



RED DOT SERIES
ILLUMINATED SIGHTS



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RED DOT SERIES
ILLUMINATED SIGHTS

INSTRUCTION
MANUAL



PROLOGUE

Rapid target acquisition, pinpoint accuracy and wide field of view make the BSA® Red Dot series ideal for handguns, rimfire, rifles, shotguns, pistols, black powders and crossbows. Each Red Dot has a finger adjustable rheostat for variable reticle brightness control and anti reflective coating. The RD30 family of scopes have an integrated 3/8" and 5/8" mounting system for optimum performance and the RD20 series has a 5/8" mount. Selected models feature a state-of-the-art RGB™ Red, Green, and Blue dot reticle for all-day shooting versatility. All Red Dots feature wide field of view, unlimited eye relief and multi-coated optics.

The BSA® RD series illuminated sights have a standard 5 MOA center dot reticle. RGB™ models have an adjustable rheostat equipped with Red, Green, and Blue dot with 3 intensity settings. Non-RGB models illuminate in standard red for all light conditions and their adjustable rheostat has 11 intensity settings and a standard 5 MOA center dot. The TW30RDL and TW30RDLL has a 9 position intensity control and an integral laser.

All models feature a new slanted hood that acts as a built-in sunshade to minimize unwanted glare and operate on a standard 3 volt lithium battery (included). Replacement battery #CR2032. The TW30RDLL includes a detachable tactical light that uses 2 (included) CR123a batteries.

It is important to adjust the center dot intensity to the current shooting light conditions.

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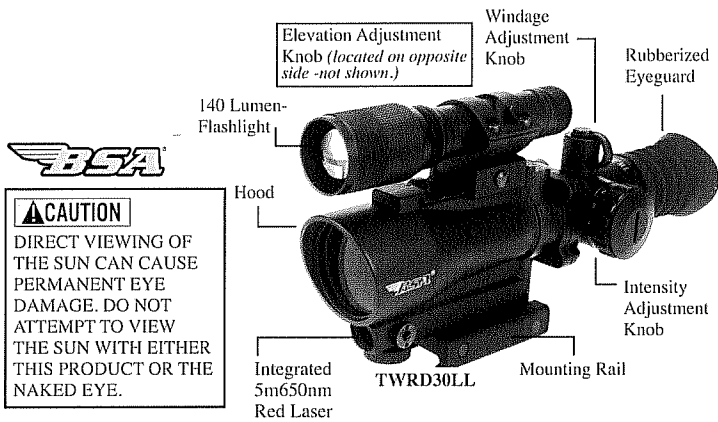
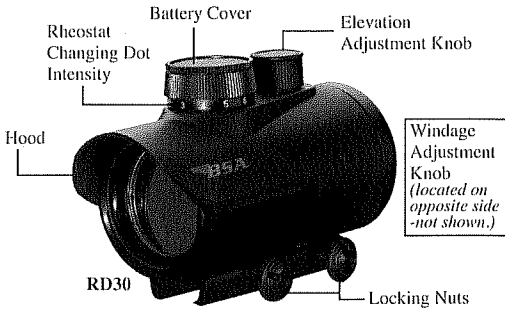
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BSA



The BSA® Red Dot is a lightweight sight for all types of shooting, especially close in and quick target acquisition under any light conditions. The integrated 3/8" and 5/8" mounting system is perfect for rifles, airguns, shotguns, pistols and bow/cross bows. The TW30RDL and TW30RDLL mount is optimized for a picattiney mount commonly found on tactical weapons such as an AR-15 flat top. When you turn the sight on, a small red dot appears in the center of your scope. You can then adjust the brightness of the dot, depending on the brightness of your surroundings. The TW30RDL and TW30RDLL also have an integral laser. Operates on a standard 3 volt lithium battery (included). Replacement battery #CR2032.

BSA® RED DOT SERIES ILLUMINATED SIGHT

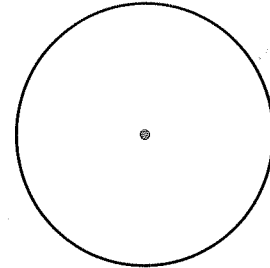


CAUTION
 DIRECT VIEWING OF THE SUN CAN CAUSE PERMANENT EYE DAMAGE. DO NOT ATTEMPT TO VIEW THE SUN WITH EITHER THIS PRODUCT OR THE NAKED EYE.

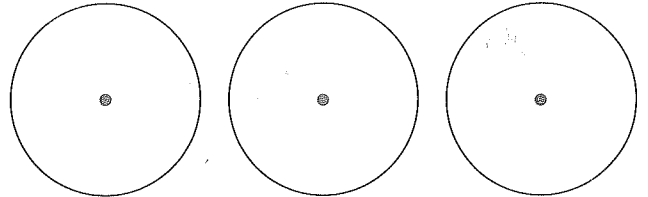
NOTE: KEEP ALL INSTRUCTIONS FOR FUTURE REFERENCE.

BSA® RED DOT SERIES ILLUMINATED SIGHTS RETICLES

I. RETICLES



5 MOA Illuminated Center Red Dot



RGB™ Standard 5 MOA Center Dot Reticle: Red, Green, & Blue

CAUTION THE OBJECTIVE LENS (FRONT) OF THE RED DOT SIGHT IS ANGLED. IT IS ANGLED FOR THE PROPER OPERATION OF THE RED DOT.

Sights With Illuminated Reticles

The battery switch housing is set on top of the eyepiece in alignment with the elevation turret. BSA offers a standard 11 position rheostat, which uses a lithium CR2032 3V battery. The battery is protected against accidental discharge during shipping by a plastic bag. The RD20 has an 11 position rheostat in front of the windage adjustment. The TW30RDL and TW30RDLL has a 9 position rheostat opposite the windage turret.

On sights with settings from 1 to 11 use setting 1 through 3 for lowest light conditions, 4 through 6 for dusk and dawn, 7 through 9 for overcast or cloudy days and 10 through 11 for bright sunny days. Individual scopes may vary and light conditions will change so for best performance always set the dot at the lowest setting that it can clearly be seen. If the dot appears to have a halo or be out of focus the brightness setting should be reduced until it is clear and sharp. On a 9 position rheostat use position 1-3 for lowest light conditions, position 4-6 for cloudy or overcast days and position 7-9 for bright daylight.

With settings from 1 to 3, use setting 1 at lowest light, 2 cloudy or overcast and 3 for brightest conditions. On scopes with Red, Green and Blue dots use the color that shows up the best against the background you are looking at, and set the brightness to match the light conditions.

- Remove the battery compartment cap by turning it counter-clockwise.
- Insert the battery with the positive (+) side facing up.
- Replace the cap by turning it clockwise and tighten to avoid moisture or water from getting inside.
- The illuminated feature is activated by turning the rheostat switch to number 1. Each click will increase the intensity, 11 being the maximum on an RD30, 3 is the maximum on a Red, Green and Blue dot model and 9 is the maximum on a TW30RDL or TW30RDLL.
- To turn the illuminated reticle off, turn the knob to the zero position.
- "To turn the TW30RDL or TW30RDLL laser on set the rheostat to the ON position.
- "To change the batteries on the TW30RDLL tactical light, remove the end cap by turning it counter clockwise. Insert two CR123a batteries + side out and replace cap by turning clockwise.

2. FUNDAMENTALS OF AN ILLUMINATED SIGHT

Six Basic Elements Form The System Of An Illuminated Sight:

I. Objective Lens:

Lens responsible for the amount of light that gets inside the scope. In illuminated sights, the objective lens is angled, this is not a defect. It is angled for the proper operation of the sight.

II. Image System:

A small metal tube with a 50% to 70% transmission mirror, set in a 15 degree slanted angle.

III. Windage and Elevation System:

The image system tube is fixed at one end and free at the other closest to the objective lens, the windage and elevation screws serve as supports for this end while providing movement or correction to the reticle to adjust the aiming point to the real point of impact of the bullet.

IV. Reticle:

The reticle replaces the iron sight system that usually comes with rifles. In the case of Illuminated Sights the reticle is a projection of light forming one or more reticles in one or more colors, depending on the reticle design.

V. Ocular Lens:

The ocular lens seals the end of the sight closest to the eye, responsible for the final collimation of the image.

VI. Rheostat Switch:

Next to the on/off function, it regulates the intensity of the LED diode. On the RW30RDL and TW30RDLL it also turns on the integral laser.

3. MOUNTING THE SIGHT

CAUTION BE SURE THAT THE FIREARM IS NOT LOADED. PRACTICE SAFE FIREARM HANDLING PROCEDURES AT ALL TIMES.

Set the rail onto the base. Align and set the crossbolts into the cut grooves of the base, and tighten each crossbolt with the help of a coin or screwdriver.

CAUTION MAKE SURE THAT THE SIGHT IS NOT IN CONTACT WITH THE RIFLE, AND THAT NO PART OF IT BLOCKS THE OPERATION OF THE ACTION. AVOID OVER-TIGHTENING THE SCREWS ON THE BASE.

4. FOCUSING THE SIGHT

CAUTION DIRECT VIEWING OF THE SUN CAN CAUSE PERMANENT EYE DAMAGE. DO NOT ATTEMPT TO VIEW THE SUN WITH EITHER THIS PRODUCT OR THE NAKED EYE.

Most of the illuminated sights in the market do not have magnification. In the last few years some models appeared on the market in a 3X version, but in both cases the sight does not require focusing.

Parallax:

In illuminated sights, the parallax is set to 50 yards or meters at the factory. There On RD30 and RD20 type sights, the parallax is set to 50 yards or meters at the factory. The TW30RDL types are set at 100 yards. axis in illuminated sights. This is only an optical illusion; the reticle never moves from its zero position.

5. ZEROING THE SIGHT

CAUTION BE SURE THAT THE FIREARM IS NOT LOADED. PRACTICE SAFE FIREARM HANDLING PROCEDURES AT ALL TIMES.

Zero sighting can be done either manually or with an optical collimator (BSA® BS30 Bore Sighter):

- 1) Move the sight back and forth until the correct eye relief distance is achieved.
- 2) Tighten the crossbolt nuts.
- 3) Attach the collimator.

Attaching The BSA® BS30 Bore Sighter To Firearms Other Than Shotguns:

Select the appropriate bore stud from the kit and insert the notched end into the collimator stud housing. Hand-tighten the silver locking screw to secure the stud. Insert the other end of the stud into the muzzle.

Attaching The BSA® BS30 To Shotguns:

Insert the notched end with the adjusting screw/knob into the collimator. Hand-tighten the locking screw. Insert the other end of the stud into the muzzle. Turn the adjusting screw/knob counterclockwise until the desired gauge or bore diameter is achieved and the collimator is secured. The adjustable collimator covers a wide range of different gauges and black powder caliber.

CAUTION IF THE BORE STUD DOES NOT INSERT EASILY, REMOVE AND VERIFY THAT THE CORRECT STUD IS BEING USED.

- 4) Look through the scope and into the collimator. Inside you will see a reference grid. If necessary, rotate the collimator until the grid lines match vertically and horizontally with the reticle vectors.

5) Adjust the windage and elevation turrets until the Red Dot lines up with the center of the collimator's grid. Each division on the grid is equal to 4 MOA or inches at 100 yards.

Pre-zeroing the scope is now complete. Remove the collimator and bore stud from the barrel and secure it in the supplied case.

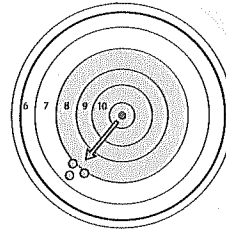
CAUTION EYE AND EAR PROTECTION IS STRONGLY RECOMMENDED. SAFE GUN HANDLING PROCEDURES MUST BE USED AT ALL TIMES. ALL DISCHARGING OF FIREARMS SHOULD BE DONE AT AN APPROVED RANGE OR EQUALLY SAFE AREA.

WARNING IF A BORE SIGHTING COLLIMATOR OR ANY OTHER BORE OBSTRUCTING DEVICE WAS USED, IT MUST BE REMOVED BEFORE PROCEEDING. AN OBSTRUCTION CAN CAUSE SERIOUS DAMAGE TO THE GUN AND POSSIBLE PERSONAL INJURY TO YOURSELF OR OTHERS NEARBY.

6) At an approved range or other safe area, complete the zeroing procedures. Make approximately one-half of the required windage correction, then approximately one-half of the required elevation correction.

Finish by applying the balance of windage and elevation correction. Making large adjustments in two small increments will prevent damage to the scope's spring.

From a steady rest position, fire three rounds at a target 50 yards away. Observe the point of impact on the target and adjust windage and elevation screws as needed to correct aim, and move the reticle to the area of the target where the three bullets impacts are (see page 11). Repeat if necessary. To zero the TW30RDLL laser adjust the elevation with the finger adjustable dial at the front of the laser. Adjust the windage with an allen wrench on the left side of the laser housing.



To place the center of the reticle (red) on the point of impact (orange), turn the elevation turret counter-clockwise to raise the point of impact. Then, turn the windage turret counter-clockwise to move the point of impact to the left.

NOTE:

Each click of adjustment changes bullet strike at a shooting distance of 100 yards by the amount indicated on the windage and elevation knobs. To calculate the click value at distances other than 100 yards, use the following formula:

Divide the distance (number of yards) by 100. The resulting number, when multiplied by the click value stated on the windage and elevation dial plates, will yield the actual click value of the scope at the shooting distance.

$$\text{Distance (yards)} / 100 = N$$
$$N \times \text{Stated Click Value} = \text{Actual Click Value}$$

Once zeroing of the weapon is completed, replace the windage and elevation caps.

Zeroing The Sight Manually:

If you have a bolt action rifle: Open the action of the firearm and remove the bolt. Looking through the bore of the rifle, make sure that the center of the target is in the center of your view.

To pre-zero the sight, adjust the windage and elevation screws so that the image appearing at the center of your bore is the same centered in the riflescope reticle. If the firearm you own is not a bolt action, we recommend the use of an optical collimator.

CAUTION BE CERTAIN THAT THE GUN IS NOT LOADED, THE ACTION IS OPEN, AND THE MUZZLE IS POINTED IN A SAFE DIRECTION. SAFE GUN HANDLING PROCEDURES MUST BE USED AT ALL TIMES.

6. BATTERY REPLACEMENT

How To Replace The Battery:

With a coin or screwdriver, unscrew the battery cap. Place the battery with the positive side up (+ symbol), then replace the cap in the housing firmly to make sure that it is water-tight.

Duracell model DL2032, Sunrise model CR2032, Energizer model ECR2032. Turn the switch on, turn the switch knob clockwise to increase the intensity of the reticle brightness, and counterclockwise to decrease it.

How To Replace The Tactical Battery:

Remove the end cap by turning it counterclockwise. Insert two CR123a batteries + side out and replace end cap by turning it clockwise.

7. MAINTAINING YOUR ILLUMINATED SIGHT

DO NOT attempt to disassemble or clean the sight internally. *This will invalidate the warranty.* If the scope requires repairs or adjustment, complete instructions can be found in the warranty.

The external optical surfaces should occasionally be wiped clean with the lens cloth provided, a soft lint-free cloth, or an optical quality lens paper. Keep the protective lens covers in place when the scope is not in use. Remove any external dirt or sand with a soft brush to avoid scratching the finish. Wipe the scope with a damp cloth, following with a dry cloth. Store the unit in a moisture-free environment.

TROUBLE SHOOTING TIPS:

Inaccuracy Issues

- First check your mount. Using your bare hands only, softly twist the sight in the rings, check for any movement. If there is any movement, re-tighten the mount. Non-permanent thread lock tight is recommended.
- Use a bench rest or sandbag to support the forearm and butt stock when making windage and elevation adjustments. This will help eliminate movement.
- Always follow through with every shot.
- Always use the ammunition of the same bullet type and weight.
- Check that your rifle is properly bedded in the stock. A loose stock can create changes to the point of impact.
- Check that your barrel and chamber are clean. Damaged rifling or excessive grease can cause inaccuracy.
- Always make adjustments in small increments.

COMPARISON CHART:

MODEL	RD20CP	RD20RGBCP	RD30CP	HMRGBD30CP	RD42	RD42CP	TW30RDL	TW30RDL
Magnification	1X	1X	1X	1X	1X	1X		
Eye Relief (in)	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
FOV @ 100 Yds (ft)	45	45	68	68	77	77	19.3	19.3
Tube Diameter	20mm	20mm	30mm	30mm	65mm	65mm	30mm	30mm
Parallax Setting	50 Yards	50 Yards	50 Yards	50 Yards	50 Yards	50 Yards	100 Yards	100 Yards
Weight (oz.)	3.5	3.5	5.94	5.94	7.56	7.56	12.8	17.6
Adjustment Graduation (MOA)	1 click = 1/2"	1 click = 1/2"	1 click = 1/2"	1 click = 1/2"	1 click = 1/2"	1 click = 1/2"	1 click = .25"	1 click = .25"
Max. Internal WIE Adjustment (MOA)	45-45	45-45	45-45	45-45	45-45	45-45	40-40	40-40
Illuminated	5 MOA	5 MOA	5 MOA	5 MOA	5 MOA	5 MOA	5 MOA	5 MOA
Reticle Type	Red Dot	RGB Dot	Red Dot	RGB Dot	Red Dot	Red Dot	Red Dot	Red Dot
Laser/ Light	No	No	No	No	No	No	Laser	Laser/Light

DO NOT open, modify, or service this product, except for changing the battery. For any service or repair, the product must be returned to BSA Optics. Please follow return guidelines. No maintenance required for product to stay in compliance.

For questions on our products and for complete instructions on warranty and repair, contact BSA Optics Customer Service at (954)581-2144 or visit bsaoptics.com

FOR RETURNING PRODUCTS

*Return products following the warranty guidelines, a brief description is included below:

- 1) Remove any accessories and rings.
- 2) Include a note with a brief description of the problem, and please include your full name, address, telephone number, and email address.
- 3) A \$10 check for return shipping and processing fees and proof of purchase.
- 4) We recommend using a shipping method with a tracking number: FedEx, UPS, etc. BSA Optics cannot be held liable for lost or damaged items.

**Please note if your product is not registered you must have proof of original purchase, or you will be subject to repair fees. (see warranty)*

Ship Products To:

BSA Optics, Inc.
1475 S. Sam Houston Blvd.
Houston, MO 65483