

SERL400

Screen Exposure Rail Lamp System



A scalable modular solution for exposing silk screen printing screens. A wide range of screen sizes can be exposed, including very large screens, due to the fully adjustable design.

Manufactured in the UK by:
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SERL400 Silk Screen Process Exposure Rail Lamp

The SERL400 Silk Screen Exposure Rail Lamp unit now makes the process of exposing artwork onto screens easier, safer and more affordable than ever.

The SERL400 is a fully adjustable and scalable solution for exposing artwork onto silk screen printing screens. Almost any size screen can be exposed from the smallest to the very largest using the SERL400 Rail Lamp. This solution is particularly suited to exposing even very long screens (as used by fabric and wallpaper designers) as well as the large variety of screens used by artists and small businesses etc.

With this system you only buy what you need and can add more rails, lights and accessories as needed. The SERL400 is designed so that it fits within your work environment, you can choose whether to suspend the rail lamp from above, support it from below, or even fix it vertically, whichever works best for you.

The SERL400 is designed so that you can place anything from one to three lights in any position along a standard rail. Exposure area is adjusted by altering the height of the rail above the artwork, altering the spacing between the lights on the rail and deciding how many lights are to be used. With this method you can expose a vast range of screen sizes using only one rail. However if your screens are even wider or longer then more rails can be added to either increase the width or length (or both) of the SERL400.

The practical exposure area is limited only by how large a sheet (or sheets) of glass can easily be handled, as a sheet of glass will be needed to cover all artwork.

The SERL400 utilises the same tried and tested Halogen / Tungsten light technology as used so successfully in the ASSEL500X2. A safe and effective light source, which does not produce harmful levels of UV radiation, and therefore does not need to be shielded. This kind of lighting should expose all standard photosensitive emulsions and films, regardless of brand. Results from numerous user surveys reveal a huge number of different brands and types of emulsion being exposed with perfect results.

You will need to experiment to find the ideal settings for your own screens (i.e. distance of lights from artwork, spacing of lights and exposure time). However a useful table is provided in this manual to record your settings for future use (you are free to make copies of the table for your own use - but you must not resell or redistribute.).

The following SERL400 components are available as standard:

- A)** Standard Aluminium Rail, 1230 mm.
- B)** Suspension eyebolts & fittings (not including suspension cable) (sold in pairs).
- C)** Daisy Chain Light Unit (includes IN/OUT plugs & 400w Bulb).
- D)** Terminal Light Unit (includes IN plug & 400w Bulb).
- E)** 3m Power lead, includes 240v fused 5Amp Tough plug (3-pin UK type).
- F)** Support bars to add an additional side rail (to increase width) (sold in pairs).
- G)** 400w Halogen / Tungsten spare bulb (sold in pairs)

H) 500w Halogen / Tungsten spare bulb (sold in pairs)

The following SERL400 components are available by special order only:

I) Long Aluminium Rail 1745mm.

J) Rail end to rail end joint connector section (to join rails together to increase length).

K) Heavy duty wired lights for long daisy chains of high wattage can be supplied (minimum order required).

The most basic set-up includes one standard rail, one Terminal light and one power lead (A + D + E). Suitable for small screens only.

The recommended basic set-up is two lights on one rail (A + C + D + E) and also suspension bolts (B) if rail will be suspended.

The basic set-up can easily be extended at any time by adding further lights and/or rails, (which are then joined together with cross-support bars or end connectors).

Benefits Include:

- Can expose screens of huge variety of size and shape including very large or long screens.
- Easily expandable modular system.
- No special assembly required. All components are ready to add for immediate use.
- Quickly dismantled to a very small size to save storage space when not needed.
- Can be suspended from above using the suspension eyebolts (in conjunction with suitable wire-rope or strong cord etc.), or
- Can be supported from below on your own purpose made legs or trestle legs or edges of tables etc. or
- Can be mounted vertically for vertical exposures.
- The lights can be fitted with either 400w or 500w Halogen / Tungsten bulbs. 400w Bulbs are supplied fitted as standard. (See 'Replacing Bulbs' – *note*: Do Not Mix 400w and 500w bulbs).
- Based on the proven technology of our highly successful Standard Exposure Lamp unit (the ASSEL500X2), which has now been in production for many years and sold worldwide.
- Bulbs are durable with an average lifespan of up to 2000 hours (depending upon frequency of switching on/off etc.) and are low cost and simple to replace.
- The unit is extremely low-cost when compared to other exposure light technologies (such as mercury vapour, metal halide and UV etc.).
- The SERL400 is also significantly lower cost than our standard exposure lamp unit (the ASSEL500X2) due to the many savings made in the design. For instance users make use of their own existing printing surface as the exposure surface, or a suitable table, or even the floor etc.

Disadvantages:

- The lights get **very hot** and should not be touched during use or used for long periods at a time.
- Users must supply their own foam block, glass sheet and exposure surface (table top or even the floor etc.). As well as a means of suspension or support ("bicycle lifts" are ideal for this and very cheap).
- This solution requires a sheet of glass to cover the artwork - which may be impractical for very large screens due to the difficulty and danger of handling larger sheets of glass - though in some cases it may be possible to use multiple sheets (depending upon the artwork type etc.).

Instructions For Use.

This is not a guide to silk screen printing. If you are not already familiar with the silk screen printing process then you are advised to read a book or two on the subject, before continuing.

Silk screen printing is simple and ideally suited to the independent small scale printer such as artists, T-shirt printers, potters (e.g. ceramic decal printing), small businesses, publishers, schools and colleges etc. The process is also used by large industry but the principles employed are basically the same.

Silk screen printing is versatile, easy and cheap in comparison with other printing methods. Very little equipment is needed, the screen frames can be self-built and now the process of producing 'positive' artwork on clear acetate sheets has become vastly simplified and much cheaper through the use of home computers and laser or inkjet printers. These are able to print artwork directly onto the clear acetate sheets normally used for OHP's (over-head projectors) like the ones commonly found in schools or lecture halls. Make sure you select the correct type of acetate sheet for your printer (i.e. laser or inkjet – don't use inkjet sheets in a laser printer as they will be exposed to high temperatures and could melt). You can also use black ink or paint to draw your artwork directly onto the acetate sheets if greater detail is not required.

Exposing Screens

1) Coat your screen with a 'photo-emulsion' - this is a light sensitive emulsion, usually supplied in a two-part mixture, which is activated when mixed. Emulsions of all kinds are available from silk screen printers supplies, they should come with instructions for mixing and use. Sensitised films are applied to screens differently (use according to manufacturers instructions) but are exposed in exactly the same way as normal emulsion coated screens.

2) Leave your screen in a dark place until perfectly dry.

3) Place the screen silk side up, frame side down, over a soft foam block which is thicker than the depth of your frame and large enough to accommodate your artwork area, whilst being small enough to fit within the screen frame (leave at least 1 inch (or 25 mm) of space between the inside edge of the frame and the foam block). The foam block will be placed on your printing / working surface (e.g. a table top or board etc.). You may improve results by placing a sheet of black paper, card or felt between the foam and the screen.

4) Place the acetate sheet, artwork side face down on top of the sensitised screen.

5) Place a sheet of clear glass over the acetate sheet. This should ideally be at least 5 mm thick and no more than around 8 mm, to provide sufficient weight to press the acetate sheet flat against the screen. The glass should have rounded corners and smooth edges to avoid damaging the screen. It may help if small weights are placed on the corners to increase contact of glass, artwork and screen. Toughened glass is recommended for safety but make sure it does not contain UV filters (some glass has UV inhibitors added, these must not be used). **(See Fig. 5).**

6) Now switch on the unit and leave the screen to be exposed. The length of exposure time required will depend on many factors; The height of the rail lamps above artwork, the spacing of the lights, the wattage of bulbs used (400W or 500W), the speed of the emulsion, the age of the emulsion (always use fresh emulsion if possible), the thickness of emulsion coat, the complexity and density of the artwork etc. The only sure way of finding the correct exposure time is to experiment with test exposures and record your results so that they can be repeated.

Use a test screen and a sheet of black card to mask say 3/4 of the screen for first exposure step, then reveal more screen so that say 1/2 is revealed for next exposure step then 3/4 and continue until full screen is exposed. The first part will have had 4 times as much exposure as the last strip. The results will narrow down the most appropriate exposure time. Further exposure steps with shorter exposure gaps can then be done to pinpoint the best exposure time.

7) Once exposure is complete, switch off the unit and immediately wash out the screen with a gentle spray of warm water (or follow specific instructions if supplied with your emulsion or film). This will remove the parts of the screen which were masked by your artwork. Leave to dry. The screen is now ready for use (once you have 'blocked' out any gaps on your screen).

Some emulsions are much faster than others (this means they are more sensitive to light and expose faster). It is therefore advisable to use a slower emulsion to avoid the need for handling in a darkroom and for greater latitude in correct exposure times.

Feedback from users has indicated that exposure times vary enormously but are grouped around 3.5 to maybe 5 or 6 minutes duration on average for most common emulsions. However some users report exposures of as much as 15 minutes duration are sometimes required in some set-ups (and it's possible your exposure may take even longer depending upon your individual set-up).

Overheating is not usually an issue for most exposures using normal emulsions. However halogen lamps do give off a lot of heat, this means that very prolonged exposures (of over 10 to 15 minutes) may result in heat build up which in extreme cases may damage the acetate sheet or possibly even the screen. If your exposures are likely to be prolonged then over-heating can easily be avoided by taking some or all of the following steps:

- Position the rail lamp further away from the artwork or
- Carry out long exposures in steps. e.g. expose the screen for say half the required time then switch off the lamps and cover the screen with black

card (be careful not to disturb the artwork). Leave the lamps to cool down for a while before removing the card and then carry out the second half of the exposure.

- Use a small desk fan placed to one side of the screen to gently blow cool air across the screen. This will help to eliminate over-heating.
- The acetate sheets made for laser printing are far more heat resistant than those designed for inkjet printing and so may be better for longer exposures.
- The sheet of glass performs a secondary function of absorbing some of the heat generated so always make sure the glass sheet is in place before operating the unit.

Setting up your lights

There are no hard and fast rules about the correct spacing and height of lights. If lights are placed further away from the screen then a longer exposure will be needed.

The closer that lights are placed together on the rail the more intense the light, which means shorter exposures, but they may also need to be placed closer to the screens to achieve even light coverage.

500w Bulbs will expose faster than 400w bulbs (note - DO NOT mix 500w and 400w bulbs on same rail).

Lights will overlap so that more intense light may occur where they overlap. To avoid this (and possible uneven exposure) you must adjust the light positions until as even an area of coverage as possible is achieved. This can easily be ascertained visually - you will be able to see if the light coverage is reasonably even with the naked eye. Some variation is to be expected and will not effect exposure.

If used in accordance with these instructions you will achieve excellent results with this unit, which should give many years of trouble-free use.

Replacing Bulbs

You may never need to replace a bulb - they have an average life-span of around 1500 to 2000 hours (though some do give up much sooner for no apparent reason). If a bulb starts to make an unusual noise or it changes colour (glows yellow or turns grey etc.) then switch the unit off immediately, unplug the unit and wait for it to cool down completely, then replace the bulb. Try not to let a bulb burn out as this may in rare circumstances cause damage to the light unit.

If you do need to replace a bulb then spares are available from the manufacturer. The SERL400 can use either 400W or 500W Halogen / Tungsten bulbs (118 mm long). DO NOT mix bulbs of different wattage, only ever use all 400W or all 500W bulbs on the same rail.

Replace bulbs by removing the retaining bolt on the edge of the glass face plate so that the face swings open (be careful in case the glass falls out). The old bulb is removed by pushing it to one side and then gently pulling it out. The replacement bulb is inserted in the same way - in reverse order.

IMPORTANT - DO NOT TOUCH the new bulb with your bare hands as any dirt or grease on the bulbs will significantly reduce their life. Use a clean cotton cloth to hold the bulb during fitting, or the piece of bubble packaging it came with.

WARNING.

- A)** Do not use this unit for any purpose other than that for which it was intended.
- B)** The unit is strong but it will not stand up to abuse from hard knocks or drops or heavy weights being placed on it or leaned against it.
- C)** Do not try and disassemble the light units. They are not intended to be taken apart (the lights can be safely removed from rails at any time to aid storage).
- D)** The only user replaceable parts are the bulbs and the 5 Amp fuse in the plug.
- E)** The best way to move or carry the unit is to hold the rail bar in the middle - don't pick-up by holding the lights.
- F)** CAUTION! ~ Do Not Touch the lights during use or soon afterwards as they get very HOT.

DO NOT OVER-TIGHTEN THE WHEEL NUTS used to hold the lights in place on the rail. These are made from aluminium and it is easy to strip the threads if over-tightened. Gentle pressure is all that is needed to secure the lights.

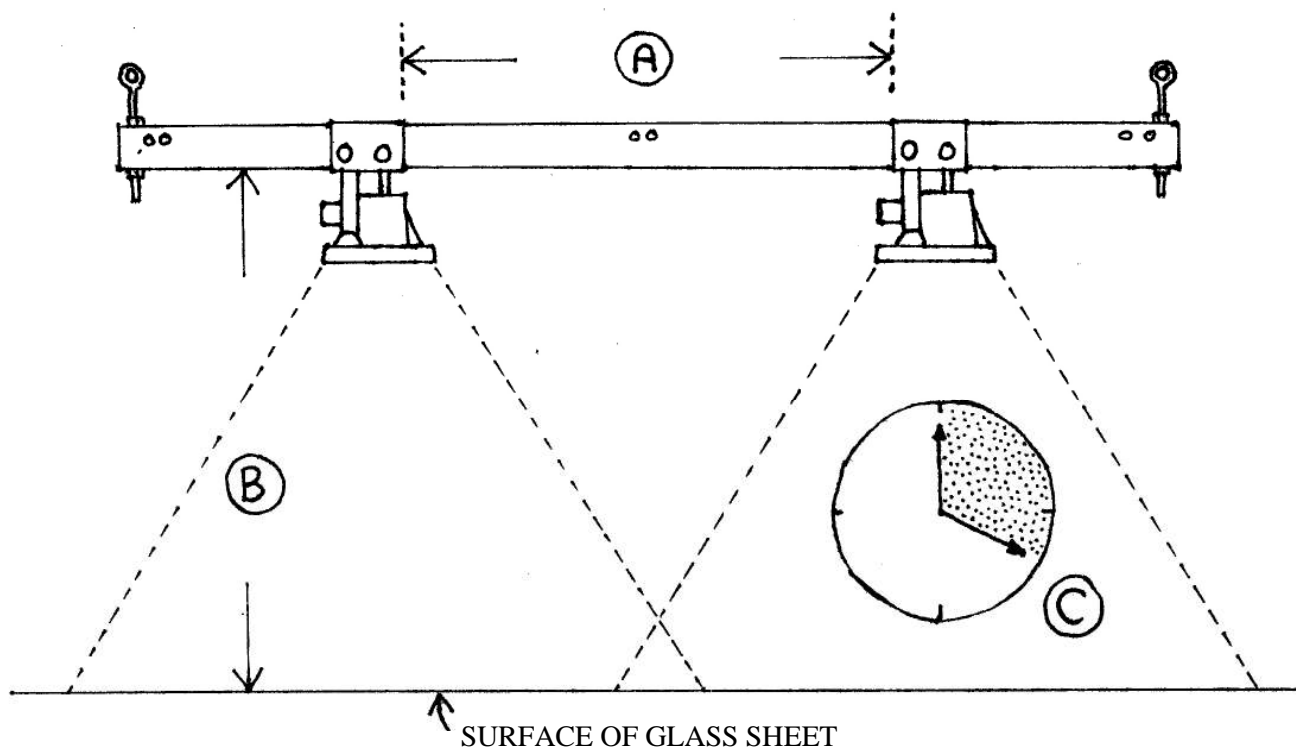


FIG.1 Key:

- A = Distance between lamps
- B = Distance between artwork (glass surface) and rail
- C = Time (duration of exposure)

FIG. 2 Using eyebolts to suspend rail.

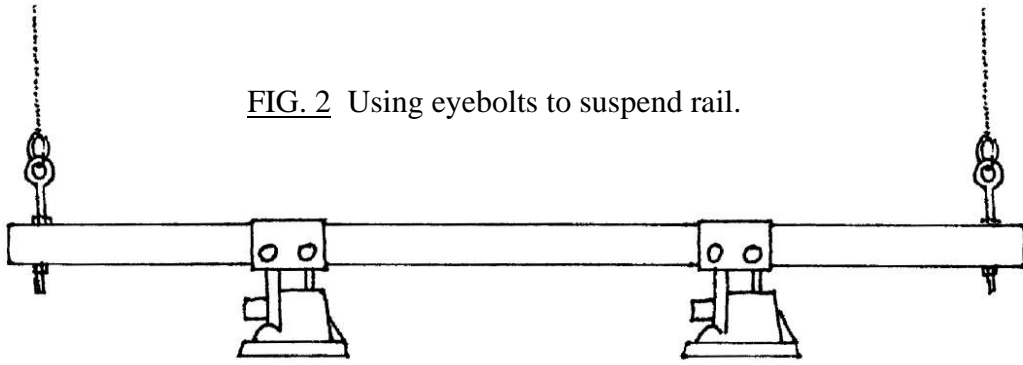


FIG. 3 Adjustable trestle legs or edge of tables can be used to support rail from below (used in pairs).



FIG. 4 Bike lifts are ideal for suspending rails from above.

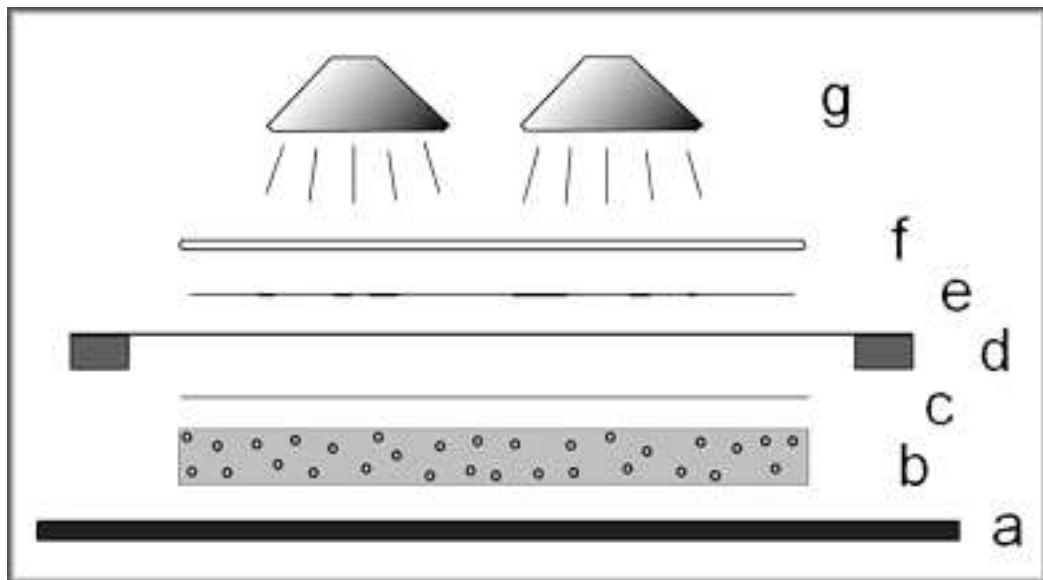


FIG. 5 **a** = Base board / table or floor etc.
b = Foam block
c = Optional sheet of black paper / card or felt
d = Screen Frame
e = Acetate sheet (artwork side down)
f = Sheet of glass
g = Lamps

