

VAN GUARD[®]

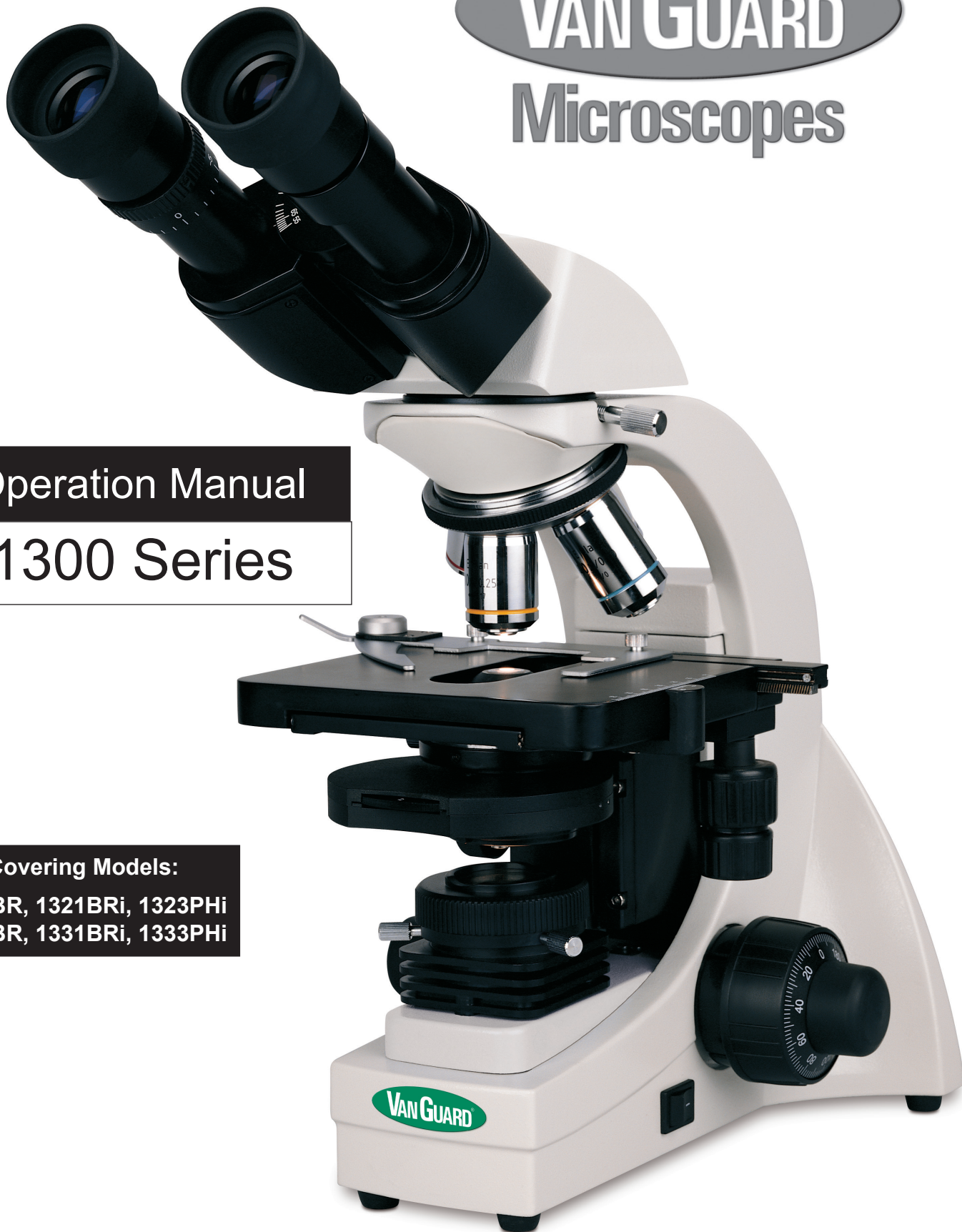
Microscopes

Operation Manual

1300 Series

Covering Models:

1320BR, 1321BRi, 1323PHi
1330BR, 1331BRi, 1333PHi





Introduction

Thank you for purchasing this 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 setting up and using the instrument.

Warranty information and a registration card can be found at the following web address:
www.veegee.com/pages/technical-support-service

1300 Series Compound Microscopes

VanGuard 1300 Series Compound Microscopes provide the necessary specifications for diagnostic and educational use in medical/veterinary clinics, universities, and industrial laboratories.

- Research Level
- Brightfield & Phase Contrast Models
- Infinity & Fixed Focal Length Models
- Precision Optics

Viewing Head. Binocular (Seidentopf), or trinocular (Seidentopf) heads rotate 360° and are inclined at 30°. All models feature interpupillary and dioptic adjustments. The trinocular head features a sliding main prism (80/20 split) to provide full-time imaging when the vertical tube is in use (80% of the image to the vertical tube and 20% to the eyetubes).

Eyepieces. 10X extra-widefield (DIN), high eyepoint with a field number of 20.

Nosepiece. Quadruple, reversed, ball bearing nosepiece with high-grade lubricant and positive stops. The nosepiece is reversed (inward-facing) to allow for easier manipulation of slides and to aid in keeping the objectives clean.

Objectives. Choose from fixed focal length (achromatic) or infinity corrected (plan achromatic). Objectives are made to DIN standards and are anti-reflective coated.

Stage. Delivering a high level of fluid motion control and longevity, the stage measures 135x140mm. Features a removable spring-clip slide holder and a chemical resistant finish. Motion is controlled by a right-hand, low position coaxial control and is driven by a rack and pinion system.

Focusing Movement. Coaxial, ultra-low position, coarse and fine focus controls feature a 23mm focusing range and are graduated to 2 microns per division. Fitted with tension adjustment and safety up-stop.

Condenser. Brightfield models come with a 1.25 N.A. Abbe condenser. Phase contrast models come with a 1.25 N.A. Zernike condenser with phase annulus rings for 10X, 20X, 40X, and 100X; also has a "0" setting for brightfield work. All condensers are mounted on a rack and pinion focusing mechanism and feature spring-loaded centering knobs and iris diaphragm.

Illumination. 20W, 6V variable quartz halogen light source. Comes with blue, green (phase contrast only), and dispersion filters. 0.25A, 250V fuse.

Base. Stable 180 x 225mm fitted with anti-skid rubber feet.

Body. Cast metal, ergonomic body with stain-resistant enamel finish.

Table of Contents

Introduction	2
Environmental Conditions	3
Parts & Accessories	
Included Parts.....	3
Microscope Diagrams.....	4-5
Optional Accessories.....	6
Setup	
Assembly.....	7
Centering the Illuminator.....	7
Substage Adjustments.....	8
Aligning the Phase Contrast Annulus Rings.....	9
Operation	
Variable Lighting Control & Power Switch.....	10
Focusing & Mechanical Stage Mechanisms.....	10
Interpupillary & Diopter Adjustment.....	11
Setting the Up-Stop Mechanism.....	11
Using the Camera Port.....	12
Oil Immersion Objectives.....	13
Using Filters.....	13
Maintenance	
Replacing the Lamp.....	14
Replacement Lamp Information.....	14
Replacing the Fuse.....	15
Replacement Fuse Information.....	15
Caring for your VanGuard Microscope.....	15
Troubleshooting	16-17
Warranty & Service Information	18
Specifications	19



See warranty card for more information:
www.veegee.com/pages/technical-support-service



Parts & Accessories

Environmental Conditions

VanGuard microscopes are highly-precise optical instruments and care should therefore be taken during storage and use to prevent damage due to extreme environmental conditions:

- Intended for indoor use only.
- Avoid placing the microscope in direct sunlight or near water that could penetrate the instrument.
- The working location should be free from mechanical vibrations and chemical vapors.
- Avoid high temperature or humidity, and dusty environments.
- Temperature range: 50 - 104°F (10 - 40°C)
- Humidity: 80% maximum, non-condensing

Included Parts

Model 1320BR

Binocular Head (1 ea.)
Stand (1 ea.)
Brightfield Condenser (1 ea.)
10X Eyepiece (2 ea.)
4X Achromatic Objective (1 ea.)
10X Achromatic Objective (1 ea.)
40X Achromatic Objective (1 ea.)
100X Achromatic Objective (1 ea.)
Dispersion Filter (1 ea.)
Blue Filter (1 ea.)
Power Cable (1 ea.)
Spare Halogen Lamp (1 ea.)
Lamp Replacement Tool (1 ea.)
Spare Fuse (1 ea.)
Dust Cover (1 ea.)
Operation Manual (1 ea.)

Model 1321BRi

Binocular Head (1 ea.)
Stand (1 ea.)
Brightfield Condenser (1 ea.)
10X Eyepiece (2 ea.)
4X, Infinity Corrected, Plan Objective (1 ea.)
10X, Infinity Corrected, Plan Objective (1 ea.)
40X, Infinity Corrected, Plan Objective (1 ea.)
100X, Infinity Corrected, Plan Objective (1 ea.)
Dispersion Filter (1 ea.)
Blue Filter (1 ea.)
Power Cable (1 ea.)
Spare Halogen Lamp (1 ea.)
Lamp Replacement Tool (1 ea.)
Spare Fuse (1 ea.)
Dust Cover (1 ea.)
Operation Manual (1 ea.)

Model 1323PHi

Binocular Head (1 ea.)
Stand (1 ea.)
Phase Contrast Condenser Assembly (1 ea.)
Phase Contrast Centering Telescope (1 ea.)
10X Eyepiece (2 ea.)
10X, Infinity, Plan, Phase Objective (1 ea.)
20X, Infinity, Plan, Phase Objective (1 ea.)
40X, Infinity, Plan, Phase Objective (1 ea.)
100X, Infinity, Plan, Phase Objective (1 ea.)
Dispersion Filter (1 ea.)
Blue Filter (1 ea.)
Green Filter (1 ea.)
Power Cable (1 ea.)
Spare Halogen Lamp (1 ea.)
Lamp Replacement Tool (1 ea.)
Spare Fuse (1 ea.)
Dust Cover (1 ea.)
Operation Manual (1 ea.)

Model 1330BR

Trinocular Head (1 ea.)
Stand (1 ea.)
Brightfield Condenser (1 ea.)
10X Eyepiece (2 ea.)
4X Achromatic Objective (1 ea.)
10X Achromatic Objective (1 ea.)
40X Achromatic Objective (1 ea.)
100X Achromatic Objective (1 ea.)
Dispersion Filter (1 ea.)
Blue Filter (1 ea.)
Power Cable (1 ea.)
Spare Halogen Lamp (1 ea.)
Lamp Replacement Tool (1 ea.)
Spare Fuse (1 ea.)
Dust Cover (1 ea.)
Operation Manual (1 ea.)

Model 1331BRi

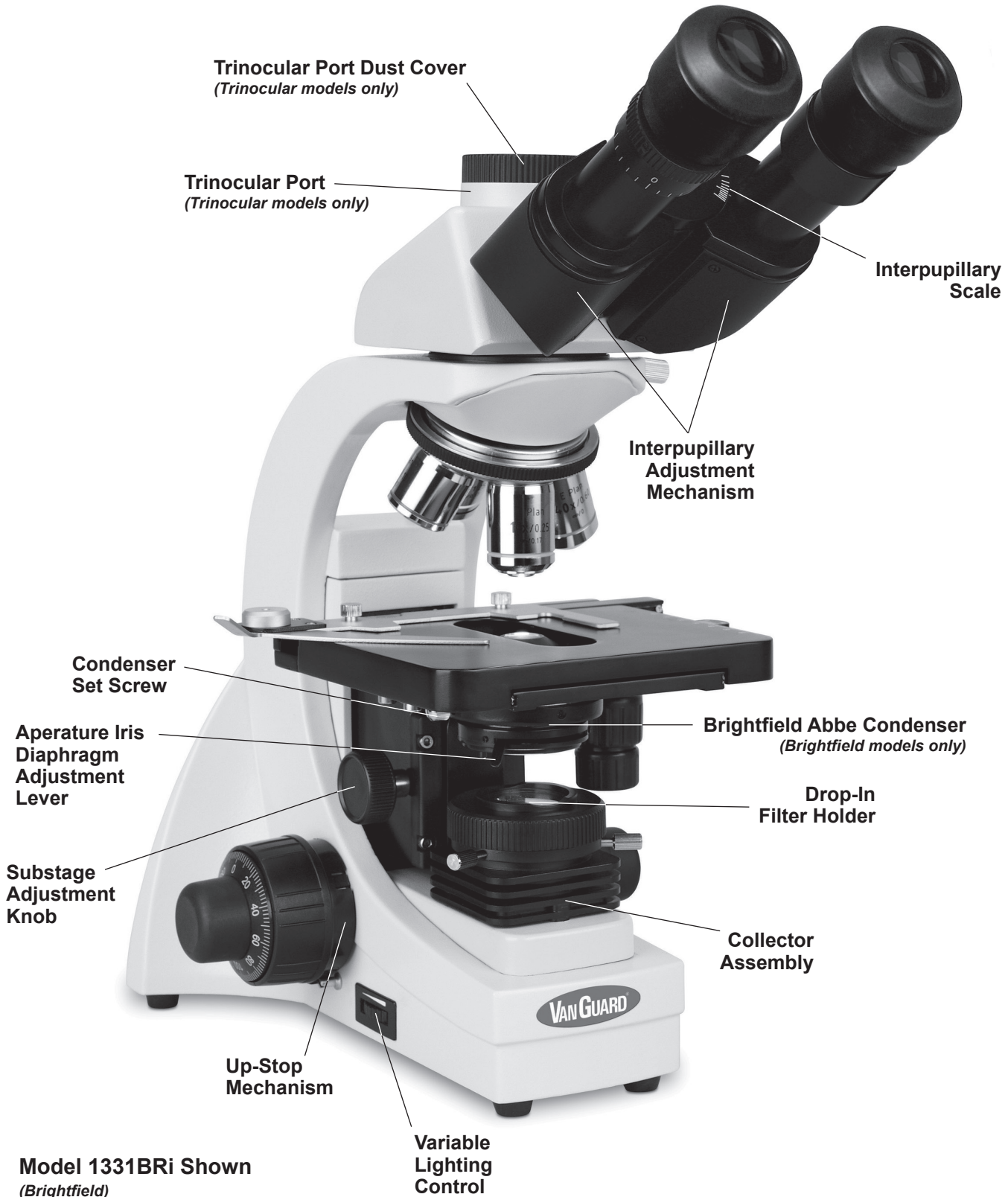
Trinocular Head (1 ea.)
Stand (1 ea.)
Brightfield Condenser (1 ea.)
10X Eyepiece (2 ea.)
4X, Infinity Corrected, Plan Objective (1 ea.)
10X, Infinity Corrected, Plan Objective (1 ea.)
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Model 1333PHi

Trinocular Head (1 ea.)
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Phase Contrast Condenser Assembly (1 ea.)
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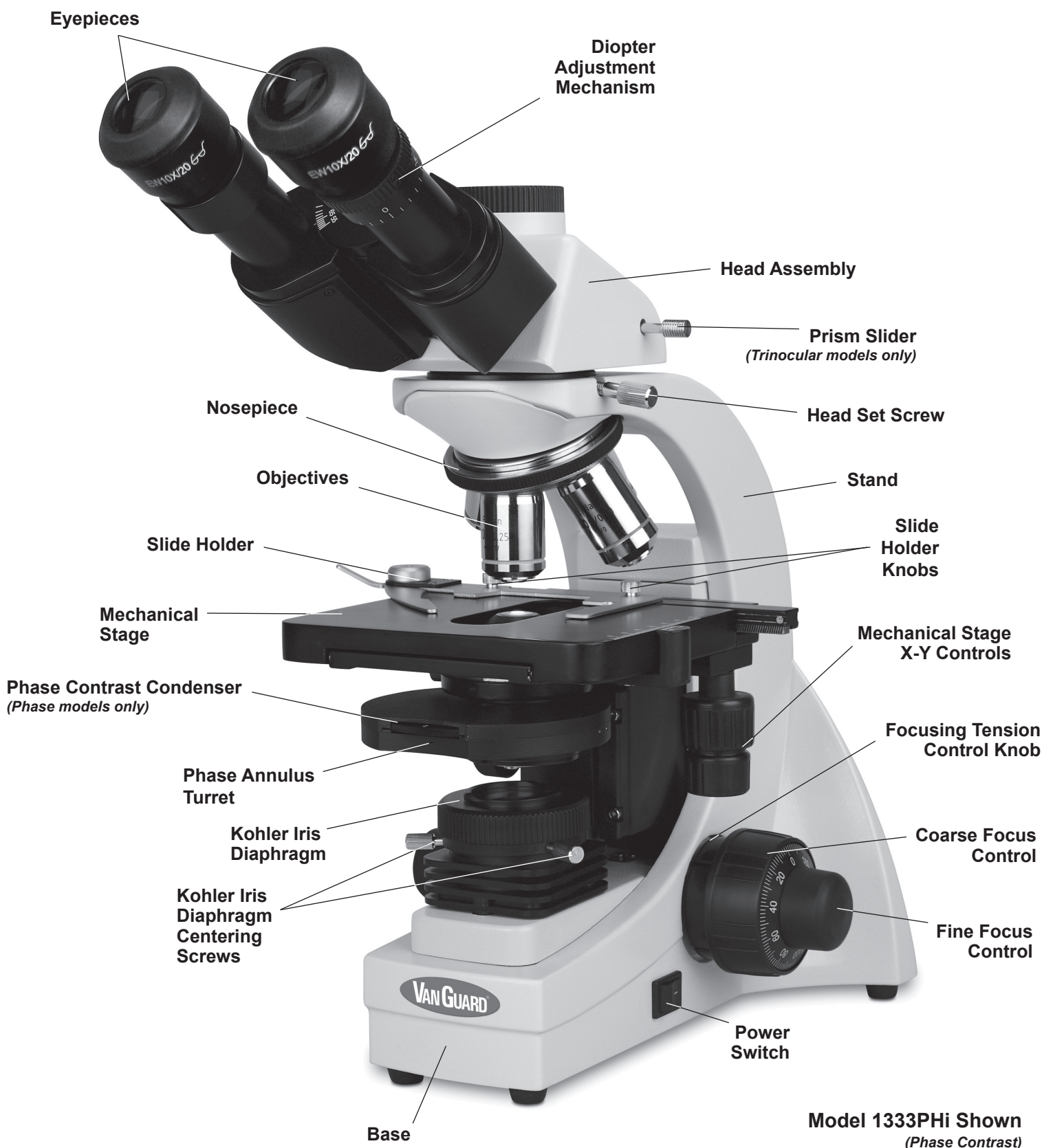


Parts & Accessories





Parts & Accessories



Model 1333PHi Shown
(Phase Contrast)



Parts & Accessories

Optional Accessories:

Digital Camera Systems:

Part Number	Description
1400-CDPC-3	USB Digital Camera Kit with Adapters and Microscopy Software, 3 Megapixels
1400-CDPC-5	USB Digital Camera Kit with Adapters and Microscopy Software, 5 Megapixels
1400-CDPC-10	USB Digital Camera Kit with Adapters and Microscopy Software, 10 Megapixels

Consumables:

Part Number	Description
1200-IOG	Immersion Oil, Low Viscosity, 1/4 fl oz

For information about parts, accessories, or service -- contact your dealer directly or contact VanGuard Microscopes at 800-423-8842 | sales@veegee.com | veegee.com

VAN GUARD® Setup

Assembly

The next three pages are dedicated to setting up the microscope. The following “Operation” section explains the various features of the microscope and how to use them.

- 1 Remove the microscope parts from the protective foam and plastic packaging. Check for all components and accessories (see list on page 3), then 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 head flange slides into the flange mount.

NOTE: Do not release the head until it is firmly secured with the head set screw.

- 4 Secure with the head set screw (figure 1a).
- 5 Remove the dust caps from the eyetubes, then insert the eyepieces into the eyetubes (figure 2).

- 6 After removing the objectives from their storage containers, individually install each one into the nosepiece by threading them clockwise into the threaded holes of the nosepiece (see figure 3). It is generally considered best practice to install the objectives in numerical order from lowest to highest magnification.

Centering the Illuminator

Verifying that the illuminator is centered will allow maximum light to reach the specimen. This process should be performed during initial setup and whenever replacing the lamp.

- 1 Be sure the microscope’s power is turned off and allow sufficient time for the lamp to cool completely.
- 2 Remove the collector assembly by grasping the lower beige section (figure 4a) while pulling upwards and out at the same time. The collector assembly is held in place by magnets and will come loose with a minimal amount of force.
- 3 The lamp (figure 4b) should be centered in the lamp socket (figure 4c). If it is not, grasp the lamp using a tissue being careful not to touch the glass envelope with your bare fingers and reposition the lamp so that the filament is positioned at the center of the socket.
- 4 Reinstall the collector assembly making sure that the rear of the collector is fitted underneath the metal retaining plate (figure 4d).

All Models

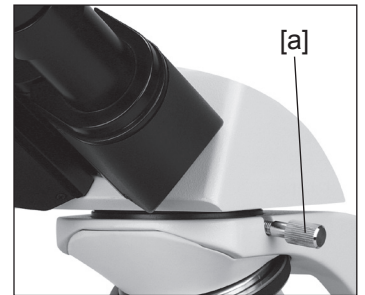


Figure 1



Figure 2



Figure 3

All Models

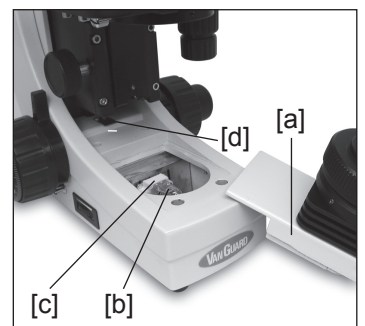
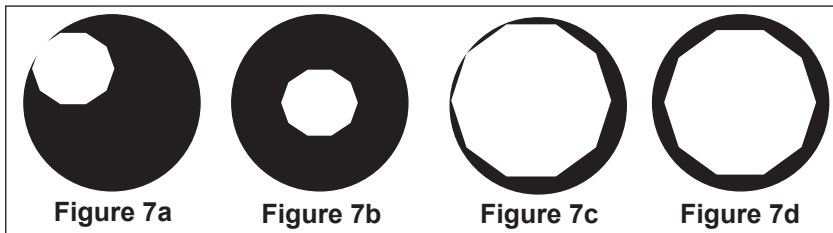


Figure 4

VAN GUARD® Setup

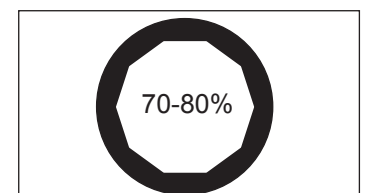
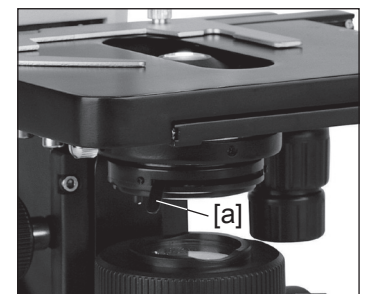
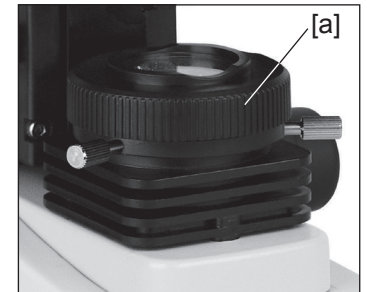
Substage Adjustments

- Centering:** Although the condenser comes pre-centered you may find it necessary to check it occasionally. A simple method for centering is as follows:
 - Rotate the nosepiece until the 10X objective is in the light path. For phase contrast models set the phase annulus turret to the “0” position.
 - Raise the substage assembly fully by turning the substage adjustment knob counter-clockwise. Be careful not to crash the condenser lens into the objectives.
 - Open the Kohler field iris diaphragm to the largest setting by rotating the adjustment ring (figure 5a) clockwise.
 - Slide the aperture diaphragm lever (figure 6a) to the right to close the aperture iris.
 - Closing the aperture diaphragm will reduce the field so that a small white hexagon is visible within a black field (figure 7a). Remove one of the eyepieces and view the image directly through the empty eyetube. Focus the hexagon by adjusting the substage adjustment knob. This white hexagon should be centered in the black field. If not, using a 1.5mm hex wrench first loosen the two condenser centering screws located at the rear of the condenser mount, then reposition the condenser until the iris is properly centered within the black field (figure 7b). Finally, tighten the condenser centering screws back down.
 - Fine tune by opening the aperture iris diaphragm until the white hexagon almost fills the entire field (figure 7c), and then readjust (figure 7d) by using the instructions in the previous step. After centering the condenser, open the aperture iris diaphragm slightly wider than the field of view.



- Vertical Focusing:** The condenser can be raised and lowered with the substage adjustment knob to focus the light for optimal illumination.
- Aperture Iris Diaphragm Adjustment:** To achieve the best contrast, resolution, and depth of field, the aperture diaphragm should be set to approximately 70-80% of the field (figure 8) to match the objective’s numerical aperture. Adjust the aperture iris diaphragm with the aperture iris diaphragm lever (figure 6a) located at the bottom of the condenser.
- Field Iris Diaphragm Adjustment:** The field diaphragm can be used to limit unwanted peripheral light from entering the condenser and interfering with the image quality.

All Models



VAN GUARD® Setup

Aligning the Phase Contrast Annulus Rings

The phase annulus rings come pre-aligned therefore it is not necessary to adjust them before use. Should it be necessary in the future (due to replacement of phase condenser or objectives) follow these steps:

- 1 Center the condenser following the steps in the “Substage Adjustments” section.
- 2 Set the objectives so they are in the approximate position for actual use. This is best achieved by placing a slide on the stage, rotating the 100X objective into position, and raising the stage until the tip of the 100X objective is just above the slide (almost touching).
- 3 Rotate the nosepiece until the 10X objective is in the light path.
- 4 Rotate the annulus turret in the phase contrast condenser until the “10” is seen in the viewing window.
- 5 Raise the substage all the way and completely open the aperture diaphragm as well as the field diaphragm.
- 6 Remove an eyepiece from one of the eyetubes and replace with the phase contrast centering telescope.
- 7 Looking through the phase contrast centering telescope, rotate the uppermost section of the phase contrast centering telescope until the image is in focus. The image seen through the phase contrast centering telescope should resemble rings superimposed on one another (figures 9 & 10).
- 8 Insert a small slotted screwdriver into one of the two access slots in the rear of the condenser (figure 11) to access the adjustment screws (or preferably use two screwdrivers at the same time, one in each access slot). While looking through the centering telescope, watch the white ring move as you turn the adjustment screw(s) in either direction. You will need to make adjustments to one or both of the screws in order to properly overlap the black annulus ring with the white ring (figure 10). If you're having problems discerning the rings from the background or from internal reflections make sure that the telescoping eyepiece is properly focused and that the substage height is adjusted correctly.
- 9 You will need to make this adjustment for each new phase objective or for all phase objectives if you are replacing the phase condenser with a new one. Be sure to match the phase annulus setting on the condenser to the appropriate phase objective when aligning.
- 10 Once the phase rings are aligned, remove the phase contrast centering telescope and replace with the standard eyepiece.

NOTE: Brightfield work can be achieved on models with a phase contrast condenser. The “0” setting on the phase annulus turret is used for this purpose.

Phase Contrast Models

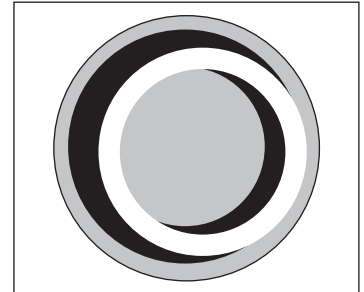


Figure 9

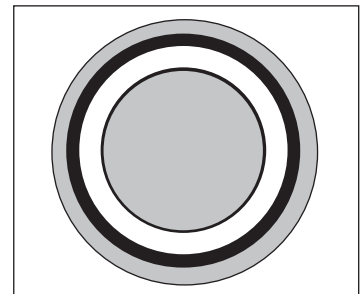


Figure 10

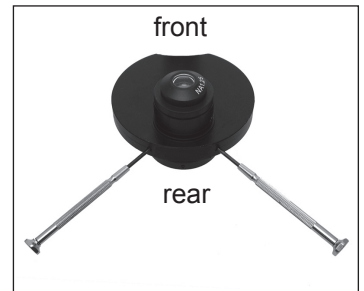


Figure 11

VAN GUARD[®] Operation

Variable Lighting Control and Power Switch

- 1 The rocker switch located on the right hand side of the microscope (figure 12) turns the power on or off. To turn the power on press the rocker on the end marked "I". To turn the power off press the rocker on the end marked "O".
- 2 VanGuard 1300 Series microscopes are equipped with a variable lighting control, located on the left side of the microscope, which allows the user to set the lighting anywhere between off and full brightness (figure 13). To increase the brightness roll the wheel towards the front of the microscope.

Focusing and Mechanical Stage Mechanisms

- 1 Turn the coarse/fine focus controls (figure 14a) to adjust the image focus. The larger, outer knob is used for coarse adjustment, the smaller knob for fine adjustment.
- 2 Turning the coarse/fine focus controls raises and lowers the stage vertically. One complete turn of the fine focusing knob raises or lowers the stage 0.3mm; the smallest graduation refers to 2 microns of vertical movement. One complete turn of the coarse focusing knob raises or lowers the stage 3.6mm. To ensure long life, turn the focusing knobs slowly and uniformly.
- 3 The focusing tension control is located just inside of the right-hand focus control knob (figure 14b). For tighter tension, use the included tension control wrench to turn the control in a clockwise motion. For looser tension, turn the control in a counterclockwise motion.
- 4 Illuminator Focusing: The condenser can be raised and lowered with the substage adjustment knob (figure 15a) to focus the light for optimal illumination.
- 5 Aperture Iris Diaphragm Adjustment: In order to achieve the best contrast, resolution, and depth of field, the aperture diaphragm should be set to approximately 70-80% of the field to match the objective's numerical aperture. Adjust the aperture iris diaphragm with the aperture iris diaphragm lever (figure 16a) located at the bottom of the condenser.
- 6 Field Iris Diaphragm Adjustment: The field diaphragm (figure 16b) is opened or closed by rotating the adjustment ring and can be used to limit unwanted peripheral light from entering the condenser and interfering with the image quality.
- 7 The mechanical stage X-Y controls, located underneath the right-hand side of the stage (figure 14c), provide easy and accurate positioning of the sample. One complete turn of the longitudinal (X) control (lower half of the stage controls) will move the specimen 34mm left or right. One complete turn of the transverse (Y) control (upper half of the stage controls) will move the specimen 20mm front or back.
- 8 The spring-loaded slide holder can be removed for users who prefer to not use it. Simply unthread the slide holder knobs (figure 16c), which lock the slide holder on the stage, and remove the slide holder.

All Models



Figure 12



Figure 13

All Models

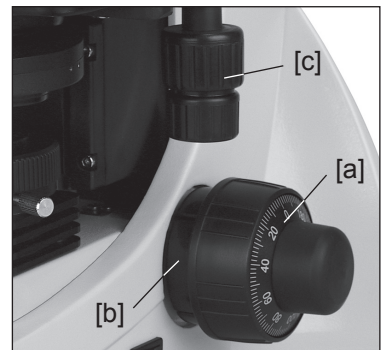


Figure 14

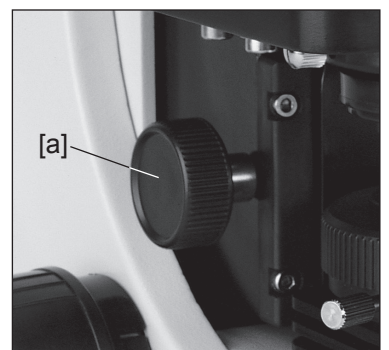


Figure 15

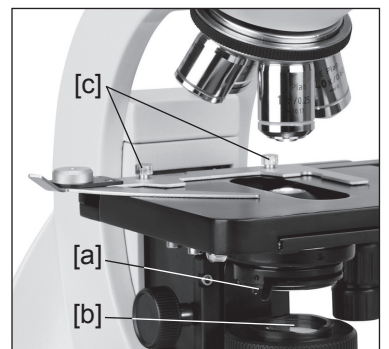


Figure 16

VAN GUARD[®] Operation

Interpupillary and Diopter Adjustment

- 1 Interpupillary adjustment (the distance between the eyepieces) is made through a “folding” action. The Seidentopf design allows for a folding adjustment which is quickly and easily done for each user (figure 17).
- 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.
 - Using the 40X objective and a sample slide (i.e., one which produces an easily focused image), close your right eye and bring the image into focus in your left eye with the coarse/fine focus control.
 - Once the image is well focused using only your left eye, set the diopter dial (figure 18a) on the right eyetube to “0” then close your left eye and check the focus with your right.
 - If the image is not perfectly focused, make fine adjustments with the diopter dial.
- 3 Once complete, the microscope is corrected for your individual vision.

Setting the Up-Stop Mechanism

The up-stop mechanism is located just inside of the left-hand focus control knobs (figure 19a). It allows the user to set a maximum point to which the stage can be raised, which prevents damage to the specimen and objective.

- 1 To set this point, first unlock the stop by pressing against the lever and rotating counter-clockwise.
- 2 Raise or lower the stage to the desired height by turning the focus control knobs. Be careful not to raise the stage high enough to crash into the objective.
- 3 Once achieved, relock by rotating the up-stop mechanism in a clockwise motion, so that its tab is facing upward (see figure 19a).
- 4 Once gently tightened, the up-stop mechanism will not allow the stage to be raised higher than the set point.

All Models



Figure 17

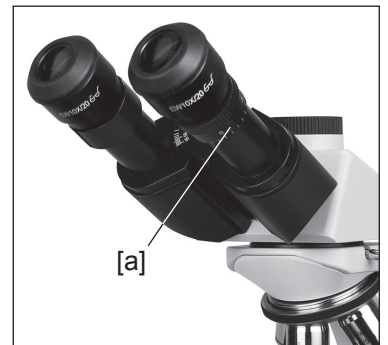


Figure 18

All Models

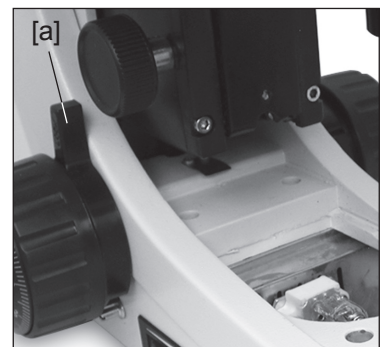


Figure 19

VAN GUARD[®] Operation

Using the Camera Port

- 1 Remove the trinocular port dust cap (figure 20a) from the trinocular port by unthreading.

- 2 Carefully thread the camera port (figure 21a) into the trinocular port in a clockwise direction until tight.
- 3 Assemble the adapters and connect to the camera using the instructions provided with the camera/adaptor kit.

Note: Camera kit is not included with this microscope.

- 4 Remove the camera port dust cap (figure 21b), then slide the adapter into the camera port.
- 5 Pull the prism slider (figure 21c) completely out to divert the image to the camera port. The 1300 Series trinocular microscopes utilize an 80/20 split sliding prism. This split prism diverts 80% of the light to the camera port and the remaining 20% to the eyepieces when engaged. This allows the eyepieces to be used while the prism slider is pulled out, although the image seen through the eyepieces will be dim when compared to normal use.

Note: When the camera port is not in use, be sure to cover with the camera port dust cap.

Trinocular Models



Figure 20

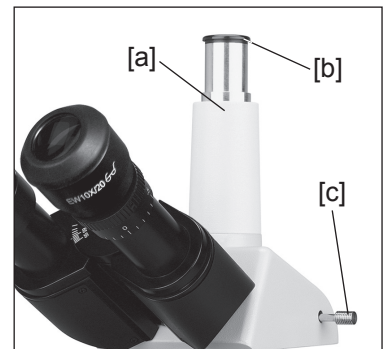


Figure 21

Operation

Oil Immersion Objectives

All Models

The 100X objective that comes with this microscope must be used with immersion oil in order to maintain image quality. After use, the objective tip needs to be wiped clean so that no oil residue remains.

Procedure for using immersion oil:

- 1 Place one drop of immersion oil on the prepared slide.
- 2 Slowly lower the 100X objective until it makes contact with the drop of immersion oil. You should now be able to focus on the specimen.

Procedure for cleaning the 100X oil immersion objective:

- 1 Lightly moisten a cotton swab with lens cleaner.
- 2 Wipe the objective with a twisting motion in order to remove all traces of the immersion oil.
- 3 Check that all immersion oil has been removed before storing the objective.

Note: Under no circumstances should an oil immersion objective be left sitting in oil for an extended period of time. Exceptionally long immersion periods can cause oil to penetrate the objective's sealant and obscure the optics, which is not covered under warranty.

Note: You should avoid getting oil on any objective other than the 100X, as they are not sealed. Pay particular attention to the 40X, given its resemblance to the 100X objective.

Using Filters

All Models

Your Vanguard Microscope was supplied with two or three filters. Brightfield models come with a dispersion (frosted) filter and a blue filter. Phase contrast models have an additional green filter.

Procedure for Using Filters:

- 1 Locate the drop-in filter holder located on the top of the collector.
- 2 Insert the desired filter into the filter holder.

Dispersion filters can be used to soften harsh illumination for both viewing and photomicroscopy. This filter can also be used to control photograph exposure levels.

The **green filter** is used mainly for added contrast and photograph color correction during phase contrast work.

The **blue filter** is used to approximate natural light and photograph color correction.

Filtering is a user preference and application specific issue; therefore, further discussion is beyond the scope of this manual. There are many sources available that explain proper filtering technique and theory.



Maintenance

Replacing the Lamp

- 1 Before attempting to replace or remove the lamp, **unplug the microscope from any power source and allow the bulb to cool completely.**
- 2 Fully raise the stage and substage assemblies. Be careful not to crash the objective into the stage or condenser lens.
- 3 Grasp the collector assembly by the lower beige section (figure 22a) while pulling upwards and out at the same time. The collector assembly is held in place by magnets and will come loose with a minimal amount of force.

- 4 Once the collector assembly is detached, remove the lamp (figure 23a) by grasping it and pulling it out from the socket (figure 23b).

Note: *Be careful not to touch the glass bulb when replacing—use a tissue or other medium to grasp the bulb. This will prevent the oils from your hand from reducing lamp life. If contact is made with the bulb, clean with rubbing alcohol and allow a brief drying period.*

- 5 When replacing, first insert the new lamp into the included lamp replacement tool (figure 24). Then use the lamp replacement tool to insert the lamp into the lamp socket (figure 25). The lamp should be properly centered within the lamp socket for optimal illumination. Remove the lamp replacement tool after insertion.
- 6 Reinstall the collector assembly making sure that the rear of the collector is fitted underneath the retaining plate (figure 23c).
- 7 Return the microscope to normal operating position.

Replacement Lamp—20W, 6V Halogen (Cat. No. 1400-20WHL)

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All Models



Figure 22

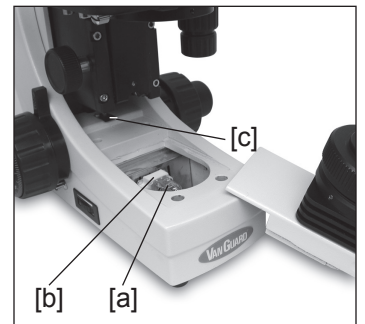


Figure 23



Figure 24

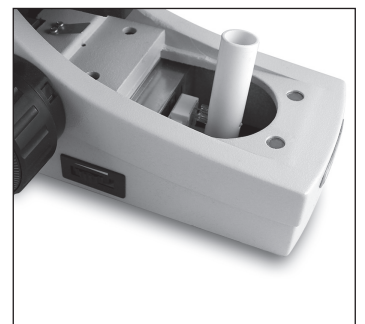


Figure 25

VAN GUARD® Maintenance

Replacing the Fuse

If the microscope is plugged in but the bulb is not turning on, the fuse could be blown. The instructions below detail how to check for a blown fuse. You can tell a fuse is blown if the wire inside the glass is broken, the glass is blackened, or by performing a continuity test.

**Before attempting to replace or remove the fuse
UNPLUG THE MICROSCOPE FROM ANY POWER SOURCE!**

- 1 Remove the fuse holder from the rear of the microscope (figure 26a) by using a slotted screwdriver to push inward while turning counter-clockwise.
- 2 Remove the fuse from the fuse holder (figure 26b).
- 3 If the fuse is blown, replace it by inserting a new fuse into the fuse holder.
- 4 Replace the fuse holder back into the microscope by pushing inward then turning in a clockwise direction with the slotted screwdriver. **Do not overtighten!**

Replacement Fuse—0.25A, 250V (Cat. No. 1400-FS1)

Caring for your VanGuard Microscope

- 1 The eyepieces and objective lenses on VanGuard Microscopes have delicate, optical coatings. Therefore they should **never** be wiped while dry because any dirt or dust will scratch the coating. Blow off the lens surface with an air-bulb and lens brush. Then use a lens cleaning solution. **Never use anything other than lens cleaner on any optical component.** Apply with a cotton swab for a minimum of wetting, then wipe the surface clean with a quality lens tissue.
- 2 The same care instructions apply to all optical parts on this VanGuard Microscope, including the substage condenser and the collector lenses.
- 3 All other parts can be cleaned with a paper towel and mild detergent. Be aware that rubbing alcohol can break down lubricants and damage the painted surfaces; it is therefore not recommended. If used, be careful when cleaning near the following parts:
 - Stage rack and pinion gears
 - Focus controls
 - Nosepiece
 - Substage gears
 - Substage controls
- 4 Xylene, since it breaks down the bonding material holding the lenses, should never be used as a cleaner.
- 5 Periodically, your VanGuard Microscope should be fully serviced by a qualified service technician.
- 6 In order to keep dust and debris out of the optical pathways, always keep the camera port and eyetubes covered (with either eyepieces or dust caps), and always use the dust cover when the microscope is not in use.

All Models

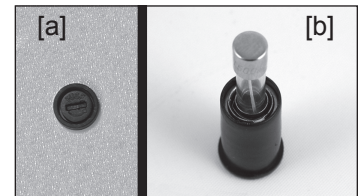


Figure 26

All Models

For information about parts, accessories, or service -- contact your dealer directly or contact VanGuard Microscopes at 800-423-8842 | sales@veegee.com | veegee.com



Troubleshooting

Symptom: No light visible from collector					
Step #	Possible Cause	How To Test	Test Result?	Solution	For More Info
1	Light is not switched on	Visually inspect	Switched on	Go to next step	
			Not switched on	Move power switch to on position	Page 10
2	Power cord not plugged in	Visually inspect	Plugged in	Go to next step	
			Not plugged in	Plug power cord into outlet	
3	Variable lighting control (VLC) turned all the way down	Visually inspect	VLC turned up	Go to next step	
			VLC turned down	Turn VLC up	Page 10
4	Microscope not getting power	Inspect outlet	Good outlet	Go to next step	
			Outlet not good	Plug power cord into working outlet	
5	Blown fuse	Visually inspect or try new fuse	Good fuse	Go to next step	
			Fuse is blown	Install new fuse	Page 15
6	Burnt out light bulb	Visually inspect or try new bulb	Good bulb	Contact dealer or VanGuard Microscopes	Page 18
			Bulb is burnt out	Install new bulb	Page 14

Symptom: Image through eyepiece(s) too dim					
Step #	Possible Cause	How To Test	Test Result?	Solution	For More Info
1	Variable lighting control (VLC) is turned down too far	Visually inspect	VLC is turned up	Go to next step	
			VLC is turned down	Turn VLC up	Page 10
2	Light bulb not centered properly	Visually inspect	Bulb is centered	Go to next step	
			Bulb is not centered	Center the bulb	Page 7
3	Condenser not centered properly	Check condenser centering	Condenser is centered	Go to next step	
			Condenser not centered	Center the condenser	Page 8
4	Condenser height not correct	Visually inspect	Height is correct	Go to next step	
			Height is not correct	Adjust condenser height	Page 8
5	Dirty condenser or collector lens	Visually inspect	Lenses are dirty	Clean condenser and/or collector lenses	Page 15
			Lenses are clean	Contact dealer or VanGuard Microscopes	Page 18

Symptom: The stage won't raise up high enough					
Step #	Possible Cause	How To Test	Test Result?	Solution	For More Info
1	Up-stop mechanism is set too low	Visually inspect	Set correctly	Go to next step	
			Set incorrectly	Adjust up-stop correctly	Page 11
2	Stage is set at maximum height	Visually inspect	At maximum height	Stage can't be raised any higher	
			Not at maximum height	Contact dealer or VanGuard Microscopes	Page 18

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Troubleshooting

Symptom: <i>No image visible in eyepiece(s) or trinocular port</i>					
Step #	Possible Cause	How To Test	Test Result?	Solution	For More Info
1	Light is not switched on	Visually inspect	Switched on	Go to next step	
			Not switched on	Move power switch to on position	Page 10
2	Variable lighting control (VLC) is set too low	Visually inspect	Not set too low	Go to next step	
			Set too low	Increase VLC level	Page 10
3	Objectives not installed	Visually inspect	Objectives are installed	Go to next step	
			Objectives not installed	Install objectives	Page 7
4	Prism slider in wrong position (trinocular models only)	Visually inspect	In correct position	Go to next step	
			Not in correct position	Set to correct position	Page 12
5	Light path blocked	Visually inspect space between illuminator and objectives	Blockage present	Remove blockage	
			Nothing blocking	Contact dealer or VanGuard Microscopes	Page 18

Symptom: <i>Can't focus on specimen image</i>					
Step #	Possible Cause	How To Test	Test Result?	Solution	For More Info
1	Up-stop is set too low	Visually inspect	Set correctly	Go to next step	
			Set incorrectly	Adjust up-stop correctly	Page 11
2	Using an immersion objective without immersion oil	Visually inspect	Oil is being used	Go to next step	
			Oil is not being used	Use immersion oil	Page 13
3	Oil in objective or dirty objective	Visually inspect	Objective is clean	Go to next step	
			Objective is not clean	Clean or replace objective	Pages 13 & 15
4	Slide is upside down	Visually inspect	Slide is correct side up	Go to next step	
			Slide is upside down	Flip slide over	
5	Cover glass is too thick	Visually inspect	Cover glass is too thick	Use #1.5 (0.17mm) cover glass	
			Cover glass is correct	Contact dealer or VanGuard Microscopes	Page 18

Symptom: <i>The stage keeps drifting downward</i>					
Step #	Possible Cause	How To Test	Test Result?	Solution	For More Info
1	Focus tension is set too loose	Check focus tension control	Tension too loose	Increase tension	Page 10
			Tension set correctly	Contact dealer or VanGuard Microscopes	Page 18

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Warranty & Service

5 Year Limited Warranty

VanGuard microscopes are warranted by VEE GEE Scientific LLC to be free from defects in material and workmanship for a period of five (5) years from the date of purchase, except for electrical components which have a one (1) year limited warranty. During this period, VEE GEE Scientific, or its authorized service station, will at their option and without charge, either repair or replace any part found to be defective in materials or workmanship.

This warranty is subject to the following limitations and exceptions and will not apply if:

- 1) There is lack of proof of date and place of purchase. The purchase invoice must accompany the unit when sent in for repair. The warranty extends to the original consumer purchaser only and is not assignable or transferable.
- 2) The damage is due to normal wear and tear, misuse, abuse, negligence, accident, inadequate maintenance, disregard for operating instruction, or to any other cause not due to the manufacture of the microscope (e.g., objective failure because of oil penetration due to lack of timely cleaning).
- 3) The serial numbers, names, and/or functions are altered or obliterated; or unauthorized repair or replacement of parts by the End-User or an unauthorized third party while under warranty.
- 4) Consumable items (such as, but not limited to, bulbs) have failed.

This warranty expressly excludes transportation damage and adjustment or readjustment. In no case shall VEE GEE Scientific be liable to the Buyer or any person for any special, indirect, incidental, or consequential damage whether claims are based in contract or otherwise with respect to or arising out of product furnished hereunder. For goods manufactured by any third party, VEE GEE Scientific's liability under warranty is limited to the terms of the warranty by the supplier for the goods. All warranty work shall be performed at the authorized service center. Contact your distributor or VEE GEE Scientific to discuss the problem and obtain instructions for the return of your microscope for repair. The original purchaser returning this product must prepay all postage, shipping, transportation, packaging, and delivery costs.

If you experience problems setting up your microscope or have service related questions please contact your dealer or VanGuard Microscopes directly at 1-800-423-8842.

Our standard business hours are 7:00 a.m. - 5:00 p.m. Central Standard Time.

Contact Information:

Toll Free	800-423-8842
Email	sales@veegee.com techsupport@veegee.com
Web	veegee.com





Specifications

Viewing Head:	Trinocular/Binocular
Viewing Head Type:	Seidentopf
Head Rotation:	360°
Head Inclination:	30°
Sliding Prism:	80/20 Split [Trinocular Models]
Interpupillary Adjustment:	55-75mm
Dioptric Adjustment:	-5 to +5
Eyepiece Magnification:	10X Extra-Widefield, High Eyepoint
Eyepiece Field Diameter:	20mm
Nosepiece:	Quadruple Position/Reversed
Brightfield Objectives:	4X [0.10 NA, 28.0mm WD]
[Achromatic or Plan Achromatic]	10X [0.25 NA, 7.4mm WD]
	20X [0.40 NA, 5.8mm WD]
	40X [0.65 NA, 0.70mm WD]
	60X [0.85 NA, 0.30mm WD]
	100X(oil) [1.25 NA, 0.25mm WD]
Phase Contrast Objectives:	10X [0.25 NA, 7.4mm WD]
[Plan Achromatic]	20X [0.40 NA, 5.8mm WD]
	40X [0.65 NA, 0.70mm WD]
	100X(oil) [1.25 NA, 0.25mm WD]
Stage Dimensions:	135mm x 140mm
Stage Motion:	Right-Hand Coaxial Control/Rack & Pinion Drive
Stage Movement Range:	50 x 80mm
Focusing Movement:	Coaxial Coarse & Fine Controls/Safety Up-Stop
Focusing Range:	40mm
Focusing Graduation:	2 Microns/Division
Brightfield Condenser:	1.25 NA Abbe Condenser with Iris Diaphragm
Phase Contrast Condenser:	1.25 NA Zernike Condenser with Iris Diaphragm
Phase Centering Tool:	Telescoping Eyepiece [Included]
Lower Illumination:	20W, 6V Variable Quartz Halogen
Fuse:	0.25A, 250V
Voltage:	110V
Base Dimensions:	175mm x 225mm
Overall Dimensions:	380mm (L) x 200mm (W) x 375mm (H)
Weight:	7kg

NA = Numerical Aperture
WD = Working Distance



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veegee.com | 800-423-8842

sales@veegee.com | techsupport@veegee.com

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