

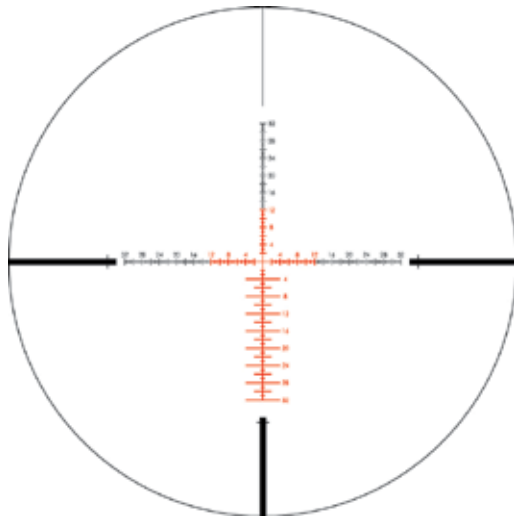
# WIPER<sup>®</sup> PST

EBR-4 SFP MOA RETICLE

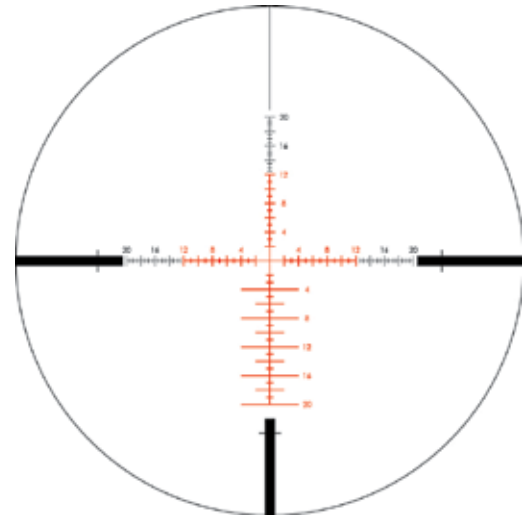


## VORTEX<sup>®</sup> SECOND FOCAL PLANE EBR-4 MOA RETICLES

Designed to maximize long-distance shooting and ranging abilities, the EBR-4 MOA reticle can be used to effectively determine ranges, holdovers, windage corrections and moving target leads. Ultra-precision laser etching on the glass reticle ensures that MOA specifications are kept to the tightest tolerances possible. The fine center crosshair subtensions on the EBR-4 MOA reticle were carefully chosen to provide the optimum balance between precision aiming and low light visibility.



3-15 X 44 EBR-4 SFP



5-25 X 50 EBR-4 SFP

## MOA SUBTENSIONS

The EBR-4 reticle is based on minute-of-angle (MOA) subtensions. MOA measurements are based on degrees and minutes: 360 degrees 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 trajectory drop in riflescopes.

A minute of angle will subtend 1.05 inches at a distance of 100 yards (29.1 mm at 100 meters). Viper PST riflescopes with MOA adjustments use .25 minute clicks which subtend .26 inches at 100 yards (7.3 mm at a 100 meters), .52 inches at 200 yards (14.6 mm at 200 meters), .78 inches at 300 yards (21.9 at 300 meters), etc.

Viper PST second focal plane (SFP) reticles are located internally near the scope's eyepiece behind the image erecting and magnifying lenses.

This style of reticle does not visually change in size when you change

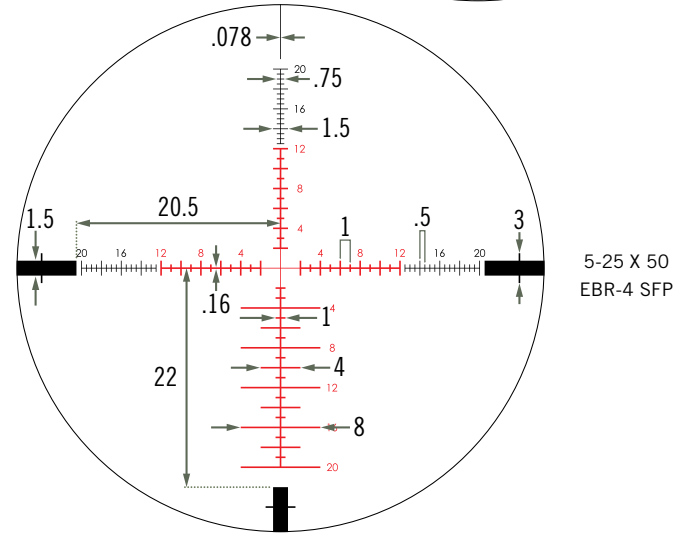
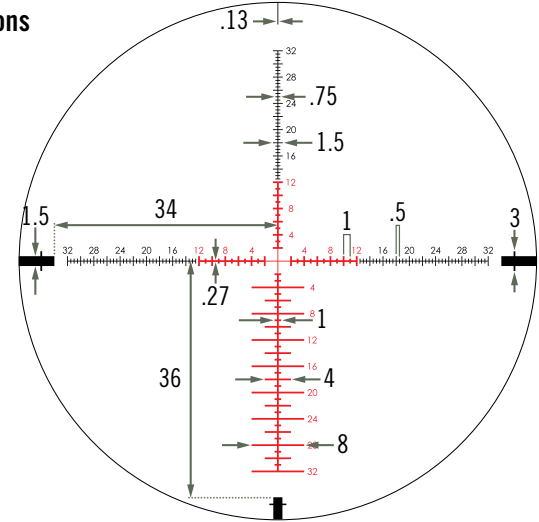
the magnification and will always maintain an ideally-sized appearance. **When using the PST second focal plane reticle it's very important to understand that the displayed reticle subtensions are only correct at the scopes highest magnification.** If a shooter attempts to range or compensate for bullet drop/wind drift using the marked reticle subtensions at a magnification other than the highest setting, error will result. The center crosshair zero is not affected by magnification, and does not change with the setting.

### Estimating MOA

Although 1 MOA is very commonly corresponded to 1 inch at 100 yards, this is not quite correct: 1 MOA at 100 yards equals 1.05 inches. Calling 1 MOA an inch per 100 yards may be acceptable at shorter distances, but it will cause a five percent error in ranging and holdover adjustments. This will result in missed shots at longer distances.

## Reticle Subtensions

3-15 X 44  
EBR-4 SFP



5-25 X 50  
EBR-4 SFP

## RANGING

MOA reticles are effective for ranging using simple formulas. To use these formulas, the shooter needs to know the size of the target or nearby object in inches or centimeters.

### MOA Ranging Formulas

$$\frac{\text{Target Size (Inches)} \times 95.5}{\text{Measured MOAs}} = \text{Range (Yards)}$$

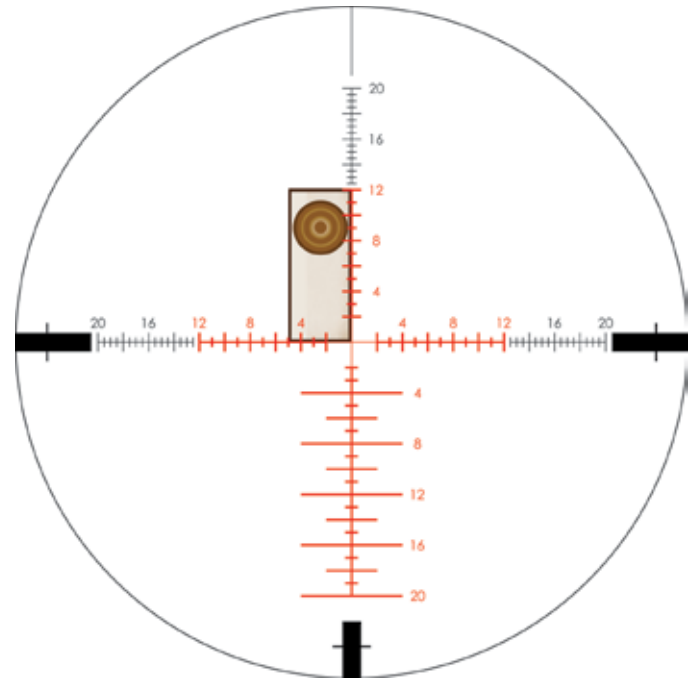
$$\frac{\text{Target Size (CM)} \times 34.37}{\text{Measured MOAs}} = \text{Range (Meters)}$$

Using either the vertical or horizontal MOA scale, place the reticle on a target of known dimensions and read the number of MOAs spanned. You will obtain maximum accuracy in ranging by calculating exact MOA measurements. MOAs should be estimated in 1/4s 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 yards 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 6-foot target (72 inches) at 12 MOAs yields 573 yards.

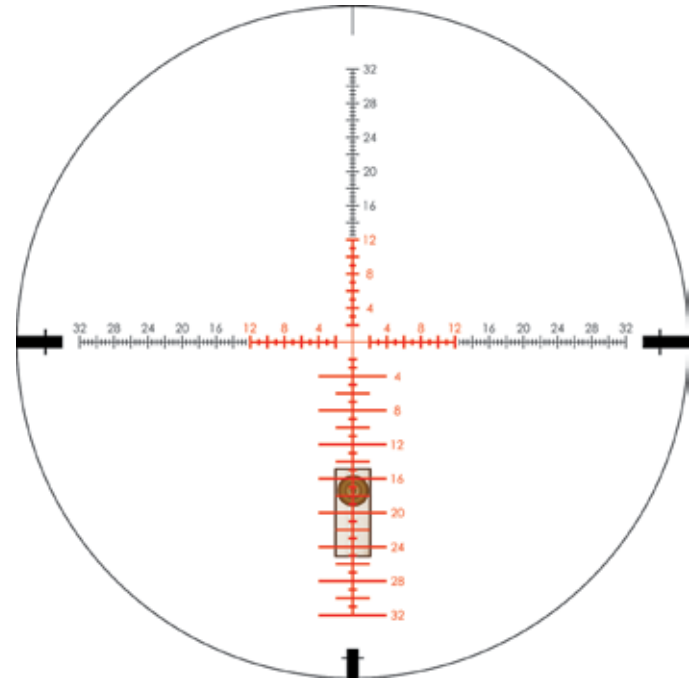
$$\frac{72 \times 95.5}{12 \text{ MOA}} = 573 \text{ Yards}$$

## ELEVATION HOLDOVERS

Once the distance has been calculated using the EBR-4 MOA reticle or a laser rangefinder, the EBR-4 can be used for rapid holdover correction for bullet drop of the cartridge being used. To get the most benefit out of the EBR-4 equipped riflescope, Vortex Optics highly recommends shooters learn their bullet drop numbers in MOAs rather than inches.

Since the EBR-4 reticle is scaled in MOAs, it is an easy job to quickly select the correct drop reference line once the shooter knows the bullet drops in MOAs. If the shooter prefers to dial come ups for bullet drop using the elevation knob, knowing bullet drops in MOAs rather than inches will allow for much faster adjustments as the MOAs can be quickly read on the elevation knob.

### Example



17.5 MOA reticle holdover at 625 yards. No wind.

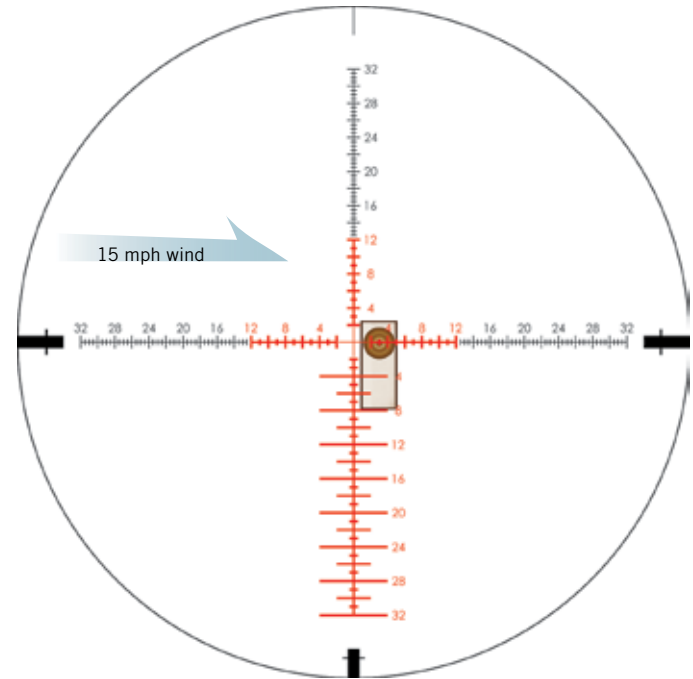
## WINDAGE AND MOVING TARGETS

The EBR-4 MOA reticle is effective when used for wind and moving target leads. Using the reticle for effective windage and moving target leads will require thorough knowledge of your weapons system's ballistic performance under varying conditions and experience in reading wind strengths and target speeds. As in bullet drops, it is important for the shooter to learn a particular weapon's windage/moving target corrections in MOAs rather than inches. Always hold the reticle into the wind.

### Basic windage correction on center crosshair

When dialing elevation come ups, the center horizontal crosshair will be used for windage or moving lead corrections.

### Example

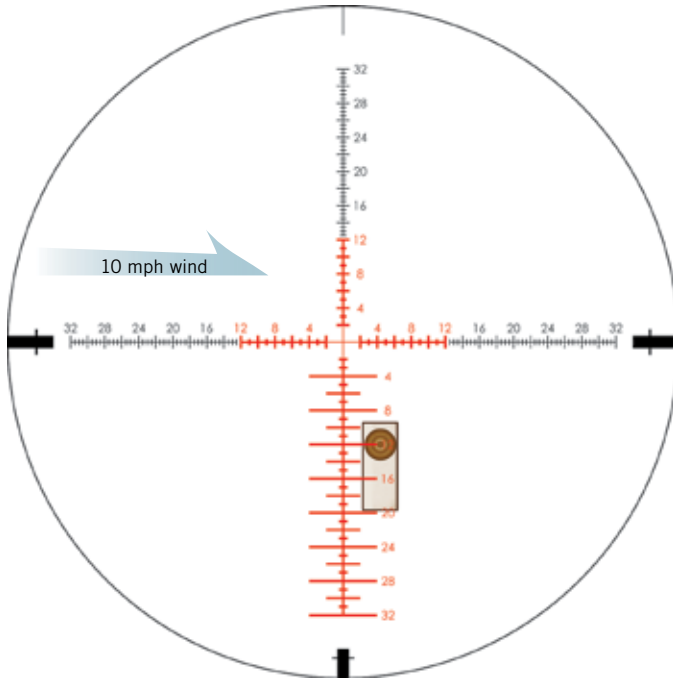


3 MOA correction for 5 mph wind at 700 yards. Elevation already dialed into turret.

### BASIC WINDAGE CORRECTION USING DROP LINE ON RETICLE

When using the reticle for elevation correction rather than dialing, the MOA marks on the center horizontal crosshair can still be used to help visually reference windage corrections.

#### Example



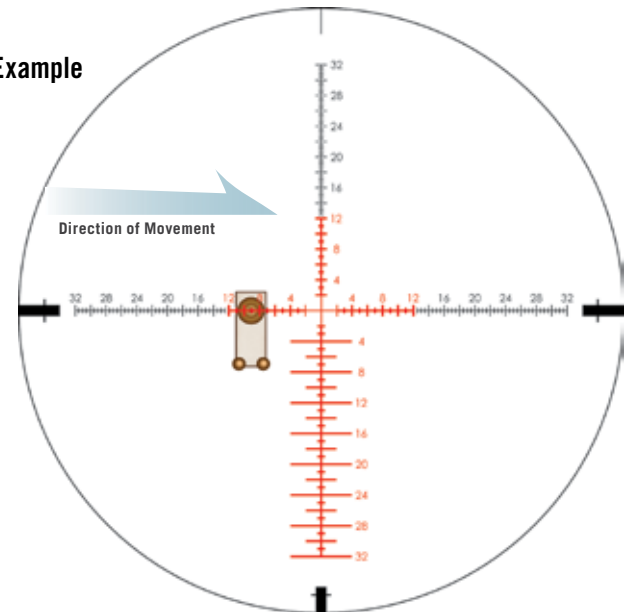
4 MOA reticle windage correction at 500 yards in 10 mph crosswind using 12 MOA reticle drop line.

### BASIC MOVING LEAD CORRECTION

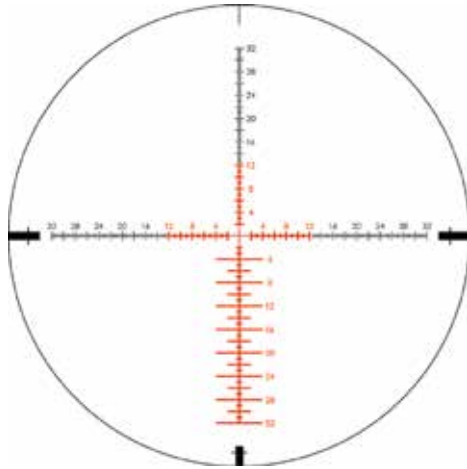
When estimating moving target leads, the MOA marks on the center horizontal crosshair can be used. Estimating moving leads will require knowing yardage distance, wind speed, moving target speed and total bullet flight times including rifle lock time. Bullet flight times can be roughly calculated based on fps velocities or a ballistic calculator.

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

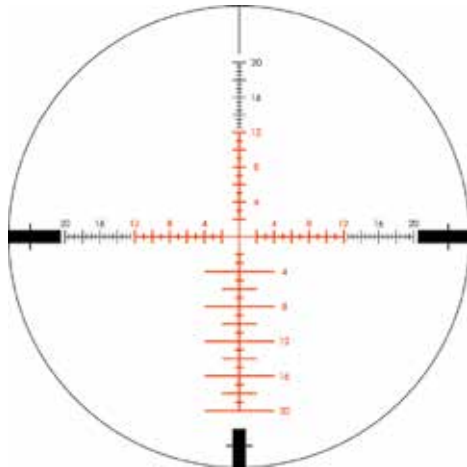
#### Example



9.4 MOA reticle correction for a target moving at 3 mph at 800 yards. No wind. Elevation already dialed into turret.



3-15 X 44 EBR-4 MOA Reticle



5-25 X 50 EBR-4 MOA Reticle

## THE VIP WARRANTY

We build optics based on our commitment to your absolute satisfaction. That's why Vortex products are unconditionally guaranteed and we make this Very Important Promise to you—a Very Important Person.

Rest assured that in the event your Viper PST becomes damaged or defective, Vortex Optics will repair or replace the riflescope at no charge to you. Call Vortex Optics at 800-426-0048 for prompt, professional, and friendly service.

Vortex Optics  
2120 West Greenview Drive  
Middleton, WI 53562  
service@vortexoptics.com



Visit [www.vortexoptics.com](http://www.vortexoptics.com) for more information. Canadian customers may visit [www.vortexcanada.net](http://www.vortexcanada.net) for customer service information.

The VIP Warranty does not cover loss, theft, deliberate damage or cosmetic damage that does not hinder the performance of the product.



#PST-EBR4-SFP-MOA-5A

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