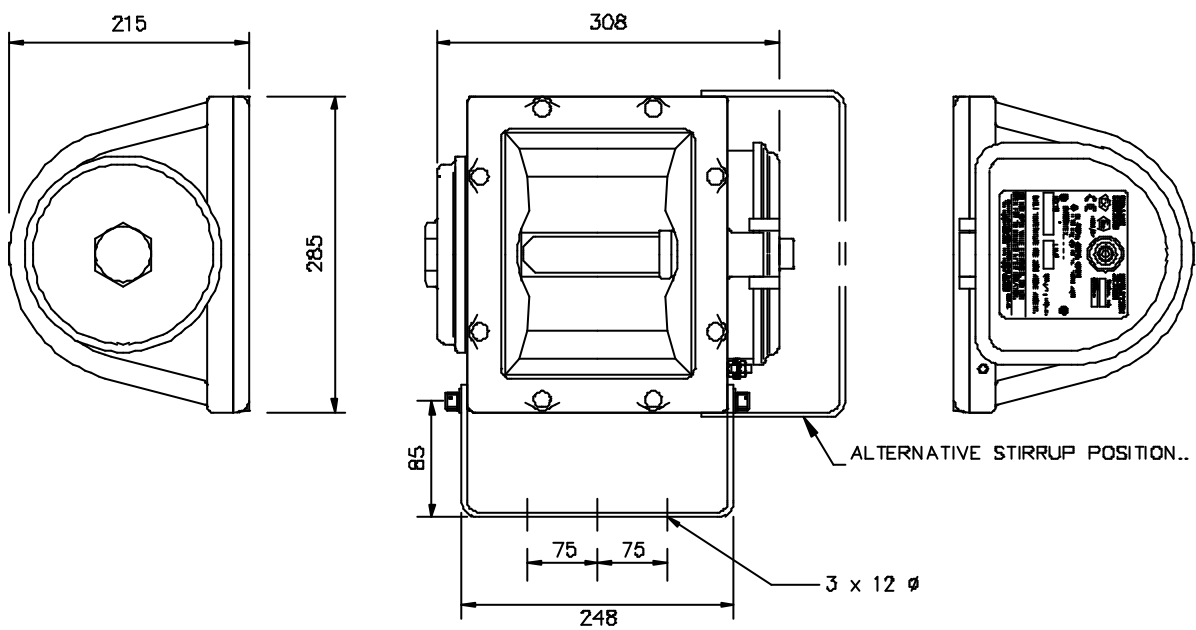


INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

Evolution Junior Floodlight


Important : Please read these instructions carefully before installing or maintaining this equipment. Good electrical practices should be followed at all times and this data should be used as a guide only.




WEIGHT OF H.I.D. FLOODLIGHT - 13 Kg
 WEIGHT OF T/HAL FLOODLIGHT - 10 Kg



0.0 Specification and ATEX Declaration

| | |
|-------------------------------|---|
| Type Of Protection | Ex de (flameproof and increased safety) |
| Protection Standards | EN 50014:1997, EN 50018:1994, EN 50019:1994 |
| ATEX Equipment Classification | Group II Category 2 G |
| Area Classification | Zone 1 and Zone 2 areas to BS EN 60079-10 and installation to BS EN 60079-14 |
| Certificate | EC Type Examination Certificate BAS99ATEX2228 |
| Equipment Coding |  II 2G EEx de IIC T2/3/4 |
| Ingress Protection | IP66 and IP67 to BS EN 60529 |

CE Mark



The CE marking of this product applies to "The Electrical Equipment (Safety) Regulations 1994", "The Electromagnetic Compatibility Regulations 1992", the "Waste Electrical and Electronic Equipment Regulations 2006" and the "Equipment and Protective Systems intended for use in Explosive Atmospheres Regulations 1996". [This legislation is the equivalent in UK law of EC directives 73/23EEC, 89/336/EEC and 2002/96/EC respectively].

ATEX Declaration

The Equipment is declared to meet the provisions of the ATEX directive (94/9/EC) by reason of the EC Type Examination and compliance with the Essential Health and Safety Requirements.

I MacLeod Technical Manager

1.0 Introduction - Evolution Junior Floodlight

The "Evolution Junior" is a compact floodlight suitable for discharge and tungsten halogen lamps. The lamp is contained in an enclosure with the cover glass permanently attached. The cover retaining screws have their heads filled and must not be removed. (This would invalidate the certificate).

The mains terminals are contained in an Ex e chamber on the end of the luminaire. This is accessed by a hinged cover held by a single bolt. The ignitor is contained with the lampholder in an Ex d assembly, which is retained in the end wall of the lamp enclosure using a bayonet arrangement locked in place by the chamber cover screw. The ballast and capacitor are contained in the 'd' chamber, access via the Ex 'd' screwed cover. The range of lamps which can be catered for are 70W SON/T and HQI/E and 150, 200, 250, 300W linear T/Hal.

Note : *The range of lamps available is as indicated in TABLE 0.
A range of mounting accessories is also available.*

1.1 Temperature Rating (Additional Information)

For lamps in TABLE 0 an (*) in the Temp. Rating column indicates a 4mm secondary glass fitted on top of the primary glass, which can be readily replaced if required.

2.0 Storage

Luminaires and control gear boxes are to be stored in cool dry conditions preventing ingress of moisture and condensation. Any specific instructions concerning emergency luminaires must be complied with.

3.0 Installation and Safety

3.1 General

There are no health hazards associated with this product whilst in normal use. However, care should be exercised during the following operations. Installation should be carried out in accordance with BS EN 60079-14 or the local hazardous area code of practice, whichever is appropriate, and fitting of specified insulating material to be adhered to where a specific fire resistance rating is required.

In the UK, the requirements of the '*Health and Safety at Work Act*' must be met.

Handling and electrical work associated with this product to be in accordance with the '*Manual Handling Operations Regulations*' and '*Electricity at Work Regulations, 1989*'. Your attention is drawn to the paragraphs (i) 'Electrical Supplies', (ii) 'Electrical Fault Finding and Replacement' and (iii) 'Inspection and Maintenance'. The luminaires are Class 1 and should be effectively earthed.

The luminaires are quite heavy and suitable means of handling on installation must be provided.

Certification details on the rating plate must be verified against the application requirements before installation.

The information in this leaflet is correct at the time of publication. The company reserves the right to make specification changes as required.

3.2 Tools

4mm and 6mm A/F socket keys.

3mm and 5mm flat blade screwdriver.

17mm A/F spanner.

Suitable spanners for installing cable glands.

Pliers, knife, wire strippers/cutters.

3.3 Electrical Supplies

The supply voltage and frequency should be specified when ordering. A maximum voltage variation of +6%/-6% on the nominal is expected. (The safety limit for T rating is +10%). Luminaires should not be operated continuously at more than +6%/-10% of the rated supply voltage of the control gear or tapping. **Care is needed connecting to the nominal 230V UK supply.** The user must determine the **actual** underlying site supply and purchase or adjust accordingly. In this case, the luminaires have multi-tapped control gear which can be set to a range of 50 and 60Hz voltages. Different ballasts are used for 50 and 60Hz. The tappings are shown on the control gear and the limits are shown on the rating plate. They are selected by the supply cable. If the equipment is located in high or low voltage sections of the system, an appropriate voltage tap should be selected, but care must be taken to log or mark the equipment so that the tapping is re-set if the equipment is re-located. If in doubt, tappings should be set on the high side. 10V Max. drop is desirable for HPS and advised for HQI. The light output will be reduced. The figures given are at the luminaire. Where the HQI lamp is used, the tapping must be set accurately for best performance.

Where shore or construction site supplies are used, which are different to the service supplies, the tappings should be re-set. If not, advice on the effect of these temporary supplies should be sought from the Technical Department. Where adverse system conditions occur, luminaires can be supplied without pfc. The circuit current will then be the lamp current, the circuit power does not change.

3.4 Lamps

The 70W HPS lamp used in this range is of a standardised type and there is no preference between make or, in the case of HPS, colour. The Evolution Junior uses a tubular 70W HPS lamp (SON/T) and the cap is E27. If mixed installations are used, care must be taken to ensure that the correct lamp is fitted on installation and replacement. HPS lamps substantially maintain their light output to the end of their electrical half life, which can be up to 24,000 hours. However, lamp replacement at around 16,000 hours is desirable to avoid piecemeal replacement on a large scale. HQI lamps have a shorter life and higher lumen depreciation. **HPS and HQI lamps should be replaced shortly after they do not light.** One indication of the end of life for HPS lamps is 'cycling', where the lamp extinguishes then re-ignites after a minute or so interval. If discharge luminaires are burned continuously, they should be switched off occasionally to allow old lamps to fail to re-ignite, rather than possibly become diodes with detrimental effects on control gear.

The above information is current at the time of publication. The development of lamps and control gear is ongoing and detailed advice on lamp performance can be obtained from the Technical Department or the lamp supplier.

Tungsten halogen lamps must be selected for the supply voltage. Running at over the rated supply voltage will reduce life and at greater than +10% will compromise the T rating.

Important : *HPS and HQI circuits should not be energised without a lamp fitted. HPS & HQI lamps with internal ignitors must not be used.*

3.5 Mounting

Luminaires should be installed where access for maintenance is practical and in accordance with any lighting design information provided for the installation. This will usually consist of aiming points and aiming angles. The mounting arrangements should be secured with lock washers or self locking nuts and bolts.

The luminaire should be mounted with the lamp axis horizontal or with the lamp vertical and the terminal cover downwards.

When the luminaire is mounted using the lowbay mounting bracket arrangement, the fitting brackets must be mounted on a horizontal surface with fitting aimed glass downwards. The minimum distance between luminaire and illuminated surface, directly in front of luminaire, is 1 metre.

3.6 Cabling and Cable Glands

3.6.1 Cables

The cable entry temperatures are given as the rise over the maximum rated ambient (T_{amb}). This allows the user to adjust the cable spec. for actual maximum site ambient.

The maximum conductor size is 6mm². Internal and external earth points are provided. 300/500V cable ratings are adequate and no special internal construction is necessary as the terminations are Ex e. The standard looping cable size is 6mm². The selection of cable size must be suitable for the fuse rating. Some guidance on this is given below. The fuse ratings apply to the circuit on the supply side of the control gear.

3.6.2 Cable Glands

This apparatus is certified to *EN 50014:1997, EN 50018:1994, EN 50019:1994.*

Cable glands for entry into Ex e enclosures when fitted with any gland to body sealing method and the supply cable, must reliably maintain the IP rating of the enclosure with a minimum value of IP54. The cable gland must withstand an impact value of 7Nm or 4Nm where the risk of mechanical damage is low.

Sealing plugs must be similarly rated and a tool must be used for their removal. Where the cable is not reliably clamped externally to the apparatus, the cable gland must clamp the cable against a pull in Newtons of 20 x the cable OD in mm for non armoured cable and 80 x the cable OD for armoured cable. Selected metal industrial cable glands may meet this requirement.

Plastic cable glands must be Ex certified. Glands for metal covered mineral insulated cables must be Ex e certified.

Two tapped cable entries are provided, one with a plug and seal suitable for permanent use, the other has a travelling plug. M20 x 1.5 entries are standard, other sizes are available on request. Where brass cable glands are used in a corrosive environment, cadmium or nickel plating should be used.

3.7 Cable Connection

The cable connections are made by slackening the terminal cover bolt and swinging the cover to one side. The conductors should be bared back so that they make full contact in the terminals, but the bare conductor should not be more than 1mm beyond the terminal. Unused terminal screws should be tightened. The core must be identified by polarity and connected in accordance with the terminal markings. Before re-fitting the cover, a final check on the correctness of connections should be made. Cover bolt torque 10Nm.

3.7.1 Selecting the Tapping

The luminaire is factory set at the highest tapping, or that given with the order. The tapping suitable for the supply is selected or confirmed on installation.

3.8 Fitting lamps

Isolate the supply before opening the end cover.

Make sure the correct lamp is selected as detailed above. Access for fitting lamps is gained through the end hinged cover. The ignitor cable connections are unscrewed and the ignitor housing turned anti-clockwise to release. The ignitor housing fixing screws are thread locked into place and are not designed to be removed in service. The lamp should be firmly screwed into place and the housing replaced. Reconnect the cables then close the hinged cover and tighten centre bolt. (The front cover is permanently fixed. The bolts have been covered with a hard setting resin to prevent removal, which would invalidate the certificate).

3.9 Inspection and Maintenance

Visual inspection should be carried out at a minimum of 12 monthly intervals and more frequently if conditions are severe, refer to *BS EN60079-17*. The time between lamp changes could be very infrequent and this is too long a period without inspection.

3.9.1 Routine Examination

The equipment must be de-energised before opening and note taken of the rated opening delay period, 15 minutes if there is a hazardous atmosphere present.

Individual organisations will have their own procedures. What follows are guidelines based on *BS EN 60079-17* and on our experience :

- 1 Ensure the lamp is lit when energised and that the lampglass is not damaged.
- 2 When de-energised and left to cool, there should be no significant sign of internal moisture. If there are signs of water ingress, the luminaire should be opened up, dried out, and any likely ingress points eliminated by re-gasketing, re-greasing or other replacement.
- 3 Check the terminal chamber gasket for any damage or permanent set and replace as required, the gasket is held in place by a few spots of silicone RTV.
- 4 Check the cable gland for tightness and nip up if necessary.
- 5 Check any external earthing.
- 6 Examine the front glass for any signs of damage. If thought necessary, the fillet of silicone sealant can be re-sealed with a proprietary brand of clear RTV silicone.

Important : *If the glass is damaged, the luminaire must be returned for servicing.*

- 7 The terminal chamber should be opened periodically and checked for moisture and dirt ingress. The cable connections should be checked for tightness. The gasket should be checked for cracks or lack of elasticity, and if necessary, replaced. *Cover bolt torque : 10Nm.*
- 8 The ignitor housing flameproof path is cylindrical and cannot be readily checked, it will not go out of shape. The ignitor housing securing bolts are designed to be fixed in place and must not be removed. When relamping, make sure the flameproof spigot path is free of dirt and slides into place smoothly. A little molybdenum spray (*Dow Corning MOLYKOTE*) can be used.
- 9 The Ex 'd' chamber access is via a screwed flamepath and is fitted with an 'o' ring seal which should be checked periodically and examined for cracks and, if necessary, replaced. When replacing the screwed cover, make sure the threads are free of dirt and screws smoothly in the luminaire. A little molybdenum spray (*Dow Corning MOLYKOTE*) can be used.
- 10 Check that mountings are secure and the adjusting disc bolts are tight.
- 11 Clean the lampglass.
- 12 If it has been suspected that the luminaire has mechanical damage, a stringent workshop overhaul will be required. Where spares are needed, these must be replaced with factory specified parts. No modifications should be made without the knowledge and approval of the manufacturer.

4.0 Electrical Fault Finding and Replacement

Any fault finding must be done by a competent electrician with the luminaire isolated and, if carried out with the luminaire in place, under a permit to work.

With HPS and HQI lamps the ignitor can become faulty. If the lamp is fitted, the choke has continuity and the connections are good and correct, they should produce an 'attempt to start' effect and a buzzing sound from the ignitor. It will be unusual to have no other parts available to perform a substitution fault finding routine and this is the normal procedure. Control gear will not normally go open circuit unless it has overheated first and the signs of this are obvious, being severe discoloration of the paint on the gear and cracks in any exposed insulation. Similarly, a bad contact at the lamp cap will usually result in signs of overheating. Before re-assembling, all connections should be checked and any damaged cable replaced.

5.0 Fuse Ratings

The fuse ratings for HID lamp circuits need to take account of three components of circuit current. Current inrush to PFC capacitors which can be up to 25 x the rated capacitor current and last 1-2 milliseconds; lamp starting current including steady capacitor current which together may decline from up to 200% of normal at 10 seconds after switch-on to normal after 4 minutes; rectification effects caused by asymmetrical cathode heating for a few seconds after starting, this effect is random and very variable.

With the availability of MCB's with a wide range of characteristics, the individual engineer can make a better judgement of what is required. Use MCB's suitable for inrush currents to reduce ratings. The normal capacitor current will probably be the determining factor, 0.076A per μF at 240V, 50Hz (adjust for other voltages by multiplication, x 6/5 for 60Hz). For HBC fuses use 1.5 x normal capacitor current. All calculations must satisfy wiring regulations. For T/Hal inrush use 8 x rated current.

Note : *Starting and running currents for 240V, 50Hz using internal control gear are outlined in TABLE 1. A conventional matrix for HBC fuses is outlined in TABLE 2.*

6.0 Disposal of Material

The unit is mostly made from incombustible materials. The capacitor is of the dry film type and does not contain PCB's. The control gear contains plastic parts and polyester resin. The ignitor contains electronic components and synthetic resins. All electrical components may give off noxious fumes if incinerated. Take care to render these fumes harmless or avoid inhalation. Any local regulations concerning disposal must be complied with. Any disposal must satisfy the requirements of the WEEE directive [2002/96/EC] and therefore must not be treated as commercial waste. The unit is mainly made from incombustible materials. The control gear contains plastic, resin and electronic components. All electrical components may give off noxious fumes if incinerated.

6.1 Lamps

Incandescent lamps and discharge lamps in modest quantities are not "special waste". The outer envelope should be broken in the container to avoid injury.

This applies to the UK, there may be other regulations on disposal operating in other countries.

Important : *Do not incinerate lamps.*



To comply with the Waste Electrical and Electronic Equipment directive 2002/96/EC the apparatus cannot be classified as commercial waste and as such must be disposed of or recycled in such a manner as to reduce the environmental impact.

0.0 Tables 0/1/2

Table 0 Lamp Ranges, Maximum Ambient and Temperature Ratings Refer to Section : 1.1

| Lamp | Wattage | Tamb °C | Temp. Rating | Cable Rating °C | Cable Rise °C |
|-------|---------|---------|--------------|-----------------|---------------|
| T/HAL | 300 | 40 | *T2 | 95 | 55 |
| T/HAL | 250 | 20 | T3 | 70 | 45 |
| T/HAL | 250 | 50 | T2 | 95 | 45 |
| T/HAL | 250 | 40 | *T2 | 90 | 50 |
| T/HAL | 200 | 40 | T3 | 85 | 45 |
| T/HAL | 200 | 25 | *T3 | 70 | 45 |
| T/HAL | 200 | 50 | *T2 | 90 | 40 |
| T/HAL | 150 | 55 | *T3 | 85 | 30 |
| T/HAL | 150 | 55 | T3 | 80 | 25 |
| SON/T | 70 | 40 | T4 | 70 | 30 |
| SON/T | 70 | 55 | T3 | 80 | 25 |
| HQI/E | 70 | 40 | T4 | 70 | 30 |
| HQI/E | 70 | 55 | T3 | 80 | 25 |

Table 1 Starting and Running Currents Refer to Section : 5.0

| Lamp | Lamp A | Start A | Run A | Capacitance µF | Circuit Power (W) |
|---------|--------|---------|-------|----------------|-------------------|
| 70W HPS | 1.0 | 0.7 | 0.45 | 10 | 87 |
| 70W HQI | 1.0 | 0.8 | 0.50 | 10 | 96 |

Notes : *Minimum power factor correction: 0.85.
The start and run currents are corrected.*

Table 2 Fuse Ratings Refer to Section : 5.0

| Lamp Wattage | Number of Lamps | | | | | |
|--------------|-----------------|----|----|----|----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 70W | 4A | 4A | 4A | 6A | 6A | 10A |

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Note :

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