

Federal State Unitary Enterprise  
Production Amalgamation  
"Novosibirsk Instrument Making Plant"



LONG RANGE NIGHT VISION DEVICE  
PDN-K, PDN-KM  
Service Manual  
AL3.803.115 RE

**The design of the night vision sight is the subject of continuous improvement and can slightly differ from the present manual.**

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## 1 INTRODUCTION

The PDN-K and PDN-KM Long Range Night Vision Devices are designed for long range observation at natural night illumination, temperature from  $-50^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  (depends on type of battery used) and relative humidity up to 80% at temperature  $25^{\circ}\text{C}$ .

The Device is powered with two R6 GOST28125-89 power cells (AA size 14.5 x 50.5 mm) having aggregate voltage 3.0 V.

The adapter kit provides compatibility with a:

- video camera provided with lens thread M37x0.75;
- video camera  $f=12.5$  mm provided with thread M40.5x0.5.

**Attention! Do not switch on the device at daylight illumination without cap 1 (fig.3). Do not aim the device at bright luminous objects. Unused device on tripod should be protected by cover 4 (fig.3).**

## 2 SPECIFICATIONS

	PDN-K	PDN-KM
Angular resolution, arc. sec for ambient illumination $5 \cdot 10^{-3}$ lx	50	
Magnification, x	9	
Field of view, °	3.83	
Eyepiece adjustment range, d	±4	
Reticule scale division, mil	5	
Voltage, V	3.0-0.5	
Current consumption, mA, not less	40	
Azimuth angle range, °	360	
Elevation angle range, °	±18	±45
Weight, kg, not less	12	13
Weight with tripod, kg, not less	25	20
Package weight, kg, not less	40	36

### 3 PACKAGE INVENTORY

	PDN-K	PDN-KM
Long Range Night Vision Device		1
Tripod with limb	1*	
Tripod		1*
Pier		1*
Protective cap		1
Adapter for videocamera (e.g. SONY CCD-TR 350E camcorder)		1
Adapter for TV camera (e.g. Computar V1218 lens to SONY SSC-M 370 CE (SSD))		1
Napkin		1
Power cell		4
Soft cover		1
Case		1
Soft cover for tripod		1
Service Manual		1

\* Optional

## **4 SAFETY PRECAUTIONS**

The Device is safe in design, used materials and components.

In order to avoid environmental pollution it is recommended to throw out the used power cells only in the places assigned for waste utilization.

## **5 DESIGN AND OPERATION PRINCIPLE**

The Long Range Night Vision Device is an electro-optic device that intensifies a weak image up to visible level. The package of device includes the following:

- Device 1 (fig.1);
- tripod 11 (fig.2) with a limb for PDN-K version;
- tripod 6 (fig.3) or pier 1 (fig.4) for PDN-KM version;
- cap 1 (fig.5) for protection of the objective lens from physical damages and excessive light in twilight conditions;

- soft cover 4 for protection of Device from straight sunlight and atmospheric precipitation;
- napkin 2 for cleaning of Device;
- case for Device;
- soft cover for tripod.

The device consists of the objective lens 4 (fig.1), eyepiece 11, image intensifier, mount bracket 6 (of dove tail type) in case of PDN-K version or fork mount 5 (fig.3) in case of PDN-KM version.

Field of view is provided with a reticule (fig.8).

The objective lens 4 (fig.1) can be covered with:

- the blend 5 preventing an irrelevant light influence in night conditions;
- the cap 1 (fig.5) preventing the lens from physical damages and excessive light in twilight conditions.

The rubber eyeshield 10 (fig.1) provides convenient viewing and protect the eye against injures.

The Device is activated by turn of handwheel 2 having the following positions:

red dot – Device switched off;



white dot – Device switched on;

white dash – Device and reticule illumination switched on.

The battery compartment in bottom contains two R6 power cells under cover 7. The handwheel 8 adjusts focus of objective lens. The diopter ring 11 provides adjustment of eyepiece.

The tripod consists of table 5 (fig.2) with limb 11 and three telescopic legs 6. The protective cap 7 in PDN-K version covers the limb when the device is removed. The smaller cap in PDN-KM version for this purpose is attached to tripod.

The PDN-KM version is fixed in seat with the screw 1 (fig.3). The Device is aimed with the handles 4. Handwheels 2 and 3 lock the Device in horizontal and vertical planes correspondingly.

Rough horizontal aiming of limb version PDN-K is available at raised handle 3 (fig.2). The handwheel 4 provides fine horizontal aiming.

The handwheel 2 provides vertical aiming. Thumb-screw 8 locks the extended leg or pier in adjusted position. Height of position for PDN-KM version with pier 1 (fig.4) is adjustable also by means of handwheel 2.

## 6 OPERATION

The handwheel 2 (fig.1) of unused Device must be set into the position marked with a red dot.

The power cells must be placed in the case.

For using of the Device:

- remove the cover from the tripod;
- release the tripod legs from the strap;
- draw the legs 6 (fig.2) apart and adjust the height of tripod (top of the cap 7) to level of the shoulders;
- remove the cap 7 from the seat and hang it on the hook on one of the tripod legs;
- press the legs in ground in order to bring the bubble of level 10 in the center of smaller circle;
- set the Device in slot of limb 11 (fig.2) and secure with the handwheel 12;
- open the cover 7 (fig.1) of battery compartment and insert the power cells according to designated polarity;
- turn the handwheel 2 (fig.1) into position designated by white dot,

eyepiece will shine with green;

- turn the handwheel 2 (fig.1) into position designated by white dot, the lighted crosshair will appear in the field of view ;

- turn the handwheel 2 to red dot to switch off the Device.

For using of video camera with M37x0.75 connection thread:

- remove the eyeshield 10 from the eyepiece;

- screw the adapter (fig.6) into thread M37x0.75 of video camera lens, rotating smaller ring;

- mount the video camera with adapter to the Device screwing the larger ring.

For using of video camera with M40.5x0.5 connection thread:

- remove the eyeshield 10 (fig.1) from the eyepiece;

- screw the adapter (fig.7) into M44x0.75 thread of the Device up to the stop;

- screw the video camera with lens on the M40.5x0.5 thread up to the stop;

- focus of the objective lens, video camera lens and eyepiece to have a sharp image.

## **7 MAINTENANCE**

In service, prevent the Device and tripod table from moisture, dust and dirt. Outer surfaces of the lens and eyepiece must be clean.

The contacts of battery compartment must be free of corrosion.

Clean the optical surfaces with clean napkin or cotton wool wetted with mixture of alcohol and ether 1:10.

After using at moisture weather wipe the Device and tripod and dry them out. Keep the Device and tripod in a dry, heated room at temperature above 5°C far from heaters.

## **8 TROUBLESHOOTING**

In the case of troubles, first check the following:

- if the polarity of power cells is proper;
- if the power cells are not discharged;
- if the lens and eyepiece are free of dust, dirt, oil, frost and moisture.

Special attention must be paid to clearness of contacts.

Malfunction	Possible cause	Elimination
Screen of image intensifier does not shine or shines weak	Power cells are discharged or improperly installed	Replace the power cells. Ensure the correct polarity
Image is dim and blurred	Outer surfaces of lens or eyepiece are wetted or dirty	Clean the surfaces with napkin or cotton wool
Image brightness rises to maximum and falls down fast or fluctuates disturbing the goggles operation	Light overload	Close the objective lens with the cap 1 (fig.5)
A falcate darkening at the margin of view-field appears	The image intensifier has been overloaded by bright light sources	Switch off the Device. Close the objective lens by cap 1 (fig.5) for 30 min.
Image collapses	The image intensifier is overloaded by bright light sources	Switch off the Device. Close the objective lens by cap 1 (fig.5) for 30 min.

If the mentioned methods do not eliminate a problem send the Device to a repair shop.

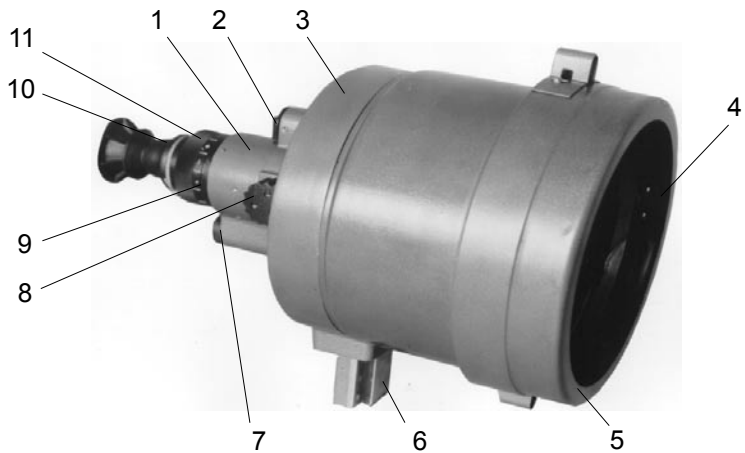
## 9 ACCEPTANCE CERTIFICATE

The PDN-K or PDN-KM Long Range Night Vision Device having serial No \_\_\_\_\_ meets the specifications and state standards and is accepted for service.

Date of issue \_\_\_\_\_

Signatures \_\_\_\_\_  
(stamp)

Federal State Unitary Enterprise  
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**Figure 1. The Night Vision Device**

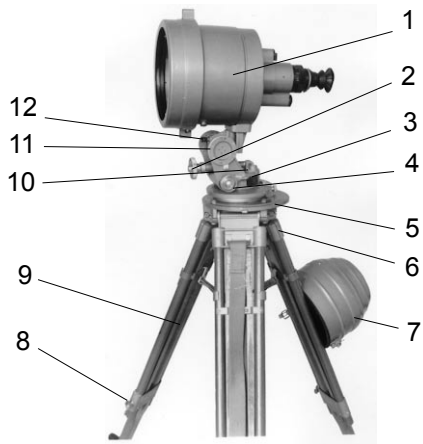


Figure 2. The PDN-K version on tripod



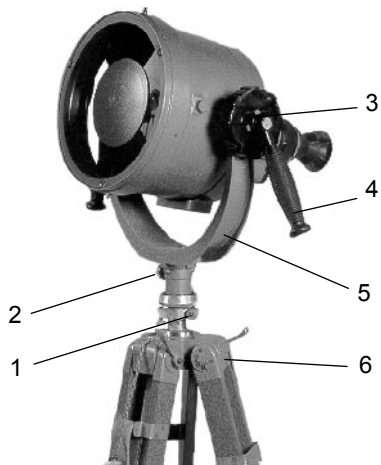


Figure 3. The PDN-KM version on tripod

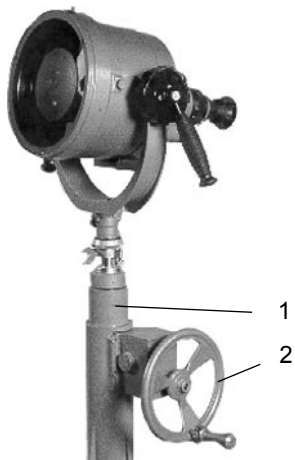


Figure 4. **The PDN-KM version on pier**

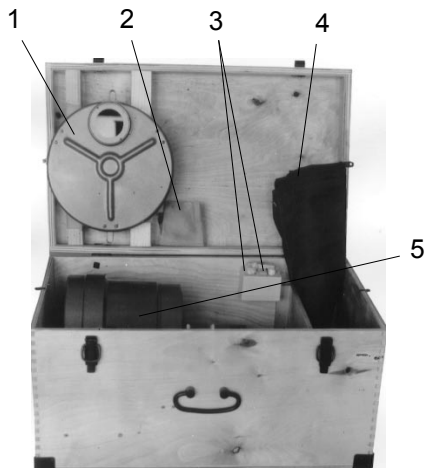


Figure 5. **Packaging case**



Figure 6. **Mount of camcorder**



Figure 7. Mount of TV camera

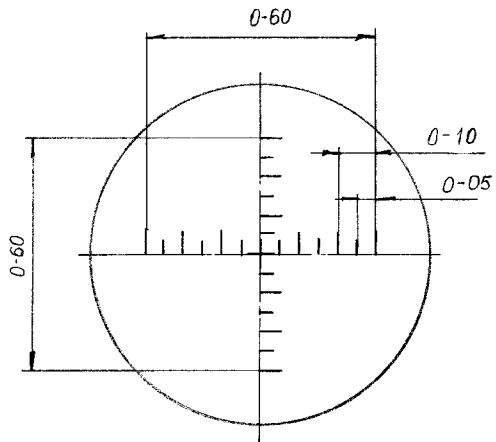


Figure 8. **Field of view**