

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

The Hinckley National Rail Freight Interchange Development Consent Order

Project reference TR050007

Environmental Statement Volume 2: Appendices

Appendix 3.2: Lighting Strategy [part 3 of 3]

Document reference: 6.2.3.2

Revision: 04

November 2022

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
Regulation 5(2)(a)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
Regulation 14

This document forms a part of the Environmental Statement for the Hinckley National Rail Freight Interchange project.

Tritax Symmetry (Hinckley) Limited (TSH) has applied to the Secretary of State for Transport for a Development Consent Order (DCO) for the Hinckley National Rail Freight Interchange (HNRFI).

To help inform the determination of the DCO application, TSH has undertaken an environmental impact assessment (EIA) of its proposals. EIA is a process that aims to improve the environmental design of a development proposal, and to provide the decision maker with sufficient information about the environmental effects of the project to make a decision.

The findings of an EIA are described in a written report known as an Environmental Statement (ES). An ES provides environmental information about the scheme, including a description of the development, its predicted environmental effects and the measures proposed to ameliorate any adverse effects.

Further details about the proposed Hinckley National Rail Freight Interchange are available on the project website:



The DCO application and documents relating to the examination of the proposed development can be viewed on the Planning Inspectorate's National Infrastructure Planning website:

<https://infrastructure.planninginspectorate.gov.uk/projects/east-midlands/hinckley-national-rail-freight-interchange/>

D-SERIES



D-SERIES




HOLOPHANE[®]

D-SERIES

The modern styling of the **D-Series** is striking yet unobtrusive - making a bold, progressive statement as it blends seamlessly with its environment. **D-Series** takes all the benefits of LED technology and moulds it into a high performance, high efficacy and long life area lighting luminaire.

With its exceptional 'finned' thermal management system, **D-Series** is capable of delivering over 100,000 hours LED module life. Offering a wide range of lumen packages and optical distributions, **D-Series** delivers optimised lighting application designs.

With the integrated ZD4i compatibility **D-Series** delivers a controllable luminaire that helps you realise energy consumption goals and demonstrate environmental responsibility. With its unique optics placed below each LED it ensures light is delivered where it needs to be, providing a uniform Nighttime Friendly environment with minimal light pollution.

Applications

- Amenity Areas
- Car Parks
- Retail Parks
- Truck Yards
- Warehousing Exterior Areas

Optics / Light Source

- Lumen packages ranging from 2,000 - 36,000 in 3 different luminaire variants
- Fully soak tested light engines ensuring LED reliability and eliminating early failures.
- 4000K/3000K colour temperature.
- RA 70.

Approvals

Complies with EN60598



IP IP65 luminaire and LED optic

Ta -40°C to +40°C

DSX1



For further information please visit the Holophane website [\[redacted\]](#)

AN ENVIABLE REPUTATION THROUGHOUT THE WORLD

125 years of 
Innovation & Excellence

When Holophane was founded in 1896 in London, headed by Pelham Trotter, it marked the start of an incredible history that has now seen Holophane become a global business revered throughout the world for its expertise, quality, innovation and excellence in lighting.

Holophane's first product was the famous patented globe in 'white' or 'rose crystal' that sold for around 2 shilling (10p). Today, Holophane continues this proud tradition with our values deeply rooted in the dedication to creating luminaires, with exceptional lighting performance, innovative patented technologies, and delivering added customer value beyond illumination.



What does it mean for our customers?

A Trusted & Reliable UK Manufacturer

From Royalty all the way to small residential projects, Holophane has been a trusted manufacturer over the decades for all manner of projects. You can be sure you are in good hands and can rely on the collective knowledge and expertise we have gathered since our inception in 1896.

Development of Innovative Products

As part of our design philosophy, Holophane are always trying to push boundaries in the development of unique product innovations. As such many of our luminaires hold UK and International design patents.

Products That Deliver Added Value

In today's world, sustainability and added value are becoming increasingly important. As such our products and solutions go further than just lighting. Many of our innovations include integrated smart connected solutions to help customers achieve further energy savings and can also enable remote monitoring.

Delivering excellent customer service

Over our 125-year history we have always been committed to delivering the best service to our customers and supporting in a myriad of ways to ensure the best possible outcomes. This goes as far as offering a free lighting design service to one-off products/solutions to meet customers unique needs.

THE D-SERIES RANGE 3 LUMINAIRES, ONE COMPLETE PROJECT SOLUTION

The **D-Series** range has been designed not only for super optical quality and performance but also to have a cohesive family aesthetic.

Available in 3 luminaire sizes, the D-Series range offers a full outdoor lighting solution for any environment.



DSX2

30,000 - 36,000 lumens
8m mounting heights and above

DSX1

11,000 - 30,000 lumens
between 6m & 10m mounting heights

DSX0

2,000 to 10,000 lumens
up to 6m mounting heights



PRODUCT FEATURES

D-SERIES

Enhanced Performance

The **D-Series** range features the very latest LED technologies. In conjunction with PMMA optics this delivers the best lighting performance coupled with low-energy consumption and high efficacy. This also means D-Series meets BREEAM compliance.

Class leading optics

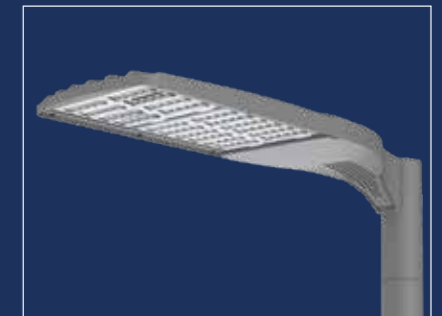
The **D-Series** range has the flexibility of 4 optimised optical distributions. Through using individual bubble optics per LED D-Series controls the light exactly where it's needed. This results in a luminaire that provides best in class spacings and uniformity.

Easy maintenance

The **D-Series** range has an easily accessible gear compartment ensuring fast and simple component changes if required.



DSX1



DSX2

Connected

The **D-Series** range is ZD4i compatible when specified with the 4-pin Zhaga socket options (TZ01 or TZ02) enabling a future proof luminaire that can be used in conjunction with Controlux Air or a expanding ecosystem of third party devices and sensors.

Note: Post Top Bracket for The D-Series range is sold separately. Please enquire with your Holophane representative for the full range of mounting options.



DSXO



THERMAL MANAGEMENT

The reliability and performance of an LED luminaire is dependent on a combination of factors. Keeping the temperature of the drivers, LEDs and electronic components as low as possible is critical to maintaining the luminaire's efficiency.

One of Holophane's key luminaire design principles ensures that the **D-Series** family utilises all three heat transfer principles of conduction, convection and radiation.



Conduction

Taking heat away from electronic components, LEDs and drivers.

The **D-Series** range has drivers and LEDs that are mounted directly to thermally efficient, LM6 Aluminium to promote efficient transfer of heat from these critical components.



Convection

From luminaire heat sink chassis and LED module to ambient air.

The **D-Series** range is designed to have drivers and LEDs that are mounted separately to avoid compound heating of components. This ensures critical components are kept as cool as possible to ensure long system life.



Radiation

Surface finish and form designed to maximise heat radiation.

The **D-Series** range incorporates a large finned casting design which increases the total surface area of the luminaire and in turn helps to promote cooling through radiation.

THERMAL MANAGEMENT

DSX1



SPECIFICATION

Specification

Single-piece die-cast aluminium housing, that conforms to EN1706 AC-46500, with integral heat sink fins to optimise thermal management through conductive cooling. LED modules are IP65 with individual lenses, and high grade aluminium housing to transfer heat away from the LEDs and dissipate through the finned housing for cooling. The LED driver is mounted in direct contact with the finned housing for cooling to promote low operating temperature and long system life. Housing is completely sealed against moisture and environmental contaminants (IP65). Installation is via the integrated mounting block and integral arm that facilitate a quick and easy installation. 3000K or warmer must be selected for IDA dark sky certification.

Features and benefits

System Longevity

- The D-Series's diecast aluminium housing acts as its primary heat sink. Its longitudinal fins employ conductive cooling techniques to dissipate heat away from the key LED components and driver that extends the life of the luminaire.
- Light engine(s) consist of either 20 or 30 high efficacy LEDs (subject to chosen configuration) mounted to a metal-core circuit board to maximize heat dissipation and promote long life.

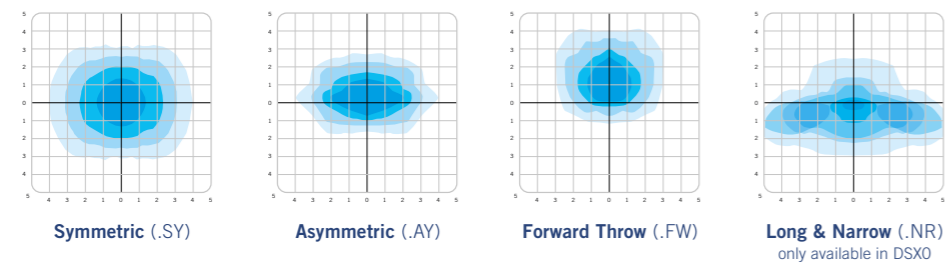
Exceptional Performance

- Offering six lumen packages ranging from 2000 lm to 36,000 lm with efficiencies of up to 143 lpw (Lumens Per Watts).
- Three optimised distributions (asymmetric, symmetric and forward throw) delivered by quality LEDs and bespoke UV stabilised optics.
- LED light engines with 0% ULOR ensuring night time friendly.

Complete Light Package

- Available with ZD4i compatibility for use with range of 3rd-party sensors and devices.
- Fully integrated into Holophane standard column range.

Light Distributions



SPECIFICATION

DIMENSIONS & PERFORMANCE

Typical luminaire performance

Configuration	Delivered Lumens	Circuit Power (W)	Driver output current (mA)	Luminaire total number of LEDs	Luminaire efficacy (lm/W)
DSX0.1.LA02X	c.2,000	15	450	20	133
DSX0.1.LA03X	c.3,000	21	650	20	143
DSX0.1.LA04X	c.4,000	29	450	20	138
DSX0.1.LA05X	c.5,000	37	570	20	135
DSX0.1.LA06X	c.6,000	45	700	20	133
DSX0.1.LA08X	c.8,000	64	990	20	125
DSX0.1.LA10X	c.10,000	81	1250	20	123
DSX1.2.LA11X	c.11,000	105	1050	30	116
DSX1.2.LA16X	c.16,000	131	700	60	126
DSX1.2.LA22X	c.22,000	208	1050	60	113
DSX1.2.LA30X	c.30,000	286	1400	60	105
DSX2.2.LA30X	c.30,000	282	1050	100	115
DSX2.2.LA36X	c.36,000	328	1000	100	121

Weight (with control gear)

DSX 0 8.0 kg
 DSX 1 12.2 kg
 DSX 2 15.0 kg

Windage (effective projected area)

DSX 0 0.09 m²
 DSX 1 0.09 m²
 DSX 2 0.10 m²

TA

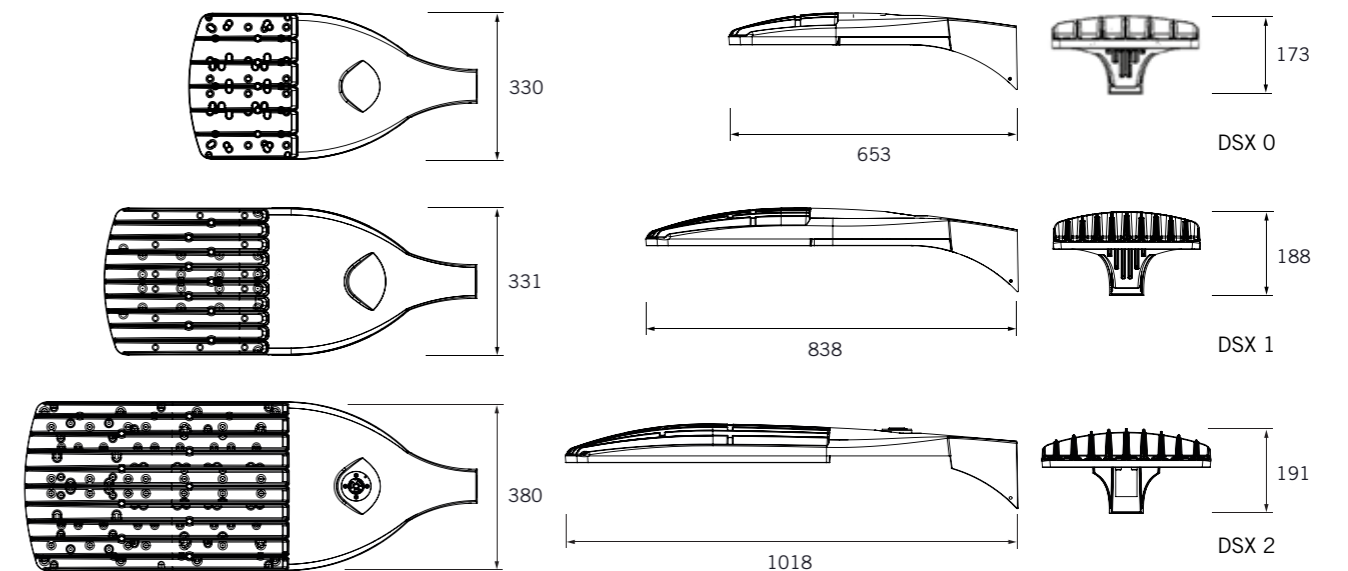
-40°C to 40°C

Note: Data is correct at time of print.

* For other life metric data in line with IEC PAS62722-2-1 and 62717 contact your Holophane Representative for details.



dimensions in mm



DSX2



Code	Luminaire (required)							
DSX0	D-Series 1 Luminaire							
Code	Series (required)							
.1	Series 1							
Code	Lamp Type (required)							
.LA02X	LED light engine producing c.2,000 lm with a nominal 3000K or 4000K colour temperature							Replace 'X' in lamp type code with either: 3 for 3000K 4 for 4000K
.LA03X	LED light engine producing c.3,000 lm with a nominal 3000K or 4000K colour temperature							
.LA04X	LED light engine producing c.4,000 lm with a nominal 3000K or 4000K colour temperature							
.LA05X	LED light engine producing c.5,000 lm with a nominal 3000K or 4000K colour temperature							
.LA06X	LED light engine producing c.6,000 lm with a nominal 3000K or 4000K colour temperature							
.LA08X	LED light engine producing c.8,000 lm with a nominal 3000K or 4000K colour temperature							
.LA10X	LED light engine producing c.10,000 lm with a nominal 3000K or 4000K colour temperature							
Code	Distribution (required)							
.SY	Symmetric light distribution							
.AY	Asymmetric light distribution							
.FW	Forward Throw distribution							
.NR	Long & Narrow distribution							
Code	Colour (required)							
.C1	Smooth White (RAL9016)							
.C4	Graphite (RAL 7011)							
.C6	Smooth Grey (RAL7035)							
.C7	Black (RAL9005)							
.C9	Metallic Silver (RAL9006)							
.RAL****	RAL Colour (Customer choice)							
Code	Voltage Electrical Class (option)							
.CII	Class II							
Code	Photocell (option)							
.TSZ	Complete with miniature 70 lux factory fitted photocell. (Zodion SS12)							
.T1	Complete with NEMA socket. (To accept standard NEMA Photocell, available from Holophane).							
.T5	Complete with 5-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) without locking top							
.T7	Complete with 7-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) without locking top							
.T5T	Complete with 5-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top							
.T7T	Complete with 7-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top							
.TZ01	Complete with 4-Pin Zhaga Socket - 'Top' (suitable photocell/node supplied by others) with weather proof locking cap							
.TZ02	Complete with 4-Pin Zhaga Socket - 'Bottom' (suitable photocell/node supplied by others) with weather proof locking cap							
Code	Control Gear (option)							
.CL7	Programmed to deliver 70% of the initial lumens over the life of the luminaire							
.CL8	Programmed to deliver 80% of the initial lumens over the life of the luminaire							
.CL9	Programmed to deliver 90% of the initial lumens over the life of the luminaire							
.CL****	customer specified programming							
Code	Dimming outputs (option)							
.LRD	DALI enabled							
.LRT56	pre-set to dim to 50% between 12am to 6am							
.LRT66	pre-set to dim to 60% between 12am to 6am							
.LRT76	pre-set to dim to 70% between 12am to 6am							
.LRT*****	Customer specified pre-set dimming							
Code	Paint finish (option)							
.C	Enhanced Paint Finish							
DSX0	.LA02X	.AY	.C7	.CII	.TSZ	.CL7	.LRD	.C
Example								



Code	Luminaire (required)							
DSX1	D-Series 1 Luminaire							
DSX2	D-Series 2 Luminaire							
Code	Lamp Type (required)							
.LA05X*	LED light engine producing c 5,000 lumens							With a nominal 3000K or 4000K colour temperature.
.LA06X*	LED light engine producing c 6,000 lumens							
.LA08X*	LED light engine producing c 8,000 lumens							
.LA11X*	LED light engine producing c 11,000 lumens							Replace X with 3 for 3000K or 4 for 4000K.
.LA16X*	LED light engine producing c 16,000 lumens							
.LA22X*	LED light engine producing c 22,000 lumens							
.LA30X†	LED light engine producing c 30,000 lumens							
.LA364**	LED light engine producing c 36,000 lumens							
Code	Distribution (required)							
.AY	Asymmetric							
.SY	Symmetric							
.FW	Forward throw							
Code	Colour (required)							
.C1	Smooth White (RAL9016)							
.C4	Graphite (RAL 7011)							
.C6	Smooth Grey (RAL7035)							
.C7	Black (RAL9005)							
.C9	Metallic Silver (RAL9006)							
.RAL****	RAL Colour (Customer choice)							
Code	Photocell (option)							
.T	Mini Photocell							
.T1	Complete with NEMA socket (To accept standard NEMA Photocell, available from Holophane)							
.T5	Complete with 5-pin dimming NEMA ANSI C136.41 socket (suitable photocell/node supplied by others) without locking top							
.T7	Complete with 7-pin dimming NEMA ANSI C136.41 socket (suitable photocell/node supplied by others) without locking top							
.T5T	Complete with 5-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top							
.T7T	Complete with 7-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top							
.TZ01	Complete with 4-Pin Zhaga Socket - Top (suitable photocell/node supplied by others) with weather proof locking top†							
.TZ02	Complete with 4-Pin Zhaga Socket - Bottom (suitable node/presence detector supplied by others) with weather proof locking top†							
Code	Control Gear (option)							
.CL7	Programmed to deliver 70% of the initial lumens over the life of the luminaire							
.CL8	Programmed to deliver 80% of the initial lumens over the life of the luminaire							
.CL9	Programmed to deliver 90% of the initial lumens over the life of the luminaire							
.D2	DALI HF electronic control gear							
Code	Dimming outputs (option)							
.LRT56	Pre-set to dim to 50% between 12am to 6am							
.LRT66	Pre-set to dim to 60% between 12am to 6am							
.LRT76	Pre-set to dim to 70% between 12am to 6am							
Code	Paint finish (option)							
.C	Enhanced Paint Finish							
DSX1	.LA224	.AY	.C7	.T1	.CL7	.LRT56	.C	
Example								



*DSX1 only +DSX1 & 2 **DSX2 only

Note: The specifications of the Holophane luminaire, all descriptions, illustrations, drawings and specifications in the Holophane catalogue and website represent only general particulars of the goods to which they apply and shall not form part of any contract. The company reserves the right to change specifications at its discretion without prior notification or public announcement.

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D-SERIES

D-SERIES



HOLOPHANE

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Expanding the boundaries of lighting™



HMAO



HMAO
High Mast Advanced Optix




HOLOPHANE[®]

HIGH MAST HMAO

The High Mast Advanced Optix (HMAO) luminaire has been engineered for new and retrofit high mast applications. With the latest in high-efficiency LED technology it provides a complete lighting solution for the simplest through to the most complex area lighting applications.

The specially engineered optical modules come with a full range of distribution options to meet the highest performance standards and deliver outstanding visibility and uniformity.

For over 125 years Holophane has enjoyed an enviable reputation throughout the world for expertise, quality and innovation in lighting. From the earliest days, when the company pioneered its famous glass refractor, the Holophane name has been ever present as a leader in the field of luminaire and lighting design. HMAO is a continuation of this proud tradition.

Applications

- Freight Terminals
- Industrial Facilities
- Car Parks
- Truck stops
- Ports and Docks
- Airports
- Motorways
- Toll Plazas

Overview

- 3000°K & 4000°K colour temperature.
- CRI > 70.
- Lumen packages ranging from 30,000 - 100,000 lumens.

Approvals



Complies with EN60598

IP65 and IK07

-20°C to +45°C (L75X limited to +40°C)

Durability
Performance
Reliability



For further information please visit the Holophane website [\[link\]](#)

PRODUCT FEATURES

In this very competitive environment, it is becoming increasingly important to reduce operating costs and improve efficiency. Holophane is your expert when it comes to delivering the most efficient lighting solutions to help you achieve that goal.

Taking advantage of the most advanced technologies available, you can achieve an energy saving of up to 66% over existing installations. Holophane's High Mast Advanced Optix (HMAO) helps you to reduce installation and long term maintenance costs.

Glass Refractor

The major advantage of glass over aluminium or plastic is its low electrostatic charge, which makes it less attractive to dust and dirt accumulation over time. A glass refractor has a much lower light depreciation over time than either aluminium or plastic, fewer luminaires are required, significantly reducing installation, operating and maintenance costs.



Self-cleaning Effect

The glass optics and the vertical ventilation slots in the heat-sink chassis work together in creating a self-cleaning optic. The heat generated by the LEDs helps to channel cooler and denser air across the low static optical glass surface thus preventing the settling of dust particles and enhancing the lumen maintenance of the luminaire.

HMAO is available in 6, 9 or 12 optical pod configurations dependent on lumen package.



Two piece electrical housing. Upper casting can be detached/hinged to aid installation.

Advanced optical control

By combining the latest in LED technology with our advanced glass refractor optic we are able to break up the image of the LEDs with a PrismGlow effect. This reduces the glare normally associated with individual LEDs and eliminates hot spots on the working environment thus creating a more uniform vertical and horizontal lighting solution.

Ventilated optical housing which can be rotated to suit application.



HIGH MAST HMAO

RETROFIT NEW BUILD

Customer benefit expressed in numbers on a new build and retrofit installation.



Design Parameters

- Designed to EN 12464-2:2014
- Target of 30 lux
- 30m mounting height in a 1000m grid
- Designed to 8000 hours

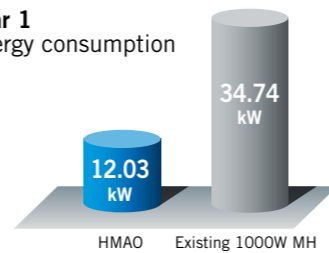
Product Used

- 32 High Mast Advanced Optix
 - Luminous flux: c45,000
 - Luminous efficiency: 144 lpw
- 32 1000MH Luminaire
 - Luminous flux: c67,000
 - Luminous efficiency: 62 lp/W

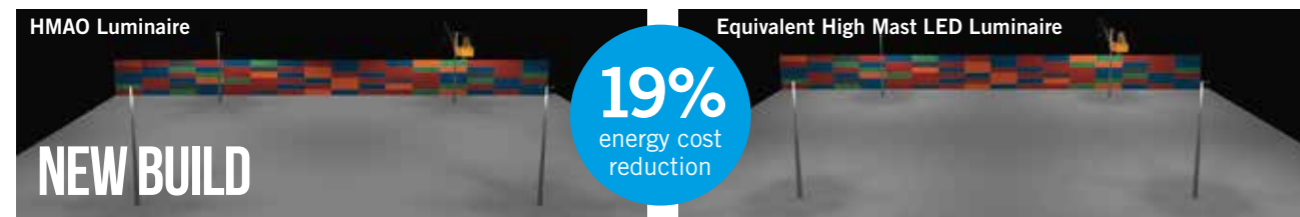
Benefits

- 66% year 1 energy savings
- Improved light control
- Horizontal/vertical uniformity improved

Year 1 energy consumption



HMAO		1000W MH
32	No of Luminaires	32
32	Eav (lux)	31
0.597	Uniformity	0.552
12.03	Total Power Load kW	34.72
£4,831	Year 1 Energy	£13,940



Design Parameters

- Designed to EN 12464-2:2014
- Target of 30 lux
- 30m mounting height in a 1000m grid
- Designed to 8000 hours

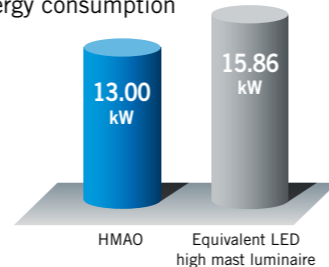
Product Used

- 26 High Mast Advanced Optix (HMAO)
 - Luminous flux: c60,000
 - Luminous efficiency: 144 lpw
- 26 Equivalent LED High Mast Luminaire
 - Luminous flux: c56,000
 - Luminous efficiency: 93 lp/W

Benefits

- 19% year 1 energy savings
- 20% improvement in uniformity
- Improved vertical illumination
- Low glare

Year 1 energy consumption



HMAO		Equivalent LED high mast luminaire
26	No of Luminaires	26
30	Eav (lux)	30
0.779	Uniformity	0.651
13.00	Total Power Load kW	15.86
£5,220	Year 1 Energy	£6,368

* Designed to EN12464-2:2014 ref 5.4

SPECIFICATION

Specification

HMAO shall consist of six, nine or twelve prismatic glass refractors manufactured from borosilicate glass to ensure longevity and minimise dirt depreciation. Each glass lens houses an LED module and creates individual optical pods. Each optical pod is housed in a fully ventilated and finned housing manufactured from aluminium to maximise heat transfer. The electrical housing consists of two castings containing the drivers, 10kV surge protection and electrical termination. The luminaire chassis and electrical housing utilises all three heat transfer mechanisms of conduction, convection and radiation to ensure that the high density modules and electronic drivers are thermally managed. Mounting is via the four bolt side arm mounting with +/-5 degree tilt and suitable for 42mm and 60mm.

3000K or warmer must be selected for IDA dark sky certification.

Features and benefits

Thermally Managed Solution

- Utilises convection and conduction to thermally manage the LEDs ensuring longer life and high delivered lumen outputs to replace 400-1000 watt metal halide systems.
- Gear housing designed to maximise heat dissipation, via conduction, from critical electronic components to ensure that they are run as cool as possible to deliver a long system life.

Exceptional Optical Performance

- Glass refractor technology which delivers a wholly luminous effect that accurately controls the output of the LEDs, reduces glare with its 'PrismGlow' and delivers excellent uniformity.
- Rotatable optical assembly providing on site alignment of distributions to specific lighting requirements and ensuring equal weight distribution on existing mast head frame.
- Seven dedicated distributions designed for all types of retrofit or new installations where high mounting is required.

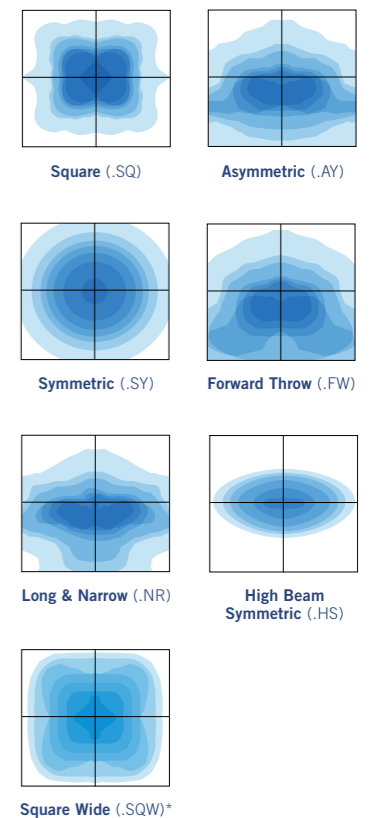
Enhanced Lumen Maintenance

- Glass optics ensure a low electrostatic charge which make it less attractive to dust and dirt accumulation over time so improving dirt depreciation.
- Ventilated luminaire chassis works together with the glass optics to create self-cleaning system which enhances the lumen maintenance of the luminaire over time.

Installation Flexibility

- Suitable for side entry mounting via the integrated four bolt mounting system which also offers 0 or 5 degree tilt.

Light Distributions



*Series 4 only

SPECIFICATION

HIGH MAST SYSTEM

HMAO is available as a replacement for existing high mast luminaires or as part of a complete highmast system.

Holophane High Mast System

The most sophisticated system on the market. This mast system consists of a headframe mounting ring for luminaire mounting, winch assembly and suitably rated switchfuse mounted in the mast base, complete with foundation set. The latched raise and lower system utilises heavy duty stainless steel cables in conjunction with three continuous contact iris action guide arms on the lowering ring. This allows all maintenance to be carried out at ground level using a portable power tool connected to the mast supply.

Available at heights of 15m, 20m, 25m or 30m.



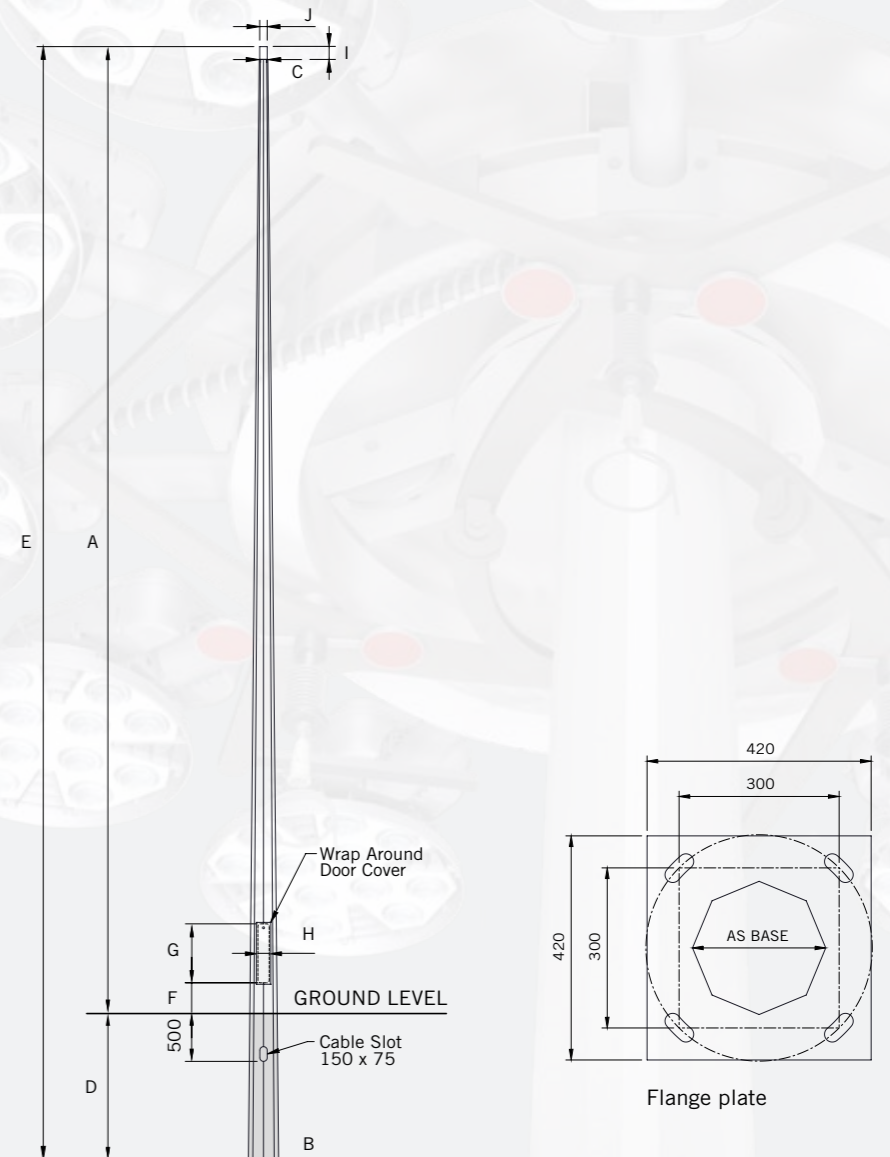
Positive fail-safe latching



Continuous contact guide arms

HIGH MAST

Holophane Octagonal Column



description	Nominal Height	Root End Diameter*	Planting Depth	Overall Length	Door to Ground	Door Opening Length	Door Opening Width	Spigot Length*	Spigot Diameter*	Shaft Diameter*	Weight kg* (Rooted/Flange Plate)	Bending Moment (ULS) Nm
8m standard duty	7700	246.3	1200	8900	300	600	115	130	76.1	N/A	111/113	Please contact Holophane for Information
10m standard duty	9700	308	1500	11200	300	600	115	130	76.1	N/A	167/153	
12m standard duty	11700	308	1700	13400	300	600	115	130	60.3	N/A	197/179	
12m heavy duty	11700	290	1700	13400	300	600	115	130	76.1	N/A	203/192	
15m standard duty	14700	322	1700	16400	300	600	115	130	60.3	N/A	257/240	
15m heavy duty	14700	379	2000	16700	300	600	115	130	88.9	N/A	421/398	

* Exclusion TBC

8-12m std Poles	Flange Plate FB2	Bolts	M24 x 820
15m std Poles	Flange Plate FB2	Bolts	M30

Contact Holophane for more information

Flange Plate and J-Bolt information will be confirmed at time of order due to the necessity in ensuring the correct plate and J-Bolts are supplied.

std = Standard **hd** = Heavy Duty Column type to be confirmed at time of order as this is based on luminaire weight, windage and geographical location.

Code	Luminaire (required)						
HMAO	High Mast Advanced Optix						
Code	Series (required)						
.3	Series 3						
.4	Series 4						
Code	Lamp Type (required)						
.L30X	LED light engine producing c.30,000 lm with a nominal 3000K or 4000K colour temperature						
.L35X	LED light engine producing c.35,000 lm with a nominal 3000K or 4000K colour temperature						
.L45X	LED light engine producing c.45,000 lm with a nominal 3000K or 4000K colour temperature						
.L52X	LED light engine producing c.52,000 lm with a nominal 3000K or 4000K colour temperature						
.L60X	LED light engine producing c.60,000 lm with a nominal 3000K or 4000K colour temperature						
.L70X	LED light engine producing c.70,000 lm with a nominal 3000K or 4000K colour temperature						
.L75X	LED light engine producing c.75,000 lm with a nominal 3000K or 4000K colour temperature						
.LC80X	LED light engine producing c.80,000 lm with a nominal 3000K or 4000K colour temperature						
.LC90X	LED light engine producing c.90,000 lm with a nominal 3000K or 4000K colour temperature						
.LC100X	LED light engine producing c.100,000 lm with a nominal 3000K or 4000K colour temperature						
Code	Optics						
.NR	Long and Narrow light distribution						
.HS	High beam symmetric distribution						
.AY	Asymmetric light distribution						
.FW	Forward throw light distribution						
.SQ	Square light distribution						
.SY	Symmetrical light distribution						
.SQW	Square wide light distribution**						
Code	Colour						
.C9	Metallic Silver RAL9006						
.RAL****	RAL Colour (customer choice)						
Code	Control Gear (options)						
.LRD	DALI, number of addresses will vary on the lumen version configured						
.CL7	Programmed to deliver 70% of the initial lumens over the life of the luminaire						
.CL8	Programmed to deliver 80% of the initial lumens over the life of the luminaire						
.CL9	Programmed to deliver 90% of the initial lumens over the life of the luminaire						
Code	Photocell (options)						
.TSZ	Complete with miniature 70 lux factory fitted photocell. (Zodion SS12)						
.TSZ	Complete with miniature 70 lux factory fitted photocell. (Zodion SS12)						
.T1	Complete with NEMA socket to accept standard NEMA Photocell, available from Holophane*						
.T5	Complete with 5-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) without locking top.						
.T5T	Complete with 5-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top						
.T7T	Complete with 7-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top						
.TZ01	Complete with 4-Pin Zhaga Socket - Top (suitable photocell/node supplied by others) with weather proof locking top.†						
Code	Paint Finish (options)						
.C	Enhanced Paint Finish						
Code	Voltage (options)						
.C-PROTEC	With 20kV/10kA surge protection						
HMAO	.3	.L30X	.NR	.C9	.LRD	.TSZ	.C
Example							



Series 3 only
Replace 'X' in lamp type code with either: 3 for 3000K 4 for 4000K

Series 4 only

Note: 42/60mm side entry, 10kV/10kA surge protection as standard.
*Luminaire is IP65 when options .T1 or .T are selected. † Not available with .LRD **Series 4 only.

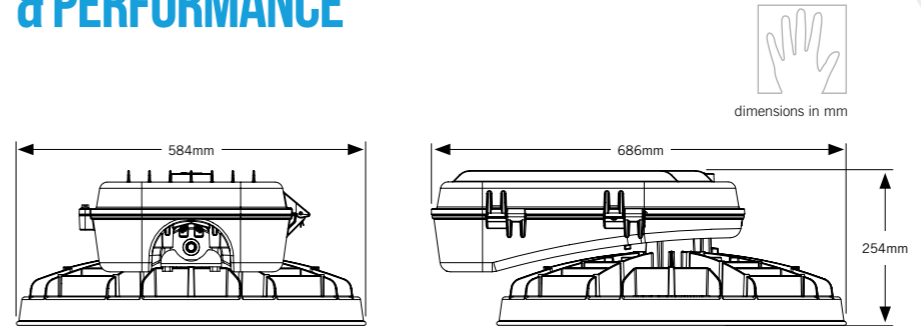
Lumen data is considered to be representative of the configuration shown, and may vary, with a tolerance on flux of +/- 7% (typical of LED manufacturers data) and luminaire power of +/- 5%.

accessories

Code	
HMAO.SD90	90° shield
HMAO.SD120	120° shield
HMAO.SD180	180° shield

Note: The specifications of the Holophane luminaire, all descriptions, illustrations, drawings and specifications in the Holophane catalogue and website represent only general particulars of the goods to which they apply and shall not form part of any contract. The company reserves the right to change specifications at its discretion without prior notification or public announcement.

DIMENSIONS & PERFORMANCE



Typical luminaire performance

Configuration	Delivered Lumens	Power Consumption (W)	Driver output current (mA)	Luminaire total no. of LED modules	Luminaire efficacy (lm/W)	Rated life of LED module (L70B50 @Tq 25°C)
HMAO.3.L30X	c.30,000	208	640	6	144	100,000
HMAO.3.L35X	c.35,000	247	750	6	142	100,000
HMAO.3.L45X	c.45,000	313	640	6	144	100,000
HMAO.3.L52X	c.52,000	370	750	6	141	100,000
HMAO.3.L60X	c.60,000	417	640	12	144	100,000
HMAO.3.L70X	c.70,000	494	750	12	142	100,000
HMAO.3.L75X	c.75,000	555	860	12	135	100,000
HMAO.4.LC80X	c.80,000	502	792	12	159	100,000
HMAO.4.LC90X	c.90,000	583	919	12	154	100,000
HMAO.4.LC100X	c.100,000	658	1040	12	152	100,000

Lumen data is considered to be representative of the configuration shown, and may vary, with a tolerance on flux of +/- 7% (typical of LED manufacturers data) and luminaire power of +/- 5%.

Weight
HMAO 23 kg

Windage
HMAO 0.120 m²



Rotatable optical assembly



Four bolt mounting suitable for 42mm and 60mm side entry



Hinged upper casting

Code	HMAOE HMAO Octagonal column					
Code	Luminaire mounting height					
.10	10 metre column					
.12	12 metre column					
.15	15 metre column					
Code	Brackets					
.1S	Single head short bracket					
.1L	Single head long bracket					
.2S	Twin head short bracket					
.2L	Twin head long bracket					
Code	Bracket type					
.SA60	Side arm bracket suitable for 60mm entry					
.SA605	5° tilt side arm bracket suitable for 60mm entry					
Code	Column category					
.LMZ	For light & medium area wind zones					
.HVZ	For heavy area wind zones					
.HEZ	For extra heavy area wind zones					
Code	Colour (bracket finish only)					
.GV	Galvanised only bracket					
.GV9	Galvanised and painted metallic silver (RAL 9006)					
Code	Optional base type					
.FB4	Flange base mounting (suitable for ground level installation only). 420 x 420 plate with 300 x 300 centres.					
HMAOE	.12	.1L	.SA60	.LMZ	.GV	.FB4
Example						

Note: 15m twin head for HEZ wind zone not available as standard. Please contact Holophane for further information.

accessories

Code	
HELE.FS1	Anchor bolt kit M24 x 820mm. Suitable for Octagonal columns.



HMAO
High Mast Advanced Optix



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Telephone: +44 (0)1908 649292 UK Fax: +44 (0)1908 367618
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E-mail: info@holophane.co.uk



AcuityBrands.
Expanding the boundaries of lighting™



AMPERA EVO



High-performance LED lighting solution with fast return on investment

Creating an efficient, economical and sustainable LED lighting solution was the driving force behind the development of AMPERA EVO.

AMPERA EVO is a road luminaire highlighting high performance, technical innovation, and simplicity. This innovative luminaire thus provides powerful lighting, fast and simple installation, easy lighting network management, as well as the fastest return on investment.

Available with various lumen packages - and numerous lighting distributions - the AMPERA EVO can meet all your road and urban lighting needs.



Concept

AMPERA EVO comes in two separate high-pressure die cast aluminium parts for the greatest installation and maintenance ease. The two parts are connected by two tool-free side latches. The electrical connection is automatically triggered on closing via a knife-type connector. This system allows safe connection with the mains cabling and prevents from any cabling error inside the gear compartment.

AMPERA EVO is available in two sizes to offer maximum flexibility and aesthetic coherence for town and city centres. AMPERA EVO takes advantage of the latest photometric innovations. It uses the LensoFlex®4 and MidFlex™ photometric engines, which have been developed around the concepts of high performance, compactness, versatility and standardisation.

AMPERA EVO comes with the IzyFix universal fixation system adapted to post-top and side-entry mounting on any pole arms (from Ø32mm, with adapter, to Ø76mm). The IzyFix system enables the luminaire to be switched from one position to another at any time, without removing it from the pole, offering complete versatility regarding pole and bracket configuration. The inclination angle can be adjusted on-site (tilting range of 110°), in both the post-top and side-entry position, to optimise the light distribution.

AMPERA EVO is a future-proof luminaire designed for a more sustainable future. It is made of highly recyclable materials and offers tool-free access for maintenance operations. Moreover, AMPERA EVO can be equipped with various control options allowing easy remote management of lighting network, with advanced features that enable the light intensity to be adjusted to what is strictly needed, thus creating environments favourable to flora and fauna.



Tool-free opening, and a mounting with two separate parts for easy installation.



The IzyFix universal fixation system, with switching from a post-top to a side-entry position, facilitates luminaire ordering and installation.

TYPES OF APPLICATION

- URBAN & RESIDENTIAL STREETS
- BRIDGES
- BIKE & PEDESTRIAN PATHS
- RAILWAY STATIONS & METROS
- CAR PARKS
- LARGE AREAS
- SQUARES & PEDESTRIAN AREAS
- ROADS & MOTORWAYS

KEY ADVANTAGES

- Cost-effective and efficient lighting solution for a fast return on investment
- On-site adjustment from post-top to side-entry without disconnecting the luminaire from the pole thanks to IzyFix
- Tool free access: easy and safe maintenance
- Connected-ready for your future Smart city requirements
- Compatible with the Schröder EXEDRA control platform
- Zhaga-D4i certified
- Adjustable inclination on-site



Connected-ready for your future smart city projects.



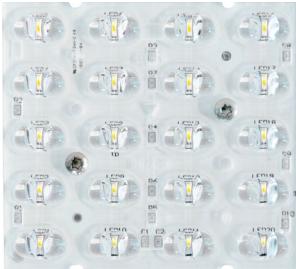
Designed for a more sustainable future.



LensoFlex®4

LensoFlex®4 maximises the heritage of the LensoFlex® concept with a very compact yet powerful photometric engine based upon the addition principle of photometric distribution. The number of LEDs in combination with the driving current determines the intensity level of the light distribution. With optimised light distributions and very high efficiency, this fourth generation enables the products to be downsized to meet application requirements with an optimised solution in terms of investment.

LensoFlex®4 optics can feature backlight control to prevent intrusive lighting, or a glare limiter for high visual comfort.



MidFlex™

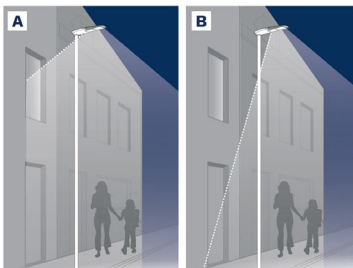
The MidFlex™ photometric engine is based on the same principle as LensoFlex®2: each LED is associated with a specific lens that generates the complete photometric distribution of the luminaire. MidFlex™ takes advantage of the maturity of mid-power LEDs for professional applications. The MidFlex™ photometric engines are based on the combination of several modules of 48 mid-power LEDs tightly positioned to maximise the LED density. This concept provides high lumen packages with a limited product footprint. The MidFlex™ photometric engines offers excellent efficiency for a sustainable performance.



Back Light control

As an option, the LensoFlex®2 and LensoFlex®4 modules can be equipped with a Back Light control system.

This additional feature minimises light spill from the back of the luminaire to avoid intrusive light towards buildings.



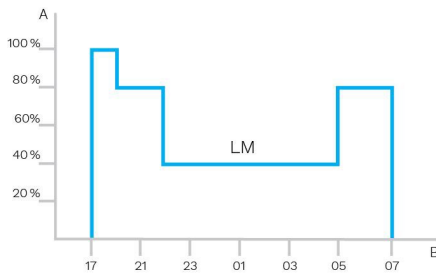
A. Without Back Light control | B. With Back Light control



Custom dimming profile

Intelligent luminaire drivers can be programmed with complex dimming profiles. Up to five combinations of time intervals and light levels are possible. This feature does not require any extra wiring.

The period between switching on and switching off is used to activate the preset dimming profile. The customised dimming system generates maximum energy savings while respecting the required lighting levels and uniformity throughout the night.

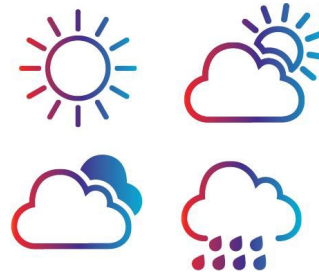


A. Dimming level | B. Time



Daylight sensor / photocell

Photocell or daylight sensors switch the luminaire on as soon natural light falls to a certain level. It can be programmed to switch on during a storm, on a cloudy day (in critical areas) or only at nightfall so as to provide safety and comfort in public spaces.



PIR sensor: motion detection

In places with little nocturnal activity, lighting can be dimmed to a minimum most of the time. By using passive infrared (PIR) sensors, the level of light can be raised as soon as a pedestrian or a slow vehicle is detected in the area.

Each luminaire level can be configured individually with several parameters such as minimum and maximum light output, delay period and ON/OFF duration time. PIR sensors can be used in an autonomous or interoperable network.





The Schröder IzyFix patented high-pressure die-casted aluminium universal fixation system is an integral part of the luminaire mounted in the factory. The IzyFix system aims to fit needs worldwide by meeting IEC and ANSI 3G testing requirements. It is intended to simplify life for customers and installers in the process of purchasing and installing luminaires for various applications.

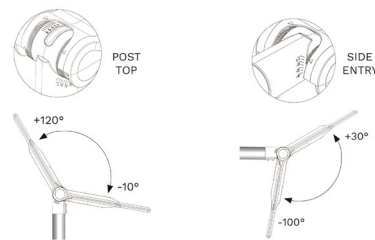
From post-top to side-entry in one movement

The innovative design allows changing from a side-entry to a post-top position – even with luminaires ordered with factory pre-cabling – without any switching work on the fixation or disconnection from the pole. Therefore the type of mounting (horizontal or vertical) does not have to be considered when ordering. This unique feature also eases installation. After setting the correct position, an accessory is provided to cover the resulting space and ensure further protection of the luminaire.

Best-in-class tilting range

The IzyFix universal fixation system enables a best-in-class range of mounting angle of 130°*, to ensure maximum lighting performance for all kinds of road scenarios and offer the possibility of installing the luminaire in extreme situations as well. With a setting mark on the body and angles on the spigot, adjusting is carried out in 5° increments by loosening two screws. The wide tilting range enables more comfortable access to the gear compartment during field maintenance.

*Depending on the size and shape of the luminaire, the inclination angle may be reduced. For more accurate information, always consult the installation sheets.



Variation for all poles

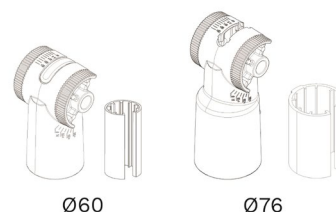
Due to the many different applications used worldwide, Schröder has created a range of fixation systems and reducers to satisfy all needs that might come up on the market.

IzyFix Ø60mm - suitable for:

- Ø32mm spigot (with reducer)
- Ø42-48mm spigot
- Ø60mm spigot

IzyFix Ø76mm - suitable for:

- Ø32mm spigot (with reducer)
- Ø42-48mm spigot (with reducer)
- Ø60mm spigot
- Ø76mm spigot





The Zhaga consortium joined forces with the DiiA and produced a single Zhaga-D4i certification that combines the Zhaga Book 18 version 2 outdoor connectivity specifications with the DiiA's D4i specifications for intra-luminaire DALI.

Standardisation for interoperable ecosystems

As a founding member of the Zhaga consortium, Schröder has participated in the creation of, and therefore supports, the Zhaga-D4i certification program and the initiative of this group to standardise an interoperable ecosystem. The D4i specifications take the best of the standard DALI2 protocol and adapt it to an intra-luminaire environment but it has certain limitations. Only luminaire mounted control devices can be combined with a Zhaga-D4i luminaire. According to the specification, control devices are limited respectively to 2W and 1W average power consumption.

Certification program

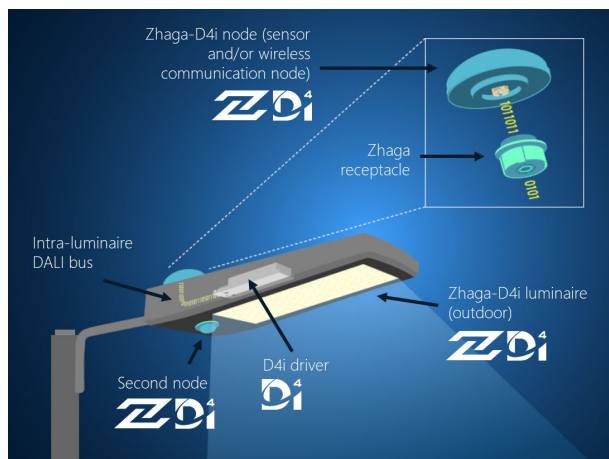
The Zhaga-D4i certification covers all the critical features including mechanical fit, digital communication, data reporting and power requirements within a single luminaire, ensuring plug-and-play interoperability of luminaires (drivers) and peripherals such as connectivity nodes.

Cost-effective solution

A Zhaga-D4i certified luminaire includes drivers offering features that had previously been in the control node, like energy metering, which has in turn simplified the control device therefore reducing the price of the control system.

2 sockets: top and bottom

The Zhaga socket is small and suited to applications where aesthetics is essential. The architecture of Zhaga-D4i also foresees the possibility of putting two sockets on one luminaire, allowing for instance, the combination of a detection sensor and a control node. This also has the added value of standardising certain detection sensor communications with the D4i protocol.





Schröder EXEDRA is the most advanced lighting management system on the market for controlling, monitoring and analysing streetlights in a user-friendly way.



Tailored experience

Schröder EXEDRA includes all advanced features needed for smart device management, real-time and scheduled control, dynamic and automated lighting scenarios, maintenance and field operation planning, energy consumption management and third-party connected hardware integration. It is fully configurable and includes tools for user management and multi-tenant policy that enables contractors, utilities or big cities to segregate projects.

A powerful tool for efficiency, rationalisation and decision making

Data is gold. Schröder EXEDRA brings it with all the clarity managers need to drive decisions. The platform collects massive amounts of data from end devices and, aggregates, analyses and intuitively displays them to help end-users take the right actions.

Protected on every side

Schröder EXEDRA provides state-of-the-art data security with encryption, hashing, tokenisation, and key management practices that protect data across the whole system and its associated services.

Standardisation for interoperable ecosystems

Schröder plays a key role in driving standardisation with alliances and partners such as uCIFI, TALQ or Zhaga. Our joint commitment is to provide solutions designed for vertical and horizontal IoT integration. From the body (hardware) to the language (data model) and the intelligence (algorithms), the complete Schröder EXEDRA system relies on shared and open technologies.

Schröder EXEDRA also relies on Microsoft™ Azure for cloud services, provided with the highest levels of trust, transparency, standards conformance and regulatory compliance.

Breaking the silos

With EXEDRA, Schröder has taken a technology-agnostic approach: we rely on open standards and protocols to design an architecture able to interact seamlessly with third-party software and hardware solutions. Schröder EXEDRA is designed to unlock complete interoperability, as it offers the ability to:

- control devices (luminaires) from other brands
- manage controllers and to integrate sensors from other brands
- connect with third-party devices and platforms

A plug-and-play solution

As a gateway-less system using the cellular network, an intelligent automated commissioning process recognises, verifies and retrieves luminaire data into the user interface. The self-healing mesh between luminaire controllers enables real-time adaptive lighting to be configured directly via the user interface.

GENERAL INFORMATION

Recommended installation height	4m to 15m+ 13' to 49'+
Circle Light label	Score ≥90 - The product fully meets circular economy requirements
Driver included	Yes
CE mark	Yes
ENEC certified	Yes
ENEC+ certified	Yes
Zhaga-D4i certified	Yes
UKCA marking	Yes
Testing standard	EN 60598-1 IEC TR 62778 EN 62262 LM 79-08 (all measurements in ISO17025 accredited laboratory) LM 80 (all measurements in ISO17025 accredited laboratory)

HOUSING AND FINISH

Housing	Aluminium
Optic	PMMA
Protector	Tempered glass
Housing finish	Polyester powder coating
Standard colour(s)	AKZO grey 900 sanded
Tightness level	IP 66
Impact resistance	IK 09
Vibration test	Compliant with ANSI C 136-31 standard, 3G load Compliant with modified IEC 68-2-6 (0.5G)
Access for maintenance	Tool-less access to gear compartment

OPERATING CONDITIONS

Operating temperature range (Ta)	-40°C up to +50°C / -40° F up to 122°F
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· Depending on the luminaire configuration. For more details, please contact us.

ELECTRICAL INFORMATION

Electrical class	I, II
Nominal voltage	220-240V AC – 50-60Hz
Surge protection options (kV)	10
Electromagnetic compatibility (EMC)	EN 55015 / EN 61000-3-2 / EN 61000-3-3 / EN 61547
Control protocol(s)	1-10V, DALI
Control options	AmpDim, Bi-power, Custom dimming profile, Photocell, Remote management
Socket	Zhaga (optional) NEMA 7-pin (optional)
Associated control system(s)	Schröder EXEDRA
Sensor	PIR (optional)

OPTICAL INFORMATION

LED colour temperature	2200K (WW 722) 2700K (WW 727) 3000K (WW 730) 3000K (WW 830) 4000K (NW 740) 5700K (CW 757)
Colour rendering index (CRI)	>70 (WW 722) >70 (WW 727) >70 (WW 730) >80 (WW 830) >70 (NW 740) >70 (CW 757)
ULOR	0%
ULR	0%

· ULOR may be different according to the configuration. Please consult us.

· ULR may be different according to the configuration. Please consult us.

LIFETIME OF THE LEDS @ TQ 25°C

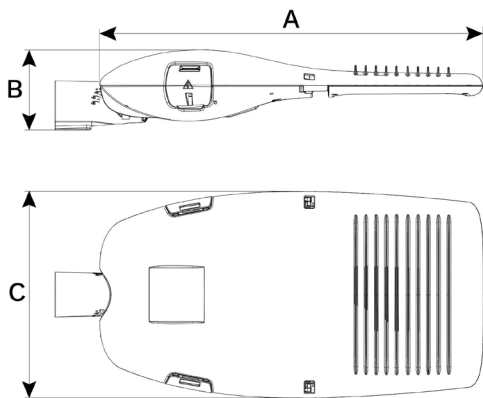
All configurations	100,000h - L95
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· Lifetime may be different according to the size/configurations. Please consult us.

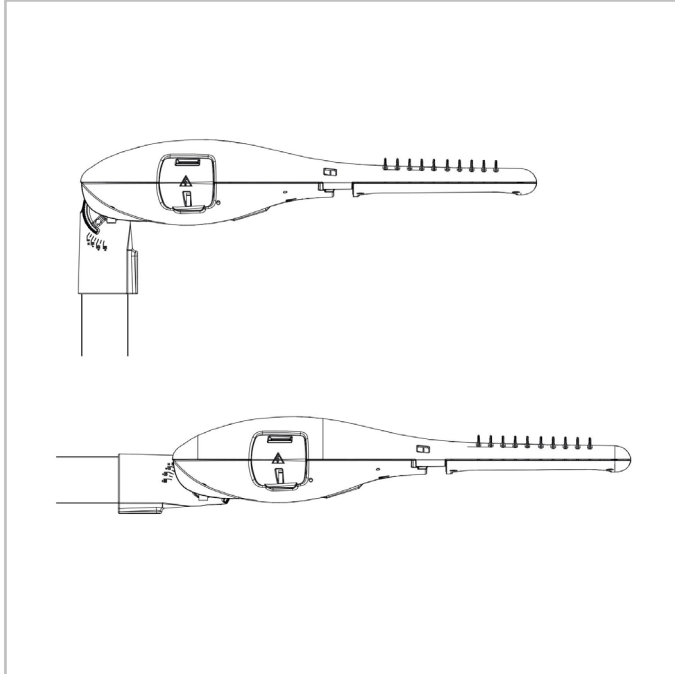
DIMENSIONS AND MOUNTING

AxBxC (mm inch)	AMPERA EVO 1 : 524x128x308 20.6x5.0x12.1 AMPERA EVO 3 : 679x143x365 26.7x5.6x14.4
Weight (kg lbs)	AMPERA EVO 1 : 5.9-7.3 13.0-16.1 AMPERA EVO 3 : 8.9-10.4 19.6-22.9
Aerodynamic resistance (CxS)	AMPERA EVO 1 : 0.04 AMPERA EVO 3 : 0.04
Mounting possibilities	Side-entry slip-over – Ø32mm Side-entry slip-over – Ø42mm Side-entry slip-over – Ø48mm Side-entry slip-over – Ø60mm Side-entry penetrating – Ø60mm Post-top slip-over – Ø32mm Post-top slip-over – Ø42mm Post-top slip-over – Ø48mm Post-top slip-over – Ø60mm Post-top slip-over – Ø76mm Post-top penetrating – Ø60mm

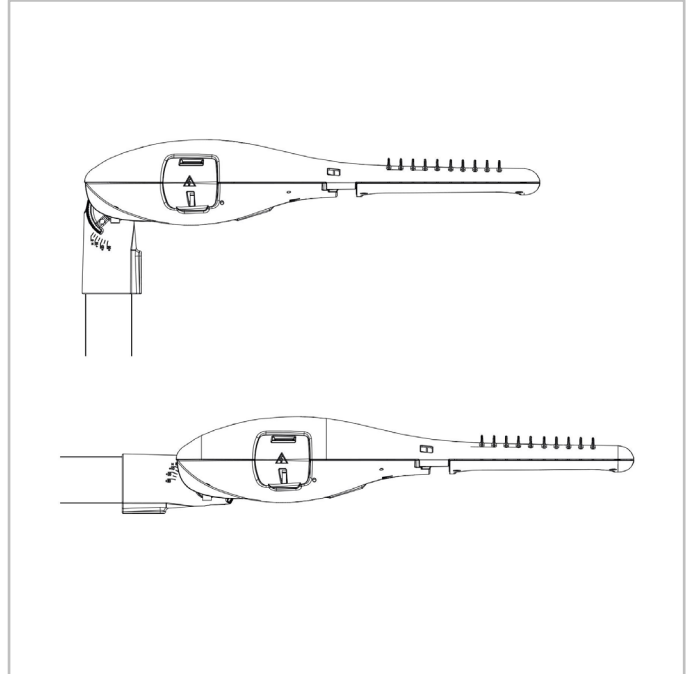
· For more information about mounting possibilities, please consult the installation sheet.



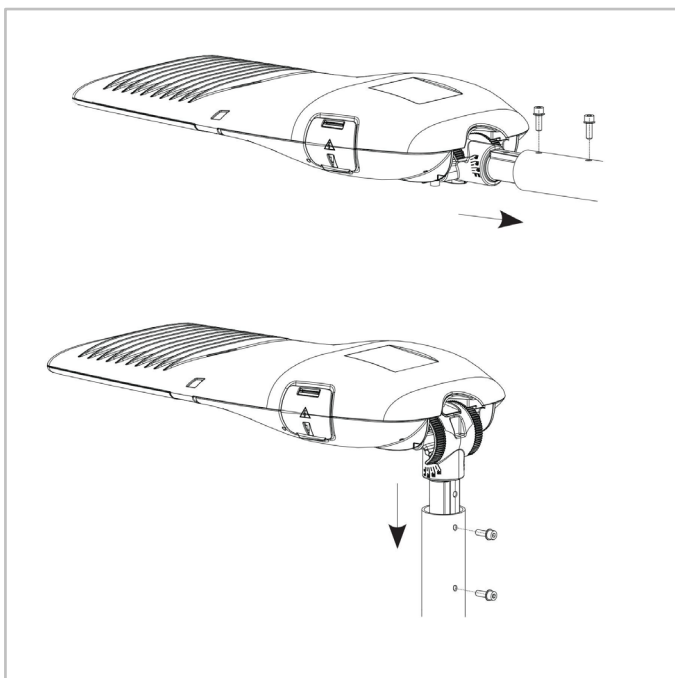
AMPERA EVO | Slip-over mounting for Ø32-60mm spigot - 2xM10 screws



AMPERA EVO | Slip-over mounting for Ø32-76mm spigot - 2xM10 screws



AMPERA EVO | Penetrating fixation for Ø60mm spigot - 2xM8 screws





Luminaire	Number of LEDs	Current (mA)	Luminaire output flux (lm) Warm White 722		Luminaire output flux (lm) Warm White 727		Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Warm White 830		Luminaire output flux (lm) Neutral White 740		Luminaire output flux (lm) Cool White 757		Power consumption (W)	Luminaire efficacy (lm/W)	Photometry
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max			
AMPERA EVO 1	10	200	600	700	700	800	800	900	700	900	800	1000	800	1000	7.8	128	
	10	300	900	1100	1000	1200	1200	1400	1100	1300	1200	1500	1200	1400	10.8	139	
	10	350	1000	1200	1200	1400	1300	1600	1200	1500	1400	1700	1400	1600	12.3	138	
	10	400	1200	1400	1400	1600	1500	1800	1400	1700	1600	1900	1500	1800	13.8	138	
	10	500	1400	1700	1700	2000	1800	2200	1700	2000	1900	2300	1900	2200	17	135	
	10	600	1700	2000	1900	2300	2100	2500	2000	2400	2200	2700	2200	2600	20.4	132	
	10	700	1900	2200	2200	2600	2400	2800	2200	2700	2500	3000	2500	2900	23.6	127	
	10	800	2100	2500	2400	2900	2600	3100	2500	2900	2800	3300	2700	3200	26.9	123	
	10	870	2200	2600	2600	3000	2800	3300	2600	3100	3000	3500	2900	3400	29.4	119	
	20	200	1300	1500	1500	1700	1600	1900	1500	1800	1700	2000	1700	2000	13.8	145	
	20	300	1900	2200	2100	2500	2400	2800	2200	2600	2500	3000	2400	2900	19.8	152	
	20	350	2100	2500	2500	2900	2700	3200	2500	3000	2900	3400	2800	3300	22.9	148	
	20	400	2400	2900	2800	3300	3000	3600	2900	3400	3200	3800	3100	3700	25.9	147	
	20	500	2900	3500	3400	4000	3700	4400	3500	4100	3900	4600	3800	4500	32.3	142	
	20	600	3400	4000	3900	4600	4300	5100	4000	4800	4500	5400	4400	5200	38.9	139	
	20	700	3800	4500	4400	5200	4800	5700	4500	5400	5100	6100	5000	5900	45.5	134	
	20	800	4200	5000	4900	5800	5300	6300	5000	5900	5600	6700	5500	6500	52.5	128	
	20	870	4500	5300	5200	6100	5700	6700	5300	6300	6000	7100	5800	6900	57	125	
	30	200	1900	2300	2200	2600	2400	2900	2300	2700	2600	3100	2500	3000	19.1	162	
	30	300	2800	3300	3200	3800	3600	4200	3300	4000	3800	4500	3700	4400	28.2	160	
	30	350	3200	3800	3700	4400	4100	4800	3800	4600	4300	5100	4200	5000	32.9	155	
	30	400	3600	4300	4200	5000	4600	5400	4300	5100	4900	5800	4700	5600	37.5	155	
	30	500	4400	5200	5100	6000	5500	6600	5200	6200	5900	7000	5700	6800	47	149	
	30	600	5100	6100	5900	7000	6400	7600	6100	7200	6800	8100	6700	7900	56.5	143	
30	700	5800	6800	6600	7900	7300	8600	6800	8100	7700	9100	7500	8900	66.5	137		
30	800	6400	7500	7300	8700	8000	9500	7500	8900	8500	10100	8300	9800	76	133		
30	870	6800	8000	7800	9200	8500	10100	8000	9500	9000	10700	8800	10400	86	124		

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %



Luminaire	Number of LEDs	Current (mA)	Luminaire output flux (lm) Warm White 722		Luminaire output flux (lm) Warm White 727		Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Warm White 830		Luminaire output flux (lm) Neutral White 740		Luminaire output flux (lm) Cool White 757		Power consumption (W)	Luminaire efficacy (lm/W)	Photometry
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max			
AMPERA EVO 1	40	200	2600	3100	3000	3500	3300	3900	3100	3700	3500	4100	3400	4000	25.9	158	
	40	300	3800	4500	4300	5100	4800	5600	4500	5300	5000	6000	4900	5800	37.8	159	
	40	350	4300	5100	5000	5900	5500	6500	5100	6100	5800	6900	5600	6700	44	157	
	40	400	4900	5800	5600	6600	6100	7300	5800	6800	6500	7700	6300	7500	50	154	
	40	500	5900	7000	6800	8000	7400	8800	7000	8300	7800	9300	7600	9100	62	150	
	40	600	6800	8100	7900	9300	8600	10200	8100	9600	9100	10800	8900	10500	76	142	
	40	700	7700	9100	8900	10500	9700	11500	9100	10800	10300	12200	10000	11900	88	139	
	40	800	8500	10100	9800	11600	10700	12700	10100	11900	11300	13500	11100	13100	101	134	
	40	870	9000	10700	10400	12300	11400	13500	10700	12700	12000	14300	11700	13900	110	130	
	48	100	-	-	-	-	2000	2100	-	-	2100	2200	-	-	15.9	138	
	48	117	-	-	-	-	2300	2400	-	-	2500	2600	-	-	18.4	141	
	48	133	-	-	-	-	2600	2800	-	-	2800	2900	-	-	20.9	139	
	48	167	-	-	-	-	3200	3300	-	-	3400	3500	-	-	26.2	134	
	48	200	-	-	-	-	3700	3900	-	-	3900	4100	-	-	31.7	129	
	48	233	-	-	-	-	4200	4400	-	-	4500	4600	-	-	37.3	123	
	48	266	-	-	-	-	4700	4900	-	-	4900	5100	-	-	44	116	
	48	300	-	-	-	-	5100	5300	-	-	5300	5600	-	-	50	112	
	96	100	-	-	-	-	4100	4300	-	-	4300	4500	-	-	29.8	151	
	96	117	-	-	-	-	4700	4900	-	-	5000	5200	-	-	34.8	149	
	96	133	-	-	-	-	5300	5600	-	-	5600	5800	-	-	39.8	146	
96	167	-	-	-	-	6500	6700	-	-	6800	7100	-	-	50	142		
96	200	-	-	-	-	7500	7900	-	-	7900	8300	-	-	61	136		
96	233	-	-	-	-	8500	8900	-	-	9000	9300	-	-	72	129		
96	266	-	-	-	-	9400	9800	-	-	9900	10300	-	-	84	123		
96	300	-	-	-	-	10200	10600	-	-	10700	11200	-	-	96	117		

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %



Luminaire	Number of LEDs	Current (mA)	Luminaire output flux (lm) Warm White 722		Luminaire output flux (lm) Warm White 727		Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Warm White 830		Luminaire output flux (lm) Neutral White 740		Luminaire output flux (lm) Cool White 757		Power consumption (W)	Luminaire efficacy (lm/W)	Photometry
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max			
AMPERA EVO 3	40	200	2600	3100	3000	3500	3300	3900	3100	3600	3500	4100	3400	4000	25.9	158	LENSO FLEX ⁴
	40	300	3800	4400	4300	5100	4800	5600	4500	5300	5000	5900	4900	5800	37.8	156	LENSO FLEX ⁴
	40	350	4300	5100	5000	5900	5500	6400	5100	6000	5800	6800	5600	6600	44	155	LENSO FLEX ⁴
	40	400	4900	5700	5600	6600	6200	7200	5800	6800	6500	7600	6400	7500	50	152	LENSO FLEX ⁴
	40	500	5900	6900	6800	8000	7400	8700	7000	8200	7900	9300	7700	9000	62	150	LENSO FLEX ⁴
	40	600	6900	8000	7900	9300	8600	10100	8100	9500	9200	10700	8900	10500	76	141	LENSO FLEX ⁴
	40	700	7700	9100	8900	10400	9700	11400	9200	10700	10300	12100	10100	11800	88	138	LENSO FLEX ⁴
	40	800	8500	10000	9800	11500	10800	12600	10100	11900	11400	13400	11100	13000	101	133	LENSO FLEX ⁴
	40	900	9300	10900	10700	12500	11700	13700	11000	12900	12400	14500	12100	14100	118	123	LENSO FLEX ⁴
	40	1000	9900	11600	11400	13400	12500	14700	11800	13800	13200	15500	12900	15100	132	117	LENSO FLEX ⁴
	50	200	3300	3800	3800	4400	4100	4800	3900	4500	4400	5100	4300	5000	31.8	160	LENSO FLEX ⁴
	50	300	4700	5500	5400	6400	6000	7000	5600	6600	6300	7400	6200	7200	46.5	159	LENSO FLEX ⁴
	50	350	5400	6400	6200	7300	6800	8000	6400	7500	7300	8500	7100	8300	54	157	LENSO FLEX ⁴
	50	400	6100	7200	7000	8200	7700	9000	7200	8500	8200	9600	8000	9300	61.5	156	LENSO FLEX ⁴
	50	500	7400	8700	8500	10000	9300	10900	8800	10300	9900	11600	9600	11300	77	151	LENSO FLEX ⁴
	50	600	8600	10100	9900	11600	10800	12700	10200	11900	11500	13400	11200	13100	93	144	LENSO FLEX ⁴
	50	700	9700	11400	11100	13100	12200	14300	11500	13400	12900	15200	12600	14800	109	139	LENSO FLEX ⁴
	50	800	10700	12500	12300	14400	13500	15800	12700	14800	14300	16700	13900	16300	127	131	LENSO FLEX ⁴
	50	900	11600	13600	13300	15600	14600	17100	13700	16100	15500	18100	15100	17700	145	125	LENSO FLEX ⁴
	50	1000	12400	14600	14300	16700	15600	18300	14700	17200	16600	19400	16100	18900	163	119	LENSO FLEX ⁴
	60	200	3900	4600	4500	5300	5000	5800	4700	5500	5300	6200	5100	6000	37.8	164	LENSO FLEX ⁴
	60	300	5700	6700	6500	7700	7200	8400	6700	7900	7600	8900	7400	8700	55	162	LENSO FLEX ⁴
	60	350	6500	7700	7500	8800	8200	9600	7700	9100	8700	10200	8500	10000	64	159	LENSO FLEX ⁴
	60	400	7300	8600	8400	9900	9200	10800	8700	10200	9800	11500	9500	11200	73	158	LENSO FLEX ⁴
	60	500	8800	10400	10200	11900	11100	13100	10500	12300	11800	13800	11500	13500	92	150	LENSO FLEX ⁴
	60	600	10200	12000	11800	13800	12900	15100	12100	14200	13700	16000	13300	15600	112	143	LENSO FLEX ⁴
	60	700	11500	13500	13300	15500	14500	17000	13600	16000	15400	18000	15000	17600	131	137	LENSO FLEX ⁴
	60	800	12700	14900	14600	17100	16000	18700	15000	17600	16900	19800	16500	19300	151	131	LENSO FLEX ⁴
	70	200	4600	5400	5300	6200	5800	6800	5500	6400	6100	7200	6000	7000	43.5	166	LENSO FLEX ⁴
	70	300	6600	7800	7600	9000	8400	9800	7900	9200	8900	10400	8700	10100	63.5	164	LENSO FLEX ⁴
	70	350	7600	8900	8800	10300	9600	11300	9000	10600	10200	11900	9900	11600	74	161	LENSO FLEX ⁴
	70	400	8600	10000	9800	11500	10800	12600	10100	11900	11400	13400	11100	13100	85	158	LENSO FLEX ⁴
70	500	10300	12100	11900	13900	13000	15300	12200	14300	13800	16200	13400	15800	106	153	LENSO FLEX ⁴	
70	600	12000	14000	13800	16100	15100	17700	14200	16600	16000	18700	15600	18200	129	145	LENSO FLEX ⁴	
70	700	13500	15800	15500	18100	16900	19900	15900	18700	18000	21000	17500	20500	152	138	LENSO FLEX ⁴	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %



Luminaire	Number of LEDs	Current (mA)	Luminaire output flux (lm) Warm White 722		Luminaire output flux (lm) Warm White 727		Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Warm White 830		Luminaire output flux (lm) Neutral White 740		Luminaire output flux (lm) Cool White 757		Power consumption (W)	Luminaire efficacy (lm/W)	Photometry
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max			
AMPERA EVO 3	70	830	15200	17800	17500	20500	19100	22400	18000	21100	20300	23800	19800	23200	180	132	LENSO FLEX ⁴
	80	200	5300	6200	6000	7100	6600	7800	6200	7300	7000	8200	6800	8000	47.5	173	LENSO FLEX ⁴
	80	300	7600	8900	8700	10200	9600	11200	9000	10600	10100	11900	9900	11600	72	165	LENSO FLEX ⁴
	80	350	8700	10200	10000	11800	11000	12900	10300	12100	11600	13600	11300	13300	84	162	LENSO FLEX ⁴
	80	400	9800	11500	11200	13200	12300	14400	11600	13600	13100	15300	12700	14900	96	159	LENSO FLEX ⁴
	80	500	11800	13800	13600	15900	14900	17400	14000	16400	15700	18500	15300	18000	121	153	LENSO FLEX ⁴
	80	600	13700	16000	15700	18400	17200	20200	16200	19000	18200	21400	17800	20800	147	146	LENSO FLEX ⁴
	80	730	15800	18600	18200	21300	19900	23400	18800	22000	21100	24800	20600	24100	182	136	LENSO FLEX ⁴
	96	67	-	-	-	-	2900	3000	-	-	3000	3200	-	-	20	160	MID FLEX ⁴
	96	100	-	-	-	-	4200	4400	-	-	4500	4600	-	-	29.8	154	MID FLEX ⁴
	96	117	-	-	-	-	4900	5000	-	-	5100	5300	-	-	34.8	152	MID FLEX ⁴
	96	133	-	-	-	-	5500	5700	-	-	5800	6000	-	-	39.8	151	MID FLEX ⁴
	96	167	-	-	-	-	6600	6900	-	-	7000	7200	-	-	50	144	MID FLEX ⁴
	96	200	-	-	-	-	7700	8000	-	-	8100	8400	-	-	61	138	MID FLEX ⁴
	96	233	-	-	-	-	8700	9000	-	-	9200	9500	-	-	72	132	MID FLEX ⁴
	96	267	-	-	-	-	9600	10000	-	-	10100	10500	-	-	84	125	MID FLEX ⁴
	96	300	-	-	-	-	10100	10500	-	-	10700	11000	-	-	92	120	MID FLEX ⁴
	144	67	-	-	-	-	4400	4500	-	-	4600	4800	-	-	30.4	158	MID FLEX ⁴
	144	100	-	-	-	-	6400	6600	-	-	6700	6900	-	-	44.5	155	MID FLEX ⁴
	144	117	-	-	-	-	7300	7600	-	-	7700	8000	-	-	52	154	MID FLEX ⁴
	144	133	-	-	-	-	8200	8500	-	-	8700	9000	-	-	59	153	MID FLEX ⁴
	144	167	-	-	-	-	10000	10400	-	-	10500	10900	-	-	74	147	MID FLEX ⁴
	144	200	-	-	-	-	11600	12000	-	-	12200	12700	-	-	91	140	MID FLEX ⁴
	144	233	-	-	-	-	13100	13500	-	-	13700	14200	-	-	107	133	MID FLEX ⁴
	144	267	-	-	-	-	14500	15000	-	-	15200	15800	-	-	126	125	MID FLEX ⁴
	144	300	-	-	-	-	15700	16300	-	-	16500	17100	-	-	145	118	MID FLEX ⁴
	192	67	-	-	-	-	5800	6000	-	-	6100	6400	-	-	39.7	161	MID FLEX ⁴
	192	100	-	-	-	-	8500	8800	-	-	9000	9300	-	-	58	160	MID FLEX ⁴
	192	117	-	-	-	-	9800	10100	-	-	10300	10700	-	-	68	157	MID FLEX ⁴
	192	133	-	-	-	-	11000	11400	-	-	11600	12000	-	-	78	154	MID FLEX ⁴
	192	167	-	-	-	-	13300	13800	-	-	14000	14500	-	-	98	148	MID FLEX ⁴
	192	200	-	-	-	-	15500	16100	-	-	16300	16900	-	-	120	141	MID FLEX ⁴
	192	233	-	-	-	-	17500	18100	-	-	18400	19100	-	-	142	135	MID FLEX ⁴
192	270	-	-	-	-	19500	20200	-	-	20500	21200	-	-	167	127	MID FLEX ⁴	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

