isel

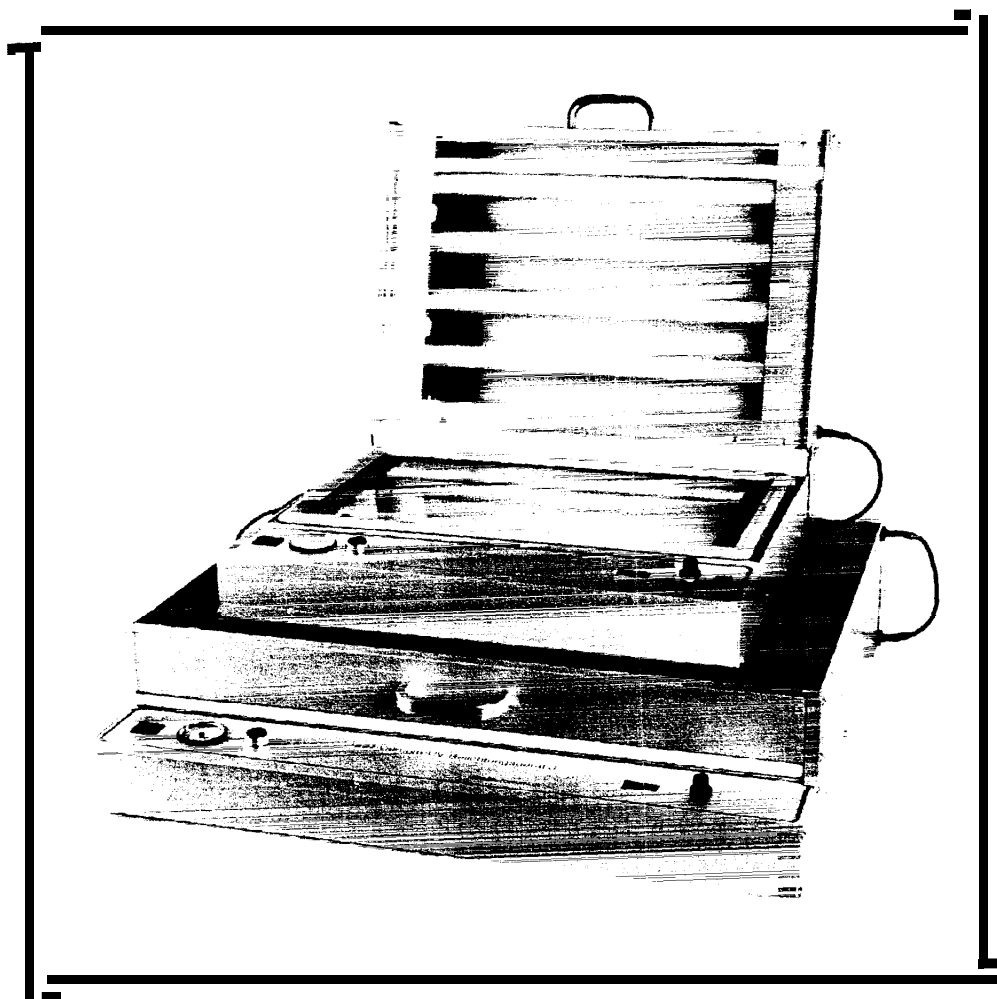# _isel_-Vakuum UV exposure device

Manual

About these instructions

In this instructions, you find different symbols marking important information for easy and fast reference.

Danger	Caution	Reference	Example	Supplementary information

In spite of every care, printing errors and errors can not be excluded.
We welcome any suggestions and remarks on faults.

isel-machines and controllers are CE-conforming and adequately labeled.
Commissioning of all other machine components is not allowed until all corresponding demands, on which the CE-security guidelines have to be applied, are fulfilled.

The **isel**automation company assumes no guarantee as soon as you carry out some modifications on the machine.

The electromagnetic compatibility test only applies to the original configuration of the machine supplied ex works.

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Contents

Safety note

UV-lamps are customary in industry, without any special safety requirements.
In spite of this we emphasize the following precaution:

Switch the UV-lamps on only when the lid is closed!

1   Intended purpose

The isel UV exposure device is suited for the light exposure of one-sided and/or double-sided printed circuit boards - up to micro run technology.
Further application areas are the production of film copies, tampon printing cliches, front panel exposures and so forth.

The exposure devices are designed for the application in dry rooms, schools, living and business areas, in laboratories and small firms.

2   Placement

The device ought to be placed onto a horizontal, stable base (e.g. workbench, table) with the control elements pointing to the front. The room must to be darkened.

3   Commissioning

3.1   Control elements
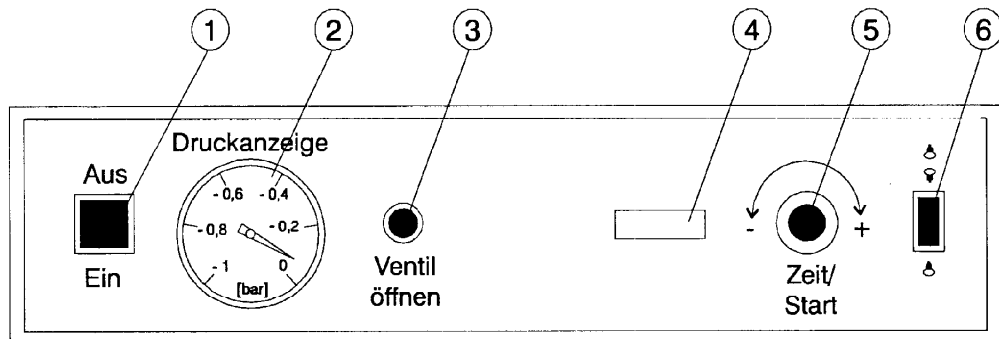
① Mains switch with integrated switch for the vacuum pump

② Pressure display

③ Valve for ventilating the vacuum

④ Time display

⑤ Start/Stop push-button
   Operating mode selection
   Time setting

⑥ Light switch for deactivating the lower tube (with a double-sided exposure device)

3.2   First commissioning

1. Connect the unit to 230 V mains.

2. Open the cover and activate the mains switch.
    A buzzing of the vacuum pump must be had hear. Within approx. 30 seconds, a low air
    pressure of approx. 0,4 bar must have built up (the film below the pressure screw is
    sucked onto the edition pane).

⚠ - Do not block the hole in the support pane if the pump is activated. It would be able to
    shatter due to low air pressure.

- Do not remove or damage the film under the hinged pane.

☞ - Press easily the support pane against the sponge rubber frame if no low air pressure is
    built up; possibly, check the horizontal placement of the device (especially important in the
    case of the device types 3 and 4).

☞ - During film exposure with the double-sided exposure device, we recommend to cover the
    support pane using an opaque base (e. g. pasteboard) since also with a switched-off
    lower exposure box light is reflected from the bottom.

3.3   Operation of the timer

With the built-in timer, you can adjust the lighting duration of the UV tube. Time setting is
possible in seconds or minutes.

Minutes-/seconds
1   2   3 display points

This point lights up if
the cover is opened.

These points only light up in the
'Minute timer' operating mode

Rotating knob and push-button combination
for setting the operating mode and the time
and the Start/Stop key
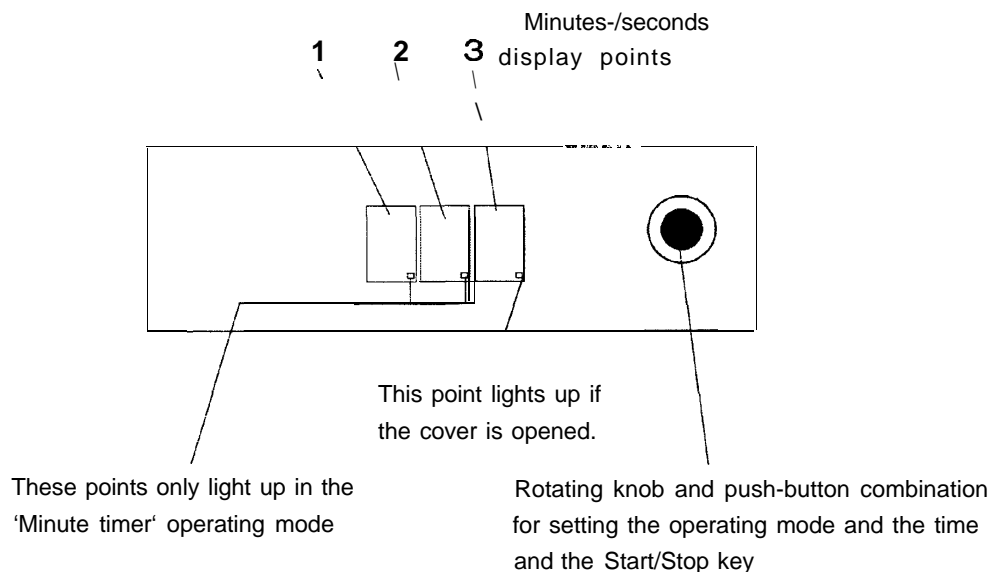
Operating modes

Second timer: If you turn on the device without pressing the rotating knob, the left number
of the display shows the minutes and the other two numbers the seconds.
Therefore, you can enter up to 9 minutes and 59 seconds

possible values of the display points: ①, ②, ③

①	minutes	{0, 1, 2, 3, 4, 5, 6, 7, 8, 9}
②	seconds ten's digits	{0, 1, 2, 3, 4, 5}
③	seconds one's digits	{0, 1, 2, 3, 4, 5, 6, 7, 8, 9}

Display value   > 234 <   corresponds to   = >   2 minutes 34 seconds
> 759 <   = >   7 minutes 59 seconds
> 045 <   = >   45 seconds
> 511 <   = >   5 minutes 11 seconds

Minute timer: If you press the knob while switch-on, the right number shows the ten's
digits of the seconds and the other two numbers the minutes. Therefore,
you enter can times up to 99 minutes and 50 seconds.
Only in this operating mode, the middle and the left point the display light
up.

possible values of the display digits: ①, ②, ③

①	minutes ten's digits	{0, 1, 2, 3, 4, 5, 6, 7, 8, 9}
②	minutes one's digits	{0, 1, 2, 3, 4, 5, 6, 7, 8, 9}
③	seconds ten's digits	{0, 1, 2, 3, 4, 5, 6, 7, 8, 9}

Display value   > 2.3.4 <   corresponds to   = >   23 minutes 40 seconds
> 7.5.5 <   = >   75 minutes 50 seconds
> 0.4.5 <   = >   4 minutes 50 seconds
> 5.1.1 <   = >   51 minutes 10 seconds
> 0.1.3 <   = >   1 minute 30 seconds
> 5.1.1 <   = >   51 minutes 10 seconds
> 9.9.5 <   = >   99 minutes 50 seconds

Switching-on of the device
After switch-on, the three LED indicators of the device flash, i.e. the timer is ready for
operation. A start of the timer is not possible since >000< is displayed.
Therefore, you have to define a preset time for the timer first.

Please note the different values of the display places in the two operating modes of the
timer.

Time input

1. Turn you the knob to the left or to the right.
   The first display place (from the right) flashes.

2. Turn the knob step-by-step to the right.
   In the flashing display place, the value increases according to the rotary motion.
   Turn again to the left if the set value is too big. You can also turn to the right until the
   desired value is displayed again.

3. Press onto the knob to take over the set value (in no case, turn the knob
   simultaneously).
   After this, the next display digit flashes.

In the same way, you can enter the other two values.

All three display digits flash again after the third value has been entered, i.e. the device is
ready for operation.
You can immediately initiate a new setting cycle if the preset time does not correspond to
your desired value. For this, turn the knob again.

Starting of the exposure

!

Switch the UV-lamps on only when the lid is closed!

Press the rotary knob.
The timer and the fluorescent tubes are turned on. The flashing of the display changes to a
continuous lighting and the set count-down is started.

You can interrupt the count-down at any time by pressing the rotary knob.
The display flashes again and the fluorescent tubes are switched off,
The remaining time remains in the display. The count-down continues if you press the rotary
knob now again.

At the end of the count-down, the fluorescent tubes are switched-off. Now, the value set
before the start of the timer reappears flashing in the display.

3.4 Replace of a fluorescent lamp

To replace a flourescent lamp **in the top, you** only have to unscrew the two Alu-ledges and
to remove the glass pane. Turn the lamp 90" in the socket and take it out.

To replace a flourescent lamp **in the bottom,** you have to push down on the glass pane
carefully till it bottoms out, and pull it forward till the back of the pane clears the frame.
Then pull the glass pane out at the back side.
Please be careful not to damage the plastic tube leading from the vacuum pump!
To replace the lamp (turn 90") and reinstall it in reverse order.

4   **Abstract: Exposure of a double-sided printed circuit board**

▪ **Creating the layout pocket**

1. Attach thin double-sided adhesive tape onto a stripe of approx. 10 mm width of base
    material (1,5 mm).

2. Place the tool films (solder side and component side) identically on top of each other
    and glue base material between the tool films at one end.

▪ **Exposure**

1. Remove the protective foil of the light-sensitive coated printed circuit board; place it into
    the layout pocket.

2. Place both onto the lower pane of glass (support pane). Apply pressure using the
    pressure pane (mobile pane of glass).

3. Turn-on the device and observe the pressure distribution. Close the device cover if the
    low air pressure has reached approx. 0,4 bar (the tool film is pressed onto the printed
    circuit board).

4. Depending on the tool film, set the exposure time between 2 and 5 minutes.

5. Check the exposure switch for double-sided exposure and press the Start push-button.
    The remaining exposure time is visible on the display. Switch-off the device at the
    completion of the exposure time (LED indicator flashes), press the valve push-button,
    and wait until the low air pressure has risen to normal.

6. Open the device and remove the exposed printed circuit board.

5   Technical data

Vakuum UV exposure devices			
	Typ 1	**Typ 2**	**Typ 3**	**Typ 4**
Exposure area [mm]	360 x 230	360 x 230	520 x 390	520 x 390
Power consumption [W]	135	260	225	440
Number of W tubes [W]	4 x 15	8 x 15	6 x 20	12 x 20
UV wave length [nm]	365			

The device is tested to the EMC guidelines for applications in living and business areas,
laboratories and small firms.