



PRODUCT MANUAL

# RAZOR<sup>®</sup> HD GEN III

RIFLESCOPE

## SPECIFICATIONS

Waterproof	IPX7
Fogproof	Argon gas purged
Length	10.1" (256.5mm)
Mounting Length	4.5" (114.3mm)
Weight	21.5 oz. (w/o battery)
Eye Relief	3.32" (84.3mm)
Field of View	1x magnification: 116' @ 100 yds. (22°) 10x magnification: 11.7' @ 100 yds. (2.23°)
Battery	CR2032

## VORTEX® RAZOR® HD GEN III RIFLESCOPES

At Vortex Optics, the need for high-performance, precision optics is the driving force behind all that we do. We carefully built the Razor® HD Gen III riflescope to provide shooters with the ultimate short and medium-range tactical riflescope.



- 1 Objective Lens
- 2 Elevation Adjustment Dial
- 3 Illumination Dial
- 4 Magnification Adjustment Ring
- 5 Reticle Focus
- 6 Ocular Lens
- 7 Windage Adjustment Dial



Images are for representation only. Product may vary slightly from what is shown.

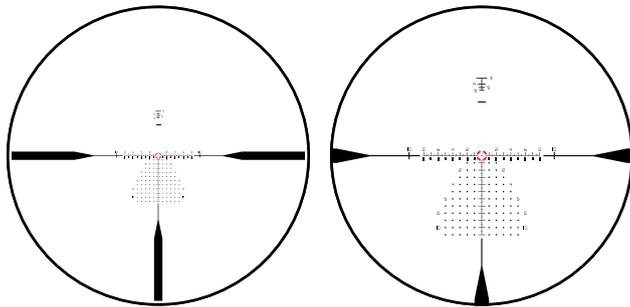
## UNDERSTANDING THE RIFLESCOPE

### Reticle Focal Plane

All riflescope reticles can be termed either first focal plane (FFP) or second focal plane (SFP), depending upon the reticle's internal location within the riflescope. This riflescope features a first focal plane reticle.

### First Focal Plane Reticles

FFP reticles are located within the riflescope near the windage and elevation turrets in front of the image-erecting and magnifying lenses. This style of reticle will visually grow and shrink as you change the magnification. The advantage of an FFP reticle is that the reticle subtensions used for ranging, holdovers, and wind drift corrections are consistent at all magnifications. Usually, the reticle will appear heavier at higher magnifications and finer at lower magnifications.



Low magnification  
example of EBR-9C MRAD Reticle

High magnification  
example of EBR-9C MRAD Reticle

### Ocular Focus

The ocular focus is essentially a one-time adjustment used to focus the reticle for maximum sharpness. This adjustment is slightly different for every shooter. A clearly focused reticle is a critical component for accurate shooting.

### Ocular Focus—Reticle Focus Adjustment

Your riflescope uses a fast-focus eyepiece designed to quickly and easily adjust the focus on the riflescope's reticle. To adjust the reticle focus:

1. Look through the riflescope at a blank white wall or up at the sky.
2. Turn focus knob fully outward (counterclockwise).
3. Turn the eyepiece focus knob inward while taking short glances (2-3 seconds) through the riflescope until the reticle image is as crisp as possible.



**TIP:** Make this adjustment quickly as your eye will try to compensate for an out-of-focus reticle.

**WARNING:** Looking directly at the sun through a riflescope, or any optical instrument, can cause severe and permanent damage to your eyesight.

### Magnification

The magnification adjustment is used to change the magnification level, or "power," of the riflescope—adjusting from low to high magnification depending on the shooter's preference.

### Magnification Adjustment

Rotate the indicator bar to the desired magnification.



### Switchview™ Throw Lever

Make magnification adjustments smooth and easy by attaching the included Switchview™ Throw Lever.

#### Installation

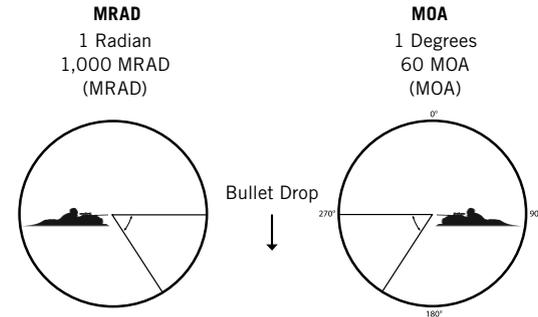
1. Properly mount your rifle scope and have the Switchview™ ring, lever, screw, wrench, and some lubricant available.
2. Find the center of travel on your rifle scope's magnification adjustment ring and place a small mark at this point as a reference for positioning.
3. Apply one drop of lubricant to the ball of the Switchview™ ring.
4. Slide the Switchview™ ring over the eyepiece and onto the magnification ring. Gently spread the ring apart – just far enough to get it over the eyepiece.
5. Carefully insert the ball of the Switchview™ ring into the socket of the lever by GENTLY working the lever onto the lubricated ball.
 

**NOTE:** Precise tolerances ensure the ball and socket fit together very tight.
6. Insert the Allen Screw through the unthreaded hole in the lever and into the ring and tighten only until SNUG and the ring doesn't slip when rotated. If you use a torque wrench, tighten to 2.2 inch-pounds (in./lbs.). When properly installed, a gap will remain between the two parts at the screw connection. Caution: Do not over-tighten. Over-tightening may cause damage to the Switchview™ and/or rifle scope.
7. Test to ensure the Switchview™ lever is in the best position for you. To adjust, simply loosen the screw and reposition the lever to a more comfortable position. Then, retighten the screw and test the new position.



### Arc Measurements

Riflescopes will use one of two arc measurements: **Milliradians (MRAD)** or **Minute of Angle (MOA)**.



**MRAD** arc measurements are based on the concept of the radian. There are 1,000 milliradians in a radian. A milliradian is always 1/1000th of any unit. So, 1 MRAD is 1m at 1000m, 1 yd. at 1000 yds., or 1 in. at 1000 inches. Most riflescopes using MRAD turrets will adjust in 1/10 MRAD increments. Adjustments can be felt by mechanical “clicks,” which subtend .10 units for each 100 units of distance (e.g. 0.1 yd. or 0.36" at 100 yds.; 0.2 yd. or 0.72" at 200 yds.; or 1cm at 100m, 2cm at 200m).

**MOA** arc measurements are based on the concept of degrees and minutes in a circle. There are 360° in a circle, and 60 minutes in a degree. One MOA will always subtend 1.05" for each 100 yds. of distance. In other words, if a rifle and scope were zeroed at 100 yds. and the target is moved out to 200 yds., the bullet's impact will be 1.05" (1 MOA) lower on the target at 200 yds. Most riflescopes using MOA turrets will adjust in 1/4-minute increments. Adjustments can be felt by mechanical “clicks,” which subtend .26" for each 100 yds. of distance.

**NOTE:** These measurements are often rounded down to 1 MOA equaling 1" at 100 yds., and each adjustment (each mechanical click) equaling 1/4" at 100 yds.

### Turrets

Turrets are used to adjust the bullet's point of impact and are marked in either MOA or MRAD. If you are unsure of which scale is used, reference the top of the adjustment turret.

There are two turrets on your riflescope. The turret on the top of the riflescope is the Elevation Turret and is used to adjust the point of impact up and down. The turret on the riflescope's right-hand side is the Windage Turret and is used to adjust the point of impact left and right. Vortex® riflescopes incorporate precision, finger-adjustable Elevation and Windage Turrets with audible and tactile clicks.

### Capped Turrets

The turrets on the riflescope are capped. You will need to remove the caps prior to making adjustments to the turrets.



### Turret Adjustments

Your riflescope features adjustable Elevation and Windage Turret dials with audible and tactile clicks. Each click moves the bullet's point of impact 1/4 MOA (for a MOA designated scope) or 0.1 MRAD (for MRAD designated scope).

### To make turret adjustments:

1. Remove the turret caps.
2. Following the directional arrows, turn the dials in the direction you wish the bullet's point of impact to go.
3. When finished adjusting, replace the turret caps.

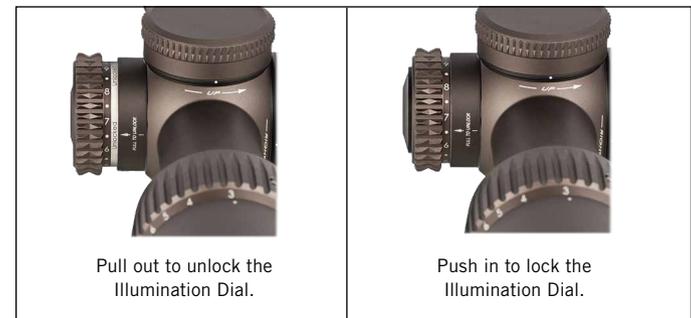
### Image Sharpness—Parallax Fixed Parallax Setting

Your scope comes equipped with a fixed parallax setting. The scope parallax is set for 150 yards.

### Illumination— Locking Side Illumination Control

Your riflescope uses a variable intensity reticle illumination system. Integrated on the side focus dial for easy access, the illumination can be set and locked at your preferred setting.

To activate the illumination, pull out the dial and adjust by rotating the adjustment dial in either direction. The Illumination Dial allows for 11 levels of brightness intensity; an "off" setting between each level allows the shooter to turn the illumination off and return to a favored intensity level with just one click.



## RIFLESCOPE MOUNTING

To get the best performance from your Vortex® riflescope, proper mounting is essential. Although not difficult, the correct steps must be followed. Please follow the instructions below for the proper scope mounting procedure, or go to [VortexOptics.com](http://VortexOptics.com) for a video tutorial.

If you are unsure of your abilities, use the services of a qualified gunsmith.

### Riflescope Mounting Checklist

- Gun vise or a solid platform/rest for your rifle
- Scope rings/mount
- Torque wrench
- Reticle leveling tool, feeler gauges, or weight on a rope

### Rings and Bases

Following the manufacturer's instructions, mount a high quality base and rings to your firearm. The Razor® HD Gen III 1-10x24 riflescope features a 34mm main tube. Ring height for the riflescope will depend on the firearm and mount being used. Consult the ring and base manufacturer for suggested heights.

AR-style rifles will usually require an extra-high mounting height on a specialized cantilever-style mount such as the Vortex® Precision Extended Cantilever Mount shown below.



**NOTE:** Vortex Optics recommends not exceeding 18 in./lbs. of torque on the ring screws, and not exceeding 35 in./lbs. on the base screws. If using something other than a Vortex® mount, verify torque from manufacturer specifications. **DO NOT** use a thread locking compound on the threads. Thread locking agents lubricate the threads, which can increase the applied torque. If thread locker is used on the threads, do not exceed 11 in./lbs. on the ring screws.



**RECOMMENDATION:** Pick up the Vortex® Torque Wrench Mounting Kit that comes with a complete set of bits needed to install Vortex® scopes and rings!

### Eye Relief and Reticle Alignment

After installing the bottom half of the cantilever mount to the mounting base, place the riflescope on the bottom ring halves and loosely install the upper ring halves. Before tightening the scope ring screws, adjust for maximum eye relief to avoid injury from recoil:

1. Set the riflescope to its highest magnification.
2. Slide the riflescope as far forward as possible in the rings.
3. While viewing through the riflescope in a normal shooting position, slowly slide the riflescope back toward your face. Pay attention to the field of view. Stop sliding the riflescope back as soon as you see the full field of view.
4. Without disturbing the front-back placement, rotate the riflescope until the vertical crosshair exactly matches the vertical axis of the rifle.

**NOTE:** Using a reticle leveling tool, a plumb bob, a bubble level, or an adjustable set of feeler gauges placed between a one-piece base and the flat bottom of the riflescope's center section will help with this procedure.

5. After aligning the reticle, tighten and torque the ring screws per the manufacturer's instructions. Use caution and do not overtighten.

## Bore Sighting

Initial bore sighting of the riflescope will save time and money at the range. Do this by using a mechanical or laser bore sight according to the manufacturer's instructions, or by removing the bolt and sighting through the barrel on some rifles.

## Centering of the Reticle

The Razor® HD Gen III riflescope is pre-set from the factory with the reticle in the center of the adjustment ranges. This is the best position to begin sight-in. If you have changed the settings and wish to reset the reticle to the center, this can be done easily:

1. Remove the windage and elevation turret caps.
2. Turn the windage and elevation turrets clockwise until stopped.
3. Turn windage and elevation turrets counterclockwise 2.5 rotations to approximately center the reticle.

## To visually bore sight a rifle:

1. Place the rifle solidly on a rest and remove the bolt.
2. Sight through the bore at a target approximately 100 yards away.
3. Move the rifle and rest until the target is visually centered inside the barrel.
4. With the target centered in the bore, make windage and elevation adjustments until the reticle crosshair is also centered over the target.

## Final Range Sight-In

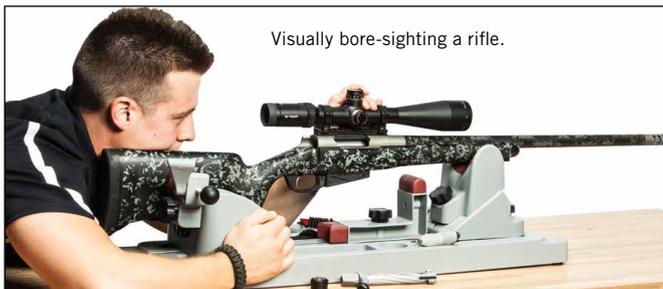
After the riflescope has been bore sighted, final sight-in should be done at the range using the exact ammunition expected to be used while hunting or competitive shooting. Sight in the riflescope at the preferred distance. 100 yards is the most common zero distance, although a 200 yard zero may be preferred for long range applications.

Be sure the reticle is in focus. (See *Ocular Focus—Reticle Focus Adjustment* section on page 5).

1. Before you begin, be sure you are in a safe environment for shooting, know your target and what is beyond it, and be sure to follow all safe shooting practices.
2. To start, verify your bore sight by placing a target at 50 yards, and shoot a three-shot group. If you have a consistent group, continue by moving your target to your desired zero distance.
3. Take another three-shot group with your target at your desired zero distance. Next, adjust the reticle to match the approximate center of the shot group.

**NOTE:** If the rifle is very solidly mounted and cannot be moved, simply look through the scope and adjust the reticle until it is centered on the group.

4. Adjust your point of aim back to the bullseye, and carefully fire another three-shot group. See if the bullet group is centered on the bullseye. This procedure can be repeated as many times as necessary to achieve a perfect zero.



### Reindexing Turret Caps

After the rifle and scope have been zeroed in, the elevation and windage dials should be reindexed to their zero indicators. This will allow you to accurately keep track of elevation or windage corrections dialed on the turrets in the field, and quickly return to an original zero-point setting.

1. While holding the elevation/windage turret cap firmly between thumb and forefinger to prevent any rotation, use the 2mm hex wrench to loosen and remove the central screw on top of dial.
2. Gently pull the turret dial straight up and off the turret post, being careful not to rotate the post.
3. Reinstall the turret dial, lining up the "0" mark with indexing mark on the scope body and replace the central screw on top of dial.
4. Replace the turret cap.



## MAINTENANCE

### Cleaning

Your Vortex® riflescope requires very little routine maintenance other than periodically cleaning the exterior lenses. The scope's exterior may be cleaned by wiping with a soft, dry cloth. When cleaning the lenses, be sure to use products that are specifically designed for use on coated optical lenses.

- Be sure to blow away any dust or grit on the lenses prior to wiping the surfaces.
- Using your breath, or a very small amount of water or pure alcohol, can help remove stubborn things like dried water spots.

### Lubrication

All components of the riflescope are permanently lubricated, so no additional lubricant should be applied.

**NOTE:** Other than to remove the turret caps, do not attempt to disassemble any components of the riflescope. Disassembling of riflescope may void warranty.

### Storage

If possible, avoid storing your scope in direct sunlight or any very hot location for long periods of time.

### Replacing the Battery:

1. Unscrew the outer cap with a coin.
2. Remove the CR2032 battery.
3. Replace with a new CR2032 battery.



## TROUBLESHOOTING

Please check the following items prior to returning a riflescope for service.

### Sighting-In Problems

Many times, problems thought to be with the scope are actually mounting problems. Be sure the mounts are properly torqued to the rifle and the scope is secured so it doesn't twist or move in the rings. An insufficient windage or elevation adjustment range may indicate problems with the base mount, base mount holes drilled in the rifle's receiver, or barrel/receiver alignment.

### Check for Correct Base and Ring Alignment

1. Center the scope reticle. (See *steps in Bore Sighting section on page 12*).
2. Attach bore sight or remove bolt and visually bore sight rifle.
3. Look through the scope. If the reticle appears significantly off center on the bore sight image, or when compared to the visually centered target when looking through rifle's bore, there may be a problem with the bases or rings being used. Confirm that correct base and rings are being used—and in the proper orientation.

### Grouping Problems

There are many issues that can cause poor bullet grouping.

- Be sure that rings are correctly torqued per the manufacturer's instructions.
- Be sure that all screws on rifle's action are properly tightened.
- Be sure rifle barrel and action are clean and free of excessive oil or copper fouling.
- Maintain a good shooting technique and use a solid rest.



## VIP WARRANTY

### OUR UNCONDITIONAL PROMISE TO YOU.

We promise to repair or replace the product. Absolutely free.

- ▶ **Unlimited.**
- ▶ **Unconditional.**
- ▶ **Lifetime Warranty.**

Learn more at [VortexOptics.com](http://VortexOptics.com)

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*Note: The VIP Warranty does not cover loss, theft, deliberate damage, or cosmetic damage not affecting product performance.*

For additional and latest manuals, visit [VortexOptics.com](http://VortexOptics.com)



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Patent Pending