



## User Instruction & Installation Manual

### FH380RC 1200 Watt Metal Halide Searchlight



### Product Reference Number:

**A2447 – 240v REMOTE CONTROL**

#### *Manufacturers details:*

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Manual Part Number: C16562  
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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 manufacturers technical data when dealing with lamps.

### 3 – Technical Information

This product has been designed to operate in accordance with the product specification. The FH380RC 1200 watt searchlight has the following features:

- All marine grade materials and fixings;
- Parabolic glass reflector;
- Stove enamel painted;
- 385° horizontal rotation;
- Vertical movement 25° to -25°;
- Motor speed 0-20°/sec fast, 0-10°/sec slow (Pan)  
0-10°/sec fast, 0-5°/sec slow (Tilt);
- Remote focus facility;
- Instant lamp re-strike. No cooling down time required;
- Economical 750 hour lamp life;
- Toughened front glass;
- Luminous flux 110000;
- Colour temperature 6000K;
- G.R.P. control gear protected to IP66;

The searchlight also performs to the following optical data:

- Metal Halide light source
- Lamp Wattage - 1200 Watts;
- Supply voltage - 220/240V;
- Peak Beam Candlepower – 28,500,000 lux;
- Range – 5343 metres;
- Divergence – 3.5°;
- Temperature range: -50°C (with heaters fitted)

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 through the deck and bolt the searchlight base securely. On an uneven surface it is necessary to use a suitable sealant, such as silicone, in order to ensure a weatherproofed joint. If anti-vibration mounts are to be fitted, the fixing holes for the mounts should also be marked out and drilled. Prior to manoeuvring the searchlight into its' fixing position, the AV mounts should be fitted to the base. 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 know more then 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 control panel to the searchlight:

Searchlight	240v 1.2Kw
Cable Size (mm <sup>2</sup> )	Distance Max
1.5	62 MTRS
2.5	101 MTRS
4.0	160 MTRS
6.0	249 MTRS
10.0	417 MTRS

- 4) Whenever possible cable terminations should be made below deck 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 FH380RC Variable Speed searchlight is as follows:**

Referring to wiring diagram C23131, a supply is fed into the control gear enclosure, which then provides a common feed to the motor gearbox, control gear and the searchlight control panel. The searchlight has been pre-wired with 3 meters of cable from the gearbox to junction box provided.

Cables required to be connected by the customer: -

5 core 1.5mm cable from the Junction Box to the Control Panel,  
3 core 1.5mm cable from the Junction Box to the Control Panel.  
3 core 1.5mm cable from the Junction Box to the Control Gear.  
12 core 0.5mm cable from the Junction Box to the Control Panel.

### **Optional Slave Panel Wiring**

8 core 0.5mm<sup>2</sup> cable from the Slave Panel to the Junction Box.

The Mains cable to the Control Gear and 3 core 1.5mm cable from the Control Gear to the Control Panel is to be supplied by the customer.

The searchlight head is pre-wired along with the connecting cable to the motor gearbox.

When the searchlight is operational the output from the control gear should be 100 volts at 13.8 amps.

## 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.

All control gear should be housed below deck/in doors. Never leave the control gear exposed to weather conditions.

The searchlight can be remotely positioned via the joystick control panel, with the facility for movement up, down, left and right. The speed of movement depends on the more pressure applied to the joystick the faster the searchlight moves. When in the desired position the joystick should be released so that it returns to its' home position, dead centre.

The variable speed gearbox has a fast and slow setting. You activate this by switching the controller switch on the control panel then selecting fast or slow.

The beam of the searchlight can be adjusted to give a variety of beam types. Using the yellow remote focus button on the joystick panel, the desired beam can be achieved for any particular application. The beam will move continuously through 'spot' to 'flood'. In order to fix the beam type, simply release the button at the desired position.

The heaters specified on this equipment are self-regulating and will shut off when they reach the dew point temperature.

**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 manufacturers 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 barrel. If this arcing is heard switch off the supply at the mains. Remove the Rear Access Panel 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 rear access panel, 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 manufacturers 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 on the rear access panel of the searchlight. If found to be faulty a new ignitor must be fitted.

### Failure of Remote Focus Facility

The remote focus mechanism is controlled by a small electric motor situated on the lampholder assembly within the searchlight barrel. If the focus of the light fails the following procedure should be adopted:

- 1) Remove the front bezel from the searchlight barrel and examine focus mechanism. If parts have become loose, tighten fasteners. The mechanism operates on a cam action and this should be checked for correct positioning;
- 2) If the mechanism is okay, check the supply to the motor. This can be done by simply placing a multimeter across the motor terminals;

- 3) If supply is present, this indicates that the motor has failed. Replace the focus motor ensuring that the assembly is correct;
- 4) If no supply is present, check the transformer in the control gear enclosure. Using a multimeter check the supply into and from the transformer. If found to be faulty, replace the transformer and check operation of focus mechanism.
- 5) If no supply is present in the control gear, check mains supply. This should be examined and rectified accordingly.

**Note: If a fault occurs on the motor gearbox, the unit should be returned to Francis Searchlights Limited for fault evaluation and repair.**

## 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 before every voyage or at least 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 if required;
  - Check the reflector mounting gaskets. If signs of corrosion or damage are evident, replace as necessary;
  - 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.**

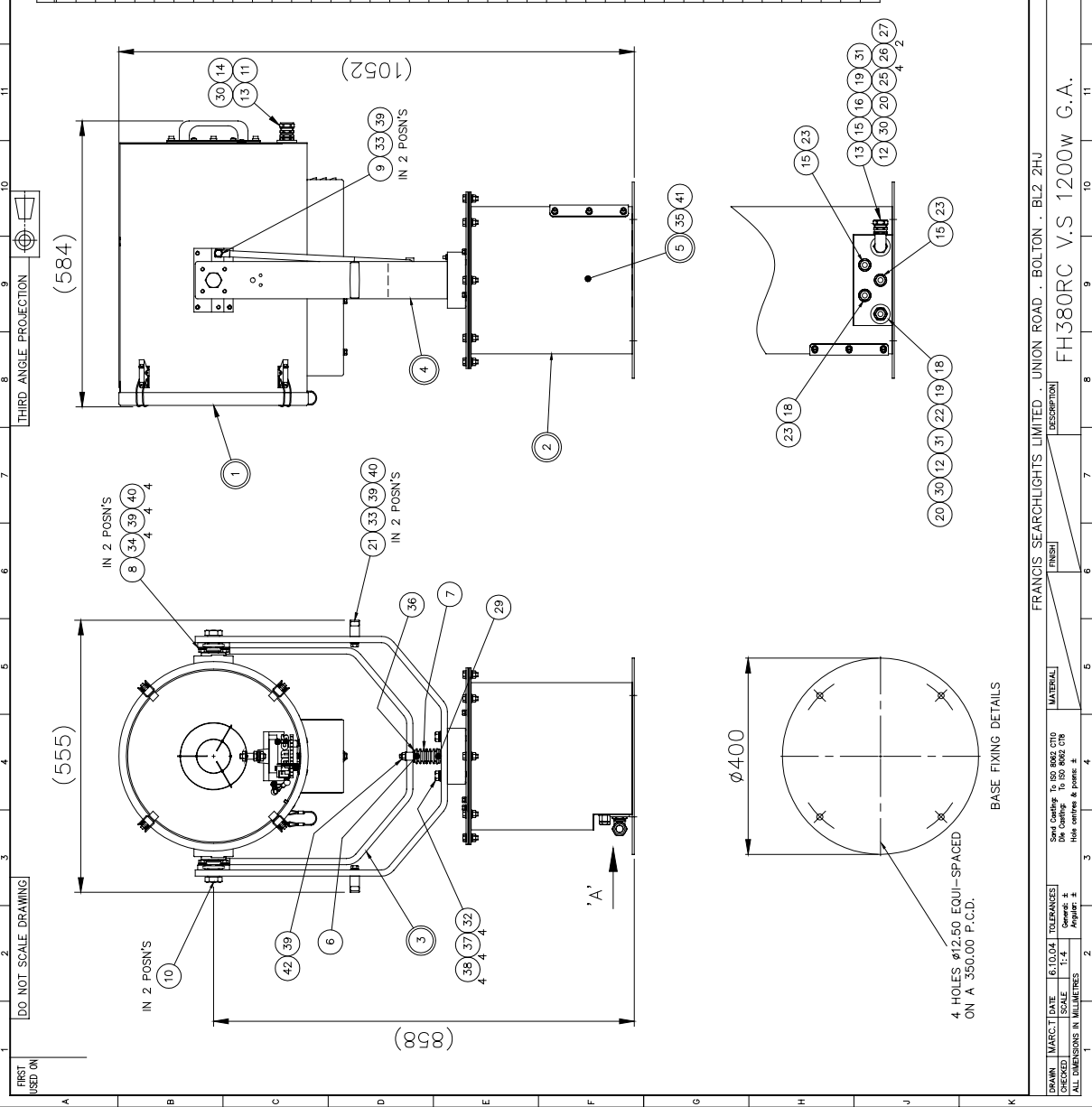
## 9 - Wiring Diagram & General Assembly

Drawing Number	Description
C23131	FH380RC 1200w 240v Variable Speed Wiring Diagram
A2447	FH380RC 1200w 240v Variable Speed G.A Control panel outline drawing
C23605	Junction Box Assembly
C24585	Control Gear Assembly



ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C21149	C21149	BARREL ASSY 240V	1
2	C22363	C22363	VARIABLE/S MOTOR UNIT	1
3	C21235	C21235	U-PIECE ASSY	1
4	C21237	C21237	CRUTCH SUB ASSY	1
5	C23174	C23174	TERMINAL RAIL ASSY	1
6	C20270	C20270	BELLOWS TOP BUSH	1
7	C20281	C20281	BELLOWS	1
8	C21823	C21823	FLANGE BEARING	2
9	C23331	C23331	U-PIECE BUSH	2
10	C21821	C21821	TRUNNION BOLT	2
11	C23579	C23579	M20 CABLE GLAND WASHER	1
12	C23578	C23578	M25 CABLE GLAND WASHER	2
13	C13762	C13762	CONDUIT GLAND M20	2
14	C22931	C22931	M20 GLAND LOCKNUT	1
15	C13751	C13751	CONDUIT M20	1
16	C22401	C22401	90° BEND ADAPTOR M20	1
17	C10158	C10158	GLAND M20	2
18	C12415	C12415	GLAND M20	2
19	C22571	C22571	REDUCING GLAND M25-M20	2
20	C22830	C22830	M25 GLAND LOCKNUT	2
21	C20943	C20943	LIFTING HANDLE	2
22	C20241	C20241	CABLE 3M 12 CORE 0.5mm	1
23	C20341	C20341	CABLE 3M 5 CORE 1.5mm	1
24	C08791	C08791	CABLE 3M 3 CORE 1.5mm BLK	1
25	C13872	C13872	CABLE 7M 1.5mm RED	4
26	C13873	C13873	CABLE 7M 1.5mm BLACK	2
27	C16112	C16112	CABLE 7M 1.5mm G/YELLOW	1
28	C16593	C16593	CABLE 3M 4 CORE 1.5mm	1
29	C21967	C21967	'O' RING	1
30	C23580	C23580	'O' RING	3
31	C23581	C23581	'O' RING	2
32	C08088	C08088	SCREW M10 x 30 HEX HD	4
33	C09208	C09208	SCREW M8 x 30 HEX HD	4
34	C06088	C06088	SCREW M8 x 25 HEX HD	8
35	C08985	C08985	SCREW M5 x 10 PAN HD	1
36	C08370	C08370	WASHER M12 PLAIN	1
37	C06091	C06091	WASHER M10 PLAIN	4
38	C16313	C16313	WASHER M10 S/C SPRING	4
39	C06999	C06999	WASHER M8 PLAIN	13
40	C15041	C15041	WASHER M8 S/C SPRING	10
41	C09231	C09231	WASHER M5 S/C SPRING	1
42	C12554	C12554	NUT M8 NYLOCK	1

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C21149	C21149	BARREL ASSY 240V	1
2	C22363	C22363	VARIABLE/S MOTOR UNIT	1
3	C21235	C21235	U-PIECE ASSY	1
4	C21237	C21237	CRUTCH SUB ASSY	1
5	C23174	C23174	TERMINAL RAIL ASSY	1
6	C20270	C20270	BELLOWS TOP BUSH	1
7	C20281	C20281	BELLOWS	1
8	C21823	C21823	FLANGE BEARING	2
9	C23331	C23331	U-PIECE BUSH	2
10	C21821	C21821	TRUNNION BOLT	2
11	C23579	C23579	M20 CABLE GLAND WASHER	1
12	C23578	C23578	M25 CABLE GLAND WASHER	2
13	C13762	C13762	CONDUIT GLAND M20	2
14	C22931	C22931	M20 GLAND LOCKNUT	1
15	C13751	C13751	CONDUIT M20	1
16	C22401	C22401	90° BEND ADAPTOR M20	1
17	C10158	C10158	GLAND M20	2
18	C12415	C12415	GLAND M20	2
19	C22571	C22571	REDUCING GLAND M25-M20	2
20	C22830	C22830	M25 GLAND LOCKNUT	2
21	C20943	C20943	LIFTING HANDLE	2
22	C20241	C20241	CABLE 3M 12 CORE 0.5mm	1
23	C20341	C20341	CABLE 3M 5 CORE 1.5mm	1
24	C08791	C08791	CABLE 3M 3 CORE 1.5mm BLK	1
25	C13872	C13872	CABLE 7M 1.5mm RED	4
26	C13873	C13873	CABLE 7M 1.5mm BLACK	2
27	C16112	C16112	CABLE 7M 1.5mm G/YELLOW	1
28	C16593	C16593	CABLE 3M 4 CORE 1.5mm	1
29	C21967	C21967	'O' RING	1
30	C23580	C23580	'O' RING	3
31	C23581	C23581	'O' RING	2
32	C08088	C08088	SCREW M10 x 30 HEX HD	4
33	C09208	C09208	SCREW M8 x 30 HEX HD	4
34	C06088	C06088	SCREW M8 x 25 HEX HD	8
35	C08985	C08985	SCREW M5 x 10 PAN HD	1
36	C08370	C08370	WASHER M12 PLAIN	1
37	C06091	C06091	WASHER M10 PLAIN	4
38	C16313	C16313	WASHER M10 S/C SPRING	4
39	C06999	C06999	WASHER M8 PLAIN	13
40	C15041	C15041	WASHER M8 S/C SPRING	10
41	C09231	C09231	WASHER M5 S/C SPRING	1
42	C12554	C12554	NUT M8 NYLOCK	1

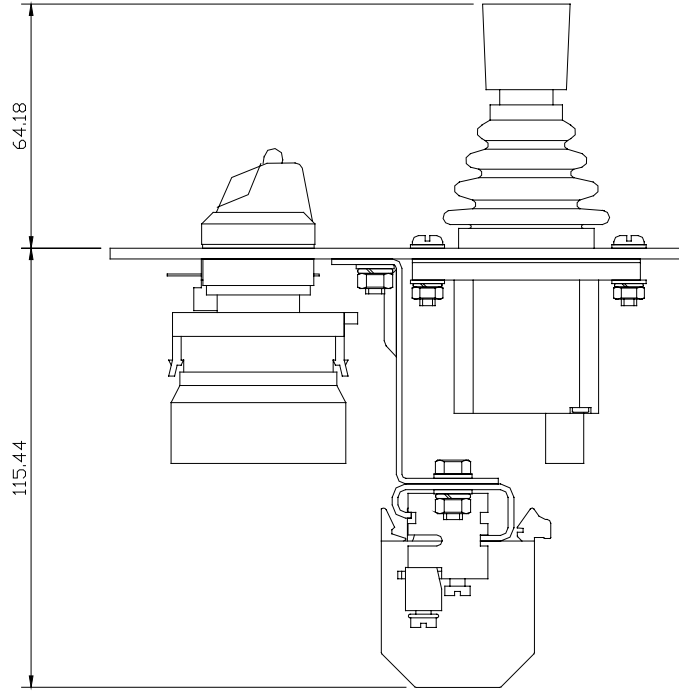
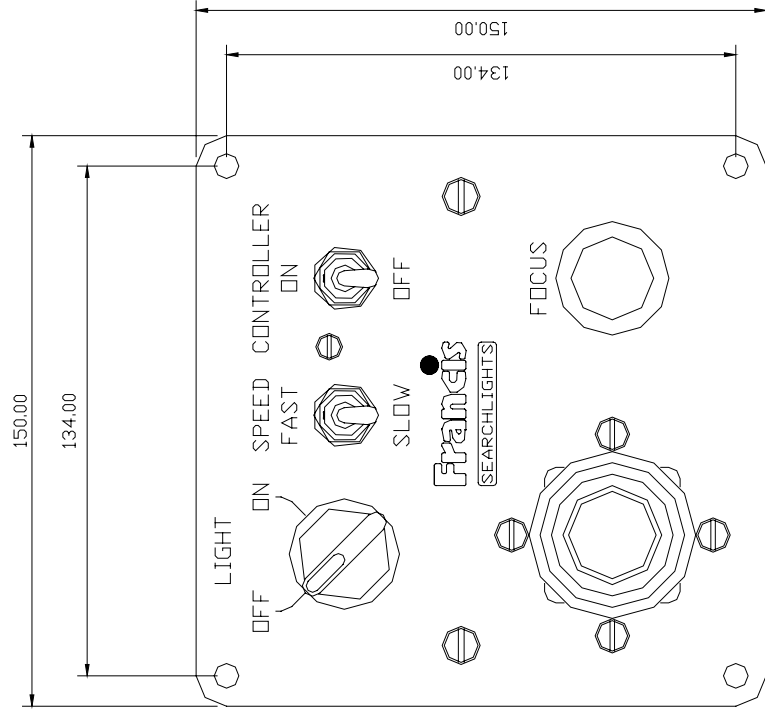


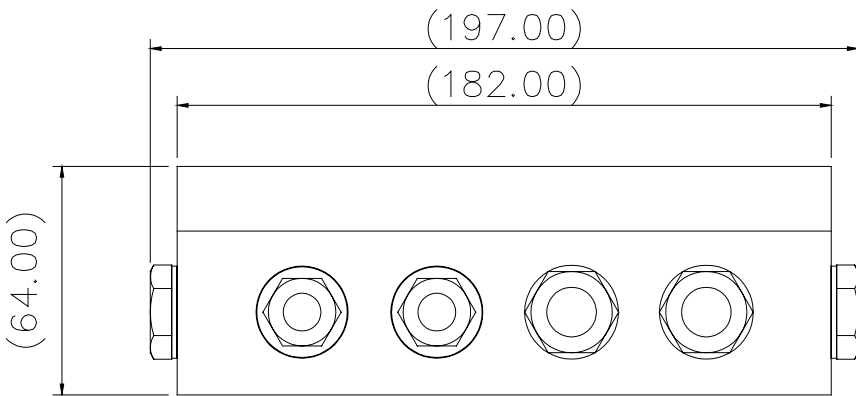
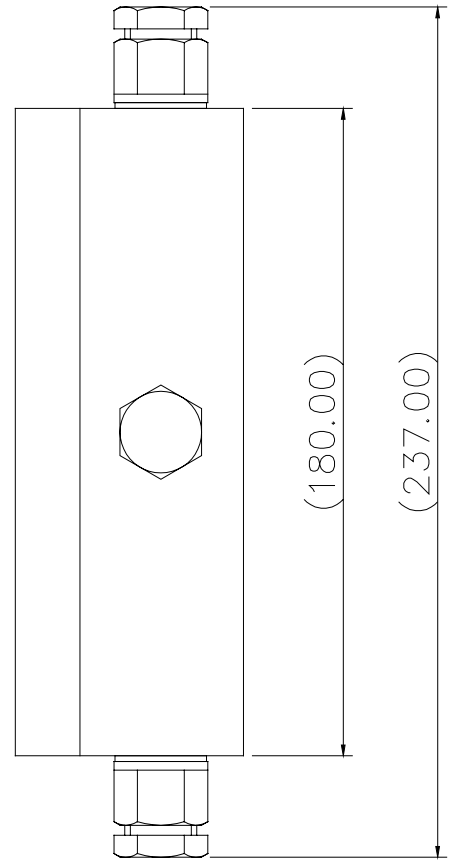
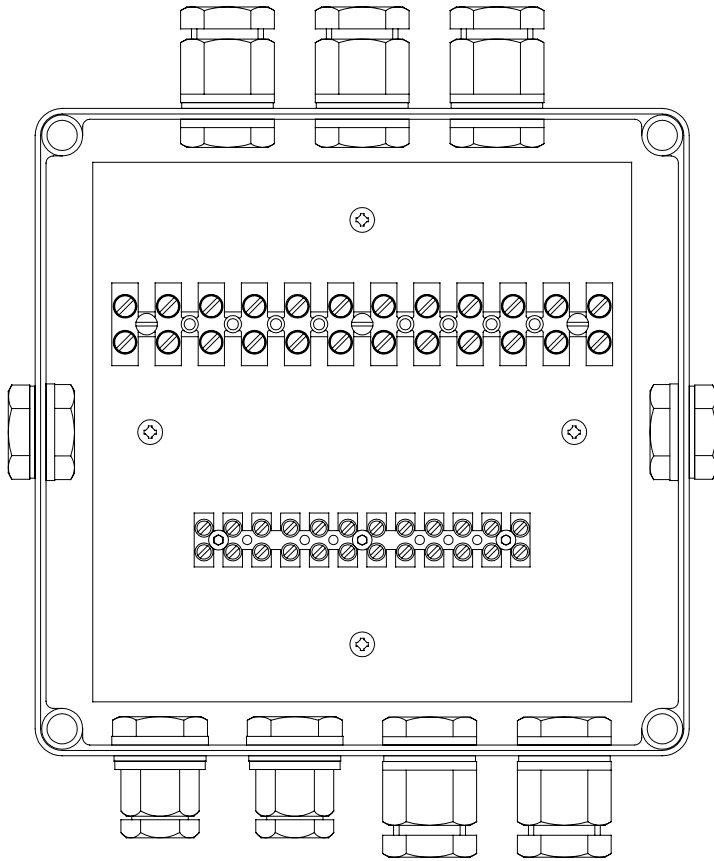
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CHECKED	SCALE	1:1	General: ±	Dim. Conting. To ISO 8002 C18
ALL DIMENSIONS IN MILLIMETRES			Angular: ±	Note centres & points: ±

MATERIAL	FINISH	DESCRIPTION

STANDARD PRACTICE	Debut at cut/machine edges	Break corners R0.25(Max) 1:0.5L
2004	A1	CONT ON SHEET

PART No./DRG No.	SHEET
A2447	1





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## 10 – Spare Parts List

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

Part Number	Description
D15746	1.2Kw Metal Halide Lamp
C09868-00	Lampholder – G38
C14143-00	Switch 10A - On/Off
C14142-00	Switch - Focus
C08919-00	Front glass
C08920-00	Front glass gasket
C22347-00	Joystick
C22941-00	Switch (Controller/Speed)
C16410-00	Motor - Remote Focus
C16854-00	Diode
C08885-00	Reflector
C20224-00	Fan
C16880-00	Ignitor
C23496-00	Ballast
C24552-00	Fuse – 10amp
C20234-00	Capacitor - 60 $\mu$ F

### Motor gearbox spares

C22403-01	Pan Motor S/Assy
C22287-00	Tilt Motor
C22380-00	Microswitch no lever
C22382-00	Microswitch with lever
C24030-01	'I' Drive Pan Speed Controller
C24060-01	'I' Drive Tilt Speed Controller
C23530-00	P.S.U.
C22301-00	Pedestal Top Sealing Gasket
C21225-00	Pedestal Cover Gasket

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.