



## User Instruction & Installation Manual

### L230 LED 90 Watt Searchlight



#### Product Reference Number:

A6138 – 240v DECK  
A6161 – 240v CABIN

A6144 – 24v DECK  
A6162 – 24v CABIN

#### *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](mailto:sales@francis.co.uk)

#### *Distributor details:*

Manual Part Number: C27703

Issue: 1      6.2.18

# 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 Diagrams & General Assemblies
- 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 LED 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.**

- The high luminance of the LED can cause severe damage to the eye if viewed directly. ALWAYS wear suitable protective goggles when viewing the LED;
- 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 LED has cooled sufficiently before removal;
- Due to the vast range of LED modules available it may appear possible that more powerful LED's can be used in the equipment than for which it was designed. Even when the unit will physically accept a higher wattage LED, this substitution is not recommended and is dangerous. This action will also void any warranties on the equipment.

## 3 – Technical Information

This product has been designed to operate in accordance with the product specification.

The L230 LED 90w searchlight has the following features:

- All marine grade materials and fixings;
- Powder coated finish;
- Pan rotation 450°;
- Tilt movement  $\pm 40^\circ$  (Deck & Deck Pedestal,  $+30^\circ$  to  $-25^\circ$  (Cabin & Cabin Pedestal));
- Economical 40,000 hour LED life;
- Toughened super clear Optiwhite front glass;
- Aluminium precision reflector;
- Up to 9,855 Lumens;
- Colour temperature 6500K;
- Searchlight Weight 8.4Kg Deck, Pedestal 4.6Kg.
- Cabin Control Assembly 2Kg, Cabin Pedestal Assembly 4.6Kg;
- PSU Weight 2.5Kg;
- High quality control gear 50/60 Hz 1ph;
- Sealing – IP66 Searchlight, PSU IP66;

The searchlight also performs to the following optical data:

- Supply voltage – 100/240v or 24v;
- Range – 823 metres is based on  $8^\circ$  divergence;
- Divergence –  $8^\circ$ ;
- Operational temperature: -50;

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.

## Fitting Instructions for Lite Range Cabin Model

### **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.

### **Mounting the Searchlight**

#### **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 weather proofed joint.

#### **For Cabin/Cabin Pedestal Models:**



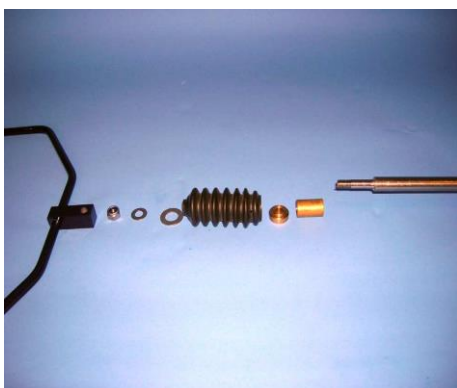
1. Remove the Base Lock Wheel.



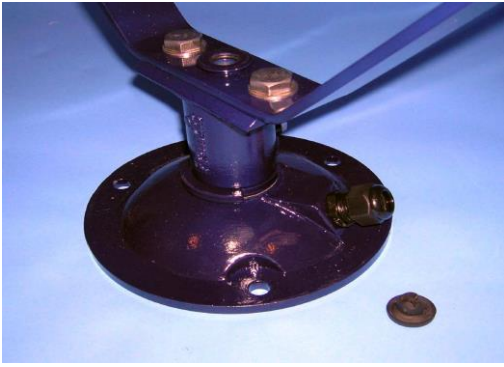
2. Replace Lock Wheel with M8 x 10 hexagon screw in the bottom fixing



3. Now remove the following items as these are only required on deck models Barrel Lock Wheels, Elevation Link and fixings



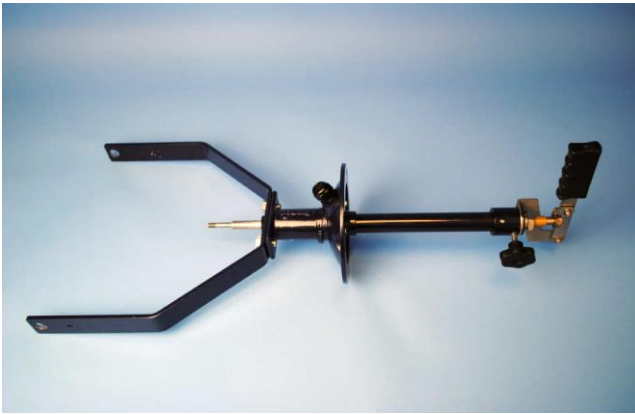
4. When installing the Under Deck mechanism, first separate the following items. U-Piece Assembly, M8 nyloc nut, M8 plain washer, M12 plain washer, Rubber Bellows, Bellows Top Bush and the Push Rod Top Bush



**5.** Remove the Blanking Plug from the Bellows Bottom Bush.



**6.** Insert the Under Deck through the centre hole making sure it's aligned as photos below



**7.** Fasten the Under Deck mechanism Using the 3 off M6 x 16 screws and spring washers



**8.** Re-Fit the following items:  
Push Rod Top Bush



**9.** Bellows Top Bush.

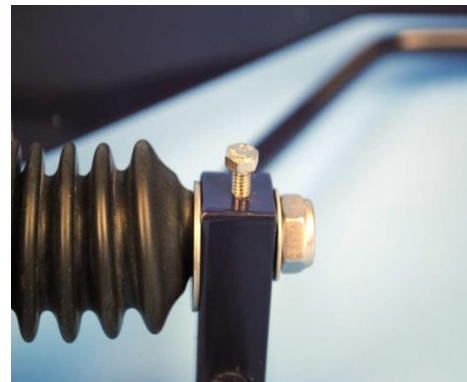
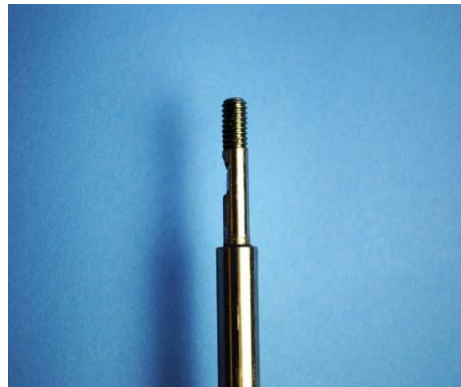


**10.** Bellows.



**11.** M12 plain washer.  
U-Piece Assy. M8 plain  
washer. M8 nyloc nut.

**12.** Make sure the mechanism is in this position before tightening the M5 x 8 hexagon screw onto the flat of the push rod



**13.** U-Piece fixings.



**14.** Fix the U-Piece Assembly using U-Piece fixings  
make sure there is a plain washer  
both sides of the U-Piece Bush.



**15.** Completed.  
Make sure the Searchlight pans and tilts correctly.



**For Pedestal Models:**

Mark out and drill through 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.

## 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 LED fitted be applied to the LED 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.
- 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

### **Installation Guideline**

A typical installation and connection routine for the L230 LED 110/240v searchlight is as follows:

Referring to wiring diagram C27105, a supply is fed into the junction box, which then provides a common feed to the searchlight.

Cables required to be connected by the customer: -

Supply cable to the junction box.

A typical installation and connection routine for the L230 LED 24v searchlight is as follows:

Referring to wiring diagram C27106, a supply is fed to the inverter, which then provides a common feed to the searchlight.

Cables required to be connected by the customer: -

Supply cable to the inverter and to the junction box.

## 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 cannot be adjusted.

**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.**

## 7- Fault Finding

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

### **Failure of LED to light.**

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

- 1) Check that the mains supply is connected to the input of the LED driver and check all connections as per the wiring diagram. On operation if the LED does not light, switch off mains supply and check all fuses;
- 2) Check output from the LED driver 38.5 volts.

## 8 - Maintenance and Servicing

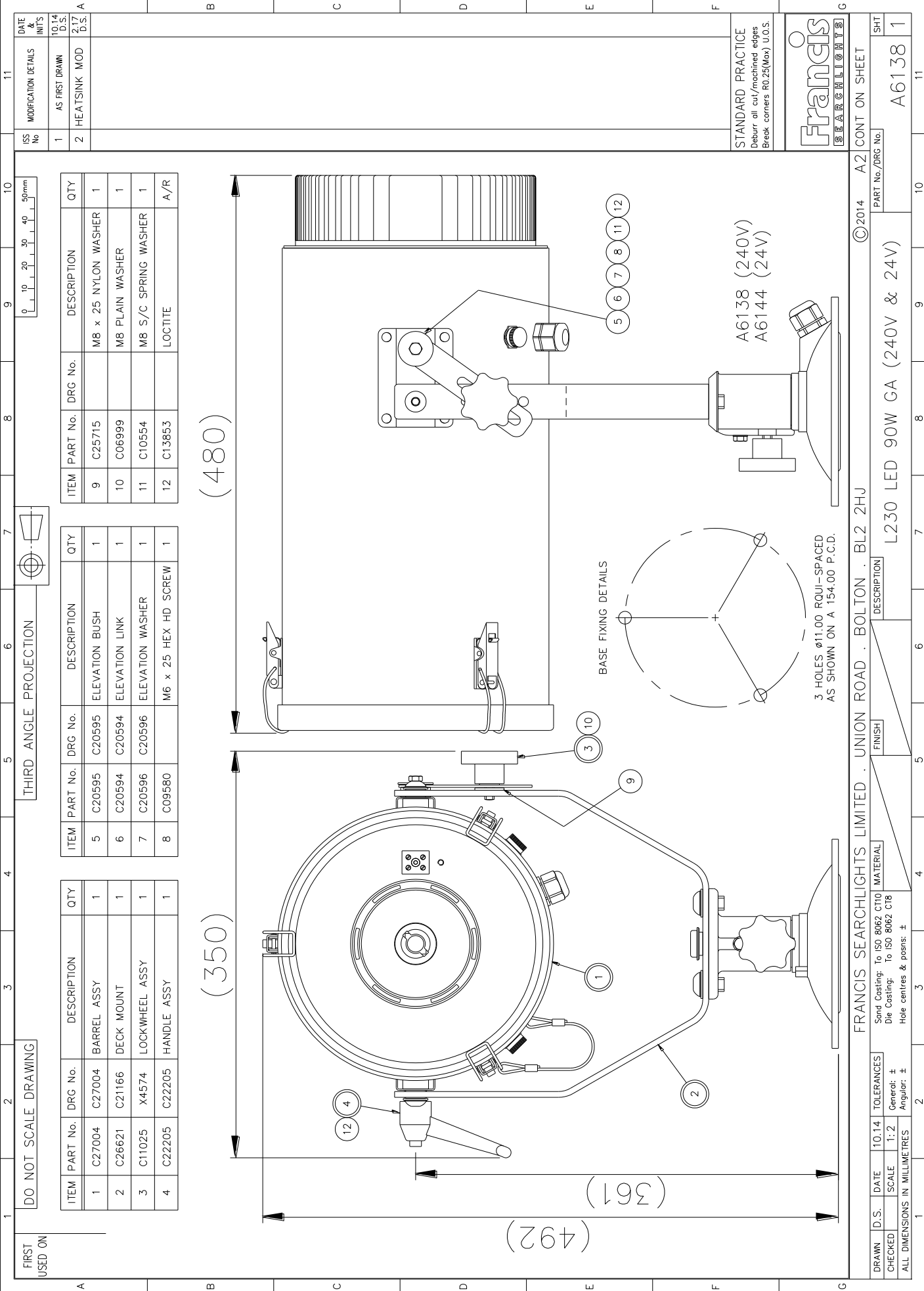
In order to prolong the service life and performance of your searchlight, the following maintenance guidelines are recommended:

- 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;
- 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).
- Every six months the external movement mechanisms i.e. lockwheels, elevation and pan mechanisms, should be lightly lubricated.

**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 Diagrams & General Assemblies

<b>Drawing Number</b>	<b>Description</b>
A6138/A6144	L230 LED 90w Deck GA
A6161/A6162	L230 LED 90w Cabin GA
C27105	Wiring Diagram 100-240v
C27106	Wiring Diagram 24v
C27095	Junction Box Assembly



FIRST USED ON

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
9	C25715		M8 x 25 NYLON WASHER	1
10	C06999		M8 PLAIN WASHER	1
11	C10554		M8 S/C SPRING WASHER	1
12	C13853		LOCTITE	A/R

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
5	C20595		ELEVATION BUSH	1
6	C20594		ELEVATION LINK	1
7	C20596		ELEVATION WASHER	1
8	C09580		M6 x 25 HEX HD SCREW	1

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C27004		BARREL ASSY	1
2	C26621		DECK MOUNT	1
3	C11025		LOCKWHEEL ASSY	1
4	C22205		HANDLE ASSY	1

ISS No	MODIFICATION DETAILS	DATE & UNITS
1	AS FIRST DRAWN	10.14 D.S.
2	HEATSINK MOD	2.17 D.S.

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

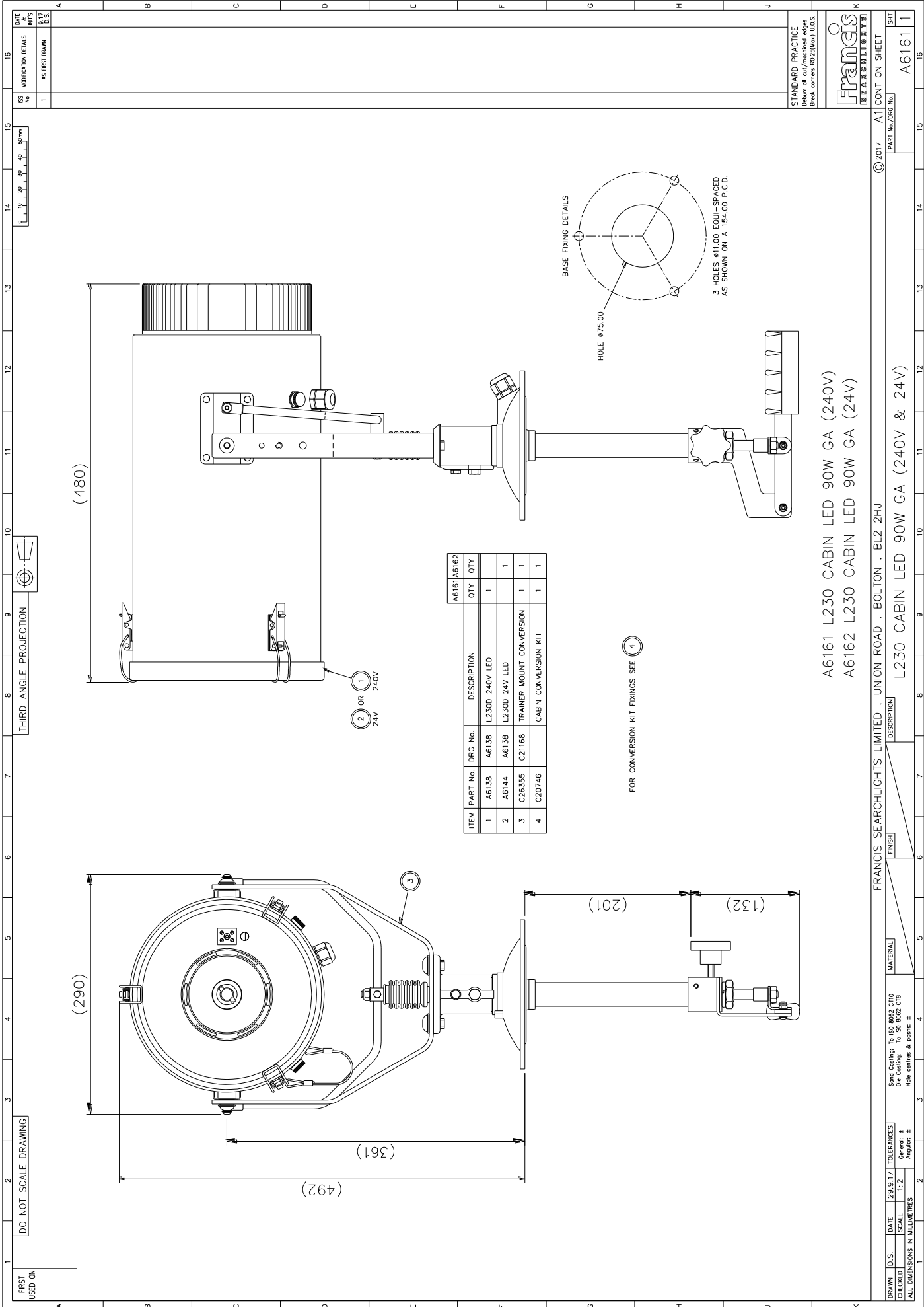
**Francis**  
SEARCHLIGHTS

©2014	A2	CONT ON SHEET
PART No./DRG No.	A6138 1	

FINISH	DESCRIPTION
To ISO 8062 CT10	L230 LED 90W GA (240V & 24V)
To ISO 8062 CT8	

DRAWN	D.S.	DATE	TOLERANCES
CHECKED <td>SCALE <td>1:2 <td>General: ± Angular: ± </td></td></td>	SCALE <td>1:2 <td>General: ± Angular: ± </td></td>	1:2 <td>General: ± Angular: ± </td>	General: ± Angular: ±
ALL DIMENSIONS IN MILLIMETRES			

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



THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

FIRST USED ON

ITEM	PART No.	DRG No.	DESCRIPTION	QTY	QTY
1	A6138	A6138	L2300 240V LED	1	
2	A6144	A6138	L2300 24V LED	1	
3	C26355	C21168	TRAINER MOUNT CONVERSION	1	1
4	C20746		CABIN CONVERSION KIT	1	1

A6161 L230 CABIN LED 90W GA (240V)  
 A6162 L230 CABIN LED 90W GA (24V)

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

DRWN	D.S.	DATE	29.9.17	TOOLERANCES	Sand Casting: to ISO 8002 C10 Die Casting: to ISO 8002 C18 Pipe centres & parts: ±
CHECKED		SCALE	1:2	GENERAL	General: ± Angular: ±
ALL DIMENSIONS IN MILLIMETRES					

STANDARD PRACTICE  
 Refer to callouts for details  
 Base centres to BS2462/1:015.

Francis  
 SEARCHLIGHTS

CONT ON SHEET  
 PART No./DRG No.  
 A6161 1

16	DATE	19.12.17
15	MODIFICATION DETAILS	AS FIRST DRAWN
14	ISS No.	1

13	12	11	10	9	8	7	6	5	4	3	2	1
----	----	----	----	---	---	---	---	---	---	---	---	---

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

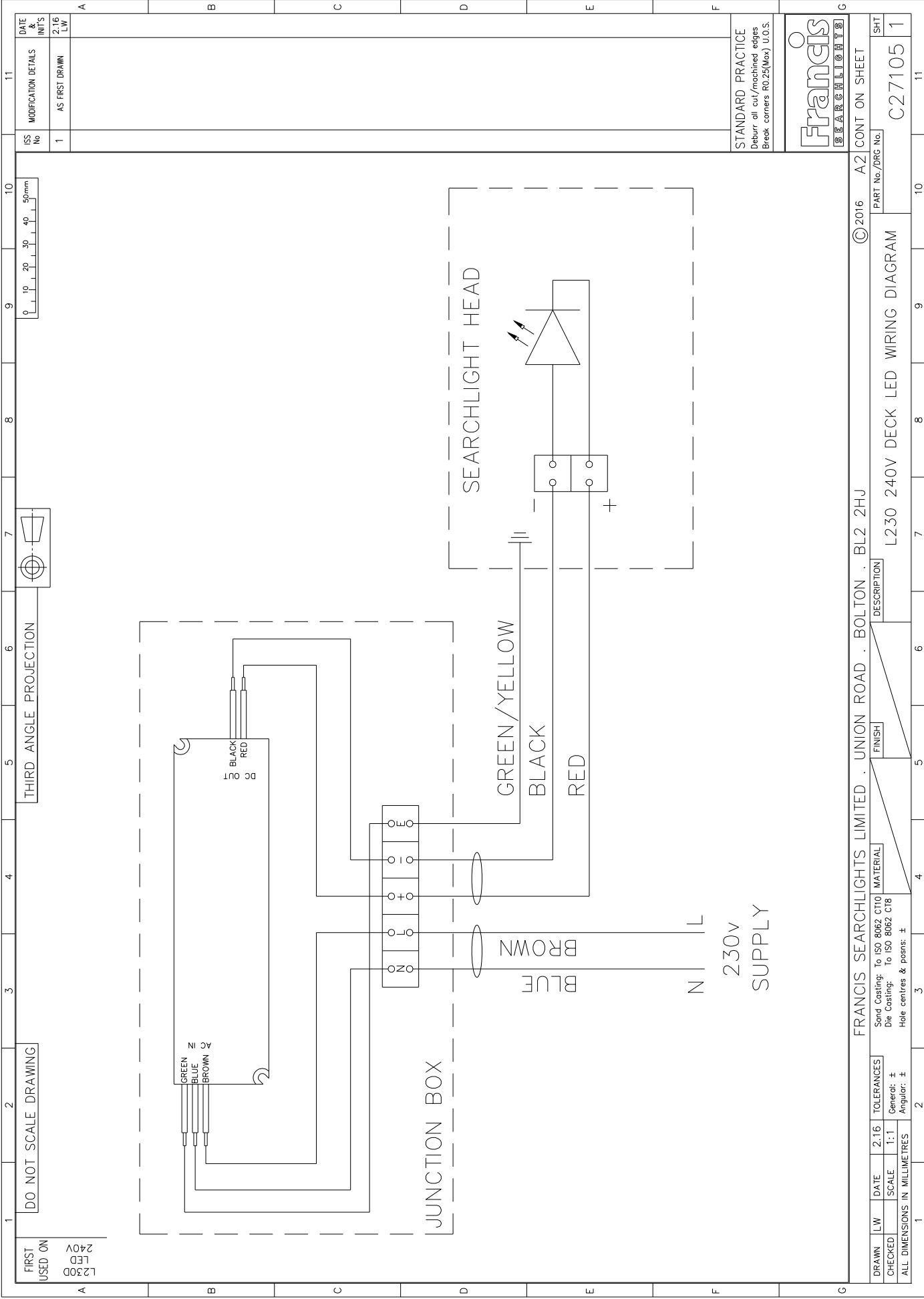
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
----	----	----	----	----	----	----	---	---	---	---	---	---	---	---	---

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

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

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

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



FIRST USED ON  
L230D  
LED  
240V

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm

DATE & INIT'S  
2.16 LW

MODIFICATION DETAILS  
AS FIRST DRAWN

ISS No  
1

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

Francis  
SEARCHLIGHTS

© 2016 A2 CONT ON SHEET

PART No./DRG No. C27105

SHT 1

DESCRIPTION  
L230 240V DECK LED WIRING DIAGRAM

FINISH  
/

MATERIAL  
/

Sand Casting: To ISO 8062 C110  
Die Casting: To ISO 8062 C18  
Hole centres & posns: ±

TOLERANCES: 2.16  
General: ±  
Angular: ±

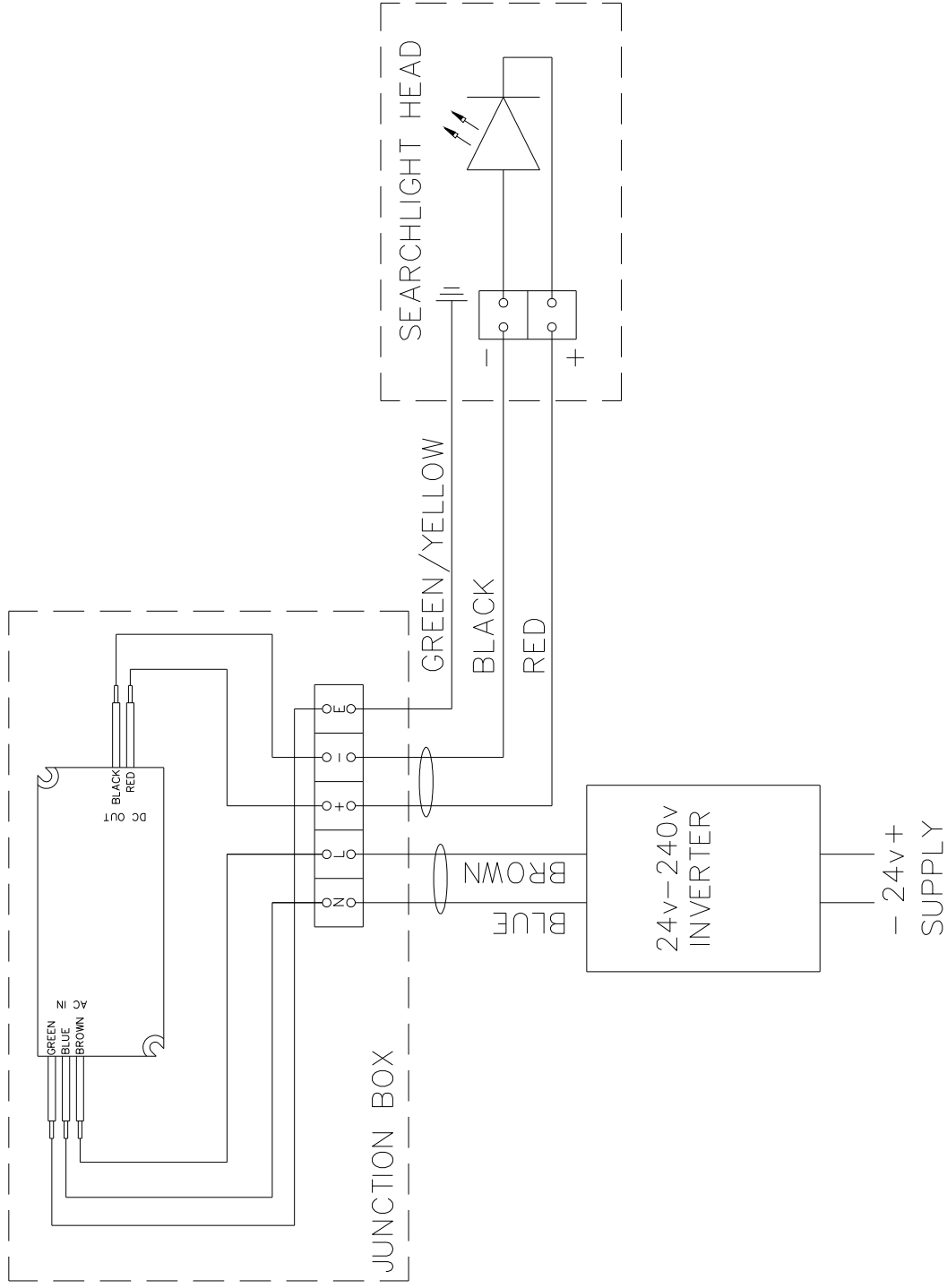
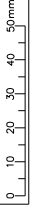
SCALE: 1:1  
ALL DIMENSIONS IN MILLIMETRES

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

FIRST USED ON  
L2300  
24V  
LED

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION



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



ISS No	1	MODIFICATION DETAILS	AS FIRST DRAWN	DATE & INIT'S	2.16 L.W.
--------	---	----------------------	----------------	---------------	-----------

© 2016	A2	CONT ON SHEET
--------	----	---------------

DESCRIPTION	L230 24V DECK L.E.D WIRING DIAGRAM
FINISH	
MATERIAL	

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

DRAWN	LW	DATE	2.16	TOLERANCES	
CHECKED		SCALE	1:1	Generat: ±	
ALL DIMENSIONS IN MILLIMETRES				Angular: ±	

Part No./DRG No.	C27106
SHT	1



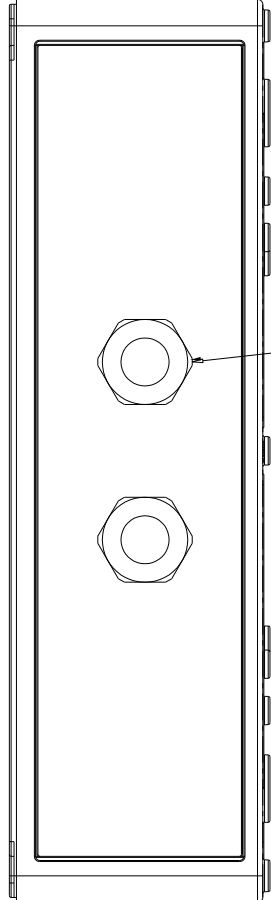
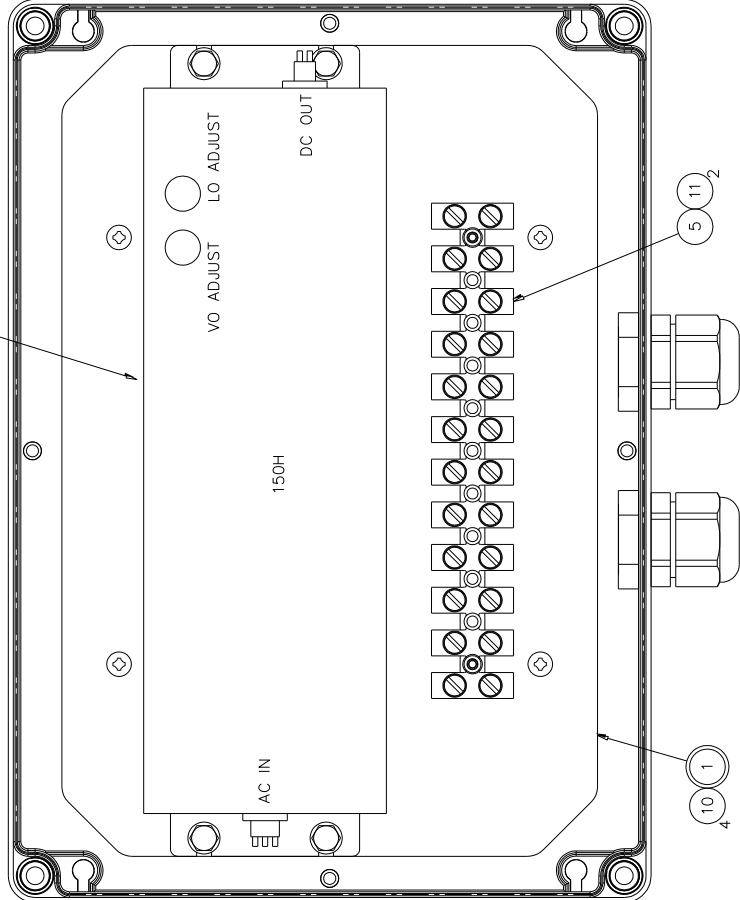
FIRST USED ON  
FR300  
LED

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

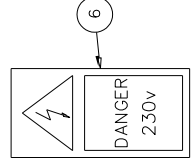
ISS No 1  
DATE & INIT'S 1.18 L/W

3 9 12 13  
4 4 4 4



ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C27705	027705	CHASSIS PLATE S/ASSY	1
2	C27094	C27094	ENCLOSURE DRILLING	1
3	C27699		LED DRIVER	1
4	C10158		M20 CABLE GLAND	2
5	C15133		TERMINAL BLOCK	1
6	C21464		230V WARNING LABEL	1
7	C22036		ISOLATE SUPPLY LABEL	1
8	C04900		FRANCIS EXTERIOR LABEL	1
9	C26955		M4 x 10 HEX HD SCREW	4
10	C23598		M4 x 8 POZI HD SCREW	4
11	C10203		M3 x 16 BTN HD SCREW	2
12	C04376		M4 PLAIN WASHER	4
13	C08793		M4 S/C SPRING WASHER	4

FIT LABELS CENTRALLY ON LID



www.Francis.co.uk  
Tel: (+44) 01204 558660

BOX DIM'N 254 x 180 x 90

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

DESCRIPTION: JUNCTION BOX ASSY 240V DECK

FINISH: MATERIAL

Stand Casting: To ISO 8052 CT10  
Die Casting: To ISO 8052 C18  
Hole centres & posns: ±

TOLERANCES  
General: ±  
Angular: ±

DATE 1.18  
SCALE 1:1  
ALL DIMENSIONS IN MILLIMETRES

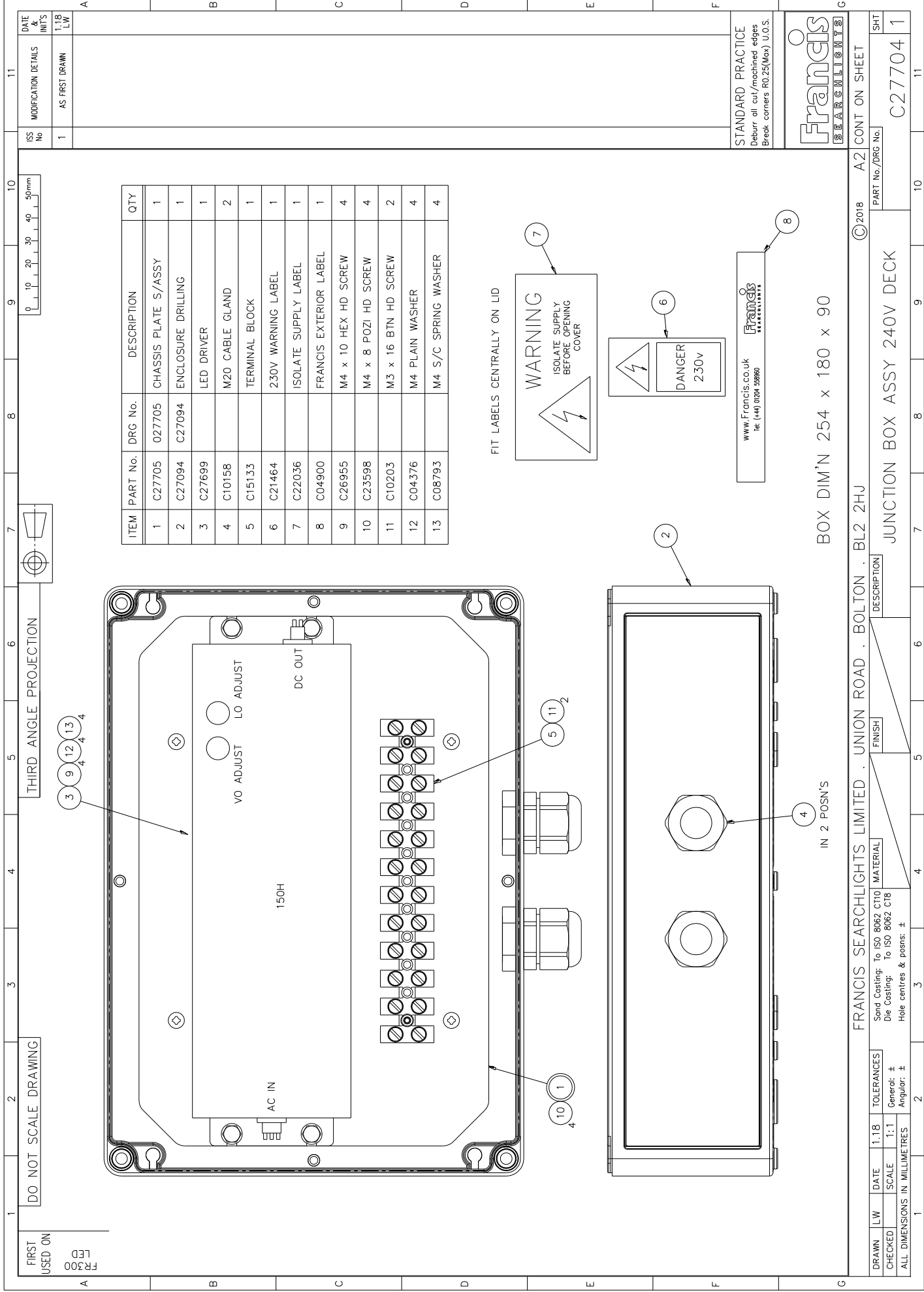
© 2018 A2 CONT ON SHEET

PART No./DRG No. C27704

SHT 1

Francis SEARCHLIGHTS

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



## 10 – Spare Parts List

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

<b>Part Number</b>	<b>Description</b>
C22205-01	Handle Assembly (Deck Model)
C11025-01	Lock wheel Assembly (Deck Model)
C10168-00	Base 'O' Ring
C10169-00	Spigot 'O' Ring
C22072-00	Push Rod Seal Washer
C21967-00	Bellows Bottom Bush 'O' Ring
C20281-00	Bellows (Cabin Model)
C20745-01	Lock wheel Assembly (Cabin Model)
C26630-00	Front Glass
C21141-00	Front Glass Gasket
C22268-01	Breather Assembly
C27692-00	LED
C27013-00	LED Holder
C27710-00	LED Adhesive Pad
C27014-00	LED Reflector
C27699-00	LED Driver
C27089-00	24v to 240v Inverter

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.