Abacus®

Leaders in Lighting

High mast lighting systems

Derek Brewer
Chief Executive of Nottinghamshire County Cricket Club
"Our working relationship with Abacus has been the epitome of a strong, creative two-way partnership. Timescales throughout the redevelopment were very tight; yet the strong understanding and excellent communications between us meant that the project was completed bang on time and within budget."

Brian Townsend
Chairman of Brocton FC
"We would like to congratulate Abacus on their professionalism throughout the project – from the early stages of conceptualisation and design, through to manufacture, site installation and commissioning. We have no hesitation in recommending Abacus and their products to others: indeed, we now see our ground as a 'show piece' for all sporting clubs."

Angus Fraser
Managing Director of Cricket
Middlesex County Cricket Club
"I think the lighting is excellent and I've had the same response from Middlesex players."

Stephen Busuttil
Projects Manager
Malta Freeport Terminals Ltd.
"I've seen for myself how long-lasting and durable the Abacus base-hinged mast is. They are quick and simple to install, and very low-maintenance."

THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2017

A bit about Abacus

Over 50 years have passed since Abacus first started its manufacturing business in Nottinghamshire, UK. We've developed a lot in that time, but our values are the same today as they've always been. Technical brilliance and outstanding customer service aren't just shallow promises: they're inherent in everything we do. They come naturally to us. And as a result, so do our customers – from all over the globe.

Renowned worldwide for our continuous innovation in floodlighting and high mast systems, Abacus has been commissioned by leading international companies to provide bespoke solutions from base-hinged to telescopic masts – in projects big and small, from Surrey to Singapore.

And it's not just our masts that are built to order. Whether you need supply-only or a start-to-finish service complete with regular ongoing maintenance, we have the package to suit you.

Our lighting has an enviable reputation around the world, with our AAA-LUX LED floodlights and our Challenger® range proving unbeatable. For a high mast system there is only one place to come – Abacus.

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Using this brochure

As you work through this brochure, refer to the back page for clear application symbols and a range of floodlighting options.

Key

- Sport
- Industry
- Airports
- Ports
- Rail
- Road
- Energy
- Communications

If you don't find what you're looking for here or would like to see our complete product portfolio, visit **www.abacuslighting.com** or contact our sales team for help and advice on +44 (0)1623 518 333.

Sports lighting
Lord's Cricket Ground

Abacus' innovative, elegant lights have adorned the hallowed ground of world-famous cricket club, Lord's, since the 2009 cricket season. Situated as it is in a residential area in the heart of London, getting planning permission for permanent floodlighting was always going to be a challenge. And that's where we came in.

As Lord's principal contractor, we had to find a solution that would provide optimum illumination of the wicket area while minimising light pollution and satisfying the strict planning criteria.
Our unique telescopic masts, which take a mere 20 minutes to raise and lower fully, were the ideal solution.

Designed, engineered and manufactured right here at Abacus, each 25 tonne mast took around 10 weeks to manufacture. After being transported to site in three pieces, the masts were hoisted onto their own 20m deep concrete foundations using a 500 tonne crane.

Mounted at the top of each one, 100 Challenger® 3 floodlights produce up to 2,000 lux of match-friendly lighting – all digitally controlled from one remote touch-screen panel.

We're keeping the whole lot in perfect working order too, thanks to our ongoing servicing and maintenance contract.

For information on suitable floodlights, see back page

South Bristol MUGA, UK

Trent Bridge Cricket Ground, UK

The right mast system for your needs

Fixed masts are ideal for:

- High structures up to 70m
- Large quantities of floodlights (as many as 200 Challenger® 3 stadium floodlights)
- Accessing by fixed ladders or manrider elevator systems to an upper platform, with further maintenance access to the floodlights via ladders

Base-hinged masts are ideal for:

- Fast installation and smaller equipment
- Easy access for maintenance, so no health and safety worries or damage to surfaces from heavy cherry pickers
- Great aesthetics, as there is no ladder or platform
- Virtually maintenance-free mast system thanks to simple but robust engineering – the hydraulic unit does all the work

Telescopic masts are ideal for:

- Locations where obtaining planning for permanent high mast lighting is going to be tough
- Minimising impact on the skyline
- Creating an exceptional design impact
- Easy control using the latest touch-screen technology

Sports lighting
Mission Hills Golf Club

Since opening in 1994, Mission Hills Golf Club China has established itself as the world's largest golf club.

The club includes ten golf courses, each designed and endorsed by the likes of Greg Norman, Ernie Els, Nick Faldo and Vijay Singh; not to mention the 230 room hotel complex, 300,000 sq ft Country Club and luxury, five-star residential development.

For Mission Hills, quality is everything; so when they needed to commission floodlighting for their 'Duval' and 'Sorenson' courses, Abacus was the natural choice.

Having already completed the lighting for their Ernie Els and Jumbo Ozaki courses, our relationship and knowledge meant we beat the international competition hands-down.

The project involved lighting the fairways, tees and greens of both courses – a challenging engineering feat, made all the more complex by the fact that the courses run parallel with each other.

To achieve the optimum level of light, a total of 150 base-hinged masts were installed across the course and fitted with over 400 Challenger® 1 floodlights, each featuring a double-ended 2kW metal halide lamp. Challenger® 1 floodlights are high-performance units with double asymmetric beam-distribution, minimising light pollution, overspill and unwanted glare for onlookers.

For information on suitable floodlights, see back page

Nottingham University, UK

Liberec Ski Jump, Czech Republic

Colorline Stadium, Norway

Dubai Rugby Sevens, Dubai

Dubai Creek Golf Club, Dubai

Kempton Park Racecourse, UK

The right mast system for your needs

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Commercial and industrial lighting
Asda (Wal Mart), UK
Dalian Petrochemical Corporation

Asda (Wal Mart), UK

Every year, hundreds of retail sites worldwide choose Abacus to supply, install and maintain their exterior lighting systems. Asda – one of the UK's leading supermarket chains – use our high mast system with lowering headframes to guide shoppers safely and securely to and from their cars at numerous stores across the country.

As well as creating a welcoming feel for people as they enter the car park, the chosen option of lowering headframes makes it easy to maintain each lighting unit without causing too much disturbance for customers – or losing valuable car parking space.

Dalian Petrochemical Corporation

China's largest producer and supplier of oil and gas, China National Petroleum Corporation (CNPC), is the fifth largest oil producer in the world and a globally reputed contractor in engineering construction. The company's subsidiary, Dalian Petrochemical Corporation, produces, supplies, stores and transports around 1,050 million tonnes of over 200 petrochemical products to the whole of China – from gas and coal to oil and diesel.

When Dalian needed a high mast lighting system for their plant in North East China, they asked for our help. We used our lowering headframe masts to ensure that the lighting could always be maintained at ground level – no matter what the access or clearance situation around them at any one time.

For information on suitable floodlights, see back page

Dalian Petrochemical Corporation, China

Bowmer Container Area, UK

The right mast system for your needs

Fixed masts are ideal for:

- Maximum flexibility for big top-loads
- Sites on a road system with unimpeded cherry picker access
- Projects with smaller capital budgets for contractors

Base-hinged masts are ideal for:

- Projects needing a quick turnaround due to the speed of installation
- Fixed headframe provides better floodlight stability over lowering headframe option
- Virtually maintenance-free mast system thanks to simple but robust engineering – the hydraulic unit does all the work

Lowering headframe masts are ideal for:

- Sites where access to the mast is difficult
- Peace of mind, thanks to the optional headframe latching system
- Reducing risks of multiple internal cable-snagging problems by using a single multi-core electrical cable system for up to 12 floodlights
- Robust engineering – first patented by us over 40 years ago

Airport lighting
Bristow Helipad

Bristow is the largest helicopter-operating company in the world. Their site at Norwich Airport, which contains a total of 12 helipads, takes passengers to and from the North Sea oil rigs all year round.

When it came to redeveloping their facility and adding a new hangar, Bristow needed a lighting upgrade that would combine excellent performance with minimal glare – an essential consideration when pilots are taking off or landing at night. Masts also had to be installed around the perimeter of the site without encroaching onto the runway or controlled air space.

Low-maintenance base-hinged masts and Abacus floodlights with integrated baffles were the ideal solution. A combination of eleven 15m, 25m and 35m masts were installed and painted in the airfield's standard red and white, with warning lights on top for low-flying craft.

Our lighting design, which directs a pool of light onto the circular apron, ensures that helicopter pilots can always see ground staff clearly when taxiing, enabling all other tasks to continue quickly and safely (cleaning, refuelling, off-loading passengers and freight, etc.).

For information on suitable floodlights, see back page

Jersey Airport, Jersey

Shanghai Pudong International Airport, China

The right mast system for your needs

Fixed masts are ideal for:

- Maximum flexibility for big top-loads
- Sites on a road system with unimpeded cherry picker access
- Projects with smaller capital budgets

Lowering headframe masts are ideal for:

- Easy maintenance access at mast base
- Peace of mind, thanks to the optional headframe latching
- Reducing risks of multiple internal cable-snagging problems by using a single multi-core electrical cable system for up to 12 floodlights
- Robust engineering – first patented by us over 40 years ago

Base-hinged masts are ideal for:

- Projects needing a quick turnaround, with quick assembly and installation
- Practical maintenance which can be carried out quickly at ground level with minimum disturbance
- A range of uses – CCTV and speakers as well as floodlights
- Easy re-painting at ground level, if necessary
- Virtually maintenance-free
- Protecting your masts and lighting in areas suffering from hurricanes and storms

Airport projects include:

Chek Lap Kok, Hong Kong

Jersey Airport, Jersey

Vienna Airport, Austria

Al Ain International Airport, UAE

Auckland Airport, New Zealand

Keflavik Airport, Iceland

East Midlands Airport, UK

Nairobi Airport, Kenya

Sharm El Sheik Airport, Egypt

Port lighting
Kalifa Bin Salman Port at Hidd, Bahrain

Bahrain is a country with infrastructural development and modernisation at the heart of its future plans. An important hub for cargo within the Middle East, this port was built on 400 hectares of land reclaimed from the existing Hidd port's basin, berths and shipping channels. The 1,800m long, 15m deep quay wall, houses two container berths, a general cargo berth, 1,500 metres of additional berthing and associated docking facilities.

We were commissioned by the port owner and operators, APM, to design and install a robust, state-of-the-art floodlighting system which would be both moisture-resistant and easy to maintain.

The solution: fourteen 40m and twenty-six 35m masts – base-hinged for easy lantern access and a proven, trusted technology worldwide. All fitted with Rhea 1kW floodlights – specially designed to IP66 to protect against the excess moisture inevitable in a port setting.

Since working with APM, we've gained worldwide acclaim and repeat business in other ports – not just because of the strength of our product, but also the single-solution design and installation package we developed hand-in-hand with the port's consultant.

For information on suitable floodlights, see back page

Rosyth, UK

Dalian Sea Port ,China

The right mast system for your needs

Base-hinged masts are ideal for:

- Projects needing a quick turnaround with quick assembly and installation
- Practical maintenance, which can be carried out quickly with minimum disturbance at ground level
- A range of uses – CCTV and speakers as well as floodlights
- Easy re-painting at ground level, if necessary
- Virtually maintenance-free

Lowering headframe masts are ideal for:

- Easy maintenance access at mast base
- Peace of mind, thanks to the optional headframe latching
- Reducing risks of multiple internal cable-snagging problems by using a single multi-core electrical cable system for up to 12 floodlights
- Robust engineering - first patented by us over 40 years ago

Fixed masts are ideal for:

- Maximum flexibility for big top-loads
- Sites on a road system with unimpeded cherry picker access
- Projects with smaller capital budgets

Port projects include:

Bilbao, Spain

Tangiers, Morocco

Port Said, Egypt

Apapa Port, Nigeria

Luanda Port, Angola

Vlissingen Port, Holland

Antwerp Port, Belgium

Tilbury, UK

Felixstowe, UK

Kings Lynn, UK

Shanghai Wai Gaogiao Container Port, China

Odessa Port, Ukraine

St Petersburg Port, Russia

Malta Freeport, Malta

Rail lighting
Tinsley Rail Yard Depot, UK

The Tinsley rail yard needed a lighting solution that would provide optimum visibility for drivers, without producing dangerous or distracting glare to them or road-bridge users. After consultation with our team of experts, the client opted for thirteen of our 20m base-hinged masts, fitted with 55 Rhea medium-beam 400kW floodlights.
These came complete with integrated baffles and special cowls to prevent light pollution and overspill.

But the benefits didn't end there. Our base-hinged technology also enabled maintenance and re-lamping to be carried out with the minimum effort, risk and cost to the depot – essential when these lights are in operation 365 days per year.

RISQS RAILWAY INDUSTRY SUPPLIER QUALIFICATION SCHEME
AUDITED

For information on suitable floodlights, see back page

Alnabru Terminal, Oslo

Tinsley Rail Yard Depot, UK

The right mast system for your needs

Base-hinged masts are ideal for:

- Projects needing a quick turnaround, with quick assembly and installation
- Practical maintenance, which can be carried out quickly with minimum disturbance at ground level
- A range of uses – CCTV and speakers as well as floodlights
- Easy access
- Easy re-painting at ground level, if necessary
- Virtually maintenance-free

Lowering headframe masts are ideal for:

- Easy maintenance access at mast base
- Peace of mind, thanks to the optional headframe latching
- Reducing risks of multiple internal cable-snagging problems by using a single multi-core electrical cable system for up to 12 floodlights
- Robust engineering – first patented by us over 40 years ago

Fixed masts are ideal for:

- Maximum flexibility for big top-loads
- Sites on a road system with unimpeded cherry picker access
- Projects with smaller capital budgets

Road lighting
St Petersburg Ring Road, Russia

This ambitious development was designed to help solve many of St Petersburg's traffic and ecological problems. The eastern half has eliminated all cargo transport from the city centre, significantly improving the environment for the city residents and businesses.

Abacus has supplied and installed the largest number of high mast lighting structures for the ring road since the project began.

The system, which has masts of up to 46m in some sections, incorporates lowering headframes that allow maintenance to be carried out at ground level in the central carriageway.

The masts, which have special design modifications to withstand harsh climatic conditions (temperatures can dip as low as -30°C), will serve the ring road for a minimum of 25 years.

The Bolshoi Obukhovsky suspension bridge, which has been part of the road's construction, meant working to devise a solution that not only brings the bridge to life at night, but once again, survives the Russian climate.

And our involvement in the city's transport system doesn't end there.
St Petersburg is also home to the largest port in North-West Russia, handling over a quarter of the country's cargo per year. The port chose our 30m lowering headframe mast system with triple pulleys to light its 307,211 square metres of sheltered warehousing.

The key advantage of the lowering headframe system is that it can operate in confined areas. The headframe can be lowered to the ground using an electrically-powered winch system.

For information on suitable floodlights see back page

Nottingham, UK

Nottingham, UK

The right mast system for your needs

Base-hinged masts are ideal for:

- Projects needing a quick turnaround with quick assembly and installation
- Practical maintenance, which can be carried out quickly with minimum disturbance
- A range of uses – CCTV and speakers as well as floodlights
- Easy re-painting at ground level, if required
- Virtually maintenance-free

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- Robust engineering – first patented by us over 40 years ago

Our products

High mast lighting is rarely a simple matter; but at Abacus, we've developed a suite of flexible products that will suit virtually any situation – no matter how complex. This at-a-glance guide has been designed to help you identify the right solution for you.

Our products at-a-glance

Base-hinged masts
- Mid range base-hinged 10m to 20m
- Grand range base-hinged 20m to 50m

Fixed masts
- Club range 15m to 30m
- Area range 20m to 50m
- Stadium range 30m to 70m

Lowering headframe masts
- 15m to 50m

Telescopic masts
- Club range to 20m
- Stadium range to 50m

Wind turbine masts
- Base-hinged range to 25m
- Fixed mast structures

Telecommunication mast structures
- Monopole structures to 60m

Buyer's guide

Solution	What are the benefits?	Considerations
Base-hinged masts Simple, robustly engineered masts requiring virtually no maintenance for the first 25 years of their life.	– Can be installed and maintained at ground level – Three times faster to install than a lowering headframe mast – No platform means a clean, attractive profile allowing for lower wind loading and foundations as a result – Can be supplied complete with all control gear and protection equipment fitted into mast base or cabinet – Any necessary maintenance is quick and simple, with few health and safety considerations – Fixed headframe means floodlights stay stable, even in strong winds	– You will need enough ground space to enable the masts to be lowered fully. This is dependent on the height of the chosen mast
Lowering headframe mast with winch A fixed mast with raising and lowering headframe. Ideal for accessing headframes at ground-level when space around the mast is tight.	– Headframe and lanterns can be lowered to the base of the mast for easy maintenance – Optional headframe latching system for extra security and stability – Single multi-core electrical cable management system for all floodlights, in comparison to other multi-cable systems – Featuring a 3-pulley design, providing significant benefits over a 2-pulley competitor system	– You'll need to make arrangements for regular servicing and maintenance. Regulations vary from market to market, but this can be required as often as once per year – Installation requires large cranes and can take up to three times longer than a base-hinged mast due to the number of components and moving parts
Fixed mast – with ladder or man rider access The best choice if you need a large quantity of floodlights – most often commissioned by sports stadia.	– Can mount up to 200 2kW Challenger® 3 floodlights – Mast bases can be designed to incorporate up to 70 sets of 2kW control gear and protection equipment – Practical access for regular maintenance	– You may need to budget for extra insurance costs, as trained specialists will be required to climb and maintain these high structures. Abacus are fully insured and experienced to carry out all types of maintenance, offering a package tailored to suit your needs
Fixed mast – no ladder or platform Simple and elegant.	– Low cost option – Like base-hinged masts, the headframe is simpler with lower wind loading and smaller foundations – No separate cabinets needed, as mast bases can be designed to incorporate up to 60 sets of 2kW control gear and protection equipment	– Best placed in situations which are easy to access using crane-and-basket equipment, with minimal risk of ground damage
Telescopic masts Our newest and most technologically sophisticated mast – perfect for areas where it may be difficult to secure planning permission.	– Low mounting height with raising and lowering capabilities makes this a great lighting solution for heavily built-up areas – Aesthetically striking – a real landmark feature for many stadia	– High-end engineering solution

Foundation and planning notes

Guidance on foundations

To help you plan the mast foundations, refer to the technical data tables, where you'll find a foundation reference alongside each mast height. This reference is calculated based on a maximum load and wind speed for each product. The correct concrete dimensions can be determined by cross referencing this code with our foundations section.

Planning the assembly and installation

To help plan your installation, talk to us for advice on the following:

- guidance on what key equipment you will need
- guidance on how long it takes to assemble and install any of the range of masts
- assembly and operating instructions for the range

Base-hinged raising and lowering masts

Abacus base-hinged masts do exactly what they say on the tin: raise and lower from ground level up to a height of 50 metres. There are eight models to choose from – mainly used to mount floodlights, CCTV cameras, wind turbines and compact communication devices.

Since the first model was introduced over 50 years ago, Abacus base-hinged masts have become some of our most popular products worldwide. Robust, simple to install and easily accessible, they're incredibly cost-effective – especially since they require minimal ongoing maintenance.

The unique operating system – the first and still best of its kind on the market – is as safe as it is simple, with its gravity lock and quick-lowering mechanism.

Why base-hinged?

- Quick and simple to assemble and install – up to three times faster than fixed or winch-lowering models
- Safe – no climbing, as all maintenance and floodlight adjustments can be done at ground level
- Virtually maintenance free – thanks to straightforward design and robust engineering
- Attractive – with no ladder or platform to interrupt the mast's clean, modern lines
- Versatile – with eight models, all designed for different load weights
- Particularly suitable for high-wind or hurricane-prone zones, as masts can be lowered in advance of storms

Specification

All masts are designed to the British High Mast standard, Institution of Lighting Engineers' Technical Report No. 7. All models are hot-dip galvanised to ISO EN 1461. Base-hinged raising and lowering masts with gravity locks are installed and operated using an independent hydraulic cylinder counterbalance unit.

Technical data

Mast ref	Mounting height (m)	Column weight (kg)	Weight of heaviest part (kg)	Max O.T.M knM		Horiz.shear at ground level (kN)	Foundation bolts	Integral gear compartment	Foundation reference*
				raised	lowered				
HL250	12	398		45	29	6	4 No. M30 x 800mm	100 x 190 x 410	50M150/50P150
	15	432	253	45	29	5	Grade 4.6 on 400x400crs	100 x 170 x 650	50M150/50P150
HL330	15	750		121	82	11		170 x 270 x 350	150M150/150P150
	18	797	370	120	82	10	4 No. M30 x 1220mm	170 x 250 x 656	150M150/150P150
	20	812		120	82	10	Grade 8.8 on 460x460crs	One off	150M150/150P150
GL400	15	1019		147	123	12			150M150/150P150
	18	1151		159	133	11			200M150/200R150
	20	1194	691	161	132	11	8 No. M30 x 1220mm	2902 x 310 x 610	200M150/200R150
	25	1278		153	133	9	Grade 8.8 on 620PCD**	Two off	200M150/200P150
GL520	20	1929		278	258	18			300R150/300M150
	25	2124		297	267	16			300R150/300M150
	30	2267	1210	298	277	15	8 No. M36 x 1200mm	406 x 426 x 610	300R150/300M150
	35	2330		226	265	13	Grade 8.8 on 700PCD**	Two off	300R150/300M150
GL620	20	3174		711	521	41			750R150
	25	3450		673	528	33			750R150
	30	3618	1848	565	518	26	16 No. M36 x 1350mm	490 x 510 x 800	750R150
	35	3731		491	512	23	Grade 8.8 on 200crs	550 x 570 x 630	750R150
	40	3865		470	527	21	(800 x 800 overall)	One off	750R150
GL720	25	4687		720	639	37			750R150
	30	5203		703	730	33			750R150
	35	5497	3365	737	760	32	20 No. M36 x 1350mm	590 x 610 x 1000	1000R150
	40	5840		759	838	31	Grade 8.8 on 180crs	650 x 670 x 630	1000R150
	45	6586		820	867	31	(900 x 900 overall)	One off	1000R150
GL800	30	7196		912	898	43			1000R150
	35	7610		987	957	42			1000R150
	40	8514	4966	989	1148	40	20 No. M36 x 1350mm	970 x 690 x 1000	1250R150
	45	8893		989	1145	39	Grade 8.8 on 180crs	730 x 750 x 630	1250R150
	50	9510		989	1327	37	(900 x 900 overall)	One off	1500R150
GL1000	30	10600		2220	2110	116	20 No. M42 x 1700mm	950 x 950 x 600	3000R150
	35	11200		2840	2090	126	Grade 8.8 @ 240crs	850 x 850 x 1000	3000R150
	40	11600	6410	2650	2070	109	(1200 x 1200 overall)		3000R150
	45	11800		2240	2070	90			3000R150
	50	12050		1790	2060	74			3000R150

*Note: this reference is based strictly on a good ground pressure of at least 150kN/m^2
**PCD = Pitch Circle Diameter

Fast and simple

Masts are assembled and installed at ground level using low-capacity equipment.

Safety first

Safe and simple maintenance at ground level. No climbing, no high level platform with difficult access.

Versatile and robust

Up to 50m high and built to last, with low-cost maintenance.

Mid range base-hinged

Grand range base-hinged

RLH5

400mm

HL250

RLH11

460mm

HL330

RLH12

620mm
Pitch Circle Diameter

GL400

RLH13

700mm
Pitch Circle Diameter

GL520

Product code	Height (m)	Max head-load (kg)	Headload capacity (m²)*
HL250	10	175	2.539
	12	150	1.504
	15	100	0.718
Lid/base section: control gear and protection equipment capacity			
1kW/2kW		Cabinet only	
Foundation assembly			
Bolts and base template		FA003G	
Top template		FC023	
Counterbalance		RLH5	

Product code	Height (m)	Max head-load (kg)	Headload capacity (m²)*
HL330	15	350	2.168
	18	245	1.875
	20	200	1.387
Lid/base section: control gear and protection equipment capacity			
1kW/2kW		Cabinet only	
Foundation assembly			
Bolts and base template		FA/HL330	
Top template		FC/HL330	
Counterbalance		RLH11	

Product code	Height (m)	Max head-load (kg)	Headload capacity (m²)*
GL400	15	550	3.516
	18	420	2.773
	20	330	2.480
	25	195	1.309
Lid/base section: control gear and protection equipment capacity			
1kW/2kW		x6	
Foundation assembly			
Bolts and base template		FA006AG	
Top template		FC026	
Counterbalance		RLH12	

Product code***	Height (m)	Max head-load (kg)	Headload capacity (m²)*
GL520	20	715	5.547
	25	425	3.750
	30	280	2.422
	35	175	0.918
Lid/base section: control gear and protection equipment capacity			
1kW/2kW		x6	
Foundation assembly			
Bolts and base template		FA007G	
Top template		FC027	
Counterbalance		RLH13	

* Headload capacity at wind speed of 45m/s. ** Assumes a Challenger® 3 type floodlight, 16kg and 0.20m² wind area.

*** Refer to the bracket specification on your quotation for actual mast height requirement; mast may be shorter to accommodate height of the bracket, maintaining floodlight's central mounting height.

RLH14/RLT

800mm

GL620

RLH15

900mm

GL720

RLH16

900mm

GL800

RLH17

Manufactured to order

1200mm

GL1000

Product code***	Height (m)	Max head-load (kg)	Headload capacity (m²)*
GL620	20	1640	17.891
	25	950	11.875
	30	580	5.078
	35	350	3.281
	40	210	1.914
Lid/base section: control gear and protection equipment capacity			
1kW/2kW		x8	

Foundation assembly

Bolts and base template	FA008CG
Top template	FC028
Counterbalance	RLH14/RLT

Product code***	Height (m)	Max head-load (kg)	Headload capacity (m²)*
GL720	25	1450	12.188
	30	1150	7.969
	35	790	6.094
	40	610	4.688
	45	285	4.258
Lid/base section: control gear and protection equipment capacity			
1kW/2kW		x4	

Foundation assembly

Bolts and base template	FA/GL720
Top template	FC/GL720
Counterbalance	RLH15

Product code***	Height (m)	Max head-load (kg)	Headload capacity (m²)*
GL800	30	1550	10.391
	35	1100	8.281
	40	950	7.070
	45	500	5.781
	50	500	4.492
Lid/base section: control gear and protection equipment capacity			
1kW/2kW		x4	

Foundation assembly

Bolts and base template	FA800G
Top template	FC800
Counterbalance	RLH16

Product code***	Height (m)	Max head-load (kg)	Headload capacity (m²)*
GL1000	30	3081	37.344
	35	2700	28.594
	40	1960	20.781
	45	1470	13.672
	50	1150	8.203
Lid/base section: control gear and protection equipment capacity			
1kW/2kW		x4	

Foundation assembly

Bolts and base template	FA/GL1000
Top template	FC/GL1000
Counterbalance	RLH17

* Headload capacity at wind speed of 45m/s. ** Assumes a Challenger® 3 type floodlight, 16kg and 0.20m² wind area.

*** Refer to the bracket specification on your quotation for actual mast height requirement; mast may be shorter to accommodate height of the bracket, maintaining floodlight's central mounting height.

Mid range (10-20m) masts and accessories

Our two mid range masts – otherwise known as the HL250 and HL330 – are made with octagonal shafts and a gravity-lock mechanism, ensuring the mast is securely positioned before it's lowered to ground level for maintenance. Cable glands mounted in the base also ensure a secure, watertight fit.

The SB range of brackets can be used with both models, plus the spigot bracket supplied with each mast is suitable for a wide variety of floodlight configurations. See p26-27 for the full range of brackets available.

HL250 base-hinged masts: 10m to 15m

There are two options for delivery and installation of the HL250 product range:

Easy-fit on site

- Mast base is factory-fitted, with a steel cabinet pre-wired and fitted to the mast. This comes complete with control gear and protection equipment (as needed for your individual project)
- Fast on-site assembly and installation
- Abacus seal of quality

Standard supply

- Mast and cabinet are supplied empty for your contractor to fit on-site

HL250 product range

Product codes	Mast height (m)	Sets of gears	1kW or 2kW	Switching	RCD socket	Abacus install
HL250 masts factory fitted with electrical equipment						
HL250D1522XRA	15	2	2		●	●
HL250D1522SRA	15	2	2	●	●	●
HL250D1522XRC	15	2	2		●	Client
HL250D1522SRC	15	2	2	●	●	Client
HL250D1532XRA	15	3	2		●	●
HL250D1532SRA	15	3	2	●	●	●
HL250D1532XRC	15	3	2		●	Client
HL250D1532SRC	15	3	2	●	●	Client
HL250D1542XRA	15	4	2		●	●
HL250D1542SRA	15	4	2	●	●	●
HL250D1542XRC	15	4	2		●	Client
HL250D1542SRC	15	4	2	●	●	Client
(For 12m, HL250S12, 10m HL250S10)	12	-	-	-	-	-
HL250 range for client to fit out						
HL250S10	10	-	-	-	-	-
HL250S12	12	-	-	-	-	-
HL250D15	15	-	-	-	-	-
HL250BOX/SUPPLY	Gear cabinet	-	-	-	-	-
Foundation assembly						
FA003G	Bolts and base template					
FC023	Top template					

HL330 base-hinged masts: 15m to 20m

Carrying up to eight Challenger® 1 2kW floodlights at 20m, the HL330 has the high-performance capability needed for medium to large projects.

As with the HL250, the HL330 product range can be delivered and installed in two ways:

Easy-fit on site

- The cabinet is delivered pre-wired and fitted with control gear and protection equipment, only the main power cable has to be connected into the mast
- Cabinet is mounted onto the mast's flange plate on site
- Allows fast on-site assembly and installation

Standard supply

- Mast and cabinet are supplied empty for your contractor to fit on-site

HL330 product range

Product codes	Mast height (m)	Sets of gears	1kW or 2kW	Switching	RCD socket	Abacus install
HL330 mast range						
HL33015	15	-	-	-	-	-
HL33017.3	18	-	-	-	-	-
HL33018	18	-	-	-	-	-
HL33019.3	20	-	-	-	-	-
HL33020	20	-	-	-	-	-
HL/330/BOX	Gear cabinet max. 4 gears	-	-	-	-	-
HL/330/BOX/A998	Gear cabinet to 10 gears	-	-	-	-	-
HL330 factory fitted control gear cabinets						
330BOX42	-	4	2			●/Client
330BOX43	-	2	2	●	●	●
330BOX52	-	4	2			●/Client
330BOX53	-	2	2	●	●	●
330BOX62	-	4	2			●/Client
330BOX63	-	2	2	●	●	●
330BOX72	-	4	2			●/Client
330BOX73	-	2	2	●	●	●
330BOX82	-	4	2			●/Client
330BOX83	-	2	2	●	●	●
330BOX92	-	4	2			●/Client
330BOX93	-	2	2	●	●	●
Foundation assembly						
FA/HL330	Bolts and base template					
FC/HL330	Top template					

Brackets for base-hinged masts

The SB bracket range is compatible with all base-hinged masts. Brackets incorporate a standard flange, enabling them to be fixed to the matching flange supplied with the mast.

The masts can also be fitted with an additional clamp-on bracket for lower-height floodlights (requiring on-site drilling to feed through additional cabling).

The brackets also feature an M20 bolt with an anti-rotation 'cup', which prevents the stirrup from moving.

In addition to the standard brackets shown, we can also design and supply bespoke brackets if required.

There are two categories of brackets – sports and area lighting. Both types are fitted with Abacus anti-rotation floodlight cups.

The brackets are supplied in easy-to-assemble kits, requiring the minimum equipment to put together.

SB bracket range

SB1

Weight (kg)	2.6
Effective area (m^2)	0.011

SB2

Weight (kg)	6.5
Effective area (m^2)	0.095

SB3

Weight (kg)	10
Effective area (m^2)	0.179

SB4

Weight (kg)	9
Effective area (m^2)	0.137

SB4H

Weight (kg)	13
Effective area (m^2)	0.236

SB5

Weight (kg)	11
Effective area (m^2)	0.25

SB6

Weight (kg)	23
Effective area (m^2)	0.368

SB8

Weight (kg) *	38	The SB8 carries either seven or eight Challenger® 1 floodlights. To be used in conjunction with shortened 18m and 20m HL330 masts as follows: HL33017.3 / HL33019.3
Effective area (m^2)	0.495	

Clamp on bracket

SBC16	Clamp on at 6m	HL250 only
SBC18	Clamp on at 8m	HL250 only
SBC3306	Clamp on at 6m	HL330 only
SBC3308	Clamp on at 8m	HL330 only

Sports lighting

Sports lighting brackets feature angled-back cross arms as standard, directing the floodlights to their target positions more effectively. To maintain the necessary central floodlight mounting height, some brackets require a mast height reduction of either 1.5m or 2.5m.

SB10

Weight (kg)	50
Mast reduction	.7m
Effective area (m²)	0.873

SB12

Weight (kg)	59
Mast reduction	0m
Effective area (m²)	0.946

SB16

Weight (kg)	180
Mast reduction	1.5m
Effective area (m²)	1.78

SB16S

Weight (kg)	146
Mast reduction	1.5m
Effective area (m²)	1.385

SB20

Weight (kg)	217
Mast reduction	1.5m
Effective area (m²)	2.226

SB20S

Weight (kg)	161
Mast reduction	1.5m
Effective area (m²)	1.604

SB24S

Weight (kg)	176
Mast reduction	1.5m
Effective area (m²)	1.823

SB32S

Weight (kg)	285
Mast reduction	2.5m
Effective area (m²)	2.78

SB36S

Weight (kg)	300
Mast reduction	2.5m
Effective area (m²)	2.999

SB40S

Weight (kg)	321
Mast reduction	2.5m
Effective area (m²)	3.213

SB44S

Weight (kg)	336
Mast reduction	2.5m
Effective area (m²)	3.437

SB48S

Weight (kg)	354
Mast reduction	2.5m
Effective area (m²)	3.656

Area lighting

Practical, simple to build on site and cheap to transport, the 'hub and spoke' bracket arrangement is most common for Area lighting. They make it possible to achieve both 180° and 360° floodlight layouts.

SB4X

Weight (kg)	11
Mast reduction	None
Effective area (m²)	0.189

SBA6X

Weight (kg)	43
Mast reduction	None
Effective area (m²)	0.664

SBA8X

Weight (kg)	47
Mast reduction	None
Effective area (m²)	0.67

SBA10X

Weight (kg)	43
Mast reduction	None
Effective area (m²)	0.664

SBA12X

Weight (kg)	50
Mast reduction	None
Effective area (m²)	0.670

Accessories

Product	Product code
Double obstruction light: 2 x 55W lamps, each with an 8,000 hour life	THO003
Bracket to mount double obstruction light onto 114mm diameter cross-arm	BKT/F22
Twin obstruction light LED	TOL/LED/220V
Lightning rod, copper, 1000mm(h), to fix to canopy of mast (M16 fixing)	LPS225

Base-hinged mast with automatic sequencing

For many years, the base-hinged mast has been a popular choice amongst clients. As such, we decided to build upon its success and take the concept one step further.

This involved developing and patenting an automatic sequencing system within the mast – a feature that enables several masts to be raised and lowered at the same time, all from a single central point.

Together with positional sensors, a Programmable Logic Control (PLC) unit co-ordinates and monitors the whole raising and lowering process. Hydraulic cylinders fitted to the base of the mast work together with a mechanised pivot, allowing the mast to raise or lower smoothly in a single failsafe operation.

Operator remotely engages pivot within mast…

…which releases the internal locking mechanism…

…which enables the mast to be lowered automatically in just a few minutes.

Applications

Because automatic sequencing eliminates the need to move a counterbalance unit from mast to mast, it's the ideal solution in situations where several masts need to be quickly lowered at the same time.

Hurricane and typhoon wind zones offer one example of an ideal application for automatic sequencing. Before the arrival of tropical storms, high-cost capital equipment can be protected by lowering the structures to safety.

Lighting solutions in action

Kempton Park Racecourse, UK

Kempton Park racecourse is set in beautiful countryside surroundings and we wanted to keep it that way. There were strict planning regulations governing the use of floodlighting at the course, which even went so far as to stipulate no permanent upright floodlights.

Our patented automatic sequencing system was the perfect solution, providing Kempton Park with lighting masts which could be raised together and lowered after each race.

We manufactured and installed 24 of our base-hinged masts for the scheme, ensuring the racecourse was lit to the highest standard, whilst the impact on the skyline was minimised by the sequencing system.

The system is easy to install (as with all our base-hinged products) and easy to operate, with simple electrical controls.

"We wanted to create an environment that would allow more people to enjoy horse racing throughout the year, in order to survive in what will become an increasingly competitive marketplace. Through extensive public consultation I am confident that we have created a showpiece stadium that benefits everyone."

Julian Thick, Managing Director, Kempton Park

Lowering headframe masts

The range of lowering headframe masts from Abacus deliver precision engineering solutions for a great variety of different projects – from major container port terminals to international airports

The engineered headframe, with its secure three-pulley system, is available with or without our innovative latching system. A single multi-core electric cable has its own independent pulley, meaning it doesn't become entangled with other cables in the mast.

Features

- Headframe supported by three stainless steel cables for longer-term stability than twin cable systems
- Option to install mechanical latching system on three arms, to release strain on cables when headframe is in the operating position
- Headframe supplied prepared ready for installation, complete with three cables looped for dropping into the mast shaft and junction box for the multicore cable mounted on headframe
- Single 275kg or single 550kg winch located in the base of the mast. The winch is self-sustaining, with a gravity latch on the input shaft
- A 10mm earth terminal is provided in the base of the mast
- Single multicore cable for all lanterns is located on an independent pulley, stopping multiple cables from becoming entangled inside the mast
- Single multicore – with 18 cores on the 275kg winch mast (for up to 8 floodlights/lanterns), or 25 cores on the 550kg model (for up to 12 lanterns)
- A multicore electric cable, with integral signal cables for CCTV and WiFi, is available on request
- Electrical cable is supplied with a plug and socket at lower end. This means you can detach the cable and power the headframe at ground level using a separate extension cable
- A lightweight dual-speed reversible power tool is supplied with its own mounting bracket, which is clamped directly to the body of the mast. A remote hand-held box with non-latching buttons controls the unit, enabling the operator to stand at a safe distance when lowering

Building your mast

Step 1

– Identify the correct Abacus floodlight from the lighting design and then…

Step 2

Select the correct headframe option based on:

– the floodlight arrangement

– external IP65 control gear

Step 3

Select the central assembly code determined by:

– mast height e.g. 30m is RLW-HF-30M-xxx-xx

– multicore electric cable, for 275kg winch is 18core (18C) & 550kg winch is 25core (25C); e.g. RLW-HF-30M-18C-XX

– whether the latching system is required (-L) or not (-NL); e.g. RLW-HF-30M-18C-NL

Note: the central assembly is delivered to site fully assembled with stainless steel cables and multicore cable factory-assembled ready for immediate installation.

Step 4

Select the correct mast structure based on:

– mast height

– winch capacity (determined by headframe choice)

– site wind speed and headframe area

For each height and winch capacity there is a light duty and medium duty mast option, which covers most requirements. Other mast structures for higher wind loads are available on request.

Step 5

Select any necessary accessories for example:

– the floodlight mounting bracket, required if a floodlight with stirrup is selected

– Power tool operating system, dependent on winch capacity

– Lightning rod

Latching option

The Abacus headframe offers flexibility through the opportunity to add a latching mechanism to the headframe, enabling it to be supported while raised and removing strain on the stainless steel cables, for long term benefits.

Step 1

Latch engages when mobile headframe is raised towards mast head.

Step 2

Once mobile headframe has docked, latch engages, raising a flag confirming to the operator that it's secure.

Step 3

Mobile headframe is raised to disengage latching, before being lowered to ground level for maintenance.

Headframe options with external gear

Lowering headframe x4 floods symmetrical external gear

Product code	RLW-LC-ASS-1
Diameter	1200mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	2m²
Winch capacity	275kg

Lowering headframe x6 floods symmetrical external gear

Product code	RLW-LC-ASS-2
Diameter	1700mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	2.6m²
Winch capacity	550kg

Lowering headframe x8 floods symmetrical external gear

Product code	RLW-LC-ASS-3
Diameter	2000mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	3.3m²
Winch capacity	550kg

Lowering headframe x10 floods symmetrical external gear

Product code	RLW-LC-ASS-4
Diameter	2400mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	3.9m²
Winch capacity	550kg

Lowering headframe x12 floods symmetrical external gear

Product code	RLW-LC-ASS-5
Diameter	2700mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	4.5m²
Winch capacity	550kg

Lowering headframe x4 floods asymmetrical external gear

Product code	RLW-LC-ASS-6
Diameter	1700mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	2.1m²
Winch capacity	275kg

Lowering headframe x6 floods asymmetrical external gear

Product code	RLW-LC-ASS-7
Diameter	2400mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	2.8m²
Winch capacity	550kg

Lowering headframe x8 floods asymmetrical external gear

Product code	RLW-LC-ASS-8
Diameter	2700mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	3.3m²
Winch capacity	550kg

Note:
★ = Mast height in metres
♦ = Add 18C for an 18 core cable or 25C for a 25 core cable
■ = NL not latched or L for latching e.g. 35m mast with an 18 core cable and latching RLW-HF-35M-18C-L

Headframe options with internal gear

Lowering headframe x4 floods symmetrical internal gear

Product code	RLW-LC-ASS-9
Diameter	1200mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	1.5m²
Winch capacity	275kg

Lowering headframe x6 floods symmetrical internal gear

Product code	RLW-LC-ASS-10
Diameter	1700mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	1.9m²
Winch capacity	275kg

Lowering headframe x8 floods symmetrical internal gear

Product code	RLW-LC-ASS-11
Diameter	2000mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	2.3m²
Winch capacity	550kg

Lowering headframe x10 floods symmetrical internal gear

Product code	RLW-LC-ASS-12
Diameter	2400mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	2.7m²
Winch capacity	550kg

Lowering headframe x12 floods symmetrical internal gear

Product code	RLW-LC-ASS-13
Diameter	2700mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	3m²
Winch capacity	550kg

Lowering headframe x4 floods asymmetric internal gear

Product code	RLW-LC-ASS-14
Diameter	1700mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	1.8m²
Winch capacity	275kg

Lowering headframe x6 floods asymmetric internal gear

Product code	RLW-LC-ASS-15
Diameter	2400mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	2.5m²
Winch capacity	550kg

Lowering headframe x8 floods asymmetric internal gear

Product code	RLW-LC-ASS-16
Diameter	2700mm
Central assembly	RLW-HF-★M-♦-■
Total headframe area	2.8m²
Winch capacity	550kg

Note:
★ = Mast height in metres
♦ = Add 18C for an 18 core cable or 25C for a 25 core cable
■ = NL not latched or L for latching e.g. 35m mast with an 18 core cable and latching RLW-HF-35M-18C-L

Lowering headframe mast structure

Once you've chosen a headframe and central assembly configuration, use the table below to find the appropriate mast.

The mast's structure is determined by your chosen headframe's useable headload area (detailed on the previous pages) and the governing wind speed on your specific site. The mast is supplied as standard with the integral winch. It is also available as an option without.

The table below gives the principal structures and loadings for most requirements. If you need more information on mast structures for particularly high wind loads or speeds, please contact our sales office.

Mast structure

Height (m)	Winch capacity kg	Product code	Basic site wind speed (m/s) **/ Hourly mean wind speed (m/s) ***/ Max 3 second gust (m/s) ****	Headload capacity (m²)	Useable head weight (kg)	Mast design information			
						Top/base/ flange Ø (mm)	Bolt assembly code and PCD*	O.T.M (kNm) and shear (kN)	Foundation refs.†
15	275	RLW-15M275S-I1	26	3.466	190	140/438/700	FA30/8/1220/600	104kNm, 8.3kN	150M150, 150P150
			28.25						
			48	3.639					
20	275	RLW-20M275S-E1	26	2.566	185	140/457.2/700	FA30/8/1220/600	130kNm, 8.7kN	150M150, 150P150
			28.25						
			48	2.597					
20	550	RLW-20M550S-M1	26	4.181	460	140/614/900	FA30/8/1220/800	190kNm, 12.5kN	200M150, 200P150
			28.25						
			48	4.222					
25	275	RLW-25M275S-C2	26	2.000	180	140/478.8/750	FA30/8/1220/650	164kNm, 9.7kN	200M150, 200P150
			28.25						
			48	2.005					
		RLW-25M275S-C3	26	2.264	180	140/476.8/750	FA30/8/1220/650	176kNm, 10.0kN	200M150, 200P150
			28.25						
			48	2.360					
25	550	RLW-25M550S-I1	26	3.025	455	140/626/900	FA30/8/1220/800	222kNm, 13.1kN	300M150, 300P150
			28.25						
			48	3.031					
		RLW-25M550S-I2	26	4.483	455	140/624/900	FA30/8/1220/800	284kNm, 15.4kN	300M150, 300P150
			28.25						
			48	4.531					
30	275	RLW-30M275S-A3	26	1.513	170	140/488.4/750	FA30/8/1220/650	200kNm, 10.6kN	200M150, 200P150
			28.25						
			48	1.506					
		RLW-30M275S-A5	26	2.295	170	140/484.4/750	FA30/8/1220/650	242kNm, 11.8kN	300M150, 300P150
			28.25						
			48	2.363					
30	550	RLW-30M550S-F2	26	3.098	445	140/634/900	FA30/8/1220/800	307kNm, 15.5kN	400M150, 400P150
			28.25						
			48	3.101					
		RLW-30M550S-F4	26	4.442	445	140/630/900	FA30/18/1220/800	377kNm, 17.6kN	400M150, 400P150
			28.25						
			48	4.509					
35	275	RLW-35M275S-C1	26	1.656	165	140/610.8/850	FA30/8/1220/750	290kNm, 14.5kN	300M150, 300P150
			28.25						
			48	1.676					
		RLW-35M275S-C3	26	2.25	165	140/606.8/850	FA30/18/1220/750	326kNm, 15.4kN	400M150, 400P150
			28.25						
			48	2.225					
35	550	RLW-35M550S-D3	26	2.860	440	140/637/900	FA30/18/1220/800	384kNm, 17.3kN	400M150, 400P150
			28.25						
			48	2.928					
		RLW-35M550S-D7	26	4.330	440	140/631/900	FA30/18/1220/800	474kNm, 19.6kN	500M150, 500P150
			28.25						
			48	4.282					
40	275	RLW-40M275S-C1	26	1.842	160	140/678.8/950	FA30/18/1220/850	396kNm, 18.1kN	400M150, 400P150
			28.25						
			48	1.808					
		RLW-40M275S-C2	26	2.177	160	140/676.8/950	FA30/18/1220/850	422kNm, 18.6kN	500M150, 500P150
			28.25						
			48	2.134					
40	550	RLW-40M550S-C6	26	3.047	435	140/668/950	FA30/18/1220/850	503kNm, 20.3kN	750M150, 750P150
			28.25						
			48	2.992					
		RLW-40M550S-E5	26	4.059	435	140/748/1000	FA30/18/1220/900	586kNm, 23.6kN	750M150, 750P150
			28.25						
			48	3.988					

Footnotes:

* All masts employ the same M30, 1220mm length foundation bolt, hot spun galvanised, Grade 8.8.

** Site wind speed: this figure is based on an assumption that site is 1km from the sea at an altitude of 0m.

*** Hourly mean is the UK standard for wind loadings. Many continental European countries specify "10-minute mean" wind speed, which varies slightly. Contact UK sales office for more information.

**** 3 second gust is the wind load design velocity used in many countries.

† For complete foundation details, refer to pages 50-55; the overturning moments (OTM) and shear forces are rounded up to the next level to calculate the suitable foundations for the mast. There is a choice of either passive or non-passive foundations, both of which are non-reinforced. For a reinforced foundation design, use the same code but with 'R' replacing the 'M' and 'P' will fulfill the requirement.

Accessory products

Product code	Description
BKT/RLW/C/M20 or M12	Bracket for floodlight with stirrup, with M20 or M12 fixing bolt
RLW07/PD/A	Power tool & torque limiter for single drum 275kg winch
RLW07/PD/1A	Power tool & torque limiter for single drum 550kg winch
RLW08/PD/DW/A	Power tool & torque limiter for double drum 1000kg winch
RLW07/PD/PORT/**M	Portable power tool and 275kg winch mounted on a mobile trolley. For multiple mast installations, no winch is mounted in mast base, thereby reducing costs
RLW08/PD/PORT/**M	Portable power tool and 550kg winch mounted on a mobile trolley. For multiple mast installations, no winch is mounted in mast base, thereby reducing costs
RLW07/HANDLE/ASSY	Manual Crank Handle with Torque Limiter for 275kg Winch
LPS225	Lightning rod, copper, 1000mm(h), to fix to canopy of mast (M16 fixing)
BALAPF1kW	Abacus 1kW encapsulated control gear, IP65, to be selected in combination with Abacus floodlight (240v)
RLW-SUP-BKT	Set of 3 brackets to support headframe when lowered for maintenance

Floodlight mounting bracket
BKT/RLW/C/M20

IP65 1kW
control gear

RLW07/PD/PORT/**M Portable power tool
RLW08/PD/PORT/**M Portable power tool

The power tool in operation, using remote control at a safe distance

Multicore electric cable

A single multicore cable is supplied with each central assembly in the mast. This reduces the risk of multiple electric cables becoming entangled inside the mast over a period of time.

A standard 18-core cable, sufficient to provide enough cores for up to 8 floodlights.

A standard 25-core cable, sufficient to provide enough cores for up to 12 floodlights.

16-core electric cable

18-core electric cable

25-core electric cable

Fixed masts:
Sports and large area

Abacus design and manufacture a huge range of products suitable to use for sports stadia, ports and wind turbines. Tackling complexities is what we do best; so whatever and wherever your project – small or large-scale – Abacus have the solution.

Brilliant design has to be carefully thought-through. And with lighting, that means considering:

- Methods of access for maintenance
- Wind levels in the proposed location
- Aesthetic options such as 'designer' headframes
- The location of control gear and protection equipment

Specification

At Abacus, we take incredible pride in our work – and it's that quality and attention to detail which has set us apart from the competition for over 50 years. In addition to our seal of quality, you can also be assured of the following specifications as standard:

- Masts are designed in accordance with ILE Technical Report No. 7
- Masts above 20m are made from friction-fit tapered polygonal shafts – typically 18-sided for minimum wind resistance
- Masts are hot-dip galvanised to ISO EN 1461

We take great pride in our workmanship, from design through to assembly and installation.

Liberec ski jump, Czech Republic

High quality manufacturing

Problem-solving the world over

Abacus have come up with complete solutions for fixed-mast floodlighting all over the world.

Visit the Sheikh Zayed Cricket Stadium in Abu Dhabi, for example, and you'll see the 70m masts we designed, made and installed – not to mention the 200 floodlights atop each one. Or, a little closer to home, the innovative circular headframes we designed and installed for the Trent Bridge Cricket Stadium in England.

Often, extreme weather plays its part in shaping our designs. For instance, the 55m masts we installed at the Kensington Oval in Barbados were designed to withstand hurricane conditions.

Tricky locations also pose their own set of challenges. Installing seven masts up to 55m high by helicopter on a 45-degree slope, for example, was no mean feat when we lit the World Cup Ski Jump in Liberec, Czech Republic.

Sometimes it's not the masts themselves but the ongoing maintenance that informs product choice. For instance, many airports and large commercial areas choose fixed masts over base-hinged or winch-lowering headframes, employing trained maintenance specialists (often Abacus or one of our international partners) to maintain their lighting at height.

Whatever your requirements, we'll find a solution that fits.

F.C. Tournai, Belgium

The Kensington Oval, Barbados

The Club range (15m–30m)

Choose from our standard range or commission a bespoke mast, depending on your project.

- 15–20m: Tubular or octagonal steel construction
- 20–30m: Multi-sided steel construction

Maintenance access

There are three options for maintaining our Club range:

- Ladder fixed permanently to mast, with security cable system
- Removable climbing rungs with security cable system
- Cherry picker vehicle mounted platform

Whichever option you choose, control and protection equipment can be factory-fitted into the base of the mast itself, or placed in an external cabinet close to the mast's base.

Fixed mast with ladder and twin platform

This fixed mast has electrical equipment factory-fitted and mounted into a cabinet in its base. Lights are accessed by a 'cherry picker' for maintenance.

Fixed mast system, Czech Republic

The range of 16m–25m Club masts has a carrying capacity of up to 8 Challenger® 1 floodlights, with access by means of climbing rungs and a platform, with security cable. At 20m and 25m, we can conceal all 8 sets of control gear and protection equipment in the mast base.

Area lighting masts feature a ladder or climbing rungs, a rest platform (optional) at 20m on the higher masts, and an enclosed platform onto which floodlights can be mounted on any side.

The 28m and 30m Club masts have a carrying capacity of up to 16 Challenger® 3 floodlights, accessed in the same way as the smaller masts above.

Control gear and protection equipment can be integrated into the mast and factory-installed by Abacus, enabling fast on-site operations. Control gear can be either IP65 or standard, depending on specification or local conditions.

Fixed Stadium and Area masts (20m–70m)

In addition to our base-hinged range, Abacus design and manufacture a wide range of fixed masts for large-scale floodlighting.

50 years' engineering experience on projects all over the world has taught us a lot about the importance of flexibility, attention to detail and customer service. As such, we offer a range of solutions to suit you.

- External ladder access with optional rest platforms
- External access using the manrider elevator system
- Internal access, with a ladder running up the inside of the mast
- External access by means of crane and basket

Fixed mast system, Barbados

Foundations

Part of our mast-design service includes providing you with a mast foundation reference, which can be cross-referenced in our standard foundations guide. This will indicate the dimensions and volume of concrete and steel required to support your mast in situ. Find out more on pages 50-55.

The manrider external-access system at work.

A 40m external-access mast being lifted into position at Shanghai's 80,000 seater stadium.

Access systems

Typical height range

EXTACC/MOBILE	EXTACC/LADDER	INTACC/LADDER	EXTACC/MANRIDER
Access by independent mobile platform	Access by fixed external ladder to platform	Access by fixed internal ladder to platform	Access by external manrider elevator to platform

Access systems close-up

Two anti-climb devices are available: the anti-climb door for ground-level ladders, or the anti-climb collar for ladders which start 3m above ground level.

A hatch provides direct access to the platform.

The manrider uses a winch to reach the maintenance platform.

Sports stadium headframes

Headframe configurations

4/8 floodlights in cross-arm arrangement

6/12 floodlights in cross-arm arrangement

8/16 floodlights in cross-arm arrangement

10/20 floodlights in cross-arm arrangement

Whatever the quantity of floodlights required, configurations are always logical, making project planning as simple as possible for both consultants and engineers.

Floodlight cables enter the mast through secure cable glands. Installation is straightforward, with clear assembly instructions included.

All headframe and ladder systems incorporate a security fall-arrest cable, in conformity with EN353-1 and EN353-2.

Accessories

Product	Product code
Safety harness and karabiner: to be used in conjunction with MIS3014 fall-arrestor	MIS3013
Fall-arrestor for use with Cable Security System: for use on 8mm security cable system	MIS3014
Double obstruction light: 2 x 55W lamps, each with an 8,000hour life	THO003
Bracket to mount double obstruction light onto 114mm diameter cross-arm	BKT/F22
Twin obstruction light LED	TOL/LED/220V

Area lighting headframes and platforms

Headframes are generally accessed by a ladder and platform or by a cherry picker. These are designed to suit each project requirement.

Control gear and protection equipment

Most of the time, control gear and electrical protection equipment is mounted in cabinets at or near the mast base. If space is limited, however, or you'd rather preserve the clean, straight lines of your mast, we can increase the dimensions of its base and conceal the equipment and access ladder inside (up to a limit of around 60 2kW floodlights).

Control gear is mounted on the inside wall of the mast and accessed by ladder.

Custom headframe design

As leaders in lighting, Abacus are always developing innovative new engineering solutions to enhance the stadium environment.

Talk to us about your ideas – you'll be amazed at the possibilities.

Trent Bridge Cricket Ground, UK

Edgbaston Cricket Ground, UK

Lord's Cricket Ground, UK

Headingley Cricket Ground, UK

Manuka Oval, Australia

Telescopic mast systems

Abacus' comprehensive range of telescopic masts has been developed to address the increasingly difficult planning requirements that clients have to meet in 'sensitive' locations. This highly engineered, patented solution provides the ideal alternative to fixed-mast floodlighting – even in space-restricted areas

The Stadium range (up to 50m)

The colossal Stadium range can accommodate 100 Challenger® 3 2kW floodlights at a mounting height of 50m – an imposing and highly effective solution for any major sports stadium.

Engineering without compromise

Incorporating the finest precision-engineering for a long, hassle-free life, the telescopic mast represents the pinnacle of technical achievement in high mast lighting. Driven by a 7m double-acting ram producing 45 tonnes of lift-thrust, the mast works in conjunction with a secondary leaf chain-management system. A supporting negative-chain system and linear string encoder, linked to a remotely located PLC (Programmable Logic Control) unit, mean the masts can be controlled and monitored from the safety and comfort of a main control room.

The Brit Oval, UK

The masts are delivered to site part-assembled. The headframe is pre-wired in-house before shipping. The headframe wiring is then connected on-site to the main multi-core cables running through the mast's centre section, using an instant plug-and-socket system.

The masts can be controlled digitally from one main control room.

50m telescopic masts at Lord's cricket stadium and 45m masts at the Brit Oval stadium, both in London. Strict planning controls in these sensitive residential neighbourhoods meant that retractable masts were the only practical solution for floodlighting both stadiums.

The 40m telescopic masts installed at the Al Shamal stadium in Qatar. Located in four corner turrets designed to emulate a traditional fort, each carries up to 100 Challenger® 3 floodlights for HDTV broadcasts. After use, each mast retracts into its own turret and out of sight at a height of 22m.

The Club range (up to 20m)

The Club telescopic range is perfect for medium-sized sports, recreational or commercial facilities where full-height permanent masts aren't feasible or necessary. Incorporating innovative, user-friendly engineering solutions, our range is as flexible as it is practical – with masts that more than double in height from their retracted position.

15m telescopic masts at Stone Dominoes Football Club in the UK. The local Planning department permitted a maximum permanent height of 8m.

Easy operation

Operated using compressed air, these pneumatic masts can be raised and lowered either remotely (from the club house, for example) or individually from the base of each mast.

The masts are delivered fully assembled, with integrated electrical and mechanical equipment ready for fast on-site installation.

Features

- Pneumatic telescopic masts, operated using compressed air
- Anodised aluminium finish
- Option for internal multi-core cable available upon request
- Anemometer controlled retraction if the design wind speed is exceeded
- Lowers to more than half the operating height, minimising any visual instrusion

Extended height (m)	Retracted height (m)	Number of sections	Base diameter (mm)	Top shaft diameter (mm)	Maximum headload (kg)
12.7	2.5	7	284	130	280
14.1	2.7	7	284	130	280
14.8	2.8	7	284	130	280
15.5	2.9	7	284	130	280
16.2	3.0	7	284	130	280
16.9	3.1	7	284	130	280
17.6	3.2	7	284	130	280
18.3 *	3.3	7	284	130	280
19.7 *	3.2	8	284	110	200
20.5 *	3.3	8	284	110	200

** External cable only*

Key switch operation locally, at mast base, or remote control operation

Control gear cabinets

Abacus will design, build and supply all the necessary control cabinets for your project. Better still, we offer comprehensive electrical support, either through our complete installation service or from one of our product supply packages.

As an ISO9001-accredited manufacturer, you can rest assured that Abacus are fully covered in everything from design and manufacture to installation and ongoing maintenance.

Our control gear is designed with the following considerations:

- Lighting specification, allowing for lower switching levels where necessary
- Correct standard of protection equipment for each floodlight
- PLC (Programmable Logic Control) unit(s) are used where necessary to provide intelligent control for lighting and/or mast systems
- Does the climate on-site require forced ventilation and/or heating systems to be built in?
- Is the cabinet built to withstand conditions on-site?
- Packing and shipping requirements for safe delivery anywhere in the world

The touch-screen display at Al Shamal stadium in Qatar controls both lighting levels and the telescopic mast system from the main control room.

Typical cabinet arrangement for a stadium.

Cabinet installation and foundation

For further information on the different cabinet installation methods and foundations, please contact the Abacus sales office.

Cabinet configurations for 2kW and 1kW floodlighting projects

2kW

No. of gears	2kW	Dim A.	Dim B.	Dim C.	Dim D.	Dim E.	Cabinet item no.
10 - 12	2	1250	1600	450	1220	1445	ELF1234
13 - 15	2	1500	1600	450	1470	1445	ELF659
16 - 21	2	1750	1600	450	1720	1445	ELF1102

For larger quantities of 2kW floodlights (between 25 and 150), we design bespoke cabinets according to specific project requirements.

1kW

No. of gears	1kW	Dim A.	Dim B.	Dim C.	Dim D.	Dim E.	Cabinet item no.
9	1	1250	1600	450	1220	1445	ELF1234
10 - 12	1	1500	1600	450	1470	1445	ELF659
13 - 15	1	1750	1600	450	1720	1445	ELF1102
16 - 18	1	2000	1600	450	1970	1445	ELF2011
19 - 24	1	2250	1600	450	2220	1445	ELF1109

Foundation design

In this section, you'll find technical guidance on foundation designs – for both the range of high masts in this brochure and bespoke masts designed by Abacus for specific clients' projects. All foundations meet BS8004 standards and comply with the Institute of Lighting Engineers' Technical Report No.7.

Allowable ground-bearing pressures

A key factor in determining the size of mast foundations is the bearing pressure of the ground in which it will sit.

Over the following pages, each standard foundation reference incorporates the ground-bearing pressure within its code, making it quick and simple to identify the kind of foundation you need.

The table below shows subsoil classifications according to the BS8004 standard, against the approximate allowable bearing pressure. We're also working to the new eurocodes, so if you require any further help, please call us on +44 (0)1623 511 111.

If there is any doubt over ground conditions, it is the client's or contractor's responsibility to consult a qualified civil engineer to establish the true bearing pressures.

Typical foundation details are provided for guidance only and should be checked with the client before use. Abacus Lighting Limited will not accept responsibility for any foundations unless they are specifically designed by us at the client's request.

Types of subsoil

Types of subsoil	Condition of subsoil	Field test applicable	Approximate allowance bearing pressure kN/m²
Rock	Not inferior to sandstone, limestone or firm chalk	Requires at least a pneumatic or other mechanically operated pick for excavation	1000
Gravel, sand	Compact	Requires pick for excavation. Wooden peg 50mm² in cross section is hard to drive beyond 150mm	Dense to very dense 150-400 Loose to medium dense 50-250
Clay, sandy clay	Firm	Can be moulded by substantial pressure with the fingers and excavated with graft or spade	50-100
Sand*, silty sand*, clayey sand*	Loose	Can be excavated with a spade. Wooden peg 50mm² in cross section can be easily driven	<75
Silt*, clay*, sandy clay*, silty clay*	Soft	Fairly easily moulded with the fingers and readily excavated	<75
Silt*, clay*, sandy clay*, silty clay*	Very soft	Natural sample in winter conditions exudes between fingers when squeezed in fist	<75

These values are provided for guidance only. If in any doubt, consult a qualified civil engineer.
*Foundations on these soils require assessment and design by a qualified civil engineer.

Planning the site: cable trenches

Cables buried directly in the ground must be marked by cable covers or a suitable marking tape.

Cables, conduits and ducts must be buried deep enough to avoid damage from any reasonably foreseeable ground disturbance. If you are in any doubt, refer to national guidelines or standards.

Typical cable trench

Foundations and flange plates

The principal method for installing a high mast involves a flange plate supported by a prepared foundation*.

The flange plate, which is welded to the base of the mast, is designed to accommodate the overturning moments (forces) for each specific mast.

Bolt holes in the flange plate are arranged in one of two ways:

1. In a square, where the stated 'bolt centre' dimension is given.
2. In a circle, where the 'pitch circle diameter' (PCD), is given.

This diameter is stated for the dimension between bolt-hole centres (see diagram).

*Root-mounting can be an option up to a height of 18m, but we don't cover this here. If you'd like more information on this method, please contact the Abacus sales office.

Square bolt configuration, with bolt centre dimensions

Circular bolt configuration, with PCD bolt centre dimensions

Assembling foundation bolts into concrete

Foundation bolts

Foundation bolts are supplied with nuts, washers, a spacer plate and a fixing template in either wood (smaller masts) or steel. Make sure the foundation bolt is put together accurately with bolts vertical and fixed rigidly so it won't be displaced or misaligned during concreting. Also, check that bolts project correctly above the foundation.

After the concrete has cured, the mast is erected and levelled on the double nuts.

The bolts should then be tightened in accordance with the final torque value, as shown in the table to the right.

Concrete

Foundations should be constructed in accordance with the following design and dimensional details. Unless otherwise specified, they should use:

- For reinforced foundations: grade C28/35 concrete and high tensile reinforcement with a yield stress of 485N/mm²
- For unreinforced foundations: C20/25 grade concrete

Cable entry ducts should be placed centrally within the concrete to facilitate entry into (and in some cases out of) the mast itself.

Concrete will typically take a minimum of 14 days to cure – enough to erect the mast subject to various factors and in accordance with recommendations.

Holding-down bolt projection and final torque values

Bolt size and grade	Projection (mm)	Torque (Nm)
M16*500 long grade 4.6	125	25
M20*500 long grade 4.6	125	50
M24*600 long grade 4.6	125	160
M30*800 long grade 4.6	150	310
M24*880 long grade 8.8	150	425
M30*1220 long grade 8.8	150	850
M36*1200 long grade 8.8	175	1450
M36*1350 long grade 8.8	175	1450
M36*1590 long grade 8.8	175	1450
M42*1700 long grade 8.8	210	2350
M48*1870 long grade 8.8	210	3500

Typical section through foundation

Glossary of foundation reference codes

The foundation reference codes on the following pages are put together like this:

500	M	150

Overturning moment kNm

Type of foundation	
P	Passive mass concrete
M	Non-passive mass concrete
R	Reinforced

Ground bearing pressure kN/m²

Standard-mass concrete: passive and non-passive foundations

We offer two standard concrete types for non-reinforced-mass foundation designs – passive and non-passive.

Passive concrete foundation Standard sizes

Foundation	O.T.M (kNm)	Bearing pressure (kN/m²)	A Width (mm)	B depth (mm)
3P150	3	150	650	750
4P150	4	150	700	800
5P150	5	150	750	800
6P150	6	150	750	900
8P150	8	150	850	950
10P150	10	150	900	950
15P150	15	150	950	1100
20P150	20	150	1050	1200
30P150	30	150	1200	1250
40P150	40	150	1250	1300
50P150	50	150	1350	1400
75P150	75	150	1450	1600
100P150	100	150	1600	1700
150P150	150	150	1800	1850
200P150	200	150	1950	2000
300P150	300	150	2250	2150
400P150	400	150	2450	2250
500P150	500	150	2700	2300
750P150	750	150	3050	2600

Ground bearing pressures below 150 kN/m² are not applicable.

Passive concrete
Typically used in firm ground with ground-bearing pressure of no less than 150kN/m²

Soil pressure distribution

Non-passive concrete
Typically used with uniform or poor subsoil with ground-bearing pressure of 75-150kN/m²

Soil pressure distribution

Non-passive concrete foundation Standard sizes

Foundation	O.T.M (kNm)	Bearing pressure (kN/m²)	A Width (mm)	B depth (mm)
3M75	3	75	880	590
3M100	3	100	880	590
3M150	3	150	880	590
4M75	4	75	950	625
4M100	4	100	950	625
4M150	4	150	950	625
5M75	5	75	1050	675
5M100	5	100	1050	675
5M150	5	150	1050	675
6M75	6	75	1100	700
6M100	6	100	1100	700
6M150	6	150	1100	700
8M75	8	75	1150	725
8M100	8	100	1150	725
8M150	8	150	1150	725
10M75	10	75	1250	775
10M100	10	100	1250	775
10M150	10	150	1250	775
15M75	15	75	1400	850
15M100	15	100	1350	825
15M150	15	150	1350	825
20M75	20	75	1500	900
20M100	20	100	1500	900
20M150	20	150	1500	900
30M75	30	75	1700	1000
30M100	30	100	1700	1000
30M150	30	150	1700	1000
40M75	40	75	1900	1100
40M100	40	100	1800	1050
40M150	40	150	1800	1050
50M75	50	75	2100	1200
50M100	50	100	1900	1100
50M150	50	150	1900	1100
75M75	75	75	2400	1350
75M100	75	100	2200	1250
75M150	75	150	2200	1250
100M75	100	75	2650	1475
100M100	100	100	2400	1350
100M150	100	150	2300	1300
150M75	150	75	3200	1750
150M100	150	100	2700	1650
150M150	150	150	2500	1400
200M75	200	75	3900	2100
200M100	200	100	3000	1650
200M150	200	150	2700	1500
300M100	300	100	3500	1900
300M150	300	150	3100	1700
400M100	400	100	3900	2100
400M150	400	150	3400	1850
500M100	500	100	4500	2400
500M150	500	150	3600	1950
750M150	750	150	4100	2200

Standard reinforced foundations

Foundation ref	O.T.M. (kNm)	Bearing pressure (kN/m²)	A (mm)	B (mm)	C (mm)	D (mm)	Base reinforcement (Each way S.C. 21)	Column reinforcement (All round S.C. 11)	Top reinforcement (Each way S.C. 21)
75R75	75	75	1100	950	600	2400	H16@250 t and b	H20@225	
75R150	75	150	1100	950	600	2050	H16@250 t and b	H20@225	
100R75	100	75	1100	950	600	2600	H16@250 t and b	H20@225	
100R150	100	150	1100	950	600	2300	H16@250 t and b	H20@225	
150R75	150	75	1100	1350	600	2900	H16@250 t and b	H20@225	
150R150	150	150	1100	1350	600	2500	H16@250 t and b	H20@225	
200R75	200	75	1100	1350	600	3200	H16@250 t and b	H20@225	
200R150	200	150	1100	1350	600	2750	H16@250 t and b	H20@225	
300R75	300	75	1500	1350	750	3700	H16@200 t and b	H20@150	
300R150	300	150	1500	1350	750	3100	H16@200 t and b	H20@150	
400R75	400	75	1500	1500	750	4100	H16@200 t and b	H20@150	H16@175
400R150	400	150	1500	1500	750	3400	H16@200 t and b	H20@150	
500R75	500	75	1500	1500	750	4400	H16@200 t and b	H20@150	
500R150	500	150	1500	1500	750	3700	H16@200 t and b	H20@150	
750R75	750	75	1500	1500	750	5000	H16@200 t and b	H20@125	
750R150	750	150	1500	1500	750	4200	H16@200 t and b	H20@125	
1000R75	1000	75	1500	1850	750	5500	H20@250 t and b	H25@150	
1000R150	1000	150	1500	1850	750	4700	H20@250 t and b	H25@150	
1250R75	1250	75	1500	1850	750	5900	H20@200 t and b	H25@125	
1250R150	1250	150	1500	1850	750	5000	H20@200 t and b	H25@125	
1500R75	1500	75	1500	1850	1000	6800	H20@150 t and b	H32@175	
1500R150	1500	150	1500	1850	1000	5400	H16@150 t and b	H32@175	
2000R75	2000	75	2000	2000	1000	7000	H20@250t and b	H25@150	
2000R100	2000	100	2000	2000	1000	6000	H20@250t and b	H25@150	
2000R150	2000	150	2000	2000	1000	5500	H20@250t and b	H25@150	
3000R75	3000	75	2100	2000	1250	7750	H20@200t and b	H25@150	
3000R100	3000	100	2100	2000	1250	7000	H20@200t and b	H25@150	
3000R150	3000	150	2100	2000	1250	6250	H20@200t and b	H25@150	
4000R75	4000	75	2100	2000	1500	8500	H20@175t and b	H32@150	
4000R100	4000	100	2100	2000	1500	7750	H20@175t and b	H32@150	
4000R150	4000	150	2100	2000	1500	7000	H20@175t and b	H32@150	
5000R75	5000	75	2100	2000	1500	9000	H20@175t and b	H32@150	
5000R100	5000	100	2100	2000	1500	8250	H20@175t and b	H32@150	
5000R150	5000	150	2100	2000	1500	7500	H20@175t and b	H32@150	H16@175
6000R75	6000	75	2500	2000	1500	9500	H20@250t and b	H32@150	
6000R100	6000	100	2500	2000	1500	8750	H20@250t and b	H32@150	
6000R150	6000	150	2500	2000	1500	8000	H20@250t and b	H32@150	
7000R75	7000	75	2500	2000	1500	10000	H25@225t and b	H32@150	
7000R100	7000	100	2500	2000	1500	9250	H25@225t and b	H32@150	
7000R150	7000	150	2500	2000	1500	8250	H25@225t and b	H32@150	
8000R75	8000	75	2600	2000	1500	10500	H32@200b + H25@250t	H32@150	
8000R100	8000	100	2600	2000	1500	9600	H25@225t and b	H32@150	
8000R150	8000	150	2600	2000	1500	8700	H25@225t and b	H32@150	
9000R75	9000	75	2600	2000	1500	11000	H32@175b H25@225t	H32@125	
9000R100	9000	100	2600	2000	1500	10000	H25@200t and b	H32@125	
9000R150	9000	150	2600	2000	1500	9000	H25@225t and b	H32@125	

Notes:

1. Concrete to have a minimum characteristic strength of 35 N/mm² at 28 days. Minimum cement content to be 300kg/m³ with a maximum water cement ratio of 0.60. Coarse aggregate size to be 20mm nominal.
2. Reinforcement to be high-yield type 2 to BS4449 – minimum yield strength to be 485N/mm². Cover reinforcement to be 40mm.
3. Links to column section to be H10@200 c/c – shape code 51 to BS8666: 2005-plus H10 internal lacers at 450 max centres horizontal and 250 centres vertical shape code 99.
4. Above table is based on the water table being below the base of the foundation.

Arrangement of reinforced foundations

Typical cross section of reinforced foundation

Floodlighting

Designed specifically for large area and sports applications, the AAA-LUX AL Series and WS Series offer fingertip control, dimming and switching with high performance, efficient LED modules.

Exceptionally effective, precise and durable, the Challenger® range of high-performance floodlights are a popular choice for anything from large stadia to local sports pitches, industrial applications to golf courses.

The range is split into three series – each designed to meet differing needs. First is the Challenger® 1 series – perfect for side-lighting, followed by roof-mounted Challenger® 2 floodlights. Completeing the range is the Challenger® 3 series – most commonly used in large-scale stadia.

AAA-LUX range

- Wireless control via smart devices, touch screen or wireless switch box simplifies operation for ease of use
- No re-lamping costs
- Instant startup, saving energy costs by reducing power consumption from wasted light

Challenger® range

- Effective control of light pollution
- Precision aiming for superior results
- GORE™ membrane breather system for optimal performance
- Sturdy toughened glass and pressure die cast bodies for a long outdoor life

AAA-LUX AL Series

AAA-LUX WS Series

Challenger® 1

Challenger® 2

Challenger® 3

Nad al Sheba Racecourse, Dubai

Emirates Golf Course, Dubai

Hyderabad Stadium, India

AAA-LUX AL Series

IP66

Benefits

- Wireless control via smart devices, touch screen or wireless switch box simplifies operation for ease of use
- Centrally monitor and adjust power consumption
- Control system enables efficient planning of maintenance
- No re-lamping costs
- Instant startup allows the light to be switched on and off as and when required, thus saving energy costs by reducing power consumption from wasted light
- Flexible dimming down to 10% for low use and security giving substantial energy savings over conventional HID lamps
- Increased system efficiency by reducing wasted light

Light Control Management System

Control, switching and dimming of AAA-LUX floodlights is made possible by the use of a number of user friendly interfaces all connected to the LCMS via LEDxLINK protocol, either locally or remotely. Switchboxes, touchscreens and smart devices provide fingertip control to enable the selection of a number of pre-programmed lighting configurations. In addition, third party devices such as sensors, timers and software interfaces can be seamlessly integrated into the system, providing further functionality and security benefits.

Technical features

- Mounting height 12-45m (AL60, AL90, AL180, AL700)
- Mounting height 12-25m (AL360)
- 3 phase as standard, single phase 230V option available
- Marine grade as standard
- Die cast aluminium polyester powder coated body
- Lenses installed behind toughened flat glass for maximum integrity of the lenses
- Weight 28kg (AL60, AL90, AL180, AL360)
- Weight 17kg (AL700)

AL Series control

When different zones of a site require full lighting levels and others need to be dimmed at different times through the dark hours, dimmed zones can be instantly switched to full lighting levels. This saves energy, keeps running costs low and increases the level of site security.

Colours

● RAL9005 Black

For full product details, visit www.abacuslighting.com

	Voltage input (VAC)	Power factor at 20% - 100%	Frequency (Hz)	Power consumption at 100% (W)		Current at 400VAC (A)		Operating temperature (°C)	
				Standard - heavy duty	High temperature	Standard - heavy duty	High temperature	Standard - heavy duty	High temperature
AL60 **AL90 *** **AL180**	400VAC	0.98	45 - 60Hz	1375W	1200W	3.5A	3.2A	-20 ~ 40°C	-20 ~ 50°C
AL700 *	400AC	0.98	45 - 60Hz	700W	600W	1.7A	1.5A	-20 ~ 40°C	-20 ~ 50°C
AL360 *	400VAC	0.98	45 - 60Hz	1375W	-	3.5A	-	-20 ~ 40°C	-

** Based on typical values*

Dimensions (mm)

AL60, AL90, AL180

AL700

Dimensions (mm)

AL360

Key features

AL60
8 LED Modules

AL180
8 LED Modules

AL360 / 50°
8 LED Modules

More available online www.abacuslighting.com

AAA-LUX WS Series

IP66

Benefits

- Wireless control via smart devices, touch screen or wireless switch box simplifies operation for ease of use
- Centrally monitor and adjust power consumption
- Control system enables efficient planning of maintenance
- No re-lamping costs
- Instant startup allows the light to be switched on and off as and when required, thus saving energy costs by reducing power consumption from wasted light
- Flexible dimming down to 10% for low use and security giving substantial energy savings over conventional HID lamps
- Increased system efficiency by reducing wasted light

Light Control Management System

Control, switching and dimming of AAA-LUX floodlights is made possible by the use of a number of user friendly interfaces all connected to the LCMS via LEDxLINK protocol, either locally or remotely. Switchboxes, touchscreens and smart devices provide fingertip control to enable the selection of a number of pre-programmed lighting configurations. In addition, third party devices such as sensors, timers and software interfaces can be seamlessly integrated into the system, providing further functionality and security benefits.

Technical features

- Mounting height 12-45m
- 3 phase as standard, single phase 230V option available
- Marine grade as standard
- Die cast aluminium polyester powder coated body
- Lenses installed behind toughened flat glass for maximum integrity of the lenses
- Weight 28kg (WS100 - WS 300)
- Weight 19kg (AL400)
- Colour temperature 5200K

WS Series control

Using a pitch side control box, smart device, sensors or computer, individual courts or areas can be switched on and others dimmed or switched off. The ability to switch lighting to full power instantly allows for unexpected use, or for a maximum energy saving between uses of the sport pitches or courts with little downtime.

Colours

● RAL9005 Black

For full product details, visit www.abacuslighting.com

	Voltage input (VAC)	Power factor at 20% - 100%	Frequency (Hz)	Power consumption at 100% (W)		Current at 400VAC (A)		Operating temperature (°C)	
				Standard - heavy duty	High temperature	Standard - heavy duty	High temperature	Standard - heavy duty	High temperature
WS100 - WS300 *	400VAC	0.98	45 - 60Hz	1550W	1375W	3.9A	2.5A	-20 ~ 40°C	-20 ~ 50°C
WS400 *	400VAC	0.98	45 - 60Hz	775W	700W	2.0A	1.8A	-20 ~ 40°C	-20 ~ 50°C

** Based on typical values*

In addition to the standard and high temperature versions, a maxium power (MP) version is also available upon request

Dimensions (mm)

Key features

WS100
8 LED Modules

WS150
8 LED Modules

WS200
8 LED Modules

WS250
8 LED Modules

WS301
8 LED Modules

WS400
4 LED Modules

More available online www.abacuslighting.com

Challenger® 1 AL6000

IP66 ULOR 0% 60° Light Control System Abacus

Benefits

- Excellent light control, reducing overspill, upward light and glare
- Includes double asymmetric distribution with flat-glass technology
- Designed for lighting outdoor sports grounds and smaller sports stadiums where the control of obtrusive light is essential
- The Challenger® 1 floodlight now contains a factory-fitted 2kW cut-out ignitor to better protect the lamp and cabling

Technical features

- Body made of high pressure die cast aluminium, first given a zinc chromate substrate, then coated in RAL7035 light grey polyester powder for optimum protection against harsh environments
- Narrow, medium and wide-beam, double asymmetric light distribution
- Toughened front glass, secured within an aluminium frame
- Double asymmetric reflector system made of high-purity, polished and anodised aluminium. Incorporates an internal baffle to improve efficiency and reduce glare
- Galvanised steel stirrup, with additional locking screws
- Sealed to IP66, with silicone rubber gasketing
- Electrical connection box (IP66) housing ignitor, located on the side of the stirrup, fitted with two GORE™ membrane breathers
- Separate aiming device for accurate results
- Breather management system regulates air flow through the cable hose and in/out through IP67 GORE™ membrane, alleviating stress on the front glass

	Wattage	Beam type	Lamp	Lamp manufacturer	Lamp reference	Weight
AL6001	2.2	Narrow	MHN-FC/B	Philips	MHN-FC2.2KW400V/640	21.4kg
AL6002	2.2	Medium	MHN-FC/B	Philips	MHN-FC2.2KW400V/640	21.4kg
AL6003	2.2	Wide	MHN-FC/B	Philips	MHN-FC2.2KW400V/640	21.4kg
AL6004	2	Narrow	MHN-LA	Philips	MHN-LA2KW400V/842	21.4kg
AL6005	2	Medium	MHN-LA	Philips	MHN-LA2KW400V/842	21.4kg
AL6006	2	Wide	MHN-LA	Philips	MHN-LA2KW400V/842	21.4kg
AL6007	2	Narrow	HQI-TS/N/L	Osram	HQI-TS2000WNL	21.4kg
AL6008	2	Medium	HQI-TS/N/L	Osram	HQI-TS2000WNL	21.4kg
AL6009	2	Wide	HQI-TS/N/L	Osram	HQI-TS2000WNL	21.4kg
AL6010	1	Narrow	MHN-FC	Philips	MHN-FC1KW230V/740	21.4kg
AL6011	1	Medium	MHN-FC	Philips	MHN-FC1KW230V/740	21.4kg
AL6012	1	Wide	MHN-FC	Philips	MHN-FC1KW230V/740	21.4kg
AL6013	2	Narrow	MH-TS 2kW/XL	Venture	MH-TS2000W/XL/K12/745	21.4kg
AL6014	2	Medium	MH-TS 2kW/XL	Venture	MH-TS2000W/XL/K12/745	21.4kg
AL6015	2	Wide	MH-TS 2kW/XL	Venture	MH-TS2000W/XL/K12/745	21.4kg
AL6016	1	Narrow	MHN-LA 842	Philips	MHN-LA1KW230V/842	21.4kg
AL6017	1	Medium	MHN-LA 842	Philips	MHN-LA1KW230V/842	21.4kg
AL6018	1	Wide	MHN-LA 842	Philips	MHN-LA1KW230V/842	21.4kg
AL6019	1	Narrow	MHN-LA 956	Philips	MHN-LA1KW230V/956	21.4kg
AL6020	1	Medium	MHN-LA 956	Philips	MHN-LA1KW230V/956	21.4kg
AL6021	1	Wide	MHN-LA 956	Philips	MHN-LA1KW230V/956	21.4kg
AL6022	2	Narrow	MHN-LA 956	Philips	MHN-LA2KW400V/956	21.4kg
AL6023	2	Medium	MHN-LA 956	Philips	MHN-LA2KW400V/956	21.4kg
AL6024	2	Wide	MHN-LA 956	Philips	MHN-LA2KW400V/956	21.4kg

Lamp manufacturer & Lamp ref.	Lamp wattage	Colour temp	RA:	Lamp lumen output (Initial lm)	Lamp current	Supply voltage	Total circuit power
Venture							
MH-TS2000W/XL/K12/745	2kW	4500K	65	240,000lm	10.3A	380/400/415V	2280W
Philips							
MHN-FC2.2KW400V/640	2.2kW	4100K	60	232,000lm	11A	380/400/415V	2370W
MHN-LA2KW400V/842	2kW	4100K	80	220,000lm	9.6A	380/400/415V	2310W
MHN-LA2KW400V/956	2kW	5600K	90	190,000lm	10.3A	380/400/415V	2310W
MHN-LA1KW230V/842	1kW	4200K	70	95,800lm	9.3A	230/240V	1140W
MHN-LA1KW230V/956	1kW	5600K	80	87,000lm	9.3A	230/240V	1140W
MHN-FC2KW400V/740	2kW	4200K	60	210,000lm	19.11A	380/400/415V	2105W
MHN-FC1KW230V/740	1kW	4100K	65	93,000lm	8.9A	230/240V	1140W
Osram							
HQI-TS2000WNL	2kW	4100K	65	230,000lm	10.4A	380/400/415V	2280W

Technical information may alter dependent on control gear used

HQI-TS

MHN-LA

MHN-FC

Dimensions (mm)

Mounting: Stirrup mounted using M20 fixing.
Stirrup adjustment +/- 140°
Weight: 21.4kg.
Front wind area: @60° setting (Flat Glass) - 0.126m² 70° max setting (+10 elevation) - 0.135m². Side wind area: 0.108m²

Maintenance

Easy maintenance: the lamp is accessed by two rear covers.

Key features

Narrow beam
55°

Narrow beam
60°

Narrow beam
65°

Medium beam
55°

Medium beam
60°

Medium beam
65°

Wide beam
55°

Wide beam
60°

Wide beam
65°

Light control system

Abacus Light Control System
Efficient, careful lighting design has given Abacus an international reputation for combining powerful, sharp illumination with low light pollution. Abacus' Lighting Control System – exclusive to the Challenger® 1 – features a series of complementary technologies to help achieve this.

Double Asymmetric Reflector
The double asymmetric reflector is designed to better concentrate and focus the light produced by each lantern. By emitting the main beam at an angle of 55, 60 or 65 degrees from the normal to the front glass, it results in a flat appearance (below), making less of the reflector visible to spectators as well minimising glare.

Challenger® 2 AL5800

IP66

Benefits

- The asymmetric reflector in the Challenger® 2 makes it ideally suited to lighting medium and larger stadia from the side – typically from the roof
- This floodlight bears the quality hallmarks of the Challenger® floodlight range

Technical features

- Body made of high pressure die cast aluminium, coated in light grey polyester powder (RAL7035)
- Reflector system made from high-purity, polished and anodised aluminium. Incorporates an internal baffle to improve efficiency and reduce glare
- Toughened front glass, secured by cast aluminium front frame
- Galvanised steel stirrup, with additional elevation locking screws
- Electrical connection box (IP66) housing an ignitor is located on the side of the stirrup and fitted with two GORE™ membrane breathers
- Designed to accept double-ended, short-arc 2kW or 1kW metal halide lamps
- To ensure the beam can be accurately aligned, there is dual provision for a gun sight aiming device on the side of the floodlight body (AL5931)
- Rear cover gives easy access for re-lamping, with a stainless steel catch for positive closure.

	Beam type	Lamp: Manufacturer product code	Lamp manufacturer	Lamp: Abacus product code	Lampholder type
AL5801	Narrow	2kW: HQI-TS 2000W/N/L	Osram	LPW2000M/LA	K12s-7
AL5802	Medium	2kW: HQI-TS 2000W/N/L	Osram	LPW2000M/LA	K12s-7
AL5803	Wide	2kW: HQI-TS 2000W/N/L	Osram	LPW2000M/LA	K12s-7
AL5804	Narrow	2kW: MHN-LA2KW/842 & 956	Philips	LPP2000MHN-TD (842) & LPP2000/D (956)	XWH-UNP
AL5805	Medium	2kW: MHN-LA2KW/842 & 956	Philips	LPP2000MHN-TD (842) & LPP2000/D (956)	XWH-UNP
AL5806	Wide	2kW: MHN-LA2KW/842 & 956	Philips	LPP2000MHN-TD (842) & LPP2000/D (956)	XWH-UNP
AL5807	Narrow	1kW: MHN-LA1KW/842 & 956	Philips	LPP1000MHN-TD (842) & LPP1000MHD-TD (956)	XWH-UNP
AL5808	Medium	1kW: MHN-LA1KW/842 & 956	Philips	LPP1000MHN-TD (842) & LPP1000MHD-TD (956)	XWH-UNP
AL5809	Wide	1kW: MHN-LA1KW/842 & 956	Philips	LPP1000MHN-TD (842) & LPP1000MHD-TD (956)	XWH-UNP
AL5810	Narrow	2kW: MH-TS2000W/L/K12/4K	Venture	LPV2000M/LA	K12s-7
AL5811	Medium	2kW: MH-TS2000W/L/K12/4K	Venture	LPV2000M/LA	K12s-7
AL5812	Wide	2kW: MH-TS2000W/L/K12/4K	Venture	LPV2000M/LA	K12s-7

Lamp references

HQI-TS / MH-TS

MHN-LA

Lamp manufacturer & Lamp ref.	Lamp wattage	Colour temp	RA:	Lamp lumen output (Initial lm)	Lamp current	Supply voltage	Total circuit power
Venture MH-TS2000W/L/K12/4K	2kW	4500K	65	240,000lm	10.3A	380/400/415V	2280W
MH-TS2000W/XL/k12/745	2kW	4500K	65	240,000lm	10.3A	380/400/415V	2280W
Philips MHN-LA2KW400V/842	2kW	4200K	80	220,000lm	9.6A	380/400/415V	2310W
MHN-LA2K400V/956	2kW	5600K	90	190,000lm	10.3A	380/400/415V	2310W
MHN-LA1KW230V/842	1kW	4200K	80	100,000lm	9.3A	230/240V	1140W
Osram HQI-TS2000WNL	2kW	4400K	65	230,000lm	10.7A	380/400/415V	2280W
HQI-TS2000WDL	2kW	5400K	85	205,000lm	10.3A	380/400/415V	2280W

Technical information may alter dependent on control gear used

Dimensions (mm)

Stirrup mounted using M20 fixing
Stirrup adjustment +/- 140°

Weight: 15kg. Front wind area: 0.196m2 70° max setting

Maintenance

Easy maintenance: the lamp is accessed by a rear cover.

Accessories

Single blade louvre – AL5922
This accessory has been designed for the Challenger® 2 & 3 to minimise upward glare while maintaining good vertical lighting levels on the playing field

Aiming tool kit – AL5931
Set of equipment and instructions to help aim the Challenger® 2 & 3 with pinpoint accuracy. This gives the highest possible level of aiming control during the commissioning stage of any floodlighting project

Colorline Stadium, Norway

Key features

AL5804
2kW MHN-LA2KW
Narrow beam

AL5805
2kW MHN-LA2KW
Medium beam

AL5806
2kW MHN-LA2KW
Wide beam

Challenger® 3 AL5900

IP66

Benefits

- The optically precise, symmetrical beam of the Challenger® 3 is specifically designed for stadium floodlighting

Options

- Half-concentric louvre (AL5921) or single blade visor (AL5922) to reduce light pollution. Gun sight aiming kit, incorporating gun sight and bracket (AL5931)
- A hot restrike option is available, complete with electronic ignitor. Compatible with standard control gear types. Contact our sales office for further details

Technical features

- Body made from high pressure die cast aluminium, coated in light grey (RAL7035) polyester powder
- Reflector system made from high-purity, polished and anodised aluminium. Incorporates an internal baffle to improve efficiency and reduce glare
- Toughened front glass, secured by cast aluminium front frame
- Galvanised steel stirrup, with additional elevation locking screws
- Electrical connection box (IP66) housing an ignitor is located on the side of the stirrup and fitted with two GORE™ membrane breathers
- Designed to accept double-ended, short-arc 2kW or 1kW metal halide lamps
- To ensure the beam can be accurately aligned, there is dual provision for a gun sight aiming device on the side of the floodlight body (AL5931)
- Rear cover gives easy access for re-lamping, with a stainless steel catch for positive closure

	Beam type	Lamp: Manufacturer product code	Lamp manufacturer	Lamp: Abacus product code	Lampholder type
AL5901	Narrow	2kW: HQI-TS 2000WDS	Osram	LPW2000M/D	K12s-7 cable
AL5902	Medium	2kW: HQI-TS 2000WDS	Osram	LPW2000M/D	K12s-7 cable
AL5903	Wide	2kW: HQI-TS 2000WDS	Osram	LPW2000M/D	K12s-7 cable
AL5904	Narrow	1kW: HQI-TS 1000WDS	Osram	LPW1000MB/L	K12s-7 cable
AL5905	Medium	1kW: HQI-TS 1000WDS	Osram	LPW1000MB/L	K12s-7 cable
AL5906	Wide	1kW: HQI-TS 1000WDS	Osram	LPW1000MB/L	K12s-7 cable
AL5907	Narrow	MHN-SA 2KW 400V/956	Philips	LPP2000MHN-SA	XW UNP
AL5908	Medium	MHN-SA 2KW 400V/956	Philips	LPP2000MHN-SA	XW UNP
AL5909	Wide	MHN-SA 2KW 400V/956	Philips	LPP2000MHN-SA	XW UNP
AL5910	Extra Narrow	MHN-SA 2KW 400V/956	Philips	LPP2000MHN-SA	XW UNP
AL5911	Narrow	MHN-SB 2KW 400V/956	Philips	LPP2000MHN-SB	K12s-7 WH UNP
AL5912	Medium	MHN-SB 2KW 400V/956	Philips	LPP2000MHN-SB	K12s-7 WH UNP
AL5913	Wide	MHN-SB 2KW 400V/956	Philips	LPP2000MHN-SB	K12s-7 WH UNP
AL5914	Extra Narrow	MHN-SB 2KW 400V/956	Philips	LPP2000MHN-SB	K12s-7 WH UNP

Lamp references

MHN-SA

MHN-SB

HQI-TS

Lamp manufacturer & Lamp ref.	Lamp wattage	Colour temp	RA:	Lamp lumen output (Initial lm)	Lamp current	Supply voltage	Total circuit power
Philips MHN-SB 2000W/956	2kW	5600K	90	200,000lm	11.5A	380/400/415V	2136W
MHN-SB/HO 2000W/956	2kW	5600K	90	220,000lm	11.5A	380/400/415V	2136W
MHN-SA 2000W/956	2kW	5600K	90	200,000lm	11.3A	380/400/415V	2136W
Osram HQI-TS2000/D/S	2kW	5900K	93	200,000lm	11.5A*	380/400/415V	2105W
HQI-TS1000/D/S	1kW	5900K	90	90,000lm	9.4A	380/400/415V	1140W

Technical information may alter dependent on control gear used

*Measured on a 10.3A ballast.

Dimensions (mm)

Weight: 15kg. Front wind area: 0.196m² at 70º elevation

Maintenance

Easy maintenance: the lamp is accessed by a rear cover.

Accessories

Single blade louvre – AL5922
This accessory has been designed for the Challenger® 2 & 3 to minimise upward glare while maintaining good vertical lighting levels on the playing field

Half concentric louvre – AL5921
This Challenger® 3 accessory provides the greatest control of upward light and overspill

Aiming tool kit – AL5931
Set of equipment and instructions to help aim the Challenger® 2 & 3 with pinpoint accuracy. This gives the highest possible level of aiming control during the commissioning stage of any floodlighting project

Challenger® 3 with louvres

Key features

AL5911
MHN-SA Pro 2kW
Narrow beam

AL5912
MHN-SB Pro 2kW
Medium beam

AL5913
MHN-SB Pro 2kW
Wide beam

AL5914
MHN-SB Pro 2kW
Extra-narrow beam

Installation
and maintenance

Installation

At Abacus, we pride ourselves on our comprehensive service; and professional installation is all part of that package.

Our experienced installation teams work internationally on projects big and small – either as your main contractor or specialist sub-contractor, supplying everything from foundations to commissioning.

So wherever and whatever your project, Abacus will make it happen – on time, on budget and to the very highest standard.

Maintenance

Great service isn't just about brilliant design, engineering and application – it's about brilliant aftercare too.

That's why Abacus have created a range of maintenance packages to keep your lighting running as smoothly as the day it was supplied.

Whatever the product, whatever the height, whatever the client – our maintenance experts have an outstanding reputation for the breadth and quality of their electrical testing and repair skills. They're used to working with both Abacus and non-Abacus products; plus they're RISQS approved – great news for rail companies who need reliable, efficient contractors with experience in their specialist field.

To find out more about Abacus maintenance packages, call +44 (0)1623 518 316 or visit our website.

APPROVED CONTRACTOR

AUDITED

REGISTERED MEMBER ECA

Constructionline
A UK GOVERNMENT CERTIFICATION SERVICE

The Abacus Advantage

Planning

- Full project management service
- Consultancy service for obtaining planning permission
- Site inspections

Design

- Tailored lighting design - low light pollution systems
- 3D CAD designs
- Structural/mechanical design - bespoke masts and headframes
- Electrical design

Product supply

- Base-hinged masts
- Lowering headframes masts
- Fixed masts
- Telescopic masts
- Exterior lanterns and floodlights
- Columns

Installation

- Foundation trenching, installation and cable laying
- Electrical inspections and installations
- Worldwide mast assembly and installation
- Consultancy service for mast installation

Aftercare

- Commissioning
- Aiming of floodlights
- Lighting level checks

Accreditations

- RISQS audited
- NICEIC (National Inspection Council for Electrical Installation Contracting)
- BSI (British Standards Institution)
- CHAS (Construction Health and Safety Scheme)
- PTS (Personal Track Safety)
- CSCS (Construction Skills Certification Scheme)
- CPCS (Construction Plant Competence Scheme)

Quick look
product guide

Masts

Application	Base-hinged masts	Lowering headframes	Fixed mast – with or without ladders	Fixed mast – no ladder or platform	Telescopic masts
	●		●	●	●
	●	●	●	●	
	●	●	●	●	
	●	●	●	●	
	●	●	●	●	
	●	●	●	●	
	●		●	●	
	●			●	

Floodlights

Application	Challenger® 1	Challenger® 2	Challenger® 3	AAA-LUX AL Series	AAA-LUX WS Series
	●	●	●		●
	●			●	
	●			●	
	●			●	
	●			●	
				●	

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Conditions of sale
All goods supplied are subject to the company's general conditions of sale which are available on request.

Registered Office:
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Registered in England No. 8494722

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