

THORN

Orus LED

Innovative road lantern
for low level mounting



Orus LED

Combining a special optic with LED performance, Orus LED is an innovative road lantern offering driver comfort and low energy consumption. Above all, Orus LED meets the most demanding safety standards at a low mounting height.



As well as the usual benefits associated with Thorn luminaires, including low energy consumption, sustainability and ease of maintenance, Orus LED uses Flat Beam® technology to exceed safety standards at a low optimised mounting height of 0.9m.

When traditional road lighting using columns or façade mounting is not feasible or desirable, Orus LED offers an innovative solution with a choice of mounting options. Orus LED delivers Performance, Efficiency and Comfort (PEC) to create a high quality lighting installation.

Performance: Visual effectiveness

Precision optics and low mounting position with respect to the road mean that more light directly hits the road surface. The light is more efficiently reflected and results in better visibility for the driver.

Efficiency: Minimising energy consumption

Using LED, specialist optics and a patented approach to road lighting at extremely low mounting heights Orus achieves efficiency as low as SLEEC-SL (Energy Efficiency Criteria Luminance) 0.28W/cd.m²/m².

LED light source and electronic control gear leads to longer life and longer service intervals

The ability to integrate a variety of controls solutions further reduces energy use.

Comfort: People satisfaction and stimulation

Use of the road optic for efficiency where there is only road based traffic or the Street optic for increased light onto areas where there are pedestrian footpaths

Patented optical design, mounted below the eyeline of the driver provides an extremely low glare environment.

Mounting of the luminaire close to the road surface provides excellent visual guidance by emphasising the curve, rise and fall of the road.



Worldwide applications



More than 25,000 Orus road lanterns have been installed around the world...

From Scandinavia to South Africa, the Caribbean Islands to New Zealand, Orus is providing safety, comfort and energy efficiency at a low mounting height.



- | | | | |
|---|---|---|--|
| Africa
East Africa
Egypt
South Africa | Europe
Belgium
Bergen
Bordeaux
Calabria
Copenhagen
Croatia
Cyprus
Denmark
Drammen
Emilia-Romagna
Finland
Flanders
Friuli-Venezia
Giulia
Göteborg
Greece
Hungary | Jönköping
Kritiansand
Landskrona
Lazio
Liguria
Lille
Lithuania
Lombardy
Luxembourg
Lyon
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Award winning Flat Beam® technology

Low level mounting with reduced direct glare and optimum luminance on all types of road surfaces

Thorn's Flat Beam® technology is a product of extensive research. The optical system offers a very sharp and controlled light distribution while optimising lamp efficiency. When combined with LED, Flat Beam® offers even more light control, driver comfort and reduced energy consumption than the already excellent HID version.

Extensively tested for glare, luminance and flicker, Thorn's innovative and award-winning Flat Beam® technology addresses two issues unique to low level mounting:

- By positioning the optical light engine below the driver's eye line, it eliminates direct glare. A recessed LED source and specific reflector means direct light cannot reach the eyes of the driver or the rear-view mirrors of a car
- A unique uniform light distribution allows Orus LED to deliver optimum luminance on all types of road surfaces, in all weather and lighting conditions

Light is projected transversally to the road (up to 11m) in a single-sided arrangement and will help drivers:

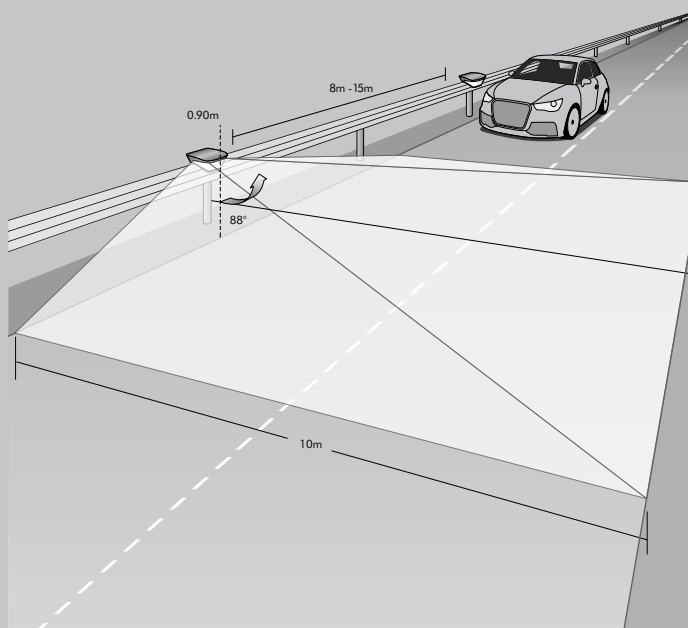
- Detect static or moving obstacles on the carriageway
- Comfortably confirm the road configuration
- Perceive the entire road surface and any issues at all speeds

Luminance without glare

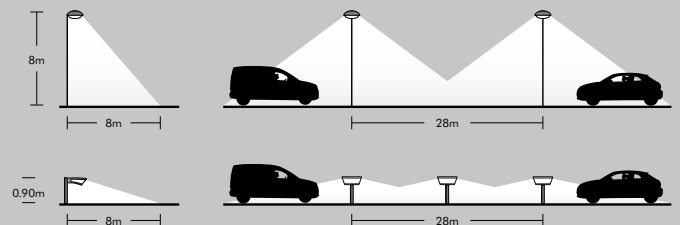
When observing road surfaces lit at low level mounting, research shows drivers perceive higher levels of road lighting because the peak of the reflected beam is roughly in the direction of the eye. This does not mean higher glare because, unlike traditional road lighting, the light sources is completely hidden from view of the driver.

Research shows that Ti (disability glare measurement) is considerably below 10% while luminance and uniformity also meet relevant standards.

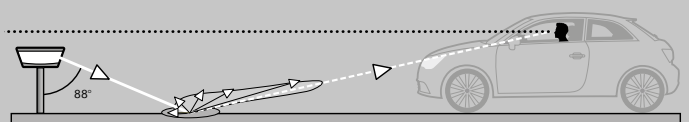
Orus LED can be installed with spacing between 8m and 15m. This flexibility allows drivers' eyes to adjust depending on speed and maintains the flicker effect below 4Hz. In most cases the flicker effect is less than 2.5Hz, maximising driver comfort.



Flat Beam® layout vs conventional layout



Flat Beam® technology: grazing light and higher luminance





Flexible lighting controls

Orus LED offers extensive lighting control for flexibility and efficiency, including at the lighting point, at a local group of lighting points or fully remote control.

Lighting control options comprise:

- Bi-power switch: stand alone dimming with an internal switch to activate/deactivate the dimming on site
- DALI control: DALI ready driver and connection
- Motion detection for people: detection device integrated into the bollard versions, works individually or networked via pilot line and corridor like function
- Power line: available in the steel bollard version. Communication via open and interoperable LONWorks protocol. Association possible with: other luminaires (eg pole mounted), gateway to switching cabinet, CMS system on server (eg Streetlight.Vision)

From the most simple stand alone dimming to the most advanced central management system, Orus LED allows perfect energy control and adjustment.

Durable and vandal resistant

Orus LED is constructed from high quality materials and engineered for low maintenance and a long operating life. Metal components are either die-cast aluminium or stainless steel, and the visor is made from strong, UV stabilised polycarbonate coated with a scratch and graffiti resistant varnish.

To withstand the additional rigours of its low mounting height, the entire Orus LED structure incorporates an IK10/40 joules rating to defend it against harsh road usage as well as vandalism. Tamper-resistant screws combine protection with easy maintenance. Both optic and gear comply with IP66.

When combined with suitable fixings, Orus LED offers considerable benefits in passive safety compared to traditional columns.



Applications

When traditional road lighting using columns or façade mounting is not feasible or desirable, Orus LED is a practical and flexible solution

Placing light exactly where it is required while combining high performance with ease of installation, Orus LED is designed for applications confronted with any of the following challenges:

- Ease of access
- Extreme weather
- Structural fragility
- Maintenance difficulties
- Risk of obtrusive light
- In the vicinity of airfields or other sensitive areas
- Other environmental or resource issues
- The Flat Beam® technology also makes Orus LED suitable for use in parks and gardens. Here the luminaires can spread light at low level without distracting attention from other illuminated features.



Road and street optics

Orus LED can be specified for use on roads with or without pedestrian traffic

Orus LED is available with a Road or Street optic. The Road optic directs light entirely onto the road while the Street optic creates a 'circle' of light around the luminaire to enable drivers to detect a pedestrian's entire body. It also allows for facial recognition by other pedestrians.

Optical options available with the stirrup and bollard versions include:

- Road performance: optimises the light spread and spacings
- Road comfort: cut-off any back light if required
- Street comfort: uses a white diffuser behind the visor for enhanced visibility of pedestrians

Orus LED's unique flat beam creates a sharp and controlled light distribution to reduce spill and place light exactly where it's needed to provide a comfortable light for all road users.

Enhanced road safety

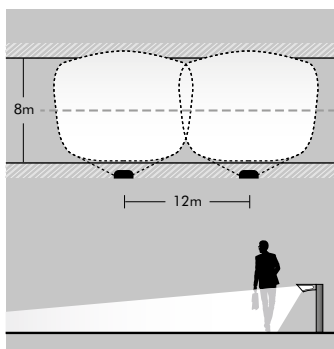
In addition to improved driver comfort, Orus LED ensures better hazard and pedestrian visibility. It combines luminance and uniformity with no glare to reveal obstacles and road surface irregularities. At the same time, the low mounting height acts as a good optical and visual guide to the road layout.

Light output from Orus LED is surprisingly resistant to obstruction by queues of traffic. There is no occultation or distracting shadows, while light emitted from the system is distributed ahead of, behind and beneath vehicles. It is also reflected by the road surface.

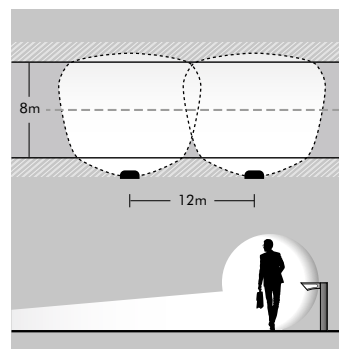
Spacing options between 8m and 15m reduce any 'pools' of darkness, whilst in stationary or slow moving traffic lighting from vehicles further maintain lighting levels.

Orus LED is also an excellent solution where obtrusive light has to be reduced. For example, it can be specified in certain residential areas, or in areas where the surrounding buildings are illuminated and road lighting should therefore be unobtrusive.

The Flat Beam® technology used in Orus LED also makes the system suitable for use in parks and gardens. Here the luminaires can spread light at low level without distracting attention from other illuminated features.



Orus Road optic



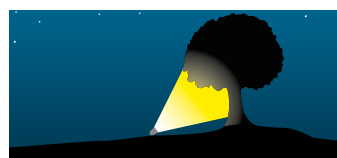
Orus Street optic



Traditional



Orus

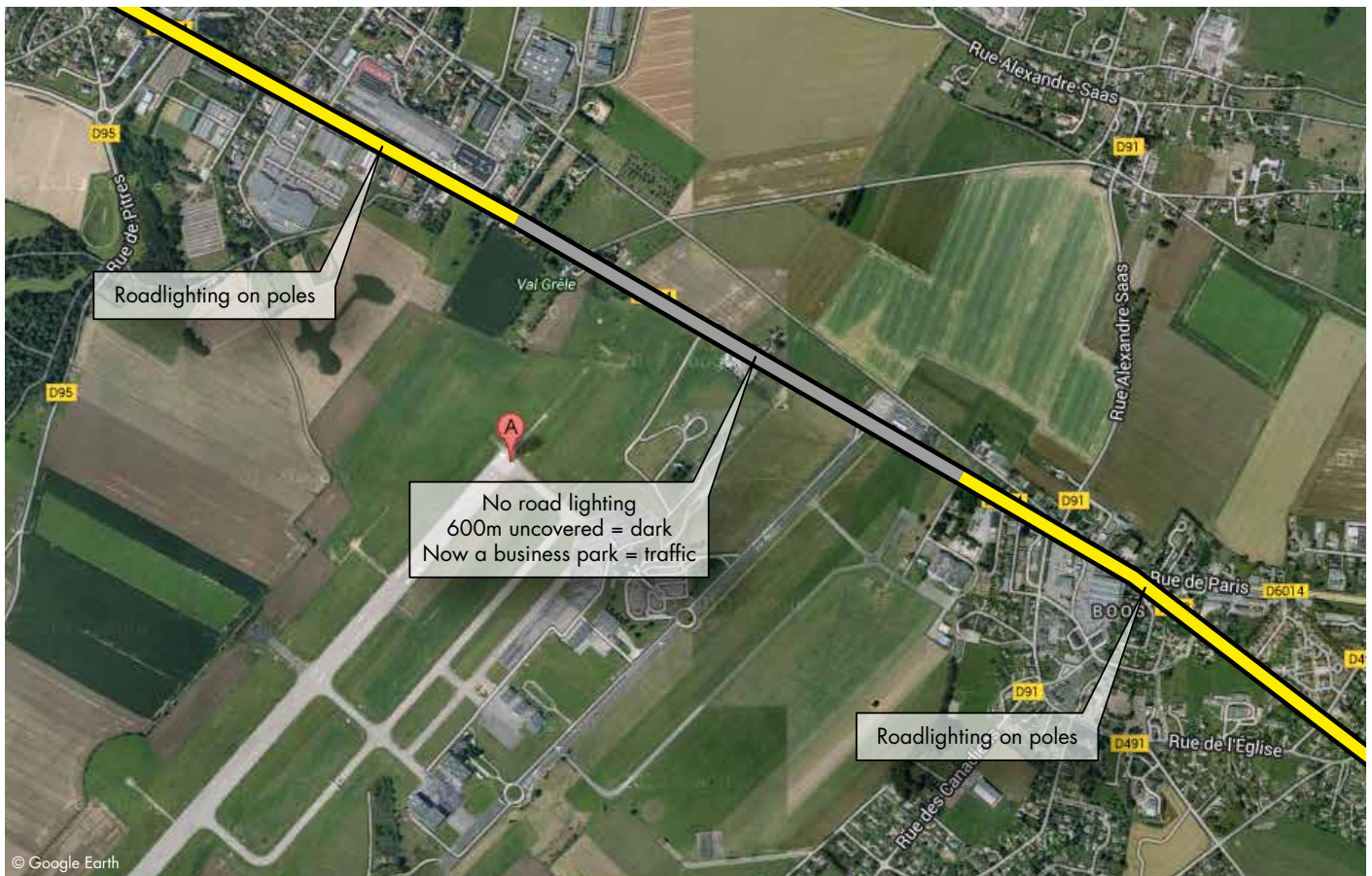


Energy efficiency

Lighting project in the vicinity of an airport

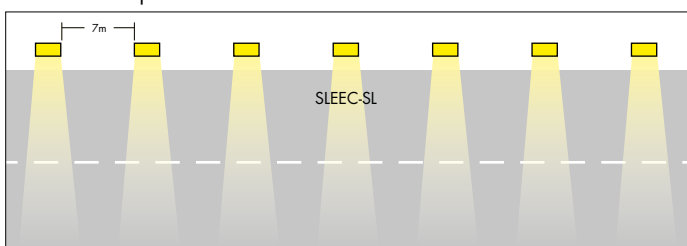
Lighting project

Major road for airport access with maximum mounting height at 5m



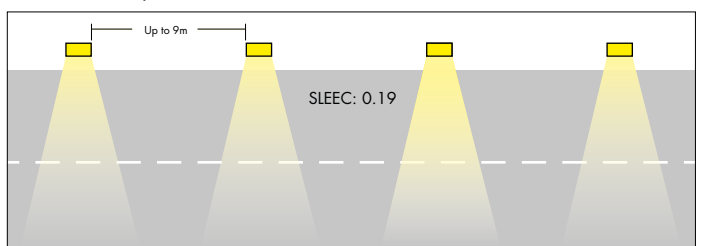
Orus 35W HIT Road

Number of lighting points for 600m of road: 85
Power consumption: 43.5W



Orus LED 1L70 Road NB

Number of lighting points for 600m of road: 66
Power consumption: 27W



When conventional installation is not possible or difficult, Orus LED is the best solution by offering a low mounting height combined with high lighting performances and a low maintenance cost (no lift) (SLEEC-SL: Street Lighting Energy Efficiency Criteria – Luminance)

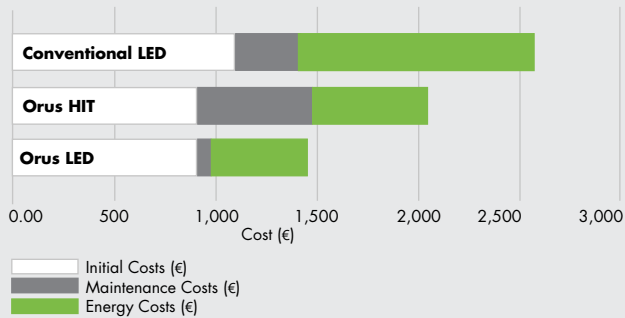


Energy efficiency

With a SLEEC-SL value at 0.28W/cd.m²/m², Orus LED is highly efficient and uses less energy than the already excellent HID version. Flexible lighting controls further increase efficiency by reducing waste light.

Me 3b (MF 0,8 R2)	L _{ave} (cd.m ⁻²)	U _o	U _i	T _i (%)	Height (m)	Width of Road (m)	Spacing (m)	Total Power System (W)	SLEEC-SL W/cd.m ⁻² /m ²	Energy Savings
Requirement	1.0	0.4 min	0.7 min	15 max	-	-	-	-	1	-
Good LED Lantern 24L70 WS	1.2	0.28	0.86	16.69	5	7	14	58	0.48	-
Orus 35W HIT	2.3	0.63	0.70	2.1	0.9	7	7	38	0.33	31%
Orus LED 1L70 NB	2.3	0.48	0.78	0.6	0.9	7	9	27	0.19	61%

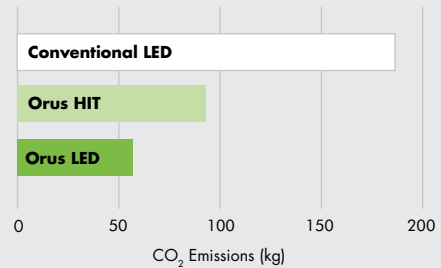
Figure 1. Total life cost



For each lighting point individually Orus LED reduces either the maintenance costs compared to the previous Orus HID version or the energy consumption compared to conventional lighting on top of pole with LED.

All in all the total TCO (cost of ownership) is improved (€/Kwh:0.15)

Figure 2. CO₂ Emissions per year (kg)



CO₂ emissions are drastically reduced

Installation and maintenance



Orus LED can be installed either single sided or on both sides of the road, with luminaire spacing between 8m and 15m. Installation on both sides will cover roads up to 20m wide, giving ample coverage for multiple lanes including cycle lanes and central reservations.

For optimum results, the mounting height of the light source has to be 0.9m from the surface to be lit while offset should be 1.5m.

Safety

Safety is assured through Class I or Class II electrical rating. All external screws are tamper-proof, restricting access to contractors only. Stirrup version wires can be fitted with extra strong sleeves to resist cutting (available as accessory).

The top of the lantern has to be parallel to the road surface and a 0° tilt of the unit can be assured using a spirit level (flat reservation on top). (2)

Whether via a stirrup or bollard, the installation of Orus LED is easy, intuitive and safe. Maintenance can also be done on site.

Stirrup:

180° rotating stirrup fixed through 2 x M10 tempered bolts. (1)

Orus LED includes a built-in aiming guide which helps to achieve the perfect horizontal setting. Once the exact angle has been selected, the secondary stirrup locking device ensures that the setting will not be altered by wind pressure or vibration. (3)

Rear access to gear components via 2 tamper proof screws. (4)

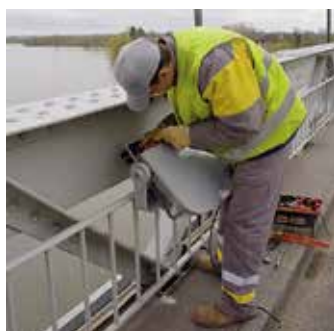
Ready for through wiring via 2 cable glands (Ø8-13mm).

Bollard:

Adjustment of the position at the flange. Recommended concrete foundation 300x300.

Gear components housed into the bollard into an IP66 box.

Access inside the bollard shaft after release of 2 temper-proof screws and head removal.



1.

2.

3.

4.



Product features

- Efficient LED lamp fitted with the award-winning Flat Beam® technology to exceed safety standards at a low optimised mounting height of 0.9m
- Eliminates direct glare for driver comfort
- Flexible lighting control options, from simple dimming to an advanced central management system
- Durable and vandal resistant with an IK10/40 joules rating

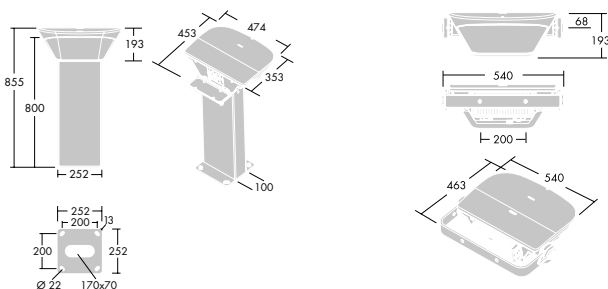
Applications

- Roads: highways and motorised traffic within and between cities
- Orus LED can overcome the following challenges:
 - Ease of access
 - Extreme weather
 - Structural fragility
 - Maintenance difficulties
 - Risk of obtrusive light
 - In the vicinity of airfields or other sensitive areas
 - Other environmental or resource issues
- The Flat Beam® technology also makes Orus LED suitable for use in parks and gardens. Here the luminaires can spread light at low level without distracting attention from other illuminated features.

LED Lamp Information

- Lumen package: From 1 800lm to 2 100lm
- Lifetime: Up to 80 000 hours B10L70
- Colour temperature: 4000K
- CRI: 80
- 27W to 42W

Overview



Standards



Materials/Finish

Housing, canopies, spigot: die-cast aluminium with min 1,000hrs salt fog resistance

Bollard: 3mm steel powder coated

Powder coating texturised light grey as standard (close to RAL9006)

Other colours and finishes available on request

Enclosure: UV stabilised polycarbonate protected against graffiti and with extra scratch resistant treatment

Reflector: high reflectance aluminium coating

Tamper-proof screws and bolts: stainless steel Ecolubric® treated

Installation/Mounting

Mounting height has to be 0.9m from carriageway while offset should be 1.5m for optimum results

Plug and socket connections

Rear access to gear via 2 x M6 tamper proof Allen screws

Cable glands for Ø8-13mm cable

Adjustment at 0° through spirit level. Tolerance of 5° is allowed

Delivered complete, ready to install

Stirrup version: Rear access to gear components

Ready for through wiring via 2 cable glands

180° rotating stirrup

Stirrup fixed through 2 x M10 tempered bolts

Bollard version: Inside bollard access to gear components

Flange mounting

Head fixed to bollard through 2 x M10 tempered bolts

Specification

To specify state: Innovative road lighting luminaire with LED, incorporating Flat Beam® technology, in die-cast aluminium reaching lighting standards at 0.9m high. Sealed to IP66 with unique lighting distribution and choice of mounting options. As Thorn Orus LED.

Ordering guides

Complete fittings					Optic		
Mounting	CL	Description	Current (mA)	Dimming	Road Perf	Road Comf	Street comf
Standard version with heat management system							
Stirrup	1	Head & stirrup	700	Bi-Power	96267815	96267817	96267819
			900	Bi-Power	96267816	96267818	96267820
				DALI			96267847
	2	Head & stirrup	700	Bi-Power	96267827	96267829	96267831
				DALI		96267846	
			900	Bi-Power	96267828	96267830	96267832
Bollard	1	Kit Head & Steel Bollard	700	Bi-Power	96267834	96267836	96267838
				DALI			96267850
			900	Bi-Power	96267835	96267837	96267839
	2	Kit Head & Steel Bollard	700	Bi-Power	96267840	96267842	96267844
				Power line		96268740	
				Corridor			96268977
				Detection			96268949
			900	Bi-Power	96267841	96267843	96267845
				DALI			96267851
High ambient temperature versions							
Stirrup	1	Head & stirrup	700	no	96268745		
			900	no	96268742		
Bollard	1	Kit Head & Steel Bollard	700	no	96268744		
			900	no	96268741		
Other bollards and accessories							
Bollard	1	Head only for non steel bollard	900	Bi-Power	96267807		
	2		700	Bi-Power	96267808		
		Concrete Bollard only					96256490
		Concrete bollard ground frame					96256489
Accessory		Cable braid (1m long)					96251381
		Keys and screws set					59004622

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