RETICLE MANUAL

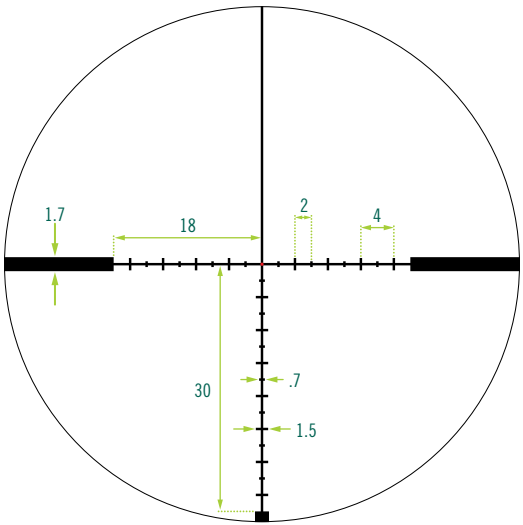
VMR-3
MOA RETICLE

SECOND FOCAL PLANE

VMR-3 MOA RETICLE

Designed to maximize long-distance shooting and ranging abilities, the VMR-3 MOA reticle can be used to effectively determine ranges, holdovers, windage corrections, and moving target leads. The fine center crosshair subtensions on the VMR-3 MOA reticle were carefully chosen to provide the optimum balance between precision aiming and low-light visibility.

Subtension Chart



Note: The VMR-3 reticle is available in second focal plane (SFP) riflescopes. The MOA values are valid at the highest magnification on most models. Check your riflescope's product manual to validate the subtended magnification of your scope.

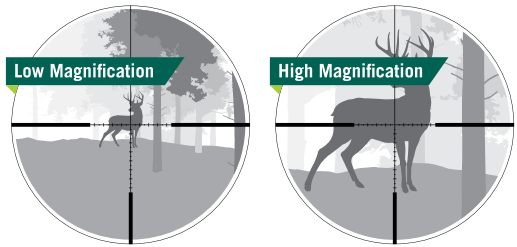
MOA Subtensions

The VMR-3 MOA reticle is based on Minute of Angle (MOA) subtensions. MOA is an angular unit of measurement used to account for bullet drop, wind corrections, and range estimation. 1 MOA will correspond to 1.047" for each 100 yards.

Note: Although 1 MOA is very commonly corresponded to 1" at 100 yards, this is not correct. 1 MOA at 100 yards equals 1.047". Calling 1 MOA, 1" per hundred yards may be acceptable for short distances, but will result in a five percent error in ranging and holdovers. This could result in missed shots.

Second Focal Plane Reticles

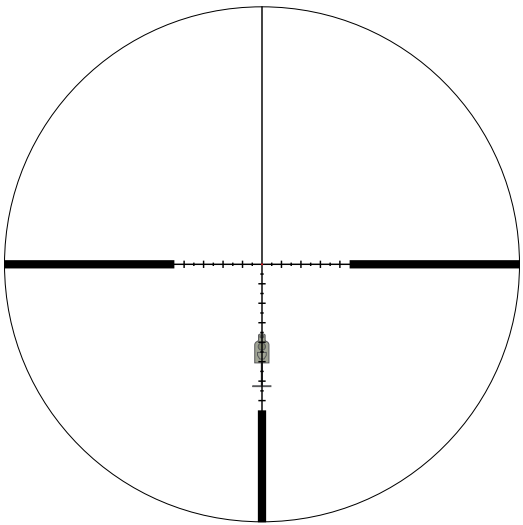
In SFP riflescopes, the listed MOA subtensions are calibrated to a specific magnification, typically the highest. The shooter can use the center crosshair on any magnification, but when using the hashmarks for longer-range shots or windage corrections, the shooter must be on the calibrated magnification. If the shooter is not on the calibrated magnification, additional calculations must be done to determine the hashmark's value.



Elevation Holdovers

Correcting for bullet drop is easy with the VMR-3's 2 MOA hashmarks. The shooter uses the bullet's drop in MOA and holds on the corresponding hashmark.

Example



17.5 MOA reticle holdover at 625 yds. No wind.

Note: You can also use the reticle like a ruler when sighting-in and while making on-the-fly corrections. Measure the difference between the bullet's point of impact and your point of aim, and either hold on that respective hashmark, or dial in the correction on the turret, using the value of the corresponding hashmark.

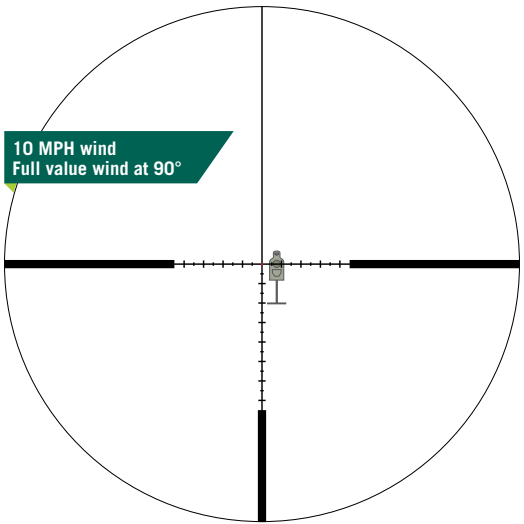
Windage and Moving Targets

Using the VMR-3 reticle for effective windage and moving target leads will require thorough knowledge of your weapon system's ballistics performance under varying conditions, and experience in reading wind and target speed. As a bullet drops, it is important for the shooter to learn a particular weapon's windage/moving target corrections in MOA rather than inches. Always hold the reticle into the wind.

Basic Windage Correction Holdovers

When dialing elevation, use the horizontal stadia for windage or moving target lead corrections.

Example

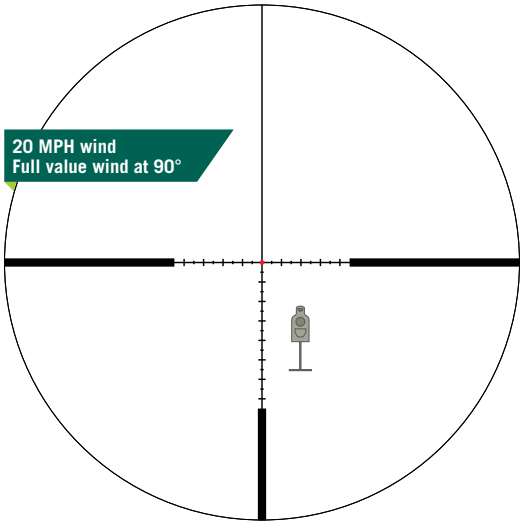


3 MOA correction for 10 mph wind.

Basic Windage and Elevation Correction Holdovers

When using the reticle for elevation correction rather than dialing, you can still use the MOA hashmarks on the horizontal stadia line to help visually reference windage corrections. Remember to hold the reticle into the wind.

Example



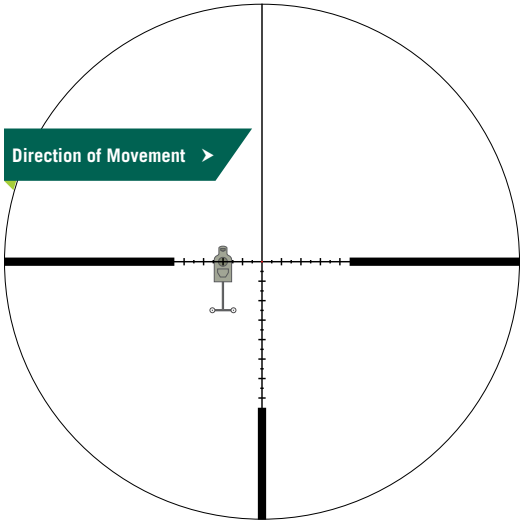
12 MOA elevation correction at 500 yds., 8 MOA windage correction for 20 mph wind.

Basic Moving Target Lead Correction

When estimating moving target leads, use the MOA marks on the horizontal stadia line. Estimating moving target leads will require knowing distance, wind speed, moving target speed, and total bullet flight time (including rifle lock time). Bullet flight times can be roughly calculated based on FPS velocities or a ballistic calculator.

Note: Correctly estimating moving target leads is difficult and requires practice and knowledge beyond the scope of this manual.

Example



8 MOA correction for a target moving 3 mph.

RANGING

MOA measurements are 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, cm, or meters.

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

$$\frac{\text{Target Size (inches)}}{\text{Measured MOA}} \times 87.3 = \text{Range (m)}$$

$$\frac{\text{Target Size (m)}}{\text{Measured MOA}} \times 3438 = \text{Range (m)}$$

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

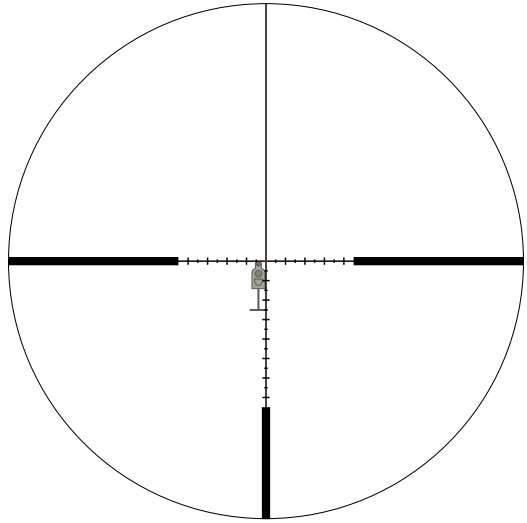
For the most accurate solution, use the longest dimension. If the object is taller than it is wide, it is best to use the object's height in the formula.

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 the best results if measured to the nearest 1/4 MOA.

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

Note: In the MOA ranging formula, you can substitute 100 for 95.5 for easier math. Be aware this will produce a five percent over-estimate error of the yardage distance obtained.

Example



Ranging a 6' target (72") at 10 MOA yields 688 yds.

$$\frac{72"}{10\ \text{MOA}} \times 95.5 = 688\ \text{yds.}$$

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