

Appendix 5 – Luminaire Schedule

Circle Square Development

Technical Submission – External Lighting

Tech Sub Reference: CS-NGB-XX-XX-TS-E-0013



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Technical Submission Date:	03/12/2019
Technical Submission Revision:	P01 (Original)

Section 1

External Scope of Works

NG Bailey Scope of works has been identified within our CPs within Annex C- External works. We identified our boundary area based on the information supplied on the drawing 1602419-HL-XX-LS-DR-Y-630-009-P3. We have taken a snapshot below.



Section 2

Design Parameters

The external scheme out with the building has been designed and developed by Hoare Lee as part of the overall master planning. Hoare Lee has overall design responsibility of the external lighting scheme and indeed accountability for compliance with the following: -

- Illuminance levels for lighting in all external areas shall be in accordance with BS 5489-1:2013+A2:2008 Lighting of roads and public amenity areas
- BS EN 13201-2:2015
- BS EN 12464-2:2014 Light and Lighting – Lighting of Workplaces – Part 2: Outdoor Places
- Secure by design (ALO requirements)
- ILP Guidance notes for the reduction of obtrusive Light 2011
- LPA requirements
- Local Authority requirements
- Guidance note - Controlling Light Pollution and Reducing Energy Consumption.

We have used the previously issued Hoare Lee luminaire schedule reference *DST-1602419-170904-DLB-Block 2, 3, 4 Luminaire Data Sheets-01*, and also the *DST-1602419-160801-DLB-Luminaire Datasheets-03*.

As stated earlier we have worked to our CP's and the Hoare Lee design and the quantities below refer to our latest drawing and provisions.

Revised External Luminaire Schedule Dated 04/07/2018					
Area	TYPE	Manufacturer	Original Quantity	Revised Quantity	
Block 2 Downlight	A	ERCO	29	29	inc in base build
Block 4 Downlight	A	ERCO	41	41	inc in base build
The Walks (2/4)	X3-1	Kemps	6	0	
The Walks (2/4)	X3-2	Kemps	6	0	
The Green	P1/P2 Column's	Selux	4	4	
The Green	x2	selux	4	4	
The Green	X2	Iguzzini	5	5	
The Walks (4/5)	X14-4	Kemps	4	0	
The Walks (4/5)	X14-7	Kemps	14	4	
The Green	X16-1	LiniLED	21	7	
The Green	X16-2	LiniLED	36	12	
The Green	X16-3	LiniLED	81	0	
The Green	X16-4	LiniLED	4	4	
The Green	X16-5	LiniLED	4	4	
The Green	X16-6	LiniLED	65	0	
Building 3	X17-1	TBC Budget	41	0	
Building 3	X17-2	TBC Budget	55	0	
Building 3 roof	X18-1	LiniLED	60	60	
Building 3 roof	x18-2	LiniLED	64	64	
	B	TBC Budget	1	1	
	R	TBC Budget	1	1	

Section 3

Supplier Details and Locations

Type A – ERCO

A type Recessed and Surface types Perimter of building 2 and building 4

Type B – WE-EF

These are located on Brancaster road

Type P1 with Tapered wood Column – SELUX

Front of building 2 and building 4

It should be noted that we have included for 4No to include power supplies and 1No to have additional data (wifi)

Type R – WE-EF

These are located on Brancaster road

Type X2 – IGUZZINI

Recessed floor uplight outside building 2.

Type X2 – WE-EF

Recessed floor uplight located on Brancaster Road.

Type X14-7 - KEMPS

Surface mounted under bench

Type X16 - SELUX

Stairwell Lighting located on each landing within the retail areas of 3a and 3b.

Type X18 - SELUX

Perimter lighting around building 3a and 3b.

Type A – ERCO

Name - Compact Surface-mounted downlight oval flood

Recessed and Surface types Perimeter of building 2 and building 4

Luminous Efficacy

Erco A type – Surface – 60lm/cw

Planning data

Cleaning (a)	1				2				3			
Ambient conditions	P	C	N	D	P	C	N	D	P	C	N	D
LMF	0.96	0.94	0.90	0.86	0.93	0.91	0.86	0.81	0.92	0.90	0.84	0.79
RSMF	0.97	0.95	0.91	0.86	0.97	0.94	0.90	0.86	0.97	0.94	0.90	0.86

Hours of operation (h)	1000	5000	10000	20000	30000	40000	50000
LLMF	1.00	0.99	0.98	0.96	0.94	0.92	0.90
LSF	1	1	1	1	1	1	1

MF	LMFxRSMFxLLMFxLSF
MF	Maintenance Factor
LMF	Luminaire Maintenance Factor
RSMF	Room Surface Maintenance Factor
LLMF	Lamp Lumens Maintenance Factor
LSF	Lamp Survival Factor
P	Room pure
C	Room clean
N	Room normal
D	Room dirty

Technical data in accordance with international norms and standards

IEC 60598	Luminaires – Part 1+2: general requirements, specific requirements and tests
IEC 62031	LED modules for general lighting – safety requirements
IEC 62471	Photobiological safety of lamps and lamp systems
EN 13032-4	Light and lighting – measurement and representation of photometric data
CIE 13	Method of measuring and specifying colour rendering properties of light sources

All technical data is subject to industrially standard tolerances.

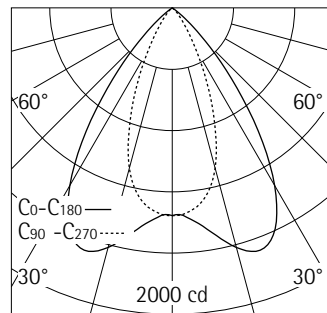
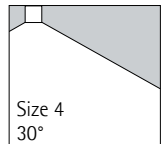
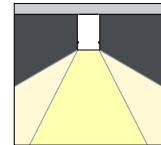
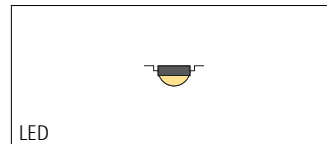
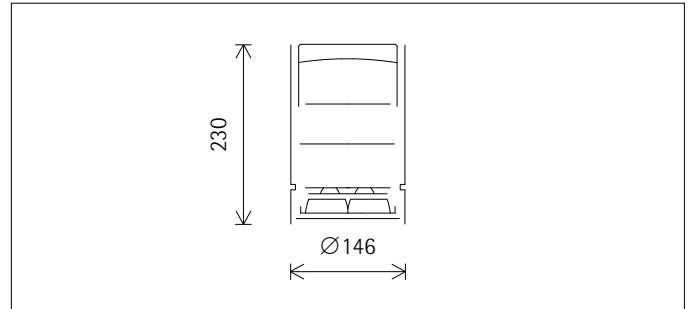
Also see www.ercos.com/ercos-led



84533.000 Graphit m
LED 16W 1680lm 3000K warm white
Phase dimmable
Version 5
Lens system, oval flood

Product description

Cylinder and ceiling fixture: corrosion-resistant cast aluminium, No-Rinse surface treatment. Double powder-coated. Tamper-proof screw.
Control gear, dimmable. 2 cable entries. Through-wiring possible. 3 terminals.
LED module: high-power LEDs on metal-core PCB. Lens system made of optical polymer.
Anti-glare ring with cross-baffle: polymer, aluminium vaporised, silver, ribbed.
Optical cut-off 30°.
Non-reflective safety glass.
Dimming with external dimmers possible (trailing edge).
Protection mode IP65: dust-proof and water jet-proof.
Weight 3.50kg
Version with 3000K CRI 95 or 2700K, 3500K, 4000K CRI 92 available on request.



h(m)	E(lx)	D(m)	
		C0	C90
1	1356	1.48	0.83
2	339	2.96	1.66
3	151	4.44	2.49
4	85	5.92	3.31
5	54	7.40	4.14

Technical data

Luminous flux of the luminaire	1340lm
Connected load	19.0W
Luminaire efficacy	71lm/W
Colour deviation	1.5 SDCM
Colour rendition index	CRI 92
Lumen maintenance (LED manufacturer specifications)	L90/B10 ≤50000h L90 ≤100000h
LED failure rate	0.1% ≤50000h
Dimming range	10%-100%
Dimming method	CCR
LMF	E
Energy efficiency class	EEI A+
Standby power per control gear	--
Luminaires per circuit breaker B16	65

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Sales network click here
www.erco.com/contact

Technical Region: 220V-240V/50Hz
We reserve the right to make technical and design changes.
Edition: 21.02.2019
Current version under
www.erco.com/84533.000

Type A – ERCO

Name - Compact Downlight oval flood

Recessed and Surface types Perimeter of building 2 and building 4

Luminous Efficacy

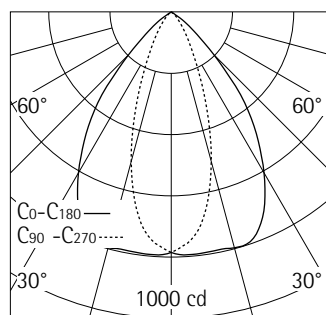
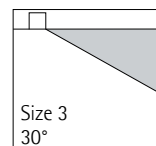
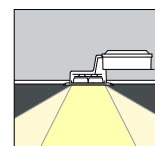
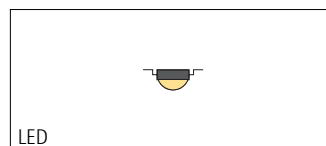
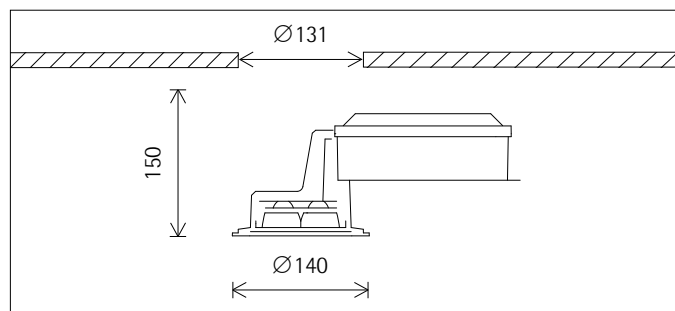
Erco – A type Recessed – 60lm/cw



84435.000 Silver
LED 8W 840lm 3000K warm white
Phase dimmable
Version 5
Lens system, oval flood

Product description

Housing with cover ring: corrosion-resistant cast aluminium, No-Rinse surface treatment. Silver, double powder-coated. Mounting with 2-point support and screw fixing, for ceiling thicknesses of 1-30mm. Side-mounted control gear: polymer, black. ERCO control gear, dimmable. 2 cable entries. Through-wiring possible. 5-pole terminal block.
LED module: high-power LEDs on metal-core PCB. Lens system made of optical polymer.
Anti-glare ring with cross-baffle: polymer, aluminium vaporised, silver, ribbed. Optical cut-off 30°.
Non-reflective safety glass.
Dimming with external dimmers possible (trailing edge).
Protection mode IP65: dust-proof and water jet-proof.
Weight 1.30kg
Version with 3000K CRI 95 or 2700K, 3500K, 4000K CRI 92 available on request.



h(m)	E(lx)	D(m)	
		C0	C90
		76°	37°
1	785	1.56	0.67
2	196	3.13	1.34
3	87	4.69	2.01
4	49	6.25	2.68
5	31	7.81	3.35

Technical data

Luminous flux of the luminaire	661lm
Connected load	11.0W
Luminaire efficacy	60lm/W
Colour deviation	1.5 SDCM
Colour rendition index	CRI 92
Lumen maintenance (LED manufacturer specifications)	L90/B10 ≤50000h L90 ≤100000h
LED failure rate	0.1% ≤50000h
Dimming range	1%-100%
Dimming method	CCR_PWM
LMF	E
Energy efficiency class	EEI A+
Standby power per control gear	--
Luminaires per circuit breaker B16	216

For your regional contact in the ERCO
Sales network click here
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Technical Region: 220V-240V/50Hz
We reserve the right to make technical
and design changes.
Edition: 21.02.2019
Current version under
www.erco.com/84435.000

Planning data

Cleaning (a)	1				2				3			
Ambient conditions	P	C	N	D	P	C	N	D	P	C	N	D
LMF	0.96	0.94	0.90	0.86	0.93	0.91	0.86	0.81	0.92	0.90	0.84	0.79
RSMF	0.97	0.95	0.91	0.86	0.97	0.94	0.90	0.86	0.97	0.94	0.90	0.86

Hours of operation (h)	1000	5000	10000	20000	30000	40000	50000
LLMF	1.00	0.99	0.98	0.96	0.94	0.92	0.90
LSF	1	1	1	1	1	1	1

MF	LMFxRSMFxLLMFxLSF
MF	Maintenance Factor
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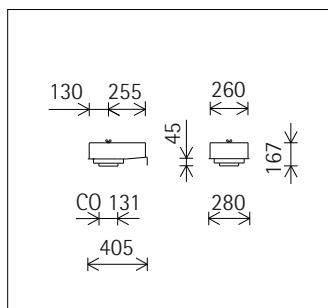
All technical data is subject to industrially standard tolerances.
Also see www.ercos.com/ercos-led

Accessories



83738.000

Concrete housing
Stainless steel, galvanised/powder-coated.
Recommended 0-8mm aggregate for the concrete.
Weight 4.35kg



Type B – WE-EF

Name - CFT540 LED - 105-0078

Location - These are located on Brancaster road.

Luminous Efficacy

B type – 98lm/cw

CFT540 LED

105-0078



1/5



Description

IP66. Class I. IK08. Marine-grade, die-cast aluminium alloy. 5CE superior corrosion protection including PCS hardware. Silicone CCG® Controlled Compression Gasket. RFC® Reflection Free Contour main lens. Integral EC electronic converter in thermally separated compartment. CAD-optimised optics for superior illumination and glare control. OLC® One LED Concept. Factory installed LED circuit board. The luminaire is factory-sealed and does not need to be opened during installation. Recommended mounting height 3.0-4.5 m, depending on wattage selected.

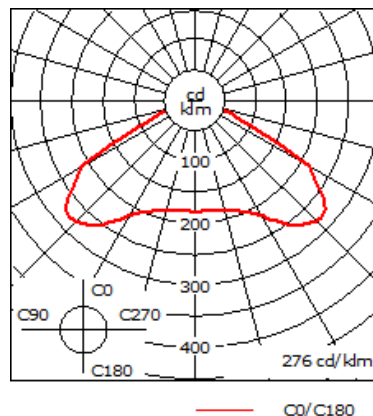
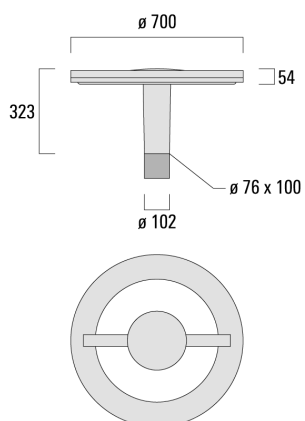
Beam Type	symmetric distribution [C50]
Light Source	LED-36/72W / 700 mA - 3000 K
CRI	80
Gear Type	EC
Nominal Luminous Flux (lm)	
LED Lumens	245.9 lm
LEDs	36
Total Lumens	8854 lm
Tj	85 °C
Rated Luminous Flux (lm)	
LED Lumens	220.9 lm
Total Lumens	7952.2 lm
Ta	25 °C
Rated Input Power	81 W

CFT540 LED

105-0078

2/5

we-ef



CFT540 LED

105-0078

3/5

we-ef

Material Specification

Body:	Marine-grade, die-cast aluminium alloy
Weight (kg):	13.30
Lens:	PMMA RFC® Reflection Free Contour technology
Colours:	RAL9004 Signal black RAL9006 White aluminium RAL9007 Grey aluminium RAL7016 Anthracite grey RAL9016 Traffic white

Prepare to Connect

WE-EF luminaires that offer the option of P2C are, in principle, the precursor to the R2C. They are designed to accommodate the necessary equipment for integration into a light management system, yet only contain standard operating equipment. The IPX6 protected and standardized interface are also factory-installed at P2C stage and equipped with a robust protective cap. If a decision for a light management system is later made, only the necessary 'smart' LED driver, with communication interface and power supply for the controller/sensor, must be installed and connected. This P2C solution avoids having to make engineering adjustments to the luminaire housing, which can lead to damage and water ingress. On request.

Ready to Connect

WE-EF luminaires that offer the option of R2C have all the necessary equipment and interfaces on board for integration into a light management system. DALI LED drivers with additional built-in power supply (12-24V DC) are the basic requirements for R2C. In addition, there is an IPX6 protected and standardized interface which is pre-wired and provided with a robust protective cap. Once the decision for a light management system has been made, a controller/sensor can simply be connected to the standardized (Zhaga Book18) interface via a bayonet lock. No additional work on the luminaire is required. On request.

Gasket:	Silicone CCG® Controlled Compression Gasket
Fasteners:	PCS Polymer Coated Stainless Steel Hardware
Ingress protection:	IP66
Impact protection:	IK08
Corrosion protection:	5CE
Surge protection:	6/6 kV (optional SP10)
Windage (EPA):	0.065 m²

Electrical Specification

Power supply:	220-240V / 50-60 Hz
Power factor:	> 0.9
Driver / Ballast:	Integral EC electronic converter

Lifetime

LED 350mA: >80,000 h Ta 25°(L90/B10)

LED 700mA: >80,000 h Ta 25°(L80/B10)

LED 1050mA: >80,000 h Ta 25°(L90/B10)

LED 1400mA: >80,000 h Ta 25°(L80/B10)

Control gear: >50,000 h Ta 25°

Electrical Accessories

Surge Protection SP10

The luminaire is fitted with an electronic converter featuring high voltage surge protection 6/6kV exceeding the requirements of EN 61000-4-5. For installation in high-risk areas, the optional SP10 (10/10kV) surge protection accessory is recommended. For comprehensive protection of the luminaires with LED light sources and electronic drivers against the effects of lightning and electrical surges, we generally recommend primary (Type 1) and secondary (Type 2) surge arrestors be installed in the sub-distribution.

 **430-0020** SP10 Integral

Control

Eco Step Dim® Advanced LED

A factory programmed Electronic Controller is fitted in the luminaire to reduce the luminous flux and power. The luminaires are operated in stand-alone mode, so no special supply and/or control cables are required. Up to five different dimming levels (D1-D5) may be individually and optionally specified for a maximum of five time periods (T1-T5). Set and programmed at the factory by agreement. Reprogramming on site is also possible. Contact WE-EF direct or your local WE-EF sales representative for an individual solution designed to precisely meet your needs.

 **430-0002** Eco Step Dim® Advanced LED

Eco Step Dim® Basic LED

A factory programmed Electronic Controller is fitted in the luminaire to reduce luminous flux and power to a preset value. Control phases such as those that are, for example, used in networks using luminaires with two conventional lamps is required to activate the switch. One step dimming only is available. As standard, lumen output is reduced to 50 per cent. Intermediate values (e.g., 25 per cent) may also be optionally realised by agreement. Contact WE-EF direct or your local WE-EF sales representative for an individual solution designed to precisely meet your needs.

 **430-0001** Eco Step Dim® Basic LED

CFT540 LED

105-0078

5/5

we-ef

Photocell PV

Standard 70 lx 'on' / 105 lx 'off', other on request

430-0017 Photocell PV

P2C Prepare to Connect

Entry level conversion of the luminaire into a 'semi-smart' P2C luminaire, for future integration into a light management system. Factory installed IP-X6-protected and standardized interface (Zhaga Book18). For future integration into a light management system, the necessary 'smart' LED driver with built-in power supply for the controller / sensor (3rd party supplier) needs to be installed and connected. P2C allows for the future inclusion into a light management system without having to make engineering adjustments to the luminaire housing, which can lead to damage and water ingress. On request.

430-0023 P2C Prepare to Connect

R2C Ready to Connect

Complete conversion of the luminaire into a 'smart' R2C luminaire, for future integration into a light management system. Factory installed IP x6 protected and standardized interface (Zhaga Book18) with DALI LED driver including additional built-in power supply (24V DC) for end controller / sensor (3rd party supplier). Pre-wired and provided with a robust protective cap, the controller / sensor can simply be connected to the standardized interface via a bayonet lock. No additional work on the luminaire required.

430-0019 R2C Ready to Connect

Type P1 with Tapered wood Column – SELUX

Name - Olivio Universal Medio SX964-11-9

Location - located in front of building 2 and building 4

Luminous Efficacy

B type – 107lm/cw

Notes

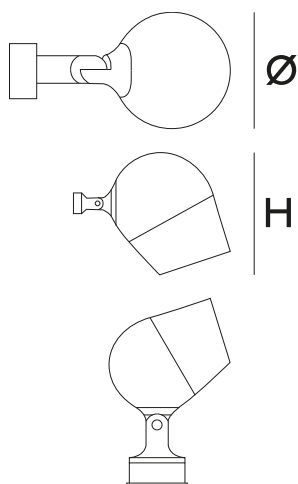
The combination selected by the architect at PlanIt is the wooden tapered column with a short bracket to support the 5No - P1 type luminaires.

P1 – Olivio Universal Medio SX964-11-9

Bracket - SeluxOlivio Sistema 3 bracket for Olivio Medio, single, made of cast aluminium, powder-coated, finish is SeluxGraphite

Olivio Universal Medio

SX 964 11-9



spotlight

rotation symmetrical 40° ($\pm 20^\circ$), medium beam,
LED, 3000 lm, 3000 K, CRI > 80, electronic converter, Total power:
28 W

spotlight, with junction box, luminaire housing made of die-cast aluminium, painted, aluminium, screws made of stainless steel, adjustable head joint ensures precise direction of luminaire head, wide pivoting range from 20° to 195°, can be rotated + / - 180°, shielding made of safety glass
Optical system: medium reflector
hidden cable entry through the head joint, easy maintenance access via lockbar mechanism,

Certifications

CE, IP67, Protection Class I

colour: Selux Graphite or special finish

Height H: 260 mm
Diameter Ø: 220 mm
Outreach : 432 mm
Weight: 6 kg
Windpressure: 0,05 m²

Make: Selux, Type: SX 964 11-9



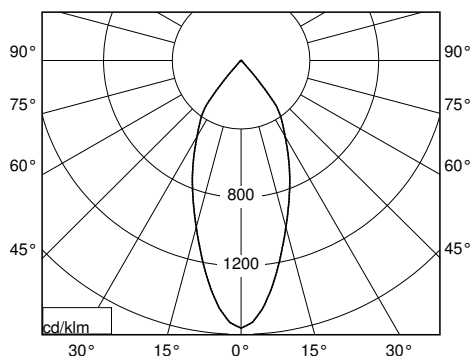
Modifications are possible due to the constant development and improvement of LED technology.

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Selux AG, Motzener Straße 34, D-12277 Berlin, T +49 30 72001-0, F -100, info@selux.com, www.selux.com

Olivio Universal Medio SX 964 11-9

Technics



Photometric data: 8480
Upward light ratio (ULR): 0 %

Lamp

LED · 3000lm · Light colour: 3000 K · CRI > 80.

Optic

medium reflector · medium beam.

Electrics

electronic converter · Total power: 28W
control options:
dynamic · DALI · fix value · individual power
reduction in 300 lumen steps ex work

Luminous flux characteristics / Operating time of LED

	20000	40000	60000	80000
Operating time LED				
Lumen maintenance	95%	92%	89%	86%
LLMF*	0.95	0.92	0.89	0.86

* = Lamp lumen maintenance factor

Modifications are possible due to the constant development and improvement of LED technology.

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Selux AG, Motzener Straße 34, D-12277 Berlin, T +49 30 72001-0, F -100, info@selux.com, www.selux.com

Additional Option

Sistema 3 - 11m wood column with Olivio +
Short Arm Bracket



selux

COLUMN N°1

A

B

C

D

E

F

G

H

A

B

C

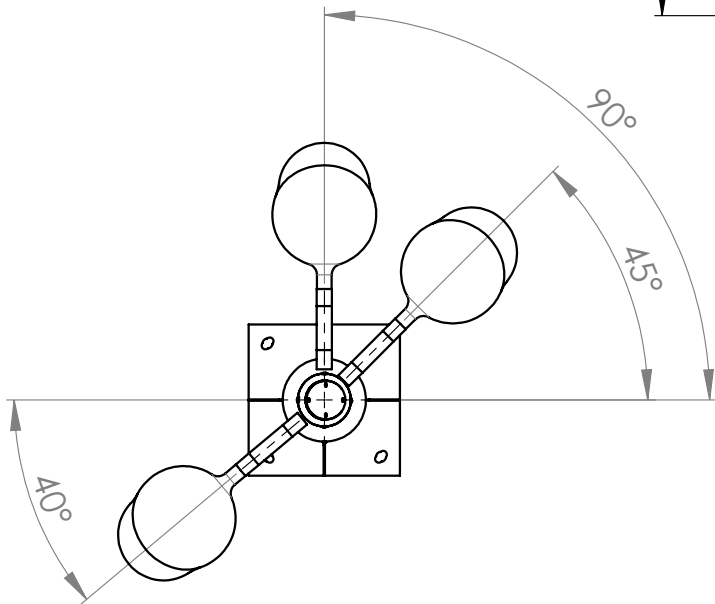
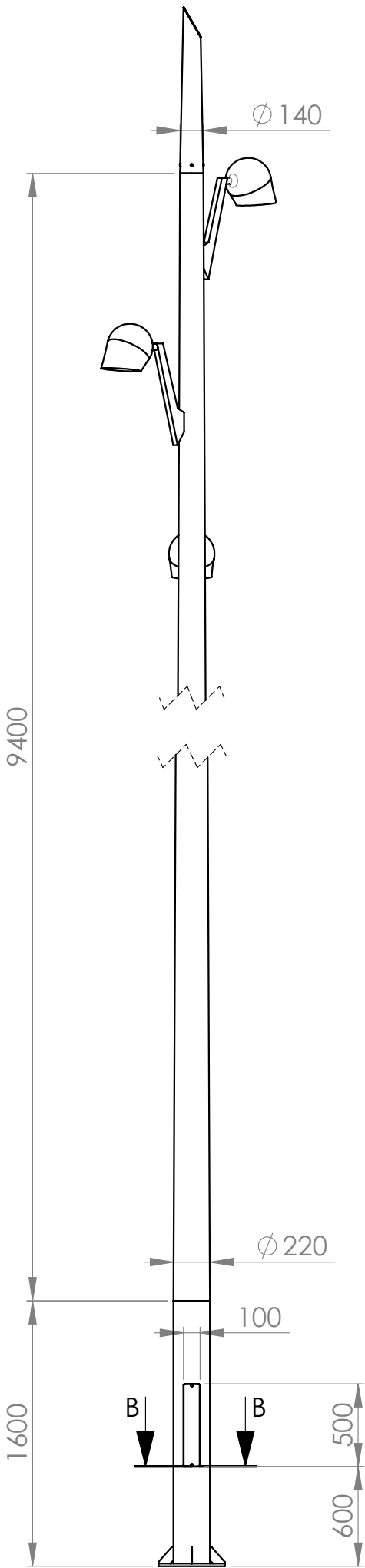
D

E

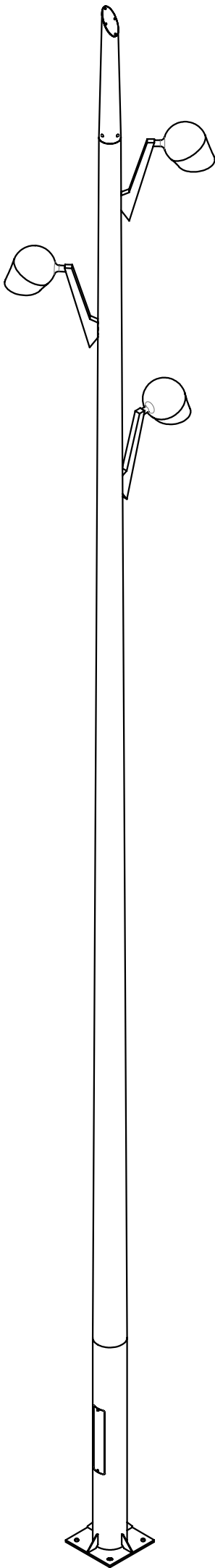
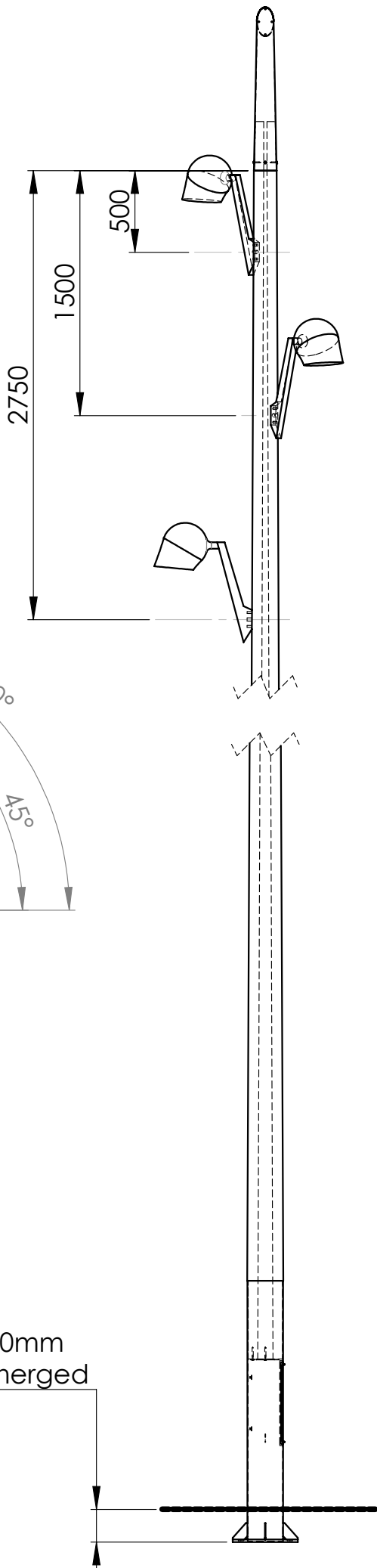
F

G

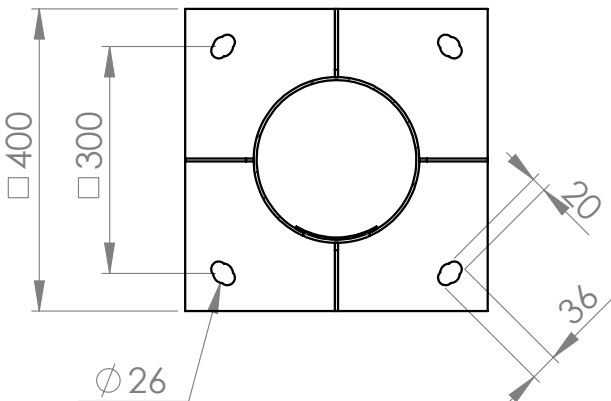
H



200mm
Submerged



COUPE B-B
ECHELLE 1 : 10



Tolérance générale: ISO 2768-ck

SM	A	03/10/2019	CREATION		
Par	Ind.	Date	Observation		
Dessiné par :		N° plan : 1927602SM-Dôme XL 11m 220-140 MANCHESTER		Folio : 1/1	AUBRILAM distributed by selux
SM		Type : Plan de presentation			
Vérifié par :		Objet 3D : 1927602SM-Dôme XL 11m 220-140 MANCHESTER			
SM		N° affaire : APS 12628 Code art.:			
		Nom affaire : CIRCLE SQUARE MANCHESTER		ECH : 1:35	
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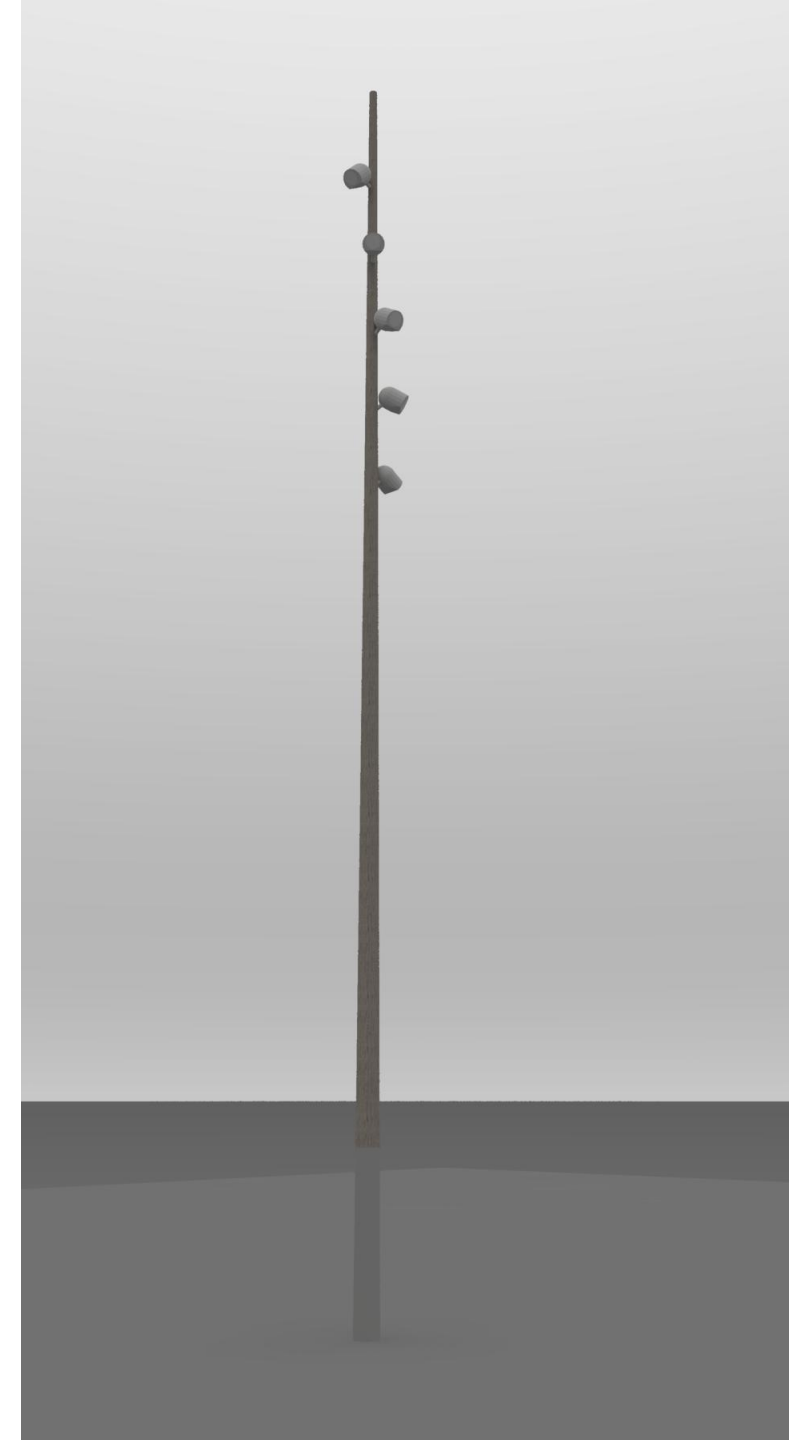
Feature Column.

Option 7.

11.5m tall tapered (12mm/m) timber column.

5 x Medio (at 10.5m, 9.75m, 9m, 8.25m, 7.5m).

Paint finish/timber finish TBC.



Feature Column.

Option 7.

9 qty Selux 11m Conical Tapered Wood Column 5 Olivio
Luminaires + Short Arm Bracket

Each comprising:

5 qty
SX 961 11-9
Selux Olivio Medio luminaire head, rotation symmetrical 40°(±20°),
medium beam, LED 3000lm, 3000K, CRI > 80, electronic converter,
Total power: 28w.
Luminaire housing made of die-cast aluminium, painted, aluminium,
screws made of stainless steel, adjustable head joint ensures
precise direction of luminaire head, wide pivoting range from 20°to
195°, can be rotated + / -180°, shielding made of safety glass,
medium reflector hidden cable entry through the head joint, incl.
10m feed cable, easy maintenance access via lockbar mechanism.
CertificationsIP67, IK06, ENEC 05, CE, Protection Class II,optional I
Finish: Selux Graphite
Height : 260mm
Diameter Ø: 163mm
Outreach : 260mm
Weight: 6 kg
Windpressure: 0,05 m²

5 qty
SX 97-551-9
Selux Olivio Sistema 3 bracket for Olivio Medio, single, made of
cast aluminium, powder-coated
Finish: Selux Graphite

1 qty
SX DMC-15372-07
Dome XL 11m 220 -140mm, flange mounted, double lock access
door, round tapered column with chamfered finialto take above
Olivio luminaires.
Timber Finish - TBC
Metalwork Finish -Grey 900 sanded – TBC

Unit Price: £14,211

See Selux Quotation Ref:
Q 108588HOARev6
Selux Project Ref:
SO 15372

Type R – WE-EF

Name - CFT540 LED - 105-0084

Location - These are located on Brancaster road

Luminous Efficacy

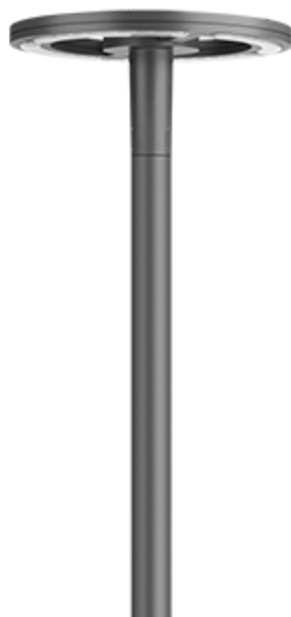
R type – 97lm/cw

CFT540 LED

105-0084

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we-ef



Description

IP66. Class I. IK08. Marine-grade, die-cast aluminium alloy. 5CE superior corrosion protection including PCS hardware. Silicone CCG® Controlled Compression Gasket. RFC® Reflection Free Contour main lens. Integral EC electronic converter in thermally separated compartment. CAD-optimised optics for superior illumination and glare control. OLC® One LED Concept. Factory installed LED circuit board. The luminaire is factory-sealed and does not need to be opened during installation. Recommended mounting height 3.0-4.5 m, depending on wattage selected.

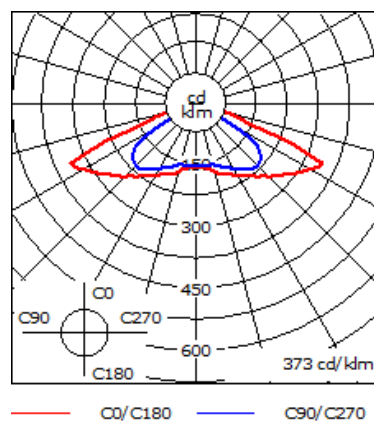
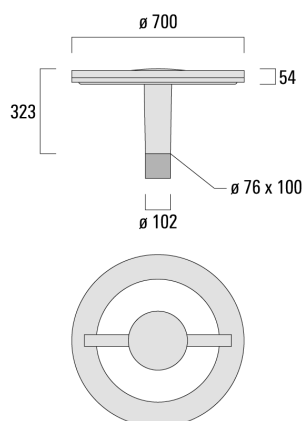
Beam Type	rectangular [R]
Light Source	LED-36/72W / 700 mA - 3000 K
CRI	80
Gear Type	EC
Nominal Luminous Flux (lm)	
LED Lumens	245.9 lm
LEDs	36
Total Lumens	8854 lm
Tj	85 °C
Rated Luminous Flux (lm)	
LED Lumens	218.5 lm
Total Lumens	7865.1 lm
Ta	25 °C
Rated Input Power	81 W

CFT540 LED

105-0084

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we-ef



CFT540 LED

105-0084

3/5

we-ef

Material Specification

Body:	Marine-grade, die-cast aluminium alloy
Weight (kg):	13.30
Lens:	PMMA RFC® Reflection Free Contour technology
Colours:	RAL9004 Signal black RAL9006 White aluminium RAL9007 Grey aluminium RAL7016 Anthracite grey RAL9016 Traffic white

⌘ Prepare to Connect	WE-EF luminaires that offer the option of P2C are, in principle, the precursor to the R2C. They are designed to accommodate the necessary equipment for integration into a light management system, yet only contain standard operating equipment. The IPX6 protected and standardized interface are also factory-installed at P2C stage and equipped with a robust protective cap. If a decision for a light management system is later made, only the necessary 'smart' LED driver, with communication interface and power supply for the controller/sensor, must be installed and connected. This P2C solution avoids having to make engineering adjustments to the luminaire housing, which can lead to damage and water ingress. On request.
----------------------	---

⌘ Ready to Connect	WE-EF luminaires that offer the option of R2C have all the necessary equipment and interfaces on board for integration into a light management system. DALI LED drivers with additional built-in power supply (12-24V DC) are the basic requirements for R2C. In addition, there is an IPX6 protected and standardized interface which is pre-wired and provided with a robust protective cap. Once the decision for a light management system has been made, a controller/sensor can simply be connected to the standardized (Zhaga Book18) interface via a bayonet lock. No additional work on the luminaire is required. On request.
--------------------	---

Gasket:	Silicone CCG® Controlled Compression Gasket
Fasteners:	PCS Polymer Coated Stainless Steel Hardware
Ingress protection:	IP66
Impact protection:	IK08
Corrosion protection:	5CE
Surge protection:	6/6 kV (optional SP10)
Windage (EPA):	0.065 m²

Electrical Specification

Power supply:	220-240V / 50-60 Hz
Power factor:	> 0.9
Driver / Ballast:	Integral EC electronic converter

Lifetime

LED 350mA: >80,000 h Ta 25°(L90/B10)

LED 700mA: >80,000 h Ta 25°(L80/B10)

LED 1050mA: >80,000 h Ta 25°(L90/B10)

LED 1400mA: >80,000 h Ta 25°(L80/B10)

Control gear: >50,000 h Ta 25°

Electrical Accessories

Surge Protection SP10

The luminaire is fitted with an electronic converter featuring high voltage surge protection 6/6kV exceeding the requirements of EN 61000-4-5. For installation in high-risk areas, the optional SP10 (10/10kV) surge protection accessory is recommended. For comprehensive protection of the luminaires with LED light sources and electronic drivers against the effects of lightning and electrical surges, we generally recommend primary (Type 1) and secondary (Type 2) surge arrestors be installed in the sub-distribution.

■ **430-0020** SP10 Integral

Control

Eco Step Dim® Advanced LED

A factory programmed Electronic Controller is fitted in the luminaire to reduce the luminous flux and power. The luminaires are operated in stand-alone mode, so no special supply and/or control cables are required. Up to five different dimming levels (D1-D5) may be individually and optionally specified for a maximum of five time periods (T1-T5). Set and programmed at the factory by agreement. Reprogramming on site is also possible. Contact WE-EF direct or your local WE-EF sales representative for an individual solution designed to precisely meet your needs.

■ **430-0002** Eco Step Dim® Advanced LED

Eco Step Dim® Basic LED

A factory programmed Electronic Controller is fitted in the luminaire to reduce luminous flux and power to a preset value. Control phases such as those that are, for example, used in networks using luminaires with two conventional lamps is required to activate the switch. One step dimming only is available. As standard, lumen output is reduced to 50 per cent. Intermediate values (e.g., 25 per cent) may also be optionally realised by agreement. Contact WE-EF direct or your local WE-EF sales representative for an individual solution designed to precisely meet your needs.

■ **430-0001** Eco Step Dim® Basic LED

CFT540 LED

105-0084

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we-ef

Photocell PV

Standard 70 lx 'on' / 105 lx 'off', other on request

430-0017 Photocell PV

P2C Prepare to Connect

Entry level conversion of the luminaire into a 'semi-smart' P2C luminaire, for future integration into a light management system. Factory installed IP-X6-protected and standardized interface (Zhaga Book18). For future integration into a light management system, the necessary 'smart' LED driver with built-in power supply for the controller / sensor (3rd party supplier) needs to be installed and connected. P2C allows for the future inclusion into a light management system without having to make engineering adjustments to the luminaire housing, which can lead to damage and water ingress. On request.

430-0023 P2C Prepare to Connect

R2C Ready to Connect

Complete conversion of the luminaire into a 'smart' R2C luminaire, for future integration into a light management system. Factory installed IP x6 protected and standardized interface (Zhaga Book18) with DALI LED driver including additional built-in power supply (24V DC) for end controller / sensor (3rd party supplier). Pre-wired and provided with a robust protective cap, the controller / sensor can simply be connected to the standardized interface via a bayonet lock. No additional work on the luminaire required.

430-0019 R2C Ready to Connect

Type X2 – IGUZZINI

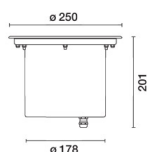
Name – E157

Location - Recessed floor upright adjacent to building 2

Luminous Efficacy

X2 type – 111lm/cw

Last information update: July 2019

**Recessed floor-standing Earth D=250 mm - Neutral White - Flood optic - DALI****Product code**

E157

Technical description

Recessed luminaire applicable to the floor or ground, designed for fitting monochrome white LED sources, for illumination, fixed optic, with DALI dimmable incorporated electronic control gear. The round frame has a diameter D=250 mm; the body and frame are made of AISI 304 stainless steel with sodium-calcium extra clear glass, thickness 15 mm. Stainless steel body coated with black paint. The luminaire is fixed to the outer casing by means of two TORX-type screws that ensure proper anchoring. Inclusive of LED circuit, OPTI BEAM aluminium reflector and black plastic cover. The product is wired using an A2 stainless steel cable gland, with type A07RNF 4x1 mm² outgoing power cord having L=1200 mm. The cable is equipped with an anti-transpiration device (IP68) consisting of a silicone seal placed on the power cable and housed inside the product. The outer casing for installation can be ordered separately from the plastic optical assembly. The assembly made up of the frame, optical assembly and outer casing guarantees 5000 kg resistance to static loads. Maximum glass surface temperature is lower than 40°C.

Installation

The product is secured to the outer casing by means of two TORX-type screws. The luminaire can be installed recessed, floor-standing, using an outer casing or on the ground without outer casing.

Dimension (mm)

Ø250x201

Colour

Steel (13)

Weight (Kg)

4.98

Mounting

Floor recessed/ground recessed

Wiring

Product inclusive of 220-240 VAC DALI dimmable electronic control gear.

Notes

IP68 degree of protection on the product and cable when using IP68 connectors * The product is not suitable for installation in swimming pools and fountains. Overvoltage protection: 4KV Common mode, 3,5KV differenzial mode

Complies with EN60598-1 and pertinent regulations



IK10



IP68

Immersione completa per periodi limitati, non idoneo in piscine e fontane.



The lighting fixtures were designed and tested to withstand a static load of up to 50000 N and to resist drive-over stress. The fixtures may not be installed in areas where snowplows are used, or where the drive-over speed exceeds 50 km/h.

Product configuration: E157**Product characteristics**

Total lighting output [Lm]: 2374
Total power [W]: 21.4
Luminous efficacy [Lm/W]: 110.9
Life Time: 100,000h - L80 - B10 (Ta 25°C)
Ambient temperature range: from -20°C to +35°C. (*)

Total luminous flux at or above an angle of 90° [Lm]: 2374
Emergency luminous flux [Lm]: /
Voltage [V]: -
Life Time: 100,000h - L80 - B10 (Ta 40°C)
Number of optical assemblies: 1

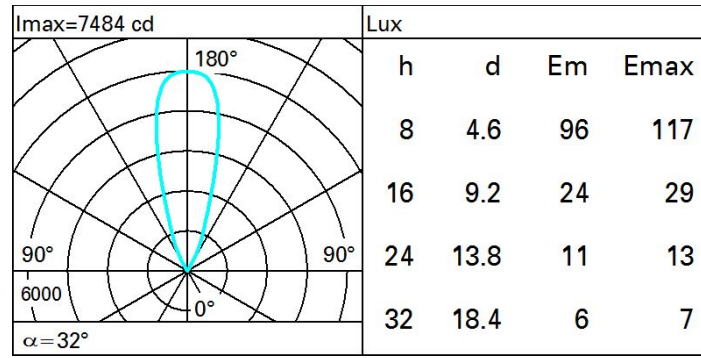
Optical assembly Characteristics Type 1

Light Output Ratio (L.O.R.) [%]: 78
Lamp code: LED
ZVEI Code: LED
Nominal power [W]: 18
Nominal luminous [Lm]: 3050
Lamp maximum intensity [cd]: /
Beam angle [°]: 32°

Number of lamps for optical assembly: 1
Socket: /
Ballast losses [W]: 3.4
Colour temperature [K]: 4000
CRI: 80
Wavelength [Nm]: /
MacAdam Step: 2

* Preliminary data

Polar



Type X2 – WE-EF

Name – ETC130-GB LED 185-2447

Location - Recessed floor uplight installed along Brancaster road.

Luminous Efficacy

X2 type – 91lm/cw

ETC130-GB LED

185-2447

we-ef

1/6



Description

IP67, Class I. IK10+. Stainless steel construction including PCS hardware. Silicone rubber gasket. Safety glass lens; max. load 5 tonnes. Luminaire can be driven over at low speed. Factory-sealed termination chamber complete with cable gland and 1.5 m of flexible PVC free cable. Cable gland with spiral cable bending protection. Integral EC electronic converter in thermally separated compartment. 'No tool' removable gear/lens tray. CAD-optimised optics for superior illumination and glare control. OLC® One LED Concept. Factory installed LED circuit board. Gimbal mounted, 360° rotatable and 30° tiltable. The optional installation blackout is recommended for mounting. To be ordered separately. Optional with Anti-Slip ceramic Coating ASC to DIN 51130 (Trip Classification 10) available on request.

Beam Type	symmetric, medium beam [M]
------------------	----------------------------

Light Source	LED-12/18W / 500 mA - 4000 K
---------------------	------------------------------

CRI	80
------------	----

Gear Type	EC
------------------	----

Nominal Luminous Flux (lm)

LED Lumens	184.8 lm
------------	----------

LEDs	12
------	----

Total Lumens	2217 lm
--------------	---------

Tj	85 °C
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Rated Luminous Flux (lm)

LED Lumens	160.3 lm
------------	----------

Total Lumens	1923.7 lm
--------------	-----------

Ta	25 °C
----	-------

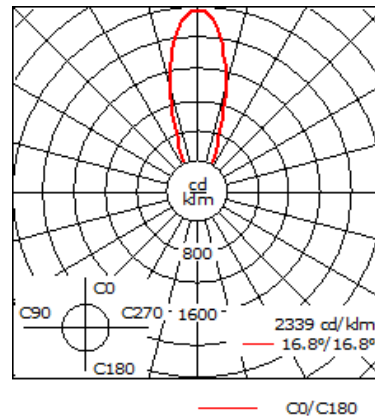
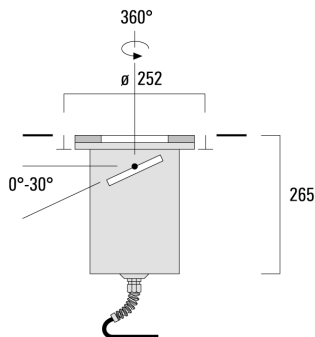
Rated Input Power	21 W
--------------------------	------

ETC130-GB LED

185-2447

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we-ef



Material Specification

Body:	Stainless steel construcion
Weight (kg):	6.20
Lens:	Safety glass lens; max. load 5 tonnes
Colours:	 Stainless Steel
Gasket:	Silicone rubber gasket
Fasteners:	PCS polymer coated stainless steel
Ingress protection:	IP67
Impact protection:	IK10+
Corrosion protection:	5CE
Surge protection:	1/2 kV (optional SP10)
Mounting:	The optional installation blockout is recommended for mounting

Electrical Specification

Power supply:	220-240V / 50-60 Hz
Power factor:	> 0.9
Driver / Ballast:	Integral EC electronic converter
Cable:	1.5 m of flexible PVC free cable

ETC130-GB LED

185-2447



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Lifetime

LED >60,000 h Ta 25°(L70/B10) Control gear >50,000 h Ta 25°

Additional Information

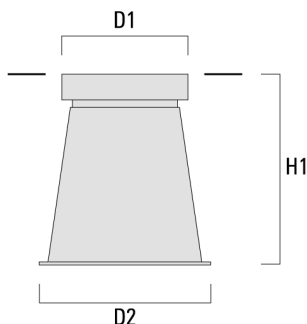
- Gimbal mounted, 360° rotatable and 30° tilt

Mounting Accessories

Installation blackout

Inground uplights are subjected to abuse and effects of the elements much more than any other luminaire. While relatively simple solutions such as aluminium housings or multiple cable entries may offer short term cost savings, they dramatically increase the risks of inground corrosion, water ingress and early failure. WE-EF's design features a stainless steel housing, factory sealed cable entry chamber, and easy installation. In order to further facilitate the installation, the following accessories are available: BET installation blackout made from rugged MDPE (Polyethylene), glass fibre reinforced PA (Polyamid), Stainless Steel (V2A) or Aluminium. To be installed during earth or masonry works, prior to eventual electrical connection of uplights. Refer to table for maximum permissible wattage. The usage of an installation blackout will influence the glass surface temperatures. Contact your local WE-EF representative for further information.

	D1	D2	H1	Weight (kg)
■ 185-0322 Blockout, Plastic	250	270	375	1.50



Installation cover

Installation cover. Temporarily encloses and protects blackout.

ETC130-GB LED

185-2447

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we-ef

C1

■ **185-0325** Installation cover BE

250



C1

Optical Accessories

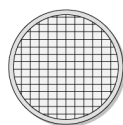
Flood lens

Broadens light distribution in all planes. Does not fit in combination with [B] lens.

C1

■ **185-2866** IO-360-ETC130-GB-LED

98



C1

Honeycomb louvre

Honeycomb louvre, matt black Teflon® coated. For luminaires equipped with [M] [EE] [EES] light distribution.

ETC130-GB LED

185-2447

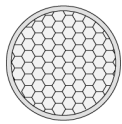
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we-ef

C1

■ **185-2870** IW-ETC130/330-GB-LED

98



C1

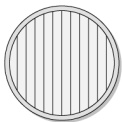
Linear spread lens

Broadens light distribution in one plane only. Does not fit in combination with [B] lens.

C1

■ **185-2632** IO-180 ETC130/330-GB LED

98



C1

Electrical Accessories

Sealable junction box

SJB sealable junction box, for inground mains connection. Terminal block 3 x 1.5 mm².

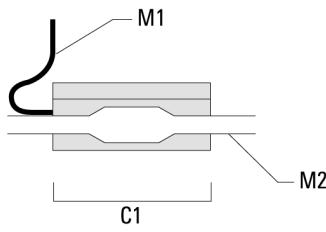
ETC130-GB LED

185-2447



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	C1	M1	M2
■ 185-1624 Sealable junction box SJB130	146	Ø 10	Ø 12 - 19



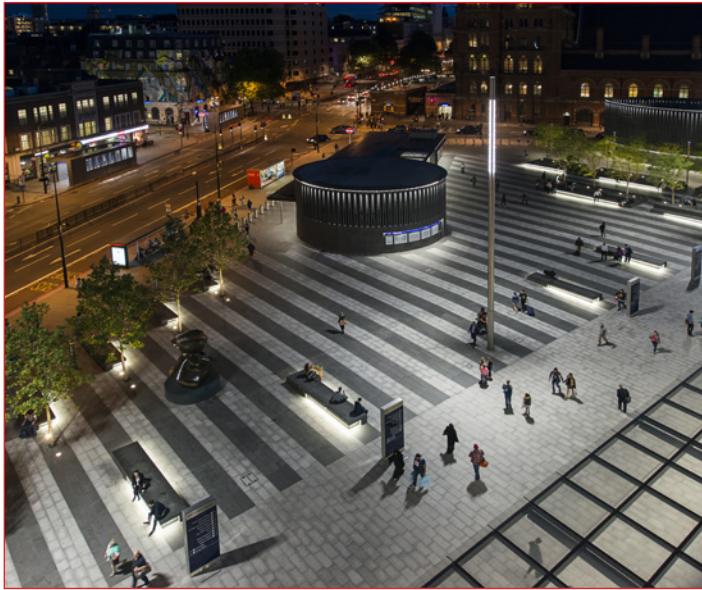
Type X14-7 - KEMPS

Name – Fortis

Location - Surface mounted under bench Located on the pathway on the west elevation of building 4

Luminous Efficacy

X14 type –81lm/cw



Overview

Fortis is a sleek and robust IP67 linear LED fixture with a homogenous appearance which delivers approximately 1369 lumens per mtr. Available in a range of dimmable colour temperatures including Dynamic White, with a stunning RGBW, RGBA option also for total colour control. Fortis is made from extremely durable anodised Aluminium which makes this luminaire suitable for the harshest of environments and is available in lengths of up to 1941mm.

Applications

• Facades • Under bench • Planters • Exterior

Features

- IP67
- Available in 2200K - 2400K - 2700K - 3000K - 3500K - 4000K - 5000K - 5700K - Dynamic White - RGBW - RGBA
- 3 step MacAdam
- CRI >80
- 72 Lumens per Watt (4000K)
- 160° Beam Angle
- LM80 lifetime
- 24V Constant Voltage
- Dimmable
- Robust Aluminium body for superior strength
- Adjustable or fixed brackets - various options
- 1941mm Maximum length

Benefits

- Various lengths available up to 1941mm
- Suitable for exterior use in the harshest of environments
- Homogenous appearance (White)
- Various colour temperatures available
- Create stunning colour changing effects by DMX or DALI
- Excellent colour rendering
- Highest quality OSRAM LED technology for all Whites (ex 2200K, 2400K Luxeon)
- Highest quality Rohm & Luxeon 3535 LED technology for RGBW
- Excellent lumen maintenance over time
- Excellent Thermal Management
- Various fixing positions
- Remote or local drivers - IP67 available
- ROHS compliant

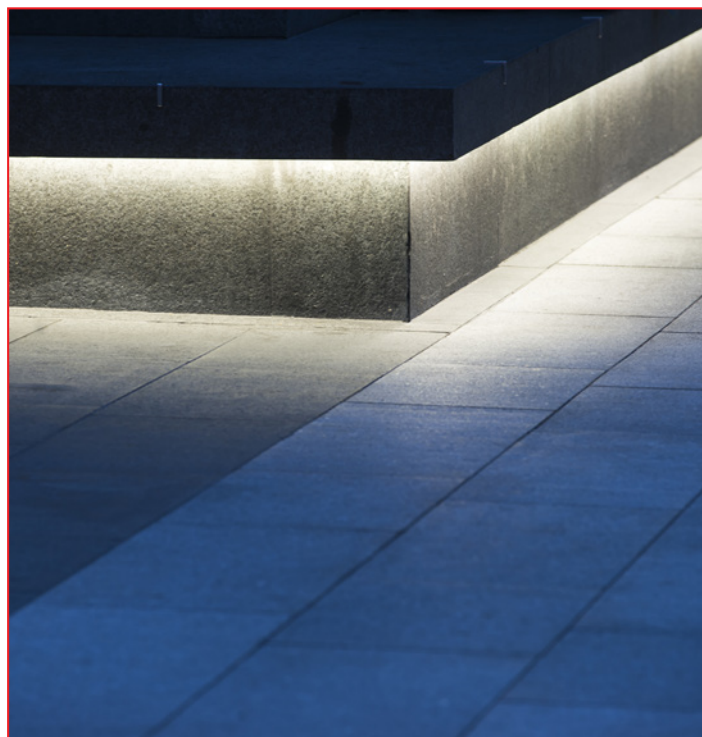
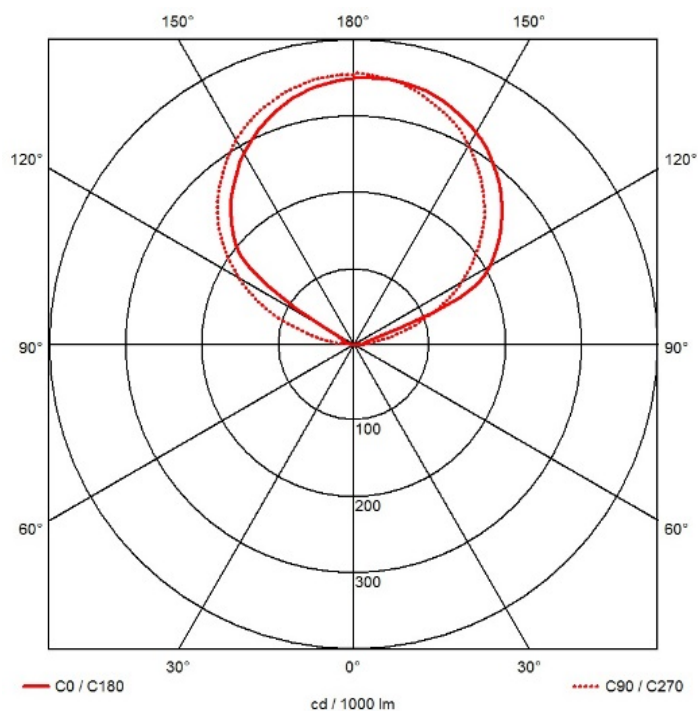
FORTIS

Technical information

FORTIS

Product Specification	FORTIS
Lumen Output (based on 4000k)	1369 - 876 - 480
Watts (per mtr)	17W - 11W - 7W - (RGBW & RGBA 19W)
Efficacy (Based on 4000K @17W)	72lm/W
Colours	2200K - 2400K - 2700K - 3000K - 3500K - 4000K - 5000K - 5700K - Dynamic White - RGBW - RGBA
CRI	80>
LED Chip	OSRAM Duris S2 (exc 2200K - 2400K) - Rohm RGB & Luxeon 3535 (RGBW only)
Binning	3 Step MacAdam
Dimming	0-10V - DALI - DMX - SWITCHED
Input Voltage	230V AC
Output Voltage	24V
Beam Angles	160°
Lifetime @ LM80	50,000hrs @ 25°C
Operating Temp	- 25°C to 55°C
IP Rating	IP67
Cover/Lens	Opal Polycarbonate
Finish	Silver Anodised Aluminium
Mounting	Fixed or Adjustable Brackets
Exterior Connection	IP68
Lengths	Max 1941mm

Photometrics



Specifications are subject to change without prior notice. Please refer to our website for the most up to date version.

FORTIS

Product Selector:

KL-FORTIS-24-17-D-F1

Colour

2200K	22
2400K	24
2700K	27
3000K	30
3500K	35
4000K	40
5000K	50
5700K	57
*Dynamic White	DW
*RGBW	RGBW
RGBA	RGBA

Watts

17W	17
11W	11
7W	7
19W (RGBW & RGBA)	19

Dimming

0-10V	0
DALI	D
DMX	X
Switched	S

Brackets

Fixed Flat 60mm	F1
Fixed 25mm	F2
Fixed Flat 45mm	F3
Adjustable 44mm	A1
Adjustable 57mm	A2
Adjustable 77mm	A3

*RGBW = 3000K used as a default

*Dynamic White = 2700K & 5700K

Please contact our sales team on **+44(0)113 263 9039** for further assistance.



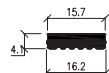
FORTIS



Specification Drawing

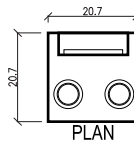
FORTIS

DIFFUSER

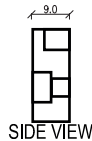


SECTION

FLAT END CAP

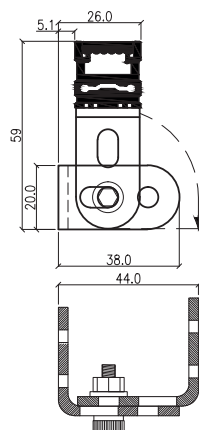


PLAN

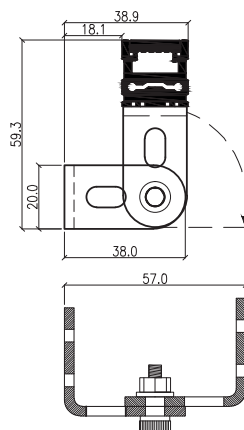


SIDE VIEW

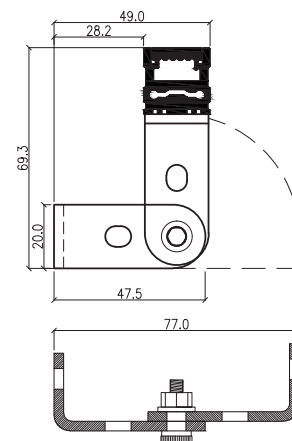
MOUNTING HINGE



A1 - 44mm

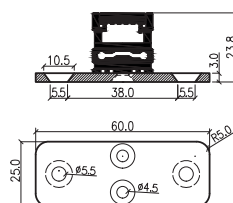


A2 - 57mm

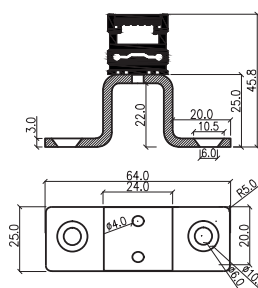


A3 - 77mm

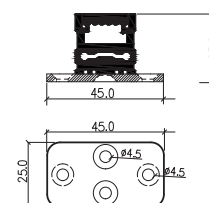
FLAT MOUNTING PLATE



F1 - FLAT - 65mm



F2 - 25mm



F3 - FLAT - 45mm

FULL SET WITH IP67 END CAP



FORTIS



Available Lengths mm

FORTIS

Single Colour & Dynamic White		RGBW/A	
Feed in	Feed in /out	Feed in	Feed in /out
78	88	195	205
128	138	362	372
178	188	529	539
228	238	697	707
278	288	864	874
328	338	1031	1041
378	388	1199	1209
428	438	1366	1376
478	488	1533	1543
528	538	1701	1711
579	589	1868	1878
629	639		
679	689		
729	739		
779	789		
829	839		
879	889		
929	939		
979	989		
1029	1039		
1080	1090		
1130	1140		
1180	1190		
1230	1240		
1280	1290		
1330	1340		
1380	1390		
1430	1440		
1480	1490		
1530	1540		
1581	1591		
1631	1641		
1681	1691		
1731	1741		
1781	1791		
1831	1841		
1881	1891		
1931	1941		

Type X16 - SELUX

Name – Forta

Location - Stairwell Lighting located on each landing within the retail areas of 3a and 3b.(Feature lighting)

Luminous Efficacy

X16 type – 30m/w



Index

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SYMBOLS & DISCLAIMER	5

Forta

The liniLED® Forta (IP68) is developed to create diffuse light lines. These casted light lines made from stainless steel (AISI 316L) are walk over and drive over, making them ideal for public applications. Available in two different versions (liniLED® Forta and liniLED® Forta S) in several colours: Ultra Warm White 2400K, Extra Warm White 2700K, Warm White 3000K, Natural White 4000K, Cold White 6500K, Red, Green, Blue and Amber.

In order to power liniLED® products safely, it is absolutely necessary to operate them with an electronically stabilized power supply protected against short circuits, overload and overheating.

To ease the luminaire/ installation approval, electronic control gear for liniLED® products should carry the CE mark. Preferably a controller from the liniLED® Control Range. In Europe, the declarations of conformity must include the following standards: CE: EN 55015, IEC 61547 and IEC 61000-3-2. For the latest version of this datasheet, visit our website: www.liniLED.com

UPS's

Made in Europe
Effective heat dissipation
IP68
Drive over
Dimmable
UV, cleaning agent, frost & seawater
Easy installation
Possible to install after paving
Available in various colours
Available in standard lengths
(415 mm, 1015 mm, 2015 mm)

Available colours

Colour	Description
	Ultra Warm White 2400K liniLED® PCB UWW 2400K Deco
	Extra Warm White 2700K liniLED® PCB EWW 2700K Deco
	Warm White 3000K liniLED® PCB WW 3000K Deco
	Natural White 4000K liniLED® PCB NW 4000K Deco
	Cold White 6500K liniLED® PCB CW 6500K Deco
	Red liniLED® PCB Red Power
	Green liniLED® PCB Green Power
	Blue liniLED® PCB Blue Power
	Amber liniLED® PCB Amber Power



Product codes & characteristics

Product characteristics

Operation voltage	24 V DC
Max. operation voltage	25 V DC
Beam angle	Diffuse
Binning	PWM dimming, 24 V DC Common Anode
Dimmable	± 50K
Weight	0.4 gram/ section
Expected lifetime	B50/L70 > 50.000 hours @ Tc = 40 °C
Degree of protection (IP)	IP68/IK10
Storage temperature	-30 °C .. 55 °C
Operation temperature	-30 °C .. 55 °C ¹

¹ Max. connection length between -20 °C and -30 °C is 7 metres.

	UWW 2400K	EWB 2700K	WW 3000K	NW 4000K	CW 6500K	Red	Green	Blue	Amber
Product code (415 mm)	24000	24001	24002	24003	24004	24005	24006	24007	24008
Product code (1015 mm)	24020	24021	24022	24023	24024	24025	24026	24027	24028
Product code (2015 mm)	24040	24041	24042	24043	24044	24045	24046	24047	24048

415 mm

Power (24 V DC)	0.44 W	0.44 W	0.44 W	0.44 W	0.44 W	1.7 W	1 W	0.7 W	1.7 W
Power (25 V DC)	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	1.8 W	1 W	0.7 W	1.8 W
Luminous flux steady	11.2 lm	12.4 lm	13.2 lm	13.2 lm	13.2 lm	6.4 lm	12.4 lm	2.8 lm	5.6 lm
Luminous efficiency	25.5 lm/W	28.2 lm/W	30 lm/W	30 lm/W	30 lm/W	3.8 lm/W	12.4 lm/W	4 lm/W	3.3 lm/W

1015 mm

Power (24 V DC)	1.1 W	1.1 W	1.1 W	1.1 W	1.1 W	4.4 W	2.5 W	1.7 W	4.4 W
Power (25 V DC)	1.2 W	1.2 W	1.2 W	1.2 W	1.2 W	4.6 W	2.6 W	1.8 W	4.6 W
Luminous flux steady	28 lm	31 lm	33 lm	33 lm	33 lm	16 lm	31 lm	7 lm	14 lm
Luminous efficiency	25.5 lm/W	28.2 lm/W	30 lm/W	30 lm/W	30 lm/W	3.6 lm/W	12.4 lm/W	4 lm/W	3.3 lm/W

2015 mm

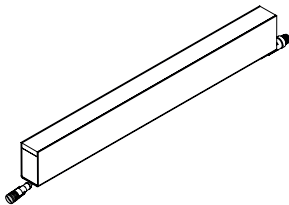
Power (24 V DC)	2.2 W	2.2 W	2.2 W	2.2 W	2.2 W	8.8 W	5 W	3.4 W	8.8 W
Power (25 V DC)	2.4 W	2.4 W	2.4 W	2.4 W	2.4 W	9.2 W	5.2 W	3.6 W	9.2 W
Luminous flux steady	56 lm	62 lm	66 lm	66 lm	66 lm	32 lm	62 lm	14 lm	28 lm
Luminous efficiency	25.5 lm/W	28.2 lm/W	30 lm/W	30 lm/W	30 lm/W	3.6 lm/W	12.4 lm/W	4 lm/W	3.3 lm/W

Accessories

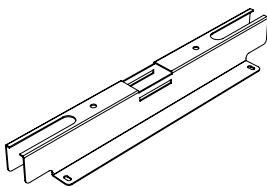
Parts included with the liniLED® Forta

The liniLED® Forta consists of 2 parts: A Luminaire and a Mounting Profile. An end cap is fixed on the female connector of the Luminaire.

In the images below the 415 mm variant is shown.



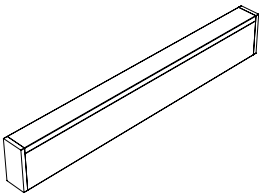
Luminaire | Material: AISI 316L & PU



Mounting Profile | Material: AISI 316L

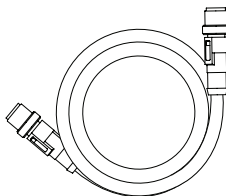
liniLED® Forta Accessories **Not** included

We recommend using these products during installation, but you have to order them separately. The Dummy is used after installing the Mounting Profile, this creates a protective base until the luminaire is placed. It is offered free of charge and is our service to you. Depending on the project, none (or a smaller number) of Dummy's are necessary. The Coupler is used to perfectly align the Mounting Profiles, the PU Connector Set is used for connecting the first luminaires and the PU Extension Cable is used for looping. The Leveller is used to indicate the final floor height. The Removal Tool can be used to remove the Dummy.



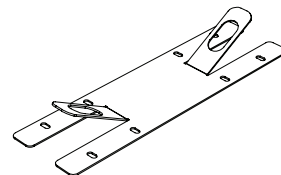
Dummy | Material: Aluminium

Product code: 24210 Forta Dummy 415 mm
Product code: 24211 Forta Dummy 1015 mm
Product code: 24212 Forta Dummy 2015 mm



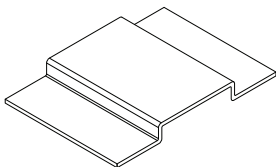
PU Connector Set | Material: PUR

Product code: 14530 PU Connector Set 5 m
Product code: 14507 PU Connector Set 10 m



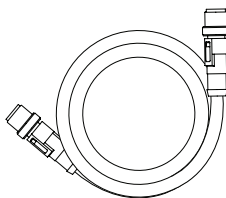
Coupler | Material: AISI 316L

Product code: 24200



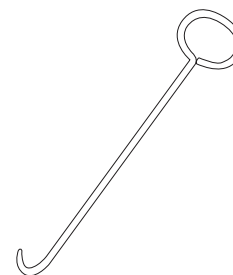
Leveller | Material: Aluminium

Product code: 24202



PU Extension Cable | Material: PUR

Product code: 14508 PU Extension Cable 5 m
Product code: 14509 PU Extension Cable 10 m



Removal Tool | Material: Steel

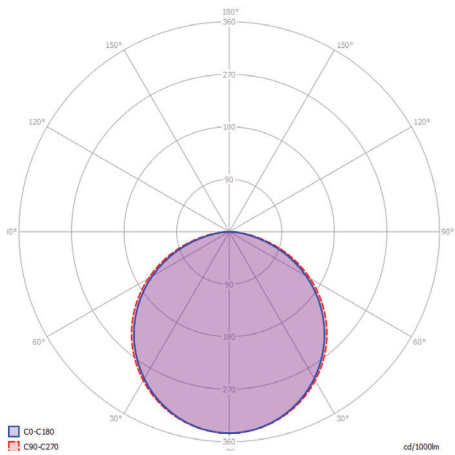
Product code: 24201

Photometric information

In the process of lighting design and calculations, the luminous flux and beam angle alone are not enough information to create a representative and realistic calculation or render. There is one set of photometric files for a one metre length of LED strip and one for a segment length, that corresponds to the cutting length of each LED strip type. Using the one metre data, quick calculations and long lengths can be simulated with photometric software. The segment data allows very detailed simulations, even curved lines can be approached in high detail.

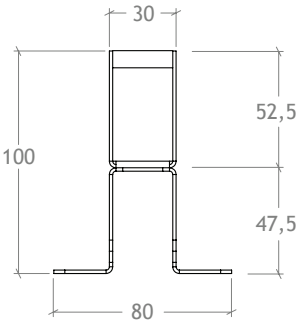
- The information on the website is available in two different file formats:
- Eulumdat (*.ldt)
 - IES LM-63-1995 (*.ies)

There is one set of photometric files for a one metre length of LED strip and one for a segment length, that corresponds to the cutting length of each LED strip type. Using the one metre data, quick calculations and long lengths can be simulated with photometric software. The segment data allows very detailed simulations, even curved lines can be approached in high detail.



Forta 3000K
This light diagram indicates the beam in the C0-C180 plane (perpendicular to the length direction of the LED strip) and in the plane perpendicular to that, the C90-C270 plane (along the length direction of the LED strip).

Product drawing



Number of connected (daisy chained) Forta Luminaires in one line*

		415	1015	2015
5 m PU connection cable	24 V DC	11	5	3
	25 V DC	17	9	5
10 m PU connection cable	24 V DC	8	4	2
	25 V DC	14	7	4

*Do not exceed the maximum amount of connected Forta Luminaires to ensure proper functionality.

Symbols

-  Manufacturer's declaration that the product meets the applicable EC directives.
-  Restriction of Hazardous Substances (RoHS): product complies with the RoHS directive and each homogeneous material does not exceed the limits for the materials mentioned under the RoHS directive (Pb, Hg, Cd, Cr6+, PBB and PBDE).
-  Dust-tight, no ingress of dust. Protected against the effects of continuous immersion in water (Immersion in water at a maximum depth of 20 metres).
-  Protected against impact energy of 20 joules.
-  Electrical appliance class III: this product is designed to be supplied from an extra-low voltage (≤ 60.0 V DC or ≤ 42.4 V AC).
-  Operating voltage of 24 V DC.
-  This product has been thoroughly tested for drive over applications.
-  Very high quality low carbon stainless steel type 316.
-  Product is resistant against ultraviolet (UV) light or sunlight. Non-UV resistant products can degrade or discolor fast when exposed to UV light.
-  Product can be cleaned with normal cleaning agents as specified in the datasheet under 'chemical compliances'.
-  This product can be stored and used below 0 degrees Celsius. Verify the minimum storage and operation temperature in the datasheet for the lowest temperature allowed.
-  This product can be applied in seawater and its environment. Elements in seawater will have no harmful effect on the product. For chemical specifications see datasheet. Verify the IP rating for proper use.
-  System guarantee of 5 years when the complete system consist of liniLED® Products with the 5 year system warranty logo.

Disclaimer

The published information is checked to be as accurate as possible, however Triolight BV or any reseller of liniLED® cannot be held liable for any damages resulting from errors or outdated information. Triolight BV reserves the right to modify the information without informing the costumers. When this document is printed or downloaded, please check for the latest version on the internet, the most up to date information will be published on www.liniLED.com. This product should not be used in applications, devices or systems where incorrect operation of the product may result in personal injury (includes emergency lighting) without written permission from the board of Triolight BV. If nevertheless used in such applications, devices or systems Triolight BV cannot be held liable for any resulting injury.

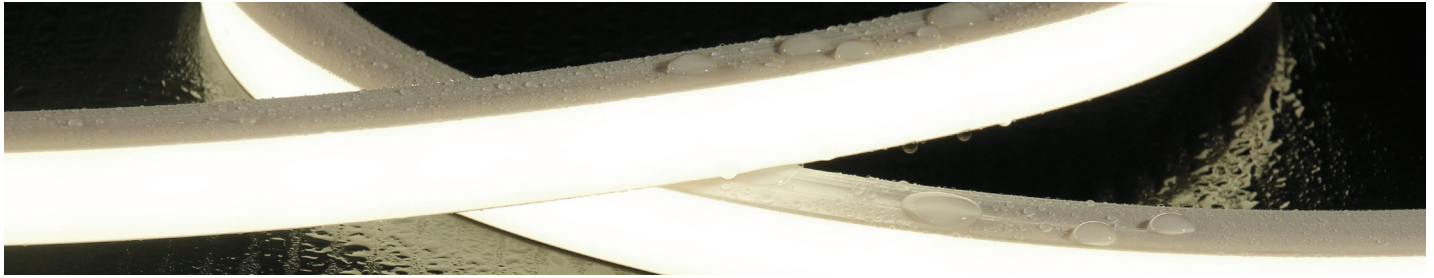
Type X18 SELUX

Name – Top diffuse

Location - Perimeter lighting around building 3a and 3b.(Feature lighting)

Luminous Efficacy

X18 type – 24m/w



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UPS's

Made in Europe
 Unique diffuse co-extrusion technology (hollow chamber)
 IP68 + >50 m/ IP69 K
 Flexible: bend radius > 150 mm
 Dimmable
 Effective heat dissipation
 Excellent lumen/ Watt efficacy
 Binning $\pm 50k$
 UV, frost, seawater & chlorine vapour resistant
 Available in various white colours
 An extensive range of accessories
 Plug & Play

Top Diffuse 18

The liniLED® Top Diffuse 18 LED strip (IP68) is a high quality, flexible LED strips with a unique, diffuse co-extrusion technology. The combination of high quality and exceptional flexibility, allows for an endless range of indoor and outdoor applications. The liniLED® Top Diffuse 18 LED strip comes with a pre-assembled mirror welded connector for instant waterproof IP68+/IP69K usage.

In order to power liniLED® products safely, it is absolutely necessary to operate them with an electronically stabilized power supply protected against short circuits, overload and overheating.

To ease the luminaire/ installation approval, electronic control gear for liniLED® products should carry the CE mark. Preferably a controller from the liniLED® Control Range. In Europe, the declarations of conformity must include the following standards: CE: EN 55015, IEC 61547 and IEC 61000-3-2. For the latest version of this datasheet, visit our website: www.liniLED.com

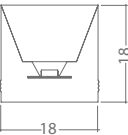
Available colours

Colour	Description
Ultra Warm White 2400K	liniLED® Top Diffuse 18 White UWW 2400K
Extra Warm White 2700K	liniLED® Top Diffuse 18 White EWW 2700K
Warm White 3000K	liniLED® Top Diffuse 18 White WW 3000K
Natural White 4000K	liniLED® Top Diffuse 18 White NW 4000K
Cold White 6500K	liniLED® Top Diffuse 18 White CW 6500K



Product codes & characteristics

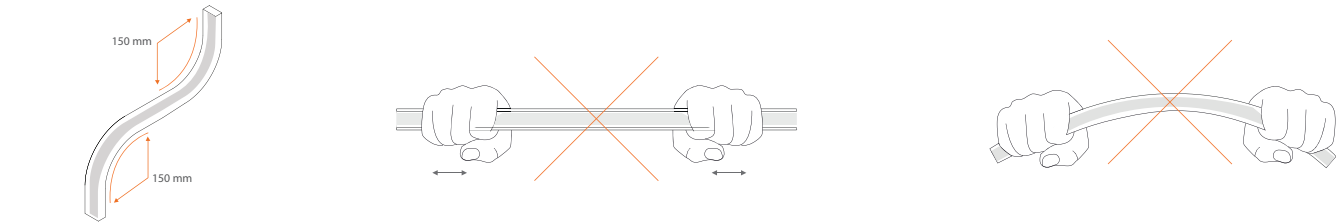
	Ultra Warm White 2400K	Extra Warm White 2700K	Warm White 3000K	Natural White 4000K	Cold White 6500K
Product code [m]	11799	11800	11801	11802	11803
Power (24 V DC)	8.9 W/m	8.9 W/m	8.3 W/m	8.6 W/m	8.6 W/m
Power (25 V DC)	9.3 W/m	9.3 W/m	8.6 W/m	9.0 W/m	9.0 W/m
Typical CCT ²	2309K	2610K	2873K	3787K	6370K
CRI	> 88	> 90	> 89	> 91	> 92
Luminous flux	220 lm/m	220 lm/m	196 lm/m	213 lm/m	226 lm/m
Luminous efficiency	25 lm/W	25 lm/W	24 lm/W	25 lm/W	26 lm/W
Spool length	max. 10 m				
Section length	5 cm				
LED	Duris tm E 3				
Number of LEDs	6 per section / 120 per metre				
Max. connection length	10 m				
Operation voltage	24 V DC				
Max. operation voltage	25 V DC				
Beam angle	110°				
Dimensions	18 x 18 mm				
Dimmable	PWM dimming, 24 V DC Common Anode				
Binning	± 50K				
Mac adam	2 steps				
Weight	340 gram per metre				
Expected lifetime	B50/L70 > 50,000 hours @ T _c = 40 °C				
Degree of protection (IP)	IP68+ > 50 m/ IP69 K ³				
Storage temperature	-30 °C .. 55 °C				
Operation temperature	-30 °C .. 55 °C ¹				
Minimal bending radius	150 mm				



¹ Max. connection length between -20 °C and -30 °C is 7 metres.
² Productname CCT refers to internal PCB for typical CCT output refer to Datasheet table.
³ In combination with the liniLED® Mirror Welded Connector.

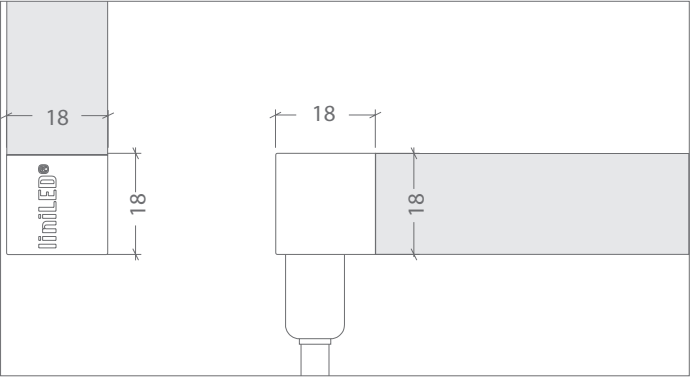
Bending radius

Maximum bending radius is 150 mm. Solely bend up or downward. Do not compress, stretch or bend the LED strip.

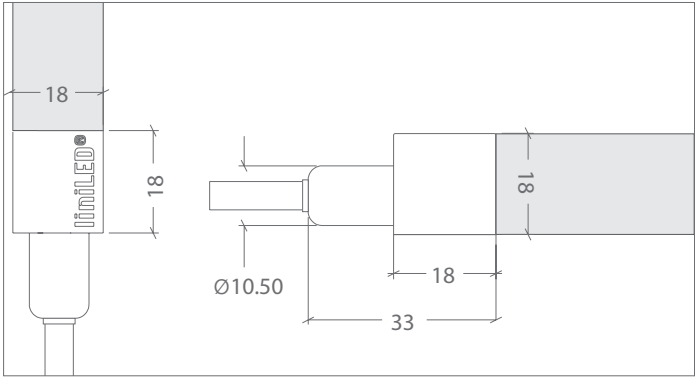


Connectors (The liniLED® Top Diffuse 18 Connectors are pre- assembled).

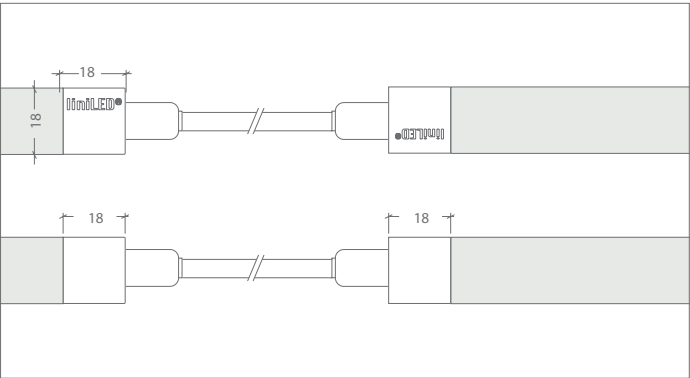
liniLED® Diffuse Connector 90° Angle 18



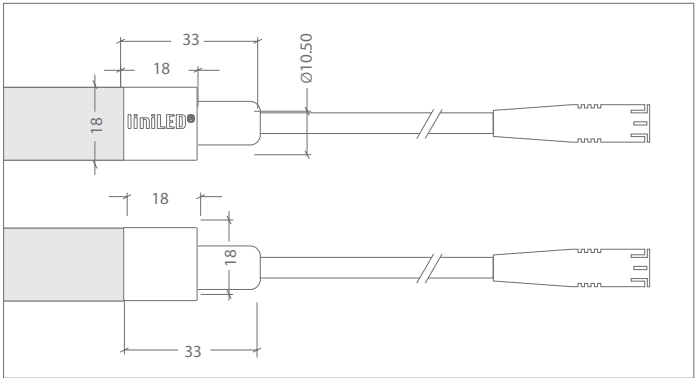
liniLED® Diffuse Connector Straight 18



liniLED® Diffuse Extension Cord 18



liniLED® Diffuse Connector Male/Female 18



For more information about the liniLED® Top Diffuse 18 Connectors see the Datasheet of the liniLED® Top Diffuse 18 Connector.

Power consumption

To power the liniLED® LED strips and lighting fixtures, a power supply from the liniLED® Power assortment can be selected. Selection of the correct power supply must be done by taking the total requested power and the environment into account.

The total power consumption can be calculated by summing the requested power of all connected products. To calculate the power consumption of a single length of LED strip, use the equation below. The typical equation is valid if the product is supplied by a 24 V DC constant voltage power supply. If the output voltage of a power supply is increased, the power consumption will increase with the same ratio and needs to be corrected by using the optional part of the equation found between brackets.

$$P_{STRIP} = P_{PRODUCT} \times X_{LENGTH} \times 110\% \left[\times \frac{U_{SUPPLY}}{24} \right]$$

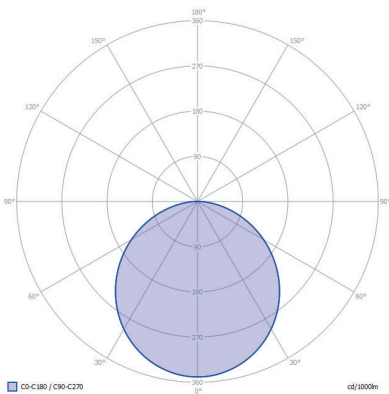
P_{STRIP}	Calculated power consumption of one LED strip in Watt
$P_{PRODUCT}$	Typical power consumption in Watt per metre of the selected LED strip This value can be found under 'Product characteristics' on page 2
X_{LENGTH}	Length of the connected LED strip in metres
110%	Safety margin to buffer differences over all production batches
<i>Optional:</i>	
U_{SUPPLY}	Set supply voltage of the power supply in Volt
24	Nominal supply voltage of liniLED® in Volt

Photometric information

In the process of lighting design and calculations, the luminous flux and beam angle alone are not enough information to create a representative and realistic calculation or render. There is one set of photometric files for a one metre length of LED strip and one for a segment length, that corresponds to the cutting length of each LED strip type. Using the one metre data, quick calculations and long lengths can be simulated with photometric software. The segment data allows very detailed simulations, even curved lines can be approached in high detail.

The information on the website is available in two different file formats:

- Eulumdat (*.ldt)
- IES LM-63-1995 (*.ies)



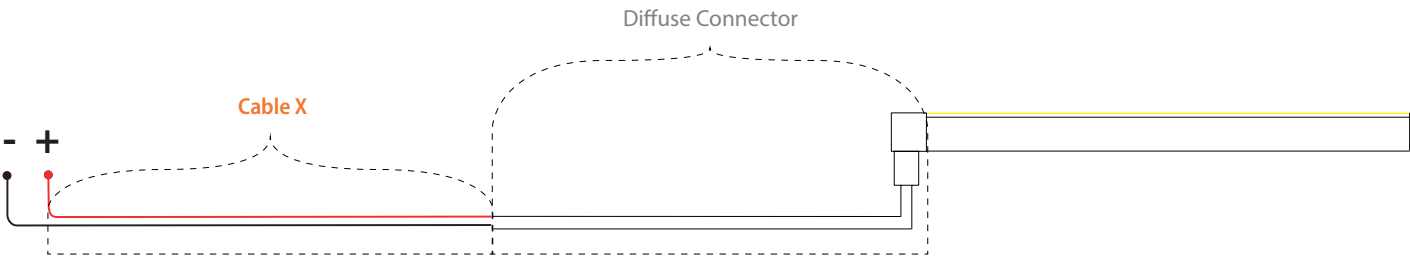
liniLED® Top Diffuse 18 2400 t/m 6500K

Cable selection

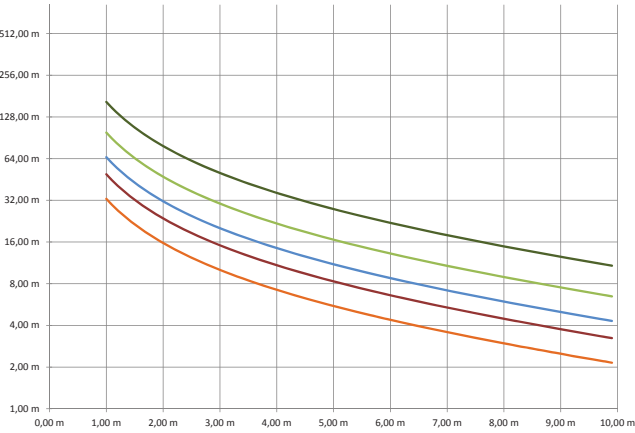
The liniLED® LED strips need a minimum voltage at the beginning of the LED strip to function according to the specifications. The table below gives an indication of the maximum cable length based on the cable thickness and power supply voltage. The connection between the cable and LED strip is with a liniLED® Mirror Welded Connector.

In case the required length is larger than the length mentioned in this table, the supply voltage is different or if a detailed wire plan with branches is planned, please contact your distributor for a detailed cable calculation.

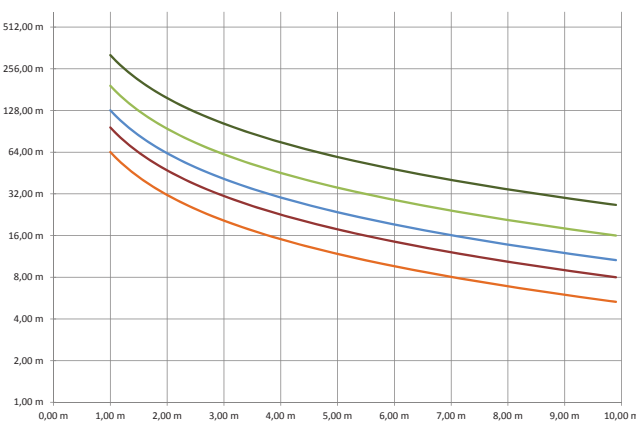
Cable X information	LED strip	Max. cable length 2400, 2700K		Max. cable length 3000K		Max. cable length 4000, 6500K	
		@ 24 V DC	@ 25V DC	@ 24 V DC	@ 25V DC	@ 24 V DC	@ 25V DC
liniLED® cable (2 x 0.50 mm²) 0.035 Ω/m	1 m	33.53 m	65.57 m	36.05 m	70.40 m	34.75 m	67.90 m
	2 m	16.12 m	32.14 m	17.38 m	34.56 m	16.73 m	33.31 m
	5 m	5.68 m	12.08 m	6.18 m	13.05 m	5.92 m	12.55 m
	10 m	2.19 m	5.40 m	2.44 m	5.88 m	2.31 m	5.63 m
Cable (2 x 0.75 mm²) 0.023 Ω/m	1 m	50.45 m	98.64 m	54.23 m	105.91 m	52.27 m	102.15 m
	2 m	24.25 m	48.35 m	26.15 m	51.99 m	25.17 m	50.10 m
	5 m	8.54 m	18.18 m	9.30 m	19.63 m	8.91 m	18.88 m
	10 m	3.30 m	8.12 m	3.68 m	8.85 m	3.48 m	8.47 m
Cable (2 x 1.00 mm²) 0.018 Ω/m	1 m	67.07 m	131.14 m	72.11 m	140.81 m	69.50 m	135.81 m
	2 m	32.25 m	64.29 m	34.77 m	69.12 m	33.46 m	66.62 m
	5 m	11.36 m	24.17 m	12.36 m	26.10 m	11.84 m	25.10 m
	10 m	4.39 m	10.80 m	4.89 m	11.77 m	4.63 m	11.26 m
Cable (2 x 1.50 mm²) 0.012 Ω/m	1 m	100.90 m	197.28 m	108.47 m	211.82 m	104.55 m	204.30 m
	2 m	48.51 m	96.71 m	52.30 m	103.98 m	50.34 m	100.21 m
	5 m	17.08 m	36.36 m	18.60 m	39.27 m	17.82 m	37.76 m
	10 m	6.61 m	16.25 m	7.37 m	17.70 m	6.97 m	16.95 m
Cable (2 x 2.50 mm²) 0.007 Ω/m	1 m	167.92 m	328.33 m	180.53 m	352.53 m	174.01 m	340.01 m
	2 m	80.74 m	160.95 m	87.05 m	173.05 m	83.79 m	166.79 m
	5 m	28.44 m	60.52 m	30.96 m	65.36 m	29.65 m	62.85 m
	10 m	11.00 m	27.04 m	12.26 m	29.46 m	11.61 m	28.21 m



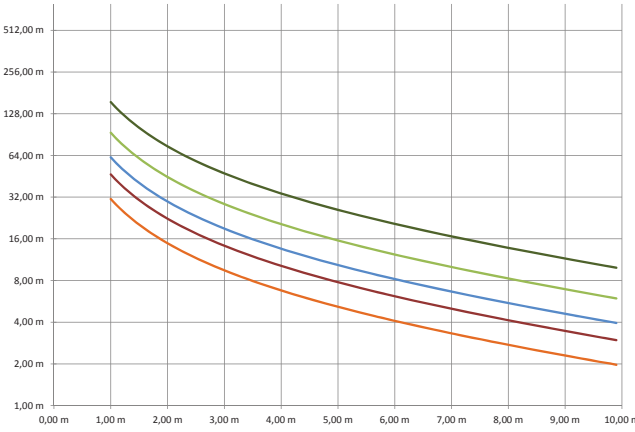
Maximum cable length



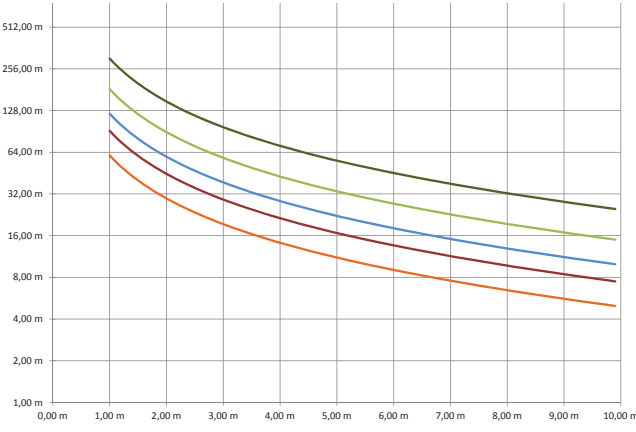
2400K @ 24 V DC



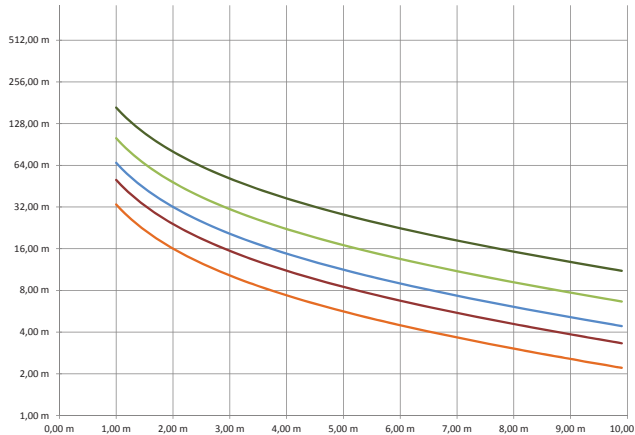
2400K @ 25 V DC



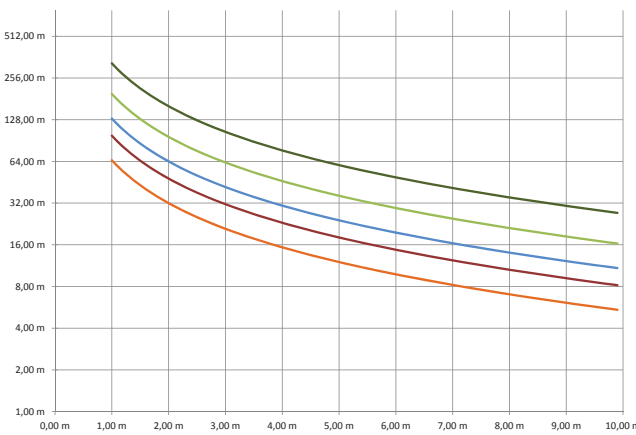
2700K @ 24 V DC



2700K @ 25 V DC

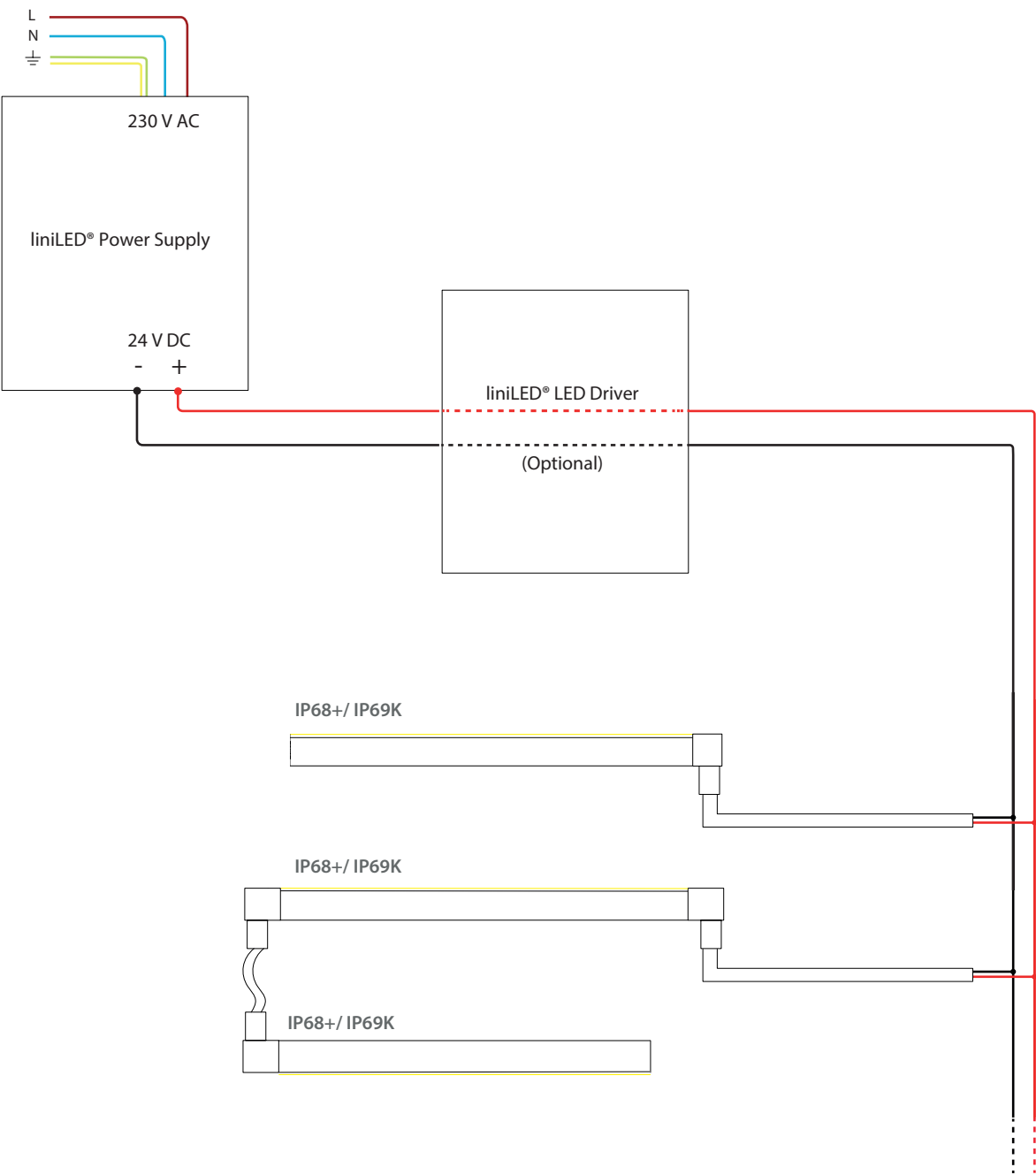


3000K/ 4000K/ 6500K @ 24 V DC



3000K/ 4000K/ 6500K @ 25 V DC

Power & Connection diagram



Disclaimer

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Symbols

- 

Manufacturer's declaration that the product meets the applicable EC directives.
- 

Suitable for mounting on all surfaces and suitable to cover with insulating material.
- 

Passed glow wire test at 850 degrees Celsius. Global European regulations specify 650 degrees Celsius by default.
- 

Restriction of Hazardous Substances (RoHS): product complies with the RoHS directive and each homogeneous material does not exceed the limits for the materials mentioned under the RoHS directive (Pb, Hg, Cd, Cr6+, PBB and PBDE).
- 

Dust-tight, no ingress of dust. Protected against the effects of continuous immersion in water (Immersion in water at a maximum depth of 50 metres) Only in combination with the liniLED® Mirror Welded Connector).
- 

Dust-tight, no ingress of dust. Protected against close-range high pressure, high temperature spray downs.
- 

Protected against impact energy of 5 joules.
- 

Bending of the LED strip is possible with a radius of ≥ 150 millimetres in the specified direction.
- 

Electrical appliance class III: this product is designed to be supplied from an extra-low voltage (≤ 60.0 V DC or ≤ 42.4 V AC).
- 

Product is resistant against ultraviolet (UV) light or sunlight. Non-UV resistant products can degrade or discolor fast when exposed to UV light.
- 

Product can be cleaned with normal cleaning agents as specified in the datasheet under 'chemical compliances'.
- 

This product can be stored and used below 0 degrees Celsius. Verify the minimum storage and operation temperature in the datasheet for the lowest temperature allowed.
- 

This product can be applied in seawater and its environment. Elements in seawater will have no harmful effect on the product. For chemical specifications see datasheet. Verify the IP rating for proper use.
- 

This product can be applied inside swimming pool environments. Elements in the air will have no harmful effect on the product. For chemical specifications of these elements see datasheet. Verify the IP rating for proper use.
- 

This product is available on request and can be applied submerged in swimming pools and their environment. Disinfectants will have no harmful effect on the product. For chemical specifications of these elements see datasheet. Verify the IP rating for proper use.
- 

The binning tolerance of this product is 2 MacAdam.
- 

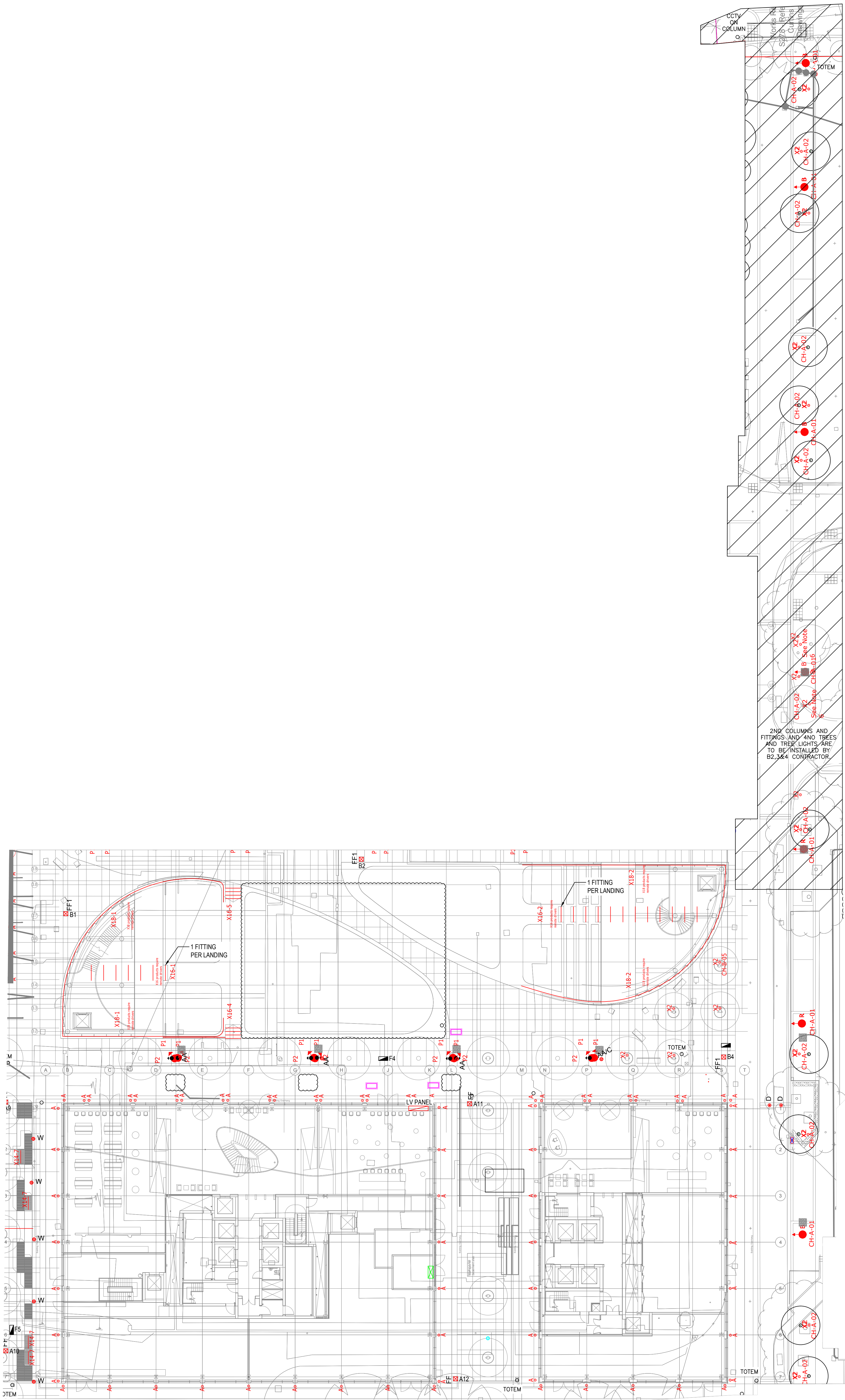
The CRI value of this product is 80 or higher.
- 

System guarantee of 5 years when the complete system consist of liniLED® Products with the 5 year system warranty logo.

Section 5

External Lighting Drawing

The particulars on the drawing we have produced has been based on the design by Hoare Lea as per the masterplan.



LIGHTING TYPES, NUMBER AND POSITIONS REFLECT
THOSE PROVIDED BY HOARE LEA DRAWING
1602419-HL-XX-L5-DR-Y-630-0009-P3 DATED 04/09/2017



SAFETY, HEALTH & ENVIRONMENTAL INFORMATION

For details of site wide and general risks to be read in conjunction with these notes, refer to the following documents:

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:
Construction and Manufacture

Maintenance, Cleaning and operation

Decommissioning and Demolition

It is assumed that all works associated with this drawing will be carried out by competent operatives working, where appropriate, to an approved method statement.

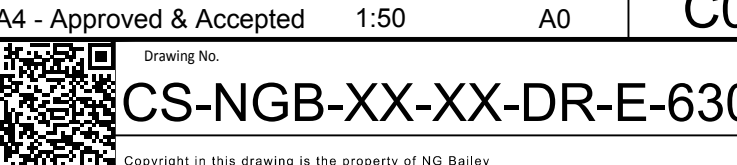
NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ANY RELEVANT CIVIL LANDSCAPE ARCHITECT, LIGHTING DESIGNER, STATUTORY UTILITIES AND OTHER SPECIALIST DRAWINGS, SPECIFICATIONS & DETAILS.
2. DO NOT SCALE FROM THIS DRAWING. DRAWING SHOULD BE PRINTED IN COLOR.
3. THIS DRAWING IS BASED ON RECORD DRAWING INFORMATION OBTAINED FROM THE VARIOUS STATUTORY AUTHORITIES.
4. THE ACCURACY AND POSITION OF EXISTING UTILITY SERVICES SHALL BE CONFIRMED WITH THE UTILITY COMPANY PRIOR TO PROGRESSING ANY WORKS ON THE LIGHTING INSTALLATION.
5. THE CONTRACTOR SHALL SUBMIT TEMPORARY WORKS PROPOSALS TO ALLOW FOR EXCAVATIONS ADJACENT TO HIGHWAY AND ADJACENT BOUNDARIES.
6. MANCHESTER CITY COUNCIL HIGHWAYS SHALL BE CONSULTED AND APPROVAL GRANTED FOR ANY TEMPORARY WORKS PRIOR TO CONSTRUCTION.
7. THE ORDER OF CONSTRUCTION AND SEQUENCE OF WORKS SHALL BE CONFIRMED BY THE CONTRACTOR IN ACCORDANCE WITH THE CONTRACT PROGRAMME.
8. THE CONTRACTOR SHALL COORDINATE ALL LIGHTING INSTALLATIONS WITH THE LANDSCAPE PROPOSALS AND BUILDING STRUCTURE.
9. THE CONTRACTOR SHALL ENSURE THAT RECESSED CHAMBER COVERS ARE PROVIDED AS REQUIRED IN CONJUNCTION WITH THE LANDSCAPE PROPOSALS.
10. PHASE 2 WATER BOLLARDS AND WATER FOUNTAINS SUPPLIES TO BE AGREED WITH UNITED UTILITIES.
11. X17 PRODUCTS POSITIONED UNDER EXTERNAL BULKHEAD (DOWNWARD AIMING DIRECTION)
12. X18 PRODUCTS POSITIONED UNDER RAILINGS/BALUSTRADE. AIMING DIRECTION UPWARDS.
13. X16 PRODUCTS POSITIONED WITHIN LOW LEVEL ARCHITECTURAL DETAIL. EXTENTS TO BE CONFIRMED WITH LANDSCAPE ARCHITECT TO COORDINATE WITH FINISHED LEVELS OF LANDSCAPE AND PLINTH. FINAL LENGTHS OF X16 PRODUCT MAY BE LESS THAN SHOWN.
14. X18 PRODUCTS POSITIONED WITHIN LOW LEVEL ARCHITECTURAL DETAIL. EXTENTS TO BE CONFIRMED WITH LANDSCAPE ARCHITECT TO COORDINATE WITH FINISHED LEVELS OF LANDSCAPE AND PLINTH. FINAL LENGTHS OF X16 PRODUCT MAY BE LESS THAN SHOWN.
15. X18 PRODUCTS POSITIONED UNDER RAILINGS/BALUSTRADE. AIMING DIRECTION UPWARDS.
16. X17 PRODUCTS POSITIONED UNDER EXTERNAL BULKHEAD (DOWNWARD AIMING DIRECTION)

LEGEND:	
	LIGHTING COLUMN
	LIGHTING BOLLARD
	ILLUMINATED HANDRAIL
	INGROUND UPLIGHTERS
	MULTIFUNCTIONAL COLUMN
	TREE LIGHT
	LED STRING
	LINEAR PROJECTOR
	WALL RECESSED FLOOR WASH
	A TYPE RECESSED
	SURFACE
	SURFACE MOUNTED UNDER BENCH
	SURFACE MOUNTED UNDER BENCH
	P1/P2 AND WOODEN TAPERED COLUMN
	(STAIRWELLS & PERIMETER) BUILDING 3A & 3B
	(PERIMETER LUMINAIRE) BUILDING 3A & 3B
	R TYPE
	B TYPE
	IN GROUND TYPE ON BRANCASTER ROAD

C03	Comments incorporated	28.11.19
C02	PC1's Removed & LED String Removed From Clouded Area	28.08.19
C01	Issued for Construction	22.05.19

321 Oriskany Lane, Salford, Manchester, M5 3AP Tel: 0161 872 0171 Fax: 0161 872 0171	
Client	
Project	Circle Square Buildings 2, 3 & 4 Oxford Road Manchester
Design Manager	G Hall
Checked By	D M Greenwood
Drawn By	J S Guy
Title	EXTERNAL LIGHTING LAYOUT PLAN FUNCTIONAL AND FEATURE LIGHTING
Issue Date	02/11/19
Scale	1:50
Drawn By	C03
Approved & Accepted	
CS-NGB-XX-XX-DR-E-6301	



Section 6

Further comments

We request that this technical submittal is signed off and approved by Hoare Lea as the external lighting designer.

END OF TECHNICAL SUBMISSION