



## **SOLO 250**

**PR-2255**

This product manual contains important information about the safe installation and use of this projector. Please read and follow these instructions carefully and keep this manual in a safe place for future reference.

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Please note that as part of our ongoing commitment to continuous product development, specifications are subject to change without notice. Whilst every care is taken in the preparation of this manual we reserve the right to change specifications in the course of product improvement. The publishers cannot be held responsible for the accuracy of the information herein, or any consequence arising from them.

Every unit is tested completely and packed properly by the manufacturer. Please make sure the packing and / or the unit are in good condition before installation and use. Should there be any damage caused by transportation, consult your dealer and do not use the unit. Any damage caused by improper use will not be assumed by the manufacturer and / or dealer.

## ACCESSORIES

### THESE ITEMS ARE PACKED TOGETHER WITH THE PROJECTOR

- Mounting Bracket (2 PCS)
- M8x25 screw for mounting brackets (4 PCS)
- Power-cord (1 PCS)
- XLR cable with XLR socket and XLR plug (1 PCS)
- Safety cord (1 PCS)
- Spare gobos (4 PCS)
- This manual (1 PCS)

## INTRODUCTION

Thank you for purchasing the SOLO 250, PR-2255.

This product manual contains important information about the safe installation and use of this projector. Please read and follow these instructions carefully and keep this manual in a safe place for future reference.

The SOLO 250 is an innovative projector with an elegant housing, which is made from high intensity and heat-resistant complex plastic. SOLO 250 complies to CE norms and standards and uses international protocol DMX 512. SOLO 250 can be used as a stand-alone unit, several units connecting with each other for synchronised master/slave operation or linked to a controller, so it is suitable for many different applications.

SOLO 250 features 9 colours, 7 interchangeable rotating gobos, an independent adjustable strobe/shutter, prism effect and remote focus. It can be setup easily with the touch-switches and a digital display.

## SAFE USAGE OF THE PROJECTOR

When unpacking and before disposing of the carton check there is no transportation damage before using the projector. Should there be any damage caused by transportation, consult your dealer and do not use the unit.

The projector is for Indoor use only, IP20. Use only in dry locations. Keep this device away from rain and moisture, excessive heat, humidity and dust. Do not allow contact with water or any other fluids.

The projector is not designed or intended to be mounted on to inflammable surfaces.



The projector is only intended for installation, operation and maintenance by qualified personnel.

The projector must be installed in a location with adequate ventilation, at least 50cm from adjacent surfaces. Be sure that no ventilation slots are blocked.

Do not project the beam onto inflammable surfaces and minimum distance is 3m. ⚠ 3m ⚠

Avoid direct exposure to the light from the lamp. The light is harmful to the eye.

Do not attempt to dismantle and/or modify the projector in any way.

Electrical connection must only be carried out by qualified personnel.

Before installation, ensure that the voltage and frequency of power supply match the power requirements of the projector.

It is essential that each projector is correctly earthed and that electrical installation conforms to all relevant standards.

Do not connect this device to any dimmer pack.

Make sure that the power-cord is never crimped or damaged by sharp edges. Never let the power-cord come into contact with other cables. Only handle the power-cord by the plug. Never pull out the plug by tugging the power-cord.

Keep the lamp clean. Do not touch the lamp glass with bare hands.

The projector should always be installed with a secondary safety fixing. A safety cord is supplied for this, which is been performed as shown in "installing the projector" section.

The lamp used in this projector is an MSD 250W discharge lamp. After being switched off don't attempt to restart the projector until the lamp has cooled, this will require approx 15 minutes. Switching the lamp on and off at short intervals will reduce the life of both the lamp and the projector, but occasional breaks in operation will prolong the life of the lamp and projector.

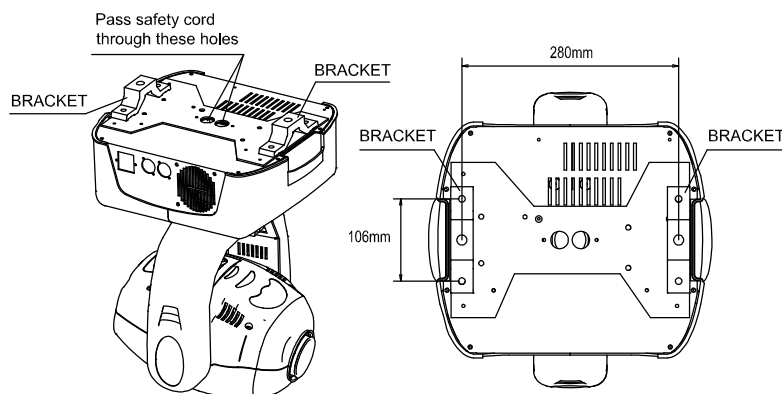
Never run the projector without a lamp.

There are no user serviceable parts inside the projector, do not open the housing and never operate the projector with the covers removed.

**Always disconnect from the mains, when the device is not in use or before cleaning it or before attempting any maintenance work.**

If you have any questions, don't hesitate to consult your dealer or manufacturer.

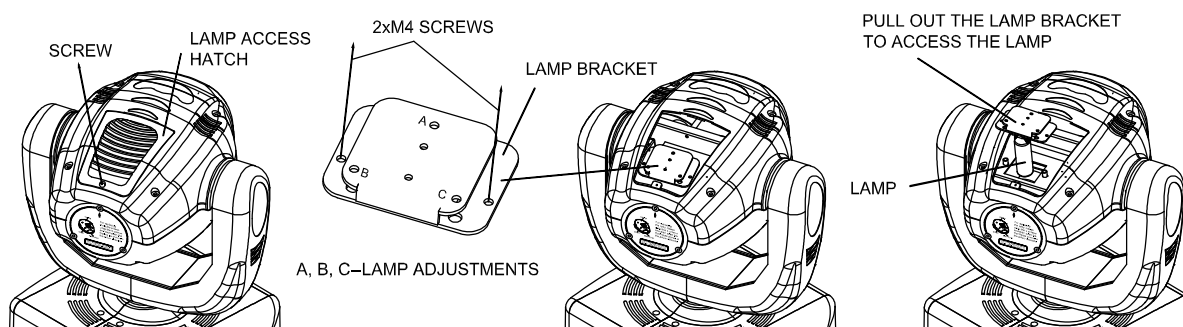
## INSTALLING THE PROJECTOR



The projector should be mounted via its bracket using 2 M12 bolts. The bracket itself attaches to the underside of the projector with 4 M8x25 bolts provided in the package. Always ensure that the projector is firmly anchored to avoid vibration and slipping whilst functioning. Always ensure that the structure to which you are attaching the projector is secure and is able to support a weight of 18Kg for each SOLO 250. For safety the projector should have a secondary fixing with a safety cord through the holes on the underside of the unit.

**WARNING:** The projector should NEVER be lifted or carried by the yoke.

## FITTING THE LAMP



Note: Read the text on back cover.

Undo the screw on the lamp access hatch upwards, and then remove the hatch.

Undo the 2xM4 screws and then pull out the lamp bracket with the old lamp.

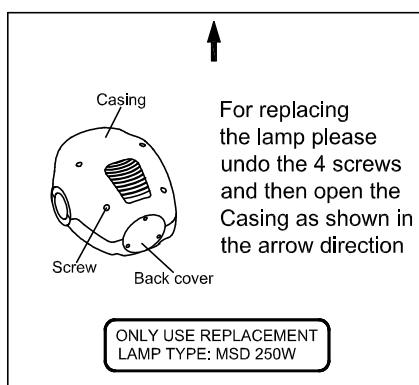
Pull out the old lamp from the lamp bracket and then plug in the new lamp. Do not touch the glass of the lamp with bare hands.

Remount the lamp bracket and fasten the screws, then remount the lamp access hatch and fasten the screws. The MSD series are high-pressure lamps with external igniters (⚠). Care should always be taken when handling these lamps. Always read the manufacturers "Instructions for use" enclosed with the lamp.

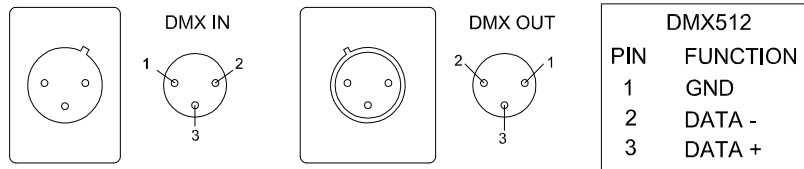
To optimise light output it will be necessary to adjust the lamp alignment to obtain an even distribution of light within the beam. The three screws (marked A, B,

and C) may be gently turned to centre the lamp within the reflector. The projector should be switched on with the shutter open and the beam focused to do this, it is also advisable to allow the lamp 5 minutes to come up to full brightness before starting to align it. Note: the three screws will only need a small adjustment to centre the lamp. Do not try to unscrew them completely. Read the rest of this manual and then come back to this section to align the lamp.

Read the text  
on back cover



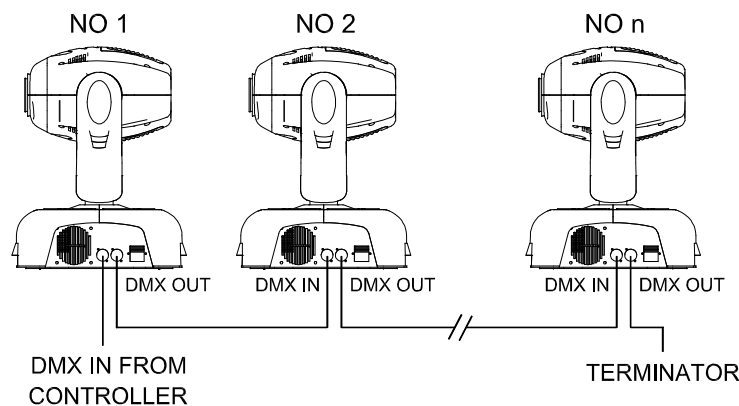
## CONTROL CONNECTIONS



Connection between controller and projector and between one projector and another must be made with 2-core screened cable, with each core having at least a 0.5mm diameter. Connection to and from the projector is via cannon 3 pin XLR plugs and sockets, which are included with the projector. The XLR's are connected as shown in the figure above.

Note: care should be taken to ensure that none of the connections touch the body of the plug or each other. The body of the plug is not connected in any way. The SOLO 250 accepts digital control signals in standard DMX512 (1990) format.

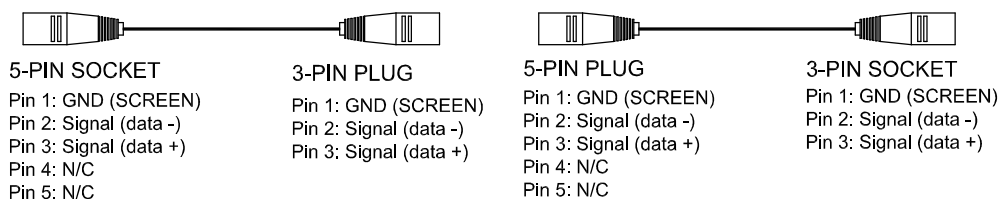
Connect the controller's output to the first fixture's input. Connect the first fixture's output to the second fixture's input and connect the second fixture's output to the third fixture's input, and in the same way for the rest. Eventually connect the last fixture's output to a DMX terminator as shown in the figure below.



When a DMX 512 signal is received the LED located near the digital display will illuminate green. When not receiving a DMX signal the green and red LEDs will be off, and if the green LED flashes, it means that the DMX signal is not correct.

### 5-PIN AND 3-PIN CONVERSION

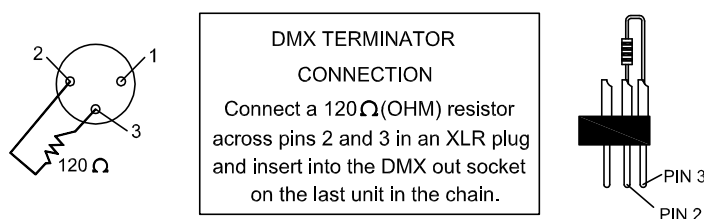
SOLO 250 uses 3-pin XLR plug / socket. If your controller uses 5-pin XLR plug / socket, you should convert 5-pin plug / socket into 3-pin socket / plug as shown below.



### DMX TERMINATOR

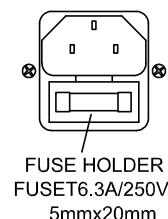
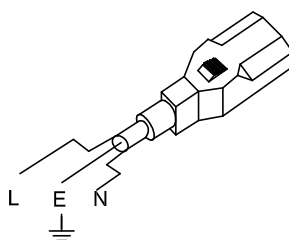
In the Controller mode or Master/Slave mode, at the last fixture in the chain, the DMX output has to be connected with a DMX terminator, which prevents electrical noise from disturbing and corrupting the DMX control signals.

The DMX terminator is simply an XLR connector with a 120Ω (ohm) resistor connected across pins 2 and 3, which is then plugged into the output socket on the last projector in the chain. The connections are illustrated below.



## POWER SUPPLY - MAINS

L = BROWN  
E = GREEN / YELLOW  
N = BLUE



Use the plug provided to connect the mains power to the projector paying attention to the voltage and frequency marked on the panel of the projector. It is recommended that each projector be supplied separately so that they may be individually switched on and off. Voltage and frequency may be changed — See “changing the operation voltage and/or frequency” section at the back of this manual.

### IMPORTANT

It is essential that each projector is correctly earthed and the electrical installation conforms to all relevant standards. Power consumption of the SOLO 250 is 400W.

## SETUP OPTIONS - PROJECTOR CONFIGURATION

To browse through the various Setup Options, press the **FUNC** button consecutively. There are 7 option codes (1~7), and each code has a specific function. The functions provided are listed in the following table.

SETUP OPTIONS		
CODE	CHOICE	FUNCTION
1	Y	Reverse Tilt enable - Tilt is reversed
	N	Reverse Tilt disable - Tilt is normal
2	Y	Reverse Pan enable - Pan is reversed
	N	Reverse Pan disable - Pan is normal
3	/	Not used
5	Y	Automatic programme (effect 1) enable
	N	Automatic programme (effect 1) disable
4	Y	Automatic programme (effect 2) enable
5	Y	
4	N	Automatic programme (effect 2) disable
5	Y or N	
6	Y	16bit Pan/Tilt movement resolution enable
	N	16bit Pan/Tilt movement resolution disable
7	Y	Movement of Master is different from slaves
	N	Movement of Master is the same with slaves

Once you have selected the desired operation code, press the key **UP** or **DOWN** to select “y” (means ON) or “no” (means OFF). N = NO, Y = YES.

Press the key **ENTER** to save the selected function and configuration. If the display is showing “y”, it means the setting has been enabled. In the same way, if it is showing “n”, it means the setting has been disabled. The Red LED will flash during this operation.

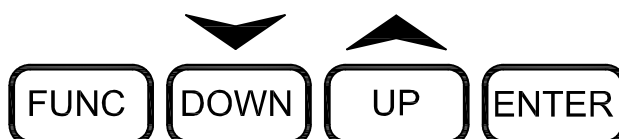
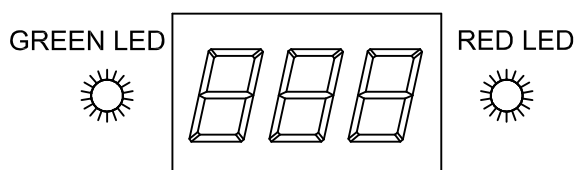
## TO SET THE DMX START ADDRESS

### PROJECTOR DMX START ADDRESS

Each SOLO 250 must be given a DMX start address so that the correct projector responds to the correct control signals. This DMX start address is the channel number from which the projector starts to “listen” to the digital control information being sent out from the controller.

The SOLO 250 has 10 channels if high resolution (16 bit) Pan & Tilt have been enabled (see the table in the next page), so set the No. 1 projector's address 001, No. 2 projector's address 011, No. 3 projector's address 021, No. 4 projector's address 031, and so on.

The SOLO 250 has 8 channels if high resolution (16 bit) Pan & Tilt have been disabled, so set the No. 1 projector's address 001, No. 2 projector's address 009, No. 3 projector's address 017, No. 4 projector's address 025, and so on.



### TO SET THE DMX START ADDRESS

Press the **UP** or **DOWN** buttons and the display will show the DMX start address.

Confirm your choice by pressing the **ENTER** button, this will save and set the DMX start address.

The display will show the latest setting each time the projector is powered up.

To control the projector with a DMX controller the DMX start address must be set.

Ensure that none of the Stand-Alone options are set or they will interfere with correct DMX operation.

## DMX CONTROL CHANNEL FUNCTIONS

The SOLO 250 uses 10 DMX channels. They are listed in the following table.

CHANNEL	DMX VALUE	DESCRIPTION
1 Gobo	0-33	Open/Clear (5-7: for 5 seconds) <b>Soft reset</b> – See Note
	34-66	Gobo 1
	67-99	Gobo 2
	100-132	Gobo 3
	133-165	Gobo 4
	166-199	Gobo 5
	200-232	Gobo 6
	233-255	Gobo 7
2 Gobo rotation	0-8	Stop
	9-163	9-163 Rotate in clockwise direction step by step 163-9 Rotate in anti-clockwise direction step by step
	164-205	Rotate in clockwise direction from slow to fast
	206-213	Stop
	214-255	Rotate in anti-clockwise direction from slow to fast
3 Colour	0-27	White
	28-55	Colour 1
	56-83	Colour 2
	84-111	Colour 3
	112-139	Colour 4
	140-167	Colour 5
	168-195	Colour 6
	196-223	Colour 7
	224-251	Colour 8
	252-255	Colour 9
4 Strobe/Shutter	0-10	Black-out
	11-195	Open gradually from black to full open (dimming)
	196-251	Strobe adjust from slow to fast
	252-255	Open
5 Pan	0-255	Pan movement from 0° to 370°
6 Tilt	0-255	Tilt movement from 0° to 265°
7 Focus	0-255	Stepless focus
8 Prism	0-31	Clear
	32-48	Prism static
	49-127	Prism rotate in anti-clockwise direction step by step
	128-189	Prism rotate in anti-clockwise direction from slow to fast
	190-193	Prism static
	194-255	Prism rotate in clockwise direction from slow to fast
9 Pan 16BIT	0-255	16 Bit Pan resolution
10 Tilt 16BIT	0-255	16 Bit Tilt resolution

### Note:

**Soft Reset** – If the DMX value sent on this channel (1) stays in the range from 5 to 7 for more than 5 seconds, the projector will start a reset sequence (Remote Requested Reset). The electronics are re-started and all motors moved to their home positions exactly as they do when the power is first switched on but the lamp is not switched off in this sequence, although the beam will be blacked out.

The channels 9 and 10 are only available when the Setup Option 6 is “ON”.  
When Setup Option 2 is “ON”, Pan movement is in anti-clockwise direction.  
When Setup Option 1 is “ON”, Tilt movement is in anti-clockwise direction.  
For the exact setting please refer to “Setup Options” section.



## STAND-ALONE MODE & MASTER/SLAVE MODE

### STAND-ALONE MODE

To operate the projector without connecting a controller, enable a combination of setup options 4 and 5, the projector will run in Stand-Alone mode with automatic programmes (effect 1 or 2) depending on the options that have been selected. See the section on “Setup Options – Projector Configuration” for full details of the available combinations.

### MASTER/SLAVE MODE

Without using a controller, many projectors can run synchronously in the Master/Slave mode by linking them with each other.

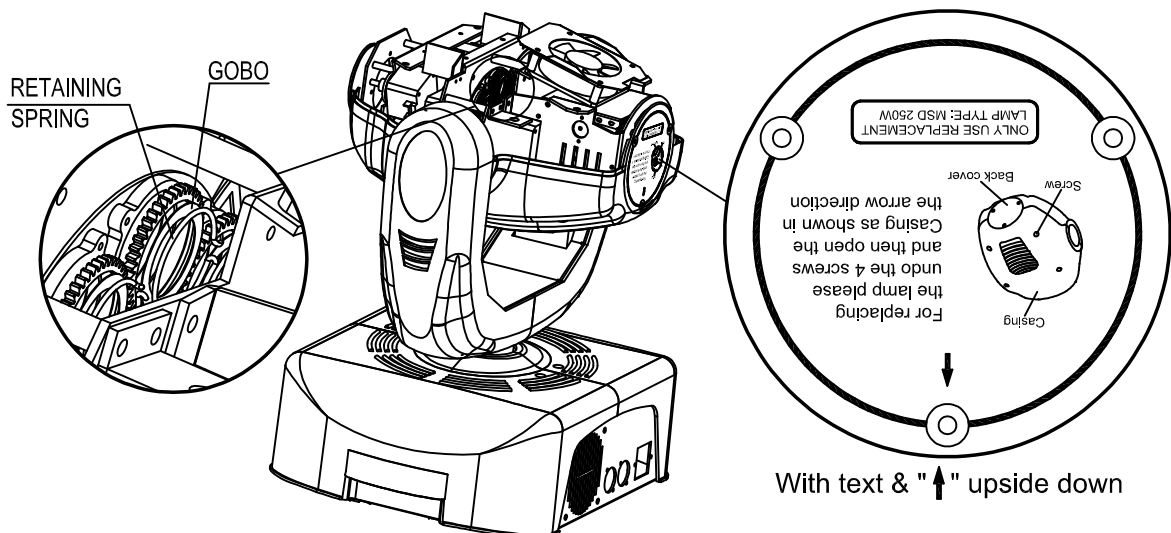
Select one projector as the master with setting the DMX start address at random but setting the setup options with automatic programmes. Regard the other projectors as the slaves setting all DMX start address “001”.

Connect the master’s output to the first slave’s input, and connect the first slave’s output to the second slave’s input. The rest may be deduced by analogy. Eventually connect the last slave’s output to a DMX terminator. (Please refer to “Control Connections” diagram.)

If the Master’s setup option 7 is “y”, movement of the Master is different from the Slaves.

Never have more than ONE projector configured as Master or the system will not work.

## CHANGING THE GOBOS



Carefully lift off the plastic cover by undoing the 4 M4 screws. (**Note:** The projector has two covers with the same shape. The cover removed must be right one, so you can change the gobos easily. How to remove the correct cover, the easy way is to position the projector with the back cover with text&“↑” upside down as shown above, and then remove the upper casing.)

Using a small screwdriver remove the gobo retaining spring.

Insert the gobo (or a glass gobo) into position, and then insert the retaining spring.

Remount the casing and retighten the 4 M4 screws.

## LUBRICATION

To ensure the continued smooth rotation of the rotating gobos and linear motion of the lens for focusing, it is recommended that the bearings for the gobo-holders and the 2 shafts for the focusing lens holder be lubricated periodically, preferably every two months. Use only high working temperature low viscosity oil. A syringe with a fine needle is the easiest way to introduce the oil to the bearings around each gobo. Do not over lubricate as this will cause spillage when the wheel rotates.

## MAINTENANCE

If the projector's lens becomes damaged or broken it should be replaced. If the lamp becomes damaged or deformed in any way it must be replaced. If the light from the lamp appears dim this would normally indicate that it is reaching the end of its life and it should be changed at once, old lamps run to the extremity of their life can explode. If the projector does not function, check the fuses on the power socket of the projector. They should only be replaced by fuses of the same specified value T6.3A 5mmx20mm. On the main PCB inside the projector there is also a fuse rated 4A/250V (fast blow, 5mmx20mm). Should these be damaged call a qualified technician before replacement. The projector has 2 thermal protection devices that will switch off the projector in case of overheating, should either of these operate, check that the fans are not blocked, and if they are dirty clean them before switching on the projector again. Check that the fans are operational, if not call a qualified technician.

**Any maintenance work should only be carried out by qualified technicians.**

## KEEPING THE PROJECTOR CLEAN

To ensure the reliability of the projector it should be kept clean. It is recommended that the fans should be cleaned every 15 days. The lens and dichroic colour filters should also be regularly cleaned to maintain an optimum light output. **Do NOT use any type of solvent on dichroic colour filters.**

Cleaning frequency depends on the environment in which the fixture operates: damp, smoke or particularly dirty surroundings can cause greater accumulation of dirt on the unit's optics. A soft cloth and typical glass cleaning products should be used in cleaning. It is recommended to clean the external optics at least once every 20 days and clean the internal optics at least once every 30 / 60 days.

**Do not use any organic solvent, e.g. alcohol, to clean the reflector mirror, dichroic colour filters or housing of the projector.**

## TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	ACTION
The projector doesn't switch on	-The power supply is not present -The lamp is not working	Check the fuse on the power socket. Replace the lamp.
The lamp comes on but the projector doesn't respond to the controller	-Wrong DMX configuration and/or start address - Defective DMX cable	Make sure that the projector is correctly configured. Replace or repair the DMX cable.
The projector only functions intermittently	-The fan has failed	Make sure the fan is working and not dirty.
Defective projection	-The lens is broken -Dust or grease on lenses	Check the lenses are not broken. Remove dust or grease from the lenses.
The projected image appears to have a halo	-Installation of the lamp is not correct -Dust or grease contamination on the optics.	Make sure the lamp is installed correctly. Carefully clean the optical group lenses and the projector components.
The beam appears dim	-Dust or grease contamination on the optics. -The lamp is at the end of its life	Check the optics are clean.  Replace with a new lamp of the specified type and rating.

## TECHNICAL DATA

**VOLTAGES:** 100/120/200/220/230/240V AC, 50Hz or 60Hz

**POWER CONSUMPTION:**

400W @ 220V

**LAMP:**

Type: MSD 250W discharge lamp

Colour Temperature: 6700°K

Socket: GY9.5 (Single end)

Manufacturers Rated Lamp Life: 2000 Hours

**COLOURS:**

9 Dichroic colours plus white

**GOBOS:**

7 interchangeable, rotating gobos with 4 extra spare gobos

Gobo diameter: 26.9mm

Gobo image diameter: 22mm

**PRISM:**

1 x 3 Facet, Bi-directionally rotating prism

**FOCUS:**

DMX controlled focus

**SHUTTER/STROBE:** Shutter for blackout and strobe 1 – 7 F.P.S.

**HEAD MOVEMENT:** Pan 370° Tilt 265°

**BEAM ANGLE:** 12°

**CONTROL:**

DMX512: 8 Channels plus 2 for Hi Res. Pan and Tilt

Stand-Alone Automatic mode and Master/Slave operation

**MOTORS:**

10 Stepper motors

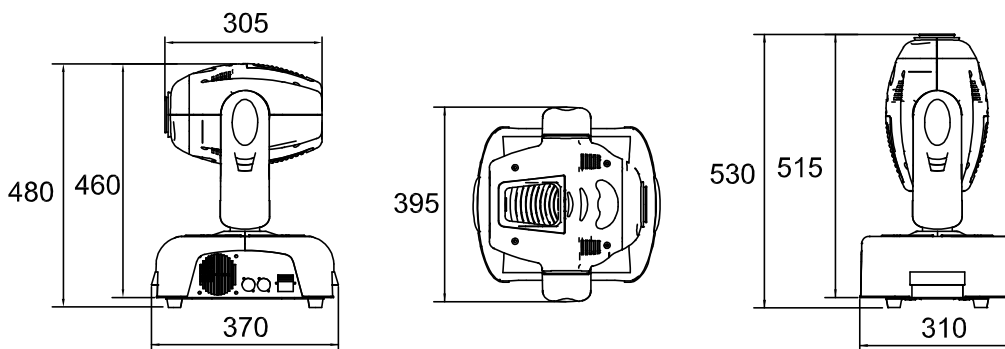
**HOUSING:**

Metal and composite plastic (IP20)

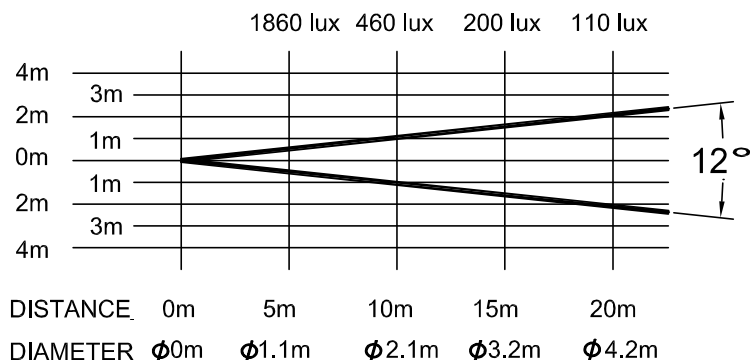
**WEIGHT:**

18Kg

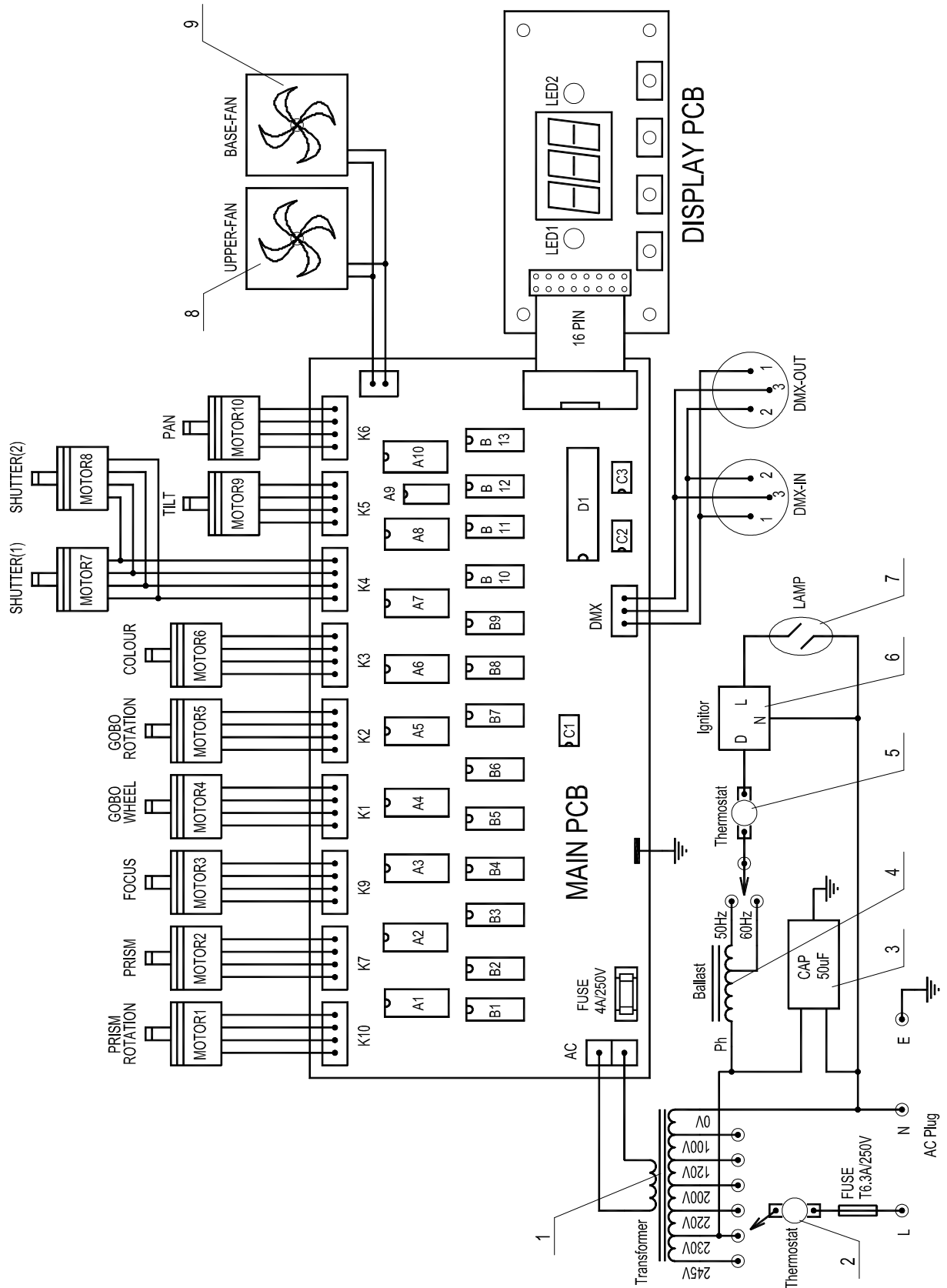
**SIZES :**



**LIGHT OUTPUT:**



# ELECTRICAL DIAGRAM



## COMPONENT ORDER CODES

NO.	NAME	PART NO.	REMARK
1	TRANSFORMER	040030301	20V 50W / 230V 300W
2	THERMOSTAT	190010065	75°C / 10A / 250W
3	CAPACITOR	140010045	50µF / 370V
4	BALLAST	040070053	230V/50-60Hz, 250W/3.6A
5	THERMOSTAT	190010054	95°C / 10A
6	IGNITOR	040090016	220V AC 50Hz
7	LAMP	100050018	MSD 250W
8	FAN	030060035	KD2409PTB-6
9	FAN	030069006	KD2408PTB1-6
FILTER	DICHROIC COLOUR FILTER	092530031	RED
	DICHROIC COLOUR FILTER	092530032	YELLOW
	DICHROIC COLOUR FILTER	092530033	ORANGE
	DICHROIC COLOUR FILTER	092530034	BLUE
	DICHROIC COLOUR FILTER	092530035	GREEN
	DICHROIC COLOUR FILTER	092530036	CYAN
	DICHROIC COLOUR FILTER	092530037	UV
	DICHROIC COLOUR FILTER	092530038	PINK
	DICHROIC COLOUR FILTER	092530039	LIGHT GREEN
MOTOR 1	MOTOR	030040052	23HS0015L
MOTOR 2	MOTOR	030040053	23HS2029L
MOTOR 3	MOTOR(2pcs)	030040084	17HS0002-59L
MOTOR 4	MOTOR	030040085	17HS0002-61L
MOTOR 5	MOTOR(4pcs)	030040101	42BYGH004-1
MOTOR 6	MOTOR	030040105	42BYGH004-4(2-axis)
A1~A7	IC	170050010	DRIVER CHIPS
A8	IC	170110004	DRIVER CHIP
A9	IC	170050001	ARITHMETIC AMPLIFIER CHIP
A10	IC	170110004	DRIVER CHIP
B1	IC	170040014	TTL LOGICAL CHIP
B2~B7	IC	170170037	D/A REVERSION CHIP
B8	IC	170040014	TTL LOGICAL CHIP
B9~B11	IC	170170037	D/A REVERSION CHIP
B12-B13	IC	170040014	TTL LOGICAL CHIP
C1	IC	170170039	STABLE-VOLTAGE CHIP
C2	IC	170170012	BUS CHIP
C3	IC	170040032	EEPROM
D1	IC	230040120	MICROPROCESSOR
/	PAN DRIVE BELT	290151217	HTD309-3M-103Z
/	TILT DRIVE BELT	290151218	HTD420-3M-140Z

**Note:** You may order all parts of the SOLO 250 besides those in the table listed above. When ordering please state the exact name and part no.. Repairs must be carried out by a qualified technician.

## CHANGING THE OPERATION VOLTAGE AND/OR FREQUENCY

**To be carried out by qualified engineers only.**

The power input settings of the SOLO 250 may be changed to suit the supply in the area where the unit is operated. The voltage and frequency is pre-set at the factory and will be marked on the exterior of the unit.

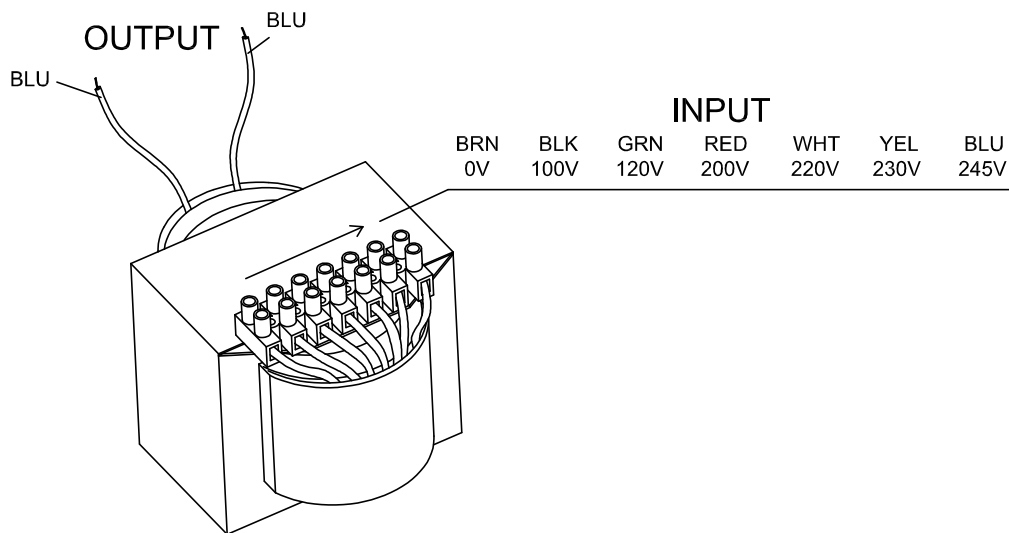
Any error or mistake in setting the frequency or voltage of the projector may seriously damage the unit.

Open both plastic covers of the base by undoing the 4 screws on the top of the base and the 8 screws on the very rim of the underside.

### **To Change the Voltage**

Locate the transformer and select the appropriate voltage from 100V, 120V, 200V, 220V, 230V and 245V according to the local supply voltage. The voltages are marked on the transformer. Move only the incoming power cable that was connected to the factory set voltage as marked on the projector. **Under NO circumstances should you move the cable attached to the 0V connection.**

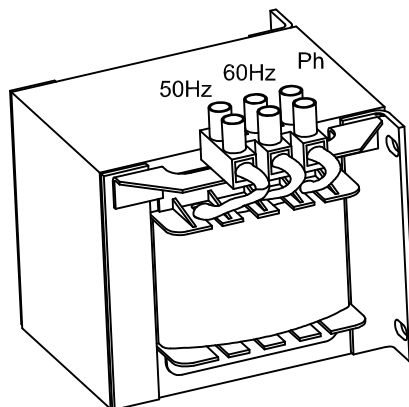
It is strongly recommended that you immediately mark the new voltage on the projector so that it may not be mistaken for the factory set voltage.



### **To Change the Frequency**

Locate the ballast in the base of the projector, and select the required frequency from 50Hz or 60Hz by moving the cable to the appropriate position. The ballast will be labelled to show the connections.

**Never move or disconnect the cable attached to the connector marked "Ph".**



It is strongly recommended that you immediately mark the new frequency on the projector so that it may not be mistaken for the factory set frequency.

Once finished with the settings, re-assemble the base of the projector and covers.



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