Manual for Neo microscope, binocular with 100x objective

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Construction of the microscope:

Objectives:
All objectives are produced according to DIN-standard. 40x and 100x objectives have a spring mount to avoid breakage of specimens and objectives. The four-hole objective revolver makes it easy to change between the different objectives.

Focusing knobs and stage stop adjustment:
The coaxial coarse and fine adjustment knobs make it easy to attain a sharp image. A vertical finger screw is placed behind the mechanical stage. When the lock nut is loosened it is possible to turn the finger screw, and thereby settle the upper limit of the stage movement. This protects the specimen from touching and/or damaging the objectives.

The stage stop adjustment (specimen protection) will also make it easier to focus fast. The microscope is delivered with a preset stage stop adjustment and it should therefore not be required to make further adjustments.

Mechanical stage:
The specimen is placed on the mechanical stage by pulling back the movable handle of the specimen holder. Gently release the handle and the specimen is placed securely. The mechanical stage can then be moved in the X and Y-axis with the coaxial mounted knobs on the vertical axle.

Condenser and iris diaphragm:
The condenser can be focused by turning the condenser knob (left side) up or down, until the best image is obtained. The condenser has a built-in iris diaphragm with a little handle for adjustment. Closing the iris diaphragm decreases the light but increases the contrast and depth of sharpness of the image. Adjustment of the iris diaphragm might be necessary when switching between objectives.

Filters:
Filters of various colors can be placed in the filter holder just beneath the iris diaphragm. This can be an advantage for example at greater magnifications where it will give a more detailed image.

Light source:
The microscope is equipped with a LED light source with a very long life span and therefore it normally will not need to be changed.

Fuse:
The fuse is mounted in the bottom of the main microscope body. It can be found under the plastic cover labeled “FUSE”.

Connecting the microscope to mains:
The microscope is developed for the use with 100-240 V / 50-60 Hz.

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General use of the microscope:

- Put the microscope on a dry and clean place.
- Place the optical head in the hole at the top of the microscope stand. Fasten it with the clamp screw or the internal hexagon. In the last case a hexagonal socket wrench is enclosed.
- Put the mains cord in a socket and turn on the microscope.
- Adjust the light intensity at mid level with the brightness control placed on the lower left side of the microscope body. The intensity of the light can be adjusted to the desired level with this adjustment wheel.
- Place a specimen on the mechanical stage.
- With the binocular optical head it is necessary to adjust the eyepiece tubes to fit the distance between the eyes. This is done by pulling or pushing the right and left black eyepiece tubes. The adjustment is finished, when the image is comfortable and shows a completely round image. Notice the number on the graduated scale on the front of the optical head, and use this number to make a quick adjustment next time the microscope is used.
- The microscope is then adjusted to your sight to achieve a good and sharp image. Look through the right eyepiece with your right eye. Use the fine focusing knob to get a sharp image of the specimen. Then look with your left eye through the left eyepiece and adjust the sharpness with the dioptric ring on the eyepiece tube. The adjustment is finished, when the image seen with the left eye is sharp.
- Move the mechanical stage up and down with the focusing knobs to obtain a clear and sharp image. The mechanical stage can be moved on the Y-axis and X-axis with coaxial mounted control knobs.
- The part of the specimen that you want to observe is placed in the field of vision with these two control knobs.
- Rotate the objective revolver so that the preferred objective is moved into the light path.

The objectives are parfocal. This means that only a minor adjustment in focus might be necessary, when changing magnification.

The 100x objective:

This is an oil immersion objective, and it is used in the following way:

- Use one of the low magnification objectives (4x and 10x) to focus on the specimen.
- Put a drop of immersion oil on the illuminated part of the specimen.
- Move the 100x objective into the optical path so that the front lens has contact with the immersion oil.
- Air bubbles in the immersion oil can be avoided, by moving the objective slightly from side to side. This will make sure that the immersion oil covers the entire lens surface.
- Focus for a sharp image.
- Remember to clean the objective thoroughly after use. For this purpose you must always use specialized optical cleaning agent and lens cleaning paper. A drop of xylol (xylene) on lens cleaning paper can be used if the lens surface is particular dirty. Make sure to wipe off all the xylol with new pieces of unused lens paper.

Maintenance:

- Put the microscope on a dry and clean place.
- The objectives are manufactured according to strict standards and tested in the factory. Please never try to disassemble them yourself.
- The surface of the lenses must never be touched with fingers or hard things. If the glass surfaces are dirty use a clean and previously unused piece of lens paper to clean it.
- Remove dust from the glass surface with a clean lens brush or an air dust cleaner for optics.
- Always use a specialized optical cleaning agent and wipe the glass surface gently several times. Each time with a fresh piece of lens cleaning paper.
- Old residues of immersion oil can most easily be removed by adding a drop of solvent as for instance xylol to the lens cleaning paper before wiping the lens. Do not soak the surface with solvent. Wipe instead several times with very little solvent, each time using a new piece of lens cleaning paper.

Caution:

Never turn the two focusing knobs against each other. It will damage them! Turn off the microscope when it is not used, and cover it with the enclosed dust cover.