



Microscopes

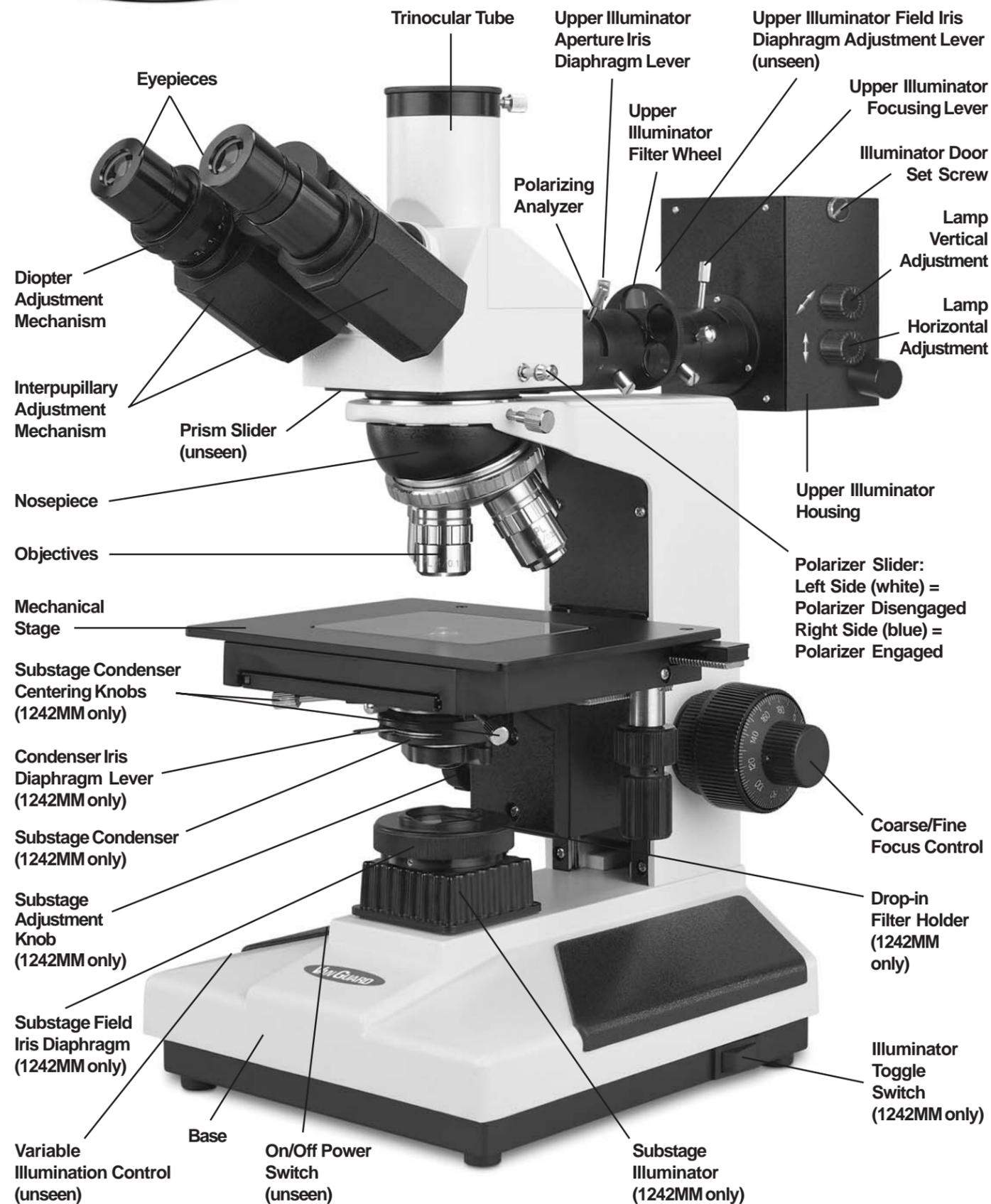


Operation Manual 1200MM Series

Covering Models: 1241MM & 1242MM



VAN GUARD® 1200MM Series Parts



VAN GUARD® 1200MM Information

Model 1241MM

- Trinocular Head (1 ea.)
- Upper Illumination Housing (1 ea.)
- Stand (1 ea.)
- 10X Eyepiece (2 ea.)
- 4X Plan LWD Objective (1 ea.)
- 10X Plan LWD Objective (1 ea.)
- 20X Plan LWD Objective (1 ea.)
- 40X Plan LWD Objective (1 ea.)

Model 1242MM

- Trinocular Head (1 ea.)
- Upper Illumination Housing (1 ea.)
- Lower Illumination Housing (1 ea.)
- Stand (1 ea.)
- 10X Eyepiece (2 ea.)
- 4X Plan LWD Objective (1 ea.)
- 10X Plan LWD Objective (1 ea.)
- 20X Plan LWD Objective (1 ea.)
- 40X Plan LWD Objective (1 ea.)
- Substage Polarizing Analyzer (1 ea.)
- Dispersion Filter (1 ea.)
- Blue Filter (1 ea.)

Replacement Lamp: 20W Halogen (Cat. No. 1200-20WHL)
 Replacement Fuse: 0.5A, 250V (Cat. No. 1200-FS1)

Maintenance

The eyepieces and objectives on VanGuard Microscopes are coated. They should never be wiped while dry as any dirt or dust will scratch the coating. The surfaces should either be blown off with an air canister, or blown and cleaned with an air-bulb and camel-hair brush. It is recommended to then use a lens cleaner. Apply with a cotton swab for a minimum of wetting, then wipe the surface clean with a quality lens tissue. Xylene, since it breaks down the bonding material holding the lenses, should never be used as a cleaner. Periodically your VanGuard Microscope should be fully serviced by a qualified service technician.

For information about parts, accessories, or service -- contact your dealer directly or contact VanGuard Microscopes at 1-800-423-8842.

General Operation

Lamp Replacement (Lower Illuminator) [MODEL 1242MM ONLY]

- 1 Before attempting to replace or remove the lamp, UNPLUG THE MICROSCOPE FROM ANY POWER SOURCE.
- 2 Replace the lamp by gently laying the microscope on its side and opening the trap door located on the bottom of the base. Loosen the trap door set screw and swing the trap door open. Once the door is open, the lamp can be removed simply by grasping the lamp and pulling it from its fixture. When replacing, insert the new lamp into the same fixture. In addition, be careful not to touch the glass lamp envelope when replacing—use a tissue or other medium to grasp the lamp. This will prevent the oils from your hand from reducing lamp life. Swing the trap door shut and secure with the trap door set screw. Before using the microscope again, follow steps 1-3 on page 4.

General Operation

Thank you for purchasing a VanGuard Microscope. With the user in mind, VanGuard Microscopes are built from modern designs and should provide a lifetime of reliable performance. We recommend you read this entire manual carefully before beginning to use the instrument.

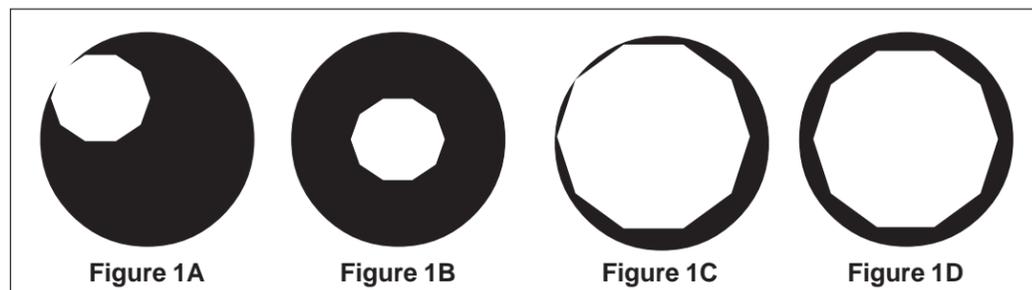
Assembly

- 1 After removing the microscope parts from the protective foam packaging and checking it over for all components and accessories (see page 7), you can begin assembly.
- 2 Place the *stand* on a stable counter top.
- 3 Place the *head assembly* on top of the *stand* so that the dovetail flange slides into place. Secure with the knurled *head set screw*. NOTE: Do not release the head until it is firmly secured with the head set screw.
- 4 **MODEL 1242MM ONLY:** Attach the upper illuminator power supply to the back of the base. Tighten down with the set screw.
- 5 Attach the *upper illuminator housing* to the trinocular head assembly. Tighten down with the set screw. Plug in the *upper illuminator housing* to the back of the base.
- 6 Slide the *eyepieces* into the eyetubes.
- 7 After removing the *objectives* from their storage containers, individually install each one into the *nosepiece* by twisting them clockwise into the threaded holes of the *nosepiece*.
- 8 **MODEL 1242MM ONLY:** Slide the condenser into the silver condenser mount and secure in place by tightening the set screw located on the front of the mount. Optionally, you may place the included dispersion (frosted) or blue filter inside the swing-out filter holder located at the bottom of the condenser.

Upper Illumination

- 1 Connect the power cord to a suitable power supply; turn on the *upper illuminator* with the *ON/OFF power switch* located on the lower left side of the instrument. If light does not come on, check to see that the *variable illumination control*, located on the lower left side of the instrument, is on the highest setting. Also, try switching the *illuminator toggle switch* located on the lower right side of the stand.
- 2 Remove one of the *objectives* from the *nosepiece*. Rotate the *nosepiece* so that the open position is in the light path. Rotate the *filter wheel* to the “open” (no filter) setting. Verify that the *field iris diaphragm* is fully open. Set the *aperture iris diaphragm* to roughly an 80% closed position. Verify that the left side (white) polarizer slider is pushed in.
- 3 Draw a “+” on a small, white piece of paper and place it onto the *stage*. Position the paper on the *stage* so that the “+” is in the middle of the round light field. A clear image of the lamp filament should be seen reflecting off the paper. If not, adjust the *focusing lever* until the image is clear. The lamp filament image should be in the center of the round field and superimposed over the “+.” If not, rotate the lamp *vertical and horizontal adjustments* until the lamp filament image is centered. Diffuse the upper light by shifting the *focusing lever* to the right.
- 4 Reinstall the *objective* that was removed in Step 2. Turn the *nosepiece* to the 4X *objective* setting. Looking through the *eyepieces*, focus on the “+” on the white piece of paper on the stage. Set the *field iris diaphragm* to about 50% closed. Close the *aperture iris diaphragm* completely. A small, light field in the middle of a larger, darker field should be seen through the *eyepieces*. If what is seen resembles Figure 1A, alternately rotate the *aperture iris diaphragm centering knobs* until the small, light field is centered as in Figure 1B.

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- 5 Fine tuning can be done by opening the *aperture iris diaphragm* until the light field almost fills the entire field. If what is seen through the *eyepieces* resembles Figure 1C, alternately rotate the *aperture iris diaphragm centering knobs* until the light field is centered as in Figure 1D. The upper illumination is now properly centered.
- 6 For normal operation, the *filter wheel* should be set so that the dispersion (frosted) filter is in the light path. This filter disperses the light for much more even illumination across the field of view. The colored filters are often used when applications or samples call for color contrasting.
- 7 The *field iris diaphragm* may need to be closed down to induce additional contrast onto a specimen. This is often necessary, depending on the sample, for the higher power *objectives*.
- 8 For polarized light, push in the right side (blue) *polarizer slider*. Slide the *polarizing analyzer* to the fully up position. When the *polarizing analyzer* is slid into position, the overall field of view should take on a much darker color. Certain colors/shapes should brighten and contrast significantly against the darker field. Polarized light can be very useful for detecting inconsistencies or defects on metal parts, circuit boards, wafers, etc.

Substage (Lower) Illumination [MODEL 1242MM ONLY]

- 1 Connect the power cord to a suitable power supply; turn on the *substage illuminator* with the *ON/OFF power switch* located on the lower left side of the instrument. If light does not come on, check to see that the *variable illumination control*, located on the lower left side of the instrument, is on the highest setting.
- 2
 - Verify that the left side (white) *polarizer slider* is pushed in.
 - Rotate the *nosepiece* until the 10X *objective* is in the light path.
 - Raise the substage assembly fully by turning the substage adjustment knob counter-clockwise.
 - Open the *aperture iris diaphragm* to the largest setting by using the *aperture iris diaphragm adjustment lever* which extends from the *condenser assembly*.
 - While looking into the microscope eyepieces, close the *field iris diaphragm* to the smallest setting by turning the uppermost section of the *substage illuminator* counter-clockwise.
 - Closing the iris in this manner will reduce the field so that a small white hexagon is visible within a black field (see Figure 1A). Focusing of the hexagon is performed by turning the *coarse/fine focus controls*. This white hexagon is the light which is passing through the field iris and should be centered in the black field. If not, move it to the center (see Figure 1B) by tightening and/or loosening the *condenser centering knobs*.
- 3 Fine tuning can be done by opening the *field iris diaphragm* until the white hexagon almost fills the entire field (see Figure 1C), and then readjusting (see Figure 1D). After centering the condenser open the field iris diaphragm slightly wider than the field of view.
- 4 For polarized light, push in the right side (blue) *polarizer slider*. Place the included *substage polarizing analyzer* on top of the field iris diaphragm. Rotate the polarizing analyzer until the overall field of view takes on a much darker color. Certain colors/shapes should brighten and contrast significantly against the darker field.

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Focusing and Mechanical Stage Mechanisms

- 1 Focus the image by turning the *coarse/fine focus control knobs*. The large knob is used for coarse adjustment, while the smaller knob is used for fine adjustment. The coaxial arrangement allows for easy, precise adjustment without stage drift.
- 2 Turning the *coarse/fine focus control* will raise and lower the *stage* vertically. One complete turn of the fine focusing knob will raise or lower the *stage* 0.3mm; the smallest graduation refers to 2µm of vertical movement. One complete turn of the coarse focusing knob will raise or lower the *stage* 3.6mm. To ensure long life, always turn the focusing knobs slowly and uniformly.
- 3 The *focusing tension control knob* is located just inside of the left-hand *focus control knob*. For tighter tension, turn the *control knob* in a clockwise motion. For looser tension, turn the *control knob* in a counterclockwise motion.
- 4 The *up-stop mechanism* is located just inside of the right-hand *focus control knob*. It allows the user to set a maximum point to which the *stage* can be raised to prevent damage to the objective and specimen. To set this point, turn the *up-stop mechanism* in a counterclockwise motion, so that its tab is facing down. Raise or lower the *stage*, by turning the *focus control knobs*, to the desired height. Once achieved, turn the *up-stop mechanism* in a clockwise motion, so that its tab is facing up. Once gently tightened, the *up-stop mechanism* will not allow the *stage* to be raised higher than the set point.
- 5 The *mechanical stage X-Y controls* provide easy and accurate positioning of the sample. One complete turn of the latitudinal (Y) control will move the specimen 34mm. One complete turn of the transverse (X) control will move the specimen 20mm.

Interpupillary and Diopter Adjustment

- 1 Interpupillary adjustment (the distance between eyepieces) is made through a “folding” action. This Seidentopf design allows for a folding adjustment which is quickly and easily done for each user.
- 2 Diopter adjustment allows for proper optical correction based on each individual's eyesight. This adjustment is easily made and is recommended prior to each use by different users to prevent eyestrain.
- 3 Using the 40X *objective* and a sample slide (i.e. one with an easily focusable image), close your left eye and bring the image into focus in your right eye with the *coarse/fine focus control*. Once the image is well-focused using only your right eye, close your right eye and check the focus with your left. If the image is not perfectly focused, make fine adjustments with the *diopter adjustment mechanism* located on the left eyetube. Once complete, the microscope is corrected for your vision.

Lamp Replacement (Upper Illuminator)

- 1 Before attempting to replace or remove the lamp, UNPLUG THE MICROSCOPE FROM ANY POWER SOURCE.
- 2 Remove the illuminator door by loosening the set screw and gently lifting the door up and outwards. The lamp can now be removed simply by grasping the lamp and pulling it from its socket. When replacing, insert the new lamp into the same socket. In addition, be careful not to touch the glass lamp envelope when replacing—use a tissue or other medium to grasp the lamp. This will prevent the oils from your hand from reducing the lamp life. Reattach the illuminator door to the *upper illuminator housing*. Be sure to center the lamp by following steps 1-5 on pages 3-4.