almost any project in a factory, workshop or warehouse

Which non-corrosive should you use?

We offer a choice of 2 ranges of non-corrosives, GREENLAND and CLEVELAND. They are both IK10 rated for impact resistance, they are both all-polycarbonate construction with stainless steel clips, they are both available in 4', 5' and 6' lengths and both are available in emergency (M3) variants - so what's the difference?

	GREENLAND	CLEVELAND
	PRO	core
IP RATING	IP66	IP65
EFFICIENCY	Up to 140 lm/W	Up to 126 lm/W
COLOUR TEMP	4000K & 5000K	4000K only
SENSOR OPTIONS	Yes, MW (fitted) or external PIR	No
WIRELESS CONTROLS	Yes	No
DIMMING OPTIONS	Yes	No
LED SPECIFICATION	L80, 100,000 hours	L70, 50,000 hours
STEEL CLIPS	GRADE 304	GRADE 201

GREENLAND is our premium product. It has a higher specification and offers more features and options

CLEVELAND is our value range offer suitable for everyday projects

Which warehouse fitting should you use?

We offer a choice of 2 fittings for warehouses and similar large indoor spaces. What are the differences?

OREGON is the high specification option suitable for a wide range of applications, including multi-use halls

KELSO is a good value alternative to OREGON but with fewer options and wattages

	OREGON	KELSO
	PRO	core
IP RATING	IP20	IP20
IK RATING	IK09	-
ATTACHMENTS	Wire guard - Ik10	No
LUMEN OUTPUT	12K, 18K, 24K, 32K	15K, 20K
EFFICIENCY (lm/cW)	129-142	150
DISTRIBUTION	Standard & high-rack	Standard only
SENSOR OPTIONS	Yes, PIR	No
DIMMING OPTIONS	Yes, DALI	No
LED SPECIFICATION	L80, 100,000 hours	L70, 50,000 hours

Emergency Output Factor (EOF)		
	STANDARD EMERGENCY	HIGH-OUTPUT EMERGENCY
GREENLAND	9%	20%
OREGON	1.8%	3.7%

In each case, choosing the high-output emergency option more than doubles the output in emergency mode, compared to the standard emergency fitting.

Contact us for technical details and availability.

High-output emergency fittings

Achieving the correct emergency lighting levels where the mounting heights are above 5m is often difficult and expensive.

We have added high-output emergency fittings to the GREENLAND and OREGON ranges to make this easier and more cost-effective.



INDUSTRIAL LIGHTING



P72

GREENLAND



P74

CLEVELAND



P76

OREGON



P78

JUPITER



P80

KELSO



P81

NEPTUNE

GREENLAND

Premium polycarbonate IP66 weather-proof, non-corrosive fitting with dimming and sensor options



BATTEN MOUNT PIR SENSOR AND REMOTE HANDSET AVAILABLE SEPARATELY - SEE PAGE 98



APPLICATIONS

- Factories, garages and workshops
- Food preparation areas
- Non-emergency versions rated to -20°C (M3L versions rated to 0°C)
- Resistant to impact and many chemical agents, but for suitability in specific environments please take specialist advice
- External under-canopy use

CONSTRUCTION

- Polycarbonate base and opal diffuser
- Grade 304 stainless steel diffuser locking and surface mounting clips
- Reinforced drill points in base for direct surface fixing, or conduit suspension
- Can also be suspended from wire/chain using clips provided

TECHNICAL DETAILS

- Single and twin rows of LEDs
- 170 lm/W
- **640mm (2ft)**
 - Single 9.5W, 1,140 lm, 120 l.lm/c.W
 - Twin 17W, 2,128 lm, 123 l.lm/c.W
- **1,240mm (4ft)**
 - Single 28W, 3,400 lm, 121 l.lm/c.W
 - Twin 45W, 6,370 lm, 140 l.lm/c.W
- **1,540mm (5ft)**
 - Single 36W, 5,012 lm, 139 l.lm/c.W
 - Twin 73W, 9,865 lm, 135 l.lm/c.W
- **1,840mm (6ft)**
 - Single 48W, 5,900 lm, 122 l.lm/c.W
 - Twin 97W, 11,652 lm, 121 l.lm/c.W
- CRI>80
- CCT 4000K in 2ft, 4ft, 5ft and 6ft or CCT 5000K in 4ft and 5ft as listed
- Branded ENEC approved, flicker free driver

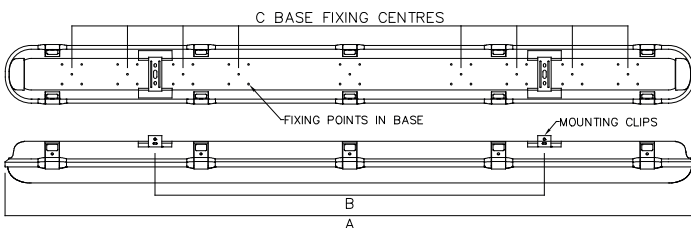
OPTIONS

EMERGENCY

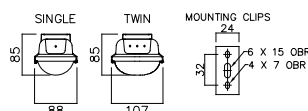
- Maintained 3 hr versions available for all sizes (except 1x2ft variant). Add suffix M3L
- Self-Test Emergency (suffix STM3) or DALI Addressable Emergency (suffix DAM3)
- High-output emergency (Suffix M3LH or STM3LH)
- **DIMMING DD** (DALI or Switch-Dim) or CF (Corridor Function) available. Add suffix DD or CF as required

SENSOR Available with microwave occupancy sensor fitted internally, available on all variants. Add suffix MW

SMART WIRELESS lighting control and addressable test options are available. See pages 100-103 or contact our technical team for details



SIZE	A	B	C
1X2/2X2	640	370	440
1X4/2X4	1240	800	600/800/1000
1X5/2X5	1540	940	600/800/1000/1200
1X6/2X6	1840	1280	800/1000/1200/1400/1600



ORDER CODE	DESCRIPTION	4000K
NGN1X2/840	Greenland LED V2 Single 2Ft 840	
NGN1X4/840	Greenland LED V2 Single 4Ft 840	
NGN1X5/840	Greenland LED V2 Single 5Ft 840	
NGN1X6/840	Greenland LED V2 Single 6Ft 840	
NGN2X2/840	Greenland LED V2 Twin 2Ft 840	
NGN2X4/840	Greenland LED V2 Twin 4Ft 840	
NGN2X5/840	Greenland LED V2 Twin 5Ft 840	
NGN2X6/840	Greenland LED V2 Twin 6Ft 840	
ORDER CODE	DESCRIPTION	5000K
NGN1X4/850	Greenland LED V2 Single 4Ft 850	
NGN1X5/850	Greenland LED V2 Single 5Ft 850	
NGN2X4/850	Greenland LED V2 Twin 4Ft 850	
NGN2X5/850	Greenland LED V2 Twin 5Ft 850	

GREENLAND

Easy installation

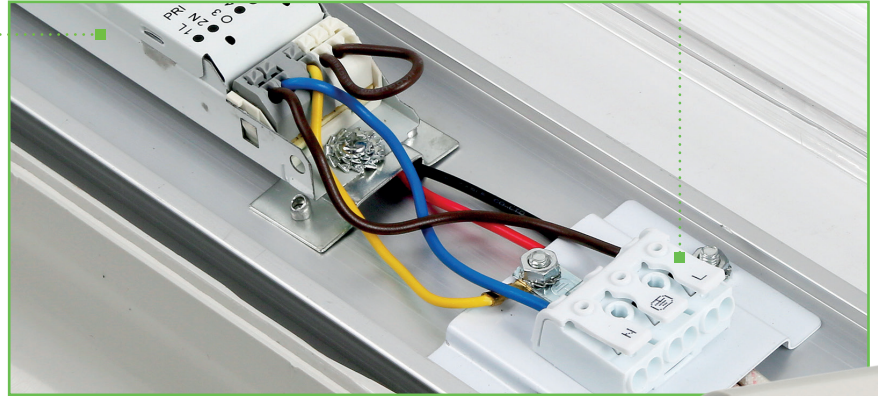
SCREWLESS TERMINAL BLOCK for 2 x 2.5mm² for loop-in/loop-out wiring

FLICKER FREE ENEC APPROVED LED DRIVER

MICROWAVE AVAILABLE.
Great for car parks, especially with corridor function (dim-to-10%)

FAST AND ACCURATE INSTALLATION
Reinforced BESA drill points pre-moulded in the base at 600mm, 800mm & 1,000mm centres

No more marking out, we did it for you!



GRADE 304 stainless steel clips.
Excellent corrosion resistance

ALL-POLYCARBONATE CONSTRUCTION ensures the maximum impact rating of IK10

Many brands supply a cable gland fitted – but most cable entry is from the rear, so you waste time removing the glands. We supply an IP66 gland, but it is loose, not fitted

GOOD GLARE CONTROL
Ribbed internal surface of the controller gives good glare control

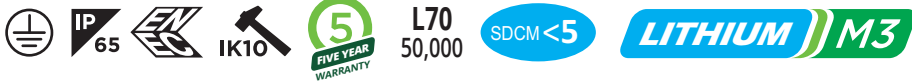
EASY TO CLEAN. Smooth external surface is easy to keep clean

GOOD THERMAL MANAGEMENT LEDs on a metal core PCB, mounted on an aluminium heat sink for good thermal management and long-life



CLEVELAND

Polycarbonate IP65 weather-proof fitting



APPLICATIONS

- Factories, garages and workshops
- Food preparation areas
- Resistant to impact and many chemical agents, but for suitability in specific environments please take specialist advice

CONSTRUCTION

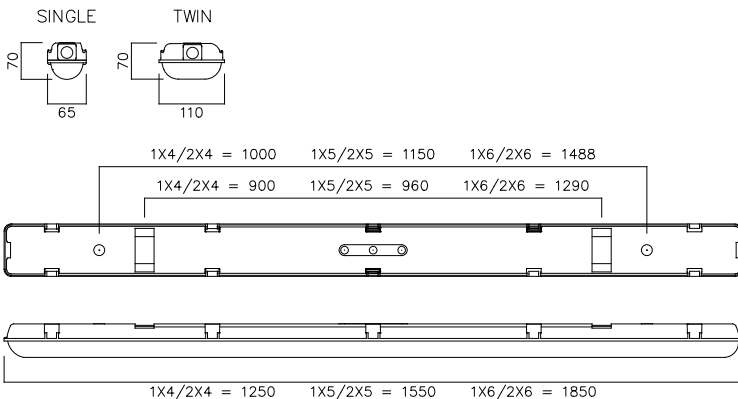
- Polycarbonate base and opal diffuser
- Grade 201 stainless steel diffuser locking and surface mounting clips
- Aluminium heat-sink
- Can also be suspended from wire/chain using clips provided

TECHNICAL DETAILS

- Single and twin rows of SMD LEDs on metal core PCB
- 150 lm/W
- **1,250mm (4ft)**
 - Single 23W, 2,915 lm, 125 l.lm/c.W
 - Twin 38W, 4,845 lm, 126 l.lm/c.W
- **1,550mm (5ft)**
 - Single 36W, 3,935 lm, 109 l.lm/c.W
 - Twin 57W, 6,615 lm, 116 l.lm/c.W
- **1,850mm (6ft)**
 - Single 47W, 5,380 lm, 114 l.lm/c.W
 - Twin 79W, 9,194 lm, 115 l.lm/c.W

TECHNICAL DETAILS (contd.)

- CRI>80
- CCT 4000K
- Branded ENEC approved flicker free driver
- Emergency maintained 3 hr version available for all sizes, as listed



ORDER CODE	DESCRIPTION
NCV1X4/840	Cleveland LED Single 4Ft IP65 Non Corrosive 840
NCV1X4/M3L/840	Cleveland LED Single 4Ft IP65 Non Corrosive M3L 840
NCV1X5/840	Cleveland LED Single 5Ft IP65 Non Corrosive 840
NCV1X5/M3L/840	Cleveland LED Single 5Ft IP65 Non Corrosive M3L 840
NCV1X6/840	Cleveland LED Single 6Ft IP65 Non Corrosive 840
NCV1X6/M3L/840	Cleveland LED Single 6Ft IP65 Non Corrosive M3L 840
NCV2X4/840	Cleveland LED Twin 4Ft IP65 Non Corrosive 840
NCV2X4/M3L/840	Cleveland LED Twin 4Ft IP65 Non Corrosive M3L 840
NCV2X5/840	Cleveland LED Twin 5Ft IP65 Non Corrosive 840
NCV2X5/M3L/840	Cleveland LED Twin 5Ft IP65 Non Corrosive M3L 840
NCV2X6/840	Cleveland LED Twin 6Ft IP65 Non Corrosive 840
NCV2X6/M3L/840	Cleveland LED Twin 6Ft IP65 Non Corrosive M3L 840



GREENLAND IP66 weatherproof fittings

OREGON

A high-performance low-bay with a wide range of dimming, sensor and emergency variants



AVAILABLE WITH OPTIONAL PIR SENSOR



AVAILABLE WITH OPTIONAL WIRE GUARD TO ACHIEVE IK10 RATING

APPLICATIONS

- Warehouses and factories
- Mounting heights 5M+

CONSTRUCTION

- Mild steel body
- Painted texture matt RAL 9016
- Aluminium extruded heatsinks
- 2 lenses available: 90° lens (Suffix 90) and High-rack lens (Suffix HR)
- Suitable for easy installation on chain, lighting trunking/rods & BESA fixings
- Piano key style terminal block for easy wiring and loop-in/loop-out
- Easy wiring using terminal access flap

TECHNICAL DETAILS

- 180 lm/W
- 90° Lens**
 - 12K - 11.5K act. lumens, 82.5W, 140 l.lm/c.W
 - 18K - 18.6K act. lumens, 144W, 129 l.lm/c.W
 - 24K - 22.4K act. lumens, 164W, 137 l.lm/c.W
 - 32K - 30.7K act. lumens, 234W, 131 l.lm/c.W
- High Rack (HR) Lens**
 - 12K - 11.3K act. lumens, 82W, 136 l.lm/c.W
 - 18K - 17K act. lumens, 144W, 118 l.lm/c.W
 - 24K - 23K act. lumens, 162W, 142 l.lm/c.W
 - 32K - 30.4K act. lumens, 234W, 130 l.lm/c.W
 - High quality Vossloh Schwabe (VS) LED modules, drivers & lenses
 - CRI>80
 - CCT 4000K

OPTIONS

EMERGENCY

- Maintained 3 hr versions (add suffix M3)
- Self-test Test Emergency (Suffix STM3) or DALI Addressable Emergency (Suffix DAM3)
- High-output emergency (Suffix M3LH or STM3LH)

DIMMING

DALI available. Add suffix DA if required

SENSORS

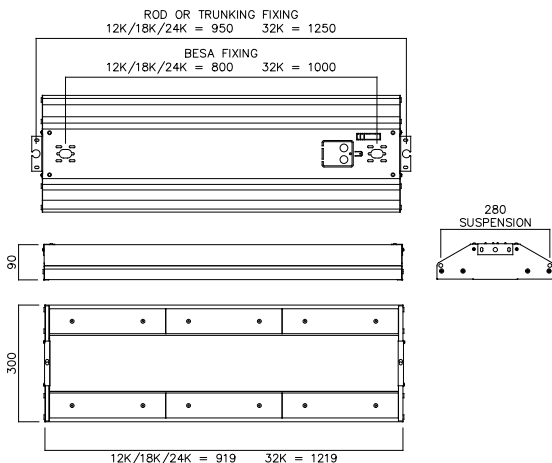
Available with PIR occupancy sensing only, add suffix PIR. For a sensor with dimming, add suffix PIRD

PANEL MOUNT CONNECTOR

Available with panel mount male connector fitted. Add suffix M02 (4-pole) or M05 (6-pole)

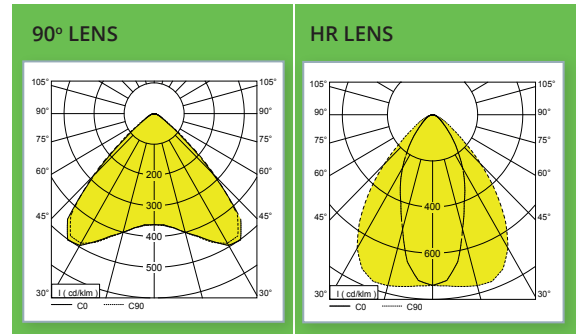
WIRE GUARD

Wire guard accessory is available that screw fixes to luminaire and raises the IK rating to IK10. Order as a separate item as listed



ORDER CODE	DESCRIPTION
NOR/V2/12K/90/840	Oregon V2 12000 Lumen LED Low-Bay 90Deg 840
NOR/V2/18K/90/840	Oregon V2 18000 Lumen LED Low-Bay 90Deg 840
NOR/V2/24K/90/840	Oregon V2 24000 Lumen LED Low-Bay 90Deg 840
NOR/V2/32K/90/840	Oregon V2 32000 Lumen LED Low-Bay 90Deg 840
NOR/V2/12K/HR/840	Oregon V2 12000 Lumen LED Low-Bay HR 840
NOR/V2/18K/HR/840	Oregon V2 18000 Lumen LED Low-Bay HR 840
NOR/V2/24K/HR/840	Oregon V2 24000 Lumen LED Low-Bay HR 840
NOR/V2/32K/HR/840	Oregon V2 32000 Lumen LED Low-Bay HR 840
ACCESSORIES	
NOR/V2/WG	Oregon V2 Wire Guard
NOR/V2/WG/32K	Oregon V2 Wire Guard for 32K

OREGON



Passive infrared motion sensor available to be supplied fitted in the OREGON. Order as /PIR (for on/off control) or /PIRD (for on/off and dimming)

OREGON is available with a passive infra-red (PIR) sensor fitted. This can be for simple on/off control, or for dimming, making use of any available daylight to keep a constant light level inside the warehouse.

One sensor per fitting or master/servant?

One-sensor-per-fitting makes installation easy, but it often doesn't produce the best user experience. As you walk down an aisle the fittings switch on as you pass under them, giving the sense you are walking into darkness.

A master/servant installation is slightly more complex, but the material costs are lower and the user experience is better. Once the first fitting in the aisle detects your presence all the others switch on, so you are walking into the light.

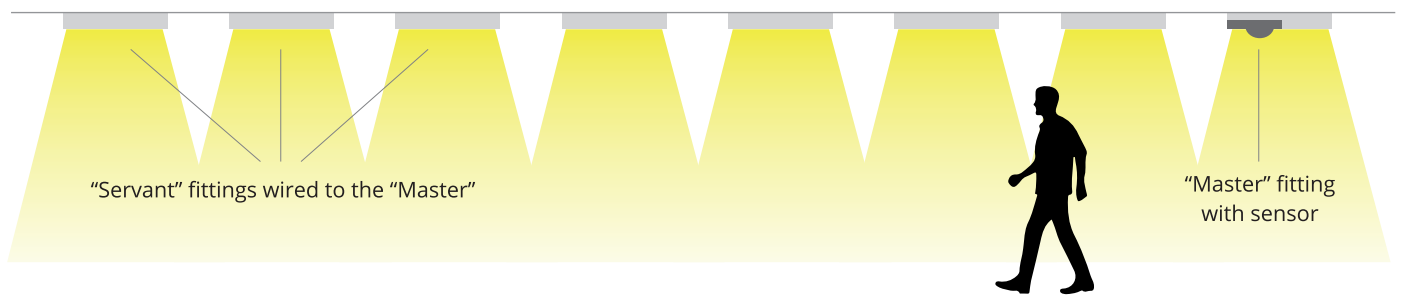


To commission an OREGON with PIR or PIRD you will need a commissioning handset.

ORDER CODE	DESCRIPTION
NHS/QUICKSETPRO	Commissioning handset for OREGON PIR/PIRD

Master/Servant operation

The whole row of servant fittings switch on as soon as the person moves under the master fitting at the start of the row



JUPITER

High performance high-bay fitting with dimming and sensor options



APPLICATIONS

- Industrial premises
- Large retail sites
- Public areas in airports, railway stations and coach terminals
- Cold stores, suitable to -30°C (except emergency)
- Harsh environments to +45°C (except emergency)

CONSTRUCTION

- Die-cast aluminium body, matt black painted
- UV stable clear polycarbonate front panel
- LEDs mounted on metal core PCB for good heat dissipation
- Driver in separate die-cast aluminium enclosure, mounted on rear of main body
- Pre-wired with 1m of H05 mains cable and 1m of H05 1-10V control signal cable
- Supplied with a steel eyelet for suspended mounting. For surface mounting a stirrup bracket is available

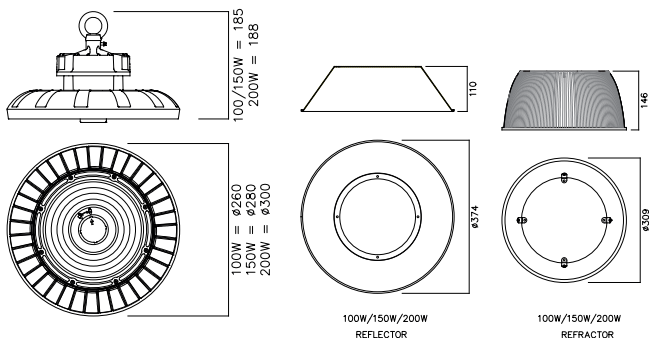
TECHNICAL DETAILS

- 190 lm/W
- 3 wattages available:
 - 100W, 15,679 lm at 99.2W, 158 l.lm/c.W
 - 150W, 23,759 lm at 149W, 159 l.lm/c.W
 - 200W, 31,664 lm at 190W, 167 l.lm/c.W
- CRI >80, CCT 4000K, beam angle 90°
- 1-10V dimming. Supplied ready for 1-10V dimming, use optional

OPTIONS

- **Dimming.** Supplied ready for 1-10V dimming
- **Emergency.** Available with a separate non-maintained emergency pack. Suffix /NM3L or /STNM3L

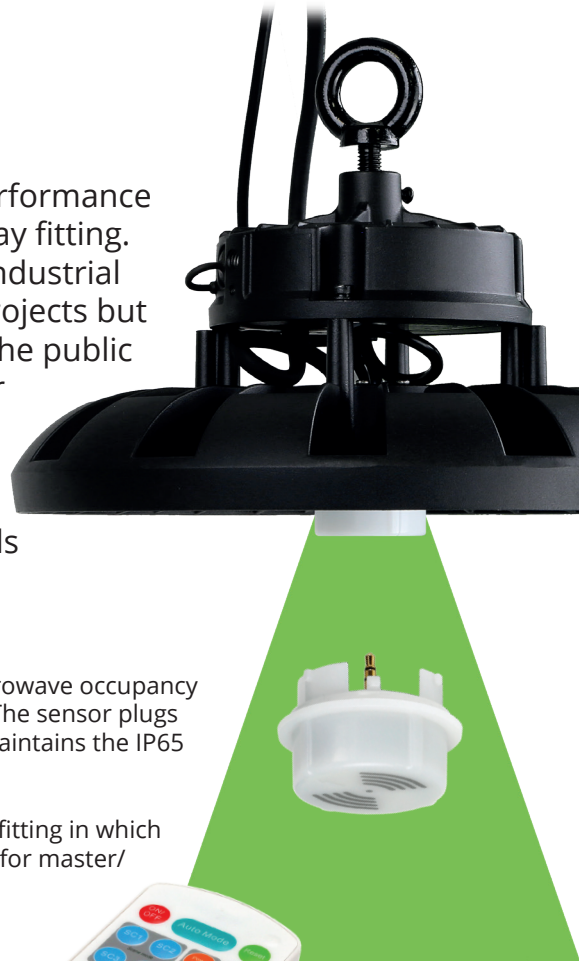
- **Attachments** to be ordered as separate items:
 - **Reflectors** (polycarbonate) and **reflectors** (aluminium)
 - **Stirrup mounting bracket** for mounting direct to a surface
 - **Microwave sensor.** Plug-in microwave occupancy sensor available, programmable via an infra-red handset. Both items to be ordered separately, as listed below



ORDER CODE	DESCRIPTION
NJP/100/1-10V/840	Jupiter 100W LED UFO High Bay IP65 1-10V 840
NJP/150/1-10V/840	Jupiter 150W LED UFO High Bay IP65 1-10V 840
NJP/200/1-10V/840	Jupiter 200W LED UFO High Bay IP65 1-10V 840
ATTACHMENTS	
NJP/PLUG-IN/MW/SENSOR	Jupiter Plug-In MW Sensor
NJP/MW/PROG/HS	Jupiter Plug-In MW Sensor Programming Handset
NJP/REFL/100-150-200	Jupiter ALI Reflector For 100W/150W/200W
NJP/REFR/100-150-200	Jupiter PC Refractor For 100W/150W/220W
NJP/SMB/100-150-200	Jupiter 100W/150W/200W Stirrup Mount Bracket Kit
N/HB/NM3L/PACK	NM3 Pack LiFePO4 for High Bay Products
N/HB/STNM3L/PACK	NM3 Pack LiFePO4 for High Bay Products Self-test

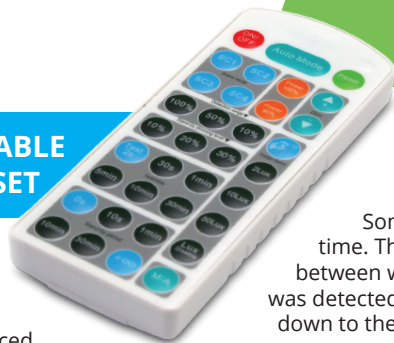
JUPITER

JUPITER is a high performance and versatile high-bay fitting. It is used chiefly in industrial and big-box retail projects but is equally suited to the public circulation and foyer areas in airports, train stations and buildings such as schools and hospitals



JUPITER can be fitted with a microwave occupancy sensor (purchased separately). The sensor plugs in with a twist-lock action and maintains the IP65 rating of the fitting.

It is designed to control just the fitting in which it is installed – it is not designed for master/servant configuration.



FULLY PROGRAMMABLE VIA REMOTE HANDSET

DETECTION RANGE

Up to 12m diameter at 7m mounting height, but the detection range can be reduced to prevent unnecessary triggering

HOLD TIME

Sometimes called the delay time. This is the amount of time between when the last movement was detected and the lights dimming down to the stand-by dimming level

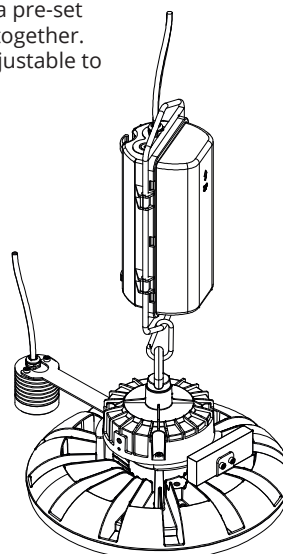
STAND-BY DIMMING LEVELS

When occupancy is no longer detected the light can be dimmed to a pre-set level before switching off altogether. The stand-by dim level is adjustable to 10%, 20% or 30%



1-10V DIMMING AS STANDARD

The JUPITER driver accepts a 1-10V dimming control signal, as generated by the sensor (available separately). Use of the sensor is optional - the driver works as a fixed-output device if no sensor is installed. Sensors with a 1-10V output are available from manufacturers such as Ex-Or and CP Electronics. For manual 1-10V dimming control, consider grid modules from Zano



REFRACTORS

Made of clear polycarbonate, the refractor reduces the beam angle very slightly, but substantially reduces the risk of glare. The refractor is generally most useful for reducing glare at lower mounting heights.



REFLECTORS

Made of aluminium, the reflector reduces the beam angle, and substantially reduces the risk of glare. The reflector is mostly used when JUPITER is installed at mounting heights above about 10m.



STIRRUP MOUNTING BRACKET

JUPITER is supplied complete with a suspension eyelet, but for mounting direct to a surface a stirrup mounting bracket is available.



EMERGENCY CONVERSION

A plug and play 3 hr non-maintained emergency pack with its own light source is available in two versions – standard NM3 and self-test NM3. Both are listed opposite and are supplied complete with lithium batteries and a 7-year warranty.

NEW

KELSO

Low-bay with choice of two outputs with multiple installation options



TOP FLAP ACCESS FOR EASY LOOP-IN/LOOP-OUT WIRING



VERSATILE MOUNTING OPTIONS INCLUDING BESA, CONDUIT, BRACKET, SUSPENDED AND CEILING MOUNTING



OPTIONAL WIRE SUSPENSION KIT. 1.5M



APPLICATIONS

- Warehouses, garages and workshops

CONSTRUCTION

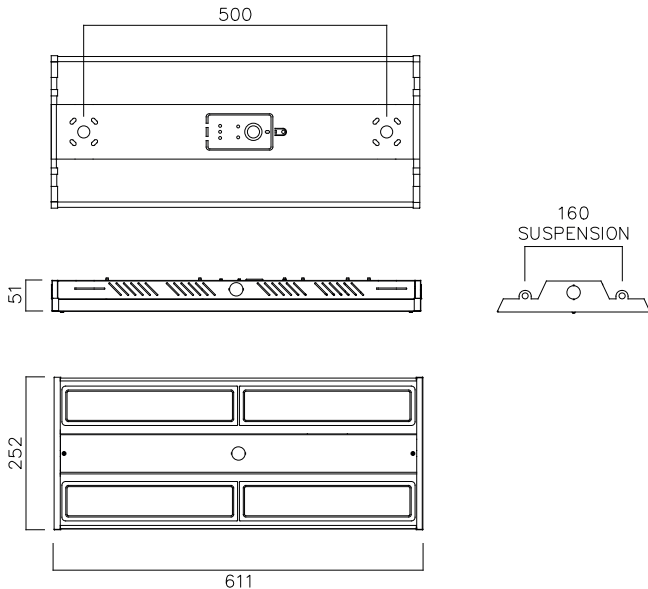
- Mild steel body
- Textured white paint finish, RAL9016
- Eye-holes for easy suspension
- Clear polycarbonate UV-stable cover
- Piano key loop-in/loop-out terminal block

TECHNICAL DETAILS

- 165 lm/W
- 2 wattages / sizes available
 - 100W, 15,068 lm at 100W, 151 l.lm/c.W
 - 135W, 20,076 lm at 134W, 150 l.lm/c.W
- ENEC approved flicker free driver
- CRI>80
- CCT 4000K
- Beam angle 110°
- Emergency maintained 3 hr version available for all sizes, as listed

KELSO IS QUICK AND VERSATILE TO INSTALL

- Piano-key terminals – no screwdriver required
- Loop-in/loop-out, 2 x 2.5mm² terminals – no junction box required
- Terminal block fitted to fold-up tab on rear for easy access
- Optional use 20mm knock-out on each end for cable entry
- Surface or suspension mounted:
 - o Eye-hole on each corner for chain suspension, and
 - o BESA fixings on rear for surface mounting



ORDER CODE	DESCRIPTION
NKE100/840	Kelso 100W LED Low Bay 840
NKE100/M3L/840	Kelso 100W LED Low Bay M3L 840
NKE135/840	Kelso 135W LED Low Bay 840
NKE135/M3L/840	Kelso 135W LED Low Bay M3L 840
ACCESSORIES	
NYA/WIRE/SUSP/KIT	Wire Suspension Kit 1.5m

NEW
NEPTUNE

High output IP65 high-bay



LITHIUM NM3

REMOTE HIGH-BAY NM3 / STNM3
EMERGENCY CONVERSION PACK.
SEE PAGE 70 FOR FURTHER INFORMATION



STIRRUP MOUNT BRACKET AVAILABLE
FOR MOUNTING AS FLOODLIGHT



APPLICATIONS

- Industrial and warehouse premises

CONSTRUCTION

- Die-cast aluminium body painted black
- Clear PC front panel
- LEDs mounted on metal core PCB
- Pre-wired with 1m of HO5 flex

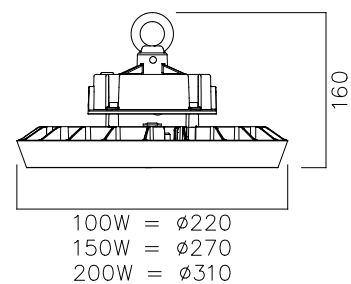
TECHNICAL DETAILS

- 185 lm/W
- Available in three wattages:
 - 100W, 15,405 lm at 99W, 156 l.lm/c.W
 - 150W, 23,034 lm at 148W, 156 l.lm/c.W
 - 200W, 31,563 lm at 200W, 158 l.lm/c.W
- CRI>80
- CCT 4000K
- Beam angle 110°

OPTIONS

- **Emergency.** Available with a separate non-maintained emergency pack. Suffix /NM3L or /STNM3L
- **Attachments** to be ordered as separate items:
 - Optional lenses** are available (as listed) to achieve 60° and 90° beam angles
 - Stirrup mounting bracket** for mounting direct to a surface

ORDER CODE	DESCRIPTION
NNT/100/840	Neptune 100W LED UFO High Bay IP65 840
NNT/150/840	Neptune 150W LED UFO High Bay IP65 840
NNT/200/840	Neptune 200W LED UFO High Bay IP65 840
ATTACHMENTS	DESCRIPTION
NNT/60DEG/100	Neptune 60 Deg Lens for 100W
NNT/60DEG/150	Neptune 60 Deg Lens for 150W
NNT/60DEG/200	Neptune 60 Deg Lens for 200W
NNT/90DEG/100	Neptune 90 Deg Lens for 100W
NNT/90DEG/150	Neptune 90 Deg Lens for 150W
NNT/90DEG/200	Neptune 90 Deg Lens for 200W
NNT/SMB/100-150	Neptune 100W/150W Stirrup Mount Bracket
NNT/SMB/200	Neptune 200W Stirrup Mount Bracket
N/HB/NM3L/PACK	NM3 Pack LiFePO4 for High Bay Products
N/HB/STNM3L/PACK	NM3 Pack LiFePO4 for High Bay Products Self-test





FLOODLIGHTING



P84

LYNX



P85

COUGAR

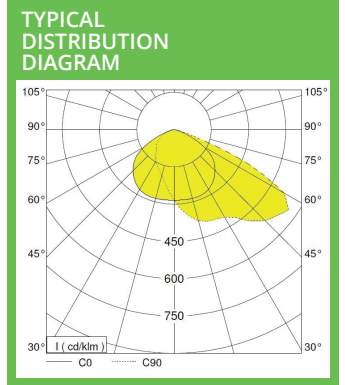


P86

PUMA

LYNX

Premium IP66 aluminium diecast asymmetric floodlight



APPLICATIONS

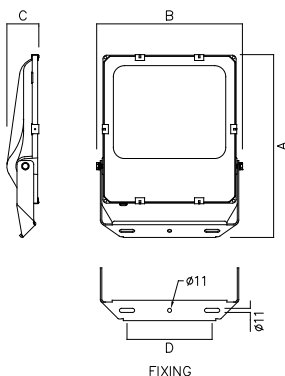
- Fascias, building facades, sports facilities, industrial premises, area floodlighting, perimeter and security lighting

CONSTRUCTION

- All variants IP66 rated
- Aluminium die-cast body enclosure
- 4mm toughened glass front panel.
- Castings and bracket painted black, fine sand texture finish (RAL9017)
- Pre-wired with 1.5m H05RN-F 3x1mm² flex
- Easy to install

TECHNICAL DETAILS

- Asymmetric lens
- 185 lm/W
- Available in five wattages:
 - 50W, 6,860 lm at 54W, 127 l.lm/cW
 - 100W, 13,970 lm at 104W, 135 l.lm/cW
 - 150W, 19,810 lm at 147W, 135 l.lm/cW
 - 200W, 26,640 lm at 206W, 129 l.lm/cW
 - 300W, 38,710 lm at 301W, 129 l.lm/cW
- CRI>70
- CCT 4000K
- PE cell versions available for dusk to dawn switching. Suffix PE1 as listed (not available on 50W version)



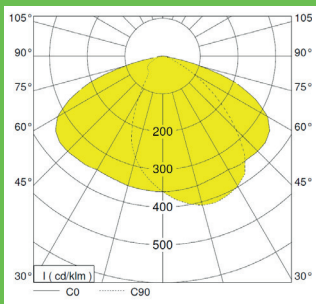
SIZE	A	B	C	D
50W	314	240	63	100-140
100W	418	330	77	130-190
150W	451	330	77	130-190
200W	494	395	87	200-260
300W	567	465	97	200-280

ORDER CODE	DESCRIPTION	WEIGHT kg	WINDAGE m ²	
NLX50/740	Lynx 50W IP66 LED Asymmetric Floodlight 740	2.6	0.05	
NLX100/740	Lynx 100W IP66 LED Asymmetric Floodlight 740	4.2	0.10	
NLX150/740	Lynx 150W IP66 LED Asymmetric Floodlight 740	4.9	0.11	
NLX200/740	Lynx 200W IP66 LED Asymmetric Floodlight 740	6.5	0.14	
NLX300/740	Lynx 300W IP66 LED Asymmetric Floodlight 740	9.8	0.20	
ORDER CODE	DESCRIPTION	WITH PE CELL	WEIGHT kg	WINDAGE m ²
NLX100/PE1/740	Lynx 100W IP65 LED Asymmetric Floodlight PE1 740		4.2	0.10
NLX150/PE1/740	Lynx 150W IP65 LED Asymmetric Floodlight PE1 740		4.9	0.11
NLX200/PE1/740	Lynx 200W IP65 LED Asymmetric Floodlight PE1 740		6.5	0.14
NLX300/PE1/740	Lynx 300W IP66 LED Asymmetric Floodlight PE1 740		9.8	0.20

COUGAR

IP65 aluminium diecast asymmetric floodlight

TYPICAL DISTRIBUTION DIAGRAM



APPLICATIONS

- Fascias, building facades, sports facilities, industrial premises, area floodlighting, perimeter and security lighting

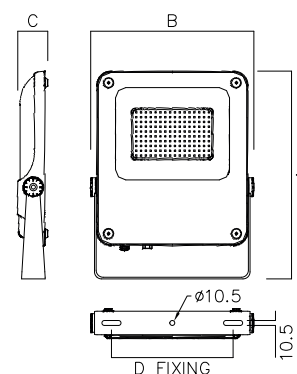
CONSTRUCTION

- All variants IP65 rated
- Aluminium die-cast body enclosure
- 4mm toughened glass front panel.
- Castings and bracket painted black, fine sand texture finish (RAL9017)
- Pre-wired with 0.7m H05RN-F 3x1mm² flex
- Easy to install

TECHNICAL DETAILS

- Asymmetric lens
- 175 lm/W
- Available in 4 wattages:
 - 50W, 6,425lm at 52W, 124 l.lm/cW
 - 100W, 10,850lm at 99W, 110 l.lm/cW
 - 150W, 16,420 at 151W, 108 l.lm/cW
 - 200W, 23,050 at 200W, 115 l.lm/cW
- CRI>70
- CCT 4000K
- PE Cell versions available for dusk to dawn switching. Suffix PEC as listed

ORDER CODE	DESCRIPTION	WITHOUT PEC	WEIGHT kg	WINDAGE m ²
NCU50/740	Cougar 50W LED IP65 Asymmetric Floodlight 740		3.20	0.05
NCU100/740	Cougar 100W LED IP65 Asymmetric Floodlight 740		4.00	0.10
NCU150/740	Cougar 150W LED IP65 Asymmetric Floodlight 740		5.60	0.11
NCU200/740	Cougar 200W LED IP65 Asymmetric Floodlight 740		7.85	0.14
ORDER CODE	DESCRIPTION	WITH PEC	WEIGHT kg	WINDAGE m ²
NCU50/PEC/740	Cougar 50W LED IP65 Asymmetric Floodlight PEC 740		3.20	0.05
NCU100/PEC/740	Cougar 100W LED IP65 Asymmetric Floodlight PEC 740		4.00	0.10
NCU150/PEC/740	Cougar 150W LED IP65 Asymmetric Floodlight PEC 740		5.60	0.11
NCU200/PEC/740	Cougar 200W LED IP65 Asymmetric Floodlight PEC 740		7.85	0.14

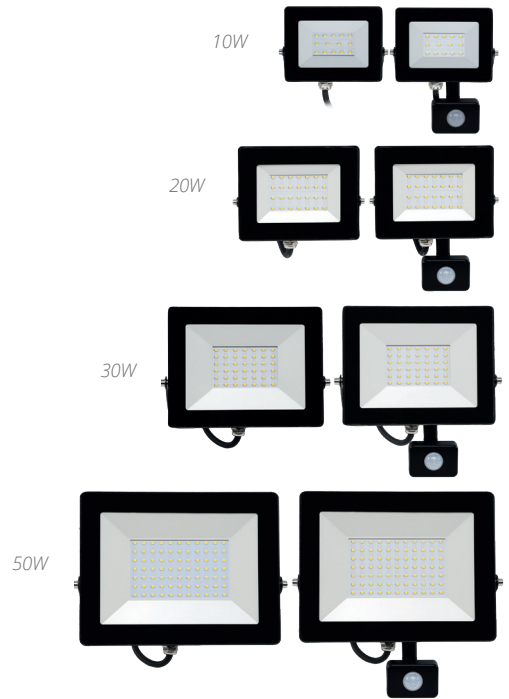


SIZE	A	B	C	D
50W	358	250	60	120-180
100W	408	281	60	142-202
150W	442	346	64	180-260
200W	532	346	68	180-260

NEW

PUMA

IP65 rated floodlights, with optional PIR, in a slim die-cast aluminium housing



APPLICATIONS

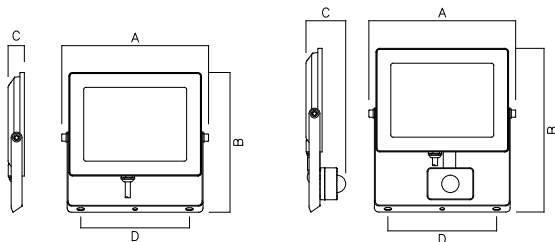
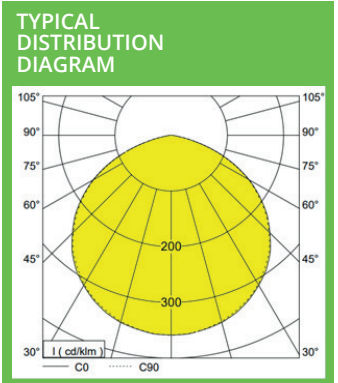
- Light commercial and residential projects, illuminating entrances, paths and perimeters

CONSTRUCTION

- Aluminium die-cast body
- Steel adjustable stirrup mounting bracket
- Bracket and castings finished with matt black fine sand textured paint
- 4mm toughened glass cover
- IP65 rated body and cover. PIR (when fitted) is IP54 rated
- Supplied pre-wired with 1m of 3-core 1mm² H05RN-F and IP65 cable gland

TECHNICAL DETAILS

- Available in 4 wattages:
 - 10W, 1,062 lm, 101 l.lm/c.W
 - 20W, 1,847 lm, 98 l.lm/c.W
 - 30W, 3,097 lm, 101 l.lm/c.W
 - 50W, 5,623 lm, 111 l.lm/c.W
- CRI>80
- CCT 4000K
- Available with PIR (IP54 rated) fitted on 180° adjustable pan and tilt bracket. Suffix /PIR as listed below
- PIR is fitted with 3 adjustment knobs:
 - Time-out (hold time) - 3 seconds – 8 minutes
 - Sensitivity (detection range) – 4-8m
 - Lux (switch-on threshold) 5 – 2,000 lux



SIZE	A	B	C	D
10W	132	121	21	90
20W	155	142	22	110
30W	203	193	22	150
50W	246	228	29	190

SIZE	A	B	C	D
10W	132	171	54	90
20W	155	191	55	110
30W	203	226	55	150
50W	246	257	56	190

ORDER CODE	DESCRIPTION	WEIGHT kg	WINDAGE m ²
NPM10/BK/840	Puma 10W LED Floodlight Black 840	0.59	0.014
NPM20/BK/840	Puma 20W LED Floodlight Black 840	0.99	0.022
NPM30/BK/840	Puma 30W LED Floodlight Black 840	1.31	0.031
NPM50/BK/840	Puma 50W LED Floodlight Black 840	1.93	0.045
ORDER CODE	DESCRIPTION	with PIR	WEIGHT kg WINDAGE m ²
NPM10/BK/PIR/840	Puma 10W LED Floodlight Black PIR 840	0.59	0.014
NPM20/BK/PIR/840	Puma 20W LED Floodlight Black PIR 840	0.99	0.022
NPM30/BK/PIR/840	Puma 30W LED Floodlight Black PIR 840	1.31	0.031
NPM50/BK/PIR/840	Puma 50W LED Floodlight Black PIR 840	1.93	0.045







STREET LIGHTING & POST-TOP



P90

BELFRY



P92

JASPER



P93

FREMONT



P94

EDMONTON

BELFRY

IP66 rated street lights in 2 sizes



BELFRY SMALL BODY WITH OPTIONAL 76-60MM MOUNTING COLLAR



BELFRY MEDIUM BODY WITH 60-34MM MOUNTING COLLAR



APPLICATIONS

- Car parks
- All road types from small access roads to urban streets

CONSTRUCTION

- Die-cast aluminium body, pre-treated for corrosion resistance
- Painted RAL9007
- Two body sizes:
 - Small, 16-68W, Weight 6.5kg
Windage 0.17m²
 - Medium, 70-137W, Weight 8.5kg
Windage 0.29m²
- 60-34mm spigot entry

TECHNICAL DETAILS

- 175 lm/W
 - Available in 8 standard wattages:
- SMALL BODY**
- 16W nom., 16.3W act., 2,420 lm, 148 l.lm/cW
 - 25W nom., 25.5W act., 3,800 lm, 149 l.lm/cW
 - 34W nom., 34.9W act., 5,020 lm, 144 l.lm/cW
 - 50W nom., 49.5W act., 7,760 lm, 157 l.lm/cW
 - 68W nom., 68.3W act., 10,335 lm, 151 l.lm/cW
- MEDIUM BODY**
- 70W nom., 76.0W act., 10,040 lm, 132 l.lm/cW
 - 95W nom., 104.5W act., 13,255 lm, 127 l.lm/cW
 - 137W nom., 139.8W act., 18,500 lm, 132 l.lm/cW
 - CRI >70, CCT 4000K
 - LEDs and driver 100,000 hours rated
 - Fully programmable DALI gear compatible with leading CMS's

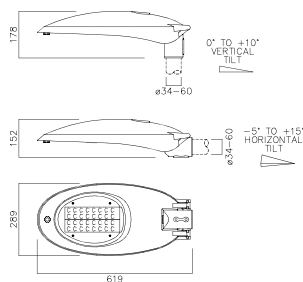
TECHNICAL DETAILS (Contd.)

- Unmetered Supply User Group (UMSUG) charge codes available

OPTIONS

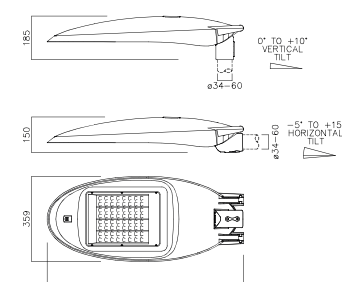
- MOUNTING COLLAR.** Option of 76-60mm collar, add suffix /76 when ordering
- LENS.** 3 different lens options for differing distributions. OP2 (most popular) is listed here. See opposite for details
- PE CELL AND NEMA SOCKET.** PE Cells or NEMA socket can be fitted

SMALL BODY



34-60MM FIXING (NO SUFFIX)

MEDIUM BODY



34-60MM FIXING (NO SUFFIX)

ORDER CODE	DESCRIPTION
SMALL BODY	
NBF16/OP2/740	Belfry 16W LED Street Light Opt 2 Lens 60-34 Fix 740
NBF25/OP2/740	Belfry 25W LED Street Light Opt 2 Lens 60-34 Fix 740
NBF34/OP2/740	Belfry 34W LED Street Light Opt 2 Lens 60-34 Fix 740
NBF50/OP2/740	Belfry 50W LED Street Light Opt 2 Lens 60-34 Fix 740
NBF68/OP2/740	Belfry 68W LED Street Light Opt 2 Lens 60-34 Fix 740
MEDIUM BODY	
NBF70/OP2/740	Belfry 70W LED Street Light Opt 2 Lens 60-34 Fix 740
NBF95/OP2/740	Belfry 95W LED Street Light Opt 2 Lens 60-34 Fix 740
NBF137/OP2/740	Belfry 137W LED Street Light Opt 2 Lens 60-34 Fix 740
ACCESSORIES	
NBF/COLLAR/76-60MM	Belfry Mounting Collar to Suit 76-60mm Diameter

SAFETY CUT-OUT - opening the cover automatically isolates the electrical supply

PHILIPS XITANIUM XTREME DRIVER. 100,000 hours rated and packed with programmable features

BREATHER VALVE FITTED - provides pressure equalisation for a reliable, long-term IP66 rating and condensation reduction

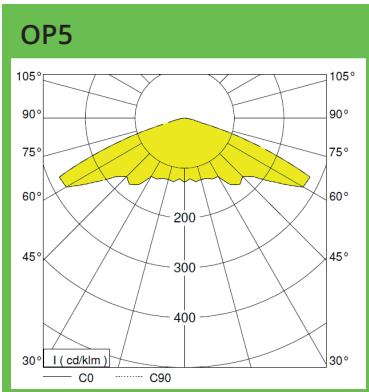
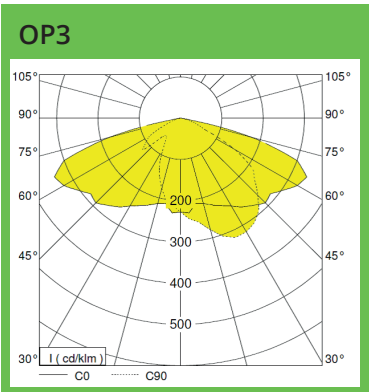
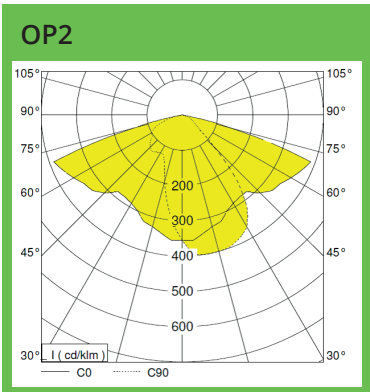
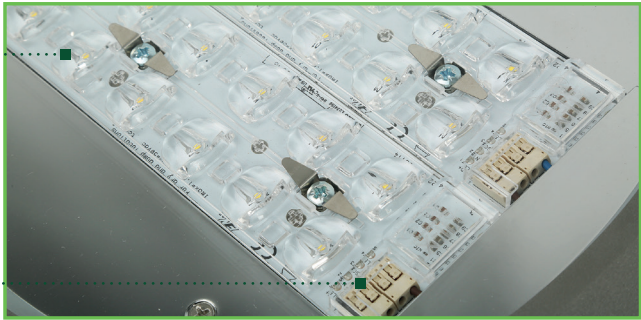
HIGH-PURITY ALUMINIUM die-cast housing, chromate pre-treated and polyester powder coated to RAL9007

ADJUSTABLE ANGLE - the mounting angle can be adjusted from -5° - +15° horizontal, 0° - +10° vertical mounting

TOOL FREE ACCESS - a simple thumb-screw gives tool-free access to the driver and terminal compartment, while maintaining its IP66 rating

INDIVIDUAL LENSES on each LED ensure precision light distribution

PHILIPS FORTIMO FASTFLEX LED modules for 100,000 hour rated reliability



BELFRY is available with 3 different lenses, OP2, OP3 and OP5 to give a choice of light distributions for different roadway types and layouts

JASPER

IP65 rated decorative post top fitting



SPIGOT REDUCER
76-60MM



APPLICATIONS

- Car parks
- Parks and gardens
- Urban amenity areas
- The light distribution of JASPER casts a circular pool of light on the ground suitable for general amenity lighting

TECHNICAL DETAILS

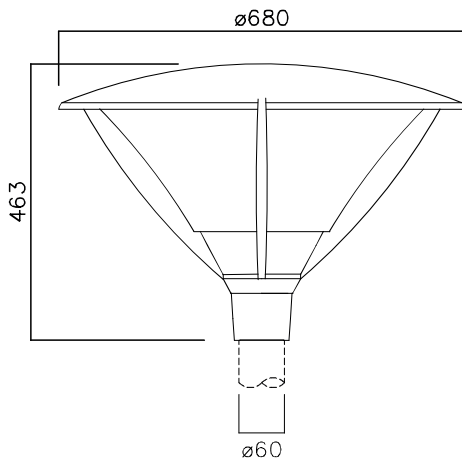
- 140 lm/W
- 35W, 3,380 lm, 96 l.lm/c.W
- CRI>70
- CCT 4000K
- PE cell version available for dusk to dawn switching. Suffix PE1 as listed

OPTIONS

POST-TOP REDUCER, 76-60mm available as an optional extra

CONSTRUCTION

- Die-cast aluminium body and base
- Polycarbonate controller
- Aluminium internal reflector
- Weight: 7.0kg
- Windage: 0.34m²



ORDER CODE	DESCRIPTION
NJS50/LED/740	Jasper 50W LED Post Top 740
NJS50/LED/PE1/740	Jasper 50W LED Post Top 740 +PE1 Post Top
ACCESSORIES	
NSR/76-60/EXT	Spigot Reducer 76-60mm External

FREMONT

IP65 rated decorative post top fitting



SPIGOT REDUCER
76-60MM



APPLICATIONS

- Car parks
- Parks and gardens
- Urban amenity areas

CONSTRUCTION

- Die-cast aluminium body and base
- Clear polycarbonate cover
- Aluminium internal reflector
- Weight: 7.2kg
- Windage: 0.25m²

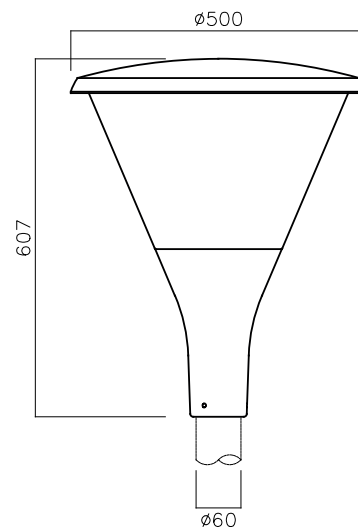
TECHNICAL DETAILS

- 145 lm/W
- 31W, 3,302 lm, 107 l.lm/c.W
- CRI>80
- CCT 4000K

OPTIONS

PHOTO-CELL Photo-cell options are not available

POST-TOP REDUCER 76-60mm available as an optional extra



ORDER CODE	DESCRIPTION
NFM40/840	Fremont 40W LED Post Top 840
ACCESSORIES	
NSR/76-60/EXT	Spigot Reducer 76-60mm External

EDMONTON

IP65 rated globe
post-top fitting



AVAILABLE WITH PE CELL FITTED



SPIGOT REDUCER
76-60MM



APPLICATIONS

- Car parks
- Parks and gardens
- Urban amenity areas

CONSTRUCTION

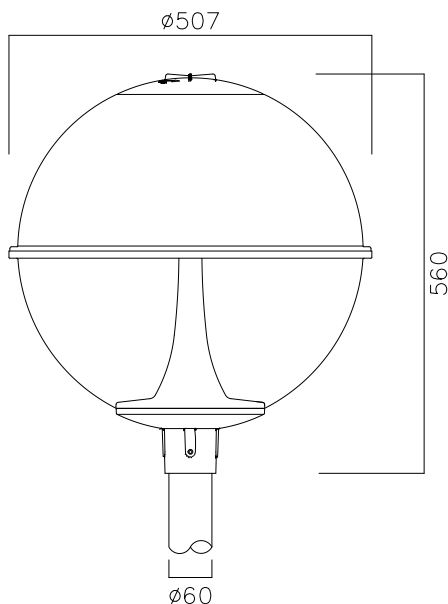
- Aluminium / steel body and base
- Clear polycarbonate cover
- Weight: 8.8kg
- Windage: 0.28m²

TECHNICAL DETAILS

- 170 lm/W
- 53.1W, 6700 lm, 126 l.lm/c.W
- CRI>70
- CCT 4000K
- PE Cell version available for dusk to dawn switching. Suffix PE1 as listed

OPTIONS

POST-TOP REDUCER, 76-60mm available as an optional extra



ORDER CODE	DESCRIPTION
NED50/BK/740	Edmonton 50W LED Black Post-Top Globe 740
NED50/BK/PE1/740	Edmonton 50W LED Black Post-Top Globe PE1 740
ACCESSORIES	
NSR/76-60/EXT	Spigot Reducer 76-60mm External



LIGHTING CONTROLS & EMERGENCY TEST SYSTEMS

More important now than ever

ELECTRICITY COSTS remain high. The combination of this and emerging wire-free technologies facilitating easier deployment of lighting controls makes these control systems more cost effective than ever.

NET-ZERO is a national goal and many companies have their own carbon neutral targets. Lighting controls are a contribution to achieving them.

WELLNESS is mainstream. Controls play a major part in making lighting human centric and making offices, schools and commercial buildings as attractive a place to be as working from home.

THE PRODUCTIVITY CRUNCH To increase living standards we need to be more productive. Manually testing emergency light fittings every month adds nothing to the sum of human wealth and happiness – so let's automate it. The latest wire-free lighting controls include addressable emergency test options that are cost-effective and easy to install.



ONE SENSOR PER FITTING



MASTER / SERVANT



WIRELESS CONTROLS



WIRED DALI

LIGHTING CONTROLS AND EMERGENCY TEST SYSTEMS THAT ARE EASY TO SPECIFY AND DEPLOY

SIMPLE CONTROLS, ordered direct from the catalogue

If you need sensors in a corridor, dusk/dawn control over the car park lighting or daylight dimming in an office, the solution can be ordered direct from the catalogue.

- **Level 1.** One sensor per fitting
- **Level 2.** Master/servant

Details are available overleaf, and on the catalogue pages of the individual fittings.

Level 1 and Level 2 solutions can all be ordered direct from the catalogue. Fittings with a sensor or with a driver that can be linked to a sensor in another fitting, all have their own part numbers. You order – we deliver (but if you need advice, don't hesitate to contact your local NVC Lighting representative or the technical support team).

CONTROL SYSTEMS, configured for you by our technical support team

- **Level 3. Wireless controls**

We support 3 wireless control options – Philips Master Connect, Casambi and HubSense from Silvair/Inventronics (formerly from Osram). The following pages (100-105) give you more details, but our technical support team will help you make the best choice for your project.

Please note - wireless controls are available across a wide range of our products, wherever you see this symbol. However, not all wireless control options are available on all product variants. Our technical support team has the details.



- **Level 4. Wired DALI**

We have a range of wired DALI solutions, suitable for medium and large scale projects.

If **MasterConnect, Casambi, HubSense** or a **wired DALI system** has been specified – we can supply what you need. **Call our technical support team (+44 (0)121 457 6340)**, get their advice and together we will create the solution that best fits your project and budget.

LEVEL 1 One sensor per fitting

This is the simplest way to add some lighting controls to an installation

Three technologies are available, depending on the requirement and application:

Microwave (MW)
An MW sensor detects any sort of movement and can be fitted behind the diffuser on a fitting. Microwave sensors are most widely used for indoor lighting control applications.

Passive Infrared (PIR)
A PIR detects the movement of heat emitting bodies such as people or animals. They do not work through solid objects or from behind a diffuser so must always be located on the outside of a fitting.

Photo-electric cell (PEC)
A PEC detects the level of ambient light and then switches the fitting on or off accordingly. Dedicated PECs are mostly used for dusk/dawn control of exterior lighting.

Built-in sensors
Many of our fittings are available with a sensor built-in. You will find these in the SURFACE & SUSPENDED, AMENITY, INDUSTRIAL, FLOODLIGHTING and STREET LIGHTING & POST-TOP sections. Full details are on each page. These solutions save energy for the end-user and are quick and easy for the contractor to install.

Add-on sensors

In some cases it is not practical to fit a sensor in our factory, but we can supply sensors that the electrical contractor can fit on the outside of a fitting, or adjacent to it, during installation. These sensors have to be ordered as separate items and the details are as follows:

Batten-mount style sensors, suitable for fitting on the end of lights such as the YALE PRO, PHOENIX or TEXAS/TEXAS PRO. These sensors are all adjustable in respect to their range/sensitivity, light-level threshold and time delay.

ORDER CODE	DESCRIPTION
N/MW/SST-MS04/ENCL	Microwave C/W Lux Time Sens Adj In ENCL Wired
N/PIR/BATT	Batten Mount PIR Sensor On/Off IP65 with Remote Handset
N/PIR/BATT/HS	Batten Mount PIR Remote Handset Only



Recessed sensor for installation in the ceilings of offices and classrooms, complete with adjustable range/sensitivity, light-level threshold and time delay.

ORDER CODE	DESCRIPTION
N/PIR/REC	Recessed Ceiling Mount PIR Sensor On/Off



Photo electric cells for installing on, or adjacent to, exterior light fittings such as some amenity fittings, street lights, flood lights and some post-top fittings.

ORDER CODE	DESCRIPTION
NPECH	Photo-Electric Cell External Head Only
NPECI2P	Photo-Electric Cell Internal 2 Part
NPECK	Photo-Electric Cell External Kit
NPECR	Photo-Electric Cell Internal 1 Part





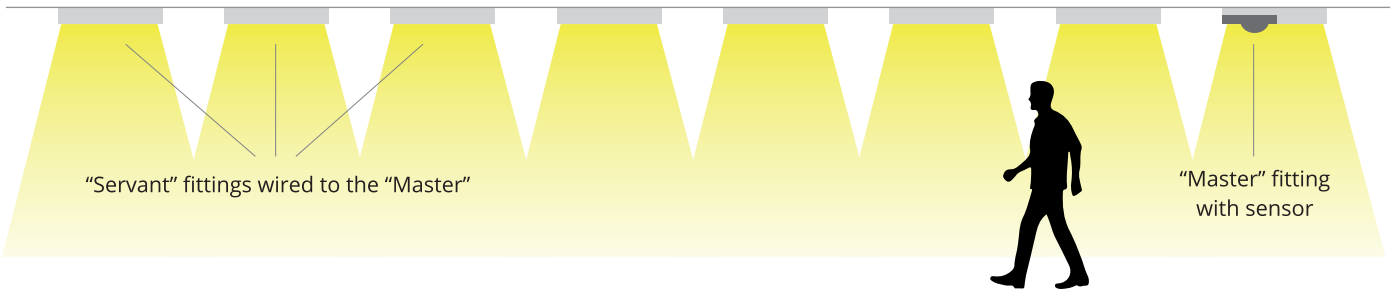
Any of the luminaires that we can supply from our SURFACE & SUSPENDED, AMENITY and INDUSTRIAL sections with a sensor ready fitted are suitable for use in a Master/Servant configuration.

In a master/servant solution, one fitting has a sensor (the master) and a group of fittings nearby, without sensors, (the servants) are wired to it. This approach reduces the cost of the fittings (compared with having a sensor in each one), but can increase the installation cost a little.

In many situations (warehouse aisles and corridors especially) the user experience is better if a master/servant approach is used, rather than a sensor per fitting.

Master/Servant operation

The whole row of servant fittings switch on as soon as the person moves under the master fitting at the start of the row



Any fitting from our SURFACE & SUSPENDED, AMENITY and INDUSTRIAL sections that is required with master/servant controls should be ordered as follows:

- For **on/off control**, the master fitting should be ordered with the suffix /MW or /PIR (as required) and the servant fittings should be ordered with no special suffix
- For **corridor function** (dim-to-10%), please order the master fitting as /CFMW or /CFPIR and the servant fittings as /CF. We will fit drivers with corridor function into the servant fittings to give dim-to-10% when the sensor in the master fitting detects there is nobody present
- For **full dimming** (to give a maintained light level/ daylight harvesting) order the master with the suffix /PIRD and order the servants with suffix /DD. We will

fit DALI dimming drivers into the servant fittings so that they dim up and down as required by the sensor in the master

Fittings that may be required with PEC or PE1 options (ie BRONX, LYNX, COUGAR, BELFRY, JASPER & EDMONTON) can be installed in a master/servant configuration. If this is required, the servant fittings should be ordered with no special suffix. Note that corridor function (dim-to-10%) is not available with PEC or PE1. In practice, master/servant is rarely used in outdoor installations because of the cost of the wiring that would be required from the master to each servant, but it is technically possible.



LEVEL 3 **Wireless Controls**

Wireless technology has advanced rapidly in recent years and now offers a reliable alternative to wired DALI solutions.

We support 3 different wireless solutions, Philips MasterConnect, Casambi and HubSense from Silvair/Inventronics (formerly from Osram). They differ from each other in several respects, but they all have some features in common:



- **Wireless.** Whereas DALI solutions require a 2-wire DALI communication bus, our wireless solutions only require power connections, not a communication bus as well. The benefits of this are:
 - **Lower installation costs**
 - **Flexibility** – if extra fittings have to be added later it is easily done
 - **Great for retro-fit** because no extra wiring is needed
- **Simple commissioning.** With DALI, commissioning (especially addressing) can be complex. The latest wire-free technologies don't use established addressing techniques, they work on a "publisher/subscriber" model which is easier to implement.
- **Less hardware.** DALI systems typically require dedicated hardware such as application controllers, head-end displays and gateways. The wireless systems we support don't need any of that, though a gateway is optional in all three of them if cloud access is required
- **App based, via iOS and Android.** Wireless systems exploit the hardware (phones and tablets) we already have. Download the necessary app (they are all free), and you are ready to start

Some of the differences between the solutions are functional. They all provide for on/off, dimming, presence/absence and lux-level sensing, daylight harvesting, scene setting and recall, corridor hold and flexible grouping of luminaires to accommodate office churn and layout changes, but there are some significant functional differences:

Some functional differences

	MasterConnect	Casambi	HubSense
Emergency Test	NO	YES	YES
Circadian Control	YES	YES	NO
DALI Interface	NO	YES	YES
Import Floorplans	NO	YES	YES

The facility with Casambi and HubSense to import floor plans into the app means that implementing larger systems is relatively easy and much preparatory work can be done before arriving on-site.

Technically, there are considerable differences

	MasterConnect	Casambi	HubSense
Multi-vendor?	Philips only	Multi-vendor ecosystem	Multi-vendor ecosystem
Communications	Zigbee & Bluetooth	Bluetooth	Bluetooth
Mesh network	Zigbee	Casambi	Bluetooth Qualified Mesh
Application layer	Philips	Casambi	Silvair/Bluetooth NLC

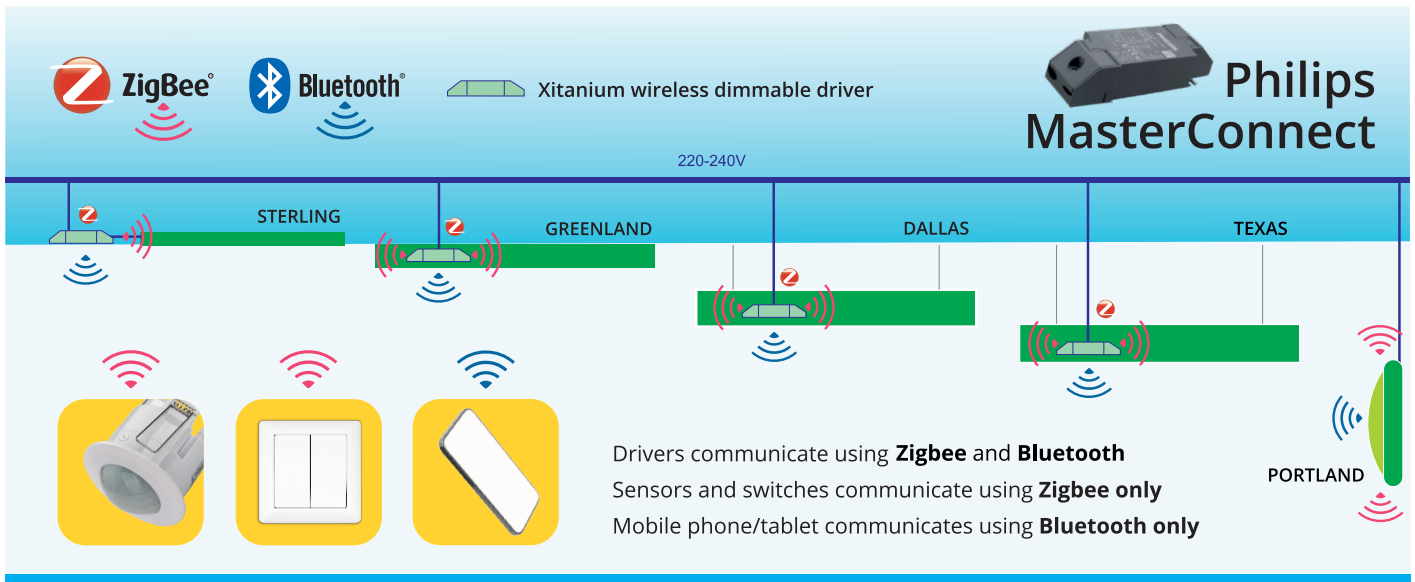
Of the three, MasterConnect is the most proprietary, being developed and supported by Philips.

Casambi is proprietary networking technology, using Bluetooth radio, but in an extensive ecosystem where multiple vendors make Casambi-compatible devices.

HubSense is the least proprietary, using Bluetooth radio, Bluetooth mesh networking, the Silvair app (open to multiple vendors) and an application layer that is Bluetooth Networked Lighting Control (NLC) compliant.


LEVEL 3
Wireless Controls - Philips MasterConnect

We have partnered with Signify to offer the Philips MasterConnect system. This is more functional and flexible than our level 2 master/servant solutions, but simpler to install and commission than full-scale DALI systems.



The MasterConnect concept is simple

At the heart of the system are Philips Xitanium drivers in NVC light fittings. The drivers have dual built-in wireless capabilities:

- **Bluetooth** - for commissioning only
- **Zigbee** – for communicating with switches, sensors and other drivers

Switches and sensors are also required. These are wireless, so you can locate them anywhere and move them if you need to. They communicate using Zigbee.

Commissioning is required, but it is a simple process. It is done via an app on your phone or tablet which communicates with the drivers via Bluetooth. From the app you put the light fittings into groups (up to 35 fittings per group) and assign the switches and sensors to each control one or more groups. Existing users report that a system with c.100 fittings can be commissioned within a day.

Without human intervention, all the Zigbee drivers, switches and sensors talk to each other and build their own Zigbee mesh network. This enables signals to be carried over long distances, round corners, between floors and past obstacles.

MasterConnect has all the features you need in most applications:

- Presence/absence detection
- Corridor hold - keeps the corridor lights on whenever someone is in the adjacent classroom or office
- Maintained light level (daylight harvesting)
- Manual over-ride for dimming and on-off
- Scene setting and recall - for presentations, quiet time, teaching etc
- Colour selection - warm white, neutral white, daylight

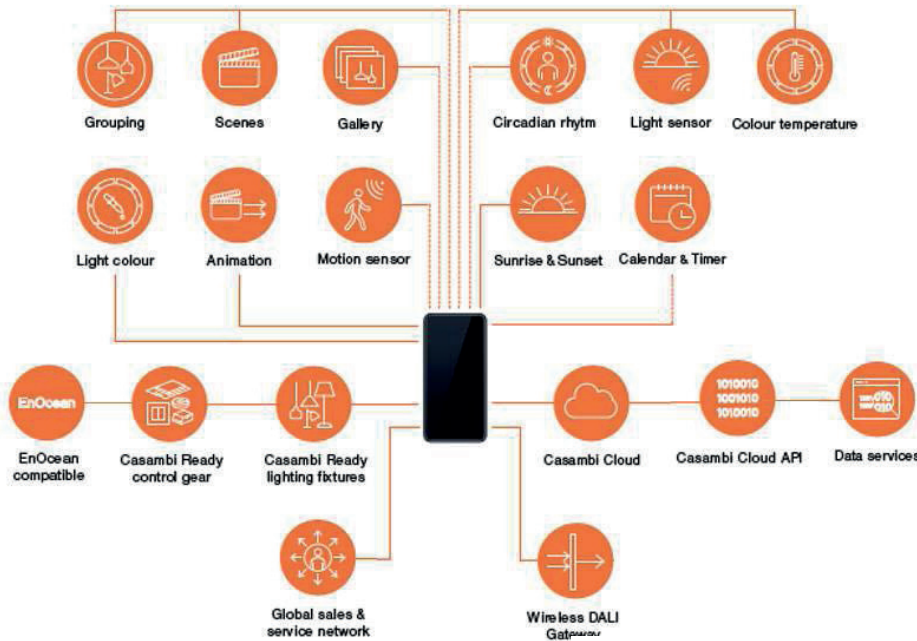
The benefits of the MasterConnect approach:

- **Easy to install**
 - No extra wires - just a mains connection to each fitting
 - Wire-free switches and sensors - easy to install and move
 - No IT infrastructure, no routers, gateways or licence fees
 - Commissioning from an iPhone or tablet
- **Flexible.** Almost any control configuration can be implemented because the system is not constrained by wires

LEVEL 3 Wireless Controls - Casambi

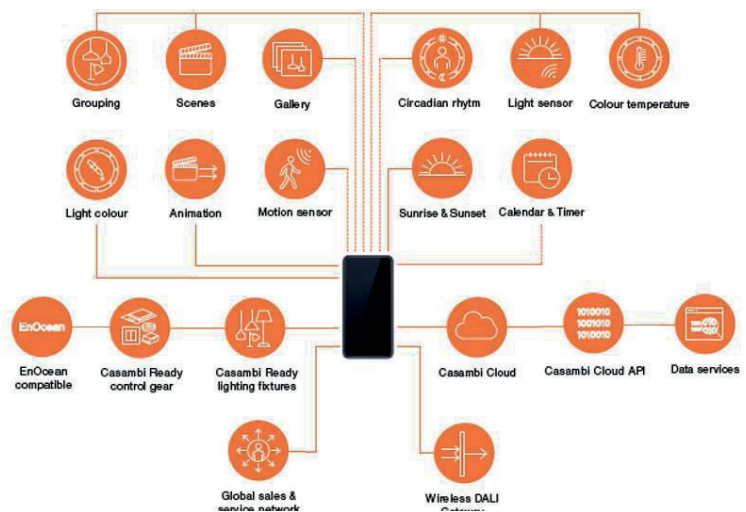
CASAMBI

Casambi was developed by engineers whose background was in Nokia and Bluetooth development.

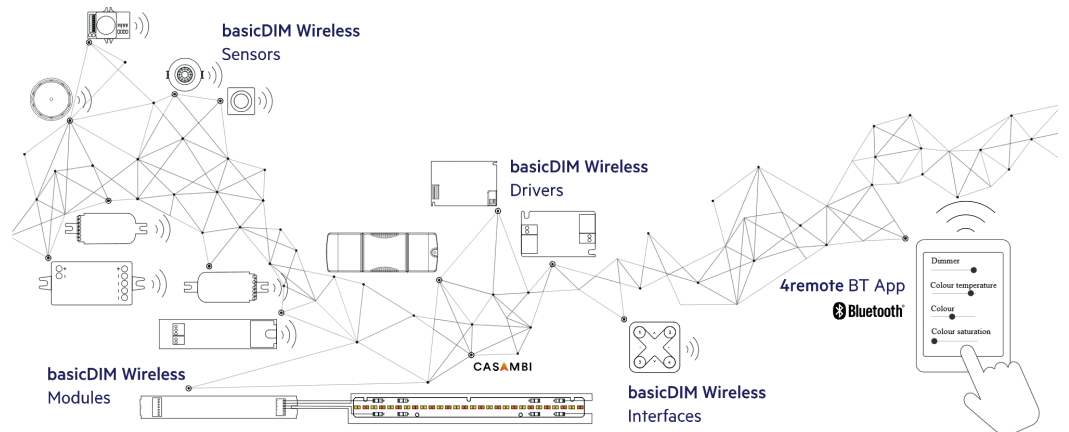


Casambi uses Bluetooth radio, but the mesh networking technology is proprietary to Casambi (unlike HubSense which uses the Bluetooth mesh technology). Multiple LED driver, sensor and switch manufacturers offer Casambi compliant components that can be integrated in a single system. The richness and diversity of the Casambi ecosystem is one of its strengths.

Casambi can be implemented as a wireless extension to a DALI system by the addition of one or more CBU-DCS devices. Implemented like this, each Casambi device will be seen by DALI as a single address and can be controlled accordingly. Likewise, data gathered on the Casambi wireless network (energy consumption or occupancy data, for example) can be passed through to the DALI network.



Using BasicDIM wireless modules from Tridonic, Casambi (like HubSense) can support a fully functioning addressable emergency lighting test system.



LEVEL

3

Wireless Controls with Emergency Test

inventronics
HUBSENSE

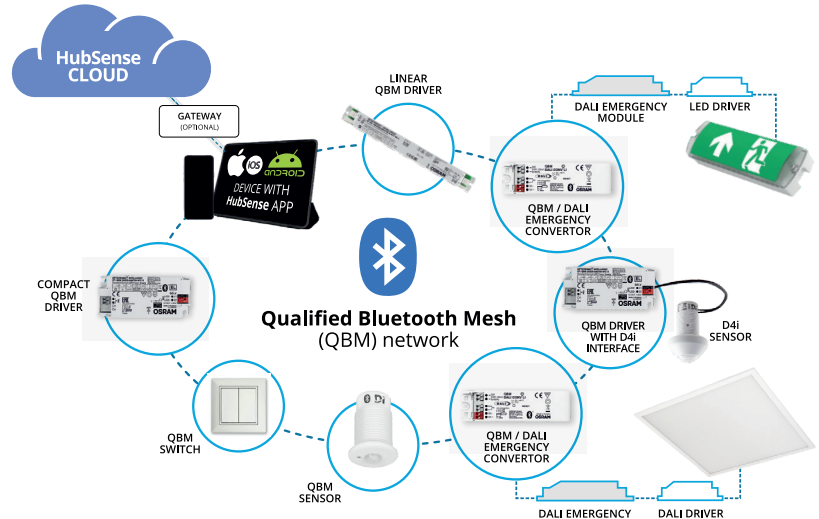
HubSense, from Silvair/Inventronics, is the most recently launched of the 3 wireless controls options we offer. It is arguably the most “open” and it includes valuable features such as addressable emergency test and the facility to import floorplans to facilitate larger implementations.

HubSense is functional and flexible

At the heart of HubSense is the HubSense app (on a phone or tablet) and a wireless Qualified Bluetooth Mesh (QBM) network, used for commissioning and communication.

Luminaires can be connected to the QBM network, either directly or indirectly:

- **Direct QBM connection.** Osram DALI-2 drivers are available, each with their own QBM connectivity built-in
- **Indirect QBM connection** via a converter. Osram QBM to DALI-2 converters are available for standard and emergency luminaires. These enable any fitting with a DALI-2 driver to be joined to the network – so you are not restricted to using Osram drivers



HubSense Lighting Control + Addressable Test Emergency

Switches and sensors can also be added to the QBM network:

- **Directly** – switches and sensors are available with built-in QBM connectivity
- **Indirectly, via D4i.** Many DALI-2 drivers include a D4i interface. Using this, any switch or sensor with a D4i interface can be plugged directly into a driver and then becomes part of the HubSense implementation.

Optionally, HubSense can be linked to the cloud with the addition of a gateway. This means that emergency test notifications can be delivered to the responsible person wherever they are, not only when their phone is in range of the Bluetooth network.

Full lighting control – and with addressable emergency test

HubSense has all the features needed in a lighting control system:

- Presence/absence detection
- Corridor hold – keeps the corridor lights on whenever someone is in an adjacent room
- Maintained light level (daylight harvesting)
- Manual over-ride for dimming and on/off
- Scene setting and recall

PLUS addressable emergency test

The benefits of HubSense addressable emergency test

- Lower cost to install than a wired DALI system
- More functional and reliable than stand-alone self-test fittings:
 - Scheduling - testing can be scheduled to take place at an appropriate time – essential in classrooms, cinemas and hospitals
 - Automated record keeping – no need for manual records that are easily overlooked or mislaid
 - Automated fault reporting – notifications direct to the responsible person's phone or tablet

LEVEL

4

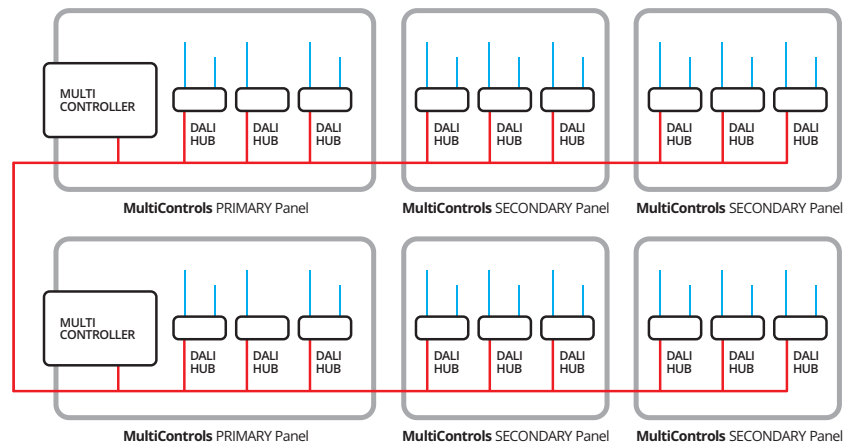
Wired DALI

Where a wired DALI networked control solution is required we have partnered with MultiControls to offer three options, each with varying levels of capability to meet your needs.

- **LightBox.** Full functionality lighting control and addressable emergency testing, typically used for projects from floor-scale to whole buildings and campuses.
- **LightBox EXPRESS.** Pre-configured solutions for smaller installations such as smaller offices and classrooms, but still offering lighting control and addressable emergency testing.
- **LightBox EMERGENCY.** Addressable emergency test (only) for up to 10,240 emergency light fittings.

LightBox

The LightBox system is a sophisticated lighting control and management system for larger projects such as offices, schools, hospitals and airports. It provides full lighting control and addressable emergency test facilities. Typically, a LightBox installation will consist of several DALI networks connected via a MultiController.



The main components of the system are:

MultiController

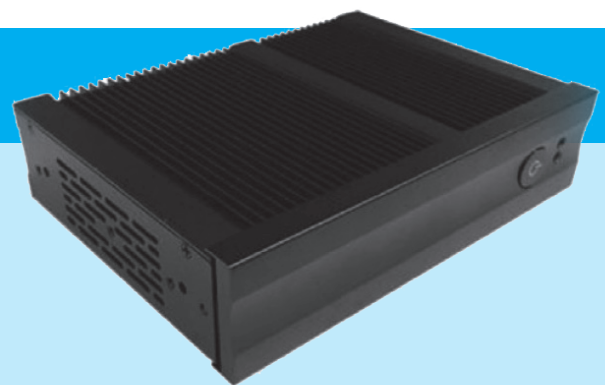
At least one MultiController is required per installation. Each MultiController can support up to 10 DALI hubs.



DALI hub

A DALI hub performs two main functions. It is the bus power supply, maintaining the correct voltage on the DALI bus. It also manages the traffic on the bus, buffering as necessary and ensuring there are no collisions.

Each hub can control two DALI buses (or networks) with up to 64 DALI devices per bus.



Input Devices

A range of devices is available for connecting direct to the DALI bus

Combined PIR and lux sensor (Multisensor)



MultiSensors can be connected direct to the DALI bus. These are available in a variety of versions for different mounting heights, sensitivities and applications.

Universal switch input interface



The universal switch input interface allows almost any switching input (latching, toggling or retractive) in multi-gang formats to be attached to the DALI bus.

Scene selection panels



MultiControls has a full scene-setting capability, so a range of push-button scene selection panels is available.

LightBox EXPRESS

This is a simplified version of LightBox designed for smaller installations. It is ideal for a floor of an office block or a group of classrooms.

The key differences between LightBox Express and a full LightBox installation are:

- LightBox Express has no MultiController. Instead, the DALI hub has an increased role, serving as both the bus power supply and the application controller – storing the logic and relationships specific to the installation.
- An app on a tablet is used for commissioning

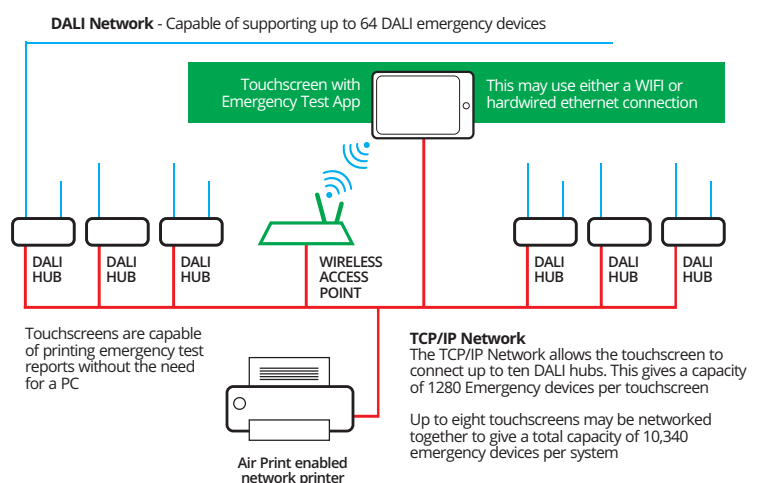
Ease of installation

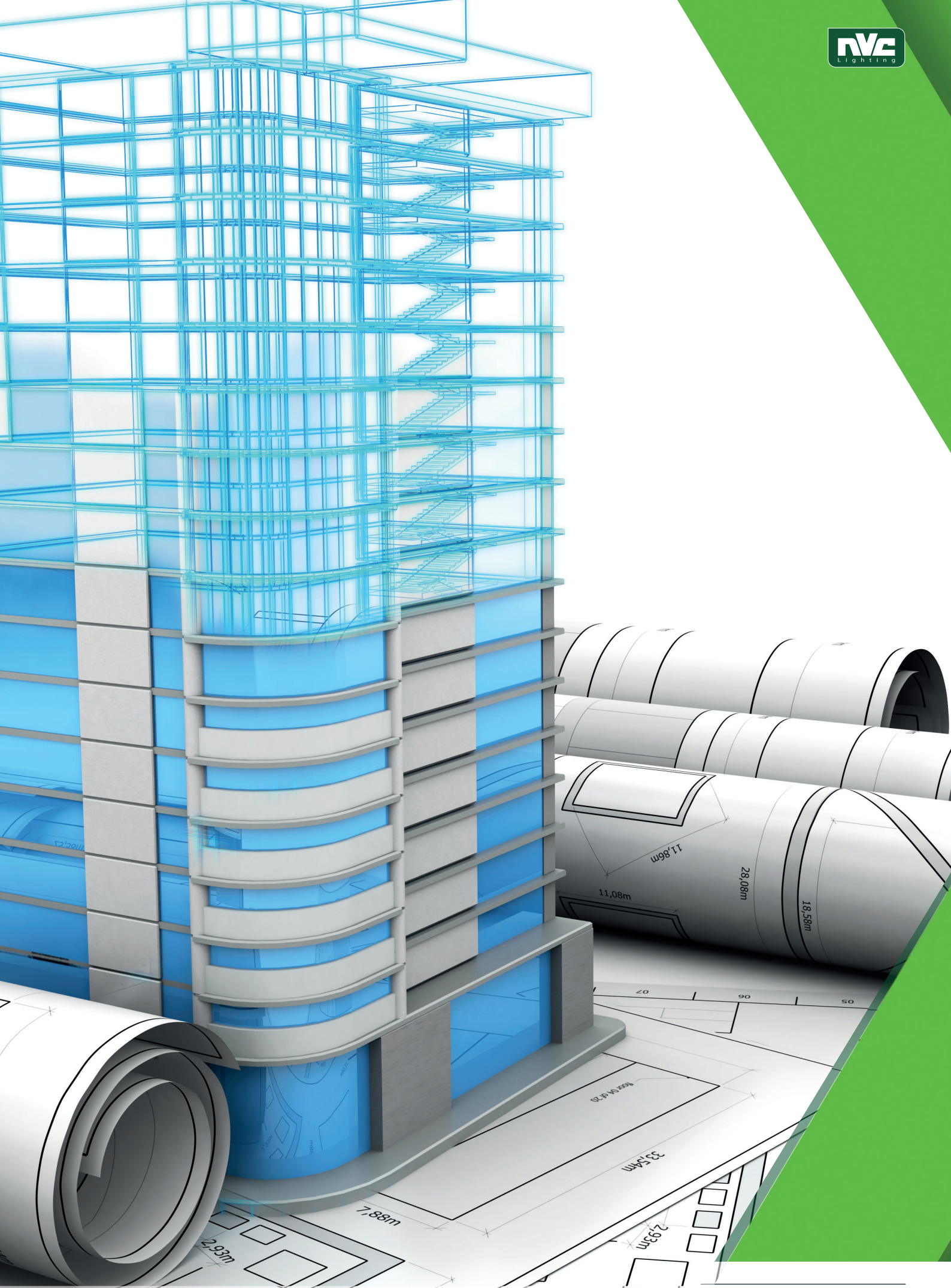
LightBox Express is compatible with most 6-pole DALI marshalling boxes on the market. If required, we can also supply our own MultiControls marshalling boxes, and a full range of pre-made plugs and leads.

LightBox SOLO and LightBox EMERGENCY

LightBox SOLO is our entry-level wired DALI addressable emergency test system. It brings all the benefits of addressable test systems within the reach of quite small projects - up to 128 emergency fittings.

LightBox EMERGENCY is an addressable emergency test system for projects with up to 1,128 emergency fittings. Both SOLO and EMERGENCY are wired DALI addressable emergency test systems only - they are not full lighting control systems. This keeps the total cost of the system down because DALI functionality is required in the emergency fittings only, and this is ordered by using the /DAM3 suffix in the order code. For schematic diagrams of SOLO and EMERGENCY, please see page 59 or contact us for further information.





TECHNICAL SECTION

SYMBOLS

P108

WARRANTY

P109

**IP RATING
+
TP(a)/TP(b)**

P110

**LITHIUM
BATTERIES**

P111

DIMMING

P112

CCT

P116

**CIRCADIAN
LIGHTING**

P117

**TUNEABLE
WHITE
LIGHTING**

P118

CRI

P120

INDEX

P122

Symbols



Class I. Basic insulation and all exposed conductive parts connected to an earth terminal



Class II. Basic and supplementary insulation in accordance with BS EN60598. No provision for an earth connection



ENEC. The control gear in this fitting carries the ENEC (European Norms Electrical Certification) mark. Any control gear carrying this mark must be independently tested to meet both the safety and the performance requirements of the applicable standards

L80 100,000

L80 100,000 & L70 50,000

These are the average lumen depreciation standards that apply to our products, as identified in this catalogue.

- The L value indicates the % of the initial lumen output that is expected to be produced once the rated running hours have elapsed. This is an average value, meaning that in any group of the same fittings it is expected that 50% will perform better than the average and 50% will perform below the average
- 100,000 and 50,000 are the rated running hours

L70 50,000



ICEL is the Industry Committee for Emergency Lighting, part of the Lighting Industry Association (LIA). ICEL Endorsed products have been independently tested to the relevant standards and the test reports assessed and checked by ICEL. The internal processes of the supplier are also audited initially and at yearly intervals thereafter to ensure no deviation of the endorsed product. ICEL endorsement is the highest assurance that the product you will receive is compliant with the relevant standards

TP(a)
TP(b)

TP(a)/(b). The thermoplastic diffuser material in this fitting has been tested and found to have the characteristics required for TP(a)/TP(b) rating



Fire rated 30, 60, 90. This fitting has been tested and found suitable for use in solid timber and I beam ceilings fire rated to 30, 60 and 90 minutes



This fitting is supplied with a **7-year unlimited hours warranty**. For details, see the Warranty Statement on page 109



This fitting is supplied with a **5-year unlimited hours warranty**. For details, see the Warranty Statement on page 109



IP rating. A table of ingress protection values is to be found on page 110



IK08. Impact tested to withstand 5 Joules (1.7Kg mass dropped from 300mm), in accordance with BS EN62262



IK09. Impact tested to withstand 10 Joules (5Kg dropped from 200mm), in accordance with BS EN62262



IK10. Impact tested to withstand 20 Joules (5Kg dropped from 400mm), in accordance with BS EN62262



1-10v This product is dimmable with an analogue, 1-10V control signal. Typically, this signal will be provided either by a sensor with a 1-10V output (manufacturers include Danlers, CP Electronics and Ex-Or) or with a manually controlled rotary switch, such as made by Varilight or Zano



Mains dimming. This fitting is dimmable with suitable mains (phase cutting) dimmers. Call our technical team for guidance if required



SDCM<3 and SDCM<5



SDCM (Standard Deviation Colour Matching) is an objective measure of the colour consistency of a light source. These symbols indicate that all fittings within any one batch of the same product will, when new, be within 3 or 5 SDCMs of each other



This fitting is certified for use in wood, paper and textile processing plants. This symbol confirms that the outer surfaces of the luminaire on which highly flammable substances such as dust or fibres may gather do not exceed the temperature limits specified in EN 60598-2-24



This product is fitted with lithium batteries



Emergency versions of this product are available. They are fitted with lithium batteries



Smart wireless addressable test options are available

Lumens per watt (lm/W) **V** luminaire lumens per circuit watt (l.lm/c.W)

Lumens per watt – a measure of LED efficiency

This is a measure of the number of lumens produced by an LED for each watt of power that goes into it, under laboratory conditions.

Luminaire Lumens per circuit watt – a measure of luminaire efficiency

This is a measure of the number of lumens produced by a light fitting for each watt of power that goes in through the driver, under realistic conditions.

In this catalogue we publish the lumens/watt (lm/W) of the LEDs used in the manufacture of each fitting and the luminaire lumens per circuit watt (l.lm/c.W) of the complete fitting.

For a user or specifier, luminaire lumens per circuit watt is the figure that matters. Lumens per watt (the measure of the LED efficiency under laboratory conditions) is useful for the designer of a light fitting, but it is generally of little value to a specifier or customer because there are so many other factors that impact on the overall efficiency of a light fitting. However, some other companies publish their lumens/watt data (often to the exclusion of their luminaire lumens per circuit watt data), so we publish both. We hope this will be helpful in assisting prospective specifiers and purchasers to make valid comparisons.

Warranty

OVERVIEW

All NVC Lighting products have either a 7-year or 5-year warranty, as follows:

- 7-year warranty on all **PRO** and **LiFe** range of products, including batteries
- 5-year warranty on all **core** range products, excluding nickel cadmium (NiCd) batteries
- All warranties are from the date of installation
- For a valid warranty claim, products must be appropriate for the intended use and professionally installed in line with current best practices
- Our warranty covers repair, replacement or refund of any faulty product

WARRANTY

Our warranty is designed to bring peace of mind to our customers. We take great care to ensure that our products will meet the expectations of specifiers, installers and end-users, but if this ever happens not to be the case we will promptly repair, replace or refund the value of any faulty product, as follows:



7-Year

All **PRO** range products identified with this mark carry a 7-year unlimited hours warranty. This includes the batteries on dedicated emergency products or emergency converted products.



5-Year

All **core** range products identified with this mark carry a 5-year unlimited hours warranty. This excludes nickel cadmium (NiCd) batteries on dedicated emergency products or emergency converted products.

TERMS

- Faulty products. We warrant our product against faults in their design, materials and workmanship. If you believe you have a warranty claim, please contact the distributor from whom you purchased the product in the first instance.
- Repair, replace or refund. At our discretion we will repair, replace or refund any product where a warranty claim is upheld, as follows:
 - o Repair. Where a repair is carried out the repaired product's warranty will be the remainder of the original warranty.
 - o Replace. Where a repair is not practical or cost-effective we will offer a replacement. The replacement may be the same as the original product or, if that is no longer available, we will offer the nearest equivalent product. Where a product is replaced the warranty will be as for a new product with a full 7 or 5 years, as appropriate.
 - o Refund. If the replacement we offer is not acceptable to the client we will provide a refund. The refund value will be the price paid to NVC Lighting Limited for the product that is the subject of the warranty claim, net of all discounts, rebates etc.
- Warranty start date. Our warranties run from the date of installation.
- Unlimited. Our warranties are not limited to a number of running hours.

CONDITIONS

When we evaluate a warranty claim we will take account of the following conditions:

- Installation. Products should be installed, maintained and tested in accordance with our instructions, local electrical installation regulations and generally accepted good installation practices. Failure to do this may invalidate the warranty.
- Ambient temperature. Unless otherwise stated in our instruction leaflet or on the data sheet, all our products are for installation in an ambient temperature not exceeding 25°C. The minimum ambient temperature for emergency products is 0°C.
- Lumen depreciation. The L values (L80, L70 etc) we state are averages. This means that in any one installation it is to be expected that up to 50% of all fitting will achieve less than their stated L values at the end of their rated life (generally 100,000 hours or 50,000 hours), while the remainder will achieve more. This means that the failure of one fitting to achieve its L value at the end of the warranty period is not, on its own, a valid warranty claim. A warranty claim based on high lumen depreciation will only be considered if it relates the average of an entire installation of a product.

EXCLUSIONS

The following are excluded from our warranty:

- Labour costs associated with removing and/or replacing products that are the subject of a valid warranty are excluded.
- On-site costs, such as the hire of access equipment, associated with removing and/or replacing products that are the subject of a valid warranty are excluded.
- Consequential losses and damages arising from faulty products including, but not limited to, costs associated with the closure of premises, loss of income, interruption of business and the compensation of staff and contractors are excluded.
- Nickel cadmium (NiCd) batteries. Because the way that batteries are used (which is outside our control) has a significant impact on the lifespan of NiCd batteries in particular, these batteries carry no warranty.

TO MAKE A WARRANTY CLAIM

If you believe you have a warranty claim, please contact the distributor from whom you bought the product in question. If the distributor is no longer in business you may contact NVC Lighting Limited direct.

Please be ready to state when and where you purchased the product and other details such as the environment in which it is installed, the nature of the alleged fault, the product identification and the batch code or date of manufacture (to be found on the product label). We will do all we can to resolve the matter quickly.

Ingress Protection (IP) Ratings as defined in BS EN60529

FOREIGN BODIES

FIRST DIGIT

0	NO PROTECTION
1	PROTECTION AGAINST THE INGRESS OF OBJECTS LARGER THAN 50MM
2	PROTECTION AGAINST THE INGRESS OF OBJECTS LARGER THAN 12.5MM
3	PROTECTION AGAINST INGRESS OF OBJECTS LARGER THAN 2.5MM
4	PROTECTION AGAINST INGRESS OF OBJECTS LARGER THAN 1MM
5	PROTECTION AGAINST THE INGRESS OF DUST IN SUFFICIENT QUANTITY TO INTERFERE WITH THE SATISFACTORY OPERATION OF THE EQUIPMENT
6	COMPLETE PROTECTION AGAINST THE INGRESS OF DUST

LIQUIDS

SECOND DIGIT

0	NO PROTECTION
1	PROTECTION AGAINST DROPS OF WATER FALLING VERTICALLY
2	PROTECTION AGAINST DROPS OF WATER FALLING AT ANY ANGLE UP TO 15° FROM THE VERTICAL
3	PROTECTION AGAINST RAIN FALLING AT ANY ANGLE UP TO 60° FROM THE VERTICAL
4	PROTECTION AGAINST LIQUID SPLASHED FROM ALL PRACTICABLE DIRECTIONS
5	PROTECTION AGAINST LOW PRESSURE JETS OF WATER FROM ALL PRACTICABLE DIRECTIONS
6	PROTECTION AGAINST HEAVY SEAS OR STRONG JETS OF WATER FROM ALL PRACTICABLE DIRECTIONS
7	PROTECTION AGAINST FULL IMMERSION TO A DEPTH OF 1M FOR UP TO 30 MINUTES

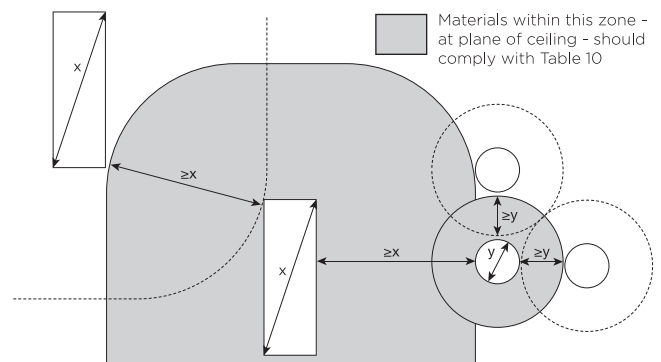
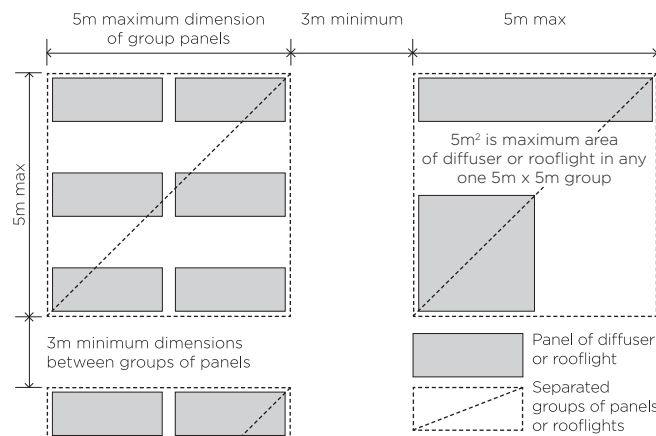
BS7671, the IET Wiring Regulations, stipulate the IP ratings that must apply to products installed in bathrooms, which are divided into zones.

- **Zone 0** Any area in a bathroom that can hold water, such as a bath or shower tray. No lighting may be installed here unless it is at least IPX7 rated and 12V SELV.
- **Zone 1** The area adjacent to Zone 0 up to 2.25m above floor level. Any lighting installed here must be IPX4 rated and 12V SELV.
- **Zone 2** Typically, Zone 2 is adjacent to Zone 1. In this zone any light fitting must be rated to at least IPX4. Fittings from our range commonly used in bathrooms include:
 - Panels: STERLING (IP44), BISMARCK (IP54)
 - Downlights: HARSTED (IP44), WESTMINSTER, WASHINGTON (IP54) MIAMI, VENUS & MERCURY (all IP65)
 - Decorative bulkheads: PORTLAND (IP54), PRESTON (IP65)
 - Linear fittings: GREENLAND (IP66) – often used in changing rooms

TP(a) and TP(b) Rated Materials

The Building Regulations Approved Document B2 (buildings other than dwelling houses) places restrictions on the use of certain thermoplastic materials when they are used as lighting diffusers and form part of a ceiling. TP(a) rated materials may be used almost without restriction,

but restrictions exist on the use of TP(b) rated materials. To determine the admissibility of a proposed TP(b) lighting diffuser layout the specifier/installer may use either of the following two diagrams.



This diagram (diagram 27) requires that 3m exclusion zones, where no TP(b) panels are present, are maintained between groups of light fittings where TP(b) panels are present.

This diagram (diagram 27a) requires that a minimum distance equal to the longest dimension of a TP(b) panel is maintained between adjacent panels.

In practice, the existence of diagram 27a means that TP(b) rated diffusers are admissible in almost any commonly used lighting layout.

LITHIUM M3

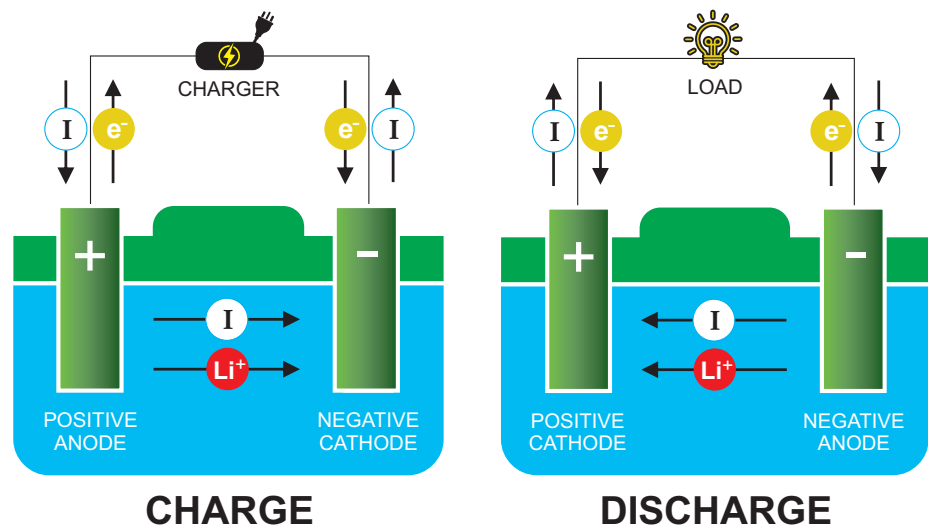
Lithium Batteries for Emergency Lighting

Lithium batteries are now available across our entire range of emergency lighting products. For a full discussion of these batteries and the benefits of switching from older nickel cadmium (NiCd) and nickel metal hydride (NiMH) technologies to lithium, please refer to the technical support section of our web-site, but here is a summary:

Lithium Iron Phosphate (LFP, or LiFePO₄)

There are many different types of lithium ion battery, but the specific type most suitable for emergency lighting, and which we use, is lithium iron phosphate.

LiFePO₄ is only one type of lithium ion chemistry, but they all work in essentially the same way as illustrated



Of all the different lithium ion chemistries, LiFePO₄ is not the lightest weight, nor does it offer the greatest energy density. However, it is the safest and has never been associated with runaway thermal events that have occurred in mobile devices and the aerospace industry where designers have striven for the lightest weight and the highest energy density.

Benefits of Lithium Iron Phosphate in Emergency Lighting

Compared to NiCd and NiMH, LiFePO₄ has these advantages:

- **Low self-discharge.** NiCd batteries are naturally discharging all the time at the rate of about 20% per month. This means that they have to be re-charged almost continually so as to be ready for use. LiFePO₄ self-discharges at the rate of just 3% per month, so charging is not continuous. The result of this is that LiFePO₄ uses much less energy.
- **Charge efficiency.** With NiCd, 15% of the charging energy is lost as heat. With LiFePO₄ only 5% is lost as heat.
- **Long-life.** NiCd batteries have a pronounced memory effect. Every time they are discharged and re-charged they lose some capacity. As a result their useful life is limited to 3 or 4 years and we, in common with most manufacturers, do not offer any warranty on NiCd batteries themselves. With LiFePO₄ there is very little capacity loss over time. Their useful life is 8-10 years and we warrant them for 7-years.
- **Better for the environment.** LiFePO₄ batteries last at least twice as long as NiCd batteries so there is less material to be disposed of. In addition, cadmium is banned under the RoHS directive because it is so toxic, but emergency lighting had an exemption because, till recently, there was no viable alternative. Lithium batteries do not contain any toxic heavy metals and are fully recyclable.

In the light of the advantages lithium iron phosphate offers over NiCd and NiMH we expect that LiFePO₄ will replace other chemistries entirely in emergency lighting over the next few years.

Dimming

A GENERAL INTRODUCTION TO DIMMING LEDS

Why dim lights at all?

People dim lights for a variety of reasons, but energy saving is the key motivation in commercial and industrial settings. Other reasons include dimming to suit the activity (watching a film or a presentation), dimming to create a mood (as in a restaurant) and dimming to give people in, say, a large office, a sense of personal control over their immediate environment.

LEDs themselves are well suited to being dimmed. Their light output can be increased and decreased by adjusting the current flowing through them and they can be switched on and off very quickly – techniques which are both used to dim LEDs.

So, why do specifiers and installers so often struggle with dimming LEDs?

It's because of the driver.

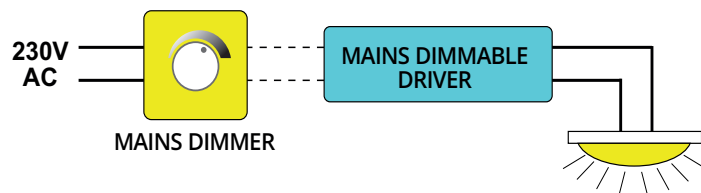
All LEDs need a driver. The first function of a driver is to transform the 230V 50Hz AC mains supply to the low voltage DC supply (typically 12-24V) which the LEDs require. Even domestic LED lamps have a driver – it is built into the lamp base. While an LED itself can be dimmed, the driver will often not be designed for this.

How do you dim the lights?

There are two ways to dim an LED light fitting:

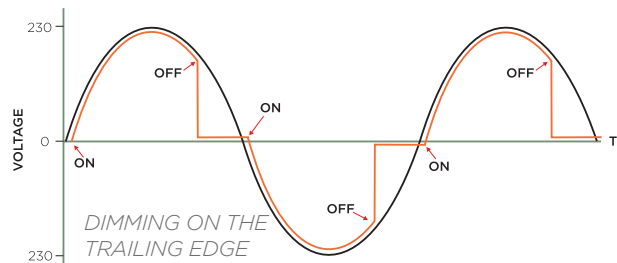
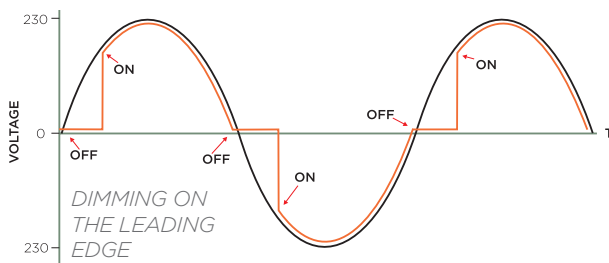
1. Mains dimming (also known as phase dimming or phase cutting). This is widely used in domestic/ residential and small hospitality projects.

Here, the dimmer is a separate device from the driver and it is located on the mains (input) side of the driver.



Mains dimmers are usually wall mounted and actuated with a rotary knob or slider.

Leading-edge (triac) and trailing-edge (MOSFET) dimmers are both types of mains dimmer and they each operate in much the same way – they switch the power to the driver on and off twice in each mains cycle.



In the UK and Europe, mains dimming is used for relatively small loads where localised control is desired – for example a living room, a hotel bedroom or a kitchen-dining area. It is therefore common to find downlights and LED lamps (for example) with drivers specially made to be compatible with mains dimming. These are often referred to as “mains dimmable drivers”. However, dimming in commercial settings is different. Lights that need to be dimmed together in an office or a warehouse will often not all be on the same phase, so mains dimming would be difficult to implement. A different approach is required, so drivers for commercial applications are generally not designed to be compatible with mains dimmers.

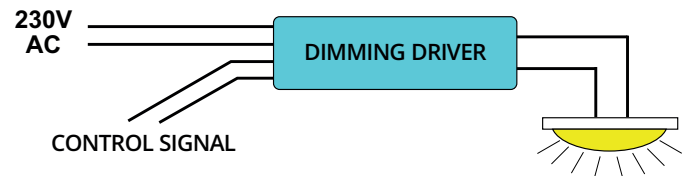
Dimming

A GENERAL INTRODUCTION TO DIMMING LEDS

2. Dimming in the driver. This is the approach used in commercial, industrial and public sector projects, for example in offices, warehouses, schools, hospitals and other large buildings.

Here, the driver is also the dimmer. The driver is a dual function device, acting not only as the driver, but as the dimmer too. These drivers are sometimes called “dimming drivers”

This dimming driver will typically be in a ceiling, not wall mounted (like a dimmer in your living room, so it is necessary to have a means of instructing the dimming driver what to do – whether to make the LEDs brighter or dimmer. For this we use a control signal, generated either by a manual input device (a touch panel rotary knob or retractive switch), a sensor or a control system.



When designing a dimmable lighting system for a commercial project an important decision is to choose the control signal. A control signal is like a language – standardising on a particular language will make the project easier to manage and help ensure all the parts can talk to each other.

What types of signal are there for controlling dimming drivers?

There are 4 types of control signal in common use for controlling dimming drivers:

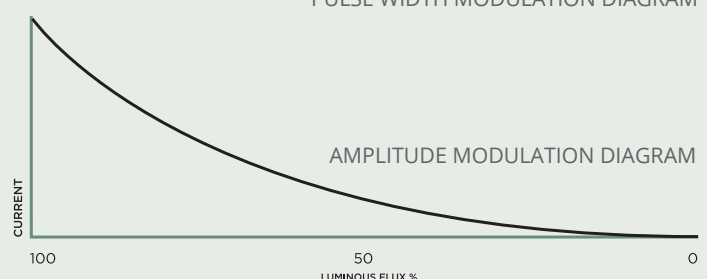
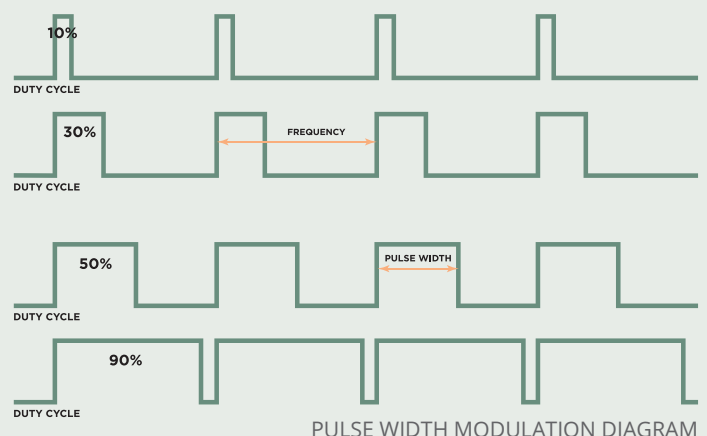
- **DALI** (Digital Addressable Lighting Interface). This is a digital signal communicated over 2 wires at 16V. In a DALI implementation each light fitting can have its own unique address, making DALI suitable for large projects. A single DALI implementation can span multiple phases.
- **Switch-dim**. This is a means of controlling a luminaire via a retractive switch. It is very simple and low cost, but only suitable for the smallest projects on a single phase.
- **Corridor function**. This can be operated by an occupancy sensor, time switch or manual switch. When the switch is “made” the light output will be 100%; when the contact is broken the output will be 10%, or some other value that has been programmed into the dimming driver.
- **1-10V**. This is an analogue control signal, communicated over 2 wires. Unlike DALI, 1-10V is not addressable and its functionality is limited to simple dimming up and down.

Technically, what’s the driver, doing when we dim the lights?

The electrical output from a driver attached to a mains dimmer, or from a dimming driver, will typically be either pulse-width modulated (PWM) or amplitude modulated (AM).

PWM entails turning the LEDs on and off. The % “on” time is the duty cycle. The higher the duty cycle the brighter the LEDs will appear to be to the human eye. The frequency of modulation varies according to the make and model of the mains dimmable driver or dimming driver. Early models often used mains frequency and this produced noticeable flicker, but higher frequencies are now commonly used to avoid this.

AM involves the gradual reduction of the drive current to reduce the light output. This method avoids any risk of visible flicker, but the electronics is more complex and slightly less efficient than PWM.



Dimming NVC Light Fittings

If you are not familiar with dimming LEDs you might benefit from reading the two preceding pages on the generalities of dimming before reading these more detailed pages.

To order a dimmable LED fitting from NVC Lighting the appropriate order code suffix must be used, and this is printed on the product label for identification purposes in case you need post sales advice. Dimming, and the correct wiring of fittings with dimming drivers, are two of the topics most frequently raised with our technical support team. These pages are designed to answer most questions, but if you are in any doubt please don't hesitate to contact the technical team on +44 (0)121 457 6340.

The available order code suffixes are as follows:

1. MD – mains dimmable.

The driver in this fitting is a mains dimmable driver – meaning that it is compatible with a suitable mains dimmer (supplied by others). It is the installer's responsibility to ensure that the dimmer being used is compatible with the driver in the NVC fitting as not all dimmers are equally suitable. We will offer advice and guidance if asked. A mains dimmable fitting is easy to connect. It needs just the switched live output from the dimmer, and the neutral, to be wired to the driver (plus earth if it is class I).

The text and diagrams that follow (below) all relate to control using techniques other than mains dimming. Fittings with the suffixes DA, DD, 1-10 and DA/DAM3 etc are all equipped with a dimming driver - where the driver performs the functions of both driver and dimmer. DAM3 is an exception in that it provides no dimming control – it is only used for DALI addressable emergency test.

2. DA – dimming via a DALI control signal only

A suitable control system or device must be present to provide the DALI control signal

3. DD – dimming with a DALI or a switch-dim control signal

An NVC fitting with a DD suffix can be installed for either DALI operation or switch-dim operation. Which is chosen (DALI or switch-dim) is up to the installer. DALI will require a control system or device to be present; switch-dim requires just a retractive switch

4. 1-10 – dimming with a 1-10V analogue control signal only

A suitable control system or device must be present to provide the 1-10V control signal

5. DAM3 - DALI addressable emergency test

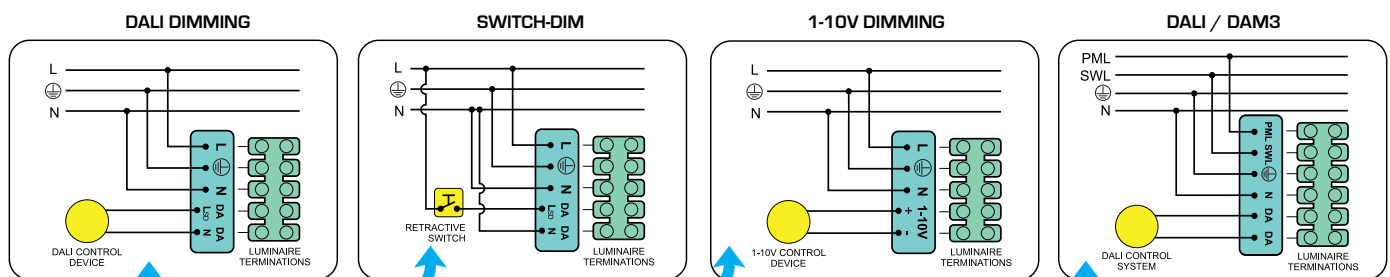
This is applicable to emergency fittings only that are to be part of a DALI addressable emergency test system, such as LightBox SOLO or LightBox EMERGENCY

6. DA/DAM3 – dimming via a DALI control signal and with DALI addressable emergency test functionality

WIRING AN NVC LIGHT FITTING EQUIPPED WITH A DIMMING DRIVER

If the driver and/or emergency module is located inside the fitting, or in an enclosure we provide for them, you will be wiring to the terminal block we supply. If the driver is located outside the fitting (as with most LED panels, for example) you will be wiring direct to the driver.

1. WIRING TO THE NVC TERMINAL BLOCK

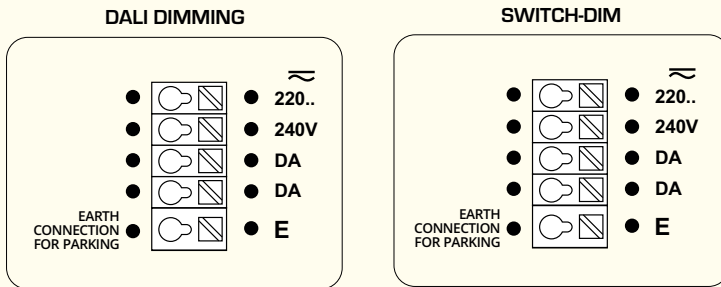


ORDER CODE SUFFIX	TERMINAL WIRING DIAGRAM			NOTES
DA	DALI wiring diagram			
DD	DALI wiring diagram	Switch-dim wiring diagram		It is the installers choice whether to wire as DALI or switch dim
1-10			1-10 wiring diagram	
DAM3				DAM3 diagram DAM3 applies to DALI addressable test only
DA/DAM3				DA/DAM3 would be a DALI dimmable fitting with DALI addressable emergency functionality too. The DALI terminals are used for both dimming control and addressable test

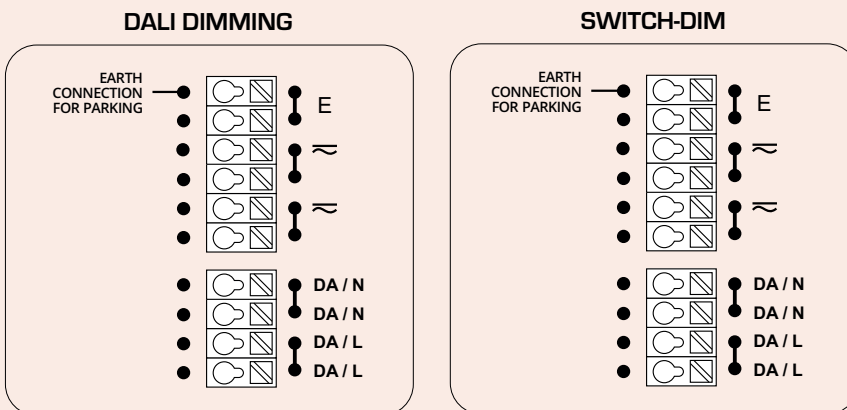
2. WIRING DIRECT TO THE DRIVER

We mostly use drivers from Osram, Tridonic and Philips. The relevant driver terminal layouts are as shown here:

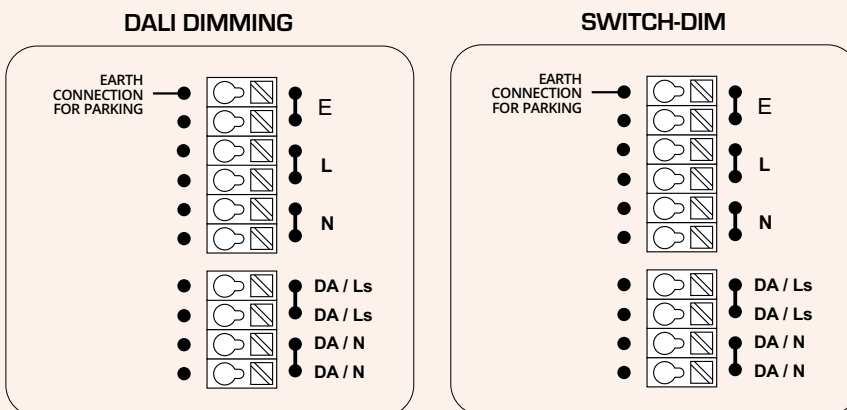
Osram QTI DALI



Tridonic ECO SR



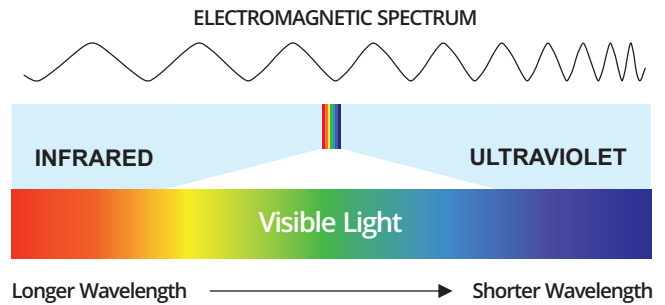
Philips Xitanium



What is Correlated Colour Temperature (CCT)?

Correlated colour temperature (CCT) is one measure of the quality of white light.

In brief, white light consists of a mix of many different wavelengths of light, from low frequency reds and oranges to much higher frequency blues and violets. The variation in the proportions of different wavelengths gives us different types of white light, from “warm” feeling light, rich in red and yellow wavelengths as we would expect to find in our living rooms or a cosy restaurant, to “cool” feeling white light, rich in the blue wavelengths, that we might find in an office or the gym. CCT is measured in kelvin (K) and gives us a precise and quantifiable means of expressing the hue of a white light.



White light of a specific correlated colour temperature is one where the colour of the light emitted correlates (or is equivalent) to the colour of the light emitted by a black-body at the same temperature.

Background: White light consists of a mix of different colours, each of which has its own wavelength.

Any object above absolute zero (0K) emits some electromagnetic radiation, but at lower levels (below about 500°C) this is not visible to the human eye. As the temperature of the object rises, the dominant wavelengths of light emitted change, so the object gradually shifts from being “red-hot” to “white-hot”.

You can visualise this by imagining a piece of iron being heated by a blacksmith or you yourself putting a poker in an open fire. At about 7,98K (525°C) the metal starts to glow a dull red. At 1,000K (727°C) it is bright red and at 6,000K (5,727°C) it appears white.

White light of a specific correlated colour temperature, say 4,000K, is one where the colour of the light emitted correlates to the light emitted by a black-body at 4,000K.

Black-body radiation: For an accurate correlation of temperature with the colour of emitted light, physicists will refer to “black-body radiation”. In this context a black-body has some specific characteristics (eg it should be non-reflective and opaque) and must be in thermodynamic equilibrium with its environment – but the principle explained above (that as a body gets hotter the quality of light that it emits changes) is very consistent throughout nature. Metal workers judge the temperature of the piece of iron, steel (or anything else) they are working on with great accuracy just by observing its colour, even though it does not fulfil all the exact requirements of a perfect black-body.

CCT in everyday use: Any lamp or luminaire that is sold should have its CCT written on it. Commonly available CCT values are as follows:

<p>2700K</p> <p>widely used in residential situations, especially where people relax. Also popular in pubs and restaurants.</p>	<p>3000K</p> <p>for general purpose residential use.</p>	<p>3500K</p> <p>sometimes used in commercial environments, especially where furniture and some luxury goods are sold.</p>	<p>4000K</p> <p>popular in offices, classrooms and supermarkets. Also widely used in street lighting.</p>	<p>5000K</p> <p>commercial and industrial use mainly.</p>	<p>6000K</p> <p>often used in areas of high activity, such as gyms.</p>
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CCT choices in different countries: Selecting the appropriate CCT for a particular space or activity is to a large extent a matter of taste. While there is objective evidence that different wavelengths of light have different effects on our metabolism (see www.nvcuk.com/technical) it is also true that geography and culture effect our choices of CCT. For many years it has been observed that for commercial applications the Scandinavian countries buy more lighting in the range of 3000K – 3500K, while southern European countries are more likely to purchase lighting in the range of 4000K – 6500K.

Colour selectable lighting: This is lighting where the installer or user can select the CCT that a fitting will emit, typically by activating a switch on the product itself. For more details please refer to the technical support section of our website.

Tunable white lighting: This is lighting where the CCT emitted can be dynamically adjusted, usually according to some pre-set parameters by a control system. For more details please refer to the technical support section of our website.

Circadian Lighting

Human centric v Circadian – what’s the difference?

“Human centric” lighting is lighting that enhances human experience, performance, health or wellbeing. It goes beyond performing the narrow function of enabling us to see better.

“Circadian” lighting is designed to act upon our circadian rhythm, either reinforcing it or subtly exploiting it for a beneficial end. Circadian lighting is often just one part of a human centric approach.

Traditional lighting emits the same intensity and quality of light regardless of the time of day or night. However, in a natural environment the tone and intensity of the light round us changes from dawn, through midday to dusk. To our bodies these daily changes in natural light act like a clock, triggering the production of different hormones that in turn cause fluctuations of our body temperature, our appetite, our wakefulness and our mood. This daily cycle is known as our circadian rhythm.

If we have no contact with natural light we are at risk of losing touch with our body clock. The balance of hormones such as melatonin and neurotransmitters such as serotonin and dopamine can become disturbed resulting in depression, anxiety, drowsiness, an inability to get a good night’s sleep, loss of appetite and more.

Circadian lighting sets out to replicate the natural changes in light that take place from dawn, through midday to dusk, helping us to maintain a healthy hormone balance, mood and sleep pattern. In schools, the subtle exploitation of circadian principles, such as a boost of bright light with a raised blue content to combat drowsiness after lunch, can lead to improvements in classroom performance and learning. Similarly, a subdued level of a lower colour temperature (3000 – 3500K) light when children come in from their mid-morning break can help to quieten the class down.

Implementing circadian lighting

Implementing circadian lighting requires suitable light fittings with drivers and a control system.

Circadian-ready (tuneable white) light fittings

These require at least two arrays of LEDs in each fitting, each array giving a specific spectral distribution and colour temperature. A suitable driver is also required that can manage the arrays so that the overall output has the desired colour temperature and intensity.

Several of our product ranges can be supplied in tuneable white versions including:

- 600 x 600 panel, STERLING
- Surface/suspended, DALLAS, YALE
- Downlights, WISCONSIN, WESTPORT
- Non-corrosive, GREENLAND

For more details and other tuneable white options, please call us.

The most suitable drivers are DALI type 8 drivers. Each driver is just one DALI address, but has at least two outputs, one for each LED array. DALI-2 contains commands that incorporate colour temperature and output level; on receipt of such a command a DALI type 8 driver will adjust the output from each array to give the desired circadian effect.

Controls for circadian lighting

- MasterConnect can incorporate manual colour selection, but not automatic circadian (tuneable white) lighting control
- LightBox and LightBox Express can provide a full circadian lighting - please enquire for further information

For more details on circadian lighting, please refer to the technical support section of our website

TUNEABLE WHITE LIGHTING, COLOUR SELECTABLE LIGHTING, CIRCADIAN LIGHTING

Tuneable White Lighting

This term is applied to a white-light source such as an LED lamp, module or luminaire. A tuneable white-light source is one in which the correlated colour temperature (CCT) of the light generated can be dynamically adjusted.

CCT is measured in kelvin (K) and applies to white light only. In simple terms, CCT describes if a white light is warm (with a distinct yellow hue), neutral or cool (with a slightly blue hue). For more details please refer to the technical support section of our website.

Most white light sources (such as a commercially available LED lamp or a light fitting) have a fixed CCT. This is usually in the range of approximately 2700K to 6500K. The lower values (c2700K -c3500K) have a higher % of the red and yellow (longer) wavelengths and are often called “warm” white – because that is the feeling they stimulate in most people.

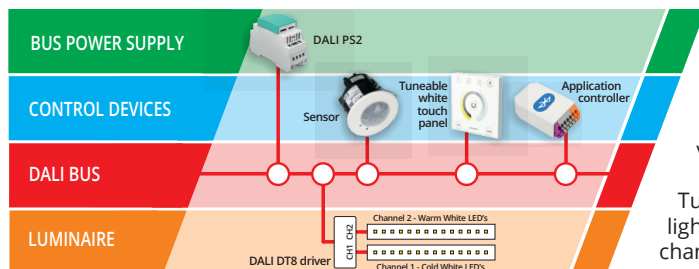
In the middle of the range (c. 3500K – 4500K) the light is described as neutral white and is comprised of a balance of longer and shorter wavelengths.

At the upper end (c4500 – c6500K) the light has a higher % of the blue (shorter) wavelengths and is usually described as “cool” white.

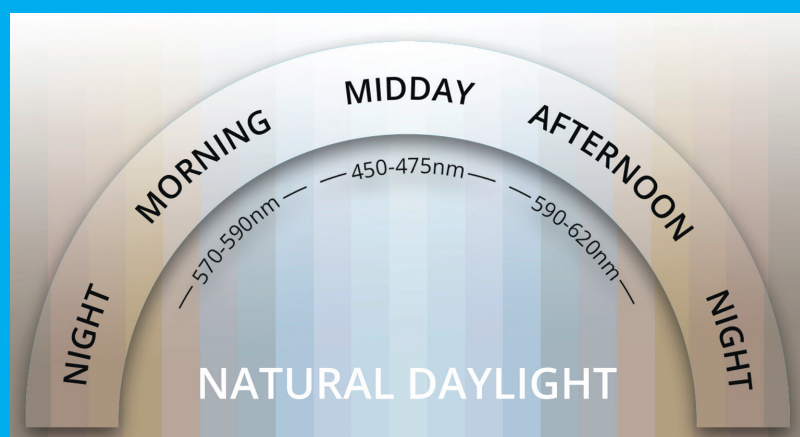
A tuneable white-light source is one which can produce white light with different CCT values in response to a suitable control signal. A true tuneable fitting will be able to generate any CCT value within a range – it is not restricted to a small number of pre-set values.

Tuneable white-light fittings will almost always be used in a circadian lighting installation, generating white light with a CCT that gradually changes (rather than altering in abrupt steps) throughout the day. For more details please refer to the technical support section of our website.

DALI TUNEABLE WHITE SCHEMATIC DIAGRAM



Circadian lighting



Circadian lighting is lighting that delivers white light, but with a changing correlated colour temperature (CCT) and intensity through the course of the day. These changes are done in such a way as to either reinforce our bodies’ natural daily waking and sleeping cycle or subtly influence it to achieve a particular behavioural result.

“Circadian” is derived from two Latin words; circa, meaning about or approximately and dies meaning a day. Humans have a circadian rhythm – a natural fluctuation over the course of about 24 hours of the level of a range of hormones in our bodies that regulate our sleeping and waking patterns, our appetite and our mood.

CCT is measured in kelvin (K) and applies to white light only. In simple terms, CCT

Colour Selectable Lighting

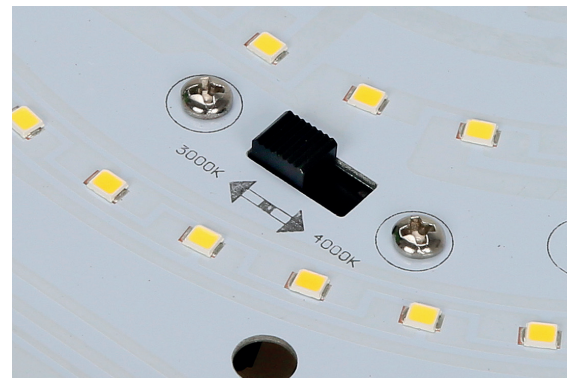
This term is applied to a white-light source such as a lamp or luminaire. A colour selectable lamp or luminaire is one in which the correlated colour temperature (CCT) of the light generated can be selected from a small number of fixed options.

CCT is measured in kelvin (K) and applies to white light only. In simple terms, CCT describes if a white light is warm (with a distinct yellow hue), neutral or cool (with a slightly blue hue). For more details please refer to the technical support section of our website.

Frequently, lighting manufacturers will produce a popular design of luminaire that could be used in different settings – for example in an office and in the home. However, in an office people will usually expect a CCT of 4000K-5000K (“cool” white), while at home they might prefer 3000K or 3500K (“warm” white).

To save the manufacturer (and the entire supply chain) from having to stock multiple versions of the same product they produce “colour selectable” fittings. These feature a switch on the product itself that allows the installer to choose from a small range of pre-set colour temperatures, so that the same fitting can be used in multiple different settings.

Note that colour selection is static. With a colour selectable fitting there is no means (short of getting inside the fitting and adjusting a switch) to change the colour temperature of the white light that is being produced. Colour selectable fittings usually offer a choice of 2 or 3 CCT values.



Colour selection is usually made with a switch on the rear of, or inside, the light fitting

describes if a white light is warm (with a distinct yellow hue), neutral or cool (with a slightly blue hue). For more details, please check here. (hyperlink to article below on CCT).

Background. In a natural environment the CCT and intensity of the light round us changes from dawn, through midday to dusk. For example, the sunlight at noon is rich in shorter (blue) wavelengths which suppresses melatonin production, thus keeping us alert. At dusk, more of the longer (red) wavelengths are produced and our melatonin output starts to rise and our bodies slow down and prepare to sleep.

The problem. Traditional lighting emits the same intensity and quality of light regardless of the time of day or night.

The effect of this on people who live and work under artificial light for long hours is to reduce or eliminate the stimuli that keep our circadian rhythm strong and healthy. When this happens, the balance of hormones, such as melatonin, and neurotransmitters, such as serotonin and dopamine, can be disrupted resulting in depression, anxiety, drowsiness, an inability to get a good night's sleep, loss of appetite and more.

A solution. Circadian lighting sets out to replicate the natural changes in light that take place from dawn, through midday to dusk, helping us to maintain a healthy hormone balance, mood and sleep pattern.

In addition, circadian principles can be exploited to create other beneficial

outcomes. For example, a boost of bright light with a raised blue content can help to combat drowsiness after lunch; a lower level of light with a stronger red/yellow component can induce a calming mood in the classrooms after the mid-morning break.

Implementation. Circadian lighting will require careful design, the use of tuneable white-light fittings and an appropriate (usually DALI based) lighting control system.

For more details please refer to the technical support section of our website

What is a Colour Rendering Index (CRI)?

THE SHORT ANSWER

A colour rendering index (CRI) is one measure of the quality of white light

In brief, the CRI of a light source (such as an LED lamp) describes how well that light can reveal the colours of objects relative to how they would be revealed under natural daylight. CRI is expressed on a scale from 0 – 100, where 100 indicates that colour will be revealed as well as it would under natural daylight, with lower values indicating that colour revelation will be less complete.

Have you ever bought a shirt and a tie, convinced they matched well, but found when you left the shop that they didn't go together at all? Or have you ever put on a pair of socks, only to find when you left the house that they weren't a pair after all? This is what can happen when colours are selected under light with a low CRI. Your eyes are not defective – but the information they are receiving is incomplete because the light source in the shop or over your sock drawer is emitting light with a low CRI.

EN12464 recommends minimum CRI values for a wide range of applications. Light sources with a CRI>90 are recommended in clothing retail, artistic and medical settings where accurate colour perception is required. CRI>80 is recommended for offices and schools, and CRI>70 is acceptable in many outdoor applications. Light sources with lower CRI values than 70 are rarely used.

CRI is only one measure of the quality of white light. Another widely used, complimentary, measure is correlated colour temperature (CCT). For details, please see here: www.nvcuk.com/technical

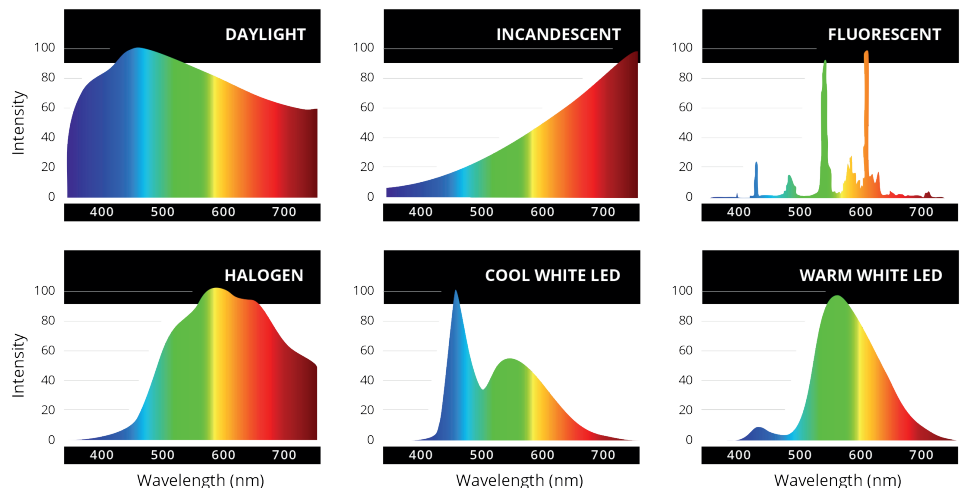
THE FULL ANSWER

First, let's consider how colour vision works

Spectral Power Distribution (SPD)

Our eyes respond to different wavelengths of light. The sun emits the full visible spectrum – every colour of the rainbow, and all the shades in between – but when sunlight falls on an object, some wavelengths are absorbed and others are reflected. It is the reflected wavelengths we see, and these define the colour of the object in question.

In terms of the ability of a light to reveal true colours, daylight is considered to be perfect. This is because it contains at least some of every single wavelength. Put in technical terms, its spectral power distribution (SPD) is continuous – there are no gaps.



An incandescent (tungsten filament) light is similar in that its SPD is continuous, but it is biased towards the red end of the spectrum. However, the SPD of all other light sources contain some gaps, so our ability to perceive colour under, say, a fluorescent lamp or some LEDs will be limited. Their CRI is less than 100.

So, if the light source under which we check the colours of a shirt or our socks is missing a few wavelengths, our clothing will never appear the same under that light source as it would under natural daylight.

Now, let's look at how CRI is measured

There is more than one measure of CRI, in just the same way that there is more than one measure of speed (mph or km/h). The CRI measure that is most widely used today (2022) is Ra defined by the Commission Internationale de l'Eclairage (CIE) in 1995.

Other measures exist, notably R96a, and IES TM-30, but these are not yet in widespread use.

Name	Appr. Munsell	Appearance under daylight	Swatch
TCS01	7,5 R 6/4	Light grey-ish red	
TCS02	5 Y 6/4	Dark grey-ish yellow	
TCS03	5 GY 6/8	Strong yellow green	
TCS04	2,5 G 6/6	Moderate yellow-ish green	
TCS05	10 BG 6/4	Light blue-ish green	
TCS06	5 PB 6/8	Light blue	
TCS07	2,5 P 6/8	Light violet	
TCS08	10 P 6/8	Light red-ish purple	
↑ Eight Colour samples (R1-R8) used to calculate CRI Ra			
TCS09	4,5 R 4/13	Strong red	
TCS10	5 Y 8/10	Strong yellow	
TCS11	4,5 G 5/8	Strong green	
TCS12	3 PB 3/11	Strong blue	
TCS13	5 YR 8/4	Light yellow-ish pink	
TCS14	5 GY 4/4	Moderate olive green	
↑ Six additional colour samples (R9-R14)			

To measure the Ra of a light source you need:

- 14 standard colour swatches, defined in CIE1995. The first eight of these are low-saturated (pastel) shades. Four of them are more highly saturated (strong) colours – red, yellow, green and blue and two are colours occurring commonly in nature
- A standard light source with a continuous SPD at a CCT of 5000K
- The light source to be tested
- The CIE 1960 colour space diagram
- ...and some specialist equipment

Calculating the Ra involves some intricate maths, but the basic method is quite simple:

1. Each of the first 8 colour swatches are illuminated under the standard (ideal or perfect) light source and their colour is plotted on the CIE1960 colour space map. The coordinates are noted. Of course, the colour swatches are standard and the light source is standard – so the coordinates are already known. Therefore, this part of the test process does not have to be repeated every time a light source is evaluated.

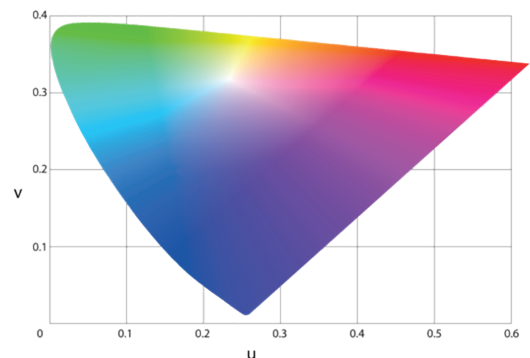
2. Each of the first 8 colour swatches are illuminated under the light source being tested and their perceived colour is plotted on the CIE colour space map. The coordinates are noted.

You now have a pair of colour coordinates for each colour swatch.

3. Calculate the distance between the coordinates in each pair, using the formula $R_i = 100 - 4.6\Delta E_i$. In brief, R_i is the rendering index that is specific to an individual swatch. The light source under test could give a high R_i on some swatches (because the light source includes the appropriate wavelengths), but a lower R_i on others.

4. Sum all 8 R_i values together and divide by 8. The result is Ra, the rendering average.

The coordinates of the other six samples can also be plotted and the R_i calculated for each one. This gives some additional information about the quality of light being produced by the lamp under test, but this is not included in the calculation of Ra.



The drawbacks of Ra as a CRI measure

While Ra is the most widely used and understood measure of the colour rendering ability of a light source it has some significant shortcomings.

The chief drawback of Ra is that it includes only the very unsaturated hues and excludes the strong red, yellow, green and blue. It is common that LEDs have a weak performance in the red part of the spectrum, yet they could perform well in an Ra test because the red swatch is excluded.

For this reason NVC Lighting (and some other lighting companies) do not merely specify their LEDs with a CCT and a minimum CRI value. Instead, we specify R_i values for some of the other colours in the CIE 1995 colour swatch deck to ensure that our lighting doesn't just look good on paper, but also looks good in real life.

Name	Section	Page	Name	Section	Page
A			LYNX	NLX FLOODLIGHTING	84
ADDISON PRO	NAD AMENITY	48	M		
ARLINGTON LiFe	NAL EMERGENCY	62	MERCURY	NMR RECESSED DOWNLIGHTS	42
B			MIAMI	NMA RECESSED DOWNLIGHTS	40
BELFRY	NBF STREET LIGHTS & POST-TOP	90	N		
BISMARCK	NBI LED PANELS	30	NEBRASKA LiFe	NNE EMERGENCY	60
BRONX SLIM	NBX AMENITY	52	NEPTUNE	NNT INDUSTRIAL	81
C			O		
CLEVELAND	NCV INDUSTRIAL	74	OREGON	NOR INDUSTRIAL	76
COUGAR	NCU FLOODLIGHTING	85	P		
D			PASCO	NPC AMENITY	47
DALLAS	NDL SURFACE & SUSPENDED	16	PHOENIX	NPH SURFACE & SUSPENDED	20
DENALI	NDE AMENITY	50	PHOTO-ELECTRIC CELLS	CONTROLS	98
E			PORTLAND	NPO AMENITY	46
EDMONTON	NED STREET LIGHTS & POST-TOP	94	PRESTON	NPE AMENITY	49
EMERGENCY CONV. KIT	EMERGENCY	68	PUMA	NPM FLOODLIGHTING	86
F			R		
FLORIDA	NFL LED PANELS	29	REBUS	NRB AMENITY	53
FREMONT	NFM STREET LIGHTS & POST-TOP	93	RENO	NRN AMENITY	54
FULTON	NFU LED PANELS	28	S		
G			SENECA LiFe RECESSED	NSC EMERGENCY	64
GREENLAND	NGN INDUSTRIAL	72	SENECA LiFe SURFACE	NSC EMERGENCY	65
H			SPARTAN	NSP AMENITY	51
HARSTED	NHR RECESSED DOWNLIGHTS	36	STERLING	NST LED PANELS	27
J			SURFACE MOUNT SENSORS	CONTROLS	98
JASPER	NJS STREET LIGHTS & POST-TOP	92	SYRACUSE LiFe	NSY EMERGENCY	66
JUPITER	NJP INDUSTRIAL	78	T		
K			TEXAS	NTE SURFACE & SUSPENDED	23
KANSAS LiFe	NKS EMERGENCY	67	TEXAS PRO	NTE SURFACE & SUSPENDED	22
KELSO	NKE INDUSTRIAL	80	V		
L			VENUS	NVS RECESSED DOWNLIGHTS	41
LEVELS 1-4	LIGHTING CONTROLS	96-105	W		
LEXINGTON LiFe	NLE EMERGENCY	61	WASHINGTON	NWA RECESSED DOWNLIGHTS	35
LINCOLN	NLN LED PANELS	26	WESTMINSTER	NWM RECESSED DOWNLIGHTS	34
			Y		
			YALE PRO	NYA SURFACE & SUSPENDED	18

HELPING YOU MAKE GREENER CHOICES

We are working to make the products we supply and the way we run our business among the most sustainable in our industry.

- **Products made to last**
 - Our warranty, 7-years from the date of installation, is our guarantee to you of lasting quality
- **Products that are more efficient**
 - LEDs, drivers and optics are improving ever month
 - Our industry-leading logistics and supply chain management means that our stock is always current
- **Products with less packaging**
 - We use cardboard packaging which is fully recyclable
 - All instruction leaflets are available via QR codes – saving paper and ink, and saving our customers the disposal costs
- **Products with the best technology**
 - Smart wireless technology makes it easier than ever for our customers to deploy energy-saving lighting controls
 - Lithium batteries in our emergency fittings last twice as long as the old NiCd technology, and they are more efficient
- **All from a supplier who is carbon neutral**
 - What CO₂ emissions we can't eliminate we offset via Carbon Neutral Britain.



NVC CATALOGUE



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