

THORN



Clan & Plurio LED

Bringing harmony to urban and residential lighting





Clan & Plurio LED

Lighting – Your demanding design brief

Today's urban planner faces lighting demands undreamt of even a decade ago. It is no longer sufficient to provide orientation and security after dark. There is little point in providing the most energy efficient neighbourhood if its not an attractive place to live. Sustainability is now recognised as one of the most influential factors in the successful completion of many projects. This covers not only the environmental dimension, but also the social and human aspects in terms of creating cohesive, urban developments.

Here are some of the requirements taken from recent urban masterplans:

Environmental

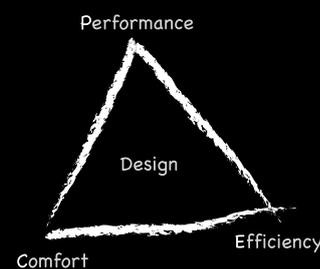
- Avoid obtrusive light
- Decrease the energy bill and CO₂ footprint
- Be cost efficient, easy to operate and maintain
- Provide good quality white light

Social

- Enhance urban and residential security and safety
- Add visual coherence to the urban landscape
- Strengthen local identity by revealing the character and heritage of focal points and landmarks
- Enhance the social dimension and stimulate the evening economy
- Reduce intrusion into residential spaces

Thorn's stylish response – Clan and Plurio LED

An emphasis on sustainability has led to the development of the Clan collection. Clan presents a portfolio linked by a single consistent design theme to give great scope to the landscape architect and designer. Together with the Plurio LED lantern it is an essential element in bringing performance, efficiency and comfort (PEC) to urban spaces.



At Thorn we recognise our sustainability responsibilities, and with the **PEC** programme we have introduced a wide-ranging philosophy that underpins our approach to lighting design and implementation. The programme is based on the principle that performance, efficiency and comfort determine the visual effectiveness of lighting.

Performance: Providing the best visual effectiveness

Efficiency: Conserving energy and effort, reducing CO₂ emissions and waste, providing lighting that is practical and efficient to install, operate and maintain

Comfort: giving people satisfaction and stimulation

These key attributes are demonstrated throughout this brochure.

A night scene of a narrow urban courtyard. The buildings are dark with white line-art outlines overlaid on them. A dog is walking on the cobblestone path in the foreground. Two people are walking away in the middle ground. The sky is dark with some stars. The overall mood is quiet and atmospheric.

CREATE A NIGHT TIME
IDENTITY

MAKE NARROW URBAN
SCENES MORE INVITING
WITH DISCREET CLAN
WALL BRACKETS

PROVIDES ORIENTATION
AND AMBIENCE

A global approach to enhance the city

In some respects lighting a city is like a musical composition. It's all about the interrelated organisation of tones, forms, rhythms and harmony. Be they fast or slow, simple or complex.



Clan C on Deco wall bracket



Detail of bracket



Clan C LED 3000lm 39W street

In the past, planners and architects have enjoyed considerable freedom of choice for façade and ground recessed lighting styles; yet the range of complimentary brackets and lanterns has been limited and lacking design flair. Clan enables the designer to achieve a fully integrated design and build a co-ordinated lighting scheme.

The use of Clan C, mounted on Deco wall bracket, and equipped with LED engines illuminates the street, uniformly and discreetly, without affecting accessibility.

The lanterns which create no upward or backward spill light provide the perfect distribution for facial recognition by pedestrians and CCTV technology.

Co-ordinated with the general ambient lighting Mica LED recessed luminaires and Milo floodlights add visual appeal and contribute immeasurably to the 'feel' of the street.

So whatever your requirements in urban lighting design, combinations of Clan and other Thorn ranges can guide and reassure you, making the place your own.



Other products used: Mica LED in ground and Milo to illuminate the niche on the façade.

TAKE THE CONTROL OF
YOUR INSTALLATION

DIMMING IS
STANDARD WITH
CONVENTIONAL
LAMPS AND LEDS

WITH LEDS,
50% DIMMING
= 50% LIGHT LEVEL
= 50% ENERGY SAVED

Decrease your energy bill and CO₂ footprint

The key to reducing your CO₂ footprint in lighting is efficient operation.



Clan C mounted on Archi twin bracket



Detail of bracket



Clan C LED 5000lm 58W street

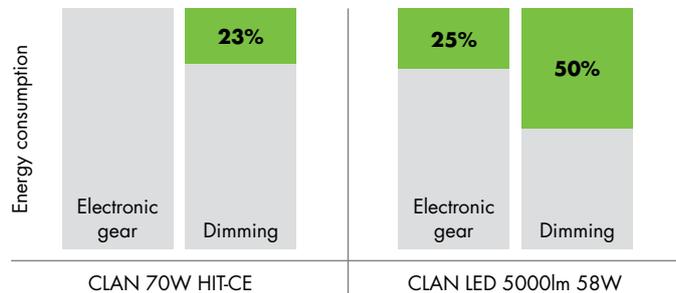
Efficient operation

Outdoor lighting accounts for 40 per cent of a city's electrical spend. This can be greatly reduced by the design of luminaire optics and the selection of the lamp and ballast combination. Indeed, Europe could save 3.5 million tonnes of CO₂ by switching to more efficient street lighting.

With Clan featuring new generations of optical systems, light sources, gears and lighting controls, you can achieve up to 50% energy savings on current aged installations without compromising on lighting levels and the quality of light according to the relevant lighting standards (e.g EN13 201).

The dimming function available with 70W HID lamps and LEDs enables further savings up to 50% with LEDs compared with conventional lamps (see graph below).

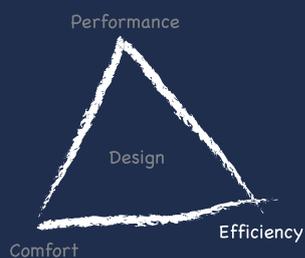
Potential energy savings with Clan 70W HIT-CE vs 58W LED



Example based on the fact that a 5000lm LED 58W package can provide the same spacings as a 70W HIT-CE in a standard pedestrian street (S2 project). More information about dimming with LEDs p.30



Additionally, the Telea lighting control system (available on request) can provide further comfort in the maintenance management of the installation through central monitoring. For future information please visit www.thornlighting.com/telea





AREA
LIGHTING



PEDESTRIAN
CROSSING
LIGHTING



STREET
LIGHTING



Clan O mounted on Deco twin bracket



Detail view of bracket



Clan O with street optic



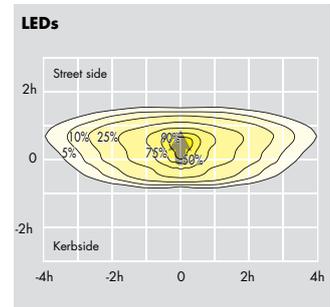
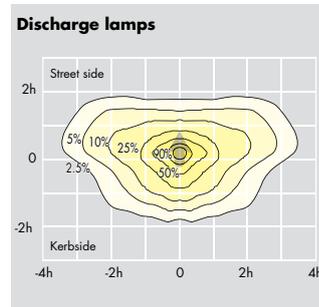
Optical performance and flexibility

A wide range of optics is available, giving great scope to the architect or designer.

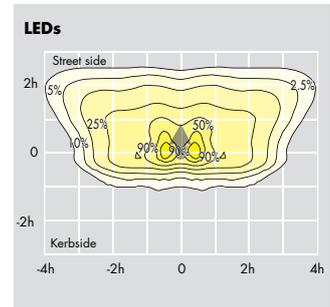
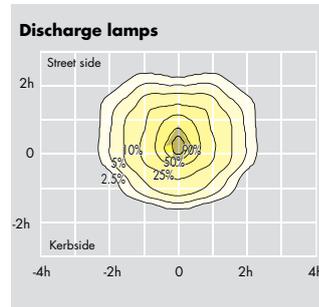
Clan allows you to provide different lighting distributions from a single, consistent design theme.

The optics have been designed around new generations of light sources (LEDs) to ensure light is delivered where it is needed without spill light and using fewer lanterns.

Streets



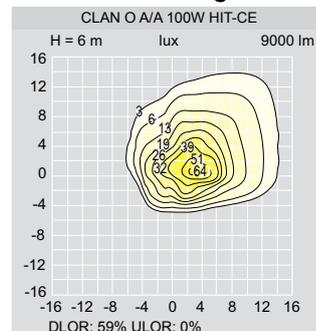
Areas



Precision optical design around individual LEDs gives better spacing and uniformity with LEDs compared to more conventional light sources on pedestrian projects.

More details about LED systems p. 30 & 31.

Pedestrian crossings



For use only with Clan Original and conventional lamps. More details p. 11.



Other products used: Qba LED and Contrast MiniPinSpot floodlights for illumination.



SIGNAL THE
PEDESTRIAN
CROSSING

HIGHLIGHTS THE
PEDESTRIAN
CROSSING AND ITS
SURROUNDS

ENSURE SECURITY
AND SAFETY OF
PEDESTRIANS



Clan O mounted on Archi single bracket



Clan O IVS



IVS flash node



CREATE VERTICAL
ILLUMINANCE FOR
AMBIANCE AND
GUIDANCE FOR
PEDESTRIANS AND
CYCLISTS

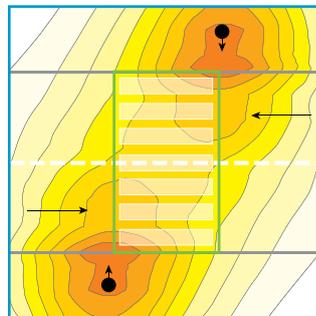
Making pedestrian crossings safer without compromising energy and visual urban scape

Each year more than 8,000 pedestrians are killed in road accidents in Europe... almost 1 in 4 of these on a pedestrian crossing*.

Better lighting is the easiest and most efficient way to reduce this issue. With the IVS (Identification Visibility Safety) system, pedestrian safety is enhanced by a dedicated double asymmetric optic – suitable for the Clan body - and the use of additional signalling, making it easy for drivers to see pedestrians on the footway and kerb from a distance, while pedestrians are able to clearly view the footway surface, obstructions and other pedestrians.

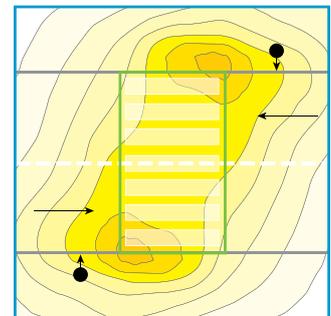
Mounted at the same height (between 4 and 6m), using the same consistent body design throughout the scheme, thus unifying the streetscape.

*Source: EuroTEST – FIA Foundation 2008



	The Predecessor Solution CP400 2 x HIT 250W 19000lm Height: 5m
Uave	0.7
Eave	136lx
W	500

NB: At 6m high: Uave = 0.9! Eave = 99lx



	IVS 2 x HIT 150W 12500lm Height: 5m
	0.7
	121lx
	300

Thanks to its purpose made, highly efficient, 150W optic, IVS maintains excellent uniformity and illuminance levels, **while reducing the installed power by 40%**



Other products used: Alumat Control Indirect

COMPACT LIGHTING
ENGINES WHICH
DISAPPEAR IN THE
LANDSCAPE

RESPECTING
THE PRIVACY OF
RESIDENTS BY
REDUCING LIGHT
TRESPASS



Clan C mounted on Archi wall bracket



Clan C with asymmetrical optic mounted on Archi single bracket

ASYMMETRIC
DISTRIBUTION
TO ENHANCE
ACCESSABILITY



Access for all

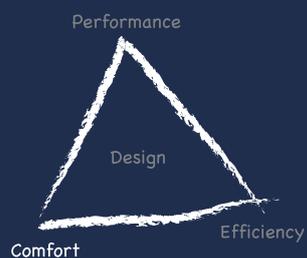
The heart of a town is complex and crowded. The mix of vehicles, street furniture and pedestrians creates a challenge, for children, the elderly and the less able.

With Clan there is scope to create free, open spaces and uncluttered streets while still providing light, thus increasing the activity and access of the street and encouraging a more balanced community.

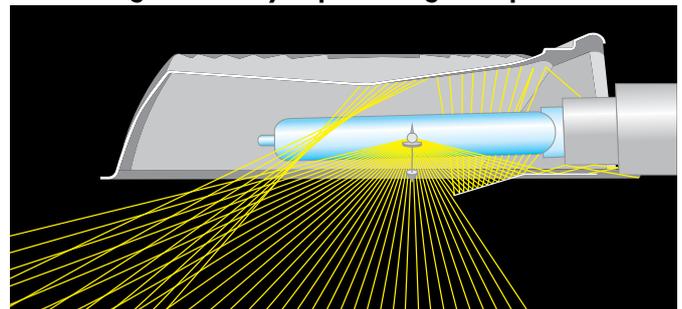
- Enhancing visibility: in the pedestrian walkways of car parks for example, Clan and Plurio can provide the required illumination level with optimal spacing thanks to clever optics.
- Careful positioning of Clan frees up central space and eases circulation. Clan can also be catenary mounted.
- Efficient optics and shielding accessories are available to guarantee the best performance and comfort.



Street optic with anti backlight accessory



Anti backlight accessory to prevent light trespass



This accessory can be mounted on Clan O or Clan C with street and asymmetrical optics.

RESPECTING THE PRIVACY
OF RESIDENCE WITH THE
STREET DISTRIBUTION

PRESERVE THE
NIGHTSCAPE

SAVE UP TO 74%
ENERGY VS MERCURY
SOLUTIONS

SAVE UP
TO 72% VS
CONVENTIONAL
HID SOLUTIONS



Plurio O LED street



Plurio street optic



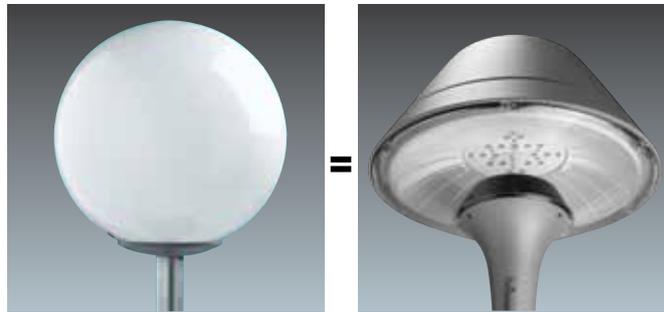
Plurio step column with decorative finial

Decrease your energy bill whilst preserving the nightscape and the privacy of residents

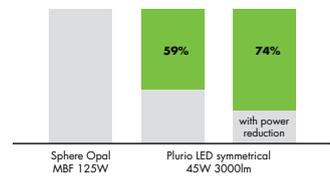
In residential and urban outskirts spaces, thousands of inefficient lighting solutions continue to waste resources and create obtrusive light.

Opal spheres using mercury lamps, will be discontinued in 2015 according to the Erp Directive. Plurio LED is the eco-friendly response for these applications.

Open pedestrian areas



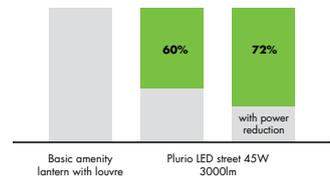
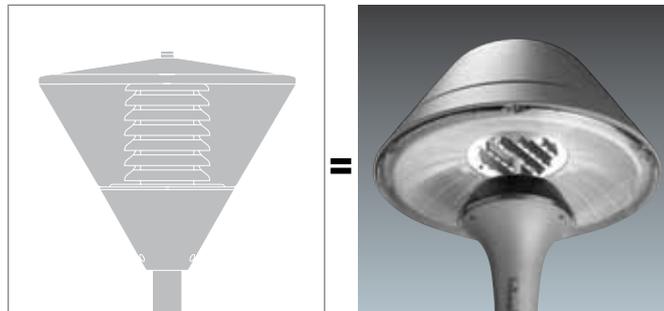
Potential energy saving with Plurio LED vs Opal Sphere



Project:
S4 Spacings: 15m
Height of light source: 4m,
Maintenance factor at installation: 0,7

Plurio LED 45W Symmetric can achieve the same spacings as an opal Sphere 125W HME in a standard pedestrian area. Replacing 10 opal spheres by 10 Plurio LED using power reduction gear over 10 years can save you 17.7 tCO₂ which equates to planting 584 large trees!

Residential streets and paths



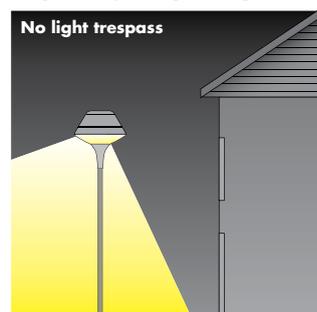
Project:
Street width: 7m
Column at 1m from street Height of light source: 4m, S4,
Spacings: 25m,
Maintenance factor at installation: 0,7)

Plurio LED 45W Street can achieve the same spacings as a basic decorative lantern with louvre, equipped with a 100W discharge lampe in a standard residential street project. Replacing 10 basic lanterns by 10 Plurio LED using power reduction gear over 10 years can save you 13.3 tCO₂ which equates to planting 439 large trees!

Preserving the nightscape and respecting the privacy of residence



Plurio with symmetric optic

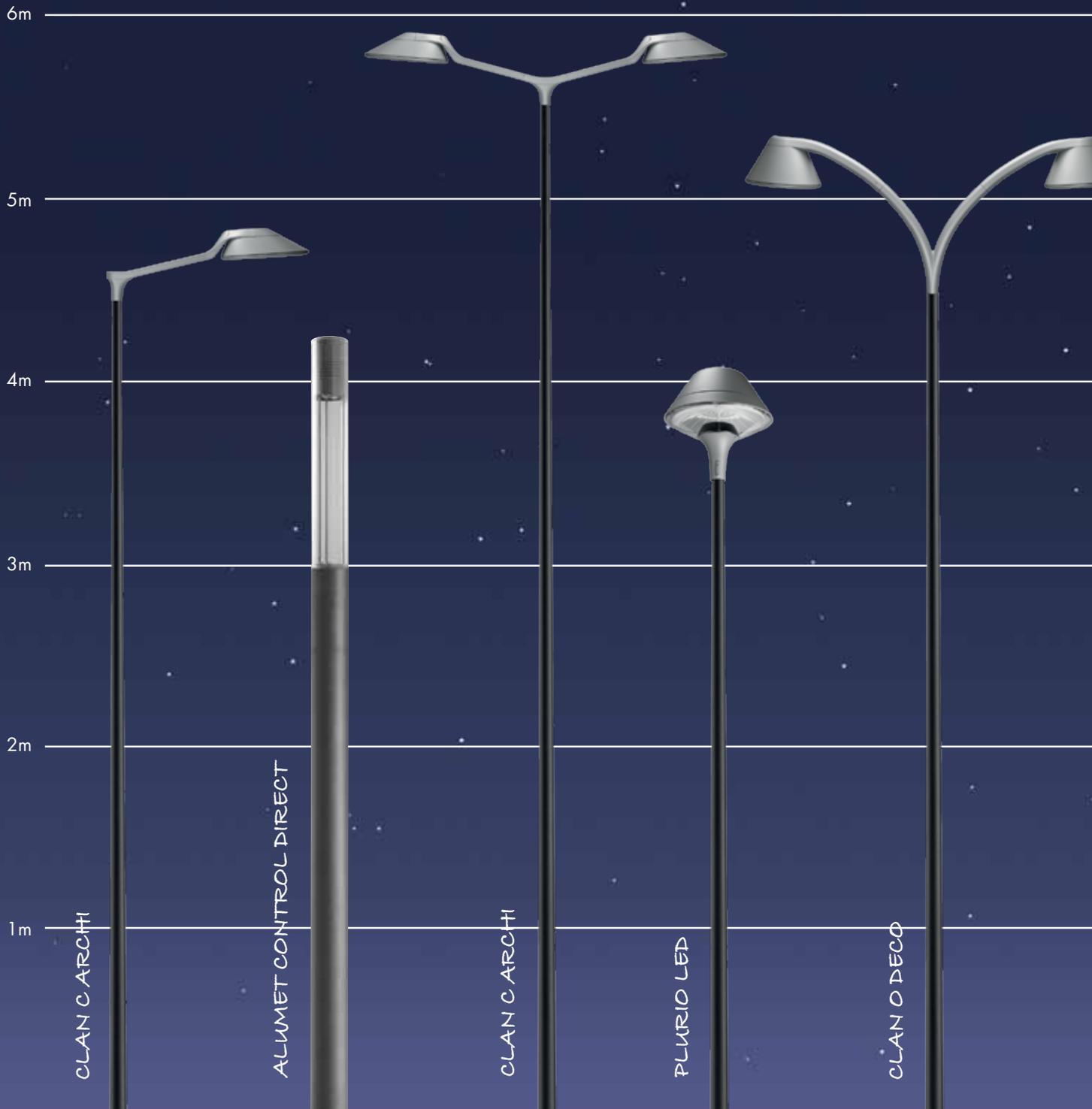


Plurio with street optic

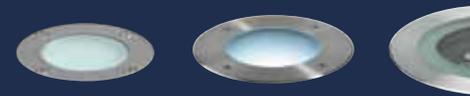
Thanks to a good optical cut off and outstanding control of light (0% upward light), Plurio is also a response to fight against obtrusive light, often called light nuisance or light pollution, this undesired light that enters the window of nearby homes or that is directed or reflected above the horizontal plane that impedes our view of the night sky.



A COORDINATED URBAN PORTFOLIO



E/FACT



MICA

A visual coherence in the urban environment

Thorn's portfolio of complimentary styles

Clan, Plurio, AluMET compliment a variety of Thorn products, together they are an essential element in achieving a harmonious lighting plan for all the areas of a city, from the centre to the suburbs. Equipped with the latest technologies and durable materials they are key to building a successful, coherent and sustainable lighting design.

Distinctive identities vs ease of maintenance

A trade off no longer exists. Now, you can have everything. For instance, you could install a Clan Archi in one area, a Clan Deco in another and a Clan basic package further on. The only difference being the brackets, now the lighting maintenance department needs to store only one type of luminaire instead of two or three previously.

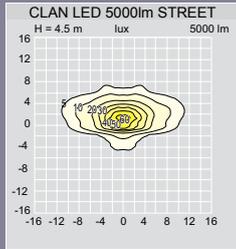
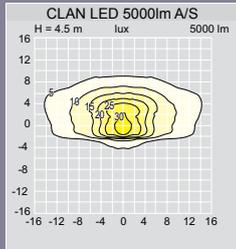
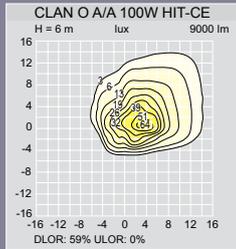
In residential or commercial areas, you can switch from a Plurio Original to a Plurio Round for example. The only difference being the canopy style, plus you need to store only one type of gear for maintenance purposes.

Hence, you preserve the visual coherence of the city while easing the maintenance management.



Clan - The range

- Two designs of lantern + Three bracket collections = 17 possibilities to match a wide scope of applications and tastes
- Three high performance optics : street (Ultra Flat Optic), area and pedestrian crossing (Identification Visibility Safety®) to light all urban spaces with one single unit to achieve visual harmony with the surrounding environment
- Anti-backlight accessory can be mounted, tool free, inside the lantern to meet the comfort needs of inhabitants
- Wide choice of lamps, gears and control packages to optimise energy consumption.
- State of the art LED versions complying with EN 13201 with an expected lifetime of 50,000 h (Ta : 25°C, L80) offering street or asymmetrical lighting distributions
- Resistant (IP66 seal), durable and recyclable materials
- Tool free maintenance of conventional lamps and gear
- Dedicated range of columns and brackets complying with EN 40

3 bracket collections	2 lanterns	3 Optics	2 Lamp Technologies
<p>Deco</p> 	<p>Clan O - Original</p> 	<p>Street lighting</p> 	<p>Conventional (HIT-CE / TC-TEL / CPO / HST)</p> 
<p>Archi</p> 	<p>Clan C - Compact</p> 	<p>Area lighting</p> 	<p>LEDs</p> 
<p>Basic</p> 		<p>Pedestrian crossing (Clan O version only)</p> 	

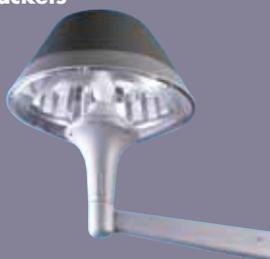
Plurio LED - The range

- Enhancing sustainability and well-being in residential and urban spaces with LEDs
- Two canopy styles to suit given landscapes and tastes
- Original shape matching Clan Original for a harmonious lighting project
- Optimised lifetime of 50 000 h (25°C Ta, L70)
- 3000 lumen/45W LED packages with symmetrical distribution ideal for renovation projects or street distribution when larger spacings are required
- Intelligent overheating protection of LEDs

- State of the art optical system complying with EN 13201
- Canopy prevents obtrusive light (ULOR = 0%)
- Excellent cut off of the asymmetrical version to prevent lighting trespass
- Resistant (IP66 seal), durable and recyclable materials
- Integrated dimming option to optimise energy consumption
- Easy installation and possibility to easily change the gear
- Dedicated range of decorative columns and brackets complying with EN40

2 columns and brackets

Brackets



Columns



2 Lanterns

Original canopy

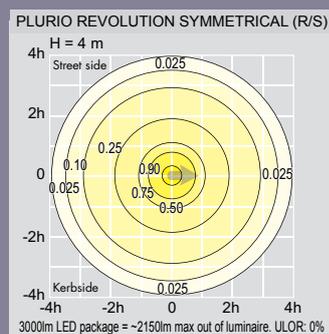


Round canopy

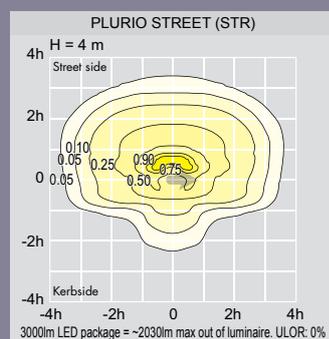


2 Optics

Revolution Symmetrical



Street



Clan - Brackets



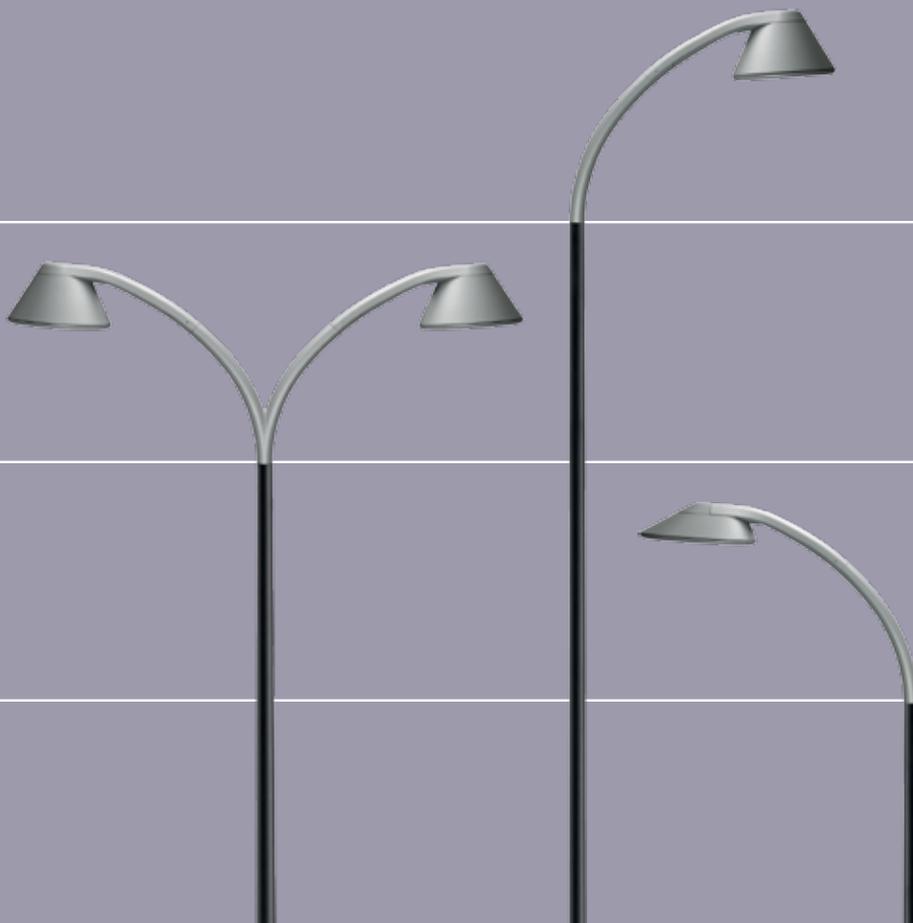
Archi Brackets

Deco Brackets





Basic Brackets



Clan Brackets

- A range of three bracket collections: Deco, Archi and Basic to create various ambiances in the city without compromising on the visual harmony
- Four designs of bracket arms in Archi and Deco collections: single, twin, wall and side outreach.
- All are crafted from cast aluminium.
- Brackets designed with wire pull facility
- Possibility to deliver the brackets pre-wired on request

Materials/Finish

Powder coated silver sanded grey Akzo 150 (close to RAL 9006). Any RAL, Akzo on request.

Installation/Mounting

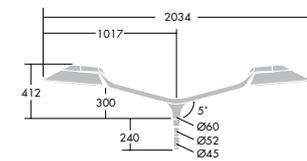
Post top brackets (Basic) for 60mm spigot column. Fixation all brackets by 2 or 4 screws. Tilt angle: 5°

Ordering guide
see pages 26, 29

Clan C with Archi bracket



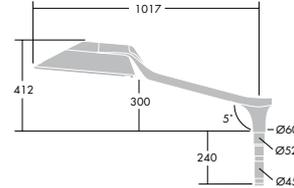
Twin (BRA x 2)



Scx: 0,113m²



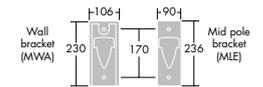
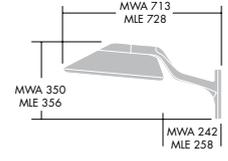
Single (BRA x 1)



Scx: 0,067m²



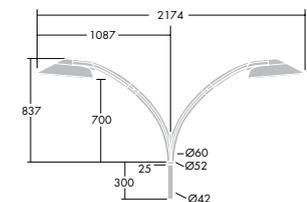
Wall (MWA) or lateral (MLE)



Clan C with Deco bracket



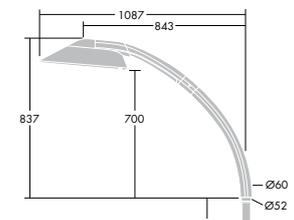
Twin (BRA x 2)



Scx: 0,159m²



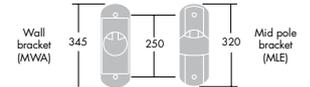
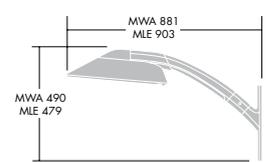
Single (BRA x 1)



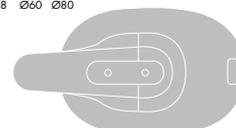
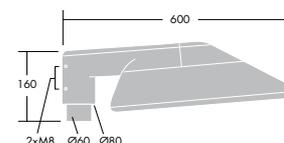
Scx: 0,084m²



Wall (MWA) or lateral (MLE)



Clan C with Basic bracket

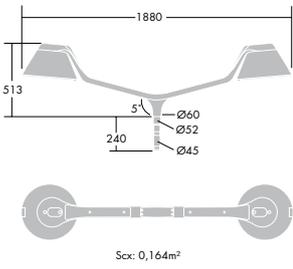


Scx: 0,065m²

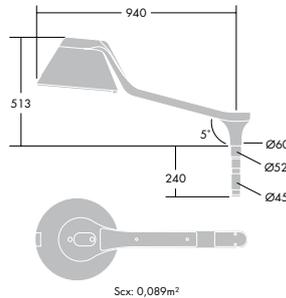
Clan O with Archi bracket



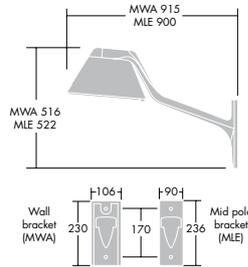
Twin (BRA x 2)



Single (BRA x 1)



Wall (MWA) or lateral (MLE)



- Clan will fit all standard columns but we can also recommend Thorn's design column Konic. Have a look at our column brochure for more information.
- All column packages are designed to the European Standard EN 40

Materials/Finish

We recommend RAL 7043 finish for best match.

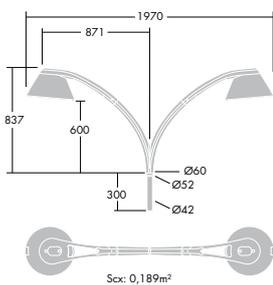
IVS - Pedestrian Crossing

Using the latest advances in LED technology, the IVS system aims to complement road signal legislation by offering highway authorities an additional safety feature: a rapid flashing indicator accessory to further warn road users to yield sooner when approaching the crossing.

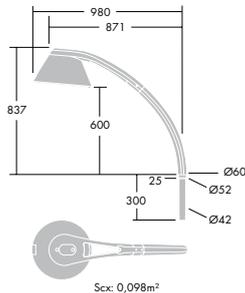
Clan O with Deco bracket



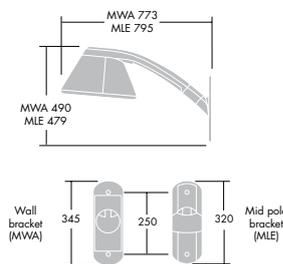
Twin (BRA x 2)



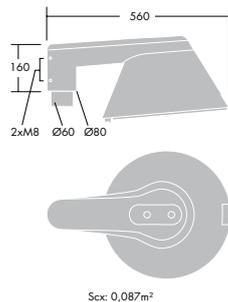
Single (BRA x 1)



Wall (MWA) or lateral (MLE)



Clan O with Basic bracket



IVS - Pedestrian crossing

Clan Lanterns



Lamps

 3000lm LED package
 = ~2900lm max out
 of the luminaire = 39W max
 with driver
 5000lm LED package = ~4350lm
 max out of the luminaire = 58W
 max with driver
 LED colour temperature: Neutral
 white 4200K, CRI : 70
 26/32/42W TC-TEL
 (FSM) compact fluorescent.
 Cap: GX24q-3/4
 50/70W HST/HIE
 (ST/MT). Cap: E27
 50/70/100W HIT-CE
 (MT) ceramic metal halide.
 Cap: E27 ignition 2,5kV
 20/35/70W HIT-CE (MT)
 ceramic metal halide.
 Cap: G12

Materials/Finish

Body: cast aluminium (LM6)
 powder coated silver grey
 textured (Akzo 150, close to
 RAL 9006)
 Enclosure: toughened glass
 Reflector and mirrors (LED version):
 high reflective anodised aluminium
 Screw fixings and clip:
 stainless steel

Installation/Mounting

Fixation of the lantern to
 dedicated brackets via 2 screws
 with safety bolts on the top.
 Recommended heights: from
 3m (with Basic bracket) to 6m,
 height of column to be chosen
 according to the height of the
 bracket, cf tables p. 27 and 29
 Dedicated range of brackets and
 columns, cannot be mounted with
 other brackets.
 Tilt: 5°, given by bracket
 Cable gland for Ø8mm to
 13 mm cable

Conventional lamp versions:
 available prewired with 7m
 HO5-VV F cable, other lengths
 and cable types (e.g: HO7RN-F)
 on request.
 LED versions prewired with 7m
 cable (2x 1,5mm² HO5-VV F or
 HO7RN-F)
 Tool-free access and replacement
 of lamp and gear with handle
 and circuit test key after opening
 of the hinged enclosure.
 All connections are socket type
 with springs.
 Delivered ready to install,
 complete with factory fitted
 integral gear, all supplied in
 one carton (without lamp).

Standards

Designed and manufactured to
 comply with EN 60598-2-3
 Class II electrical
 Ta 25°C (-20° / +35°)
 IP66: Ingress Protection
 IK08: shock resistance
 CE

1.

2.



3.

4.



5.

6.

Installation and maintenance friendly to optimise your operating costs:

1. Fixation with the bracket on the top
2. Automatic disconnection when the cover is open
3. Easy access to lamp and gear
4. The gear tray can be removed without tools for easy maintenance
5. 3 lamp positions
6. Integrated reconnection key to test the lamp at relamping

Ordering guide and photometric data see pages 26, 28

Plurio LED



Lamps

 3000lm LED package =
~2150lm max out of
the luminaire = 45W max with
driver LED colour temperature:
Neutral white 4200K, CRI: 70
Intelligent overheating protection:
Reversible luminous flux reduction
when exceeding $T_a > 28^\circ$,
switch-off for $T_a > 38^\circ\text{C}$
Also available with conventional
lamps (Plurio range)

Standards

Designed and manufactured to
comply with EN 60598-2-3
□ Class II electrical
 $T_a 25^\circ (-20^\circ / + 35^\circ)$
◆ IP66: Ingress Protection
IK08: shock resistance
CE

**Ordering guide and
photometric data see
page 29**

Materials/Finish

Base and canopy made of
aluminium (LM6) powder coated
silver grey 150 textured (close to
RAL 9006) with dark sandy grey
900 (close to RAL 7043) on
bicolour version
Diffuser: clear UV stabilized
polycarbonate with anti glare
prisms on the outer part
Internal reflector and cable
pipe: white highly reflective
ABS (plastic)
Mirrors (asymmetrical version):
high reflective anodised
aluminium
Screw fixings: stainless steel

Installation/Mounting

Post top mounting
Spigot: 60mm (length: 75mm)
Recommended height: 3/4m
Dedicated range of columns
and brackets
Pre-wired versions available with
4m cable
Delivered ready to install, complete
with factory fitted integral gear,
all supplied in one carton



5.

6.

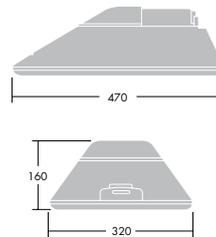
Installation

All in one box

1. No need for the installer to move around the column to fix and centre the lantern base
2. Foam filter to isolate base and avoid condensation
3. Easy connection via terminal block below gear casing
4. The gear is easily placed into the base without need of extra fixation (gear retained by bowl in step 6).
5. Place the bowl/canopy over the base. Make sure that the arrow is on the street side for the street version. Fix via 3 screws using the same tool as used for fixing the base.
6. The LED engine in the head is simply plugged into the base

Clan C Ordering guides (Lanterns, brackets and columns)

For complete fitting, order luminaire, bracket and column.
Lamp to be ordered separately (except LEDs).



Lighting Controls

e-Control is Thorn's initiative to increase the use of dimming and lighting control in products and lighting solutions.



Power control



Radio Frequency

Lanterns

Lamp type : LEDs / Power reduction	ILCOS	Socket	Street optic		Asymmetric optic (A/S)		Street optic with Basic bracket (BRA)		
			Weight (Kg)	SAP Code	Weight (Kg)	SAP Code	Weight (Kg)	SAP Code	
 II CLAN C LED 39W/BP CL2 N7M* CLAN C LED 58W/BP CL2 N7M	LED	-	10,1	96258131	10,1	96258143	11,7	96258457	
	LED	-	10,1	96258132	10,1	96258144	11,7	96258120	
Lamp type : conventional									
Gear : conventional									
II CLAN C 50/70W HID E27 230V CL2 N7M*	ST/MT(CE)	E27	8,3	96257576	8,2	96257607	9,9	96258114	
Gear : electronic									
CLAN C 26/32/42W TC-TEL CL2 N7M*	FSM	GX24q-4	6,7	96257573	-	-	8,2	96258113	
CLAN C 70W HIDE 2,5Kv E27 CL2	ST/MT(CE)	E27	6,2	96257577	6,1	96257608			
CLAN C 100W HIT-CE E27 DGE CL2	ST/MT(CE)	E27	6,2	96257580	6,2	96257611			
CLAN C 35W HIT-CE G12 CL2 N7M	MT(CE)	G12					8,4	96258116	
CLAN C 70W HIT-CE G12 CL2	MT(CE)	G12	6,2	96257583	6,1	96257614			
II CLAN C 100W HIT-CE G12 CL2	MT(CE)	G12	6,2	96257584	6,1	96257615			
CLAN C 150W HIT-CE G12 CL2	MT(CE)	G12	6,2	96257585	6,1	96257616			
CLAN C 45W CPO CL2	MT(CE)	PGZ12	6,3	96257586	6,2	96257617			
CLAN C 60W CPO CL2	MT(CE)	PGZ12	6,3	96257588	6,2	96257619			
CLAN C 90W CPO CL2	MT(CE)	PGZ12	6,4	96257590	6,3	96257621			
CLAN C 140W CPO CL2	MT(CE)	PGZ12	6,4	96257592	6,3	96257623			
Gear : electronic / power reduction and controls									
CLAN C 70W/BP HID 2,5kv E27 DGE CL2	ST/MT(CE)	E27	6,3	96257578	6,3	96257609			
CLAN C 60W CPO/BP CL2	MT(CE)	PGZ12	6,3	96257594	6,2	96257625			
II CLAN C 90W CPO/BP CL2	MT(CE)	PGZ12	6,4	96257596	6,3	96257627			
CLAN C 140W CPO/BP CL2	MT(CE)	PGZ12	6,4	96257598	6,3	96257629			
CLAN C 70W/LDRF CL2*	ST/MT(CE)	E27	6,4	96257604					

*V = Variant, modification of a standard version
 N 7M: precabled with 7m HO5-VV F 2x1,5mm² cable
 F 7M: precabled with 7m HO7RN-F 2x1,5mm² cable
 W 7M: precabled with 7m HO7RN-F 3x1,5mm² cable
 CPO/BP: Power reduction for 8 hours as standard
 LDRF versions: the bracket needs to be ordered on request

Optical accessory

Description	Weight (Kg)	SAP code
CLAN C LVBACK	0,05	96257632

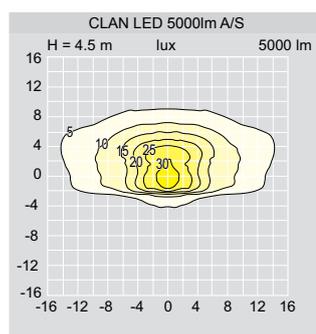
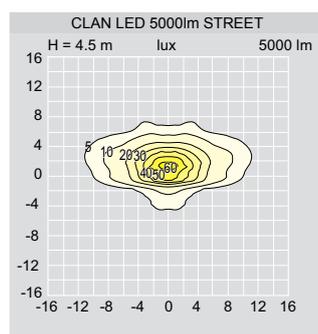
Bracket

	Description	Weight (Kg)	SAP Code
Archi	Single	CLAN ARCHI/C BRAx1 MTP D60	6,3 96257393
	Twin	CLAN ARCHI/C BRAx2 MTP D60	10,4 96257394
	Wall	CLAN ARCHI/C BRAx1 MWA	3 96257395
	Mid pole	CLAN ARCHI/C BRAx1 MLE	3,3 96257396
Deco	Single	CLAN DECO/C BRAx1 MTP D60	6,5 96257397
	Twin	CLAN DECO/C BRAx2 MTP D60	9,2 96257398
	Wall	CLAN DECO/C BRAx1 MWA	3,6 96257399
	Mid pole	CLAN DECO/C BRAx1 MLE	4 96257400
Basic	CLAN BASIC/C D60	1,7 96258254	

Mounting heights

Please note that the mounting height of the package varies with the bracket collection chosen. For example you should choose a 5.5m column to obtain a mounting height close to 6m with the Deco but a 6m column to go with the Archi and Basic bracket.

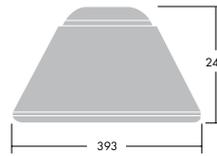
Column height (H)	Mounting height		
	Deco	Archi	Basic
3	3,7	3,3	2,9
3,5	4,2	3,8	3,3
4	4,7	4,3	3,8
4,5	5,2	4,8	4,3
5	5,7	5,3	4,8
5,5	6,2	5,8	5,3
6	6,7	6,3	5,8





Clan O Ordering guides (Lanterns, brackets and columns)

For complete fitting, order luminaire, bracket and column.
Lamp to be ordered separately (except LEDs).



Lighting Controls

e-Control is Thorn's initiative to increase the use of dimming and lighting control in products and lighting solutions.



Power control



PowerLine

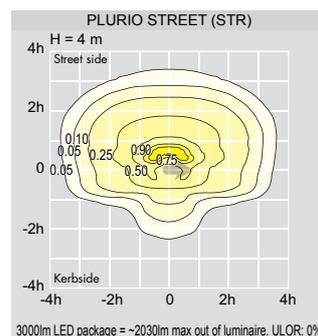
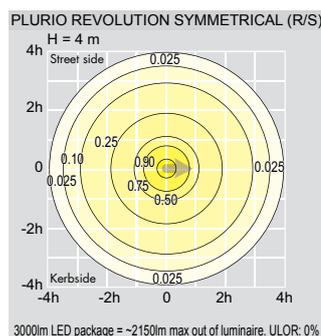
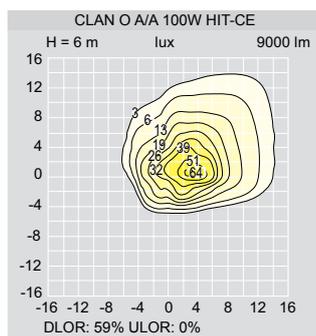


Radio Frequency

Armaturer

Lamp type : LED / power reduction	ILCOS	Socket	Street Optic		A/S Optic (Asymmetric)		Pedestrian Crossing Optic (A/A)		Street Optic with Basic bracket (BRA)		Street catenary version (MCA)
			Weight (Kg)	SAP Code	Weight (Kg)	SAP Code	Weight (Kg)	SAP Code	Weight (Kg)	SAP Code	SAP Code
CLAN O LED 39W/BP CL2 N7M*	LED	-	11,6	96258137	11,6	96258149			13,5	96258125	-
CLAN O LED 58W/BP CL2 N7M*	LED	-	11,6	96258138	11,6	96258150			13,5	96258126	-
Lamp type : conventional											
Gear : conventional											
CLAN O 50/70W HID E27 230V CL2 N 7M*	ST/MT(CE)	E27	8,8	96257639	8,7	96257673			10,7	96258118	
CLAN O 100W HIT-CE E27 CL2	MT(CE)	E27	7,7	96257643	7,7	96257677	8,6	96257726			96257712
Gear : conventional / power reduction											
CLAN O 70W/BP HST E27 CL2	ST/MT(CE)	E27	7,9	96257641	7,8	96257675					96257710
Gear : electronic											
CLAN O 26/32/42W TC-TEL CL2	FSM	GX24q-4	6,2	96257635							96257706
CLAN O 26/32/42W TC-TEL CL2 N7M*	FSM	GX24q-4	7,2	96257636					9,2	96258117	
CLAN O 70W HIDE 2,5Kv E27 CL2	ST/MT(CE)	E27	6,8	96257640	6,8	96257674					96257709
CLAN O 100W HIT-CE E27 DGE CL2	ST/MT(CE)	E27	6,9	96257644	6,2	96257678	7,8	96257727			96257713
CLAN O 20W HIT-CE G12 CL2	MT(CE)	G12	6,2	96257645	6,8	96257679					96257714
CLAN O 20W HIT-CE G12 CL2 N7M	MT(CE)	G12		V		V			9,2	96258115	
CLAN O 35W HIT-CE G12 CL2	MT(CE)	G12	6,2	96257646	6,2	96257680					96257715
CLAN O 35W HIT-CE G12 CL2 N7M	MT(CE)	G12		V		V			9,2	96258119	
CLAN O 70W HIT-CE G12 CL2	MT(CE)	G12	6,8	96257647	6,8	96257681	7,7	96257728			96257716
CLAN O 100W HIT-CE G12 CL2	MT(CE)	G12	6,8	96257648	6,8	96257682	7,7	96257729			96257717
CLAN O 150W HIT-CE G12 CL2	MT(CE)	G12	6,8	96257649	6,8	96257683	7,7	96257730			96257718
CLAN O 45W CPO CL2	MT(CE)	PGZ12	6,9	96257650	6,9	96257684					96257719
CLAN O 60W CPO CL2	MT(CE)	PGZ12	6,9	96257652	6,9	96257686					96257720
CLAN O 90W CPO CL2	MT(CE)	PGZ12	7,0	96257654	7,0	96257688	7,9	96257731			96257721
CLAN O 140W CPO CL2	MT(CE)	PGZ12	7,0	96257656	7,0	96257690	7,0	96258112			96257722
Gear : electronic / power reduction and controls											
CLAN O 70W/BP HID 2,5Kv E27 DGE CL2	MT(CE)	PGZ12	7,0	96257642	7,0	96257676	-	-		V	96257711
CLAN O 60W CPO/BP CL2	MT(CE)	PGZ12	6,9	96257658	6,9	96257692	-	-		V	96257723
CLAN O 90W CPO/BP CL2	MT(CE)	PGZ12	7,0	96257660	7,0	96257694	-	-		V	96257724
CLAN O 140W CPO/BP CL2	ST/MT(CE)	PGZ12	7,0	96257662	7,0	96257696	-	-		V	96257725
CLAN O 70W/LDRF CL2*	ST/MT(CE)	E27	6,9	96257668	6,9	96257702	-	-		V	-
CLAN O 70W/LDC CL2	ST/MT(CE)	E27	7,1	96257669	7,1	96257703	-	-		V	-

*V = Variant, modification of a standard version, N 7M : precabled with 7m HO5-VV F 2x1,5mm² cable, F 7M : precabled with 7m HO7RN-F 2x1,5mm² cable
W 7M : precabled with 7m HO7RN-F 3x1,5mm² cable, CPO/BP : Power reduction for 8 hours as standard,
LDRF versions : the bracket needs to be ordered on request, MCA : please order the catenary bracket separately



Optical accessory

Description	Weight (Kg)	SAP code
CLAN O LVBACK	0,06	96257631

Bracket

	Description	Wt (Kg)	SAP Code	
Archi	Single	CLAN ARCHI/O BRAx1 MTP D60	5,9	96257401
	Twin	CLAN ARCHI/O BRAx2 MTP D60	9,5	96257402
	Wall	CLAN ARCHI/O BRAx1 MWA	3,4	96257403
	Mid pole	CLAN ARCHI/O BRAx1 MLE	3,7	96257404
Deco	Single	CLAN DECO/O BRAx1 MTP D60	6,2	96257405
	Twin	CLAN DECO/O BRAx2 MTP D60	8,6	96257406
	Wall	CLAN DECO/O BRAx1 MWA	3,9	96257407
	Mid pole	CLAN DECO/O BRAx1 MLE	4,3	96257408
Basic	CLAN BASIC/O BRA MTP D60	1,9	96258255	

Mounting heights

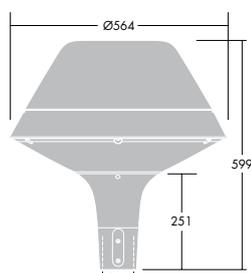
Please note that the mounting height of the package varies with the bracket collection chosen.

For example you should choose a 5.5m column to obtain a mounting height close to 6m with Deco but a 6m column to go with the Archi and Basic bracket.

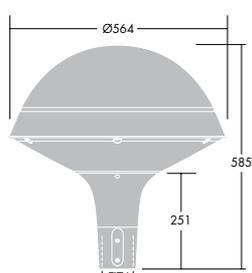
Column height (H)	Mounting height		
	Deco	Archi	Basic
3	3,6	3,2	2,7
3,5	4,1	3,7	3,2
4	4,6	4,2	3,7
4,5	5,1	4,7	4,2
5	5,6	5,2	4,7
5,5	6,1	5,7	5,2
6	6,6	6,2	5,7

Plurio LED Ordering guide

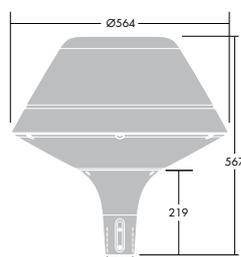
For den nyeste informasjon om varenumre vennligst se www.thornlighting.no/PLRL



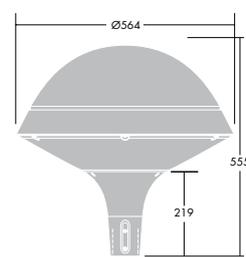
Plurio Original
Scx: 0.075m²



Plurio Round
Scx: 0.075m²



Plurio Original
Scx: 0.070m²



Plurio Round
Scx: 0.070m²

LEDs for durability and low maintenance

In modern sustainable urban master plans, few designers would create projects without considering LEDs

High Performance optical system®

Thorn has developed a unique and patented technological concept for its symmetrical optics, as used in Clan, and the Plurio LED asymmetric lantern. Complying with the EN13201, this concept offers the optimisation of the overall optical system with high lumen output, high efficacy, better control of the flux and glare limitation without the need to tilt the luminaire.

The optical system has been optimised using:

- A combination of LEDs and LEDs with lenses to achieve the longitudinal flux distribution
- Grids to achieve the transversal flux distribution
- Mirror finishes to optimise the light distribution and limit glare : they also ensure that each LED effectively delivers light to the application. Contrary to pure directional systems the failure of one LED will not affect the distribution of the luminaire.

For more information please visit: www.thornlighting.com/clan

The Plurio and Clan LED lanterns are ideal for the following applications:

Appropriate Depending on project	Light distribution	Clan LED				Plurio LED	
		3000lm		5000lm		3000lm	
		Street	Area*	Street	Area*	Street	Area*
Lighting project classes							
Urban motorised roads	CE2/Me3/Me4						
Urban motorised street	CE3/S1/S2						
Urban pedestrian street & cycle path	S2/S3						
Piazza, car park	S2/S3						
Residential streets	S3/S4/S5/S6						
Parks and gardens	S4/S5/S6						

*Asymmetrical distribution in Clan and symmetrical rotational in Plurio LED

This table is valid for today's LEDs, but with the rate of performance increase exceeding that of traditional lamps it will be possible to cover classes up to CE1 within the next few years and to further improve energy efficiency.

Performance and efficiency are the key elements to optimise energy consumption and ensure the safety of end users. The challenge, of course, is to maintain this over time and to reduce maintenance costs

Optimised lifetime

Clan LED has been designed for a 80,000h lifetime (L70, 25°) or 50,000h lifetime (L80, 25°C). In a typical night time burning situation, this can equate to over 20 years, but the ambient operating temperature has an important effect on the life expectancy of the LED luminaire. In the graph (fig 1) the horizontal line marks this minimum number of hours and the curve shows LED life expectancy expressed in hours for various average ambient temperatures at night. Thus, the number of hours can exceed 80,000h dependant upon geographical location.

See Fig. 1.

Gain 20% lifetime with dimming

All Clan LED lanterns are available with integrated dimming at no extra cost. Dimming can increase the lifetime of an installation by 20%. For example at 10°C, instead of 80,000hrs, the dimmable Clan LEDs can achieve over 100,000hrs, i.e about 25 years!

See Fig. 2.

Save energy and installation costs with dimming

If a 20 year lifetime is more applicable, you can select a higher maintenance factor (see fig.2 : 0,83 instead of 0,80 used here) to increase the initial light levels and reduce the number of light points installed, as well as installation costs and energy consumption.

Thanks to dimming, lighting points can be reduced by 3 on one km street. This roughly equates to a 15% saving on the global cost of ownership (based on 20 year European usage).

Hence, you will shorten the payback period.

See Fig. 3.

Contrary to conventional lamps, dimming not only saves energy, but thanks to a higher maintenance factor, implying a reduced number of lighting points, you can make further savings on installation and energy with Clan LEDs, without initial extra cost!

Fig. 1. Clan LEDs lifetime vs ambient temperature

Lifetime Clan LEDs : 80,000hrs with 70% initial flux @500mA-Ta=25°C

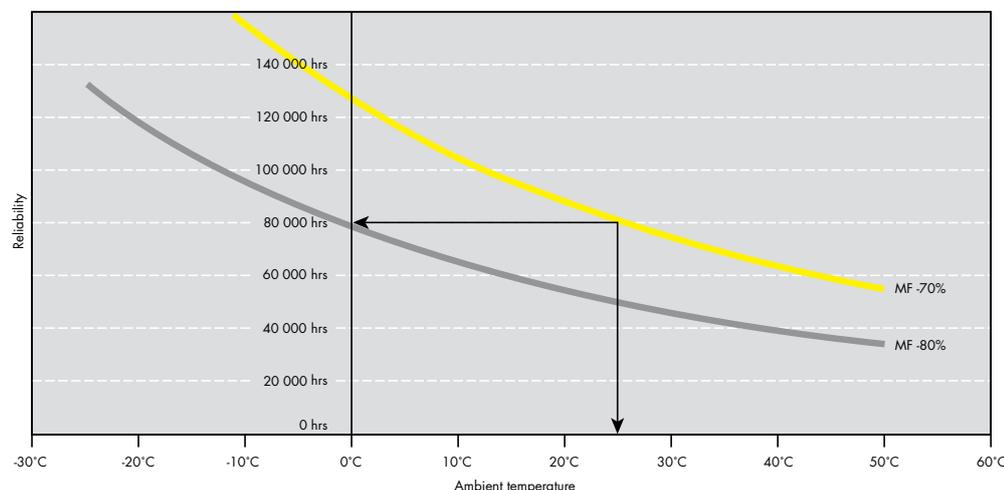
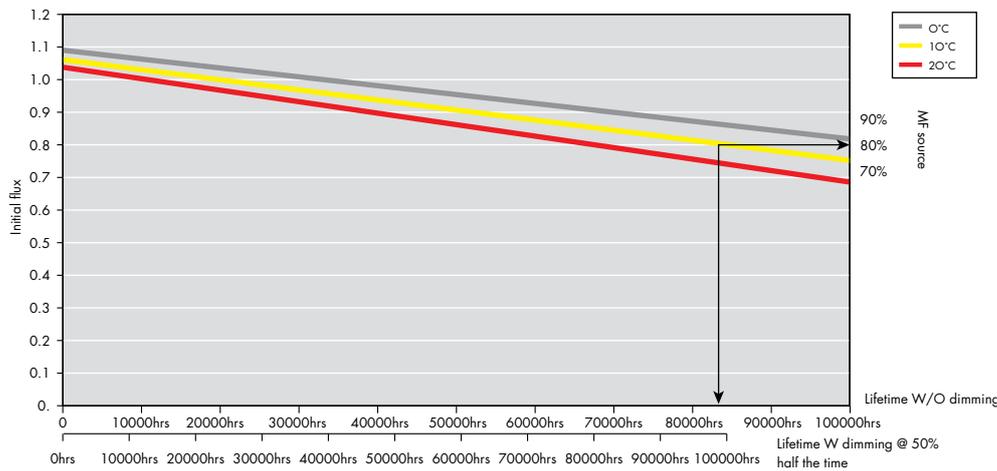


Fig. 2. Initial flux and Maintenance Factor vs ambient temperature

Dimming can increase the lifetime of an installation by 20%. For example at 10°C, instead of 80,000hrs, the dimmable Clan LEDs can achieve over 100,000hrs, i.e about 25 years!

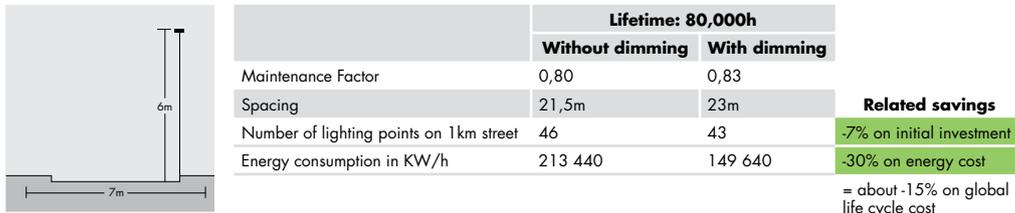


L80, 10°C = 84,000hrs
 L80, 10°C with dimming (50% for 50% of the time) = 100,000hrs
 L83, 10°C with dimming (50% for 50% of the time) = 80,000hrs

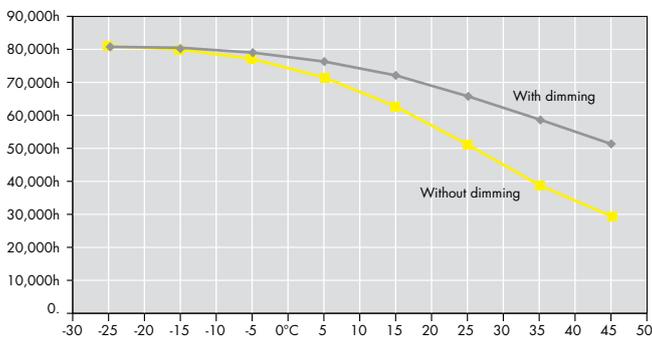
Fig. 3

Save 15% on global life cycle cost with dimming

Example: Clan LED 5000lm 58W, Lighting class: S1, Ambient temp: 10°



Plurio LED lifetime vs ambient temperature



Plurio LED: B10 L70 700mA, Dimming = 50% of power 50% of the night

- At 0°C, 90% of Plurio LEDs achieve 71 000h lifetime (18 years) with 70% initial flux maintained, about 19 years with dimming.
- At 10°C, 90% of Plurio LEDs achieve 67 000h lifetime (about 17 years) with 70% initial flux maintained, about 18 years with dimming.
- At 20°C, 90% of Plurio LEDs achieve 56 000h lifetime (about 14 years) with 70% initial flux maintained, about 17 years with dimming.

Contrary to using Clan with different LEDs, the dimming option does not have a significant effect on the lifetime up to 20°, but remains important for reducing your carbon footprint.

Best in class LEDs

To help ensure long term performance and reliability, Thorn designs its LED light engines around industry leading LEDs. The main selection criteria is their ability to meet targets of flux maintenance, i.e 80% of the flux maintained after 50,000hrs at 25°C ambient temperature for Clan.

Heat management and dirt protection

Good thermal design is the key to longevity as the heat generated in operation could adversely affect performance and the ultimate life of components. A finned aluminium heat sink proves efficient at dispersing internally generated heat while, being enclosed, minimises the accumulation of dirt and maintains optimal performance. Moreover, the glass cover prevents from an early ageing of the luminaire. All optical and electronic parts are protected in an IP66 environment to withstand most environmental conditions.

Therefore, the only maintenance required is cleaning of the diffuser/ glass every three 3 years to ensure the maintenance of light levels, as per conventional lanterns.

Reliable driver technology

LED drivers have a higher reliability than electronic ballasts, which are more complex and sensitive, and are more comparable to simple transformers commonly used in many LED products ie computers and mobile phones. Indeed, driver manufacturers publish a 5% to 10% catastrophic failure rate after end of life.

In the event of failure an LED driver can be replaced, being positioned independently from the array of LEDs. Although unlikely the potential for an LED failure exists and replacement is not so straightforward. Your Thorn contact can propose a solution according to the level of criticality of the defect and the product concerned.

THORN

Lighting people and places

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Thorn Lighting AS

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7048 Trondheim

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Kundeservice

Tlf 22 82 07 00

Fax 73 89 44 02

e-mail: ordre.no@thornlighting.com

Retur av varer

All retur av varer må skje etter
avtale med kundeservice.

Fakturaadresse

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