Electron
Microscopy
Sciences

# INSTRUCTIONAL MANUAL
# CAT. (Model) 7000-1-2
## Integrally Mounted Inspection Microscope


**Electron Microscopy Sciences**
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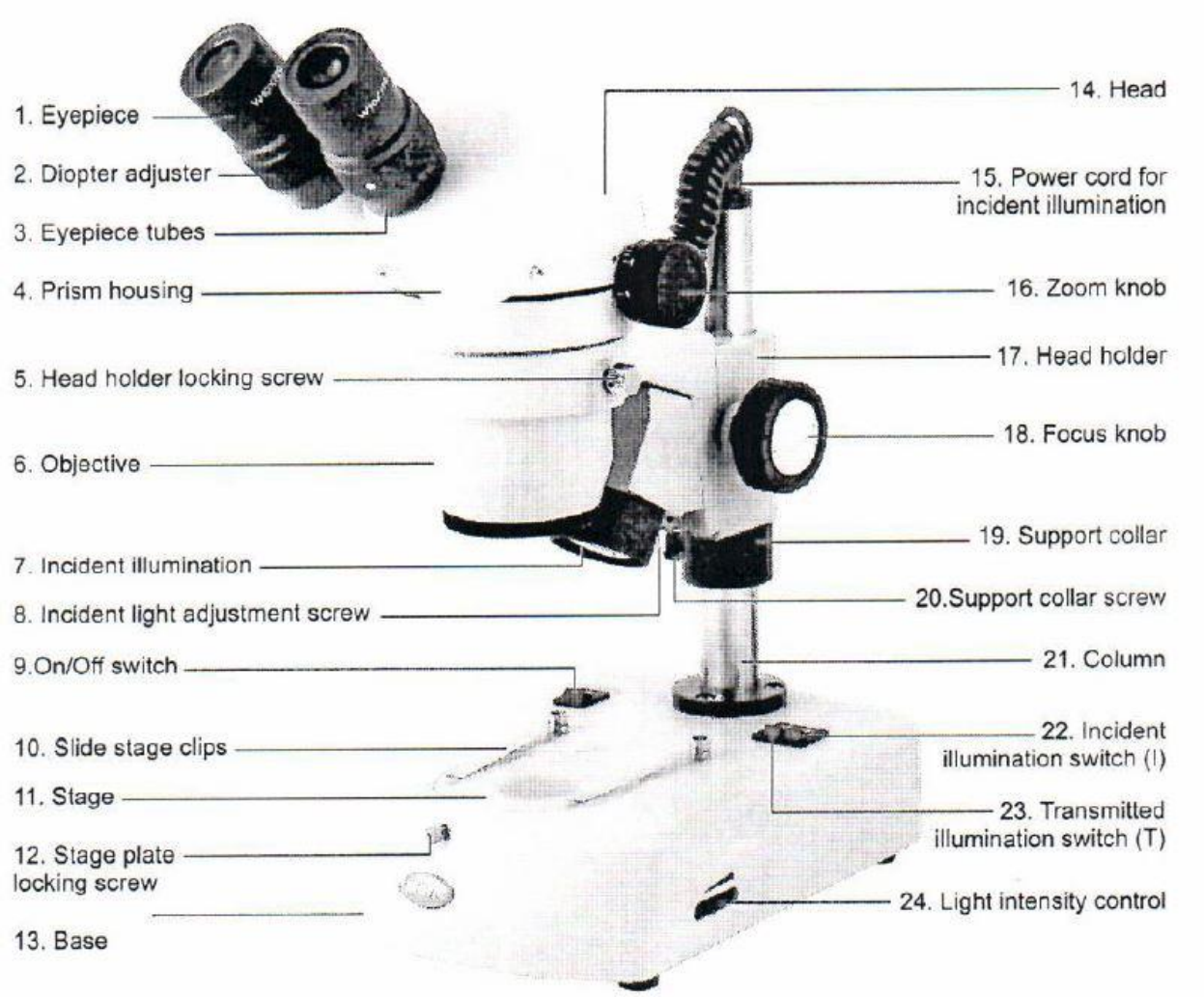
## Microscope parts

Before reading this manual, we recommend becoming familiar with the parts of the microscope, as they will facilitate the process of using this product as per your unique application.

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## An Introduction to the Integrally Mounted Inspection Microscope

These stereomicroscopes are precision instruments, designed to deliver perfect examinations. With little maintenance required and optimum functioning, this microscope is guaranteed to meet your application needs.

Uses:

- The study of 3D objects
- Examination of small parts
- Dissection of biological specimens
- Observation of slide specimens

## Unpacking your Microscope

We recommend that you save all packing containers in the case that any items need be returned.

Contents:

- Binocular:
  - Illuminated base with a pole for a moveable head, also illuminated
  - Black and white opaque stage
  - Binocular head with an eyepiece
  - Eyepiece protectors
  - Frosted glass stage
  - Blue filter
  - Protective cover
  - 1,5mm hexagonal key
- Trinocular:
  - Illuminated base with a pole for a moveable head, also illuminated
  - Black and white opaque stage
  - Trinocular head with an eyepiece
  - Adapter for a photographic camera (and one for a CCD camera)
  - Eyepiece protectors
  - Frosted glass stage
  - Blue filter
  - Protective cover
  - 1,5mm hexagonal key

- Be sure to remove and handle all contents of the microscope with care.
- Do not touch the lenses of the optical elements.
- Avoid contact with dust and other particle contaminants, as they can damage the quality of the image.

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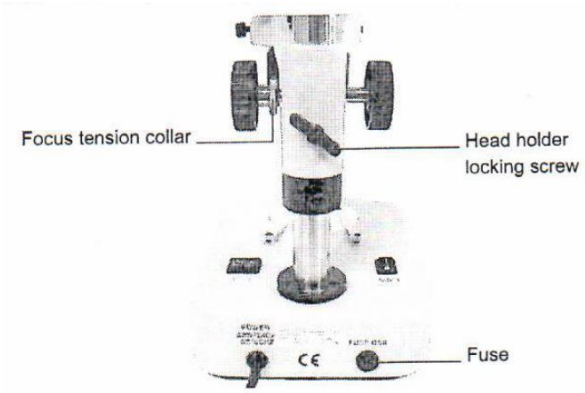
## Assembly

Please following the instruction provided below carefully.

1. Place the base of the microscope (13) upright on a flat, stable and clean surface.
2. Ensure that the head holder locking screw (Figure 1) is tight.
3. Loosen the head holder locking screw (5) and place head (14) in head holder (17) with extreme care.
4. Tighten screw.
5. Connect incident illumination to power cord (15) located at the upper part of the column (21).

Figure 1.




**WARNING**

BEFORE CONNECTING THE STEREOMICROSCOPE TO A POWER SOURCE, ALWAYS CHECK THAT THE VOLTAGE COINCIDES WITH THAT OF THE STEREOMICROSCOPE.

## Operation

The stereomicroscope has two stages:

1. Frosted glass: Used for the observation of microscope slides or samples that are thin or translucent
2. Black and white stage: Used for non-transparent objects or for dissection. For best contrast results, choose the slide of the stage to use.

**WARNING**

TRANSMITTED ILLUMINATION CAN ONLY BE USED WITH THE FROSTED GLASS STAGE. THE HEAT GENERATED BY THE TRANSMITTED ILLUMINATION CAN MELT OR DAMAGE THE BLACK AND WHITE STAGE. SUCH DAMAGE WOULD NOT BE INCLUDED UNDER WARANTEE.

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**Starting up**

1. Changing the stage
    a. Loosen the stage plate locking screw (12) and remove the stage (11)
    b. If wishing to use the glass stage, insert the blue filter in the center of the base with the frosted surface facing down
    c. Place the glass stage with the frosted surface, again, facing down
    d. Retighten the state plate locking screw
2. Before connecting the stereomicroscope to a power source, adjust light intensity to its minimum (24). This must be repeated every time the stereomicroscope is turned on or off, to prolong the life of the bulb.

On the base of the microscope are three light switches:

**MAIN**: Principal switch, which turns the whole unit on or off
**I**: Turns incident light on or off (illumination from above)
**T**: Turns transmitted illumination on or off (illumination from below)

3. Press the principal switch (9) to an ON position “I”.
4. Press the incidental illumination (22) or transmitted illumination (23) or both at the same time “I” or “II”, according to your application needs.
5. Light intensity should be adjusted according to the objective used, or the type of sample observed.
6. The angle of the incident illumination can be adjusted by using the adjustment screw (8) that can be used to vary the orientation of the lens.

**Interpupillary adjustment**

1. Looking through the eyepiece (1), move the eyepiece tubes (3) by taking hold of the prism housing (4) and moving out, or inwards.
2. Interpupillary distance is correct when the two fields of view viewed through both eyepieces appear complete, and are unified into one.
3. Interpupillary distance should be adjusted for each new user.

**Focusing**

1. Turn the zoon knob (16) to the lowest magnification 1X.
2. Place a flat object or a microscope slide on the center of the stage (11).
3. Turn focusing knobs (18) to mid-focus range.
4. The head holder (17) is mounted on a column (21), on which it can be moved up or down, depending on the size of the object to be focused on in the application.
    a. Support head holder (17) with one hand without touching any lens, and with the other, loosen the screw (20) on the support collar (19). The head holder can then be slid to the base (13).
    b. Without letting go of the head, loosen the head holder locking screw (Figure 1).
    c. While looking through the eyepiece, move the head holder up or down until the object appears in focus.
    d. Tighten the head holder locking screw. Do not let go of the head yet.
    e. Slide the security collar up to the head holder, and tighten the support collar screw. The head can then be released.
    f. It is not necessary to adjust the head every time the sample is changed – only when it appears out of focus.
5. Adjust the focus knobs, (18) until the image appears sharp.

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**Diopter adjustment**

Diopter adjustment collars are located on the eyepiece tubes. Their normal position is at the lowest part of the collar, aligned with the sign marked on the eyepiece tube.

**For differences in eyesight**

1. Using only the right eye, look through the right eyepiece (1) and adjust focus.
2. Using the left eye, look through the eyepiece and adjust the focus by turning the diopter adjuster (2) located on the left-hand tube (3) until the image appears sharp. Do not use the focus knobs to adjust focus (18).

**Changing magnification**

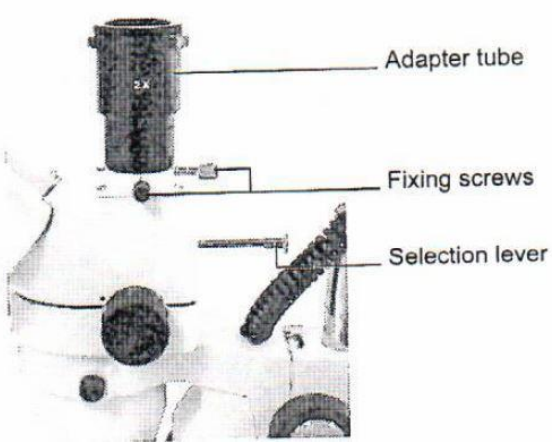
1. Turn the zoom control (16) to the highest magnification, 4X.
2. Though the stereomicroscope has been parfocalized, focus needs to be adjusted as the objectives of a low magnification offer a more precise field of view.
3. Once the image is in focus with the higher magnification objectives, it is not necessary to adjust the focus when lower magnification objectives are used.

**Adapting a photographic or video camera**

This product comes equipped with a vertical image port on the head for the installation of a photographic reflex type camera/video camera, using the corresponding adapters.

Located at the back of the head is a selection lever (Figure 2) that transmits the image to the vertical point. In an extended position, however, the image is transmitted to the vertical port, but the image cannot be viewed by the correct eyepiece.

Figure 2.




**Adapting a photographic camera**:

An adapter tube is required. This tube includes 2X lenses to balance the correct parfocality between the images received by the binocular and vertical ports. This balance can be achieved providing that this parfocality has been adjusted accordingly.

The adapter tube has a T-type thread at one end here adapter mounts of all types can be adapted for all reflex camera brand names.

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**NB**: The T-type adapter mount is not included as it is an item specific to each brand of camera on the market.

1. To connect the camera to the microscope, first remove the front lens of the camera and place the corresponding T mount. Screw on the adapter lube provided, onto the mount of the camera.
2. Loosen the knurled screw (Figure 2) situated on the side of the vertical port on the head, sufficiently enough to remove the protective cover.
3. Insert the adapter tube with the camera already mounted on the vertical port. If it does not insert with ease, unscrew the knurled screw until the adapter fits.
4. Re-tighten the knurled screw so that the camera is secure.
5. Operate the camera according to the instructions.

**Adapting a video camera**

An adapter tube is required. This adapter tube includes 0.5X lenses that correct the parfocality of images, from both binocular and vertical ports, shown on the TV monitor – provided that that parfocality has been correctly adjusted.

The adapter tube is provided with a “C” thread, and a “CS” ring, which can adapt different kinds of video camera.

1. Loosen the knurled screw (Figure 2) on the side of the vertical port of the head sufficiently enough to remove the protective cover.
2. Insert the adapter tube with the camera already mounted on the vertical port, as shown in Figure 3. If it does not insert with ease, unscrew the knurled screw until the adapter tube fits.
3. Retighten the knurled screw firmly so that the camera is secure.
4. Operate the camera according to manufacture instructions.

If the image on the controller appears out of focus when the objective is changes, it is possible that the CS mount is responsible. Place or remove it, according to the procedure to obtain parfocality

## Maintenance

**WARNING**

FOR YOUR OWN SAFETY, SWITCH OFF AND DISCONNECT THE MICROSCOPE FROM ANY ELECTRICAL SOURCE BEFORE ATTEMPTING ANY MAINTENANCE PROCEDURE TO AVOID THE RISK OF ELECTROCUTION. CONSULT YOUR DISTRIBUTOR IF ANY REPAIR OR MAINTENANCE IS REQUIRED.

**Optical maintenance**

Do not attempt to disassemble any optical component. For any repair work not specific in this instruction manual, please call our Customer Service Department at 1-800-523-5874.

Before cleaning the lens surface, remove any dust or particles with a brush or with a low pressure compressed air.

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*Cleaning the eyepiece*

1. Do not remove the eyepiece (1) from the eyepiece tube (3).
2. Clean the external surface by dampening the lens with breath.
3. Dry the lens with special lens paper. Dry in circular movements from the center of the lens outwards. Do not wipe the lens when already dry as this could cause scratching.

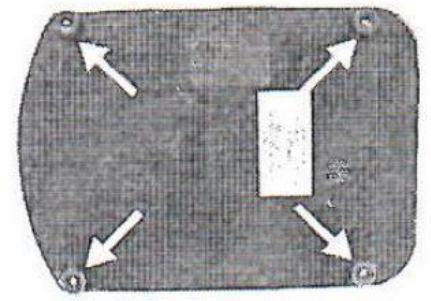
*Cleaning the objectives*

1. Do not remove objectives from the microscope.
2. Only clean the surface area. Use a soft cotton cloth dampened slightly with Xylene. Dry the lens afterwards with the same cloth.

*Electrical maintenance: Changing the transmitted illumination bulb*

1. Rest the stereomicroscope on its side being extremely careful not to damage the eyepiece (1) or the stage (11).
2. Unscrew the 4 screws indicated in Figure 3 and open the cap on the base.
3. With a cloth, carefully pull out the bulb and disconnect it from the socket.
4. Do not touch the new bulb with your hands. Use a clean cloth to insert the pins of the bulb into the socket.
5. If the bulb is accidentally touched with bare hands, it MUST be cleaned.
6. Close the cover on the base and screw down firmly.

Figure 3.



*Electrical maintenance: Changing the incident illumination bulb*

1. Unscrew the illuminator protector tube (7), turning it counterclockwise, and removing the tube from that of the lenses.
2. With a cloth, carefully pull out the bulb to disconnect it from the socket.
3. If the bulb is accidentally touched with bare hands, it MUST be cleaned.
4. Replace illuminator lens tube, turning it clockwise, and screwing in the protector tube.

*Electrical maintenance: Changing the fuse*

1. With a flat screwdriver, lightly press on the slot of the fuse holder cover (Figure 1) and turn ¼ in the direction of the arrow marked.
2. Release pressure and completely remove the loosened cover.
3. Remove the fuse from the removed cover, and insert the new one – ensure that it is 0.5 Amps.
4. Insert the cover
5. Repeat step 1 but turning ¼ in the opposite direction to the arrow. The cover must be firmly closed.

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*Mechanical maintenance: Adjusting the tension focus*

Tension comes pre-adjusted. The best point of tension is that which permits the focus knobs to move as loosely as possible, without the head sliding down with its own weight.

The tension adjustment collar for focusing (Figure 1) is situated between the focusing knob (18) and the head holder (17).

1. Loosen the screw located in the collar hole with the 2mm hexagonal key.
2. To increase the tension, turn the collar counterclockwise; to decrease it, turn it clockwise.
3. Retighten the hexagonal key.

## Troubleshooting

### Electrical problems

| PROBLEM | CAUSE | SOLUTION |
|---|---|---|
| The bulb doesn't work | Outlet inoperative | Have it repaired by a qualified technician |
| | Cable not connected | Connect the cable to a power source |
| | Bulb burned out | Replace bulb |
| | Fuse blown | Replace fuse |
| | Wrong bulb | Replace with appropriate bulb |
| Bulb has short life span | Very high voltage | Reduce light intensity to the minimum before turning the stereomicroscope on or off |
| Bulb burns out immediately | Wrong bulb | Replace with the appropriate bulb |
| Bulb flickers | The bulb is not inserted correctly into the socket | Insert bulb correctly |
| | Bulb on the point of burning out | Replace bulb |
| | Fuse cover badly closed | Have repaired by a qualified technician |
| Fuse blown quickly | Wrong fuse | Replace with appropriate fuse |
| Fuse blown instantly | Short circuit | Have repaired by a qualified technician |

### Image quality

| PROBLEM | CAUSE | SOLUTION |
|---|---|---|
| Poor resolution | Eyepieces dirty | Clean eyepieces |
| | Objectives dirty | Clean objectives |
| Spots or stains in field of view | Eyepieces dirty | Clean eyepieces |

### Mechanical problems

| PROBLEM | CAUSE | SOLUTION |
|---|---|---|
| It does not stay in focus | The head drops down | Adjust the tension of the coarse focus knob |

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For any questions or for ordering information, please contact Customer Service at 1-800-523-5874.

*Thank you for choosing*
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