User Instruction & Installation Manual

LX480 Manual Control
1Kw Xenon Searchlight

Product Reference Number:

A2277 – LX480 Deck Pedestal 240v
A2278 – LX480 Deck Pedestal 115v
A2279 – LX480 Cabin 240v
A2281 – LX480 Cabin 115v
A2282 – LX480 Cabin Pedestal 240v
A2283 – LX480 Cabin Pedestal 115v

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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 Xenon 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.

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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, the lifting handles 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 jackets 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 there are several options available:
    - Return the lamp, via the supplier, to the lamp manufacturer in its complete packaging
    - Because of the cold internal pressure of the lamp is approximately 8 bar, the lamp must first be depressurised before disposal. Place the lamp, in its protective jacket, in a plastic bag and drop from a height of 1 to 2 metres onto a hard surface;
- XBO lamps do not contain materials which are harmful to the environment and thus are not subject to special waste disposal regulations;
- 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 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.

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3 - Technical Information

This product has been designed to operate in accordance with the product specification. The LX480 1000 watt searchlight has the following features:

- All marine grade materials and fixings;
- Electronic power supply unit;
- Parabolic glass reflector, Optional nickel reflector;
- Stove enamel painted;
- Full 360° horizontal rotation;
- Vertical movement Deck +45° to -25°, Cabin +40 to -40;
- Internal self-regulating heater.

The searchlight also performs to the following optical data:

- Xenon light source;
- Lamp Wattage - 1000 Watts;
- Supply voltage – 220/240v or 100/115v;
- Peak Beam Candlepower – 67,779,546 lux;
- Range – 8,233 metres;
- Divergence - 1.5° to 10°;
- 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 Power Supply Unit and Ignitor are included overleaf. For more detailed information please contact the manufacturer.

PSU ref.: ECG 1000 XE
Ignitor ref. ZG 120 XE

ECG 1000 XE – SERIE

Preliminary

(HBX 1000)

Electronic Xenon ballast 330 – 1000W

Please read this information carefully, before installing and operating the power supply!

1. Beschreibung HBX 1000

Ein Array mit 1.000W besteht aus drei Modulen, von dem jedes eine Ausgangsleistung von max. 334W bei einer Brennspannung von 20 – 27V liefern kann. Somit können die Arrays separat an der Netzleitung angeschlossen werden und auch jedes für sich betrieben werden.

Jedes Array wird mit einem Controlboard ausgestattet auf dem mittels eines Mikroschalters jedes einzelne Modul zu- oder weggeschaltet werden kann. Das Controlboard verfügt darüber hinaus über eine separate Stromversorgung, um ein Nachlaufen der Lüfter zu ermöglichen.

Für eine 2000W Xenonlampe werden also 2 Arrays benötigt, für eine 1600W Lampe ebenfalls, wobei 1Array vollständig und ein Weiteres zu 2/3 verwendet werden.

Die Konstruktion der Arrays ist so ausgelegt, dass zwei auf der vom Kunden zur Verfügung gestellten Montageplatte montiert werden können.

2. Fotos

Ansicht Lüfterseite

Ansicht Anschlussseite

3. Electrical Data

All values are valid at 25 ± 5°C, unless otherwise noted

Input Data

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Input voltage AC Line	U	V AC	100-240	90 - 264	
System wattage	P_{LI}	W			depends on select
Input current	I_{LI}	A			depends on select
Line frequency	Fin	Hz	50/60	47 – 63	
Line Power factor	PFC	1	1.0	0.92 to 1.0	
Leakage Current to PE	I_{Leak_SA}	µA	<150		Standalone

Other Operation Data	Symbol	Unit	Nominal	Tolerances	Remarks
System wattage during ignition	P_{Iign}	W		<30	
System wattage standby-operation	P_{LIStby}	W	1	0.5 – 2.0	

Lamp Output Data

Ignition	Symbol	Unit	Nominal	Tolerances	Remarks
Ignition voltage with ZG100Xe	U_{ign}	kV_{peak}	32		Load capacity <20pF
Ignition time automatic restart counter	$t_{ign\ on}$	sec.	1 5	0.9 – 1.1 --	 attempts

Run-up Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Run-up Current @ 15V Lamp voltage	I_{max} Imax	A A		+/-10% Max.	Inside specified lamp-parameter (select by S1)
In rush Current	I_{max}	A			0 to 1ms

MISCELLANEOUS DATA

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Power losses at 115V at 230V	P_V	W	40 – 130 30 - 110	+/-	Depends on power select
Efficiency	η	1	0.83	0.8 – 0.9	Depend on Lamp current
Ambient temperature	T_A	°C	+ 25	-10 - +40	non condensing
Maximum temperature at test point	T_c	°C	+80		
Internal temp. switch off temperature	$T_{c\text{-}off}$	°C	+90	+85 - +95	At heatsink no de-rating till switch off

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Standby Mode	Symbol	Unit	Nominal	Remarks
Minimum mains shut-off time for restart	T_{reset}	s	3	Standby mode is present when the lamp doesn't light 1. when ignition hasn't been successful 2. when lamp output is shorted 3. when lamp extinguishes while running

Geometry and Weight	Symbol	Unit	Nominal	Tolerances	Remarks
Length	l	mm		+/-1	See dwg.
Width	w	mm		+/-1	See dwg.
Height	h	mm		+/-1	see dwg.
Housing			n.a.		open frame, req. ext.cooling
Weight	W_B	Kg		+/-0.05	

Wiring length	Symbol	Unit	Nominal	Tolerances	Remarks
Between ignitor and lamp	L_{il}	mm		t.b.d.	As short as possible
Between ballast and ignitor	L_{bl}	mm	t.b.d.	t.b.d.	External Ignitor

Cooling method	Symbol airflow	Unit meter per second	Nominal	Remarks Must be checked in actual application

Plugs and Cables	Manufacturer / Type	Remarks / Header/Contacts
Ballast mains plug		
Ballast interface plug		
Fan connection plug		
Connection Ballast-Ignitor		
Option plug		
Igniter HV plug to lamp		

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Lamp voltage	U_{La}	V	- 29 10 - 120	+/-5% +/-5%	Depends on lamp select
Lamp wattage	P_{La}	W		+/-2%	Selectable by Mode Sw. (not implemented yet)
Lamp current	I_{La}	A	Up to		Depend on select
End-Of Life-Cut off voltage	$U_{La, max}$	V	30	+/-2V	After run-up completed
End-Of-Life-Cut off time	$t_{EOL-Off}$	S	< 0.2		
RF-Ripple of output power	$\Delta P_{La,rip}/ P_{La}$	%	< 1 p-p		13V-30V
50Hz –60Hz Ripple		%	< 1 p-p	< 4 p-p	13V 30V
Shift in output power with shift in input voltage	$\Delta P_{La}/ \Delta U_{LI}$	1		< 0.005	within nominal values
Open circuit voltage	U_{ocv}	V	110	105 –115	

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Additional hints for use and safety:

Safety

Because of instant hot restrike, the output voltage to the lamp can reach values of up to +/-15000 Volts! Please ensure minimum 15mm clearance between all lamp terminals to PE, to prevent arc to ground situation!! Primary wiring has to meet national requirements for electric safety!

Connection

Model HBX1000 has separate input connectors and separate output connectors. It shall be assured that in end use application that inputs as well as outputs are connected in parallel. At the output, positive outputs of both modules are connected and negative outputs are connected respectively as well.

Lamp power selection:

By switches.

Cooling

Fan cooling is mandatory.
In all cases, the temperature at the temperature test point should be tested to ensure most reliable operation. This temperature should not exceed 80°C.
Temperature overload is protected by an internal temperature switch at 90°C at the internal heatsink.

Fuse and Safety

CAUTION! For Continued Protection Against Risk of Fire, Replace Only with same Type and Rating of Fuse! The fuse is a fixed built- in component with T5A / 250V rating.
If the fuse has failed, the power-supply must be returned to the factory for repair.

Increasing reliability and functions

Custom modifications of power curves and adaption to other lamp types are possible upon request.

Please see the following pages for additional information about wiring, mounting and operating data.

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ZG 120Xe

Igniter for low Voltage DC-Lamps with Lamp- currents up to 120A

Please read this information carefully, before installing and operating the igniter!

Features:

Ballasts:

HBX1000
HBX500

Revolutionary drive system: needs no more external powersource, self synchronisation with ballast

- Igniter for DC-Xenon and HQ discharge lamps operated by electronic ballasts
- Suitable for low voltage and high current DC lamps with lamp voltages up to 100V DC
- Compliant to RoHS-directive 2002/95/EC
- Self stopping operation (2sec)
- DC-Impedance of about 1000 µΩ
- DC-Power loss of about 10W @ 100Amps, 15,8W @ 120Amps
- DC-Power loss of 28W @ 160Amps

Technical data

Rated current	120A, no add cooling, please see Diagram 1-3
Temporary over current <90s within a period of 5 minutes	200 A
Ignition voltage:	Min 32kVp
Input voltage range	DC 0-160 V / threshold for ignition > 70V
Operation mode	Asymmetrical : Cathode or Anode grounding
Ignition mode control	Self stopping igniter nearly 2 sec./self sourcing by ballast, no external source necessary
Pulse rate	Approximately 30/sec.@70V
Repetition rate	depends on ballast, break of min.10 sec. is required
Operating temperature	115°C max. @ Ignition coil TP 1 / 85°C @ TP 2
Cable length	HV to lamp 50 cm max., for hot re-ignition: **short as possible**
Dimensions (H x W x L)	115 x 103 x 30/45 mm
Weight:	Roughly 920g
Connectors	4 x M6 Screw-Terminals with Nuts M6 for cable-shoes

Regulatory Specifications

Safety	According to IEC (UL) 60950-1
RoHS	According to 2002/95/EC

Power Losses versus Lamp Current

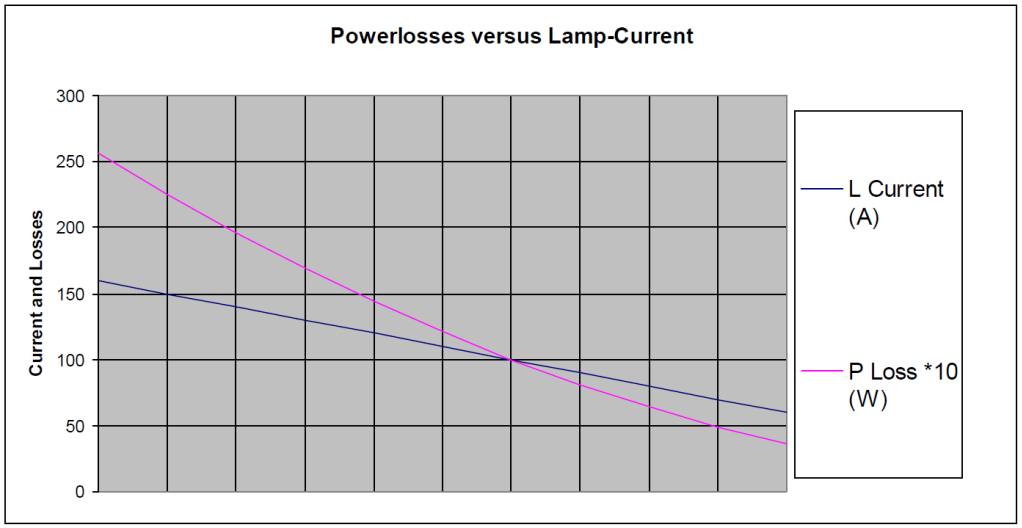


Diagram 1:

Powerlosses versus Lamp current, for Example: 10W @ 100Amps

Thermal hints for use

The igniter consists of two different parts:

1. the Main Ignition Coil and

2. the Electronic Puls Generator

Both parts are potted in one case, but separated in two different areas of this.

Because electronic parts are temperature sensitive, this area (Temp Test Point 2) should be operated with less or equal to 85°C, this area does not heat up for itself.

The second part is the ignition coil. The ignition coil is not temperature sensitive and allows an operating temp up to 130°C. For a good thermal solution and a long lifetime of the whole system (potting compound, housing material aso.), we limited this temperature (Testpoint 1) to about 115°C (120°C could be accepted as an absolut maximum).
Lower temperatures are welcome in every case!
The used potting compound is rated to 130°C @ UL 94V-0.

There are two options to operate this ignitor :

1. Without any cooling by forced air

The maximal operating current without forced air is 120Amps @ 50°C.
It should be ensured, that the ambient air has enough room to move.
The thermal situation should be controlled in the final product.
For details please see diagram 2.

2. With forced air

The same conditions are valid for this operation too. The only difference is the higher Lamp operation current. Depend on the airflow, it is possible to use it for up to 160Amps or more.

The only limiting item is the temperature at the coil (Temp Testpoint1)!
For details please see diagram 3.

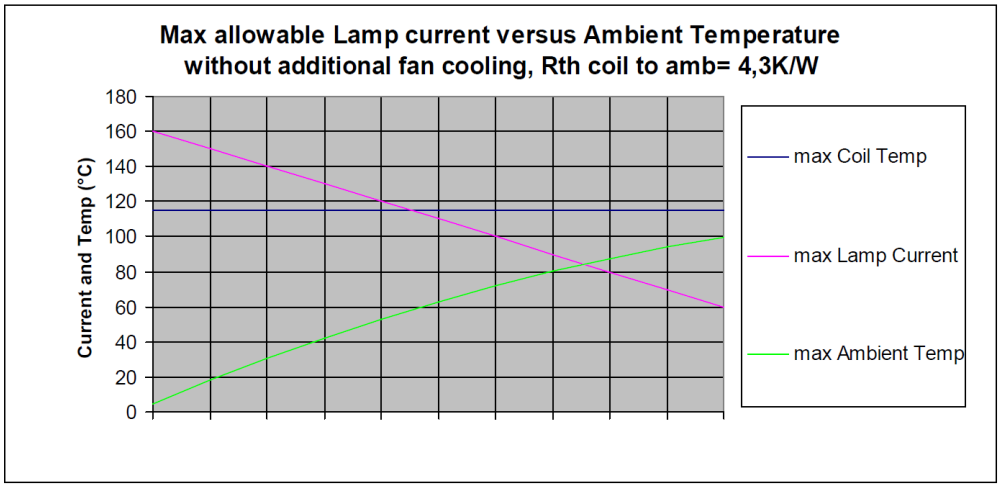


Diagram 2:

Maximum Lamp-Current without Fan versus Ambient
Example: 120Amps @ 50°C Ambient
Coil Temperature nearly 115°C

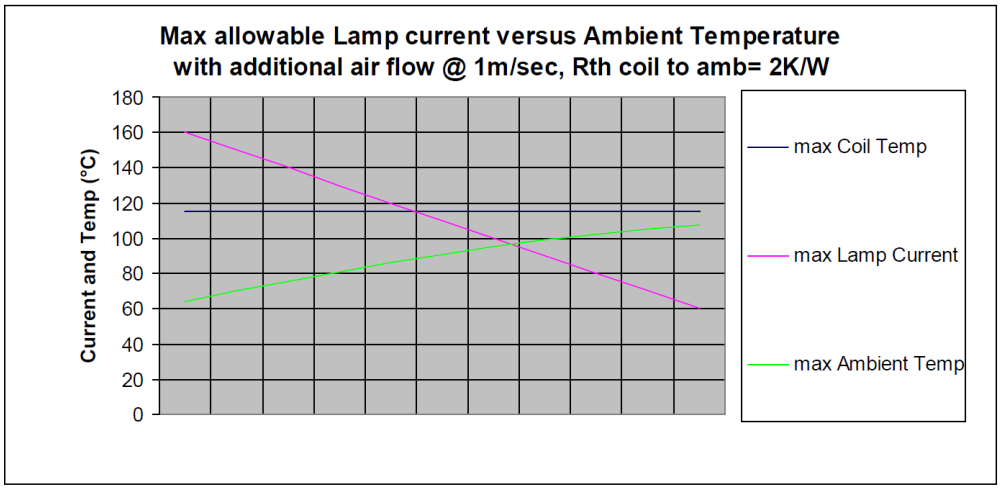
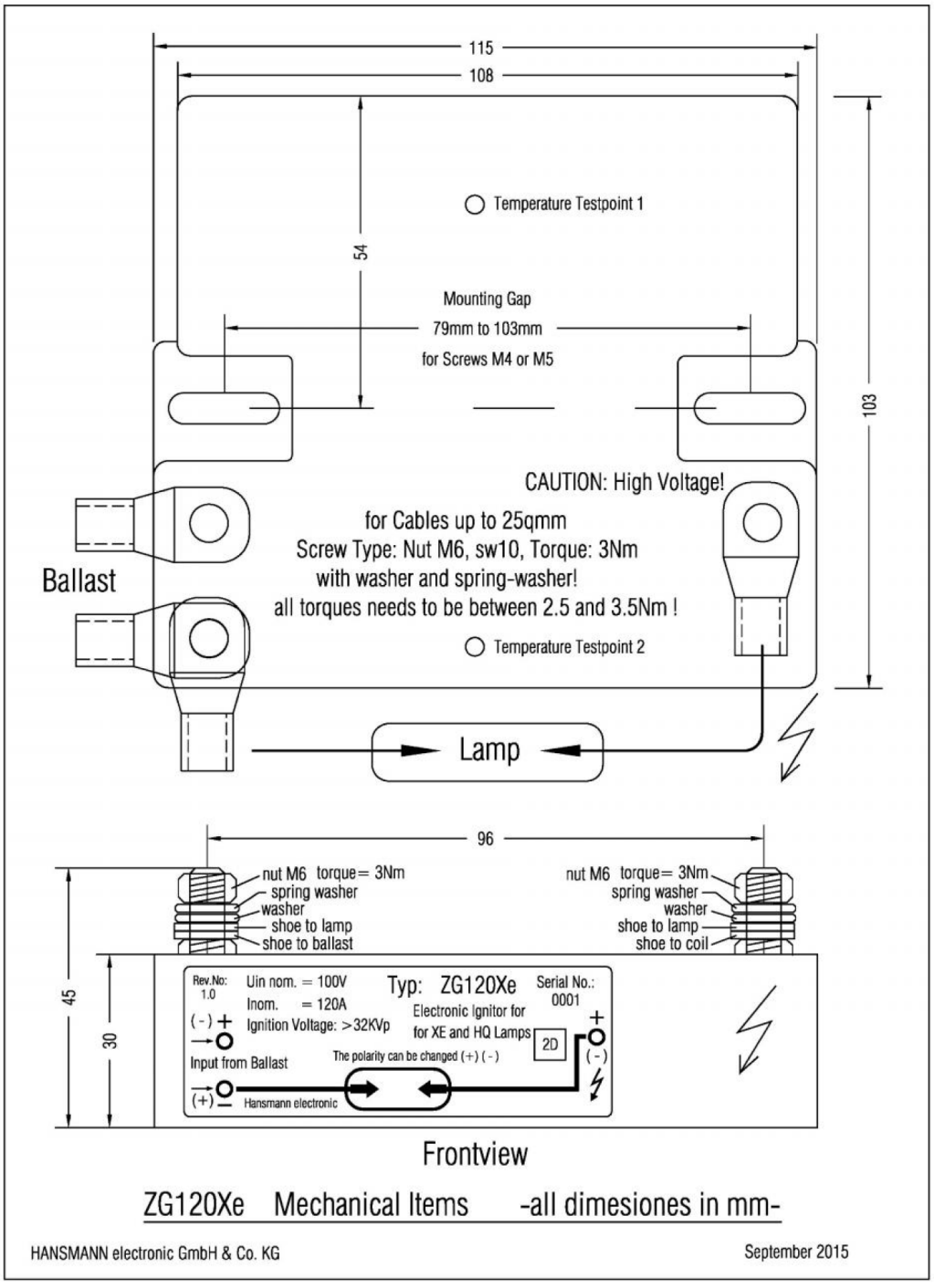


Diagram 3:

Lamp current versus Ambient temperature with active cooling by Fan,
Airflow about 1m/sec, Example: 160Amps @ 60°C Ambient
Coil Temperature nearly 115°C

Dimensions and mounting drawing



Safety Instructions

1. **User Accessibility**
   Ensure that all non-isolated electrical connections are not user accessible inside the final application. All inputs and outputs are considered primary connections

2. **Isolation Requirements**
   Please insure a minimum clearance of 15mm or more between all lamp terminals and non-isolated connections originating from the lamp outputs of the ignitor to any conductive part that is connected to PE.

3. **Requirements for Cables**
   Only use cables specified for the maximum current and isolation specified inside this datasheet and the datasheet of the used ballast. All isolation materials used shall meet UL94-V1 flammable level or higher

4. **Application with lamps driven by DC-current**
   While using DC-lamps, insure that the electrical connection follows the plus and minus guideline inside applicable drawings of ballast, ignitor and lamp.

5. **Temperature**
   Insure that the maximum temperature of 115°C (Testpoint 1) and 85°C (Testpoint 2) is not exceeded.

7. **Over current**
   Insure that the applied power mode does not exceed the maximum current specified in the table above. Run-up currents for the lamp are to be interpreted as “temporary over currents”. There is not any over current protection implemented inside the product.

8. **Opening or removing potting material**
   Do not remove any potting material from the ballast. Hazardous voltage may be stored inside components even after the electrical connection has been removed. Removing potting material will cause mal-function and voids any warranties for the product.

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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 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. Fit the 'O' ring in position and bolt the searchlight base securely. On an uneven surface it is necessary to use a suitable sealant, such as silicone, in order to ensure a weatherproofed 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.

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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.

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 PSU should NOT be positioned no more then 5 meters away from the searchlight.

The following table below indicates the maximum length of cable to be used for the AC supply cable, from the control panel to the searchlight:

Searchlight	115v 1Kw	240v 1Kw
Cable Size (mm^2)	Distance Max	Distance Max
1.5	17 MTRS	75 MTRS
2.5	28 MTRS	123 MTRS
4	44 MTRS	195 MTRS
6	68 MTRS	304 MTRS
10	115 MTRS	509 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.

Installation Guidelines

A typical installation and connection routine for the searchlights is as follows:

Referring to wiring diagram X4737, a 240v or 115v AC supply should be connected to the Power Supply Unit as shown, which then provides a common feed to all other functions and equipment.

Cables required to be connected by the customer: -

4 core 4mm cable from the Searchlight into the PSU, doubling up the pairs.
4 core 1.5mm cable from the Searchlight to the PSU.
Mains supply cable.

(Customer may need to provide a suitable junction box to extend these cables – 3 metres supplied). The searchlight head is pre-wired.

When the light is in operation the output from the PSU should be approximately 19v dc at 54amps.

Upon striking, the running wattage of the lamp can be calculated by using the equation:

$$P = VI$$

Where P= Power (watts)
V= Voltage (V)
I = Current (Amps)

Instruments required: D.C. Ammeter & Multi meter

Procedure

1) With the multi meter, test the DC voltage in the searchlight head. This should be approximately 19 volts.
2) With the D.C ammeter, test the current of the red DC cable at front of searchlight. It should read approximately 54 amps.
3) Multiply these readings together, as shown above, to obtain the desired wattage required, usually about 1026watts.

Fitting instructions for the 1Kw xenon lamp

Referring to the diagram overleaf:

1) Unfasten the eight latches on the front and rear of the searchlight;

2) Remove the front bezel (A) and rear bezel (B) assemblies and carefully place to one side, ensuring no damage;

3) Unscrew the two M6 hexagon screws (C) from the front lampholder mounting block (D) and remove the front lampholder assembly from the mounting bracket;

4) Loosen the knurled screw on the front (E) lampholder assembly;

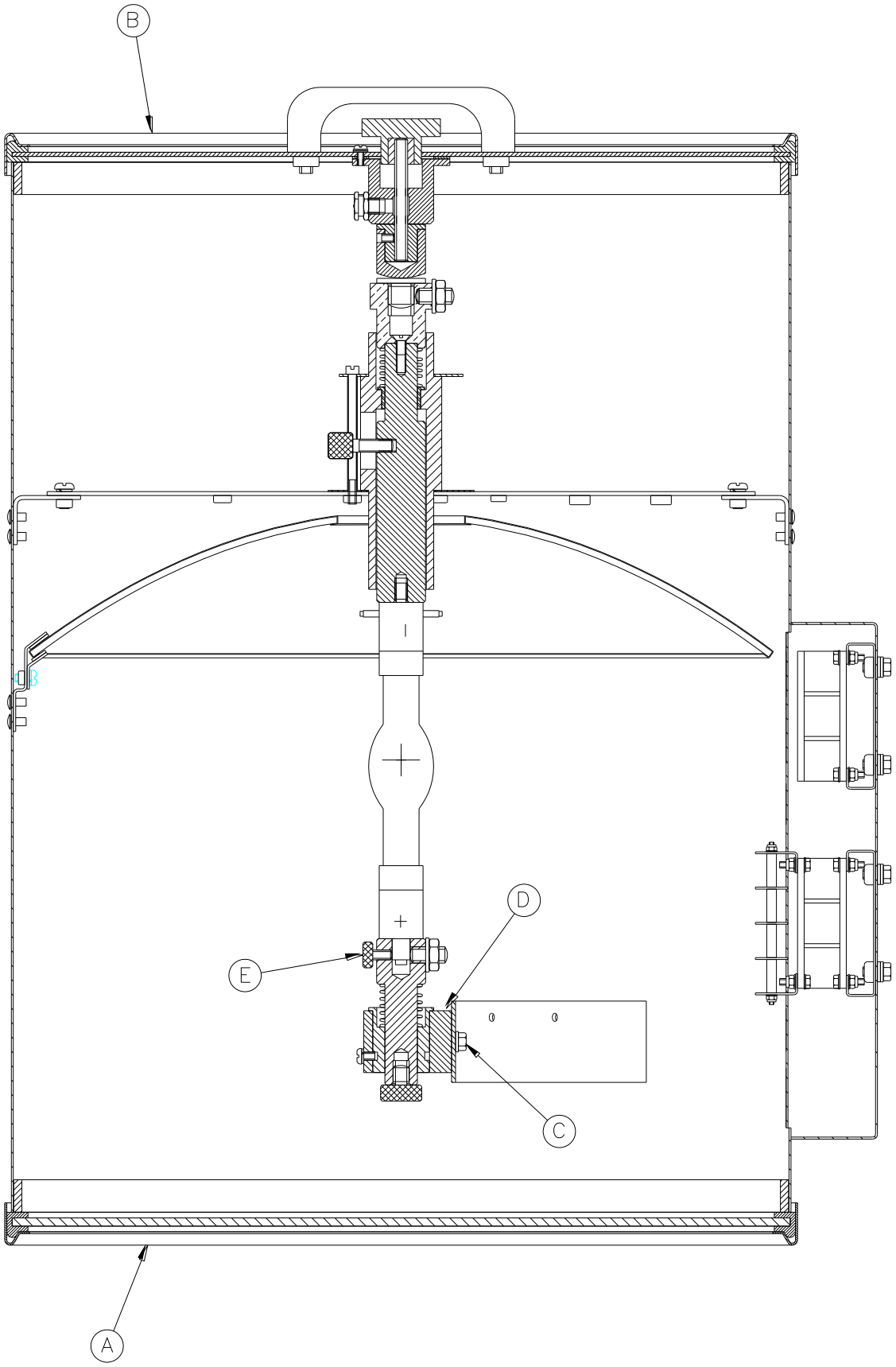
5) The lamp can now be inserted, make sure that the negative (cathode) end of the lamp is towards the rear of the searchlight and gently screw the end of the lamp into the rear lampholder socket. Do not over tighten as this may result in the lamp shattering due to undue force;

6) Fasten the front lampholder mounting block back in position, it will be necessary to pull the front socket against its spring to fit over the lamp. When in place tighten the front knurled screw (E);

7) Fasten the front and rear lampholder leads as wiring diagram, ensuring the connections are secure;

8) The front bezel and rear bezel can now be replaced. Ensure all latches are securely fastened down in order to provide effective waterproof seal;

9) Removal is the reverse of the above.



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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 PSU should be housed below deck.

The searchlight can be positioned using the elevation and base 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. By turning the focus lock wheel positioned on the Rear Dome clockwise/anti-clockwise, the lamp holder mechanism moves through spot to flood positions. When the desired beam is achieved simply release the lock wheel.

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 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;
- Ensure that the power rating of the Xenon lamp to be fitted is suitable for the lamphouse and power supply equipment (rectifier);
- 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;
- The inert gas (Xenon) used in XBO lamps are under a pressure of several bar even when the bulb is cold. FOR SAFETY REASONS THE LAMP MAY ONLY BE INSERTED INTO THE LAMPHOUSE WITH THE PROTECTIVE JACKET FITTED;
- Do not twist or bend the fused quartz bulb when fitting the lamp as mechanical stresses MUST be avoided;
- Ensure that the spring contacts firmly surround the pins on the cap of the lamp. Do not apply unnecessary force when tightening the screws;
- After inserting the lamp, ensure that there is sufficient axial play in the lampholder. 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;
- Electrical leads must be arranged in such a way that there is a sufficient air gap (approximately 40mm) between them and the lamphouse, in order to prevent flashovers from the ignition voltage. All flexible leads must have strain-relieving clamps;
- Before putting the lamp into service for the first time, check the polarity of the electrical connections. INCORRECT POLARITY WILL CAUSE IMMEDIATE DESTRUCTION OF THE LAMP;
- 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);
- 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;

Notes:

1) XBO lamps are designed for dc operation only. The dc current may only be varied within the limits of the current control range. A XBO lamp operates best at rated current; over the life of the lamp, the current may be increased to its maximum value to compensate for loss of light. The output of the lamp can be reduced by operating the lamp at minimum current but this does not prolong the life of the lamp;
2) For safety reasons, XBO lamps should be replaced once they reach the end of their average lamp life, and not later than 1.25 times they're average lamp life. After this time there is an increased risk of the lamp exploding;
3) The anode (positive cap marked '+') must be on top when the lamp is inserted in the vertical position. If the anode is incorrectly inserted the arc will be unstable, the bulb will blacken more quickly and the lamp will prematurely fail;
4) The HT lead from the high voltage terminal of the Ignitor, must be connected to the cathode (negative cap marked '-'). If the lamp is connected with the wrong polarity it will be irreparably damaged after a very short time.
5) In all circumstances the lamp manufacturer's data should be referred to when dealing with lamps.

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7- Fault Finding

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

Please refer to the following table for the trouble-shooting of Xenon lamps.

Fault	Cause	Remedy
■ Wrong Polarity	■ Lamp incorrectly fitted ■ Faulty wiring	■ Anode (large electrode) must always be on top in vertical burning position ■ Check polarity, transpose connections if necessary
■ Cap overheated ■ Cap temperature above 230°C	■ Faulty contacts ■ Cooling equipment defective	■ Check terminals, tighten or renew ■ Check cooling equipment and replace if necessary
■ Arc unsteady	■ Lamp operated outside current control range	■ Correct current setting
■ Bulb draws in air	■ Crack in graded seal caused by overheated cap ■ Maximum cap temperature 230°C	■ Check terminals - tighten or renew
■ Glass erosion on fused quartz bulb	■ Lamp operated outside current control range ■ Lamp service life exceeded	■ Correct current setting ■ Check meter
■ Electrodes damaged	■ Current ripple too high	■ Have power supply inspected
■ Asymmetrical blackening of lamp (in horizontal burning position)	■ Lamp operated too long in same position	■ Turn lamp through 180° after half service life

Failure of Lamp to Ignite

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

1) Check that the mains supply is connected to the input of the PSU. On operating the switch, if the lamp does not light switch off mains supply and check all fuses;
2) If the lamp still does not ignite, check the searchlight head. On your command get an operator to activate the starting switch for approximately 5 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 dome to expose the two supply leads to the xenon 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 dome, ensuring the latches are secure, and perform the check again, listening for the cracking. If the lamp still fails to ignite, switch off at the mains and replace the xenon lamp in accordance with the safety procedures within this manual and the manufacturers' 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 xenon 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 32,000 volts or higher). The ignitor is activated by switching the lamp on and 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.

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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 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 earth 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).
- Every six months the external movement mechanisms i.e. lock wheels, 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 Diagram and General Assembly

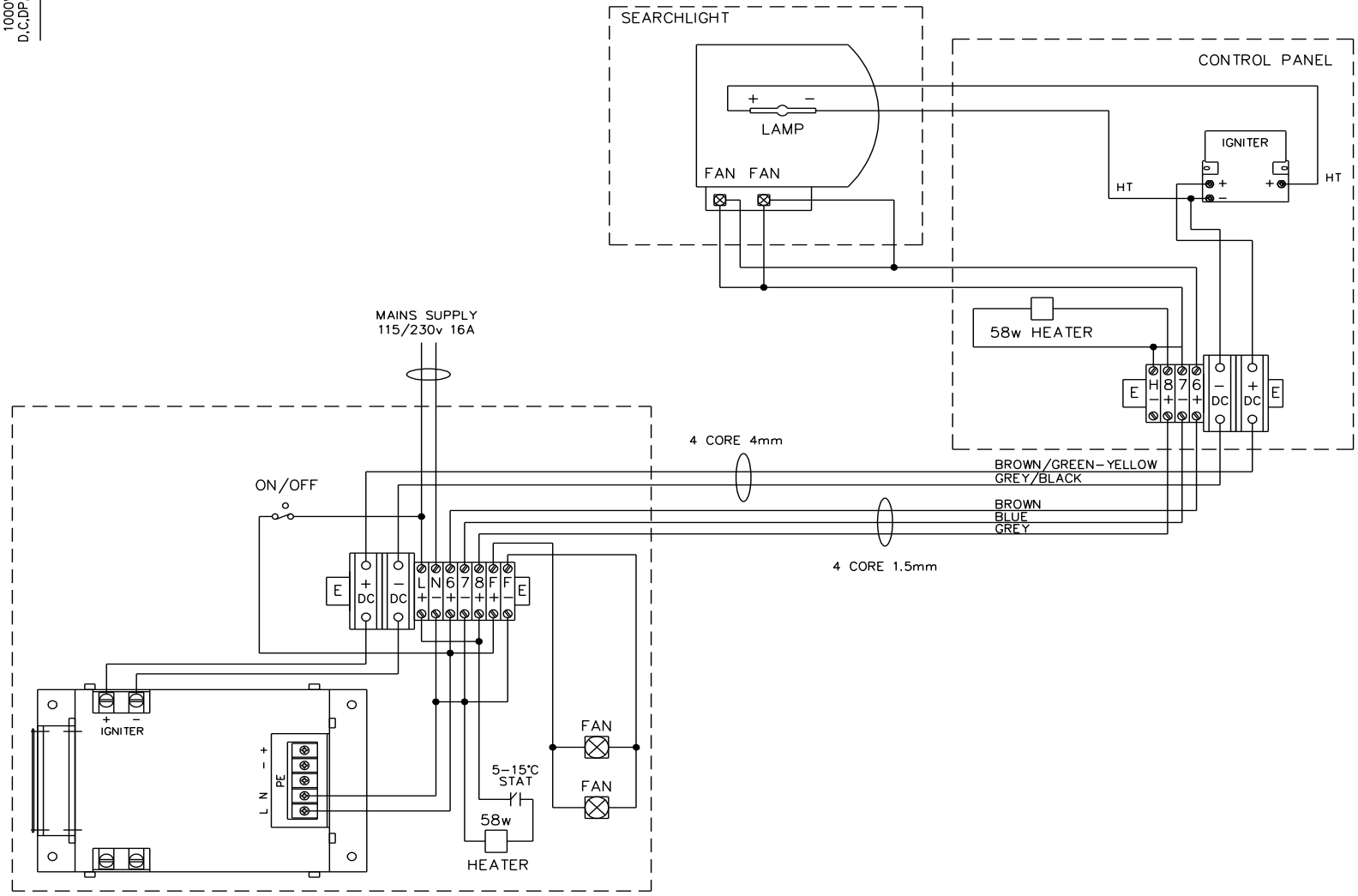
Drawing Number	Description
X4737	Xenon Wiring Diagram
A2277	LX480DP General Assembly Drawing
A2279	LX480C General Assembly Drawing
A2282	LX480CP General Assembly Drawing
C26807	PSU Enclosure Assembly

FIRST USED ON FX380 1000W D.C.DP.CP

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm



ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	6.97 D.S.
2	THERMOSTAT REMOVED. NEW HEATER (EC0705)	1.99 D.S.
3	CABLE CHANGED TO 4 CORE 4mm (EC1096)	5.05 M.T.
4	NEW ROTEC PSU (EC0000)	4.15 D.S.

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

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A2

CONT ON SHEET

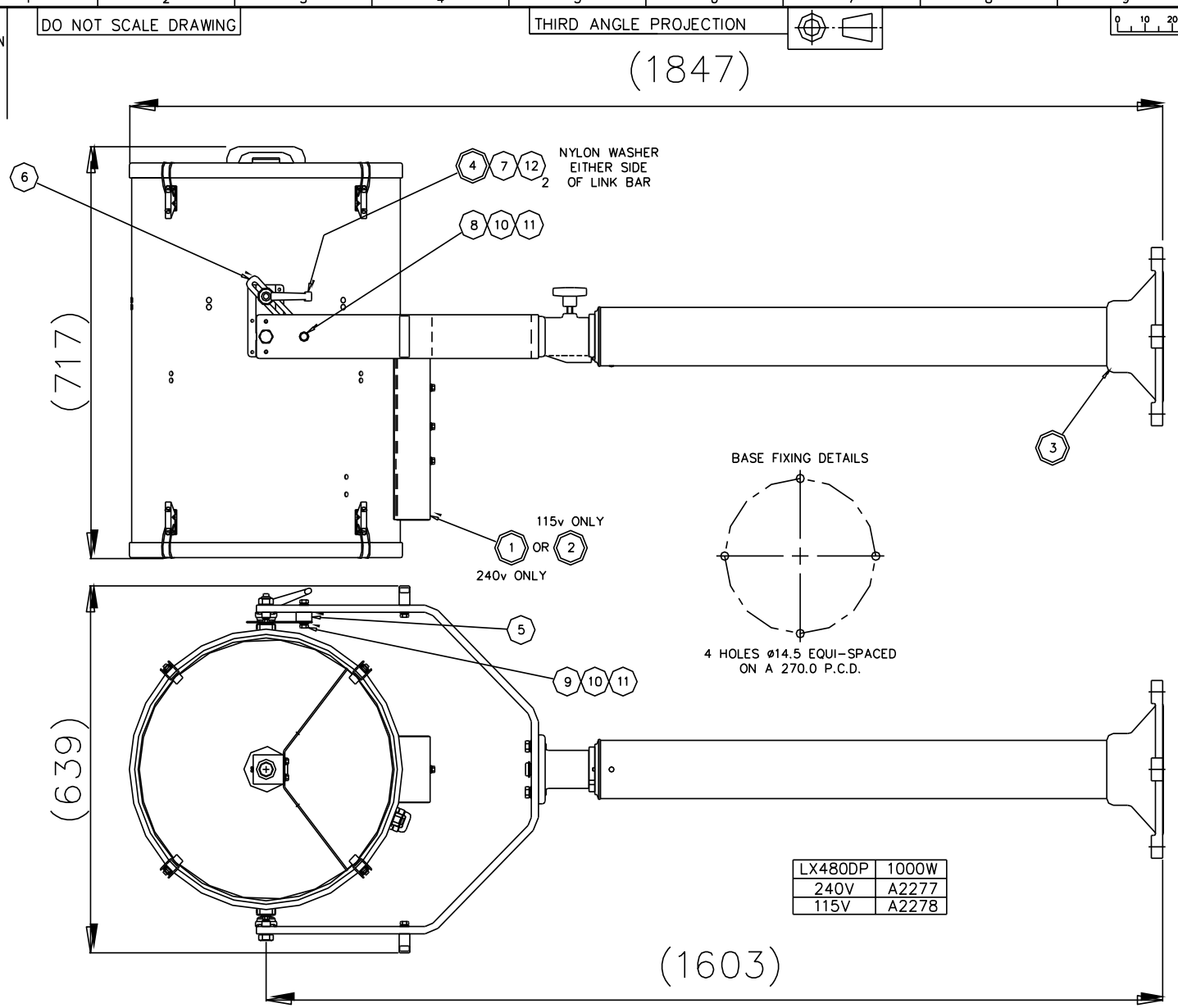
DRAWN	D.S.	DATE	5.6.97	TOLERANCES	Sand Casting: To ISO 8062 CT10	MATERIAL	FINISH	DESCRIPTION	PART No./DRG No.
CHECKED		SCALE		General: ±	Die Casting: To ISO 8062 CT8			1000W XENON WIRING DIAGRAM	X4737
ALL DIMENSIONS IN MILLIMETRES				Angular: ±	Hole centres & posns: ±				SHT 1

FIRST USED ON LX480DP 1KW

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm



LX480DP	1000W
240V	A2277
115V	A2278

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	4.02 D.S.
2	SEAMED MOVED TO BDC. C'PANEL HOLES MOVED 20mm. S/PLATE HOLES MOVED 54.5mm TOWARDS BACK. (EC1139)	7.06 D.S.
3	NYLON WASHERS ADDED (EC1424)	7.12 D.S.

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

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CONT ON SHEET

DRAWN	D.S.	DATE	4.02	TOLERANCES
CHECKED		SCALE	1:5	General: ±
ALL DIMENSIONS IN MILLIMETRES				Angular: ±

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

MATERIAL

FINISH

DESCRIPTION: LX480DP 1KW G.A.

PART No./DRG No.: A2277

SHT 1

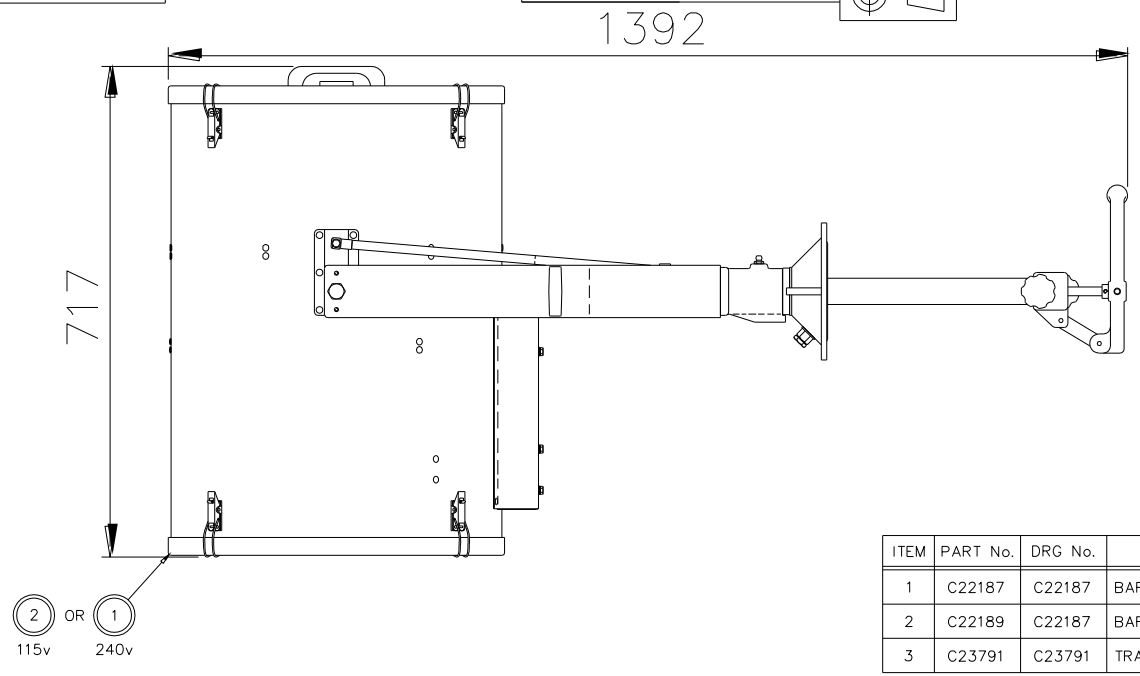
FIRST USED ON

DO NOT SCALE DRAWING

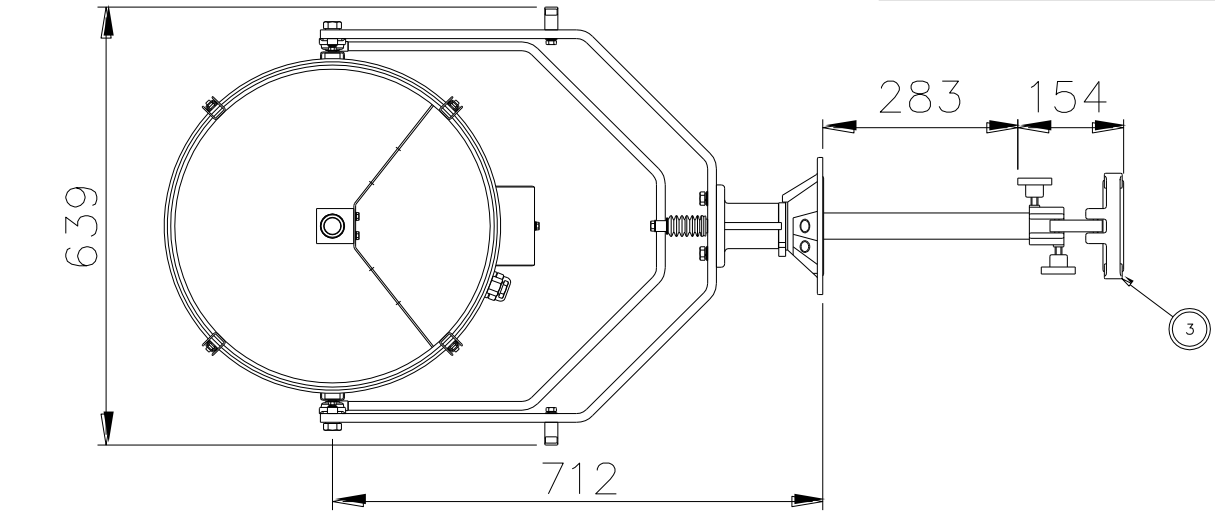
THIRD ANGLE PROJECTION

0 10 20 30 40 50mm

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	4.07 D.S.



ITEM	PART No.	DRG No.	DESCRIPTION	240v QTY	115v QTY
1	C22187	C22187	BARREL ASSY 240v	1	
2	C22189	C22187	BARREL ASSY 115v		1
3	C23791	C23791	TRAINER MOUNT	1	1



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

Francis SEARCHLIGHTS

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CONT ON SHEET

DRAWN	D.S.	DATE	4.07	TOLERANCES	Sand Casting: To ISO 8062 CT10
CHECKED		SCALE	1:5	General: ±	Die Casting: To ISO 8062 CT8
ALL DIMENSIONS IN MILLIMETRES				Angular: ±	Hole centres & posns: ±

MATERIAL

FINISH

DESCRIPTION: LX480C 1Kw GA

PART No./DRG No.: A2279

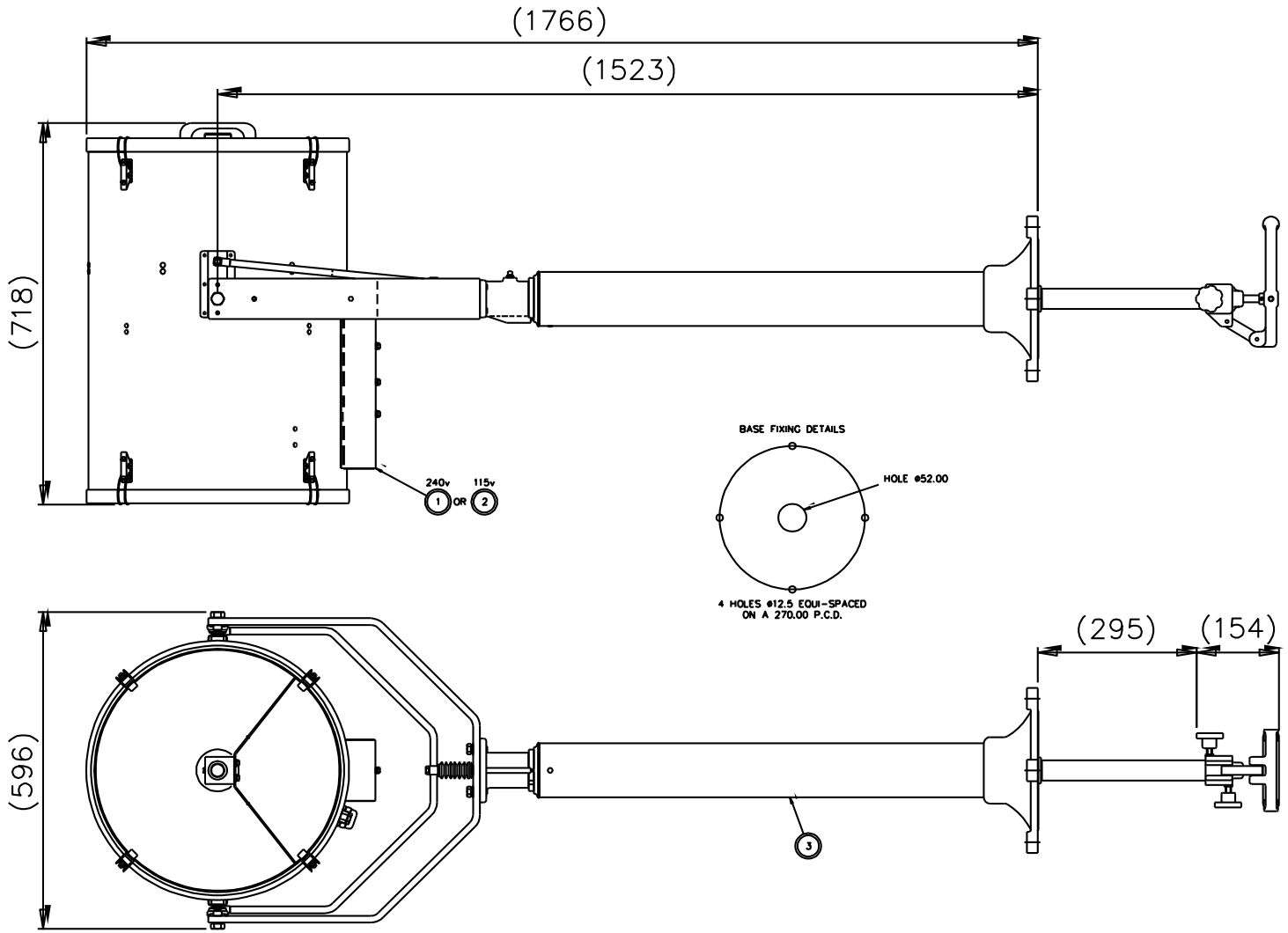
SHT: 1

FIRST USED ON

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

ISS No	MODIFICATION DETAILS	DATE & INITS
1	AS FIRST DRAWN	10.07 D.S.



A2282 LX480CP 1Kw 240v
A2283 LX480CP 1Kw 115v

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C22187	C22187	BARREL ASSY 240v	1
2	C22189	C22187	BARREL ASSY 115v	1
3	C24042	C24042	TRAINER MOUNT	1

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

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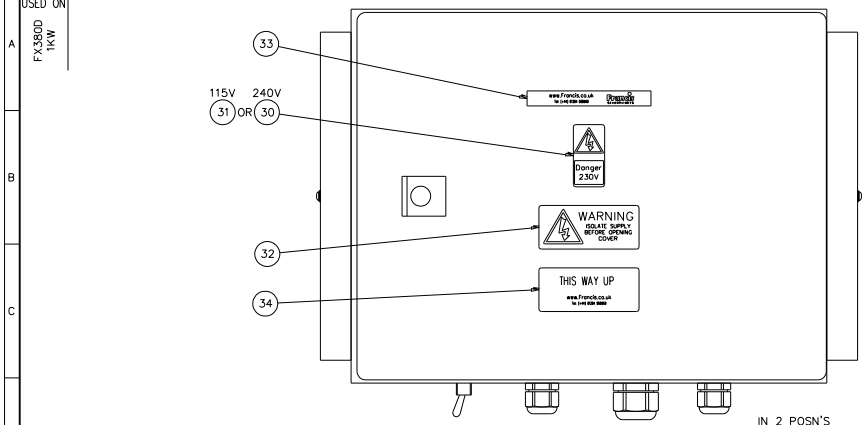
A1 CONT ON SHEET

DRAWN	D.S.	DATE	25.10.07	TOLERANCES	Sand Casting: To ISO 8062 CT10 Die Casting: To ISO 8062 CT8 Hole centres & posns: ±	MATERIAL	FINISH	DESCRIPTION	PART No./DRG No.
CHECKED		SCALE	1:4	General: ± Angular: ±				LX480CP 1Kw G.A.	A2282
ALL DIMENSIONS IN MILLIMETRES									SHT 1

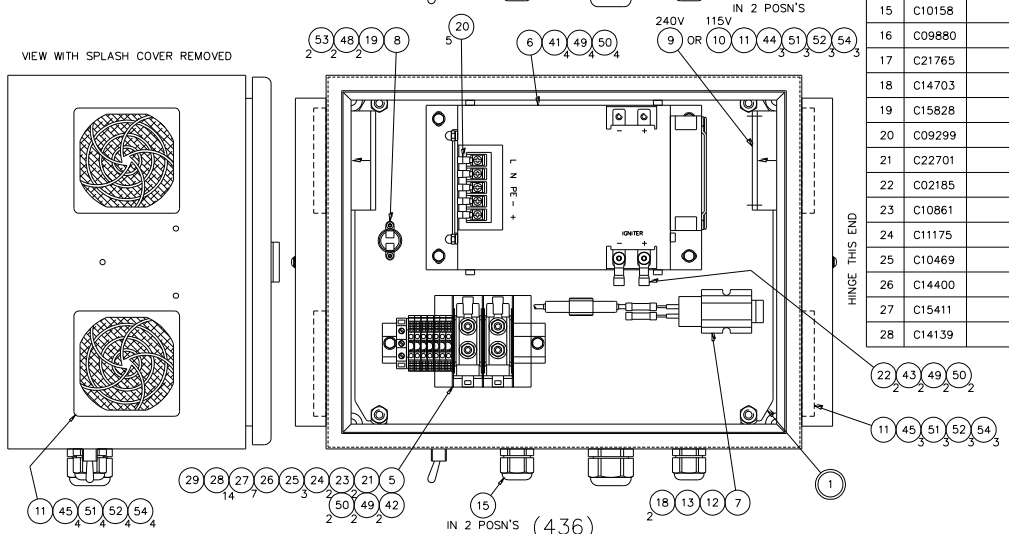
FIRST USED ON FX380D 1KW

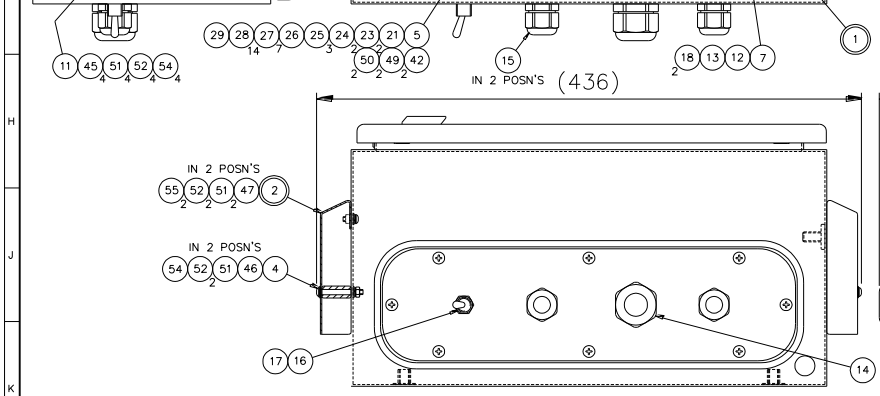
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION



VIEW WITH SPLASH COVER REMOVED





ITEM	PART No.	DRG No.	DESCRIPTION	240V QTY	115V QTY
1	C26679	C26679	CHASSIS PLATE S/ASSY	1	1
2	C25012	C25012	FAN SPLASH COVER S/ASSY	2	2
3	C26678	C26678	PSU ENCLOSURE DRILLING	1	1
4	C24687	C24687	SPLASH COVER PILLAR	2	2
5	C17223	X4966	DIN RAIL	1	1
6	C26622		PSU	1	1
7	C23277		HEATER	1	1
8	C24889		THERMAL SWITCH	1	1
9	C16930		FAN 240V	2	
10	C16931		FAN 115V		2
11	C25013		FAN COVER	4	4
12	C24118		FUSE	1	1
13	C24021		FUSEHOLDER	1	1
14	C15450		M25 CABLE GLAND	1	1
15	C10158		M20 CABLE GLAND	2	2
16	C09880		SWITCH	1	1
17	C21765		SEALING BOOT	1	1
18	C14703		RED BUTT CONNECTOR	2	2
19	C15828		RED SHROUDED CRIMP	2	2
20	C09299		M4 RED EYELET	5	5
21	C22701		M6 YELLOW EYELET	2	2
22	C02185		M5 YELLOW EYELET	2	2
23	C10861		H/C TERMINAL	2	2
24	C11175		H/C SPACER	3	3
25	C10469		H/C COVER	1	1
26	C14400		TERMINAL	7	7
27	C15411		TERMINAL MARKERS	14	14
28	C14139		END COVER	1	1

ITEM	PART No.	DRG No.	DESCRIPTION	240V QTY	115V QTY
29	C14379		EARTH TERMINAL	1	1
30	C21464		230V WARNING LABEL	1	
31	C22078		115V WARNING LABEL		1
32	C22036		ISOLATE SUPPLY LABEL	1	1
33	C04900		FRANCIS EXTERIOR LABEL	1	1
34	C24369		THIS WAY UP LABEL	1	1
35	C14161		6mm S/C SILICONE CABLE RED	A/R	A/R
36	C14162		6mm S/C SILICONE CABLE BLACK	A/R	A/R
37	C26799		1.5mm S/C SILICONE CABLE BROWN	A/R	A/R
38	C15838		1.5mm S/C SILICONE CABLE BLUE	A/R	A/R
39	C15112		1.5mm S/C SILICONE CABLE G/Y	A/R	A/R
40	C04481		RED SLEEVING	A/R	A/R
41	C13352		M5 x 16 HEX HD SCREW	4	4
42	C13351		M5 x 10 HEX HD SCREW	2	2
43	C09895		M5 x 10 SKT BUTTON HD SCREW	2	2
44	C10120		M4 x 20 CSK HD SCREW	6	6
45	C06981		M4 x 16 CSK HD SCREW	7	7
46	C14468		M4 x 35 SKT BUTTON HD SCREW	2	2
47	C14533		M4 x 10 SKT BUTTON HD SCREW	4	4
48	C14502		M3 x 6 SKT BUTTON HD SCREW	2	2
49	C08392		M5 PLAIN WASHER	8	8
50	C09231		M5 S/C SPRING WASHER	8	8
51	C04376		M4 PLAIN WASHER	21	21
52	C08793		M4 S/C SPRING WASHER	19	19
53	C10747		M3 S/C SPRING WASHER	2	2
54	C06266		M4 FULL NUT	15	15
55	C12039		RTV	A/R	A/R
56					

C26807 1KW DECK PSU ENCLOSURE ASSY 240V
C26808 1KW DECK PSU ENCLOSURE ASSY 115V

USE ITEMS BELOW FOR WIRING
35 36 37 38 39 40

BASE FIXINGS
340mm X 260mm (8mm HOLES)
WEIGHT – 14KGS

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	9.15 D.S.

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

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 A1 CONT ON SHEET

DRAWN	D.S.	DATE	16.9.15
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: 1KW DECK PSU ENCLOSURE ASSY

PART No./DRG No. C26807 SHT 1

10 - Spare Parts List

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

Part Number	Description
C26622-00	Power Supply Unit
C26623-00	Ignitor
C16930-00	Fan (240v) (PSU & Searchlight)
C16931-00	Fan (115v) (PSU & Searchlight)
D22843	1Kw Xenon Lamp
C20707-00	Front Glass
C20568-00	Front Glass/ Rear Bezel Gasket
C22377-01	Heater & Fuse Assembly
C21714-00	Reflector
C10170-00	'O' ring Seal Base (Deck Pedestal & Cabin Pedestal)
C21502-01	Base Lockwheel Assembly (Deck Pedestal)
C22205-01	Side Lockwheel Assembly (Deck Pedestal)
C11377-00	Focus Body Flange Seal
C20281-00	Bellows (Cabin & Cabin Pedestal)
C22072-00	Push Rod Seal Washer (Cabin & Cabin Pedestal)
C21967-00	'O' Ring (Cabin & Cabin Pedestal)
C11026-01	Pan Lock wheel Assembly (Cabin & Cabin Pedestal)
C11148-00	'O' Ring Seal Base (Cabin)
C24580-01	Tilt Lock wheel Assembly (Cabin & Cabin Pedestal))

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.

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