illuminator WITH fibre-optic BUNDLE

ovc-1

Operating Instructions

1. APPLICATION

Illuminator with fibre-optic bundle is used as a light source for various optical devices and medical equipment with fibre-optics elements.

The device can be applied in clinics and hospitals for different operations and medical researches when it is undesirable or prohibited to use a lamp direct thermal exposure.

The device is intended for operations at hospitals and field operation rooms at temperature range from +10° up to +35°C and relative humidity 80%.

2. TECHNICAL SPECIFICATIONS

1.	**Light transmitting fibre bundle length**	**mm**	**1800 ± 25**
2.	**Illumination at center of light spot at distance 100mm from the end of light transmitting fibre fund, not less**	**lux**	**6000**
3.	**Light source in illuminator – lamp KGM9-70**		
4.	**Power voltage and frequency**	**V, Hz**	**220±10%, 50**
5.	**Power consumption at stabilized voltage, not more**	**W**	**70**
6.	**Illuminator dimensions, not more**	**mm**	**250x165x265**
7.	**Weight of illuminator without accessories, not more**	**Kgs.**	**6.0**
8.	**Mean lifetime, not less**	**years**	**5**
9.	**Lamp switching mechanism non-failure operation probability for 1000 cycles of the mechanism work, not less**		**0.9**

3. DELIVERY SET

NAME	QTY
Illuminator	**1 pc.**
Flexible fibre bundle in cladding	**2 pcs.**
Clamp	**2 pcs.**
Adaptor	**2 pcs.**
Power cable	**1 pc.**
Fibre bundle muff	**2 pcs.**
Cloth cover of fibre bundle	**2 pcs.**

4. ARRANGMENT AND OPERATION

4.1. Device operation

The base principle of OVC-1 operation is transmitting of light flux from an incandescent lamp to the ends of light transmitting fibre bundles.

A light beam made by a lamp transferred through the condenser lenses system is transmitted to the enter side of the fibre bundle that using a fibre bundle muff is attached to the enter plug of the device or a fibre optics instrument (set of

endoscopic mirrors, light transmitting fibre tips type UMZ and KHIS).

4.2. Design description

The main unit of the device is the illuminator consisting of the case 1 (See Figure 2 in the Operating Instruction in Russian), inside the case there is two condensers 3 into the frame of the lamps switching mechanism 2. Two incandescent lamps (one of them is operational and another one is reserve) are set into lamp sockets 4 that are installed into the bracket 2 from two sides and locked by screws 5.

Lamp sockets are mounted to the axis with operational handle 6 by means of leverage. Interchanging of lamps in process of operation can be conducted using the handle 6 turning out. The lamp power supply is supplied via the reducing transformer 7.

Power supply switching on is made with the power cable and the toggle switch 8.

The clamps 1 (Figure 3) that are in delivery set of OVC-1 are necessary for holding of fibre bundles 2 in process of a medical operation when medical tools are being changed. Clamps are attached to a surgical garb and the fibre bundles via the fibre bundle muff are attached to the clamps 3.

5. GENERAL INSTRUCTIONS

Medical device OVC-1 is an optical instrument thus the following rules should be observed during an operation:

5.1. It is necessary to keep the device at room temperature within 24 hours after its transportation from outdoors, then start this device inspection, delivery set checking out and operating.

5.2. When the fibre bundles are handled or placed into a position it is prohibited to touch opened surfaces.

5.3. It is forbidden to throw and twist the fibre bundles to radius less than 50 mm to avoid of light transmitting fibre bundles damaging.

5.4. It is forbidden to remove or adjust any optical elements of the device (except of a burned-up lamp) since it can be resulted in misalignment of the device.

5.5. It is forbidden to use power voltage different from 220 V, 50 Hz.

6. SAFETY MEASURES

6.1. The device should be operated in rooms where there is no increased electrical danger.
The following condition can cause in high danger for the device:
1. dampness or current-conducting floor area;
2. current-conducting floors (metal, ground, brick, concrete);
3. high temperature more than +40°C.
6.2. Before switching on of the device to the electrical net the cord isolation should be regularly inspected. It is prohibited using a cord with damaged cladding isolation.
6.3. When halogen lamp is being changed the device should be off switched the line.

7. PREPARATION FOR USE

7.1. The device lamps workability should be checked before switching on to the electrical net. In case one of a lamps is out of work it should be interchanged by another one (see Section 9.3.). Before a lamp installation its surface should be cleaned by ethyl alcohol.

7.2. Before operating the fibre optics muffs and clamps should be asepticized in distilled hot boiling water within 1 hour. The cloth cover of fibre bundle should come through steam disinfection. The illuminator case should be cleaned by 3% solution of hydric dioxide. The light transmitting fibre bundles should be disinfected by 3% solution of hydric dioxide and serialized in 6% solution of hydric dioxide.

7.3. Switcher should be in position 'ВЫКЛ'

7.4. Adaptors and fibre optics muffs should be used in operation with bundles and instruments having the standard attaching sizes.

8. OPERATIONAL PROCEDURE

- Connect light transmitting fibre bundles to the Illuminator sockets by means of finger pressing from below, level up the

strip and input the bundle end side.

- Screw on the muff to the tread tips on the contra verse ends of the bundles and attach the necessary instruments to the muff,

- Put in the plug of the net cable to the illuminator,

- Switch on the cord to the electricity net,

- Move the switcher on to position 'ВКЛ' ,

- When operation is completed turn the switcher to off position 'ВЫКЛ'

ATTENTION! Continuous working time of the illuminator device with the fibre optics is not more than 4 hours.

9. MAINTENANCE WORK

9.1. Before the illuminator operating it is required to check the technical state during that please use this Operating Instructions.

9.2. Follow the safety measures at all types of technical state checking out.

9.3. Technical state checking types, operations, periodicity, methods, technical requirements, list of devices applied during this inspection are presented in Table 3.

During interchanging of burnt lamp complete the following points:

1. Switch off the device and keep it till cooled,

2. Loosen the screws fixed the end-side covers of the illuminator case, remove the covers:

3. Loosen the screws and carefully move out the lamp socket holding it in hand and avoiding of cables damaging,

4. Loosen the screws that fixing the contact brackets of the lamp and put of a burnt lamp,

5. Put on one of spare lamps and tighten the screws very densely,

6. Put on the lamp clamp to the bracket and tighten the screws,

7. Use operating handle on the illuminator panel and move the lamp between condensers, switch on power supply,

8. input adjusting instrument to the socket of illuminator case,

9. Obtain an image of a lamp filament on a screen distant by 200 – 250 mm from the illuminator case,

10. In order to match image of a lamp filament with enter end-sides of the fibre bundles each the lamp has movable rollers in three inter-perpendicular directions in its own lamp socket: along the axis and up – down owing to sockets shifting in the bracket allocation site, across the axis in horizontal plane by means of screws with subsequent tightening of lock-nuts. If a lamp is installed in correct way its filament image should be equal from both sides (in order to check the adjusting device can be input in contra verse illuminator socket and obtain the second image)

9.4. To ensure stable work of the device the timely technical maintenance should be provided.

9.5. Follow the safety measures noted in Section 6 during the technical maintenance.

9.6. It is recommended to carry out the technical maintenance within process of the device technical state checking out and terms intended for it.

9.7. Technical maintenance procedure consists as per follows:

1. Clean the device from dust or impurities with a dry clean cambric napkin or a soft squirrel brush;

2. Remove the device cover using a screwdriver. Clean dust from lamps using a purified cotton tampon wetted in alcohol (see section 9.3);

3. Tighten screws that are fixing the illuminator side covers by means of a screwdriver.

9.8. The following operations should be made within process of a regular technical maintenance:

1. Remove the device end side covers. Clean dust, impurities from all internal surfaces of the illuminator and from all device components.

9.9. In case if at process of the technical state checking out and the technical maintenance there is a discrepancy of the device from the technical specification appeared the device is not allowed to be operated and must be repaired.

Technical state checking operation. Who is responsible.	Technical state checking out periodicity	What is being tested. Checking means and methods.	Technical specification
Visual inspection. Provided by specialists that are in charge with its operation.	Every time at preparatory works with the illuminator to be operated as per Section 7 and during other technical state checking operations fulfillment	**Permanent testing of technical state** Carried out by means of visual inspection without special instruments and facilities application: 1.Running order and durability of a power cable	Power cable cladding must be without breaks and current supply cords are not viewed. Fixation of a cable with the electrical plug must be strength and out of cracks.
		2.running order and proper fixation of the illuminator power supply switcher.	Switcher turning on must be made by light pushing up to position 'ВКЛ' Switching off is made by pushing to position 'ВЫКЛ'
		3) Lamps switching handle running order; 4) varnish and galvanic coatings and signs state; 5) halogen lamp set up and switching on.	Handle must be turned without any braking There are no dents, scratches, rust points, etc on the device case. Marks must be clear. Lamp setting and interchanging is made as per Section 9.3.
		6) lamp surface cleanliness	Dust must not be gathered on lamp surface.
Testing of illumination value of the device. Provided by specialists	One time per 6 months	Illumination value is to be checked by luxometer U116: 1. prepare the device to be worked as per Sections 6 and 7 of the present documents; 2. measure the illumination value in the center of light spot. Photo element should be perpendicular to light beam going from fibre bundle end.	Illumination made by the illuminator at distance 100 mm from fibre bundle must be not less than 6000 lux
Accurate testing of all parts units that make the illuminator partially disassembled. Provided by specialist.	Annually	**Regular testing of technical state** Unscrew 8 screws and remove end covers of the device. Test as per follows: 1.electrical circuit status; 2. slightly rocking and jerking of units check the stable fixation of transformer, condensers, switchers, etc; 3) check durability of contact joints of cords with transformer, switchers, etc. Provided without special purpose instruments or equipment.	Transformer, condensers, switchers and other units fixation and fastening must be durable. Contact joints of mounted cords with transformer, switchers must be durable.

10. POSSIBLE FAILURES AND REPAIR MEANS

10.1 The list of the most often and possible failures and reasons/means to repair them are presented below

Failure designation, additional features	Possible reason	Repair means
Halogen lamp does not work	Lamp is burnt Cut in power cable	Interchange a lamp Repair power cable
Voltage lack in lamp holder	Breakage of illuminator electrical circuit, broken micro switchers, broken transformer	Interchanging provided with help of specialist

11. STORAGE

In a clinic or a hospital conditions the device should be preserved covered by polyethylene casing, fibre bundles placed in a box. in dry place avoiding of dust and dangerous exhalation

It is forbidden to hold the device in a room with weeping materials or chemical active steams or gases.

12. aCCEPTANCE CERTIFICATION

This illuminator with fibre-optic bundle OVC-1 is fully complied with the technical specification TU3-3.1383-84-78 and accepted ready for service

13. manufacturer Warranty

Manufacturer guarantees the conformance of this device to the requirements of the technical specification at a customer proper operations, transportation and storage conditions.

Warranty period is 12 months from the date of the device setting to operations but not later than 18 months from the date of delivery to a customer.

In case of this device failure to use within warranty period as well as if a customer finds out unacceptable defects at first seeing it is necessary to return it back along with its certificate in Russian and English.