



## User Instruction & Installation Manual

### LH300 575 Watt Metal Halide Searchlight



**Product Reference Number:**

**A2859 – LH300 575w**

*Manufacturer's details:*

Francis Searchlights Ltd  
Union Road, Bolton  
**Lancashire, BL2 2HJ, UK**  
Tel: +44 (0) 1204 558960  
Fax: +44 (0) 1204 558979  
<http://www.francis.co.uk>  
E-mail: [sales@francis.co.uk](mailto:sales@francis.co.uk)

*Distributor details:*

Empty box for distributor details.

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# 1 - Introduction

**It is imperative that this manual is read carefully and understood before installing your equipment. For your future reference please keep this manual in a safe place.**

Thank you for specifying a product from the Francis Searchlights range. All Francis products are designed to give complete customer satisfaction and are manufactured to the highest engineering standards in order to ensure optimum performance and service life.

The Francis Metal Halide range combines features proven over many years service in the most hazardous conditions in both marine and land installations.

In order to prolong the life and performance of your product, we recommend that you only specify Francis Searchlights spare parts. This will also ensure that any warranties on your equipment will not be invalidated. Information on spares ordering and parts is provided in this manual.

Should you ever need to contact Francis Searchlights Ltd. regarding your equipment, please quote the Product Serial Number at all times.

## 2 - Safety Precautions

The following instructions must be adhered to, in order to ensure a safe working environment and the safety of the user.

**Note: When unpacking or manoeuvring the searchlight into its fixing position, suitable lifting points must be used in order to prevent damage to the equipment or personal injury.**

- Because of the high internal pressure within the lamp, there is a risk of explosion in either a hot or cold state;
- During operation this lamp emits intense UV radiation which is harmful to the eyes and skin. Suitable protection should be worn;
- The high luminance of the arc can cause severe damage to the eye if viewed directly. ALWAYS wear suitable protective goggles when viewing the lamp;
- Always use protective sleeves supplied with the lamp;
- Should it be necessary to examine the lamp with the front bezel removed, always use a protective shield and wear goggles to ensure a safe working environment;
- Searchlights get hot. Never touch the unit when lit and always allow 15 to 20 minutes for cooling down after turning the searchlight off;
- Never place anything on or cover the searchlight when in use;
- Ensure the lamp has cooled sufficiently before removal;
- If undue force appears necessary to remove the lamp, the equipment should be inspected by a competent person or contact the manufacturer;
- When disposing of lamps, return the lamp, via the supplier, to the lamp manufacturer in its complete packaging;
- Due to the vast range of lamps available it may appear possible that more powerful lamps can be used in the equipment than for which it was designed. Even when the unit will physically accept a higher wattage or voltage lamp, this substitution is not recommended and is dangerous. This action will also void any warranties on the equipment.
- Always refer to the lamp manufacturer's technical data when dealing with lamps.

### 3 – Technical Information

This product has been designed to operate in accordance with the product specification. The LH300 575 watt searchlight has the following features:

- Constructed from stainless steel;
- Parabolic formed deep dish aluminium reflector;
- Powder coated finish;
- Vertical movement +40° to -45°;
- External lamp focus adjustment;
- Economical 3000 hour lamp life;
- Toughened front glass;
- Spill rings to prevent unwanted glare & stray light;
- Axially mounted Metal Halide light source;
- Supplied with stainless steel security bracket and safety cable;
- Luminous flux 45000;
- Colour temperature 7200K;
- Searchlight protected to IP66;
- G.R.P. control gear protected to IP67;

The searchlight also performs to the following optical data:

- Metal Halide light source GX9.5;
- Lamp Wattage - 575 Watts;
- Supply voltage - 220/240V;
- Peak Beam Candlepower – 11,641,957 lux;
- Range – 3,412 metres;
- Divergence – 7°;

In order that the searchlight operates correctly it is imperative that competent personnel are responsible for the installation, operation and servicing of this equipment. Failure to adhere to this advice may cause premature failure or incorrect operation of the searchlight, which may damage the equipment or cause personal injury.

## 4 - Unpacking and Installation Instructions

The following instructions should be read and fully understood prior to installing the equipment to ensure that the correct procedures are followed and all safety precautions are observed.

**Note: If the equipment has been in storage for a considerable amount of time, it is advisable to conduct a routine maintenance check on all parts before installation.**

### Safety Precautions

This equipment should not be connected to an electrical supply before being installed. Installation procedures should be adhered to in order to ensure a safe working environment and reduce the risk of damage or personal injury.

### Preparing the Mounting Position

Mark out and drill the fixing holes, when in the desired position bolt the searchlight firmly down.

## 5 - Electrical Installation

For safety purposes, only competent personnel should perform the electrical installation. All equipment should be installed to current Electrical Regulations and Standards.

In order to obtain the maximum light output from the searchlight, it is essential that the full operating voltage of the lamp fitted be applied to the lampholder contacts.

### Method of Electrical Connection

- 1) Disconnect the supply before working on the electrical system;
- 2) The searchlight must be connected to a fused electrical supply, using suitably sized cable;
- 3) If the searchlight is located a considerable distance from the supply, provision must be made in the cable size in order to overcome the voltage drop.

**The Control Gear should NOT be positioned no more than 5 meters away from the Searchlight.**

The following table below indicates the maximum length of cable to be used for the AC supply cable, from the supply to the searchlight:

| Searchlight                   | 240v 575w    |
|-------------------------------|--------------|
| Cable Size (mm <sup>2</sup> ) | Distance Max |
| 1.5                           | 129 MTRS     |
| 2.5                           | 210 MTRS     |
| 4.0                           | 333 MTRS     |
| 6.0                           | 520 MTRS     |
| 10.0                          | 871 MTRS     |

- 4) Whenever possible cable terminations should be made indoors and with approved terminal devices;
- 5) If a spare auxiliary fuse or circuit breaker is not available, one of the correct type and rating should be fitted and connected to a positive supply. It is advisable to locate a bus bar or main connection and avoid any direct connection to the supply;
- 6) For 110/220v AC products, the following colour coding system should be used for the customer supply cable:

Brown            - Live  
Blue             - Negative  
Green/Yellow   - Earth

**Note: This equipment must be earthed.**

## Installation Guideline

A typical installation and connection routine for the LH300 searchlight is as follows:

Referring to wiring diagram C23721, a supply is fed into the control gear enclosure, which then provides a common feed to the control gear and the searchlight.

Cables required to be connected by the customer: -

Mains supply cable to the Control Gear, refer to above for suitable size cable.

The searchlight is supplied with 4 metres of 3 core 1.5mm cable from the Control Gear enclosure to the searchlight.

(Customer may need to provide a suitable junction box to this cable).

## 6 - Operating Instructions

This equipment is designed for use out of doors, in free air. Never place anything on, or cover, the searchlight when in use as this may present a hazard.

The searchlight is mounted using the two M12 fixing holes (70mm centres).

To change the tilt angle simply release the M10 hexagon screws on the side of the stainless steel mounting bracket then lock in the desired position.

The searchlight is fitted with two safety chains, one on the front bezel and one from the searchlight head to its mounting bracket.

To fit a lamp use the following steps.

Remove the front bezel/glass assembly by depressing the catch on the securing latches.  
Let the bezel assembly hang on its safety cable.  
Hold the lamp using a dry cloth making sure not to put any finger prints on the lamp glass.  
Push the lamp into the lampholder. Make sure it is fully inserted.  
Re-fit the bezel assembly and test.

The beam of the searchlight can be adjusted to give a variety of beam types. Using the rear focus knob the beam can be adjusted by simply pushing or pulling until the desired beam is achieved.

**This product should not be used for any purpose other than for which it was designed. Any modifications to the product should not be undertaken without consulting the manufacturer.**

## Setting to Work

Safe service in use necessitates the strict observance of the following precautions.

- Any article fabricated from quartz or glass is inherently fragile and care should therefore be taken, at all times, when handling lamps;
- Eye protection must be worn when handling lamps that have been removed from their packaging materials. The protective sleeve should not be removed from the lamp for safety reasons, as there is a remote possibility of the lamp shattering violently, especially if it is subjected to mechanical shock or vibration;
- Ensure that the power rating of the lamp to be fitted is suitable for the lamphouse and power supply equipment;
- Always isolate the equipment from the supply before inserting a lamp;
- Before inserting the lamp ensure that all contacts are clean. Contacts must be renewed at the slightest sign of corrosion. Sanding or filing down corroded areas is not recommended as this will only make the conducting surface between the pin and lampholder smaller, thus causing the lamp to overheat;
- Do not twist or bend the fused quartz bulb when fitting the lamp as mechanical stresses MUST be avoided;
- When inserting or removing a lamp, always hold it securely by its' base in order to prevent breakage between base and bulb;
- The lampholder must not exercise mechanical tensions on the lamp, neither during insertion or operation. Contacts must not discolour during use;
- For safety reasons, the lamp should be replaced once it has reached its' average life, and not later than 1.25 times the stated life. With continuing use the risk of the lamp exploding increases due to alterations within the quartz;
- Before the protective sleeve is removed, suitable protection must be worn i.e face mask and gloves with wrist protection;
- Never touch the quartz bulb with bare hands, as fingerprints will make the glass cloudy and cause a severe loss of light. This may also cause recrystallisation and thus weaken the bulb material. Should the bulb be inadvertently touched, remove fingerprints with methylated spirit and a clean, soft paper towel. The bulb should then be wiped with distilled water. NOTE: ALWAYS WEAR MASK AND GLOVES DURING CLEANING);
- All packaging and the protective sleeve must be retained for re-use. Whenever removing a lamp, the protective sleeve must always be used for safety reasons;

**In all circumstances the lamp manufacturer's data should be referred to when dealing with lamps.**

## 7- Fault Finding

All fault finding must be conducted by a competent person or qualified Electrical Engineer.

### Failure of Lamp to ignite

In the event of the lamp failing to light the following steps should be taken:

- 1) Check that the mains supply is connected to the input of the ballast gear and check all connections as per the wiring diagram. On operation if the lamp does not light, switch off mains supply and check all fuses;
- 2) Check the searchlight head. On your command get an operator to switch on the light for approximately 2 seconds. During this time listen for any noise (cracking or hissing) coming from within the ignitor box mounted on the side of securing bracket. If this arcing is heard switch off the supply at the mains. Remove the front bezel, spill ring and reflector to expose the two supply leads from the ignitor to the lamp. Using a dry cloth wipe these leads to remove any dust, moisture or condensation that may have formed around the inside of the barrel. Replace the reflector, spill ring and front bezel, ensure the latches are secure, and perform the check again, listening for the cracking. If the lamp still fails to ignite, switch off at the mains and replace the lamp in accordance with the safety procedures within the manual and the manufacturer's information.

**Any further tests to be carried out with regards to lamp failure must be conducted by a competent electrical engineer and should not be carried out in an explosive atmosphere.**

- 3) Before a metal halide lamp will ignite, the electrically insulated gas between the electrodes must be ionised. This is done by the ignitor which produces a high frequency voltage (up to 30,000 volts or higher). Switching the lamp on activates the ignitor. A cracking or hissing noise should be heard. The ignitor is housed within the box mounted on the side of the securing bracket. If found to be faulty a new ignitor must be fitted.

## 8 - Maintenance and Servicing

In order to prolong the service life and performance of your searchlight, the following maintenance guidelines are recommended:

- Maintenance checks should be conducted every three months;
- Before checking, disconnect the equipment from the supply;
- Visually inspect the condition of the equipment;
- Any major or minor structural damage should be rectified immediately in order to reduce sympathetic wear;
- After inspection it may be necessary to clean the inside of the searchlight. The following procedure should be adhered to:
  - Remove the front bezel;
  - Clean the front glass inside and out using a proprietary glass cleaner or metal polish;
  - Clean the reflector by removing the spill ring if required;
  - Ensure that the lampholder is free from corrosion or other damage;
  - Check earthing point for conductivity;
- It is advisable to check all seals and gaskets for signs of degradation. Renew if necessary;
- Upon completing all maintenance requirements the searchlight should be tested for full working order (approximately 20 minutes).

**If in any doubt as to the correct servicing procedures to adopt please contact your distributor/agent or the manufacturer who will be able to advise the best course of action for your product.**

## 9 - Wiring Diagrams & General Assemblies

| Drawing Number | Description     |
|----------------|-----------------|
| C23721         | Wiring diagram  |
| A2859          | LH300 575w G.A. |

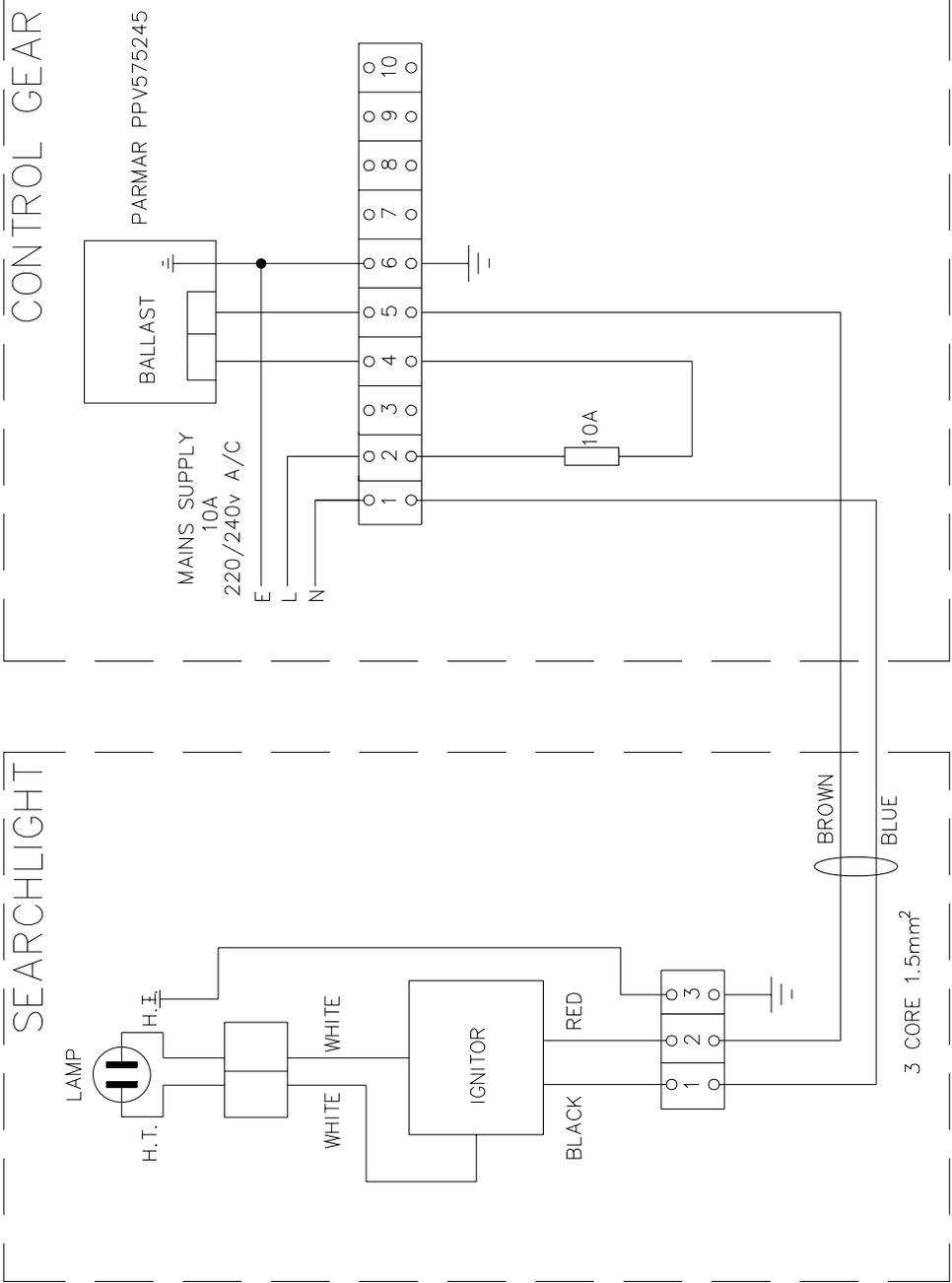
FIRST USED ON  
LH300  
975W

DO NOT SCALE DRAWING

THIRD ANGLE PROJ



| ISS No | MODIFICATION DETAILS                             | DATE & INTS |
|--------|--|-------------|
| 1      | AS FIRST DRAWN                                   | 1.07 LW     |
| 2      | LAYOUT MOD. (EC1181)                             | 5.08 D.S.   |
| 3      | FUSE 10A WAS 20A (EC1378)                        | 1.12 D.S.   |
| 4      | WIRING REVISED TO CONTROL GEAR TERMINAL (EC1486) | 5.13 LW     |



STANDARD PRACTICE  
Deburr oil cut/machined edges  
Break corners R0.25(Max) U.O.S.  
TOLERANCES U.O.S: --  
General: ±  
Angular: ±  
Hole centres & posns: ±  
Sand Casting: To ISO 8062 CT10  
Die Casting: To ISO 8062 C18

**Francis**  
**SEARCHLIGHTS**

|                               |       |           |          |   |  |               |                  |     |
|-------------------------------|-------|-----------|----------|---|--|---------------|------------------|-----|
| DRAWN LW                      |       | DATE 1.07 | MATERIAL | FRANCIS SEARCHLIGHTS LIMITED, UNION ROAD, BOLTON, BL2 2HJ |  | © 2007 A3     | PART No./DRG No. | SHT |
| CHECKED                       | SCALE | FINISH    |          | DESCRIPTION   |  | CONT ON SHEET |                  |     |
| ALL DIMENSIONS IN MILLIMETRES |       |           |          | WIRING DIAGRAM  |  | C23721        |                  |     |
|                               |       |           |          |   |  | 1             |                  |     |

| ISS | NO | DESCRIPTION                           | DATE     |
|-----|----|---------------------------------------|----------|
| 1   |    | AS PER DRAWING                        | 10.06.11 |
| 2   |    | BROUGHT IN LINE WITH DETAIL DRAWING A |          |

| DATE     | DESCRIPTION                           |
|----------|---------------------------------------|
| 10.06.11 | AS PER DRAWING                        |
|          | BROUGHT IN LINE WITH DETAIL DRAWING A |

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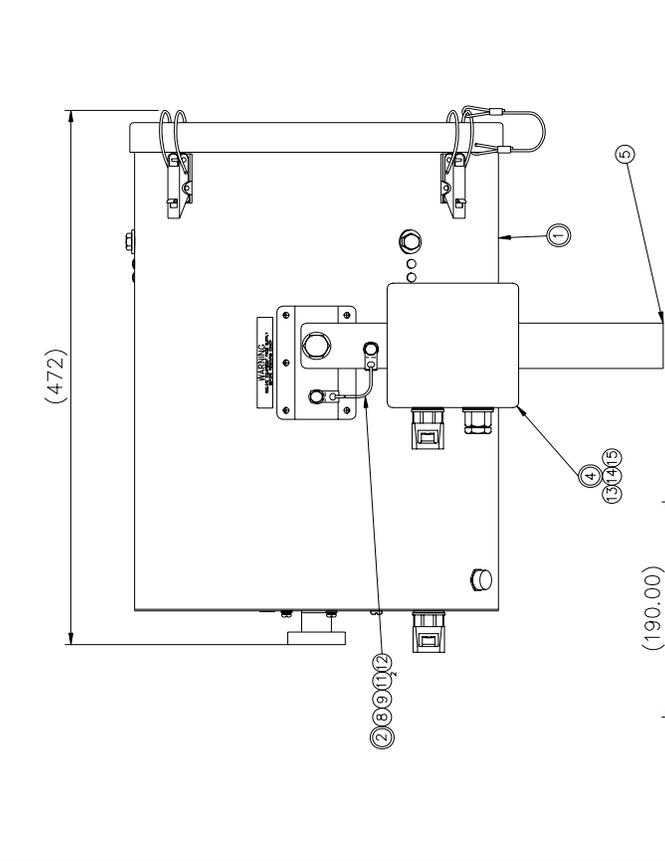
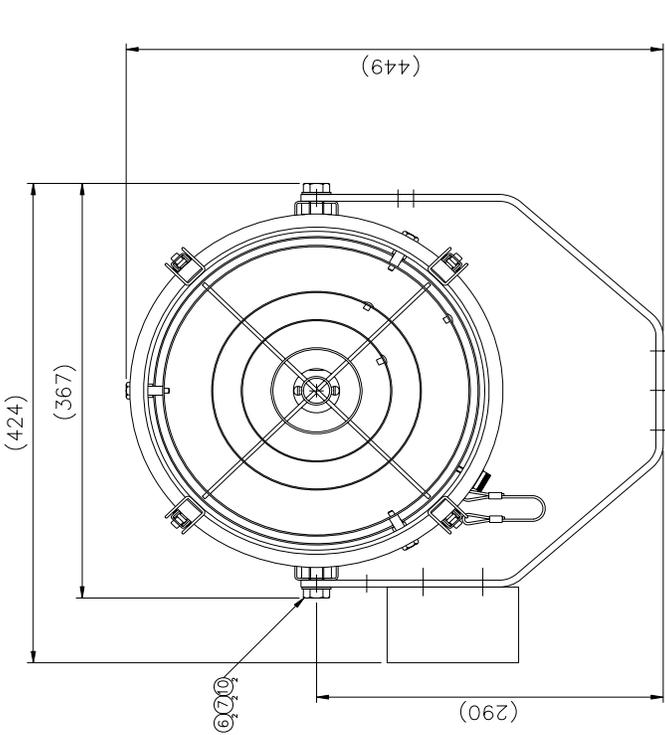
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| DATE     | DESCRIPTION                           |
|----------|---------------------------------------|
| 10.06.11 | AS PER DRAWING                        |
|          | BROUGHT IN LINE WITH DETAIL DRAWING A |



| REF | PART No.  | DRG. No. | DESCRIPTION             | QTY |
|-----|-----------|----------|-------------------------|-----|
| 1   | C23663-01 | C23663   | BARREL ASSEMBLY         | 1   |
| 2   | C16842-01 | X4645    | SAFETY CABLE ASSEMBLY   | 1   |
| 3   | C21294-01 | C21294   | CONTROL ASSY            | 1   |
| 4   | C23712-01 | C23712   | IGNITER BOX ASSY        | 1   |
| 5   | C23719-01 | C23719   | CRUTCH                  | 1   |
| 6   | C22145-01 | X2768    | TRUNNION SPACER         | 2   |
| 7   | C20769-00 | ---      | M12 x 16 HEX HEAD SCREW | 2   |
| 8   | C08210-00 | ---      | M6 x 16 HEX HEAD SCREW  | 1   |
| 9   | C08120-00 | ---      | M6 x 10 HEX HEAD SCREW  | 1   |
| 10  | C08370-00 | ---      | M12 PLAIN WASHER        | 2   |
| 11  | C06897-00 | ---      | M6 PLAIN WASHER         | 2   |
| 12  | C12353-00 | ---      | M6 NYLOCK NUT           | 1   |
| 13  | C09895-00 | ---      | M5 x 10 PAN HEAD SCREW  | 2   |
| 14  | C08392-00 | ---      | M5 PLAIN WASHER         | 2   |
| 15  | C09231-00 | ---      | M5 SPRING WASHER        | 2   |
| 16  | C08791-00 | ---      | 3 core 1.5mm CABLE      | 4M  |

STANDARD PRACTICE  
Refer to sub drawing for details  
Refer to sub drawing for details



© 2006 A11 CONT ON SHEET  
PART No. / DRG No. A2859  
SHEET 1

FRANCIS SEARCHLIGHTS LIMITED UNION ROAD . BOLTON . BL2 2HU  
LH300 575W GA

| DRWING                        | LN | DATE | SCALE | 1:2 | 10.06.11 | TOLERANCES  | FINISH | MATERIAL | DESCRIPTION |
|-------------------------------|----|------|-------|-----|----------|---|--------|----------|-------------|
| CHECKED                       |    |      |       |     |          | See Cont'g to ISO 8803 C10<br>Die Coating to ISO 8802 C18 |        |          |             |
| ALL DIMENSIONS IN MILLIMETRES |    |      |       |     |          | Hole centres & posns ±                                    |        |          |             |

## 10 – Spare Parts List

The following spare parts can be ordered directly from the manufacturer:

| <b>Part Number</b> | <b>Description</b>     |
|--------------------|------------------------|
| D23720             | 575w Metal Halide Lamp |
| C03022-00          | Lampholder – GX9.5     |
| C22268-01          | Breather Unit          |
| C20645-00          | Front glass            |
| C20567-00          | Front glass gasket     |
| C23653-00          | Reflector              |
| C22056-00          | Ignitor                |
| C20537-00          | Ballast                |
| C14135-00          | Fuse Carrier           |
| C15754-00          | Fuse                   |

In order to prolong the life and performance of your product, we recommend that you only specify Francis Searchlights spare parts. This will ensure that any warranties on your equipment will not be invalidated.

When ordering spare parts please contact the Sales Department at Francis Searchlights Limited. Please quote searchlight model and serial number at all times. This will enable a fast response to your spares' requirements.