



RETICLE MANUAL

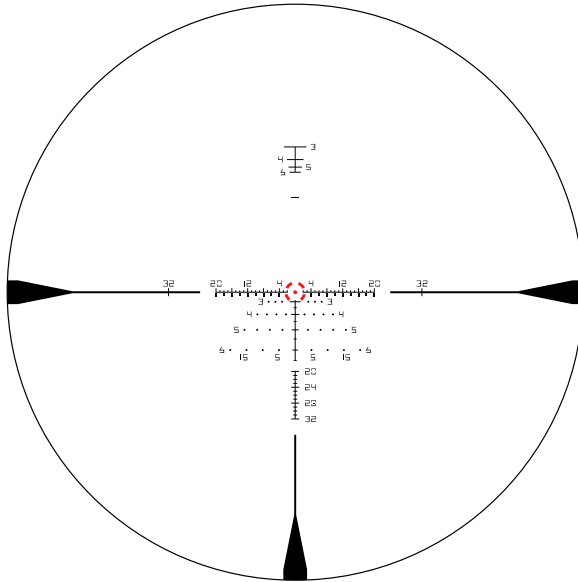
RAZOR[®] HD GEN III

RIFLESCOPE

1-10x24 | EBR-9 BDC MOA RETICLE | FIRST FOCAL PLANE

THE VORTEX® EBR-9 BDC MOA RETICLE

You have purchased a Vortex® riflescope equipped with the EBR-9 BDC MOA reticle. Designed to maximize long distance shooting and ranging abilities, the EBR-9 BDC MOA reticle can be used to effectively determine ranges, holdovers, and windage corrections.



EBR-9 BDC MOA Reticle

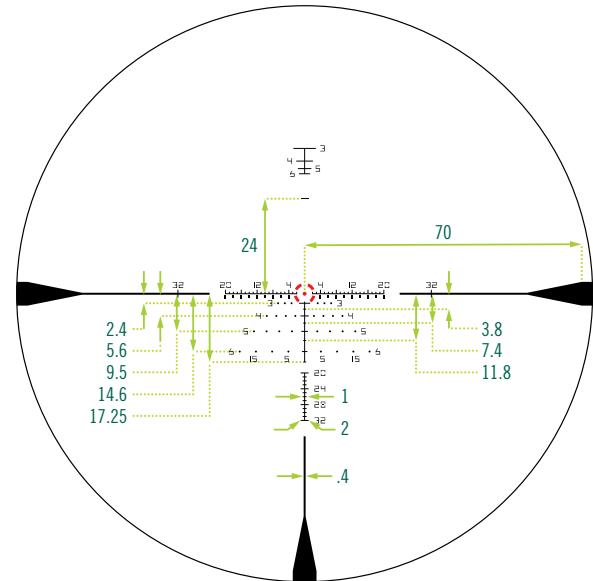
MOA Subtensions

The EBR-9 BDC reticle is based on Minute of Angle (MOA) subtensions. MOA measurements are based on degrees and minutes: 360° in a circle, 60 minutes in a degree for a total of 21,600 minutes. These angular measurements are used to estimate range and correct for bullet-drop in riflescopes. 1 MOA will correspond to 1.05" for each 100 yds. or 29.1mm for each 100m of distance.

First Focal Plane Reticles

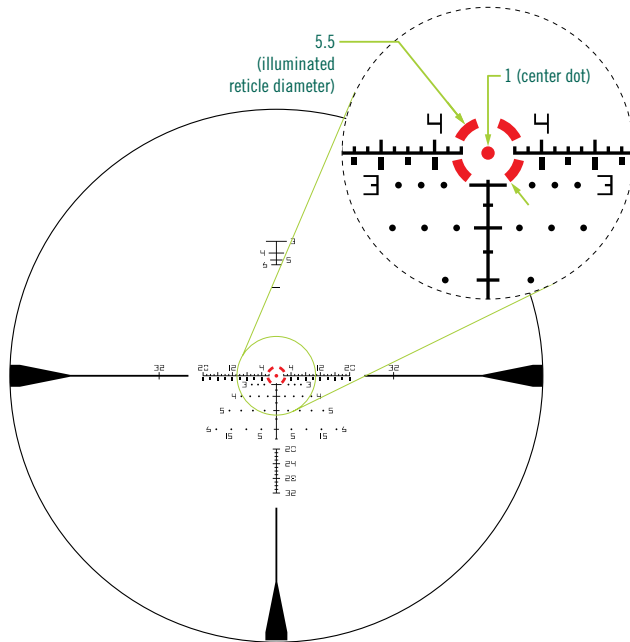
In the Razor® HD Gen III first focal plane riflescopes, the listed MOA subtensions of the EBR-9 BDC reticle are valid at all magnification levels. This means the shooter can use the magnification level most appropriate for the situation and still have effective holdover and windage reference marks. This is also extremely valuable in a high-stress situation, as the shooter does not have to remember to set the scope to one particular magnification to get valid holdovers—an action necessary with the more common second focal plane reticles.

EBR-9 BDC MOA Subtensions



Subtensions measured in MOA.
Reticle image shown for representation only.

EBR-9 BDC MOA Subtension (Continued)



Subtensions measured in MOA.
Reticle images shown for representation only.

RANGING

MOA measurements are very effective for ranging using a simple formula. To use this formula, the shooter needs to know the size of the target or nearby object in inches.

MOA Ranging Formula

$$\frac{\text{Target Size (in.)} \times 95.5}{\text{Measured MOA}} = \text{Range (yds.)}$$

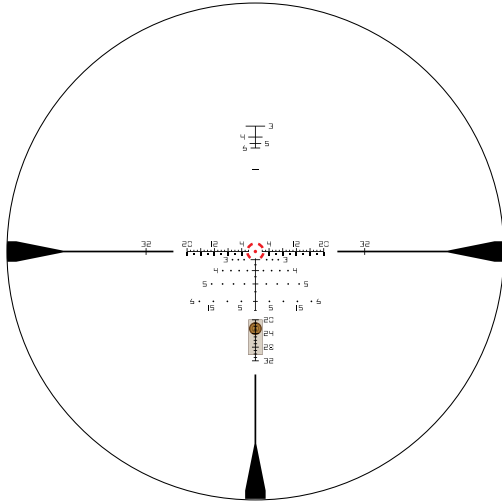
$$\frac{\text{Target Size (cm)} \times 34.38}{\text{Measured MOA}} = \text{Range (m)}$$

Using either the vertical or horizontal MOA scale, place the reticle on a target of known dimensions and read the number of MOA spanned. You will obtain maximum accuracy in ranging by calculating exact MOA measurements. MOA should be estimated in quarters if possible.

Accurate measuring will depend on a very steady hold. The rifle should be solidly braced using a rest, bipod, or sling when measuring. Once you have an accurate MOA reading, use the formula to calculate the distance.

NOTE: In the MOA ranging formula, a shooter may substitute 100 for 95.5 in the interest of speedier calculations. Be aware that this will produce a five percent over-estimation error of the yardage distance obtained.

Example

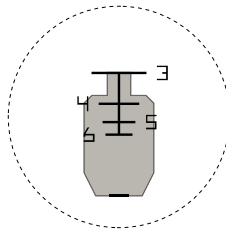


Ranging a target stand that is one yard tall at 11.3 MOA to get 304 yds.

$$\frac{36 \times 95.5}{11.3 \text{ MOA}} = 304 \text{ yds.}$$

Ranging:

The ranging feature at the top of the reticle can be used to range a silhouette target. Place the horizontal hashmark at the base of the target. With the firearm firmly supported, look to the top of the target to see which reference line the target aligns with. The 3, 4, 5, and 6 indicate the range in hundreds of yards. The horizontal lines correlate to the width of the shoulders of a silhouette target at each distance.



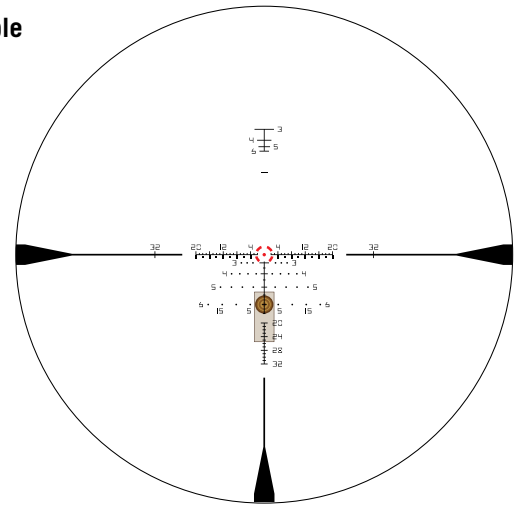
Elevation Holdovers

The EBR-9 BDC reticle makes it easy to quickly select the correct bullet-drop reference. If the shooter prefers to dial for bullet-drop using the Elevation Turret, knowing bullet-drop in MOA rather than inches will allow for much faster adjustments as the MOA can be quickly read on the Elevation Turret.

If shooting at a known range, the shooter can simply use the holdover marks. The 3, 4, 5 and 6 indicate the holdover in hundreds of yards. If shooting at a target at 300 yds, simply holdover on the 3 reference line under the horizontal stadia.

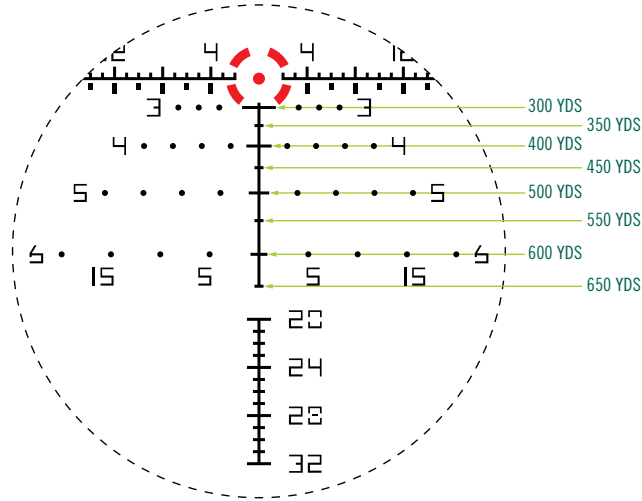
Once the distance has been calculated using the EBR-9 BDC reticle, or a laser rangefinder, the EBR-9 BDC can be used for rapid holdover correction for bullet-drop of the cartridge being used. To get the most benefit out of the EBR-9 BDC equipped riflescope, Vortex Optics **HIGHLY RECOMMENDS** shooters learn their bullet-drop numbers in MOA rather than linear units. Remember, 1 MOA will correspond to 1.05" for each 100 yds. or 29.1mm for each 100m of distance.

Example



Holdover correction for 600-yard shot. No wind.

EBR-9 BDC MOA Subtension (Yardage)



Standard Bullet Drop for Popular 5.56mm / .223 Loads

5.56 mm / .223 55 - 77 grain, boat tail bullets, 2700 - 3000 FPS muzzle velocity

Main crosshair zeroed 200 yards

Hashmark	Distance	Bullet Drop
1st	300 Yards	7.5 Inches
2nd	400 Yards	23.5 Inches
3rd	500 Yards	50 Inches
4th	600 Yards	92 Inches

Standard Bullet Drop for Popular 7.62mm / .308 Loads

7.62 mm/.308 Winchester 168 grain, boat tail bullets, 2650 FPS muzzle velocity

7.62 mm/.308 Winchester 175 grain, boat tail bullets, 2600 FPS muzzle velocity

Main crosshair zeroed 200 yards

Hashmark	Distance	Bullet Drop
1st	285 Yards	7.2 Inches
2nd	385 Yards	22 Inches
3rd	485 Yards	47.4 Inches
4th	600 Yards	92 Inches

Note: It is important to understand that the previously-listed subtensions and yardages are designed to work with the riflescope set at the highest magnification. The main crosshair zeroed at 200 yards can always be used at any magnification.

WINDAGE CORRECTION

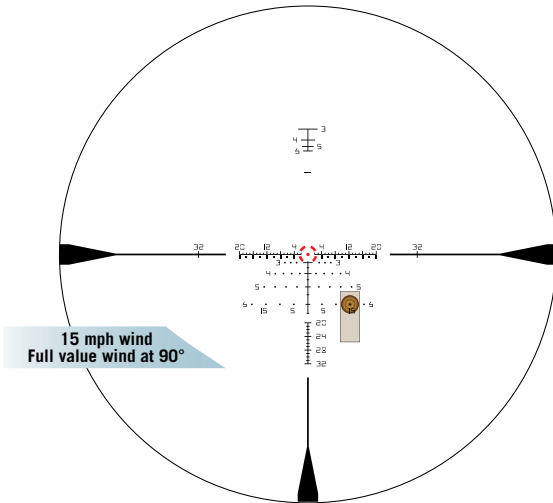
Using the reticle for effective windage leads will require thorough knowledge of your weapon system's ballistic performance under varying conditions and experience in reading wind strengths. As a bullet drops, it is important for the shooter to learn a particular weapon's windage corrections in MOA. Always hold the reticle into the wind when correcting for wind drift.

Basic Windage Correction on Center Crosshair

When dialing elevation adjustments, the center horizontal crosshair will be used for windage or moving target leads. MOA marks are graduated in 1 MOA increments on the top of the horizontal crosshair, and 2 MOA increments on the bottom. MOA marks are BDC down to the 20 MOA mark, then in 1 MOA increments from 20 MOA to 32 MOA.

Note: Starting at the vertical stadia, each dot represents a 5, 10, 15, 20 MPH crosswind hold.

Example



Windage correction at 600 yards and 15 MPH crosswind.



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