JuniorLED

euromex
microscopes holland

user manual

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Contents

1. Introduction

With your purchase of the JuniorLED microscope you have chosen a quality product. The JuniorLED microscopes are developed for use at schools and during nature initiation classes. The maintenance requirement is limited when using the JuniorLED in a decent manner. This manual describes the construction of the microscope, how to use the microscope and maintenance of the microscope

2. General safety instructions

Intended use: a non-medical device
This device is intended for general observation of cells and tissues, with transmitted/reflected illumination and with the specimen fixed on a slide

2.1 Dangers associated with the operation

- Improper use could result in injury, malfunction or damage to property. It must be ensured that the operator informs every user of existing hazards
- Danger of electrocution. Disconnect the power to the entire lighting system before installing, adding or changing any component
- Not to be used in corrosive or explosive environments
- Avoid direct exposure of eyes to the collimated light beam or direct light from the light guides or fibres
- To avoid a hazard to children, account for all parts and keep all packing materials in a safe place

2.2 Prevention of biological and infectious hazards

Infectious, bacterial or viral biohazard substances under observation may be a risk to the health of humans and other living organisms. Special precautions should be taken during in vitro medical procedures:

- **Biological hazards**: keep a logbook of all the biological substances or pathogenic microorganisms that were under observation with the device and show it to everybody before they use the device or before they do some maintenance work on the device! Agents can be bacterial, spores, enveloped or non-enveloped virus particles, fungi or protozoa
- **Contamination hazard:**
  - A sample that is properly enclosed with a cover glass never comes in direct contact with the device parts. In that case prevention of contamination lies in the handling of the slides; as long as the slides are decontaminated before use and are undamaged and treated normally, there is virtually zero risk of contamination
  - A sample that is mounted on a slide without cover glass, can come in contact with components of the device and may be a hazard to humans and/or the environment. Therefore, check the device and accessories on possible contaminations. Clean the device's surfaces and its components as thoroughly as possible. Should you identify a possible contamination, inform the local responsible person in your organisation
  - Operators could be contaminated from other activities and cross-contaminate components of the device. Therefore, check the device and accessories on possible contaminations. Clean the device's surfaces and its components as thoroughly as possible. Should you identify a possible contamination, inform the local responsible person in your organisation. it is recommended to wear sterile gloves when preparing the slides and handling the device in order to reduce contamination by the operator
- **Infection hazard:** direct contact with the focusing knobs, stage adjustments, stage and eyepieces/tubes of the device can be a potential source of bacterial and/or viral infections. The risk can be limited by using personal eyeshades or eyepieces. You can also use personal protections such as operation gloves and/or safety goggles, which should be changed frequently to minimize the risk
- **Disinfectant hazards:** before cleaning or disinfecting, check if the room is adequately ventilated. If not, wear respiratory protective gear. Exposure to chemicals and aerosols can harm human eyes, skin and respiratory system. Do not inhale vapours. During disinfection, do not eat, drink or smoke. Used disinfectants must be disposed of according to local or national regulations for health and safety

2.3 Disinfection and decontamination:

- Exterior casing and mechanical surfaces must be wiped with a clean cloth, dampened with a disinfectant
- Soft plastic parts and rubber surfaces can be cleaned by gently wiping a clean cloth, dampened with a disinfectant. Discoloration can occur if alcohol is used
- The front lens of eyepieces and objectives are sensitive to chemicals. We recommend not to use aggressive disinfectants but to use lens paper or a soft fibre-free tissue, damped in cleaning solution. Cotton swabs may also be used. We recommend you use personal eyepieces without eyeshades in order to minimize risk
- Never immerse or dip the eyepiece or objective into a disinfectant liquid! This will damage the component
- Never use abrasive compounds or cleaners that may damage and scratch optical coatings
- Properly clean and disinfect all possible contaminated surfaces of the device or contaminated accessories before storing for future use. Disinfection procedures must be effective and appropriate
- Leave the disinfectant on the surface for the required exposure time, as specified by the manufacturer. If the disinfectant evaporates before the full exposure time, reapply disinfectant on the surface
- For disinfection against bacteria, use a 70% aqueous solution of isopropanol (isopropyl alcohol) and apply for at least 30 seconds. Against viruses, we recommend to refer to specific alcohol or non-alcohol based disinfection products for laboratories

Before returning a device for repair or maintenance through a Euromex dealer, an RMA (return authorization form) together with a decontamination statement must be filled in! This document - available from Euromex for any reseller- must be shipped together with the device at all times

Handle with care

- This product is a high quality optical instrument. Delicate handling is required
- Avoid subjecting it to sudden shocks and impacts
- Impacts, even small ones, can affect the precision of the instrument

Handling the LED

Note: Always disconnect the power cord from your device before handling the LED bulb and power unit and allow the system to cool down approximately 35 minutes to avoid burns

- Never touch the LED with your bare hands
- Dirt or fingerprints will reduce the life span and can result in uneven illumination, lowering the optical performance

- Use only original Euromex replacement LEDs
- The use of other products may cause malfunctions and will void warranty
- During use of the device, the power unit will get hot; never touch it while in operation and allow the system to cool down approximately 35 minutes to avoid burns

Dirt on the lenses

- Dirt on or inside the optical components, such as eyepieces, lenses, etc., affects the image quality of your system negatively
- Always try to prevent your device from getting dirty by using the dust cover, prevent leaving fingerprints on the lenses and clean the outer surface of the lens regularly
- Cleaning optical components is a delicate matter. Please, read the cleaning instructions further on in this manual

2.4 Model with rechargeable batteries

- Always disconnect the power cord from the device before you replace the rechargeable batteries
- The rechargeable batteries must not be thrown away as regular trash but should be taken to special waste collection sites, according your local or national regulations
- Risk of explosion: when removing the rechargeable batteries, do not throw the batteries into fire or any other heat source
- Do not replace the rechargeable batteries with non-rechargeable batteries
- Avoid extreme environmental conditions and temperatures which could affect the rechargeable batteries and lead to fire, explosion or leakage of hazardous substances
- If the rechargeable batteries have leaked, avoid contact of the chemicals with skin, eyes and mucous membranes
- When in contact with the chemicals, flush the affected areas immediately with plenty of fresh water and seek medical attention

2.5 Environment, storage and use

- This product is a precision instrument and it should be used in a proper environment for optimal use
- Install your product indoors on a stable, vibration free and level surface in order to prevent this instrument to fall thereby harming the operator
- Do not place the product in direct sunlight
- The ambient temperature should be between 5 to +40°C and humidity should be within 80% and 50%
- Although the system is anti-mold treated, installing this product in a hot, humid location may still result in the formation of mold or condensation on lenses, impairing performance or causing malfunctions
- Never turn the right and left focus knobs in opposite directions at the same time or turn the coarse focus knob past its farthest point as this will damage this product
- Never use undue force when turning the knobs
- Make sure that the device can dissipate its heat (fire hazard)
- Keep the device away from walls and obstructions for at least approximately 15 cm
- Never turn the device on when the dust cover is in place or when items are placed on the device
- Keep flammable fluids, fabric, etc. well out of the way

Disconnect power

Always disconnect your device from power before doing any maintenance, cleaning, assembling or replacing LEDs to prevent electric shocks

Prevent contact with water and other fluids

Never allow water or other fluids to come in contact with your device, this can cause short circuiting your device, causing malfunction and damage to your system

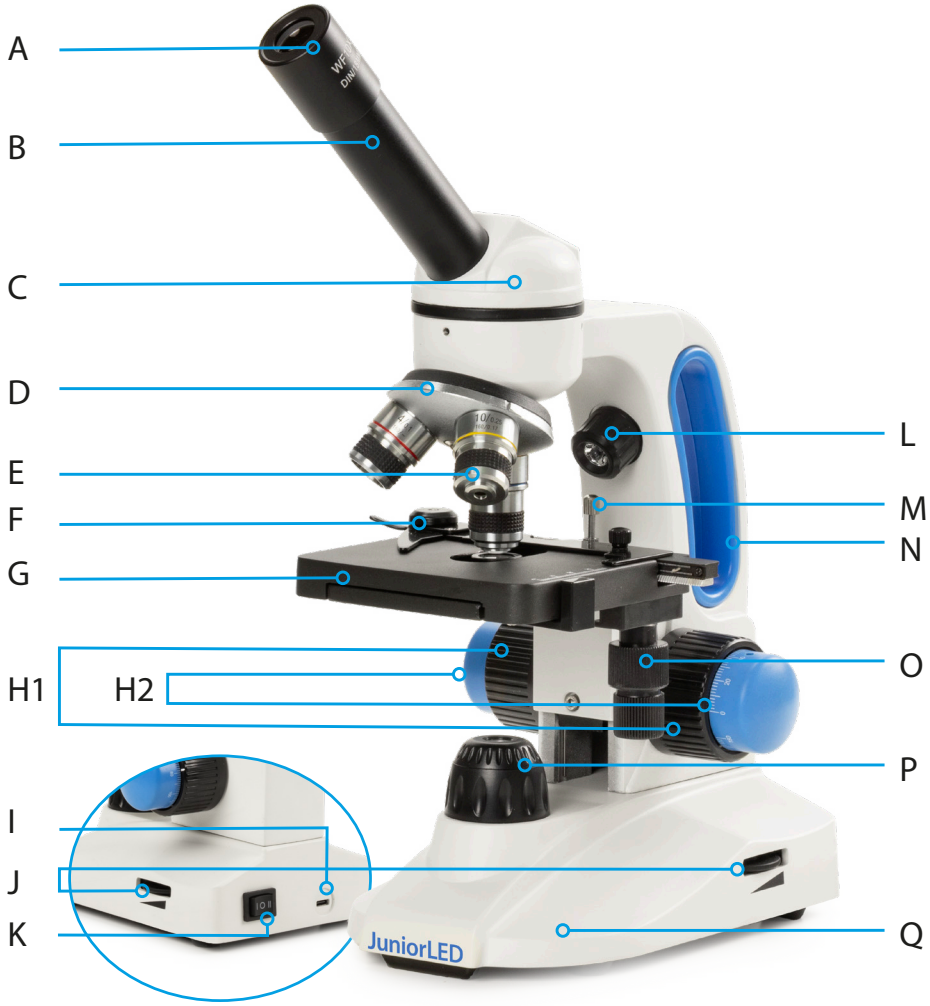
Moving, assembling and storing

- This device is a relatively heavy system, consider this when moving and installing the system
- Always lift the device by holding the main body and base of the device
- Never lift or move the device by its focusing knobs, stage or head
- When needed, move the device with two persons instead of one
- Please store dry, at temperatures 15 to 35 degrees Celcius

3.0 Construction of the JuniorLED

The names of the several parts are listed below and are indicated in the picture:

A. Eyepiece	**J.** Illumination adjustment
B. Tube	**K.** On/off/on button
C. Monocular head	**L.** Incident Illumination
D. Revolving nosepiece	**M.** Safety device
E. Objectives	**N.** Stand arm with handle
F. Object clamp	**O.** X-Y stage adjustment
G. Object stage	**P.** Transmitted Illumination
H. Coarse (1) and fine (2) adjustment	**Q.** Microscope base
I. USB-C power input	



4.0 Function of the specific parts

The stand contains a stand arm (N), base plate (Q) and an object stage (G). You should hold the microscope always at the upper part of the stand (N) when moving it

4.1 Tube

The 360° rotating tube (B) is equipped with a WF10x eyepiece (A) with a fixed pointer. The eyepiece can be rotated and is locked with a screw

4.2 Revolving nosepiece

The revolving nosepiece (D) is equipped with 3 objectives (E)

4.3 Optical equipment

- The JuniorLED microscopes are as a standard equipped with one wide field eyepiece WF10x (A) and three achromatic objectives 4x N.A. 0.10, 10x N.A. 0.25 and S40x N.A. 0.65 (E)
- The eyepiece is locked with an Allen screw
- The S40x objective has a spring mount to avoid possible damage to the slide and lens. The numeric aperture (N.A.) of the objective indicates the maximum resolution of the objective. The total magnification can be calculated by multiplying the magnification of the eyepiece with the magnification of the objective. The magnifications are displayed in the table below:

Eyepiece	Objective	Magnification
10x	4x	40x
10x	10x	100x
10x	40x or 60x	400x or 600x

4.4 Object stage

The stage is equipped with a mechanical x/y translation stage for precise movement of the slide which is placed in the object clamp

4.5 Course and fine adjustment

The course- (H1) and fine adjustment (H2) knobs are used to change the height of the mechanical stage in order to focus on the sample

4.6 Single lens condenser

A single lens condenser N.A. 0.65 has been fixed in the object stage

4.7 Illumination JuniorLED

- The JuniorLED is equipped with double LED illumination. The light intensity can be adjusted by the intensity controller wheel (1)
- The switch on the back (2) is used to turn on the transmitted illumination ("I"), to turn on the incident illumination ("II"), or turn off the device ("o")
- The JuniorLED comes with a UBC-C charger (connecting to the microscope by the USB-C power input (3)) and batteries (underneath the microscope

5. Preparing the microscope for use

- Remove the packing and put the microscope on a flat surface. The objectives are pre-mounted. The batteries are supplied. You need to insert them into the batteries compartment in the bottom plate of the microscope. Use only batteries supplied by Euromex
- Put the power adapter USB-C plug into the power input (I, or 3)) at the rear side of the microscope and put the plug into the mains supply
- Switch on the microscope (K, or 2). Sit comfortably down behind the microscope and take a relaxed position while viewing through the eyepiece (A)

6.0 Working with the microscope

Please read the following instructions to achieve the best microscope observing results

6.1 Basic steps

- Put the object stage (G) with the course adjustment knobs (H) at the lowest position
- Put a slide in the object clamp (F) with the thin cover glass on top of the specimen slide
- The specimen must be positioned exactly at the centre
- Turn the objective 4x (E) in the light path
- Move the object stage (G) upwards by turning the course adjustment knob (H1) until the specimen is visible
- With the fine adjustment knobs (H2) the image can be focused
- Adjust the light intensity if needed (J, or 1)
- The microscope is now set for observing with the 4x objective
- For larger magnifications, first use the 10x, followed by the S40x objective
- When changing the slide it is advisable to start again with using the 4x objective and repeat the steps as described above

6.2 Slide protection

- The microscope has a safety device (M) to avoid damaging the objectives and the specimen slide. This device has been factory pre-set. This device is configured so that - in case of working with the S40x objective - the stage can never be turned up so high that the specimen touches the objective, causing damage to either the objective or the specimen
- It is recommended to use slides of 1.0 – 1.2 mm thickness (product numbers: PB.5150, PB.5155, PB.5160) in combination with cover glasses of 0.13 mm or 0.17 mm thickness (product numbers: PB.5165, PB.5168).

7.0 Maintenance and cleaning

Always place the dustcover over the microscope after use. Keep the eyepiece and objectives always mounted on the microscope to avoid dust entering the instrument

7.1 Cleaning the optics

- When the eyepiece lens or front lens of the 10x or S40x objective are dirty they can be cleaned by wiping a piece of lens paper over the surface (circular movements). When this does not help put a drop of alcohol on the lens paper

  Note:
  Never put xylol or alcohol directly on the lens!
- Please note that Euromex offers a special microscope cleaning kit: **PB.5275**

  Note: Cleaning cloths containing plastic fibers can damage the coating of the lenses!
- It is not necessary – and not recommended – to clean the lens surfaces at the inner side of the objectives. Sometimes dust can be removed with high pressured air. There will never be dust in the objectives if the objectives are not removed from the revolving nosepiece

Note: More on cleaning of the microscope and lenses can be found on the Euromex academy website: www.euromex.academy

7.3 Changing the LEDs

Warning:
Always remove the AC adapter from the mains supply before changing the bulb!

Warning:
Never touch a new LED with your fingers! This will shorten the lifetime of the LED

For the incident illumination:

- Remove the lamphousing by unscrewing it (1)
- Remove the old LED and replace it with the new one (2)
- Screw the lamp housing back

For the transmitted illumination:

- Raise the stage as far as it will go (1)
- Remove the top part of lamphousing by screwing it out of the bottom part (2)
- Remove the old LED and replace it with the new one (3)
- Screw the lamp housing back

7.4 (Re)placing the batteries

- Gently lay the JuniorLED on its side
- Remove the battery compartment lid by unscrewing the screw (1)
- (Re)place batteries. Note the correct position (2, 3)
- Replace the lid and refasten screw