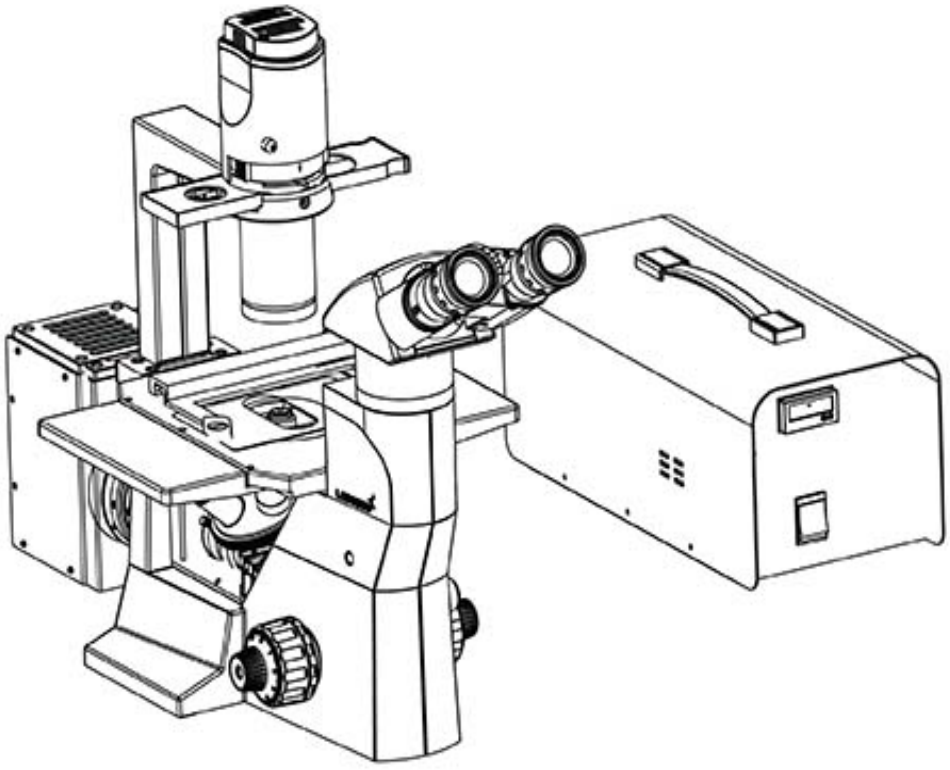
LABOMED®

TCM 400 FLR
User Manual

Inverted Microscope

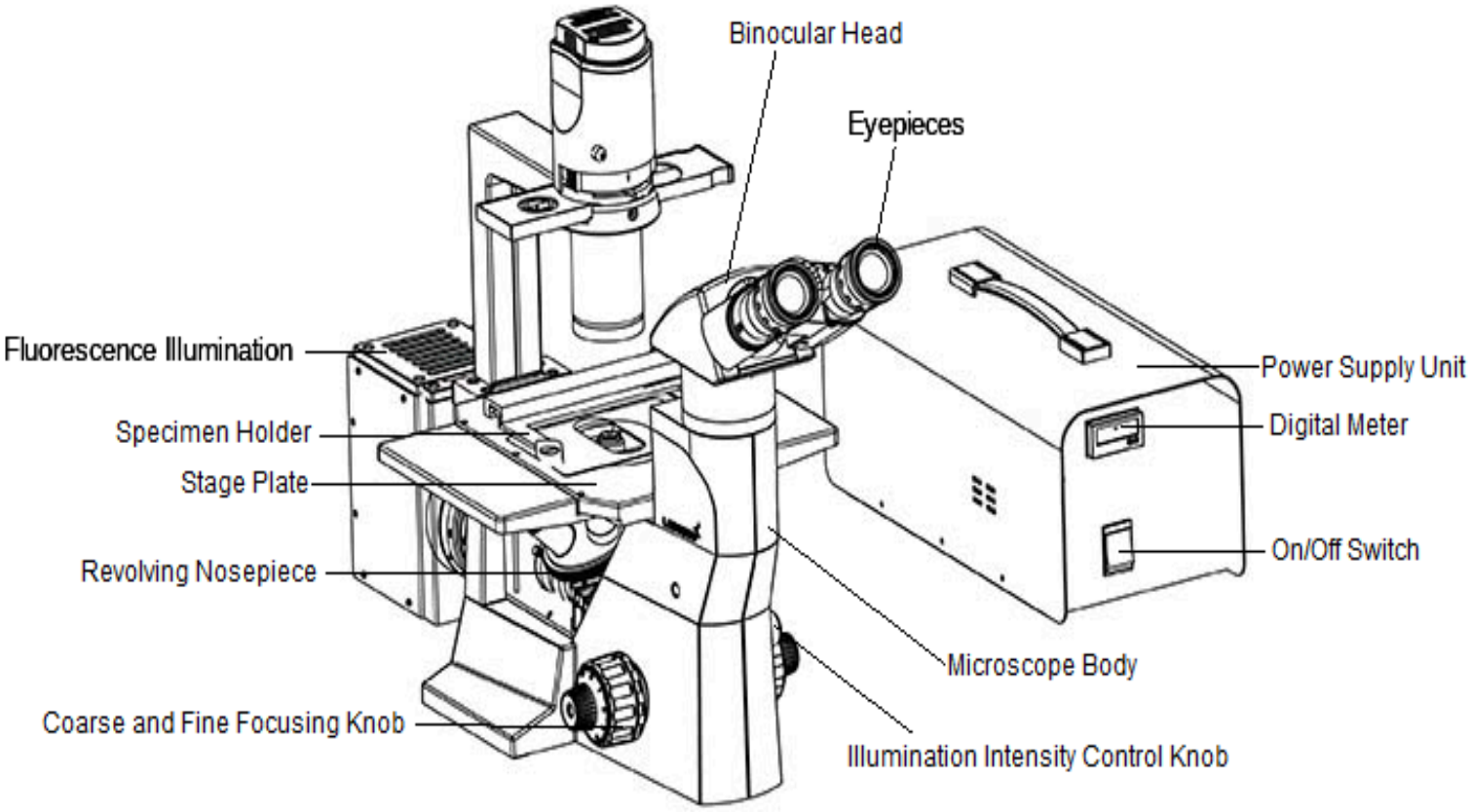


To ensure correct use of this instrument and to avoid injury during operation,
read this manual completely before use.

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Issue 1.1
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TCM 400 FLR


Binocular Head
Eyepieces
Fluorescence Illumination
Power Supply Unit
Specimen Holder
Digital Meter
Stage Plate
On/Off Switch
Revolving Nosepiece
Microscope Body
Coarse and Fine Focusing Knob
Illumination Intensity Control Knob

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PACKAGING CONTENTS

1. FL attachment in 2 parts
2. 2 filter cubes
3. Power supply
4. Power cord
5. UV protection shield

SAFETY INSTRUCTIONS

- The fluorescence attachment is manufactured in accordance with CE safety standards and regulations.
- The fluorescence attachment is intended for use only as prescribed in this manual.
- Make sure that the main switch on the power supply unit is set to OFF (O) before supplying power to the unit.
- The power supply unit contains high-voltage components. Do not attempt to disassemble the unit when it is turned ON (I).
- To avoid injury, do not remove the lamp housing while the lamp is lit. Also, do not turn the lamp ON while the lamp housing is removed, to avoid damaging the instrument.
- Before opening the lamp housing to replace the lamp, set the main switch to OFF (O) and unplug the lamp housing's connecting cord from the output connector on the power supply unit. Wait at least 10 minutes, or until the lamp housing has cooled down, before making any changes.
- Do not open the lamp housing while the system is turned ON, as any user contact with internal parts may cause injury.
- A used mercury burner must be disposed of in compliance with the ordinances or regulations of your national or local government.
- The manufacturer will not accept any liability for damage caused by any user following unsafe practices with the instrument.

⚠ Avoid using the lamp beyond its service life. The mercury lamp contains high-pressure gases. If the lamp is used beyond its service life, stress may accumulate inside the lamp and, in the worst but very rare case, the lamp may burst.

INSTALLATION

Carefully remove all parts from the packing.

1. Remove the plastic cover (1) from the microscope to make room for the fluorescence attachment.
   Bring the nosepiece to its maximum height by rotating the coarse knob (2) counterclockwise. Remove the illumination power cable before removing the cover. Apply equal pressure with your thumbs to the inner sides of the panel (3 and 4) to push it out. Refer to Fig. 1 and 2.

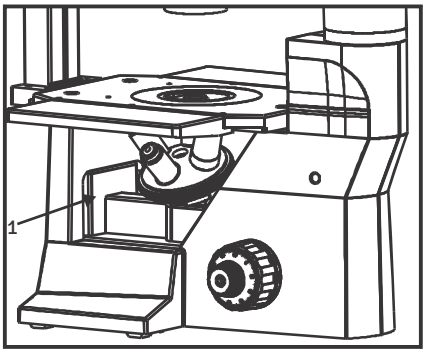


Fig. 1

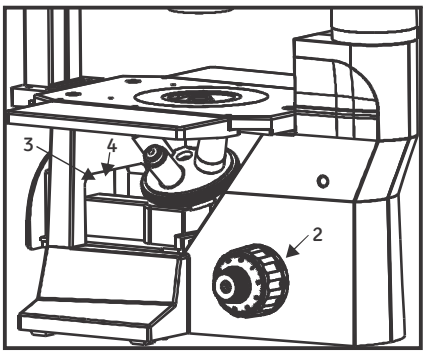
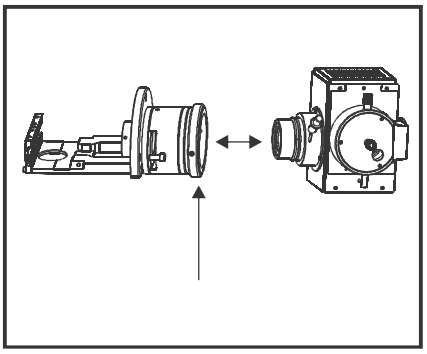
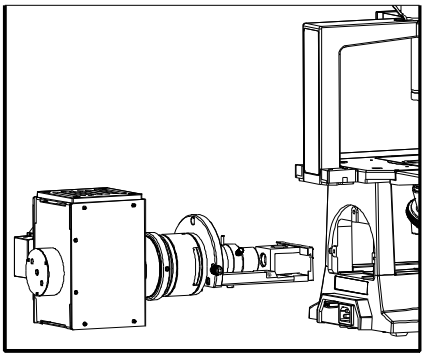


Fig. 2

2. Join the optical assembly and the illumination assembly to complete the FL attachment. Guide the illumination assembly to the optical assembly. Secure both parts with the Allen screws (1) provided. Refer to Fig. 3.

3. Mount the attachment on the microscope as shown in Fig. 4 and secure it with the 3 screws. Then install the filter in the guide slot as shown in Fig. 5.


Fig. 3


Fig. 4

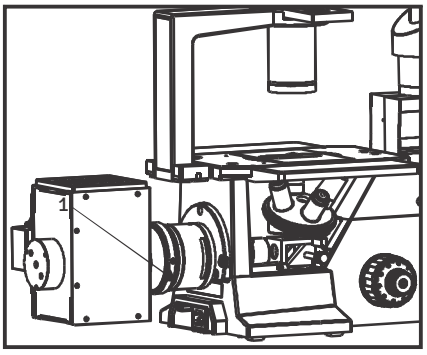


Fig. 5

INSTALLATION

Open the illumination housing to install the mercury lamp. Loosen the thumb-screw indicated by the arrow and gently pull the lamp door out of the lamp housing.

To avoid any damage to the mercury vapor lamp, a plastic rod (1) is fitted in place of the lamp during transit. Remove this rod by loosening the two screws indicated by the two arrows A and B in Fig. 6.

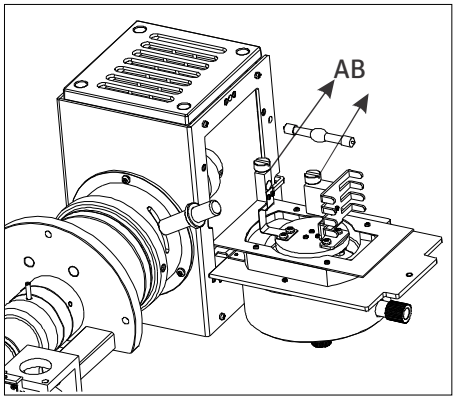


Fig. 6

Mount the mercury vapor lamp in place of the plastic rod and tighten the screws to secure the lamp, as shown in Fig. 6A.

Avoid touching the lamp, to prevent leaving fingerprints on the glass. If there is any residue on the lamp's surface, gently wipe it off with soft tissue paper.

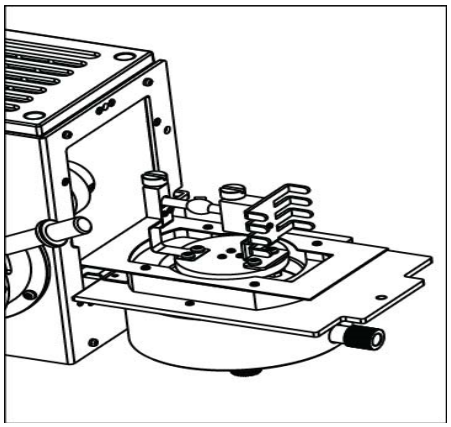


Fig. 6A

Connect the power cable coming from the illumination housing to the power supply unit at the point indicated by arrow A in Fig. 7.
(1). Connect the power cord to the AC inlet indicated by arrow B in Fig. 7.

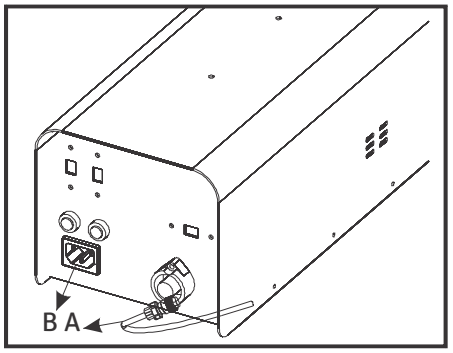


Fig. 7

INSTALLING THE B AND G FILTERS

Select the filter to be used on the fluorescence attachment. Insert the slider into the filter housing and gently slide it in. It will stop at the index position.

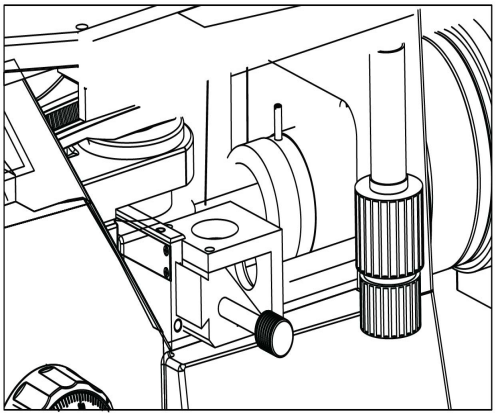


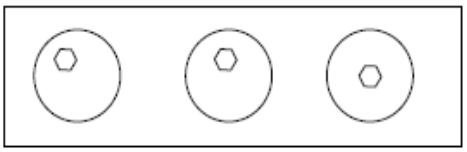
Fig. 8

MAINTAINING OPERATING LIFE

- Make sure that the power supply unit is connected to the proper supply voltage.
- Set the main switch on the power supply unit to (I). After the lamp has ignited, allow at least 5 minutes for the light to stabilize.
- To avoid shortening the operating life of the power supply unit, do not turn the power ON while the lamp is not mounted.
- Avoid turning the power ON and OFF at short intervals, as this may reduce the working life of the power supply.
- After the lamp is turned OFF, it must not be re-ignited before the mercury vapor has cooled and condensed. Wait approximately 10 minutes before turning the power to the fluorescence attachment ON again.

CENTERING THE LIGHT BEAM

- Turn the power supply ON. Allow the lamp at least 5 minutes to fully illuminate for optimal use.
- The halogen illumination of the microscope should be kept off while working with the FLR.
- Place the specimen slide on the stage. Select the excitation light by setting the filter block as follows:



For G excitation: move the red sliding block to its outermost position.

For B excitation: push the blue sliding block in to its innermost position.

For O light (non-excited light): slide the filter out to the parking position.

- Observe the specimen slide through the eyepieces of the microscope.
- When fluorescent light is not required, turn the power supply of the attachment OFF and set the sliding filter block to its middle (neutral) position. To view the specimen normally under the microscope's own illumination, turn the microscope ON.

OBSERVING A SPECIMEN

First, allow the mercury vapor lamp at least five minutes to fully illuminate for optimal use (it is very important to give the system enough time to ignite fully in order to achieve a fully illuminated centering beam). Look into the eyepieces and adjust the collector focusing knob to make the field as bright and as even as possible, then turn the knob clockwise to tighten it, as shown in Fig. 9, part 1. When the lamp is fully illuminated, a beam of light is visible in the field of view through the eyepieces.

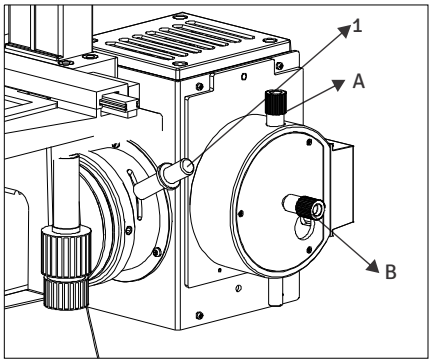


Fig. 9

To center this beam of light in the field of view, two centering knobs are located on the lamp housing, as indicated by the two arrows (A and B) in Fig. 9. Adjusting these two knobs shifts the focused beam. Adjust the beam position to the center of the field of view, as shown in Fig. 9A.

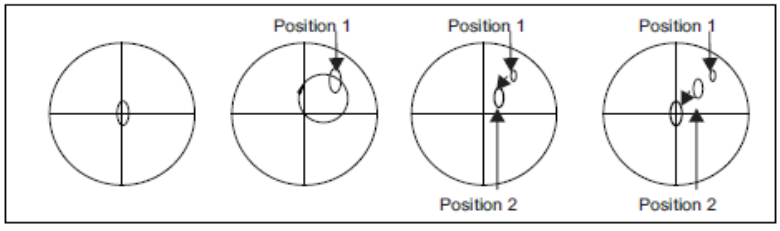


Fig. 9A

TROUBLESHOOTING

Problem	Cause	Remedy
Optical system		
1) The mercury lamp lights up, but the field of view remains dark.	**The filter slider is not engaged properly in the light path.**	**Set the filter to the required setting.**
2) The image is unclear, blurred or has poor contrast.	**a) Objectives and/or filters are dirty.** **b) The field iris diaphragm is not fully open.**	**Clean them with tissue or lens paper.** **Adjust the field iris diaphragm so that the image circumscribes the field of view.**
3) The field of view is vignetted or not evenly illuminated.	**a) The objective is not engaged properly in the light path.**	**When rotating the nosepiece, make sure that the objective clicks into position.**
	b) The filter slider is not engaged properly in the light path.	**Engage the required filter properly in the light path.**
	c) The mercury lamp is not centered properly.	**Center the mercury lamp correctly. This procedure is shown on page 7.**
	d) The beam focus deviates from the correct position.	**Adjust the condenser knob. This procedure is shown on page 7.**
4) The mercury lamp does not light after the power supply is switched ON.	**Some mercury lamps may not ignite the first time the power supply is turned ON.**	**Press the Trigger button on the front panel of the power supply unit and wait for the lamp to ignite.**
Electrical system		
1) The lamp housing or main switch indicator does not light up.	**a) The power cord is not connected properly.**	**Make sure that the power cord is firmly in place.**
	b) The fuse has blown.	**Replace it with a fuse of the same type and rating.**
2) The main switch indicator lights up, but the mercury lamp remains OFF.	**a) The connecting cable is not engaged properly.**	**Make sure that the connection is secure.**
	b) The mercury lamp is not mounted.	**Install the mercury lamp as described on page 5.**
3) The light flickers intermittently.	**a) The lamp has not been given enough time to reach full brightness.**	**Allow at least 5 minutes after turning the power supply ON for the lamp to reach full brightness. If the flickering persists, press the Trigger button.**
	b) The service life of the lamp has expired.	**Replace the mercury lamp.**

TECHNICAL SPECIFICATIONS

Type	: Transmitted fluorescence illumination based on switching of dichroic mirror cubes
Observation modes	: B excitation and G excitation
Lamp type	: HBO 50 W high-pressure mercury vapor lamp
Supply voltage	: 110V AC, 60 Hz / 220V AC, 50 Hz
Operating environment	: Indoor use Ambient temperature: 5°C to 40°C Maximum relative humidity: 80% at 40°C

FILTER SPECIFICATIONS

B excitation

Excitation filter	**: Transmission 90% at wavelengths of 420 to 480 nm. Transmission 0% at wavelengths from 485 nm.**
Dichroic mirror	**: Transmission 93% at wavelengths from 540 nm. Transmission 0% at wavelengths of 400 to 530 nm.**
Barrier filter	**: Transmission 95% at wavelengths from 535 nm. Transmission 0% at wavelengths of 400 to 500 nm.**
Recommended fluorescent dye	**: Acridine orange, both DNA and RNA**

G excitation

Excitation filter	**: Transmission 85% at wavelengths of 490 to 525 nm. Transmission 0% at wavelengths from 530 nm.**
Dichroic mirror	**: Transmission 90% at wavelengths from 600 nm. Transmission 0% at wavelengths of 400 to 595 nm.**
Barrier filter	**: Transmission 92% at wavelengths from 615 nm. Transmission 0% at wavelengths of 400 to 575 nm.**
Recommended fluorescent dye	**: Acridine Red FM™ 5-95**

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