



Operating Instructions

Telescopic Sight

3.5-26x56 FF

81-012-06-0202458

© Copyright 2013 CASSIDIAN OPTRONICS GmbH. All rights reserved.

CASSIDIAN

CASSIDIAN OPTRONICS GmbH

Wetzlar Site

Gloelstraße 3 -5

D-35576 Wetzlar

Phone: +49 6441 404-380

Fax: +49 6441 404-322

Internet: www.cassidian-optronics.com

Preliminary Remarks

- 1 The Telescopic Sight 3.5-26x56 FF is a fine mechanical optical precision instrument.

Exact knowledge of the device is required for

- correct handling,
- reliable functioning during operation,
- maintenance of long life-span

- 2 Important instructions for technical security are especially emphasized



ATTENTION for working methods, which must be exactly followed, in order to avoid damage or destruction of the device.



CAUTION for working methods, which must be exactly followed, in order to avoid that persons are harmed.



NOTE technical requirements the user of the device must especially pay attention to.

- 3 Reference to illustrations and location numbers are stated in brackets, Example: (2/3) means illustration 2, location number 3.

- 4 **Manufacturer**

CASSIDIAN
CASSIDIAN OPTRONICS GmbH
Wetzlar Site
Gloelstraße 3-5
35576 Wetzlar

- 5 If you have found errors or have ideas to contribute to a better manual, please contact us. We are grateful for suggestions originating from practical use.

Table of Contents

Preliminary Remarks	II
Table of Contents	III
Illustrations	V
Safety Regulations	VII
1 Description	1 - 1
1.1 Designation	1 - 2
1.2 Determined Use	1 - 2
1.3 Marking	1 - 2
1.4 Technical Data	1 - 3
1.5 Design and Function	1 - 4
1.5.1 General	1 - 4
1.5.2 Mountable Accessories (Optional)	1 - 4
1.5.3 Design	1 - 6
1.5.4 Reticle	1 - 9
1.5.5 Function	1 - 12
1.6 Scope of Supply	1 - 13
2 Operation and Maintenance	2 - 1
2.1 Operating Instructions	2 - 2
2.1.1 General	2 - 2
2.1.2 Replacement of Battery	2 - 2
2.1.3 Operation	2 - 3
2.1.4 Mounting and Test Firing / Adjustment to Weapon	2 - 6
2.1.4.1 Mounting of Telescopic Sight	2 - 6
2.1.4.2 Test Firing / Adjustment to Weapon	2 - 6
2.2 Operation under special climatic and other conditions	2 - 9
2.2.1 General	2 - 9
2.2.2 Use at low temperatures	2 - 9
2.2.3 Use at high temperatures	2 - 10
2.2.4 Use at high humidity	2 - 10

2.3	Maintenance	2 - 11
2.3.1	Commodities	2 - 11
2.3.2	Maintenance Plan	2 - 12
2.3.3	Battery	2 - 13
2.3.4	Scope Protection Cap	2 - 13
2.3.5	Cleaning of optics and inspection	2 - 13
2.3.6	Housing (Tube)	2 - 14
2.3.7	Operating controls	2 - 14
2.4	Fault finding and elimination	2 - 15
2.5	Transportation	2 - 16
2.6	Storage	2 - 16
3	Mounting of Optional Accessories.....	3 - 1
3.1	Mounting of Baffle, screwable	3 - 2
3.2	Mounting of Backlight Tube, screwable	3 - 2
3.3	Mounting of Baffle, clampable	3 - 2
3.4	Mounting of Backlight Tube, clampable	3 - 3
3.5	Mounting of Yellow Filter	3 - 4
3.6	Mounting of Laser Protection Filter	3 - 4
3.7	Mounting of Eyeguard	3 - 5
3.8	Mounting of Polarization Filter	3 - 6

Illustrations

Illustration 1	Marking	1 - 2
Illustration 2	Mountable Accessories	1 - 5
Illustration 3	Design	1 - 7
Illustration 4	Reticle Pattern	1 - 9
Illustration 5	Cutout Reticle	1 - 10
Illustration 6	Illuminatable Reticle Pattern	1 - 11
Illustration 7	Optical Structure	1 - 12
Illustration 8	Scope of Supply	1 - 14
Illustration 9	Replacement of Battery	2 - 2
Illustration 10	Operating Controls	2 - 3
Illustration 11	Adjustment of Brightness	2 - 5
Illustration 12	Zero Setting	2 - 6
Illustration 13	Loosening of Screws	2 - 7
Illustration 14	Mounting of Accessories to objective	3 - 3
Illustration 15	Mounting of Accessories to Eyepiece	3 - 5

Safety Regulations

- Use of the device as directed is essential for safe operation. Therefore, familiarize yourself thoroughly with the contents of these operating instructions. This manual must always be kept accessible at all times.
- The device may only be operated with the accessories described in these operating instructions. Other accessories may only be used if their safety unobjectionable usability has been proven by the manufacturer. The operator or user must convince himself hereof.
- Modifications and repairs may only be performed by the manufacturer or persons explicitly authorized by him. The manufacturer is not liable for damages due to unauthorized performed modifications or repairs of the devices. In addition, all warranty claims then become invalid.
- Accident prevention regulations must be observed in accordance with the legal requirements.
- The use of the device may only be permitted by trained and qualified persons having knowledge of the valid safety regulations. It is the responsibility of the operator of the equipment to train and instruct the operating personnel accordingly.
- Before putting the systems into operation their proper condition must be verified.
- Under no circumstances look through the sight at the sun or laser light sources. This could lead to serious eye injuries.
- When using lithium batteries the for the country customary safety regulations and operating instructions must be observed.

Notes

1
Description

1.1 Designation

Name: Telescopic Sight 3.5-26x56 FF
Short designation: ZF 3.5-26x56 FF
Part Number: 81-012-06-0202458

1.2 Determined Use

The Telescopic Sight 3.5-26x56 FF together with a sniper rifle serves the shooter for identification, acquisition and sighting of target.
The built-in reticle illumination enables aiming during dusk and dawn.
In addition, it is equipped with a parallax compensation from 50 m to ∞ .

1.3 Marking

The Telescopic Sight is marked on the upper and lower side of the eyepiece unit.

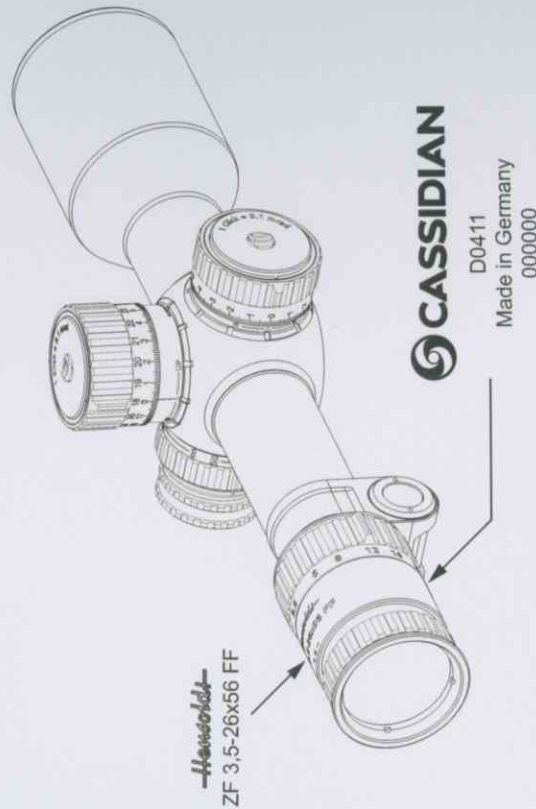


Illustration 1 Marking

1.4 Technical Data

Dimensions

ZF 3.5-26x56 FF Length Width Height
Ring diameter (mount) ~ 356 mm* .. ~ 113 mm* .. ~ 86 mm*
* Dimensions can differ slightly depending upon setting at the time.

Weight

ZF 3.5-26x56 FF ~ 1300 g

Electrical Data

Reticle illumination red
Automatic shutoff
of reticle illumination after approx. 3 hours
Power supply battery CR 123 A

Optical Data

Magnification 3.5power to 26power
Entrance pupil 56 mm
Exit pupil 9.6 mm to 2.2 mm
Field of view 10.1 m to 1.43 m at 100 m
Interpupillary distance approx. 90 mm
Parallax compensation 50 m to ∞
Resolution min 3" (image center, at magnification 26x)
Diopter adjustment -2.5 dpt to +2 dpt
Transmission > 88%
Superelevation angle adjustment
- per detent in elevation and azimuth 0.1 mrad $\triangleq$ 1 cm/100 m
Usable adjustment range elevation 360 cm/100 m (360 click)
Usable adjustment range azimuth $\pm$ 80 cm/100 m ($\pm$ 80 click)
Max. total adjustment range
- elevation 400 cm /100 m*
- azimuth $\pm$ 100 cm/100 m
Overflow elevation 40 cm/100 m
Overflow azimuth $\pm$ 20 cm/100 m
* The weapon rail must have a forward tilt or a scope mount in order to make use of the entire adjustment range.

1.5 Design and Function

1.5.1 General

The Telescopic Sight 3.5-26x56 FF is a monocular/monobjective telescope with a lens erecting system and 3.5power magnification. The reticle of the telescopic sight can be illuminated and brightness regulated with the illumination control.

The parallax between reticle pattern and image scene can be compensated for continuously for target distances of 50 m to ∞ .

Sealing elements in the scope prevent moisture from entering, so that the telescopic sight is always useable even during sudden temperature changes, rain, snow and fog.

The supplied scope protection cap (2/1) protects the front lenses from damage during transportation.

1.5.2 Mountable Accessories (Optional)

In order to prevent the user being blinded by too intensive sunlight and disturbing optical reflections the eyeguard (2/2) can be screwed in front of the eyepiece. In addition, it prevents optical reflections of the facial skin when using a night sight attachment.

The eyeguard can only be used in conjunction with the adapter ring (2/10).

The supplied baffles (2/3) and (2/5) can, if required, be mounted onto or in front of the objective (3/7). The screwable baffle (2/3) is screwed in front of the objective and the clampable baffle (2/5) is mounted to objective and clamped tight. They have the following functions:

- prevent reflections of the incoming backlight towards target (camouflage),
- protect the user against obliquely incident sun rays.

Instead of the baffles also one of the backlight tubes (2/4) and (2/6) can be placed in front of the objective.

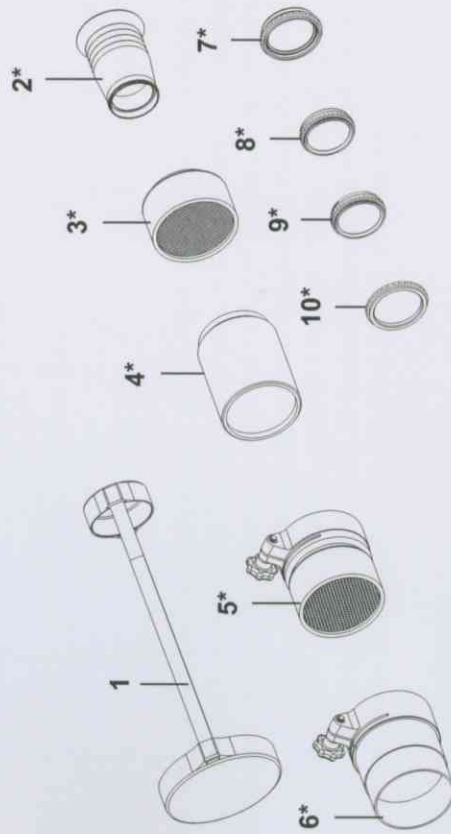
The screwable backlight tube (2/4) is screwed in front of the objective (3/7) and the clampable backlight tube (2/6) is mounted to objective and clamped tight. They prevent the user from being blinded by backlight.

For an image low in contrast there is the possibility of screwing a yellow filter (2/8) in front of the eyepiece. The yellow filter can only be used in conjunction with the adapter ring (2/10).

Is suspected that the shooter may be aimed at with lasers a laser protection filter (2/9) is to be screwed in front of the eyepiece to prevent damages to the eye of the shooter by the laser ray. The laser protection filter has a wavelength of 1064 nm and laser protection level L6.

The laser protection filter can only be used in conjunction with the adapter ring (2/10).

In order to make use of the yellow filter (2/8), the eyeguard (2/2) or the laser protection filter (2/9) the adapter ring (2/10) is required. It is screwed into the eyepiece (3/1) and the yellow filter, the eyeguard or the laser protection filter can be screwed into the inside thread of the adapter ring.



*Accessories are only supplied as an option.

Illustration 2 Mountable Accessories

- | | | | |
|---|----------------------------|----|-----------------------------|
| 1 | Scope protection cap | 6 | Backlight tube, clampable,* |
| 2 | Eyeguard* | 7 | Polarization filter* |
| 3 | Baffle, screwable* | 8 | Yellow filter* |
| 4 | Backlight tube, screwable* | 9 | Laser protection filter |
| 5 | Baffle, clampable* | 10 | Adapter ring |

In order to sight a target at certain angular ranges through reflecting glass disks a polarization filter (2/7) can be mounted to the eyepiece. The filter reduces reflections of the sighted glass disk.

Is the scope not mounted it can then be stored in the scope protector Flecktarn 72 camouflage. After the scope has been placed inside the scope protector it is closed with two straps.

For mounting the telescopic sight to a Picatinny rail a scope flip-on mount can be supplied.

The scope may only be mounted on the weapon by authorized qualified personnel such as gunsmiths.

1.5.3 Design

The Telescopic Sight 3.5-26x56 FF consists of:

- the eyepiece (3/1)
- the magnification adjustment with erecting system (3/2)
- the tube (3/6) and
- the objective (3/7)

The index mark for diopter zero setting is located on the eyepiece (3/1). The eyepiece is screwed into the eyepiece tube (3/11). Engraved on the eyepiece tube is "0", the direction indicator for diopter adjustment, device designation and the index mark for magnification adjustment.

The magnification adjustment with erecting system (3/2) is fixed to tube (3/6). The magnification values are marked on the adjustment ring of the magnification adjustment. During magnification change the reticle pattern is also **magnified**.

Integrated in the tube (3/6) are the mounts for elevation and azimuth adjustment.

The elevation adjustment (3/5), rotary knob for parallax compensation (3/4) with illumination control for reticle illumination (3/3) and the azimuth adjustment (3/8) are fixed outside of the tube.

In addition, the index marks (3/9) for elevation adjustment and azimuth adjustment are engraved on tube.

On the rotary knob for elevation adjustment the adjustment values from 0 to 350 are marked in two levels. One rotation has 180 clicks. One click is equivalent to one graduation mark. The second level can be reached by pulling

the rotary knob up when in the 180 click position.

The mechanical stop of rotary knob is positioned at -5 click $\pm$ 1 click.

One graduation mark (click) in elevation and azimuth corresponds to 1 cm/100 m and the rotary knobs click into place audibly and tangibly every 10 clicks.

On the rotary knob for azimuth adjustment the adjustment values $\pm$ 80 are engraved.

Both rotary knobs for range and azimuth adjustment are required for hit correction.

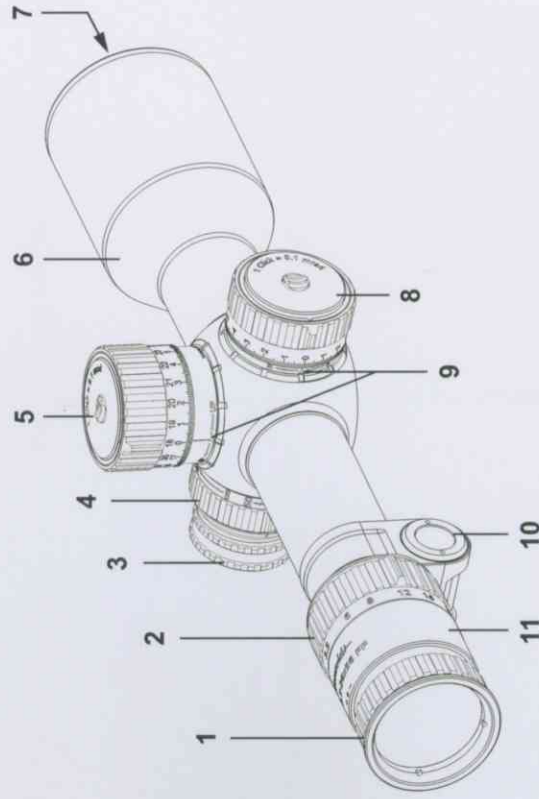


Illustration 3 Design

- | | |
|---|---|
| 1 Eyepiece | 6 Tube (housing) |
| 2 Magnification adjustment with erecting system | 7 Objective |
| 3 Rotary knob for illumination control | 8 Azimuth adjustment |
| 4 Rotary knob for parallax compensation | 9 Index marks with direction indication |
| 5 Elevation adjustment | 10 Battery compartment |
| | 11 Eyepiece tube |

The battery compartment (3/10) is integrated in the rear portion of the tube (3/6). The battery compartment lid is secured with a rubber band. On the battery compartment lid the installation position of the battery is shown.

The reticle illumination is turned on by pulling the rotary knob for Illumination control (3/3) out and turned off by pressing it back in. After the rotary knob for Illumination control has been pulled out the marking for turning direction of illumination becomes visible. The reticle illumination turns off automatically after 3 hours.

A necessary change of battery (low batt.) is indicated by pulsating brightness of reticle illumination with a frequency of approx. 1 Hz.

The objective (3/7) is built into the tube (3/6).

1.5.4 Reticle

The reticle pattern of the telescopic sight consists of the centering bars (4/1) and the inner crosshairs (4/2). The illuminated section of the reticle is shown in Illustration 6. The distances of the various graduations are shown in Illustration 4 and Illustration 5.

Line thickness:
0.5 cm/100 m

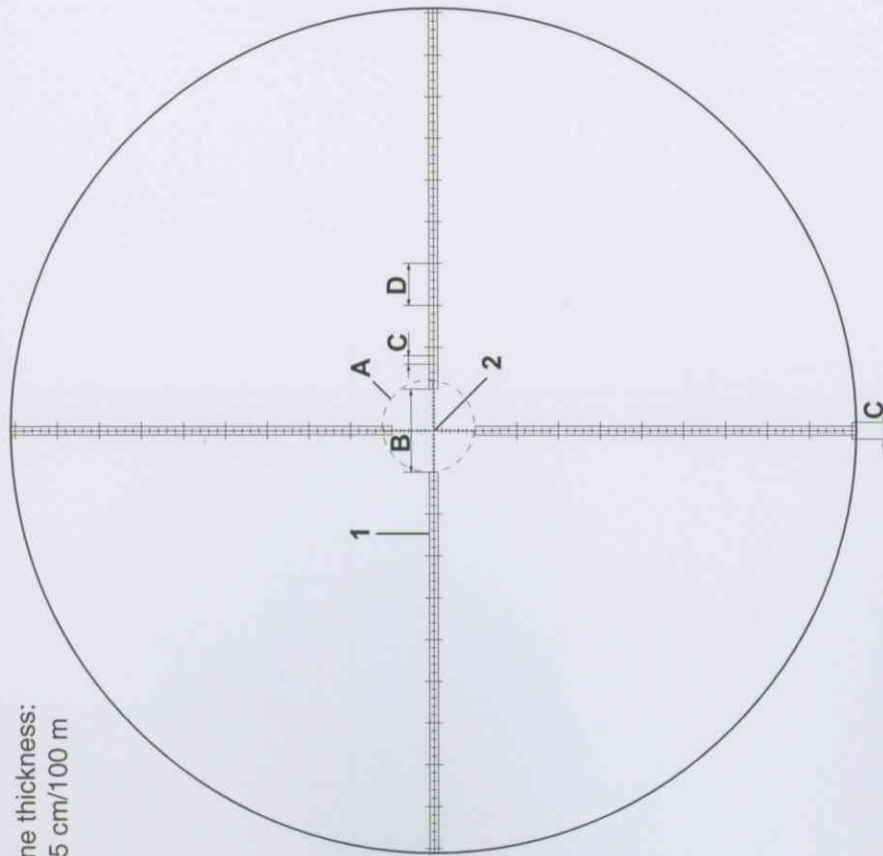


Illustration 4 Reticle Pattern

- 1 Centering bars
- 2 Inner crosshairs
- A Cutout

- B 10 mrad $\triangleq$ 100 cm/100 m
- C 1 mrad $\triangleq$ 10 cm/100 m
- D 5 mrad $\triangleq$ 50 cm/100 m

In the upper right section of the centering bars a fine graduation (5/1) for distance estimation is located. The line height is 0.125 mrad.

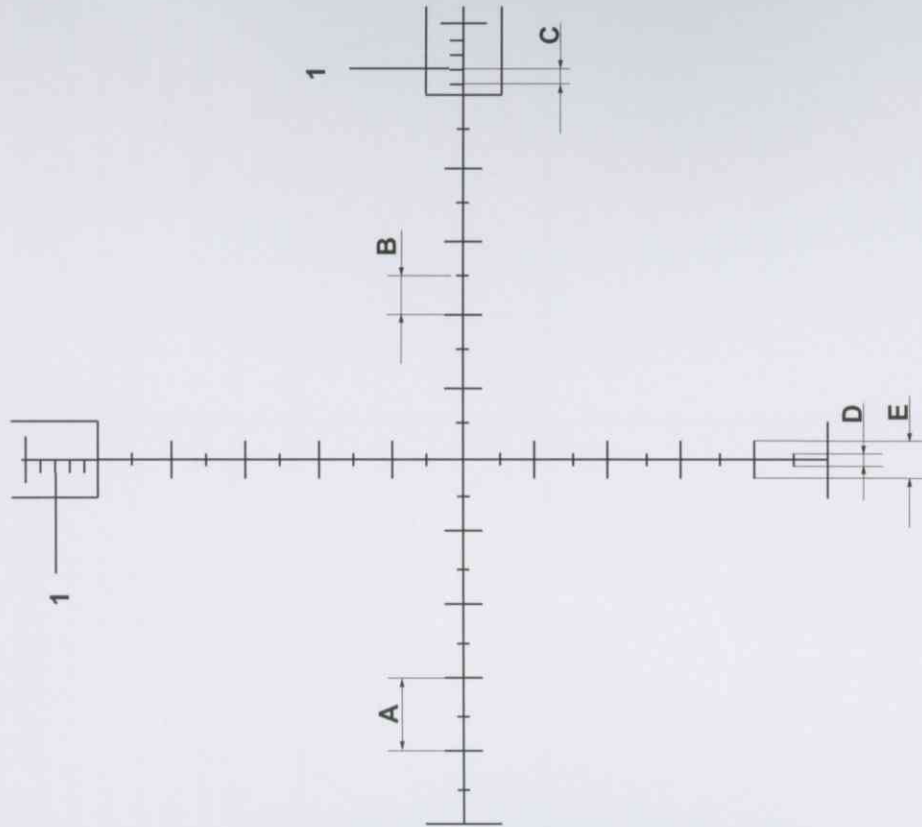


Illustration 5 Cutout Reticle

- | | | | |
|---|----------------------------------|---|---------------------------------------|
| 1 | Fine graduation | C | 0.2 mrad $\triangleq$ 2 cm/100 m |
| A | 1 mrad $\triangleq$ 10 cm/100 m | D | 0.125 mrad $\triangleq$ 1.25 cm/100 m |
| B | 0.5 mrad $\triangleq$ 5 cm/100 m | E | 0.25 mrad $\triangleq$ 2.5 cm/100 m |

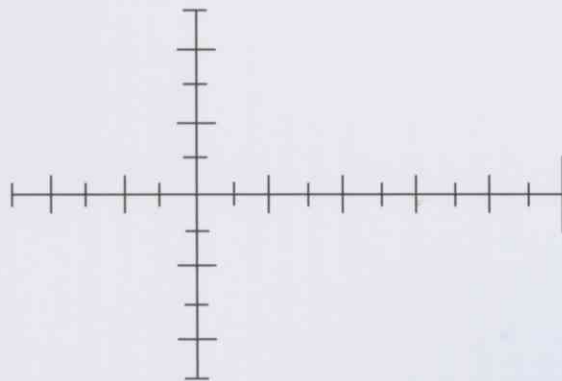


Illustration 6 Illuminatable Reticle Pattern

1.5.5 Function

The parallel rays coming from the target at setting " ∞ " of rotary knob for parallax compensation (3/4) are imaged vertically and laterally inverted by the objective (7/1) over the field lens (7/8) in the first image plane (7/2). In the first image plane the reticle (7/7) is located and built-in vertically and laterally inverted and during magnification changeover is also **magnified**.

Through adjustment of rotary knob for parallax compensation the field lens is shifted in longitudinal direction, whereby the from finity coming rays for the respective distance are imaged in the first image plane. The reticle and the focused scene coincide and therefore imaged parallax-free.

Via the lenses of the magnification adjustment with erecting system (7/6), which can be moved towards one another in longitudinal direction, the image is pictured upright and non-reversed in the second image plane (7/5). Here it is viewed magnified in the eyepiece (7/3). The eyepiece is adjustable by +2 to -2.5 diopter.

The exit pupil (7/4) lies approx. 90 mm in front of the first eyepiece lens.

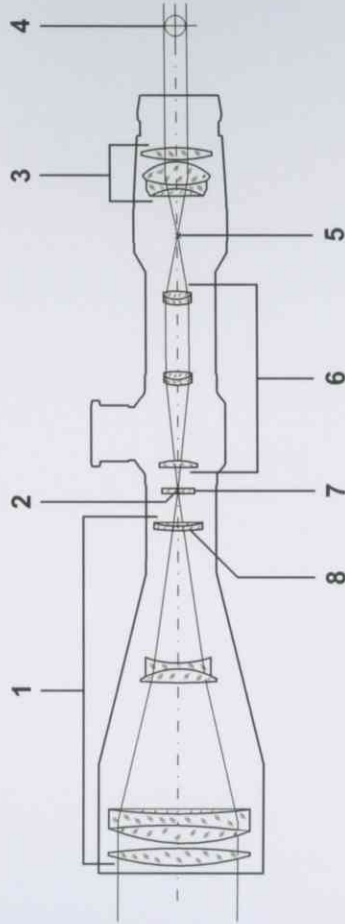


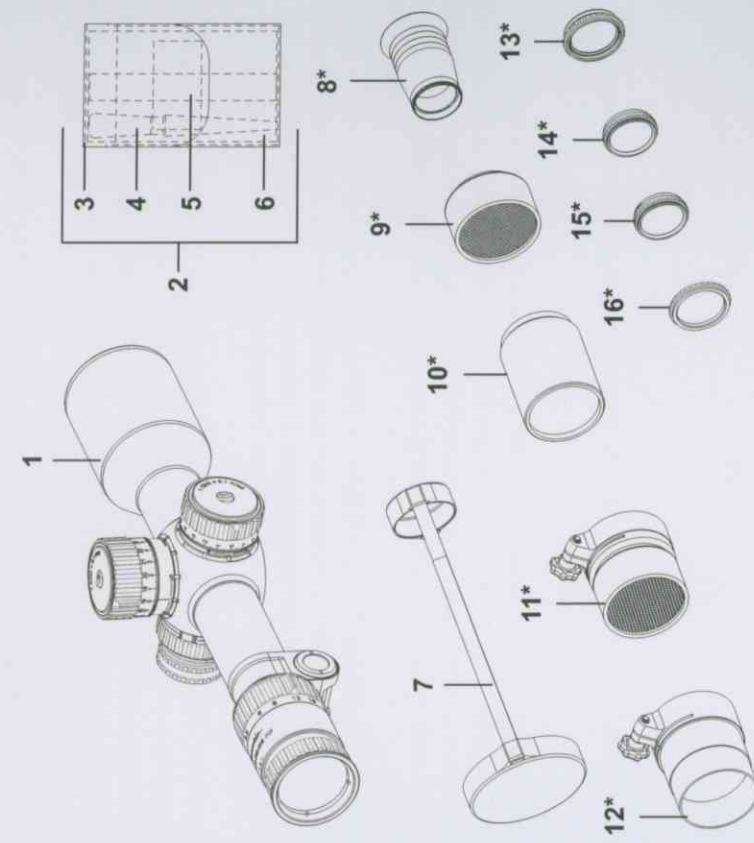
Illustration 7 Optical Structure

- | | |
|-------------------------------|-------------------------------|
| 1 Objective | 5 2 nd image plane |
| 2 1 st image plane | 6 Erecting system |
| 3 Eyepiece | 7 Reticle |
| 4 Exit pupil | 8 Field lens |

1.6 Scope of Supply

The telescopic sight will be delivered to the corresponding customer in a commercially available carton.

The parts stored in the tool kit bag are not pictured.



* Accessories are only supplied as an option.

Illustration 8 Scope of Supply

Item	Qty.	Designation	Part Number
1	1	Telescopic Sight 3.5-26x56 FF	81-012-06-0202458
2	1	Tool Kit Bag with Contents	81-012-06-0228079
3	1	TT CIG BAG	10162668
4	1	Dust Brush acc. to TL 7920-0024-22	10039767
5	1	Optics Cleaning Cloth 80x115 TL 6640-003	10034420
6	1	Optics Cleaning Cloth 190x190 microfiber	10162699
7	1	Scope Protection Cap	81-012-06-0220676
8	1	Eyeguard*	330296-9031-000
9	1	Baffle, screwable*	330297-9032-000
10	1	Backlight Tube, screwable*	330297-9024-000
11	1	Baffle, clampable*	330297-9028-000
12	1	Backlight Tube, clampable*	521680-8060-000
13	1	Polarization Filter*	81-012-06-0225286
14	1	Yellow Filter*	330296-9026-000
15	1	Laser Protection Filter*	330296-9025-000
16	1	Adapter Ring, complete*	81-012-06-0225426
**	1	Battery CR 123 A	commercially available
**	1	Scope Protector, Flecktarn 72 camouflage*	10221142
**	1	Operating Instructions	81-012-91-0227368

*Accessories are only supplied as an option.
** not shown



2

Operation and Maintenance

2.1 Operating Instructions

2.1.1 General

The telescopic sight is a fine-mechanical optical precision instrument. It is to be handled with utmost care and treated with consideration and no force should be applied. The device is to be protected against heavy blows and vibrations. If not in use the telescopic sight is to be removed from rifle and stored appropriately.



CAUTION Under no circumstances look through the telescopic sight at the sun or laser light sources. This could lead to serious eye injuries.

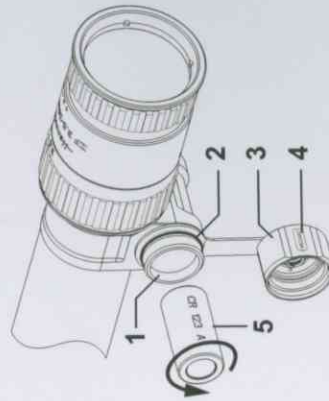
2.1.2 Replacement of Battery

(1) Unscrew lid of battery compartment (9/3) in arrow direction.

(2) Remove battery (9/5).

(3) Inspect O-ring (9/2) for cleanliness and damages. If necessary, clean or replace ring.

(4) Place new battery in battery compartment (9/1) position-orientated (9/4) as shown on lid of battery compartment.



NOTE The position of the battery is shown on the lid of the battery compartment in screwed-on condition.

(5) Screw lid of battery compartment (9/3) in contrary to arrow direction and tighten. Thereby take care that O-ring does not get damaged.

2.1.3 Operation

(1) Remove scope protection cap (2/1).

(2) Focus reticle pattern by turning eyepiece (10/1).

(3) Focus target by turning rotary knob for parallax compensation (10/2).



NOTE If the scope is being used together with a night sight attachment (NSV) the rotary knob for parallax adjustment must be set to "∞". After adjusting focusing on the night sight attachment optimize parallax adjustment on telescopic sight, if necessary.

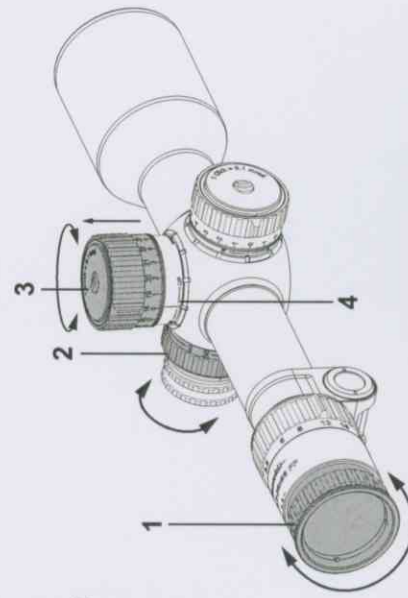
(4) Set sighting range on scale ring of elevation adjustment (10/3).



NOTE For values above 180 clicks the rotary knob for elevation adjustment must be turned in direction "up" (10/4) until stop and then pulled up.
When using a weapon rail not having forward tilt within extreme adjustment ranges it can happen that the adjustment range is not sufficient and must be compensated with a scope mount having forward tilt.

Illustration 10 Operating Controls

- 1 Eyepiece
- 2 Rotary knob for parallax compensation
- 3 Rotary knob for elevation adjustment
- 4 Index mark elevation with direction indication



- (5) Under poor light conditions switch reticle illumination on by pulling the rotary knob for illumination control (11/6) out.
- (6) By turning the rotary knob for illumination control (11/6) regulate illumination intensity in correspondence to the light conditions.



NOTE In which direction the rotary knob for illumination control (11/6) is to be turned is indicated by the turning direction marking (11/1).
The rotary range is limited by a stop.

- (7) By turning the magnification adjustment ring (11/4) set the desired magnification.

- (8) During shooting correct shot pattern with rotary knob for elevation adjustment (11/2) and rotary knob for azimuth adjustment (11/3).



NOTE For values above 180 clicks the rotary knob for elevation adjustment must be turned in direction "up" (10/4) until stop and then pulled up.
The rotary knob for elevation adjustment (11/2) on Illustration 11 is shown in the second plane.

- (9) Should the scope no longer be needed turn reticle illumination off by pressing rotary knob for illumination control (11/5) in arrow direction, remove the screwed-on or clamped-on filter and slip on scope protection cap (2/1).

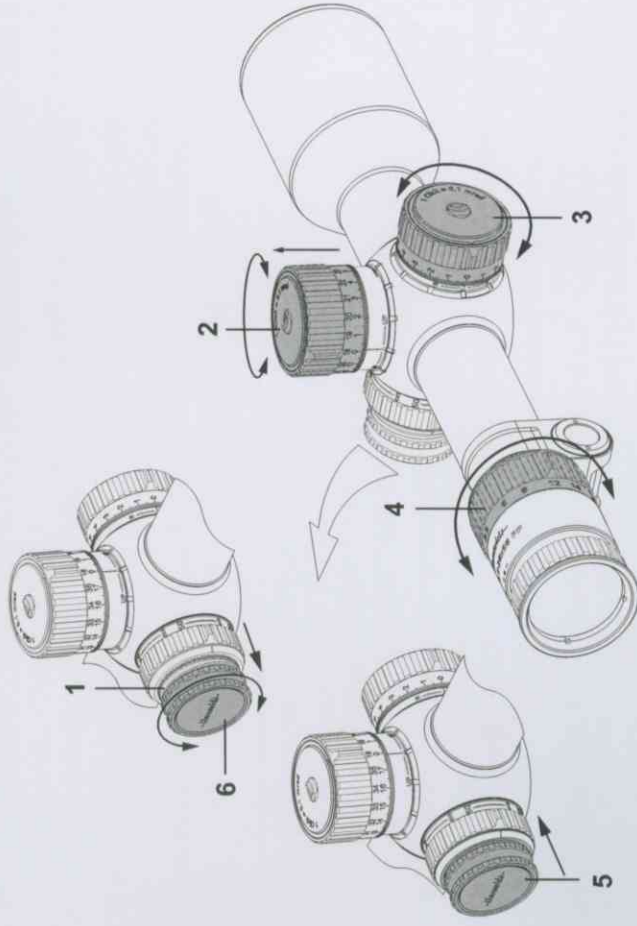


Illustration 11 Adjustment of Brightness

- 1 Marking for turning direction
2 Rotary knob for elevation adjustment
3 Rotary knob for azimuth adjustment
4 Ring for magnification adjustment
5 Rotary knob for illumination control "off"
6 Rotary knob for illumination control "on"

2.1.4 Mounting and Test Firing / Adjustment to Weapon

2.1.4.1 Mounting of Telescopic Sight

- (1) The scope may only be mounted by an authorized expert such as a gunsmith.
There is the possibility of mounting the scope with a ring mount or the scope flip-on mount.



NOTE Should the telescopic sight **not** be mounted by an expert, Messrs. Cassidian Optonics GmbH will not accept any warranty claims in regard to target accuracy and the given adjustment values.

2.1.4.2 Test Firing / Adjustment to Weapon

- (1) Mount scope as described in section 2.1.4.1.
(2) Place weapon in test firing equipment. Mount target disk at a distance of 100 m and adjust line of bore to target disk.

- (3) Set "zero" of scale on rotary knob for elevation adjustment (12/4) to the index mark elevation (12/3) and the "zero" of scale on rotary knob for azimuth adjustment (12/1) to the index mark azimuth (12/2).

- (4) Shoot dispersion pattern.

- (5) Determine deviation and correct aiming point of telescopic sight by means of rotary knob for elevation adjustment (12/4) and rotary knob for azimuth adjustment (12/1).

- (6) Shoot new dispersion pattern and, if necessary, correct aiming point anew.

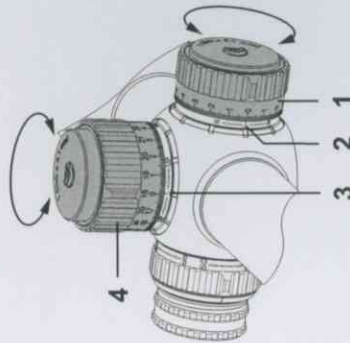


Illustration 12 Zero Setting

- 1 Rotary knob for azimuth adjustment
2 Index mark azimuth
3 Index mark elevation
4 Rotary knob for elevation adjustment

- (7) Loosen screw (13/1) half a turn in turning direction with a suited screwdriver or bullet casing, thereby hold onto rotary knob of elevation adjustment (13/4).



NOTE Screw (13/1) and rotary knob for elevation adjustment (13/4) are captive and **cannot** be disassembled.

- (8)

Set "zero" of scale of rotary knob for elevation adjustment (12/4) to the index mark elevation (12/3).

- (9)

Hold onto rotary knob for elevation adjustment (13/4) and with a suited screwdriver or bullet casing tighten screw (13/1). The rotary knob for elevation adjustment must remain on zero-setting.

- (10)

Hold onto rotary knob for azimuth adjustment (13/3) and with a suited screwdriver or bullet casing loosen screw (13/2) half a turn.



NOTE Screw (13/2) and rotary knob for azimuth adjustment (13/3) are captive and **cannot** be disassembled.

- (11)

Set "zero" of scale of rotary knob for azimuth adjustment (12/1) to the index mark azimuth (12/2).

- (12)

Hold onto rotary knob for azimuth adjustment (13/3) and with a suited screwdriver or bullet casing tighten screw (13/2) in contrary to turning direction. The scale ring of azimuth adjustment must remain on zero-setting.

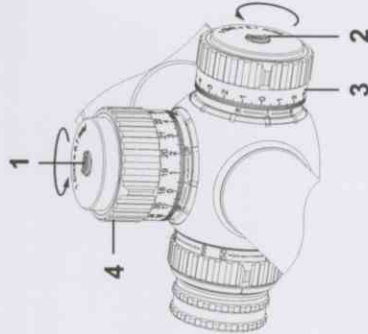


Illustration 13 Loosening of Screws

- 1 Screw
2 Screw
3 Rotary knob for azimuth adjustment
4 Rotary knob for elevation adjustment

- (13) Shoot new dispersion pattern and, if necessary, repeat adjustment beginning with step (5).



NOTE

The telescopic sight is zeroed in and by means of the elevation adjustment the corresponding range can be set.

2.2 Operation under special climatic and other conditions

2.2.1 General

- (1) Fine-mechanical optical instruments should function under special climatic conditions exactly as under normal conditions.
- (2) Operation and maintenance under special climatic conditions, however, requires special care in keeping sight operational and protection against intensive wear and tear.

2.2.2 Use at low temperatures

- (1) The telescopic sight is to be protected against extreme temperature fluctuations. Is it to be brought into a room with high temperatures, place it in a case beforehand. The lid should not be opened until telescopic sight has reached room temperature.
- (2) Outer condensation is to be removed with a soft clean cloth. The optical components are to be dried with the optics cleaning cloth.
- (3) Condensation inside the telescopic sight indicates that device is not sealed properly. Should condensation remain continuously and appear repeatedly return sight for inspection of sealing.
- (4) At low temperatures movable parts such as the adjustments can become stiff. This can be done away with by moving the corresponding parts repeatedly. If the parts can only be moved sluggishly or not at all, then only slow warming up helps. This can be achieved by rubbing with a cloth. Better, however, is gradual warming up in a room as described above in paragraph (1). By no means may an optical instrument be warmed up too intensively or too quick, since the glass parts may crack. Therefore, it is prohibited to use open flames or welding lamps and other such means on the scope.
- (5) Glass components should not be breathed on to warm them up.
- (6) As described in Section 1.5.3 a necessary change of battery (low batt.) is indicated by pulsating brightness of reticle illumination. Since the battery voltages drops at low temperatures it is possible that the "low Batt." display function is activated (at approx. -40 °C), even though the battery capacity is still sufficient.

2.2.3 Use at high temperatures

- (1) Protect telescopic sight particularly well against dust and sand, especially bearing and gliding parts as well as glass components.
- (2) Keep rubber parts flexible by rubbing them in with talcum powder.

2.2.4 Use at high humidity

- (1) High humidity and salty air enhance corrosion.
- (2) Pay attention that surface of sight is flawless.
- (3) Replace scope which is not sealed properly and return it for repair.

2.3 Maintenance

Maintenance includes

- determination and reporting of failures, damages and decrease in performance
- checking completeness of accessories
- cleaning

User should perform the jobs stated in the maintenance plan 2.3.2 **before** and **after** use.

Repairs which go beyond the activities described herein may only be performed by us or personnel authorized by us.

Should a failure occur during use, which cannot be eliminated, kindly contact:

CASSIDIAN
CASSIDIAN OPTRONICS GmbH
Wetzlar Site
Gloelstraße 3-5
D-35576 Wetzlar
Phone: +49 6441 404-358
Fax: +49 6441 404-322
Email: hensoldt@cassidian-opttronics.com
Internet: www.cassidian-opttronics.com

2.3.1 Commodities

- optics cleaning cloth or optics cleaning paper
- cleaning cloth
- spirit
- disinfectant
- ethyl alcohol

2.3.2 Maintenance Plan

Item	Component	Inspection	No. of items to be inspected	Auxiliary material actions	Section	When? before after
1	battery	performance, leakage	1	replace battery	2.3.3 2.1.2	b, a
2	scope protection cap	damages, cleanness	2	replace scope protection cap, clean with cleaning cloth	2.3.4 2.3.4	b, a b, a
3	objective and eyepiece	damages, cleanness	2	return for repair, cleaning of optics	2.3.5 2.3.5	b, a b, a
4	housing components	mechanical damages, corrosion, cleanness	1	return for repair, clean with cleaning cloth	2.3.5 2.3.6	b, a b, a
5	rotary knob illumination, elevation adjustment, azimuth adjustment, rotary knobs	damages, movability, function, cleanness, legibility of symbols	4	return for repair, clean with ethyl alcohol, return for repair	2.3.7 2.3.7 2.3.7	b, a b, a b, a
6	lid of battery compartment	damages, function	1	return for repair	2.3.6	b, a

2.3.3 Battery

When battery no longer performs with sufficient energy or there are signs of leakage (spots) an exchange must take place.



ATTENTION

- Do not store the telescopic sight with battery installed.
- Only use batteries which are protected against leakage.



NOTE



- Do not throw batteries in the normal waste disposal, but in the special waste disposal intended for recycling.
- When using lithium batteries the for the country customary safety regulations and operating instructions must be observed.

2.3.4 Scope Protection Cap

Inspect scope protection cap for

- tight fit
- damages
- cleanness

Clean scope protection cap with a damp cleaning cloth and rub dry.

2.3.5 Cleaning of optics and inspection

Inspect eyepiece (3/1) and objective (3/7) for

- damages
- cleanness

If eyepiece or objective are damaged, return telescopic sight for repair.

Remove any slight residue on glass surfaces first with a dust brush and then clean with optics cleaning cloths. In order to do so, breath on glass and rotate the optics cleaning cloth in circular movements from the middle to the edge of the glass surface.

Only clean glass components with dust brush and optics cleaning cloth.
Replace optics cleaning cloths regularly.
Remove heavy residue on glass surfaces with water and a dish washing detergent. Dab wet glass surfaces dry with optics cleaning cloths.

2.3.6 Housing (Tube)

Inspect housing for:

- mechanical damages
- varnish damages
- corrosion
- cleanness.

Should housing be damaged or corroded return device for repair.
Do not oil or grease mechanical components, operating controls, drives, etc.

Remove loose dust or dirt with a soft and dry cleaning cloth.
Remove tight clinging dirt with a damp cleaning cloth.

Inspect O-ring (9/2) for damages and cleanness. Replace, if necessary.

2.3.7 Operating controls

Inspect rotary knob for illumination control (11/5) with on/off switch, elevation adjustment (11/2), azimuth adjustment (11/3) and rotary knob for parallax compensation (10/2), magnification adjustment with erecting system (11/4) and diopter adjustment on eyepiece (10/1) for

- visible damage
- movement
- function
- cleanness
- legibility of symbols

Should one of the controls be missing or hard to move resp. without function, return telescopic sight for repair.
Do not oil or grease controls.
Clean controls with a cleaning cloth and ethyl alcohol.

2.4 Fault finding and elimination

Fault	Cause	Elimination
reticle pattern not illuminated	battery discharged	replace battery (see 2.1.2), if necessary, return telescopic sight for repair
image misted	moisture inside telescopic sight	return telescopic sight for repair
reticle pattern blurred	eyepiece not focussed	focus eyepiece
image blurred	eyepiece or objective unclean	clean eyepiece and/or objective (see 2.3.5)
	objective misted outside	clean eyepiece and/or objective (see 2.3.5)
	objective misted inside	return telescopic sight for repair
	parallax adjustment incorrect	adjust parallax, if necessary, return telescopic sight for repair
no high-contrast image with the NSV	parallax compensation not adjusted correctly on scope	adjust parallax compensation (see 2.1.3) if necessary, return telescopic sight for repair

2.5 Transportation

Before the telescopic sight is transported it must be packed in commercial packing in such way that possible damage of scope is prevented.

2.6 Storage

The telescopic sight can be stored unlimited.

Before storage

- perform steps stated in maintenance plan 2.3.2
- remove battery or re-chargeable battery
- store all components in a dry room.

Once a year during storage inspect scope for

- proper storage (- 55 °C to + 50 °C)
- faultless condition.

After storage and before taking into operation

- perform steps stated in maintenance plan 2.3.2
- follow steps stated in 2.1.2 to 2.1.4
- inspect completeness

3

Mounting of Optional Accessories

3.1 Mounting of Baffle, screwable

- (1) Remove scope protection cap (2/1).
- (2) Screw baffle, screwable (14/6) into objective (14/3) and tighten slightly.
- (3) When the baffle, screwable, is no longer needed, screw baffle screwable entirely out of objective and stow away.

3.2 Mounting of Backlight Tube, screwable

- (1) Remove scope protection cap (2/1).
- (2) Screw backlight tube, screwable (14/7) into objective (14/3) and tighten slightly.
- (3) When the backlight tube, screwable is no longer needed, screw backlight tube, screwable entirely out of objective and stow away.

3.3 Mounting of Baffle, clampable

- (1) Remove scope protection cap (2/1).
- (2) Loosen clamping screw (14/4).
- (3) Push baffle, clampable (14/5) onto objective (14/3) and clamp tight with clamping screw.
- (4) When the baffle, screwable, complete, is no longer needed, loosen clamping screw and remove baffle, clampable, and stow away.

3.4 Mounting of Backlight Tube, clampable

- (1) Remove scope protection cap (2/1).
- (2) Loosen clamping screw (14/2)
- (3) Push backlight tube, clampable (14/1) onto objective (14/3) and clamp tight with clamping screw.
- (4) When the backlight tube, clampable, is no longer needed, loosen clamping screw and remove backlight tube, clampable, and stow away.

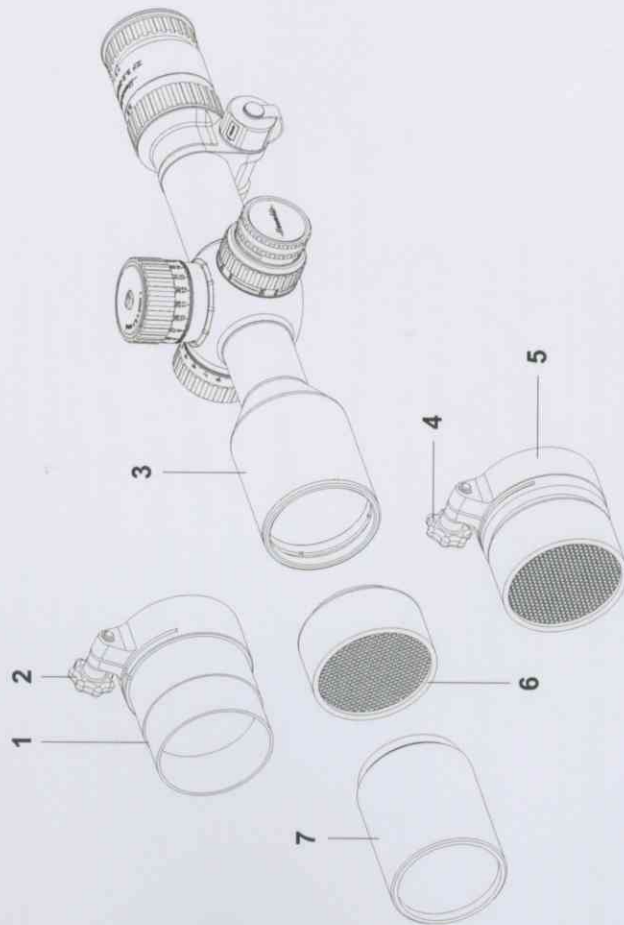


Illustration 14 Mounting of Accessories to objective

- | | | | |
|---|---------------------------|---|---------------------------|
| 1 | Backlight tube, clampable | 5 | Baffle, clampable |
| 2 | Clamping screw | 6 | Baffle, screwable |
| 3 | Objective | 7 | Backlight tube, screwable |
| 4 | Clamping screw | | |

3.5 Mounting of Yellow Filter

- (1) Remove scope protection cap (2/1).
- (2) Hold onto eyepiece (15/1) and screw adapter ring (15/5) into eyepiece and tighten slightly.
- (3) Hold onto adapter ring (15/6) and screw yellow filter (15/4) into adapter ring and tighten slightly.



NOTE The yellow filter and the laser protection filter should not be used together at the same time.

- (4) When the yellow filter (15/4) is no longer needed, hold onto adapter ring (15/6) turn yellow filter out of adapter ring and stow away.
- (5) Hold onto eyepiece (15/1) and screw adapter ring (15/6) out of eyepiece (15/1) and stow away.

3.6 Mounting of Laser Protection Filter

- (1) Remove scope protection cap (2/1).
- (2) Hold onto eyepiece (15/1) and screw adapter ring (15/6) into eyepiece and tighten slightly.
- (3) Hold onto adapter ring (15/6) and screw laser protection filter (15/2) into adapter ring and tighten slightly.



NOTE The yellow filter and the laser protection filter should not be used together at the same time.

- (4) When the laser protection filter (15/2) is no longer needed, hold onto adapter ring (15/6) turn laser protection filter out of adapter ring and stow away.
- (5) Hold onto eyepiece (15/1) and screw adapter ring (15/6) out of eyepiece and stow away.

3.7 Mounting of Eyeguard

- (1) Remove scope protection cap (2/1).
- (2) Hold onto eyepiece (15/1) and screw adapter ring (15/6) into eyepiece and tighten slightly.
- (3) Hold onto adapter ring (15/6) and eyeguard (15/3) into adapter ring.



NOTE The eyeguard can be used at the same time together with the laser protection filter or yellow filter. When using the yellow filter or the laser protection filter then first one of the filters must be mounted as described in Section 3.5 or 3.6. The eyeguard is then screwed into the corresponding filter.

- (4) When the eyeguard (15/3) is no longer needed, hold onto adapter ring (15/6) or one of the filters and screw the eyeguard out of the adapter (15/6), the yellow filter (15/4) or the laser protection filter (15/2) and stow away.



Illustration 15 Mounting of Accessories to Eyepiece

- | | |
|---------------------------|-----------------------|
| 1 Eyepiece | 4 Yellow filter |
| 2 Laser protection filter | 5 Polarization filter |
| 3 Eyeguard | 6 Adapter ring |

3.8 Mounting of Polarization Filter

- (1) Remove scope protection cap (2/1).
- (2) Hold onto eyepiece (15/1) and screw polarization filter (15/5) into eyepiece.
- (3) When the polarization filter (15/5) is no longer needed, hold onto eyepiece (15/1) and screw polarization filter out of eyepiece and stow away.