VAN GUARD

Microscopes

Operation Manual

1400 Series

Covering Models:

1420BR, 1421BR, 1430BR, 1431BR, 1423PH & 1433PH

1.888.610.7664 www.calcert.com sales@calcert.com

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.

1400 Series Compound Microscopes

The 1400 Series Compound Microscopes are the flagship of the VanGuard Microscope Line. Combining top performance with highly-advanced features and optics, the 1400 Series models produce images of the utmost in clarity. Choose from brightfield or phase contrast.

Viewing Head. Binocular or trinocular (Seidentopf) heads rotate 360° and are inclined at 30°. All models feature interpupillary and dioptric adjustment. The trinocular heads feature a sliding main prism (70/30 split) to provide full-time imaging when the vertical tube is in use. (70% of the image to the vertical tube and 30% to the viewing eyetubes).

Eyepieces. 10X widefield (DIN) with a field number of 18.

Nosepiece. Quadruple or quintuple, 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. Achromatic or plan achromatic objectives are available on the brightfield models. Plan achromatic objective come standard on the phase contrast models. All objectives are made to DIN standards and are coated.

Stage. Delivering a high level of fluid motion control and longevity, the stage measures 140mm x 140mm. 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 40mm focusing range and are graduated to 2 microns per division. Fitted with tension adjustment and safety autostop.

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 “zero” setting for brightfield work. All condensers are mounted on a rack and pinion focusing mechanism and feature spring-loaded centering knobs and an iris diaphragm with a swing-in filter holder.

Illumination. 20W variable quartz halogen light source. Comes with blue, green (phase contrast models only), and neutral density filters.

Base. Stable 225mm x 160mm base fitted with anti-skid rubber feet.

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

Dimensions. 225mm (L) x 160mm (W) x 400mm (H); 8.3kg.

Table of Contents

See warranty details on page 16 for more information.
Warranty card available at:

VAN GUARD® Parts & Accessories

Included Parts:

Model 1420BR
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.)
Neutral Filter (1 ea.)
Blue Filter (1 ea.)
Power Cord (1 ea.)
Instruction Manual (1 ea.)
Dust Cover (1 ea.)

Model 1421BR
Binocular Head (1 ea.)
Stand (1 ea.)
Brightfield Condenser (1 ea.)
10X Eyepiece (2 ea.)
4X Plan Objective (1 ea.)
10X Plan Objective (1 ea.)
40X Plan Objective (1 ea.)
100X Plan Objective (1 ea.)
Neutral Filter (1 ea.)
Blue Filter (1 ea.)
Power Cord (1 ea.)
Instruction Manual (1 ea.)
Dust Cover (1 ea.)

Model 1430BR
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.)
Neutral Filter (1 ea.)
Blue Filter (1 ea.)
Power Cord (1 ea.)
Instruction Manual (1 ea.)
Dust Cover (1 ea.)

Model 1431BR
Trinocular Head (1 ea.)
Stand (1 ea.)
Brightfield Condenser (1 ea.)
10X Eyepiece (2 ea.)
4X Plan Objective (1 ea.)
10X Plan Objective (1 ea.)
40X Plan Objective (1 ea.)
100X Plan Objective (1 ea.)
Neutral Filter (1 ea.)
Blue Filter (1 ea.)
Power Cord (1 ea.)
Instruction Manual (1 ea.)
Dust Cover (1 ea.)

Model 1423PH
Binocular Head (1 ea.)
Stand (1 ea.)
Phase Contrast Condenser (1 ea.)
Phase Contrast Centering Telescope (1 ea.)
10X Eyepiece (2 ea.)
10X Plan Phase Objective (1 ea.)
20X Plan Phase Objective (1 ea.)
40X Plan Phase Objective (1 ea.)
100X Plan Phase Objective (1 ea.)
Neutral Filter (1 ea.)
Blue Filter (1 ea.)
Green Filter (1 ea.)
Power Cord (1 ea.)
Instruction Manual (1 ea.)
Dust Cover (1 ea.)

Model 1433PH
Trinocular Head (1 ea.)
Stand (1 ea.)
Phase Contrast Condenser (1 ea.)
Phase Contrast Centering Telescope (1 ea.)
10X Eyepiece (2 ea.)
10X Plan Phase Objective (1 ea.)
20X Plan Phase Objective (1 ea.)
40X Plan Phase Objective (1 ea.)
100X Plan Phase Objective (1 ea.)
Neutral Filter (1 ea.)
Blue Filter (1 ea.)
Green Filter (1 ea.)
Power Cord (1 ea.)
Instruction Manual (1 ea.)
Dust Cover (1 ea.)

VAN GUARD® Parts & Accessories

Optional Accessories:

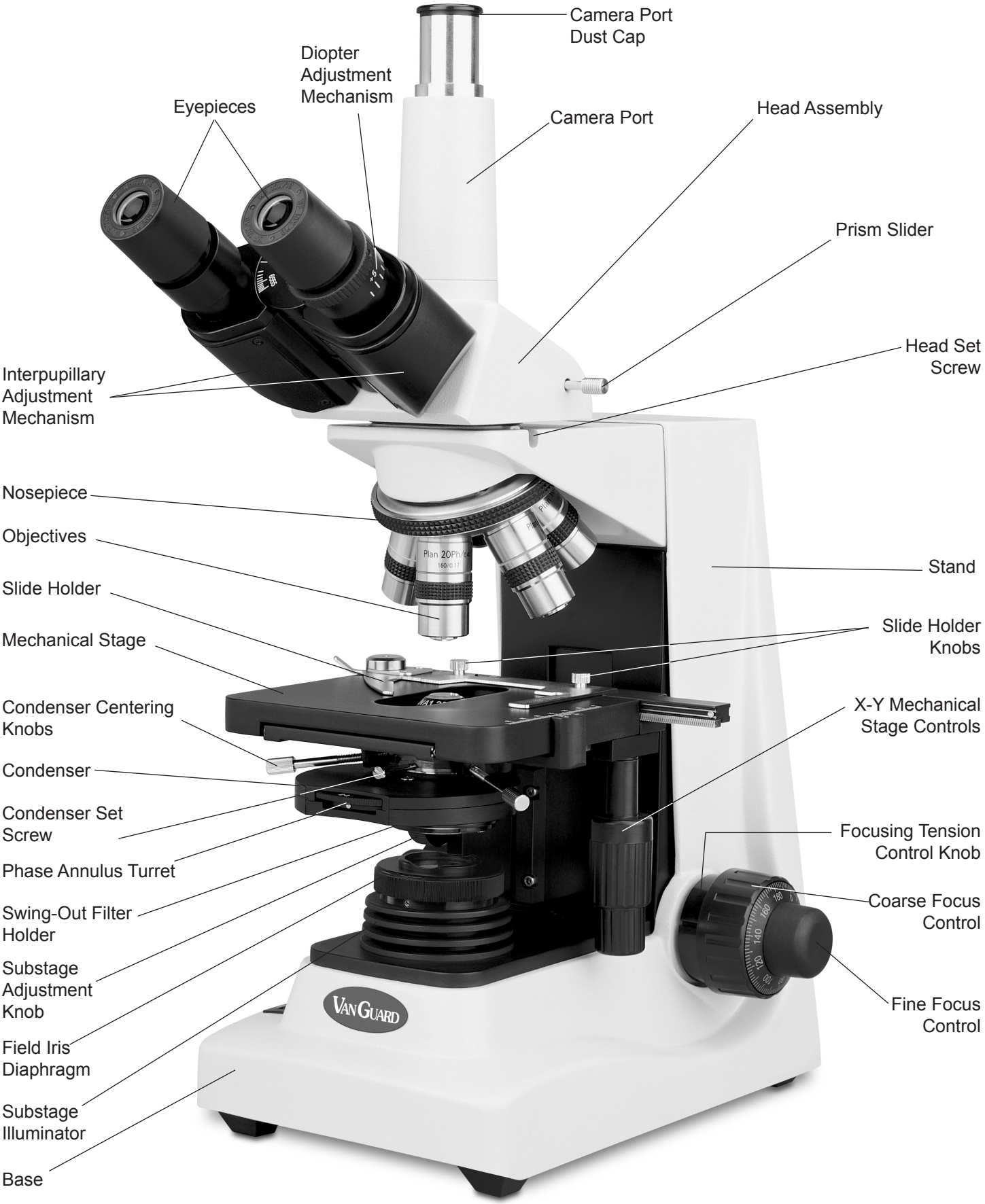
35mm, Video, and Digital Camera Systems:

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

Other Accessories:

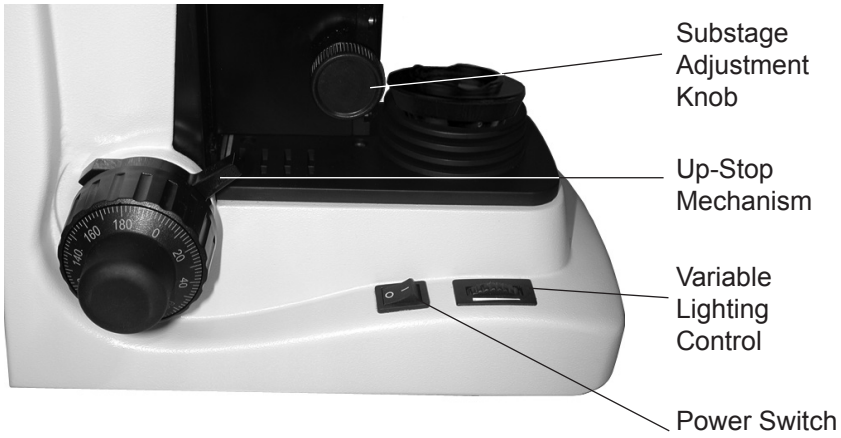
Part Number:	Description:		
Call for Part Numbers	20X Eyepieces		
Call for Part Numbers	Objectives:	Achromatic:	4X, 10X, 20X, 40X, 60X, 100X (oil)
Call for Part Numbers		Plan Achromatic:	4X, 10X, 20X, 40X, 60X, 100X (oil)
Call for Part Numbers		Plan Achromatic Phase:	10X, 20X, 40X, 100X (oil)
1200-IOG	Immersion Oil, Low Viscosity (1/4 oz. Bottle)		

VAN GUARD® 1400 Series Parts

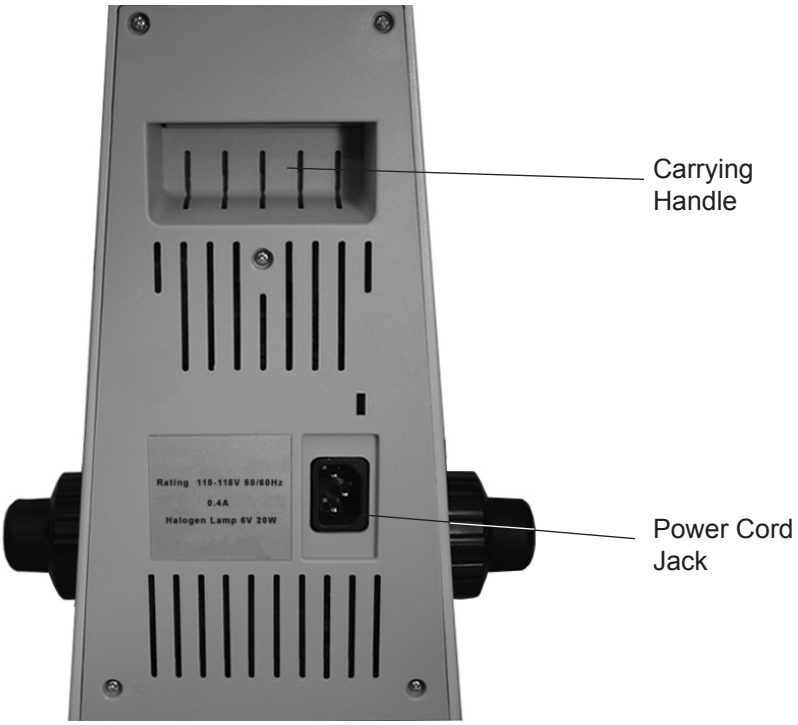


VAN GUARD® 1400 Series Parts

1400 Series Lower Left View



1400 Series Rear View



VAN GUARD® Setup

Assembly

All Models

All part names in italics are illustrated on pages 5 or 6.

1. After removing the microscope parts from the protective foam packaging and checking it over for all components and accessories (a list is provided on page 3), 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 hex *head set screw* using the included hex wrench (see figure 1).

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

Figure 1

4. If you are setting up a trinocular microscope, carefully screw the *camera port* onto the *head assembly* in a clockwise direction until tight (see figure 2).

Figure 2

5. Remove the protectors from the eyetubes and replace with the *eyepieces* (see figure 3).

Figure 3

Assembly instructions are continued on the next page.

VAN GUARD® Setup

Assembly (continued)

All Models

6. After removing the *objectives* from their storage containers, individually install each one into the *nosepiece* by twisting them counterclockwise into the threaded holes of the *nosepiece* (see figure 4).

Figure 4

If not already in place, install the *condenser assembly* into the *condenser mount.*

8. Raise the *substage* and *stage* to their maximum height (see figure 5). Raise the *stage* via the *coarse/fine focus controls*, and the *substage* using the *substage adjustment knob*.
9. Loosen the condenser set screw enough to allow the neck of the condenser to slide through the silver ring.

Figure 5

10. Gently slide the neck of the *condenser* through the silver ring of the *condenser mount* until it will go no further (see figure 6). Make sure that the text “NA 1.25” is facing up as you install the *condenser*. If the *condenser* will not slide freely through the silver ring (and you’ve checked that the *condenser set screw* is backed out far enough), **do not force**, simply wiggle the *condenser* while lightly pushing up.
11. Once the *condenser* assembly is in place, lower the *substage* via the *substage adjustment knob* and tighten the *condenser set screw* just enough to prevent the *condenser* from coming out.

    Note: The phase contrast condenser is pictured, but the assembly instructions are identical for the brightfield condenser.

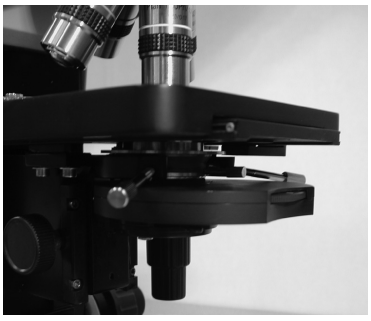


Figure 6

12. Connect the female end of the power cord to the microscope (the jack is on the back) and the male end to a suitable power supply, then turn the *substage illuminator* on with the *power switch* located on the lower left side of the instrument. If the light does not come on, check to see that the *variable lighting control*, located next to the *power switch* is on the highest setting.

VAN GUARD® Setup

Centering the Condenser

1400BR Brightfield Models

NOTE: For the 1400PH's please disregard the condenser centering instructions; these models only require phase ring alignment, as described on the following page.

1. Adjustments to the substage condensing system are crucial for proper illumination and performance. There are three basic adjustments which need to be made: Centering, Vertical Focusing, and Aperture Adjustment.

2. **Centering**: The *condenser* must be centered in the light path to ensure proper light control. A simple method for centering is as follows:

   - 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 *aperature iris diaphragm* to the largest setting by using the *aperature 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 8A). Focusing of the hexagon is performed by turning the *coarse/fine focus controls*. This white hexagon is the light whichis passing through the field iris and should be centered in the black field. If not, move it to the center (see figure 8B) by tightening and/or loosening the *condenser centering knobs*.
   - Fine tuning can be done by opening the *field iris diaphragm* until the white hexagon almost fills the entire field (see figure 8C), and then readjusting (see figure 8D). After centering the condenser open the field iris diaphragm slightly wider than the field of view.

Figure 8A

Figure 8B

Figure 8C

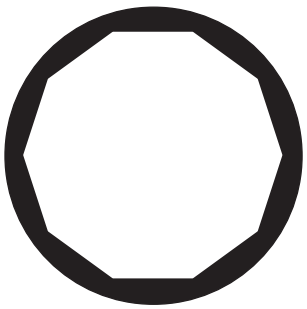


Figure 8D

3. **Vertical Focusing**: The *condenser* can be raised and lowered with the *substage adjustment* knob to focus the light for optimal illumination.

4. **Aperture Adjustment**: The light path can be adjusted with the *aperature iris diaphragm adjustment* lever located just below the condenser. Aperture adjustments are made to induce contrast into a specimen, not to adjust light intensity.

Note: If you purchased a 1420BR, 1421BR, 1430BR or a 1431BR this step completes the setup. Skip ahead to page 11, "Using Your 1400 Series Microscope." If you purchased a 1423PH or a 1433PH, continue on to the next page, "Aligning the Phase Contrast Annulus Rings."

VAN GUARD® Setup

Aligning the Phase Contrast Annulus Rings

1400PH Phase Contrast Models

Phase contrast is a system which involves a series of light baffling annular rings. Proper alignment of these rings is absolutely necessary to achieve optimum phase contrast.

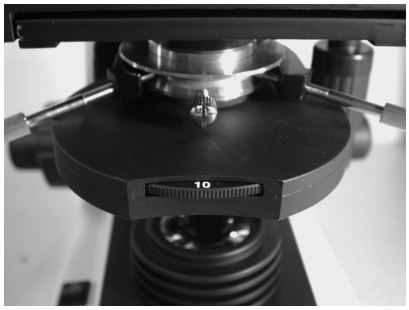


Figure 5

Figure 6

1. Begin by turning on the *substage illuminator* with the *power switch* located on the lower left side of the instrument. 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, then raising the stage (via the *coarse/ fine focus control* knobs) until the tip of the 100X *objective* is just above the slide (almost touching).
2. Rotate the *nosepiece* until the 10X *objective* is in the light path, then rotate the *phase annulus turret* (the dial on the front of the condenser) in the *phase contrast condenser assembly* until the "10" is seen in the viewing window (see figure 5).
3. Remove an *eyepiece* from one of the *eyetubes* and replace with the *phase contrast centering telescope* (see figure 6).
4. After loosening the set screw on the *phase contrast centering telescope*, look through the *phase contrast centering telescope* and pull out the uppermost piece of the *phase contrast centering telescope* until the image is in focus. Tighten the set screw.
5. The image seen through the *phase contrast centering telescope* should resemble rings superimposed on one another (see Figure 7A). What is actually being viewed are the phase rings.
6. Turn the *condenser centering knobs*, which extend from the condenser mount, until the two rings of light are centered upon one another (see Figure 7B).
7. Once the phase rings are centered, remove the *phase contrast centering telescope* and replace with the *eyepiece*.
8. The phase rings are now centered for the other remaining *objectives*. This process shouldn't need to be repeated for each objective setting, although it is advised to perform off and on checks with the *phase contrast centering telescope* to confirm that the phase rings are still centered.

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.

Figure 7A

Figure 7B

Note: This completes the setup for the 1423PH and the 1433PH. The next 3 pages will explain how to use and make adjustments to the microscope.

Using Your 1400 Series Microscope

Focusing and Mechanical Stage Mechanisms

All Models

1. Focusing adjustment is achieved by turning the *coarse/fine focus control*s (see figures 9 and 10). The large knob is used for coarse adjustment, the smaller knob for fine adjustment. The coaxial arrangement allows for easy, precise adjustment without stage drift.
2. Turning the *coarse/fine focus control* 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 knob* is located just inside of the right-hand *focus control* knob (see figure 9). For tighter tension, turn the control knob in a clockwise motion. For looser tension, turn the control knob in a counterclockwise motion.
4. **Vertical Focusing**: The *condenser* can be raised and lowered with the *substage adjustment* knob to focus the light for optimal illumination.
5. **Aperture Adjustment**: The light path can be adjusted with the *iris diaphragm adjustment* lever located underneath the condenser. Aperture adjustments are made to induce contrast into a specimen, not to adjust light intensity.

Figure 9

Figure 10

6. The *mechanical stage X-Y controls,* located underneath the right-hand side of the stage (see figure 9), provide easy and accurate positioning of the sample. One complete turn of the longitudinal (Y) control (lower half of the stage controls) will move the specimen 34mm left or right. One complete turn of the transverse (X) control (upper half of the stage controls) will move the specimen 20mm front or back.
7. The spring-loaded slide holder can be removed for users who prefer to not use a *mechanical stage*. Simply loosen the knurled *slide holder knobs* which lock the *slide holder* on the stage, and slip out the *slide holder*.

Setting the Up-Stop Mechanism

All Models

The *up-stop mechanism* is located just inside of the left-hand *focus control* knob (see figure 10). It allows the user to set a maximum point to which the *stage* can be raised.

1. To set this point, turn the *up-stop mechanism* in a counterclockwise motion, so that its tab is facing down (which is also the “no up-stop position” for normal use).
2. Raise or lower the *stage*, by turning the *focus control* knobs, to the desired height. **Be careful not to raise the stage high enough to crash into the objective.**
3. Once achieved, turn the *up-stop mechanism* in a clockwise motion, so that its tab is facing up (see figure 10).
4. Once gently tightened, the u*p-stop mechanism* will not allow the *stage* to be raised higher than the set point.

Using Your 1400 Series Microscope

Interpupillary and Diopter Adjustments

All Models

1. Interpupillary adjustment (the distance between eyepieces) is made through a “folding” action. The Seidentopf design allows for a folding adjustment which is quickly and easily done for each user (see figure 11).
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 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, close your left eye and check the focus with your right. If the image is not perfectly focused, make fine adjustments with the *diopter adjustment mechanism* located on the right eyetube (see figure 12). Once complete, the microscope is corrected for your vision.

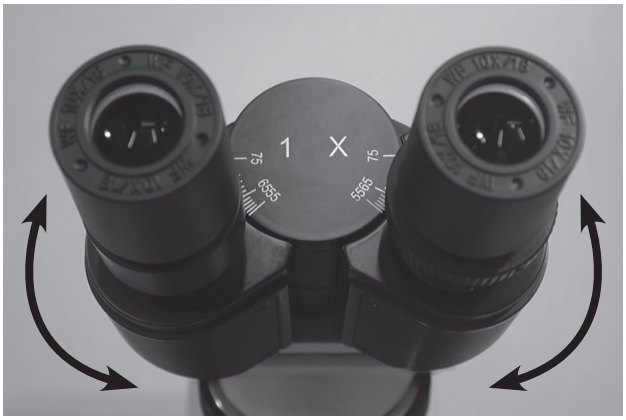


Figure 11

Figure 12

Oil Immersion Objectives

All Models

The 100X *objective* which 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 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 the immersion oil has been removed before storing the objective.

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.

Using Your 1400 Series Microscope

Using the Camera Port

Trinocular Models Only

1. Make sure that you have installed the *camera port tube* as described on page 7 and shown in figure 13.
2. Assemble the adapters and connect to the camera using the instructions provided with the camera/adapter kit.

   Note: Camera kit is not included with this microscope. Please see page 3 for available camera kits.
3. Remove the *camera port dust cap*, then slide the adapter into the *camera port* (see figure 14).
4. Pull the *prism slider* completely out to divert the image to the *camera port*. The *prism slider* is the silver knob on the right side of the *head assembly* (see figure 13).

   Note: The 1400 Series Microscopes utilize a 70/30 split sliding prism. This split prism diverts 70% of the light to the camera port and the remaining 30% to the *eyepieces*. 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.
5. When the *camera port* is not in use, be sure to cover with the *camera port dust cap*.

Figure 13

Figure 14

VanGuard® Maintenance

Replacing the Lamp

All Models

1. Before attempting to replace or remove the lamp, UNPLUG THE MICROSCOPE FROM ANY POWER SOURCE AND ALLOW SUFFICIENT TIME FOR THE LAMP TO COOL.
2. Lamp replacement is done by laying the microscope on its back and opening the trap door located on the bottom of the base by pulling on the release knob (see figure 15).

   Note: Be careful not to touch the glass lamp when replacing -- use a tissue or other medium to grasp the lamp. This will prevent the oils from your hand from reducing lamp life. If contact is made with the lamp, clean lamp with rubbing alcohol and allow a brief drying period.
3. Once the door is open, the lamp can easily be removed simply by grasping the lamp and pulling it from the fixture (see figure 16).
4. When replacing, insert the new lamp into the same fixture. Make sure that the pins on the lamp slide easily into the slots. You should not have to force the lamp.

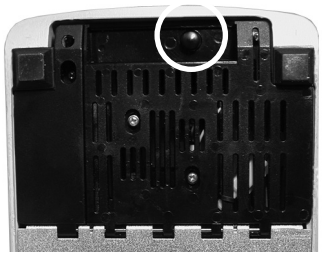


Figure 15

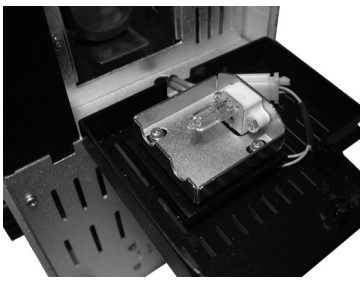


Figure 16

Replacing the Fuse

All Models

1. If the microscope is plugged in but the lamp is not turning on, the fuses could be blown. To check the fuses, UNPLUG THE MICROSCOPE FROM YOUR POWER SOURCE and remove the 5 screws securing the back panel (see figure 17).
2. Once the screws are removed, carefully pull the rear cover away from the microscope. There is a small circuit board connected to the rear cover that houses the two fuses (see figure 18 - note: connecting wires removed for clarity). Avoid pulling on the rear cover hard enough to loosen any of the wires that connect the circuit board to the microscope.
3. To replace the blown fuse(s) (the wire inside is broken, or the glass is blackened) pull the fuse out of it's holder and snap a new fuse in. You might need to use a screwdriver to lever the fuse out, but be careful not to scratch the circuit board.
4. Replace the rear cover and the five screws.

Figure 17

Replacement Lamp -- 20W Halogen (Part No. 1400-20WHL)
Replacement Fuse -- 0.25A, 250V (Part No. 1400-FS1) [2 required]

Maintenance

All Models

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.

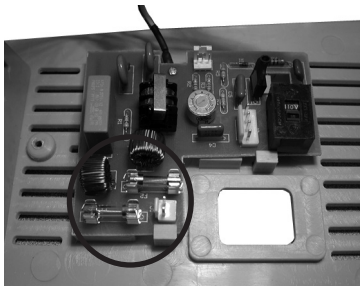


Figure 18

VAN GUARD® Specifications

1400BR and 1400PH Microscopes

Viewing Head:	Binocular or Trinocular
Viewing Head Type:	Seidentopf
Head Rotation:	360°
Head Inclination:	30°
Sliding Prism:	70/30 Split [Trinocular Models]
Interpupillary Adjustment:	55-75mm
Dioptric Adjustment:	-5 to +5
Eyepiece Magnification:	10X Widefield
Eyepiece Field Diameter:	18mm
Nosepiece:	Quadruple/Reversed [1400BR] Quintuple/Reversed [1400PH]
Brightfield Objectives: **(Achromatic or Plan Achromatic)**	4X [0.10 N.A., 17.0mm W.D., 4.5mm F.O.V.] 10X [0.25 N.A., 8.0mm W.D., 1.8mm F.O.V.] 40X [0.65 N.A., 0.40mm W.D., 0.45mm F.O.V.] 100X [1.25 N.A., 0.25mm W.D., 0.18mm F.O.V.]
Phase Contrast Objectives: **(Plan Achromatic)**	10X [0.25 N.A., 8.0mm W.D., 1.8mm F.O.V.] 20X [0.40 N.A., 0.50mm W.D., 0.9mm F.O.V.] 40X [0.65 N.A., 0.40mm W.D., 0.45mm F.O.V.] 100X [1.25 N.A., 0.25mm W.D., 0.18mm F.O.V.]
Stage Dimensions:	140mm x 140mm
Stage Motion:	Right-Hand Coaxial Control/Rack & Pinion Drive
Stage Movement Range:	50 x 75mm
Focusing Movement:	Coaxial Coarse & Fine Controls/Safety Autostop
Focusing Range:	40mm
Focusing Graduation:	2 Microns/Division
Brightfield Condenser:	1.25 N.A. Abbe Condenser with Iris Diaphragm
Phase Contrast Condenser:	1.25 N.A. Zernike Condenser with Iris Diaphragm
Phase Centering Tool:	Telescoping Eyepiece [1400PH]
Illumination:	20W/6V Variable Quartz Halogen
Fuses:	0.25A, 250V [2 each]
Voltage:	110V
Base Dimensions:	225mm x 160mm
Overall Dimensions:	225mm (L) x 160mm (W) x 400mm (H) [Binocular Models]
Weight:	8.3kg [Binocular Models]

VanGuard® 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.

Printed in the USA

No. VGMNL081919-1400BR/PH

1.888.610.7664 www.calcert.com sales@calcert.com