THORN

North Star Lighting

Troika

Troika is the new asymmetric 'flat glass' floodlight from Thorn for 250 - 600 Watt discharge lamps using adjustable lampholders for a range of sports, functional and architectural floodlighting applications.

Its innovative reflector has been designed to optimise floodlighting performance and the adjustable lampholder offers a variety of light distributions making Troika suitable for a wide range of applications. At the same time, the light output is finely controlled to minimise light pollution.

The single size body is used with a variety of integral gear options, giving a range of 250 to 600 Watts.

Employing the best in materials and manufacturing technology, Troika also boasts features which simplify installation and maintenance, plus a range of accessories, all combined to give the best value in 'flat glass' floodlighting today.

This unique combination of performance and product features make Troika ideally suited to floodlighting applications where high performance must be matched by effective control of light pollution, for example, floodlit sports areas, indoor sports halls, swimming pools, airport aprons, docks, car parks, freight yards, and motorway service areas. Applications extend to architectural floodlighting where uplighting and facade illumination is required.

Whilst the engineering needs have been comprehensively addressed, attention has also been paid to the aesthetics of the product, resulting in a sleek housing with a simple style.

Flat glass technology

A floodlight with an asymmetrical light distribution which enables the illumination of large areas whilst maintaining a horizontal (flat) front glass position.

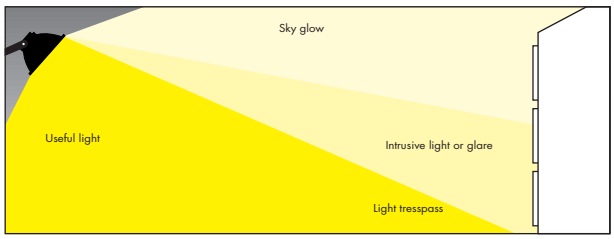


Diagram 1 - Light trespass and Sky glow

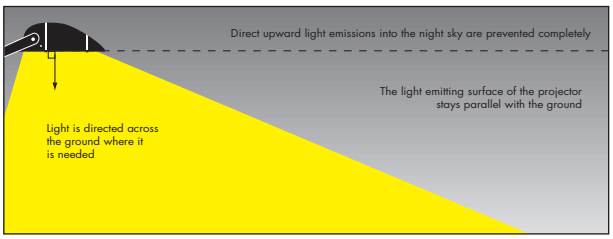


Diagram 2 - Horizontal position of flat glass

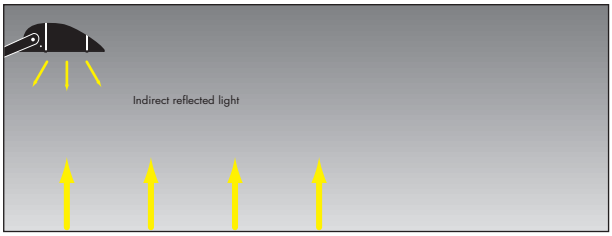


Diagram 3 - Reflected Sky glow

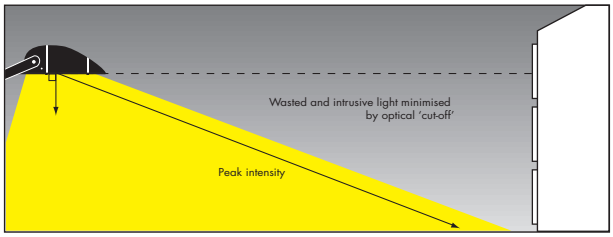


Diagram 4 - Peak intensity

The avoidance of light pollution using 'flat glass' technology

The term light pollution is used to describe a number of adverse effects which are undesirable by-products of many exterior lighting applications. To some, light pollution prevents us seeing the night sky, to others it is the glare from a badly aimed floodlight. The main components of light pollution can be clearly identified and positive steps can be taken to minimise their effects, including the correct selection of lighting equipment and proper control of the light output. Such control must be inherent to the floodlight if it is to be effective.

Light trespass is the spillage of light beyond a designated area into an adjacent area. At best it is a waste of light and energy. *(see diagram 1)*

It can be eliminated by proper optical design of the reflector so that the edges of the beam are tightly controlled within the required area.

Intrusive light or glare is the result of poor control of light output. The most common example is probably from sports lighting, where the intense output of high power floodlights is visible to neighbours inside their own homes. This can cause irritation and disturbed sleep and in extreme cases could be a distraction to passing traffic.

This can be avoided if the floodlight has a total cut off in the light distribution near to the horizontal such that neither the lamp nor the optics are visible beyond the designated area. *(see diagram 2)*

Sky glow describes the effects of light escaping into the night sky, which can produce a halo of light above towns and other significant lighting installations. In addition to being visually unpleasant this has the effect of obscuring the night sky.

With floodlights it is caused by two components. Firstly the direct upward light from a floodlight. This can be eliminated by the use of horizontal 'flat glass' designs. Secondly, upward light reflected from the ground. In sports lighting for example, grass can reflect around 10% while some artificial surfaces can reflect as much as 20 - 25%. High illumination levels common to sports floodlighting applications can make this reflected component significant. *(see diagram 3)*

The solution is to light to the lowest average lighting level consistent with proper visibility for the sport and to achieve high levels of uniformity. Floodlight installations that give high uniformity with a minimum number of floodlights can satisfy this requirement. Inherent in this solution is the use of floodlights that have a peak intensity at a high elevation angle, combined with a cut off angle below the horizontal.

Light pollution can be minimised with a well designed lighting installation if the floodlight offers a:

- precisely controlled light distribution
- peak intensity at a high elevation angle
- total cut off below the horizontal *(see diagram 4)*
- high levels of illuminance and uniformity

Designing installations with flat glass floodlights

The designer of a lighting installation can achieve his lighting objectives using traditional floodlights, free from the constraints of light pollution considerations, by rotating the floodlights from side to side, as well as tilting them up and down.

However, when using 'flat glass' floodlights, the lighting performance must be achieved by using only the side to side rotational adjustment. If this fails to achieve the required performance levels, there are a limited number of options available in areas where light pollution is more sensitive:

- Do nothing and sacrifice lighting performance
- Increase the number of floodlights, so increasing installation and running costs, and sky glow from more reflected light
- Tilt the floodlights in the vertical plane, increasing light trespass and glare
- Increase the mounting height, which will lead to higher costs in the columns

Troika offers the solution

Troika is an extremely efficient 'flat glass' asymmetric floodlight with a light cut-off close to the peak intensity angle.

It also offers a choice of four different light distributions for each lamp option. The light distributions vary not only in their degree of asymmetry, but also in their intensity and beam width. By mixing and matching the light distributions to individual installations, the designer can achieve the lighting objectives while still retaining the 'flat glass' in a horizontal position. *(see diagram 1)*

Troika Optimised Installation
- Performance
- Illuminance
- Uniformity

Troika Reduced Light Pollution
- No direct upward light
- Minimised skyglow contribution
- Minimised light trespass
- Minimised glare

Troika Reduced Costs
- Reduced quantity - lower installation and maintenance costs
- Reduced column costs

Troika's unique optical system

Troika Variable 60-70 - uses a reflector in conjunction with a variable position lampholder, which provides three different light distributions, varying in intensity, beam width and peak angle intensity (Ipeak), from the same reflector. These floodlights provide three different Ipeak angles between nominally 60° and 70°. They are ideal for applications that require illumination over a wide area, for instance tennis courts, multi-purpose sports facilities, indoor sports halls, car and lorry parks. *(see diagram 2)*

Troika Fixed 45 - uses a different reflector with a fixed position lampholder, providing a single light distribution per lamp option. The Ipeak angles of these floodlights is nominally 45° and is ideal for applications where a surface must be illuminated from a source with a degree of incidence significantly below 60°. The best examples are swimming pools and uplighting applications, where a lower i-peak angle is required to avoid excessive surface reflectance. *(see diagram 3)*

Note that the exact Ipeak angles and distributions of Troika depend upon the lamp option selected. Please refer to the photometric tables detailed on pages 12 and 13.

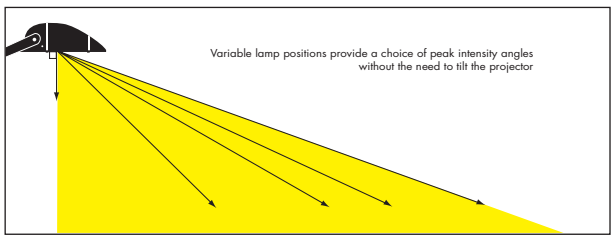


Diagram 1 - Variable lamp positions

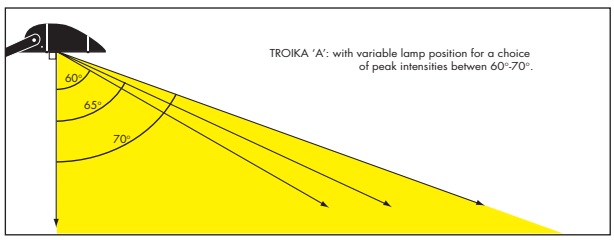


Diagram 2 - Troika variable 60-70

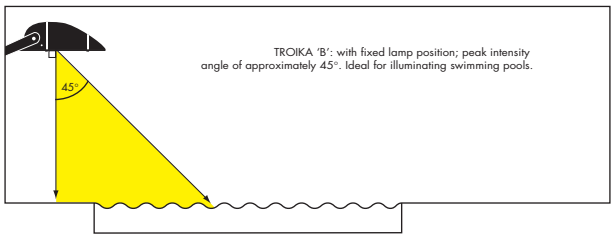


Diagram 3 - Troika fixed 45

As can be seen, due to its photometric versatility, Troika really initiates the next generation in 'flat glass' lighting solutions.

Please refer to the sample projects on pages 10 and 11 of this brochure to see typical schemes.

Product detail
Ordering guide
Dimensions
Accessories

Lamps

250W/400W/600W HPS-T Tubular High Pressure Sodium, Cap E40.

250W/400W HPS-DE Double Ended High Pressure Sodium, Cap FC2.

250W/400W HIT Tubular Metal Halide, Cap E40.

250W/400W HIT-DE Double Ended Metal Halide, Cap FC2.

Materials/Finish

Body: Re-cyclable pressure die-cast aluminium LM2, powder coat painted in grey. Standard finish close to RAL9007.
Alternative colour finish available on request.
Gear tray cover: Re-cyclable technopolymer (Polyamide reinforced with 20% glass fibre)
Glass: Toughened, 5mm thick
Stirrup: Galvanised steel, painted in grey
Bolts and screws: Stainless steel
Glass fixing toggles: Re-cyclable technopolymer (Polyamide reinforced with 20% glass fibre)
Reflector: Ultra specular pre-anodised high grade aluminium
Accessories frame: Aluminium

Installation/Mounting

Access to lamp via hinged glass released by four retained Allen screws and sliding toggles.
Lamp replacement possible without removing attachments.
Installation of gear tray and access to separate gear compartment via removable gear cover released by four retained Allen screws.
Cable gland for 7.5 - 13mm diameter cable.
Additional knock out provided for through wiring.
Aiming is simplified by indicator on floodlight body.
Stirrup fixed by bolts through central 22mm diameter hole and two further 15mm diameter holes positioned 100mm either side of the central hole.
Maximum ambient temperature (Ta max) = + 35°C (250 & 400W lamp options).
Maximum ambient temperature (Ta max) = + 25°C (600W lamp options).
The 600W option may be used for interior applications if the control gear is housed remotely from the fitting.

Standards

Designed and manufactured to comply with EN 60598
Electrical Class II as standard
Electrical Class I with accessory kit.
850°C Hot Wire
IP65 CE
Shock resistance as standard: IK 08 (5 Joules)
Shock resistance with wire guard: IK 10 (20 Joules)
Windage: 0.12m^2

Specification
To specify state:
'Flat glass' asymmetric floodlight in die-cast aluminium with high grade technopolymer gear tray cover and adjustable lamp holder mechanism, sealed to IP65 (optical and gear compartment). Access to lamp via hinged glass with four retained fixing points. Installation of, and access to, gear tray via removable cover with integral respirator. Suitable for 250W/400W/600W high pressure sodium lamps and 250W/400W metal halide lamps.
As Thorn Troika.

Floodlight

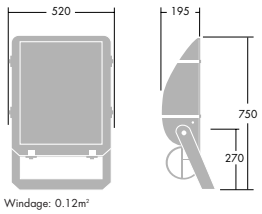
Order floodlight plus gear tray for complete luminaire. Lamps to be ordered separately.

Lamp type & rating		Description	Weight (Kg)	Cat. No.
HPS-T/HIT	250W/400W	Floodlight with variable lampholder	14.0	QTKA2540MSE40
HPS-T/HIT	250W/400W	Floodlight with fixed position lampholder	14.0	QTKB2540MSE40
HPS-DE/HIT- DE	250W/400W (Philips)	Floodlight with variable lampholder	14.0	QTKA2540MSFC2
HPS-DE/HIT- DE	250W/400W (Philips)	Floodlight with fixed position lampholder	14.0	QTKB2540MSFC2
HIT-DE	250W (Osram)	Floodlight with variable lampholder	14.0	QTKA25MFC2
HIT-DE	250W (Osram)	Floodlight with fixed position lampholder	14.0	QTKB25MFC2
HPS-T	600W	Floodlight with variable lampholder	14.0	QTKA600SE40
HPS-T	600W	Floodlight with fixed position lampholder	14.0	QTKB600SE40

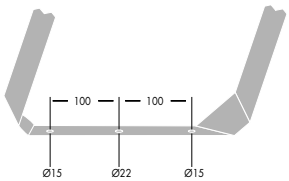
Product available in white on request.

Gear Trays

Lamp type & rating		Reflector	Weight (Kg)	Cat. No.
HIT	250W (Philips)	Variable	3.50	CON2HPI-T250.4
HIT	400W (Philips)	Variable	4.98	CON2HPI-T400.4
HIT	250W (Osram)	Variable	3.50	CON2SHP250.4
HIT	400W (Osram)	Variable	4.98	CON2HQI-T400.4
HPS-XLT	250W	Variable	3.50	CON2SHP250.4
HPS-XLT	400W	Variable	4.98	CON2SHP400.4
HPS-T	250W	Variable	3.50	CON2SHP250.4
HPS-T	400W	Variable	4.98	CON2SHP400.4
HPS-T	600W	Variable	7.90	QTKG600HPS
HIT	250W (Philips)	Fixed	3.50	CON2HPI-T250.4
HIT	400W (Philips)	Fixed	4.98	CON2HPI-T400.4
HIT	250W (Osram)	Fixed	3.50	CON2SHP250.4
HIT	400W (Osram)	Fixed	4.98	CON2HQI-T400.4
HPS-XLT	250W	Fixed	3.50	CON2SHP250.4
HPS-XLT	400W	Fixed	4.98	CON2SHP400.4
HPS-T	250W	Fixed	3.50	CON2SHP250.4
HPS-T	400W	Fixed	4.98	CON2SHP400.4
HPS-T	600W	Fixed	7.90	QTKG600HPS
HIT-DE	250W	Variable	3.50	CON2MH250.4
HIT-DE	400W	Variable	4.98	CON2MH400.4
HPS-DE	250W	Variable	3.50	CON2SHP250.4
HPS-DE	400W	Variable	4.98	CON2SHP400.4
HIT-DE	250W	Fixed	3.50	CON2MH250.4
HIT-DE	400W	Fixed	4.98	CON2MH400.4
HPS-DE	250W	Fixed	3.50	CON2SHP250.4
HPS-DE	400W	Fixed	4.98	CON2SHP400.4



Windage: 0.12m²



Accessories

All accessories are mounted in a common aluminium frame which fixes to the face of the floodlight and is hinged along one side to ease lamp maintenance. Access to the lamp can be achieved without the need to fully remove the accessories.

A number of accessories have been designed either to add a splash of colour to an illumination project, to protect the floodlight from vandalism or other impacts, or to further control the light emissions for extra sensitive installations.

Lux guillotine
A particularly inventive accessory is the 'adjustable vertical light shield', which has been developed for areas of extreme sensitivity to light spill. It is adjustable on-site and enables the light beam to be cut off exactly where it is required.

Description	Weight (Kg)	Cat. No.
Class I kit (to be fitted to the gear tray on site)	0.1	QTKEK
Lux guillotine and accessory frame	1.5	QTKLG
Barn doors	1.0	QTKBD
Wire guard	1.9	QTKWG
Louvre	0.85	QTKLV
Colour filter (red)	1.9	QTKFI/R
Colour filter (blue)	1.9	QTKFI/B
Colour filter (green)	1.9	QTKFI/G
Colour filter (yellow)	1.9	QTKFI/Y
Short stirrup	-	QTKSS

Sample Projects

EN 12193 is the European norm for sportslight applications.

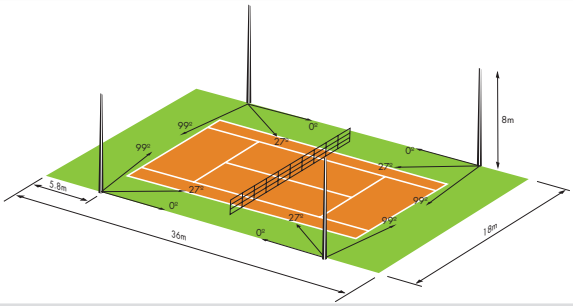
Because lamp output declines with age, we illustrate below figures which have been calculated including a 20% allowance as "maintainance factor"

Multi-purpose Sports Hall
Sports covered by these designs: Basketball, Floorball, Football (5 and 6-a-side), Handball, Martial arts, Netball, Volleyball, Weightlifting, Wrestling, Aerobics and Gymnastics

Single Tennis Court - Class 3 (training)

No of floodlights: 8 (variable)
No of columns: 4
Mounting Height: 6.0m
Lamp: HPS-T 400W
Lamp position 1
Initial lamp lumens: 48000lm

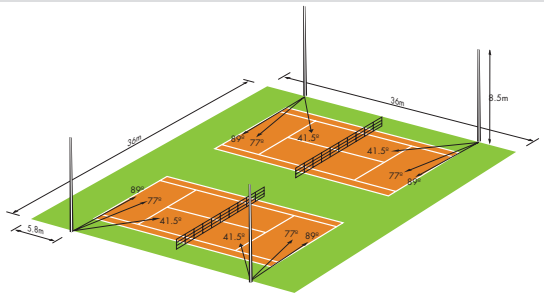
	Troika result	EN12193 Requirement
Dimension	36 x 18m	36 x 18m
Calculation Points	15 x 7	15 x 7
Maintained Average Illuminance	205 Lux	200 Lux
Uniformity	0.6	0.6
Glare Rating	48	55
Colour Rendering Index	25	20



Double Tennis Court - Class 3 (training)

No of floodlights: 12 (variable)
No of columns: 4
Mounting Height: 8.0m
Lamp: HPS-T XL-T 400W
Lamp position 3
Initial lamp lumens: 58500lm

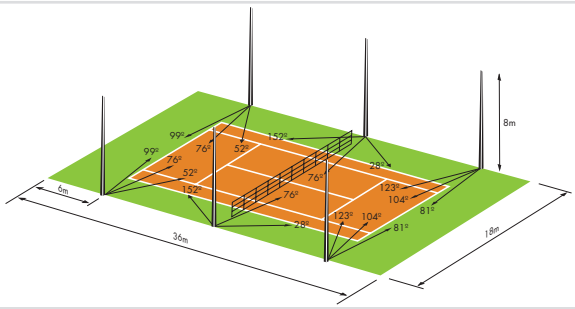
	Troika result	EN12193 Requirement
Dimension	36 x 36m	36 x 36m
Calculation Points	15 x 15	15 x 15
Maintained Average Illuminance	200 Lux	200 Lux
Uniformity	0.61	0.6
Glare Rating	48	55
Colour Rendering Index	25	20



Single Tennis Court - Class 2 Competition

No of floodlights: 18
No of columns: 6
Mounting Height: 8.0m
Lamp: HIT 400W
Lamp position 1
Initial lamp lumens: 38000lm

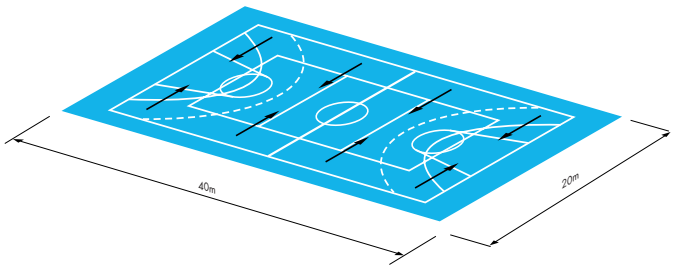
	Troika result	EN12193 Requirement
Dimension	36 x 18m	36 x 18m
Calculation Points	15 x 7	15 x 7
Maintained Average Illuminance	300 Lux	300 Lux
Uniformity	0.8	0.7
Glare Rating	41	50
Colour Rendering Index	65	60



Multi-purpose Sports Hall - Class 3 (training)

No of floodlights: 8 (variable)
Mounting Height: 7.0m
Lamp: HPS-XLT 400W
Lamp position 3
Initial lamp lumens: 56500lm

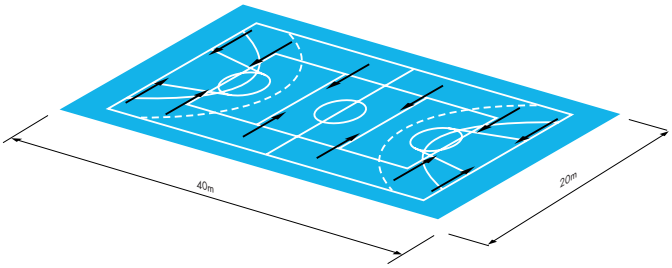
	Troika result	EN12193 Requirement
Dimension	40 x 20m	40 x 20m
Calculation Points	15 x 9	15 x 9
Maintained Average Illuminance	215 Lux	200 Lux
Uniformity	0.71	0.5
Glare Rating	47	not specified
Colour Rendering Index	25	20



Multi-purpose Sports Hall - Class 3 (training)

No of floodlights: 12 (variable)
Mounting Height: 7.0 m
Lamp: HIT 400W
Lamp position 3
Initial lamp lumens: 38000lm

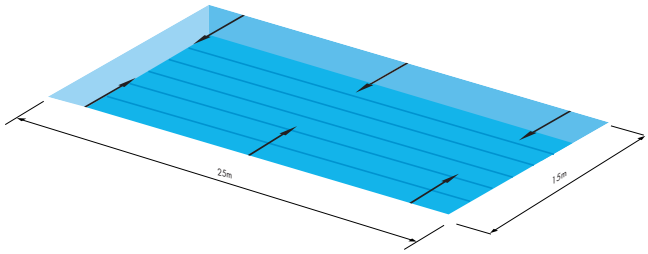
	Troika result	EN12193 Requirement
Dimension	40 x 20m	40 x 20m
Calculation Points	15 x 9	15 x 9
Maintained Average Illuminance	210 Lux	200 Lux
Uniformity	0.59	0.5
Glare Rating	46	not specified
Colour Rendering Index	65	60



Swimming Pool - Class 3 (training)

No of floodlights: 6 (fixed)
Mounting Height: 8.0m
Lamp: HPS-T 400W
Lamp position fixed
Initial lamp lumens: 48000lm

	Troika result	EN12193 Requirement
Dimension	25 x 15m	25 x 15m
Calculation Points	13 x 7	13 x 7
Maintained Average Illuminance	225 Lux	200 Lux
Uniformity	0.66	0.5
Glare Rating	31	not specified
Colour Rendering Index	25	20

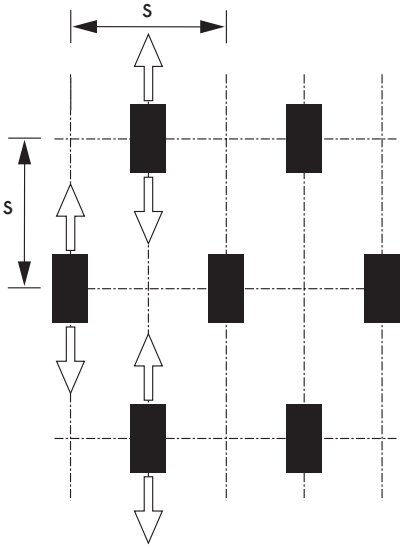


Parking Area

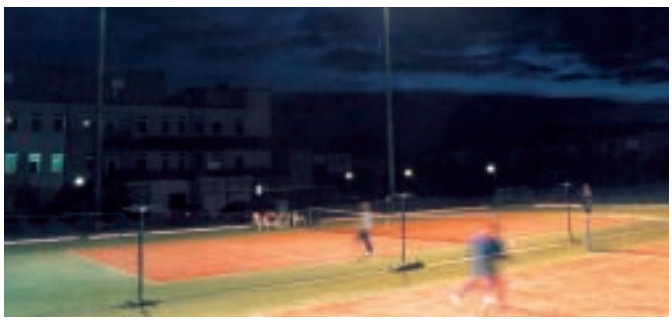
The table allows the user to select the lamp wattages, the mounting height of the floodlight and the spacings according to the illuminance and uniformity requirements of the installation.

No of floodlights per column: 2

		Mounting Height: S = H x 3.5	
HPS-XLT 600W position 1		20m	12m
HPS-XLT 400W position 1	21m	15m	10m
HPS-XLT 250W position 1	16m	12m	8m
Average Illuminance (Maintained)	13Lux	25Lux	60Lux
Uniformity (Emin/Eav)		0.31	
Uniformity (Emax/Emin)		7.9	
Glare Rating	<50	<50	<50
		Mounting Height: S = H x 3.0	
HPS-XLT 600W position 1		23m	15m
HPS-XLT 400W position 1	25m	18m	12m
HPS-XLT 250W position 1	18m	12m	8m
Average Illuminance (Maintained)	13Lux	25Lux	60Lux
Uniformity (Emin/Eav)		0.5	
Uniformity (Emax/Emin)		4.7	
Glare Rating	<50	<50	<50



This symbol represents one mast with 2 No. fittings



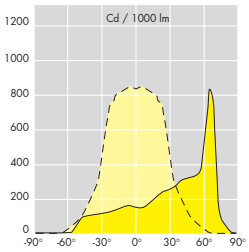
Photometric data

The following guide has been designed to provide an overview and comparison of the photometric performances of each lamp option.

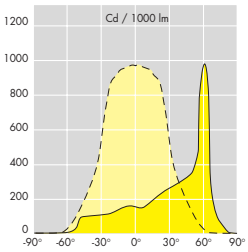
Troika Variable
refers to products using the 60°-70° Ipeak angle reflector with variable lamp position. For more details see page 6.

Troika fixed
refers to the approximate 45° Ipeak angle reflector with fixed lamp position. For more details see page 6.

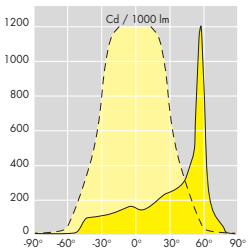
250W HPS-T



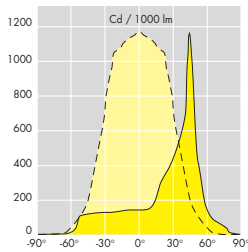
Lamp: 250W HPS-T position 1 —— Vertical
I max: 854 cd/1000 lm **I peak:** 67° – – – Horizontal
I max/2: Horizontal: 2 x 31° Vertical: 59°/72°



Lamp: 250W HPS-T position 2 —— Vertical
I max: 975 cd/1000 lm **I peak:** 63° – – – Horizontal
I max/2: Horizontal: 2 x 33° Vertical: 56°/68°

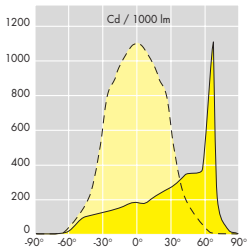


Lamp: 250W HPS-T position 3 —— Vertical
I max: 1248 cd/1000 lm **I peak:** 59° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 54°/64°

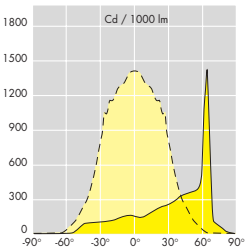


Lamp: 250W HPS-T fixed position —— Vertical
I max: 965 cd/1000 lm **I peak:** 46° – – – Horizontal
I max/2: Horizontal: 2 x 35° Vertical: 37°/51°

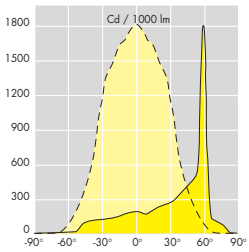
250W HPS-DE



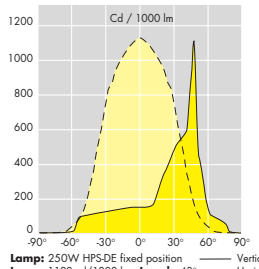
Lamp: 250W HPS-DE position 1 —— Vertical
I max: 1095 cd/1000 lm **I peak:** 68° – – – Horizontal
I max/2: Horizontal: 2 x 32° Vertical: 63°/71°



Lamp: 250W HPS-DE position 2 —— Vertical
I max: 1423 cd/1000 lm **I peak:** 65° – – – Horizontal
I max/2: Horizontal: 2 x 33° Vertical: 61°/67°

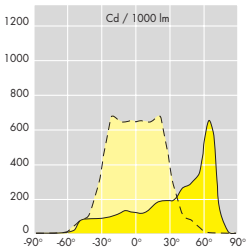


Lamp: 250W HPS-DE position 3 —— Vertical
I max: 1808 cd/1000 lm **I peak:** 61° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 57°/64°

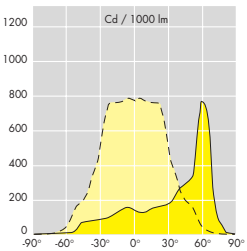


Lamp: 250W HPS-DE fixed position —— Vertical
I max: 1122 cd/1000 lm **I peak:** 48° – – – Horizontal
I max/2: Horizontal: 2 x 36° Vertical: 37°/52°

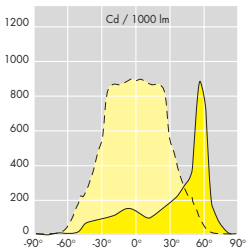
250W HIT (Philips)



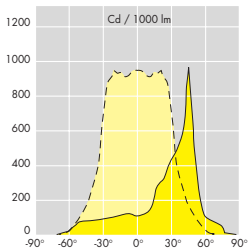
Lamp: 250W HIT (Philips) position 1 —— Vertical
I max: 683 cd/1000 lm **I peak:** 68° – – – Horizontal
I max/2: Horizontal: 2 x 32° Vertical: 56°/73°



Lamp: 250W HIT (Philips) position 2 —— Vertical
I max: 790 cd/1000 lm **I peak:** 61° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 54°/70°

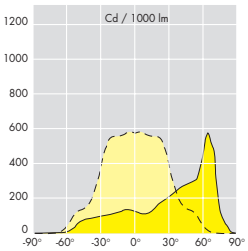


Lamp: 250W HIT (Philips) position 3 —— Vertical
I max: 916 cd/1000 lm **I peak:** 57° – – – Horizontal
I max/2: Horizontal: 2 x 36° Vertical: 52°/66°

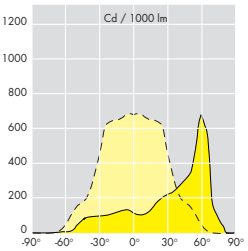


Lamp: 250W HIT (Philips) fixed position —— Vertical
I max: 958 cd/1000 lm **I peak:** 47° – – – Horizontal
I max/2: Horizontal: 2 x 35° Vertical: 35°/53°

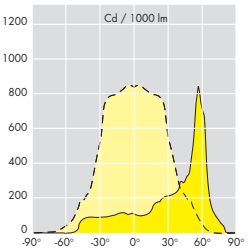
250W HIT (Osram)



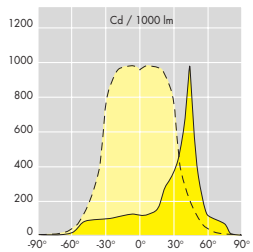
Lamp: 250W HIT (OSRAM) position 1 —— Vertical
I max: 584 cd/1000 lm **I peak:** 64° – – – Horizontal
I max/2: Horizontal: 2 x 33° Vertical: 39°/72°



Lamp: 250W HIT (OSRAM) position 2 —— Vertical
I max: 691 cd/1000 lm **I peak:** 60° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 52°/68°

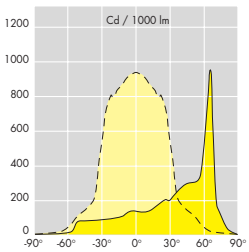


Lamp: 250W HIT (OSRAM) position 3 —— Vertical
I max: 858 cd/1000 lm **I peak:** 57° – – – Horizontal
I max/2: Horizontal: 2 x 35° Vertical: 51°/64°

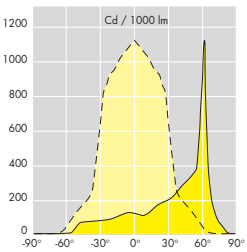


Lamp: 250W HIT (OSRAM) fixed position —— Vertical
I max: 986 cd/1000 lm **I peak:** 44° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 34°/50°

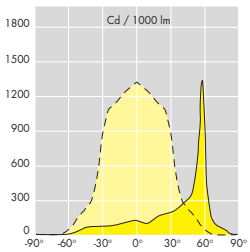
250W HIT-DE



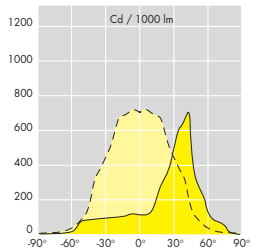
Lamp: 250W HIT-DE position 1 —— Vertical
I max: 931 cd/1000 lm **I peak:** 66° – – – Horizontal
I max/2: Horizontal: 2 x 32° Vertical: 61°/70°



Lamp: 250W HIT-DE position 2 —— Vertical
I max: 1125 cd/1000 lm **I peak:** 63° – – – Horizontal
I max/2: Horizontal: 2 x 32° Vertical: 58°/66°

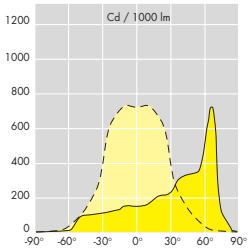


Lamp: 250W HIT-DE position 3 —— Vertical
I max: 1325 cd/1000 lm **I peak:** 59° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 54°/62°

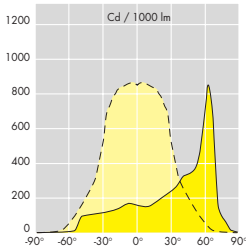


Lamp: 250W HIT-DE fixed position —— Vertical
I max: 720 cd/1000 lm **I peak:** 44° – – – Horizontal
I max/2: Horizontal: 2 x 37° Vertical: 25°/50°

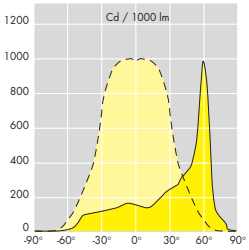
Troika Variable 400W HPS-XLT



Lamp: 400W HPS-T (XL) position 1 —— Vertical
I max: 732 cd/1000 lm **I peak:** 68° – – – Horizontal
I max/2: Horizontal: 2 x 33° Vertical: 58°/73°

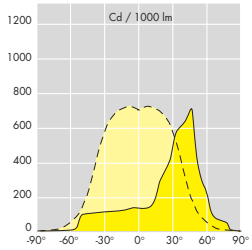


Lamp: 400W HPS-T (XL) position 2 —— Vertical
I max: 868 cd/1000 lm **I peak:** 64° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 56°/70°



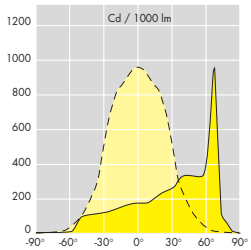
Lamp: 400W HPS-T (XL) position 3 —— Vertical
I max: 1000 cd/1000 lm **I peak:** 61° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 54°/67°

Troika Fixed

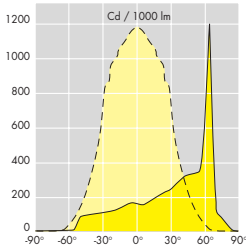


Lamp: 400W HPS-T(XL) fixed position —— Vertical
I max: 723 cd/1000 lm **I peak:** 47° – – – Horizontal
I max/2: Horizontal: 2 x 38° Vertical: 22°/53°

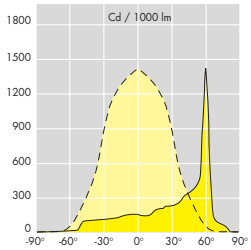
400W HPS-DE



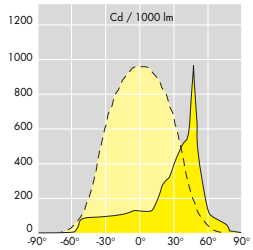
Lamp: 400W HPS-DE position 1 —— Vertical
I max: 963 cd/1000 lm **I peak:** 69° – – – Horizontal
I max/2: Horizontal: 2 x 31° Vertical: 62°/72°



Lamp: 400W HPS-DE position 2 —— Vertical
I max: 1184 cd/1000 lm **I peak:** 65° – – – Horizontal
I max/2: Horizontal: 2 x 33° Vertical: 60°/68°

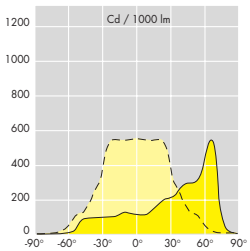


Lamp: 400W HPS-DE position 3 —— Vertical
I max: 1408 cd/1000 lm **I peak:** 61° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 57°/64°

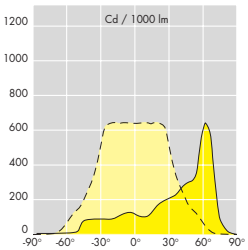


Lamp: 400W HPS-DE fixed position —— Vertical
I max: 965 cd/1000 lm **I peak:** 47° – – – Horizontal
I max/2: Horizontal: 2 x 36° Vertical: 35°/52°

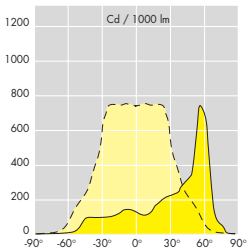
400W HIT (Philips)



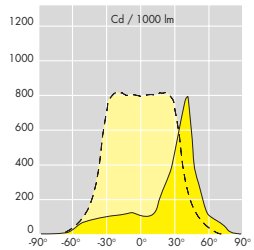
Lamp: 400W HIT (Philips) position 1 —— Vertical
I max: 548 cd/1000 lm **I peak:** 66° – – – Horizontal
I max/2: Horizontal: 2 x 36° Vertical: 38°/74°



Lamp: 400W HIT (Philips) position 2 —— Vertical
I max: 649 cd/1000 lm **I peak:** 63° – – – Horizontal
I max/2: Horizontal: 2 x 37° Vertical: 52°/71°

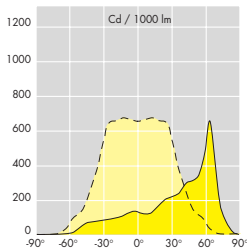


Lamp: 400W HIT (Philips) position 3 —— Vertical
I max: 759 cd/1000 lm **I peak:** 59° – – – Horizontal
I max/2: Horizontal: 2 x 38° Vertical: 51°/67°

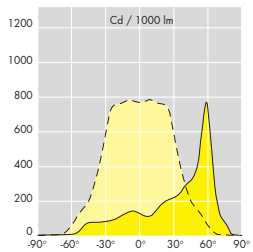


Lamp: 400W HIT (Philips) fixed position —— Vertical
I max: 825 cd/1000 lm **I peak:** 43° – – – Horizontal
I max/2: Horizontal: 2 x 38° Vertical: 28°/50°

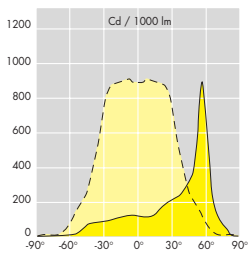
400W HIT (Osram)



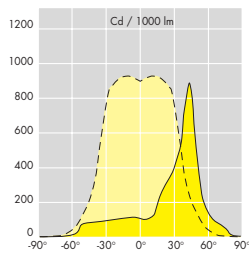
Lamp: 400W HIT (OSRAM) position 1 —— Vertical
I max: 681 cd/1000 lm **I peak:** 65° – – – Horizontal
I max/2: Horizontal: 2 x 37° Vertical: 52°/71°



Lamp: 400W HIT (OSRAM) position 2 —— Vertical
I max: 791 cd/1000 lm **I peak:** 61° – – – Horizontal
I max/2: Horizontal: 2 x 38° Vertical: 52°/67°

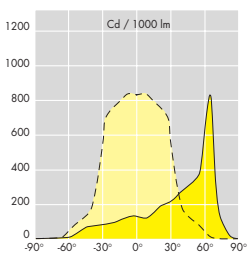


Lamp: 400W HIT (OSRAM) position 3 —— Vertical
I max: 919 cd/1000 lm **I peak:** 58° – – – Horizontal
I max/2: Horizontal: 2 x 38° Vertical: 51°/64°

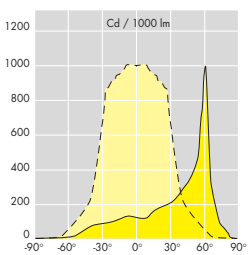


Lamp: 400W HIT (OSRAM) fixed position —— Vertical
I max: 933 cd/1000 lm **I peak:** 44° – – – Horizont
I max/2: Horizontal: 2 x 38° Vertical: 32°/52°

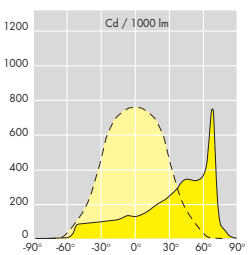
400W HIT-DE



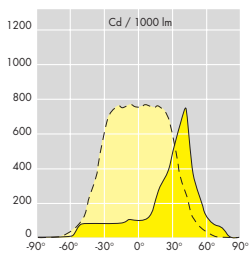
Lamp: 400W HIT-DE position 1 —— Vertical
I max: 839 cd/1000 lm **I peak:** 66° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 58°/69°



Lamp: 400W HIT-DE position 2 —— Vertical
I max: 1002 cd/1000 lm **I peak:** 63° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 56°/66°

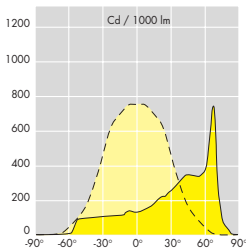


Lamp: 400W HIT-DE position 3 —— Vertical
I max: 1151 cd/1000 lm **I peak:** 59° – – – Horizontal
I max/2: Horizontal: 2 x 35° Vertical: 52°/63°

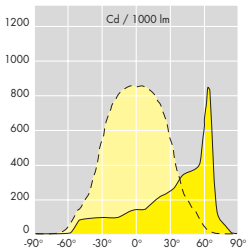


Lamp: 400W HIT-DE fixed position —— Vertical
I max: 777 cd/1000 lm **I peak:** 43° – – – Horizontal
I max/2: Horizontal: 2 x 37° Vertical: 26°/49°

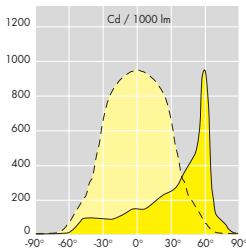
600W HPS-T



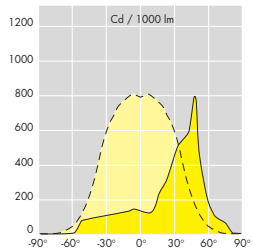
Lamp: 600W HPS-T position 1 —— Vertical
I max: 756 cd/1000 lm **I peak:** 69° – – – Horizontal
I max/2: Horizontal: 2 x 34° Vertical: 61°/72°



Lamp: 600W HPS-T position 2 —— Vertical
I max: 859 cd/1000 lm **I peak:** 65° – – – Horizontal
I max/2: Horizontal: 2 x 35° Vertical: 59°/69°



Lamp: 600W HPS-T position 3 —— Vertical
I max: 938 cd/1000 lm **I peak:** 61° – – – Horizontal
I max/2: Horizontal: 2 x 36° Vertical: 51°/66°



Lamp: 600W HPS-T fixed position —— Vertical
I max: 804 cd/1000 lm **I peak:** 49° – – – Horizontal
I max/2: Horizontal: 2 x 38° Vertical: 27°/55°

Technical Information

During the development process, as much attention has been paid to the physical design of the product as to the photometric design. The result is a floodlight that simplifies and minimises installation and maintenance procedures.

1. 

2. 

6. 

3. 

7. 

4. 

8. 

5. 

9. 

1, **Lamp Position Selection**
2 & 3 Punchmarks in the reflector identify the lamp holder position. The selected position of the lampholder can be checked by seeing which series of marks the lamp support bracket is adjacent to. For example, position 1 has been selected in photograph 1, position 2 in photograph 2 and position 3 in photograph 3.

4 & 5 To manually adjust the selected lamp position is simple. Pull out the brass toggle to release the adjustable fixing bracket allowing the lampholder and lamp support to be repositioned. When the lamp support bracket is adjacent to the desired position, release the brass toggle and manoeuvre the lampholder until it clicks and locks into position.

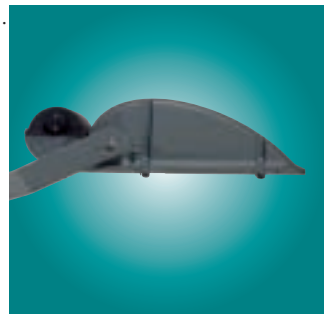
6, 7, 8 & 9 **Gear Tray Installation**
Troika has been designed to house all control gear integrally. The gear trays are supplied separately and designed to ensure simple and rapid installation.

An Electrical Class I Kit can be supplied for installations which require floodlights to be earthed.

10. 

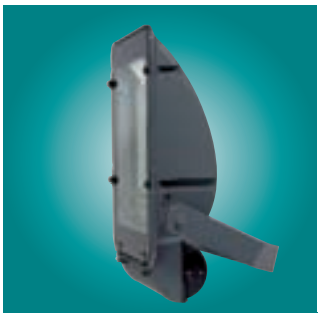
11. 

12. 

13. 

14. 

15. 

16. 

17. 

18. 

19. 

20. 

10 **Gear Canopy Respirator**
& The circulation of air in the gear
11 tray can help to prolong the life of components and materials.

The integral 'respirator' device of Troika allows air to flow in and out of the gear tray canopy, but with a filter to prevent dust ingress and a 'chicane' arrangement to keep out moisture, while maintaining the integrity of the unit to IP65.

12, **Adjustable Stirrup**
13, The adjustable and reversible
14, stirrup provides a multitude of
15 mounting options.
&
16

17. **Stirrup Aiming Guide**
An aiming guide is integrated into Troika to assist the installer in achieving the 'flat glass' position.

18. **Stirrup Locking Mechanism**
When the exact aiming angle has been selected, the secondary stirrup locking device ensures that the floodlight setting will not be altered by wind pressure or vibration.

19. **Glass**
Access to the lamp is via the hinged front opening glass, requiring only one person for maintenance.

20. When the glass is closed and the fixing toggles are slid back into position and tightened, the gasket between the glass and the floodlight body ensures the IP65 rating.

THORN

Lighting people and places

North Star Lighting, Inc.

2150 Parkes Drive Broadview, IL 60155
Tel: 800-229-4330 Fax: 708-681-4006
website: www.nslights.com

Thorn Lighting Limited

UK Sales desk -
Orders/Stock Enquiries
Tel: 08701 610 610
Fax: 08701 610 611

Regional Offices
& Lighting Design Centres
Tel: 08701 610 710
Fax: 08701 610 711

South East - North of London (northl)
South East - South of London (southl)
Major Projects - Southern (centls)
3 King George Close, Eastern Avenue West,
Romford, Essex RM7 7PP

Midlands (mids)
11 Galena Close, Tamworth,
Staffordshire B77 4AS

South West (southw)
Major Projects - Western (bbcs)
16 Columbus Walk, Atlantic Wharf,
Cardiff, Wales CF10 4TL

Major Projects - Northern (yorks)
Unit 5, Clarke Hall Farm, Aberford Road,
Wakefield, West Yorkshire WF1 4AL

North East (northe)
Trading Estate, Spennymoor,
Co. Durham DL16 7UR

North West (northw)
The Towers, Wilmslow Road, Didsbury,
Manchester M20 2SE

Scotland (scot)
Hamilton Business Centre, Caird Park,
Hamilton, Lanarkshire ML3 0QB

Northern Ireland (northi)
Prince Regent Road, Castlereagh,
Belfast BT5 6QR

e-mail
Each Region has 5 e-mail addresses that are in a standard format as follows:

(Using 'South West' as an example with its short code 'southw')

quotes.southw@thornlight.com
orders.southw@thornlight.com
stock.southw@thornlight.com
queries.southw@thornlight.com
enquiries.southw@thornlight.com

Outdoor Lighting
The Towers, Wilmslow Road, Didsbury,
Manchester M20 2SE
Tel: 0161 445 2719
Fax: 0161 448 8015
e-mail: outdoor@thornlight.com

Airfield Lighting
3 King George Close, Eastern Avenue West,
Romford, Essex RM7 7PP
Tel: 01708 776289
Fax: 01708 742322
e-mail: airfield@thornlight.com
Website: www.thornairfield.com

International Sales
3 King George Close, Eastern Avenue West,
Romford, Essex RM7 7PP
Tel: 01708 776284
Fax: 01708 741827
e-mail: international.sales@thornlight.com

Spare Parts
Tel: 0191 301 3131
Fax: 0191 301 3038
e-mail: spares@thornlight.com

Technical Support
Tel: 0870 600 8111
Fax: 0191 301 3907
e-mail: technical@thornlight.com

Brochureline Answering Service
Brochures on specific products/ranges
Tel: 01708 776333
Fax: 01708 776381
e-mail: brochures@thornlight.com

Other Offices in:
Australia, Austria, China, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hong Kong, Hungary, India, Ireland, Italy, Latvia, Lithuania, New Zealand, Norway, Poland, Russia, Singapore and Sweden

www.thornlighting.co.uk

Member of The Lighting Industry Federation

UK Sales and Distribution

FM 12233
UK Manufacturing

Publication No: 211(UK) Printed in England - 8/02