



User Instruction & Installation Manual

FB230 Tungsten Halogen Searchlight



Product Reference Number:

B7162 – FB230 LV Chrome **B7168 – FB230 LV Semi-Gloss Black**
B7181 – FB230 HV Chrome **B7174 – FB230 HV Semi-Gloss Black**

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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 FB 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 FB230 searchlight has the following features:

- All marine grade materials and fixings;
- Parabolic glass reflector;
- Stove enamel paint or chrome finish;
- 360° horizontal rotation;
- Vertical movement +90° to -30°;
- Toughened front glass;
- Tungsten halogen light source 12/24v or 110/230v;
- External lamp focus adjustment between;
- Integral on/off switch;
- Enclosure protection to IP56;

The searchlight also performs to the following optical data:

Volts	Watts	Range @ 1 Lux	P.B.C.P. x 1000	Div*	Lamp Life (Hours)	Lamp Cap	Despatch Number
12v	100w	643M	414	2°	2000	GX6.35	D9848
24v	150w	784M	614	2°	300	GX6.35	D14795
24v	250w	910M	828	2°	2000	GX6.35	D4695
24v	250w	1095M	1200	2°	300	GX6.35	D9851
120v	300w	912M	832	4.9°	75	GX6.35	D16883
230v	300w	888M	790	4.9°	75	GX6.35	D16841

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

Bolt the searchlight firmly down, on and 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	12v 100w	24v 150w	24v 250w
Cable Size (mm ²)	Distance Max	Distance Max	Distance Max
1.5	2 MTRS	5 MTRS	3 MTRS
2.5	3 MTRS	8 MTRS	5 MTRS
4.0	5 MTRS	13 MTRS	8 MTRS
6.0	7 MTRS	20 MTRS	12 MTRS
10.0	15 MTRS	34 MTRS	20 MTRS

Searchlight	120v 300w	230v 300w
Cable Size (mm ²)	Distance Max	Distance Max
1.5	13 MTRS	24 MTRS
2.5	21 MTRS	39 MTRS
4.0	32 MTRS	62 MTRS
6.0	50 MTRS	96 MTRS
10.0	84 MTRS	161 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.

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 beam of the searchlight can be adjusted to give a variety of beam types. Using the external focus wheel, the desired beam can be achieved for any particular application.

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:

- Unclip the latches on the front of the searchlight, allowing the bezel and glass to hang clear on the captive latch;
- For easier access the light shield may be removed by undoing the centre screw;
- 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, fixing the centre screw in position;
- Position the front bezel onto the searchlight and retain in position using the latches;

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: Multimeter with leads
 Ammeter

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

- Using the multimeter, take a voltage reading;
- Using the ammeter, take an amp 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 multimeter. 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 multimeter. Replace lamp ensuring all precautions and instructions previously outlined in this manual are adhered to.

8 - Maintenance and Servicing

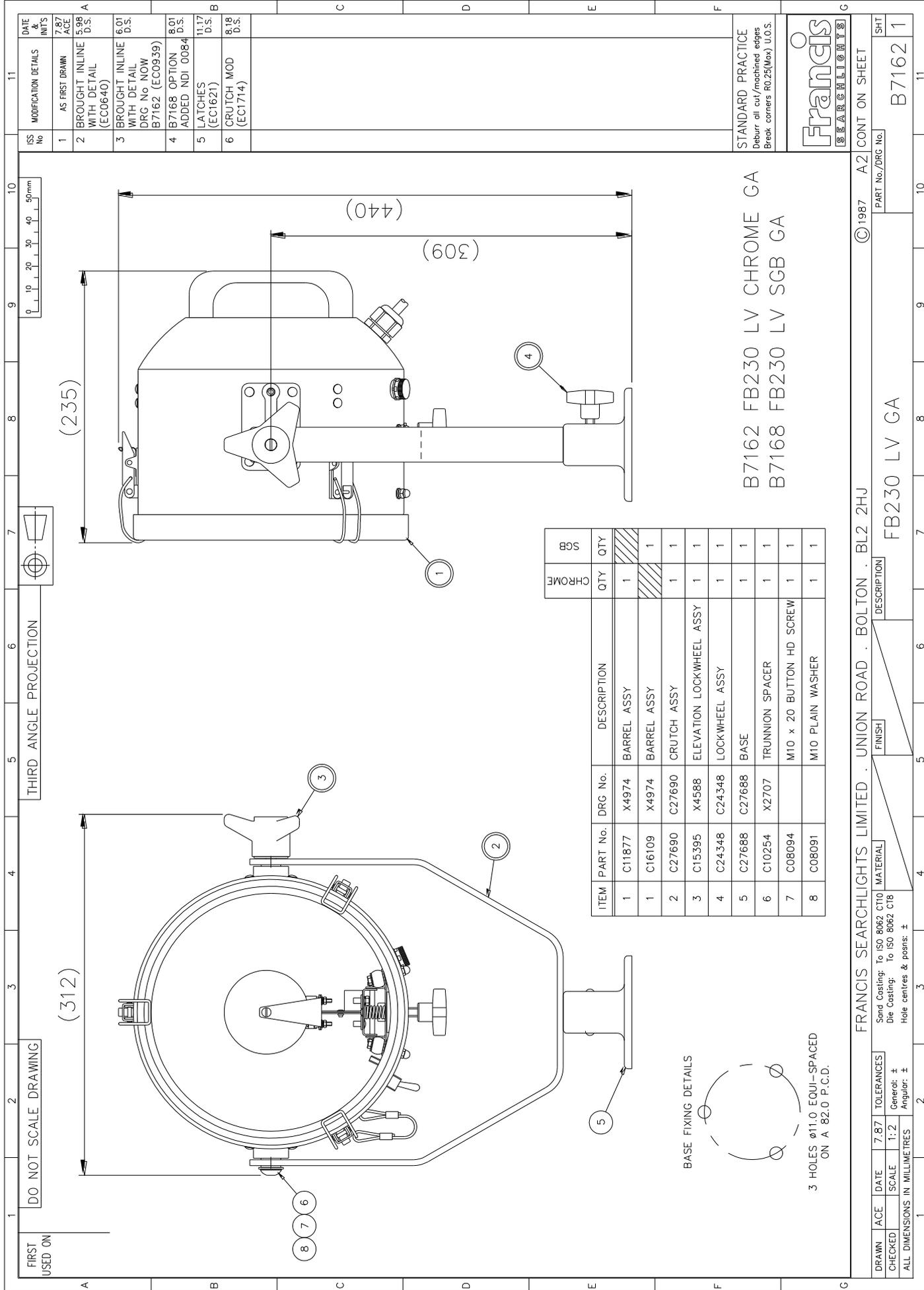
In order to prolong the service life and performance of your searchlight, the following maintenance guidelines are recommended:

- 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;
 - 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 earth point for conductivity;
- It is advisable to check all seals and gaskets for signs of degradation. Renew if necessary;
- The searchlight is fitted with a breather, 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 - General Assembly

Drawing Number	Description
B7162	FB230 LV
B7174	FB230 HV



ISS. No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	7.87 AGE
2	BROUGHT INLINE WITH DETAIL (EC0640)	5.98 D.S.
3	BROUGHT INLINE WITH DETAIL DRG No. NOW B7162 (EC0939)	6.01 D.S.
4	B7168 OPTION ADDED NDI 0084	8.01 D.S.
5	LATCHES (EC1621)	11.17 D.S.
6	CRUTCH MOD (EC1714)	8.18 D.S.

B7162 FB230 LV CHROME GA
 B7168 FB230 LV SGB GA

STANDARD PRACTICE Deburr all cut/machined edges Break corners R0.25(Max) U.O.S.	
Francis SEARCHLIGHTS	
©1987	A2 CONT ON SHEET
PART No./DRG No.	B7162 1
SHT	1

FRANCIS SEARCHLIGHTS LIMITED . UNION ROAD . BOLTON . BL2 2HU	DESCRIPTION
FB230 LV GA	
FINISH	
MATERIAL	
Sand Coating: To ISO 8062 CT10	
Die Coating: To ISO 8062 C18	
Hole centres & posns: \pm	
TOLERANCES	
SCALE 1:2	General: \pm
	Angular: \pm
ALL DIMENSIONS IN MILLIMETRES	

10 - Spare Parts List

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

Part Number	Description
D9848	12v 100w T/H Lamp
D14795	24v 150w T/H Lamp
D4695	24v 250w T/H Lamp
D9851	24v 250 w T/H Lamp
D16883	120v 300w T/H Lamp
D16841	230v 300w T/H Lamp
C22268-01	Breather Assembly
C13033-01	LV Lampholder conversion Kit
C16888-01	HV Lampholder conversion Kit
C09888-01	Focus wheel assembly
C15395-01	Elevation lock wheel assembly
C24348-01	Base lock wheel assembly
C16761-00	AV mount
C16878-00	Lampholder
C09880-00	Switch
C27276-00	Front glass
C27284-00	Front glass gasket
C06675-00	Reflector
C14239-00	Rear handle
C16893-00	Focus grommet
C14501-00	Focus seal
C08827-00	Focus spring
C10055-01	Mirror clip sub assembly
C02686-00	3 pin plug
C02685-00	3 pin socket
C14938-01	Red filter assembly
C14940-01	Blue filter assembly
C14942-01	Clear filter assembly
C14939-01	Amber filter assembly
C14941-01	Green filter assembly
B7001	30M LV cable reel
B7002	45M LV cable reel
B7003	90M LV cable reel
B7004	30M HV cable reel
B7005	40M HV cable reel
B7006	80M HV cable reel
B7007	Tripod
B7016	12v Interrupter unit
B7017	24v interrupter unit

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.