State Unitary Enterprise
Production Amalgamation
“Novosibirsk Instrument-Making Plant”

MODULAR NIGHT VIEWER
MPN-8KM

Service Manual

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05.04

1 GENERAL DIRECTIONS

The MPN-8KM modular night viewer (hereafter referred to as a "viewer") is designed for direct observation in the night time. It can be used with photo and videocameras.

The built-in IR illuminator makes it possible to see in the total darkness.

The viewer is provided with a ZENIT-AUTOMAT photo camera (objective lens MS HELIOS-44K-4). Optional adapters allow connecting the viewer with various photo or video cameras.

A 25 mm objective lens ensures sharp image at a range from 0.25 m to infinity, and 90 and 100 mm lenses allow having sharp image from 5 m to infinity.

There is the threaded socket for photo tripod in the bottom of device.

The viewer can be used at a temperature from -40° to +40°C. Lower temperature limit depends on type of batteries used. Relative humidity must not exceed 97% at a temperature of 25°C.

The viewer is powered with two AA batteries.

WARNING: It is strictly prohibited to switch on the viewer in daylight conditions without the protective cap 3 on the lens 2 (fig. 1) and to observe the bright luminous objects.

2 SPECIFICATIONS

Focal length of eyepiece, mm	25
Voltage, V	2.4 – 3.6
Diopter adjustment range, D	± 5
Operating time for one battery at a temperature of +25°C, h:	
without IR illuminator	16
with IR illuminator	2

The model dependent specifications are listed in the table 1.

Table 1

Specifications	1x objective lens	4x objective lens
Focus of objective, mm	27	100
Magnification, x	1	4
Angular field of view, degrees, not less	36	10
Relative aperture of objective	1:1.2	1:1.7
Overall dimensions, mm, not less	169x67x80	241x68x89
Weight, kg, not less	0.6	0.97

3 PACKAGE CONTENTS

The package contents is shown in the table 2.

Table 2

Designation	Quantity
MPN-8KM device with 1x objective lens	1
4x objective lens	1
Strap	1

Continuation of the table 2

Designation	Quantity
AL5.960.089 adapters:	
37x0.75	1
40.5x0.5	1
49x0.75	1
52x0.75	1
55x0.75	1
58x0.75	1
Carrying bag	1
Service manual	1

Note: There may be slight changes in design of the article and its spare parts.

4 SAFETY REGULATIONS

The viewer is safe in use due to its principle of operation, design, components and materials used and complies with the standard GOST R 50909-96.

To avoid the pollution of environment it is recommended to utilize used power supplies only in the places assigned for waste utilization.

5 DESIGN AND PRINCIPLE OF OPERATION

The MPN-8K modular night viewer is an electro-optical device. Its principle of operation is based on the intensification of image brightness with the help of image intensifier.

The viewer consists of objective lens, image intensifier (II), eyepiece, built-in IR illuminator and two power supplies.

The device is provided with two objective lenses having magnification 1^x and 4^x correspondingly.

The objective lens 2 (fig. 1) can be covered with the threaded cap 3. The cap protects the lens from damages and excessive light in twilight conditions. The knurled ring A on the lens provides the focus adjustment.

The rubber eye-shield 1 protects the eye of the user from injures.

The IR illuminator 1 (fig. 4) is designed to light up an object viewed.

The device is switched on with the help of "ON" button. The IR illuminator is switched on and off by means of pushing the button "*". When the IR illuminator is on, a red spot appears in the field of view of device.

There are battery compartments in the body of the viewer, which are covered with a threaded covers 4 (fig. 1).

The polarity of the batteries is shown on the body of the device.

The viewer can be joined to photo or video cameras by means of adapters 1 (fig. 3 and 5).

The strap 5 (fig. 1) protects the viewer against accidental drops. The threaded socket 1/4" for strap is used for mounting the viewer on a tripod 1 (fig. 2).

The viewer is provided with a carrying bag and packed into a cardboard box.

6 OPERATION

It is **prohibited**:

- to disassemble the viewer;
- to switch on the viewer in daylight and twilight conditions without protective cap on the objective lens;
- to aim the viewer at luminous objects;
- to store the viewer with batteries inserted.

Remember: Bright light in the field of view can damage the viewer!

Before operation take the viewer out of the bag and check if a protective cap 3 (fig. 1) is put on the objective lens 2 and the switch is set into position OFF.

In the -night time the viewer is used without protective cap 3 (fig. 1).

WARNING: Change the objectives whem the viewer is switched OFF only.

Do not allow an atmospheric precipitation to enter into the viewer While the lenses are being changed!

Switch on the viewer by means of pushing the button “ON”.

A photo camera can be joined to the viewer in the following way:

- unscrew the eye-shield 1 (fig. 1) with the mounting from the viewer;

- open up the diaphragm of the photo camera and screw the adapter 1 (fig. 3) into the photo camera lens;

- screw the viewer into the adapter to joint it to the camera.

Switch on the viewer. Adjust the focus by means of turning the knurled ring. Now the viewer is ready to take a photograph.

Switch off the viewer after using, put the cap 3 (fig. 1) on the lens 2, disconnect the photo camera and adapter, screw the eye-shield in the viewer.

Remove the batteries from the viewer and put the batteries and the viewer into the bag.

A video camera can be connected to the viewer in the same order.

To join the viewer to a telescope:

- screw up an adapter 1 (fig. 5) instead of the objective of device;
- place the adapter with the viewer where the eyepiece of the telescope should be.

7 MAINTENANCE

The device should be kept clean of dust and dirt. The outer optical surfaces should be always clean.

The viewer is the subject of following periodic maintenance procedure:

- clean the viewer from dust, dirt and moisture;
- check out the contacts of power supply;
- wipe grease spots on optical surfaces with a clean napkin or cotton wool.

In case of significant pollution, the alcohol, ether or their mixture can be used in the following way:

- wind some cotton wool on a wooden stick;
- wet the cotton wool in the solvent and shake it up to remove the excess;
- clean the glass twice or more avoiding touching the mounting;
- replace the cotton wool and wipe the glass dry moving from center to edge circularly.

8 STORAGE

The viewer must be protected from physical damages.

It is to be stored in a heated storage facility at a temperature ranging from 5° to 35°C. Relative humidity must not exceed 85%. Daily temperature variations must not exceed 5°. It is recommended to keep the viewer in its carrying bag with batteries taken off.

9 TROUBLESHOOTING

In case of a disorder in operation check out the following:
- the polarity of the batteries;
- whether the device is switched on;
- whether the power supplies are discharged;
- the cleanness of optical surfaces;

The cleanness of contacts in the power supplies demands special attention.

Table 3. The list of possible disorders.

Disorder	Possible reason	Methods of repair
1 The screen of image intensifier is slightly glowing or not glowing at all	The batteries may be discharged or incorrectly installed	Replace the batteries or install them correctly keeping in mind the polarity

Continuation of the table 3

Disorder	Possible reason	Methods of repair
2 The brightness of image falls having approached the maximum or fluctuates	Light overload	Cover the objective lens with a special cap
3 The image is weak and not sharp	Sweat or dirt on the outer optical surfaces of the eyepiece and/or objective	Clean the objective and the eyepiece with a flannel or cotton cloth
4 The image "folds up"	The image intensifier is spoiled	Switch the device off and hold it for 30 min having covered the objective with a cap

10 ACCEPTANCE CERTIFICATE

Night viewer MPN-8KM , serial number _____ , is in compliance with specifications and is fit for service.

Date of issue _____

Signatures _____

(stamp)

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1 – eye-shield; 2 – objective lens; 3 – cover; 4 – cover; 5 – strap

Figure 1. **MPN-8KM with 1x objective lens**

1 – Photo tripod

Figure 2. **MPN-8KM with 1x objective lens**

1 – adapter

Figure 3. **MPN-8KM joined to a photo camera**

1 – Infrared illuminator

Figure 4. **MPN-8KM with 4x objective**

1 – adapter

Figure 5. **MPN-8KM joined to a telescope**