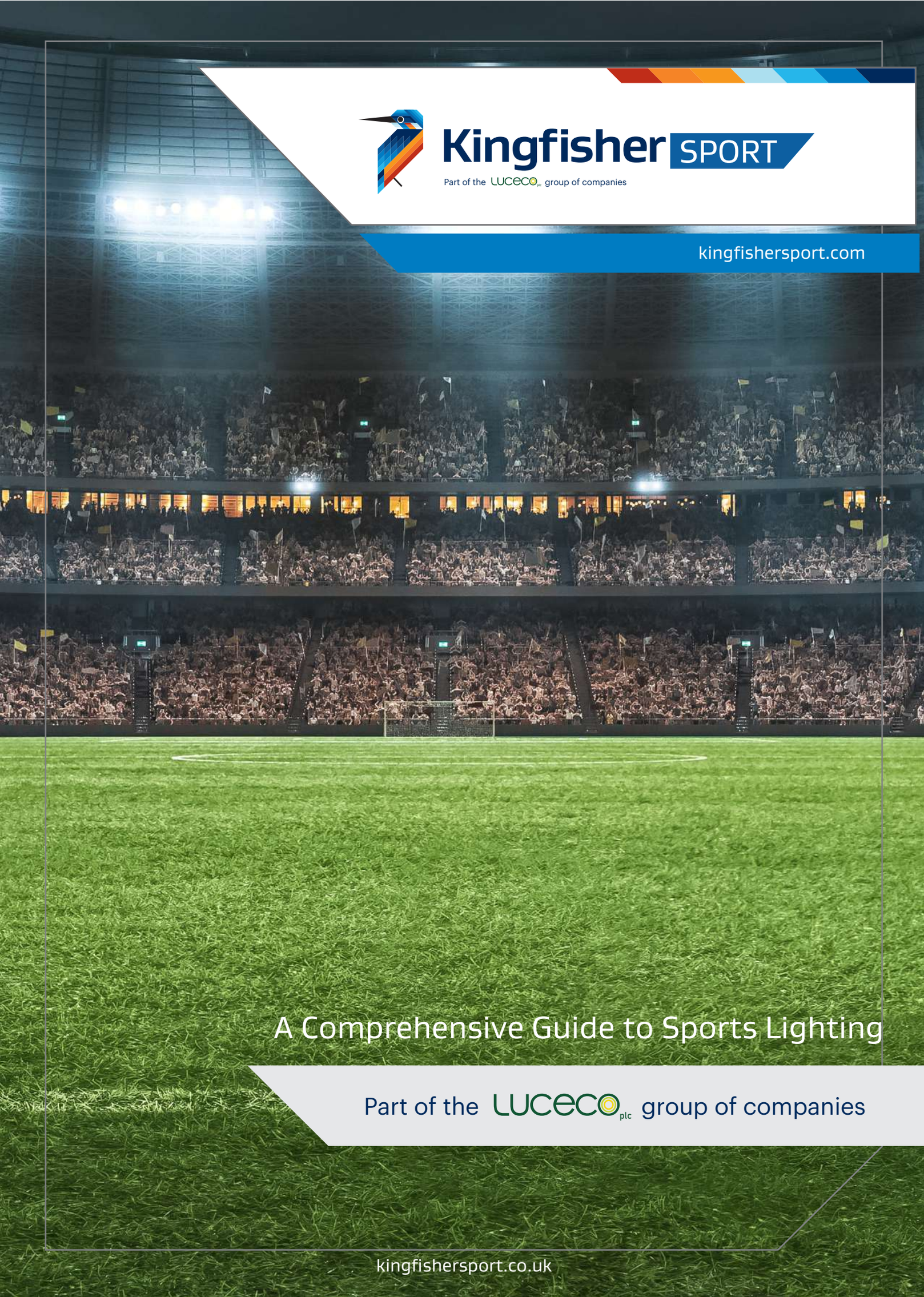


Kingfisher SPORT

Part of the LUCECO plc group of companies

kingfishersport.com

A Comprehensive Guide to Sports Lighting

Part of the LUCECO plc group of companies

kingfishersport.co.uk

Welcome

As leading industry experts, we have a wealth of knowledge and experience in Sports Lighting. With a vast array of high-profile projects, we've worked with some of the country's leading venues.

Kingfisher Sport offers a dedicated range of lighting, masts and accessories created with almost 35 years in the industry. Our world class product range has been designed and engineered in the UK to offer the perfect solutions for everything from grass roots sports teams to large stadium schemes. Using the latest in reflector technology, our range offers performance and efficiency as standard with flicker-free illumination ideal for broadcasting on HDTV.

We offer full bespoke end-to-end solutions, guiding you through from conception to commissioning. Choose from simple supply, all the way through to installation and maintenance packages. Our fully qualified team can offer ROI calculations, 3D visualisations and scheme designs, as well as full location consultations to ensure you get the right system for your site.

Accreditations

Contents

4 - 21 Standards & Regulations

22 - 29 Specifications

30 - 39 Product Guide

44 - 51 Installation Guide

52 - 59 Technical Info

60 - 61 Glossary

62 Contacts

Sports Lighting Standards

Lighting standards are developed by industry experts in technical committees and published by groups such as BSI (British Standard Institute) and CIE (International Commission on Illumination).

These standards are normalised across Britain and Europe (BS EN) and have become the main guide to which lighting designers turn to. Even though the standards aren't legally binding, adhering to them demonstrates competency and that a duty of care has been given to the user.

We've curated this handbook to guide you through the lighting standards for many sports such as hockey, football and tennis and given governing body (FA, LTA, etc) specific requirements.

Athletics

The table below demonstrates the two sections of the Athletics standard; track and field.

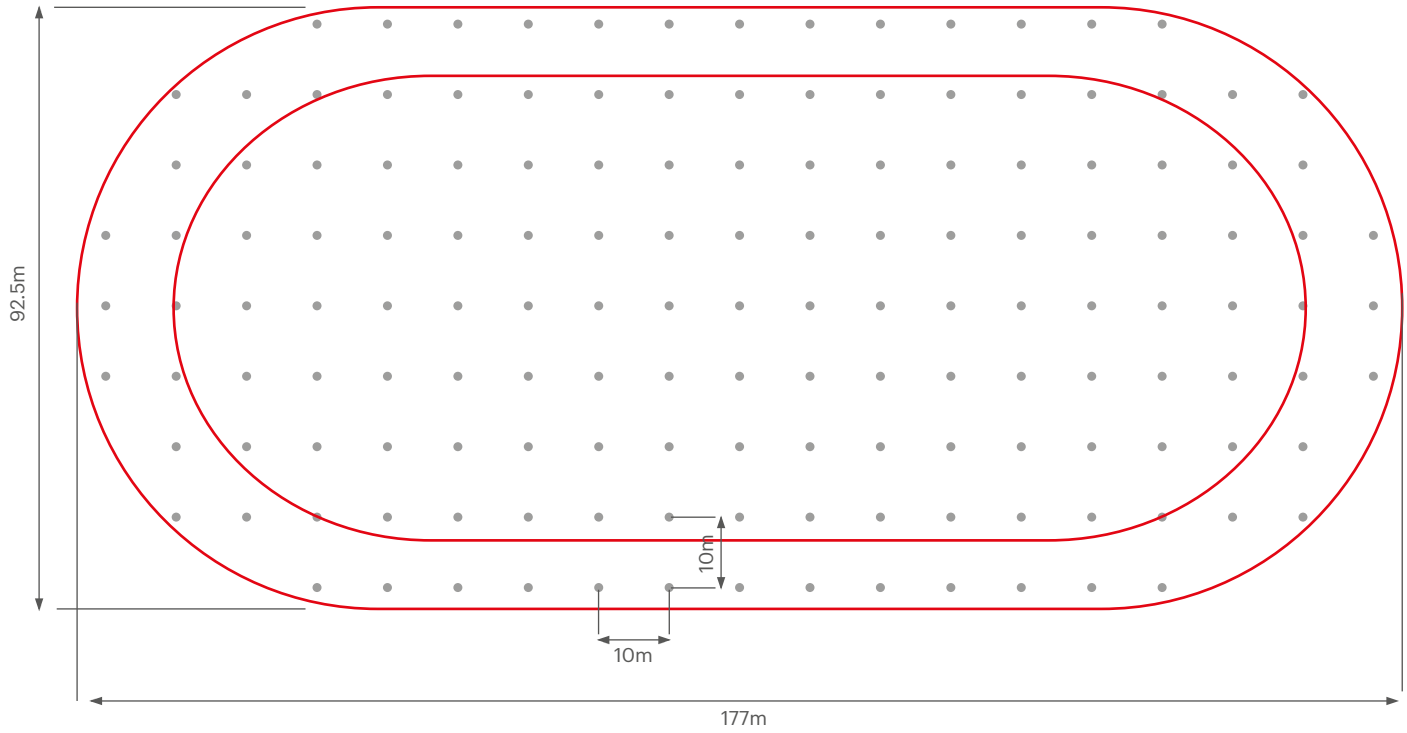
Below we can see the three levels of play for both standards. Class I and II represent larger scale professional grounds and as we go to Class III, we then venture into community spaces.

This is followed by the average lux levels (^{E}hor Ave^{lx}) with a high of 500 as well as horizontal uniformity levels (^{U2}hor) with the highest at 0.7. After this, we can see the highest glare rating (R_G) at 50 and colour rendering (R_A) at 65 and 80.

Track & Field - In Alignment with BS EN 12193						
Levels of Play	Horizontal Illuminance		Reference Area		R_G	R_A
	^{E}hor Ave^{lx}	^{u2}hor	Length	Width		
Class I	500	0.7	100	4.9 to 9.80	50	80
Class II	300	0.6	100	4.9 to 9.80	50	65
Class III	200	0.5	100	4.9 to 9.80	50	65

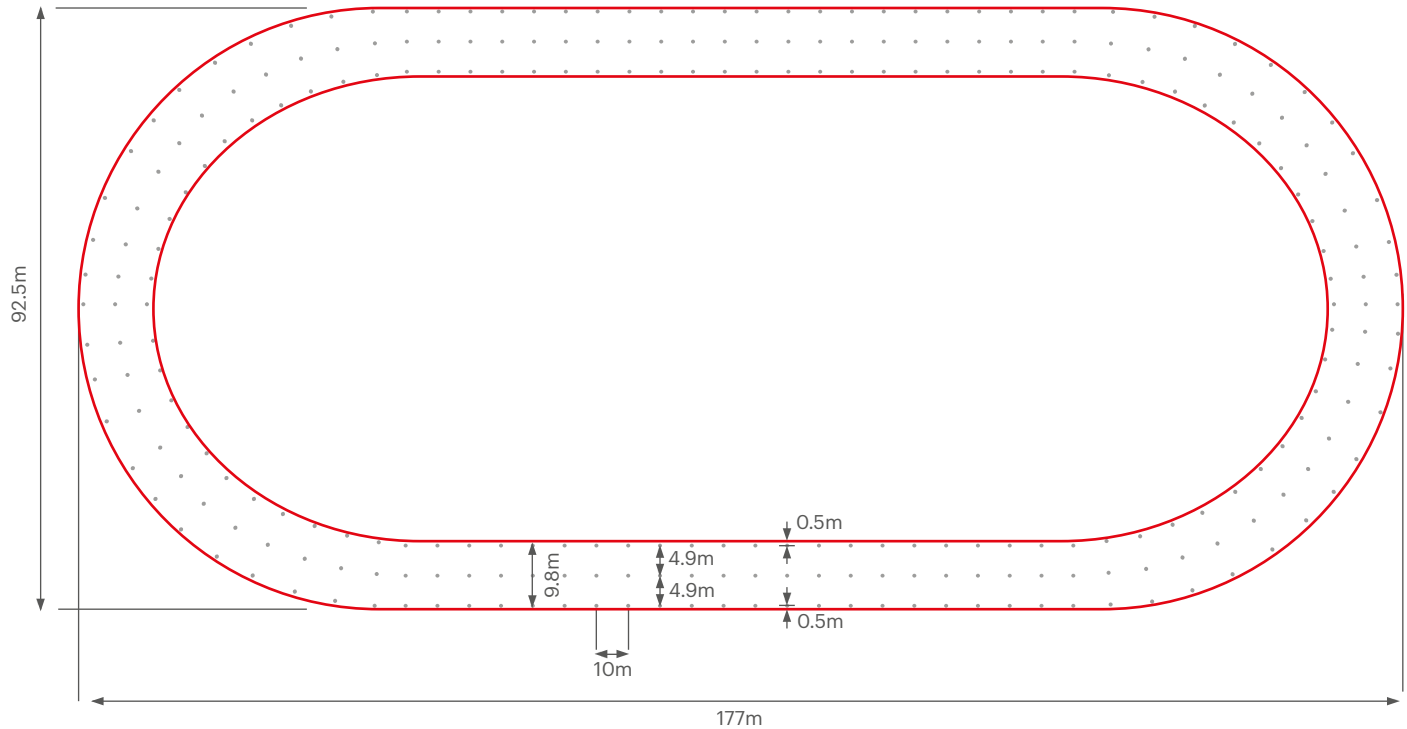
Track & Field - In Alignment with England Athletics						
Levels of Play	Horizontal Illuminance		Reference Area		R_G	R_A
	^{E}hor Ave^{lx}	^{u2}hor	Length	Width		
Class I	500	0.7	150	80	50	80
Class II	200	0.7	150	80	50	65
Class III	100	0.5	150	80	50	65

Track & Field



Commissioning layout grid

Track Only



Commissioning layout grid

Football

Sports Lighting works to an array of standards which must be met. The two most recognised governing bodies for football lighting are FA Standards and British Standards BS EN 12193.

There are significantly higher levels of play when it comes to sports especially when complying with FA Standards. Therefore meticulous attention must be paid to the type of site being illuminated. We're not only focusing on the levels of play but also the categories to which the levels of play sit in.

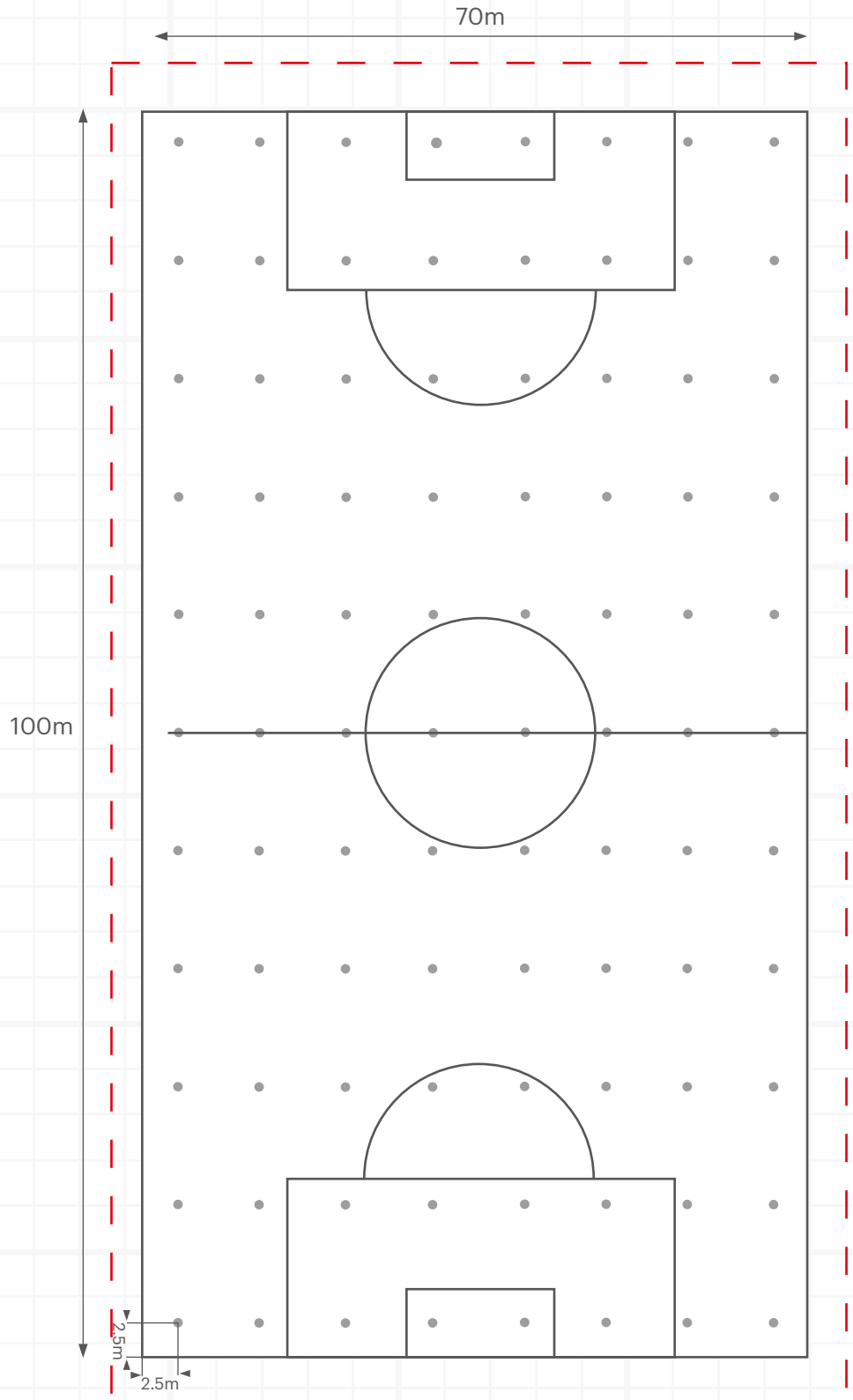
As seen below, the table has been split into the categories, levels of play, average lux levels and uniformity for the horizontal illuminance.

BS EN 12193				
Levels of Play	Horizontal Illuminance		R_G	R_A
	^{E}hor Ave^{lx}	^{u2}hor		
Class I	500	0.7	80	50
Class II	200	0.6	65	50
Class III	75	0.5	55	50

*In line with BS EN 12191

Football			
	Levels of Play	Horizontal Illuminance	
		$E_{hor\ Ave}$ lx	u^2_{hor}
UEFA	4	1400	0.5
	3	1200	0.4
	2	800	0.4
	1	Sufficient**	-
Championship	-	800	0.4
League 1 & League 2	-	500	0.5
The FA	Grade A Conference	250	0.3
	Grade B Conference	200	0.3
	Grade C - G	200	0.25
FAW	Platinum	1200	0.45
	Gold	800	0.4
	Silver	500	0.3
	Bronze	300	0.25
	Entry	200	0.25
UEFA	Tier 1	500	-
	Tier 2	250	-
	Tier 3	250	-
The Scottish FA	Gold	800	0.40
	Silver	500	0.30
	Bronze	300	0.25

Football



Commissioning layout grid

Hockey

Hockey pitches can be a challenge to illuminate. Similarly to other sports, hockey has two governing bodies, FIH (International Hockey Federation) and British Standards, as well as being divided into televised and non-televised. This also shows a difference in the level of play between the two.

Non-Televised guidance allows the use of Classes I, II and III which are international and national, regional and local, training and recreational sports (including schools). However, televised shows us the difference in TV's and screens.

The table below shows the average lux levels and uniformity levels, as well as glare and colour rendering requirements.

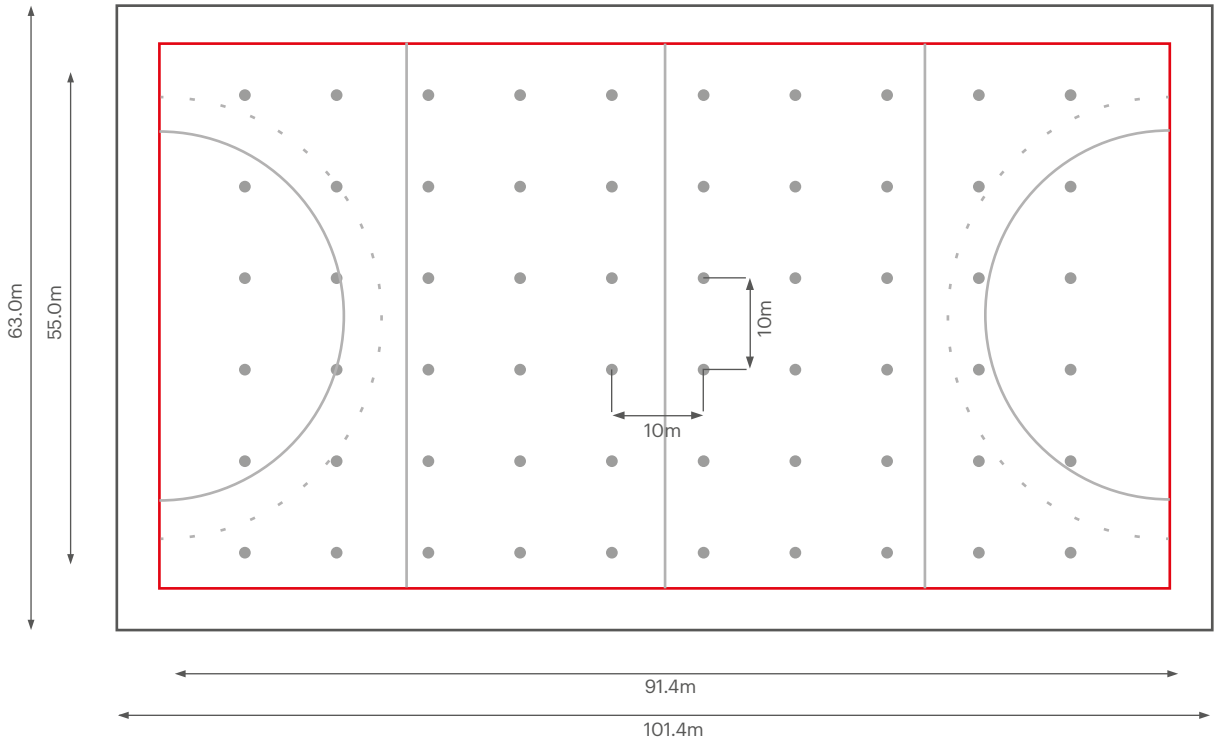
Non-Televised Hockey				
Levels of Play	Horizontal Illuminance		R_G	R_A
	^{E}hor Ave^{lx}	^{u2}hor		
Class I	500	0.7	50	65
Class II	350	0.7	50	65
Class III	200	0.6	50	65

Televised Hockey						
Levels of Play	Horizontal Illuminance		Vertical Illuminance		R_G	R_A
	^{E}hor Ave^{lx}	^{u2}hor	^{E}ver Ave^{lx}	^{u2}ver		
TVI	2000	0.7	1650	60	50	65
TV2	1650	0.7	1400	60	50	65
TV3	1000	0.5	750	35	50	65

*In line with FIH Standards and BS EN 12193

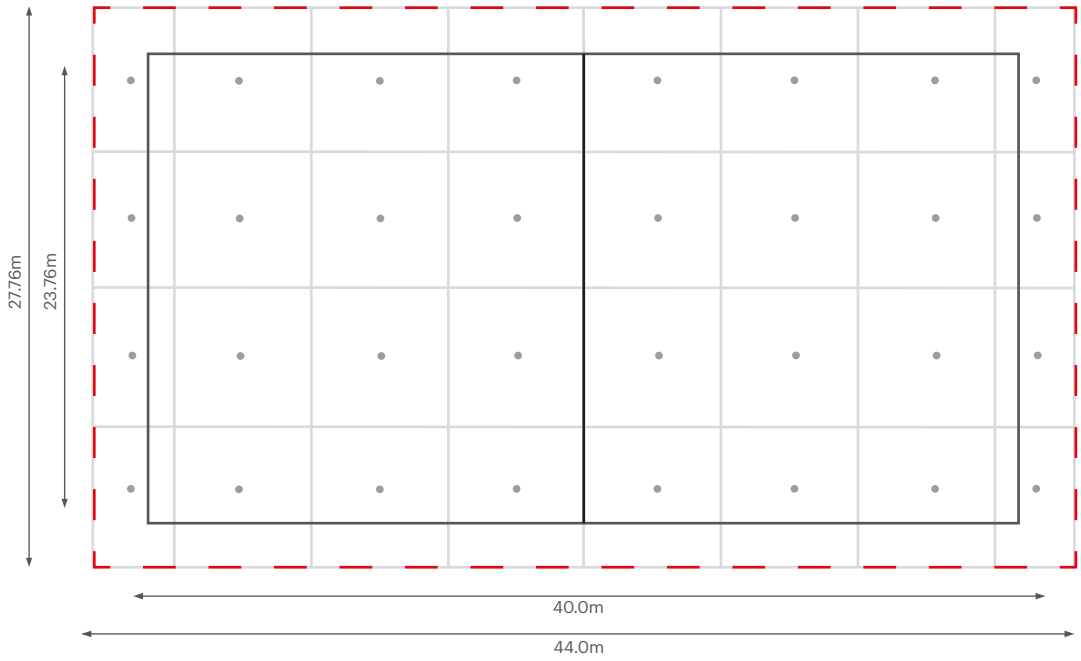
Full Sized Hockey Field

Typical column position options - 11 a-side field



Commissioning layout grid

Hockey 5s Court



Commissioning layout grid

MUGA

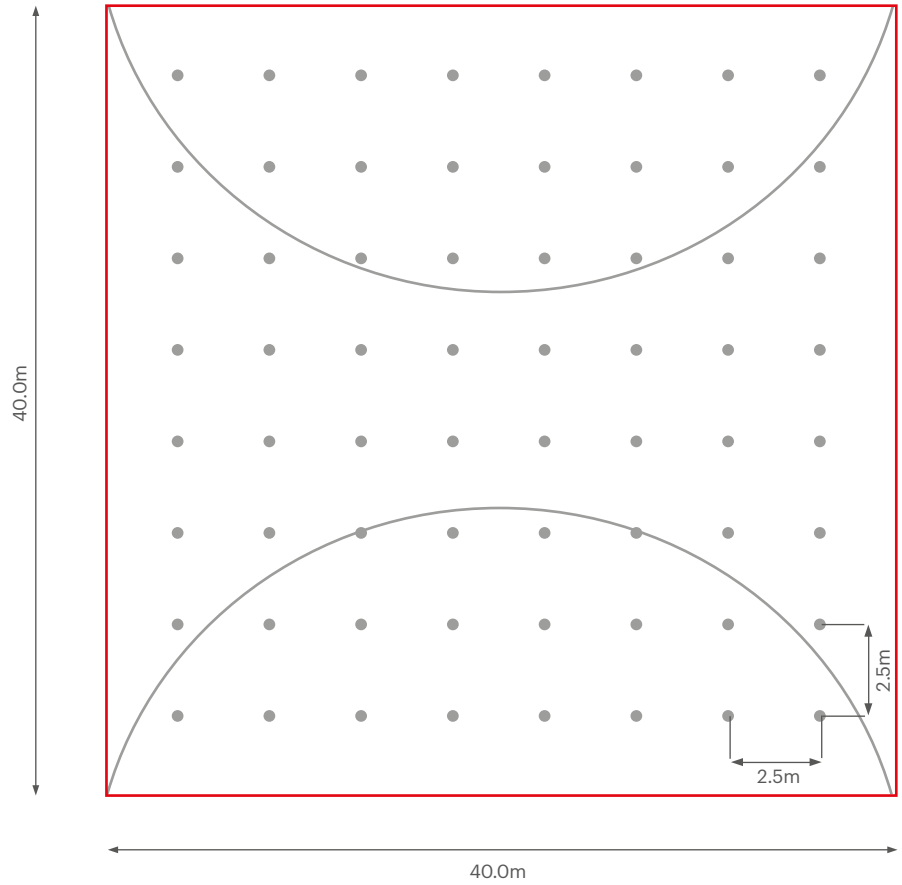
Multi Use Games Areas (MUGA) are often created for use at community level and most often used in twilight hours. As indicated in the name, MUGA caters for a range of sports including, 5-a-side football, netball or basketball, hockey and many more. Therefore, when considering lighting, it is important to cater for the most demanding requirements.

An example of this would be for an area that has been marked out for both netball and football, it would need to be lit to the standards of netball, as this requires higher lux levels.

The table below shows the guidance to be followed for MUGA.

Club & Community Lighting for Tennis, Netball, 5-a-Side, Basketball, Rush Hockey					
		Club		Community	
		Horizontal Illuminance (Lux)	Uniformity (Emin/Eave)	Horizontal Illuminance (Lux)	Uniformity (Emin/Eave)
Netball		400	0.7	400	0.7
Tennis (recommended)	PPA	500	0.7	500	0.7
	TPA	400	0.6	400	0.6
5-a-side football		120	0.6	120	0.6
Basketball		200	0.6	75	0.5
Rush hockey		350	0.7	200	0.7

MUGA Pitch



Commissioning layout grid

Rugby

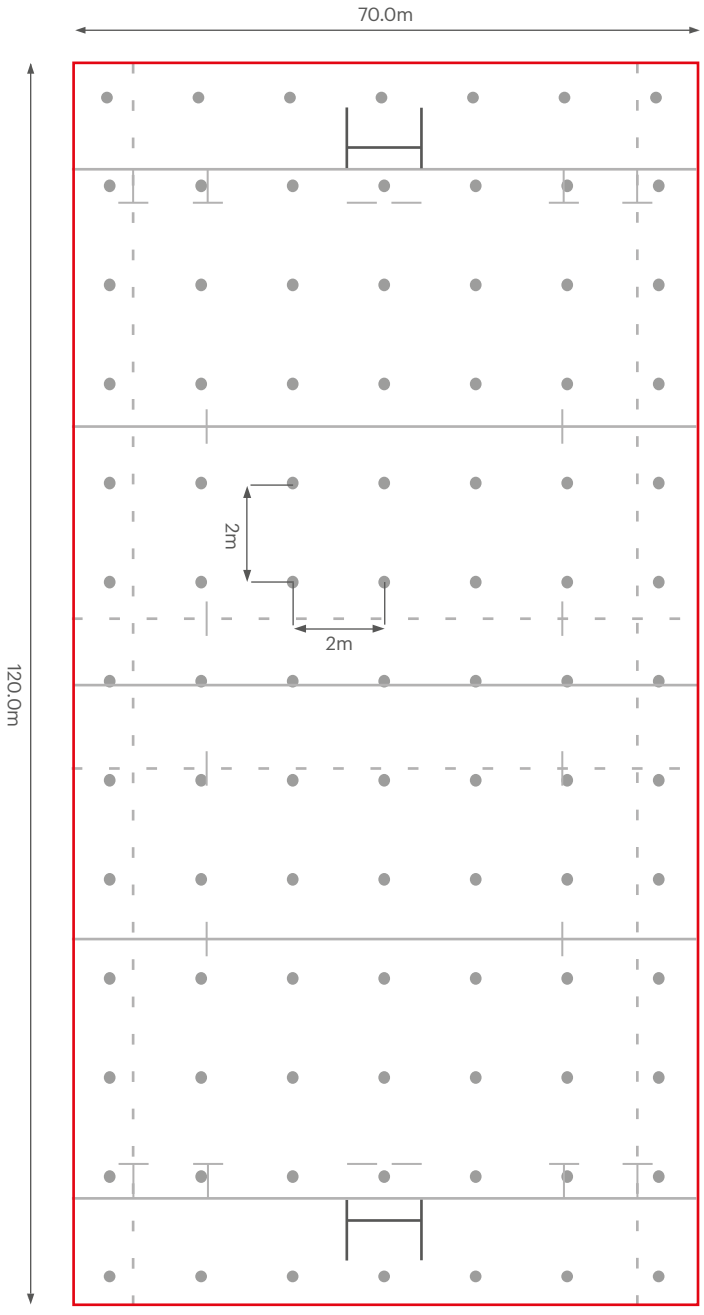
Similarly to football there are many lighting categories for Rugby, as well as two governing bodies, Rugby Union and British Standards. We have the Rugby Football Union, Welsh Rugby Union, Irish Rugby Union, World Rugby and of course British Standards.

Each of these categories feature different levels which must be met. However, these differ for training and matches; classes and WR 1, 2 and 3. For each level of play, yet again we have the highest average lux level of 200 and a low of 75 - 100. Then we have high horizontal uniformity levels which peak 0.8.

Rugby			
	Levels of Play	Horizontal Illuminance	
		$E_{hor\ Ave}$ lx	u^2_{hor}
RFU	Levels 2 - 5: Matches	200	0.6
	Levels 2 - 5: Training	100	0.5
	Levels 6 - 12: Matches	100	0.5
	Levels 6 - 12: Training	100	0.5
WRU	A Licence	300	-
	B Licence	300	-
	Class 1	500	0.7
	Class 2	300	0.6
	Class 3	250	0.6
	Class 4	140	0.5
	Class 5	75-100	0.5
IRDU	Class II	200	0.6
	Class III	100	0.5
World Rugby	WR1	2000	0.8
	WR2	1750	0.5
	WR3	>500	0.7

*In line with Rugby Football Union, World Rugby, Irish Rugby Football Union and BS EN 12191

Full Sized Rugby Pitch



Commissioning layout grid

Tennis

Tennis is divided into two categories – indoor and outdoor. Although they are quite similar, it is important to remember indoor tennis courts need a low glare rating of 35 or less because the light is trapped within the four walls of the venue.

Tennis courts usually require a higher lux level in comparison with many other sports. This is due to the much smaller surface area of a ball, making it more dificult for players and spectators to see while in play.

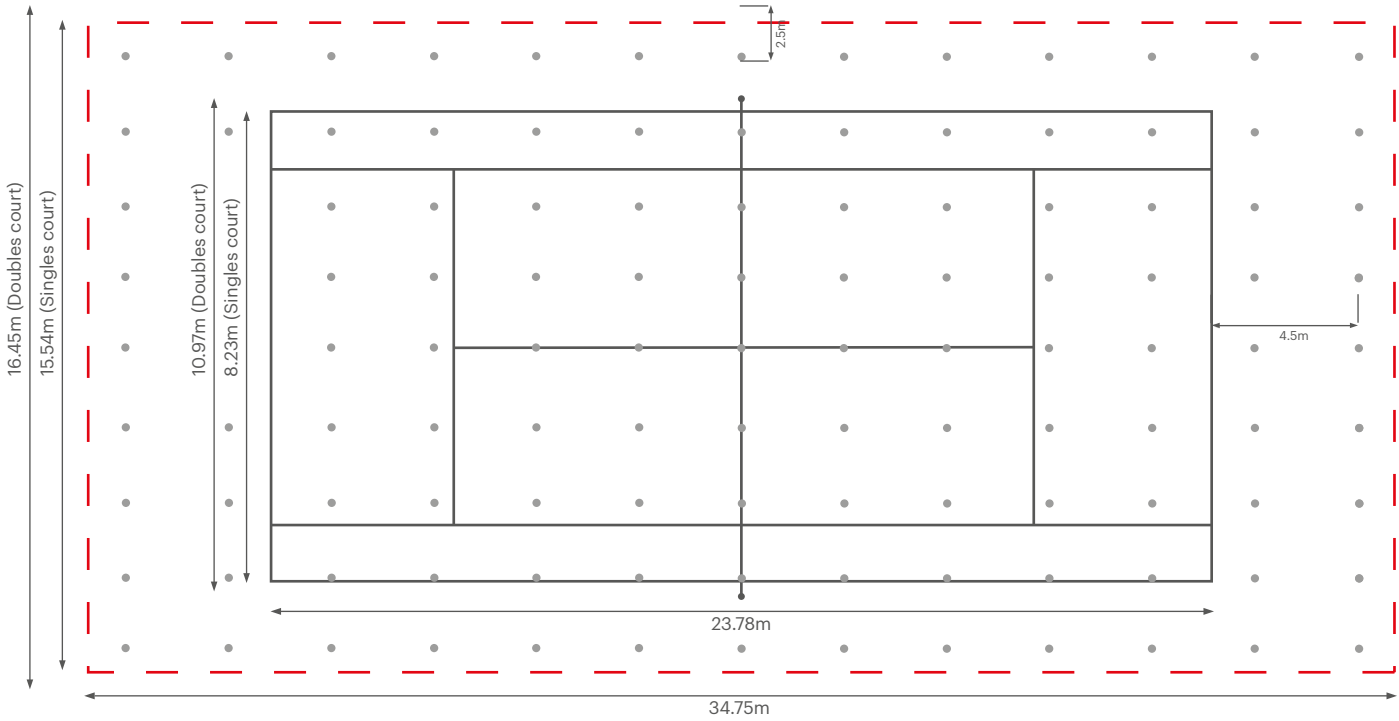
The table below shows the values for both the horizontal illuminance in the principal area (PA) and total area (TA), as well as the glare rating (R_G) and colour rendering (R_A).

Tennis						
Levels of Play	Horizontal Illuminance (PA)		Vertical Illuminance		R_G	R_A
	$E_{hor\ Ave}$ lx	u^2_{hor}	$E_{ver\ Ave}$ lx	u^2_{ver}		
Indoor	600	0.7	500	0.6	35	80
Outdoor	500	0.7	500	0.6	50	70

*In line with LTA and BS EN 12193

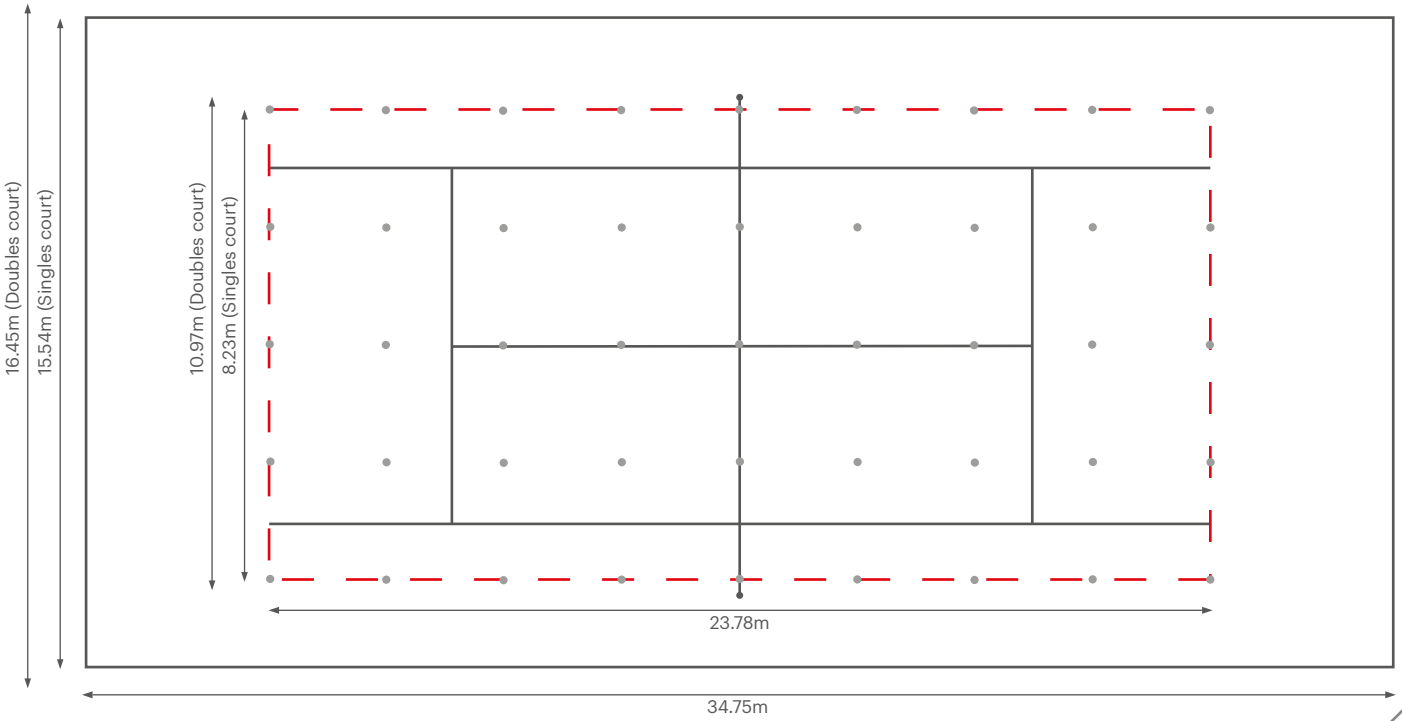
Total Playing Area

Commissioning grid layout



Principle Playing Area

Commissioning grid layout



Padel Tennis

Padel Tennis is divided into two categories – indoor and outdoor.

Whilst the minimum levels are stated below, a 10% over performance should be taken into consideration when undertaking the initial design i.e. (0.9 maintenance factor).

Lighting designs shall use a sufficiently small calculation grid spacing (i.e. 1.0m x 1.0m as illustrated on the next page) over the playing area centred on the net line position of the court which will remove the potential for any 'dark or over lit' patchy areas to be within the overall playing area.

The table below shows the values for both the horizontal illuminance for both the indoor and outdoor game.

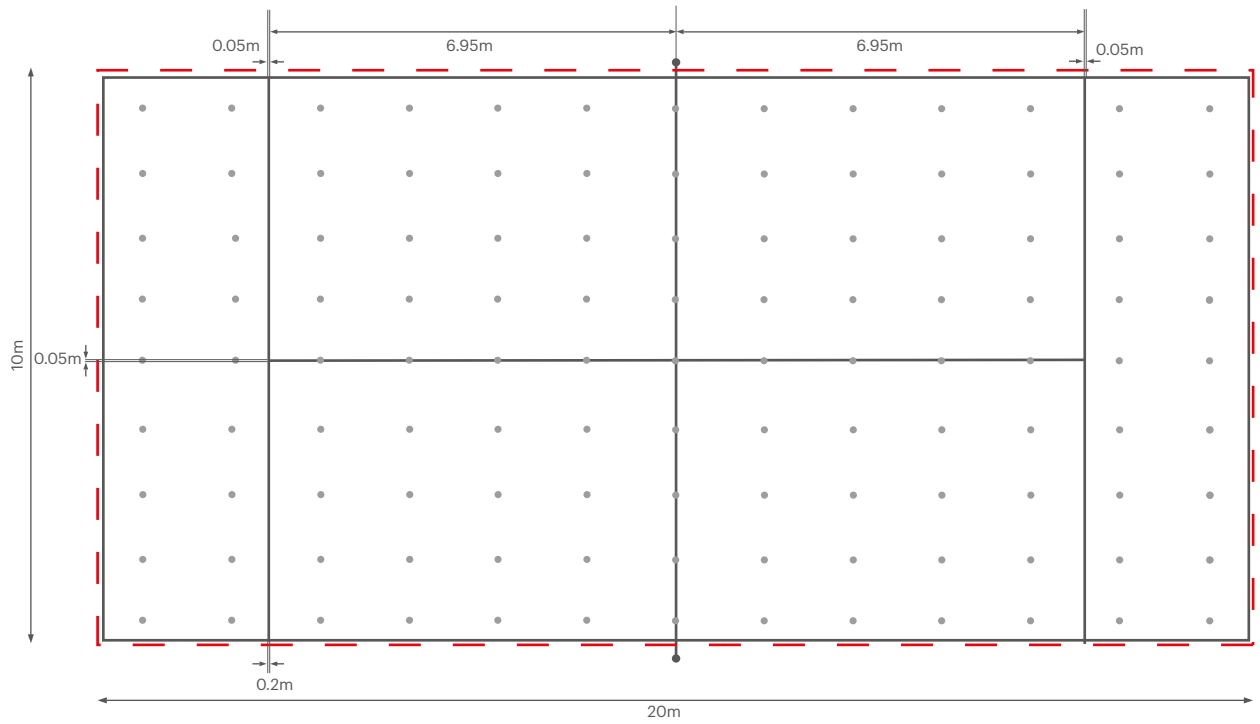
Padel Tennis - Indoor		
Levels of Play	Horizontal Illuminance	
	$E_{hor\ Ave}$ lx	u^2_{hor}
I	750	0.7
II	500	0.7
III	300	0.5

*In line with LTA

Padel Tennis - Outdoor		
Levels of Play	Horizontal Illuminance	
	$E_{hor\ Ave}$ lx	u^2_{hor}
I	500	0.7
II	300	0.7
III	200	0.6

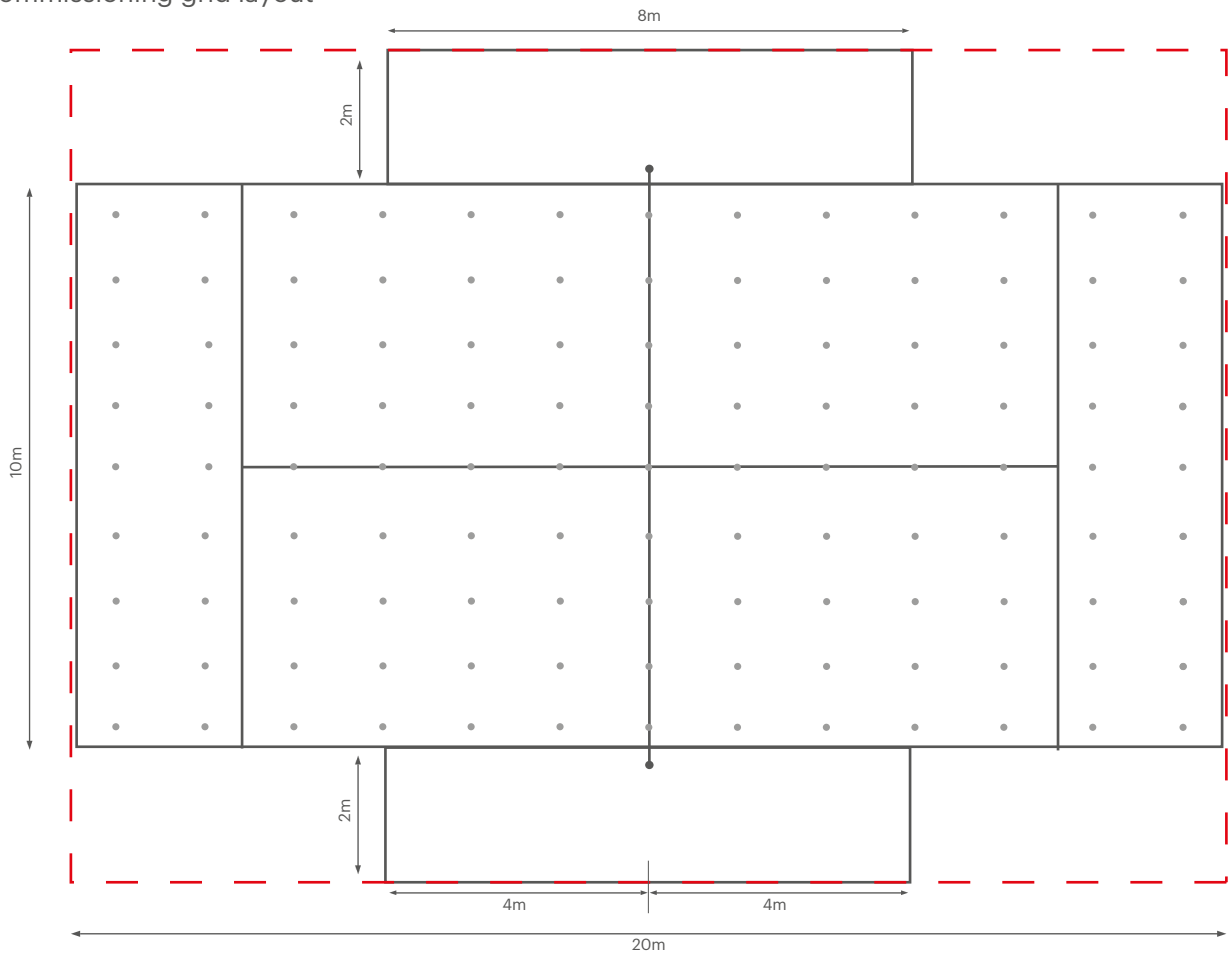
Playing Area

Commissioning grid layout



Out of Court Play

Commissioning grid layout



Specification

In this section we delve into some of the elements that can often be overlooked, such as key environmental considerations including wildlife habitats, the reduction of obtrusive light, circular economy and the latest in LED technology.

We also talk about the design philosophies that set Kingfisher luminaires apart from other manufacturers in the marketplace and how we are changing the shape of sports lighting.

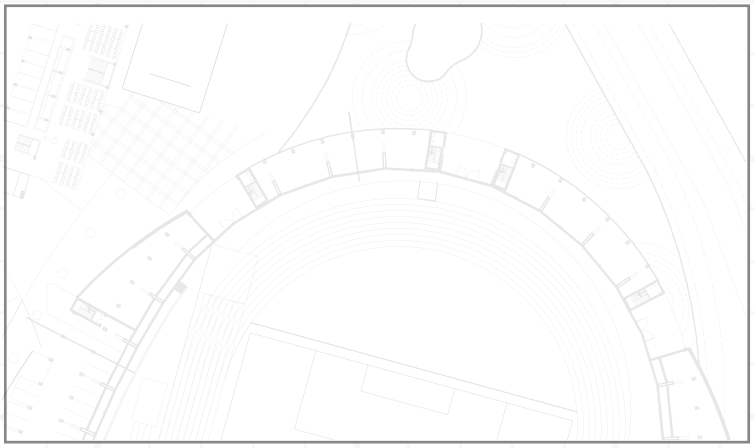
Environmental

Minimising the impact of LED lighting on the wider environment is at the heart Kingfisher Lighting practices. As part of the wider Luceco Group, we are working towards exceeding our target of being Net Zero by 2025 with careful attention paid to product design, manufacturing processes, product packaging, all the way through to lighting design techniques.

Circular Economy

A defining factor that stands the Kingfisher product range apart from other fittings on the market is the key focus on sustainability and the philosophy of 'repair, reuse and recycle'. Our luminaires are specifically designed to ensure almost all parts are repairable or replaceable, extending the life of your sports lighting system.

Lighting Design



Good lighting design practices are of vital importance in creating the best, most sustainable schemes with minimal impact to the environment. Whether that be light pollution, wildlife habitats or human centricity.

The Kingfisher Sport Lighting Design Team have a wealth of experience in sports schemes and are dedicated to fulfilling not only the highest client requirements but exceeding expectations when it comes to environmental responsibility.

Colour Temperature

Colour temperature can have a huge impact on the areas surrounding sports grounds. The Kingfisher Sport product range offers a variety of colour temperature options to perfectly tailor schemes ensuring minimal disruption both on and off the pitch.

Higher colour temperatures such as 5000K and 4000K are the most common in sports lighting, therefore flat-to-ground fittings with sharp cut off of light is of vital importance to reduce light spill while still maintaining the performance needed for professional sporting games.

Warmer temperatures such as 2700K have lesser effects on wildlife habitats and residential areas, and can be used alongside cooler colours to create the perfect scenes.

DarkSky Friendly Lighting

DarkSky Accredited

DarkSky International have made it their mission to reduce the amount of light pollution across the world. They educate the public on the consequences of light pollution and provide useful insights and resources in their campaign.

DarkSky is an internationally recognised organisation dedicated to reducing the impact of excessive use of artificial light on the night sky. They recommend reputable manufacturers who can meet their strict criteria and award the 'DarkSkyApproved'. The criteria include reduced back spill, flat to ground illumination, and 0% ULOR.

In order to meet these requirements, we ensure the amount of blue light within a scheme is lower and light is focused on the task area reducing disturbances for both human and wildlife alike.

Our DarkSky approved luminaires are all designed and engineered in the UK and use innovative technology to increase efficiency, reduce glare and of cause, light pollution. We have a range of approved flood, street, and wall mounted fixtures to ensure visual comfort as well as compliance for dark sky areas.

ILP GN01

The Institution of Lighting Professionals (ILP) have created guidance notes to contribute to and encourage the active reduction of obtrusive light. As active members of the ILP, we work to these guidelines and action them within all designs wherever possible and produce innovative solutions to combat light pollution.

The full document can be accessed through the ILP, however read on for a snapshot of the new guidance on topics such as environmental zoning, lighting design and luminaire selection.

Guidance Notes on Obtrusive Lighting

Keeping within Environmental Zones

The guidance surrounding environmental zones has been adjusted to give further detail and clarity. This gives greater understanding of how each area should be approached.

Zone	Surrounding	Lighting Enviroment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

The Best Lighting Results are Produced from an Even Better Lighting Design

GN01 is clear to stress the importance of using competent lighting designers with proven experience. This ensures that lighting installations that mitigate all aspects of obtrusive light.

Designers must take into consideration a whole host of consideration in order to achieve compliance including the performance of the luminaire, mounting heights, surrounding environments and installation methods.

Making the Right Choice - Fittings and Installation

Due to the increased awareness and more stringent requirements surrounding the performance and effects of luminaires within sports lighting, it is more important than ever to choose the right fittings.

GN01 recommends that all sports lighting should now be flat-to-ground and/or have a beam angle of less that 70°, as well as close consideration being paid to mounting positions. Placing luminaires at higher levels can often give more flexibility with aiming, while still reducing the risk and impact of obtrusive light on residential and wildlife environments in the surrounding areas.

The guidance notes illustrate good and bad practice for installation, with recommendations to achieve different lighting effects.

Values for the Control of Obtrusive

Light Intrusion

The guidance to specify light levels and limits used to be 'design only'. The requirements have now changed, and base level checks are needed to meet defined light limits. This will determine the total light allowed over the entire design including the total light on windows.

Limitation of Bright Luminaires in the Field View

The limitations of luminaires should be considered in designs that are based on viewing distances and projected areas from surfaces causing a nuisance for the occupants of adjacent premises.

When more than one lantern is located close to each other, the observer should see them as one light source. As a result, the bright luminaire surfaces facing the observer are assessed.

Luminaire Intensity

The luminaires used to be assessed for luminaire intensity per unit. Now, this is measured from a factor of the light source size and observer distance, and we need to group fittings that are close together.

Regulations

Light Pollution is now classed as a statutory nuisance just like noise or industrial pollution. If schemes are inadequate, it could result in sites being prosecuted, fined, or visited by environmental planning – even after the planning stage. It is imperative that this guidance is taken seriously throughout the industry to avoid obtrusive light wherever possible.

Impact on Calculation

All designers must consider ULOR, UFR, Vertical Illuminance and Glare.

ULOR – Upward Light Output Ratio

The standard parameters still apply which limit direct upward light but additional considerations have been added, such as Sky Glow and UFR.

UFR - Upward Flux Ratio

Upward Flux Ratio considers reflected light and splits areas into lit zones and spill areas, moving the focus onto the control of light. The contributing factors are lux levels, reflectance values, utilisation of light and environmental zones.

The CIE Standards lists of reflectance values depends on low, medium or high values. These numbers may be too low for sports. Fortunately, we have designs that do comply with sports lighting requirements using our Amnis series.

What's Next

Please take the time to read the guidance notes and talk to our experienced designers to alleviate the risk of a non-compliant lighting scheme.

Design Philosophy

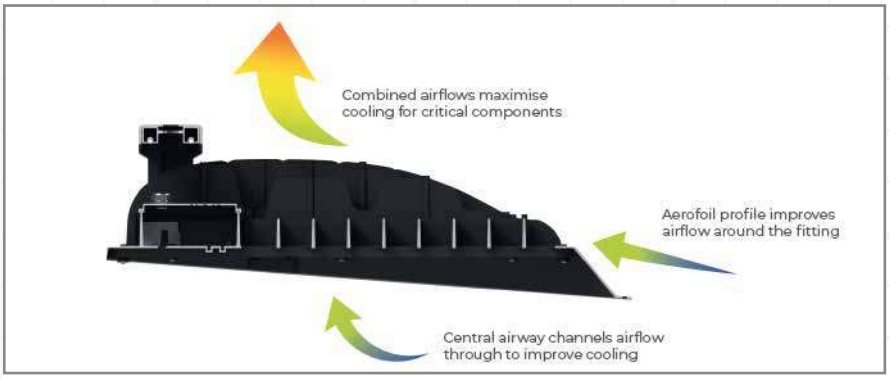
Build quality, spill light, glare and flicker are the principal priorities for sports fittings to ensure optimum performance whilst limiting the impact on the wider environment.

Our products are designed to last, utilising the strength and durability of die-cast aluminium bodies with tier one components and the purpose built optical and thermal systems.

Aerofoil Heatsink Technology

Our sports range incorporates a thermal air gap between the optic modules and through the heatsink fins, increasing airflow through the body of the fitting. This ensures that the luminaire and the inner components are kept at optimum temperatures, as well as reducing air pressure on the underside and sides of each fin which improves the overall stability at height.

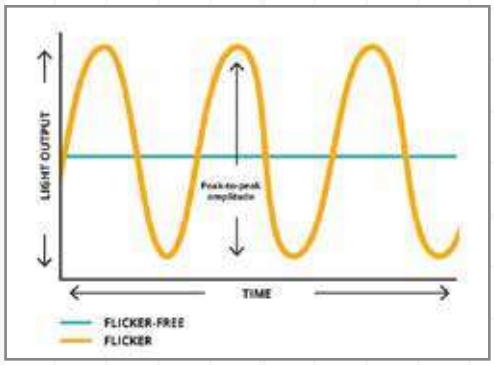
This unique design feature limits the movement of the fittings mounted on the mast, creating a safer, more efficient environment without additional stresses on the bracketry and column itself.



Flicker-Free

Professional level and grass root sports grounds demand flicker-free illumination to support slow-motion and HD televised viewing, as well as both professional and amateur photography and videography.

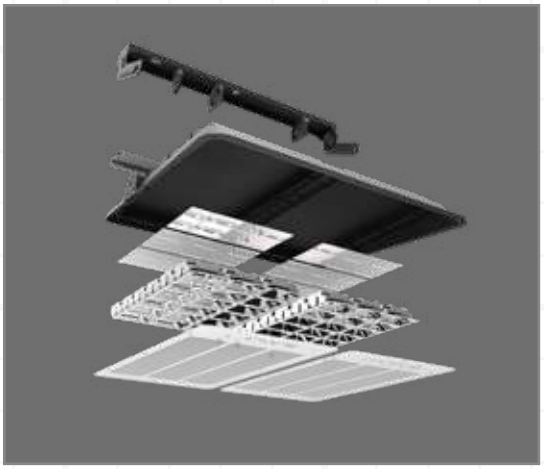
Our series of sports lighting has been specifically designed with a flicker index of 0.12% in accordance with the professional guidance notes by CIBSE which states that any luminaire with a flicker index <1% is classed as flicker-free, alleviating the risk of on-screen flicker and distorted imagery.

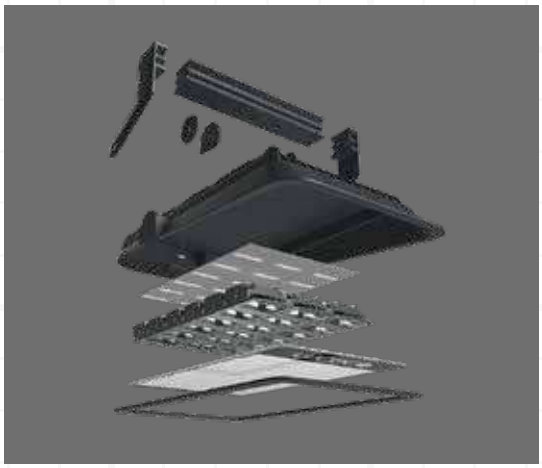


Reflector Technology

Reflector Technology Explained

The Amnis Series has been designed using Alanod™ MIRO-Silver Reflector Technology which provides an efficient, low glare output. Using high-reflectance surfaces, this technology allows us to redirect incident light back to the front of the fitting, producing a comfortable output and allowing the light to be directed exactly where it's needed.

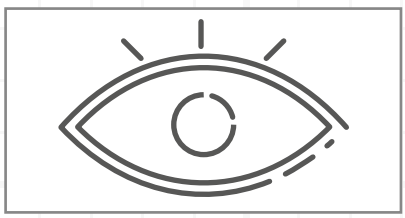




The Benefits

Reduced Obtrusive Light
The Amnis offers both excellent horizontal and vertical cut off due to its advanced reflector system and built-in hood.

Low Glare
Glare poses concern with sports lighting for both players and spectators alike. Glare is drastically cut, with levels on the pitch and in the stands being far lower than the British standard limits outline. The Amnis Series performs far better than other luminaires in the market.



IDA Accredited
With ULOR at 0%, this flat-to-ground fitting safeguards against sky glow and has achieved dark sky friendly status, carrying the 'Fixed Seal of Approval' from the International Dark Skies Association. With a strict assessment process, this coveted accreditation is testament to this highly developed system. Find out more about the IDA on page 25

Efficiency
The Alanod™ system allows to the light to be directed to the task area meaning no light wastage occurs, making it one of the most efficient and high performing luminaires in the Sports realm. All systems offer a reduced energy consumption, saving both money and extending the lifetime of the fitting.

Delve deeper into our sports lighting offering including luminaires, masts, bracketry, and control systems.

Our range of high performing luminaires have been designed and engineered in the UK to the highest standards. With bespoke optical systems, tier one components and utlising the wealth of our experience in the industry we are confident we can develop the most efficient scheme for all types of sporting applications.

Amnis Series

A powerful, high-performance range of luminaires, designed and engineered in the UK offering a pitch perfect output and outstanding efficiency.

The Amnis series has been designed using Alanod™ MIRO Silver Reflector Technology providing an efficient, low glare output. These high quality sports flood lights offer a 100,000 hours lifetime across the whole fitting and come with a marine grade finish as standard; this really is a Fit&Forget™ solution.

Key Features

- External & integral spill shields
- Fully controls compatible
- Colour temperature range
- Flicker-free performance
- Bespoke optical system
- Aerofoil heatsink technology
- Reduced obtrusive light
- IDA approved

Built to Last

The custom heatsink has been specifically designed to optimise thermal management improving the efficiency and the life of the fitting. The 100,000 hours lifetime not only refers to the LEDs, but the fitting and components as a whole unit, making it one of the best luminaires of its kind on the market.

Alanod™ MIRO Silver Reflector Technology

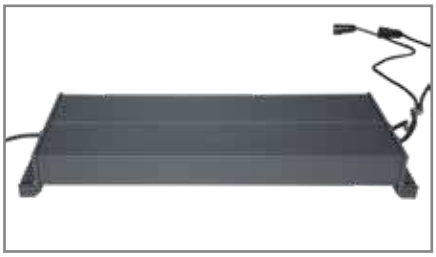
Using reflector based technology, Amnis provides best-in-class output with low glare for improved visual comfort, making it the perfect choice for sports and stadium lighting and one of the most efficient flood lights on the market to date.

Flicker-Free

Amnis is the ideal fitting for all professional or grass roots sports grounds and perfect to illuminate the best televised sporting moments without the risk of on-screen flicker or distorted imagery. Specifically designed with a flicker index of <1%, Amnis is perfect for slow motion and HDTV broadcasting.

AMNIS Flood

Scan for datasheet



Designed and engineered in the UK the AMNIS Flood offers the best possible performance and efficiency as standard. Using bespoke reflector and heatsink technology, this luminaire is ideal for large area lighting such as sports facilities and high mast applications.

Key Features

- 900.0W – 1300.0W
- 95,927 - 188,662 Luminaire Lumens
- Efficacy up to 150lm/W
- ULOR 0%
- 2700K, 4000K & 5000K
- CRI >70 & >80
- Lifetime >100,000hr L85 B10 at 25°C
- Flat-to-ground with 5º Built in Hood
- Reflector System
- Flicker Index 0.12% / HDTV Ready

IP66 | IK08 | Colour Temperature | Marine Grade Finish | Anti-glare | 100,000 hrs LIFETIME

Inrush Data

Wattage (W)	Inrush Current (A)	Inrush Duration (µS)
450	150	450
665	225	450
900	300	450
1350	450	450

Windage by Elevation

Tilt (°)	Windage (m²)
0	0.16
5	0.16
10	0.16
15	0.16
20	0.21
25	0.26
30	0.31

Specification Text

The luminaire shall be manufactured from **high pressure die-cast aluminium** with **high transmission glass** and shall be fabricated to support **improved circular economy**.

Using **reflector technology** and a **bespoke optical system**, the luminaire shall be capable of producing **low glare, flicker-free** precision illumination.

It shall have an LED efficacy of **150 luminaire lm/W** and will be capable of producing up to **188,662 luminaire lumens** at 4000K with a CRI>70. It shall have an asymmetric forward throw optic and rated at **IP66 and IK08**.

Weight:

Fitting:	28.2 kg
Driver:	6.2 kg
Fitting with integral driver:	34.4 kg

Windage: 0.10m²
Material: Die-cast Aluminium
Paint Finish: Marine Grade Powder Coated Anthracite Grey

Embodied Carbon: 414 - 743 kg CO^2e

DESIGNED & ENGINEERED IN THE UK

Scan for datasheet

AMNIS Match

Experience power and performance with the AMNIS Match flood light. This flat-to-ground fitting is the perfect solution for sports and recreational grounds, with its powerful performance, low glare output and compact design.

Key Features

- 450.0W – 665.0W
- 47,439 - 95,667 Luminaire Lumens
- Efficacy up to 145 lm/W
- ULOR 0%
- 2700K, 4000K & 5000K
- CRI >70 & >80
- Lifetime >100,000hr L85 B10 at 25°C
- Flat-to-ground with 5° Built in Hood
- Reflector System
- Flicker Index 0.12% / HDTV Ready

IP66 | IK08 | Colour Temperature | Marine Grade Finish | Anti-glare | 100,000 hrs LIFETIME

Specification Text

The luminaire shall be manufactured from **high pressure die-cast aluminium** with **high transmission glass** and shall be fabricated to support **improved circular economy**.

Using **reflector technology** and a **bespoke optical system**, the luminaire shall be capable of producing **low glare, flicker-free** precision illumination.

It shall have an LED efficacy of up to **145.0 luminaire lm/W** and will be capable of producing up to **95,667 luminaire lumens** at 4000K with a CRI>70. It shall have an asymmetric forward throw optic and rated at **IP66 and IK08**.

Weight:

Fitting:	15.9 kg
Driver:	5.5 kg
Fitting with integral driver:	21.0 kg

Windage: 0.10m²
Material: Die-cast Aluminium
Paint Finish: Marine Grade Powder Coated Anthracite Grey
Embodied Carbon: 425 - 541 kg CO^2e

DESIGNED & ENGINEERED IN THE UK

Inrush Data

Wattage (W)	Inrush Current (A)	Inrush Duration (µS)
450	150	450
665	225	450
900	300	450
1350	450	450

Windage by Elevation

Tilt (°)	Windage (m²)
0	0.10
5	0.10
10	0.10
15	0.10
20	0.11
25	0.13
30	0.16

ZACTIS

ZACTIS is a high-performance flat-to-ground LED floodlight perfect for sports, high mast and area applications. As well as facilitating easy installation and maintenance, the sleek, low-profile design, reduces the load together with decreasing windage.

Specification Text

The luminaire shall be manufactured from **high-pressure die-cast aluminium**.

It shall have an **LED efficacy of up to 138 lm/W** and will be capable of producing up to **44,156 luinaire lumens** at 4000K with a CRI >70.

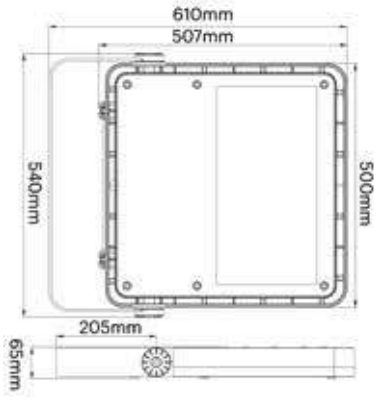
It shall have an **asymmetric forward throw optic** and is **rated at IP65 and IK08**.

Weight:	15.0kg - 16.5kg
Windage:	0.04m²
Material:	Die-cast Aluminium
Paint Finish:	Marine Grade Powder Coated Anthracite Grey

DESIGNED & ENGINEERED IN THE UK

Key Features

- 125.0 - 320.0W
- 16,447 - 44,156 Luminaire Lumens
- Efficacy up to 138 lm/W
- 640mA - 805mA
- 2700K & 4000K
- CRI >70
- Lifetime >100,000hr L80



Scan for datasheet

IP65 IK08 Colour Temperature Marine Grade Finish 100,000 hrs LIFETIME

Bracketry

Selecting the right bracketry for any site is vitally important with considerations such as weight, windage, weather conditions, orientation, and of course safety needing to be addressed.

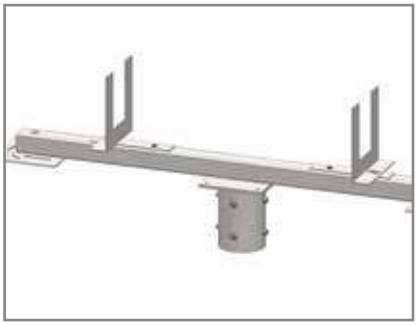
Our range of bracketry is fabricated from hot-dip galvanised steel as standard, ensuring a long life and hardwearing finish. Standard or marine grade paint can be applied to any of our brackets, guaranteeing they are fit for purpose in any environment.

These fixtures are equipped with two fixing points to secure the orientation angle, improving stability, and keeping them in line with British standards. An additional fixing point is positioned on the bracket to install a safety chain for further peace of mind.

Designed and fabricated in-house, these high-spec bracketry systems include a 'pot and arm' which enables quick installation should existing masts not have the standard spigot diameter. This can save vital time and costs during the installation process.

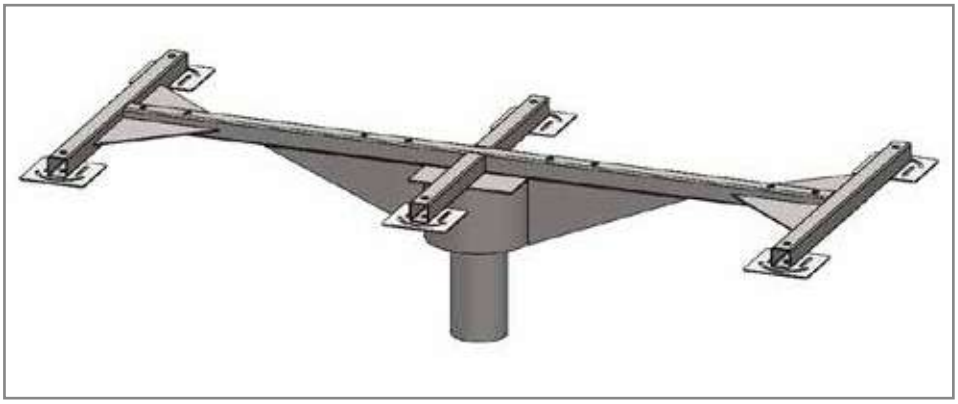
Standard Bracketry

Our standard bracketry options includes both inline and staggered arrangements for up to four fittings. All systems have been designed to meet weight and windage guidance to ensure safety in any location.



Bespoke Bracketry

Our product design and fabrications team can efficiently produce customised options for almost any number and position of luminaires required.

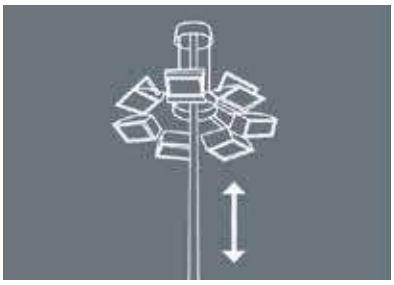


Masts

With a comprehensive range of masts, Kingfisher Sport can help simplify the technical nature of these systems, ensuring each project achieves the best possible solution.

Our team will guide you through the wealth of information taking into consideration the current site conditions, available space, maintenance requirements, regulations, and the local environment. Through this we can build the optimum bespoke system, through either the simple supply of masts, luminaires and bracketry, all the way to full installation and maintenance packages.

We offer three types of mast, with a range of options perfect for each category, including paint options, control systems and bespoke bracketry.

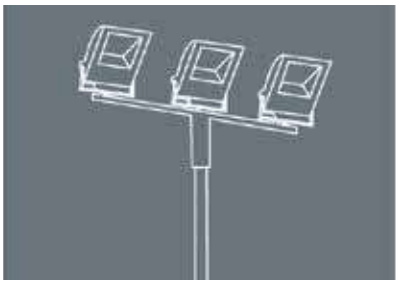


Lowering Head Frames

This mast allows the fitting to be fixed to a movable frame which can be secured in position or lowered down the length of the mast using a powered winch and pulley system. This mechanism simplifies the process for regular maintenance.

The Benefits

- Maintenance is carried out safely at ground level
- No need for expensive high level platform equipment
- Great for areas with space restrictions as no ground clearance is required

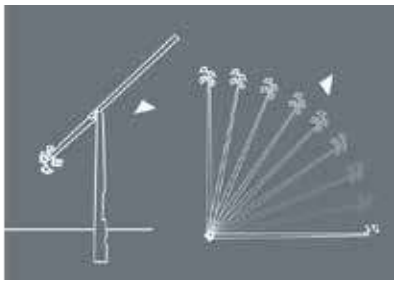


Fixed Masts

Fixed masts are exactly that – fixed!
Teamed with efficient lighting they offer a great way to light large areas. Don't forget maintenance must be carried out on specialist equipment at height.

The Benefits

- Easily maintained mast - no moving parts
- Standard installation process



Mid-Hinged Masts & Base-Hinged Masts

Hinged masts are popular on sports facilities. They hinge in the middle, or at the base allowing the lighting to be accessed at ground level. Remember that ground clearance is needed in the lowered position.

The Benefits

- Installation and maintenance is carried out safely at ground level
- No need for expensive high level platform equipment

Talk to the team about bespoke options

Kingfisher Controls
Part of the LUCECO group of companies

Whether it be simple dimming profiles, bespoke scene setting or fully DMX schemes, getting the right control system for your site will save both energy and money. The Kingfisher Control system affords the ability to design the right package to take full advantage of cost saving technology that is built to last.

Switch System Explained

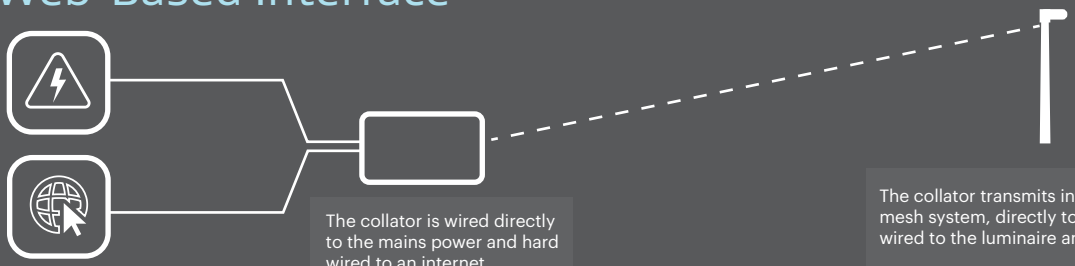
The switch system gives the user full control without an over complicated user interface. This simple solution is perfect for schemes requiring a variety of outputs to service the differing functions on-site. With two options of set-up, this system is capable of being controlled from a simple push button scene switch or via a wireless device via a secure web portal.

Simple Push Button System

The switch controller is wired directly to the mains power and pre-programmed with lighting commands

The switch controller transmits programmed information via a Bluetooth mesh system, directly to the controller within or wired to the luminaire and controls the light output

Web-Based Interface



The collator is wired directly to the mains power and hard wired to an internet connection

The collator transmits information via a Bluetooth mesh system, directly to the controller within or wired to the luminaire and controls the light output

Luminaire commands are input online via a secure portal

Example Functions

Button 1:	Match Mode. Full pitch on at 100%
Button 2:	Training Mode. 1st half pitch on at 100%
Button 3:	Training Mode. 2nd half pitch on at 100%
Button 4:	Maintenance Mode: mast 1 at 25%
Button 5:	Event Mode: Full pitch at 50%
Button 6:	All off

Controllers

The Kingfisher Control System starts with the controller, this forms the basis of all systems. These devices can be pre-fitted into each luminaire and give the ability to link, dim and control luminaires when integrated with dimmable drivers and sensors.

Scene Switch

Scene setting is an important aspect of lighting control, but some systems are over complicated. Our scene switches are simple to use and install taking little or even no training to operate. The push-button panels and key fobs are pre-programmed before leaving KF HQ to your desired
command and the system does the rest for you! Scene switches with 2, 4 or 6 buttons can be supplied for use with the 230V or battery powered controllers.

Web Connected or Wired Solutions

Our controllers offer the perfect bespoke solution for wireless controls and scene setting. The controllers are installed into each luminaire and communicate directly to the scene switch. For locations without internet access, our wired system allows you to have the same functionality through access points.

Collators allow for diagnostics and reporting on fittings as well as timed events via a web portal.

Equipment

Controller

Scene Switch

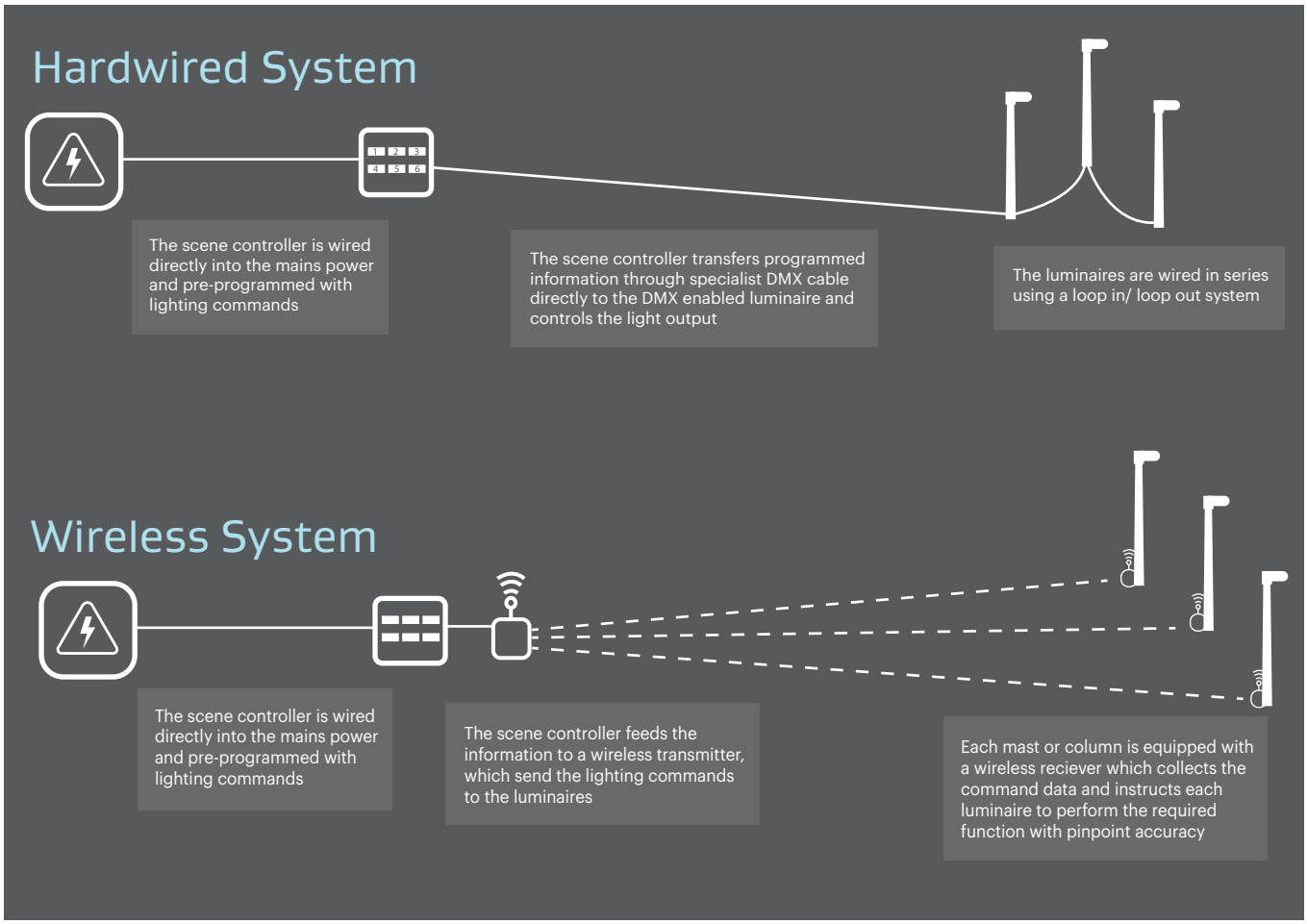
Key Fob

Collator

DMX System Explained

The DMX control systems from Kingfisher Controls presents an intelligent way of utilising your lighting scheme to create simple or complex scenes for a wealth of scenarios.

With hardwired or wireless options, create the system that perfectly complements the growing needs of your club or site and choose from simple pre-set scenes or work with our trusted developers on creating fully bespoke light shows.



Example Functions

Button 1:	Match Mode. Full pitch on at 100%
Button 2:	Training Mode. 1st half pitch on at 100%
Button 3:	Training Mode. 2nd half pitch on at 100%
Button 4:	Static Event Mode: Full pitch at 50%
Button 5:	Show 1 (3mins – 100%)
Button 6:	Show 2 (3mins – 100%)
Button 7:	Light Chase (Looped)
Button 8:	Wave Effect (Looped)
Button 9:	Sparkle Effect (Looped)
Button 10:	All off

Scene Controllers

The scene controllers are hardwired into main power and pre-programmed with the desired scenes prior to installation, saving time on-site. This device passes information through the chain to the luminaires with the simple push of a button. Each hardware port can have a maximum of 32 devices up to 300m when hard-wired.

Specialist Cable

DMX cable is specially designed to transfer vital information in real time without signal noise. This system uses high quality 3 core 120ohm cable and runs throughout the controls scheme to give flawless results.

Wireless Transmitter/ Reciever

These devices are specially selected to transmit and receive DMX signals wirelessly via radio signals (2.4GHz, 5.2Ghz, 5.8Ghz). Transmitters are hardwired into the scene control box and receive, then transmit DMX signals from its program. Receivers are hard-wired into the fittings, via DMX cable, and loop in and out of fittings. Transmitters and receivers are paired to give seamless instructions to each luminaire connected to the system.

Equipment

Scene Controller

Specialist DMX Cable

Wireless Transmitter/ Reciever

Installation Guidance

Your quick reference guide to on-site installation including drivers, brackets and spill shields.

Amnis Flood Far Gear

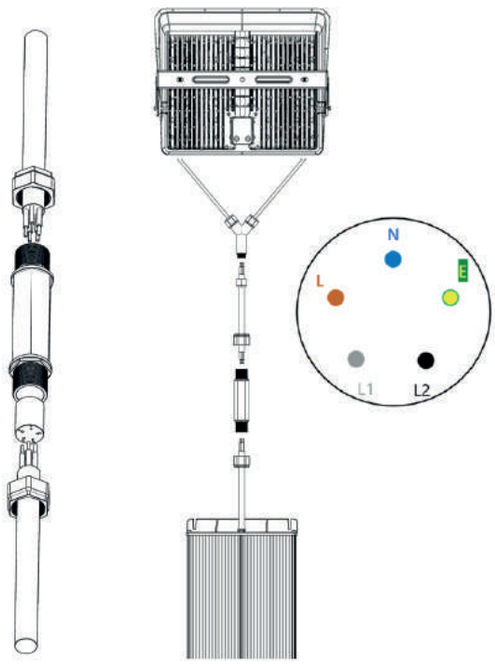
This guide demonstrates how to connect a ‘far gear’ to Amnis 1350W.
Any wiring should be done by a qualified electrical engineer and tested before installation.

1. Using LATCON T-connector, connect the two female connectors from the Amnis into the male connectors on the T-connector.

2. This will leave you with one single 5-core cable which will go through the holes in the bracket and down the column, out to the gearbox. Finally connect the female into the male connector on the output side of the gear box.

   As shown below, ensure that all wires are wired properly and meet up to the right ones within the connector.

	EN	DE	FR	IT	ES
L	BROWN	BRAUN	MARRON	MARRONE	MARRÓN
E	GREEN-YELLOW	GRÜN-GELB	VERT-JAUNE	VERDE-GIALLO	VERDE-AMARILLO
N	BLUE	BLAU	BLEU	BLU	AZUL
1 (L)	GREY	GRAU	GRIS	GRIGIO	GRIS
2 (L)	BLACK	SCHWARZ	NOIR	NERO	NEGRO



3. Finally, connect the input cable of the gearbox into the power supply that is on site. Ensure that all glands are tight, and that the connectors have been ‘twisted and clicked’ in the right positions (including the connector holes lining up correctly), as this will only achieve the IP rated given.

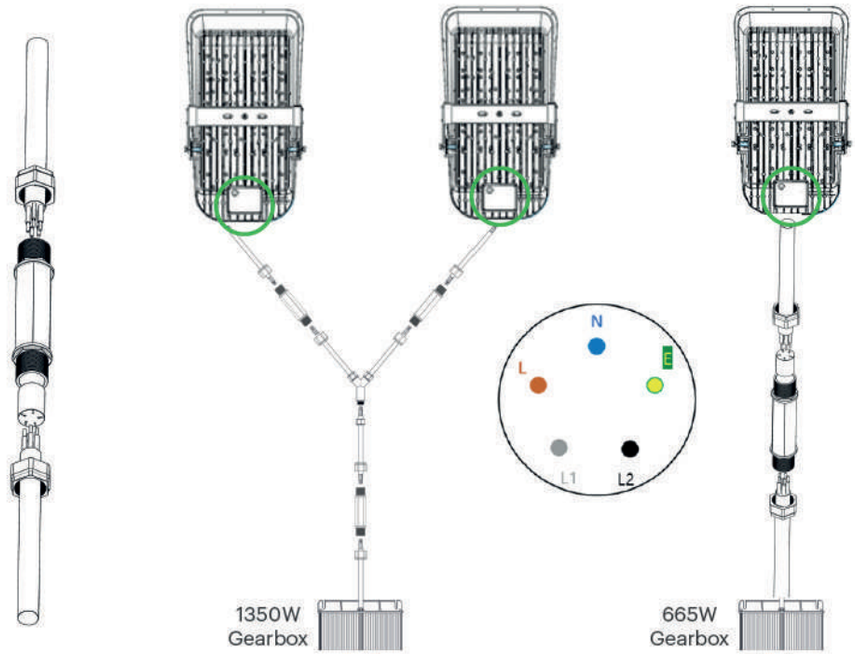
Amnis Match Far Gear

This guide demonstrates how to connect a ‘far gear’ to Amnis Match.
Any wiring should be done by a qualified electrical engineer and tested before installation.

1. Using LATCON T-connector, connect the two female connectors from the Amnis into the male connectors on the T-connector.

2. Then will leave you with one single 5-core cable, which will go through the holes in the bracket and down the coloumn, out to the gearbox. Finally connect the female into the male connector on the output side of the gear box.

   As shown below, ensuring that all wires are wired properly and meet up to the right ones within the connector



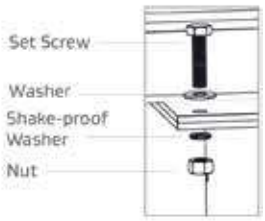
3. Finally, connect the input cable of the gearbox into the power supply that is on site. Ensuring that all glands are tight, and that the connectors have been ‘twisted and clicked’ in the right positions (including the connector holes lining up correctly), as this will only achieve the IP rated given.

Amnis Bracket Installation

This guide demonstrates how to install the Amnis Series to columns and masts using the STM Amnis bracket.

Components

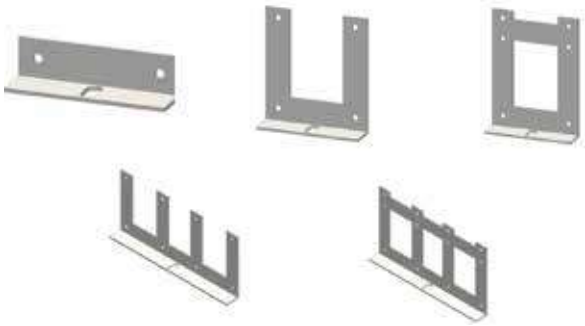
STM Amnis pot



STM Amnis pot to fix bracket arms to column.

(X4) M10 to fix to arm and grub screw to column

STM Amnis gear brackets



STM gear brackets hold driver box for near gear version.

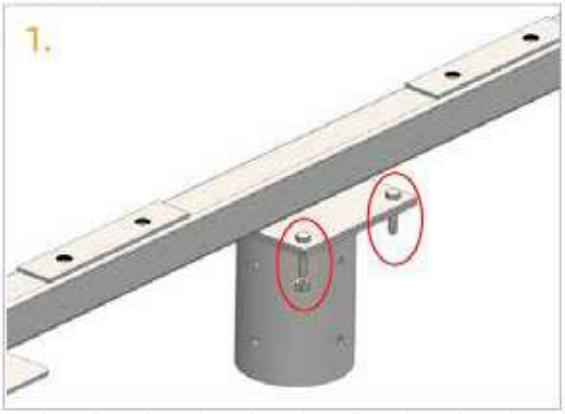
(x2)M20 to fix 2 plates
(x4)M12 to fix 1 gearbox

STM Amnis gear bracket arms

STM gear bracket arms hold Amnis flood light.

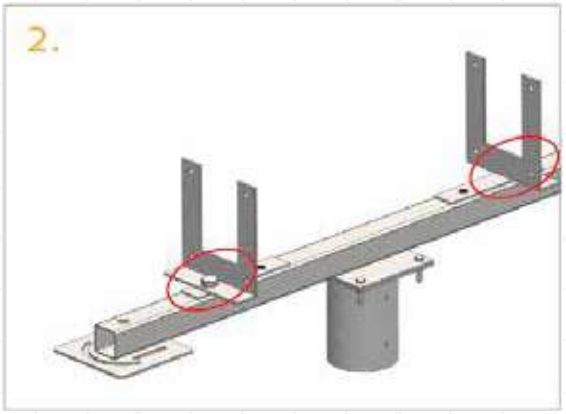
(x1)M20 to fix 1 luminaire

1.



Use **M10x30 set screws**, washers, shakeproof washers and then nut to secure the arm to the pot 60Nm

2.



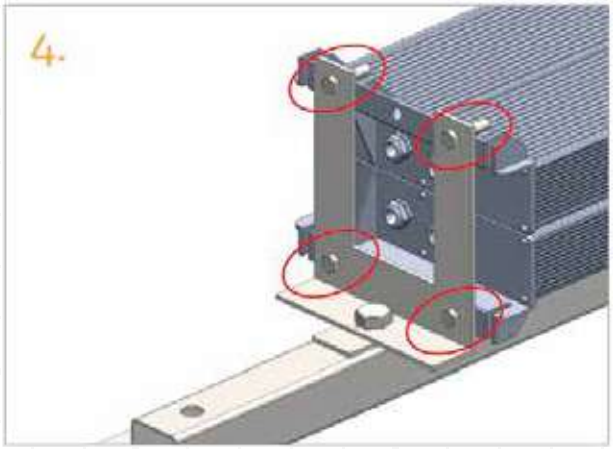
Use **M20x40/100 set screws**, washers, shakeproof washers and then nut to secure the L plates to the arm 100Nm

3.

Inner holes are for 665w Amnis Match flood lights

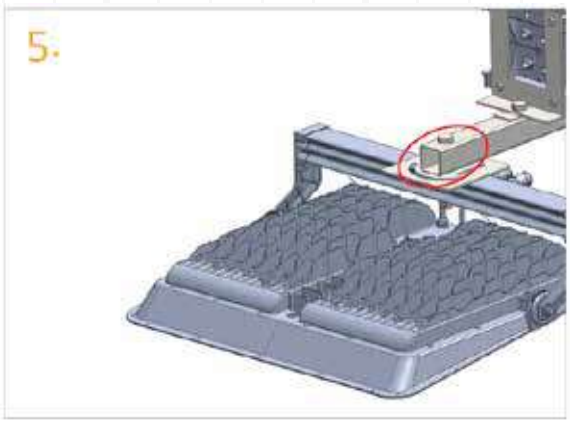
Outer holes are for 1350w Amnis flood lights

4.



Use **M12x30 set screws**, washers, shakeproof washers and then nut to secure the driver boxes to the L plates 60Nm

5.



Use **M20x150 set screws**, washers, shakeproof washers and then nut to secure the flood light to arm 100Nm

Amnis Spill Shield Installation

The Amnis Match spill shield has been designed specifically for sites close to residential areas. The shield has been fabricated to limit the viewing angle of the glass and alleviate the risk of light spilling into these areas and causing visual discomfort.

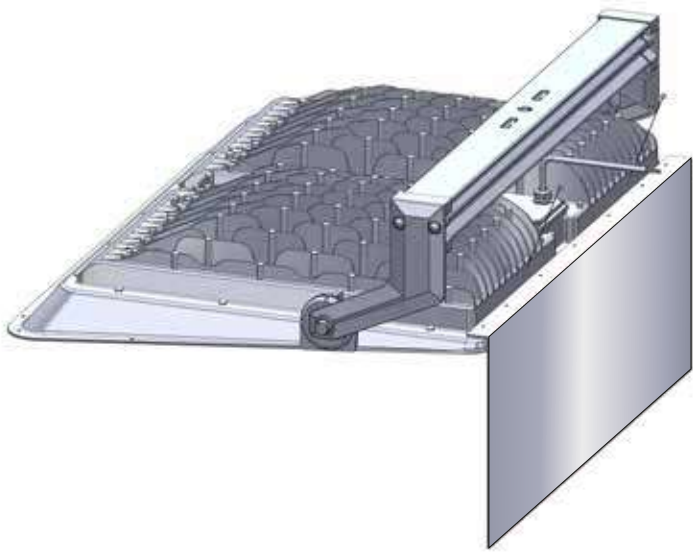
This quick reference guide demonstrates how to install the three types of spill shields to the Amnis Match luminaire.

Before you commence, please note the following:

- All works MUST be carried out by a trained engineer and all safety procedures must be followed.
- Take extra care not to use electric drills as too much torque will deform the aluminium sheet.
- Be mindful that bracket rotation may be limited when the spill shield is installed.

Back Spill Shield

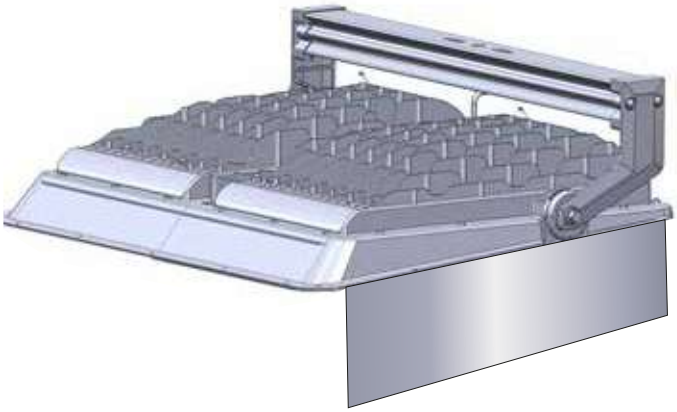
1. Firstly, remove the 4 rubber black hole caps as this is where the holes will line up for fixing the back spill shield.
2. Line up the back spill shield over the holes at the bottom of the Amnis Match. Ensure the curve of the spill shield is offsetting the curve at the bottom of the Amnis frame.
3. Insert FAST M6x8mm Cap head screws into the 4 holes and using a Phillips screwdriver, tighten these to fix the spill shield firmly to the fitting.



Side Spill Shield

1. Line up the spill shield with the three holes on the top corner of the amnis hood.Insert M5x16 fast pozi pan screws in the three holes.

2. Use an M5 repair washer and M5 nut under the pozi pan screw. Use a screwdriver and an 8mm spanner on either side to tighten the spill shield to the fitting.

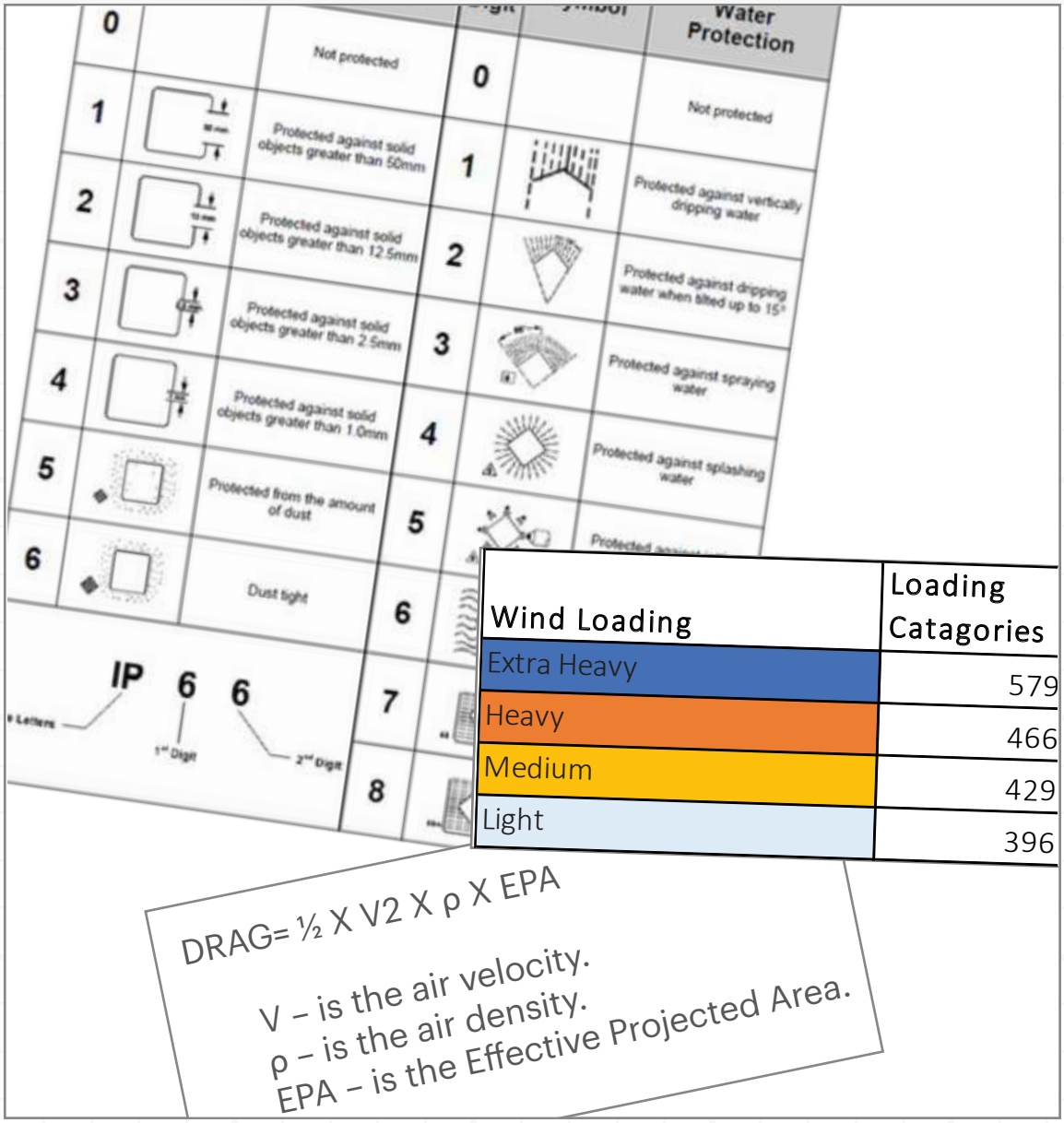


Bespoke Fabrication

Our in house design and fabrication team have the capabilities to create bespoke shields for special projects. Talk to the Kingfisher Sport Team for more information.

Technical Information

We have compiled key technical information to assist with the planning and specification of your sports lighting scheme. Included in this section are weight and windage guides, maintenance factor calculations, vital electrical data, as well as a glossary of terms for reference.



Wind Loading	Loading Catagories
Extra Heavy	579
Heavy	466
Medium	429
Light	396

DRAG= ½ X V2 X ρ X EPA

V – is the air velocity.
ρ – is the air density.
EPA – is the Effective Projected Area.

Weight & Windage

Windage Explained

In terms of lighting, windage simply refers the force of the wind on a stationary object. When a luminaire is mounted on a column or building, the windage is calculated to assess how much pressure will be added to the fitting by the wind conditions. In order to ensure the column or mast, bracketry and luminaire itself can withstand these pressures and remain steadfast in its installed position without fear of sway, calculating the correct windage is vitally important.

Windage & Drag Calculation

Calculating the drag force is key to ensuring masts and luminaires remain where they are supposed to be.

Drag force is calculated using this formula:

$$DRAG = \tfrac{1}{2} \times V2 \times \rho \times EPA$$

V – is the air velocity.
ρ – is the air density.
EPA – is the Effective Projected Area.

EPA is calculated with this formula:

$$EPA = Cd \times FPA$$

Windage & Drag Calculation

EPA 'Effective Projected Area' is used to determine how much force a luminaire will apply to the mounting brackets or pole at a given wind velocity. (this is different to FPA in that different shaped surfaces have less drag than a simple 2D flat surface. A sphere has less drag than a flat circular plate of the same diameter)

FPA – Frontal Projected Area.

Cd – Drag Co-efficient

Windage Calculated by Region

Administrative Area	Maximum Altitude m	10 Min Mean Wind Velocity m/sec	Rationalised Wind Loading Region
Aberdeen	141	25.2	Heavy
Aberdeenshire	117	25.73	Heavy
Angus	250	25.2	Extra Heavy
Antrim	217	26.25	Extra Heavy
Argyll and Bute	170	27.3	Extra Heavy
Armagh	250	24.68	Extra Heavy
Bath and North East Somerset	250	22.05	Medium
Bedfordshire	147	23.1	Light
Blackburn and Darwen	142	24.15	Medium
Blackpool	98	24.15	Light
Blaenau Gwent	250	22.05	Medium
Bournemouth	98	24.15	Light
Bracknell Forest	250	21	Light
Bridgend	221	22.58	Medium
Brighton and Hove	147	23.1	Light
Bristol	231	21.53	Light
Buckinghamshire	202	22.05	Light
Caerphilly	250	22.05	Medium
Carmarthenshire	250	25.2	Extra Heavy
Cambridgeshire	117	24.68	Medium
Cardiff	250	22.05	Medium
Ceredigion	142	24.15	Medium
Channel Islands	141	25.2	Heavy
Cheshire	193	23.1	Medium
Clackmannanshire	190	24.15	Heavy
Conwy	250	24.15	Extra Heavy
Cornwall	141	25.2	Heavy
Cumbria	242	25.73	Extra Heavy
Darlington	72	25.73	Medium
Denbighshire	244	23.1	Heavy
Derby	174	22.58	Light
Derbyshire	193	23.1	Medium
Devon	142	24.15	Medium
Dorset	193	23.1	Medium
Down	250	25.2	Extra Heavy
Dumfries and Galloway	117	25.73	Heavy
Dundee	242	25.73	Extra Heavy
Durham	217	26.25	Extra Heavy
East Ayrshire	117	25.73	Heavy
East Dunbartonshire	165	24.68	Heavy
East Lothian	141	25.2	Heavy
East Renfrewshire	250	25.2	Extra Heavy
East Riding of Yorkshire	217	26.25	Extra Heavy
East Sussex	147	23.1	Light
Edinburgh	165	24.68	Heavy
Essex	167	23.63	Medium
Falkirk	190	24.15	Heavy
Fermanagh	250	25.2	Extra Heavy
Fife	141	25.2	Heavy
Flintshire	193	23.1	Medium
Glasgow	165	24.68	Heavy
Gloucestershire	231	21.53	Light
Greater London	174	22.58	Light
Greater Manchester	167	23.63	Medium
Gwynedd	250	25.2	Extra Heavy
Halton	147	23.1	Light
Hampshire	147	23.1	Light
Hartlepool	95	26.25	Heavy
Herefordshire	202	22.05	Light
Hertfordshire	147	23.1	Light
Highland	127	28.35	Extra Heavy
Inverclyde	242	25.73	Extra Heavy
Isle of Anglesey	94	25.2	Medium
Isle of Man	94	25.2	Medium
Isle of Wight	147	23.1	Light
Isles of Scilly	52	25.2	Light
Kent	167	23.63	Medium
Kingston upon Hull	52	25.2	Light
Lancashire	141	25.2	Heavy
Leeds City	250	24.68	Extra Heavy
Leicester	174	22.58	Light
Leicestershire	193	23.1	Medium
Lincolnshire	94	25.2	Medium
Londonderry	217	26.25	Extra Heavy
Luton	202	22.05	Light
Medway	174	22.58	Light

Administrative Area	Maximum Altitude m	10 Min Mean Wind Velocity m/sec	Rationalised Wind Loading Region
Merseyside	142	24.15	Medium
Merthyr Tydfil	250	22.58	Heavy
Mid Lothian	141	25.2	Heavy
Middlesbrough	95	26.25	Heavy
Milton Keynes	202	22.05	Light
Monmouthshire and Newport	202	22.05	Light
Moray	250	25.2	Extra Heavy
Neath Port Talbot	193	23.1	Medium
Norfolk	95	26.25	Heavy
North Ayrshire	217	26.25	Extra Heavy
North East Lincs	52	25.2	Light
North Lanarkshire	190	24.15	Heavy
North Lincs	94	25.2	Medium
North West Somerset	202	22.05	Light
North Yorkshire	95	26.25	Heavy
Northamptonshire	147	23.1	Light
Northumberland	50	26.25	Medium
Nottingham	147	23.1	Light
Nottinghamshire	142	24.15	Medium
Orkney	87	29.4	Extra Heavy
Oxfordshire	250	21	Light
Pembrokeshire	142	24.15	Medium
Perth and Kinross	165	24.68	Heavy
Peterborough	98	24.15	Light
Plymouth	142	24.15	Medium
Poole	147	23.1	Light
Portsmouth	147	23.1	Light
Powys	193	23.1	Medium
Reading	250	21	Light
Redcar and Cleveland	95	26.25	Heavy
Renfrewshire	250	25.2	Extra Heavy
Rhondda Cynon Taff	250	22.58	Heavy
Rutland	122	23.63	Light
Scottish Borders	117	25.73	Heavy
Shropshire	250	22.58	Heavy
Slough	250	21	Light
Somerset	193	23.1	Medium
South Ayrshire	117	25.73	Heavy
South Gloucester	231	21.53	Light
South Lanarkshire	165	24.68	Heavy
South Yorkshire	142	24.15	Medium
Southampton	174	22.58	Light
Southend	147	23.1	Light
Staffordshire	221	22.58	Medium
Stirling	250	25.2	Extra Heavy
Stockton on Tees	72	25.73	Medium
Stoke on Trent	221	22.58	Medium
Suffolk	94	25.2	Medium
Surrey	250	22.58	Heavy
Swansea	167	23.63	Medium
Swindon	250	21	Light
Telford and Wrekin	202	22.05	Light
Thurrock	174	22.58	Light
Torbay	122	23.63	Light
Torfaen	250	22.05	Medium
Tyne and Wear	217	26.25	Extra Heavy
Tyrone	250	25.2	Extra Heavy
Vale of Glamorgan	221	22.58	Medium
Warrington	147	23.1	Light
Warwickshire and Coventry	250	22.05	Medium
West Berkshire and Newbury	250	21	Light
West Dunbartonshire	141	25.2	Heavy
West Lothian	190	24.15	Heavy
West Midlands	231	21.53	Light
West Sussex	147	23.1	Light
West Yorkshire	250	24.68	Extra Heavy
Western Isles	87	29.4	Extra Heavy
Wiltshire	202	22.05	Light
Windsor and Maidenhead	250	21	Light
Wokingham	250	21	Light
Worcestershire	231	21.53	Light
Wrexham	221	22.58	Medium
York	52	25.2	Light
Shetland	Ask for details	31.50	Ask for details

Wind Loading	Loading Catagories
Extra Heavy	579
Heavy	466
Medium	429
Light	396

Terrain Category I:
Seasides. At the edge of a lake with a length exposed to the wind of at least 5km. Flat even land without obstacles.

Terrain Category II:
Fenced off cultivated land, some small agricultural buildings, houses or trees.

Terrain Category III:
Industrial or suburban zones and forest.

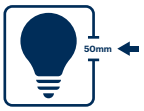
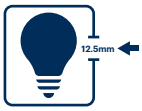
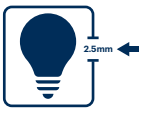
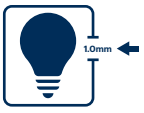
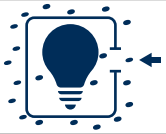
Terrain Category VI:
Urban perimeters with at least 15% of the surface built on, and/or on which the average heights of buildings exceed 15m.

Protection Rating

IP Ratings

EN 60529 outlines an international classification system for the sealing effectiveness of enclosures of electrical equipment against foreign bodies and moisture.

This classification system uses the letter 'IP' (ingress protection) followed by one, two or three digits. An 'X' is used if there is only one class of protection: ie IPX4 which addresses moisture resistance only.

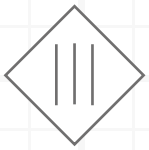
1st Digit	Symbol	Solid Object Protection	2nd Digit	Symbol	Water Protection
0		Not protected	0		Not protected
1		Projected against solid objects greater than 50mm	1		Projected against vertically dripping water
2		Projected against solid objects greater than 12.5mm	2		Projected against dripping water when tilted up to 15°
3		Projected against solid objects greater than 2.5mm	3		Projected against spraying water
4		Projected against solid objects greater than 1.0mm	4		Projected against splashing water
5		Projected against dust. Limited ingress of dust permitted	5		Projected against jets of water
6		Dust tight. No ingress of dust	6		Projected against powerful jets of water
IP 6 6 Code Letter — 1st Digit — 2nd Digit			7		Projected against temporary immersion in water
			8		Projected against continuous immersion in water

Electrical Information

Electrical Insulation Classes

CLASS I
Lighting fittings with all accessible metal parts connected to the earth.

CLASS II
Light fittings where all accessible metals parts are insulated from voltage in case of failure. The light fitting does not require an earth device.



CLASS III
Light fittings working with low voltage.

UKCA - UK Conformity Assessed
The conformity mark that indicates compliance with the applicable requirements for products sold within Great Britain

CE – Conformite Europeenne
The CE mark states conformity of products to the essential requirements of the European Community Directives.

Inrush Data

This refers to the power being drawn when a circuit is first energised. The following data shows the inrush currents and duration that apply to the Amnis Series and can be used to calculate which breakers are needed for a safe installation.

Wattage (W)	Inrush Current (A)	Inrush Duration (µS)
450	150	450
665	225	450
900	300	450
1300	13.4	5,840

Maintenance Factors

Maintenance Factors Explained

In short, the maintenance factor in lighting installations refers to the loss of light over time. During the operating time of luminaire, there can be a decrease in the lumen output due to degradation of the system.

Other factors must be taken into consideration including the localised environment surounding the luminaire such as dust, moisture or other pollutants which can add decrease of light output.

These factors should be calculating at the planning stage of any project by a qualified Lighting Designer to ensure accurate results.

The following calculations show the mainenance factor and lifetime curve of the Amnis Flood using differing operating hours.

Example Calculations - Amnis Flood

In order to calculate the depreciation over the design life, we use the following formula:

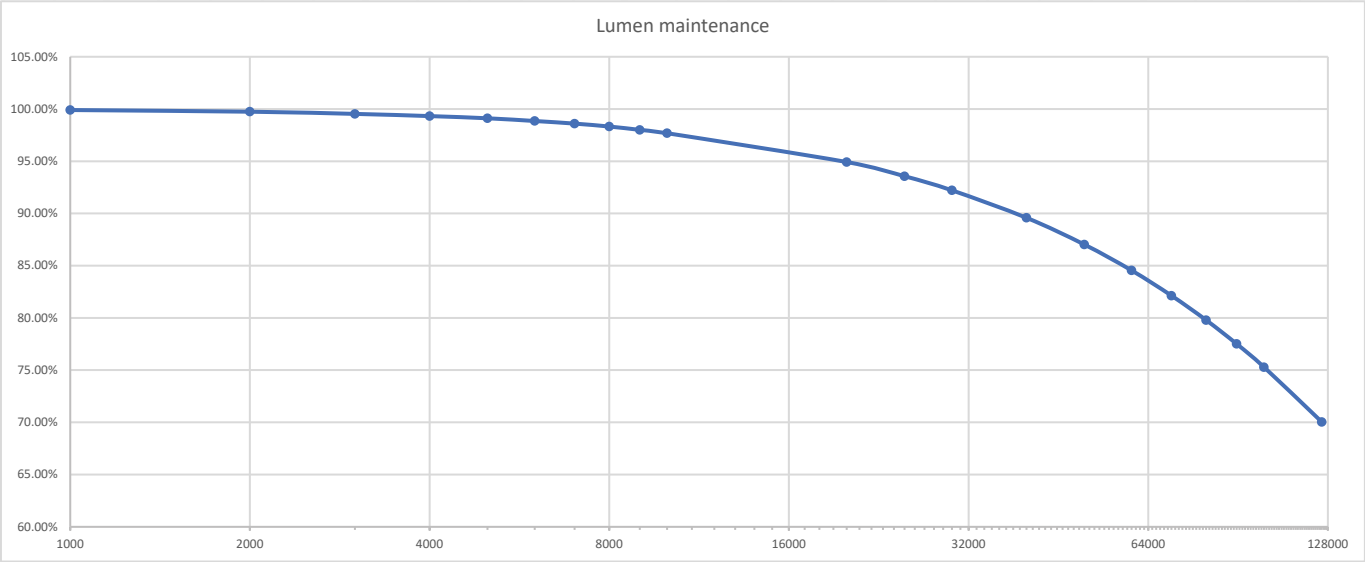
Maintenance Factor Calculation	
Design Life	5000
Lumen Maintenance (LLMF)	0.9912
Cleaning Cycle	24
LMF	0.96
Failure Factor (F)	1%
MF	0.951457

$$MF = \frac{X}{100} \times \frac{(100-Y)}{100} \times LMF$$

$$MF = LLMF \times \frac{(100-F)}{100} \times LMF$$

Maintenance Curve

The maintenance curve for Amnis shows results for different design life times.



Hours	Lumen Maintenance
1000	99.91%
2000	99.75%
3000	99.54%
4000	99.33%
5000	99.12%
6000	98.86%
7000	98.61%
8000	98.33%
9000	98.01%
10000	97.69%
20000	94.93%
25000	93.57%
30000	92.22%
40000	89.59%
50000	87.03%
60000	84.55%
70000	82.13%
80000	79.79%
90000	77.51%
100000	75.29%
125000	70.03%

Cleaning Frequency (Months)	MF
12	0.96
24	0.96
36	0.95
48	0.94
60	0.93
72	0.92

Design Hours	MF (to 2 D.P.)
5000	0.95
10000	0.94
25000	0.90
50000	0.84
100000	0.72

Glossary of Terms

Amp - A measurement of the flow of electrical current. One amp is equal to the electric force of one volt acting across the resistance of one ohm.

Ballast – Device connected between the supply and one or more discharge lamps which serves mainly to limit the current of the lamps to the required value.

Beam Angle - Measures the spread of a light source. Lighting with a wider beam angle is more suitable for general purpose. Narrower beam angles are good for highlighting specific objects or areas.

Candela - The unit of measure for the intensity of light at the source roughly equal to the amount of light in any direction from the flame of a candle.

Colour rendering index (CRI) - is a measure of the ability of a light source to reproduce the colours of various objects being lit by the source

Colour Temperature - A measure of how warm or cold a white light source appears. Warm light sources offer a softer, yellower light, while cool light sources emit a bluer, more intense light. Colour temperature is measured in Kelvins (K), and the lower the number, the warmer the light.

Driver – A driver is a device which controls the amount of power to an LED board or fitting, protecting it from sudden increases in voltage. Drivers are required to use low voltage LEDs and they can improve the performance and lifespan of LED light bulbs.

Efficacy - This refers to the amount of light produced per watt of electricity (comparable to efficiency). It is the rate at which a lamp is able to convert electrical power (watts) into light (lumens), expressed in terms of lumens per watt (LPW)

Emergency Lighting - Lighting that is designed to activate when a mains power outage occurs, usually powered by a rechargeable battery. Emergency lighting is useful when normal power may be cut off, and it is a health and safety requirement for areas around fire exits.

Flicker – Light flicker refers to rapid or quick and, repeated changes in the brightness of light over time – light that appears to flutter and be unsteady. It is caused when the voltage supplied to a light source changes or when the power line voltage itself fluctuates.

Glare - This occurs when the contrast between dark and light is accentuated. This can cause discomfort for people using spaces near the luminaire.

Heat Sink - A heat sink is used to draw heat away from certain parts of an electronic circuit. Because LEDs are sensitive to heat, a heat sink is often an important part of a luminaire. Heat sinks help to preserve the lifespan of LED lights.

IP Rating – An IP rating is a way of showing how effective an item is at blocking out foreign bodies. The IP stands for Ingress Protection and the following numbers (i.e. IP67, IP56, etc) refer to the protection an item offers against the intrusion of the two categories of foreign bodies, i.e. solid (e.g. dust) and liquid (water).

IK Rating - The IK rating is an international standard that indicates how resistant a product is to impact. The standard BS EN 62262 relates to IK ratings, to identify the degree of protection provided by enclosures for electrical equipment against external mechanical impacts.

Ignitor – A device intended, either by itself or in combination with other components in the circuit, to generate voltage pulses to start a discharge lamp without providing preheating of the electrodes.

Lumen - The quantity of luminous flux emitted within a unit solid angle (one steradian) by a point source with one candela intensity in all directions.

Lux - The amount of visible light per square meter incident on a surface. 1 lux = 1 lumen/square meter

Maintenance Factor - A lighting system's maintenance factor indicates how much of the initial luminous flux remains available at the end of its service life. The maintenance factor must be determined by the lighting designer and the new value of the luminous flux multiplied by it.

Obtrusive Light – This is any unwanted light that is illumination areas near a light source. For example, a luminaire that shines light onto a nearby residential areas or wildlife habitat.

PIR - Stands for Passive Infrared detection device. In lighting, it is connected to a luminaire. A PIR detection device turns the light on or off when there is a large change in infrared activity, usually when someone enters or exits a room. This helps to save energy. PIRs are frequently used in security lighting.

Photocell – These are sensors that change resistance depending on the amount of light it detects. Simply put, a photocell with allow the light source to activate when little to no light is detected, meaning the luminaires is activated when natural light deteriorates.

Power Factor - This is the ratio of power actually used in an electric circuit, the real power (expressed in kW), to the power that is apparently being drawn from the power source, the apparent power (expressed in kVA).

Reflector Technology – This solution is precisely designed to concentrate the light from the LED chips and project a focused beam pattern to put the light where you need it using a serious of 'reflectors'. This technology is used to reduce glare, obtrusive light and promote comfort.

Uniformity – This is the ratio of the minimum lighting level to the average lighting level in a specified area. It's a quality parameter for the overall illuminance distribution.

Upward Light Output Ratio (ULOR) - The effectiveness of a luminaire in transmitting the light from the lamp out into the environment

Volt - The unit of electrical potential, or difference in electrical pressure, expressing the difference between two electrical charges.

Watt - A standard unit of power defined as one Joule of energy transferred or dissipated in one second.

Wind Area / Windage - A general term describing the amount of exposure of an object to the force of the wind.

Key Contacts

Project Sales Team

Lee Hayter
Head of Sports & High Mast
M: +44(0)7393 148858
E: lhayter@kingfisherlighting.com

Thomas Ford
Sports & High Mast Technical Sales Engineer
M: +44(0)797 4454611
E: tford@kingfisherlighting.com

Robyn Du Preez
Sports & High Mast Project Sales Engineer
M: +44(0)7379 089156
E: rpreez@kingfisherlighting.com

Project Support

Gemma Blyton
Project Team
T: +44(0)1623 703109
E: gblyton@kingfisherlighting.com

Abbie Cottam
Project Team
T: +44(0)1623 415211
E: acottam@kingfisherlighting.com

Kingfisher Lighting Ltd
Ratcher Way
Crown Farm Business Park
Nottinghamshire
NG19 0FS

T: +44 (0)1623 415900
E: sport@kingfisherlighting.com
W: kingfishersport.co.uk

Kingfisher SPORT

Part of the LUCECO group of companies

Kingfisher Lighting Ltd
Ratcher Way
Crown Farm Business Park
Mansfield
Nottinghamshire
NG19 0FS

T: +44 (0)1623 415900
E: sales@kingfisherlighting.com

Kingfishersport.co.uk