



User Instruction & Installation Manual

FX380 Manual Control 500 watt Xenon Searchlight



Product Reference Number:

A2980 – 115v Deck	A2981 – 240v Deck
A2982 – 115v Deck Pedestal	A2983 – 240v Deck Pedestal
A2984 – 115v Cabin	A2985 – 240v Cabin
A2986 – 115v Cabin Pedestal	A2987 – 240v Cabin Pedestal

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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.

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 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;
- 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.

3 - Technical Information

This product has been designed to operate in accordance with the product specification. The FX380 500 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 $\pm 40^\circ$, Cabin & Cabin Pedestal $+40^\circ -20^\circ$;
- Internal self-regulating heater.

The searchlight also performs to the following optical data:

- Xenon light source;
- Lamp Wattage - 500 Watts;
- Supply voltage - 220/240V or 110v/115v;
- Peak Beam Candlepower - 28,000,000 Lux;
- Range - 5,290 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 500DC
Ignitor ref.	ZG 30 XE

ECG 500 DC-C

HBX500

Electronic Power Supply for Xenon Lamps



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

Igniters:

- ZG 30Xe-S 35Amps Igniter with **symmetrical** ignition,
no Anode or Cathode Ground operating
- ZG 30Xe-A 35Amps Igniter with **asymmetrical** ignition,
Anode or Cathode Ground operating
- ZG 60Xe 75Amps Igniter with **asymmetric** ignition
Anode or Cathode Ground operating

Suitable for:

Osram Lamps

Ushio Lamps

Luxtel Lamps

Perkin Elmer Excelitas Lamps

Features:

- Power supply for Xenon filled short arc lamps, **DNVGL-CG 0339 certified**
- Designed for Xenon short arc lamps rated **up to 500W/ 44A**
- Output power customer selectable by control Voltage **0-5V**
- Capable to drive lamp voltage ranges from **15 to 29V**
- length x width x height (mm) 170/220/224 x 132/139 x 141, 2,125 kg
- **Ballast boards inside IEC(UL) 60601 certified, HALT tested**
- Input voltage range from **90V AC to 264V AC**, power factor corrected line input, built-in EMI-filter: meets CE and FCC part "A"
- μ P 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 cascable for use for higher wattage Xenon lamps
- Auxiliary regulated 24V/ 0.2A output for Subsystems, **permanent available**
- Flexible Design: new lamps and functions adaptable by software

Electrical Data

All values are valid at $25 \pm 5^{\circ}\text{C}$, unless otherwise noted

Input Data

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Input voltage AC Line	U	V AC	100-240	90 - 264	
Input voltage DC-Line	U	V DC	DC-input is possible but not certified		
System wattage	P_{LI}	W		300 -600	depends on select
Input current	I_{LI}	A		5 – 14	depends on select
Line frequency	F_{in}	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 Relais
Leakage Current to PE	I_{Leak_SA}	μA	<500@230V		Standalone

Other Operation Data	Symbol	Unit	Nominal	Tolerances	Remarks
System wattage during ignition	P_{Iign}	W	25	<30	
System wattage standby-operation	P_{LIstby}	W	1,5	0.5 – 2.0	

Lamp Output Data

Ignition	Symbol	Unit	Nominal	Tolerances	Remarks
Ignition voltage with ZG ..Xe	U_{Iign}	kV _{peak}	30-35		Depends on Igniter
Ignition time	$t_{Iign\ on}$	sec.	1	0.9 – 1.1	attempts
automatic restart counter			5	--	

Run-up Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Run-up Current @ 15V	I_{max}	A	66	+10%	Inside specified lamp-parameter (select by internal Mode-switch)
Lamp-voltage	I_{max}	A		Max.	
In rush Current	I_{max}	A	80		0 to 1ms

Nominal Operation	Symbol	Unit	Nominal	Tolerance s	Remarks
Lamp voltage	U_{La}	V	10 - 29	+/-5%	Depends on lamp select
Lamp wattage	P_{La}	W	500	+/-2%	Fixed factory set-up 500W
Lamp current	I_{La}	A	Up to 44Amps		Depend 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	$\Delta P_{La,rip} / P_{La}$	%	< 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	$\Delta P_{La} / \Delta U_{LI}$	1		< 0.005	within nominal values
Open circuit voltage for ignition	U_{ocv}	V	110	105 –120	

LIFETIME DATA

All values for $U_u = 230 \text{ V}_{\text{rms}}$

Temperature at test point = 70°C

	Symbol	Unit	Nominal	Tolerances	Remarks
ballast lifetime	t_{Life}	h	25.000	> 25.000	acc. To MIL HDBK for nominal operation

MISCELLANEOUS DATA

Nominal Operation	Symbol	Unit	Nominal	Tolerances	Remarks
Power losses at 115V at 230V	P_V	W	30 – 90 25 - 80	+/-	Depends on power select
Efficiency	η	1	0.85	0.8 – 0.9	Depend on Lamp current
Ambient temperature	T_A	$^\circ\text{C}$	+ 25	-10 - +50	non condensing
Internal temp. switch off temperature	$T_{\text{c-off}}$	$^\circ\text{C}$	+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 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	170/220/224	+/-1	See dwg.
Width	w	mm	132/139	+/-1	See dwg.
Height	h	mm	141	+/-1	see dwg.
Housing					Closed AL
Weight	W_B	g	2125		

Wiring length	Symbol	Unit	Nominal	Tolerances	Remarks
Between igniter and lamp	L_{il}	mm		t.b.d.	As short as possible
Between ballast and igniter	L_{bl}	mm	t.b.d.	t.b.d.	External Igniter ZG 30Xe/A/S

Cooling method	Symbol	Unit	Nominal	Remarks
	airflow	meter per second	Built in fan	Thermal Situation should be checked in actual application

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 on page 6
Ballast Control interface plug	ST 1 JST / B6B-EH-A I Isolated to line voltage. GND connected to PE	See drawing on page 6
Connection Ballast to Igniter	By Screw M5 and Cable-shoes (Cu16-5) for 16qmm	See drawing on page 6

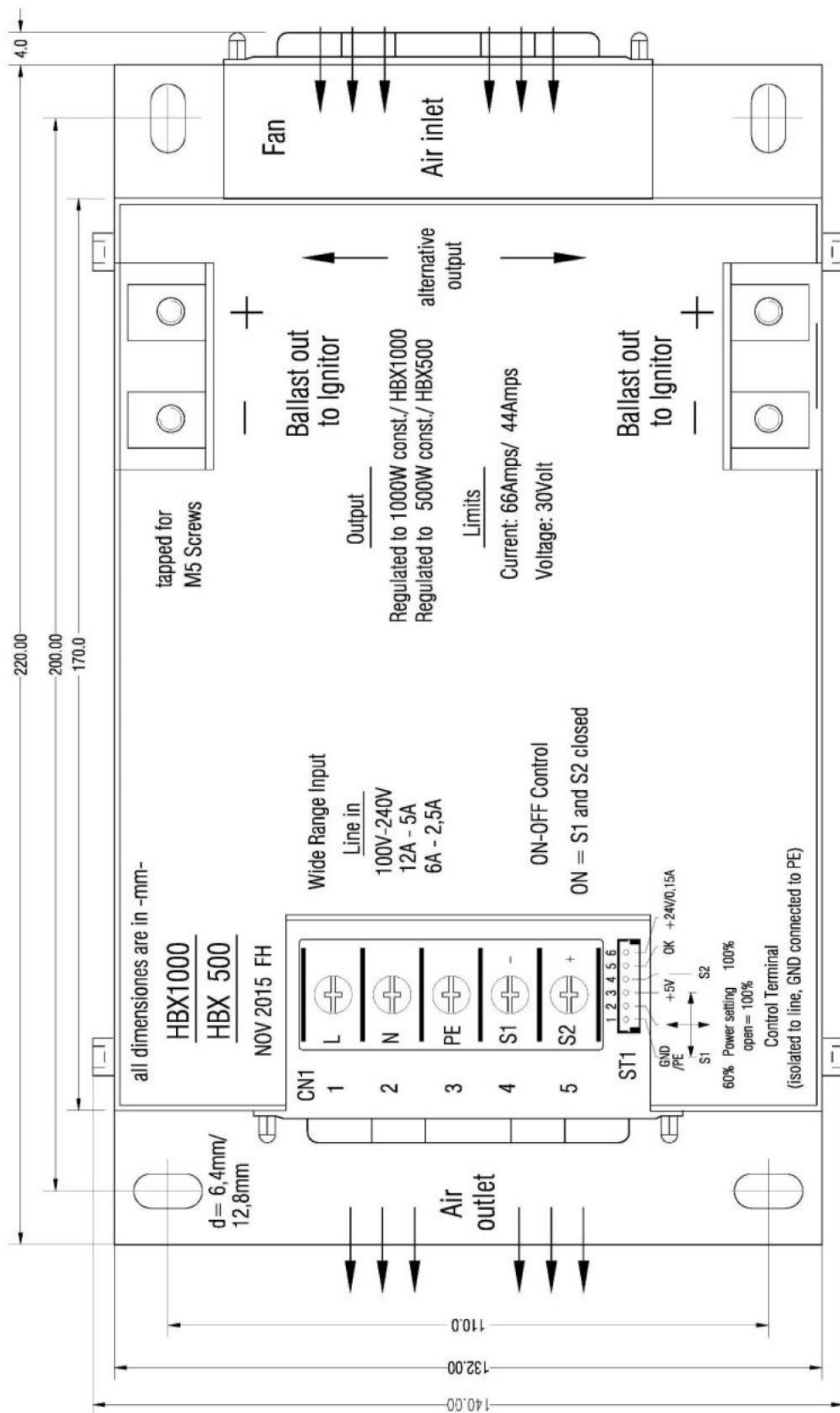
PIN Assignment and Fuse

Connector		Signal	Status	Description
Line input CN 1	PIN 1	AC in -L-		AC - wide range input Voltage 90V – 264V
	PIN 2	AC in -N-		Safety Ground
	PIN 3	PE		
CN 1	PIN 4 (-) PIN 5 (+)	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 Lamp Voltage Minus and Power	Connection to external Igniter ZG 60Xe ZG 120Xe	
Option Board terminal ST1 opto-isolated	Pin 1 Pin 2 Pin 3 Pin 4 Pin 5 Pin 6	GND/PE/CN1-Pin4 Power control input +5V ON-OFF/CN1-Pin5 Lamp Lit feedback +24V-0,15A auxiliary out		GND and 24V return Voltage or PWM control, 5V =500W 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 2xT 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 ballastboards HBX180 CB- Test, and UL must be completed with the final product
RFI – (Radio Frequency Interferences) (Funkentstörung)	has to be done with complete assembled project, built-in EMI-filter, that meets CE and FCC (A) requirements, for “B” an additional Filter is recommended (has to be tested with final product)

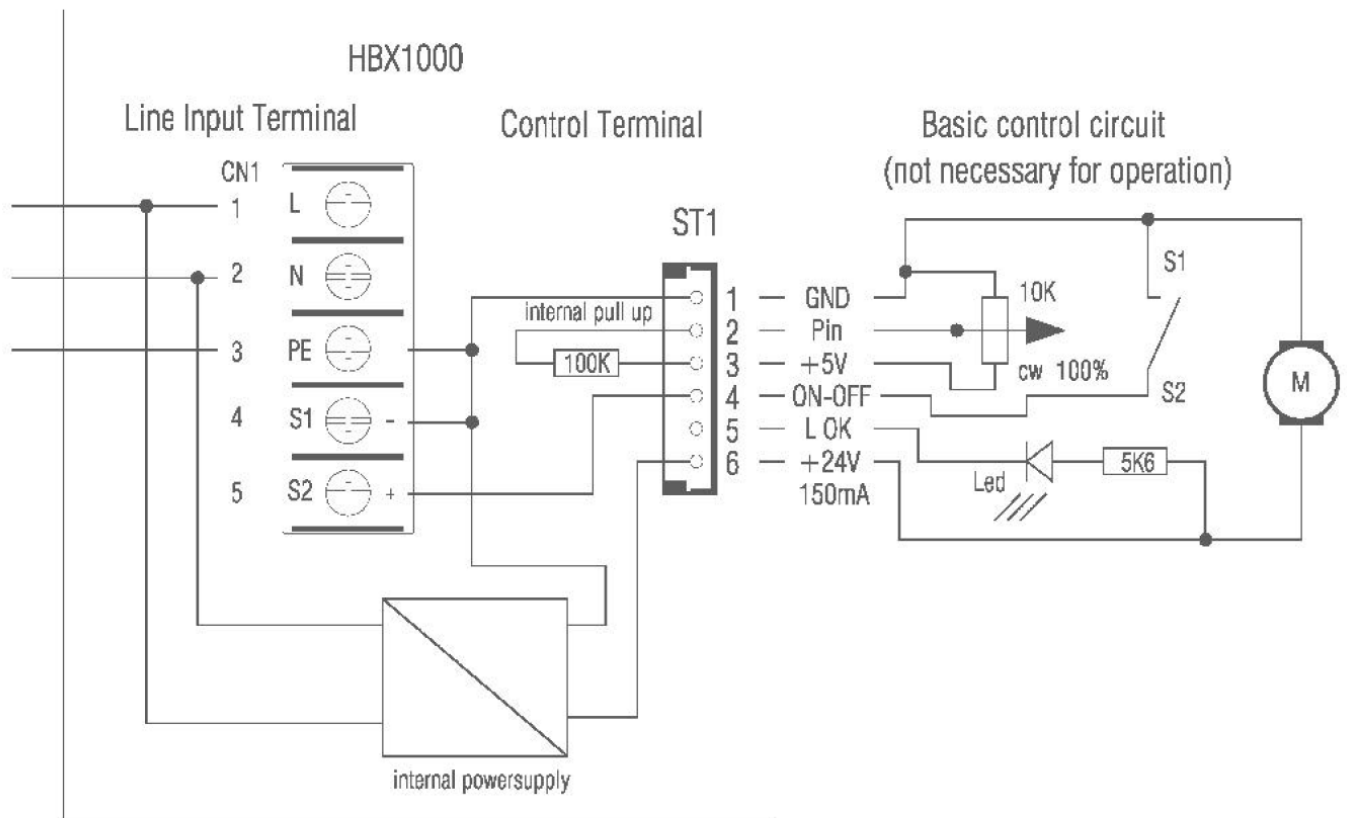
Environmental Requirements	Ambient conditions	Remarks
Storage Temperature Range	-20°C - +60°C	
Operating Temperature Range	-10°C – 40°C	Depend on cooling
Humidity Range	20% - 95% non condensing	
Altitude operating	0 Ft. to 10000 Ft.	
Altitude not operating	0 Ft. to 40000 Ft.	
Vibration operating	G _{rms} , 5 Hz to 500 Hz random 10min x y z axis	t.b.d. not tested
Vibration not operating	G _{rms} , 5 Hz to 500 Hz random 10min 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

Specifications subject to change without notice



Outline Configuration of HBX500 and HBX1000 are equal.

Control Configuration of HBX500 and HBX1000 is equal



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 or by 5V PWM Signals with 100Hz to 500Hz. It can left open for 100% output Power.

Pin 5 is an open collector output to drive a Led for amp OK operation.

Additional hints for use and safety:

1. 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 electrical safety!

2. Lamp power selection:

By multimode 16-step switch (0-F). Only factory setup. Not for end user.

3. 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)!

4. Cooling

This unit is assembled with an internal fan, which ensures proper operation at ambient temperatures up to 50°C. Nevertheless it is necessary to keep air in- and -outlet free.

Temperature overload is protected by an internal temperature switch at 90°C at the internal heatsink.

5. Fuse and Safety

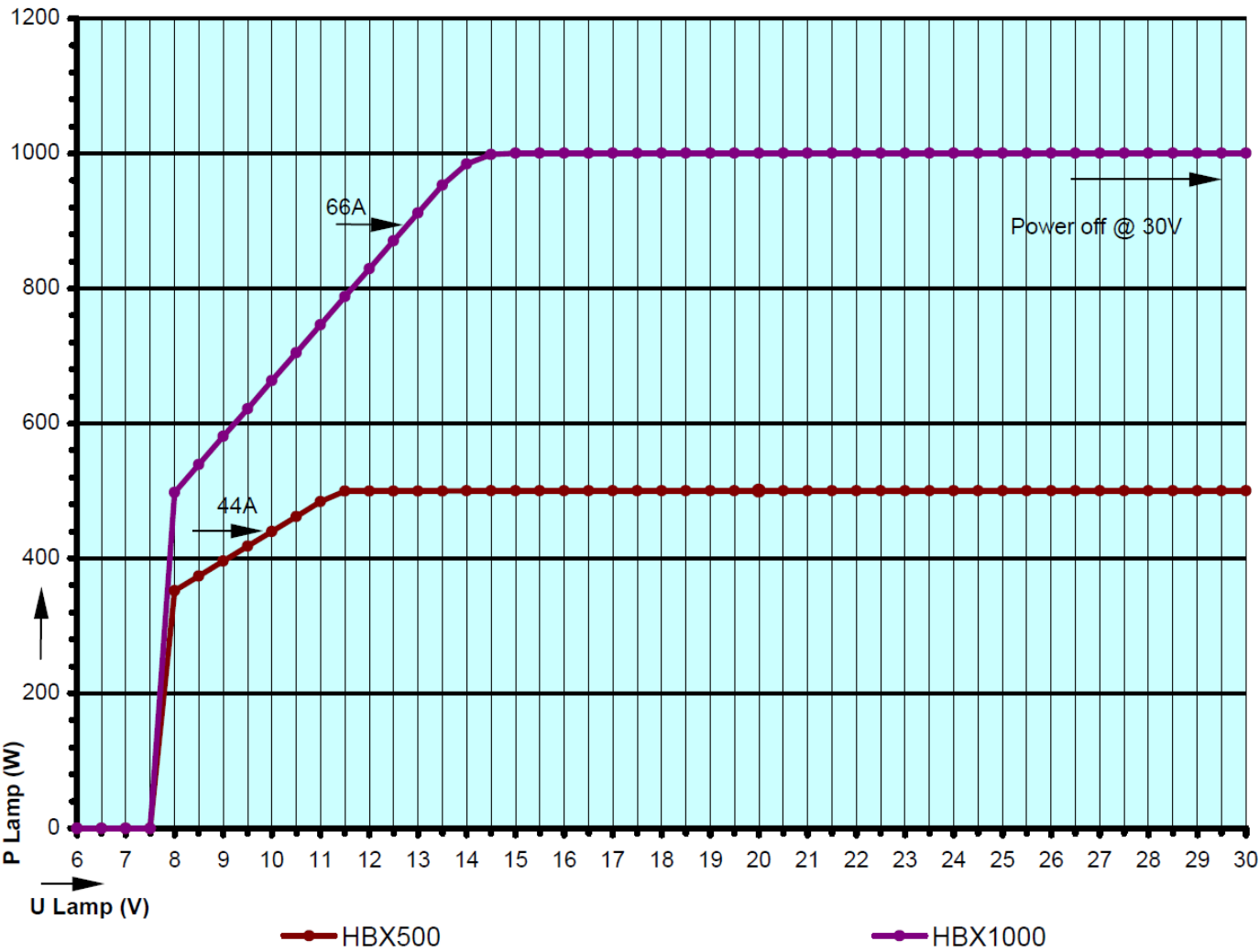
CAUTION! For Continued Protection Against Risk of Fire, Replace Only with same Type and Rating of Fuse! The fuse is a fixed built-in component with T5A / 250V rating.

If one of the fuses has failed, the power-supply must be returned to the factory for repair.

6. Increasing reliability and functions

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

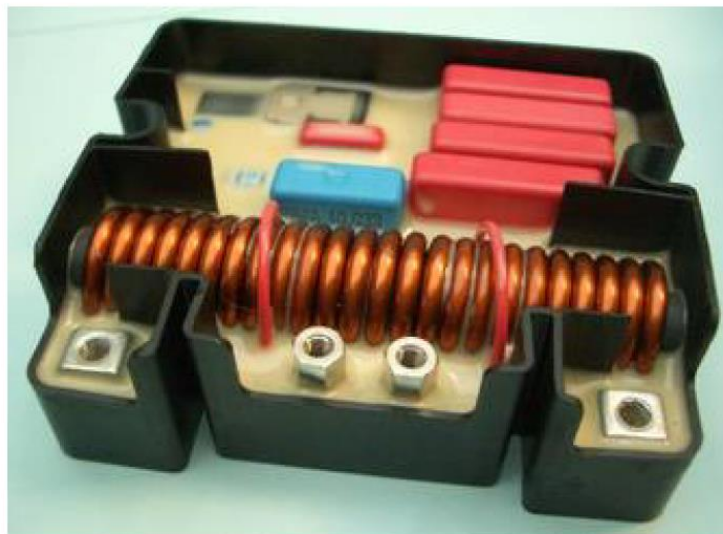
HBX500- HBX1000 Output Power 500W - 1000W vrs. Ulamp



Standard Factory Set up HBX500, HBX1000; 500W-44A, 1000W-66A

ZG 30 XE

Electronic self stopping igniter for Xenon lamps



Technical data

Maximum ampacity	35 A
Ignition voltage:	± 18 kV
Input voltage range	ca. 80 – 120V DC
Operation mode	symmetrical (S)
Ignition mode control	self stopping by time 2sec/+ threshold voltage ca. 70V DC
Pulse rate	100 / s
Repetition rate	10 ms
Ambient temperature	70° C
Cable length	HV 300 mm recommended LV dep. on diameter
Dimensions (L x W x H)	78 x 67 x 25 mm
Weight:	160 g
Connectors	screw 2 x M3x6, 2 x M4x6

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.

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 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 than 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 supply to the searchlight:

Searchlight	115v 500w	240v 500w
Cable Size (mm ²)	Distance Max	Distance Max
1.5	34 MTRS	148 MTRS
2.5	55 MTRS	242 MTRS
4	88 MTRS	384 MTRS
6	137 MTRS	598 MTRS
10	230 MTRS	1001 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 ease of use, a single pole switch, of the appropriate rating, should be fitted in a convenient location. All cable lengths should be kept to a minimum.

Installation Guidelines

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

Referring to wiring diagram C20609, 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: -

3 cores 4mm cable from the Searchlight into the PSU.

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 17v dc at 28amps.

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 & Multimeter

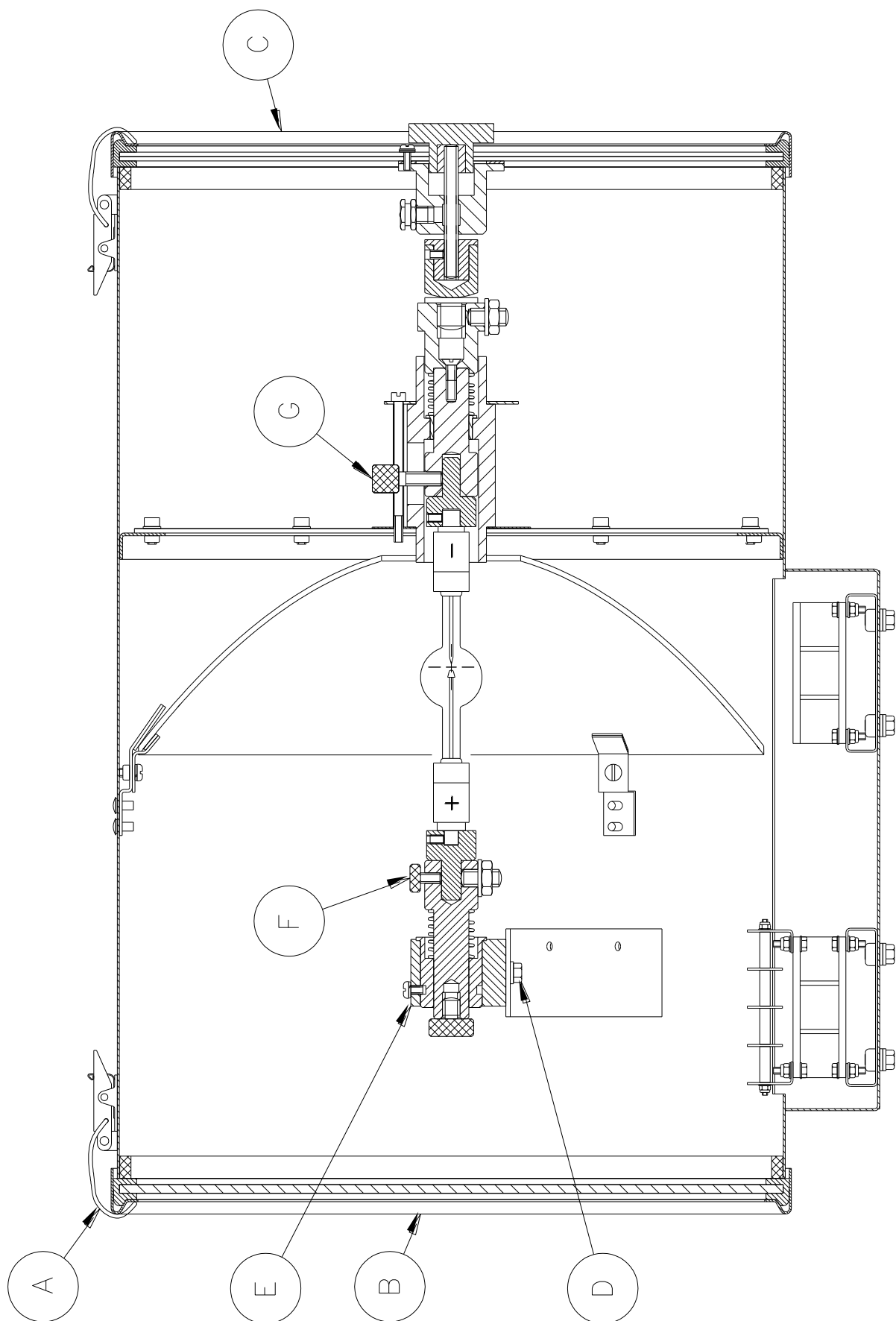
Procedure

- 1) With the multimeter, test the DC voltage in the searchlight head. This should be approximately 17 volts.
- 2) With the D.C ammeter, test the current of the red DC cable at front of searchlight. It should read approximately 28 amps.
- 3) Multiply these readings together, as shown above, to obtain the desired wattage required, usually about 476watts.

Fitting instructions for the 500w 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 and allow to hang from the safety chain;
- 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 assemblies;
- 5)** The lamp can now be inserted, ensure that the lamp extension caps are securely in position prior to insertion. The negative (cathode) end of the lamp should be inserted towards the rear of the searchlight, incorrect insertion of the lamp can irreparably damage the lamp and equipment;
- 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.



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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 baseplate lockwheels. 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.

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. An 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 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 circumstances the lamp manufacturer's data should be referred to when dealing with lamps.

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
<ul style="list-style-type: none">■ Wrong Polarity	<ul style="list-style-type: none">■ Lamp incorrectly fitted■ Faulty wiring	<ul style="list-style-type: none">■ Anode (large electrode) must always be on top in vertical burning position■ Check polarity, transpose connections if necessary
<ul style="list-style-type: none">■ Cap overheated■ Cap temperature above 230°C	<ul style="list-style-type: none">■ Faulty contacts■ Cooling equipment defective	<ul style="list-style-type: none">■ Check terminals, tighten or renew■ Check cooling equipment and replace if necessary
<ul style="list-style-type: none">■ Arc unsteady	<ul style="list-style-type: none">■ Lamp operated outside current control range■ Magnetic stabilisation for horizontal operation defective	<ul style="list-style-type: none">■ Correct current setting■ Check magnetic stabilisation
<ul style="list-style-type: none">■ Bulb draws in air	<ul style="list-style-type: none">■ Crack in graded seal caused by overheated cap■ Maximum cap temperature 230°C	<ul style="list-style-type: none">■ Check terminals - tighten or renew
<ul style="list-style-type: none">■ Glass erosion on fused quartz bulb	<ul style="list-style-type: none">■ Lamp operated outside current control range■ Lamp service life exceeded	<ul style="list-style-type: none">■ Correct current setting■ Check meter
<ul style="list-style-type: none">■ Electrodes damaged■ Premature blackening	<ul style="list-style-type: none">■ Current ripple too high■ Auxiliary mirror incorrectly adjusted	<ul style="list-style-type: none">■ Have power supply inspected■ Adjust auxiliary mirror
<ul style="list-style-type: none">■ Asymmetrical blackening of lamp (in horizontal burning position)	<ul style="list-style-type: none">■ Lamp operated too long in same position	<ul style="list-style-type: none">■ 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 strike 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 18,000 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.

8 - Maintenance and Servicing

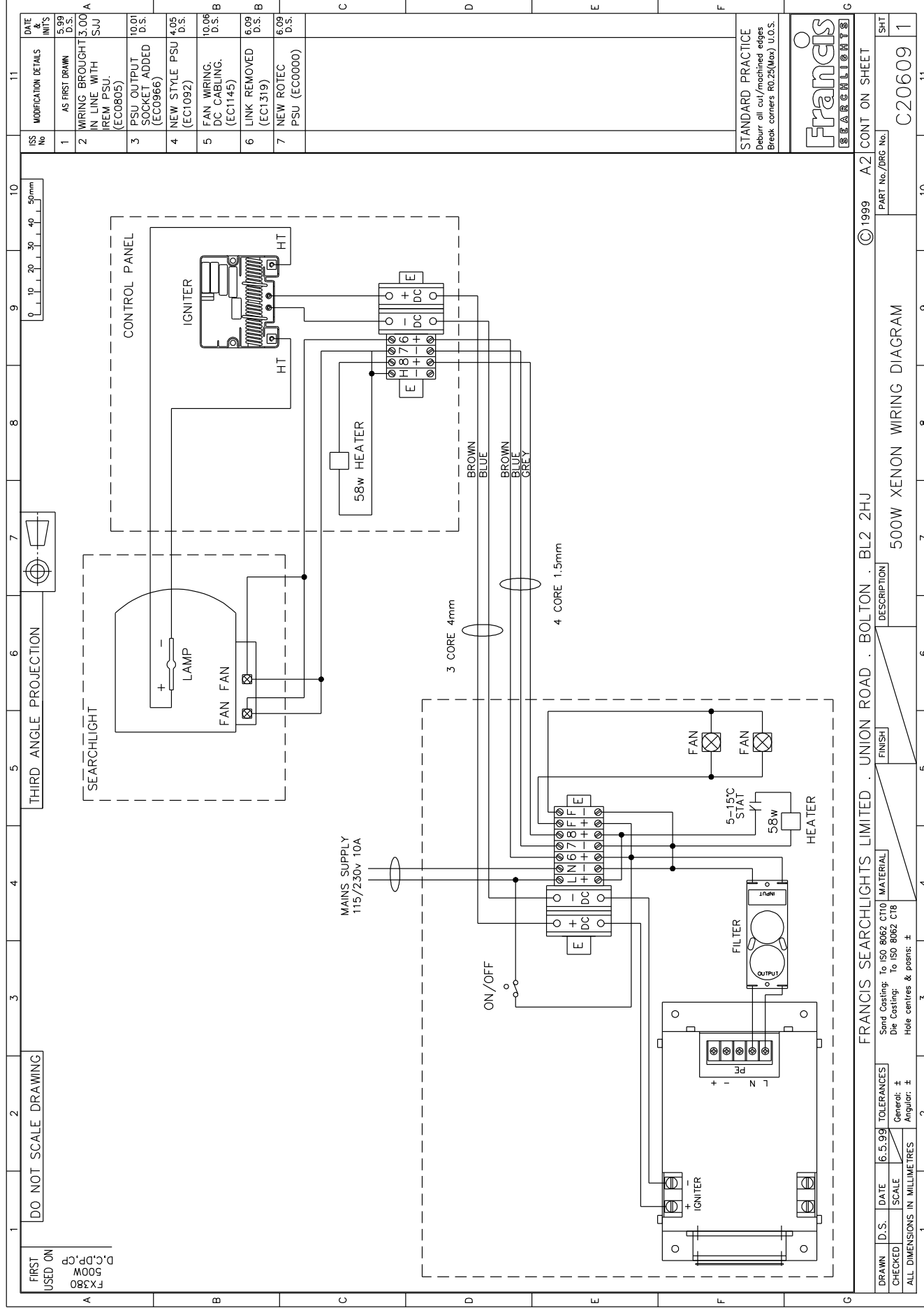
In order to prolong the service life and performance of your searchlight, the following maintenance guidelines are recommended:

- Maintenance checks should be conducted before every voyage or at least every three months;
- Before checking, disconnect the equipment from the supply;
- Visually inspect the condition of the equipment;
- Any major or minor structural damage should be rectified immediately in order to reduce sympathetic wear;
- After inspection it may be necessary to clean the inside of the searchlight. The following procedure should be adhered to:
 - Remove the front bezel;
 - Clean the front glass inside and out using a proprietary glass cleaner;
 - Clean the reflector if required;
 - Check 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. lockwheels, elevation and pan mechanisms, should be lightly lubricated.

If in any doubt as to the correct servicing procedures to adopt please contact your distributor/agent or the manufacturer who will be able to advise the best course of action for your product.

9 - Wiring Diagram & General Assembly Drawings

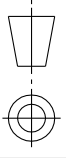
Drawing Number	Description
C20609	Xenon Wiring Diagram
X4719	FX380 Deck General Assembly
X4720	FX380 Deck Pedestal General Assembly
X4721	FX380 Cabin General Assembly
X4722	FX380 Cabin Pedestal General Assembly
C26677 / C26991	Power Supply Enclosure Assembly



DO NOT SCALE DRAWING

(569)

THIRD ANGLE PROJ



FIRST USED ON

FX380D

0

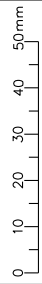
10

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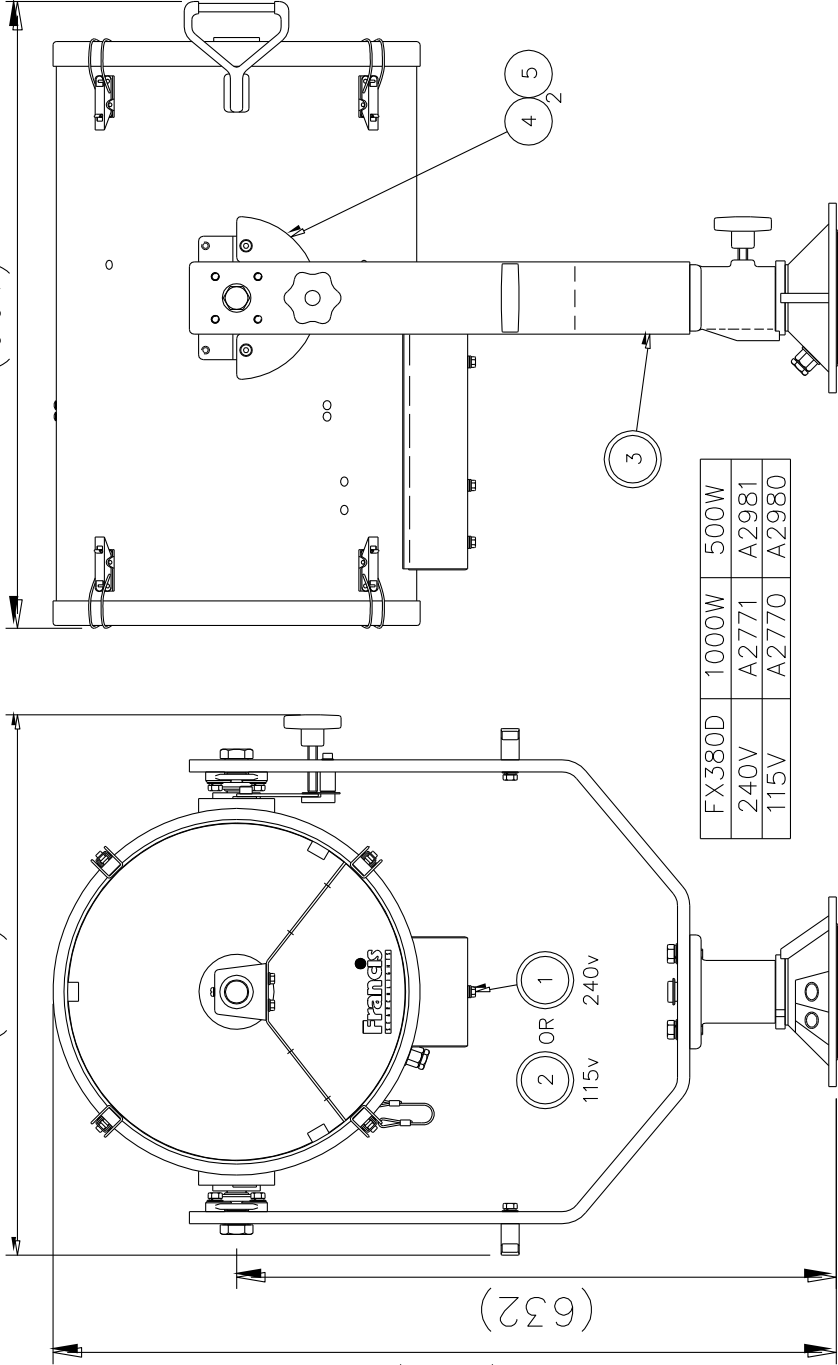
50mm



(825)

(632)

(661)



1

2

OR

1

240v

2


115v


3

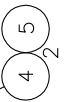
4

5

2







FX380D

240V

115V

1000W

A2771

A2770

500W

A2981

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	C16940	X4729	DECK MOUNT	1					

STANDARD PRACTICE

Deburr all cut/machined edges

Break corners R0.25(Max) U.O.S.

TOLERANCES U.O.S. -

General: ±

Angular: ±

Hole centres & posits: ±

Sand Casting: To ISO 8062 CT10

Die Casting: To ISO 8062 CT8

Francis

SEARCHLIGHTS

DRAWN

CHECKED

ALL DIMENSIONS IN MILLIMETRES

D.S.

SCALE

1:5

DATE

9.6.97

MATERIAL

DESCRIPTION

FX380D G.A.

PART No./DRG No.

X4719

SHT

1

© 1997

A3

CONT ON SHEET

DO NOT SCALE DRAWING

FIRST USED ON FX380DP

THIRD ANGLE PROJECTION
(1706)

(1513)

(661)

(569)

BASE FIXING DETAILS

4 HOLES Ø12.5 EQUI-SPACED ON A 270.0 P.C.D.

1 OR 2
240v 115v

1 2 3 4 5

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

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

Francis SEARCHLIGHTS

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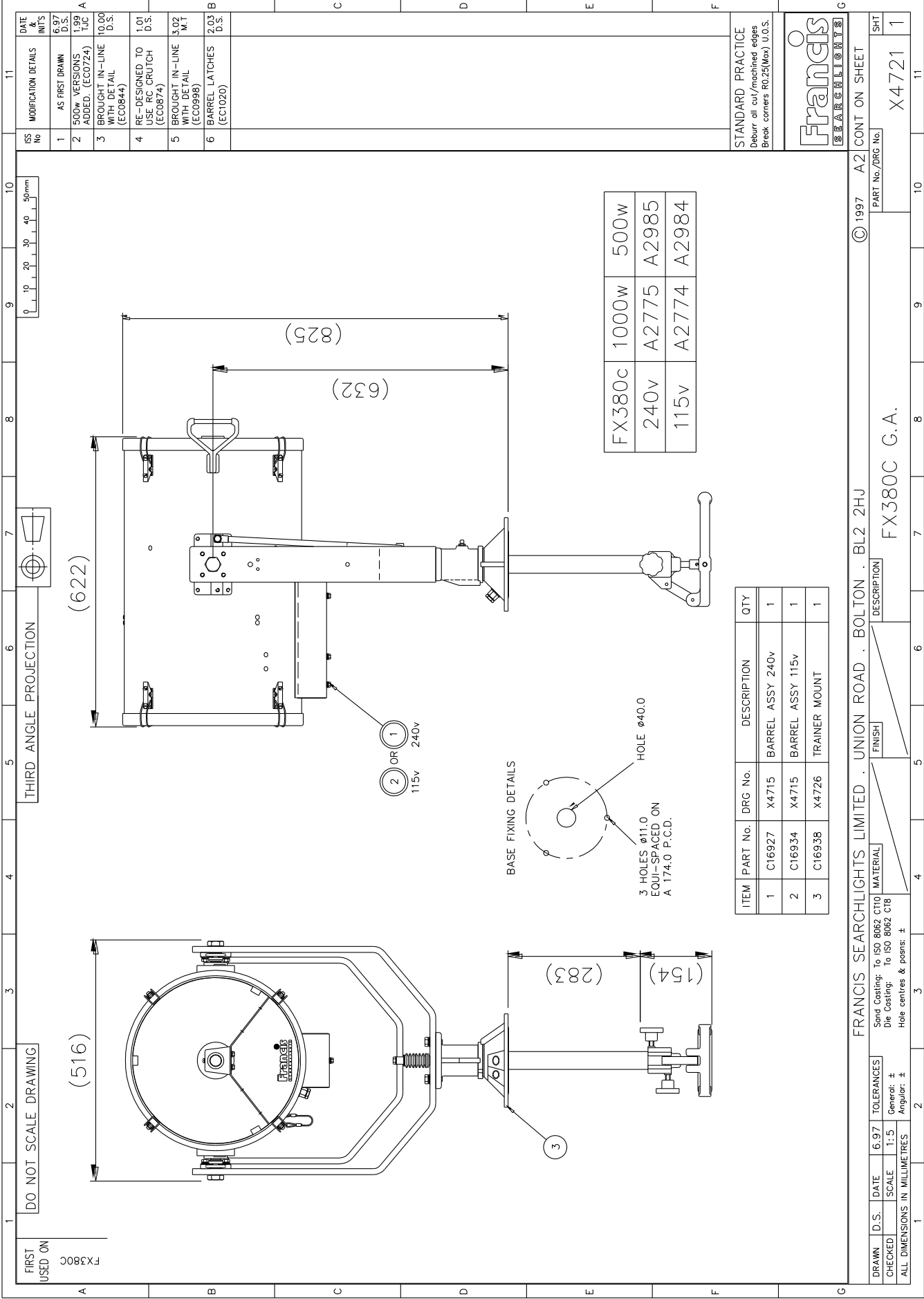
PART No./DRG No. X4720 SHT 1

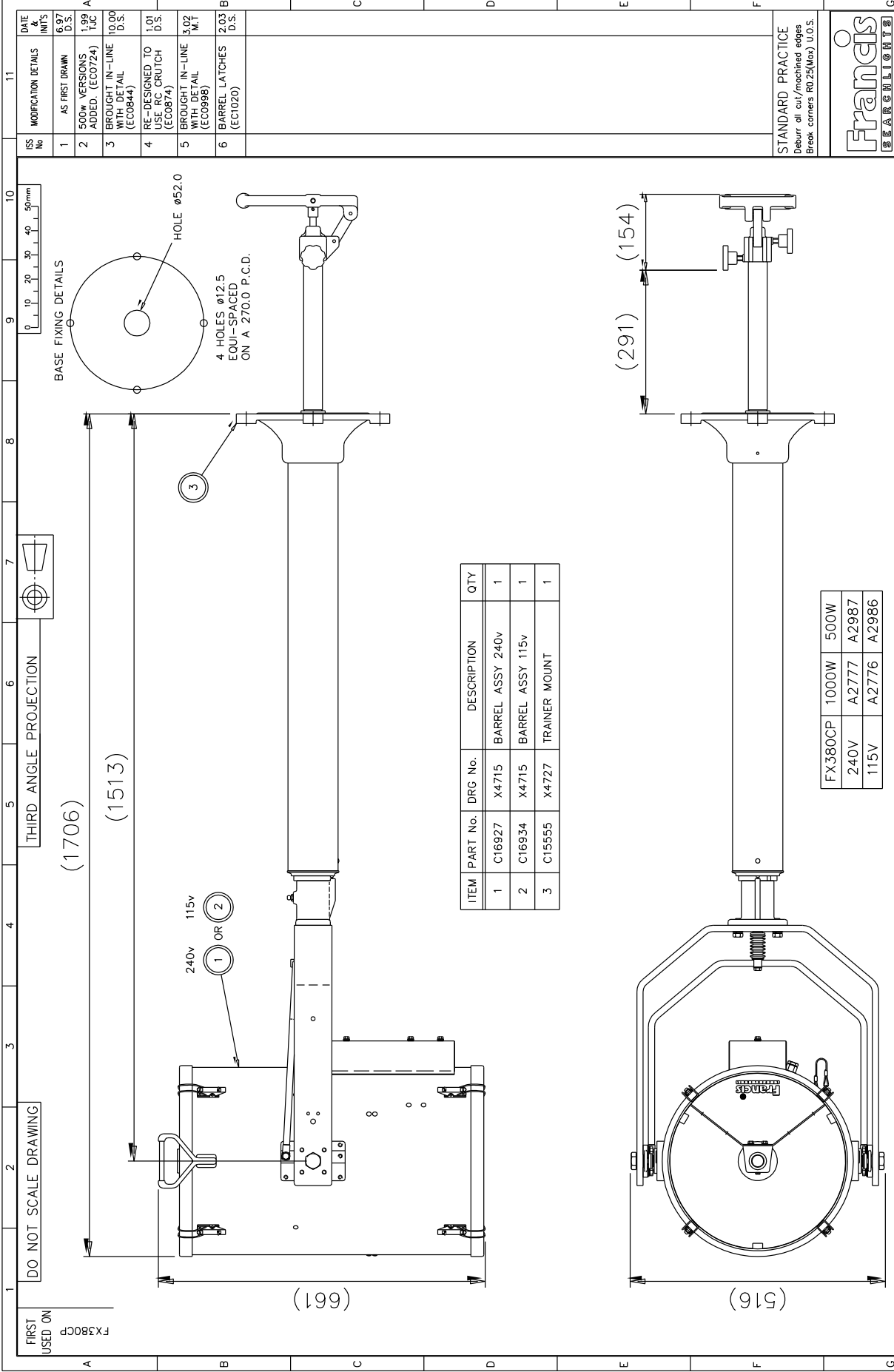
FRANCIS SEARCHLIGHTS LIMITED . UNION ROAD . BOLTON . BL2 2HJ

Sand Coating: To ISO 8062 CT10
Die Coating: To ISO 8062 C18
Hole centres & posns: ±

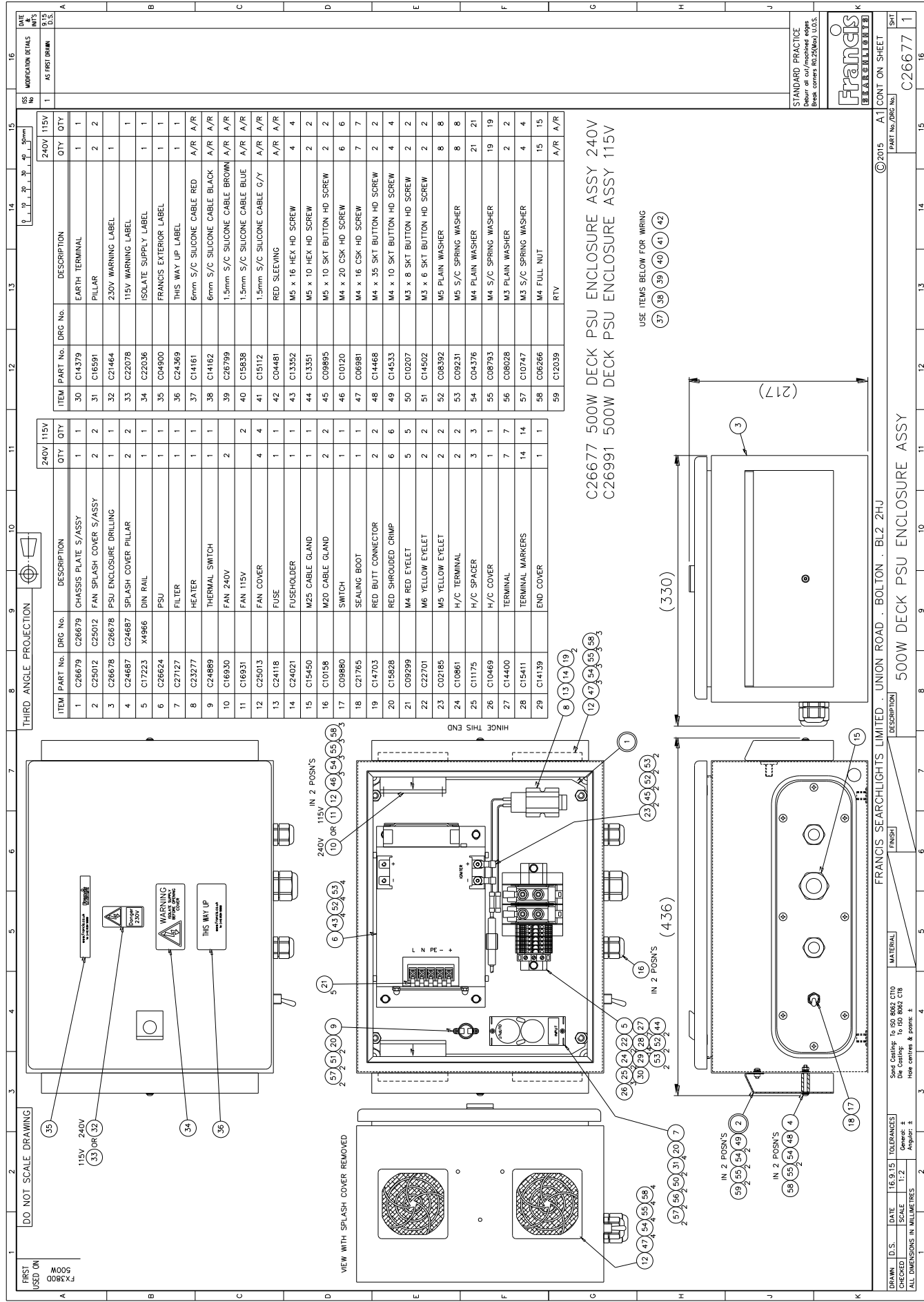
TOLERANCES:
General: ±
Angular: ±

DRAWN D.S. DATE 6.97 TOLERANCES
CHECKED SCALE 1:5
ALL DIMENSIONS IN MILLIMETRES





FRANCIS SEARCHLIGHTS LIMITED . UNION ROAD . BOLTON . BL2 2HJ															©1997	A2	CONT ON SHEET					
DRAWN	D.S.	DATE	6.97	TOLERANCES		Sand Casting: To ISO 8062 CT10		MATERIAL		FINISH		DESCRIPTION		PART No./DRG No.		SHT						
CHECKED		SCALE	1:5	General: ± Angular: ±		Die Casting: To ISO 8062 CT8						FX380CP G.A.				1						
ALL DIMENSIONS IN MILLIMETRES			2		3		4		5		6		7		8		9		10		11	



C26677 500W DECK PSU ENCLOSURE ASSY 240V
C26991 500W DECK PSU ENCLOSURE ASSY 115V

10 - Spare Parts List

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

Part Number	Description
C26624-00	Power supply unit
C26625-00	Ignitor
C27127-00	PSU EMI Filter
C16930-00	Fan (240v) (PSU & Searchlight)
C16931-00	Fan (115v) (PSU & Searchlight)
D20322	Lamp
C08919-00	Front glass
C22011-00	Front & rear bezel 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 Ped & Cabin Ped)
C20281-00	Bellows
C08926-00	Seal
C24889-00	Thermal Switch
C09880-00	PSU On/Off Switch
C21765-00	Switch Sealing Boot

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.