



User Instruction & Installation Manual

Voyager Remote Control Em Arc Searchlight



Product Reference Number:

A2661 – VM330 WHITE 115v/240v 350w

A2663 – VM330 MIRRORED STN.S (CHROME) 115v/240v 350w

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: C24076

Issue: 7

26-1-17

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 Assembly
- 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 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;
- EmArc lamps operate under very high-pressure conditions (up to 200 bar) and at high temperatures (inner bulb temp $\pm 1000^{\circ}\text{C}$) and may unexpectedly shatter;
- Lamps must not be used beyond their rated service life. Operation beyond the rated service life will increase the likelihood of bulb rupture; fast switching cycles will reduce lamp life.
- Never look directly into an illuminated searchlight as this may cause severe damage to eyesight from UV. 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 safety goggles or face mask and protective gloves 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 (minimum 10 minutes after switching off);
- If undue force appears necessary to remove the lamp, the equipment should be inspected by a competent person or contact the manufacturer;
- 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.
- In the event of a bulb rupture, a limited amount of mercury vapour could be emitted. To avoid inhaling this mercury vapour (which is toxic and can be harmful for lungs and nervous system) using a mask remove the front bezel from the searchlight and ventilate thoroughly for a period of at least 30 minutes.
- At the end of rated life, when lamp is removed from service, please dispose of in accordance with local universal waste law (Lamps are stamped with Hg mark). Some areas require all mercury containing lamps to be recycled, contact your environmental department for any regulation that may apply.

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 VM330 RC searchlight has the following features:

- All marine grade materials and fixings;
- Parabolic glass reflector;
- Stove enamel painted or Mirrored 316 Stainless Steel (Chrome);
- Instant lamp re-strike. No cooling down time required;
- Economical 2000 hour lamp life;
- 350° horizontal rotation;
- Vertical movement +20° to -20°;
- Motor speed 2°- 20°/sec (Pan). 10°/sec (Tilt);
- Remote focus facility;
- Self Regulating internal heater;
- Toughened front glass;
- Searchlight to IP66;

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

- Em Arc light source;
- Lamp Wattage – 350 Watts;
- Supply voltage – 115/240 volts;
- Peak Beam Candlepower – 18,200,000 lux;
- Range – 4266 metres;
- Divergence – 2.5°;
- 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.

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. When in the desired position, fit the base gasket supplied and fasten 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. If no cabling is required to be seen on deck, there is the option to wire from underneath the base directly into the deck. See drawing A2645 for details.

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:

The Junction Box should NOT be positioned no more than 5 metres away from the Searchlight

The following table indicates the maximum length of cable to be used for AC supply cable, from the supply to the Searchlight

Searchlight	240v 350w	115v 350w
Cable Size (mm ²)	Distance Max	Distance Max
1.5	212 MTRS	49 MTRS
2.5	346 MTRS	79 MTRS
4	548 MTRS	126 MTRS
6	854 MTRS	196 MTRS
10	1429 MTRS	329 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:

Note: This equipment must be earthed.

Installation Guidelines

A typical installation and connection routine for the VM330 RC 240v supply searchlight is as follows:

Referring to wiring diagram C24077, a supply is fed to the junction box (control devices), which then provides a common feed to the searchlight and joystick panel.

The searchlight to junction box has been pre-wired with 3 meters of 12cores 0.5mm and 3 cores 2.5mm cable. The only cables that need to be supplied by the customer are the 12 cores 0.5mm cable from the joystick panel to the junction box and the mains cable

Optional Slave Panel Wiring

12 cores 0.5mm² cable from the Slave Panel to the Junction Box.

NOTE both panels MUST NOT be operated simultaneously as this may damage the equipment

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.

The pan speed can be adjusted using the potentiometer mounted on the joystick panel. The movement increases from 2° to a maximum of 20°/sec when turned clockwise. The tilt speed runs at 10°/sec and cannot be adjusted.

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.

There is the option for added slave panels, the slave panel has all the features of the main panel i.e. joystick, speed control focus and on/off.

NOTE both panels MUST NOT be operated simultaneously as this may damage the equipment

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;
- The following safety equipment must be worn when handling lamps eye protection i.e. safety goggles or full-face mask and safety gloves;
- Always isolate the equipment from the supply before inserting a lamp;
- Do not twist or bend the fused quartz bulb when fitting the lamp as mechanical stresses MUST be avoided;
- 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 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 socket screws on the front of the searchlight, remove the bezel and glass and store in a safe place;
- Fit the rear lampholder lead over the thread of the lamp and then screw into the rear lampholder;
- Fit the front lampholder lead over the thread of the lamp and fasten in place using the nut supplied with the lamp;
- Replace the front bezel and glass, ensuring the socket screws 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 from the terminal block inside the searchlight;
- 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 240v 350w Em Arc lamp:
Voltage reading = 240v; Amps reading = 1.45 amps

Therefore, Wattage = $240 \times 1.45 = 350$ 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 body). If supply is present, disconnect unit from power supply before removing the lamp. If noticeable damage to lamp is present, the lamp will have failed. 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 and the output from the control board in the junction box. 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 block in accordance with the wiring diagram. If found to be correct, see remedy 3;
- 3) Remove the 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.

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 earth point for conductivity;
- The body of the mirrored stainless-steel version can be leaned to keep its chrome look using a metal polish and a lint free cloth.
- 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 Diagrams and General Assembly

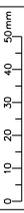
Drawing Number	Description
C25392	Wiring Diagram
C23949	Slave Panel Wiring Diagram
C24497	<u>Multiple</u> Slave Panel Wiring Diagram
A2645	VM330RC General Assembly Drawing
C23976	Joystick Control Panel Main Slave & Slave
C23991	Joystick Control Panel
C24933	Junction Box Assembly

[Back To Top](#)

11 10 9 8 7 6 5 4 3 2 1

A B C D E F G

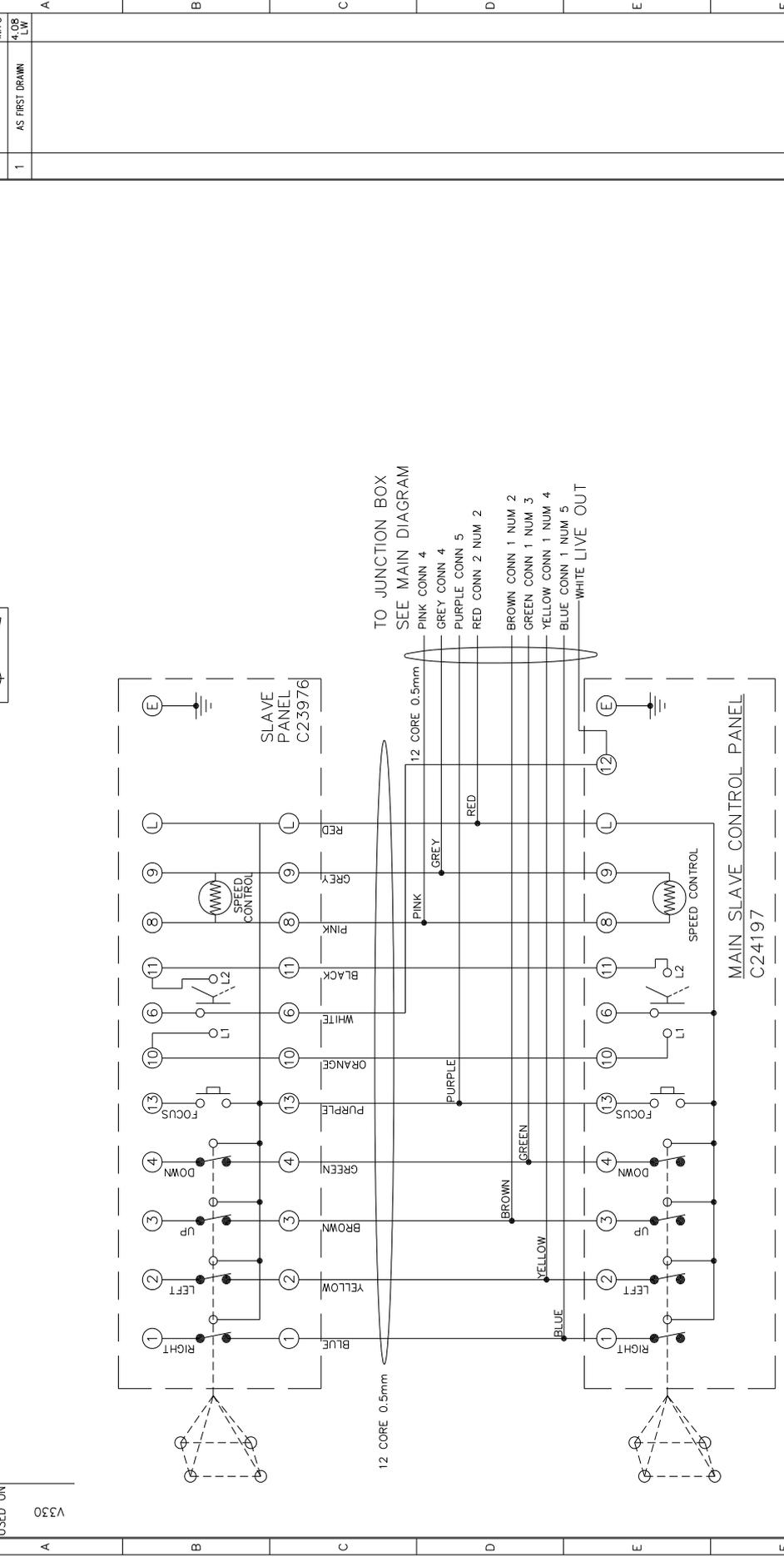
DATE & INIT'S	4.08 LW
MODIFICATION DETAILS	AS FIRST DRAWN
ISS No	1



THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

FIRST USED ON V330



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



© 2008 A2	CONT ON SHEET
PART No./DRG No.	C23949
SHT	

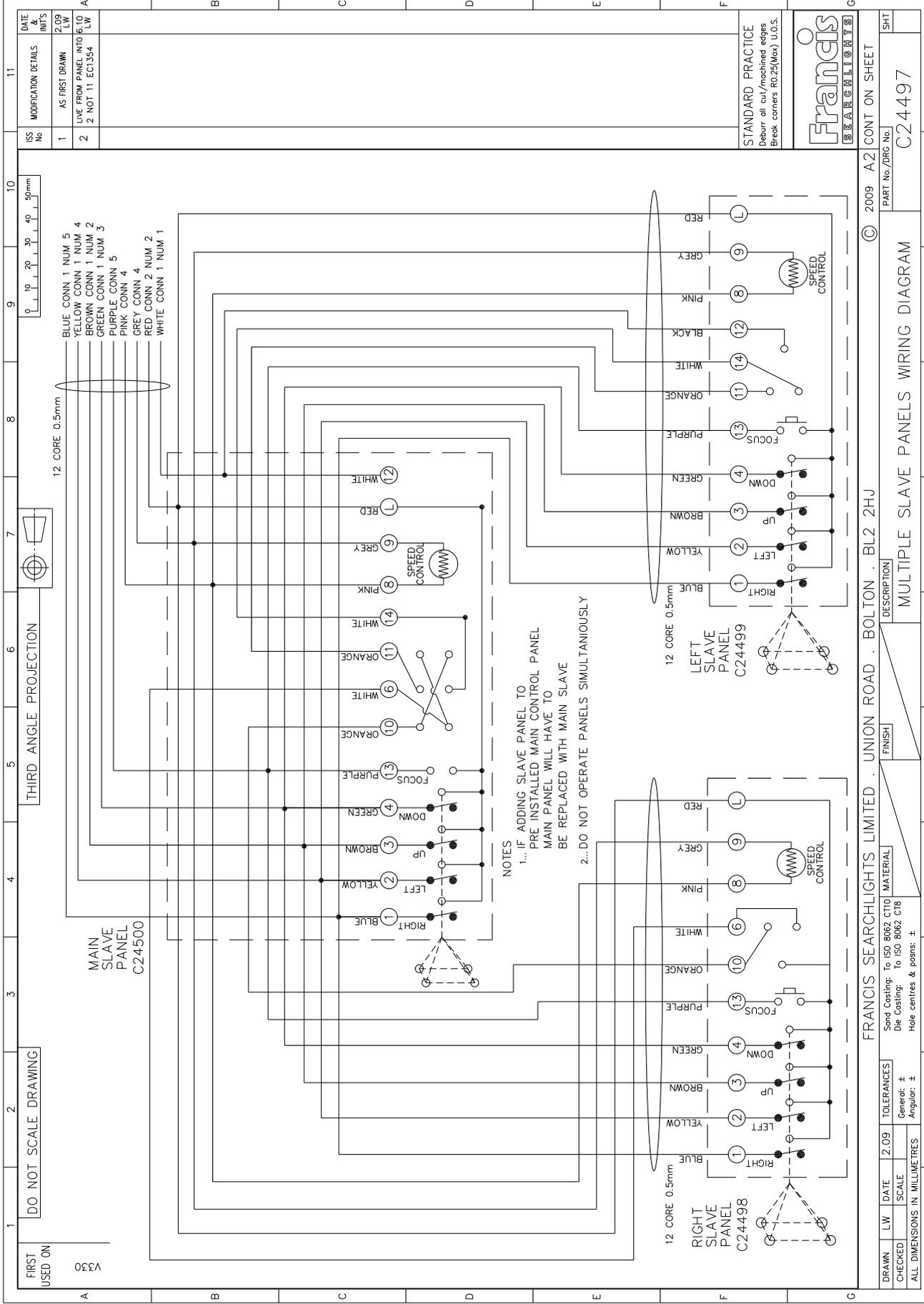
FRANCIS SEARCHLIGHTS LIMITED · UNION ROAD · BOLTON · BL2 2HU

FINISH	DESCRIPTION
	SLAVE PANELS WIRING DIAGRAM

DRAWN	LW	DATE	4.08	TOLERANCES
CHECKED				Scale Casting: To ISO 8062 C110
ALL DIMENSIONS IN MILLIMETRES				Die Casting: To ISO 8062 C18
				Hole centres & posns: ±

- NOTES
- 1... IF ADDING SLAVE PANEL TO PRE INSTALLED MAIN CONTROL PANEL MAIN PANEL WILL HAVE TO BE REPLACED WITH MAIN SLAVE
 - 2... DO NOT OPERATE PANELS SIMULTANEOUSLY

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



ISS No	MODIFICATION DETAILS	DATE INITS
1	AS FIRST DRAWN	2.09 LW
2	LIVE FROM PANEL INTO 6, 10 & 11	2.11 LW
2	NOT 11 ECI354	2.11 LW

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

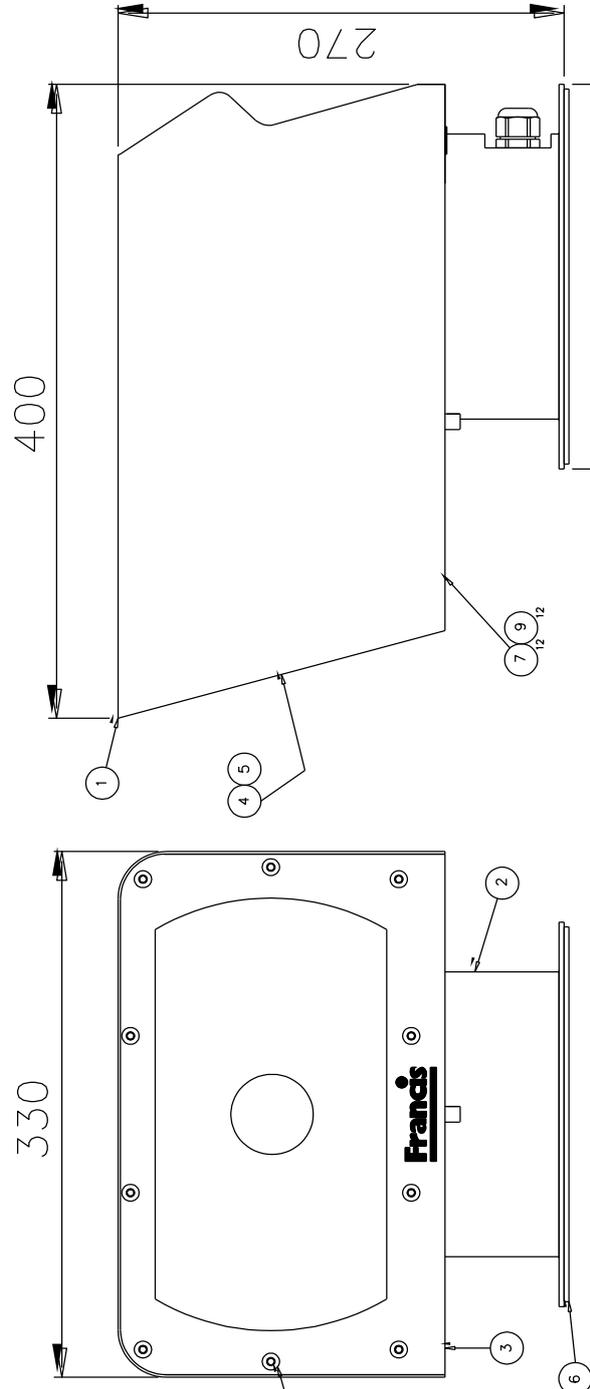


© 2009 A2 CONT ON SHEET	
PART No./DRG No.	C24497
SHT	11

FRANCIS SEARCHLIGHTS LIMITED · UNION ROAD · BOLTON · BL2 2HJ	
DESCRIPTION	MULTIPLE SLAVE PANELS WIRING DIAGRAM
FINISH	
MATERIAL	
Sand Casting: To ISO 8062 C110	
Die Casting: To ISO 8062 C18	
TOLERANCES	General: ±
Scale	Angular: ±
ALL DIMENSIONS IN MILLIMETRES	

LIGHT IS PRE-WIRED USING CABLE GLANDS TO THE REAR BUT IF PREFERRED CAN BE WIRED THROUGH HOLE IN THE BASE PLATE. BLANKING PLUGS ARE SUPPLIED IF CUSTOMER WISHES TO CHANGE FROM WIRING AT THE REAR.

Ø22mm HOLE IS RECOMMENDED FOR CABLE TO PASS THROUGH IF WIRING THROUGH CENTRE



ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C23946	C23946	HOUSING ASSY	1
2	C23951	C23951	BASE ASSY 250w HALOGEN	1
2	C23982	C23982	BASE ASSY 300w XENON	1
2	C23985	C23985	BASE ASSY 150w XENON	1
2	C24087	C24087	BASE ASSY 350w EM ARC	1
3	C23909	C23909	BEZEL COVER PLATE	1
4	C23903	C23903	GLASS	1
5	C08835	X2675	GASKET	1
6	C24079	C24079	GASKET	1
7	C16432		SCREW M4 x 12 SKT HD	12
8	C23954		SCREW M6 x 10 SKT BT HD	10
9	C21853		WASHER DUBO (REF 199)	12

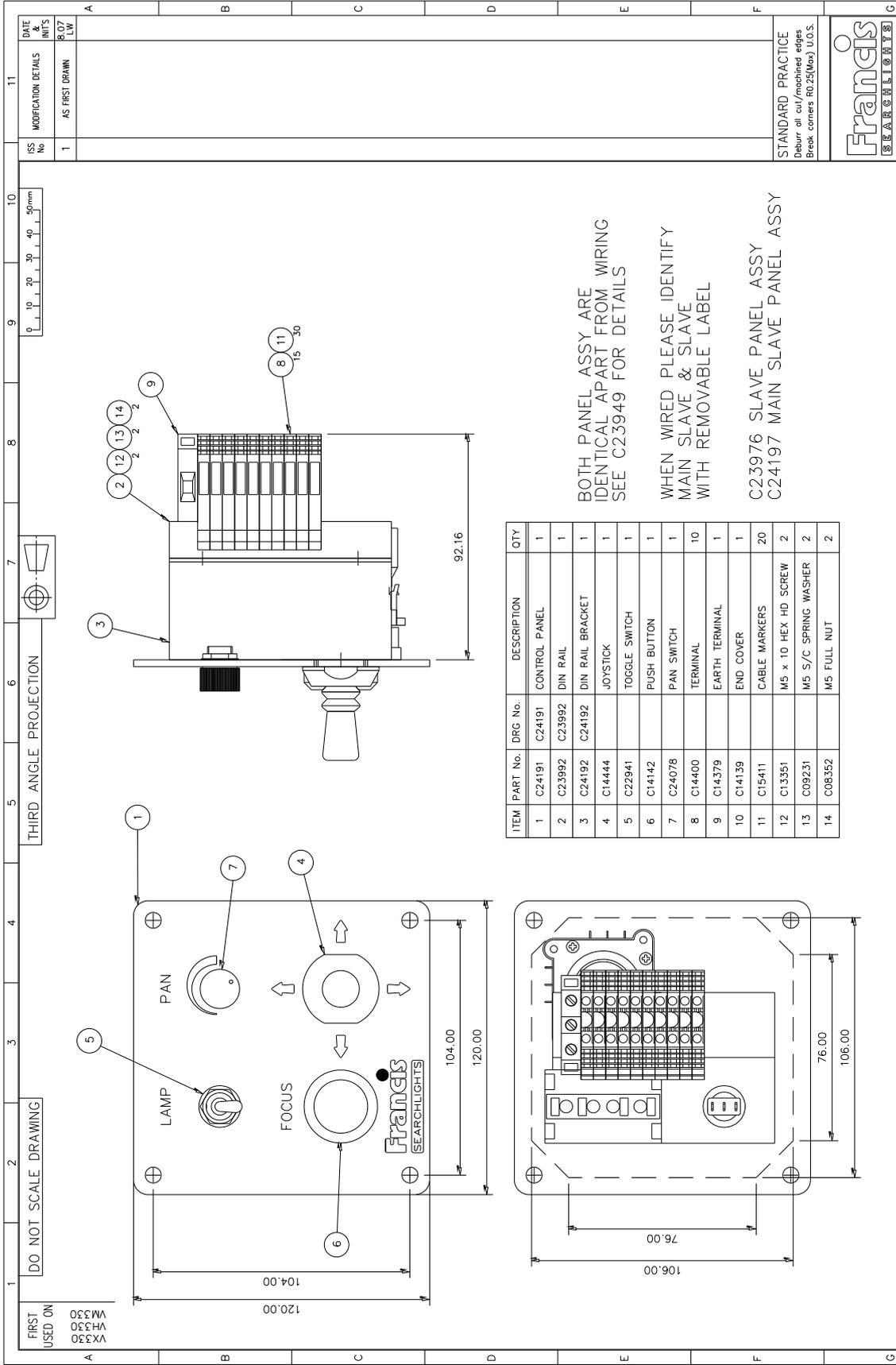
BASE FIXINGS
4 HOLES Ø8.2 EQUI-SPACED
ON A 220 P.C.D.

NOTE
ITEMS 4,5 7 & 9 ARE NOT IN VIEW

- A2645 LV 250w TUNG HAL
- A2646 HV 300w XENON
- A2647 HV 150w XENON
- A6051 LV 150w XENON
- A2661 HV 350w EM ARC
- A2669 LV 250w TUNG HAL (INC TRANSFORMER)
- A2648 LV 250w TUNG HAL CHROME
- A2649 HV 300w XENON CHROME
- A2650 HV 150w XENON CHROME
- A6052 LV 150w XENON CHROME
- A2663 HV 575w EM ARC CHROME
- A2671 LV 250w TUNG HAL CHROME (INC TRANSFORMER)

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





ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C24191	C24191	CONTROL PANEL	1
2	C23992	C23992	DIN RAIL	1
3	C24192	C24192	DIN RAIL BRACKET	1
4	C14444		JOYSTICK	1
5	C22941		TOGGLE SWITCH	1
6	C14142		PUSH BUTTON	1
7	C24078		PAN SWITCH	1
8	C14400		TERMINAL	10
9	C14379		EARTH TERMINAL	1
10	C14139		END COVER	1
11	C15411		CABLE MARKERS	20
12	C13351		M5 x 10 HEX HD SCREW	2
13	C09231		M5 S/C SPRING WASHER	2
14	C06352		M5 FULL NUT	2

BOTH PANEL ASSY ARE IDENTICAL APART FROM WIRING SEE C23949 FOR DETAILS

WHEN WIRED PLEASE IDENTIFY MAIN SLAVE & SLAVE WITH REMOVABLE LABEL

C23976 SLAVE PANEL ASSY
C24197 MAIN SLAVE PANEL ASSY

ISS No	1	DATE & INT'S	8.07 LW
MODIFICATION DETAILS	AS FIRST DRAWN		

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

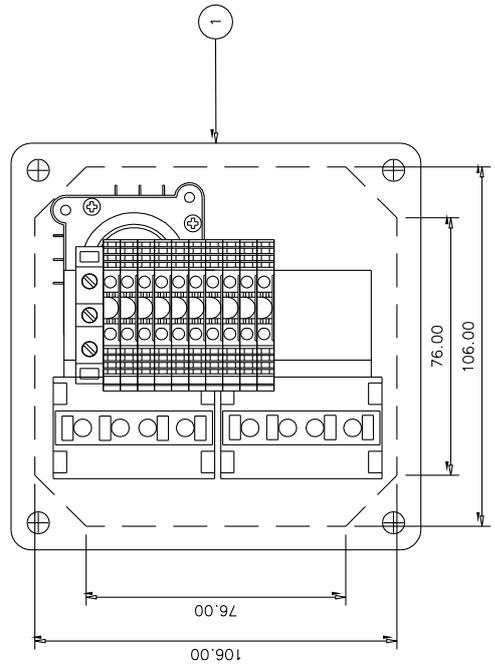
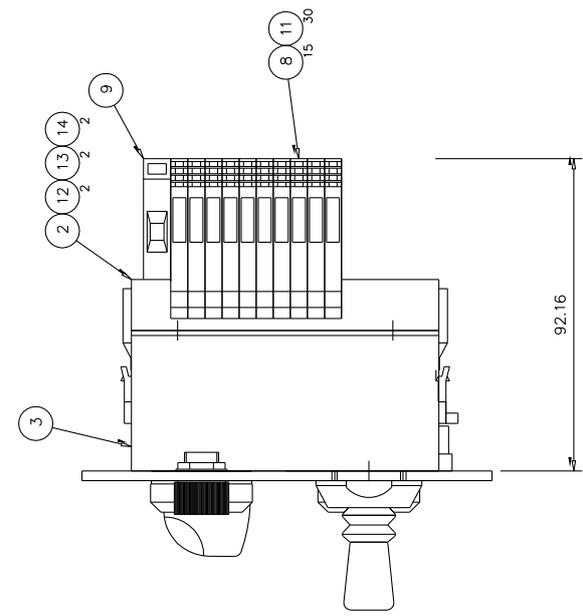
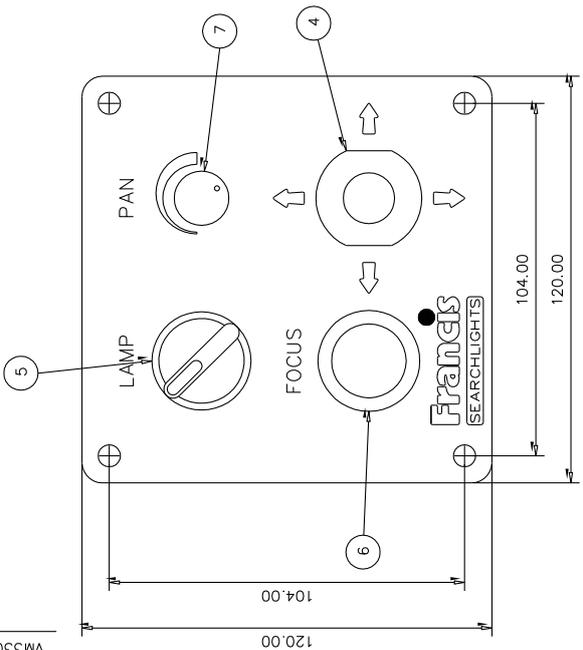
Francis SEARCHLIGHTS

DRAWN	LW	DATE	8.07	TOLERANCES	Spec Casting: To ISO 8052 CT10 Die Casting: To ISO 8082 CT8
CHECKED		SCALE	1:1	General: ± 0.2 Angular: ±	
ALL DIMENSIONS IN MILLIMETRES					
FRANCIS SEARCHLIGHTS LIMITED · UNION ROAD · BOLTON · BL2 2JH					
				FINISH	
				DESCRIPTION	SLAVE PANEL ASSEMBLY
				PART No./DRG No.	C23976
				CONT ON SHEET	1

ISS No	1
DATE & UNITS	11
MODIFICATION DETAILS	
AS FIRST DRAWN	
B.07 LW	



THIRD ANGLE PROJECTION



ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C23990		CONTROL PANEL	1
2	C23992		DIN RAIL	1
3	C23970		DIN RAIL BRACKET	1
4	C14444		JOYSTICK	1
5	C14143		SELECTOR SWITCH 10 AMP	1
6	C14142		PUSH BUTTON	1
7	C24078		PAN SWITCH	1
8	C14400		TERMINAL	10
9	C14379		EARTH TERMINAL	1
10	C14139		END COVER	1
11	C15411		CABLE MARKERS	20
12	C13351		M5 x 10 HEX HD SCREW	2
13	C09231		M5 S/C SPRING WASHER	2
14	C08352		M5 FULL NUT	2

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



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

© 2007 A2 CONT ON SHEET

DRAWN	LW	DATE	B.07	TOLERANCES	Material	FINISH	DESCRIPTION	PART No./DRG No.	SHT
CHECKED		SCALE	1:1	General: ± 0.2	To ISO 8062 CT10		CONTROL PANEL ASSEMBLY	C23991	1
ALL DIMENSIONS IN MILLIMETRES				Angular: ±	To ISO 8062 C18				
				Hole centres & posns: ±					

10 - Spare Parts List

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

Part Number	Description
D27734-00	350w Em Arc Lamp
C24181-00	Ignitor
C24185-00	350w PSU
C14143-00	Switch 10A - On/Off
C14142-00	Switch – Focus
C14444-00	Joystick
C24078-00	Switch (Controller/Speed)
C23803-00	Front Glass
C08835-00	Front Glass Gasket
C16410-00	24v Motor – Focus and Tilt
C23802-00	Reflector
C22268-01	Breather Assembly
C24089-01	Pan Motor Sub Assembly
C22382-00	Microswitch with lever
C24000-00	Speed Controller
C23530-00	PSU Converter
C14981-00	Relay (PSU)
C23805-00	Relay (Housing)
C23969-01	Sensor Block Assembly
C21567-00	Heater
C24079-00	Mounting Base Gasket
C22104-00	Fan

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.