User Instruction & Installation Manual

L300 HV 250w RF Laser

Product Reference Number:

A7306 – 115/240v Deck
A7307 – 115/240v Deck Pedestal
A7308 – 115/240v Cabin
A7309 – 115/240v Cabin Pedestal

Manufacturer's details:

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Distributor details:

Manual Part Number: C29768
Issue: 2 26.3.24

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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 to ensure optimum performance and service life.

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

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 always quote the Product Serial Number.

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2 - Safety Precautions

The following instructions must be adhered to, 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 to prevent damage to the equipment or personal injury.

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

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3 – Technical Information

This product has been designed to operate in accordance with the product specification. The L300 250w Laser searchlight has the following features:

- All marine grade materials and fixings.
- Powder coated finish and stove enamel paint finish.
- Full 450° horizontal rotation.
- Vertical movement ±40˚ (Deck & Deck Pedestal).
- Vertical movement +30˚ to -25˚ (Cabin & Cabin Pedestal).
- Instant re-strike. No cooling down time required.
- Economical 12,000-hour Laser life.
- Toughened super clear Opti white front glass.
- Precision made glass lenses.
- Remote focus facility.
- Control Panel fitted with on/off and focus.
- Sealing – IP56 Searchlight.
- Searchlight weight Deck 25 Kgs, Deck Pedestal 29Kgs, Cabin 28Kgs, Cabin Pedestal 32Kgs.

The searchlight also performs to the following optical data:

- Supply voltage – 115/240v.
- Luminous flux 16,000 Lumens.
- Colour temperature 6,500K.
- Range – 7211 metres.
- Divergence – Spot 1° - Flood 18°.
- Temperature range: -50°C to + 65°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.

Note: The laser lifetime is based on the recommended input power and heat dissipation when the luminous flux retention rate is 50%.

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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, 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. 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.

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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.

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 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/ratings 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 L300 250w Laser searchlight is as follows:

Referring to wiring diagram C29766, a supply is fed into the on/off control box, which then provides a common feed to the searchlight.

The following cables have been fitted as standard.

3 metres of 5 core 1.5mm cable from the control box to the searchlight.

Cables required to be supplied by the customer: -

The Mains cable to the on/off Control box.

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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 pan and tilt lock wheels. When in the desired position the lock wheels must be securely fastened to prevent damage.

The beam of the searchlight can be adjusted to give a variety of beam types. Using the yellow remote focus button on the Control Box, the desired beam can be achieved for any application. The beam will move continuously through ‘spot’ to ‘flood’. To fix the beam type; simply release the button at the desired position.

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

On an uneven surface when bolting down the searchlight it is necessary to use a suitable sealant, such as silicone, to ensure weather proofed joint.

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.

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7- Fault Finding

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

Failure of Laser to light.

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

1) Check that the mains supply 115/240v is connected to the input of the on/off control box and check all connections as per the wiring diagram. Check the output from the 48v PSU across terminals 3 & 2 in 48vdc. Check the output from the 24v PSU across terminals 9 & 8 is 24vdc. Check the three fans are working and there is 24vdc across terminals 6 & 5. On operation if the Laser does not light, switch off mains supply and check all fuses.

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8 - Maintenance and Servicing

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 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 lenses 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.

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9 - Wiring Diagrams & General Assemblies

Drawing Number	Description
A7306	L300 HV 250w RF Laser Deck General Assembly
A7307	L300 HV 250w RF Laser Deck Pedestal General Assembly
A7308	L300 HV 250w RF Laser Cabin General Assembly
A7309	L300 HV 250w RF Laser Cabin Pedestal General Assembly
C29766	Wiring Diagram
C29761	RF ON/OFF Control Unit

FIRST USED ON

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm

ISS No	MODIFICATION DETAILS	DATE & INITS
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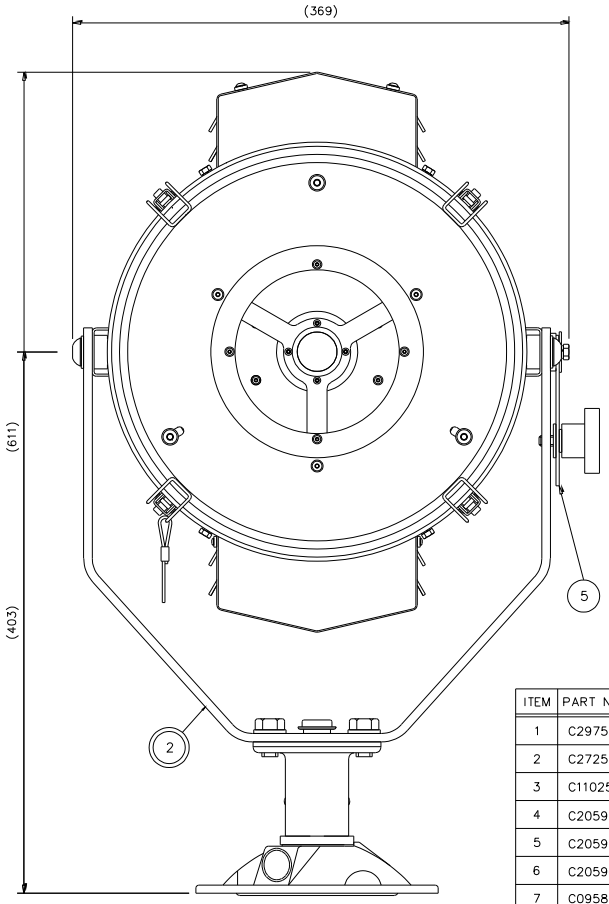

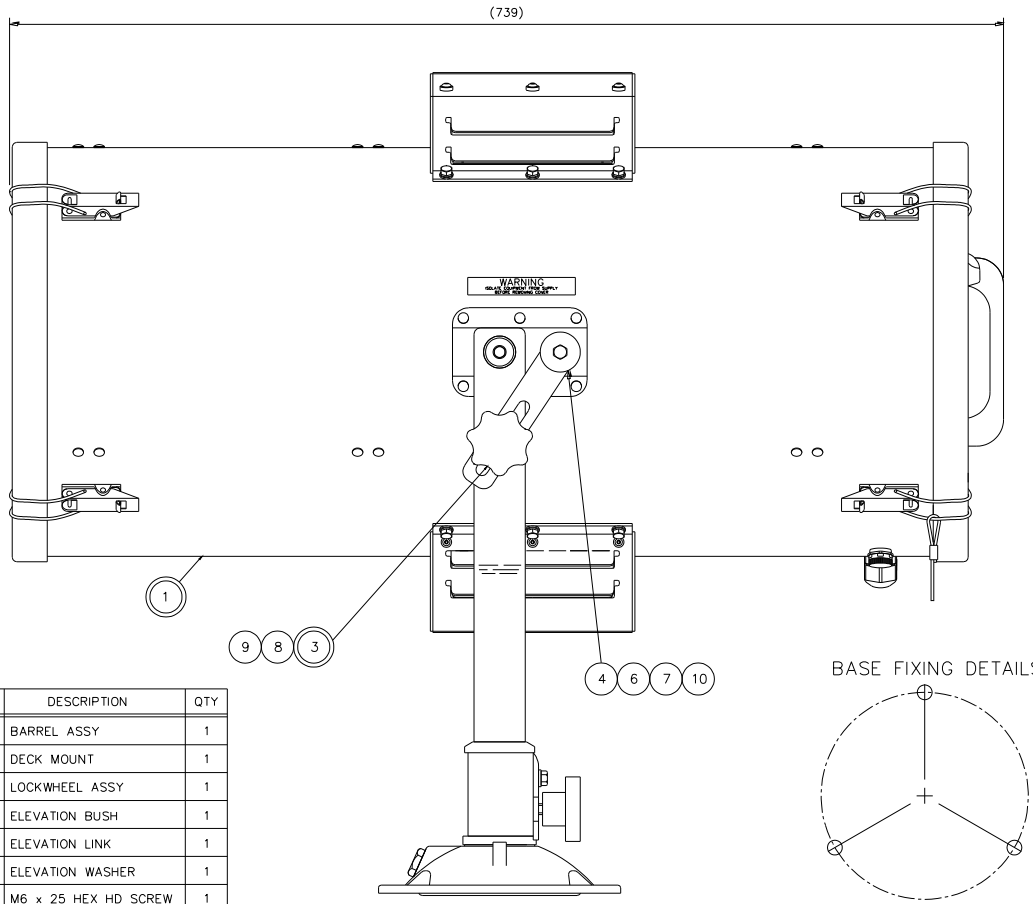

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C29753	C29753	BARREL ASSY	1
2	C27255	C20641	DECK MOUNT	1
3	C11025	X4574	LOCKWHEEL ASSY	1
4	C20595	C20595	ELEVATION BUSH	1
5	C20594	C20594	ELEVATION LINK	1
6	C20596	C20596	ELEVATION WASHER	1
7	C09580		M6 x 25 HEX HD SCREW	1
8	C06999		M8 PLAIN WASHER	1
9	C25715		M8 x 25 O/D WASHER	1
10	C10554		M6 S/C SPRING WASHER	1

BASE FIXING DETAILS

3 HOLES ø11.00 EQUI-SPACED
AS SHOWN ON A 154.00 PCD

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

Francis SEARCHLIGHTS

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

A1 CONT ON SHEET

DRAWN	J.H.	DATE	7.22
CHECKED		SCALE	1:2
ALL DIMENSIONS IN MILLIMETRES			

TOLERANCES
General: ±
Angular: ±

Sand Casting: To ISO 8062 CT10
Die Casting: To ISO 8062 CT8
Hole centres & posns: ±

MATERIAL

FINISH

DESCRIPTION

L300 DECK HV 250W RF LASER G.A

PART No./DRG No. A7306

SHT 1

FIRST USED ON

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm

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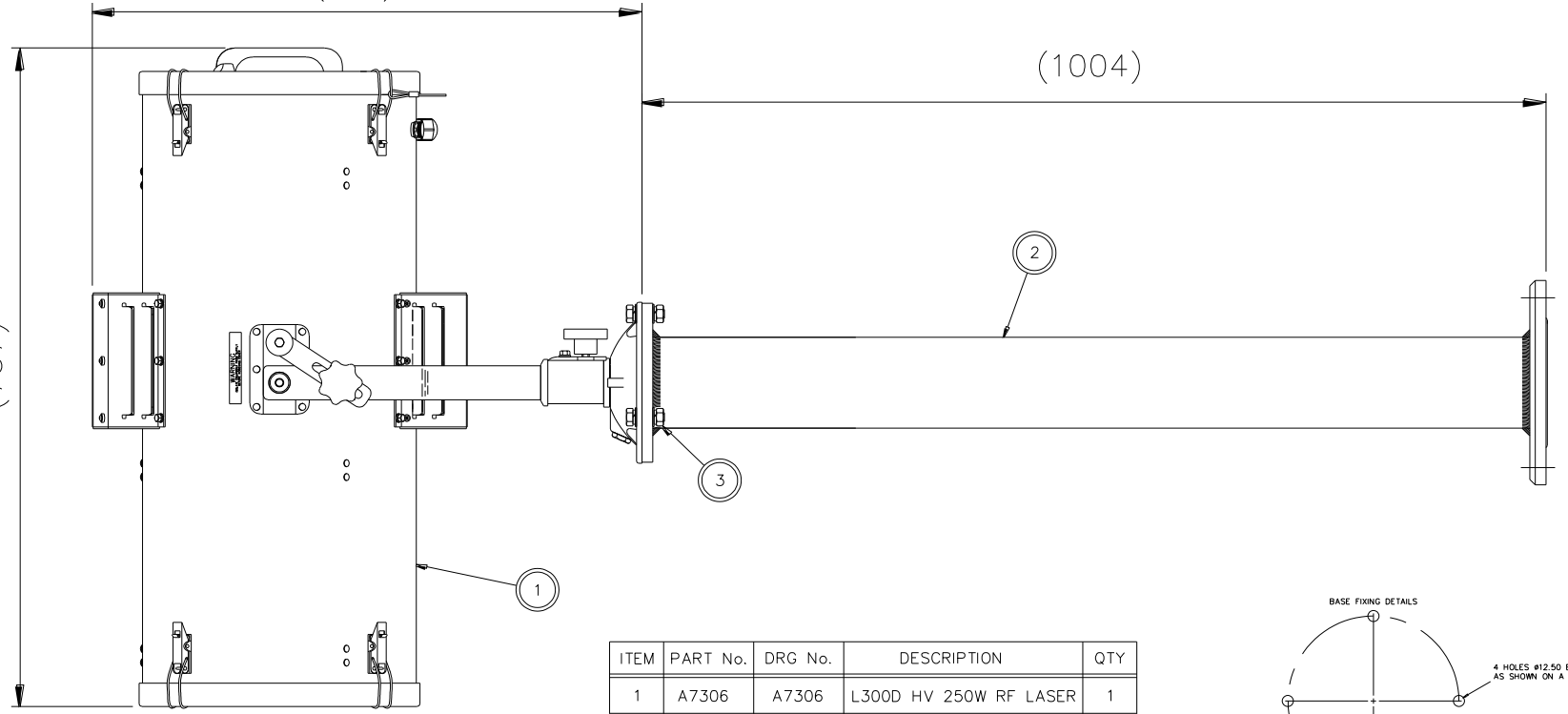

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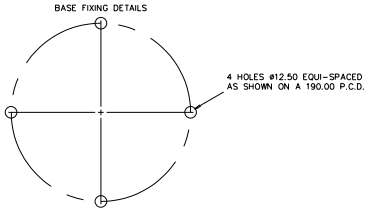
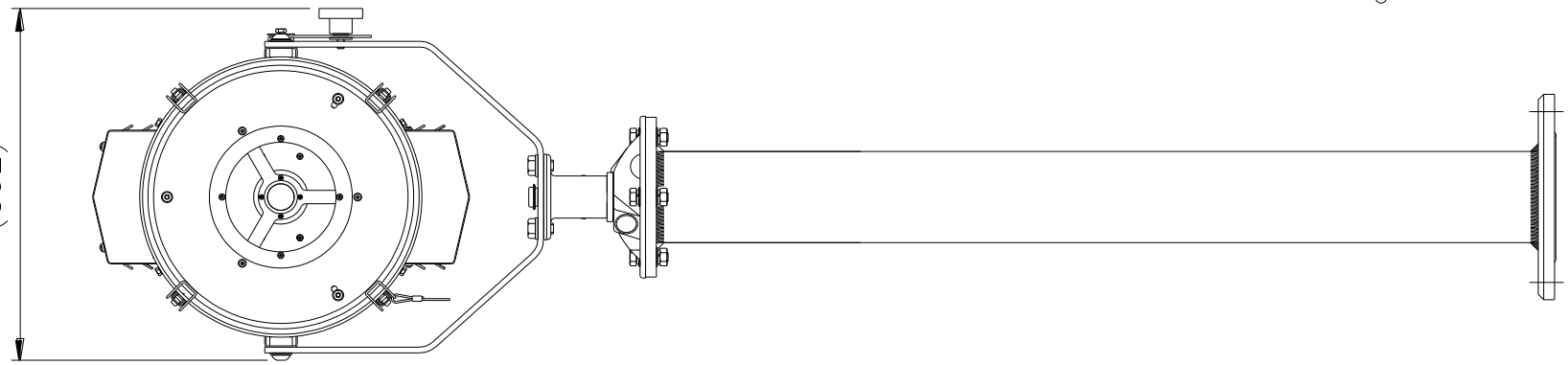
1	A7306	A7306	L300D HV 250W RF LASER	1
2	C20719	C20719	PEDESTAL ASSEMBLY	1
3	C20747		DP CONVERSION KIT	1





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

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 A2

CONT ON SHEET

DRAWN	J.H.	DATE	12.22	TOLERANCES	Sand Casting: To ISO 8062 CT10	MATERIAL	FINISH	DESCRIPTION	PART No./DRG No.	SHT
CHECKED		SCALE	1:4	General: ±	Die Casting: To ISO 8062 CT8			L300 DECK PEDESTAL HV 250W RF LASER	A7307	1
ALL DIMENSIONS IN MILLIMETRES				Angular: ±	Hole centres & posns: ±					

FIRST USED ON

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm

ISS No	MODIFICATION DETAILS	DATE & INIT'S
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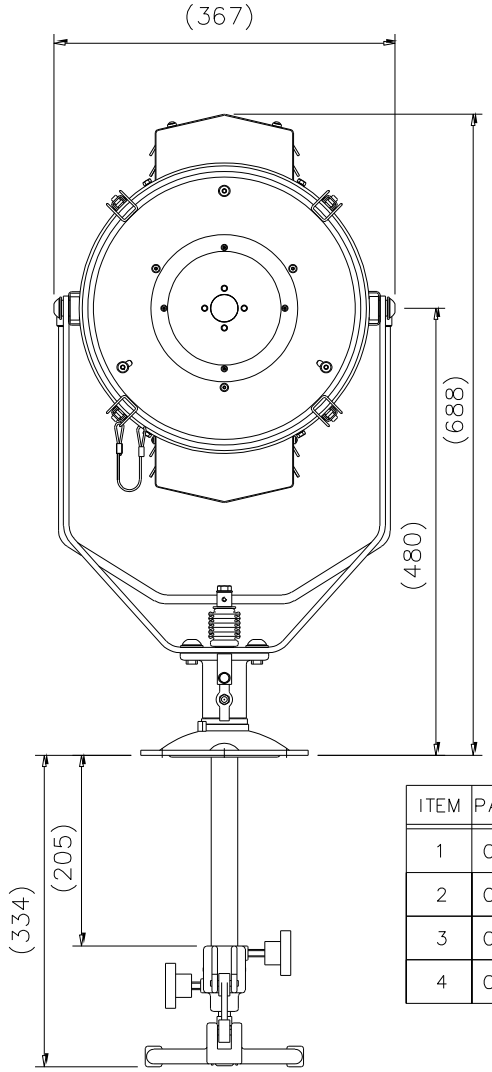

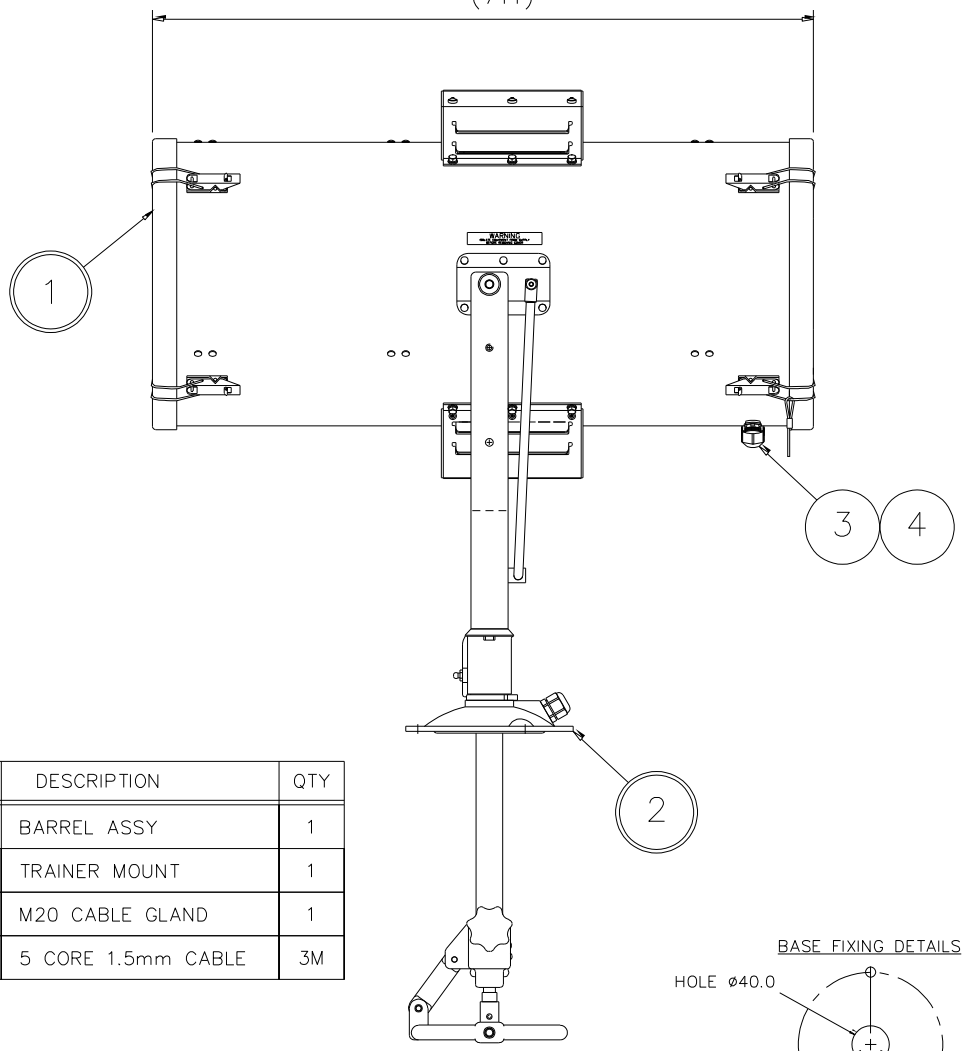

ITEM	PART No.	DWG	DESCRIPTION	QTY
1	C29752	C29752	BARREL ASSY	1
2	C29664	C29664	TRAINER MOUNT	1
3	C10158		M20 CABLE GLAND	1
4	C20341		5 CORE 1.5mm CABLE	3M

BASE FIXING DETAILS

3 HOLES ø11.0 EQUI-SPACED AS SHOWN ON A 154 P.C.D.

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

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A2 CONT ON SHEET

DRAWN	J.H.	DATE	12.22	TOLERANCES	MATERIAL	FINISH	DESCRIPTION
CHECKED		SCALE	1:4	General: ±			L300 CABIN HV 250W RF LASER
ALL DIMENSIONS IN MILLIMETRES				Angular: ±			

Sand Casting: To ISO 8062 CT10
Die Casting: To ISO 8062 CT8
Hole centres & posns: ±

PART No./DRG No. A7308 SHT 1

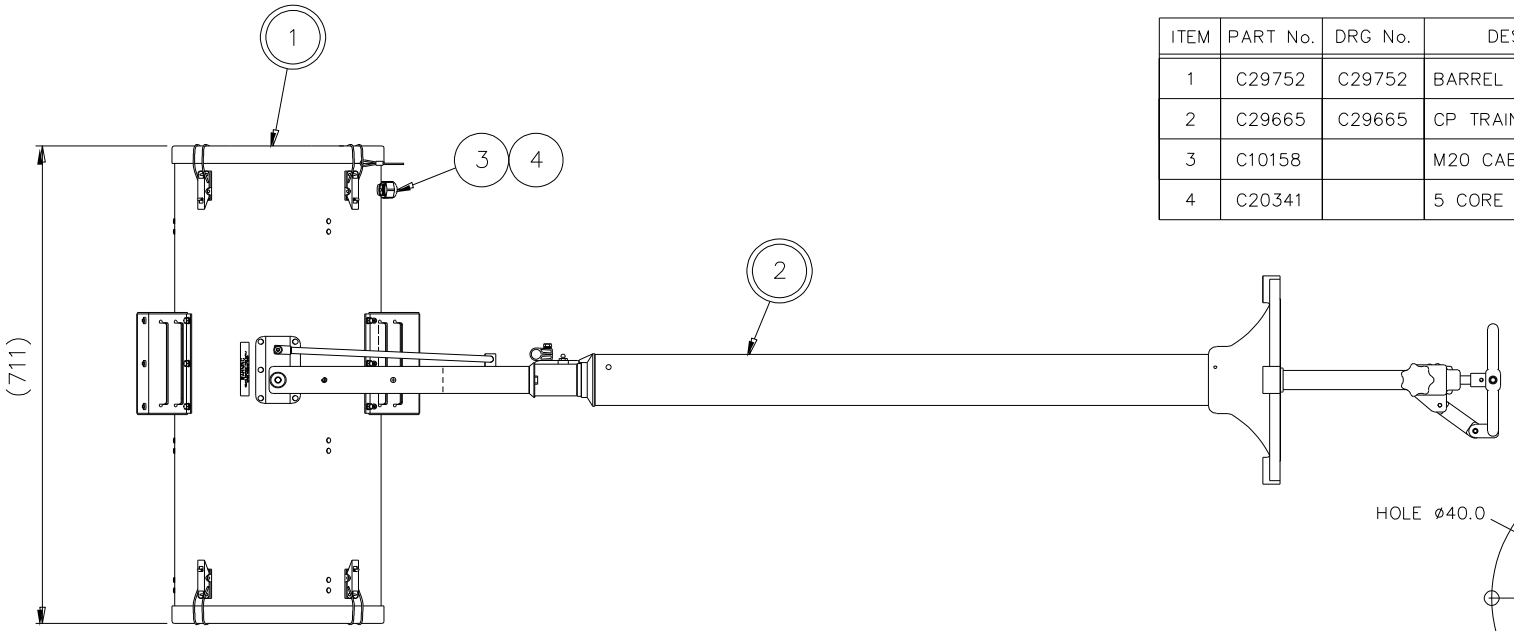
FIRST USED ON

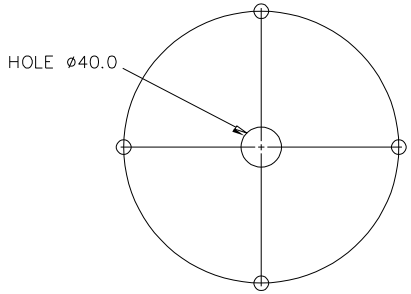
DO NOT SCALE DRAWING

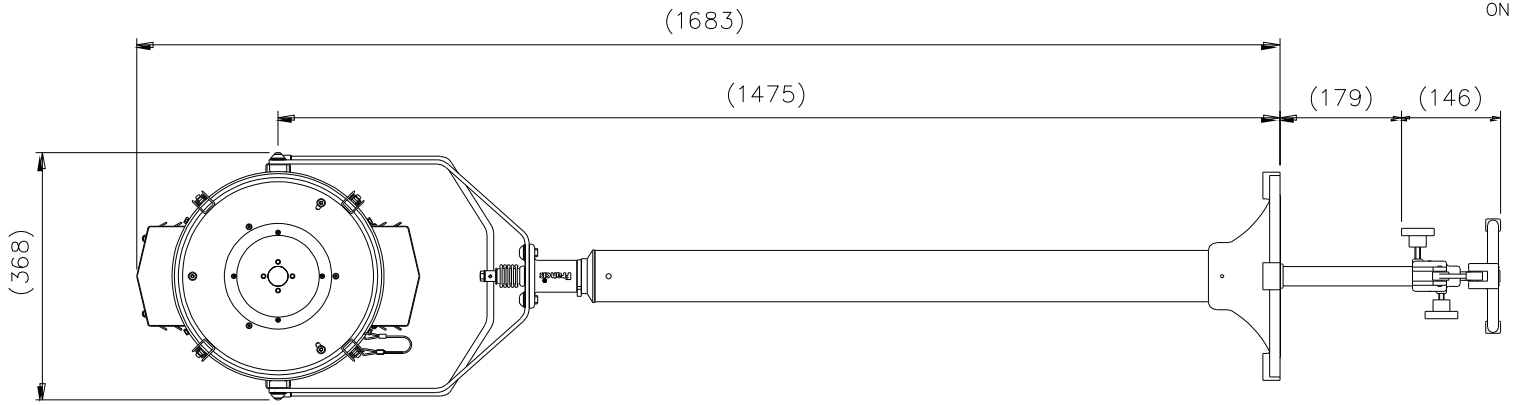
THIRD ANGLE PROJECTION

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	12.22 J.H.

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C29752	C29752	BARREL ASSY	1
2	C29665	C29665	CP TRAINER MOUNT	1
3	C10158		M20 CABLE GLAND	1
4	C20341		5 CORE 1.5mm CABLE	3M







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

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A1

CONT ON SHEET

DRAWN	J.H.	DATE	12.22
CHECKED		SCALE	1:4

ALL DIMENSIONS IN MILLIMETRES

TOLERANCES
General: ±
Angular: ±

Sand Casting: To ISO 8062 CT10
Die Casting: To ISO 8062 CT8
Hole centres & posns: ±

MATERIAL

FINISH

DESCRIPTION

L300 CABIN PEDESTAL HV 250W RF LASER

PART No./DRG No. A7309

SHT 1

FIRST USED ON
L300
250W LASER
A3706

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm

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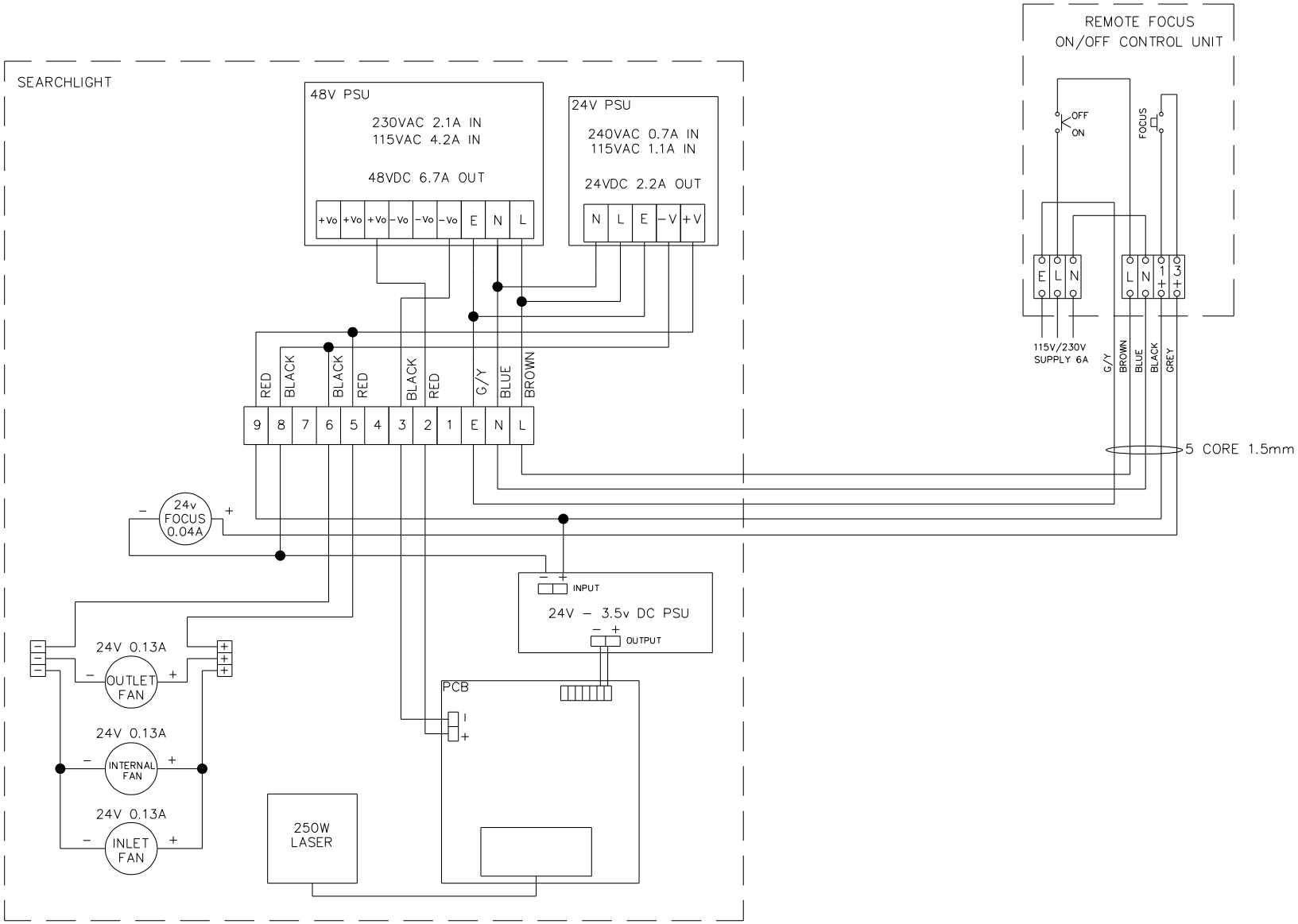

STANDARD PRACTICE
Deburr all cut/machined edges
Break corners R0.25(Max) U.O.S.

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 A2

CONT ON SHEET

DRAWN	J.H.	DATE	7.22	TOLERANCES	Sand Casting: To ISO 8062 CT10
CHECKED		SCALE	1:1	General: ±	Die Casting: To ISO 8062 CT8
ALL DIMENSIONS IN MILLIMETRES				Angular: ±	Hole centres & posns: ±

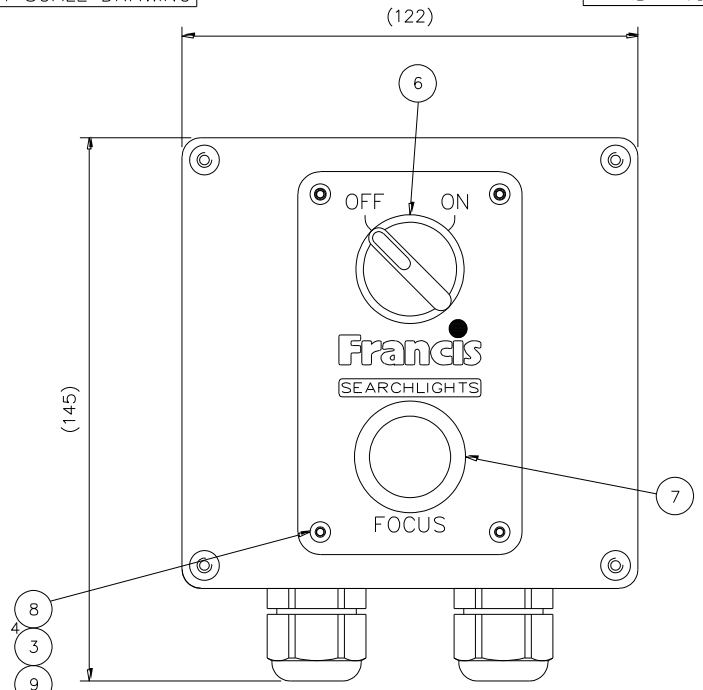
MATERIAL | FINISH | DESCRIPTION: L300 250W RF LASER WIRING DIAGRAM | PART No./DRG No.: C29766 | SHT: 1

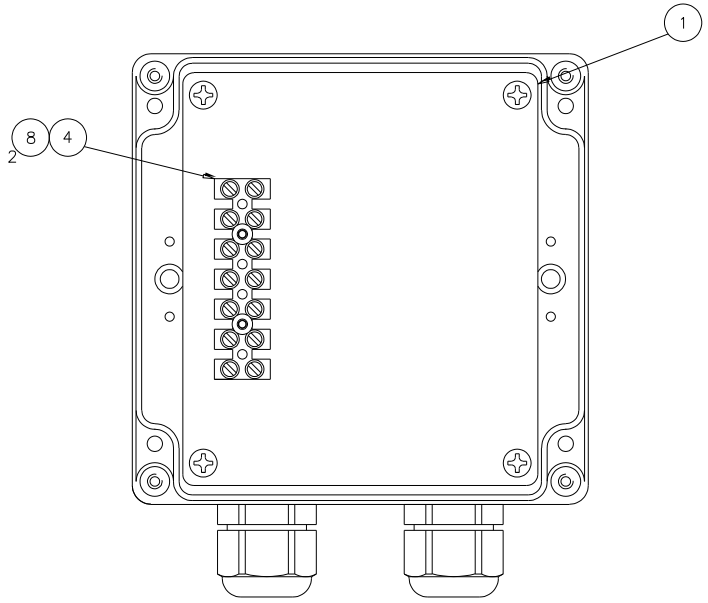
FIRST USED ON

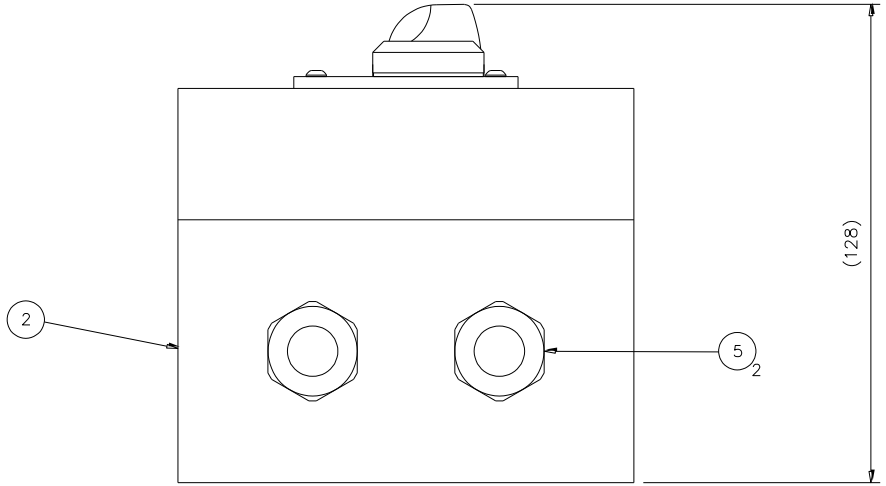
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm







ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C29763	C29763	CHASSIS PLATE S/ASSY	1
2	C29762	C29762	ENCLOSURE DRILLING	1
3	C29765	C29765	CONTROL PANEL	1
4	C15056		TERMINAL BLOCK	1
5	C10158		M20 CABLE GLAND	2
6	C14143		10A SELECTOR SWITCH	1
7	C14142		PUSH SWITCH	1
8	C21488		M3 x 12 BTN HD SCREW	6
9	C08028		M3 PLAIN WASHER	4
10	C10747		M3 S/C SPRING WASHER	4
11	C05298		M3 FULL NUT	4

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	11.22 J.H.

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

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A2 CONT ON SHEET

DRAWN	J.H.	DATE	11.22	TOLERANCES	Sand Casting: To ISO 8062 CT10 Die Casting: To ISO 8062 CT8 Hole centres & posns: ±
CHECKED		SCALE	1:1	General: ± Angular: ±	
ALL DIMENSIONS IN MILLIMETRES					

MATERIAL

FINISH

DESCRIPTION: RF ON/OFF CONTROL UNIT

PART No./DRG No.: C29761

SHT: 1

10 – Spare Parts List

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

Part Number	Description
Searchlight	
C29757-00	250w Laser Module Assembly
C27224-00	Front Glass
C20567-00	Front Glass Gasket
C22268-01	Breather Assembly
C27820-00	Fan (Top, Bottom Vents & Laser Module)
C29758-00	PCB
C29759-00	Step Down Transformer PCB
C16410-00	Focus Motor
C16534-00	Focus Motor Cover
C29756-00	Front Lens
C29755-00	Middle Lens
C29754-00	Rear Lens
C29033-00	24v PSU
C29530-00	48v PSU
C11025-01	Pan & Tilt Lock Wheel Assembly (Deck & Deck Pedestal))
C11026-01	Pan & Tilt Lock Wheel Assembly (Cabin & Cabin Pedestal)
C10168-00	Base ‘O’ Ring (Deck & Cabin)
C10169-00	Spigot ‘O’ Ring
C21967-00	Bellows Bottom Bush ‘O’ Ring
C08926-00	Push Rod Seal
C20634-00	Pedestal Base ‘O’ Ring (Deck Pedestal & Cabin Pedestal))
C20281-00	Bellows (Cabin & Cabin Pedestal)
Control Unit	
C14143-00	On/Off Selector Switch
C14142-00	Focus Pushbutton

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 always quote searchlight model and serial number. This will enable a fast response to your spares’ requirements.

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