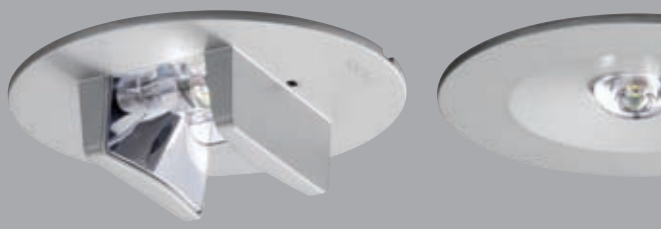
THORN

Voyager LED Series

Discreet, high performance,
LED emergency lighting



For emergency lighting that adapts to any design and structure, choose Voyager LED series

- Flexible, can be installed and wired to function as a Non-Maintained, Maintained emergency luminaire or Switched Maintained emergency luminaire
- Sustainable, environmentally friendly NiMH Battery providing higher power density
- Efficient:
- high power LED technology, gives excellent performance and spacing,
- low parasitic power consumption
- long life and low maintenance
- Discreet, good looking, and compact with recessed options

Voyager LED Route, surface, white

Voyager LED Spot, surface, silver

Voyager LED Area, surface, white

Voyager LED Route, recessed, silver

Voyager LED Spot, recessed, silver

Voyager LED Area, recessed, white

Voyager LED series emergency lighting enables lighting designers to specify fittings that install into any space, consume less power, require smaller power supplies, and can run for longer periods than before. The combination of performance, efficiency and comfort delivered by Voyager LED series puts this integrated range ahead of traditional fluorescent-based systems for peace of mind and genuine value.

The aluminium bodied Voyager LED series share the same unobtrusive and extraordinarily compact styling which makes a low impact to interior décor under normal conditions.

They are available in both recessed and surface mounting formats and are finished in white or silver.

But discretion is only one of their virtues, another is enormous versatility.

There are three sophisticated optics designed around the superior LED package from Cree providing luminaires optimised for emergency performance for use along escape routes 'Route' (see page 8), throughout open areas 'Area' (see page 6) and for accenting particular emergency hazards or for use in areas that require higher levels of local illumination 'Spot' (see page 10).

And as you would expect from Thorn, the collection includes the choice of SelfTest and Thorn Addressable Test functionality which gives you the option to connect into Thorn's Explorer Project and Vision, a centralised test system, via individual SelfTest luminaires into a centralised test system via a simple DALI connection saving the user even more money.

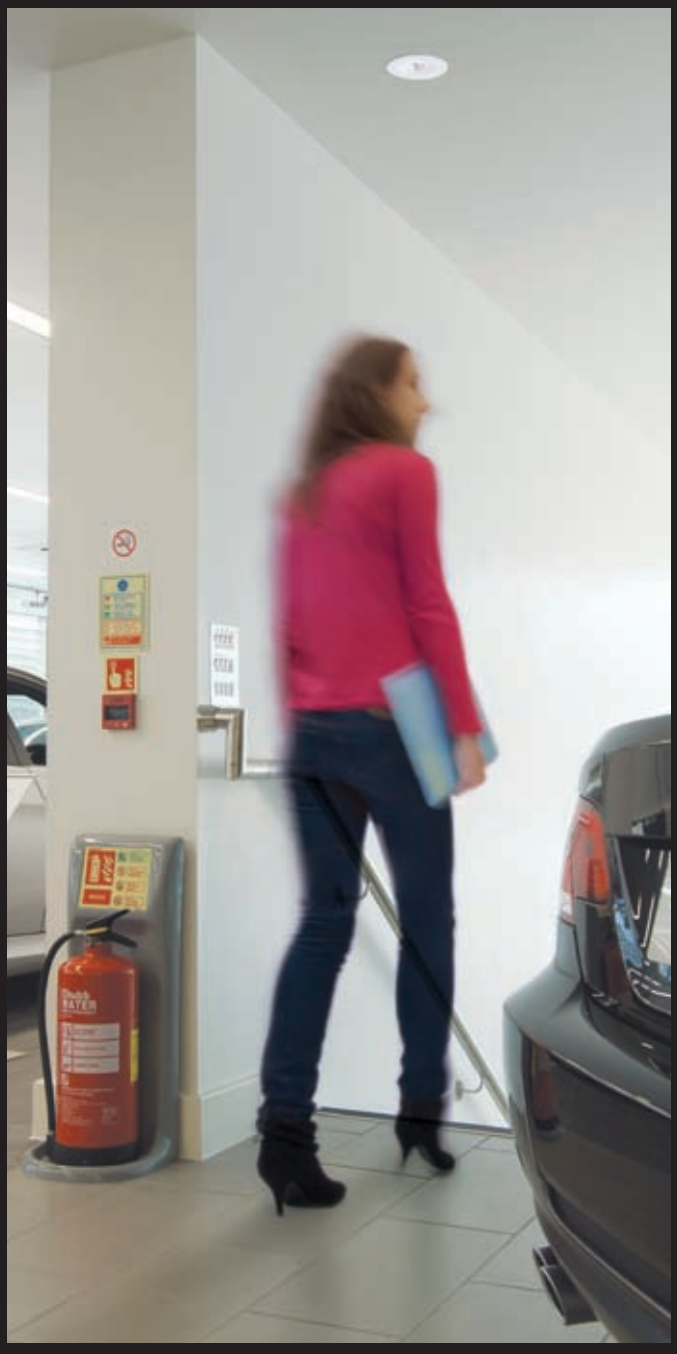
Comparison of typical parasitic load costs:

The Voyager LED series offers significant operating savings when compared with conventional forms of emergency lighting.

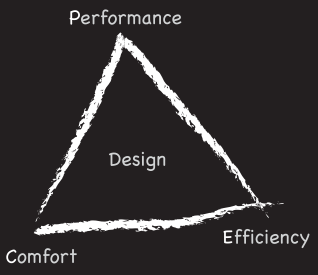
Emergency luminaire	Typical power consumption	Typical running cost per annum €	Typical annual saving for 100 luminaire site €
8W NM emergency luminaire (2 cell)	4 watts	3.87	0
High power LED (2 cell)	2.4 watts	2.33	155

Performance, Efficiency and Comfort (PEC) – for a better lit environment

Voyager LED series evokes the spirit of Thorn Lighting's dynamic, results-orientated PEC programme



The programme is based on the principle that Performance, Efficiency and Comfort determine the effectiveness of lighting, its impact on the people using it, and its impact on the natural environment. Voyager LED series delivers the right light on the right place at the right time.



Performance: providing the best visual effectiveness

- The different options within the range provide a solution to all situations and ensure the installation meets the relevant regulations.
- High power LED technology ensures good visibility, providing a safer lit environment.
- Superior optical control ensures a glare free view.

Efficiency: conserving energy and effort, reducing CO_2 emissions and waste, providing lighting that is practical and efficient to install, operate and maintain

- The use of LED technology reduces power demand and conserves energy.
- The small size of the luminaire uses less material, and is therefore a more sustainable design.
- Uses environmentally friendly NiMH battery technology
- Easy to install and service, reducing the cost of ownership. The option for Thorn Explorer Project provides automatic monitoring and testing of luminaire status, providing test reports fulfilling statutory requirements.

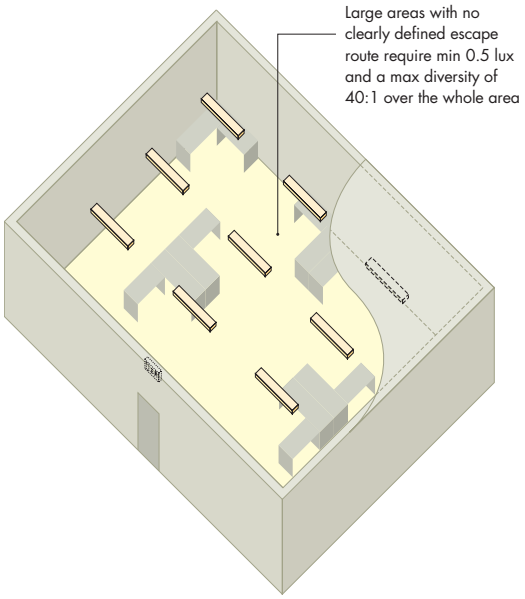
Comfort: giving people satisfaction and stimulation

- The small size of the luminaire gives a discrete appearance, blending in with the architecture of the space.
- A well-designed emergency installation using good quality luminaires gives reassurance to users of the space.

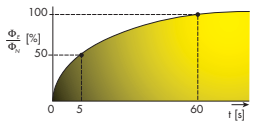
Application - Open Area

Requirement

The requirements for emergency lighting in open areas state that a system has to provide sufficient light (0.5 lux according to EN 1838) to avoid panic. During an emergency, or even a short term mains failure, all occupants must feel safe. If evacuation is required, occupants must be guided to the nearest exit by the shortest possible route without becoming lost or tripping over.



Legislative requirement

Definition	Escape area - Open or re-configurable area, including covered car parks and stepped areas in covered stadia (excluding designated escape routes)
Areas	> 60m²
Lighting level	Minimum 0.5 lux in core area (excludes 0.5m border)
Diversity: Φmax : Φmin Ratio of illuminance to min illuminance	< 40 : 1
Response time Time to reach emergency lighting levels	50% in 5 sec 100% in 60 sec 
Colour rendering (Ra)	>40
Glare High contrast between luminaire and background leads to glare. Disability glare prevents you seeing properly.	

Mounting Height h	Escape Route & Open Area Max. Luminous Intensity Imax
m	cd
2.5≤h<3.0	900
3.0≤h<3.5	1600
3.5≤h<4.0	2500

Voyager LED Area
Voyager LED Area luminaires are made from die-cast aluminium. They are extraordinarily compact (85mmØ or 146mm²), incorporate NiMH batteries which offer up to three hours of emergency lighting, and can be installed and maintained without tools. A visible LED monitor is included in the luminaire to indicate that the batteries are being charged. They are available in either white (RAL 9016) or silver (RAL 9006) in these variants:

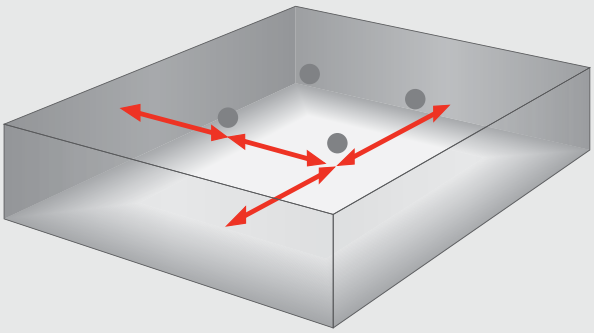
MRE – Recessed
The MRE is designed to be recessed into suspended ceilings, its low-profile L-shaped battery and control gear box fits through the cut-out aperture. For fitting into concrete ceilings a recessing box is available.

MCE – Surface mounted
The MCE is designed to be surface mounted, the gear tray is first fixed on to the mounting surface and the cast aluminium body snaps firmly into place. The housing (only 33mm deep) covers the inverter and batteries.

E3M/E3TX – Manual and SelfTest
Both versions are available in two testing formats: E3M are basic emergency types for manual testing, either in Maintained or Non-Maintained mode. E3TX provide SelfTest emergency, indicating status and faults via a bi-coloured LED. If connected to the DALI based Thorn Explorer Project and Explorer Vision, they provide full automatic testing and visualisation for peace of mind.

Solution
The Voyager LED Area meets and exceeds these requirements and provides:

- Excellent diversity ratio (ratio of maximum to minimum illuminance), worse case 30:1 significantly better than the legal minimum of 40:1
- High response time, with full light output provided immediately through to the end of rated duration.
- Maximum Glare figure of 32.5 cd, significantly below limits
- And spacing as high as 11.6 metres



Spacing table for Open areas (0.5 lx)

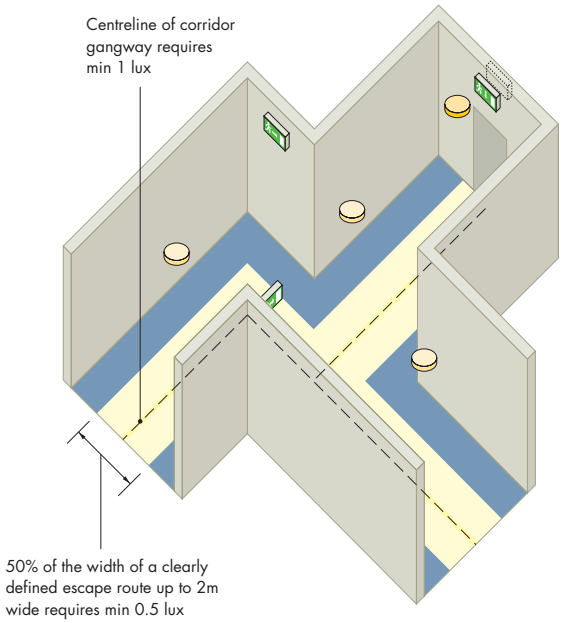
	(m)		(m)	
Mounting height	**E3M**	**E3TX**	**E3M**	**E3TX**
2.5	2.5	3.0	9	9.5
3.0	1.5	2.5	10	10.5
4.0	0	0.8	9.9	11.6

E3M = basic emergency; E3TX = SelfTest or, if connected to Explorer addressable test

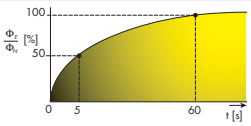
Application - Escape Route

Requirement

The specifications for emergency lighting in escape routes requires sufficient light (1 lux according EN 1838) to be provided to enable occupants to see their escape route and evacuate the building safely.



Legislative requirement

Definition	Clearly defined exit route, including moving walkways, which must always be kept clear
Routes	Considered as a 2m wide strip or a series of 2m strips
Lighting level	Minimum 1 lux on centre line at floor level. Minimum 0.5 lux on 0.5m either side of the centre line (50% of the route width)
Diversity: Φmax : Φmin Ratio of max illuminance to min illuminance	< 40 : 1
Response time Time to reach emergency lighting levels	50% in 5 sec 100% in 60 sec 
Colour rendering (Ra)	>40
Glare High contrast between luminaire and background leads to glare. Disability glare prevents you seeing properly.	

Mounting Height h	Escape Route & Open Area Max. Luminous Intensity Imax
m	cd
2.5≤h<3.0	900
3.0≤h<3.5	1600
3.5≤h<4.0	2500

Voyager LED Route
Voyager LED Route luminaires are made from die-cast aluminium. They are extraordinarily compact (85mmØ or 146mm²), incorporate NiMH batteries which offer up to three hours of emergency lighting, and can be installed and maintained without tools. A visible LED monitor is included in the luminaire to indicate that the batteries are being charged. They are available in either white (RAL 9016) or silver (RAL 9006) in these variants:

MRE
The MRE is designed to be recessed into suspended ceilings, its low-profile L-shaped battery and control gear box fits through the cut-out aperture. For fitting into concrete ceilings a recessing box is available.

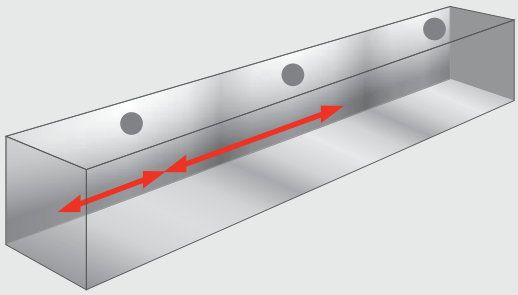
MCE
The MCE is designed to be surface mounted, the gear tray is first fixed on to the mounting surface and the cast aluminium body snaps firmly into place. The housing (only 33mm deep) covers the inverter and batteries.

E3M/E3TX
Both versions are available in two testing formats: E3M are basic emergency types for manual testing, either in Maintained or Non-Maintained mode. E3TX provide SelfTest emergency, indicating status and faults via a bi-coloured LED. If connected to the DALI based Thorn Explorer Project and Explorer Vision, they provide full automatic testing and visualisation for peace of mind.

Solution
Voyager LED Route luminaires use special optics to comply with these requirements. The optic is mounted axially in line with the escape route for maximum performance.

They deliver:

- Excellent diversity ratio (ratio of maximum to minimum illuminance) with a worse case of 20:1 that is compared with the legal minimum of 40:1
- Instant response time
- Maximum glare figure of 180cd, significantly below limits



Spacing table for Escape routes (1 lx)

	(m)		(m)	
Mounting height	**E3M**	**E3TX**	**E3M**	**E3TX**
2.5m	5.8	6.1	13.4	14
3m	6.3	6.7	15	15.6
4m	6	7.3	17.5	18.4

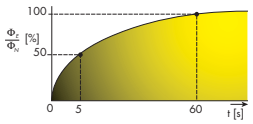
E3M = basic emergency; E3TX = SelfTest or, if connected to Explorer addressable test

Application - Spot lighting

Requirement

First aid points, fire extinguishers, hoses and other relevant equipment such as eye wash stations require satisfactory lighting (5 lux if not an escape route) in the event of an emergency.

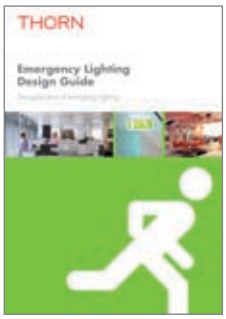
Spot Lighting

Definition	An area requiring extra levels of illumination to enable an activity or recognition to take place
Areas	Fire call point, fire extinguishers and first aid points
Lighting level	Fire call point, fire extinguishers and first aid points not on an escape route need to be lit to 5 lux minimum
Diversity: Φmax : Φmin Ratio of illuminance to min illuminance	< 40 : 1
Response time Time to reach emergency lighting levels	50% in 5 sec 100% in 60 sec 
Colour rendering (Ra)	>40

Glare
High contrast between luminaire and background leads to glare. Disability glare prevents you seeing properly.

Mounting Height h	Escape Route & Open Area Max. Luminous Intensity Imax
m	cd
2.5≤h<3.0	900
3.0≤h<3.5	1600
3.5≤h<4.0	2500

Find out more...
For detailed information on the planning of emergency schemes please refer to the Emergency Lighting Design Guide.



Voyager LED Spot
Voyager LED Spot luminaires are made from die-cast aluminium. They are extraordinarily compact (85mmØ or 146mm²), incorporate NiMH batteries which offer up to three hours of emergency lighting, and can be installed and maintained without tools. A visible LED monitor is included in the luminaire to indicate that the batteries are being charged. They are available in either white (RAL 9016) or silver (RAL 9006) in these variants:

MRE
The MRE is designed to be recessed into suspended ceilings, its low-profile L-shaped battery and control gear box fits through the cut-out aperture. For fitting into concrete ceilings a recessing box is available.

MCE
The MCE is designed to be surface mounted, the gear tray is first fixed on to the mounting surface and the cast aluminium body snaps firmly into place. The housing (only 33mm deep) covers the inverter and batteries.

E3M/E3TX
Both versions are available in two testing formats: E3M are basic emergency types for manual testing, either in Maintained or Non-Maintained mode. E3TX provide SelfTest emergency, indicating status and faults via a bi-coloured LED. If connected to the DALI based Thorn Explorer Project and Explorer Vision, they provide full automatic testing and visualisation for peace of mind.

Solution
The Voyager LED Spot meets and exceeds these requirements and provides:

- An instantaneous response time
- Worse case glare level of 156cd, significantly below the legal limits
- A beam diameter of up to 1m at 3.5m mounting.

Performance table for Voyager LED Spot

	Area of illumination to 5 lux (m^2)	
Mounting height	E3M	E3TX
2.5m	2	2.3
3m	2.1	2.6
3.5m	2.2	2.7

E3M = basic emergency; E3TX = SelfTest or, if connected to Explorer addressable test

Peace of mind with Thorn Explorer

Explorer SelfTest (E3TX)
Explorer SelfTest technology can be added to emergency lighting fittings to provide simple and reliable stand-alone automatic testing. Incorporated in E3TX versions of Voyager LED luminaires, it contains an intelligent diagnostic processor that automatically performs the testing and uses a Bi-colour LED to show the test results. Compliance with regulations requires a simple visual check of the luminaires at monthly intervals, with results recorded in a central log book and listing any failures.

Explorer SelfTest technology delivers:

- Easy installation, with automatic self-commissioning and no additional cabling
- Simple monthly visual monitoring by staff
- Fast recharge cycles for batteries of 10 to 15 hours (24 hours for manual test fittings)
- Bi-colour LED (red and green) status indication
- Intelligent scheduler learns to test while the building is unoccupied

Explorer SelfTest is an ideal testing solution for small applications or building refurbishments. Key applications include small shops, offices and public buildings.

Why choose basic manual testing?
At Thorn we believe that basic manual testing of emergency luminaires is an unsatisfactory approach that may only be suitable for budget-driven installations which do not calculate whole-life costs.

Manual luminaire testing requires intensive human intervention to comply with today's stringent regulations. Every month a 'competent individual' must walk around the site and manually switch the fittings into emergency test mode to perform a functional test. After this a record sheet for each fitting must be completed and safely stored. The same process must be carried out for the three-hour duration test once a year. Because LED indicators on manual luminaires only show whether the battery is being charged, any further faults require a manual check of the fitting.

Given the high total commitment of time and record keeping over the lifetime of a lighting installation, the whole life cost of the manual approach makes it inefficient and uneconomic.

Typical whole life cost comparison for mandatory testing

Life cost of manual testing	€802,747
Life cost of SelfTest	€423,326
Saving over Manual test	€379,421
Life cost of central addressable Testing (e.g. Explorer Project & Vision)	€378,486
Saving over Manual test	€424,261
Saving over SelfTest	€44,840

Example based on an installation of 999 luminaires and EU mandatory test requirements

Explorer Project (E3TX)
To protect the life-saving benefits of an emergency lighting system, appropriate maintenance is essential. It may also be a legal requirement, especially in the areas of regular inspection, testing and maintenance in workplaces and public buildings.

To help premises managers and owners comply with best practice as well as the law, Thorn offers the Explorer range of automated test systems for emergency lighting. Explorer systems provide a testing process that is fully compliant with European Standards, combining peace of mind with safety. They eliminate the need for costly and time-consuming manual testing by a 'competent person' and can be specified in three versions to suit different applications and budgets.

Explorer Project is a centrally-addressable testing system that provides fully automatic monitoring, testing and fault logging for up to 256 emergency fittings. It delivers:

- Ultimate convenience for emergency lighting testing
- Automatic, paper-free storage of results for two years
- A reporting function that identifies each luminaire, its location and details of the fault
- Coverage up to 900 metres from the local controller
- Flexible scheduling of tests to suit local requirements
- Staggered testing to minimise the risk of depleted batteries
- Simple installation and commissioning
- Simple connection of E3TX Voyager LED luminaires using polarity-free twin DALI wire and standard mains-rated installation materials

Explorer Project is particularly suitable for small-to-medium projects requiring an easy and convenient way of maintaining an emergency lighting installation. Schools, colleges, small offices, surgeries, libraries and public buildings are typical user groups.

Find out more...
For further information on Explorer please refer to the "Explorer" brochure.

Specifications

Lamps
2.7W high power LEDs

Materials/Finish
Surface mounting version
Body: cast aluminium alloy body, finished in RAL 9016 white or RAL9006 metallic silver.
Recessed version - aluminium alloy reflector, finished in RAL 9016 white or RAL 9006 metallic silver, polycarbonate housing for battery and control gear.

Installation/Mounting
Surface mounting with rear and side entry. Recessed version cable entry into remote control gear.

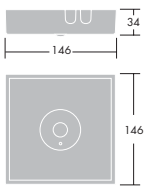
Standards
Designed and manufactured to comply with EN 60598 2-22, EN 55015
Class I electrical (surface mounted versions)
Class II electrical (recessed versions)
IP40 from below, IP20 from above

Specification
To specify state:
Compact LED based, self contained luminaire, suitable for recessed or surface mounting with optics optimised for Escape Routes, Open Areas and Spot lighting. 3 hours emergency duration from Nickel Metal Hydride batteries, maintained operation. Manual or self/addressable test capability.
As Thorn Voyager LED Series.

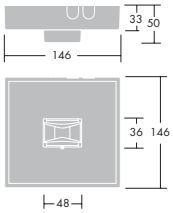
Voyager LED Area, surface, white

Voyager LED Route, surface, white

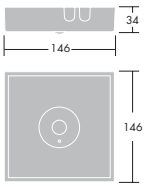
Voyager LED Spot, surface, silver



Area, surface mounted



Route, surface mounted

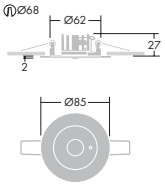


Spot, surface mounted

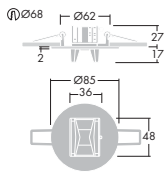
Voyager LED Area, recessed, silver

Voyager LED Route, recessed, silver

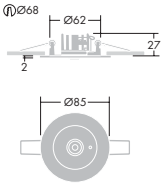
Voyager LED Spot, recessed, white



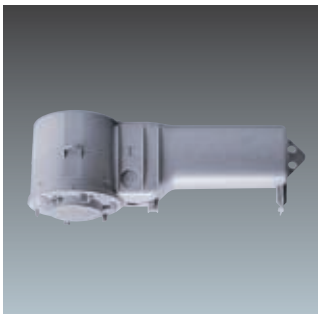
Area, recessed



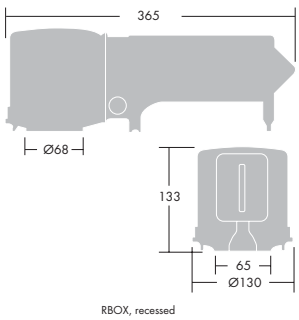
Route, recessed



Spot, recessed



Optional recess box for installation of MRE versions into concrete ceilings



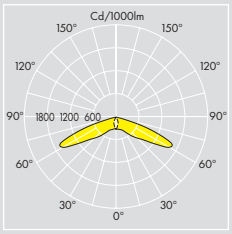
RBOX, recessed

Ordering Guide

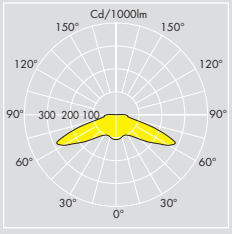
Ordering Guide

Description	Weight (Kg)	SAP Code
Route		
VOYAGER LED ROUTE MCE E3M SIL	0.8	96503713
VOYAGER LED ROUTE MCE E3TX SIL	0.8	96503714
VOYAGER LED ROUTE MCE E3M WHI	0.8	96503715
VOYAGER LED ROUTE MCE E3TX WHI	0.8	96503716
VOYAGER LED ROUTE MRE E3M SIL	1.2	96503717
VOYAGER LED ROUTE MRE E3TX SIL	1.2	96503718
VOYAGER LED ROUTE MRE E3M WHI	1.2	96503719
VOYAGER LED ROUTE MRE E3TX WHI	1.2	96503720
VOYAGER LED ROUTE KIT E3M	0.3	96503721
VOYAGER LED ROUTE KIT E3TX	0.3	96503722
Area		
VOYAGER LED AREA MCE E3M SIL	0.8	96503723
VOYAGER LED AREA MCE E3TX SIL	0.8	96503724
VOYAGER LED AREA MCE E3M WHI	0.8	96503725
VOYAGER LED AREA MCE E3TX WHI	0.8	96503726
VOYAGER LED AREA MRE E3M SIL	1.2	96503727
VOYAGER LED AREA MRE E3TX SIL	1.2	96503728
VOYAGER LED AREA MRE E3M WHI	1.2	96503729
VOYAGER LED AREA MRE E3TX WHI	1.2	96503730
VOYAGER LED AREA KIT E3M	0.3	96503731
VOYAGER LED AREA KIT E3TX	0.3	96503732
Spot		
VOYAGER LED SPOT MCE E3M SIL	0.8	96236608
VOYAGER LED SPOT MCE E3TX SIL	0.8	96236609
VOYAGER LED SPOT MCE E3M WHI	0.8	96236610
VOYAGER LED SPOT MCE E3TX WHI	0.8	96236611
VOYAGER LED SPOT MRE E3M SIL	1.2	96503733
VOYAGER LED SPOT MRE E3TX SIL	1.2	96503734
VOYAGER LED SPOT MRE E3M WHI	1.2	96503736
VOYAGER LED SPOT MRE E3TX WHI	1.2	96503737
VOYAGER LED SPOT KIT E3M	0.3	96236612
VOYAGER LED SPOT KIT E3TX	0.3	96236613
Recessing Box*		
RBOX PE VOYAGER LED MRE CONCRETE	0.3	96236606

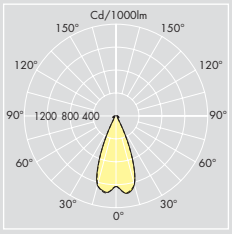
E3M - 3 hour emergency manual test maintained
E3TX - 3 hour emergency SelfTest, or Addressable Test if connected to Explorer Project/Vision
KIT - for integration into luminaires
MCE - ceiling surface mounted
MRE - recessed mounted
PE - polyethylene,
RBOX - recessing box
SIL - silver coloured
WHI - white
* Used in conjunction with recessed luminaires when mounting into concrete



Voyager LED Route
Lamp: 1xHigh power LED
Flux: 115lm **Power:** 2.2W



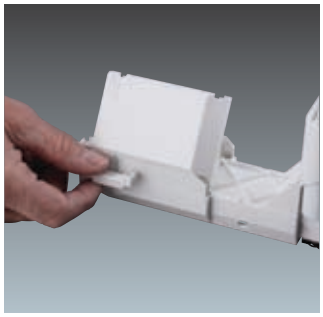
Voyager LED Area
Lamp: 1xHigh power LED
Flux: 115lm **Power:** 2.2W



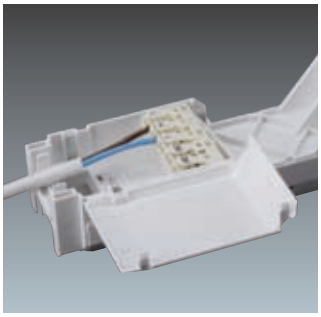
Voyager LED Spot
Lamp: 1xHigh power LED
Flux: 115lm **Power:** 2.2W

Installation

1.

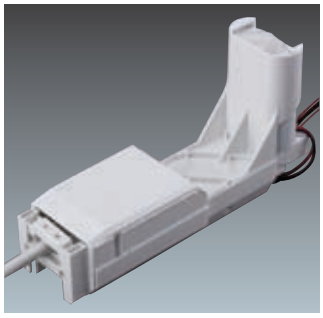


2.



3.

4.



5.

1. *The recessed version of Voyager LED series (MRE) has been designed to make installation as simple as possible;*
2. *The specially moulded cable clamps should be snapped off the body ready for use.*
3. *Mode of operation Non-Maintained, Maintained or Switched Maintained is selected at this point.*

6.

4. *Use the cable clamps to lock off input cable so as to avoid strain on the terminal block*
5. *Close the body to shroud the connections*
6. *Insert the control gear in through the recess prepared for the Voyager LED series*
7. *Insert Voyager LED series luminaire, job done!*

7.

THORN

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