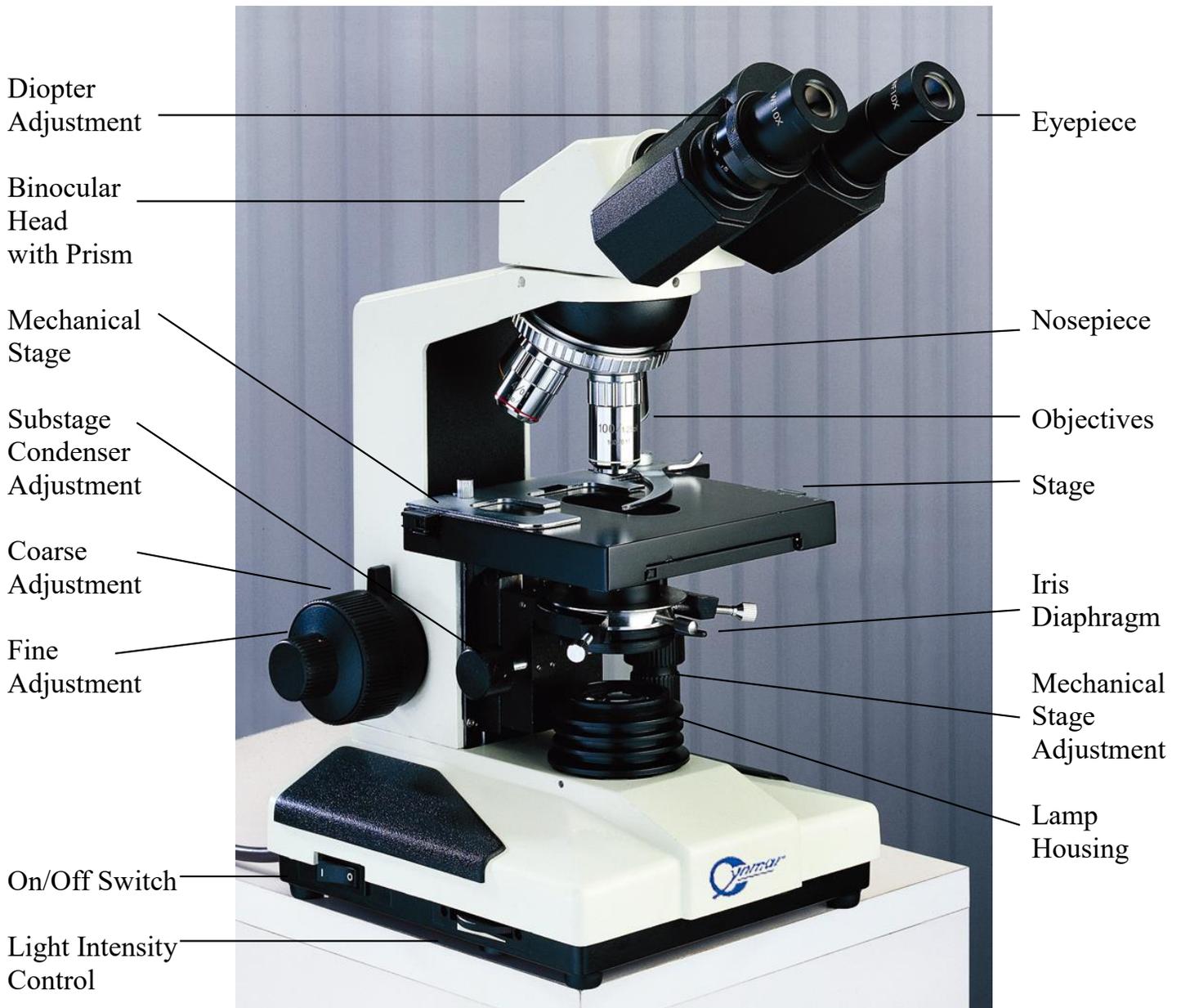




N700 Series Compound Microscopes



Binocular

Instruction Manual

Assembly

Remove the basic unit from its container. *Save at least one container.* Do not throw away any boxes or packing materials until the contents of the shipping container have been checked against the packing list. Take great care not to touch, scratch, or mar any glass or lens surface. This may adversely affect image quality. Place on a firm table or bench and adjust for comfortable viewing. Install the objectives and eyepieces if not already installed.

I. ASSEMBLING THE HEAD AREA

A. HEAD: *Carefully place the head on the stand and tighten the head screw.*

Inclined 45°, rotates 360°; monocular, binocular, or trinocular models available.

B. EYEPIECE(S): *Carefully unpack the eyepiece(s) and slip them into the ocular tubes.*

The N700 Series is equipped with a DIN 10x **Widefield** eyepiece with pointer. The lenses are coated to reduce glare and reflection. Binocular and trinocular models have **diopter and interpupillary adjustments** allowing operators to compensate for eye acuity, and eliminate eye strain and fatigue over extended viewing time.

INTERPUPILLARY ADJUSTMENT: One round circular field is obtained by adjusting the binocular tubes closer together or farther apart.

DIOPTER ADJUSTMENT: The left eyepiece has a diopter adjustment of ± 5 diopters. Focus the fixed eyepiece and adjust the moveable eyepiece until a matching sharp image is obtained.

EYEPIECE CLEANING:

Brush and/or blow off the surface before cleaning. Moisten lens paper with a small amount of lens cleaner and wipe the glass surface. Now use a dry section of the lens paper and wipe the surface clean. If a film or smudge is still found, use a clean, double end Q-tip for cleaning. **Use a Q-tip only once.** Moisten the end of a Q-tip with lens cleaner and work in a circular motion (clockwise). Begin in the center of the lens and move to the outer edges. With the dry end of the Q-tip, begin in the center of the lens with a circular motion (counterclockwise) moving to the outer edges of the eyepiece, removing dirt and moisture. Be sure all moisture is removed.

NOTE: Q-tips are slightly more abrasive than lens paper and are not recommended for daily cleaning.

II. ASSEMBLING THE ABOVE STAGE AREA

A. NOSEPIECE

Quadruple, large knurled ring, ball-bearing movement, positive detent stops.

B. OBJECTIVES *Start with the 4x objective and screw the objectives into the nosepiece; place objectives in the sequence most convenient for your work. Make sure the objectives are tightened in place.*

There are four objectives available with the N700 Series: DIN 4x, 10x, 40xR, 100xR(oil). All objectives have a large Numerical Aperture (N.A.), are parfocal and par-centered, and have a lens coating to provide maximum resolution. The 40xR and 100xR(oil) objectives are spring retractable to protect the lens and specimens. Micro-plan or plan field objectives are available.

FOR CORRECT PARFOCAL OF OBJECTIVES:

1. Adjust the eyepiece width (diopter adjustment) and read the scale.
2. Set both eyepiece scales (interpupillary adjustment) to the same diopter reading.



OBJECTIVE CLEANING

Objectives are an important part of a microscope. They should be carefully cleaned, especially the oil immersion objective (100x), which should be cleaned immediately after use to prevent a film buildup on its

surface. If dirt or smudges are found on the optical surface of an objective, carefully clean with lens paper moistened in a "lens cleaning solution." Xylene and related chemicals are **not** recommended for cleaning on a routine basis, because these chemicals attack the lens mounting cements. However, some slide preparations may require xylene to clean a particular smudge off the lens. If a film or smudge is still found, use a clean, double-end Q-tip to clean the surface. Moisten the Q-tip in a lens cleaner and start in the middle of the lens working in a clockwise circular motion to the outer edge of the lens. Using the dry end of the Q-tip, work in a counterclockwise direction to the edge of the lens. Do not apply heavy force or scrubbing action to the 40xR or 100xR objective lenses. **NOTE:** Q-tips are slightly more abrasive than lens paper and are not recommended for daily cleaning.

IMMERSION OIL: A drop of oil is placed between the 100x objective and the cover slip. Crown or Cargille's nondrying oils are recommended over Cedarwood or other oils. Often objective lenses are recessed and cannot be cleaned with lens paper. In these cases, use a moistened Q-tip with lens solution to clean the lens and dry off the moisture with the dry end of the Q-tip. Again, do not apply heavy force to the lenses that are mounted in the end of the objective.

NOTE: Always clean your 100xR objective immediately after using oil.

C. STAGE

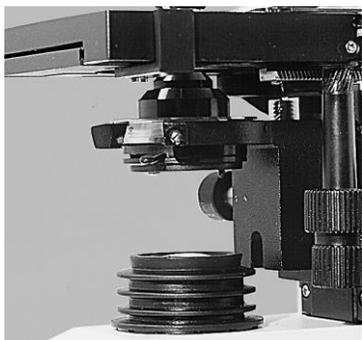
Large, sturdy stage; approximately 125mm x 140mm

D. MECHANICAL STAGE

Built-in, graduated mechanical stage with low position coaxial controls. (40mm Y-axis, 75mm X-axis)
The specimen can easily be located by moving the glass slide back and forth across with the mechanical stage.

NOTE: When using the 40xR or 100xR objectives, the recommended cover glass thickness should be 0.17mm or thinner. (#1 cover slip)

III. ASSEMBLING SUBSTAGE AREA



A. ABBE CONDENSERS/IRIS DIAPHRAGM: The condenser/iris system should be installed and centered.

NOTE: To check the centering, use the 4x objective and close the iris diaphragm down. Turn the stage up toward the objective, and the condenser down until the iris leaves come into focus. Use the two thumb screw to center the iris. (If the centering screws are Allen set screws, use an Allen wrench for centering.)

ABBE CONDENSER

The **Abbe Condenser**, with a Numerical Aperture (N.A.) of 1.25, provides the quality of light required by 100x oil lenses. The condenser, mounted on a rack and pinion gear under the stage, fills the back lens element of the objective to improve the resolution of an image. The condenser is also adjustable to accommodate the other objectives. When the 4x and 10x objectives are used, the condenser can be lowered so that each field of view is filled with light rays.

IRIS DIAPHRAGM

The **Iris Diaphragm** controls the quantity and quality of light reaching the objective by adjusting the iris leaves under the condenser.

B. FILTERS

White and blue filters are provided with each microscope. The white filter is used to reduce and disperse light in the optical field. The blue filter will convert the halogen light to natural daylight wavelengths. The filters are placed under the condenser in the filter housing.

C. ILLUMINATION *Switch on the light. Adjust the brightness control until the specimen you're viewing is in good contrast for details. Adjust the diaphragm to increase or decrease the contrast for improved viewing.*

BRIGHTNESS ADJUSTMENT

Turning Microscope On: The brightness adjustment must be at its lowest intensity to protect the bulb. Bulbs turned on with the brightness adjustment at higher intensity may last only 10 hours instead of 100 hours.

Turning Microscope Off: The brightness adjustment must be turned down before turning off in order to obtain maximum bulb life.

BULB

The bulb needed is a 6 volt, 20 watt, halogen pin bulb (021-00397). **DO NOT TOUCH THE BULB WITH YOUR FINGERS**, as the oil and moisture off your hands will cause a weakness in the bulb's surface.

NOTE: Bulbs last much longer if warmed up a couple of minutes at low intensity prior to increasing the brightness.

BULB REPLACEMENT

When replacing the bulb, be sure the light switch is turned off and the microscope is unplugged. Tilt the microscope on its side and open the lamp housing in the base using a Phillips screwdriver. Loosen the screw so that the hinge door will open and swing down. Using some type of protection for your fingers, carefully remove the old bulb and replace it with a new 6 volt, 20 watt halogen pin bulb (021-00397). **DO NOT TOUCH THE BULB WITH YOUR FINGERS**. Make sure the new bulb is fitted tightly so the hinged door will close.

NOTE: The bulb is factory centered, but the new bulb may not be centered. If centering is required, use the 4x objective and raise the condenser up until the filament of the bulb comes into view. Loosen the other Phillips screw and center the filament in the field. Tighten the screw in place.

FUSE

A 1.5 amp, fast-acting fuse (CSA-09260), located on the bottom plate; circular knob marked "Fuse."

Troubleshooting

PROBLEM: Objectives	Causes	Remedies
1. Not parfocal between objectives	1. Objectives are not screwed in tight.	1. Tighten the objectives.
2. Objective lens touches specimen when changing objective.	2.a. The slide with the specimen is facing down and not up. 2.b. Cover slip is too thick	2.a. Place the specimen or cover slip in the up position. 2.b. Replace cover slip with a #1 type.
3. Blue colors look green; red colors look pink.	3. There's a film over the end of the objective.	3. Use a Q-tip to clean the objective.
4. 100x objective is focusing some distance from the cover slip.	4. Oil and/or moisture has leaked into the objective tube.	4. Objective will have to be cleaned and resealed or replaced.
PROBLEM: Electrical		
1. Light flickers, changing intensity.	1.a. Building voltage or room voltage fluctuates. 1.b. Loose connection. 1.c. Bulb is about to burn out 1.d. Bulb is not the recommended 6V,20W, pin type.	1.a. Use a voltage control unit. 1.b. Secure all electrical connections. 1.c. Replace bulb. 1.d. Replace with correct bulb.
Surge Protectors are highly recommended.		
2. No light	2.a. Fuse burned out; wrong fuse 2.b. Bulb burned out 2.c. Switch intensity control is not on.	2.a. Replace with a new fuse. 2.b. Replace with a new bulb. 2.c. Turn on switch, increase intensity control.
3. Bulb/fuse burns out too frequently.	3. Wrong bulb or fuse.	3. Replace one or both.
PROBLEM: Viewing Area		
1. Field of view is shaded on one side.	1.a. Nosepiece isn't clicked in place. 1.b. Condenser isn't correctly mounted. 1.c. Head is not centered	1.a. Click nosepiece in place. 1.b. Remove/reinsert the condenser. 1.c. Tighten the screw holding the head in place.
2. The image is not sharp.	2.a. Dirt on the objective, condenser, or eyepiece. 2.b. Dirty specimen. 2.c. Immersion oil on 100xR lens may have bubbles. 2.d. Light is too bright. 2.e. Position of condenser 2.f. Objective not clicked into position.	2.a. Clean optic surfaces carefully. 2.b. Clean tip and bottom of slide. 2.c. Clean and replace immersion oil. 2.d. Reduce the amount of light. 2.e. Raise or lower condenser. 2.f. Click objective into place.
PROBLEM: Focusing		
1. Specimen isn't coming into focus.	1.a. Clean eyepieces and objectives are required. 1.b. Slide with specimen is upside down. 1.c. Cover slip is too thick	1.a. See section on eyepieces and objectives. 1.b. Turn slide over. 1.c. Need #1 cover slip for oil lens.

Parts and Accessories

Order No.	Description
011-02955	10xWF Eyepiece with pointer
011-02956	10xWF Eyepiece
013-08223	4x Micro-Plan Achromat Objective
013-08225	10x Micro-Plan Achromat Objective
013-08227	40xR Micro-Plan Achromat Objective
013-08229	Objective
013-08231	100xR(oil) Micro-Plan Objective
013-08233	4x Plan Achromat Objective
013-08235	10x Plan Achromat Objective
013-08236	40xR Plan Achromat Objective
021-00397	100xR(oil) Achromat Objective
CSA-09269	Bulb, 6V, 20W, halogen Fuse, 1.5 A

Objectives

Micro-Plan Achromat Objectives



013-08223 4x 013-08225 10x 013-08227 40xR 013-08229 100xR



011-02955
10x
with pointer

011-02956
10x
no pointer



021-00397
20W
halogen bulb

Plan Achromat Objectives



013-08231 PL 4x 013-08223 PL 10x 013-08235 PL 40xR 013-08236 PL 100xR

Limited Warranty

Purchase of items branded Cynmar® are warranted against defects in workmanship and materials for 90 days from the original purchase date. Should there be a defect or malfunction of the product, Cynmar® will repair or replace the product (at its option) free of charge excluding shipping charges, which remain the responsibility of the Purchaser. This limited warranty is void if the product has been subjected to damage, unreasonable use, improper service, modification, or other causes not arising from defects in original materials or workmanship.

Cynmar, LLC reserves the right to make changes in instrument design in accordance with scientific and mechanical progress, without notice and without obligation

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