

Ushio UV Lamps for Karl Suss MJB 3 Mask Aligner

Ushio Karl Suss MJB 3 is one of most common contact mask aligners for photolithography. Lamps of Ushio Corporation are commonly used for the aligner. The feature size of the photolithography is affected by photoresist thickness, photoresist type, and the wavelength of the UV lamp used for exposure. The Karl Suss MJB 3 can be equipped with several kinds of exposure optics for the exposure process which are listed as follows

- UV 400 – It includes a 350-W mercury high pressure lamp and diffraction optics. The wavelength is between 350 nm and 450 nm. A resolution of 0.4 μm can be obtained under optimum conditions.
- UV 300 – It has the same lamp as the UV 400. An optical filter and a modified diffraction reducing lens plate distinguish it from UV 400. The wavelength range shrinks down to 280 – 350 nm. Because of the new features, a resolution of 0.4 μm can be obtained under optimum conditions. The exposure time is somewhat longer than with the UV 400 optics (why?).
- UV 250 – This system has a 500 W mercury xenon high pressure lamp and a diffraction reducing lens plate which is similar to UV 300. The wavelength range is between 230 and 260 nm. A resolution of 0.3 μm can be obtained under optimum conditions.
- UV 200 – A 350-W cadmium xenon high pressure lamp is used as a light source. The wavelength is between 210 and 230 nm. The highest resolution can be obtained with an excimer laser with the peak wavelength of 193 nm (ArF) or 248 nm (KrF). A resolution of 0.2 micron can be reached.

Generally the life time of the UV lamps is around 600 hours.

We are using UV 400 exposure optics. The idle power is 275 W; the maximum power is 400 W and the minimum power is 200 W. The exposure intensity is 19 mW/mm^2 . In order to improve the life time of the lamp, we can reduce the idle power of the lamp.

The lamp hours can be checked by pressing and holding the “DS” key in CIC 1000 constant intensity controller for more than 3 and less than 5 second in all modes.

When using the aligner, you can switch the exposure lamp on about 15 – 20 minutes before exposing.

When finished, switch off the exposure lamp.