

# Solar Effects Projector Manual

## Do's and Do Not's

### Do

1. Read instruction manual before installation or use.
2. Use a safety chain firmly attached to a mounting strong enough to withstand the shock should the projector fall.
3. Ensure that the mounting point will withstand its weight.
4. Refer electrical installation work to qualified personnel.
5. Ensure that all fastening devices are securely tightened before use.

### Do Not

1. Operate in wet conditions or allow liquid to enter.
2. Touch the lamp glass with bare hands.
3. Cover the air inlet grilles when projector is on.
4. Remove hatch or case when projector is hot.
5. Remove hatch or case when connected to mains.
6. Allow flammable materials within 500mm when hot.
7. Flash test the mains input.
8. Operate the lamp for more than the specified life.
9. Operate if the lamp is damaged or deformed.
11. Operate if heat filter or lens is scratched or damaged.



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## OPERATING INSTRUCTIONS

### PACKED BOX CONTENTS

Solar 250 Projector with 85mm Lens  
2 metre IEC Lead

### POWER RATING

350W MAX

### OPERATING VOLTAGE

220-240V~ 50-60Hz or 110-120V~ 50-60Hz

### FUSES

**Mains:** 220-240V~ T2A/250V (20 x 5mmØ)

110-120V~ T4A/250V (20 x 5mmØ)

**12V~ :** T4A/250V

### IMPORTANT NOTES

**ALL FAN INLET GRILLES MUST BE CLEAR WHEN THE PROJECTOR IS IN USE. NEVER OBSTRUCT.**

Failure will cause the projector to overheat, may cause damage, and the thermal cut-out to switch projector off\*.

**AN EFFECT MUST ALWAYS BE IN THE GATE OF THE PROJECTOR WHEN IN USE.**

Failure may cause the plastic parts of the focussing lens to melt.

**THE PROJECTOR MUST ONLY BE USED WITHIN 90° OF HORIZONTAL.**

**DO NOT TOUCH THE LAMP WITH BARE HANDS AND NEVER TOUCH HOT LAMP.**

Wear gloves or use a soft cloth or tissue.

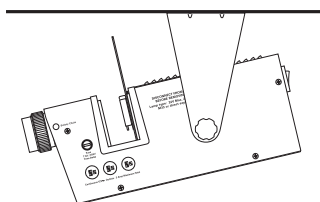
**DO NOT ATTEMPT TO SERVICE THE PROJECTOR UNLESS YOU ARE QUALIFIED AND WORKING UNDER THE DIRECTION OF THE MANUFACTURER.**

### MOUNTING

The first step is to position the projector in a place from which images can be projected onto the desired surface. The projector must always be mounted using its bracket and the air inlet grilles must be clear to allow airflow.

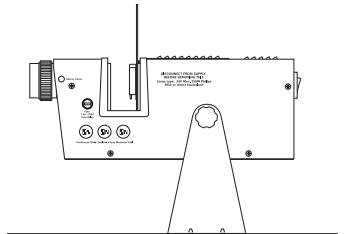
**There are 4 methods of mounting:**

1. Suspended from above with its hanging bracket firmly fixed to a strong beam or Trilite truss.

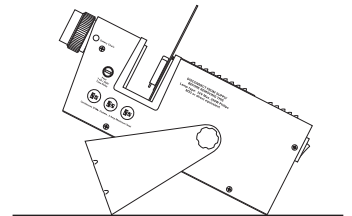


A safety chain should be fitted and secured, to an immovable object, with a maximum drop of 30cm (12"). All nuts, bolts, hanging bracket knobs and other fixings must be securely tightened.

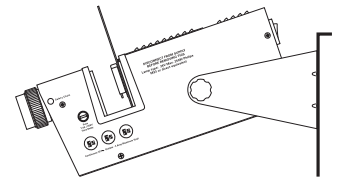
2. Fixed with the hanging bracket under the projector onto an immovable flat surface.



3. Mounted on top of a flat surface by using the hanging bracket as an adjustable stand.



4. Fixed with the hanging bracket behind the projector, at an angle, bolted to an immovable vertical surface.



### ADJUSTING THE BRACKET

When setting up the projector, to project the image where required, it may be necessary to adjust the hanging bracket.

1. Loosen central knobs on both sides and rotate the bracket or projector into the desired position.
2. Tighten knobs securely.

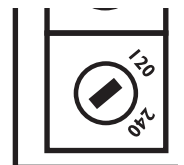


### MAINS CONNECTION

Before use check the voltage selector switch, on the back of the projector, is set to the same voltage as your local mains supply. If incorrect, move to the correct voltage position using a flat ended screw driver.

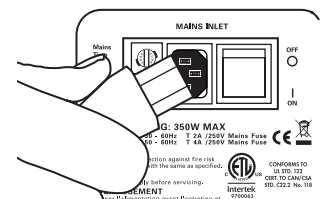
**Fuse**

**Voltage Selector Switch**



### Switching On

Simply plug in the IEC lead to the back of the projector and switch to the ON position.



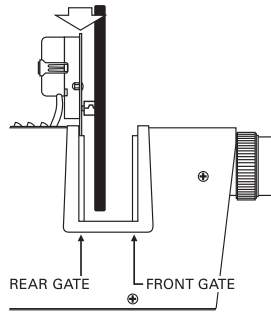
\* If the thermal cut out engages, allow to cool, check and clear air inlets and outlets, and switch projector back on.

## OPERATION

This Effects Projector is designed exclusively for use with the OPTI Solar Range of Effects Accessories and OPTI Effects. Ask your dealer for a demonstration.

### Before switching on the Effects Projector:

1. Ensure that all air inlets and outlets are clear of all obstructions and the projector is not placed in a position that may compromise cool, dry airflow.
2. Select the Effect and appropriate Effect Accessory.
3. Fit the Effect onto the Effect Accessory as described in the Effect Accessory Instructions.
4. Place the Effect and Accessory into the gate of the Projector by sliding into the rear gate runners.



The main effect should be fitted into the rear gate runners for maximum life and object illumination. Image altering effects like Distortion Wheels can be fitted into the front gate runners.

5. Once the Effect(s) and Effects Accessories are in place (if powered), plug into the 12V~ sockets on the side of the Effects Projector.



### Switching on the Effects Projector:

Turn the Effects Projector on by connecting to the mains and switching the supply on (as detailed in MAINS CONNECTION).

## FOCUSING A PROJECTED IMAGE

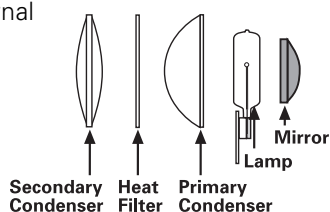
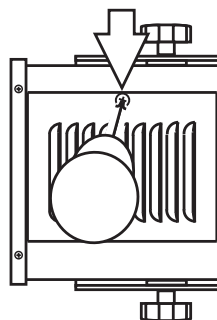
Switch on the Effects Projector, point at the projection surface and focus the image by twisting the focussing lens to move it in and out until the desired focus is achieved.



## LAMP CHANGING

Switch off mains supply and allow to cool for 30 minutes, then:

1. Remove lamp cover screw on the top of the projector and remove lamp cover.
2. Remove internal lamp cover plate.
3. Remove old lamp without touching with bare hands.
4. Replace with the appropriate new lamp. (Taking care not to touch with bare hands).
5. Replace and secure internal lamp cover plate.
6. Replace and secure the cover with screw.



## LAMP DISPOSAL

Dispose of the old lamp in accordance with the local regulations.

## CLEANING

After 3 months (or 500 hours) use, or when changing the lamp, the optical system may need cleaning.

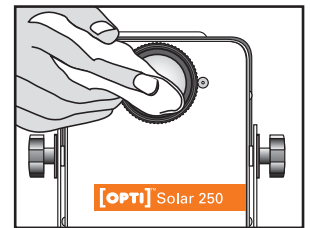
Switch off mains supply, disconnect the Projector from the transformer and allow to cool for 30 minutes, then:

1. Remove cover plate screw and remove cover plate.
2. Use a soft tissue or lens cloth with a little methylated spirit or pure alcohol to clean lenses.
3. To clean the mirror, first remove the lamp, as detailed in previous section, then wipe clean.

### Lens Cleaning

The focussing lens may need cleaning from time to time.

Use a soft tissue or cloth with a little methylated spirit or pure alcohol to clean the lens.



## CHANGING FUSES

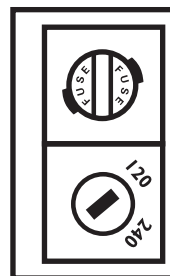
### Mains fuse

The mains fuse is fitted into the rear IEC panel. Mains fuse ratings are shown on page 1:

1. Unscrew retaining screw cap.
2. Remove old fuse and replace with new fuse.
3. Refit and tighten screw cap.

Mains Time Delay Fuse

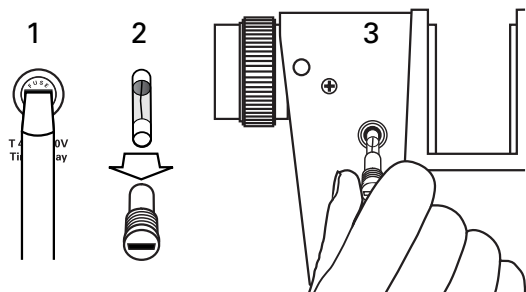
Voltage Selector Switch



### 12V~ fuse

The 12V~ outlets are protected by a 20mm x 5mmØ T4A/250V time delay fuse.

The 12V~ fuse is located on the side of the projector next to the front part of the gate and between the Safety Chain eye and the three 12V~ sockets.

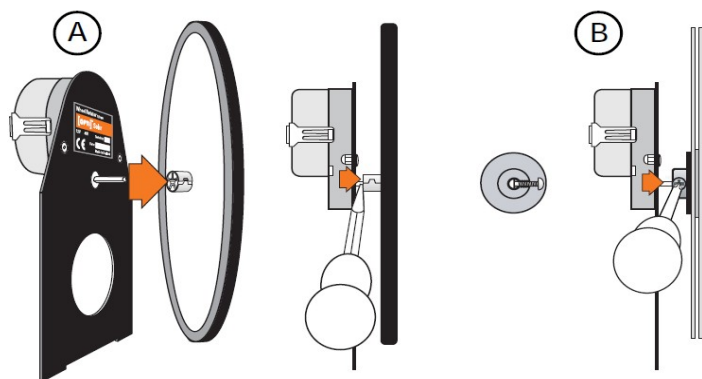


1. Unscrew retaining screw cap.
2. Remove old fuse and replace with new fuse.
3. Refit and tighten screw cap.

## Fitting an Effect Wheel

To project an Effect Wheel you will need a Wheel Rotator (see top of page 7 for options).

Fit the central boss of the wheel over the 'D' section drive spindle of the Wheel Rotator. If it is a plastic Wheel (A) the boss is self fixing. If the Wheel is 575 safe (B) tighten the screw onto the flat side of the 'D'.



To remove a plastic Wheel (A) gently prise the boss off with a flat ended screwdriver. If the Wheel is 575 safe (B) loosen the screw off of the flat side of the 'D' and pull off Wheel.

## Plugging 12V~ Effect Accessory into the projector

Powered effects accessories need to be connected to one of the 12V~ sockets on the side of the unit. The Solar 250 has 3 two-pin sockets. The Solar 100C has 2 two-pin sockets on the opposite side to the Solar 250.

The two-pin plug from the powered effect accessory fits into any of the sockets.

Once power is applied and the projector is turned on the effect accessory will start to operate. In the case of an autochanger it will initialise and locate itself with position 1 in the field of illumination.

## The Gate

The 'gate' of an OPTI Effects Projector is the area between lamp optics and the focussing lens into which the effect(s) to be projected are placed.

On both the Solar 250 and 100C the gate is a fixed opening and has two sides with runners on them into which 'effect accessories' which hold the effect(s) to be projected.

**Rear** The side closest to the lamp optics. The primary or main focal effect is fitted onto the appropriate effects accessory and this is then placed into the rear gate runners.

**Front** The side closest to the focussing lens. The secondary or image altering part of the effect, if required, is fitted onto the appropriate effects accessory and this is then placed into the front gate runners.

## Effects

The range of effects available for the Solar 250 and 100C is split into three main groups. Effect Wheels, Effect Cassettes (50mm or 3") and Static Gobos.

There is a wide range of standard Wheels and Effect Cassettes available which are featured on our web site and in our Effects & Projection catalogue. In addition, if you require something bespoke we can produce custom effects in all sizes which also includes static gobos and slide transparencies.

## Fitting a Wheel Rotator into the projector

1. Slide the wheel rotator into the rear gate runners of the projector (closest to the lamp - see side elevation left).
2. Slide firmly home. Ensure that the base of the back plate of the effect accessory is at the bottom of the projector's gate runners. This is for optimum safety and will ensure that the effect(s) are in the correct position for projection.



6 inch wheel being fitted to a Solar Wheel Rotator using a small cross head screw driver.

# Lens Selection

The standard lens supplied with your projector is a three element 85mm f2.8 42.5mm diameter plastic helical focussing groove unit.

Lens selection is important because the lens affect the size of the projected image and can affect the possible projection distance.

## LENSES

60mm  
85mm  
100mm  
Zoom Attachment

FG6150  
FG6160  
FG6170  
FG6120



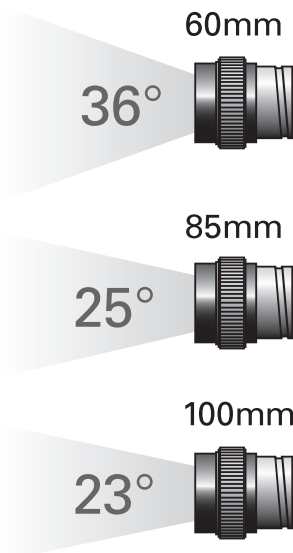
## Lens Angles

The focal length of a lens determines how wide an angle the image is projected.

In simple terms the larger the number of the focal length of the lens the narrower the beam. The lower the number the wider the angle. This angle is called the 'inclusive angle'.

The illustrations show the inclusive angles for OPTI Solar lenses.

The 'inclusive angle' of each lens can be plotted on design drawings to determine the projected image size.



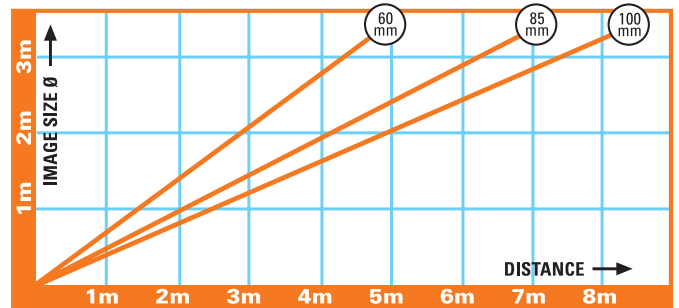
## Lens Selection Calculations

The formulae below are to help select right lens for your application. All dimensions in millimetres.

- 1. IMAGE SIZE** =  $\frac{\text{PROJECTION DISTANCE}}{\text{FOCAL LENGTH}} \times \text{OBJECT}^* \text{ SIZE}$
- 2. PROJECTION DISTANCE** =  $\frac{\text{IMAGE SIZE}}{\text{OBJECT SIZE}^*} \times \text{FOCAL LENGTH}$
- 3. FOCAL LENGTH** =  $\frac{\text{PROJECTION DISTANCE}}{\text{IMAGE SIZE}} \times \text{OBJECT}^* \text{ SIZE}$
- 4. OBJECT\* SIZE** =  $\frac{\text{IMAGE SIZE} \times \text{FOCAL LENGTH}}{\text{PROJECTION DISTANCE}}$

## Lens Selector Chart

Shown here are image sizes and projection distances for OPTI Solar lenses based on object size of 35mm diameter.

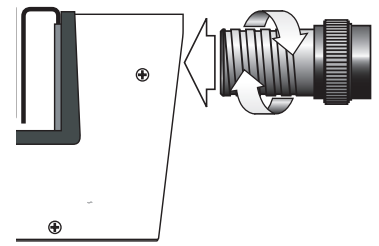


## Lens Fitting & Focus

In order to project a crisp focussed image it is necessary to adjust the focussing lens after the unit has been aimed at the desired projection surface.

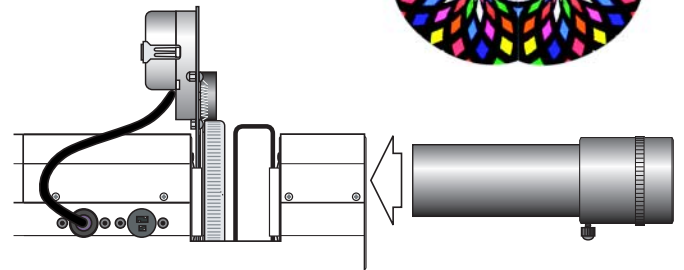
### Fitting the lens

1. Insert the lens until it meets resistance.
2. Rotate clockwise to locate.
3. Rotate lens in either direction to focus.



## Kaleidoscope Lens Fitting & Focus

The OPTI Kaleidoscope Lens replaces the focussing lens and repeats a section of an effect as a six sided image. It fits directly into the OPTI Solar 250 and 100C projectors.



### Fit Lens

1. Ensure the lens locking screw is slackened off.
2. Slide in the Kaleidoscope lens until desired focus is achieved.
3. Fine tune by turning the end of the lens and tighten lens locking screw. (This fixes the adjustable part of the lens in place).

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## IMPORTANT SAFETY INSTRUCTIONS

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When using your projection equipment basic safety precautions should be followed, including the following:

1. Read and understand all instructions before using the equipment.
2. To avoid thermal 'cut out' or heat damage ensure all air inlets and outlets are clear of obstruction before use.
3. Never use the appliance without an effect and effect accessory in the gate. Doing so will cause the plastic parts in the focussing lens to melt.
4. Close supervision is necessary when any appliance is used by, or near, children. Do not leave appliance unattended while in use.
5. Care must be taken, as burns can occur from touching hot parts.
6. The appliance switch is provided with the symbol 'O' indicating 'OFF' and 'I' indicating 'ON'.
7. Do not operate appliance with a damaged cord, or if the appliance has been dropped, or damaged, until it has been examined by a qualified service person.
8. Position the cord so that it will not be tripped over, pulled, or come into contact with hot surfaces.
9. If an extension cord is necessary, a cord with a current rating at least equal to that of the appliance should be used. Cords rated for less amperage than the appliance may overheat.
10. Always unplug appliance from electrical outlet before cleaning and servicing and when not in use. Never yank cord to pull plug from outlet. Grasp plug and pull to disconnect.
11. Let appliance cool completely before packing. Loop cord loosely around appliance when storing.
12. To reduce risk of electric shock, do not immerse product in water or other liquids.
13. To reduce the risk of electric shock - do not dismantle this appliance. Take it to a qualified repairer when servicing is required. Incorrect reassembly can cause electric shock when the product is subsequently used.
14. The use of an accessory attachment not recommended by the manufacturer may cause a risk of fire, electric shock, or injury to persons.
15. Connect this appliance to a grounded outlet.
16. Disconnect this unit from its source of supply before replacing the projection lamp.
17. The axis across the width of the projector should remain horizontal if possible. Tilting the projector along this axis may reduce lamp life.
18. During focussing of the projected image beware of rotating the projection lens too far anti-clockwise, as this may cause the lens to become separated from the projector, and perhaps dropped and broken which may cause injury.
19. DO NOT attempt lamp replacement while the unit is still hot as there is a risk of burns from the lamp.
20. The procedures described in the Maintenance section must be carried out by qualified service personnel who should work under the authority of the manufacturers recognised agent.
21. After any maintenance or cleaning all parts must be absolutely dry before refitting to the projector.

**SAVE THESE INSTRUCTIONS**