

B-150 Series

INSTRUCTION MANUAL

Model
B-150 series (B-151, B-152, B-153, B-155, B-156, B-157, B-159)
B-150 ALC series (B-151ALC, B-152ALC, B-153ALC, B-155ALC, B-156ALC, B-157ALC, B-159ALC)
B-150R-PL series (B-151R-PL, B-152R-PL, B-153R-PL, B-155R-PL, B-156-RPL, B-157R-PL, B-159R-PL)

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1. Warning

This microscope is a scientific precision instrument designed to last for many years with a minimum of maintenance. It is built to high optical and mechanical standards and to withstand daily use. We remind you that this manual contains important information on safety and maintenance, and that it must therefore be made accessible to the instrument users. We decline any responsibility deriving from incorrect instrument use that does not comply with this manual.

2. Safety Information



Avoiding Electrical Shock

Before plugging in the power supply, make sure that the supplying voltage of your region matches with the operation voltage of the equipment and that the lamp switch is in off position. Users should observe all safety regulations of the region. The equipment has acquired the CE safety label. However, users have full responsibility to use this equipment safely. Please follow the guidelines below, and read this manual in its entirety to ensure safe operation of the unit.

3. Package content

3.1 B-151, B-151ALC, B-151R-PL



- | | |
|------------------------------|-----------------------------|
| ① Frame | ⑤ Objectives (4X, 10X, 40X) |
| ② Monocular observation head | ⑥ Dust cover |
| ③ Eyepiece | ⑦ Green filter |
| ④ Tension adjustment tool | ⑧ Power supply |

3.2 B-152, B-152ALC, B-152R-PL, B-153, B-153ALC, B-153R-PL



- | | |
|------------------------------|-----------------------------------|
| ① Frame | • B-152 (all) (4X, 10X, 40X) |
| ② Monocular observation head | • B-153 (all) (4X, 10X, 40X, 60X) |
| ③ Eyepiece | ⑥ Dust cover |
| ④ Tension adjustment tool | ⑦ Green filter |
| ⑤ Objectives | ⑧ Power supply |

3.3 B-155, B-155ALC, B-155R-PL



- | | |
|-----------------------------------|-----------------|
| ① Frame | ⑥ Dust cover |
| ② Monocular observation head | ⑦ Green filter |
| ③ Eyepiece | ⑧ Power supply |
| ④ Tension adjustment tool | ⑨ Immersion oil |
| ⑤ Objectives (4X, 10X, 40X, 100X) | |

3.4 B-156, B-156ALC, B-156-RPL, B-157, B-157ALC, B-157R-PL



- | | |
|------------------------------|-----------------------------------|
| ① Frame | • B-156 (all) (4X, 10X, 40X) |
| ② Binocular observation head | • B-157 (all) (4X, 10X, 40X, 60X) |
| ③ Eyepiece | ⑥ Dust cover |
| ④ Tension adjustment tool | ⑦ Green filter |
| ⑤ Objectives | ⑧ Power supply |

3.5 B-159, B-159ALC, B-159R-PL



- ① Frame
- ② Binocular observation head
- ③ Eyepiece
- ④ Tension adjustment tool
- ⑤ Objectives (4X, 10X, 40X, 100X)
- ⑥ Dust cover
- ⑦ Green filter
- ⑧ Power supply
- ⑨ Immersion oil

4. Unpacking

The microscope is housed in a moulded Styrofoam container. Remove the tape from the edge of the container and lift the top half of the container. Take some care to avoid that the optical items (objectives and eyepieces) fall out and get damaged. Using both hands (one around the arm and one around the base), lift the microscope from the container and put it on a stable desk.



Do not touch with bare hands optical surfaces such as lenses, filters or glasses. Traces of grease or other residuals may deteriorate the final image quality and corrode the optics surface in a short time.

5. Intended use

Standard models

For research and teaching use only. Not intended for any animal or human therapeutic or diagnostic use.

IVD Models

Also for diagnostic use, aimed at obtaining information on the physiological or pathological situation of the subject.

6. Symbols and conventions

The following chart is an illustrated glossary of the symbols that are used in this manual.



CAUTION

This symbol indicates a potential risk and alerts you to proceed with caution.

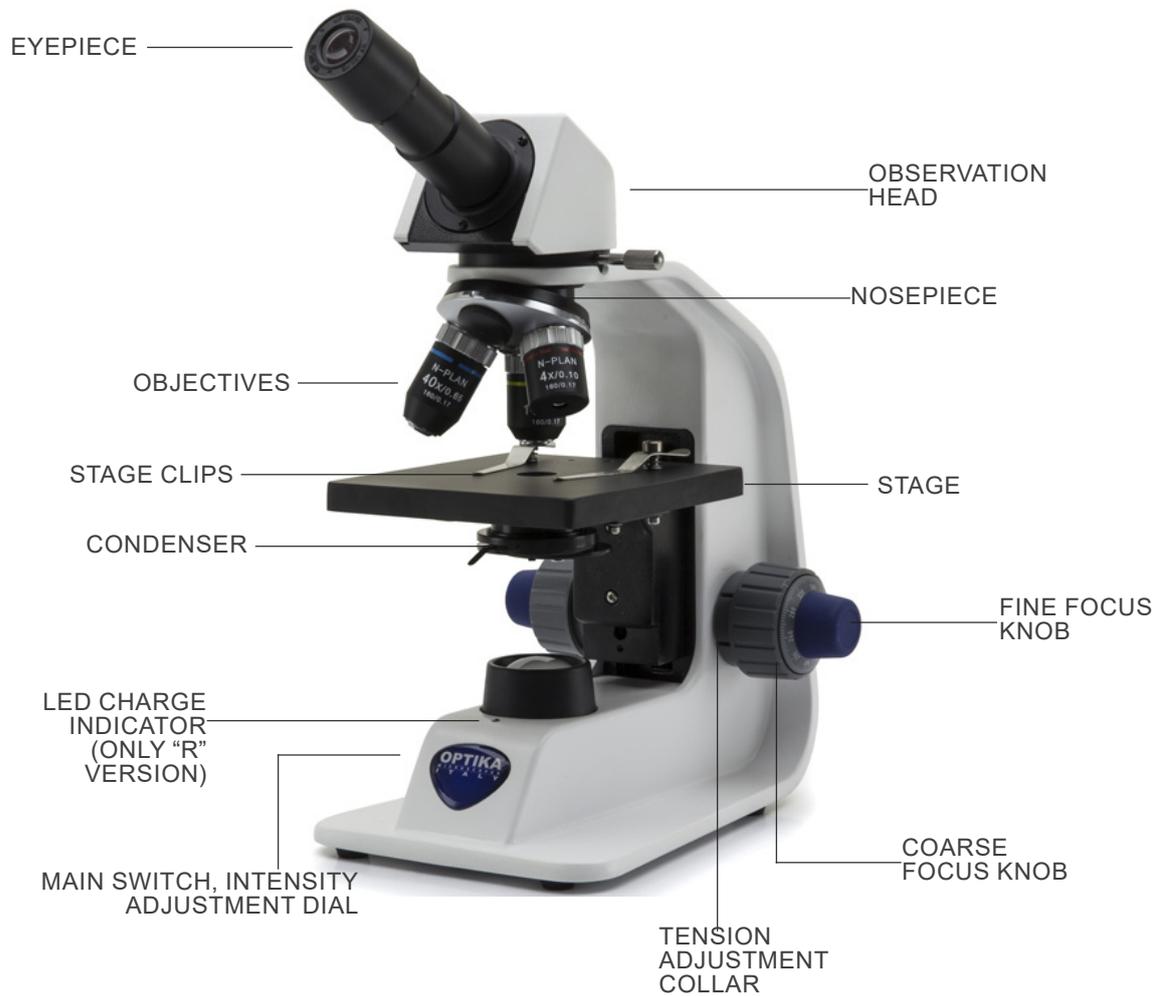


ELECTRICAL SHOCK

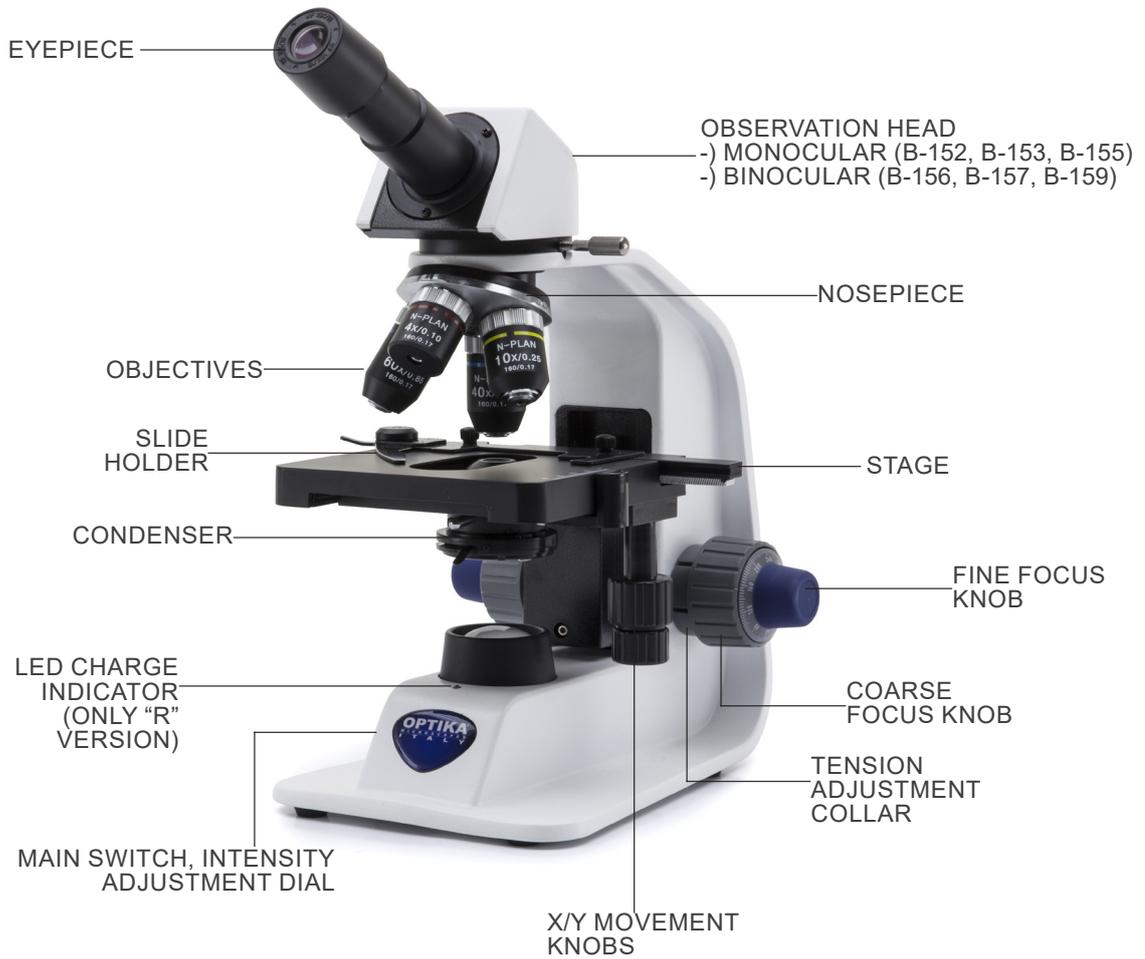
This symbol indicates a risk of electrical shock.

7. Instrument description

7.1 B-151, B-151R-PL



7.2 B-152, B-153, B-155, B-156, B-157, B-159, B-152R-PL, B-153R-PL, B-155R-PL, B-156-RPL, B-157R-PL, B-159R-PL



7.3 B-151ALC, B-152ALC, B-153ALC, B-155ALC, B-156ALC, B-157ALC, B-159ALC



8. Assembling

8.1 Assembling the microscope

1. Remove the dust cap from the microscope frame and from the bottom of the observation head.
 2. Insert the optical head above the stand and tighten the screw. (Fig. 1)
- **Hold the head with one hand during the locking in order to avoid that the head falls.**



Only for ALC models:

3. Connect the cable of the ALC (Automatic Light Control) system to the socket placed on the observation head and on the back side of the frame. (Fig. 2)



4. Insert both eyepieces into the tubes of the optical head. (Fig. 3)
- **For models B-151, B-152, B-153 and B-155: only one eyepiece is used as these models are monocular.**



5. Insert the power supply jack in the socket placed at the rear side of the microscope. (Fig. 4)



8.2 Polarizing set (optional)

1. Place the polarizer on the light exit ① at the base of the microscope. (Fig. 5)



2. Loosen the head fixing knob ② and remove the head from the microscope frame. (Fig. 6)



3. Insert the analyzer ③ into the hole inside the frame. (Fig. 7)
4. Put back the head into its original position and lock the fixing knob.



9. Use of the microscope

9.1 Light intensity adjustment

Operate on the light intensity adjustment dial ① to turn ON, OFF the microscope and to increase, decrease the illumination voltage. (Fig. 8)



Fig. 8

9.2 Use of ALC system

1. Press the ALC button ② (Fig. 9). The light on the microscope will turn off for some seconds, then will turn on again.
 2. An optimal brightness level is set
 3. Now the system will automatically adapt the brightness to the eyepieces when an objective is changed, when the aperture diaphragm is used or when another specimen is placed on the stage.
 4. Pressing the ALC button again, the ALC system will be disabled.
- **When ALC system is active the light intensity dial is not active.**



Fig. 9

9.3 Coarse focus tension adjustment

- **Adjust the tension using the provided tool.**

The coarse knob tension is pre-set in the factory.

1. To modify the tension according to personal's needs, rotate the ring ③ using the provided tool (Fig. 10).
- Clockwise rotation increases the tension.
 - If the tension is too loose, the stage could go lower by itself or the focus easily lost after fine adjustment. In this case, rotate the knob in order to increase the tension.



Fig. 10

9.4 Stage

All models except B-151 series

Stage accepts standard slides 26 x 76 mm, thickness 1.2 mm with coverslide 0.17mm. (Fig. 11)

1. Open the spring arm of the slide holder ④ and place the slide from the front on the stage.
 2. Gently release the spring arm of the slide holder.
- **A sudden release of the spring arm could cause the falling of the slide.**



Fig. 11

9.5 Adjust the interpupillary distance

- **This operation can be done only on binocular models.**
 - 1. Hold the right and left parts of the observation head using both hands and adjust the interpupillary distance by turning the two parts until one circle of light can be seen. (Fig. 12)
 - The graduation on the interpupillary distance indicator ①, pointed by the spot “.” on the eyepiece holder, shows the distance between the operator’s eyes.
- The range of the interpupillary distance is 48- 75 mm.



9.6 Diopter adjustment

- **This operation can be done only on binocular models.**
- 1. Look into the right eyepiece with your right eye only, and focus on the specimen.
- 2. Look into the left eyepiece with your left eye only. If the image is not sharp, use the diopter adjustment ring ② to compensate. (Fig. 13)
- **The adjustment range is ± 5 diopter. The number indicated on the adjustment ring graduation should correspond to the operator’s diopter correction.**



9.7 Use of oil immersion objective

B-155 and B-159 models only

1. Focus the specimen with a low power objective.
2. Lower the stage.
3. Put a drop of oil (provided) on the area of the specimen to be observed. (Fig. 14)
- **Make sure that there are no oil bubbles. Air bubbles in the oil damage the image quality.**
- To check for bubbles: remove an eyepiece, fully open the aperture diaphragm and observe the objective exit pupil. (The pupil must be circular and bright).
- To remove the bubbles, gently move the nosepiece to the right and left to move the immersion objective a few times and allow the air bubbles to move.
4. Insert immersion objective.
5. Return the stage to the upper focusing point and obtain an optimal focus using the fine focus knob.
6. After use, gently remove the oil with a soft paper towel or a lightly moistened optic paper with a mixture of ethyl ether (70%) and absolute ethyl alcohol (30%).
- **The immersion oil, if not immediately cleaned, could crystallize creating a glass-like layer.**
- **In this situation the observation of the specimen would be difficult (even not impossible) due to the presence of an additional thickness on the objective.**



9.8 Aperture diaphragm

- The Numerical Aperture (N.A.) value of the aperture diaphragm affects the image contrast. Increasing or reducing this value one can vary resolution, contrast and depth of focus of the image. Move the diaphragm lever ① (Fig. 15) toward left or right to decrease or increase the N.A. value.
- With low contrast specimens set the numerical aperture to about 70%-80% of the objective's N.A. If necessary, remove on eyepiece and, looking into the empty sleeve, adjust the condenser's diaphragm in order to obtain an image like the one in Fig. 16.



Fig. 15

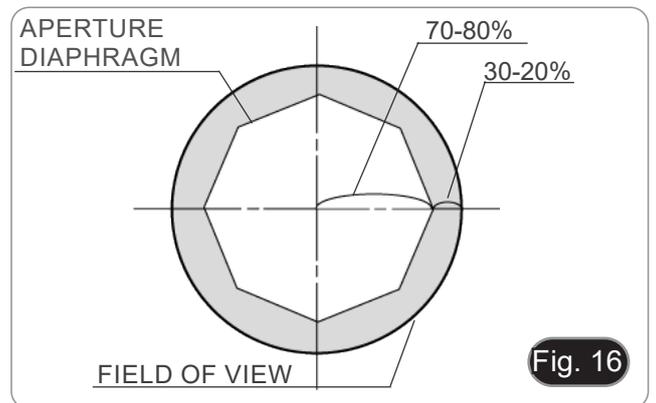


Fig. 16

9.9 Use with rechargeable batteries

This operation can be done only with “R” models.

When the microscope is plugged with the power supply, the LED indicator for the battery recharge ② is lit. (Fig. 17)

- Power supply connected, battery low: LED lights RED. When charging is completed, it turns GREEN.
- Power supply not connected, microscope off: LED is always OFF.
- Power supply not connected, microscope on, battery charged: LED is GREEN.
- Power supply not connected, microscope on, battery almost low: LED is RED.



Fig. 17

9.10 Use of the polarizer (optional)

1. Remove the specimen from the stage.
2. Looking inside the eyepieces, rotate the polarizer until the darkest position is achieved.
3. Once the dark is achieved (“extinction” or “Crossed Nicol” position) it is possible to begin the observation.

10. Maintenance

Microscopy environment

This microscope is recommended to be used in a clean, dry and shock free environment with a temperature of 5°-40°C and a maximum relative humidity of 85 % (non condensing). Use a dehumidifier if needed.

To think about when and after using the microscope



- The microscope should always be kept vertically when moving it and be careful so that no moving parts, such as the eyepieces, fall out.
- Never mishandle or impose unnecessary force on the microscope.
- Never attempt to service the microscope yourself.
- After use, turn off the light immediately, cover the microscope with the provided dust-cover, and keep it in a dry and clean place.

Electrical safety precautions



- Before plugging in the power supply, make sure that the supplying voltage of your region matches with the operation voltage of the equipment and that the lamp switch is in off-position.
- Users should observe all safety regulations of the region. The equipment has acquired the CE safety label. However, users do have full responsibility to use this equipment safely.

Cleaning the optics

- If the optical parts need to be cleaned try first to: use compressed air.
- If that is not sufficient: use a soft lint-free piece of cloth with water and a mild detergent.
- And as a final option: use the piece of cloth moistened with a 3:7 mixture of ethanol and ether.
- **Note: ethanol and ether are highly flammable liquids. Do not use them near a heat source, near sparks or near electric equipment. Use these chemicals in a well ventilated room.**
- Remember to never wipe the surface of any optical items with your hands. Fingerprints can damage the optics.
- Do not disassemble objectives or eyepieces in attempt to clean them.

For the best results, use the OPTIKA cleaning kit (see catalogue).

If you need to send the microscope to Optika for maintenance, please use the original packaging.

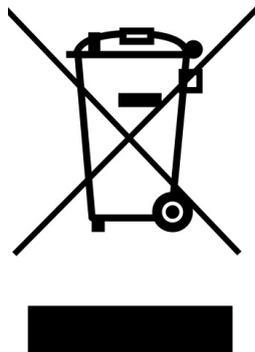
11. Troubleshooting

Review the information in the table below to troubleshoot operating problems.

PROBLEM	CAUSE	SOLUTION
I. Optical Section:		
LED operates, but field of view remains dark	Power supply is unplugged	Connect
	Brightness is too low	Set brightness to a proper level
	Batteries are uncharged	Fully charge the batteries
Dirt or dust is visible in the field of view	Dirt/dust on the specimen	Clean the specimen
	Dirt/dust on the eyepieces	Clean the eyepieces
Image looks double	Aperture diaphragm is stopped down too far	Open aperture diaphragm
Visibility is poor. <ul style="list-style-type: none"> • Image is not good • Contrast is poor • Details are indistinct • Image glares 	Revolving nosepiece is in an incorrect position	Move the nosepiece to a click stop
	Aperture diaphragm is too closed or too open	Adjust aperture diaphragm
	Dust or dirt on lenses (condenser, objectives, eyepieces and slide)	Clean thoroughly
One side of the image is out of focus	The nosepiece is not in the center of the light path	Turn the nosepiece to a click stop
	The specimen is out of place (tilted)	Place the specimen flat on the stage
	The optical performance of the sample cover glass is poor	Use a cover glass of better quality
II. Mechanical Section:		
The coarse focus knob is hard to turn	The tension adjustment collar is too tight	Loosen the tension adjustment collar
The focus is unstable	The tension adjustment collar is too loose	Tighten the tension adjustment collar
III. Electric section:		
The LED doesn't turn on	No power supply	Check the power cord connection
	Batteries are uncharged	Fully charge the batteries
The brightness is not enough	The brightness adjustment is low	Adjust the brightness
The light blinks	The power cord is poorly connected	Check the power cord
IV. Observation tube:		
Field of view of one eye does not match that of the other	Interpupillary distance is incorrect	Adjust interpupillary distance
	Incorrect diopter adjustment	Adjust diopter
	Your view is not accustomed to microscope observation	Upon looking into eyepieces, try looking at overall field before concentrating on specimen range. You may also find it helpful to look up and into distance for a moment before looking back into microscope

Equipment disposal

Art.13 Dlsg 25 July 2005 N°151. "According to directives 2002/95/EC, 2002/96/EC and 2003/108/EC relating to the reduction in the use of hazardous substances in electrical and electronic equipment and waste disposal."



The basket symbol on equipment or on its box indicates that the product at the end of its useful life should be collected separately from other waste. The separate collection of this equipment at the end of its lifetime is organized and managed by the producer. The user will have to contact the manufacturer and follow the rules that he adopted for end-of-life equipment collection. The collection of the equipment for recycling, treatment and environmentally compatible disposal, helps to prevent possible adverse effects on the environment and health and promotes reuse and/or recycling of materials of the equipment. Improper disposal of the product involves the application of administrative penalties as provided by the laws in force.

OPTIKA® S.r.l.

Via Rigla, 30 - 24010 Ponteranica (BG) - ITALY Tel.: +39 035.571.392
info@optikamicroscopes.com - www.optikamicroscopes.com

OPTIKA® Spain

spain@optikamicroscopes.com

OPTIKA® USA

usa@optikamicroscopes.com

OPTIKA® China

china@optikamicroscopes.com

OPTIKA® India

india@optikamicroscopes.com

OPTIKA® Central America

camerica@optikamicroscopes.com
