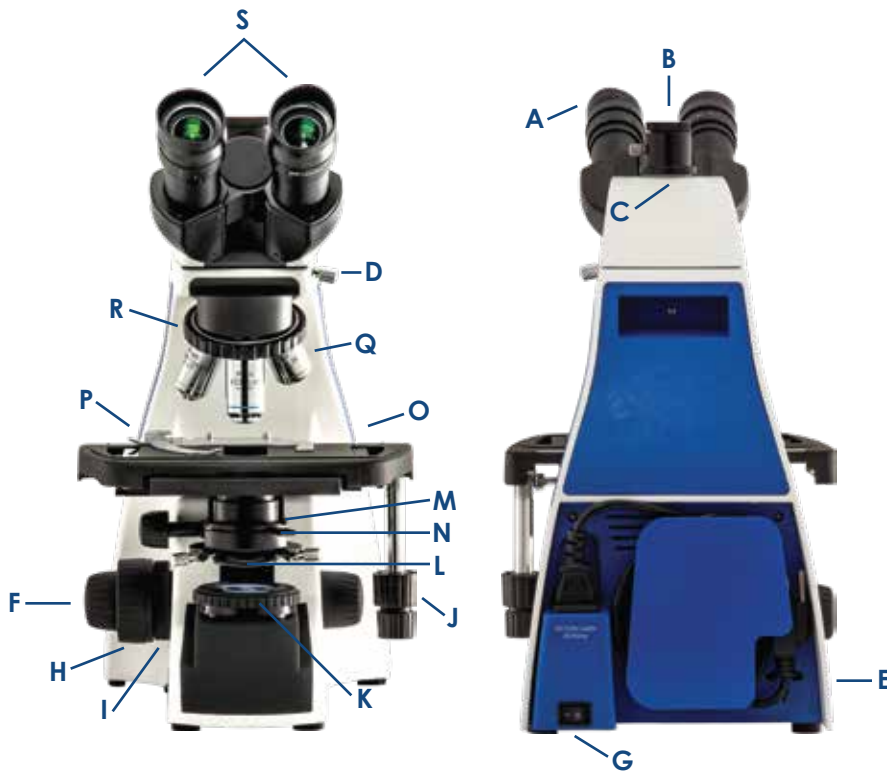




Model pictured:

### Innovation Trinocular Microscope

*Not all features available on all models - see back page for model specifications.*



- A** Diopter Adjustment
- B** Trinocular Head (Binoc Available)
- C** C-mount Camera Attachment (Trinoc Only)
- D** Head Retention Screw
- E** Brightness Control
- F** Fine Focus
- G** On/Off Switch
- H** Coarse Focus
- I** Focus Friction Control
- J** X/Y Axis Stage Controls
- K** Base Condenser
- L** Filter Holder
- M** Substage Abbe Condenser
- N** Substage Iris Diaphragm
- O** Stage
- P** Slide Holder
- Q** Objectives
- R** Nosepiece
- S** Eyepieces

### Introduction

LW Scientific is proud to present our newest medical-grade Microscope, the Innovation. With its 10/22 built-in-diopter eyepieces and high contrast, achromatic infinity plan objectives, the Innovation Microscope ensures users don't miss even their specimen's finest details. Optional accessories such as a Phase Contrast Turret, Epi-Fluorescent attachment, and Simple Polarizing Kit give the Innovation even more flexibility. Additionally, a rackless, double-layer mechanical stage allows users to view two specimens at once. For the best experience with your new Innovation Microscope, please follow the guidelines in this manual.

### Unpacking and Setup

scope. Please retain all packaging material for future use. **Carefully unpack** your Innovation Microscope using the following checklist for all the parts and accessories:

- 1 - Microscope body with Abbe condenser
- 2 - 10x/22 eyepieces
- 2 - Rubber eye guards
- 1 - Head (Binocular or Trinocular)
- 4 - Objectives 4X, 10XR, 40XR, 100XR (oil)  
(20X with the 5-objective nosepiece model)

- 1 - Blue filter (packed with dust cover)
- 1 - 3 prong power cord
- 1 - Immersion oil (0.25oz)
- 1 - Dust cover
- 1 - Fuse

## Assembly

- 1 Remove the body of the microscope and place it on a sturdy, dust-free surface. Remove the plastic plugs in the nosepiece. Install the objectives, so that the nosepiece turns clockwise from the 4x, to 10x to the 40x and finally to the 100x objective.
- 2 Remove the microscope head from the Styrofoam carton and pull off the protective covers from the head mount and eyepiece tube. Insert the head mount into the upper arm of the body. Once the head seats, tighten the head retention screw to secure the head in place. **Note:** Do not over-tighten.
- 3 Remove plastic covers and packing material near the stage, the condenser and lower light assembly.
- 4 Insert the 10x/22 eyepieces, ensuring that the built-in diopters are set with "0" to the white reference line, and ensuring that the eyepieces are pushed fully into the eyetubes with the white reference line on top (Figures 1 and 2). The eyepieces are designed to fit tightly into the eyetubes so that the diopters will be easy to adjust without spinning the eyepieces.
- 5 Attach either the tall rubber eyeguards (Figure 1), or the short rubber rims (Figure 2) to the top edge of the eyepieces. If the user wears eyeglasses, the short rubber rims will allow a cushioned resting place for eyeglasses.
- 6 Attach the power cord.

Figure 1



Figure 2



## Lamp Replacement

LED lamps are very reliable. However in the event the lamp needs to be replaced, ensure that the power switch is in the OFF position and that the power adapter is removed. Remove the base condenser by pulling it free to expose the LED light. The LED will be replaced as a module. The module is the LED lamp, heat sink, and wire harness. To remove, first carefully place the microscope on its side, ensuring any optics or accessories are secure or removed. Remove the screws from the perimeter of the base plate including the ones in the rubber feet. This will expose the plug for the LED wire harness. Unplug the module. There are two screws that mount the LED module to an adjustment bracket. Remove these two screws and carefully remove the LED module with the harness. If the LED module screws are difficult to reach, you may remove two screws located on the bottom of the unit, freeing the LED module bracket and allowing easier access. To install, reverse the removal procedure, ensuring the new LED is secure, plugged in, and adjusted to sit centered on the base condenser.

## Power

If you suspect faulty electronics, call LW Scientific technical service department at 800-726-7345.

## Operation

- 1 Once you have assembled all the parts and allowed your microscope to come to room temperature, plug the power cord into the appropriate AC outlet. **Note:** Excess cold can fog lenses, cause lamp to fail, and cause all optics to "fog." Be sure to allow time for your scope to acclimate to room temperature.
- 2 Turn the light on using the black on/off switch on the rear of the microscope. Next, adjust the light intensity using the brightness control knob located on the lower left side of the microscope.
- 3 In order to become acquainted with the controls, choose a specimen slide with which you are familiar - for example, an old hematology slide or a commercially prepared slide. Place the slide into the slide holder by pushing back on the thumb guard to open the slide finger. The slide finger closes slowly to eliminate the possibility of chipping the corner of your slide.
- 4 Move the slide to the center of the stage by turning the stage control knobs, located just below the stage. These knobs allow you to move the slide on the X-Y axis (forward/backward and left/right).
- 5 The sub-stage iris should then be set to match the aperture of the objective for maximum resolution under each objective power. There are numbers on the iris ring to show the correct setting for each objective power. You should begin with the 4x or 10x objective. Only set the iris wide open when using the 100x oil objective. Closing down the iris on smaller objective powers will improve resolution, contrast, and depth of field.

## Operation Continued

- 6 Once you are comfortably seated, look into the oculars and move the eyepiece tubes together or apart until you see only one complete circle of light. You have now adjusted your interpupillary distance.
- 7 Using the 4x or 10x objective and the coarse and fine adjustment knobs, bring the specimen into focus. Now, move the 40x objective into place. You will feel a "clicking" action when the objective is seated properly. Again, adjust focus for best image. You should also adjust the iris diaphragm (as listed above) for the best contrast and resolution.
- 8 **Diopter Adjustment:** Since you are using a binocular or trinocular microscope, you need to adjust for the normal difference in vision between your two eyes. This is a simple but critical adjustment! First, make sure that the diopter adjustments on the eyepieces are set to the midpoint of travel, with the "0" mark lined up with the white reference line. Close your left eye and look into the right eyepiece with your right eye. Adjust the fine focus to give you the best image. Now close your right eye and look with your left eye into the left ocular. Using the diopter adjustment on the eyepiece, adjust the focus until you see a clear, focused field. Now both eyes should see a perfectly focused image. Always double check that the diopters remain at or near "0" mark.
- 9 **Friction Adjustment:** With repeated use and wear, the stage may drift downward out of focus. If this happens, you need only to tighten the friction control ring (located on the left side of the microscope between the coarse adjustment and the body of the microscope). If the coarse focus is hard to turn, you may choose to loosen the friction adjustment.
- 10 **Parfocality:** All LW Scientific microscopes are manufactured to be parfocal – meaning that when you change objectives or magnification, the specimen will remain very close to being in focus, with only a fine adjustment needed. To achieve the best parfocality, make certain diopters are set at or near the "0" mark.

## Warranty

The Innovation is covered by a limited lifetime warranty on materials and workmanship and a 1 year warranty on electronics from date of purchase. If there is any indication of a problem, contact LW Scientific. Operating the unit after noticing a problem could compound a simple problem and cause an unnecessary expense to the owner. LW Scientific support staff will troubleshoot problems over the phone and attempt to solve problems in the most expedient manner. This may include sending parts that can easily be installed by the user, or directing the user through a simple adjustment to the unit. Making repairs to the unit without authorization from LW Scientific will void the warranty.

If the unit must be shipped in for repair, LW Scientific will issue a Return Merchandise Authorization (RMA) number. You will need to provide the serial number and have either a warranty card on file at LW Scientific or proof of purchase.

## Maintenance

- 1 Always cover your microscope with the dust cover when not in use. When cleaning the lenses, use lens paper or a cotton swab dipped in lens cleaning solution.
- 2 Excess oil should be cleaned off your 100x objective and stage immediately. An alcohol pad is best for removing oil from the stage and the other metal parts but is not recommended for use on the lenses. Use lens cleaning solution and lens paper to clean off your objectives.
- 3 Dust in the nosepiece or ocular tubes should be blown out using filtered air. Canned air dusters work well for this job.
- 4 Whenever you remove an objective, we recommend that you place it back into the original plastic shipping vial until ready to be placed back on the microscope. **SCREW THE OBJECTIVE SECURELY INTO THE CAP OF THE HOLDER - DO NOT DROP OBJECTIVE LOOSELY INTO CONTAINER.**
- 5 To keep your microscope in top condition for years, LW Scientific recommends that you have the microscope professionally serviced once a year.

**Warning:** The 40x and 60x objectives are not intended for oil immersion. Damage to the 40x and 60x objective due to oil immersion is not covered under warranty.

# Specifications

## NOSEPIECE

Reverse quadruple / quintuple nosepiece  
Multiple ball bearing mounted

## HEAD

Binocular (Seidentopf), Trinoc available  
Digital cameras available  
Diopter adjustment +/-5 (built into each eyepieces)  
Inclined 30°, rotates 360°  
10X/22 Super WF HP eyepieces  
(15X/16 eyepieces available)  
30mm eyetube  
Interpupillary distance range 48-75mm

## OBJECTIVES

Infinity High Contrast Plan objectives  
Choose from 4 or 5 hole nosepiece  
4X, 10X, 40XR, 100XR (oil) with the 4-hole nosepiece  
4X, 10X, 20X, 40XR, 100XR (oil) with the 5-hole nosepiece  
50X (oil) and 60X dry objectives are also available  
Anti-fungal, parfocal, parcentric, color-coded

## ADJUSTMENT CONTROLS

Stage Controls: Knobs allow movement of slide on X-Y axis  
Etched vernier scales  
Coarse Adjustment: Range of 22 mm  
Fine Adjustment: Graduation of 2µm  
Variable Light Adjustment

## STAGE

Double Layer Mechanical Stage (216mm X 150mm)  
Graphite-Coated Surface  
Coaxial drive controls, rackless  
Range of traverse: 75mm x 55mm  
Slow-close hydraulic slide finger

## FOCUS

Coarse adjustment: range of 18mm  
Fine adjustment: graduation of 0.001mm  
Tension control knob

## ILLUMINATION

Moveable Abbe condenser, NA 1.25  
Iris Diaphragm  
LED provides 50,000 hours of light and consistent, even brightness  
Variable light adjustment  
Simple Koehler illumination  
90-240V / 50-60Hz automatic-switching power input

## CONSTRUCTION

Rugged alloy

## WEIGHT AND DIMENSIONS

Height: 16" (406 mm)  
Length: 15" (381 mm)  
Width: 8.5" (216 mm)  
Weight: 14.2" (6.4kg)

## PACKAGING DIMENSIONS

21lb (9.5kg)  
21x16x13

## HARD CARRY CASE DIMENSIONS

15lb (6.8kg)  
22x18x12

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100 Lauman Lane, Suite A, Hicksville, NY 11801  
Tel: (877) 877-7274 | Fax: (516) 801-2046  
Email: [Info@nyscopes.com](mailto:Info@nyscopes.com)  
[www.microscopeinternational.com](http://www.microscopeinternational.com)