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TECHNICAL SPECIFICATION SHEET

PRODUCT NAME: MICROSCOPE
MODEL: CX RII

ENVIRONMENTAL CONDITIONS:
• DESIGNED FOR INDOOR USE
• INSTALLATION CATEGORY II
• POLLUTION DEGREE 2
• INDOOR USE
• ALTITUDE: 2000 METERS
• TEMP: 5°C TO 40°C
• RELATIVE HUMIDITY: MAX 80% AT TEMP UPTO 31°C
• SUPPLY VOLTAGE SHALL NOT EXCEED ± 10% OF THE RATED INPUT VOLTAGE GIVEN BELOW

SUPPLY VOLTAGE: 120 VAC TO 240 VAC
FREQUENCY: 50/60 HZ
FUSE: F2.5A/250V
POWER SUPPLY TO THE HALOGEN LAMP: 12V AT 20W

CAUTION: HIGH VOLTAGE FUSE REPLACEMENT
WARNING: HIGH VOLTAGE POWER INLET
EARTH
WARNING: HIGH TEMPERATURE BULB REPLACEMENT
Eye Piece
Quadruple Nosepiece
Objectives
Mechanical Stage
Abbe Condenser
Collector Lens
Hand Guard

Binocular Observation Head
Stand
Potentiometer
Focussing Knob

CX RII
(Binocular)
STANDARD COMPONENTS

Key                DESCRIPTION
1  EYE GUARD
2  EYE PIECE
3  FOCUSSING MOUNT
4  SLIDE COVER
5  BINO HOUSING ASSEMBLY
6  BINO COVER PLASTIC
7  NOSE PIECE ADAPTER
8  STAND
9  LOCKING SCREW
10 POTENTIOMETER
11 POTENTIOMETER KNOB
12 BACK PLATE ASSEMBLY WITH ELECTRICALS
13 FIXED GIB
14 MOVING BALL SLIDE
15 CRITICAL MOUNT
16 LENS BARREL (CRITICAL MOUNT)
17 BOTTOM PLATE ASSEMBLY
18 HAND GUARD
19 FILTER HOLDER
20 ABBE CONDENSER
21 SUB STAGE ASSEMBLY
22 CENTERING RING
23 MECHANICAL STAGE
24 SLIDE CARRIER
25 FINE MOTION KNOB
26 COARSE MOTION KNOB WITH GEAR HOUSING
27 PINION BUSH ASSEMBLY
28 TENSION ADJUSTING RING
29 WAVE WASHER 35 x 28 x 0.15
30 DELRIN WASHER INSIDE-T
31 COARSE MOTION KNOB PLAIN
32 NOSE PIECE COVER PLASTIC
33 RP SERIES OBJECTIVES
34 QUADRUPLE NOSEPICE
UNPACKING

Remove the microscope components carefully from the packing box. Please ensure the following components before discarding the packing material:-

2.1 Stand which includes microscope arm, focusing mechanism, condenser, quadruple nosepiece, Base with built-in illumination system, extra fuse and mechanical stage.

2.2 RP series Objectives 4x, 10x, 40x (SL), 100x (SL,Oil) or as ordered

2.3 10x WF Eyepieces or as ordered

2.4 ABBE Condenser N.A. 1.25

2.5 Blue Filter or as ordered

2.6 Immersion Oil, as ordered

2.7 Spare Lamp(s) as ordered

2.8 Dust cover

2.9 Instruction Manual

2.10 Spare electricals, ordered as extras

2.11 Binocular Head or Trinocular Head, as ordered

2.12 Optional accessories such as Phase Telescope, Darkfield/Brightfield slider, Polarizing kit, Video Adapters, Photo adapter for 35mm SLR camera, Adapter for Digital camera alongwith 10x Photoeyepiece.

Please note optional accessories are not shipped as part of standard equipment and are shipped in separate packaging as ordered.

INITIAL SET UP

3.1 Objectives - Screw the RP series objectives into the nosepiece in the consecutive order of the magnification.

3.2 Eyepieces - Insert the Eyepieces into the ocular tubes of Observation Head and secure the Eyepieces firmly.

3.3 Observation Head - Unpack it to install using following procedures:

1. Loosen the Head Locking screw.

2. Place the Observation Head on the stand and engage the dovetail ring provided at the bottom into the engaging recess provided on the stand.

3. Tighten the Head locking screw after rotating the Binocular Head to your preferred direction of use.
OPERATING PROCEDURE

This procedure explains how to use CX R series Microscope. It does not include information on general techniques of microscopy.

4.1 Make sure all the exposed optical surfaces are free of dirt. Plug the power cord into a grounded outlet. Bring the light intensity regulator to lowest level and switch on the power.

4.2 Adjust the observation head to convenient working position (fine adjustment of observation head is explained later in this manual).

4.3 Take down the stage to a fairly low position with the help of coarse focus knob.

4.4 Make sure that the stage surface is free of dust, grit or any other material that will interfere with the movement of the specimen slide across the surface of the stage or scratch the slide and the stage between the stage fingers. Position the specimen area of the slide (cover glass up-ward) over the centre of stage aperture. Use the stage control knobs to move the specimen slide to the desired position.

4.5 Rotate the nose piece with the help of soft feel knurled nosepiece ring to bring lowest magnification objective (40 X) in the viewing position. Focus position stop at 40X is factory pre-set for easy reference.

4.6 Adjust the mechanical stage position with the help of focusing mechanism at a position to get crisp and clear image of the specimen.

4.7 Adjust the fine focus knob to sharpen the image in the centre of the field of view.

4.8 Look at the image and adjust the condenser aperture to obtain the clearest possible image. The clarity of the image depends upon the size of the aperture. As the aperture becomes smaller, the contrast and the depth of focus increases, but the resolving power decreases. The clearest image is produced by the combination of these three factors.

4.9 Examine the specimen. Move the slide at suitable position to observe some specific features of the specimen at higher magnification.
4.10 Use the fine focus knob to sharpen the image. Until you gain sufficient experience in use of this microscope, it is wise to always obtain an image and to do the focusing with lower power objective and then to increase magnification by going to successively higher power objectives one step at a time.

4.11 When using objective of higher numerical aperture (N.A.) proper focusing of the abbe condenser is important. Focus the abbe condenser by racking the condenser movement knob up and down so that the field is evenly illuminated.

4.12 CX RII has a rotary potentiometer coupled with an electronic circuit for regulating the light intensity. Rotate the potentiometer from low to high as you go from low magnification to high magnification objectives for obtaining best light in the field of view.

The procedure for examining a specimen using the oil immersion objectives is as follows:

a. Rotate the nosepiece so that the low power objective is in the light path.

b. Place one drop of immersion oil on the lighted area of the specimen slide. Dust or air bubbles in the oil can destroy the definition of the image. If the bubbles are trapped between the objective lens and the slide, clean off the oil and start again. Keep the oil tightly stoppered and don’t shake the bottle.

c. Rotate the nosepiece so that the RP series 100x oil immersion objective is in the light.

d. With your eye at the level of the stage, use coarse focus knob to raise the stage with specimen cover glass. When you see a flash of light at this location, the objective lens has made contact with the immersion oil and the microscope can be focussed using the fine focus knob.

e. Each time you finish using the oil immersion objective, wipe off all traces of oil from the objective and the specimen cover glass with a lens tissue or clean soft cloth.

This will:

- Prevent dust and dirt from accumulation on the lens of the objective and degrading its optical performance.
- Keep the slide clean to work with.
- Prevent oil from contaminating the high dry objective (RP series 40x) and deforming its optical performance. Since this objective has a short working distance and might accidently contact oil.
- Keep your hands free of oil. Oily finger prints accidentally transferred to the optical elements degrade their performance.

The performance and life of 100x oil immersion objectives is warrantied only if proper immersion oil such as E-merck or Cargille labs is used. Liquid parafin is highly corrosive to the front lens elements and must never be used.
FINE ADJUSTMENT OF BINOCULAR HEAD

Rotate the Binocular head to bring it to a convenient position. Normally it is kept aligned and not rotated.

Adjust interpupillary distance by bringing the eyepiece tubes closer or apart till you see one fused image.

If the image from both oculars does not fuse, you are required to do Dioptric adjustment on the oculars as explained below :-

1) Set dioptric scale on focussing (left) ocular at 64(nominal) (or corresponding to your IPD setting number)

2) Bring 10x objective in position and focus the slide in the right eye with coarse and fine focus knob keeping the left eye closed.

3) Close the right eye and seeing through the left eye, focus the left ocular up and down by rotating the focussing sleeve till the image is in sharp focus.

4) Look through both the eyes. If interpupillary adjustment required, do so as explained earlier.

ADJUSTING THE EYESIGHT DIFFERENCE

Set dioptric scale on right eye tube to 64 (or corresponding to your IPD Setting). Looking into the right hand eyepiece with the right eye, focus the image by turning focus knob.

Looking into the left hand eyepiece with the left eye, focus the image by turning the focussing sleeve
ADJUSTING THE TENSION

Grip the coarse motion knob with gear house from the opposite side and rotate the tension adjusting ring in the anti clockwise direction for increasing and vice-versa for decreasing the tension.

CHANGING OF BULB

- Halogen Lamp (12V 20W or 12V 30W)
- Unplug the microscope cord, keeping the regulator in off position
- Rest the microscope on the flat back of the arm
- Pull the plunger to open the door
- Replace the bulb with due care and caution

**Note**: Use tissue paper to handle bulb. Direct contact with fingers will leave grease/stain on bulb which will degrade its performance.
CAUTION IN HANDLING

1. Avoid sharp knocks:
   Handle the microscope gently taking care to avoid sharp knocks.

2. Location of microscope:
   Avoid DUST, VIBRATION and exposure to high temperature, Moisture or direct sunlight.

3. Replacing the lamp bulb or fuse:
   Before replacing the lamp or fuse, be sure to turn off the power switch and disconnect the power source cord from the socket.

4. Dirt on the lens:
   Do not leave dust, dirt or finger marks on the lens surfaces. They will prevent you from clear observation of the specimen image.

CARE & MAINTENANCE

Your microscope has been engineered for long life with a minimum of maintenance required. In general, routine maintenance is limited to keeping the microscope clean. Always protect the microscope with dust cover when not in use.

1. Cleaning the lenses:
   To clean the lens surfaces, remove dust using a soft brush or gauze. Only for removing finger marks or grease, soft cotton cloth, lens tissue or gauze lightly moistened with absolute alcohol (ethanol or methanol) should be used. For cleaning the objectives only use xylene. Observe sufficient caution in handling alcohol and xylene.

2. Cleaning the painted surfaces:
   Avoid the use of any organic solvent (e.g. thinner, xylene, ether, alcohol etc.) for cleaning the painted surfaces and plastic parts of the instrument. Painted surfaces may be cleaned with dry cloth.

3. Never attempt to dismantle:
   Never attempt to dismantle the instrument so as to avoid the possibility of impairing the operational efficiency and accuracy.

4. Periodical checking:
   To maintain the performance of the instrument, we recommend the customers to get the instrument checked periodically. For details, contact your nearest agency.

⚠️ The performance and life of 100x oil immersion objectives is warranted only if proper immersion oil such as E-merck or Cargille labs is used. Liquid paraffin is highly corrosive to the front lens elements and must never be used.

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PROBLEMS & REMEDIES

The user will normally not find any disorder in the instrument. However if some difficulty is encountered recheck the use referring to this table

1. Optical Manipulation

<table>
<thead>
<tr>
<th>Failure</th>
<th>Cause</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darkness at the periphery or uneven brightness of viewfield</td>
<td>• Revolving nosepiece not in click stop position.</td>
<td>• Revolve it to click position</td>
</tr>
<tr>
<td>Dirt or dust on the viewfield</td>
<td>• Dirt or dust on eyepiece lens.</td>
<td>• Cleaning</td>
</tr>
<tr>
<td></td>
<td>• Dirt or dust on the slide</td>
<td>• Cleaning</td>
</tr>
<tr>
<td>No good image obtained (low resolution or contrast)</td>
<td>• No coverglass attached to slide</td>
<td>• Attach coverglass</td>
</tr>
<tr>
<td></td>
<td>• Too thick or thin coverglass</td>
<td>• Use specified thickness</td>
</tr>
<tr>
<td></td>
<td>• Slide may be upside down</td>
<td>• Turn over the slide</td>
</tr>
<tr>
<td></td>
<td>• Immersion oil soils the top of dry system objective (especially 40x)</td>
<td>• Cleaning</td>
</tr>
<tr>
<td></td>
<td>• Dirt or dust on the lens (Condenser, Objective Eyepiece, Slide)</td>
<td>• Cleaning</td>
</tr>
<tr>
<td></td>
<td>• No immersion oil used on imm. oil 100 x objective.</td>
<td>• Use immersion oil</td>
</tr>
<tr>
<td></td>
<td>• Air bubbles in immersion oil.</td>
<td>• Remove bubbles</td>
</tr>
<tr>
<td></td>
<td>• Unspecified immersion oil used</td>
<td>• Use specified immersion oil.</td>
</tr>
<tr>
<td></td>
<td>• Condenser aperture too much closed.</td>
<td>• Open properly</td>
</tr>
<tr>
<td></td>
<td>• Too low position of condenser.</td>
<td>• Bring it up to get proper illumination.</td>
</tr>
<tr>
<td>Failure</td>
<td>Cause</td>
<td>Actions</td>
</tr>
<tr>
<td>--------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Image moves while being focused</td>
<td>• Specimen rises from stage surface • Revolving nosepiece not in click stop position.</td>
<td>• Place it stable. • Revolve it to click stop position.</td>
</tr>
<tr>
<td>Image tinged yellow</td>
<td>• Blue filter not used or lamp intensity low</td>
<td>• Use daylight filter. Adjust potentiometer for adequate light.</td>
</tr>
<tr>
<td>Insufficient brightness of illumination</td>
<td>• Condenser aperture too much closed • Dirt or dust on lens / condenser, objective • Too low position of condenser</td>
<td>• Open it properly • Cleaning • Correct positioning</td>
</tr>
<tr>
<td>High power objective touches the slide when changed over from low power.</td>
<td>• Upside down of slide • Too thick coverglass</td>
<td>• Turn over the slide. • Use specified thickness coverglass</td>
</tr>
<tr>
<td>Slippage of focus in coarse focussing</td>
<td>• Tension on knobs too less</td>
<td>• Increase tension on knobs.</td>
</tr>
<tr>
<td>Fine focussing in effective</td>
<td>• Tension on knobs too high</td>
<td>• Loosen Tension on knobs.</td>
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