

# ZFK 4 x 25

## Description and Utilization Instructions

### 1. Clarification of Concept

The ZFK 4 x 25 is a telescopic sight with fixed magnification with dual cross hair adjustments, central viewing, and attached mount.

### 2. Purpose

The dust and watertight ZFK 4x25 (fig. 1) is for use under the harsh climatic conditions of military operations for telescopic sights used on the MPi AK74 N and AKS 74 N.

### Remarks:

The adjustment ring therefore is only marked "AK 74 N".

With the help of the ZFK 4x25 the following tasks can be completed:

- Aiming at targets at distances between 100 and 1000m;
- Estimating the distance to a target whose approximate size is known.

### 3. Technical Data

Magnification	4 x
Diameter of the entrance pupil	25 mm
Diameter of the exit pupil	6.25 mm
Field of View	6° or 10.5 m at 100 m (31.5 m at 300 m)
Pupil section width	65 mm
Geometrical brightness	40
Twilight number	10
Length without rubber pieces	225 mm
Mass without rubber pieces	600 g

The ocular is corrected for a false sighting of 0.5 m.

#### 4. Description of the Assembly Groups and Functional Elements

The described optical system has been modeled via modern mathematical methods and optimized and developed on the basis of efficiency for telescopic sights.

Minor adjustments to the geometry of the optics and the number of optical elements has insured optimal weight without limiting the quality of the optical picture. Through this configuration the ZFK 4x25 can withstand climatic and dynamic shocks. Besides these advantages, of special importance is the scopes ability to withstand nuclear irradiation. Thereby the ZFK 4 X25 retains its usefulness on the occasion of a nuclear explosion.

On the reticle (fig. 2) are placed: the crosshairs, the scale for compensating for lead and windage and the distance estimation scale. The scale for lead and windage compensation reaches out on both sides of the vertical crosshair to the 20-mark (0-20). The distance between 2 vertical marks on the scale is 2 units (see also sketch 2).

The distance estimation (ranging) scale makes it possible to estimate the distance to a target of a known width of 0.5 m (if placed between one of the left or right point marks and the vertical crosshair) or of a known width of 1.0 m (if placed between two directly opposite point marks). The digits 2, 4 ... 10 indicate distances of 200, 400 ... 1000 m (see sketch 1).

##### Translators Note:

Two paragraphs about the Tritium illumination of the reticle have been marked out because all scopes imported into the U.S. were supposed to have the Tritium removed.



**The point of aim** (the intersection of the crosshairs) always appears in the center of the field of view despite any adjustments for range or corrections for point of impact.

The shooting range adjustment is made by turning the upper ring on the vertical adjustment knob (1 fig. 3).

The defined stop points (change in range equal to 100 m between one stop point and the next) and their corresponding marks on the lower, numbered ring makes possible reproducible adjustments for range. The numbers 1, 2 ... 9 engraved on the lower ring (2 fig. 3) indicate ranges of 100 m, 200 m ... 900 m.

The marked ranges go up to 900 m; the range of 1000 m is not marked, making 1 full turn back to the mark labeled 1 sets this distance.

##### Caution!

Avoid over turning the adjustment knob.

Through the dual crosshair adjustments for both vertical and horizontal corrections the scope can be adjusted for the weapon.

**The shade piece** (3 fig. 5) is an attachable rubber piece and is used to limit light from the front of the scope from reaching the shooters eye.

**The eyepiece** (4 fig. 5) is an attachable rubber piece and is used to limit light from the side of the scope from reaching the shooters eye without reducing the field of view.

**The weather cover** (5 fig. 5) is used to prevent damage from dirt and pollution and mechanical damage, both during use by the shooter and during transportation.

The scope and accessories are stored in the carrying case (6 fig. 5) including: weather cover, bag (16 fig. 5) with dust brush (7 fig. 5) and optical cleaning-cloth (8 fig. 5), and the "Description and Users Guide" (9 fig. 5).

### Remarks

The shade and eyepieces are considered components of the scope (see fig. 4).

The ZFK 4 X25 is stored in the carry case without the rubber pieces installed but with the weather cover in place (see fig. 5). Therefore, the scope with the adjustment knobs is the bulk of what is stored. The carry case is closed via a strap and metal loops.

### 5. Using the ZFK 4x25

The scope is mounted on the rifle by sliding its mounting bracket onto the scope rail starting from the end near the butt-stock and sliding it toward the barrel until it is stopped by the screw (10 fig. 4) (Translators note: the locking lever should be rotated toward the front of the scope while doing this.) The locking lever (11 fig. 4) is then rotated toward the butt-stock and locked in place and thereby scope is tightened onto the scope rail.

The right eye is placed on the rubber eyepiece in order to see the target in the field of view without interference. The left eye can be closed. The intersection of the crosshairs is moved to be over the desired hold point. Turning the upper ring on the vertical adjustment knob sets the range.

#### 5.1 Sighting in the Scope

On the basis of Instruction A C50/1/721 Part 7, the weapon is fired and the manual sights are adjusted. After the weapon is sighted in with the manual sights, the scope is sighted in per the following:

- (1) Install the scope on the weapon.
- (2) Secure the weapon in a shooting vise with the both the manual sights set at position 3 and aimed at the center of the lower edge of a target at 100m, next, place a 2 cm square piece of white paper at the point of aim on the target with its lower edge on the lower edge of the target and its right or left edge on a line with the center line of the target.

- (3) Set the range adjustment on the scope to position 3. Look through the scope and check the position of the intersection of the crosshairs on the target.

If the horizontal crosshair is not coincident with the lower edge of the white paper square, loosen the 3 set screws (13 fig. 3) for the vertical adjustment knob (1 fig. 3) approximately one-half turn, move the horizontal crosshair up or down as necessary to align it with the lower edge of the paper by turning the upper ring on the vertical adjustment knob (the lower ring with the numbers should not turn during this adjustment) then carefully and equally re-tighten the 3 lock screws.

If the vertical crosshair does not lie along the edge of the white paper, loosen the clamp screw (14 fig. 3) on the horizontal adjustment knob using a key (sketch 3) ( a penny will work) by approximately one-half turn, move the vertical crosshair left or right as needed by turning the horizontal adjustment knob until it aligns with the edge of the white paper that is along the centerline of the target, then re-tighten the clamp screw (when the clamp screw is tightened properly the horizontal adjustment knob will not turn).

Turning of the vertical adjustment knob in the direction labeled T moves the point of impact lower and thereby compensates for shooting high. Turning in the direction labeled H moves the point of impact up (see fig. 3).

Turning the horizontal adjustment knob in the direction L moves the point of impact left and thereby compensates for shooting right. Turning in the direction R moves the point of impact right (see fig. 3).

- (4) After sighting in the weapon with the scope shoot per paragraph 7.2 of the Instruction A 05/1/721. Set the ZFK to range stop point 3. Thereby the control point will be 11.0 cm above the aim point. If the center point of impact is more than 3 cm away from the control point in any direction, then the scope must be re-sighted in per step 3.

The shot pattern is normal (for semiautomatic fire), if all 4 hits fall within a circle with a diameter of 8 cm.

- (5) After any further corrections the grouping from a second string must be measured.
- (6) After the final string, the position of the center point of impact is entered on the Weapons Condition Card.

### Remarks

- The vertical and horizontal adjustment knobs for sighting in of the scope/weapon do not have click adjustments. Their orientation and movements are checked and monitored using the adjustment scales on the knobs.
- Intermediate horizontal corrections are required when the observed middle impact point measured from the control point along the horizontal at 100 m becomes about 13 mm.
- Intermediate vertical corrections are required when the observed middle impact point measured from the control point along the vertical at 100 m is about 40 mm.
- After the corrections it is necessary to check and proof the correction using the same conditions as these instruction state.

### 5.2 Ascertaining the Target Distance

Examples:

- With help of the distance estimation scales (see sketch 1) a 0.5 m wide target (approximately width of a persons chest) positioned between the vertical crosshair and touching the right hand point mark corresponding to 300 m distance. Therefore this target is at 300 m. The wider (1 m wide) target (approximates two people standing shoulder to shoulder) is positioned between and touches both points that correspond to the number 4 or 400 m distance.
- With help of the lead and windage scale (see sketch 2)

Distance (m) = (known width in m)(1000)/(width in marks) = (1 · 1000)/4 = 250 m or approximately sight range setting 3.

### 5.3 Using the Scale for Lead and Windage Compensation

– To correct for side winds

For side wind from right use the left marks and for side wind from left use the right marks.

**Adjustment Mark to use for Wind Speed of**

Range in m	2 m/s	4 m/s	8 m/s
100	–	–	–
200	–	–	0.5
300	–	0.5	1
400	–	0.5	1
500	0.5	1	2
600	0.5	1	2
700	0.5	1	2
800	0.75	1.5	3
900	1	2	4
1000	1	2	4

– To correct for moving target

If the target is moving from right to left use the right marks and if the target is moving from left to right use the left marks.

**Adjustment Mark to use for**

Range in m	Running Target 10km/h (3 m/s)	Driving Target 20km/k (6 m/s)
100	1.5	3
200	1.5	3
300	2	3.5
400	2	3.5
500	2	4
600	2.5	4.5
700	2.5	5
800	2	–
900	3	–
1000	3.5	–

## 6. Handling and Storage

The ZFK 4x25 is a highly valuable optical tool and therefore requires corresponding handling and storage. Its robust development should not mislead one into being careless with this tool. Therefore are the following basic rules for the appropriate usage to be aware of:

- When the ZFK 4x25 is not in operation, it shall be placed in the carry case with the shade piece and eyepiece and the weather cover in place. The eyepiece and shade piece are placed in the bottom of the carry case.
- The adjustment knob for the adjustment of the range stops evenly and is through design restricted. Do not force the adjustment knob past the final stop point.
- Besides rain, snowfall or very dusty times the weather cover is except during immediate operation, to be installed.
- Generally never allow the ZFK 4x25 to lay under direct sunlight any longer than needed.
- Encroachment and repairs are only to be undertaken by skilled optical repair people.
- It is not allowed to transport the ZFK 4x25 in vehicles unsecured.

The storage is to follow procedures outlined by valid military definitions.

## 7. Cleaning

Remove the rubber pieces to clean. Damp ZFK 4x25's must first be allowed to dry, and certainly in summer placed in shade and in winter begin the cleaning when the ZFK 4x25 has reached room temperature and is dry.

First of all, clean the outer mechanical parts with a brush to free them of contamination. The exterior optics are cleaned of sand and dust particles with a second clean, dry dust brush. The rest of the contamination is removed from the middle to the edge with a flannel cloth in a cross wise direction (possibly breath on). Do not allow the outer optical planes to be come contaminated with oil, fat or fingerprints.

Un-moderated strong rubbing with the flannel cloth and remaining dust particles on the optical planes destroy the reflection reducing coating.

The cleaning of inner optics and the removal of assembly groups and component parts is allowed only in the specially cleaned workstation designed therefore.

The mounting rail on the weapon and the mounting bracket on the scope are cleaned of contamination using a brush and a rag.

The outer tube and the adjustment parts are wiped with an oil dampened rag (weapon oil 1372/W 22) to prevent corrosion.

## 8. Proofing of the ZFK 4x25

In the framework of maintenance the user next is to examine the following items for the ZFK 4x25:

- (1) Completeness and outer appearance of the parts and accessories
  - Shade piece and eyepiece are parts of the scope. The complete accessories are the carry case, the weather cover and the bag with dust brush and the optical cloth and this manual.
  - Scratches and dents, that infringe upon the function or water tightness are not permitted.

- (2) Cleanliness and appearance of the optical parts
  - Uncleaness, damage and caulking visible on the ocular and aggravate viewing are not permitted.
  - Lose parts of the inner apparatus are not permitted.
- (3) Crosshair skewing
  - The cross hairs are correct when installed. The horizontal cross hair must stay horizontal and the vertical cross hair must stay vertical. Permitted skewing:  $\pm 1^\circ$ .
- (4) Function of the Crosshair adjustments
  - The upper ring of the vertical adjustment knob for changing the range must move within the designated stop points without hindrance.

(5) Function of the Reticle Lighting

*Section has been crossed out do to the previously mentioned removal of the Tritium used for lighting the reticle.*

(6) Function of the Attaching Clamp

The ZFK 4x25 is by design installed and clamped down onto the scope rail on the weapon. Thereby the hold of the scope on the scope rail must begin when the lever is at least  $45^\circ$  from being closed. The attaching clamp is adjusted correctly if the scope cannot be shifted to the rear by hand.

Necessary corrections can be made by turning the crown nut (12 fig 4) in defined step distances (be aware the threads are left handed). An adjustment of the crown nut to change the clamping pressure necessitates performing an adjustment of the crosshairs (per section 5.1) and a shooting test.

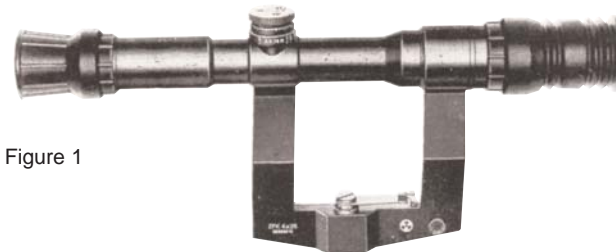


Figure 1

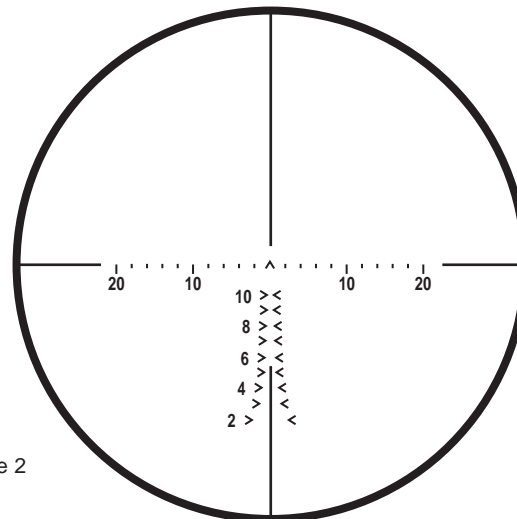


Figure 2

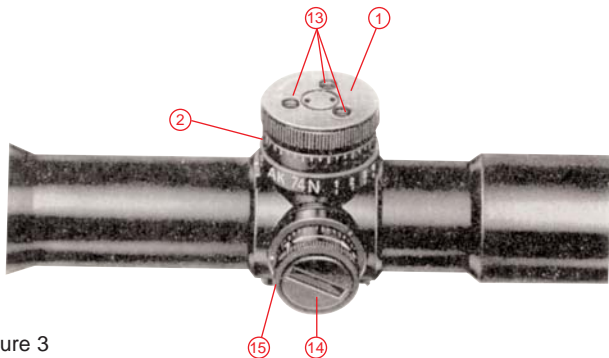


Figure 3



Figure 5

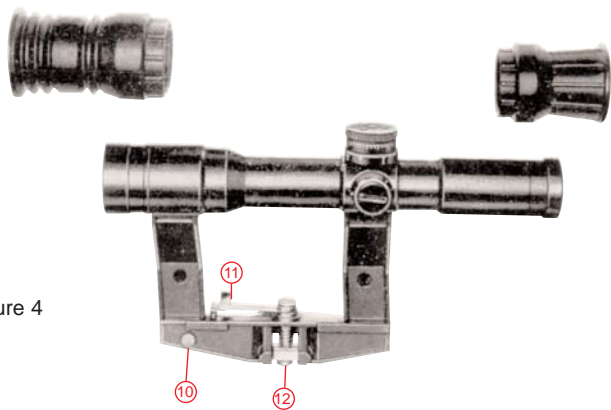
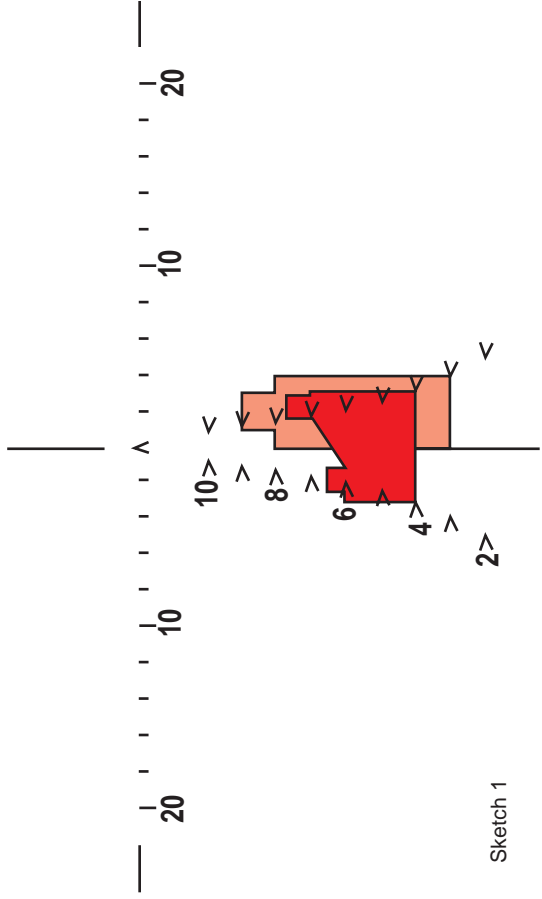
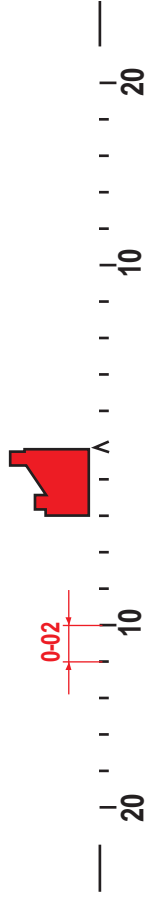


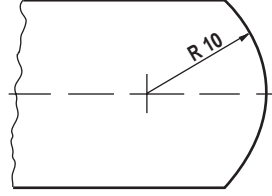
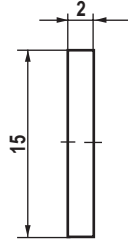
Figure 4



Sketch 1



Sketch 2



Sketch 3