

PRODUCTION AMALGAMATION
“NOVOSIBIRSK INSTRUMENT MAKING PLANT”



NIGHT VISION MONOCULAR “HELIOS - 01”

SERVICE MANUAL
3.803.106 PЭ

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The monocular is subject to continuous development and improvement, consequently it may incorporate minor changes in detail from the information contained herein.

1 APPLICATION

Night vision monocular "Helios - 01" (here and after as monocular) is intended for observation and terrain orientation at night by natural light of the Moon and stars as well as in conditions of low illumination intensity and in full darkness.

Monocular is completed with adapters M49x0.75 and M37x0.75, which are allow to mount a monocular on camera and video camera and to operate at night.

An eyepiece of monocular has a diopter laying which allows adjusting it by user's eye.

Electrical diagram of monocular allow to protect am image converter from the intensive light at night.If bright lighting gets into the monocular objective the screen of the image converter goes out for some period of time.

Design of monocular provides a mechanical safety and protection from the rain, snow and dust.

The monocular can operate at the ambient temperature from minus 40°C to 40°C and relative humidity of maximum 80% at the temperature of 25°C.

The monocular is not injurious to health. It is not necessary to take special measures to protect a user.

A present of small spots on the screen have not influence on operation of product.

ATTENTION !

It is not recommended to make the following:

DO NOT DISASSEMBLE A PRODUCT AND SWITCH IT!

DO NOT CONNECT THE PRODUCT TO SUPPLY UNIT WITH TENSION MORE THAN 1.5V !

DO NOT SWITCH THE MONOCULAR ON IN DAYLIGHT WITH THE PROTECTIVE LENS COVER REMOVED !

DO NOT DIRECT THE MONOCULAR AT BRIGHT SOURCES OF LIGHT !

2 SPECIFICATIONS

Range of visibility,m,not less
without illuminator:

by natural light of the Moon upto 250
at moonless night upto 100
in the full darkness with the use of illuminator upto 100

Angular field of view, ..., not less

20

Magnification in the center of field of view, fold, not less

1.8

Range of diopter laying of eyepiece, diopter, not less

± 4

Range of objective focusing, m

0.5... ∞

Time of switching, sec, not less

2

Supply unit

two A-316 (AA) dry batteries

Voltage supply at the temperature of 20°5°C,mA, not more:

without illuminator

30

with illuminator

125

Mass, kg, not less

without bag

0.915

with bag

1.115

Overall dimensions, mm, not less

190x90x75

3 STANDARD EQUIPMENT

	page
	pcs.
Night Vision Monocular "Helios-01"	1
Light filter	1 in bag
Adapter M49x0.75	1 in bag
Supply unit	2
Carrying bag	1
Packing box	1
Service manual	1

4 DESIGN AND PRINCIPLE OF OPERATION

The monocular is a complex optoelectronics system for individual use. Its principle of operation is based on conversion (intensification) of the image of an objects of low brightness into the visible image at night by natural light of Moon the stars and so on as well as conversion (intensification) of IR illumination of various objects to be invisible by eye into the visible one. The user sees a magnified image of object.

The monocular consists of an objective lens 3 (Fig.1), eyepiece 10 and body 6. The body 6 contains an image converter and two battery housings 5.

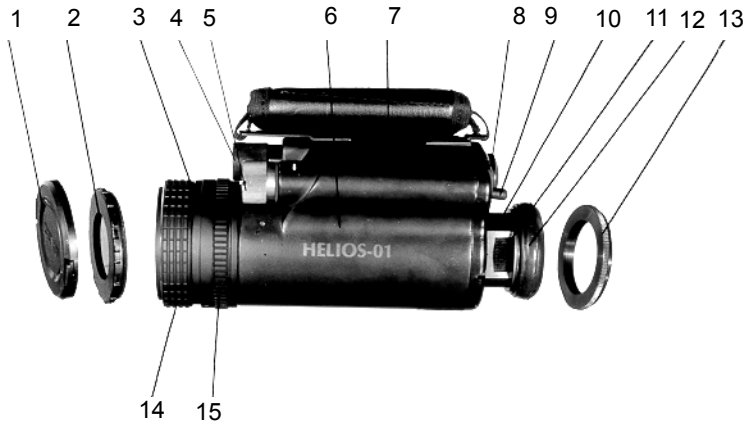


Fig. 1 **General view**

The objective lens has a protected cover 1.

Eyeshield 12 provides a convenient operation and to protect an eye from damage.

IR illuminator 4 is located on the body 6. The button to be intended for switching of image converter 8 and switch 9 of the illuminator are located on the cover of body. When the switch is disposed in red spot, the product is switched on. Electrical diagram of monocular allows to protect an image converter from the intensive light at night. If bright lighting gets into the monocular objective the screen of the image converter goes out for some period of time.

For convenience the monocular is supplied with a belt 7 and a carrying bag. The monocular, light filter and two cells are packed into the carrying bag.

The light filter 2 is intended for checking of operation of product and observation for various objects at high level of illumination.

Adapter 13 is intended for mounting of camera and video camera on

monocular. Monocular is completed with strap 7 and bag.

The design of the product allows using other photoobjectives, which have an operating length of 45.5 mm and connecting size of M 42x1.

5 PREPARATION FOR OPERATION AND ORDER OF OPERATION

Before operation:

- install the batteries into the battery housing with the polarity order shown on the covers;
- screw up the covers 5 (Fig.1) into the body 6 to stop.
- remove the protective cover 1 from the objective lens, put a light filter 2, switch the monocular pressing a button 8;
- make sure of the green luminance of the phosphor screen which is due to appear not later than 2 seconds after the monocular has been switched on.

The monocular can operate without light filter at night.

To use a monocular at night it is necessary to shut a diaphragm rotating a ring 15 and to switch the monocular pressing a button 8.

The brightness of screen illumination can be adjusted with diaphragm to be located in objective lens.

- switch the monocular pressing the button 8 keeping up the level of brightness of screen illumination.
 - rotating a ring 11 of eyepiece 10 and ring 14 of objective lens one
- 12

should achieve a sharp image of object.

At night or in full darkness one should switch IR illuminator 4 with the use of switch 9.

When the work is over, the batteries are to be removed from the battery housings, the objective lens is to be covered and the monocular is to be put into the case.

When using the monocular together with a camera it is necessary to:

- screw up an eyeshield 12 from eyepiece 10;
- screw an adapter 13 in the eyepiece of monocular (Fig.2);
- open a diaphragm of objective lens;
- connect the camera to monocular as it is shown on figure 3;
- switch a monocular.

Rotating a ring 11 of eyepiece 10 and ring of objective lens of monocular and camera one should achieve a sharp image of object.

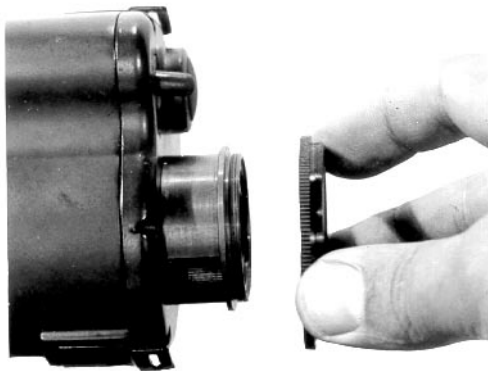


Fig. 2 Mounting of adapter on monocular

The brightness of screen illumination can be adjusted with ring 15.

To make an adjustment of camera one should read a service manual for camera.

To remove a camera from monocular one should make all above points in the other way.



Fig. 3 Mounting of camera on monocular

When the work is over, the batteries are to be removed from the battery housings, the objective lens is to be covered and the monocular is to be put into the case.

When using the monocular together with a video camera it is necessary to:

- screw up an eyeshield 12 from eyepiece 10;
- screw a video camera on eyepiece 10 by thread as it is shown on figure 4.

- switch a video camera;

- switch a monocular;

To make an adjustment of video camera one should read a service manual for video camera.

The brightness of screen illumination can be adjusted with ring 15.

To remove a video camera from monocular one should make all above points in the other way.

When the work is over, the batteries are to be removed from the battery housings, the objective lens is to be covered and the monocular is to be put into the case.



Fig. 4 Mounting of videocamera on monocular

6 MAINTENANCE

The monocular must be kept clean and protected from dust, shocks and friction of the optical surfaces. A cotton cloth to be wet with purified alcohol is to be used to clean optical surfaces. It is not recommended to use other alcoholic substances. In non-working time the monocular is to be kept in the case.

7 RULES OF STORAGE

The monocular is to be stored in the heated rooms. For long storage it is recommended to remove batteries from the battery housings and keep them in the battery pockets of the carrying case.

8 POSSIBLE TROUBLES AND TROUBLES-SHOOTING

Troubles	Probable reason	Troubles-Shooting
No luminance of the screen after switching the device on	The batteries are installed in the wrong order. The batteries are discharged. The objective lens is covered.	Install the batteries right order. Change the batteries. Remove the cover. Have the device repaired
Weak screen luminance	The batteries are discharged. The objective lens is covered.	Change the batteries. Remove the cover.
Not sharp image	The objective lens or eyepiece are not focused.	Focus the objective lens and adjust the eyepiece.
No luminance of the screen in the presence of the bright source of light in the field of view	The protective scheme operates.	Get the bright light source out of the field of view.

9 ACCEPTANCE CERTIFICATE

Night Vision Monocular “Helios - 01” , serial № _____ , is in compliance with specifications and found fit for service.

Date of manufacture _____

Signature _____

10 WARRANTY

The producer guarantees the conformity of night vision monocular to technical specifications in the case the user observes all the requirements to operation, transportation and storage.

The claims are not admitted in the event of a failure, which is due to careless use violation of the rules of operation, transportation and storage.

The Producer offers a 12 months' guarantee since the monocular has been bought (if sold by retail) or received by the user (if not sold by retail).

The guarantee does not apply to batteries.