



User Instruction & Installation Manual

FH560 Deck 2.5 Kilowatt Metal Halide Searchlight



Product Reference Number:

A2899 – FH560D 2.5Kw

Manufacturer's details:

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

Distributor details:

Manual Part Number: **C26459**

23.4.14 Issue: 1

CONTENTS

- 1 - Introduction
- 2 - Safety Precautions
- 3 - Technical Information
- 4 - Unpacking and Installation Instructions
- 5 - Electrical Installation
- 6 - Operating Instructions
- 7 - Fault Finding
- 8 - Maintenance and Servicing
- 9 - Wiring Diagram
- 10 - Spare Parts List

1 - Introduction

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

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

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

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

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

2 - Safety Precautions

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

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

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

- Always refer to the lamp manufacturer's technical data when dealing with lamps.

3 - Technical Information

This product has been designed to operate in accordance with the product specification. The FH560D 2500 watt searchlight has the following features:

- All marine grade materials and fixings;
- Parabolic glass reflector;
- Stove enamel painted;
- Full 360° horizontal rotation;
- Vertical movement $\pm 40^\circ$;
- Internal self regulating heater;
- Instant lamp re-strike, no cooling down time required;
- Economical 500 hour lamp life;
- Toughened front glass;
- Luminous flux 240000;
- Colour temperature 6000K;

The searchlight also performs to the following optical data:

- Metal Halide light source;
- Lamp Wattage - 2500 Watts;
- Supply voltage - 220/240V;
- Peak Beam Candlepower – 141 million lux;
- Range – 11,870 metres;
- Divergence - 1.5° ;
- 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.

Technical information on the Irem Ignitor & PSU is included overleaf. For more detailed information please contact the manufacturer.

Ignitor ref: AD3050B-US (Irem)
PSU ref: BC2500E (Irem)

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 sealant, such as silicone, in order to ensure a weatherproof 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.

- 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 Guidelines

A typical installation and connection routine for the FH560D 2.5Kw searchlight is as follows:

Referring to wiring diagram C26458, a supply is fed to the Junction box, which then provides a common feed to the Switch box, Power Supply Unit and the Searchlight.

The mains supply lead, power supply unit, switch box & searchlight is pre-wired with 3 metres of cable to the junction box.

When the light is in operation, the output from the PSU should be approximately 115v ac at 25.6amps.

Basic Operation

When the searchlight is switched on a supply is fed to the PSU and linked to the ignitor. Also from the PSU, a dc output is fed to the lamp. The ignitor ionises the gas within the lamp and this strikes the light.

NOTE:

Ensure the PSU red remote switch is set in the on position.

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

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

Using the template provided mark out and drill the fixing holes through the deck. When bolting down the searchlight on an uneven surface, it is necessary to use suitable sealant, such as silicone, in order to ensure a weatherproof joint.

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 jacket must be retained for re-use. Whenever removing a lamp, the protective jacket must always be used for safety reasons;
- In all circumstances the lamp manufacturer's data should be referred to when dealing with lamps.

7- Fault Finding

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

Failure of Lamp to Ignite

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

- 1) Check that the mains supply is connected to the input of the PSU and check all connections as per the wiring diagram. Turn on the light using the switch box, 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 activate the switch box 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 bezel 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 rear bezel, ensuring the latches are securely tightened, 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 this manual and the manufacturer's information.

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

- 3) Before a metal halide lamp will ignite, the electrically insulated gas between the electrodes must be ionised. This is done by the ignitor which produces a high frequency voltage (up to 30,000 volts or higher). Switching the lamp on activates the ignitor. A crackling or hissing noise should be heard. The ignitor is housed within the rear of the searchlight barrel. This is a totally encapsulated unit and repair is not advised. If found to be faulty a new ignitor must be fitted.

8 - Maintenance and Servicing

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

- Maintenance checks should be conducted before very 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

Drawing Number	Description
A2899	FH560D 2.5Kw G.A
C26458	Wiring Diagram
C26461	Switch Box
C23604	Junction Box Assembly

11

10

9

8

7

6

5

4

3

2

1

11

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

11

10

9

8

7

6

5

4

3

2

1

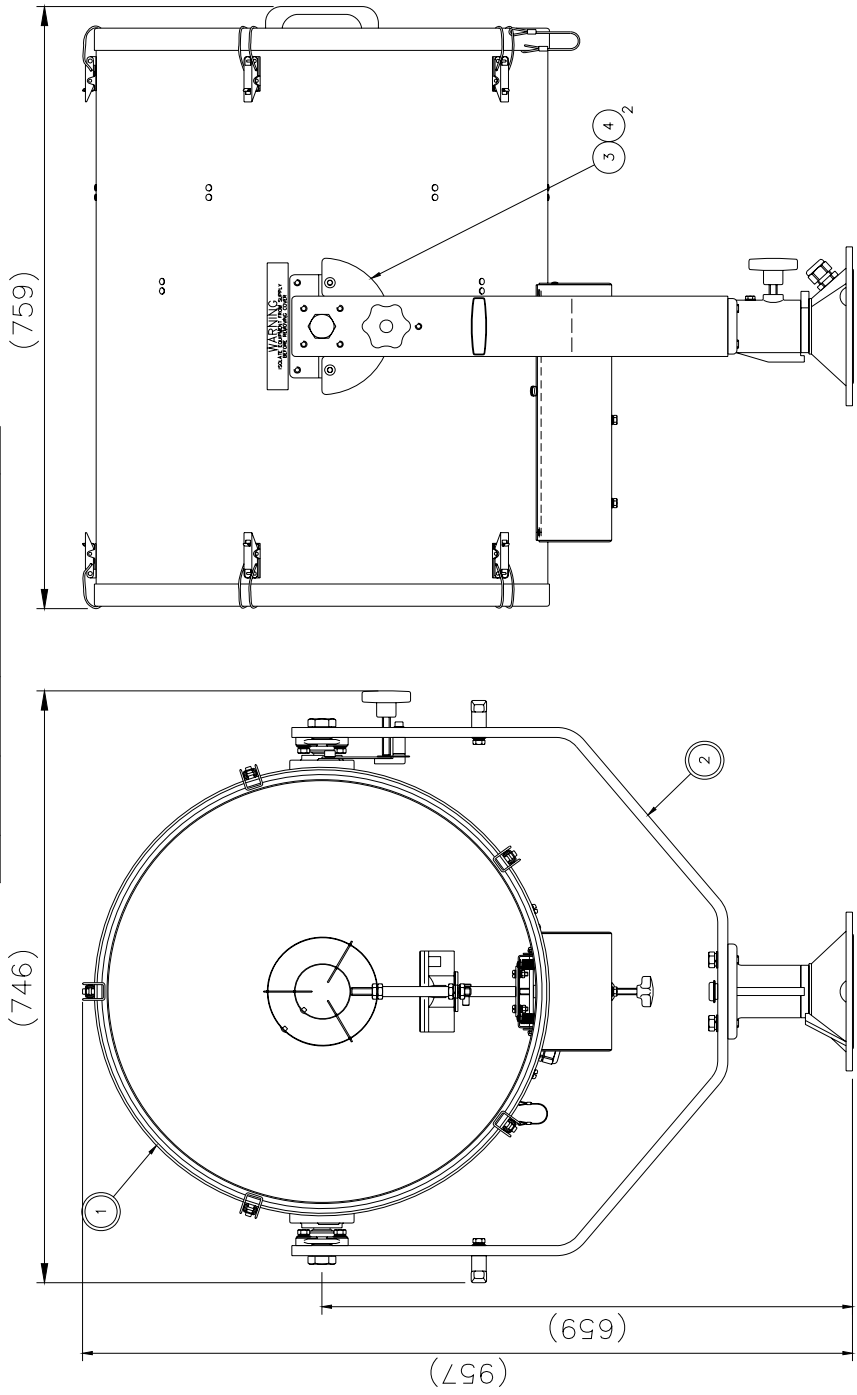
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION



FIRST USED ON
FH560D
2.5KW

ITEM	PART No.	DRG. No.	DESCRIPTION	QTY
1	C26451	C26451	BARREL ASSY	1
2	C26453	C26453	DECK MOUNT	1
3	C11380	X2863	QUADRANT	1
4	C11182		M8 x 16 CAP HD. SCREW	2



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



© 2014 A2 CONT ON SHEET
PART No./DRG. No. A2899
SHT 1

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

DESCRIPTION
FH560D 2.5KW GA

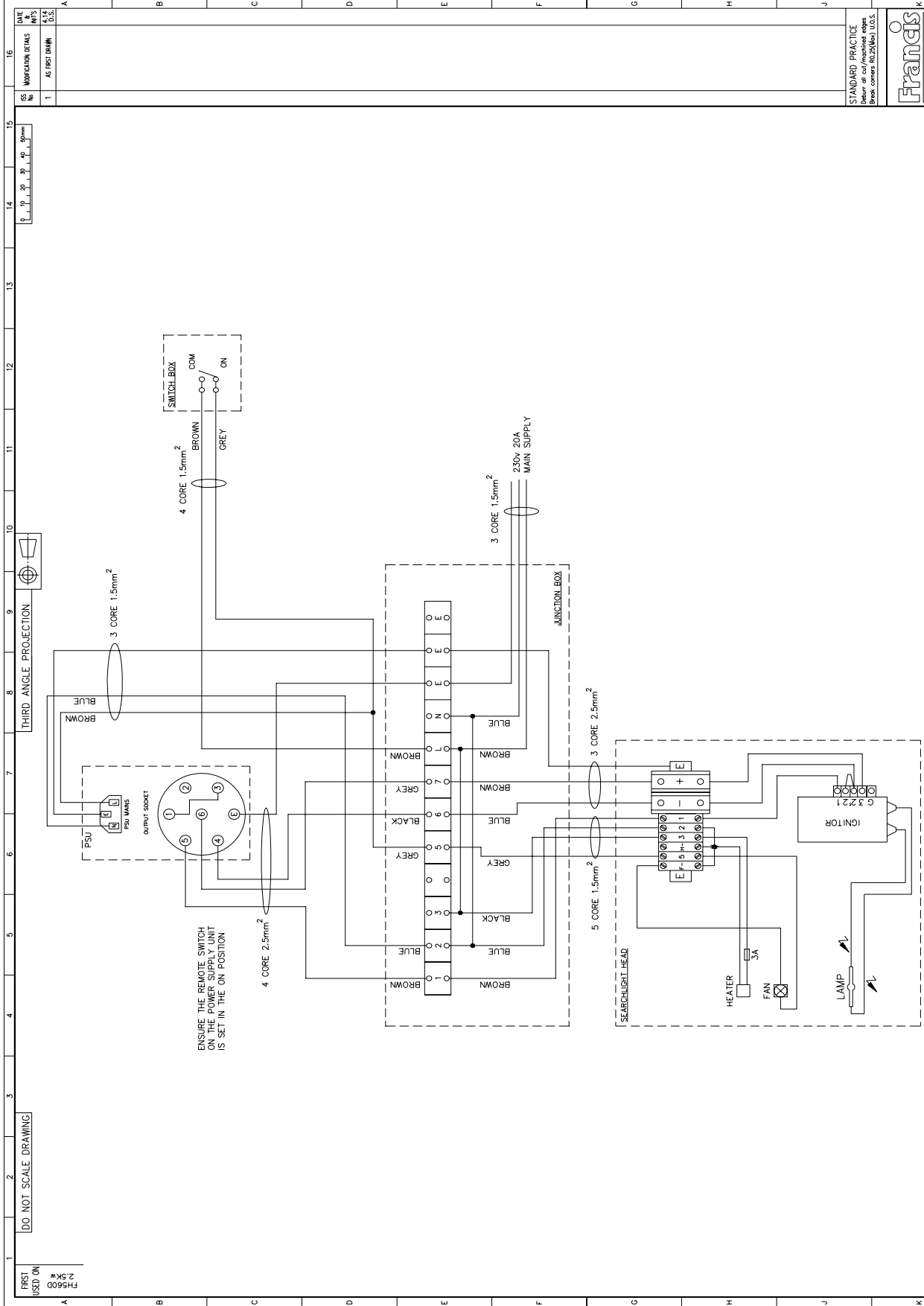
FINISH

ISO 8062 CT10 MATERIAL
ISO 8062 C18

TOLERANCES
General: ±
Angular: ±

SCALE 1:4
Hole centres & posns: ±

ALL DIMENSIONS IN MILLIMETRES



16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

DO NOT SCALE DRAWING

FIRST USED ON
F15600
2.5k
1:1

NO	DESCRIPTION	DATE	BY	SCALE	TOLERANCES	GENERIC #	APPROV #
1	AS FIRST DRAWN	1.17	D.S.				

STANDARD PRACTICE
Depart at cut/machined edges
Break corners R0.25(Min) (U.S.S.)

Francis
FRANCIS SEARCHLIGHTS LIMITED

© 2014 A1 CONT ON SHEET

UNION ROAD · BOLTON · BL2 2HU

WIRING DIAGRAM

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

DESCRIPTION

FINISH

MATERIAL

Send Coating to ISO 9002 C10
DIN Coating to ISO 9002 C18
Flow control & points 1

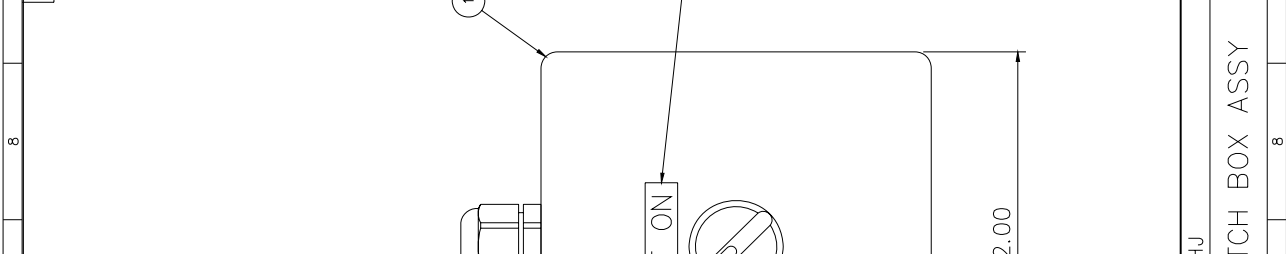
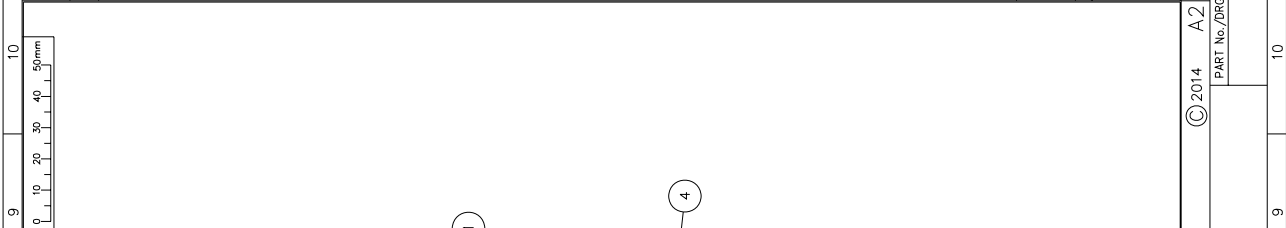
DATE 24.4.14
SCALE
TOLERANCES
Generic #
Approv #

ALL DIMENSIONS IN MILLIMETRES

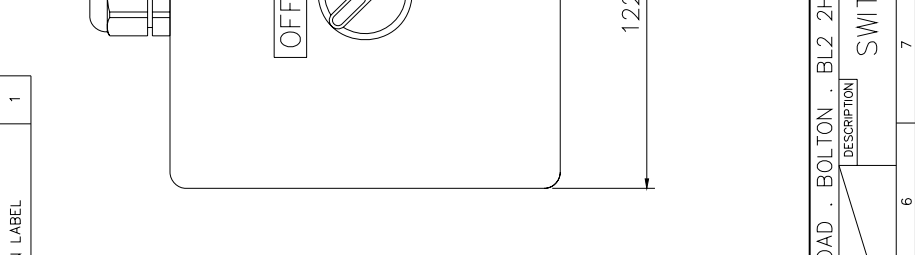
PART No./DWG No.
C26458 1

SHT
1

ISS No	1	DATE & INT'S	4.14
MODIFICATION DETAILS	AS FIRST DRAWN	D.S.	



ITEM	PART No.	DRG. No.	DESCRIPTION	QTY
1	C26460	C26460	SWITCH BOX DRILLING	1
2	C23002		SWITCH	1
3	C10158		CABLE GLAND	1
4	C24573		OFF/ON LABEL	1



DO NOT SCALE DRAWING

FIRST USED ON
FH560D
A2899
2.5KW

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

© 2014 A2 CONT ON SHEET

Francis SEARCHLIGHTS

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

DRAWN	D.S.	DATE	4.14	TOLERANCES	General: ±
CHECKED	SCALE	1:1		Angular: ±	
ALL DIMENSIONS IN MILLIMETRES					

FINISH

MATERIAL

To ISO 8062 CT10

To ISO 8062 C18

Hole centres & posns: ±

DESCRIPTION

SWITCH BOX ASSY

PART No./DRG No.

C26461

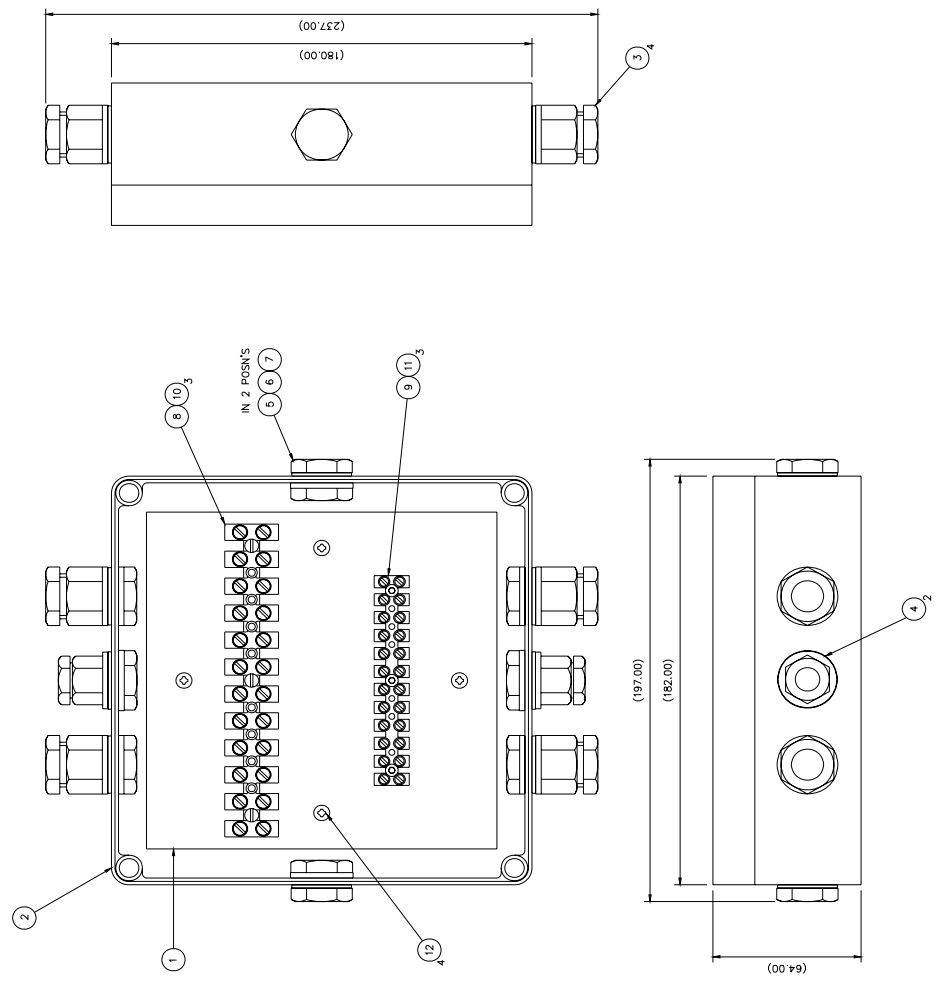
SHT

1

DATE 16
 SS INSCRIPTION DETAILS 15
 4.00 90mm
 1 AS FIRST DRAWN

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C23602	C23602	CHASSIS PLATE ASSY	1
2	C23607	C23599	JUNCTION BOX DRILLING TYPE 'B'	1
3	C12415		M20 GLAND	4
4	C10158		M20 GLAND	2
5	C20349		GLAND BLANK M20	2
6	C23527		SEALING WASHER M20	2
7	C22635		LOCKING NUT M20	2
8	C15133		TERMINAL BLOCK 32A	1
9	C15056		TERMINAL BLOCK 17.5A	1
10	C10203		SCREW M3 x 16 PAN HD	3
11	C23268		SCREW M3 x 16 SOCK CAP HD	3
12	C23598		SCREW #4 x 8 PAN POLYIMATE	4

DO NOT SCALE DRAWING
 THIRD ANGLE PROJECTION



STANDARD PRACTICE
 (Refer to drawing notes for details)
 Break corner R0.25(Min) U.S.S.

Francis
 株式会社フランシス

© 2006 A1 CONT ON SHEET
 PART No./DRG No.
 C23604
 SHT
 1

FRANCIS SEARCHLIGHTS LIMITED · UNION ROAD · BOLTON · BL2 2HU
 FINISH DESCRIPTION
 MATERIAL
 Sand Coating to ISO 8062 C10
 Die Coating to ISO 8062 C1B
 Hot centres & points 2

DRAWN MARC.J DATE 3.5.06 TOLERANCES
 CHECKED SCALE 1:1
 ALL DIMENSIONS IN MILLIMETRES
 Generate: 4
 Angular: 1

10 - Spare Parts List

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

Part Number	Description
C09868-00	G38 Lampholder
C20223-00	Ignitor (Irem ref: AD3050/B-US)
C20224-00	Fan
D20194	2.5Kw Metal Halide Lamp
C23002-00	On/Off Switch, Switch box
C20881-00	Front Glass
C20569-00	Front Glass Gasket
C23277-01	Heater & Fuse Assembly
C05396-00	Reflector
C21172-00	PSU (Irem ref: BC2500E)
C21173-00	Male Plug for C21172-00
C21502-01	Base lockwheel
C21503-01	Side lockwheel
C11148-00	Base 'O' ring

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.