User Instruction & Installation Manual

FX380 Manual Control
1Kw Xenon Searchlight

Product Reference Number:

A2771 – FX380D 1Kw 240v
A2773 – FX380DP 1Kw 240v
A2775 – FX380C 1Kw 240v
A2777 – FX380CP 1Kw 240v

A2770 – FX380D 1Kw 115v
A2772 – FX380DP 1Kw 115v
A2774 – FX380C 1Kw 115v
A2776 – FX380CP 1Kw 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 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.

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, the lifting handles must be used 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 depressurized 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.
- Xenon 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 FX380 1000-watt searchlight has the following features:

- All marine grade materials and fixings.
- Electronic power supply unit.
- Parabolic glass reflector.
- Stove enamel painted.
- Full 360° horizontal rotation.
- Vertical movement Deck & Deck Pedestal ±40°, Cabin & Cabin Pedestal +40° -20°;
- 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 110v/115v.
- Peak Beam Candlepower - 45,000,000 Lux.
- Range - 6,700 metres.
- Divergence - 1.5°.
- Temperature range -50°C.

In order that the searchlight operates correctly it is imperative that competent personnel are responsible for the installation, operation, and servicing of this equipment. Failure to adhere to this advice may cause premature failure or incorrect operation of the searchlight, which may damage the equipment or cause personal injury.

Technical information on the Power Supply Unit and Ignitor are included overleaf. For more detailed information please contact the manufacturer.

PSU ref.: ECG 1000 XE
Ignitor ref. ZG 60 XE

ECG 1000 DC-C

Type HBX 1000

Electronic Control Gear for DC short arc lamps up to 1000W

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

Suiting igniters

ZG 60Xe	**60Amps igniter with asymmetric ignition for Anode or Cathode Ground operating.**
ZG 120Xe	**120Amps igniter with asymmetric ignition for Anode or Cathode Ground operating.**

Features.

Power supply for xenon filled short arc lamps, DNVGL-CG 0339 certified.
Designed for xenon short arc lamps rated up to 1000W 66A.
Output power customer selectable by control Voltage 0-5V.
Capable to drive lamp voltage ranges from 15 to 29V.
Ballast boards inside IEC(UL) 60601 certified and HALT tested.
Input voltage range 90V AC to 264V AC, power factor corrected, built in EMI filter, meets CE and FCC part 'A'.
µP controlled, digital power management with high output stability over lamp lifetime.
Output short circuit protected and 'Arc to Ground' protected.
Operation with Cathode or Anode to Ground/PE possible.
Galvanic separation of lamp output and line input, thermal shut off at 90°C.
Shut off function for end of life and lamp fail parameter.
Ballast cascadable for use for higher wattage Xenon lamps.
Auxiliary regulated 24V 0.2A output for subsystems, permanent available.
For OSRAM, Ushio, LuxteL, Excelitas, PerkinElmer lamps.
Flexible Design, new lamps, and functions adaptable by software.

ELECTIRCAL 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_{L1}	W		600-240	Depends on select
Input current	I_{L1}	A		5-14	Depends on select
Line frequency	Fin	Hz	50/60	47-63	
Line Power factor	PFC	1	1.0	0.92 to 1.0	
Line inrush current limiting	A peak		13	Limiting Element will be shorted by Relay	
Leakage Current to PE	I Leak_SA	µA	<500@230V		Standalone

Other Operation Data	Symbol	Unit	Nominal	Tolerances	Remarks
System wattage during ignition	P lign	W	25	<30	
System wattage standby operation	P LISTtby	W	1,5	0.58 – 2.0	

Lamp Output Data

Ignition	Symbol	Unit	Nominal	Tolerances	Remarks
Ignition voltage with ZG Xe	U ign	KV Peak	30-35	<30	Depends on igniter
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. I max.	A A	66	+10% Max	Inside specified lamp parameter (Select by internal Mode switch)
In Rush Current	I max.	A	80		0 to 1ms

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Lamp voltage	U La	V	10 – 29	± 5%	Depends on lamp select
Lamp wattage	P La	W	1000	± 2%	Fixed factory set-up Mode #4 1000W
Lamp current	I La	A	Up to 66		Depends on set up
End of life cut off voltage	U La max.	V	30	± 1V	After run up completed
End of life cut off time	T EOL-Off	S	< 0.2		
RF ripple of output power	P La.rip / P La	%	< 1 p-p		15,5V-30V
50Hz-60Hz Ripple		%	< 1 p-p	< 4 p-p	13V 30V
Shift in output power with shift in input voltage	P La / U LI	1		< 0.005	Within nominal values
Open circuit voltage for ignition	U ocv	V	110	105 - 120	

LIFETIME DATA

All values for Uu = 230 V mrs
Temperature at test point = 70°C

	Symbol	Unit	Nominal	Tolerances	Remarks
Ballast lifetime	T Life	h	25,000	> 25,000	Acc. To MIL HCBK for nominal operation

MISCELLANEOUS DATA

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Power losses 115V 230V	P v	W	 60 – 180 45 - 160	±	Depends on power select
Efficiency	η	1	0.85	0.8 – 0.9	Depend on lamp current
Ambient temperature	T A	°C	+25	-10 - +50	Noncondensing
Internal temperature. Switch off temperature	T C-Off	°C	+90	+85 - +95	At heatsink no de-rating till switch off

Standby Mode	Symbol	Unit	Nominal	Remarks
Minimum mains shut off time for restart	T Reset	S	3	Standby mode is present when the lamp does not light. 1. When ignition has not 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	170/220/224	± 1	See drawing
Width	w	mm	132/139	± 1	See drawing
Height	h	mm	141	± 1	See drawing
Housing					Closed AL
Weight	W B	g	2660		

Wiring length	Symbol	Unit	Nominal	Tolerances	Remarks
Between igniter and lamp	L ll	mm		t.b.d.	As short as possible
Between ballast and igniter	L bl	mm	t.b.d.	t.b.d.	External igniter ZG 60Xe

Cooling method	Symbol	Unit	Nominal	Thermal situation must be checked in actual application
	Airflow	Metre per second	Built in fan	

Plugs and cables	Manufacturer / Type	Remarks / Header / Contacts
Ballast mains plug CN 1	Screwable for wires up 1.5qmm For max. input current = 14Amp	See drawing
Ballast Control interface plug	ST 1 JST / B6B-EH-A Isolated to line voltage. GND connected to PE.	See drawing
Connection Ballast to Igniter	By screw M5 and cables shoes (CU 16-5) for 16qmm	See drawing

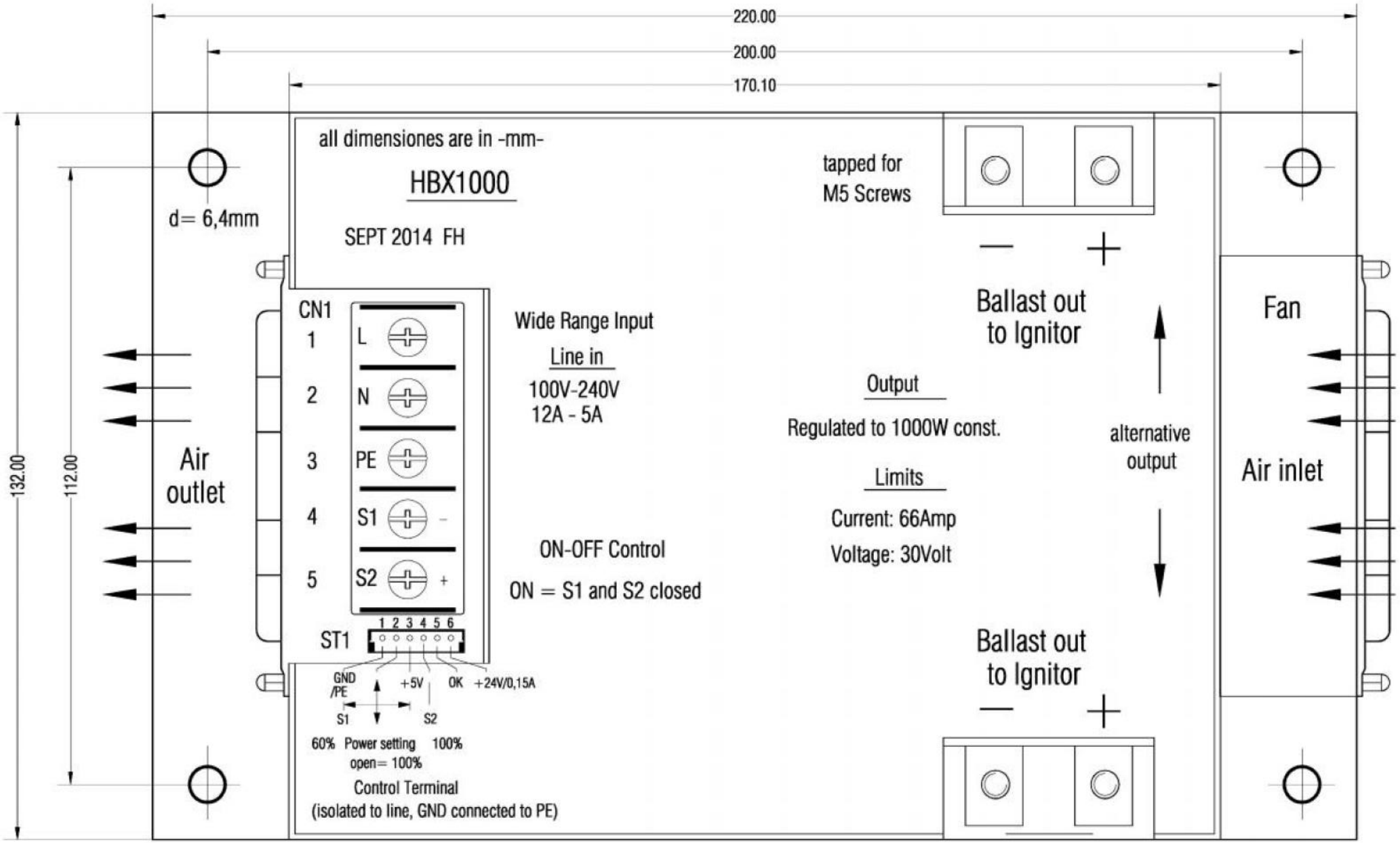
PIN Assignment and Fuse

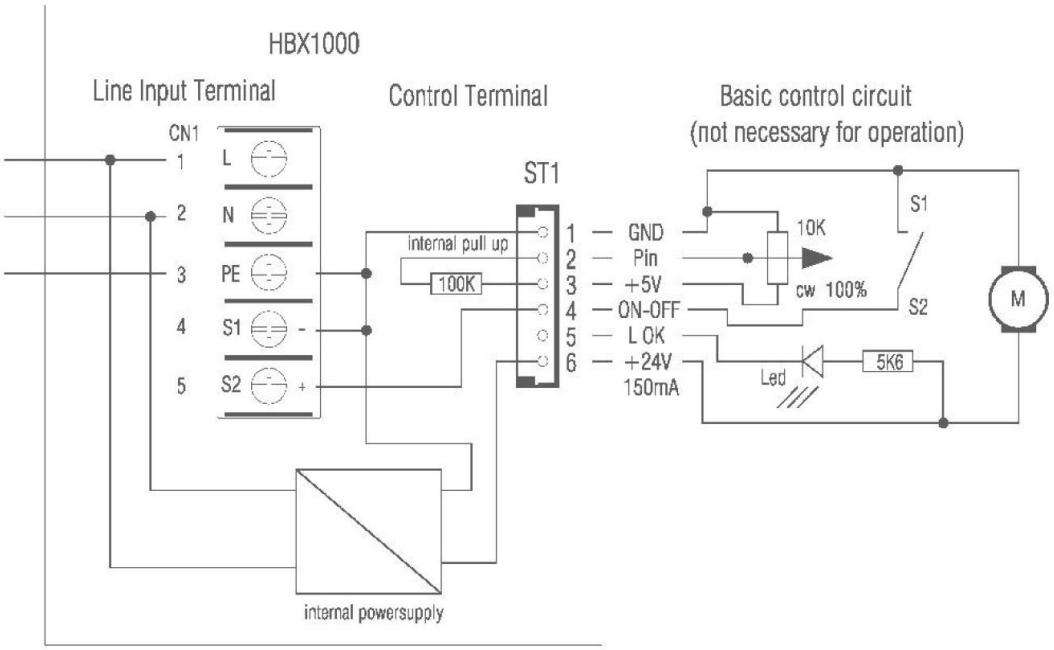
Connector		Signal	Status	Description
Line input CN 1	PIN 1 PIN 2 PIN 3	AC IN -L- AC in -N- PE		AC – wide range input voltage 90v-264v Safety Ground
CN 1	PIN 4 (-)	ON-OFF / GND By switch, by open collector or by control voltage 0-24v		Universal ON-OFF control input
Lamp output terminal	Copper rails, tapped with M5 for cable shoes (Cu16-5)	Plus, Minus Lamp voltage and power		Connection to external igniter ZG60Xe ZG 120Xe
Option Board terminal ST1 opto-isolated	PIN 1 PIN 2 PIN 3 PIN 4 PIN 5 PIN 6	GND/PE/CN1-Pin 4 Power control input +5V ON-OFF/CN1-Pin 5 Lamp lit feedback +24V-0.15A aux. out		GND and 24V return. Voltage or PWM control, 5V = 1000w Use for power-control potentiometer. ON-OFF input, Power On = <1V Open collector output (NPN), OK is low For external subsystems
Fuse		Fixed built in 3xT 5A 250V		CAUTION! For continued protection against risk of fire, replace only with same type and rating of fuse

Standards	
Safety and performance Certifications	UL 60601-1, IEC 60601-1 (CB) for ballast boards HBX180 CB Test, and UL must be completed with the final product
RFI (Radio Frequency Interferences)	Must be done with complete assembled project, built in EMI filter, that meets CE and FCC (A) requirements, for “B” an additional filter is recommended (must be tested with final product

Environmental Requirements	Ambient conditions	Remarks
Storage Temperature Range	-20°C - +60°C	
Operating Temperature Range	-10°C - +40°C	Depends on cooling
Humidity Range	20% - 95% non-condensing	
Altitude operating	0 FL to 10000 FL	
Altitude not operating	0 FL to 40000 FL	
Vibration operating	G rms, 5Hz to 500Hz random 10 min. x y z axis	t.b.d. not tested
Vibration not operating	G rms, 5Hz to 500Hz random 10 min. x y z axis	t.b.d. not tested
Shock operating	G rms, ½ sine wave 11ms x y z axis	t.b.d. not tested
Shock not operating	G rms, ½ sine wave 11ms x y z axis	t.b.d. not tested

Specification subject to change without notice


220.00
200.00
170.10
132.00
112.00
all dimensiones are in -mm-
HBX1000
SEPT 2014 FH
d= 6,4mm
tapped for
M5 Screws
Ballast out
to Ignitor
Fan
Air
outlet
Air inlet
CN1
1 L
2 N
3 PE
4 S1 -
5 S2 +
Wide Range Input
Line in
100V-240V
12A - 5A
Output
Regulated to 1000W const.
alternative
output
Limits
Current: 66Amp
Voltage: 30Volt
ON-OFF Control
ON = S1 and S2 closed
ST1
1 2 3 4 5 6
GND
/PE
+5V
OK
+24V/0,15A
S1
S2
60% Power setting 100%
open= 100%
Control Terminal
(isolated to line, GND connected to PE)
Ballast out
to Ignitor



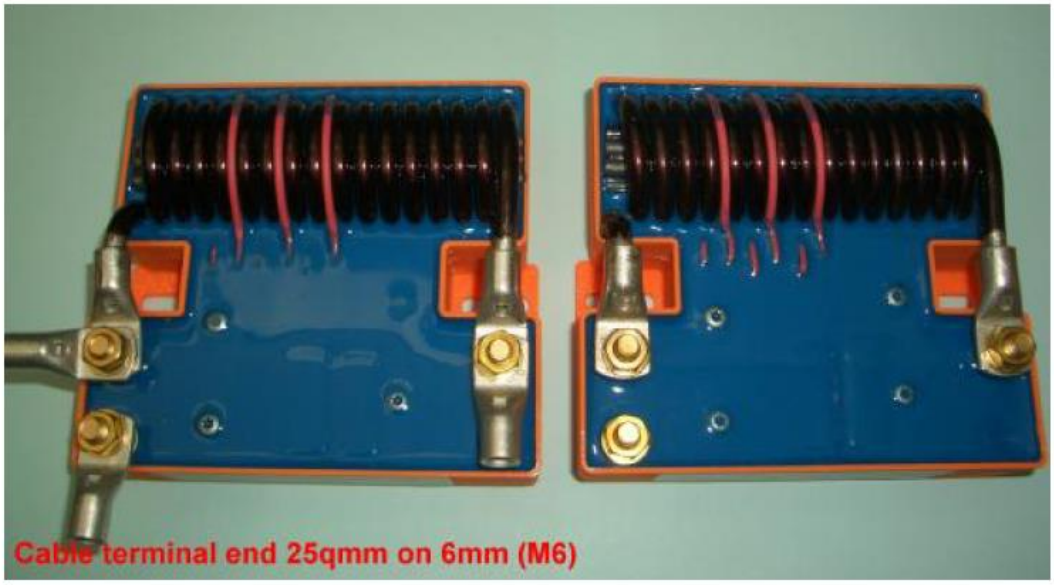
Basic circuit for use.

Pin 4 for ON-OFF is a multiple use universal input, which can be driven by signals up to 24v. To operate the lamp S1 and S2 must be closed.

PIN 3 is a high impedance input for power adjust. It can be driven by voltage between 0v and 5v PWM signals with 100Hz to 500Hz. It can be left open for 100% output power.

PIN 5 is an open collector output to drive a LED for amp OK operation.

Igniter connection



Additional information for use and safety

Safety

Because of instant hot restrike, the output voltage to the lamp can reach values of up to ± 15,000 volts! Please ensure minimum 15mm clearance between all lamp terminals to PE, to prevent arc to ground situation!! Primary wiring must meet national requirements for electrical safety.

Lamp power selection

By multimode 16 step switch (O-F). Only factory setup. Not for end user.

Auxiliary 24v Output

The unit has one 24v output terminal for driving subsystems.
The maximum output current for this output is total 150mA.
The 24v output voltage is permanently available, even when the lamp is not in operation.
This terminal is connected to PE with GND (24v return).

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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. 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, 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.

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 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/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.

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 cores 4mm cable from the Searchlight into the PSU, doubling up the pairs.
4 cores 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 eight latches (A) on the front and rear of the searchlight.

2) Remove the front bezel (B) and rear bezel (C) assemblies.

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

4) Loosen the knurled screw on the front (F)and rear (G) lampholder assembles.

5) The lamp can now be inserted, make sure that the negative (cathode) end of the lamp is towards the rear of the searchlight & the cathode (negative) adaptor is securely fastened to end of lamp.

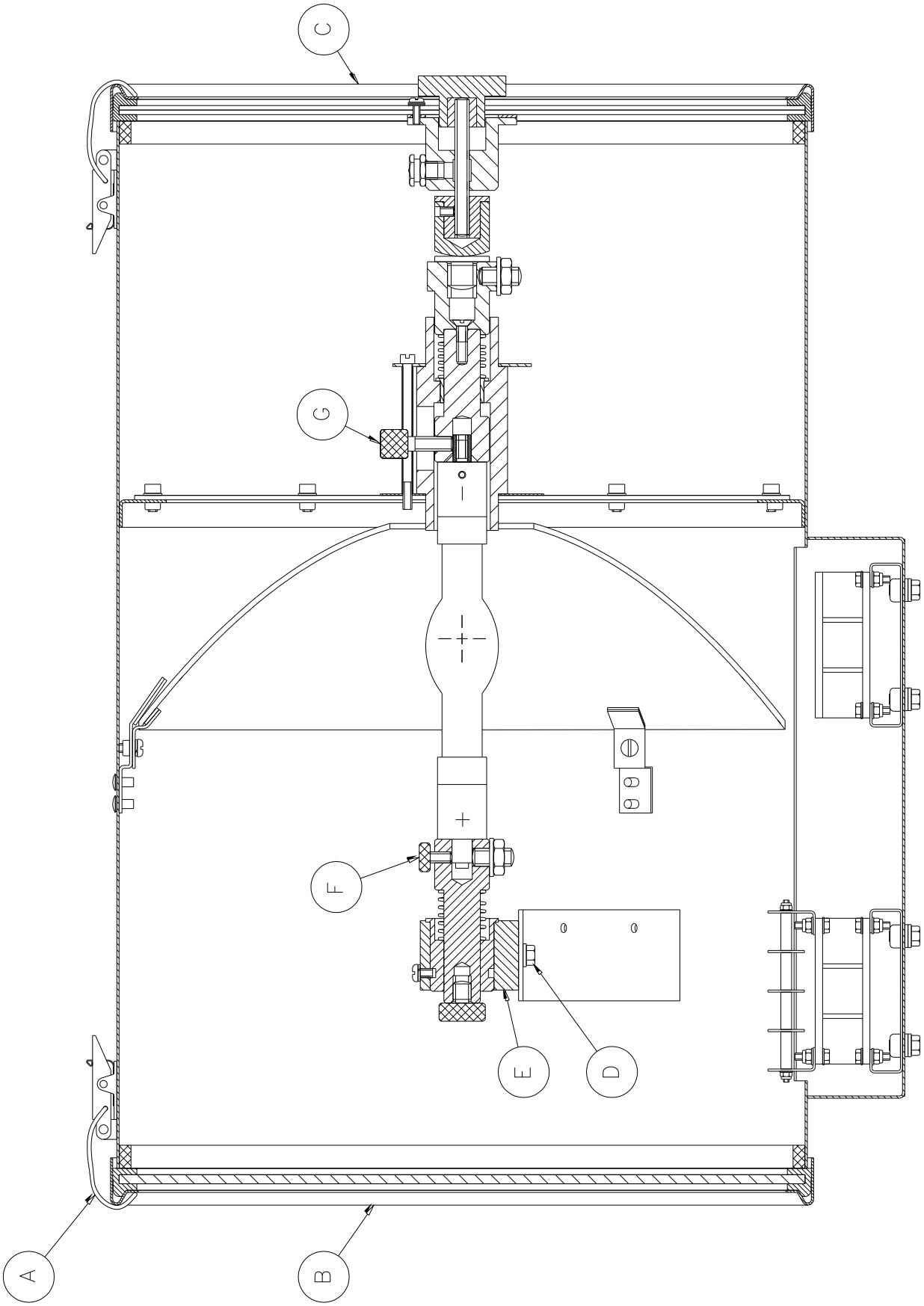
6) Tighten the knurled screw (G) on the rear lampholder assembly to hold the lamp in position.

7) 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 (F).

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

9) The front bezel and rear bezel can now be replaced.

10) Removal is the reverse of the above. When replacing the lamp retain cathode (negative) adaptor C13544-37 for re-use. (See instruction 5 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 lockwheels 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 lockwheel 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 lockwheel.

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, always, 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 Xenon 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, 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) Xenon lamps are designed for dc operation only. The dc current may only be varied within the limits of the current control range. Xenon lamps 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, Xenon lamps should be replaced once they reach the end of their average lamp life, and not later than 1.25 times their 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 circumstance 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 troubleshooting 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. ■ Magnetic stabilisation for horizontal operation defective.	■ Correct current setting. ■ Check magnetic stabilisation.
■ 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. ■ Premature blackening.	■ Current ripple too high. ■ Auxiliary mirror incorrectly adjusted.	■ Have power supply inspected. ■ Adjust auxiliary mirror.
■ 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

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 reflector if required.
    - Check the reflector mounting gaskets. If signs of corrosion or damage are evident, replace, as necessary.
    - Ensure that the lampholder is free from corrosion or other damage.
    - Check earthing point for conductivity.
- It is advisable to check all seals and gaskets for signs of degradation. Renew if necessary.
- Upon completing all maintenance requirements, the searchlight should be tested for full working order (approximately 20 minutes).
- 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 Diagram & General Assembly Drawings

Drawing Number	Description
X4737	Xenon Wiring Diagram
X4719	FX380 Deck General Assembly
X4720	FX380 Deck Pedestal General Assembly
X4721	FX380 Cabin General Assembly
X4722	FX380 Cabin Pedestal General Assembly
C26807 / C26808	Power Supply Enclosure Assembly

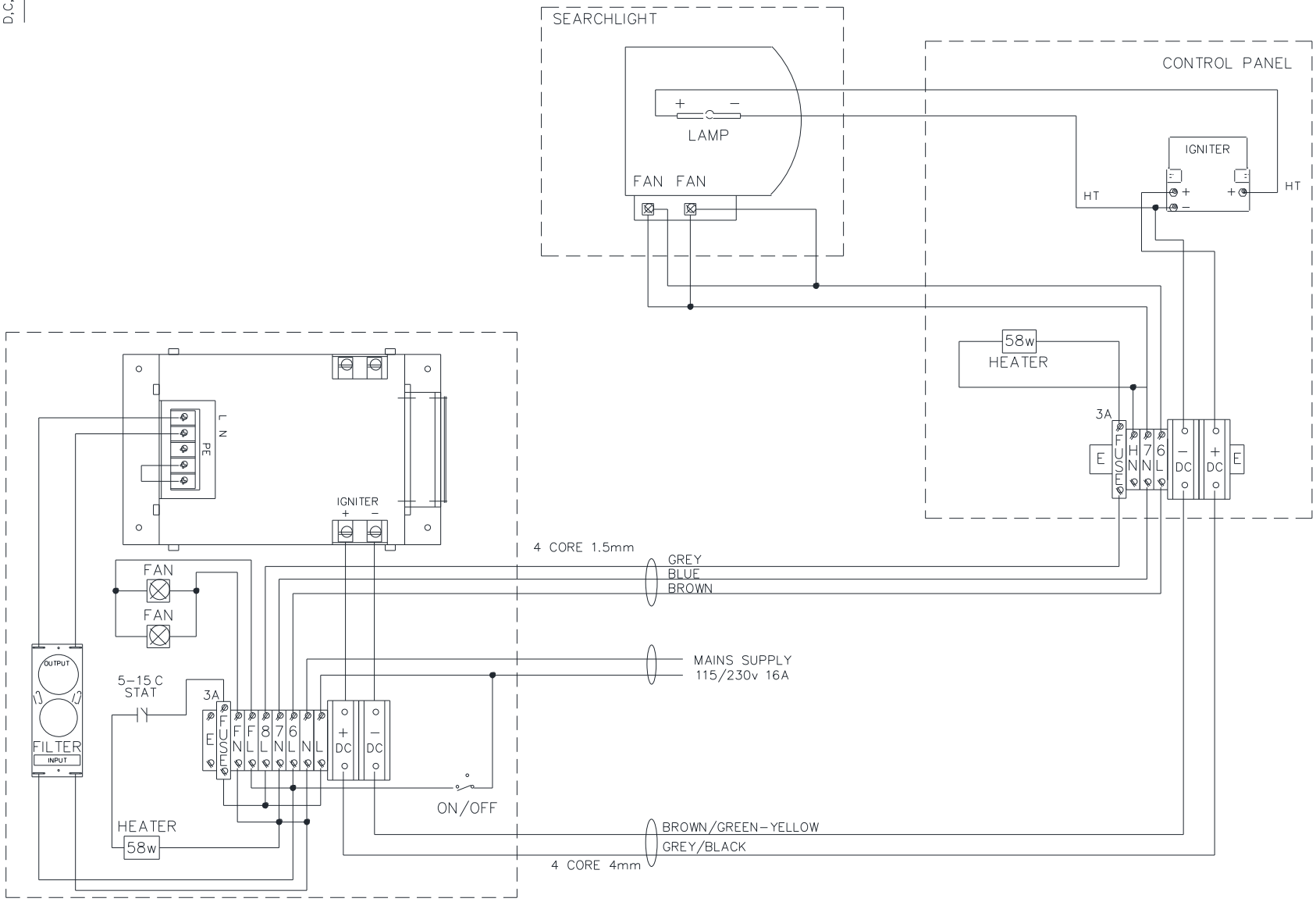
FIRST USED ON FX380 1000W D,C,DP,CP

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 (EC1660)	4.15 D.S.
5	TERMINAL FUSE ADDED (EC1734)	12.18 LW



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

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CONT ON SHEET

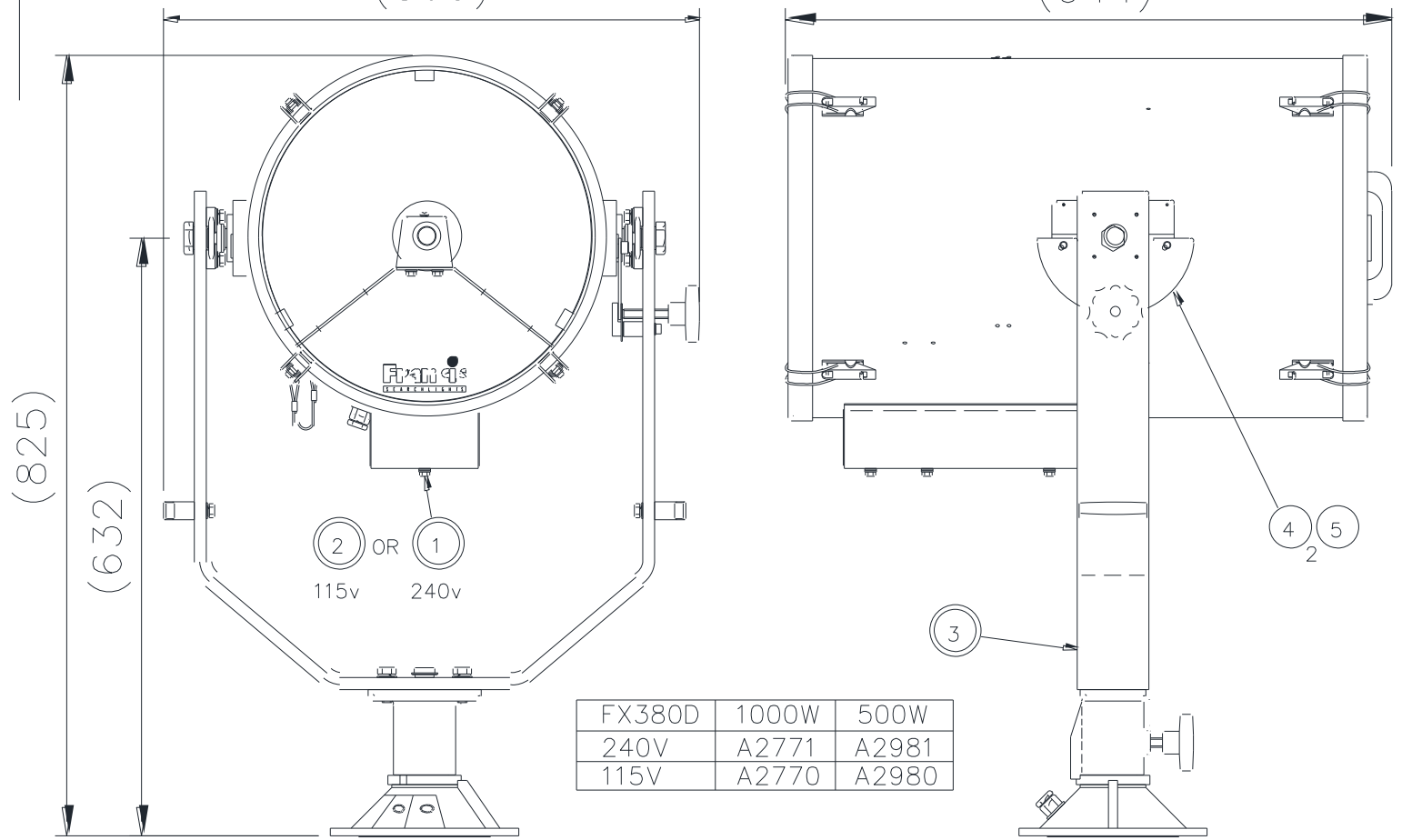
DRAWN	D.S.	DATE	5.6.97	TOLERANCES	Sand Casting: To ISO 8062 CT10	MATERIAL	FINISH	DESCRIPTION	PART No./DRG No. / SHT
CHECKED		SCALE		General: ±	Die Casting: To ISO 8062 CT8			1000W XENON WIRING DIAGRAM	X4737 / 1
ALL DIMENSIONS IN MILLIMETRES				Angular: ±	Hole centres & posns: ±				

FIRST USED ON FX380D

DO NOT SCALE DRAWING

THIRD ANGLE PROJ

0 10 20 30 40 50mm



FX380D	1000W	500W
240V	A2771	A2981
115V	A2770	A2980

ITEM	PART No.	DRG No.	DESCRIPTION	QTY	ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C16927	X4715	BARREL ASSY 240v	1	4	C11380	X2863	QUADRANT	1
2	C16934	X4715	BARREL ASSY 115v	1	5	C11182		M8 x 16 SKT CAP HD SCREW	2
3	C16939	X4728	DECK MOUNT	1					

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	6.97 D.S.
2	500W VERSIONS ADDED. (EC0724)	1.99 TJC
3	BROUGHT IN-LINE WITH DETAIL (EC0844)	10.00 D.S.
4	RE-DESIGNED TO USE RC CRUTCH (EC0874)	1.01 D.S.
5	BROUGHT IN-LINE WITH DETAIL (EC0998)	3.02 M.T
6	BARREL LATCHES (EC1020)	2.03 D.S.

STANDARD PRACTICE

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

TOLERANCES U.O.S: –

General: ±
Angular: ±
Hole centres & posns: ±

Sand Casting: To ISO 8062 CT10
Die Casting: To ISO 8062 CT8

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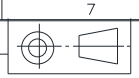
CONT ON SHEET

DRAWN	D.S.	DATE	9.6.97	MATERIAL	FINISH	DESCRIPTION	PART No./DRG No.	SHT
CHECKED		SCALE	1:5			FX380D G.A.	X4719	1
ALL DIMENSIONS IN MILLIMETRES								

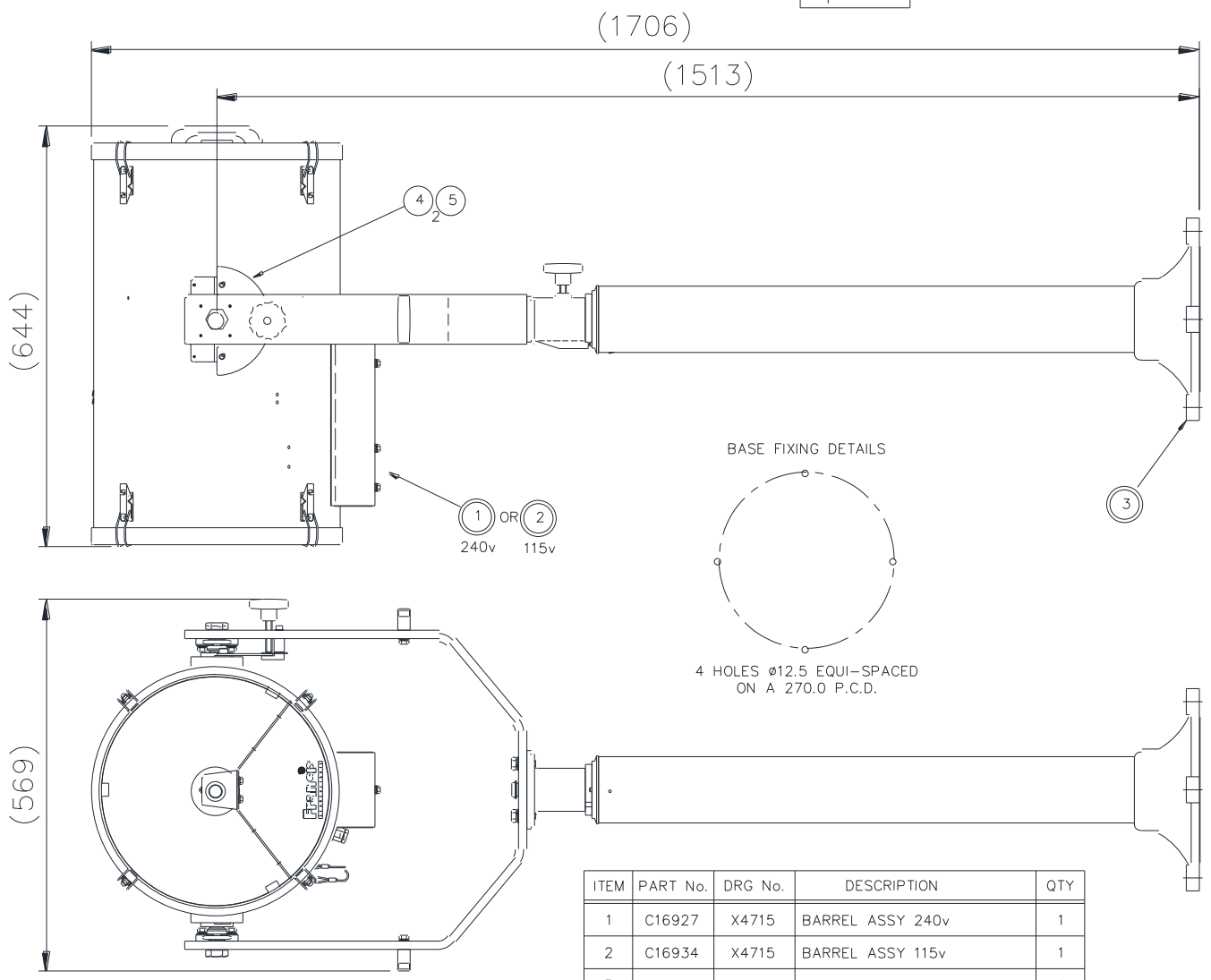
FIRST USED ON FX380DP

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION



0 10 20 30 40 50mm



ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C16927	X4715	BARREL ASSY 240v	1
2	C16934	X4715	BARREL ASSY 115v	1
3	C16940	X4729	DECK MOUNT	1
4	C11380	X2863	QUADRANT	1
5	C11182		M8 x 16 SKT CAP HD SCREW	2

FX380DP	1000W	500W
240V	A2773	A2983
115V	A2772	A2982

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	6.97 D.S.
2	500w VERSIONS ADDED. (EC0724)	1.99 TJC
3	BROUGHT IN-LINE WITH DETAIL (EC0844)	10.00 D.S.
4	RE-DESIGNED TO USE RC CRUTCH (EC0874)	1.01 D.S.
5	BROUGHT IN-LINE WITH DETAIL (EC0998)	3.02 M.T
6	BARREL LATCHES (EC1020)	2.03 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	6.97	TOLERANCES	Sand Casting: To ISO 8062 CT10 Die Casting: To ISO 8062 CT8 Hole centres & posns: ±
CHECKED		SCALE	1:5	General: ± Angular: ±	
ALL DIMENSIONS IN MILLIMETRES					

MATERIAL

FINISH

DESCRIPTION: FX380DP G.A.

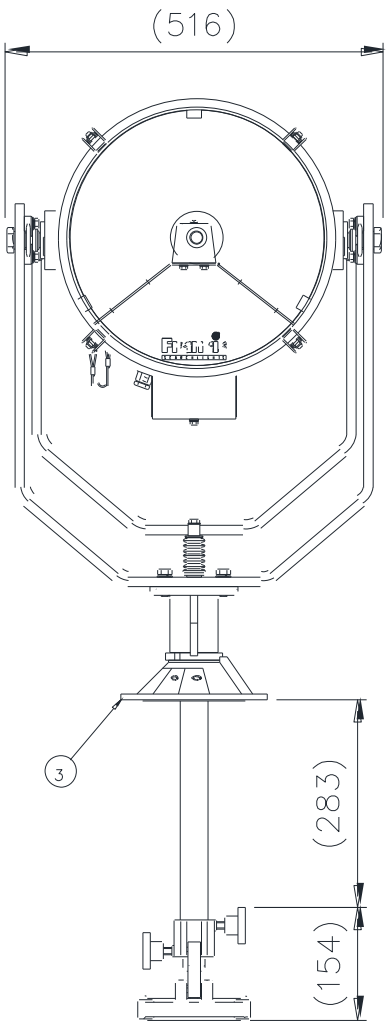
PART No./DRG No.: X4720

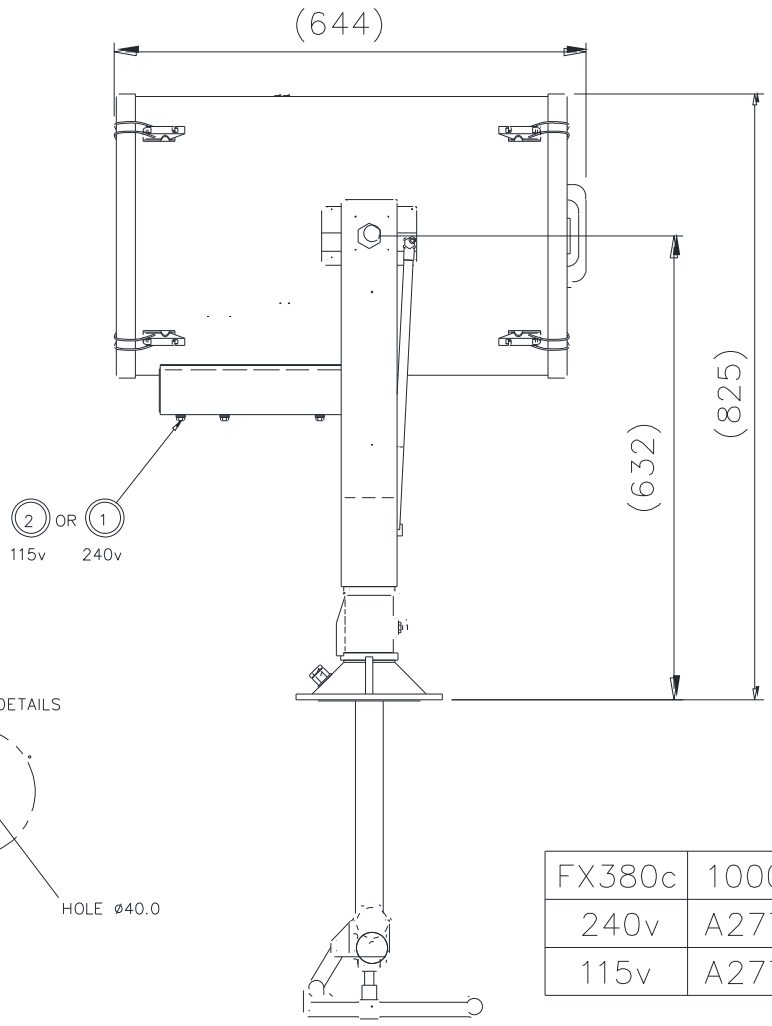
SHT: 1

FIRST USED ON FX380C

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION





BASE FIXING DETAILS

FX380c	1000w	500w
240v	A2775	A2985
115v	A2774	A2984

ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C16927	X4715	BARREL ASSY 240v	1
2	C16934	X4715	BARREL ASSY 115v	1
3	C16938	X4726	TRAINER MOUNT	1

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	6.97 D.S.
2	500w VERSIONS ADDED. (EC0724)	1.99 TJC
3	BROUGHT IN-LINE WITH DETAIL (EC0844)	10.00 D.S.
4	RE-DESIGNED TO USE RC CRUTCH (EC0874)	1.01 D.S.
5	BROUGHT IN-LINE WITH DETAIL (EC0998)	3.02 M.T
6	BARREL LATCHES (EC1020)	2.03 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	6.97
CHECKED		SCALE	1:5
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: FX380C G.A.

PART No./DRG No.: X4721

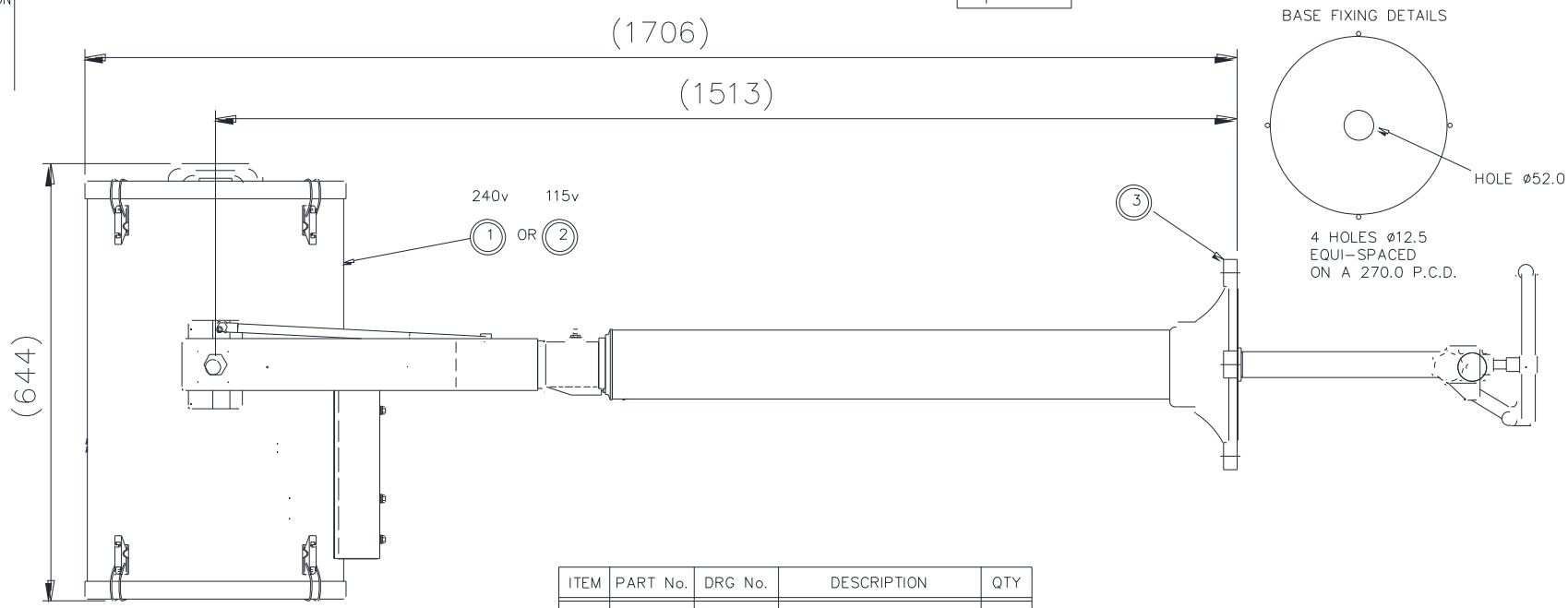
SHT 1

FIRST USED ON FX380CP

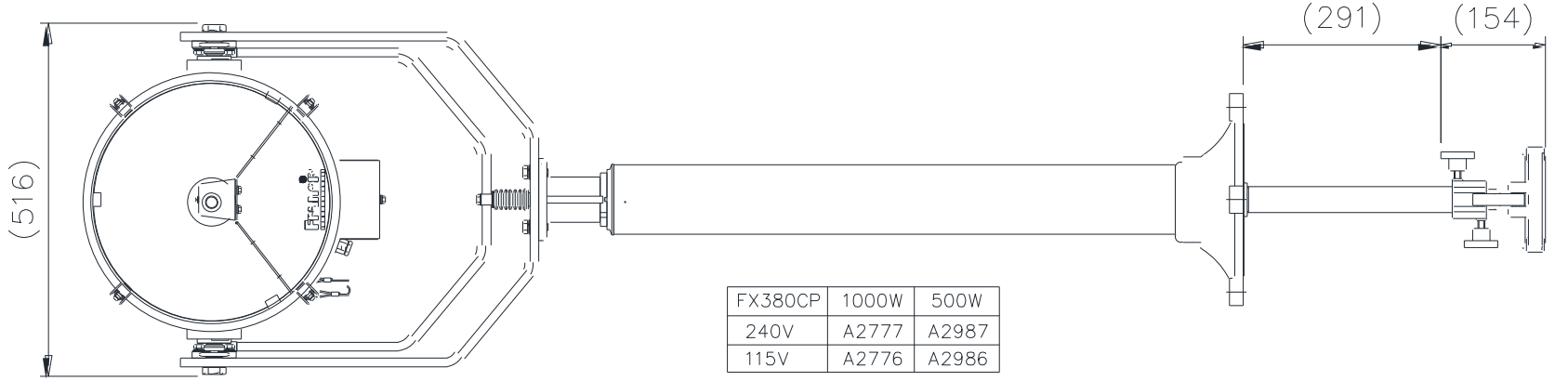
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm



ITEM	PART No.	DRG No.	DESCRIPTION	QTY
1	C16927	X4715	BARREL ASSY 240v	1
2	C16934	X4715	BARREL ASSY 115v	1
3	C15555	X4727	TRAINER MOUNT	1



FX380CP	1000W	500W
240V	A2777	A2987
115V	A2776	A2986

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	6.97 D.S.
2	500w VERSIONS ADDED. (EC0724)	1.99 TJC
3	BROUGHT IN-LINE WITH DETAIL (EC0844)	10.00 D.S.
4	RE-DESIGNED TO USE RC CRUTCH (EC0874)	1.01 D.S.
5	BROUGHT IN-LINE WITH DETAIL (EC0998)	3.02 M.T
6	BARREL LATCHES (EC1020)	2.03 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	6.97	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: FX380CP G.A.

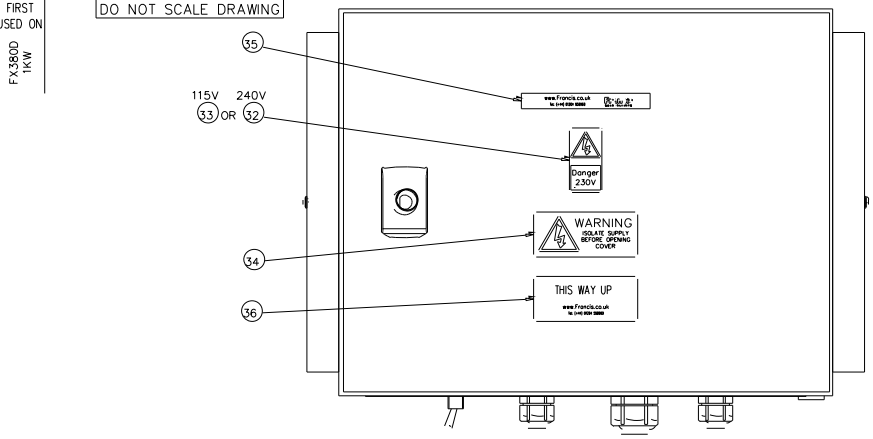
PART No./DRG No.: X4722

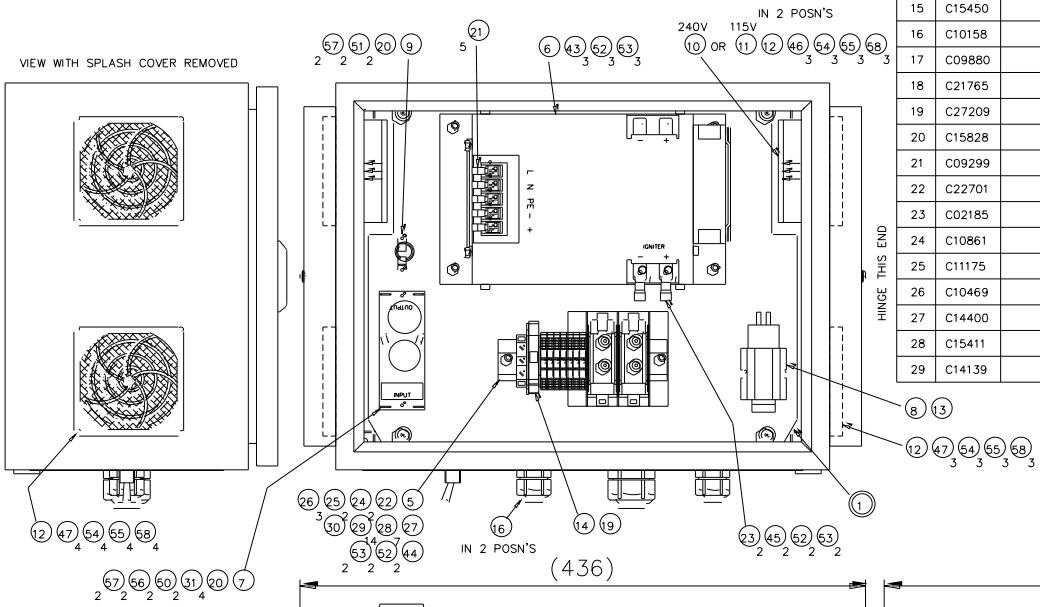
SHT: 1

FIRST USED ON FX380D 1KW

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION



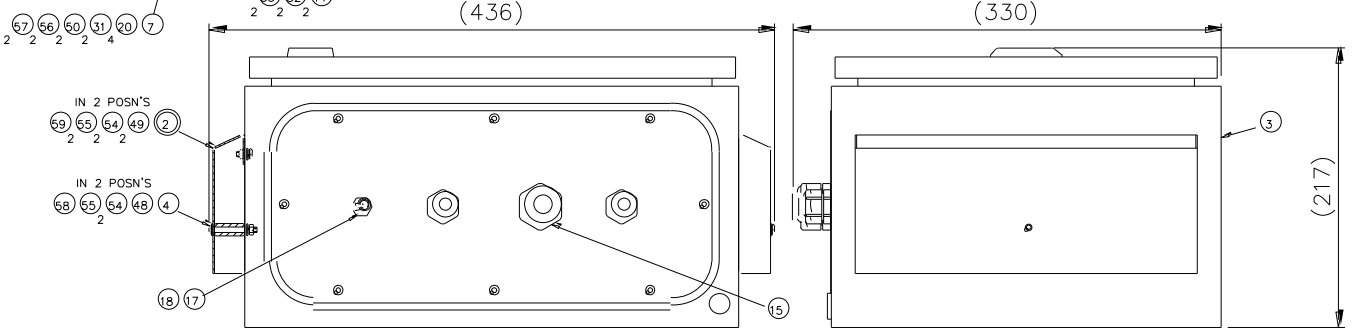


ITEM	PART No.	DRG No.	DESCRIPTION	240V QTY	115V QTY
1	C26679	C26679	CHASSIS PLATE S/ASSY	1	1
2	C25012	C25012	FAN SPLASH COVER S/ASSY	2	2
3	C26678	C26678	PSU ENCLOSURE DRILLING	1	1
4	C24687	C24687	SPLASH COVER PILLAR	2	2
5	C17223	X4966	DIN RAIL	1	1
6	C26622		PSU	1	1
7	C27127		FILTER	1	1
8	C23277		HEATER	1	1
9	C24889		THERMAL SWITCH	1	1
10	C16930		FAN 240V	2	
11	C16931		FAN 115V		2
12	C25013		FAN COVER	4	4
13	C24118		FUSE	1	1
14	C27208		TERMINAL FUSE HOLDER	1	1
15	C15450		M25 CABLE GLAND	1	1
16	C10158		M20 CABLE GLAND	2	2
17	C09880		SWITCH	1	1
18	C21765		SEALING BOOT	1	1
19	C27209		TERMINAL FUSE END COVER	1	1
20	C15828		RED SHROUDED CRIMP	6	6
21	C09299		M4 RED EYELET	5	5
22	C22701		M6 YELLOW EYELET	2	2
23	C02185		M5 YELLOW EYELET	2	2
24	C10861		H/C TERMINAL	2	2
25	C11175		H/C SPACER	3	3
26	C10469		H/C COVER	1	1
27	C14400		TERMINAL	7	7
28	C15411		TERMINAL MARKERS	14	14
29	C14139		END COVER	1	1

ITEM	PART No.	DRG No.	DESCRIPTION	240V QTY	115V QTY
30	C14379		EARTH TERMINAL	1	1
31	C16591		PILLAR	2	2
32	C21464		230V WARNING LABEL	1	
33	C22078		115V WARNING LABEL		1
34	C22036		ISOLATE SUPPLY LABEL	1	1
35	C04900		FRANCIS EXTERIOR LABEL	1	1
36	C24369		THIS WAY UP LABEL	1	1
37	C14161		6mm S/C SILICONE CABLE RED	A/R	A/R
38	C14162		6mm S/C SILICONE CABLE BLACK	A/R	A/R
39	C26799		1.5mm S/C SILICONE CABLE BROWN	A/R	A/R
40	C15838		1.5mm S/C SILICONE CABLE BLUE	A/R	A/R
41	C15112		1.5mm S/C SILICONE CABLE G/Y	A/R	A/R
42	C04481		RED SLEEVING	A/R	A/R
43	C13352		M5 x 16 HEX HD SCREW	3	3
44	C13351		M5 x 10 HEX HD SCREW	2	2
45	C09895		M5 x 10 SKT BUTTON HD SCREW	2	2
46	C10120		M4 x 20 CSK HD SCREW	6	6
47	C06981		M4 x 16 CSK HD SCREW	7	7
48	C14468		M4 x 35 SKT BUTTON HD SCREW	2	2
49	C14533		M4 x 10 SKT BUTTON HD SCREW	4	4
50	C10207		M3 x 8 SKT BUTTON HD SCREW	2	2
51	C14502		M3 x 6 SKT BUTTON HD SCREW	2	2
52	C08392		M5 PLAIN WASHER	7	7
53	C09231		M5 S/C SPRING WASHER	7	7
54	C04376		M4 PLAIN WASHER	21	21
55	C08793		M4 S/C SPRING WASHER	19	19
56	C08028		M3 PLAIN WASHER	2	2
57	C10747		M3 S/C SPRING WASHER	4	4
58	C06266		M4 FULL NUT	15	15
59	C12039		RTV	A/R	A/R

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

USE ITEMS BELOW FOR WIRING
37 38 39 40 41 42



BASE FIXINGS
340 x 260 M8 FIXINGS

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	9.15 D.S.
2	TERMINAL FUSE HOLDER ADDED (EC1734)	12.18 LW
3	PSU ENCLOSURE CHANGED (EC1891)	3.21 LW

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

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DRAWN	D.S.	DATE	16.9.15	TOLERANCES
CHECKED		SCALE	1:2	General: ± Angular: ±

ALL DIMENSIONS IN MILLIMETRES

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)
D21229	Lamp
C08919-00	Front glass
C22011-00	Front glass gasket
C23277-01	Heater & Fuse Assembly
C06020-00	Reflector
C21502-01	Base lockwheel assembly
C21503-01	Side lockwheel assembly
C11148-00	'O' ring seal (Deck & Cabin)
C10170-00	'O' ring seal (Deck Pedestal & Cabin Pedestal)
C20281-00	Bellows
C08926-00	Push Road Seal
C24889-00	Thermal Switch
C09880-00	PSU On/Off Switch
C21765-00	Switch Sealing Boot
C13544-37	Cathode (negative) adaptor

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 spare's requirements.

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