

Mounting manual

LED DIY kit For Zeiss Standard



This LED set is developed to replace the halogen light of the Zeiss microscope

This manual shows in detail how to do this easy job, images or microscope constructions may be different than yours, but the idea is rather simple

The microscope was modern for its time, with the halogen lamp, but we find more and more problems in supplies and lampbases, parts are getting harder to find. So we developed this LED light set, the LED gives (much) more light at a better color, and is just like the halogen adjustable in intensity.

We start the conversion with the removal of all loose parts (filters), also the objectives and the head. (If you can take the specimen clamp of, than do so.)



You can take the intensity knob from the scope's base, by lifting the cover, and loosen the nut (with a flat plier or pipe wrench) the nut does not have to be removed, just loosened, you can lift the knob from the axel of the regulator.

Put the stage of the microscope in the lowest position, if you put the microscope upside down, you can slide it over the edge of the table (keep it in control !!!) now you can access the bottom parts much easier



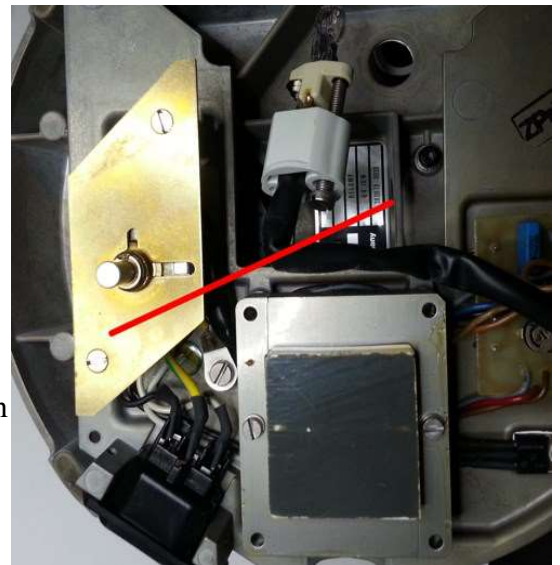
Now the bottom is in top, you can see the parts of the light system



loosen the handscrew that holds the halogen base, and lift it from the holder.

Take out the screw that holds the lampbase. The halogen lampbase is hanging on it's wires.

Remove the halogen regulator/ transformer parts from the base of the scope, (your microscope may look different) in the end there is no electrical part left in the base. The cylindrical part that protrudes (in some types) in the rear of the scope can stay in place (or mounted again if it had to come off while removing the transformer).



Please be careful not to drop the microscope from the table while taking the parts from the base.

Put all the removed parts aside, except the lamp base part.

Now you can start mounting the new LED parts. We have placed the new knob on the black oval dimmer body, you can remove it by loosening the screw in the side of the knob. Now you can also take of the nut and rings that we supplied.



There is a bag with mounting parts that you may or may not need while mounting the dimmer unit and cable in the base of the microscope. We explain how.

Start with guiding the LED bracket (and cable end) through the opening in the base, take the screw from the aluminum bracket, and place the bracket in the lampholder, it should be able to slide a bit back and forth, fix the crew through the long slot in the rear, back in the aluminum bracket. (Does not have to be tightened yet)





The LED , The yellow dome can now be positioned above the center of the mirror, this is a good starting position for later adjustment.

You can fix the lampholder back in the base of the microscope, and tighten the handscrew to keep it in place.

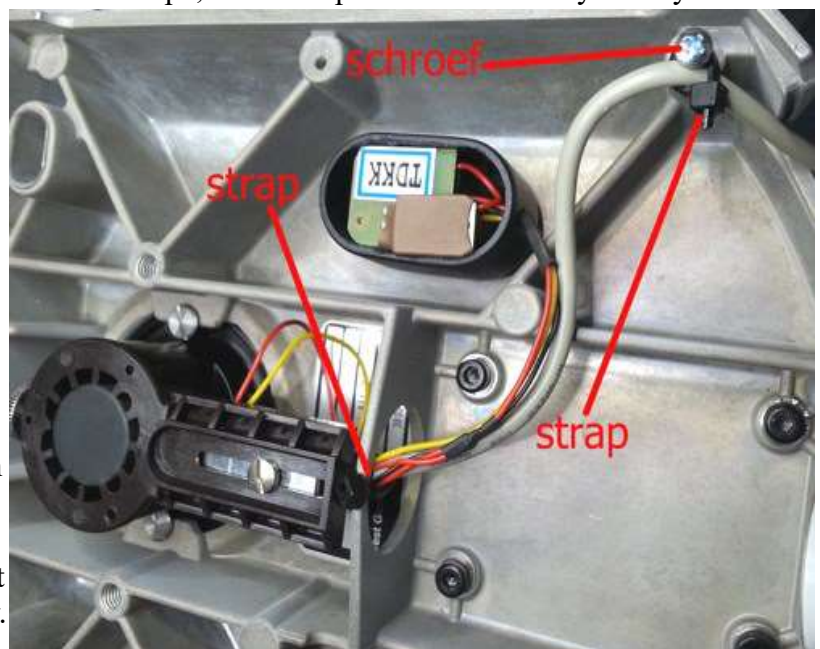
NB The yellow dome of the LED is a silicon lens, it can resist normal handling, but can be scratched or get dirty with fingerprints or dust. Try to avoid mechanical stress, or pressure to the dome. Cleaning can be done with a moist (water) qtip, leave to dry in air.

Next step is the mounting of the dimmer part. This can give you some fiddling because rings have to be placed on both sides of the base..... (ask for help or take your time)

There are some different models of the same microscope, so in this part of the manual you may have to use your own judgement.

Start with the big flat ring place it around the shaft of the dimmer (on top of the black plastic body), check the wires of the dimmer that they aren't tangled, and put the axle of the dimmer through the hole in the base of the microscope.

Some microscope models have a large opening where the nut of the dimmer has no grip... there you need the washer with the extra rim, put the rim of the washer in the opening and keep it in place with the nut of the dimmer. The nut has to turn easy, if not you have it crooked on, take it off and try again. Fix it hand tight for now. (there are several other parts included in the bag, in case your scope has another configuration, make sure there is a washer under the nut)



Now you can fix the cables in a neat way (and preferably in a way you don't pull them loose in case of accident) , see the image for some suggestions.

For instance mount a screw in the corner, and fix the USB cable so it has a good pull relieve.

There will be an opening in the base where the original mains cable has been, you can guide the USB cable in that direction.

If you didn't do it already you can mount the plastic cylindrical part in the rear of the microscope's base. Cut the remaining tail ends from the straps, and put the microscope upright again.

You have placed the spacer with the rim in the large opening of the microscope, check if the rim is in the opening, and tighten the nut. **Be careful**, the thread of the dimmer is made of plastic, do not use excessive force. Hold the dimmer in the "straight" position while fixing the nut.



Turn the white axel of the dimmer in the off position, (click, CCW) now you can put the knob on the axel, whit the arrowpoint at the “off” sign. Lift the knob 1 mm while fixing the small screw in the knob. (if the knob is scratching the surface or the nut, when turned, please lift it another mm.)

Now you can check if the LED is functioning, put the USB plug in (any) the USB outlet of a USB charger or PC, make shure the USB power is on, you can see the LED light shining if you rotate the new intensity knob ON and further.



You can put all the removed microscope parts back on.

The mounting is finished, the next part of the manual is for adjusting the LED and some warnings and tips.

Settle yourself like you're used to behind the scope, and adjust the light intensity as normal. You may notice the bright white color of the light. Be aware that the LED produces more light than the halogen and this white color invites to use a higher intensity, please keep it as low as possible to safe your eyes. Due to the white color do we not need the blue filter anymore. You can check the centering of the LED from this point



Check the centering with a low mag objective, see if the spread is even. (assumed that your light system (substage condensor) is centered)

If there are brighter or darker area's than the LED has to be centered, just like the halogen can you shift the position of the filament (chip), loosen the (new) screw a bit so the LED can be shifted, in the rail of the lampholder, place a piece of paper over the light output on the base or the stage of the scope and watch the light spot, while sliding the LED in an other position, repeat this till the light output is as homogene as possible. Careful fix the screw (not to change the found position)

When the intensity knob is in the OFF position, the LED is OFF, but the USB power is still on, please unplug the charger or switch off the PC when you are finished, this saves in current, and is better as fire prevention

Because the LED dimmer uses a USB 5v power, you can use any USB source you may have. Like a charger, a PC, or laptop, a powerbank (which may have an automatic shutdown system) or even a solar panel.

Never look straight in the beam of a high power LED