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Instruction manual

VWR® Microscope VisiScope Series 600

Model	European Catalogue Number
IT600 FLD	630-3267

CE UK CA

VWR®

VERSION: 1.0
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Table of contents

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 Contents

1 Microscope body
2 Condenser
3 Stage extension
4 Mechanical stage
5 Phase contrast slider
6 Darkfield slider
7 Eyepieces
8 Centering telescope
9 Metal insert for stage
10 Glass insert for stage
11 Centering screws
12 Power supply
13 Power cord
14 Green filter (IF550)
15 Blue filter (LBD)
16 Dust cover
17 Holder for Petri diam. 38 mm
18 Holder for Terasaki and Petri diam. 65 mm
19 Holder for slide and Petri diam. 54 mm
20 Lens cleaning tissues
21 Allen screwdriver
22 UV protective shield
23 Fluorescence filter selector
24 Diffusion filter
25 Fluorescence LED lamp housing

NOTE: The IT600FLD is fully configurable in the number and type of objectives. Therefore, the objectives are not shown in this diagram even though they are included in the configuration.

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 care to ensure that the optical items (objectives and eyepieces) do not fall out and get damaged. Using both hands (one around the neck and one around the base), lift the microscope from the container and put it on a stable desk.

5. Intended use

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

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

1 Photo/tv port
2 Eyepiece
3 Diopter Adjustment ring
4 Light path Selector lever
5 Microscope body
6 Transmitted light intensity indicator
7 Eco button
8 Brightness adjustment knob (transmitted light)
9 Tension adjustment collar
10 Coarse focus knob
11 Fine focus knob
12 Main switch
13 X-y stage movement knobs
14 Objective
15 Stage
16 Stage plate
17 Condenser
18 Phase contrast slider
19 Led housing
20 Led centering knobs
21 Field stop lever
22 Condenser Centering screws
23 Aperture stop lever

Opposite side

1 Diffusion filter
2 Fluorescence led lamp housing
3 Fluorescence filter selector
4 Brightness adjustment knob (reflected light)
5 Fluorescence filter indicator
6 Reflected light intensity indicator
7 UV shield

7.1 Microscope assembling

7.1.1 Installing the objectives

Turn the coarse focusing knob 1 until the nosepiece reaches its lowest position. (Fig. 1)

For a safe transport, the nosepiece is placed in the lowest position and the tension adjustment collar 2 is adjusted to the appropriate tension when the microscope leaves the factory. (Fig. 1)

1 Screw the lowest magnification objective on to the nosepiece from the right side, then turn the turret clockwise. Install the other objectives in the same way, following the sequence from low to high magnification.

Note: the objectives can also be installed through the stage opening. (Fig. 2)

Clean the objectives regularly. In inverted microscopes, the objectives are very sensitive to dust.

To prevent dust and contamination from entering the microscope, cover all the unused holes with dust caps 3. (Fig. 3)

When operating, use the low magnification objective (4x or 10X) to search and focus the specimen, then switch to higher magnifications.

When switching between objectives, slowly turn the nosepiece until it clicks. The click means that the objective is in the right position, in the center of the light path.

FIGURE 1

FIGURE 2

FIGURE 3

7.1.2 Installing stage and stage extensions

The stage extension can be installed on either side of the stage to enlarge the working surface. The mechanical stage must be installed on the right side of the microscope.

1 Installing the stage extension: screw the bolts on to the extension, then mount the extension from below the stage. (Fig. 4)

FIGURE 4

2 Installing the mechanical stage: as for the extension, the mechanical stage is fixed with two bolts under the stage. (Fig. 5)

FIGURE 5

7.1.3Installing stage inserts

When using holder, metal or glass stage plates, make sure that the plate is horizontal.

1 Install the stage insert in the stage opening. (Fig. 6)

FIGURE 6

2 Install the holder in the mechanical stage. (Fig. 7)

FIGURE 7

3 Multi well plates can be directly inserted in the mechanical stage. (Fig. 8)

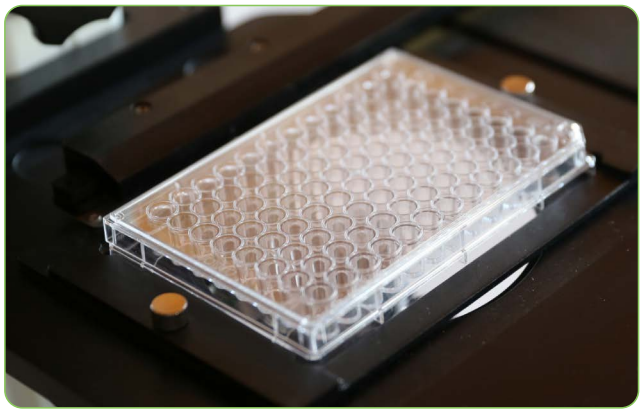


FIGURE 8

7.1.4 Installing eyepieces

Insert both eyepieces into the tubes of the optical head. (Fig. 9)

FIGURE 9

7.1.5 Installing the condenser

1 Slide the condenser into the condenser holder, inserting the pin on the rear side of the condenser with the alignment groove in the condenser holder. (Fig. 10)

FIGURE 10

2 Lock the condenser with the locking knob 1 on the right side of the condenser holder. (Fig. 11)

FIGURE 11

3 Insert the Phase contrast slider (or the DF slider) into the condenser, printed face up. (Fig. 12)

4 Pull the slider into the "SL" position, to the click stop.

FIGURE 12

7.1.6 Mounting the fluorescence lamp housing

1 Unscrew the lamp housing lock. (Fig. 13)

FIGURE 13

2 Insert the lamp housing in the fluorescence illuminator connector in the back side of the microscope. (Fig.14)

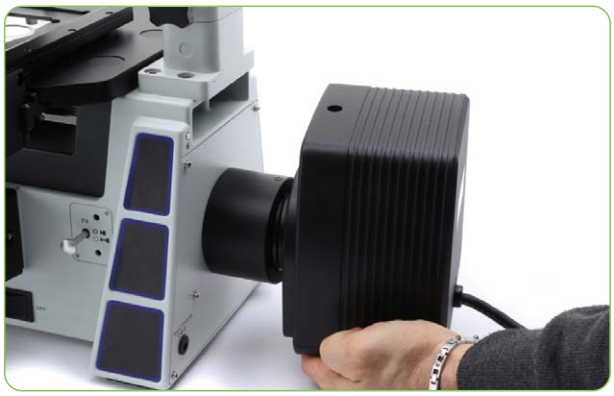


FIGURE 14

3 Tighten the locking screw using the provided Allen screwdriver. (Fig.15)

FIGURE 15

4 Connect the cable of the lamp housing to the connector in the back side of the microscope. (Fig.16)

FIGURE 16

7.1.7 Connecting the power cord

1 Turn the main switch 1 to "OFF" before connecting the power cord. (Fig. 17)

FIGURE 17

2 Insert the plug of the provided power supply into the power socket of the microscope. (Fig. 18)

FIGURE 18

3 Plug the power cord into the socket of the power supply. (Fig. 19)

4 Plug the power cord into the mains socket. Check for a safe connection.

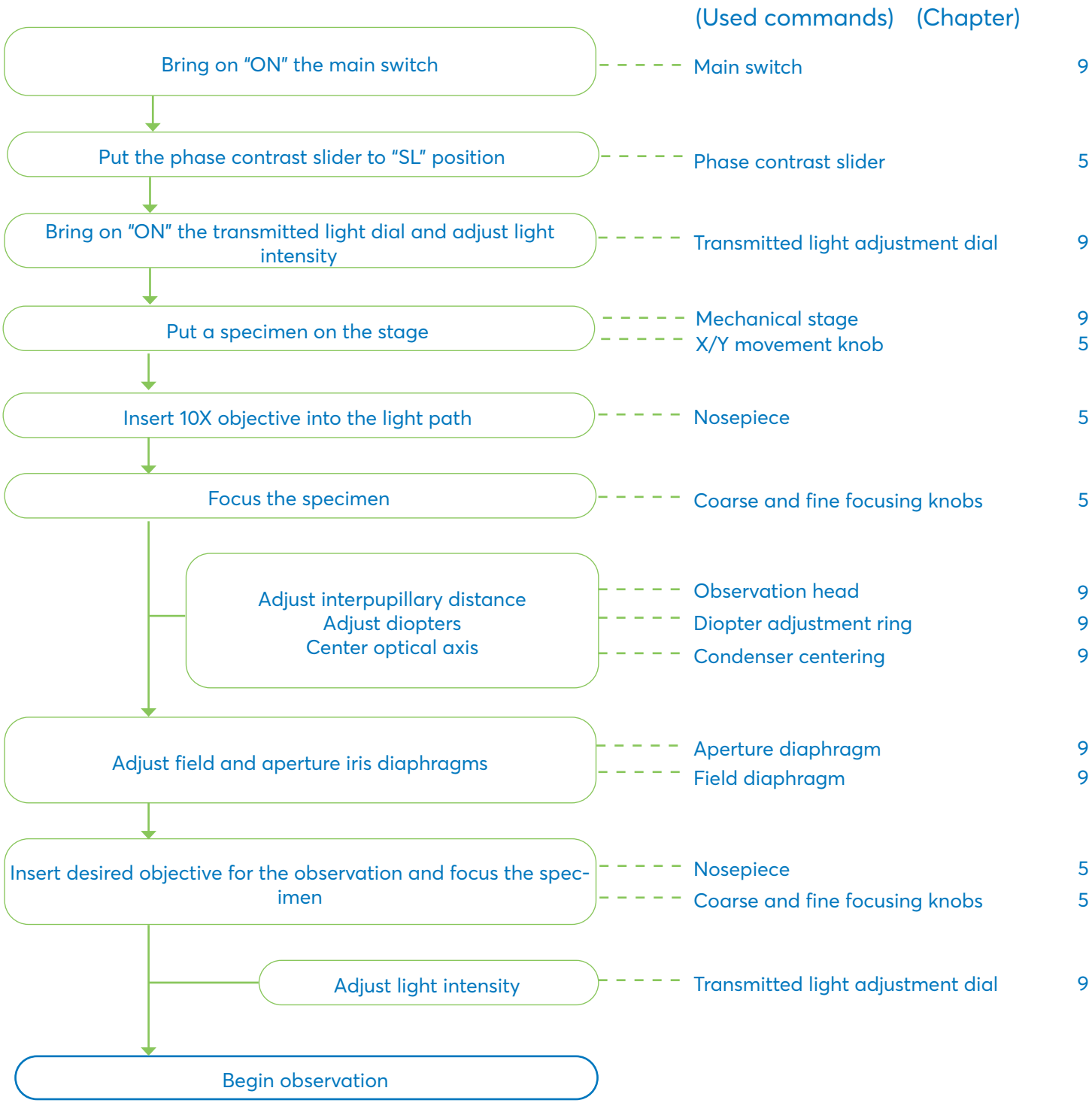
Please use the provided power cord.

If lost or damaged, please refer to qualified service.

Connect the power cord to a grounded power supply only.

FIGURE 19

8. Summary of brightfield observation procedures (transmitted light



9. Use of the microscope in brightfield (transmitted light)

9.1 General switch on

To activate the transmitted light illuminator, put the main switch 1, located on the right side of the stand, to the position "ON". (Fig. 20)

FIGURE 20

9.2 Brightness adjustment

1 Turn the transmitted light brightness adjustment knob 2 to increase and decrease the brightness. (Fig.21)

FIGURE 21

2 While rotating the brightness adjustment knob, the LED indicator on the front panel 3 will turn ON or OFF some segments. (Fig. 22)

FIGURE 22

9.3 Adjust the interpupillary distance

Observing with both eyes, hold the two eyepiece prism assemblies. Rotate them around their common axis until the fields of view match.

The graduation on the interpupillary distance indicator 4, pointed by the spot "." on the eyepiece holder, shows the distance between the operator's eyes. (Fig. 23)

The range of the interpupillary distance is 48-75 mm.

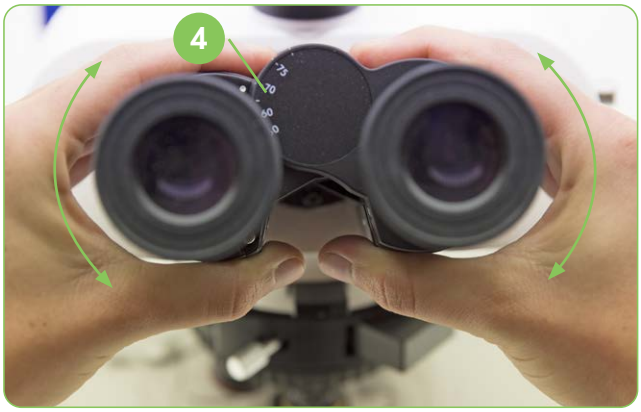


FIGURE 23

9.4 Diopter adjustment

– Both eyepieces are provided with diopter adjustment ring. Put each ring in the "0" position before proceeding with the adjustment.

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 1 to compensate. (Fig. 24)

The adjustment range is ±5 diopter. The number indicated on the adjustment ring graduation should correspond to the operator's diopter correction.

FIGURE 24

9.5 Use of eyeshields

Use with eyeglasses

Fold rubber eyeshields with both hands. Folded eyeshields avoid scratching the lenses of eyeglasses. (Fig. 25)

FIGURE 25

Use without eyeglasses

Raise eyeshields and observe at the microscope placing eyes to the shields, avoiding external light to disturb the observation. (Fig. 26)

FIGURE 26

9.6 Light path selection

The observation head is equipped with an optical path selector that allows the light to be distributed to the eyepieces and to the photo / TV port.

1 Move the selector 2 to the left (In) or to the right (Out) to distribute the light. (Fig. 27)

POSITION	IN	OUT
LIGHT	100% TV	100% EYEPIECES

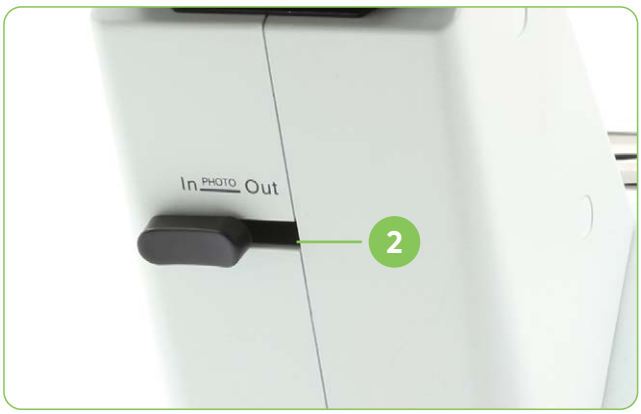


FIGURE 27

9.7 Coarse focus tension adjustment

The tension of the coarse focusing knob is factory preset.

1 To modify the tension according to personal's needs, rotate the ring 1. (Fig. 28)

Clockwise rotation increases the tension.

If the tension is too loose, the revolver 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.

FIGURE 28

9.8 Stage and stage inserts

For the best image quality, use flasks, Petri dishes and slides with a 1.2 mm thickness.

1 Place the proper insert for your specimen (according to the table on the right) on the stage, and fix it with the stage clip.
2 Turning the X and Y knobs, move the specimen to the required position. (Movement range: 120 (width) × 78 (length) mm).

When switching objectives, take care not to touch the holder plates with the objectives, as the plates may damage the front lens.

	Holder for Petri diameter 38 mm (holder for Terasaki needed) (provided with the microscope)
	Holder for Terasaki and Petri diameter 65 mm (provided with the microscope)
	Holder for slide and Petri diameter 54 mm (provided with the microscope)
	Holder for 2+2 slides
	Holder for Utermöhl-Chamber (holder for Petri diameter 54 mm needed)

9.9 Illumination column

9.9.1 Using colour filters

Use 45 mm diameter filters.

1 Place the filter into the condenser hole. (Fig. 29)
2 You can stack a group of colour filters in the filter holder, if you ensure that they are level and that the whole thickness is less than 11 mm.

Filter	Green (IF550)
Use	Phase contrast microscopy

FIGURE 29

9.9.2 Tilting the condenser holder

When a bigger space is needed between condenser front lens and stage surface, it is convenient to tilt the condenser. Doing this it is possible to use the ambient light to illuminate the specimen. (Fig. 30)

FIGURE 30

9.9.3 Rotating the condenser holder

When using big bottles, the illumination pillar can be rotated out of the light path allowing to place them on the stage.

1 Rotate the knob 1 on the right side of the illumination pillar (Fig. 31) to unlock the rotation, then swing out the condenser holder from the light path. (Fig. 32)
2 Put the specimen on the stage and begin observation.
3 Once terminated the observation return the illumination column to its original position and lock the knob.

FIGURE 31

FIGURE 32

9.9.4 Centering the LED

LED light source is pre-centered before the shipment from the factory.

Should a new adjustment is needed, use the three adjustment knobs 1 on the right side of the illumination pillar. (Fig. 33)

On the left side of the LED housing there is a slider with a frosted filter. This filter has the function to make the illumination more homogeneous.

It is recommended to remove the filter to perform the LED centering operation, and to keep the filter in during normal observation.

FIGURE 33

9.9.5 ECO button

1 Press the ECO button (Fig. 34) to activate the "ECO" function.

Once activated, the system will automatically shut-off after 20 minutes from the activation.

2 To deactivate the function, press the ECO button again.

FIGURE 34

9.9.6 Centering the Field Diaphragm (FS)

1 Slide the phase slider to the "SL" position 1 (Fig. 35)

2 Engage the 10x objective, place the specimen on the stage and adjust approximate focusing.

FIGURE 35

3 Use the field diaphragm (FS) selector lever 2 (Fig. 36) to close the field diaphragm.

FIGURE 36

4 Focus the field diaphragm by rotating the height adjustment knob 3 (Fig. 37), until the edges of the field diaphragm are sharp.
5 Rotate the two centering screws 4 on the condenser so that the field diaphragm image becomes concentric with the field of view. (Fig. 37-38).
6 Using the FS lever 2, gradually open the diaphragm. The condenser is centered when the image of the diaphragm is symmetrical to the field of view.
7 In normal use, open the diaphragm until the image circumscribes the field of view.

FIGURE 37

9.9.7 Effect of the field diaphragm

Field diaphragm adjusts the illuminated area to obtain a high contrast image.

Set the diaphragm according to the objective in use until it circumscribes the field of view, in order to eliminate unnecessary light to eyepieces. (Fig. 38)

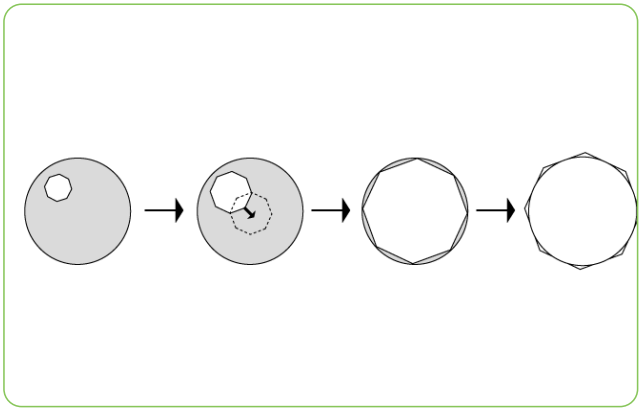


FIGURE 38

9.9.8 Use of diffusion lens

When using 4x objective, an additional lens is needed.

1 Insert the lens 1 when 4x objective is in the light path, remove it when all the other objectives are used. (Fig.39)

If the diffusion lens is used with other objectives then 4x, the field diaphragm will be not visible any longer.

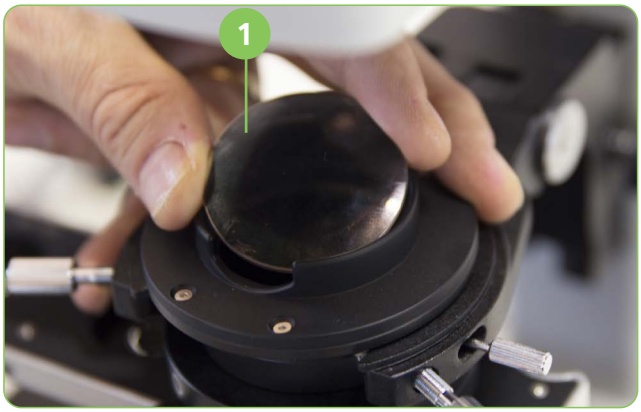


FIGURE 39

9.9.9 Aperture diaphragm (AS)

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.

With low contrast specimens set the numerical aperture value 2 to about 70%-80% of the objective's N.A. (Fig. 40). If necessary, remove one eyepiece and, looking into empty eyepiece sleeve, adjust the condenser's ring in order to obtain an image like the one in Fig. 41.

FIGURE 40

In brightfield, optimum observation is generally possible by setting the aperture diaphragm to between 70% and 80% of the numerical aperture of the objective.

In phase contrast (PH) or in darkfield (DF), the aperture diaphragm must be fully opened by operating on the AS lever.

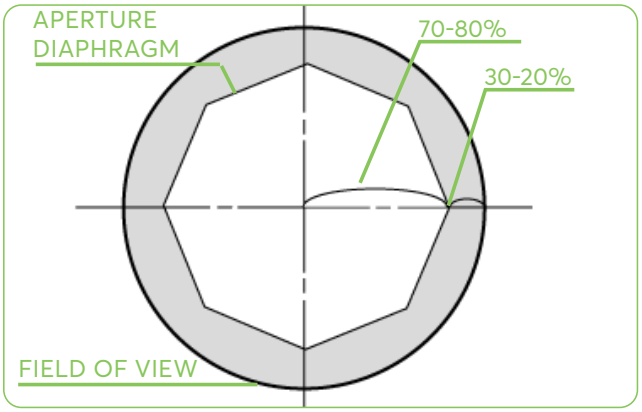


FIGURE 41

10. Use of the microscope in phase contrast (transmitted light))

10.1 Phase contrast slider

The light ring is pre-centered when the microscope leaves the factory. It should therefore need no further adjustment. Should a re centering is needed, it can be performed via the two side bolts.

The 4x/10x position 1 must be used with 4x and 10x phase contrast objectives, the 20x/40x position 2 with the 20x and 40x and the SL position 3 is used for brightfield. (Fig. 42)

Slider	SL	4x/10x	20x/40x
Meaning	empty hole	Phase ring 4x/10x	Phase contrast observation with 4x and 10x objectives
Application	20x/40x	Phase ring 20x/40x	Phase contrast observation with 20x and 40x objectives

FIGURE 42

10.2 Centering the phase ring

Usually this operation is not needed. If necessary, please proceed with the following steps:

1 Place a specimen on the stage and focus it.
2 Remove the eyepiece from the sleeve, and replace it with the centering telescope (CT). (Fig. 43)
3 Check that the phase ring and the objective match, and that both are steadily set on a click stop.

FIGURE 43

4 Use the CT to focus on the slider phase ring image 1 (bright) and the objective phase ring image 2 (dark). If phase ring image is not sharp, adjust the CT until you can see a clear image of the phase ring. (Fig. 44)

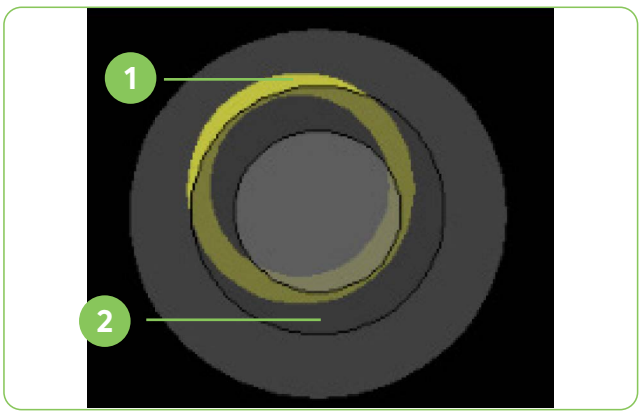


FIGURE 44

5 Adjust the bolts of the two centering holes in the phase contrast slider using the centering screws 3 (Fig. 45)until the condenser phase ring and the objective phase ring center coincide. (Fig. 46)

6 The centering of the slider phase ring and the objective phase ring must be checked with each objective.

If the phase ring is incorrectly centered, the contrast will be severely impaired.

The phase ring may need re centering during and after observation of very thick specimens.

The phase ring may show an apparent misalignment if the cover glass is not flat.

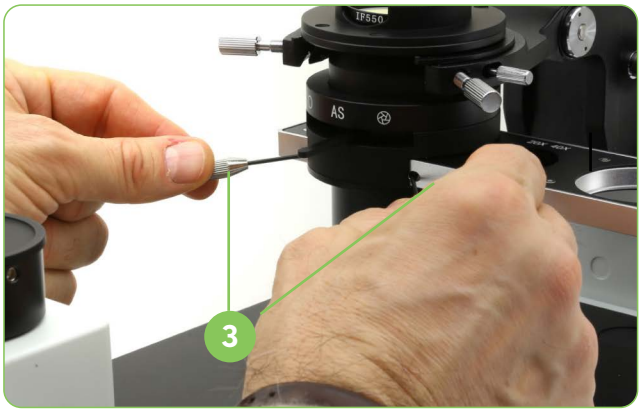


FIGURE 45

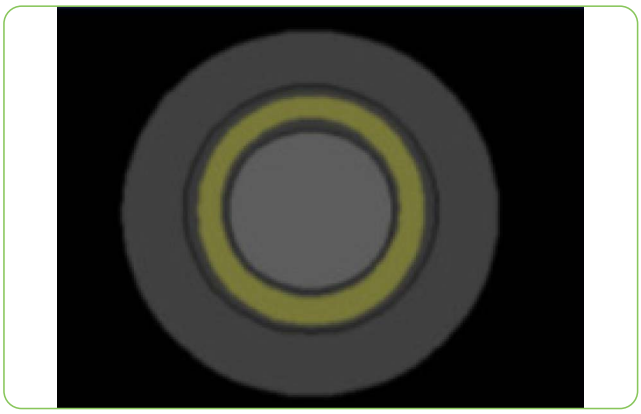


FIGURE 46

11. Use of the microscope in darkfield (transmitted light)

11.1 Darkfield slider

1 Move the slider into empty position 1 to perform brightfield observation. (Fig. 47)
2 Move the slider into position "DF" 2 to perform darkfield observation.
3 When observing in darkfield, keep the aperture diaphragm adjustment lever on the "O" (open) position.

Darkfield observation is possible with objectives having N.A. up to 0.40.

With higher N.A. the darkfield effect cannot be achieved because of the condenser N.A.

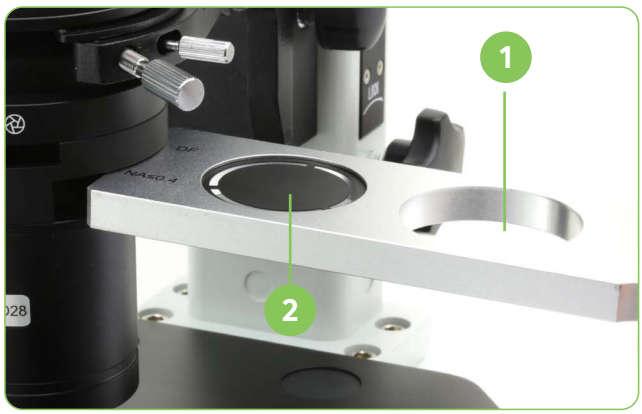
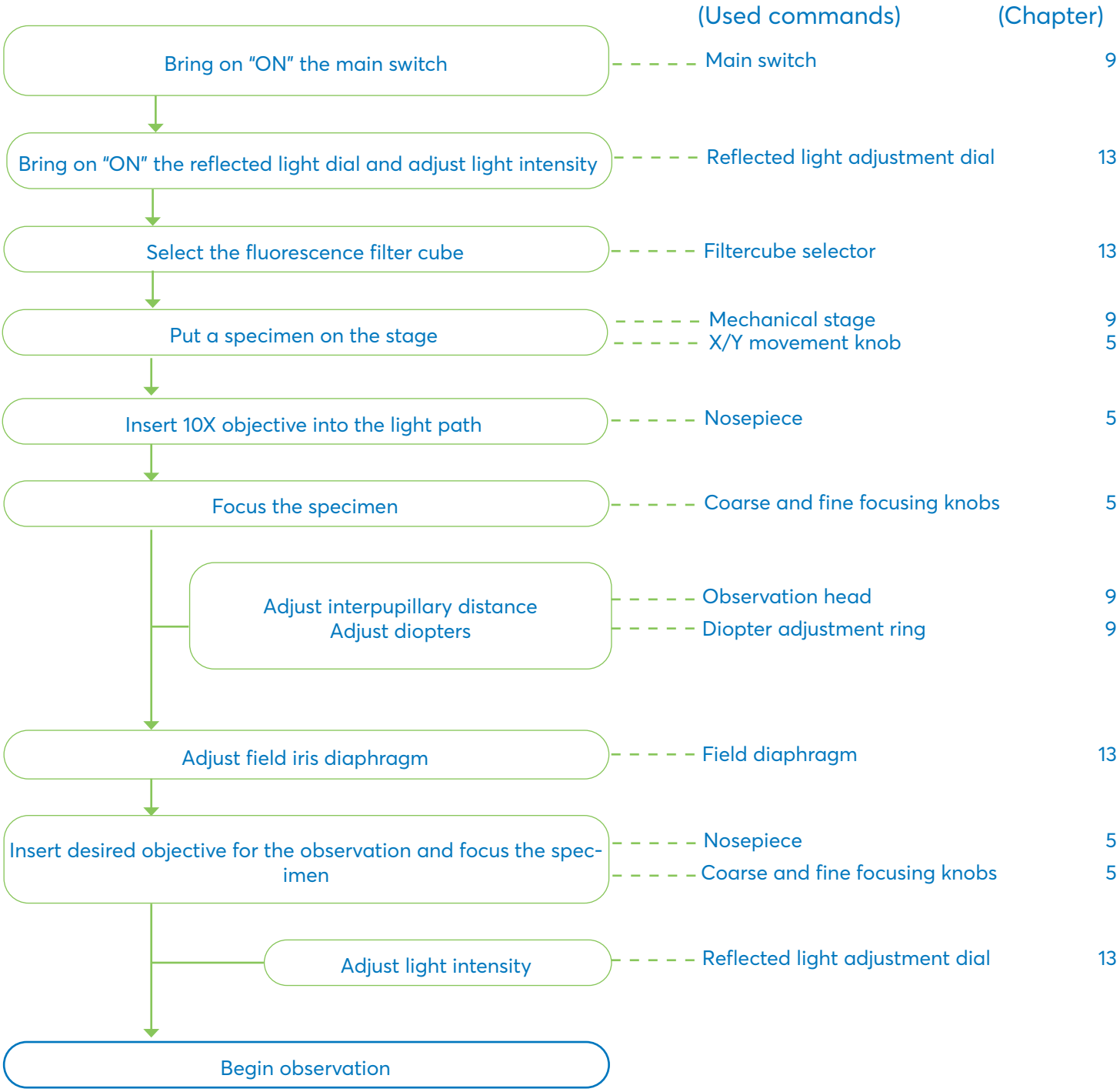


FIGURE 47

Slider position	Empty	DF
Meaning	empty hole	darkfield ring
Application	Brightfield observation	Darkfield observation with 4x,10x, 20x objectives

12. Summary of fluorescence observation procedures (reflected light)



13. Use of the microscope in fluorescence (reflected light)

Fluorescence illuminator has a dedicated LED light source.

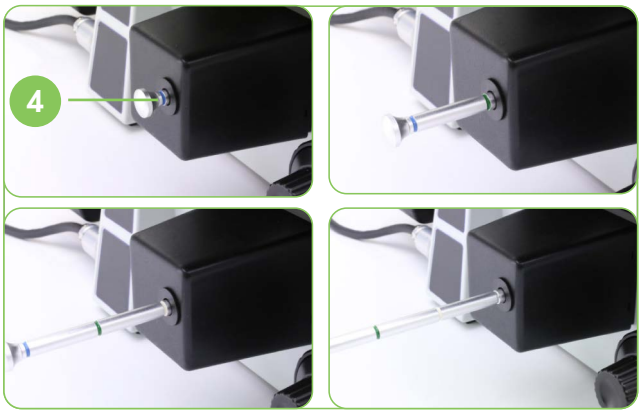
Insertion of dedicated LED is motorized: the LED switching is automatic when moving the filtercube selector.

If the reflected light dial is in "O" (OFF) position, the whole mechanism is switched off and therefore the LED will not move when the filtercube selector is moved.

1 Switch on the fluorescence illuminator by turning the reflected light intensity dial 1 The LED scale for the reflected light 2(Fig. 48) and the filter cube indicator 3 (Fig. 50) will turn on.
2 Move the filtercube selector 4 in one of the 4 position available until it moves to a click stop. (Fig. 49a, b, c, d). The filter cube indicator 3 will change accordingly (Fig. 50).

If the filtercube selector is not moved in a precise click stop, the LED will not change and the filtercube indicator panel will not light up.

The filtercube selector has 4 positions marked with colored rings. The correspondence of the filtercube selector and the filtercube indicator panel is the following:



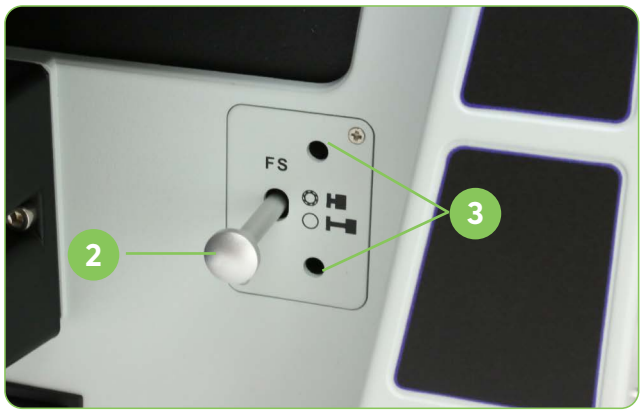
Colored ring	Blue (49a)	green (49b)	White (49c)	White (49d)
Letter on the panel	B	g	uv	Ultra violet
Excitation Filter	Blue	Green	Ultra violet	empty

3 Place a fluorescent specimen on the stage.
4 Insert the desired objective in the light path and focus the specimen.
5 Change the light intensity using the light intensity dial 1 according to the specimen.

Filter Cube	uv	B	G
Excitation filter	365/50 nm	470/40 nm	560/40 nm
Dichroic mirror	400 nm	495 nm	585 nm
Emission filter	420lp nm	525/50 nm	645/75 nm
Application	Autofluorescence DAPI: staining for DNA Hoechst: chromosomes	FITC: fluorescent antibodies Achridine orange: DNA, RNA Auramine	Rhodamine, TRITC: fluorescent antibodies Propidium Iodide: DNA, RNA RFP

13.1 Centering the field diaphragm (FS)

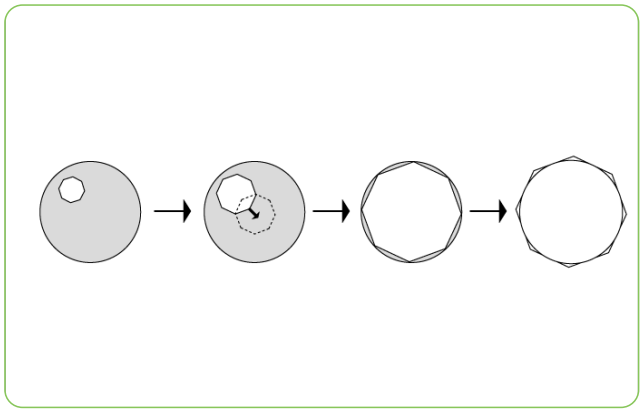
1 Insert the filter B by moving the filtercube selector 1. (Fig. 49). The "B" LED on the front panel will light up 4. (Fig. 50).
2 Engage the 10x objective by rotating the nosepiece, place the specimen on the stage and adjust approximate focusing.
3 Use the FS selector lever 2 (Fig. 51) to close the field diaphragm.
4 Using the provided Allen wrench, rotate the two centering screws 3 so that the field diaphragm image becomes concentric with the field of view. (Fig. 52)
5 Using the FS selector 2, open the field diaphragm until the field iris image inscribes the field of view. If the image is found to be eccentric, adjust the centering again. (Fig. 52).
6 In normal use, open the diaphragm until the image circumscribes the field of view.



13.2 Effect of the field diaphragm

Field diaphragm adjusts the illuminated area to obtain a high contrast image.

Set the diaphragm according to the objective in use until it circumscribes the field of view, in order to eliminate unnecessary light to eyepieces. (Fig. 52)



14. Simultaneous Phase Contrast + Fluorescence Observation

This microscope allows to perform transmitted light Phase contrast Observation in combination with reflected light Fluorescence.

Specimens with risk of quick fading can be observed first in Fluorescence and then in Phase contrast.

Combined observation allows to easily identify some specimen areas emitting fluorescence.

1 Turn on the reflected light intensity dial.
2 Move the filtercube selector into the "OP" (empty) position.
3 Insert the desired PH objective into the light path and insert the corresponding position of the phase contrast slider.
4 Focus the specimen.
5 Adjust the transmitted light intensity.
6 Move the filter cube selector to the desired filter position.
7 Adjust the reflected light intensity.
8 To obtain the proper specimen observation, adjust the transmitted light intensity, in order to modulate the fluorescence intensity with the phase contrast intensity.

15. Microphotography

15.1 Use of C-mount cameras

1 Loosen the clamping screw 1 on the trinocular port and remove the dust cap 2. (Fig. 53)

2 Screw the C-mount adapter 3 to the camera 4 and insert the round dovetail of the C-mount into the empty hole of the trinocular port, then tighten the clamping screw 1. (Fig. 54)

15.2 Use of Reflex cameras

1 Insert the Reflex adapter 1 into the relay tube to the microscope 2.
2 Screw the "T2" ring 3 (not provided) to the reflex adapter.
3 Connect the Reflex camera 4 to the "T2" ring just installed (Fig. 55).
4 Mount the other end of the relay tube 2 into the empty hole of the trinocular port, then tighten the clamping screw. (Fig. 53)

"T2" ring is not provided along with the microscope, but is commercially available.

While shooting dark specimens, darken eyepieces and viewfinder with a dark cloth to minimize the diffused light.

To calculate the magnification of the camera: objective magnification * camera magnification * lens magnification.

If using an SLR camera, mirror movement may cause the camera to vibrate.

We suggest lifting the mirror, using long exposure times and a remote cord.

16. Troubleshooting

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

Problem	Cause	Solution
I. Optical Section:		
LED does not light	Power cord/supply is unplugged	Connect into the power outlet
LED operates, but field of view remains dark	Brightness is too low	Set brightness to a proper level
	Too many colour filters have been stacked	Reduce the number of the filters
	Fluorescence filter selector is not in a click stop position	Move the selector to a click stop
	Reflected light field stop is not completely open	Open field stop completely
	Fluorescence cube is not suited for the specimen	Use a suited fluorescence cube
Field of view is obscured or not evenly illuminated	Light path selector knob is set to the camera position	Move the selector to the eye position
	The nosepiece is not in the correct position	Turn the nosepiece to a click stop
	The colour filter is partially inserted	Insert the filter to full depth
	When using 4x objective the diffusion lens is not inserted	Insert the lens
	The phase contrast slider is not in the proper position	Move the slider to a click stop
Dust and stains can be seen in the field of view.	Dirt/dust on the specimen	Clean thoroughly
	Dirt/dust on the to surface of the condenser	
	Dirt/dust on the eyepieces	
Image looks double	Aperture diaphragm is stopped down too far	Open aperture diaphragm
	The condenser is not properly centered or it is in a wrong height	Set the condenser according to Koehler settings.
Poor image quality:		
The image is not sharp The contrast is not high The details are not clear The phase contrast is low.	The nosepiece is not in the center of the light path	Turn the nosepiece to a click stop
	Aperture diaphragm is too closed or too open	Adjust aperture diaphragm
	The lenses (condenser, objective, eyepieces are culture dish) are dirty	Thoroughly clean all the optical system
	Fluorescence cube is not suited for the specimen	Use a suited fluorescence cube
	In phase contrast observation, the bottom thickness of the sample is more than 1.2mm	Use a sample holder whose bottom thickness is max **1.2** mm
	A brightfield objective is used for phase contrast observation	Switch to a phase contrast objective
	The condenser phase ring is not matched with the objective phase ring	Adjust the condenser ring to match the objective phase ring
	The condenser phase ring is not centered	Adjust the bolts to center
	The objective used is not compatible with the phase ring	Please use a compatible objective
	The phase contrast depends on the sample position	The sample holder is not flat. Move the sample around until a compatible area is found.
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 glass slide is poor	Use a slide glass with better quality
Image appears to waver	Revolving nosepiece is not corrected mounted	Push slide dovetail all the way until it is stopped
	Objective is not correctly engaged in light path	Make sure that revolving nosepiece clicks into place correctly
	Condenser not properly centered	Center the condenser properly
Field of view becomes only slightly brighter when the voltage is raised	Condenser not properly centered	Center the condenser properly
	Condenser too low or too high	Adjust the condenser height position
II. Mechanical Section:		
The coarse focus knob is hard to turn.	The tension adjustment collar is too tight	Loosen the tension adjustment collar
The revolver goes down by itself during observation	The tension adjustment collar is too loose	Tighten the tension adjustment collar
III. Electrical section:		
LED doesn't turn on	Power supply not connected	Check for proper connection
Brightness is not enough	Brightness setting is too low	Adjust brightness
Light blinks	Power supply not well connected	Check for proper connection
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
V. Microphotography:		
Image edge is unfocused	To a certain extent it is due to achromatic objectives features	To minimize the problem, set the aperture diaphragm in a proper position
Bright spots appear on the image	Stray light entering in the microscope through eyepieces or camera viewfinder	Cover eyepieces and viewfinder with a dark cloth

17. Repair and maintenance

Microscopy environment

This microscope is recommended for use in a clean, dry and shock free environment with a temperature of 0-40°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 vertical when moving it 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 down the illumination intensity control and turn the light off. Cover the microscope with included the 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 require cleaning first use compressed air.

If that is not sufficient use a soft lint-free 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 attempting to clean them.

For the best results, use the VWR cleaning kit.

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

18. Technical service

Web Resource
Visit the VWR's website at www.vwr.com for:

Complete technical service contact information

Access to VWR's Online Catalogue, and information about accessories and related products

Additional product information and special offers

Contact us For information or technical assistance contact your local VWR representative or visit. www.vwr.com.

19. Warranty

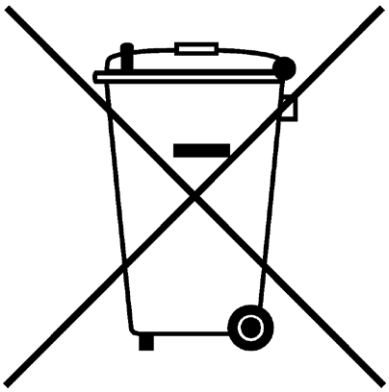
VWR International warrants that this product will be free from defects in material and workmanship for a period of five (5) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

20. Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorizations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorization, unless any refusal is due to a defect of the product.

Disposal



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.

Instead it is your responsibility to correctly dispose of your equipment the end of its life cycle by handling it over to an authorized facility for separate collection and recycling. It is also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.

For more information about where you can drop off your waste equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

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