



User Instruction & Installation Manual

FH300 Remote Control Variable Speed Twin Head Metal Halide Searchlight



Product Reference Number:

A6074 – FH300RC 575w Twin Head 240v

Manufacturer's details:

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Manual Part Number: C24870

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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 FH 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.

- Prevent rain, snow, condensation and water droplets from contacting the lamp as this may cause bulb failure and possible shattering;
- Quartz halogen bulbs run with a high internal pressure in excess of atmospheric. Whilst the construction is inherently strong, there is a slight risk of the bulb shattering;
- Never look directly into an illuminated searchlight as this may cause severe damage to eyesight. If it is necessary to inspect a lamp whilst in operation, always wear suitable protective goggles;
- 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;
- Never attempt to clean a lamp whilst in use;
- 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 breaking a lamp for disposal, care must be taken to ensure the glass fragments are safely contained. This operation must be performed out of doors in free air. In all circumstances refer to the lamp manufacturers instructions packed with the lamp;
- 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 FH300RC Twinhead searchlight has the following features:

- All marine grade materials and fixings;
- Parabolic glass reflector;
- Stove Enamel Power Coating paint;
- Instant lamp re-strike. No cooling down time required;
- Economical 750 hour lamp life;
- 385° horizontal rotation;
- Vertical movement +30° to -30°;
- Motor speed 0-20°/sec fast, 0-10°/sec slow (Pan)
0-10°/sec fast, 0-5°/sec slow (Tilt);
- Remote focus facility;
- Thermostatically controlled internal heater.(Optional);
- Toughened front glass;
- Luminous flux 49000;
- Colour temperature 6000K;
- G.R.P. control gear protected to IP66;

The 240v searchlight also performs to the following optical data:

- Metal Halide light source G22;
- Lamp Wattage - 575 Watts;
- Supply voltage - 220/240V;
- Peak Beam Candlepower – 13,600,000 lux with standard Glass
- Peak Beam Candlepower – 10,880,000 lux with UV Glass
- Range – 3685 metres;
- Range UV – 2948 metres
- Divergence – 2.5°;
- 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, 4 Holes Ø12.5mm on a 350 PCD. 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. On an uneven surface it may be necessary to use a suitable sealant such as silicone, in order to ensure a weatherproofed joint.

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 following table should be used for indication purposes only:

Searchlight	240v 575w
Cable Size (mm ²)	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 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;

Installation Guidelines

Standard

A typical installation and connection routine for the FH300RC Twin Head searchlight is as follows:

Referring to wiring diagram C24871-1, the Mains supply is fed into each control gear, which then provides a common feed to the motor gearbox, control panel and the searchlight.

The searchlight has been pre-wired with 3 meters of cable from the gearbox to junction box & to the Control Gear Enclosure.

Cables required to be connected by the customer: -

8 core 1.5mm cable from the Junction Box to the Control Panel.

12 core 0.5mm cable from the Junction Box to the Control Panel.

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

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 can be remotely positioned via the joystick control panel, with the facility for movement up, down, left and right. When in the desired position the joystick should be released so that it returns to its' home position, dead centre.

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 jacket 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;
- 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;
- The lamp must be capable of unimpeded expansion when it warms up to operating temperature. Mechanical forces must not be applied to the fused quartz bulb;
- Before the protective jacket 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);

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

When fitting the lamp:

- Always isolate the equipment from the supply when inserting a lamp;
- Ensure the circuit is suitably fused;
- Ensure the lamp is of the correct power rating and type;
- Check lampholder is in good condition. If the contacts show any sign of corrosion, replace the lampholder;
- Check the lampholder is in a good dry condition. Never allow water to collect in the lamp fitting or come into contact with the lamp.

To fit the lamp:

- Loosen all the thumbscrews on the front of the searchlight, remove the bezel and glass and store in a safe place;
- For easier access the light shield/spill ring may be removed by undoing the fasteners;
- Cut open one end of the protective sleeve surrounding the lamp;
- Using the sleeve to prevent the fingers coming into contact with the lamp, position the two pins above the holes in the lampholder;
- Gently push the lamp into the lampholder and remove the protective sleeve;
- Replace the light shield/spill ring and front bezel assembly, ensuring the thumbscrews are securely fastened.

Testing

Upon correct installation and connection to an electrical supply, the equipment can be tested in order to ensure its' correct performance. A competent person with some knowledge of electrical equipment must carry out this work.

Equipment required: Multi-meter with leads
 Ammeter

Using the equation $P=VI$, the approximate power output of the equipment can be calculated in the following way:

- Using the multi-meter, take a voltage reading;
- Using the ammeter, take an amps reading from the live cable to the lamp;
- Multiply these figures together to give an approximate wattage (Power output).

For example:

Using a 24v 150w Tungsten halogen lamp:
Voltage reading = 24v; Amps reading = 6 amps

Therefore, Wattage = $24 \times 6 = 144$ watts

7- Fault Finding

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

Failure of Lamp to light

Causes:

- 1) Power not supplied;
- 2) Fuse blown;
- 3) Failed lamp

Remedy:

- 1) Check voltage at supply. If supply is not present the fault is at the customer supply. If power is present, see remedy 2;
- 2) Check fuse for visual failure. If none noticeable check fuse for continuity using a multi-meter. If fuse found to be faulty, replace with new part and test equipment again for correct working order. If found to be working correctly see remedy 3;
- 3) Firstly, check supply at lampholder connecting block (within searchlight barrel). If supply is present, disconnect unit from power supply before removing the lamp. If noticeable damage to filament is present, the lamp will have failed. The lamp can also be checked for continuity using a multi-meter. Replace lamp ensuring all precautions and instructions previously outlined in this manual are adhered to.

Failure of Remote Focus

Causes:

- 1) Power not supplied;
- 2) Faulty connections;
- 3) Failed motor

Remedy:

- 1) Check voltage at supply. If no supply present fault is at customer supply. If power is present see remedy 2;
- 2) Check all wiring connections on motor and terminal rail, in accordance with the wiring diagram. If found to be correct, see remedy 3;
- 3) Remove focus motor and apply 24v DC directly across terminals. If motor does not rotate the unit has failed. A new focus motor should be fitted to the lampholder assembly.

NOTE: If a fault occurs on the pan and tilt 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;
- It is advisable to check all seals and gaskets for signs of degradation. Renew if necessary;
- The searchlight is fitted with a breather unit. This ensures a steady airflow in order to prevent any vacuum forming within the barrel.
- 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 and General Assembly

Drawing Number	Description
A6074	FH300RC 575w 240v Twinhead Searchlight G.A
C24871	FH300RC 575w Twin Head Wiring Diagram
C21294	Control Gear Assembly
C26263	Junction Box Assembly
	Control Panel

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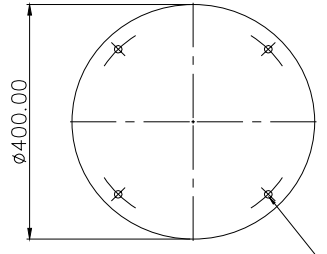
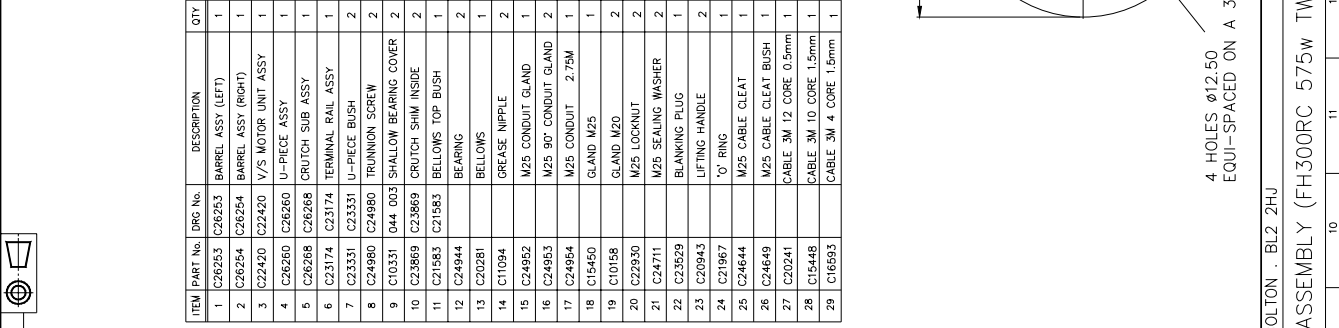
DATE	15	16
NO.		
MODIFICATION DETAILS		
1	AS FIRST DRAWN	A

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
30	C13872		CABLE 7M 1.5mm RED	1
31	C13873		CABLE 7M 1.5mm BLACK	1
32	C15112		CABLE 7M 1.5mm G/YELLOW	1
33	C08088		SCREW M10 x 30 HEX HD	4
34	C09208		SCREW M8 x 16 BTN HD	2
35	C21398		SCREW M6 x 12 HEX HD	2
36	C10733		SCREW M6 x 30 HEX HD	6
37	C11872		SCREW M6 x 25 HEX HD	2
38	C09580		SCREW M5 x 12 CSK HD	1
39	C10142		SCREW M5 x 16 HEX HD	8
40	C13352		SCREW M4 x 8 HEX HD	2
41	C14644		WASHER M10 PLAIN	6
42	C08091		WASHER M8 PLAIN	4
43	C15313		WASHER M10 S/C SPRING	4
44	C06999		WASHER M8 S/C SPRING	4
45	C15041		WASHER M6 S/C SPRING	15
46	C08997		WASHER M6 PLAIN	7
47	C10954		WASHER M5 S/C SPRING	8
48	C15273		WASHER M5 NYLON	16
49	C08392		WASHER M4 PLAIN	2
50	C09231		WASHER M4 S/C SPRING	2
51	C04376		WASHER M4 PLAIN	2
52	C09793		NUT M10 NYLOC	1
53	C12355		NUT M10 NYLOC	8
54	C08352		NUT M6 FULL NUT	6
55	C06267		NUT M6 FULL NUT	5
56	C22036		LABEL ISOLATE SUPPLY	5
57	C21464		LABEL DANGER 230v	5
58				

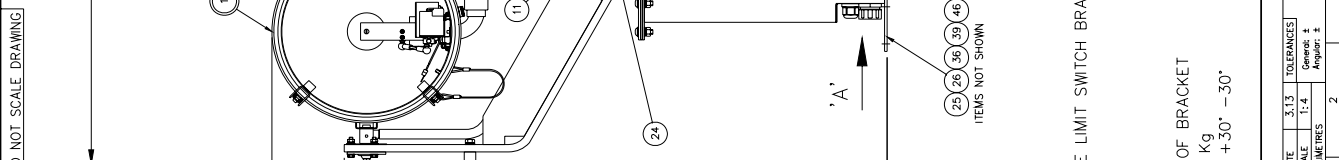
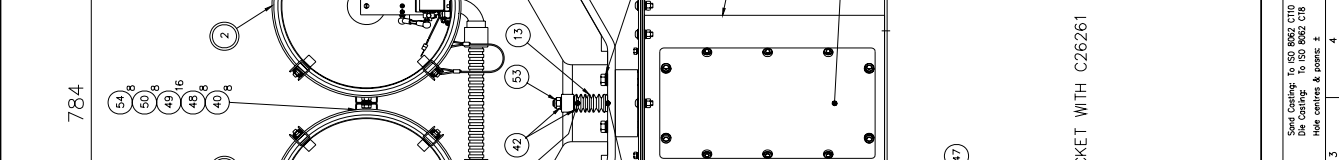
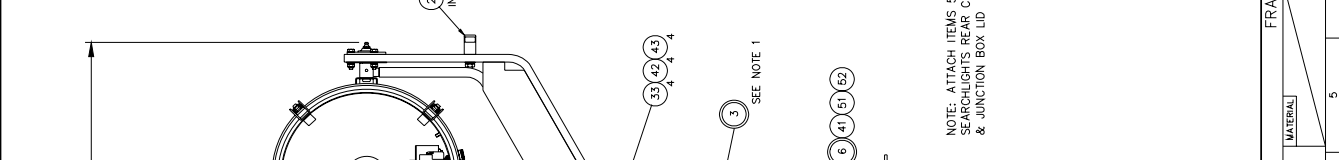
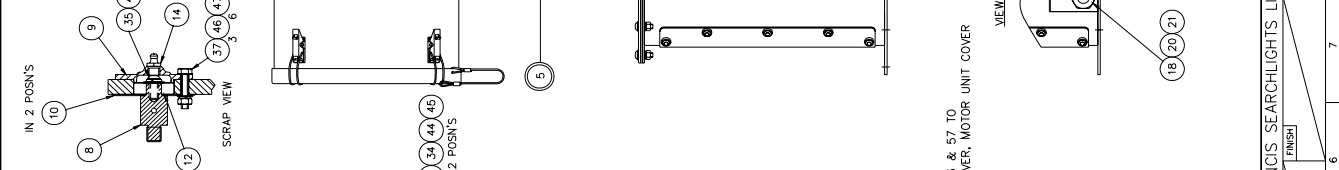
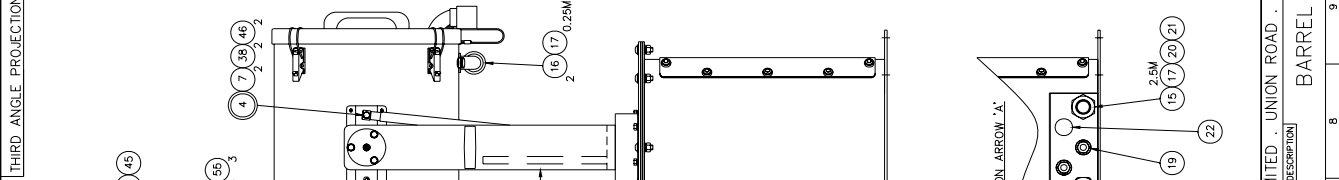
STANDARD PRACTICE
Below of cut/finished edges
Great corners R0.25(Max) U.S.

Francis
SEARCHLIGHTS LIMITED

© 2013	A1	CONT ON SHEET
		PART No./DRG No.
		A6074
		SHT
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4 HOLES Ø12.50
EQUI-SPACED ON A 350.00 P.C.D.



NOTE: ATTACH ITEMS 56 & 57 TO SEARCHLIGHTS REAR UNIT COVER, MOTOR UNIT COVER & JUNCTION BOX LID

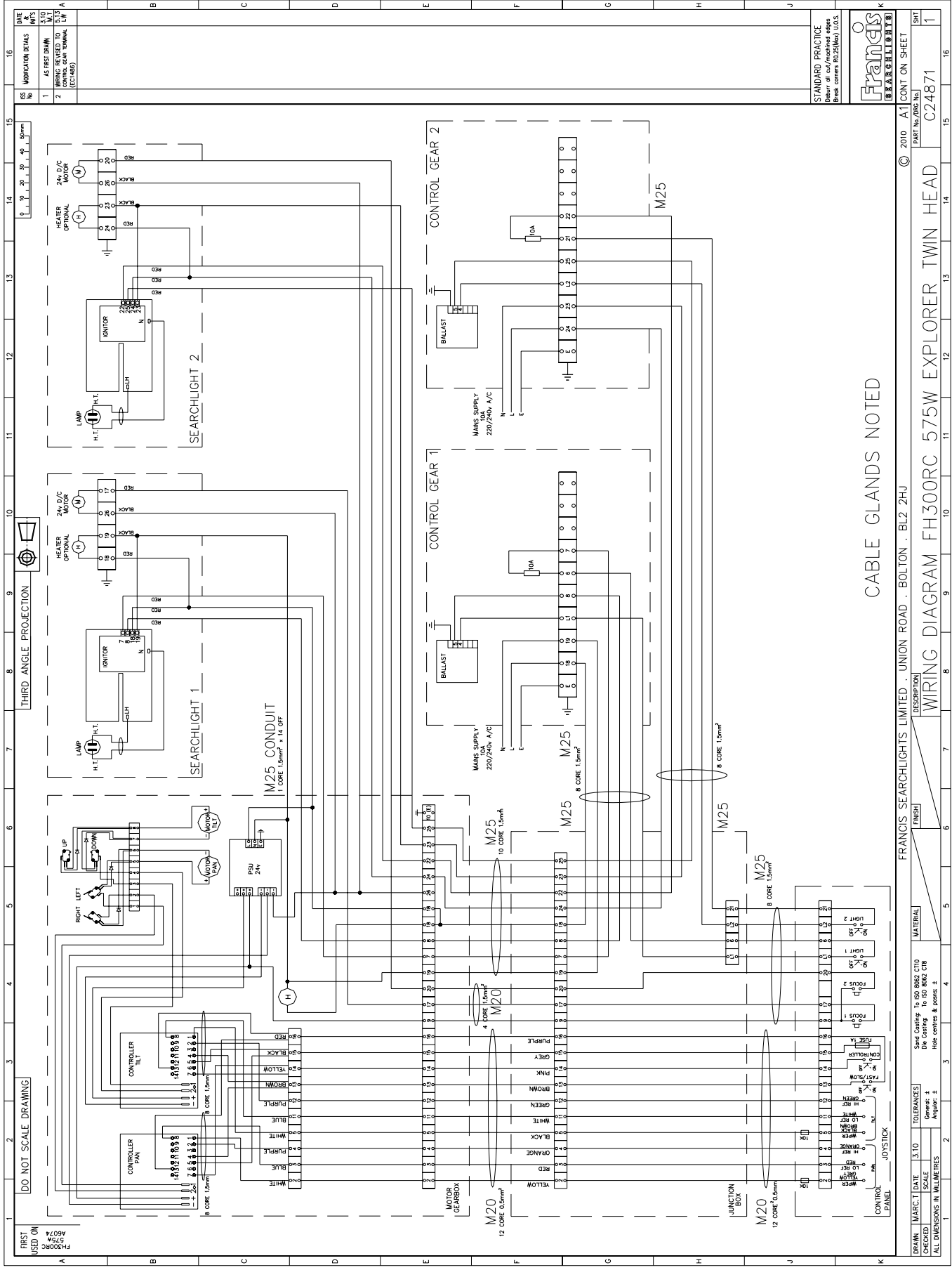
ITEMS NOT SHOWN
25 26 36 39 46 47

NOTE:
1. REPLACE LIMIT SWITCH BRACKET WITH C26261

EXTREMES OF BRACKET
WEIGHT 56 Kg
MOVEMENT +30° -30°

FIRST USED ON	DO NOT SCALE DRAWING	THIRD ANGLE PROJECTION	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
			0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
			0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160

FINISH	DESCRIPTION
	FRANCIS SEARCHLIGHTS LIMITED . UNION ROAD . BL2 2HU
	BARREL ASSEMBLY (FH300RC 575w TWIN HEAD)
MATERIAL	
Scale Conforming to ISO 6925 C10	
Scale Conforming to ISO 6925 C16	
Note centre & points 2	



REV	NO	DESCRIPTION	DATE
1	AS FIRST DRAWN	1/10	
2	AS NOTED AND WORKING AS DRAWN (ECC-1485)	1/10	

DO NOT SCALE DRAWING

FIRST USED ON
FRANCIS SEARCHLIGHTS LIMITED
BOLTON

THIRD ANGLE PROJECTION

SEARCHLIGHT 1

SEARCHLIGHT 2

M25 CONDUIT
1 CORE 1.5mm² x 14.0FT

M20
12 CORE 0.5mm²

M25
8 CORE 1.5mm²

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10 CORE 1.5mm²

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CHECKED	General: 2	Angular: 1	
ALL DIMENSIONS IN MILLIMETRES			

FINISH

FRANCIS SEARCHLIGHTS LIMITED · UNION ROAD · BOLTON · BL2 2JH

DESCRIPTION

WIRING DIAGRAM FH300RC 575W EXPLORER TWIN HEAD

PART No./REV. No.

C24871

CONT ON SHEET

A1

1

STANDARD PRACTICE
Drawn as cut/machined edges
Break corners R0.25(Min) U.S.G.S.

1 2 3 4 5 6 7 8 9 10 11

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

DATE 3.98 D.S.

ISS No. 1

MODIFICATION DETAILS

AS FIRST DRAWN

BALLAST BRKT ADDED (EC0652)

CONTROL GEAR ASSY REVISED (EC0711)

ITEM 4 BILL W.D. 7.99 R/JM

ITEM 4 DELETED (EC0736)

ITEM REFS REVISED 4.00 FOR NEW DESIGN C21294 & C21295 ADDED TO DRC. (EC0794)

PART No. CORRECTION 6.05 (EC0911)

BALLAST MOD. 6.05 (EC0936)

EXTRA EARTH ADDED (EC1097)

GLANDS & TERMINALS CHANGED FOR NEW IGNITOR (EC1100)

REC. FOR NEW M.C. (EC1144)

C10158 HAS REPLACED C1012415 (EC1179)

C24230 ADDED (EC1184)

STANDARD PRACTICE

Debur all cut/machined edges

Break corners R0.25(Max) U.S.S.

1998 A2 CONT ON SHEET

FRANCIS SEARCHLIGHTS

FRANCIS SEARCHLIGHTS LIMITED . UNION ROAD . BOLTON . BL2 2HU

Some Casting: to ISO 8062 C10

Die Casting: to ISO 8062 C18

Hole centres & posns. #

FINISH

DESCRIPTION

575W CONTROL GEAR ASSY

575W CONTROL GEAR ASSY

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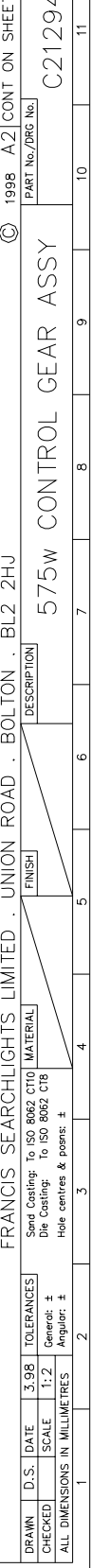
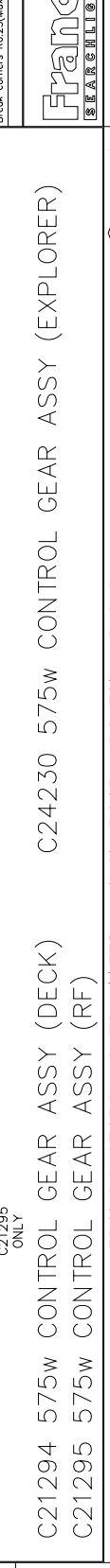
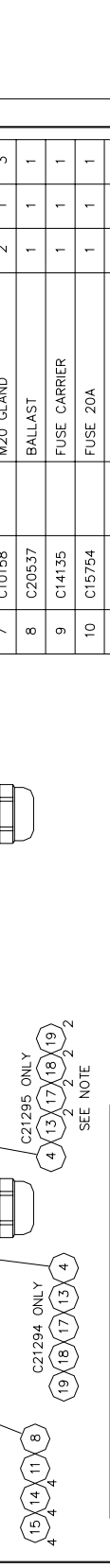
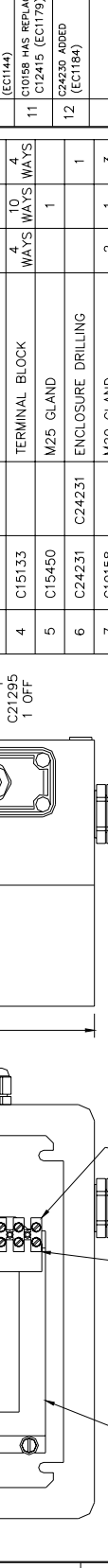
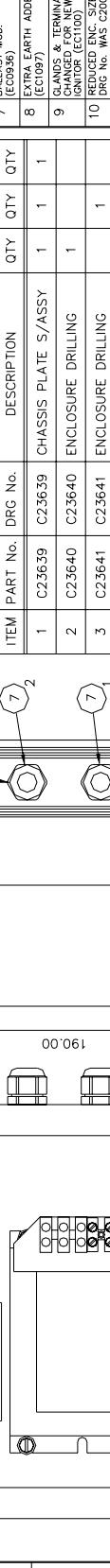
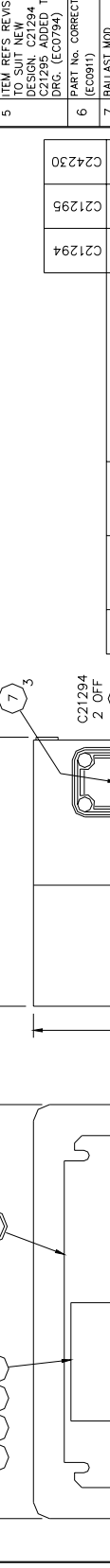
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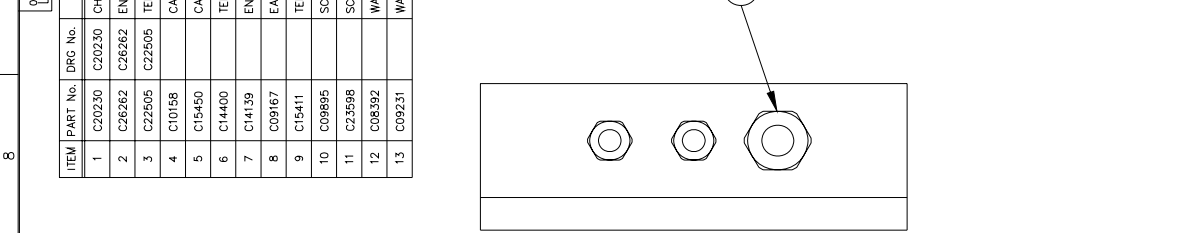
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1	C23639	C23639	CHASSIS PLATE S/ASSY	1	1	1
2	C23640	C23640	ENCLOSURE DRILLING	1	1	1
3	C23641	C23641	ENCLOSURE DRILLING	1	1	1
4	C15133		TERMINAL BLOCK	4	10	4
5	C15450		M25 GLAND	1	1	1
6	C24231	C24231	ENCLOSURE DRILLING			1
7	C10158		M20 GLAND	2	1	3
8	C20537		BALLAST	1	1	1
9	C14135		FUSE CARRIER	1	1	1
10	C15754		FUSE 20A	1	1	1
11	C10213		M6 x 12 PAN HD SCREW	4	4	4
12	C10136		M4 x 16 PAN HD SCREW	1	1	1
13	C10139		M3 x 20 PAN HD SCREW	1	2	1
14	C10554		M6 S/C SPRING WASHER	4	4	4
15	C06997		M6 PLAIN WASHER	4	4	4
16	C08793		M4 S/C SPRING WASHER	1	1	1
17	C10747		M3 S/C SPRING WASHER	1	2	1
18	C08028		M3 PLAIN WASHER	1	2	1
19	C05298		M3 FULL NUT	1	2	1



DRWN	D.S.	DATE	3.98	TOLERANCES
CHECKED	SCALE	1:2	General: #	Angular: #
ALL DIMENSIONS IN MILLIMETRES				
FRANCIS SEARCHLIGHTS LIMITED . UNION ROAD . BOLTON . BL2 2HU				
FINISH				
DESCRIPTION				
575W CONTROL GEAR ASSY				
PART No./DRG No.				
C21294				
SHT				
1				

DATE & INTS	11
MODIFICATION DETAILS	AS FIRST DRAWN
ISS No	1

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C20230	C20230	CHASSIS PLATE ASSY	1
2	C26262	C26262	ENCLOSURE DRILLING	1
3	C22505	C22505	TERMINAL RAIL	1
4	C10158		CABLE GLAND M20	3
5	C16450		CABLE GLAND M25	4
6	C14400		TERMINAL	25
7	C14139		END COVER	1
8	C09167		EARTH END STOP	2
9	C15411		TERMINAL MARKER	50
10	C08895		SCREW M5 x 10 PAN HD	2
11	C23598		SCREW #4 x 8 PAN POLIMATEHD	2
12	C08392		WASHER M5 PLAIN	2
13	C09231		WASHER M5 S/C SPRING	2



STANDARD PRACTICE	2010	A2	CONT ON SHEET
Deburr all cut/mech'd edges			
Break corners R0.25(Max) U.O.S.			

FRANCIS SEARCHLIGHTS LIMITED · UNION ROAD · BOLTON · BL2 2HJ

DESCRIPTION: JUNCTION BOX ASSY FH300 TWIN HEAD

FINISH: [Blank]

MATERIAL: [Blank]

Font Casting: To ISO 8662 CT10

Die Casting: To ISO 8662 C18

Hole centres & posns: ±

DRAWN	LW	DATE	3.10	TOLERANCES	General: ± 0.20
CHECKED		SCALE	1:2	Angular: ±	
ALL DIMENSIONS IN MILLIMETRES					

DO NOT SCALE DRAWING

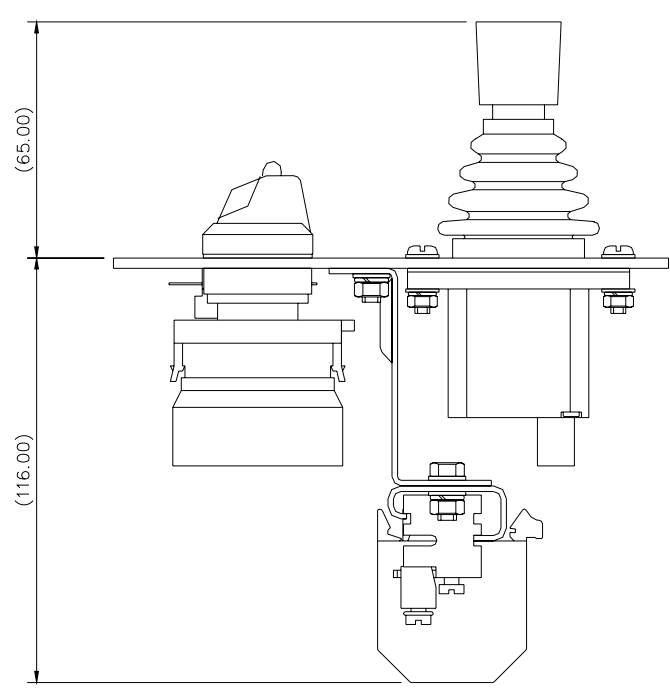
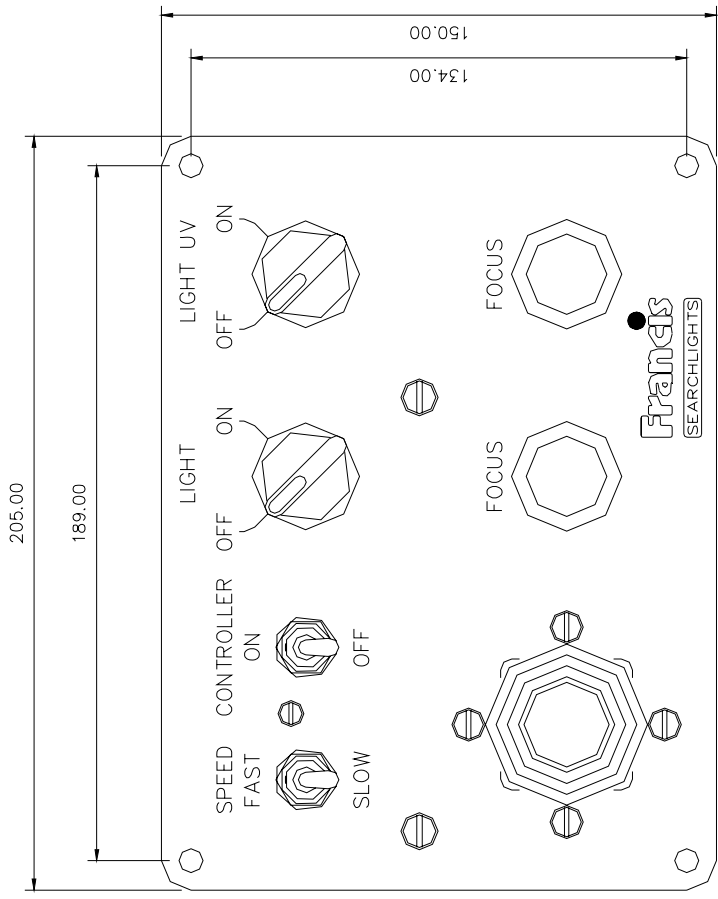
THIRD ANGLE PROJECTION

50mm scale bar: 0, 10, 20, 30, 40, 50mm

FRANCIS SEARCHLIGHTS

DATE & INTS	11
MODIFICATION DETAILS	AS FIRST DRAWN
ISS No	1

FRANCIS SEARCHLIGHTS



10 - Spare Parts List

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

Part Number	Description
Searchlight Spares	
D15764	575w Metal Halide Lamp
C10870-00	Lampholder – G22
C08890-00	Front glass
C21849-00	UV Front Glass
C08891-00	Front glass gasket
C08884-00	Reflector
C23338-00	Ignitor
C22268-01	Breather Unit Assembly
C14143-00	Switch - On/Off
C14142-00	Switch – Focus
C14444-00	Joystick
C16410-00	Motor - Remote Focus
C16761-00	A.V. Mount (Lampholder)
C20281-00	Bellows
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
C23530-01	P.S.U.
C22301-00	Pedestal Top Sealing Gasket
C26185-00	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.