

# EXP3040LED contact exposure unit

translation of the original instructions



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## Leaflet

The EXP 3040 LED is a high speed double sided exposure machine mainly designed for high resolution production of printed circuit boards, stencils and clichés in small and medium quantities !  
Two special 100 W LED bulbs ensure almost parallel light.

### Construction

- Sturdy aluminium frame construction. The chassis consists of a sliding drawer system.

### Operation

- EXP 3040 LED guarantees a perfect exposure within a minimum of time and energy consumption. A touch display allows easy preset and read out of all settings. UV-light emission controllers are not necessary with LED technology because the bulbs have a lifetime of plus 10.000 hours with very constant light emission.

A vacuum pump provides a close and uniform contact between artwork and board. The machines have powerful cooling fans for the LEDs.

### Features EXP 3040 LED

- Max. Working area 350 mm x 450 mm (recommended: 300 mm x 400 mm)
- Vacuum assisted drawer
- Suitable for fine line PCBs
- Suitable for exposure and curing of solder mask.

## Technical Data

|                               |                                  |
|-------------------------------|----------------------------------|
| <b>EXP3040LED</b>             |                                  |
| <b>Dimension (BxHxT):</b>     | 820 x 780 x 1620 mm <sup>3</sup> |
| <b>Weight:</b>                | ca. 120 kg                       |
| <b>Electrical connection:</b> | 230 V / 50 Hz, ca. 800 W         |
| <b>Fuse</b>                   | 5 A                              |
| <b>Max. exposure size:</b>    | 300 x 400 mm <sup>2</sup>        |
| <b>Vacuum</b>                 | -0.8 bar                         |

Technical changes reserved

## EG-Declaration of Conformity



### EG-Konformitätserklärung/Declaration of Conformity

|   |   |
|---|---|
| Hersteller / Supplier:  | Bungard Elektronik GmbH & Co. KG<br>Rilkestraße 1<br>51570 Windeck Germany                  |
| Bevollmächtigte Person für die Zusammenstellung der technischen Unterlagen:<br>Person in charge | Jürgen Bungard, Geschäftsführer /general director<br>Rilkestraße 1<br>51570 Windeck Germany |
| Produkt:  | Exposure Unit <b>EXP3040LED</b>   |

Hiermit erklären wir, dass die oben beschriebenen Maschinen allen einschlägigen Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.

Die oben genannte Maschine erfüllt die Anforderungen der nachfolgend genannten Richtlinien und Normen:

We hereby declare that the machines described above complies with all relevant provisions of the Machinery Directive 2006/42/EC.

The above machine meets the requirements of the following guidelines and standards:

- **Maschinenrichtlinie 2006/42/EG / Machinery Directive 2006/42/EC**
- **EMV-Richtlinie 2014/30/EG / EMC Directive 2014/10830EC**
- **Niederspannungsrichtlinie 2014/35/EG / Low Voltage Directive 2014/35/EC**
  
- **DIN EN 60204-1** Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen / Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- **DIN EN ISO 14121-1** Sicherheit von Maschinen - Risikobeurteilung - Teil 1: Leitsätze / Safety of machinery - Risk assessment - Part 1: Principles
- **DIN EN ISO 12100-1** Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze, Risikobeurteilung und Risikominderung / Safety of machinery - Basic concepts, risk assessment and risk reduction
- **DIN EN 55014-1 2012-05** Elektromagnetische Verträglichkeit, Anforderungen an Haushaltsgeräte, Elektrowerkzeuge und ähnliche Elektrogeräte, Teil 1: Störaussendung / Electromagnetic compatibility Requirements for household appliances, electric tools and similar electrical appliances Part 1: Emission
- **DIN EN 55014-2-2009-06** Elektromagnetische Verträglichkeit - Anforderungen an Haushaltgeräte, Elektrowerkzeuge und ähnliche Geräte - Teil 2: Störfestigkeit - / Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity
- **Niederspannungsrichtlinie / Low Voltage Directive 2014/35/EG**
- **Maschinenrichtlinie / Machinery Directive 2006/42/EG/37/EG**

Windeck, 10.6.2020

\_\_\_\_\_  
Jürgen Bungard Geschäftsführer

## Intended Use

Exposure of positive or negative developing photoresist, solder mask and Alucorex. All other application need our written consent or happen on risk of the operator.

The Bungard GmbH & Co. KG accepts no liability for damages incurred in non-authorized use or application of the machine.

## Safety instructions

### General

Read all the safety instructions and all the operating instructions thoroughly before using the unit for the first time.

Keep these safety instructions and operating instructions somewhere safe in case you need to refer to them again in the future.

The EXP3040 LED is designed for use in the laboratory and operation by qualified staff. Also the unit should be repaired by qualified staff only. Never try to do more in the way of maintenance to your unit than the operating instructions allow. Beyond that, always consult an expert for repair work.

The machines are not intended for the integration or interconnection with other machines or systems. They may only be used in specially equipped rooms and be operated by qualified personnel. Children and pets must be kept away!

The general safety regulations for handling electrical equipment need to be observed.

### Transport

Only use suitable lifting and transport equipment such as forklifts or pallet lifts. Secure the machine against sliding / tilting. Danger of damage!

### Place of installation

The machine must be level and must have sufficient space around the machine for operation and maintenance (approx 1m on all sides).

Do not place the unit in a location near heat sources such as radiators, hot air ducts, furnace, and the like.

The installation environment is crucial to the smooth operation with the EXP3040LED. You must therefore place special emphasis on a dust-free room and an indoor air free of corrosive vapors, to ensure proper function.

### Electrical

The machine is manufactured using tested components according to standard practice for electrical safety. This does not release the user from his duty of care when handling electrically powered devices.

Connect the device only to the power source indicated in the operating instructions or on the device. We assume a house-side fuse for the power source. The connection to the power supply may only be performed by a specialist.

The yellow-red main switch disconnects the machine from the power supply. The fuse protection of the circuit and the residual current circuit are to carry out on site.

After completion of the work, the main switch should always be turned off.

Before any work on the machine (cleaning, etc.) and when not in use switch off the machine and unplug it.

### Lamps

When replacing the LED-unit let the unit cool sufficiently.

The intensity and spectre of the UV light from the LED-unit can be compared to that of skin tanning sets: It may irritate your eyes. You should therefore avoid to look directly into the light for a longer time.

Avoid contamination by ferric chloride. They lead to a partial absorption of the UV light because of its red-dish-brown color and thus to underexposed areas on the board.

Only use Original-Bungard-spare parts!

### Cleaning

When cleaning the appliance, keep yourself to the manufacturer's recommendations.

### Vacuum

The thickness of the workpieces to be processed should not exceed 5 mm, otherwise a functional impairment of the vacuum, or even damage to the vacuum foil may result. For this reason, no sharp objects between the glass plate and the vacuum film may be on the glass table, when the vacuum is turned on. Also make sure that the vacuum hose is not blocked by obstacles.

### Operation safety

Do not stare into the UV lamps! Intended use is carried out in a closed state, in order to avoid eye injuries.

Lift the lid only to place artwork (prevent lid from falling)

Do not drop machine

### Environment

Attention: LED lamps must be handled carefully and disposed of in accordance with the rules of hazardous waste.

## Set Up

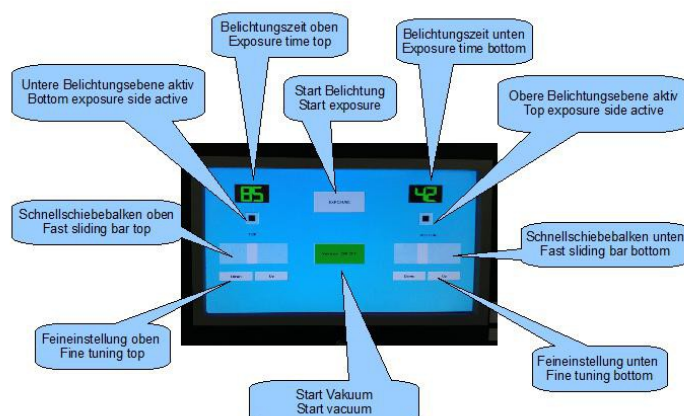
The machine is supplied in a special wood packing. Check the condition of packing immediately at reception. Goods delivered by a carrier and signed as "Received in good condition" will be impossible to be returned as "Damaged in transit". If you recognize any damage after unpacking you need to declare this transport damage to the shipping agent immediately in written and verbal. In this case please also notify us.

To unpack, remove the lateral wood package. Due to the weight and danger of damage do not just roll the unit off the pallet. Use a fork lift to take the unit off the pallet and place it on even ground. From then on the machine may be moved on it's rollers.

The installation location of the machine is of special importance. You should choose a mostly dust free room with a non corrosive atmosphere. The floor should be flat and straight. Place the machine in some distance to the wall so you always have access to the rear and the lower exposure level.

To check that the electrical components of the unit work correctly, please follow the operating instructions given here below. The set requires a 230 V, 50 Hz main supply.

After connecting the machine to buildings power supply you can turn on the red main switch



## Operating

To start exposure pull out the exposure drawer.

Lift the vacuum frame and click it against the magnetic fixation.

Put your board onto the glass plate. Place the artwork onto the board. For double sided boards, we propose that you mount the top and bottom artwork on an L-shaped carrier so that they superimpose and form a "bag" with lateral stops for the board. You will have best results with the emulsion side of the artwork (film) lying directly on the photoresist. Take care not to enclose dust particles between the board and the artwork.

Now slowly return the vacuum frame into its horizontal position. (If any displacement of the artwork has occurred, re-open the frame and rearrange the artwork.)

With the machine turned on, tip on the touch display to activate operation.

Press the vacuum button. The button will turn green and the vacuum pump will start running. Within a few seconds, the pump will have evacuated the air between the frame and the plate. The vacuum indicator will show approx. 0.8 bar.

The polyester foil is structured to allow an easy and complete evacuation on the whole surface. Nevertheless, there might remain an air cushion between the artwork and the board. Wipe over the polyester foil with your hand or with a soft cloth to remove any rest of air. Using the handle, smoothly close the cover.

To start the exposure, follow the instructions below.

First activate the exposure levels you want to use. A black square above top (on the left) or bottom (on the right) will indicate that this exposure level is active.

Now set the time. With the slider you can set the approximate time very fast and with the **up** and **down** buttons, you can adjust to the precise time you want.

After everything is set and controlled, insert the drawer into the machine and press the **exposure** button. The lamps will light on and the timer(-s) will count down.

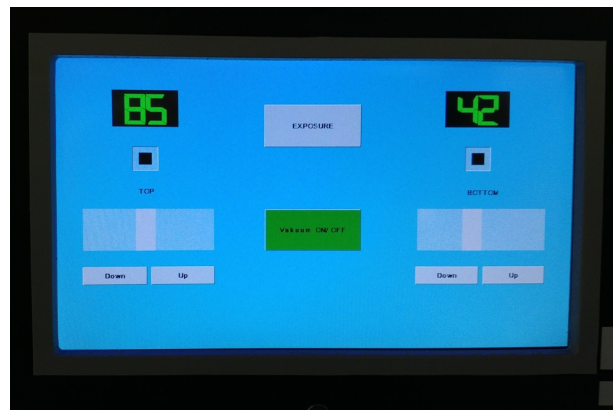
Do not switch off the vacuum during exposure! With the artwork losing contact to the board, severe under-cut may result.

When having completed the exposure, slide out the drawer, switch off the vacuum and open the frame.

Never lift the frame with the vacuum pump running.

The intensity and spectre of the UV light from the LED-lamps can be compared to that of skin tanning sets: It may irritate your eyes. You should therefore avoid to look directly into the light for a longer time.

If for any reasons you want to stop vacuum or exposure you have to turn off machine by the main switch.



## Maintenance



There is only little maintenance necessary for the EXP3040 LED exposure set. The vacuum pump, for instance, is maintenance free. To protect it from dirt and dust, there is a filter put in front of it.

We want to tear your special attention to a careful maintenance of the vacuum foil. It should be cleaned regularly using water and a soft detergent. Do not use solvents.

Be extremely careful not to contaminate the foil with spots of developer or etching liquid.

Do not put pieces with an height of more than about 5 mm under the frame. This could lead to serious deformation or even cuts in the foil.

## Spare Part List

|        |   |   |   |
|--------|---|---|---|
|        | EXP3040 LED Vakuumrahmen                                | EXP3040 LED Vacuum frame  |    |
| 640002 | EXP3040 LED Reparatur Vakuumrahmen                      | repair of EXP3040 LED vacuum frame  |   |
| 640003 | EXP3040 LED Vakuumpumpe                                 | EXP3040 LED vacuum pump   |   |
| 640005 | EXP3040 LED Glasplatte                                  | EXP3040 LED glass plate   |   |
| 640006 | EXP3040 LED Leuchteinheit                               | EXP3040 LED LED-unit  |   |
| 640010 | EXP3040 LED Manometer                                   | EXP3040 LED Manometer   |  |
| 6000   | Schaumklebeband für EXP3040 LED Platte/Vakuumrahmen 2 m | Foam tape for EXP3040 LED plate / vacuum frame 2 m                                    |   |
|        | EXP3040 LED Reparatur-Kit Vakuumrahmen(Folie+Dichtung)  | repair set of EXP3040 LED vacuum frame(black rubber tape & transparent plastic sheet) |   |

## Guarantee

All machines are submitted before distribution to examination on function and continuous operation firmness. On the machine we grant a work warranty of 12 months to our customers starting from purchase date on accuracy in material and processing. We warrant at our choice by exchange of incorrect parts or by repair of the machine in our house. Old parts change into our possession.

## Disclaimer of Warranty

Bungard GmbH & Co.KG reserves the right to change or enhance its machines or machine specifications according to its judgement, if necessary. Bungard cannot be held responsible to implement aforesaid changes into machines sold already.

Bungard products and services are liable to the current prices and conditions, which are subject to change.

The instructions and definitions in this document are also subject to change and mark no assurance on the part of Bungard.

This manual contains informations of the Bungard EXP3040 LED and is the translated English version.

Please regard the "Sales terms and delivery conditions". These are available after fulfilment of the contract. We don't furnish a guarantee or warranty in cause of damages at material or hurts of people because of

Incorrect use of the machine

Wrong setup, installing and operating of the machine or incapable service

Use of the machine with defective safety equipment

Non-observance of the service manual in regard to transport, stocking, setup, installation and service of the machine

Unlicensed modifications at the machine

Incorrect or incomplete repairs

Destructive force effect at the machine in cause of foreign objects or external use of force

Use of non-original spare parts

normal wear parts.

We cannot accept subsequent claims from damage or destruction of work pieces worked on in the machine, because we have no knowledge or control over the operating conditions at your site. This is valid in a general manner also for requirements from damage to articles, buildings and persons as well as the environment.

We do not warrant that the function of the machine will meet the customer's requirements or that the operation of the machine will to this regard be error free.

In no event will we be liable to the customer for any incidental, consequential, or indirect damages of any kind, including loss of profit and prosecution for environmental pollution, even if we could have been aware of the possibility of such damages.

All information was arranged with great care. We reserve ourselves however mistake and technical changes without previous announcement.

Running the machine in corroding, humid, dusty, extremely hot or explosive atmosphere happens at the operator's own risk and responsibility.

We explicitly exclude any warranty for damages resulting from running the machine in in corroding, humid, dusty, extremely hot or explosive atmosphere.

## Copyright

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