



User Instruction & Installation Manual

LX300 Deck & Cabin 24v 150 Watt Xenon Searchlight



Product Reference Number:

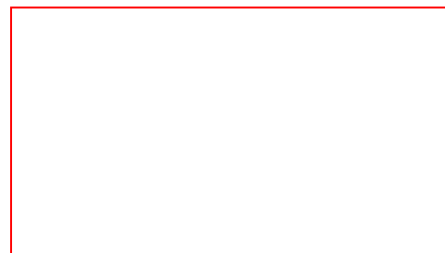
A2476 – LX300 Deck

A2478 – LX300 Cabin

Manufacturers 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

Distributor details:



Manual Part Number: C23169
Issue : 5

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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 Xenon 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 LX300 150watt searchlight has the following features:

- All marine grade materials and fixings;
- Parabolic aluminium deep-dish reflector;
- Stove enamel painted;
- Full 360° horizontal rotation;
- Vertical movement +40° to -35° (Deck); ±25° (Cabin);
- Remote focus facility;
- Internal self-regulating heater;
- Instant lamp re-strike. No cooling down time required;
- Economical 1200 hour lamp life;
- Toughened front glass;
- Supplied with control panel incorporating focus control and on/off switch;
- Luminous flux 2900;
- Colour temperature 6000K;
- Sealing to IP66 Gearbox, IP66 Searchlight, IP67 PSU Box & IP65 Control Box.
- Deck searchlight weight 16.9 Kgs.
- Underdeck mechanism 2.3 Kgs.
- PSU weight 2.7 Kgs.
- Control panel box assembly 0.5 Kgs.

The searchlight also performs to the following optical data:

- Xenon light source
- Lamp Wattage - 150 Watts;
- Supply voltage – 24v DC;
- Peak Beam Candlepower – 6,079,770 lux;
- Range – 2,465 metres;
- Adjustable lamp focus, 1.5° spot to 10° flood;
- Temperature range: -50°C

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

Using the template provided mark out and drill the fixing holes through the deck or cabin roof. In the case of cabin control models, a centre hole is also required to allow the mechanism to pass through.

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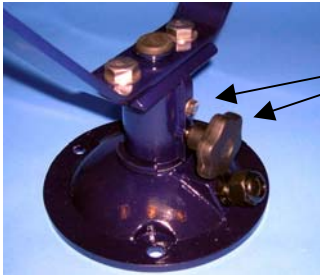
For Deck Models

Fit the 'O' Ring in position and bolt the searchlight base securely down. On an uneven surface it is necessary to use a suitable sealant, such as silicone, in order to ensure a weatherproofed joint.

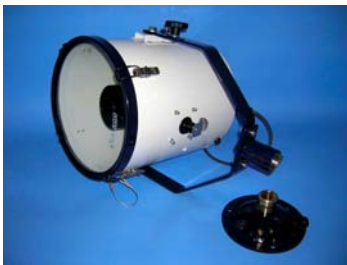
For Pedestal Models

Mark out and drill through the deck or cabin roof using the template provided. Remove the cable gland in the base and replace with the blanking plug supplied. Secure the pedestal to the deck using appropriate fixings and then mount the searchlight to the pedestal and secure using the fixings provided. A drilled hole is also required in the deck to allow for the connection to an electrical supply. The searchlight is supplied with 3 metres of supply cable so that the installer can choose a suitable connection point.

Fitting Instructions for Lite Range Cabin Model



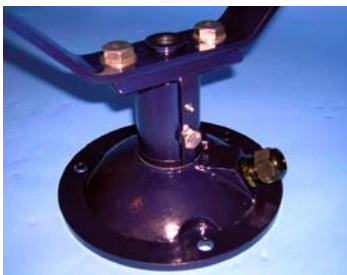
Remove the Base Lockwheel and the M6 Hexagon Screw.



Now lift the searchlight head and crutch free of the base.



Insert the brass Crutch Base Sleeve into the Crutch Base and align the spot face with the top M6 hole. (Do not fasten the Crutch Base Sleeve in position yet).



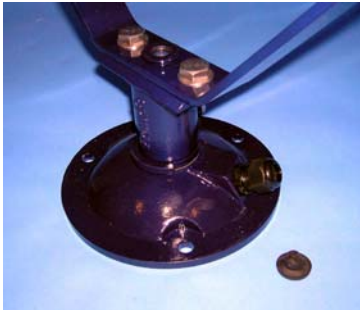
Re-mount the searchlight head onto its base and fasten in position using the M8 x 10 hexagon screw in the bottom fixing.



Now remove the following items as these are only required on deck models.
Barrel Lockwheel
Elevation Link & Fixings.



When installing the Underdeck Mechanism first separate the following items. U-Piece Assembly, M8 Nyloc Nut, M8 Plain Washer, M12 Plain Washer, Rubber Bellows, Bellows Top Bush and the Push Rod Top Bush.



Remove the Blanking Plug from the Bellows Bottom Bush.



Insert the Underdeck through the centre mounting hole, rotating until the Push Rod engages in the Crutch Base Sleeve.



When fully located fix in position using the top M6 hexagon screw. (do not overtighten)



Fasten the underdeck Mechanism using the 3 off M6 x 16 Pan head screws and spring washers.

Re-Fit the follows items



Push Rod Top Bush
Bellows Top Bush

Rubber Bellows

M12 Plain Washer
U-Piece Assembly
M8 Plain Washer

M8 Nyloc Nut



U-Piece fixings



Fix the U-Piece Assembly using the above fixings make sure there is a Plain Washer both side of the U-Piece Bush.



Completed. Make sure the searchlight pans and tilts correctly.

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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	LX300 24v 150w
Cable Size (mm ²)	Distance Max
1.5	5 MTRS
2.5	8 MTRS
4.0	13 MTRS
6.0	20 MTRS
10.0	34 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

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

Referring to the wiring diagram C23159, a 24v supply is fed to the Control Panel which then provides a common feed to the PSU and all other components.

Cables requiring connection by customer:

8 core 1.5mm² from the searchlight to the PSU box,

3 core 6mm² and 5 core 1.5mm² from the PSU box to the control panel. All three cables are supplied in 3 metre lengths.

When the light is in operation the output from the PSU should be approximately 17.5v 8 amps.

Basic Operation

When the searchlight is turned on a 24v supply is fed to the PSU. This in turn generates a sufficient voltage to the ignitor in order that the ignition voltage is achieved and the Xenon lamp strikes. After the lamp has lit, the PSU regulates the voltage through the ignitor so that the lamp operates within its design parameters.

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 positioned using the elevation and base lockwheels. When in the desired position the lockwheels should be securely fastened to prevent damage.

The beam of the searchlight can be adjusted to give a variety of beam types. Using the remote focus switch on the control 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 switch at the desired position.

Please note that a heater is fitted in the searchlight and is hardwired so that it is permanently on. The heater specified on this equipment is self-regulating and will shut off when the dew point temperature is reached. It should be noted that the power to the control panel must be left on to allow the heating element to function correctly.

The breather at the rear of the searchlight ensures a steady airflow to prevent any vacuum forming within the barrel.

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.

Please refer to the following table for the trouble-shooting of Xenon lamps.

Fault	Cause	Remedy
<ul style="list-style-type: none"> ■ Wrong Polarity 	<ul style="list-style-type: none"> ■ Lamp incorrectly fitted ■ Faulty wiring 	<ul style="list-style-type: none"> ■ Anode (large electrode) must always be on top in vertical burning position ■ Check polarity, transpose connections if necessary
<ul style="list-style-type: none"> ■ Cap overheated ■ Cap temperature above 230°C 	<ul style="list-style-type: none"> ■ Faulty contacts ■ Cooling equipment defective 	<ul style="list-style-type: none"> ■ Check terminals, tighten or renew ■ Check cooling equipment and replace if necessary
<ul style="list-style-type: none"> ■ Arc unsteady 	<ul style="list-style-type: none"> ■ Lamp operated outside current control range ■ Magnetic stabilisation for horizontal operation defective 	<ul style="list-style-type: none"> ■ Correct current setting ■ Check magnetic stabilisation
<ul style="list-style-type: none"> ■ Bulb draws in air 	<ul style="list-style-type: none"> ■ Crack in graded seal caused by overheated cap ■ Maximum cap temperature 230°C 	<ul style="list-style-type: none"> ■ Check terminals - tighten or renew
<ul style="list-style-type: none"> ■ Glass erosion on fused quartz bulb 	<ul style="list-style-type: none"> ■ Lamp operated outside current control range ■ Lamp service life exceeded 	<ul style="list-style-type: none"> ■ Correct current setting ■ Check meter
<ul style="list-style-type: none"> ■ Electrodes damaged ■ Premature blackening 	<ul style="list-style-type: none"> ■ Current ripple too high ■ Auxiliary mirror incorrectly adjusted 	<ul style="list-style-type: none"> ■ Have power supply inspected ■ Adjust auxiliary mirror
<ul style="list-style-type: none"> ■ Asymmetrical blackening of lamp (in horizontal burning position) 	<ul style="list-style-type: none"> ■ Lamp operated too long in same position 	<ul style="list-style-type: none"> ■ Turn lamp through 180° after half service life

Failure of Lamp to ignite

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

- 1) Check that the supply is connected to the control panel and check all connections as per the wiring diagram. On operation if the lamp does not light, switch off 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. Remove the front and rear bezels 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 front and rear bezels, ensuring the latches are securely fastened, and perform the check again, listening for the cracking. If the lamp still fails to ignite, switch off at the supply 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 xenon 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 25,000 volts or higher). Switching the lamp on activates the ignitor. A cracking or hissing noise should be heard. The ignitor is housed within the rear of the searchlight barrel. 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 rear bulkhead assembly within the searchlight barrel. If the focus of the light fails the following procedure should be adopted:

- 1) Remove the rear 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 there is a fault on the control panel (check all terminations are secure) or with the supply. This should be examined and rectified accordingly.

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;
- 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.

Notes for Lamp Fitting/Removal

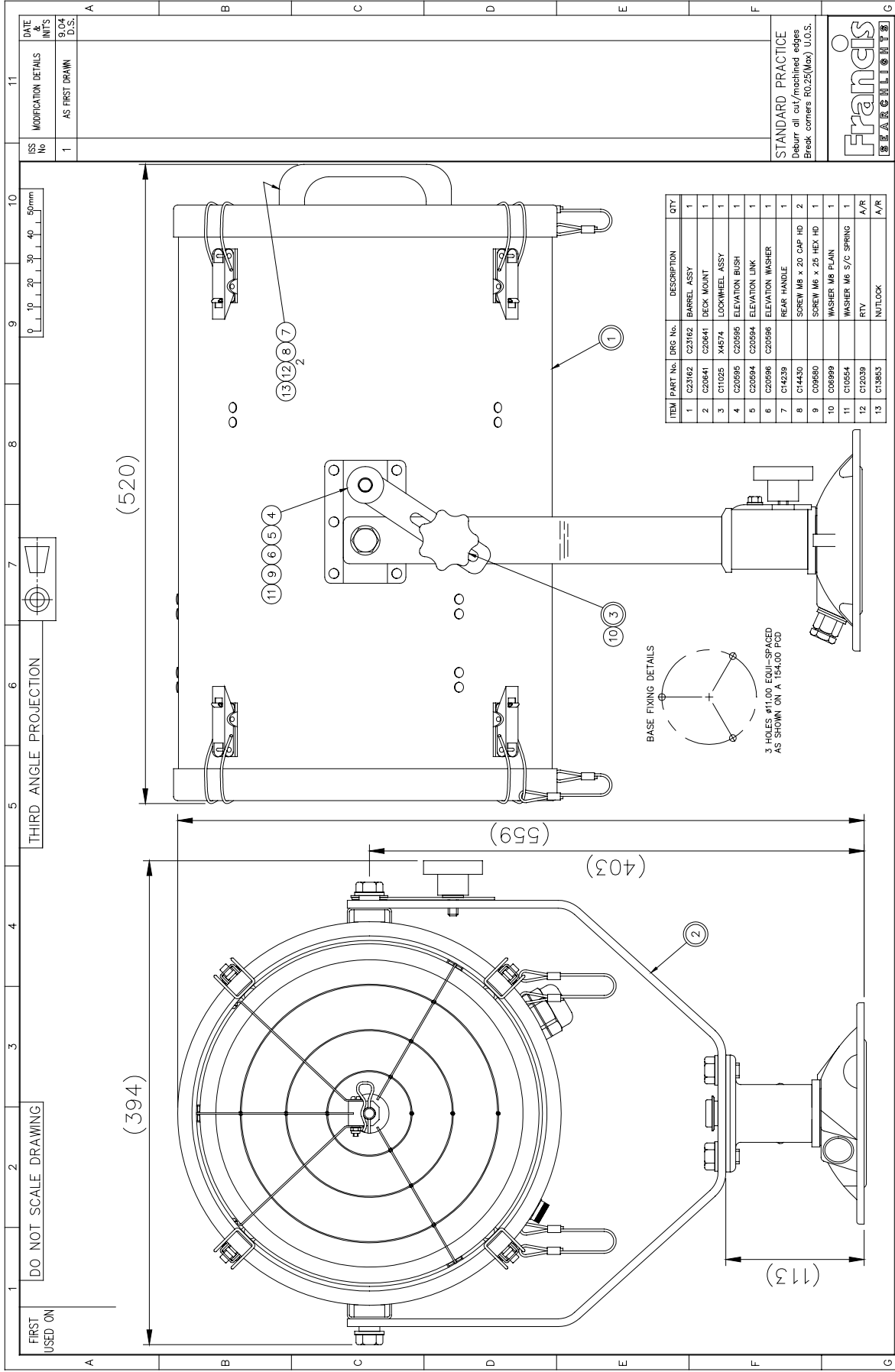
To fit lamp:

- Remove lamp from packaging, ensuring protective jacket is still in place;
- Remove front and rear bezels from searchlight by unfastening the latches.
- Now remove the spill rings from the front of the searchlight by removing the clips;
- Place the lamp through the lampholder HT/reflector boss and secure with T-bar at rear;
- Place the HT lead (red) over the front of the lamp (positive) and secure in position using the lamp heatsink;
- Now screw the Tufnol insulator into the lamp heatsink and ensure that the HT lead is tightly secured to prevent any arcing;
- Place the PTFE bush over the insulator and fix mechanism in position by pushing the retaining clip through the insulator;
- Replace the spill rings in front of barrel and fix in position with clips;
- Replace front and rear bezel assemblies and fasten down latches securely, ensuring bezels are central to barrel and a good seal is achieved;
- Reverse this procedure for lamp removal.

Note: The protective lamp jacket must be removed prior to lamp strike. Retain jacket for future use.

9 – General Assembly and Wiring Diagram

Drawing Number	Description
A2476	LX300 Deck 24v 150w
A2478	LX300 Cabin 24v 150w
C23159	Wiring Diagram
X4193	Control Panel Wiring



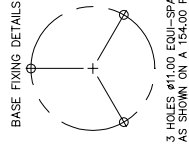
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION



ISS No	1
DATE	AS FIRST DRAWN
MODIFICATION DETAILS	
INT'S	
G.O.A	
D.S.	

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C23162		BARREL ASSY	1
2	C20641		DECK MOUNT	1
3	C11025	X4574	LOCK/WHEEL ASSY	1
4	C20695		ELEVATION BUSH	1
5	C20584		ELEVATION LINK	1
6	C20586		ELEVATION WASHER	1
7	C14239		REAR HANDLE	1
8	C14430		SCREW M6 x 20 CAP HD	2
9	C09680		SCREW M6 x 25 HEX HD	1
10	C06899		WASHER M6 FLAN	1
11	C10554		WASHER M6 S/C SPRING	1
12	C12039		RTV	A/R
13	C13853		NUTLOCK	A/R



STANDARD PRACTICE
Debur all cut/machined edges.
Break corners R0.25(Max) U.S.S.

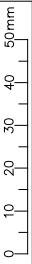


FRANCIS SEARCHLIGHTS LIMITED . UNION ROAD . BOLTON . BL2 2HU	© 2004	A2	CONT ON SHEET
DRAWN	D.S.	DATE	6.9.04
CHECKED	SCALE	1:2	TOLERANCES
ALL DIMENSIONS IN MILLIMETRES	General: ±	Angular: ±	
Sand Casting: To ISO 8062 CT10		MATERIAL	
Die Casting: To ISO 8062 CT8		FINISH	
Hole centres & posns: ±		DESCRIPTION	
		LX300D 24V 150W	
		PART No./DRG No.	
		A2476	
		SHT	
		1	

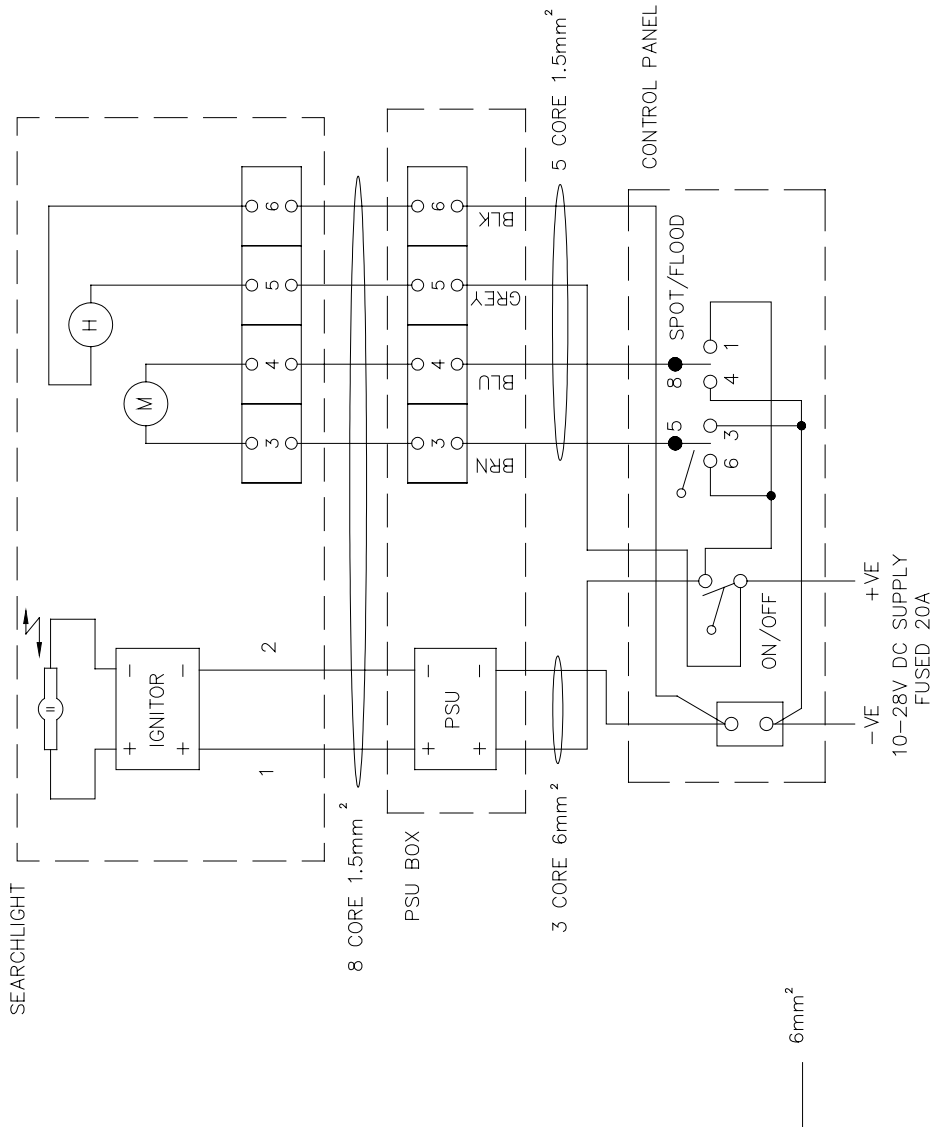
FIRST USED ON
LX300
150W

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THIRD ANGLE PROJ



ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	9.04 D.S.
2	5 CORE CABLE COLOUR CHANGE (EC1084)	12.05 M.T
3	8 CORE CABLE WAS 12 CORE (EC1324)	6.09 LW



STANDARD PRACTICE
Deburr all 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 CT8

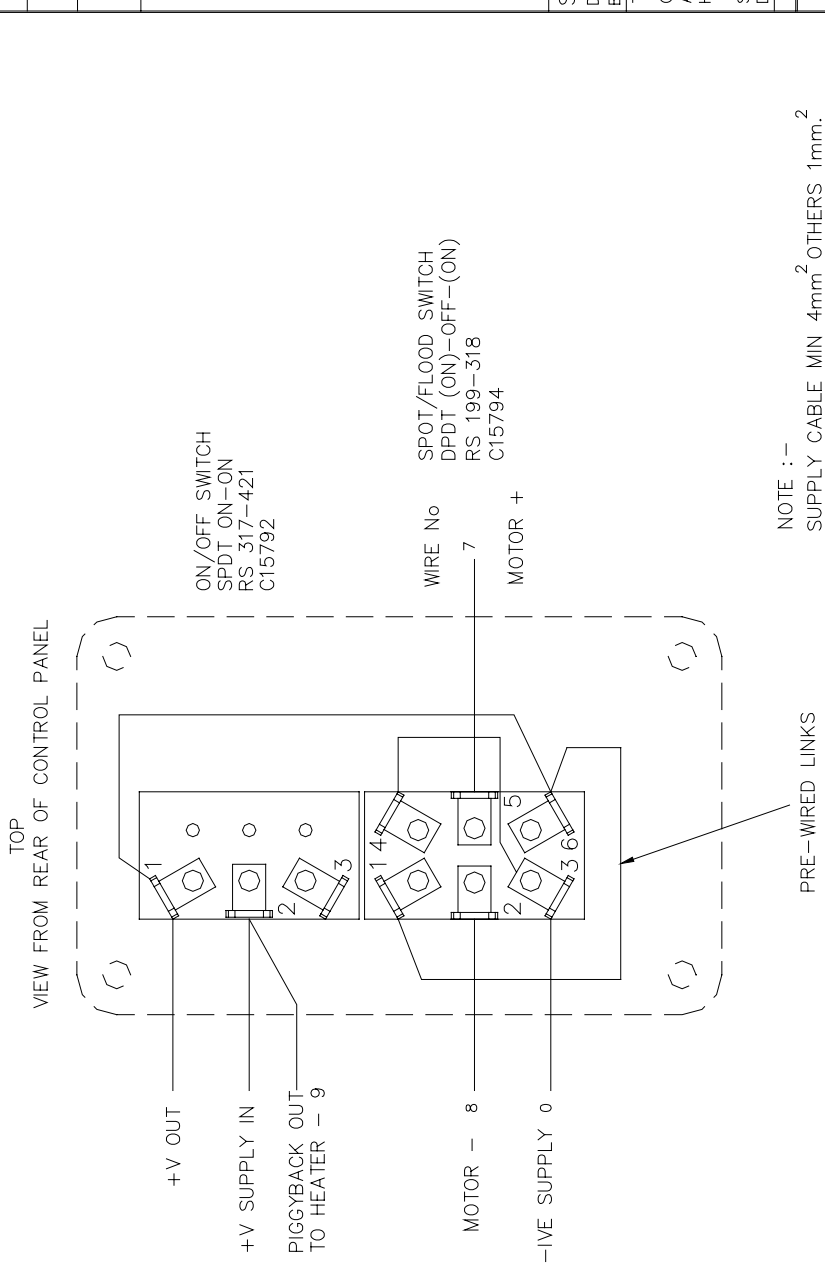
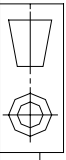
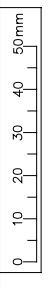


DRAWN		D.S.	DATE	15.7.04	MATERIAL	FINISH	DESCRIPTION	
CHECKED		SCALE		WIRING DIAGRAM		PART No./DRG No.		SHT
ALL DIMENSIONS IN MILLIMETRES		© 2004		A3	CONT ON SHEET		C23159 1	

FIRST USED ON
FX230

DO NOT SCALE DRAWING

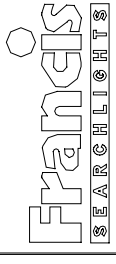
THIRD ANGLE PROJ



NOTE :-
SUPPLY CABLE MIN 4mm² OTHERS 1mm.²
ALL CONNECTIONS 0.25 RECEPTICLES.

ISS No	MODIFICATION DETAILS	DATE & UNITS
1	AS FIRST DRAWN	11.94 D.S.
2	DRAWING REVISED	12.95 SJJ
3	HALF-STROBE REMOVED (EC0524)	10.96 D.S.
4	CONNECTION TO HEATER ADDED. (EC0892)	02.01 SJJ

STANDARD PRACTICE
Deburr all 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 CT8



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DRAWN	D.S.	DATE	30.11.94	MATERIAL
CHECKED		SCALE		
ALL DIMENSIONS IN MILLIMETRES				FINISH
DESCRIPTION			PART No./DRG No.	SHT
CONTROL PANEL WIRING			X4193	1

10 – Spare Parts List

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

Part Number	Description
D8151	150w Xenon Lamp
C10168-00	'O' ring Base
C10169-00	'O' ring Spigot
C22072-00	Push rod seal washer
C21967-00	Bellows bottom bush 'O' ring
C20281-00	Bellows
C24348-01	Deck Lockwheel Assembly (Pan & Tilt)
C20745-01	Cabin Lockwheel Assembly (Tilt)
C20645-00	Front glass
C20567-00	Front glass gasket
C21909-00	Reflector
C14230-00	Retaining Pin
C21567-00	Barrel Heater
C22268-01	Breather Assembly
C15299-18	Lamp Connector
C23171-01	Lampholder H.T.
C16592-00	Ignitor
C16410-00	Motor - Remote Focus
C16596-00	150w Xenon PSU
C15792-00	On/Off Switch
C15794-00	Focus Switch

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.

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