Operating instructions

Spotting Scope 45-S H32

Spotter 45-S H32

331060-9903-000

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Preliminary Remarks

1 The Spotting Scope 45-S H32 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

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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.

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Illustrations

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 manufacture 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.

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

Notes

1
Description

1.1 Designation

Name: Spotting Scope 45-S H32
Short designation: Spotter 45-S H32
Part Number: 10204909

1.2 Determined Use

The Spotter 45 was developed for identification and observation of objects. In addition, due to its variable and high magnification as well as the also being magnified MIL-Dot-reticle it serves the marksman for viewing target hit.

The focusing range of the Spotter 45 is 20 m to ∞.

1.3 Marking

Marking is located on the front end, both sides of the rubber-armouring and on the bottom side of the eyepiece unit.

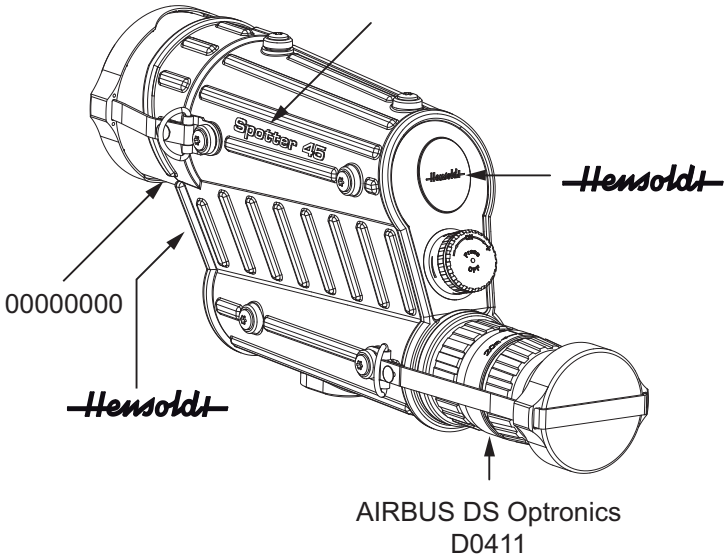

Illustration 1 Marking

1.4 Technical Data

Description	Data
Dimensions	
Spotter 45 (L x W x H	~ 345 mm* x ~ 90 mm x 160 mm
Tripod Connection	3/8” with rotary lock, standard: DIN 4503
* measurement at focus setting “ ∞” and diopter setting “0”	
Weight	
Spotter 45	~ 1770 g
Electrical Data	
Power supply	round cell 3 V CR 2032 alternative 3 V BR 2032
Automatic shut-off of reticle illumination	after 3 hours
Optical Data	
Magnification	15power to45power
Entrance pupil	72 mm
Exit pupil	4.8 mm to 1.6 mm
Field of view	49 m to 19 m at 1000 m
Eye relief	30.5 mm
Focusing	20 m to ∞
Resolution	min 3.0”
Diopter setting	-3 dpt to +2 dpt
Transmission	approx. 85 %
Reticle	
Reference line	± 23 mil ≙ 230 cm /100 m
Distance between the numbers	1 mil ≙ 10 cm/100 m
Distance between the graduation marks	0.2 mil ≙ 2 cm/100 m
Distance between the vertical numbers	1 mil ≙ 10 cm/100 m

1.5 Design and Function

1.5.1 General

The Spotter 45 is a monocular/monobjective telescope with a lens erecting system and 15power to 45power magnification. The reticle of the Spotter 45 can be illuminated and brightness regulated with the illumination control.

Focusing of image scene can be adjusted continuously for target distances of 20 m to ∞.

Sealing elements in the Spotter 45 prevent moisture from entering, so that the Spotter 45 is always useable even during sudden temperature changes, rain, snow and fog.

The fixed protection caps on the objective (2/12) and the eyepiece (2/6) protect the front lenses from damage during transportation of the Spotter 45.

In order to mount the Spotter 45 to a tripod a tripod thread (2/10) is located at the bottom of the housing, guaranteeing secure and steady handling during observation.

The supplied carrying strap can either be fastened to the Spotter 45 or the carrying bag.

With the carrying strap the possibility exists to carry the Spotter 45 directly against the body, enabling quick sighting of the target.

The Spotter 45 and part of the accessories can be stored in the carrying bag.

The mountable accessories are only supplied as an option.

1.5.2 Design

- The Spotter 45 consists of:
- the housing (2/1)
- the magnification adjustment with erecting system (2/7)
- the eyepiece (2/6) and
- the objective (2/12)

The magnification adjustment with erecting system (2/7) is fixed to housing (2/1). The magnification values are marked on the adjustment ring of the magnification adjustment. The engraving on the intermediate ring shows the focusing range and the focusing direction 20 m - ∞ as well as the mark (2/4) for the magnification setting.

The focusing unit with adjustment ring is built into the magnification adjustment with erecting system.

The eyepiece (2/6) is integrated in the focusing unit with adjustment ring and can be adjusted by -3 dpt to +2 dpt. The fastening ring for the eyeguard (2/5) is located on the eyepiece tube.
The eyeguard rests in the groove of the fastening ring.

During magnification change the reticle pattern is also magnified.

The rotary knob for illumination control (2/3) for the reticle illumination is located outside on the housing.
The battery compartment for the round cell is integrated in the rotary knob for illumination control.
The protection caps for the objective (2/11) and the eyepiece (2/8) are screwed to the housing.
Underneath the fastening screws for the protection caps clamps (2/9) are located for fastening the carrying strap upon requirement
The threaded inserts inside the housing to which the rails according to MIL-standard can be fixed, are protected against dirt and damage by a cap, complete (2/2).
The tripod thread (2/10) is located on the bottom of the housing.

The reticle illumination is turned on by turning rotary knob for illumination control (2/3) and turned of by pressing rotary knob for illumination control.
When illumination is turned off the selected brightness is memorized.
The rotary knob for illumination control has no end setting and when it is turned on it has an idle operating range of ± 45°.

The reticle illumination shuts off automatically after three 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 (2/12) is built into housing.

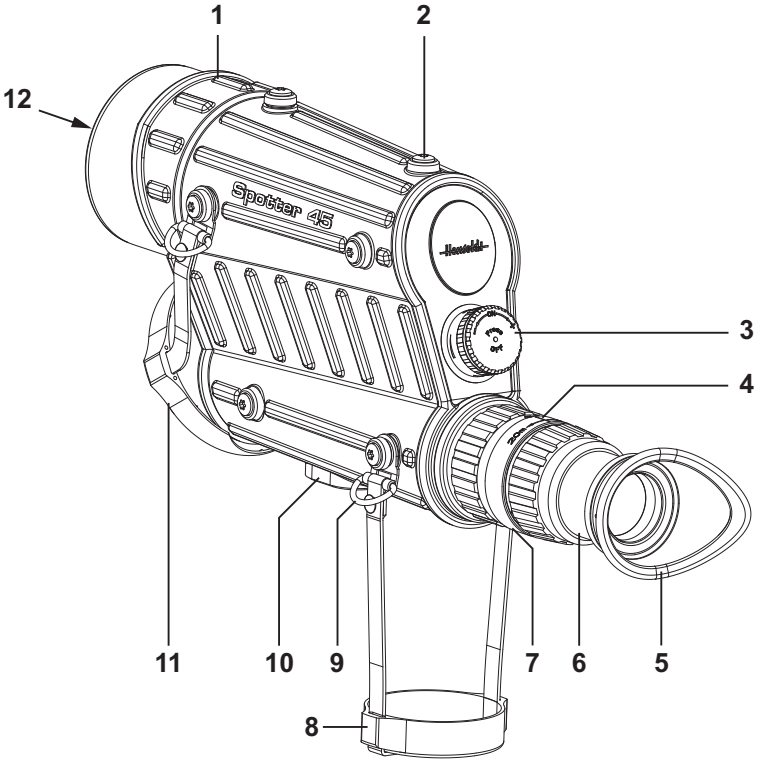

Illustration 2 Design

1 Housing
2 Cap, complete
3 Rotary knob for illumination control
4 Mark
5 Eyeguard
6 Eyepiece
7 Magnification adjustment with erecting system
8 Eyepiece protection cap
9 Clamp
10 Tripod thread
11 Objective protection cap
12 Objective

1.5.3 Reticle

The reticle pattern of the Spotter 45 consists of reference lines (3/1) with a length of ± 23 mil and a grid (3/A). Section A is shown in Illustration 4.
The reticle pattern shown in Illustration 3 is an example. The sectional view of the reticle pattern shown is dependent upon the magnification set. Operation of the reticle is described in the instructions of Messrs. Horus Vision, LLC. for H32 reticle.

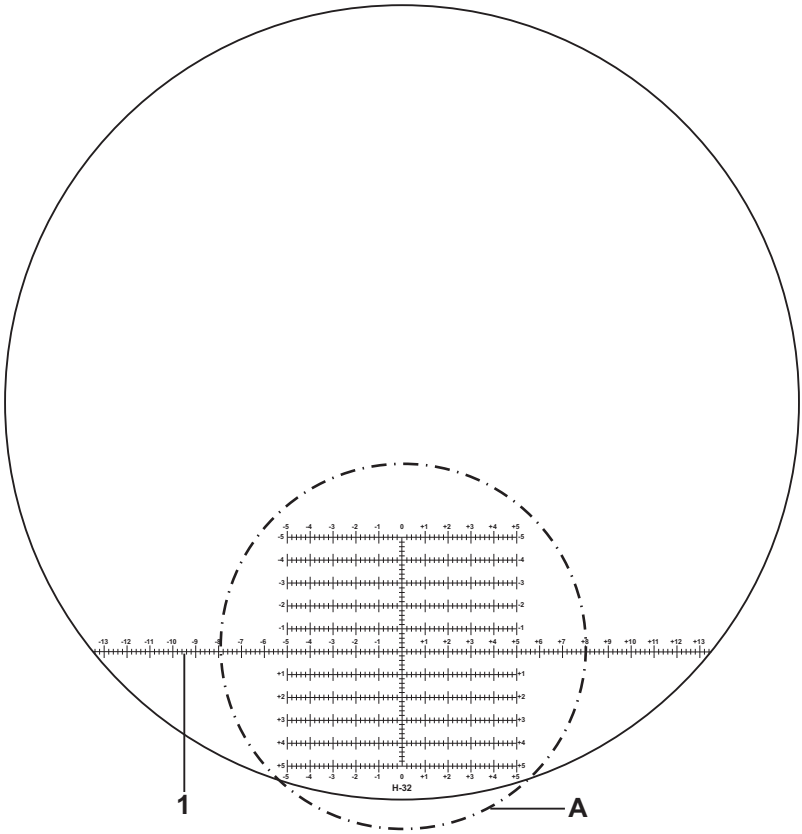

Illustration 3 Reticle Pattern

1 Reference line A Grid

The intervals of the grid are shown in Illustration 4.

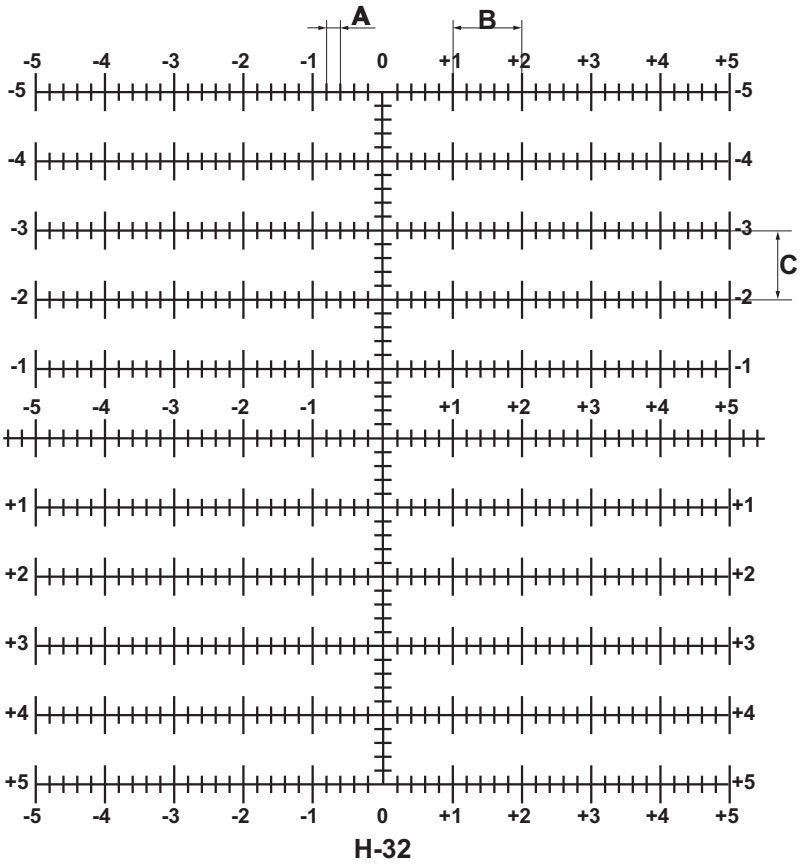

Illustration 4 Sectional View Reticle Pattern

A 0.2 mil ≙ 2 cm/100 m
B 1 mil ≙ 10 cm/100 m
C 1 mil ≙ 10 cm/100 m

1.5.4 Function

The parallel rays coming from the target at setting “∞” of adjustment ring for focusing are imaged vertically and laterally inverted by the objective (5/1) in the first image plane (5/9), in which the reticle (5/8) is located, thereby mirror 1 (5/2) and mirror 2 (5/10) deflect the ray path.
Through adjustment of rotary knob for focusing the reticle (5/8), the field lens (5/7) and the magnification adjustment with erecting system (5/6) are 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 (5/6), which can be moved towards one another in longitudinal direction, the image is pictured upright and non-reversed in the second image plane (5/3). Here it is viewed magnified together with the reticle in the eyepiece (5/4)). The eyepiece is adjustable by -3 dpt to +2 dpt.
The exit pupil (5/5) lies approx. 30.5 mm in front of the first eyepiece lens.

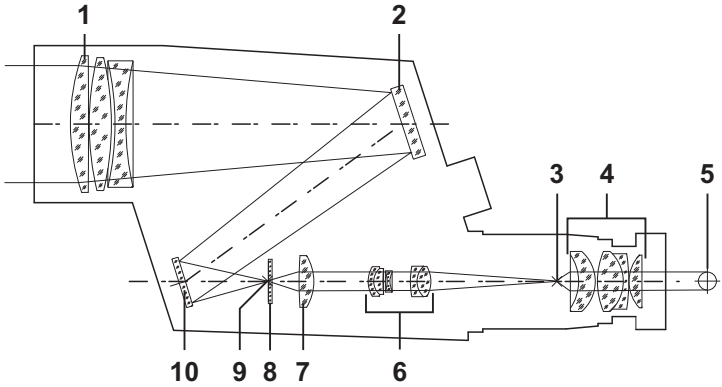

Illustration 5 Optical Structure

1 Objective
2 Mirror 1
3 2nd image plane
4 Eyepiece
5 Exit pupil
6 Erecting system
7 Field lens
8 Reticle
9 1st image plane
10 Mirror 2

1.6 Scope of Supply

The Spotter 45 will be delivered to the corresponding customers in a commercially available carton.
The parts stored in the tool kit bag are not pictured.

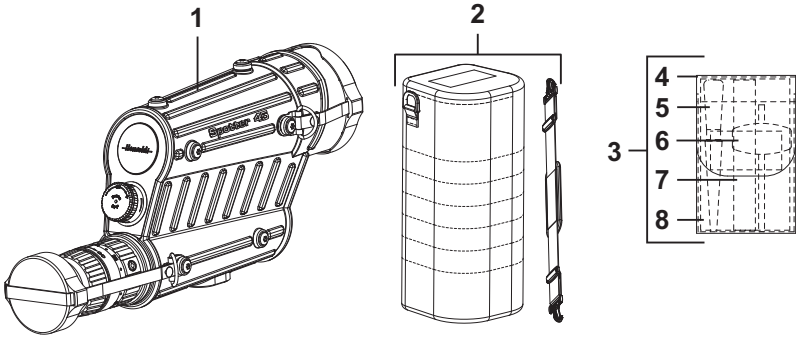

Illustration 6 Scope of Supply

Item	Qty.	Designation	Part Number
1	1	Spotter 45	331060-9300-000
2	1	Carrying Bag with Carrying Strap	10172423
3	1	Tool Kit with contents	331060-9010-000
4	1	Tool Kit TT CIG BAG	10162668
5	1	Dust Brush	10039767
6	1	Screwdriver, TORX 25	331060-1010-000
7	1	Optics Cleaning Cloth	10034420
8	1	Micro-Fibre Cleaning Cloth	10162699
*	1	Adapter Sleeve	331060-0300-000
*	1	Rectangular Socket 48 mm x 48 mm x 10 mm	10177825
*	1	Operating Instructions	OpIn 331060-7044-010

* Not shown

2

Operation and Maintenance

2.1 Operating Instructions

2.1.1 General

The Spotter 45 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 Spotter 45 is to be protected against heavy blows and vibrations.

CAUTION Under no circumstances look through the Spotter 45 at the sun or laser light sources. This could lead to serious eye injuries.

2.1.2 Replacement of Battery

1. Hold onto rotary knob of illumination control (7/3) and unscrew lid of battery compartment (7/1).

NOTE When unscrewing hold onto lid of battery compartment, since there is a spring on the lid and lid would pop off.

2. Remove battery (7/2).
3. Place new battery in mount with positive pole facing lid of battery compartment.
4. Press lid of battery compartment against rotary knob for illumination control position orientated and screw tight. Thereby hold rotary knob for illumination control tight.

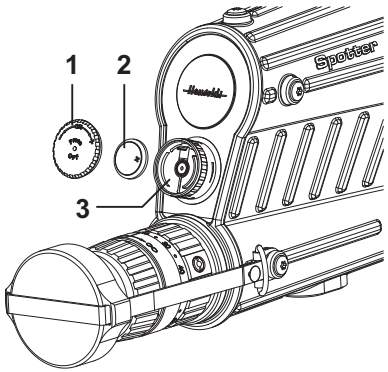

Illustration 7 Replacement of Battery

1 Lid of battery compartment
2 Battery
3 Rotary knob for illumination control

2.1.3 Operation

1. Remove the objective protection cap (8/1) and upon requirement clamp under objective (8/4) (see illustration 9) or place over tripod thread (8/3).

NOTE If protection cap of objective is placed over tripod thread then it can be used as a platform for the Spotter 45.

2. Remove eyepiece protection cap (8/2).

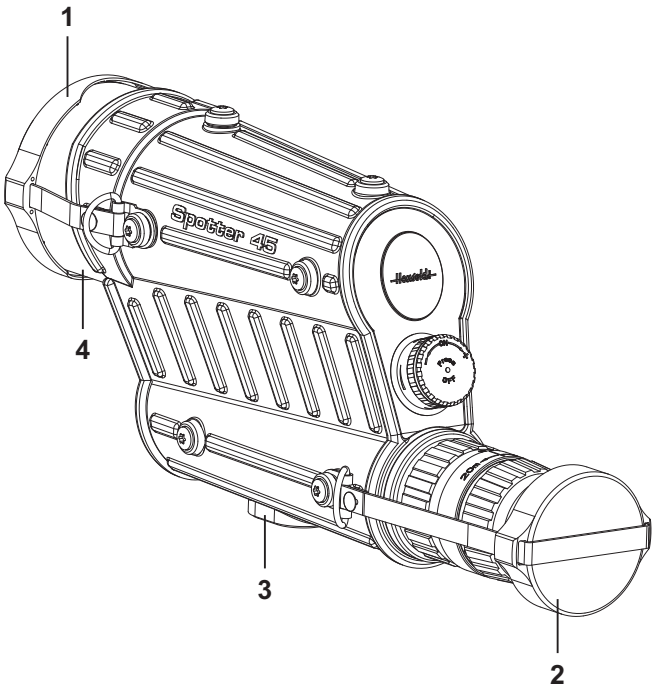

Illustration 8 Removal of protection cap

1 Objective protection cap
2 Eyepiece protection cap
3 Tripod thread
4 Objective

3. Focus reticle pattern by turning eyepiece (9/3)).
4. If necessary, mount Spotter 45 with tripod thread (9/7) on a tripod or tripod head and coarsely sight at object. (Observe operating instructions of tripod or tripod head).
5. Sight at object and focus by turning focusing adjustment ring (9/4)).
6. Set desired magnification by turning magnification adjustment ring (9/5).
7. Under poor light conditions switch reticle illumination on with rotary knob for illumination control (9/1)) and with rotary knob regulate illumination intensity in correspondence to the light conditions.

NOTE When turning reticle illumination on the idle motion range of the rotary knob is ±45°. It can be turned without stop. If brightness does not change while turning, then the maximum value has been reached.

8. Should the Spotter 45 no longer be required switch reticle illumination off by pressing rotary knob for illumination control (9/1). Invert the eyeguard (9/2) in direction of the housing, put eyepiece protection cap (8/2)and objective protection cap (8/1) on and unscrew Spotter 45 from tripod.
9. Is the Spotter 45 to be transported on the carrying strap, fasten one of the snap-hocks of the carrying strap to the clamp (9/6) at the eyepiece (9/3) and the other snap-hock of the carrying strap to the clamp (9/9).
10. Should the Spotter 45 no longer be transported on the carrying strap, stow the Spotter 45 away in the carrying bag.

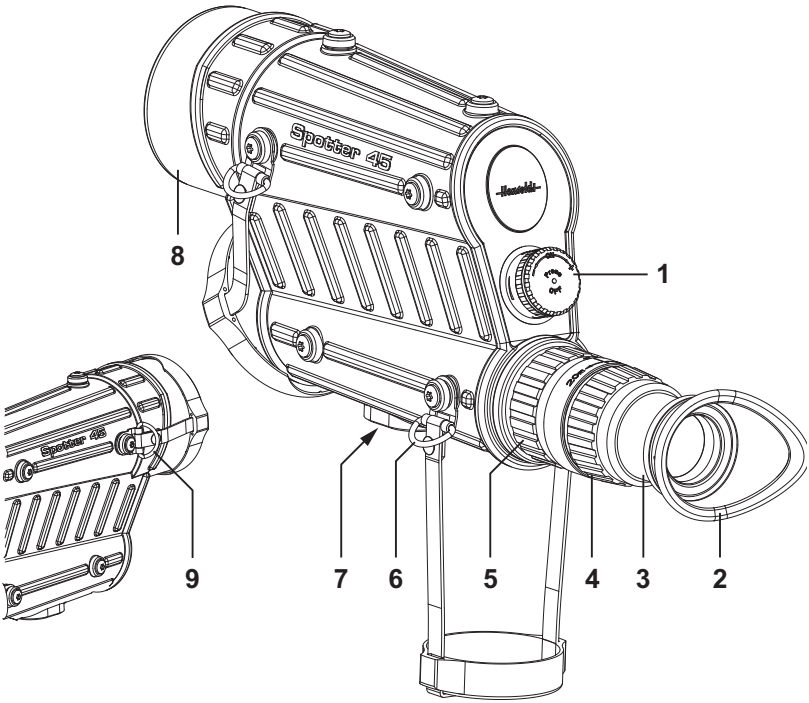

Illustration 9 Operating Controls

1 Rotary knob for illumination control
2 Eyeguard
3 Eyepiece
4 Focusing adjustment ring
5 Magnification adjustment ring
6 Clamp
7 Tripod thread
8 Objective
9 Clamp

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 Spotter 45 operational and protected against intensive wear and tear.

2.2.2 Use at low temperatures

1. The Spotter 45 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 Spotter 45 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 Spotter 45 indicates that device is not sealed properly. Should condensation remain continuously and appear repeatedly return Spotter 45 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 a Spotter 45 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 Spotter 45.
5. Glass components should not be breathed on to warm them up.

6. As described in section 1.5.2 a necessary change in battery (low battery) is indicated by the reticle illumination pulsating.
   Since at low temperatures battery power drops, it is possible that the display function “low. batt.” is activated (at approx. -40 °C), even though battery capacity is still sufficient.

2.2.3 Use at high temperatures

1. Protect Spotter 45 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 Spotter 45 is flawless.
3. Replace Spotter 45 which is not sealed properly and return 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:

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Internet: www.airbusds-optronics.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	2	replace battery	2.3.3	b, a
2	protection caps objective/ eyepiece	damages cleanness	2	replace protection caps clean with cleaning cloth	2.3.4	b, a
3	objective and eyepiece	damages cleanness	2	return for repair cleaning of optics	2.3.5	b, a
4	housing components	mechanical damages, cap, complete cleanness	1	return for repair screw cap, complete clean with cleaning cloth	2.3.5	b, a
5	switch illumination, adjustment focusing / magnification	damages, movability, function cleanness legibility of symbols	4	return for repair clean with ethyl alcohol return for repair	2.3.7 2.3.7	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 (section 2.1.2).

ATTENTION
- Do not store the Spotter 45 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.

2.3.4 Protection Caps

Inspect protection cap for
- tight fit
- damages
- cleanness

Clean protection caps with a damp cleaning cloth and rub dry.

2.3.5 Cleaning of optics and inspection

Inspect eyepiece (9/3) and objective (9/8) for
- damages
- cleanness

If eyepiece or objective are damaged, return Spotter 45 for repair.

Remove any slight residue on glass surfaces with a dust brush first 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 cloth.

2.3.6 Housing

Inspect housing for:
- mechanical damages
- varnish damages
- corrosion
- cleanness.

Should housing be damaged or corroded return Spotter 45 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 sealing ring of lid battery compartment (7/2) for damages and cleanness. Replace, if necessary.

2.3.7 Operating controls

Inspect rotary knob for illumination control with on/off-switch (9/1), magnification adjustment ring (9/5) and focusing adjustment ring (9/4) for
- visible damage
- movement
- function
- cleanness
- legibility of symbols

Should one of the controls be missing or hard to move resp. without function, return Spotter 45 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 Spotter 45 for repair
image misted	moisture inside Spotter 45	return Spotter 45 for repair
reticle pattern blurred, image blurred	eyepiece not focussed, eyepiece or objective unclean, eyepiece or objective misted outside, objective misted inside, focusing not adjusted correctly	focus eyepiece clean eyepiece and/or objective (see 2.3.5) clean eyepiece and/or objective (see 2.3.5) return Spotter 45 for repair adjust parallax setting, if necessary, return Spotter 45 for repair

2.5 Transportation

Before the Spotter 45 is transported it must be packed in commercial packing in such way that possible damage of Spotter 45 is prevented.

2.6 Storage

The Spotter 45 can be stored unlimited.

Before storage
- perform steps stated in maintenance plan 2.3.2
- remove battery
- store all components in a dry room.

Once a year during storage inspect 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 2.1.3
- inspect completeness

Replacement of Eyeguard

1. Remove eyepiece protection cap (8/2)
2. Press ring (10/3) in direction of housing until it hangs freely from the eyepiece sleeve.
3. Remove eyeguard (10/1) from fastening ring (10/2).
4. Press new eyeguard over rim of fastening ring so that the rim of the fastening ring rests in the groove of the eyeguard.
5. Push ring onto rim of the eyeguard.
6. From the eyepiece side press with the thumb against the eyeguard and to the same position of the ring. Press step-wise over the diameter of the eyeguard until stop.

NOTE When pressing ring on care must be taken that the ring is pressed-on uniformly and the eyeguard is not damaged.

7. Evert eyeguard and mount the eyepiece protection cap back on.

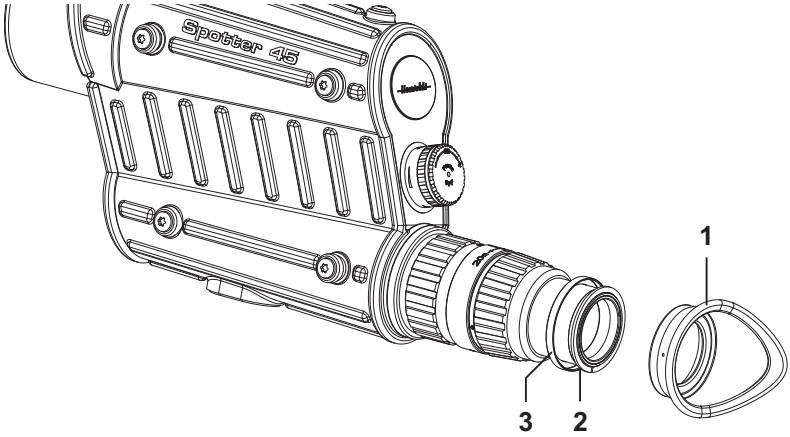

Illustration 10 Replacement of Eyeguard

1 Eyeguard
2 Fastening ring
3 Ring

Replacement of Fastening Ring

1. Remove eyeguard, as described in Annex A.
2. Expand fastening ring (11/2) at the slitted ends and remove from eyepiece support (11/4).

⚠ **ATTENTION** When removing fastening ring observe that ring (11/3) does not fall off the eyepiece support.

3. Expand new fastening ring (11/2) at the slitted ends and push over the eyepiece support so that it rests into the groove of the eyepiece support.
4. Mount eyeguard as described in Annex A.

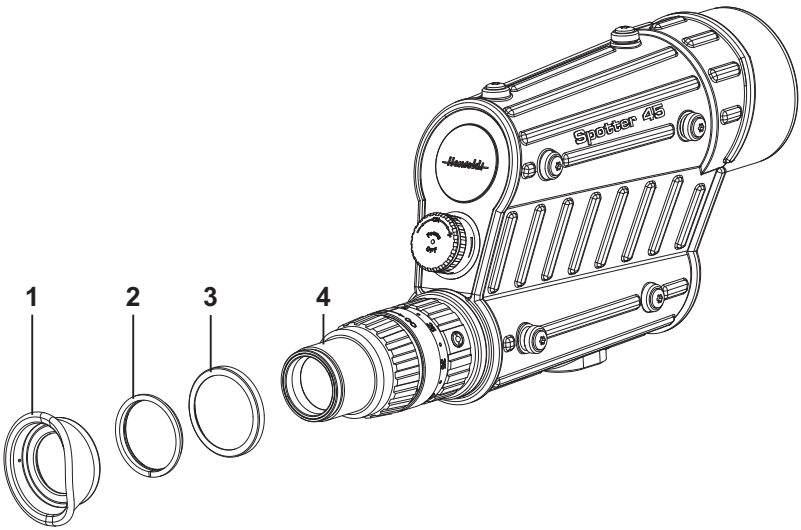

Illustration 11 Replacement of Fastening Ring

1 Eyeguard
2 Fastening ring
3 Ring
4 Eyepiece support