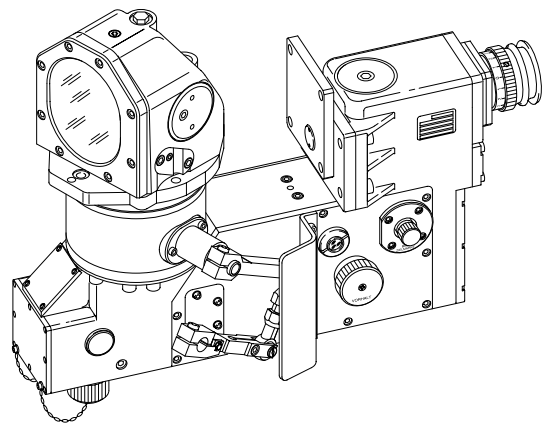
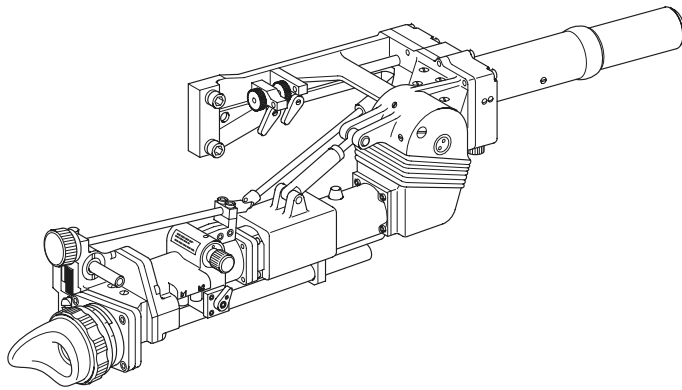


TELESCOPIC SIGHTS FOR ARMOURED VEHICLES



...you
might be
interested
in.



We make it visible.

With compliments

Subject to design and construction modifications

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Telescopic Sight-Z18

Brief description

The FERO-Z18 is a monocular telescopic sight with 8x magnification, developed for use in the Leopard 2 main battle tank. The available versions are distinguished by cross hair modification to user requirements.

The optical articulated joint of the FERO-Z18 equalizes the elevation movement of the weapon, whereby the line of sight runs parallel to the weapon and the eyepiece occupies a fixed position in the turret.

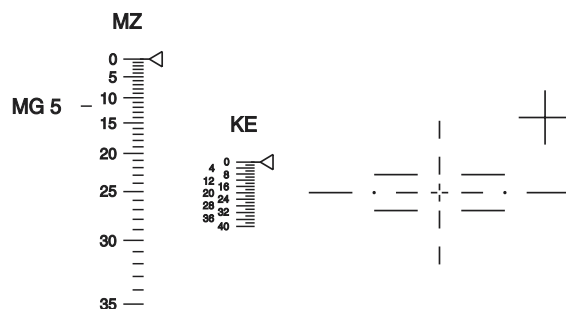
The FERO-Z18 comprises four main assemblies:

- Head assembly
- Articulated assembly
- Intermediate assembly
- Viewing assembly.

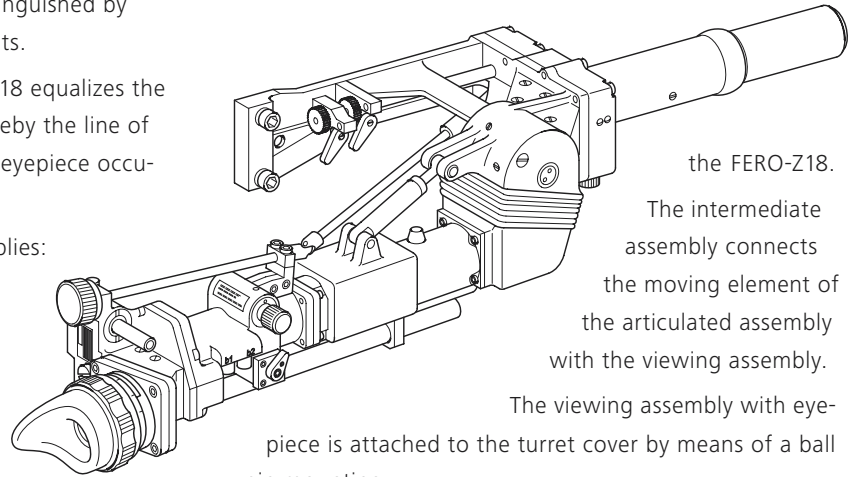
The head assembly is located in the turret aperture by means of a ball race.

The reticle package - comprising the cross hairs, objective lens and reticle illumination - is located in the head assembly which is connected to the fixed element of the articulated assembly. The reticle package consists of two reticles which can be adjusted vertically in relation to each other. Reticle I contains the ammunition-related and range-dependent angle of elevation values in a centesimal division, and has ± 5 mrad vertical adjustment by means of a rod provided for adjustment during installation. Reticle II incorporates the NATO aiming cross, adjusting mark and the index marks for the elevation angle values. It can be moved vertically over the scale of Reticle I by means of an adjusting rod. The reticle package is provided with a

Reticle



second adjusting rod for lateral adjustment of ± 5 mrad during installation. The fixed element of the articulated assembly is attached to the cradle parallel to the weapon by means of a locating pin and two bolts. Consequently, movement of the optical articulated joint does not undermine the high target accuracy of



the FERO-Z18.

The intermediate assembly connects the moving element of the articulated assembly with the viewing assembly.

The viewing assembly with eyepiece is attached to the turret cover by means of a ball pin mounting.

The FERO-Z18 is aligned parallax-free for a combat range of 1,500 m.

The laser protective filter is permanently located in the optical path, and the sun protective filter can be slewed in as required. To protect the operator's eyes, a fire screen momentarily interrupts the optical path when the weapon is fired. The controllable reticle light also permits aiming at night.

The ± 4 dioptre range allows the eyepiece to be adapted to suit any individual operator eye defects.

A protective tube has been developed to prevent the front lens of the FERO-Z18 being damaged by contamination penetrating the head channel. The protective tube is built into the head channel of the weapon cradle and flanged on from the outside by three bolts. A glass flat at the end of the tube body seals the protective tube on the inside. This prevents the further penetration of contamination.

The protective tube can be easily dismantled for cleaning purposes. The glass flat can be renewed if necessary by slackening off the retaining ring.

No adjustment to the FERO-Z18 is necessary after cleaning.



Technical data

Mechanical data

Aiming sector elevation	-10° to +20°
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Optical data

Objective focal length	240 mm
Eyepiece focal length	30 mm
Magnification	8x
Entrance pupil diameter	40 mm
Exit pupil diameter	5 mm
Eye distance	≥ 20 mm
Resolution	≤ 8"
Angle of field of view	10° ± 0.5°
Diopter adjustment eyepiece	± 4 dpt.
Reticle erection	90° ± 5'
Sight mark setting range	± 5 mrad
Parallax at 1,500 m	± 0.15 dpt.
Cross hair sequence	± 0.15 mrad

Electrical data

Lighting unit	28 V / 3 W, tol.: 21 V to 30 V
Solenoid, fire screen	28 V / 30 W, tol.: 21 V to 30 V
Closing time, fire screen	≤ 25 ms

Dimensions

FERO-Z18

Length	1045 mm
Width	285 mm
Height	234 mm

Case

Length	1200 mm
Width	400 mm
Height	400 mm

Weight

FERO-Z18	16.7 kg
Case	25.0 kg
Total weight	42.0 kg

Environmental conditions

Environmental test	MIL-STD-810C
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Scope of delivery

Article	NATO Stock no. Part No.
FERO-Z18 in case	1240-12-178-3176 009-078.700-000
FERO-Z18	1240-12-178-3177 009-078.100-000
Case	8145-12-310-9679 009-078.840-000
Protective tube	1240-12-313-9740 009-153.102-000
Adapter	1240-12-314-0953 009-153.101-000
Key	5120-12-314-0564 009-153.102-000W1
Spare part kit	1240-12-324-9305 009-153.120-000

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FERO-Z18 A2

Telescopic Sight-Z18 A2

Brief description

The FERO-Z18 A2 is a monocular telescopic sight with 8x magnification, developed for use in the Leopard 2 A5 main battle tank. The available versions are distinguished by cross hair modification to user requirements.

The optical articulated joint of the FERO-Z18 A2 equalizes the elevation movement of the weapon, whereby the line of sight runs parallel to the weapon and the eyepiece occupies a fixed position in the turret.

The FERO-Z18 comprises four main assemblies:

- Head assembly
- Articulated assembly
- Intermediate assembly
- Viewing assembly
- Deflector for FERO-Z18 A2.

The head assembly is located in the turret aperture by means of a ball race.

The reticle package - comprising the cross hairs, objective lens and reticle illumination- is located in the head assembly which is connected to the fixed element of the articulated assembly. The reticle package consists of two reticles which can be adjusted vertically in relation to each other. Reticle I contains the ammunition-related and range-dependent angle of elevation values in a centesimal division, and has ± 5 mrad vertical adjustment by means of a rod provided for adjustment during installation. Reticle II incorporates the NATO aiming cross, adjusting mark and the index marks for the elevation angle values. It can be moved vertically over the scale of Reticle I by means of an adjusting rod. The reticle package is provided with a

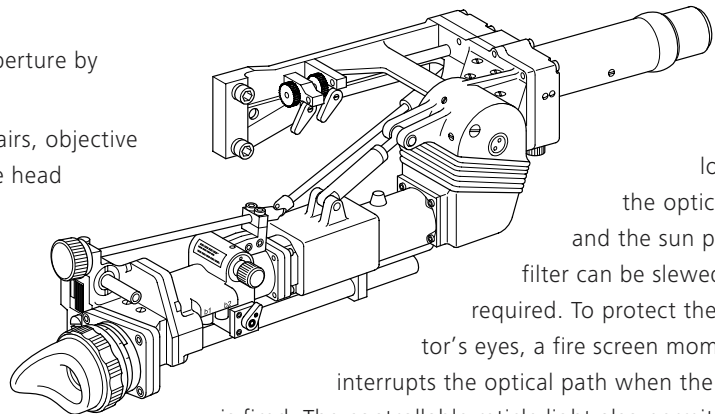
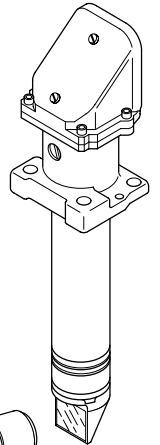
second adjusting rod for lateral adjustment of ± 5 mrad during installation. The fixed element of the articulated assembly is attached to the cradle parallel to the weapon by means of a locating pin and two bolts. Consequently, movement of the optical articulated joint does not undermine the high target accuracy of the FERO-Z18 A2.

The intermediate assembly connects the moving element of the articulated assembly with the viewing assembly.

The viewing assembly with eyepiece is attached to the turret cover by means of a ball pin mounting.

The FERO-Z18 A2 is aligned parallax-free for a combat range of 1,500 m.

The laser protection filter is permanently



located in the optical path, and the sun protection filter can be slewed in as required. To protect the operator's eyes, a fire screen momentarily interrupts the optical path when the weapon is fired. The controllable reticle light also permits aiming at night.

The ± 4 dioptre range allows the eyepiece to be adapted to suit any individual operator eye defects.

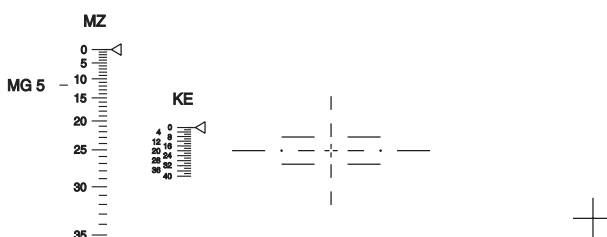
The deflector for FERO-Z18 A2 is a periscope with a magnification of 1:1. It deflects the beam cluster by $2 \times 90^\circ$. It is fixed in the turret shield. It is necessary in order to move the objective of the FERO-Z18 A2 to the outside of the turret shield above the muzzle.

The hood with window is screwed with the flange 1 of the intermediate tube. It protects the prism, large from external influences.

The intermediate tube with prism is the carrier of the hood and the prism, small. It is fixed with the flange 2 at the turret shield.

A protective cap protects the prism, small from damage.

Reticle



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Technical data

Mechanical data

FERO-Z18 A2

Aiming sector elevation -10° to $+20^\circ$

Deflector for FERO-Z18 A2

Centering slot 8D10
Upper diameter 72D10
Under diameter 70D10

Optical data

FERO-Z18 A2

Objective focal length 240 mm
Eyepiece focal length 30 mm
Magnification 8x
Entrance pupil diameter 40 mm
Exit pupil diameter 5 mm
Eye distance ≥ 20 mm
Resolution $\geq 8''$
Angle of field of view $10^\circ \pm 0.5^\circ$
Diopter adjustment eyepiece ± 4 dpt.
Reticle erection $90^\circ \pm 5'$
Sight mark setting range ± 5 mrad
Parallax at 1,500 m ± 0.15 dpt.
Cross hair sequence ± 0.15 mrad

Deflector for FERO-Z18 A2

Periscopic relief 489.98 mm
Adjustment prism to centering slot 10'
Parallelism of the optical axes $\leq 1'$

Electrical data

Lighting unit 28 V / 3 W,
tol.: 21 V to 30 V
Solenoid, fire screen 28 V / 30 W,
tol.: 21 V to 30 V
Closing time, fire screen ≤ 25 ms

Dimensions

FERO-Z18 A2

Length 1010 mm
Width 285 mm
Height 234 mm

Case

Length 1200 mm
Width 400 mm
Height 400 mm

Deflector for FERO-Z18 A2

Length 92 mm
Width 142 mm
Height 567 mm

Weight

FERO-Z18 A2 16.5 kg
Case 25.0 kg
Total weight 42.0 kg
Deflector for FERO-Z18 A2 7.5 Kg

Environmental conditions

Environmental test MIL-STD-810C
(in extracts)

Scope of delivery

Article	NATO Stock No. Part No.
FERO-Z18 A2 in case	009-079.700-000
FERO-Z18 A2	1240-12-336-2558 009-079.100-000
Case	8145-12-339-3729 009-079.840-000
Deflector for FERO-Z18 A2	1240-12-339-5794 009-205.100-000

Subject to design and construction modifications

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Antitank Aiming Telescope TN-80

Brief description

The antitank aiming telescope PzF-TN 80 is the optical aiming device of the SPH 2000 for direct fire against tanks.

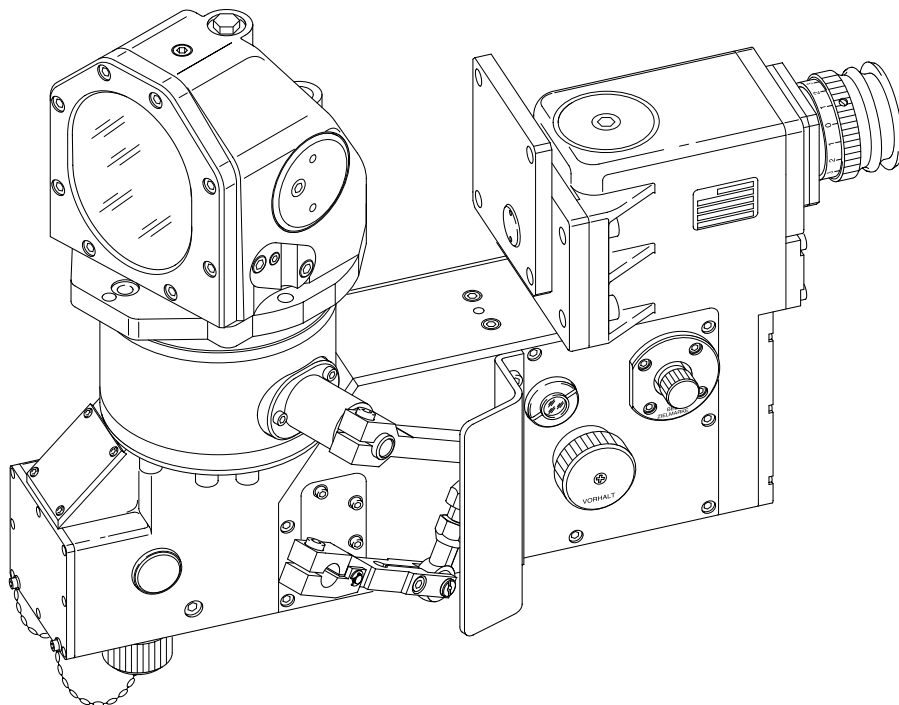
It is fixed in the turret. The line of sight is aligned to the weapon, in elevation the deviating mirror of the viewing head is driven by the weapon's trunnion.

It enables the following tasks:

- Target designation, target identification and aiming during day or night to high accuracy of $\pm 0,1$ mrad.

Performance:

- Magnification day and night 8x with monocular eyepiece.
- The elevation range of the line of sight is -44 mrad to +349 mrad.
- Optical channel with monocular eyepiece for day and night (I² tube 2nd gen.).
- The change from day to night mode is possible by a mechanical switch.
- Protective filters against laser and bright sunlight are integrated.
- In order to take a lead and an offset angle, the reticle is movable by a mechanical drive.
- The brightness of the reticle is adjustable manually.
- The electrical power for the I² tube and for the reticle illumination will be supplied from the turret, but in emergency mode a battery will deliver the necessary power for approximately 8 h before recharging.



Technical data

Mechanical data

Range of elevation	-2.5° to +20° Δ -44 mrad to +349 mrad
Range of lead	40 km/h cross speed

Optical data

Day sight

Magnification	8x
Eyepiece	monocular
Entrance pupil diameter	48 mm
Exit pupil diameter	6 mm
Field of view	7°
Diopter adjustment eyepiece	\pm 4 dpt
Resolution	0,04 mrad
Laser protective filter	1060 nm
Protective filter against bright sunlight	

Nightvision

I ² -tube	2nd gen.
Magnification	8x
Field of view	4.8°

Electrical data

Turret network	24 V DC / 0.25 A max. (21.5 V DC to 30 V DC)
Battery (back up)	6 V DC (4 x 1,5 V battery Mignon LR6)

Dimensions

	Length	Width	Height
PzF TN-80	515 mm	285 mm	380 mm

Weight

PzF TN-80	30 kg
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Environmental conditions

Environmental test	MIL-STD-810C (in extracts)
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Scope of delivery

Article	NATO Stock No./ Part No.
PzF TN-80 with fixing subassembly	009-222.000-000
PzF TN-80	1240-12-341-6745
	009-222.100-000

Subject to design and construction modifications

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