



# EXPOSURE UNIT MANUAL

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Manufactured by: Ranar

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XPO Series

# IMPORTANT UNIT INFORMATION

This unit's Serial No. is: \_\_\_\_\_

Date Sold: \_\_\_\_\_

Sold by: \_\_\_\_\_

## Electrical Specifications

Voltage: \_\_\_\_\_

Amps: \_\_\_\_\_

For more information you may consult the wiring diagram on the last page.

For additional help you can contact us at:

1-800-421-9910 or [sales@ranar.com](mailto:sales@ranar.com)

## Warranty

Warranty applies to only the original purchaser on a pro-rated basis.

3 years on mechanical parts

2 years for the heat panel and

1 year for electrical parts.

### **WARRANTY IS NON TRANSFERABLE.**

**This is parts only, warranty labor not included.** Parts must be returned to Ranar for inspection at customer's expense. Ranar covers shipping within the continental USA. UPS Ground service only, expedited service available at customer's expense. Parts subject to inventory on hand usually ships same day if notified by noon.

Ranar Screen Printing Equipment Inc

1340 Stylemaster Dr

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[www.ranar.com](http://www.ranar.com)

# Safety Information

Read this manual before assembling and operating your exposing unit.

## Intended Use:

- This equipment is intended for the curing of specialized emulsions and films, primarily used in the screen printing industry, with ultraviolet light.

## Safety:

- The operator should read and understand this manual before operating this equipment. Store manual and safety information near equipment for easy access to operators.
- Never leave equipment unattended while in operation.
- Children and pets must be kept clear of the work area.
- Do not store any objects on top of the exposing unit
- Unplug power cord before removing glass or entering control box.
- Do not operate if control panel has been removed.
- Do not operate if power cord is damaged.
- Do not attempt to defeat safety interlocks

## EFFECTS OF UNDER AND OVER EXPOSURE

It is usually preferred to over expose rather than under expose. An under-exposed screen will wash out most of the detail which will result in a less durable stencil for printing. On the other hand, an over-exposed screen will block the fine detail from coming through, causing loss of resolution of the stencil. However, the stencil will generally be more durable because it has received more light. For optimum screen making performance, an exposure calculator is a valuable and inexpensive aid in determining exposure time.

**NOTE:** The vacuum frame is designed so that some air leakage is allowed. This is necessary for cooling off the vacuum pump. **DO NOT ATTEMPT TO SEAL ALL AIR LEAKS.**

## **\*\*WARNING HANDLE GLASS WITH CARE\*\***

- Wear gloves when handling the glass
- Lay glass only on a flat protected surface
- Glass, although strong, can shatter if the edges are subject to an impact

# ASSEMBLY

Your XPO Series Exposure Unit will require partial assembly upon receipt. Please unpack your unit carefully so as not to damage it or break the glass, and ensure that no parts or hardware are discarded with the packing materials.

Use of some tools (not provided) will be required.



**Step 1.** After removing the unit from the shipping carton, take a moment to identify each of the following parts:

Exposure Unit

2 Legs

2 Braces

2 Feet

Hose

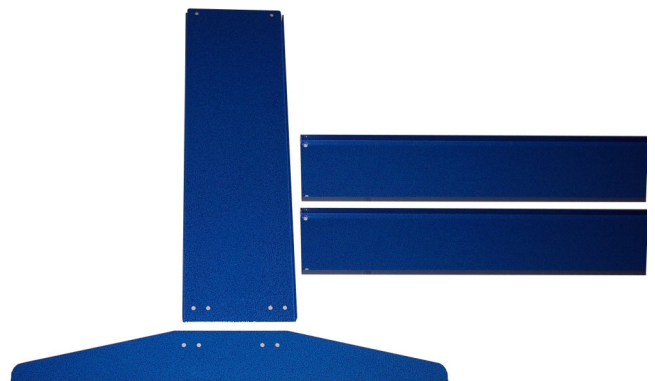
Hardware Bag (20 ¼-20 Bolts, Nuts and Washers)

**Step 2.** Using the hardware provided attach the feet to each of the legs. Once the feet are in place and secure, attach the braces to unite the two legs.

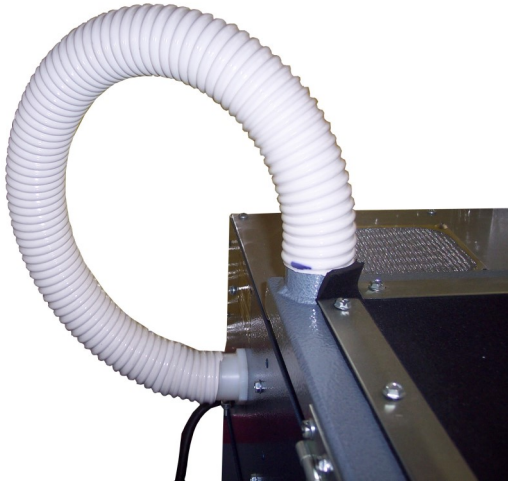
**Step 3.** Erect the base you have just assembled and with the help of a second person, carry the exposure unit and mount it on top.

**CAUTION: Do not leave the exposure unit sitting on the frame for too long, or attempt to use it without securing it with the hardware provided. Doing so could result in the unit falling, being damaged or potentially hurting you or any other person nearby.**

Align the pre-drilled holes on the legs and frame of the exposure unit. Using the hardware provided, secure it in place. Double check that all the bolts you have put in are secured and tightened.



**Step 4.** Your unit is almost ready to use. Carefully push in the vacuum hose provided.



It is not necessary to glue, tape, or otherwise tighten the hose.



# DEFINITIONS & PRINCIPLES OF SCREEN MAKING

In its basic principles, exposing screens is a simple procedure:

1. Screen mesh or fabric is stretched to the screen frame.
2. A photographically sensitive medium in the form of direct emulsion or film is applied to the mesh.
3. Artwork in the form of a film positive is contacted with the emulsion.
4. Film positive and mesh are exposed to light energy (UV wavelength.)
5. The unexposed copy areas are then washed out of the screen, leaving a “stencil” through which ink passes to create the printed image.

**PRECAUTION:** Be sure that the glass hold down clamp is in a secure setting when operating the XPO.

## TYPES OF EMULSION

**DIRECT EMULSION:** Using a scoop coater, direct emulsions are applied as a heavy liquid to the front and back of the screen mesh and allowed to dry. Depending on the desired thickness of the dried film, multiple coatings are usually used. Direct emulsions vary in speed (light sensitivity) and percentage of solids. Some require the addition of sensitizer prior to exposing.

**CAPILLARY FILM:** Applied directly to the screen mesh, capillary or indirect films provide a consistent film thickness and eliminate the variables of coating the screen. Generally, capillary films are not as durable as direct emulsions. They vary in speed and film thickness. Consult your emulsion supplier for recommendations and application instructions.

## EXPOSURE VARIABLES

**LIGHT SOURCE:** The greater the UV output, the lesser amount of exposure time required. The eight unfiltered black-light fluorescent bulbs in the Exposure unit provide an efficient light source for exposing screens effectively.

**EXPOSURE DISTANCE:** Greater distance from the light source to the screen requires longer exposure time. The XPO Series Exposure Units provide a fixed distance (6”), which eliminates this variable.

**SCREEN MESH:** Finer screen meshes require less exposure time than coarser meshes. Dyed meshes will require a 20% addition of exposure time.

**EMULSION SPEED:** Consult your supplier for guidelines when using fluorescent black-light sources.

## SCREEN PREPARATION TIPS

Regardless of how good you may be as a screen printer, or how good your equipment may be, your print will only be as good as the quality of your stencil.

Here are some tips that will help you produce a good stencil:

- Check that the tension of the mesh is firm all the way to the edge. On wood frames, avoid using any frame that is warped. On aluminum frames, also check the corners for VOIDS.
- Once the screen is inspected, prepare a degreaser to clean the mesh before applying the emulsion. The mesh should be thoroughly WASHED so that the stencil will stick to the screen.
- Using one part of SIMPLE GREEN to 12 parts of water will allow best cleaning without excessive foaming.
- Rinse the screen thoroughly and let it dry.
- **IMPORTANT: before coating** –Coat the screen under subdued lighting. You can use a 40 W yellow bug light. Do NOT coat screens where they are exposed to bright light (fluorescent or sunlight).
- After the screen is completely dry, fill a scoop coater ½ full with liquid emulsion. Then using the sharp edge of the scoop-coater apply the emulsion to the back side of the screen, then apply 1 coat to the front side and let it dry.

For your reference, the thicker the emulsion coating, the more ink you will deposit when printing. It will require more exposure time but will be more resistant to pinholes.

The thinner the emulsion coating, the image will be slightly sharper. It will require less exposure time, but it will deposit less ink while printing.

- Place screens horizontally for drying. The emulsion must be dried completely before exposing. The drying process can be enhanced by using a small fan over the screen.
- To avoid pinholes, make sure that your drying area is clean and dust free. Should you encounter a pinhole in the emulsion, you can apply a small amount of BLOCK OUT SOLUTION or tape to fill the hole and block the ink from going through onto your garment.
- Please follow the exposure times shown on the back of this manual as a good starting point.
- **Do NOT wash out image in bright light or sunlight as the emulsion will harden in place, and will make image washout very difficult.**
- The film positives should be located under the screen mesh with the emulsion side against the screen.

# Operations

1. The XPO fluorescent exposure unit series can be operated using a power switch that turns the unit on and off (Switch controls all electric current to the unit.) The amber switch light will glow when the switch is on.. The Vacuum and Exposure Lights can be operated in manual or auto mode. Vacuum Switch Controls the vacuum motor operation. To operate, install art and screen on glass, close vacuum lid and turn vacuum on “auto”. To use unit as an art table, turn vacuum setting to “off”.

**Tip:** If necessary, drape a string cord along inside edge of screen – air will follow string when vacuum is being drawn down to ensure faster and complete draw.

2. The amber safe lights has an independent switch (Viewing Light) and can be used to position artwork and emulsion coated screens before exposing to ultraviolet lights. The amber viewing lights are safe to use with screen printing emulsions and films.

**Note:** Can be used as a light table to inspect artwork or artwork touch ups. Etc.

### 3. To set the time:

- 1)Use the yellow button (<<) to change the digit you want increased (up button) or decreased (down button). The number you change will blink rapidly on the SV (set value) display. Press the (<<) button to move to another digit. To set that number, press **MODE**.
- 2)Once the desired exposure time is set, push the momentary switch to start the countdown timer. If the rocker switches are in the auto position, both the UV lamps and the vacuum will start.
- 3)When the vacuum and exposure light switches are in the auto position, the push button will activate the timer and will automatically count down the exposure times

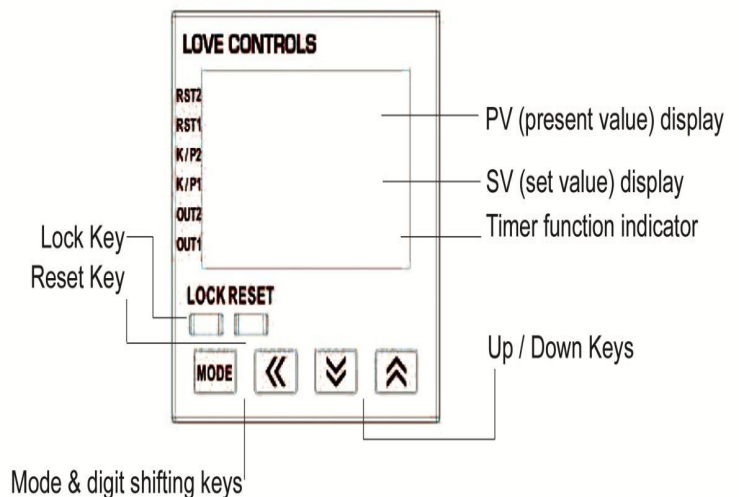
The memory on the timer will keep the same set time until changed. The parameters are set at the factory. The lock and reset keys are not in use.

- Suggested photopolymer exposure times: 30-90 seconds for block letters
- Suggested Photopolymer exposure times: 25 seconds for fine lines and halftones.

**Note:** When testing lights eye protection recommended.



FRONT KEY FUNCTIONS





## Operations Sequence

1. Turn on power switch and turn on viewing light switch.
2. Clean glass and position artwork and screen within the vacuum area.
3. Lay a small string across edge of screen to allow maximum vacuum.
4. Lower lid and attach latch.
5. Verify that vacuum and exposure light switches are set to auto.
6. Set exposure time.
7. Engage the push to start button to activate the exposure cycle.
8. This will engage the lights and vacuum until the time has counted down.
9. When timer expires allow vacuum to release before lifting vacuum frame.
10. Screens are now exposed and can be rinsed out in appropriate washout sink.

**Note:** Exposure times can be affected by many variables such as emulsion type, brand, thickness, i.e. quantities of coats, mesh color, humidity and the type of artwork to be exposed such as half tones, block letters and fine lines. Please use exposure calculator.

## General Information

- Exposing Unit must be on a flat surface to eliminate stress on the glass.
- **CAUTION!** Screens must be free of sharp edges. All surfaces coming in contact with vacuum blanket should be rounded and smooth.
- **Vacuum blanket is not covered under warranty.**
- Keep the lid in the raised position when not in use. It will increase the life of the gas shock cylinders and the neoprene blanket.

## APPROXIMATE EXPOSURE TIMES FOR BLACK LITE LAMPS

The following exposure times are given for **undyed mesh ranging from 100 to 200 threads per inch count**. These are approximate and will require testing for optimum results. For **undyed meshes below 100 or above 200** you will have to test and adjust accordingly. For dyed meshes, the basic rule is to compensate by adding 20% of the normal time for undyed meshes. Whenever possible, use an exposure calculator for best results with any given emulsion.

For your convenience, below are the emulsion manufacturers' websites and recommended exposure times:

<b>AUTOTYPE</b>	<b>www.autotype.com</b>	<b>MURAKAMI</b>	<b>www.murakami.com</b>
AUTOSOL PLUS	1.5 – 2.0 Minutes	BLU	1.5 Minutes
Classic	3.0 Minutes	AQUASOL	2.5-3.0 Minutes
7000	4.0 Minutes	TXR	2.0 Minutes
8000	5.0 Minutes	DCS TEXTILE	3.0 Minutes
<b>CHROMALINE</b>	<b>www.chromaline.com</b>	PHOTOCURE SR (Red)	2.5 Minutes
Chroma Blue	1.45 Minutes	<b>SAATIprint</b>	<b>www.saatichem.com</b>
CP2	3.0 Minutes	Graphic PU	2.5-3.0 Minutes
UDC-2	2.0 Minutes	Textil PC Blue	2.0 Minutes
<b>IMAGE-MATE</b>	<b>www.image-mate.com</b>	Textil PV Pink	1.5 Minutes
701	4.0 Minutes	Textil W-HT	3.5 Minutes
<b>KIWO</b>	<b>www.kiwo.com</b>	<b>ULANO</b>	<b>www.ulano.com</b>
Poly Plus	3.5 Minutes	QFX	2.0 Minutes
Polycol Next	2.0 Minutes	QTX	Under 1.5 Minutes
<b>XENON</b>	<b>www.xenonproducts.com</b>	925 WR (Water Resistant)	4.0 Minutes
TEX	3.0 Minutes		
903 WR (Water Resistant)	5.0 Minutes		

## REPLACEMENT LIGHTS

Use only black lights as specified. If you have any further questions, contact the supplier from which you purchased this unit.

**XPO 2426 / XPO 2331** — 20 watt “rapid start” black light bulb. 9,000 hour life.

**XPO 2848** — 40 watt “rapid start” black light bulbs. 20,000 hour life.

## TROUBLE SHOOTING

### **Bulbs not lighting.**

1. Rotate bulbs in sockets for good connection,
2. Check socket for corrosion in humid or damp climate,
3. Under certain circumstances the light might flicker and not light properly:
  - a. The XPO unit needs to be above 60 degrees for the lights to work correctly.
  - b. In rare circumstances, the polarity of the electric outlet may be reversed. To correct this problem, simply reverse the (2) live wires on the receptacle.

**LIGHTS** – XPO incorporates rapid start black lights to reduce exposure times, any replacement bulbs should match the exact specifications of the original equipment.

**GLASS** – If glass replacement is necessary, use only 3/16” clear glass. The glass is set in place. After exposing a screen, allow the vacuum to completely release before raising top.

### **ELECTRIC**

All XPO Series Exposure Units are designed to operate on standard 120 volt and 240 volt AC current. The smaller units can be operated on circuits rated at standard 15-amp 120v circuit, the 240v also works on a standard 15 amp.

**Note:** All units can operate on 50 Hz when required.

## TROUBLE SHOOTING GUIDE FOR VACUUM BLANKET

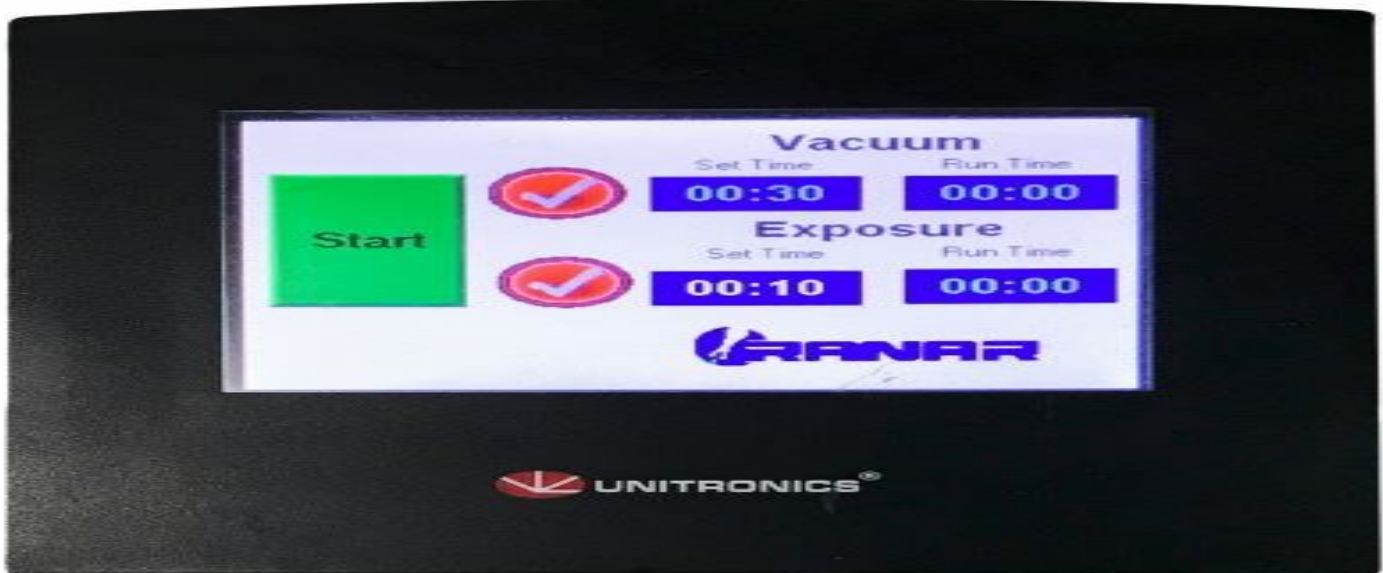
Please check the following steps if the rubber blanket is not drawing a vacuum around your screen frame.

1. Be sure the vacuum motor is working.
2. Make sure your vacuum hose is secure on both the vacuum pump and vacuum frame. To be sure the vacuum pump is working correctly, remove the vacuum hose going into the rubber blanket; cover with your hand. If the vacuum pump is working correctly, you will feel a strong suction on your hand.
3. Turn the vacuum pump on and apply pressure on both the left and right hand side of the rubber blanket frame so that the additional pressure will possibly cause a better seal. If need be, repeat the same process on the backside of the vacuum frame. If a vacuum is not sealed after following the above procedure, check the rubber blanket for holes.
  - a. With the XPO Unit lights on and the vacuum off you will examine for excess light leakage (this spacing causing failure for the vacuum draw).
  - b. Examine between the top and bottom frame where the sponge rubber gaskets are. Also examine for variance in light leakage from the bottom glass frame to the exposure light box.

# Touch screen walkthrough

## Setting Vacuum and Exposure Time

Press Blue "set time" button on either Vacuum or Exposure.



### 1. Enter the desired vacuum delay time.

The first two digits represent minutes, while the latter represents seconds. Use the left/right yellow arrows to desired digit position.

### 2. Pressing the return arrow takes you back to start screen.

### 3. Pressing the green start button activates the vacuum pump first then the exposure LED's.

The Red arrow indicator will turn green once operation begins.

Note: it is recommended to use 25 seconds for vacuum pump delay.

Exposure times will vary depending on your type of emulsion.

