



# Royce Thompson Lighting technology

High Quality, Accurate and Reliable photocell controls for Street,  
Highway and Amenity lighting



**Royce Thompson for over 55 years, has always been known for quality, reliability and speed of delivery of their products.**



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# Royce Thompson

## Photo-electronic controls

Royce Thompson continue to lead the way with our range of Photo Electric Controls

- 01 Oasis 2000
- 02 Microstar 2000

**Royce Thompson has been at the forefront of the photo-electronic street lighting and amenity controls market since 1963.**

With our extensive experience, Royce Thompson has given street and amenity lighting engineers the 'fit and forget' products that they know and trust. After all, they want to know they have products that will ensure years of exceptional performance on key transport, infrastructure and road network projects nationwide.

We have continually focused on high quality and reliability, long service life and delivering goods to our customers on time whilst providing value and a service you can trust.

Todays street lighting engineers agree that a photo-electronic control located many metres in the air on street or amenity architecture must be reliable and high quality. After all, who wants to have to replace or repair products that cannot meet the service lifetime of the luminaires they are controlling. Royce Thompson photo-electronic controls ensure peace of mind and the knowledge that their superior performance mean no expensive returns have to be undertaken to replace failed equipment.

**Royce Thompson Photocells**  
A Photo-Electronic control unit or photocell is an electronic switch that is triggered according to a specific light level measured on the Lux scale. With our electronic or microprocessor technology, photocells operate in a number of ways depending on the level of accuracy required.





# The benefits

## Microprocessor technology

Royce Thompson utilise microprocessor technology with specifically designed photocell control software.

The microprocessor with control circuitry includes stabilising technology for voltage supply, temperature, synchronous switching and its unique state machine to extend the life of the load switching relay contacts and also to prevent spurious switching.

Fundamentally, the state machine ensures exact control of the lighting unit providing an instant switch ‘ON’ when the specified light level is reached, for highly accurate switching to pre-programmed lux levels (See Photocell State Machine on Page 7).

Microprocessor technology in Royce Thompson photocells delivers significant benefits:

- Greater load handling capacity - up to 3 x 400 W
- No contact arcing
- Positive/negative switching differential (1:1.5 positive, 1:0.5 negative or 1:1 ON/OFF switching)
- Instant switch-on for greater accuracy
- Inverted use, close to a Sodium light source
- Very low power consumption for clear energy savings (e.g. 0.25 W for Oasis & Microstar).

For the vast majority of applications, such as street and underpass lighting, Royce Thompson photocells are connected to the distribution network via an unmetered supply, without their energy consumption being recorded.

In order to confirm their energy consumption, photocells must be tested, inventoried and provided with a charge code by the relevant authority for unmetered equipment (ELEXON/ UMSUG - the Unmetered Supplies User Group).

The charge code defines the circuit Watts of the equipment and confirms that load testing has been undertaken by the manufacturer, thus ensuring energy consumption has been recorded as accurately as possible.

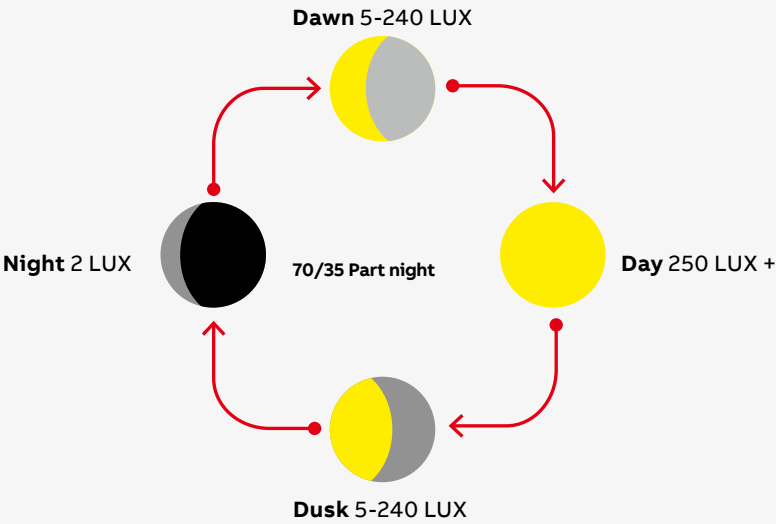
Photocell energy consumption charges are based on average power consumption over a 24 hour period with further charges for the lamp and control gear used, and the photocell switch setting.

Selecting the most appropriate photocell and switch setting can therefore deliver significant energy and cost saving benefits (see overleaf).

Photocell State Machine Program settings

State setting	Outcome
When daylight falls to preset DUSK STATE	Load switches ON
For load to switch back OFF	Cell must return to DAY STATE
When night STATE is reached	The unit is set to switch at dawn
When pre-set dawn STATE is reached	After a pre-set delay load switches OFF
To switch load back ON	Level must drop back to night STATE

State Machine Pre-programmed Lux Levels



Photocell cost comparison

Photocell Type	Thermal	Electronic	Microprocessor (Oasis)
Power/Hours	3 W 12 hours	1 W 24 hours	0.25 W 24 hours
Annual energy consumption (KWh)	13.14	8.76	2.19
Cost of energy (£0.10/KWh)	£1.314	£0.876	£0.219
Cost of energy for 10K Photocells	£13,140.00	£8,760.00	£2,190.00
At Day STATE	£10,950.00	£6,570.00	-

Based on this comparison, assuming an Oasis 0.25 W photocell is installed into a 70 W SON-T luminaire, the following costs can be estimated based on different switch regimes and part night operation:

Photocell Type	70/35	35/18	70/35 Part night	35/18 Part night
Average annual hours	4154	3984	2147	1977
Annual consumption at 70 W (KWh)	290.78	278.88	150.29	138.39
Cost of energy (£0.10/KWh)	£29.08	£27.88	£15.03	£13.84
Cost of energy for 10K x 70 W SON-T	£290,800.00	£278,800.00	£150,300.00	£138,400.00
Cost of energy for 10K x Oasis	£2,190.00	£2,190.00	£2,190.00	£2,190.00
Total cost of energy (£)	£292,990.00	£280,990.00	£152,490.00	£140,590.00
Switch Regime Savings	-	£12,000.00	-	£11,900.00
Part Night Savings	-	-	£140,500.00	£140,400.00

Note: Part night savings based on 5.30 hour saving per night, although during summer months this may not be accurate as light may not need to switch on during dawn conditions. Costings for example only & savings within particular installations may vary. Contact ABB Royce Thompson for a project savings estimate.



Range overview

Technical specification

Product selection guide



Type	Premium Intelligent NEMA Microprocessor Photocells					Miniature Intelligent Microprocessor Photocells					Two Part Remote Detector	
Reference	Oasis 1000	Oasis 2000	Monostar 1000	Monostar 2000	Nightstar	Microstar 2000*	Microstar Ultra HT	Nightstar Miniature	Q18	ER4N	P42E	V400
Sensor Type	Filtered Silicon Photodiode	Filtered Silicon Photodiode	Filtered Silicon Photodiode	Filtered Silicon Photodiode	Filtered Silicon Photodiode	Filtered Silicon Photodiode	Filtered Silicon Photodiode	Filtered Silicon Photodiode	Filtered Silicon Photodiode	Filtered Silicon Photodiode	Phototransistor	LDR
Sensor Control	Microprocessor	Microprocessor	Microprocessor	Microprocessor	Microprocessor	Microprocessor	Microprocessor	Microprocessor	Microprocessor	Microprocessor	Discrete Components	Discrete Components
Std Switching level	70 Lux ON 35 Lux OFF	70 Lux ON 35 Lux OFF	70 Lux ON 35 Lux OFF	70 Lux ON 35 Lux OFF	70 Lux ON 35 Lux OFF 00:00 OFF - 05:30 ON	70 Lux ON 35 Lux OFF	70 Lux ON 35 Lux OFF	70 Lux ON 35 Lux OFF 00:00 OFF - 05:30 ON	70 Lux ON 35 Lux OFF	70 Lux ON 35 Lux OFF	70 Lux ON Within 1:1.5Adjustable Lux ON Diff Lux OFF within 1:1.5 Lux OFF	
Operating Voltage Range	198-270 VAC 50/60 Hz	110-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz	198-270 VAC 50/60 Hz
Max Lamp Load	3 x 400W Inductive (96uF) 8A	3 x 400W Inductive (96uF) 10A	2 x 250W inductive (60uF)	2 x 400W inductive (60uF)	2 x 400W Inductive (96uF)	3 x 400W Inductive (96uF) 10A	3 x 400W Inductive (96uF) 10A	2 x 400W Inductive (96uF)	3 x 400W Inductive (96uF) 10A	3 x 400W Inductive (96uF) 10A	2 x 250W inductive (60uF) 2000w Res	2 x 250W inductive (60uF) 2000w Res
Zero crossover voltage switching	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Power consumption	0.25w	0.25w	0.5w	0.5w	0.25w	0.25w	0.25w	0.25w	0.25w	0.25w	0.25w	0.25w
Operating Temp range	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C
Ingress protection	IP65	IP67	IP65	IP67	IP67	IP65 (Lens) IP54 (Casing)	IP65 (Detector) IP54 (Casing)		ATEX Protection	IP65 (Detector) IP54 (Casing)	IP65 (Detector) IP54 (Casing)	IP65 (Lens) IP54 (Casing)
Dimensions Dia x D	85.5 x 72 mm	85.5 x 72 mm	85.5 x 72 mm	81 x 75 mm	85.5 x 72 mm	57x31x25 mm	57x31x25 mm	57x31x25 mm	195x130x109 mm	68x75x92 mm (Controller). 25x35 mm (Detector)	77x75x74 mm (Controller). 20x52 mm (Detector)	68x75x92 mm (Controller). 68x68x86 mm (Detector)
MOV Surge Protection	No	Yes	NO	Yes	Yes	On Request (Supplied loose)	On Request (Supplied loose)	On Request (Supplied loose)	Yes	Yes	No	No
Options 1 - Positive & Negative Differential	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	(Positive only)	(Positive only)
Options 2 - Kit	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Options 3 - Conduit	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Options 4 - 110Vac	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Options 5 - 48Vac	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	NO	NO
Options 6 - 24Vac	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	NO	NO
Options 7- Reverse Acting	Yes	Yes	No	No	N/A	Yes	Yes	Yes	Yes	Yes	NO	Yes
Options 7- Part Night	See Nightstar	See Nightstar	See Nightstar	See Nightstar	Yes	See Nightstar Mini	See Nightstar Mini	Yes	Yes	Yes	NO	NO
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\*Two part miniature version also available in this range - the ER12

Product selection guide



Type	Economy Photocells				
Reference	P12HE	P12RE	S300	Astro Nova City	V16
Sensor Type	Phototransistor	Phototransistor	Phototransistor	N/A	Phototransistor
Sensor Control	Discrete Components	Discrete Components	Discrete Components	Microprocessor	Discrete Components
Std Switching level	70 Lux ON Within 1:1.570 Lux ON Within 1:1.5 Lux OFF	70 Lux ON Within 1:1.570 Lux ON Within 1:1.5 Lux OFF	70 Lux ON Within 1:1.570 Lux ON Within 1:1.5 Lux OFF	Astronomical & Fixed Time Schedule	Adjustable Lux ON Diff 1:1.5 Lux OFF
Operating Voltage Range	220-270 VAC 50/60 Hz	220-270 VAC 50/60 Hz	220-270 VAC 50/60 Hz	220-265VAC 50/60 Hz	2200VA/ 10A Res
Max Lamp Load	2 x 250W inductive (60uF) 2000w Res	2 x 250W inductive (60uF) 2000w Res	2 x 250W inductive (60uF) 2000w Res	2 x 16A Res 10A Ind 250Vac	
Zero crossover voltage switching	No	No	No	No	No
Power consumption	0.6w	0.6w	0.6w	1w	2.5w
Operating Temp range	minus 20° to + 60°C	minus 20° to + 60°C	minus 20° to + 60°C	minus 10° to + 45°C	minus 20° to + 45°C
Ingress protection	IP65 (Lens) IP54 (Casing)	IP65 (Detector) IP54 (Casing)	IP65	IP20	IP54

<< continued



Type	Economy Photocells				
Reference	P12HE	P12RE	S300	Astro Nova City	V16
Dimensions Dia x D	57x31x25 mm	57x31x25 mm (Controller). 25x26	85.5 x 72 mm	65x35x88 mm	93x67x50 mm
MOV Surge Protection	No	No	No	N/A	No
Options 1 - Positive & Negative Differential	(Positive only)	(Positive only)	(Positive only)	N/A	(Positive only)
Options 2 - Kit	N/A	N/A	N/A	N/A	N/A
Options 3 - Conduit	N/A	N/A	Yes	N/A	N/A
Options 4 - 110Vac	Yes	Yes	Yes	N/A	N/A
Options 5 - 48Vac	Yes (dc only)	Yes (dc only)	Yes (dc only)	N/A	N/A
Options 6 - 24Vac	Yes (dc only)	Yes (dc only)	Yes (dc only)	N/A	N/A
Options 7- Reverse Acting	Yes (dc only)	Yes (dc only)	Yes (dc only)	N/A	N/A
Options 7- Part Night				Yes	NO
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# Royce Thompson Photocell Configurations

Royce Thompson photocells are available in a number of configurations, with light level detection or Part Night operation, to meet the various needs of the street and amenity lighting market, including:

- 01 Premium Intelligent NEMA Microprocessor Photocells
- 02 Miniature Intelligent Microprocessor Photocells
- 03 Two Part Remote Detector

**One Part NEMA photocell**  
The photo-electronic control is housed in a polycarbonate casing with a UV stabilised plastic cone, with base fixing to a NEMA socket as standard, or with optional flying leads.

**One Part miniature photocell**  
including a standard miniature casing, ideal for use where installation space is limited or minimum aesthetic impact is specified.

**Two Part Photocell with Remote Detector**  
Enables placement of the lens to monitor light levels, whilst the controller is placed within reach in the lighting unit to permit functional testing.

**Two Part miniature photocell**  
Allows both remote placement of the lens, and installation of the miniature controller in lamps where space is limited.

Generally, selection of the most appropriate photocell for the installation is determined by the performance, energy savings and value for money required from the photocell.

For controlling photocell switching, the Royce Thompson range is further divided into two types, with two relay options:

**Microprocessor based photocell**  
Ensures highly accurate switching, positive and negative switch differential and a controlled 'OFF' level, from a choice of monostable or bi-stable switching relay.

**Photocell control by discrete component**  
For a low cost, simple solution to photo-electronic control, with suitability for positive switch differential only and an uncontrolled 'OFF' level, from a monostable relay.

A monostable relay is energised within the photocell throughout the time that the load is switched 'ON'. This results in higher power consumption.

A bi-stable relay delivers a voltage pulse to change the load state from 'ON' to 'OFF' and vice versa. This reduces the overall power consumption and results in a lower overall cost to the user.

## Premium Intelligent Microprocessor Photocells

Oasis 1000, Oasis 2000, Monostar 1000, Monostar 2000 and Nightstar



Nightstar



Oasis



Monostar

- Key features:**
- Very low power consumption
  - Filtered silicon photo-diode
  - Microprocessor based photo-electronic control
  - Accurate switching
  - Zero crossover voltage' switching
  - Highly durable polycarbonate sealed casing
  - UV stabilised acrylic paste cone
  - NEMA base connection
  - Suitable for use with LED, halogen and discharge lighting

- Applications**
- Road way Lighting
  - Local Authority street lighting
  - PFI street lighting projects
  - Footpath and Sign lighting
  - Industrial Retail, commercial and car park lighting
  - Security Lighting
  - Flood Lighting
  - Car park and amenity lighting

**Description**  
These premium intelligent microprocessor photocells are divided across three tailored families to meet your need for a true 'fit and forget' solution. These are -Oasis, Monostar and Nightstar.

By using high quality components, Oasis and Monostar are the optimum microprocessor controls designed for switching accuracy, reliability and long service life which is essential to the long list of lighting applications in the market.

The Nightstar photocell is ideal where energy saving is vital, but the costs and complexities associated with a remote monitoring and control system cannot be justified.

All can be tailored to a variety of lux requirements and offer full or part night operation, NEMA connections and IP65 and IP67 to match your precise needs



01

02

03



Miniature Intelligent Microprocessor Photocells

Microstar 2000, Nightstar Miniature, Microstar Ultra HT and Q18 (ATEX)



Nightstar Miniature



Q18

Key features:

- Very low power consumption
- Filtered silicon photo-diode
- Microprocessor based photo-electronic control
- Accurate switching
- 'Zero crossover voltage' switching
- Highly durable polycarbonate sealed casing
- Compact miniature casing IP65 when suitably installed
- Suitable for use with LED, halogen and discharge lighting
- Q18 conforms with ATEX hazardous area zones 1 & 2 (EXII 2 G, Ex d IIC T6 to T4)

Applications

- Energy saving replacement for conventional miniature photocells
- Road way Lighting
- Local Authority street lighting
- PFI street lighting projects
- Footpath and Sign lighting
- Industrial Retail, commercial and car park lighting
- Security Lighting
- Flood Lighting
- Car park and amenity lighting
- Q18 is specifically for ATEX industrial hazardous areas, security, flood and high bay lighting

Description

These miniature intelligent microprocessor photocells are divided across four tailored families to meet your need for a true 'fit and forget' solution. These are - Microstar, Nightstar miniature and Microstar Ultra and Q18 (ATEX).

By using high quality components and housing in a compact standard sized miniature casing, Microstar is the optimum microprocessor controls designed for switching accuracy, reliability and long service life which is essential to the long list of lighting applications in the market.

The Nightstar miniature photocell is ideally suited as an energy saving replacement to existing conventional photocells or for new architectural, vandal resistant or slimline LED luminaires. All can be tailored to a variety of lux requirements and power consumptions offering full or part night operation as well as IP65 ingress protection to match your precise needs.

Two Part Remote Detector Photocells

ER4N, P42E, V400 and V16



ER4N



P42E



V400



V16

Key features:

- Very low power consumption
- Filtered silicon photo-diode
- Microprocessor based photo-electronic control (ER4N only)
- Accurate switching
- 'Zero crossover voltage' switching (ER4N only)
- Highly durable polycarbonate sealed casing
- Compact miniature casing IP65 when installed
- Suitable for use with LED, halogen and discharge lighting
- Compact remote detector
- Includes a test facility on some models

Applications

- General lighting load switching at predetermined lux levels
- Road way Lighting
- Local Authority street lighting
- PFI street lighting projects
- Footpath and Sign lighting
- Commercial, Industrial, Retail, commercial and car park lighting
- Security Lighting
- Flood Lighting
- General lighting control applications requiring regular functional testing
- Tunnel and Underpass lighting
- Car park and amenity lighting

Description

These two part photocells with remote detector are divided across four tailored product types to meet your specific requirements for a true 'fit and forget' solution and a varied choice of lux levels.

By using high quality components and using a separate compact detector and robust controller housing to permit installation lamps where space is limited and the controller needs to be sited in an convenient, easy to reach location. With optional part night functionality they deliver comparable performance to our high quality one

part photocells yet provides a manual override test switch to test the lighting circuit when required.

The two part photocell is ideally suited as an energy saving replacement to existing conventional photocells or for new architectural, vandal resistant or slimline LED luminaires. All can be tailored to a variety of lux requirements and power consumptions offering full or part night operation as well as IP54 and IP65 ingress protection to match your precise needs.

One Part and Two Part Miniature Photocells

P12HE, P12RE, S300 and Astronomic Time Clocks



P12HE



P12RE



S300



Astronomic Time Clocks

Key features:

- Low power consumption
- Accurate switching
- Highly durable polycarbonate sealed casing
- Compact miniature casing IP65 when installed
- Suitable for use with LED, halogen and discharge lighting
- Compact remote 20mm detector (P12RE only)
- Includes a test facility on Astro Timeclocks only

Applications

- General lighting load switching at predetermined lux levels
- Road way Lighting
- Local Authority street lighting
- Footpath and Sign lighting
- Commercial, Industrial, Retail, commercial and car park lighting
- Security Lighting
- Flood Lighting
- General lighting control applications requiring regular functional testing
- Tunnel and Underpass lighting

Description

These photocells are divided across four tailored product types to meet your specific requirements for a true 'fit and forget' solution and a varied choice of lux levels and lead lengths.

By using high quality components, these photo control units have a well established reputation for giving long trouble free service where a reliable low cost solution is required. With a compact detector and robust controller housing these units can be installed within luminaires where space is limited.

The compact nature of the P12HE and P12RE casing ensures they can easily be installed into lighting units where space is at a premium such as bulkhead light fittings. All can be tailored to a variety of lux requirements and power consumptions offering full or part night (Astro only) operation as well as IP54 and IP65 ingress protection to match your precise needs.

The S300 Nema is a domed omni-directional photocell in a polycarbonate housing that is also available in kit form. The kit includes the S300

photocell, ROTALOC socket, wall mounting bracket, sealing gasket, screws and wall plugs providing installation convenience for a variety of applications.

The Astro Nova City astronomic time switch is perfect for lighting control applications where switching to a fixed or astronomic time schedule is required. Highly accurate, the Astro Nova City is easy to programme, with timing for 29 UK cities pre-programmed, part night functionality and automatic GMT/BST adjustment included, to ensure lamp activation in line with specific customer and location requirements. The astronomic time switch is DIN rail mounted.



**New for 2018** - The Bluetooth activator for Astronomic time switches is now available to allow programming from up to 10 meters distance via a mobile phone app. Easily inserted into the time switch it allows full programming via the convenience of a mobile or tablet

Accessories

To compliment the range of Detectors and photocells, Royce Thompson has a wide range of accessories listed below;



01



02



03



04



05



06

**01 Rotaflash Beacon Controller**  
The optimum controller for flashing beacons delivering reliable and accurate flashing with manual synchronization and low energy consumption.

**02 Rotaloc NEMA Socket**  
Provides a high quality NEMA socket for Royce Thompson photocells.

**03 Rotaloc Wall Bracket**  
Provides a robust mounting bracket for Rotaloc NEMA bases.

**04 Power-Tap Adapter**  
Provides a temporary supplementary pole top power outlet.

**05 B16 Shorting Plug**  
For testing or activation of the circuit prior to all photocells being installed.

**06 B13 Photocell Power Relay**  
A 30 amp relay for controlling multiple photocells enabling group switching. Ideal when the load exceeds the capacity of individual photocells.







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