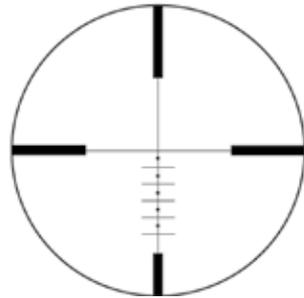


BR



Reticle



Swarovski Optik Ballistic Reticle (BR Reticle)

Instructions for use.

The Swarovski Optik Ballistic Reticle is available in the following riflescopes:

AV 3-10x42
AV 4-12x50 • AV 6-18x50

General Information:

Congratulations on the purchase of your Swarovski Optik rifle scope with the long range Ballistic Reticle (BR). This reticle was designed so that a hunter or target shooter will be able to shoot at longer ranges by taking the guesswork out of how high to hold over a target as with a standard style reticle. In most situations this will also eliminate the need to adjust turret settings to compensate for long range bullet drop. Once set to a desired zero and the Bar and Dot values are determined, just hold over to the appropriate markings.

The BR reticle was developed so that in most instances a 200 yard/meter zero will be all you need and still keep the long range markings within practical shooting ranges. When using this reticle for hunting, please keep in mind the practical range limitations of the cartridge being used as well as the limitations of your own shooting ability. A high quality range finder such as our LG 8x30 Laser Guide is strongly recommended for determining distance.

There are many variables that go into terminal ballistics for hunting, but a good general rule to follow is that deer size game needs a minimum of 1000 foot pounds of energy and elk size game 1500 to 2000 foot pounds for a clean harvest of the animal. Bullet placement, bullet construction and judging wind drift are also equally important factors. The use of rests, bi-pods, shooting sticks, and the like are always advocated for long range shooting.

One of the advantages to the Swarovski Optik BR system is that there will be less likelihood of wounding game at longer ranges because you will know where to hold to place the bullet where you want it to go. Another advantage is not having to determine how high the bullet will be at closer ranges with a far zero distance on the main central crosshair. When most rifles are zeroed in at 250 yards to 500 yards (or further), the mid range trajectories, from the muzzle to the zero distance, can become too high for comfort in situations that close shots present themselves (4 to 12 inches high depending on zero distance). The BR reticle allows you to keep mid range trajectories to a minimum with a 200 yard zero while having an adequate amount of reference points for long range precision shooting. In the event the rifle will be used for very long distance target shooting almost any reasonable zero can be used where short mid range trajectories are not a concern.

Once zeroed on the main crosshair the BR reticle gives the shooter 10 reference points in the form of Bars and Dots for long distance shooting. Swarovski Optik supplies decals for many popular calibers using factory ballistics. If your caliber is not one of these or you reload, we supply blank decals so you can fill in your own ballistic data. You can determine this information by logging on to our website at www.swarovskioptik.com and clicking on "Products", "Riflescopes", "Swarovski Optik TDS/BR Ballistic Calculator", then "BR Reticle". You will now be at the BR Login Form Page. In the lower left hand corner, click on "description" for the BR Calculator instructions. Or, simply call customer service at 1-800-426-3089 for assistance.

Sighting in and using your Ballistic Reticle

Using the decals supplied with Factory Ballistic Data

The zero distance on these decals is based at 200 yards. If one of these decals is the round you are using, sight in your rifle at 200 yards and place the decal on the stock of your rifle for quick reference and you are ready to go. If you only have a 100 yard range, these decals have data of how high to sight in at 100 yards to obtain the 200 yard zero. These factory ballistic decals are based on manufacturers factory data and in most cases are from 24 inch barrels.

Factors that can change these values are different barrel lengths, great change in altitude, shooting at steep angles, temperature and humidity. It is always best to practice shooting at farther distances to double check impact distance values, including the environment and conditions you will be hunting or shooting in.

Note - The yardage values on the Factory Ballistic decals are based on the following conditions:

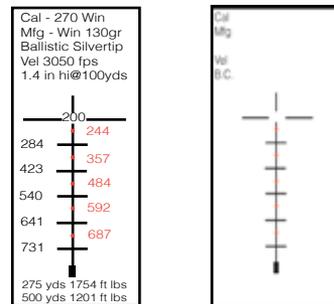
Altitude – Sea Level

Temperature – 59 degrees F, 15 degrees C

Relative Humidity – 78%

Incline Angle – 0 degrees (Flat horizontal plane)

Swarovski Optik Ballistic Reticle Decals



A word about the energy figures. Every bullet has a maximum amount of energy, measured in foot pounds at the muzzle that continuously decreases as the bullet slows.

The accepted norms for minimum amounts of muzzle energy needed to cleanly harvest deer size game have been 1000 ft lbs, and for elk size game 1500 ft lbs. Foot pounds of energy is only one factor of terminal ballistics. There are others, primarily bullet placement, bullet construction, wind and your own personal limitations. The first energy figure is the maximum yardage where you will have at least 1700 ft lbs of energy left for larger elk size game. The second energy figure will be the yardage figure where you will have approximately 1200 ft lbs left for deer size game.

The large Alaskan bears usually require at least 3000 foot pounds with the properly constructed bullet. African or other dangerous game often require upwards of 4000 foot pounds or more! The energy figures on the BR decals are for your reference and are intended for non dangerous game.

Using the BR calculator on the Swarovski Optik website

The BR calculator on our website is another way to determine downrange values. Go to www.swarovskioptik.com to click on the Ballistic Calculator. There is a pdf you can download with more specific instructions.

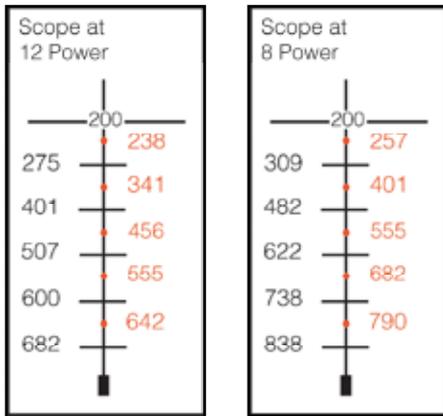
Maximum Scope Power and Operating Power

The distance values of the dots and bars of the BR reticle are determined at the riflescope's maximum power. In all likelihood, if a long shot presents itself the maximum power is usually chosen anyway. This does not mean the scope has to be on maximum power all the time. If you are hunting in an area where you may have to shoot 200 yards or under, you can place the magnification on minimum or lower powers to gain the benefit of the wider field of view and rely on the main central crosshair, just as you would a standard style Plex crosshair. Another reason you may want to turn the power down is to brighten the image in very low light conditions. Your zero of 200 yards on the central crosshair will not change regardless of the power you are on. Just keep in mind that if the magnification is turned down from the scopes maximum power, the values of the bars and dots will indicate distances further away (see example). This is because the reticle is in the 2nd focal plane and the further the power is turned down, the further the distance the bars and dots will mean. If desired, indicated distances of the Bars and Dots at lower powers can be determined by getting on our website at www.swarovskioptik.com and clicking on the BR calculator and lowering the operating power to a desired level or by calling customer service at 800-426-3089.

Example of BR reticle with the scope at maximum power and at a reduced power.

Cartridge – 30-06 Springfield manufactured by Hornady with a 150 gr InterBond bullet at 2910 fps zeroed at 200 yards on the main central crosshair.

Rifle Scope – Swarovski Optik AV 4-12x50 with BR reticle.
Distances in yards.



The zero of 200 yards on the main central crosshair does not change regardless of power setting, just like any conventional Plex or standard crosshair.

Shooting Angles

Probably the greatest factor to effect the values of the bar and dot impact points are steep angles. Ballistics are determined over a flat or horizontal plane. Most people will shoot over a target when steep angles come into play. The following is an example of what happens to a bullet's impact point when the rifle barrel is changed *up or down* to a 30 degree angle.

Cartridge: 300 WSM 165 gr Nosler Partition 3130 fps 200 yard zero

Bullet impact distances for BR reticle

| No Angle | | 30 degree Angle | |
|----------|-------|-----------------|-------|
| 245 | dot 1 | 282 | dot 1 |
| | bar 1 | 327 | bar 1 |
| 362 | dot 2 | 409 | dot 2 |
| | bar 2 | 482 | bar 2 |
| 491 | dot 3 | 548 | dot 3 |
| | bar 3 | 608 | bar 3 |
| 601 | dot 4 | 664 | dot 4 |
| | bar 4 | 716 | bar 4 |
| 695 | dot 5 | 764 | dot 5 |
| | bar 5 | 809 | bar 5 |

As you can see shooting at steep angles has the effect of increasing the yardage distances of the dot or bar. In this case if you had ranged to the game animal at 424 yards and decided that bar 2 (430 yards) would be the best place to hold. If you raised or lowered the barrel to a 30 degree angle, the bullet impact of bar 2 would be at 482 yards. Coming up to the next intersection, dot 2 would put you at 409 yards, more appropriate for that 424 yard shot at this angle.

Since it is virtually impossible to know what angle or distance may present itself at any given time, the best rule to follow when you encounter steeper angles is to hold to the next intersection above where you think you should.

You can experiment with different angles with your own cartridge by getting on the BR Ballistic Calculator on our website at www.swarovskioptik.com and changing the "Incline Angle" degree field.

Distances between bars and dots

The following are the distances that the dots and bars represent below the main horizontal crosshair **in inches, at 100 yards**, at the scope's maximum power.

Dot 1 – 0.90 in

Bar 1 – 1.80 in

Dot 2 - 3.60 in

Bar 2 – 5.40 in

Dot 3 – 7.20 in

Bar 3 – 9.00 in

Dot 4 – 10.80 in

Bar 4 – 12.60 in

Dot 5 – 14.40 in

Bar 5 – 16.20 in

The following are the distances that the dots and bars represent below the main horizontal crosshair in centimeters, at 100 meters, at the scope's maximum power.

Dot 1 – 2.5 cm

Bar 1 – 5.0 cm

Dot 2 – 10 cm

Bar 2 – 15 cm

Dot 3 – 20 cm

Bar 3 – 25 cm

Dot 4 – 30 cm

Bar 4 – 35 cm

Dot 5 – 40 cm

Bar 5 – 45 cm

If you have any questions please call customer service at 800-426-3089.

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