

Laboratory set for studying optics

LABOTRIX OPTICA 02

PRODUCT PASSPORT

Kyiv

2026

1. Basic product information

- 1.1. Product name — Laboratory set for studying optics.
- 1.2. Trademark — Labotrix.
- 1.3. Model — OPTICA O2; full trade name — LABOTRIX OPTICA O2.
- 1.4. Manufacturer — Labotrix Group Limited, China.
- 1.5. Intended use: A comprehensive laboratory set designed for practical work and experiments in optics in schools, gymnasiums and higher education institutions. The set allows students to master the principles of optical systems, study the phenomena of refraction, dispersion, diffraction and the action of light filters, as well as determine the focal lengths of lenses and the main optical characteristics of elements. The device is used during training in the optics section of physics and develops students' experimental skills.
- 1.6. Design features: The set consists of an optical bench with a 60-centimeter scale, which allows you to accurately position optical elements relative to each other. Contains a set of lenses of different focal lengths, a prism, a diffraction grating, laser light sources and other optical elements necessary for demonstrating and studying various optical phenomena. All components are placed in a special box for storage and transportation, and each element is fixed in a housing for protection during transportation.
- 1.7. Digital learning support: The product includes access to an online teaching support course hosted in a learning management system (LMS) and designed for 70 academic hours of classes. The course is designed to meet the current curricula of secondary education institutions in Ukraine. The materials are grouped into research modules in the disciplines of physics, biology, chemistry, STEM, and each topic contains a lesson plan, a list of necessary supplies, an experiment scenario, step-by-step instructions for laboratory work with an explanation of the expected result, a video demonstration of work methods, interactive exercises and tasks for independent study, suitable for both individual and group work. All modules are designed for this equipment and tested on it, so the course works in a direct chain of "equipment → methodology → learning results". The course has a built-in assistant based on a language model with a search through the course knowledge base (Retrieval-Augmented Generation): based on the topic of the lesson, it selects relevant experiments, methodically describes the sequence of conducting the research, analyzes typical student errors and gives personal advice on how to get rid of them, changes the level of complexity to prepare for a specific class, and helps to write a research report and organize the conclusions. The assistant's knowledge base is localized and aligned with the Ukrainian curriculum. The license for the course and accompanying software is valid for 12 months from the date of transfer of access; the content, interface, and answers of the assistant are provided exclusively in Ukrainian.

2. Technical specifications

- Brand — Labotrix
- Model — OPTICA O2
- The article number is LTX-OPTICA-O2
- Product type — laboratory set for optics experiments
- Specific purpose - teaching optics according to the school curriculum of secondary education institutions
- The number of minimum configuration items is 20.
- Optical bench length (centimeter) — 60
- Optical bench scale (millimeter) — 1
- Number of lenses in the set (pieces) — 3
- Lens focal lengths (millimeters) — 100, 150, 200
- Prism type — isosceles rectangular prism
- Aperture aperture (millimeter) — 3
- Screen dimensions (millimeters) — 120 × 130
- Type of diffraction grating — linear, 2 pcs. in a set
- Number of slots in the set (pieces) — 2
- Laser sources - point and line
- Frame and support material - metal and plastic
- Lens and prism material - optical glass
- Screen material - matte plate
- Operating conditions — premises of an educational institution, air temperature from +5 to +40 °C, relative humidity from 40 to 60 % without condensate
- Service life (year) — 5
- Digital learning support — online course in a learning management system (LMS)
- Course volume (academic hour) — 70
- Language-model-based assistant — built into the course, with retrieval over a localized knowledge base (Retrieval-Augmented Generation)
- Validity period of the license for the course and the software (month) — 12
- Language of the course, of the interface and of the answers of the assistant — Ukrainian
- Warranty period (month) — 12
- Language of marking and operating documentation — Ukrainian
- Product marking — trademark, model and a space for the inventory number
- Packaging — individual box of corrugated cardboard with the contents secured in a foam insert
- Ready-to-use condition — supplied in assembled form, requires no additional setup
- Surface care - the lenses, mirror, and screen can be wiped with a microfiber cloth; the working surface of the diffraction gratings cannot be wiped.
- User requirements - students work with laser light sources only under the supervision of a teacher

3. Equipment

- Optical bench with scale, 60 cm — 1 pc.
- Supports for optical bench — 2 pcs.
- Light source (electric lamp) — 1 pc.
- Movable supports for frames — 8 pcs.
- Lens holder frame — 4 pcs.
- Set of lenses with different focal lengths ($F = 100$ mm, $F = 150$ mm, $F = 200$ mm) — 1 set:
- Lens with a focal length of 100 mm — 1 pc.
- Lens with a focal length of 150 mm — 1 pc.
- Lens with a focal length of 200 mm — 1 pc.
- Prism with stand (isosceles rectangular) — 1 pc.
- Plate with the image of the letter "F" - 1 pc.
- Diaphragm with a hole, $d = 3$ mm — 1 pc.
- Mirror — 1 pc.
- Screen, 120×130 mm — 1 pc.
- Block — 1 pc.
- Slot — 2 pcs.
- Diffraction grating — 2 pcs.
- Set of color filters — 1 set.
- Frame holder for diffraction grating — 2 pcs.
- Laser line — 1 pc.
- Foam insert — 1 pcs
- Packing box — 1 pc.
- Laser point — 1 pc.
- Product Passport and Warranty Card — 1 pcs
- Right of access to the online course with a language-model-based assistant (license) — 1 pcs

The kit consists of a closed package and does not require assembly before first use. The kit includes a printed methodical guide with a description of 5 basic laboratory works on this equipment - this is an independent printed document, separate from the online training course (clause 1.7): the course is available through a learning management system (LMS) and covers 70 academic hours of classes with a much wider list of topics, scenarios and tasks than the printed guide.

4. Safety measures

4.1. General requirements

- Before first use, read this passport and keep it together with the product.
- The kit is intended for use under the supervision of a qualified teacher or instructor.
- Inspect the unpacked set for mechanical damage; damaged optical elements must not be used.

- Follow safety precautions when working with glass, electrical appliances, and laser light.

4.2. Safety when working with lasers

- Never look directly into the laser beam or its reflection from mirror surfaces.
- Make sure that the laser light is not directed at the eyes of the experiment participants.
- Turn on the lasers only when conducting an experiment; turn them off when finished.
- Only allow adults or students to use lasers under direct supervision.

4.3. Safety when working with glass

- Optical elements (lenses, prism, mirror) are made of glass and can easily break if dropped.
- Move glass parts carefully, avoiding drops and impacts.
- If a glass element breaks, immediately collect the fragments and dispose of them safely.
- Do not attempt to use broken optical elements; order replacements.

4.4. Electrical safety

- The light source operates on mains current; follow electrical safety rules when using it.
- Do not touch electrical contacts and sockets with wet hands.
- Regularly check the integrity of the power cable insulation for damage.

4.5. It is strictly forbidden

- Directing laser light at people, especially the eyes.
- Leave lasers turned on unattended.
- Immerse optical elements or diffraction gratings in water or any other liquid.
- Clean optical surfaces with abrasive materials and aggressive chemicals.
- Touch or wipe the working surface of diffraction gratings with your fingers, remove them from the holding frames.
- Use the kit in explosive or flammable environments.

5. Preparation for work

- 5.1. Unpack the kit and check the completeness according to section 3 of this passport. We recommend that you keep the original packaging for further transportation.
- 5.2. Inspect each optical element for visible damage, cracks, or contamination. Damaged elements are not allowed to operate.
- 5.3. Place the optical bench on a flat, stable surface free from vibrations.
- 5.4. Attach the optical bench supports to the bench, following the instructions, to ensure stability.

- 5.5. Connect the light source to the electrical network and check its functionality before the experiment.
- 5.6. Clean the optical surfaces (lenses, mirror, prism) with a clean soft cloth to remove dust.

6. Procedure

6.1. Installation of optical elements

Place the optical elements on the optical bench, following the experimental diagram given in the methodical manual. Use the movable supports and frames to precisely position the elements relative to the bench scale.

6.2. Alignment of the optical system

Make sure that all optical elements are aligned in height so that the light beam passes through the centers of the lenses and through the centers of other elements.

6.3. Turning on and adjusting the light source

Turn on the light source and adjust its position so that the light beam passes through the diaphragm onto the first optical element of the experimental system.

6.4. Conducting the experiment

Follow the instructions in the methodical manual for each specific laboratory work. Record the results of measurements, conduct analysis and formulate conclusions.

6.5. Completion of work

Turn off the light source and turn off the lasers (if used). Disassemble the experimental setup and return all components to the storage box.

6.6. Working with an online course

- Obtain an account at the educational institution and activate the right of access to the course; the validity period of the license is counted from the date on which access is transferred.
- Select a lesson topic from the course list: each topic includes a plan, a list of supplies, a procedure for completing the work, and the expected result.
- Formulate a request to the assistant on the topic of the lesson - he will suggest relevant experiments, describe the sequence of actions, and indicate where students make the most mistakes.
- Set the level of difficulty of the tasks for a specific class; the assistant will help draw conclusions based on the results of the work.

7. Care, maintenance and possible malfunctions

7.1. Cleaning

- Wipe the lenses, mirror, and screen only with a dry or slightly damp microfiber cloth, using light movements, without pressing.
- It is forbidden to wipe the working surface of diffraction gratings: touch and fabric fibers spoil the grating lines and distort the diffraction pattern; do not remove the grating from the holder frame.
- Do not use alcohol, acetone, other organic solvents, or hot water - they will damage the optical coatings.
- Regularly remove dust from frames, supports, and other non-optical components with a soft brush.

7.2. Periodic control

- Check the integrity of the optical elements, especially the lenses and prisms, at least once a month.
- Check the integrity of the power cable insulation and the condition of the light source contacts.
- Check the smooth movement of the movable supports on the optical bench; clean the scale from dust if necessary.

7.3. Possible malfunctions and ways to eliminate them

Symptom	Possible cause	User actions
The light source does not light up	No power, broken link in the cable, burnt out lamp	Check the power supply, check the cable integrity, replace the lamp with a new one
The image on the screen is blurry or distorted.	Optical elements misaligned, dirty optical surfaces	Readjust the position of the elements, clean the optical surfaces
The laser does not emit light	Batteries are low, laser is not turned on, incorrect connection	Replace batteries, turn on laser, check for proper connection
Reduced brightness of the diffraction pattern	The diffraction grating is dirty from contact or dust, the laser is not aligned properly.	Do not wipe the working surface of the grid: remove dust with a jet of air or contact a service center; readjust the laser direction

Symptom	Possible cause	User actions
Movable supports slide along the bench	Scale contamination, wear of support mountings	Clean the bench scale, check and tighten the mounting screws

8. Storage and transportation conditions

- Store the kit in a closed box in a dry room at a temperature not lower than +5 and not higher than +40 °C and a relative humidity of up to 80% without condensation.
- Protect components from dust, direct sunlight, and heat sources.
- Take special care to store the lenses, prism, and mirror by placing them in soft cases or special compartments in the box.
- When transporting, use the original box or equivalent container with shock-absorbing material to protect against impacts.
- Do not place heavy objects on top of the kit box.
- For long-term storage (more than 3 months), check the condition of the components and clean the optical surfaces before use.
- The storage period before commissioning is unlimited provided that the stated requirements are observed.

9. Warranty obligations

- 9.1. The warranty period of the product is 12 months from the date of sale specified in the warranty card.
- 9.2. The manufacturer guarantees that the product complies with the declared technical characteristics, provided that the rules for transportation, storage and operation set out in this passport are followed.
- 9.3. During the warranty period, product defects that have arisen due to the manufacturer's fault will be eliminated free of charge. The method of elimination (repair, component replacement or product replacement) is determined by the service center.
- 9.4. Warranty service is provided upon receipt of a correctly and completely filled out warranty card and a document confirming the fact and date of purchase.
- 9.5. The warranty does not apply to cases where the malfunction is caused by:
 - mechanical damage, in particular cracks, chips and deformation of the housing and of the components of the product;
 - violation of the operating, storage or transportation rules set out in this passport;
 - ingress of liquid or foreign objects into the product, and also the action of insects and animals;

- independent disassembly, repair or modification of the product, in particular repair at unauthorized workshops;
- use of the product other than for its intended purpose;
- force majeure circumstances (fire, flood, earthquake, etc.).

9.6. The warranty does not apply to natural wear and tear of the coating and appearance of the product, as well as to consumables.

10. Product disposal

- The product must not be disposed of together with unsorted municipal waste. This is indicated by the marking in the form of a crossed-out container on the product or its packaging.
- After the end of the service life, hand the product over to a collection point for the corresponding waste or to an organization holding the appropriate permit.
- Hand over the packaging elements (cardboard, polymer materials) to the corresponding streams of recyclable materials.

Contacts

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Conditions of use and storage of the product

The product is intended for educational work in general secondary education institutions and is used only under the control and supervision of a teaching staff member; the recommended age of students — from 10 years, that is, students of grade 5 and of higher grades. Keep the product in a dry, clean and ventilated room at a temperature from +5 to +40 °C and relative air humidity up to 80 % without condensation, separately from heat sources and out of direct sunlight, moisture and dust. Use the product exclusively for its intended purpose and do not allow drops, impacts or other mechanical damage. If you notice damage, a crack or any malfunction, stop working with the product immediately and inform the teacher or the responsible person of the educational institution; repairing the product on your own is prohibited.

WARRANTY CARD

Product name:	Laboratory set for studying optics
Product model:	LABOTRIX OPTICA O2
Serial number:	
Date of sale:	
Warranty period:	12 months from the date of sale
Trading organization:	
Signature of the seller:	

The goods have been received in working order, without visible damage, complete, and have been checked in my presence. I have no claims regarding the quality of the goods; I have read and agree to the operating and warranty service conditions.

Full name of the buyer

Buyer's phone number Buyer's signature

Dear Customer!

Thank you for choosing Labotrix products. After-sales service of this product is provided in accordance with the regulations of the company and the legislation of the country of sale. So that we can serve you quickly and without unnecessary formalities, check that this warranty card is filled in correctly at the moment of purchase and keep it together with the payment document throughout the entire warranty period. When applying for repair, hand the product over to the seller or to the service center together with the filled-in card.

Procedure for applying

1. The right to free warranty service for the product is valid for 12 months from the date of sale specified in the warranty card. Within this period, components that have failed due to a manufacturing defect are repaired or replaced without payment from the buyer.
2. Before contacting, make sure that the malfunction is not caused by the reasons listed in section 9 of this passport, and if possible, use the table of possible malfunctions in section 7.3.
3. After the 12-month warranty period, repairs are carried out for a fee; the cost of work and spare parts is determined depending on the nature of the malfunction.

Grounds for refusal of warranty service

The company reserves the right to refuse free service or to perform the work on a paid basis if at least one of the following circumstances is established:

- absence of the warranty card, its incomplete or corrected completion, and also the absence of a document confirming the purchase;
- non-conformity of the serial number of the product with the number specified in the card, or damage to the factory marking;
- traces of independent disassembly, repair or modification of the product;
- damage caused by violation of the operating rules, connection to an unsuitable power source or external mechanical impact;
- damage as a result of force majeure circumstances.

Service Records

Date of entry	Description of the malfunction	Work performed	Position, signature, full name of the responsible person