



PRODUCT MANUAL

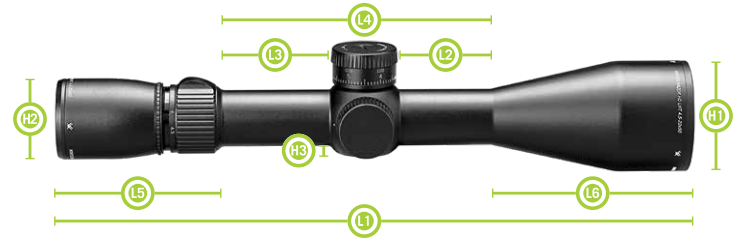
# **RAZOR<sup>®</sup> HD LHT<sup>™</sup>**

**FFP RIFLESCOPE**

**SPECIFICATIONS**

CONFIGURATION	4.5-22x50	4.5-22x50
RETICLE	XLR-2 MOA	XLR-2 MRAD
FOCAL PLANE	First Focal Plane (FFP)	
ILLUMINATION	Yes	
ILLUMINATION SETTINGS	10	
BATTERY TYPE	CR2032	
BATTERY LIFE @ INTENSITY 6	36 hrs.	
EYE RELIEF	4.0" (101.6mm)	
LINEAR FIELD OF VIEW	23.5' - 4.7' @ 100 yds.	
ZERO STOP	RevStop™	
TURRET STYLE	Elevation - Locking Exposed	Windage - Capped
TUBE SIZE	30mm	
ADJUSTMENT GRADUATION	1/4 MOA	0.1 MRAD
TRAVEL PER ROTATION	15 MOA	6 MRAD
MAX ELEVATION ADJUSTMENT	75 MOA	22 MRAD
MAX ELEVATION ADJUSTMENT W/ REVSTOP™ INSTALLED	27 MOA	11 MRAD
MAX WINDAGE ADJUSTMENT	45 MOA	12.5 MRAD
PARALLAX SETTING	25 yds. - ∞	25m - ∞
LENGTH	13.3"	
WEIGHT (W/O BATTERY)	21.7 oz.	

**4.5-22x50**

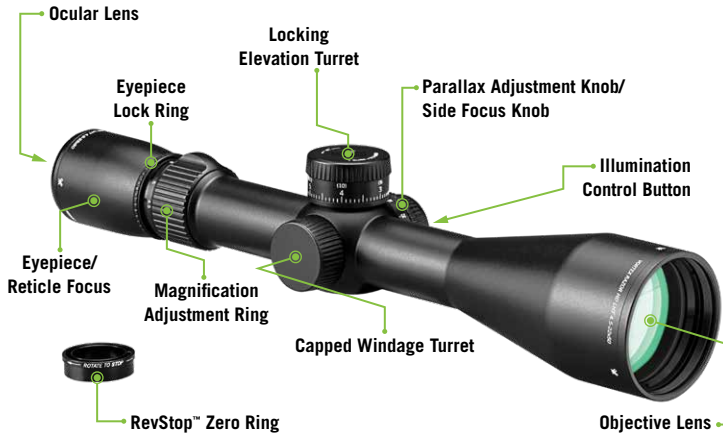


	L1	L2	L3	L4	L5	L6
<b>LENGTH</b>	13.3" (337.8mm)	1.9" (48.3mm)	2.2" (55.9mm)	5.6" (142.2mm)	3.4" (86.4mm)	4.2" (106.7mm)
<b>OBJECTIVE/OCULAR DIAMETERS</b>	<b>H1</b>		<b>H2</b>		<b>H3</b>	
	2.3" (58.4mm)		1.7" (43.2mm)		0.13" (3.3mm)	

## RAZOR® HD LHT™ RIFLESCOPES

One scope to rule them all. From dark-timber whitetails to executing precision, long-range shots on an open-country mule deer—and everything in between—there’s the Razor® HD LHT™. A stunning, HD optical system delivers a crystal-clear sight picture with tack-sharp resolution. Turn every second of legal shooting light into an opportunity. Take to the field with confidence knowing you’ve sacrificed nothing with the Razor® HD LHT™.

### Understanding the Controls



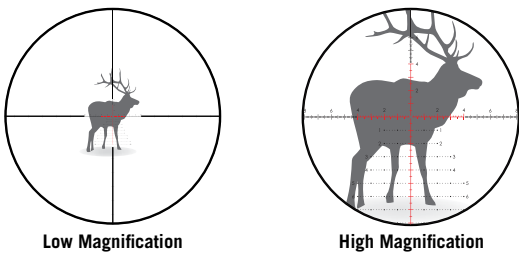
## SETUP

### Reticle Focal Plane (Second Focal Plane vs. First Focal Plane)

All riflescope reticles can be termed either first focal plane (FFP) or second focal plane (SFP), with respect to the reticle’s internal location within the erector system. An SFP reticle is visually consistent in size and weight across the magnification range; however the subtension values are only accurate on one magnification, typically the highest. In contrast, an FFP reticle will scale with magnification, and their subtensions used for ranging, holdovers, and wind corrections will remain constant. The reticle size will appear larger at higher magnifications, and smaller at low magnification.

### First Focal Plane Reticle

This riflescope features a first focal plane (FFP) reticle. FFP reticles are located within the riflescope near the windage and elevation turrets, in front of the erector tube. This style of reticle will appear to grow and shrink as you change the magnification.



## Ocular Focus

The ocular focus is typically 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. When setting up a scope, this should be the first adjustment you make and should only need to be changed from user to user, or if your eyesight changes over time.

### Ocular Focus – Reticle Focus Adjustment

The Razor® HD LHT™ riflescope uses a Locking Eyepiece designed to quickly and easily adjust the focus on your riflescope's reticle.

Adjusting the reticle focus to your eye:

1. Loosen the Lock Ring several turns by spinning it clockwise.
2. Turn the Magnification Adjustment Ring to the highest power. Looking through the optic, turn the Locking Eyepiece counterclockwise until the reticle is slightly blurry.
3. While looking at a white wall or clear blue sky, taking short glances through the optic, turn the Locking Eyepiece clockwise until the reticle is clear and crisp as soon as you look through the optic. This may take several attempts.
4. Once the reticle is in focus, tighten the Lock Ring to secure the adjustment.

**Note:** You do not want your eye to focus to the reticle, rather you want the reticle in focus to your eye instantly when looking through the optic. Looking away and letting your eyes refocus is important in getting the Ocular Focus set correctly.

Once this adjustment is complete, it will not be necessary to refocus every time you use the riflescope. However, because your eyesight may change over time, you should recheck this adjustment periodically.



## Parallax

Parallax results when the target image is not on the same optical plane as the reticle within the scope. This can cause an apparent movement of the reticle in relation to the target if the shooter's eye is off-axis behind the optic.

### Adjustable Parallax

These Razor® HD LHT's™ come equipped with a Parallax Adjustment Knob located on the left-hand side of the turret housing. When the parallax is properly adjusted, the shooter should experience no parallax error.

Dial the Parallax Adjustment Knob until the target image is as sharp as possible. The yard/meter numbers on the knob should be used as general reference points only. Check for parallax error by moving your head up, down, left, and right without influencing the gun. The parallax is correct if there is no apparent shift between the reticle and the target image. If you notice any shift, adjust the focus knob slightly until all shift is eliminated.

**Note:** If the reticle and the image are not both simultaneously in focus, readjust your Locking Eyepiece. See Ocular Focus – Reticle Focus Adjustment section.



### Magnification Adjustment

The magnification adjustment is used to change the riflescope's "power." The Razor® HD LHT™ riflescopes are variable powered optics with a 5x optical design.

To adjust your optic's magnification, rotate the Magnification Adjustment Ring clockwise, or counterclockwise, to increase or decrease the magnification to your desired level.



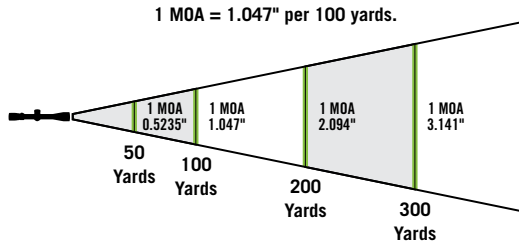
## TURRETS

The Razor® HD LHT™ riflescopes are offered in either Minute of Angle (MOA) or Milliradian (MRAD). All Razor® HD LHT™ riflescopes will have a matching reticle/turret configuration.

**Note:** The top of both the Windage and Elevation turrets will state whether the scope is laid out in MOA or MRAD.

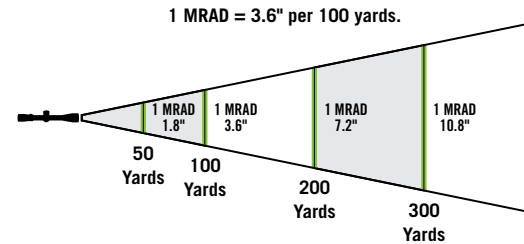
### Minute of Angle (MOA) Adjustment

Minute of Angle is an angular unit of measurement commonly found in riflescopes. It is used to measure bullet drop, wind holdovers, and for measuring targets. Both the reticle and turrets will be laid out in specific MOA values. 1 MOA equates to 1.047" at 100 yards, 2.09" at 200 yards, 3.14" at 300 yards, etc. Being an angular unit of measurement, the value of 1 MOA will increase/decrease proportionally as you increase/decrease the distance you are shooting. For this reason, think about all of your adjustments in MOA, rather than a linear unit such as inches. If your turret, reticle, and drop chart are all laid out in MOA, adjusting your scope for bullet drop or windage corrections is extremely easy.



### Milliradian (MRAD) Adjustment

Milliradian is an angular unit of measurement commonly found in riflescopes. It is used to measure bullet drop, wind holdovers, and for measuring targets. Both the reticle and turrets will be laid out in specific MRAD values. 1 MRAD equates to 3.6" at 100 yards, 7.2" at 200 yards, 10.8" at 300 yards, etc. Being an angular unit of measurement, the value of 1 MRAD will increase/decrease proportionally as you increase/decrease the distance you are shooting. For this reason, think about all of your adjustments in MRAD, rather than a linear unit such as inches. If your turret, reticle, and drop chart are all laid out in MRAD, adjusting your scope for the bullet drop or windage corrections is extremely easy.



### Elevation and Windage Turrets

Use turrets to adjust the bullet's point of impact. The Razor® HD LHT™ riflescopes use either 1/4 MOA or .1 MRAD turret adjustments on both the Windage and Elevation Turrets. Each click will move the bullet's point of impact roughly .25" at 100 yards for MOA, and .36" at 100 yards for MRAD. The turret on the rifle's top is the Elevation Turret, which is used to adjust the bullet's point of impact up and down. The turret on the rifle's right-hand side is the Windage Turret and is used to adjust the bullet's point of impact left and right.

## Exposed Locking Elevation Turrets

Razor® HD LHT™ riflescopes come equipped with an exposed Locking Elevation Turret and capped Windage Turret. This allows the shooter to quickly dial their elevation adjustment while still having protection from accidental adjustments on both turrets.



### Adjusting Exposed Locking Elevation Turrets:

1. Pull up on the turret so that it is no longer in the locked position.
2. Following the direction arrows, turn the dial in the direction you wish the bullet's point of impact to change. (If you hit high, dial down. If you hit low, dial up.)
3. When finished adjusting, push down to lock the turret in place.

**Note:** The reticle will move in the opposite direction of the turret dials. When you dial up, the reticle will move down, forcing you to aim higher, changing your point of impact upward.



### Adjusting Capped Turrets:

1. Remove the turret cap by spinning it counterclockwise.
2. Following the directional arrows, turn the dials in the direction you wish the bullet's point of impact to change. (If you hit right, dial left. If you hit left, dial right.)
3. When finished adjusting, replace the turret cap.

**Note:** The scope is still waterproof with the caps removed.

## Illumination

The Razor® HD LHT™ uses a variable intensity illuminated reticle to aid in low-light performance.

### To Turn Illumination On

Push the Illumination Control Button located on the rifle scope's left-hand side.

### To Adjust Illumination Brightness

Once the illumination is on, repeatedly push the button to cycle through 10 levels of brightness. When adjusted to the maximum or minimum brightness, the dot will flash, and the direction of adjustment will reverse. You must go to the maximum or minimum setting to change the direction of adjustment.

### To Turn Illumination Off

Push and hold the Illumination Control Button for four seconds. The illumination will shut off automatically in six hours after the last adjustment. When turned on, the illumination will return to the previously set brightness.

**Note:** When the illumination is off, the reticle will appear black.

## Battery Installation/Replacement

To install/change the battery, unscrew the Illumination Control Button's cap and install a new CR2032 battery with the positive (+) facing out.



### Replacing the Battery

1. Hold the Side Focus Knob and unscrew the Illumination Control Button cap by spinning counterclockwise.
2. Remove the CR2032 battery.
3. Replace with a new CR2032 battery with the positive side (+) facing out.
4. Reinstall the battery cap by spinning clockwise until tight.

## RIFLESCOPE MOUNTING

To get the best performance from your riflescope, proper mounting is essential. Although not difficult, the correct steps must be followed. If you are unsure of your abilities, use the services of a qualified gunsmith.

Please take note of the instructions on the following pages. For the proper scope mounting procedure, go to [VortexOptics.com/vortex-nation-videos](http://VortexOptics.com/vortex-nation-videos) for a video tutorial.

### Riflescope Mounting Checklist

- Gun vise or a solid platform for your rifle
- Scope rings
- Torque wrench
- Reticle leveling tool(s) (such as feeler gauges or bubble levels and a plumb bob)

**Recommendation:** Pick up the Vortex® Torque Wrench Mounting Kit, which comes with the complete set of bits needed to install Vortex® scopes and rings.



### Rings And Bases

The Razor® HD LHT™ riflescopes feature a 30mm main tube. Be sure to select a base and matching rings appropriate for your rifle, and mount according to manufacturer's instructions.

**Tip:** Selecting the proper ring height to provide appropriate clearance between the riflescope and any part of the rifle is paramount. The proper height will also allow for a comfortable head position and aid in establishing a solid and consistent shooting position. The height of a ring will not have an adverse effect on accuracy and overall range or performance.

### Eye Relief And Reticle Adjustment

After installing the bottom ring halves on 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.

1. Set the riflescope to its highest magnification.
2. Move the riflescope fore and aft in the rings until you achieve a full, unobstructed sight picture.
3. Without disturbing the fore-aft placement, rotate the riflescope until the reticle is level. Use a leveling tool(s) such as feeler gauges, or bubble levels and a plumb bob to aid in this process.
4. After leveling the reticle, tighten and torque the ring screws down per manufacturer's instructions. Use caution and do not over-tighten ring screws.

**Note:** We typically suggest 15-18 in.lbs of torque on the ring screws. If the mount/ring manufacturer suggests more or less, contact the Vortex® Technical Department for best instructions. For base clamp screws on the rings/mounts, reference the ring manufacturer's specifications. We do not recommend liquid thread-locking compound on the ring screws.

If you have questions about a specific setup, please call our Technical Department at:

1-800-4VORTEX (1-800-486-7839) Ext. 5

## Bore Sighting

Initial bore sighting of the riflescope will save time and money at the range by roughly aligning the scope to the rifle. Do this by either using a mechanical or laser bore sighter according to the manufacturer's instructions, or by removing the bolt and sighting through the barrel.

### To Visually Bore Sight a Rifle

1. Place the rifle on a solid rest and remove the bolt.
2. Sight through the bore at a target approximately 100 yards away.
 

**Note:** It will help to have larger, high contrast target to focus on as it can be difficult to pick up smaller targets through the rifle's bore.
3. Move the rifle and rest until the target is visually centered inside the barrel.
4. With the target centered in the bore, make the necessary windage and elevation adjustments until the reticle is also centered on the target. You may notice the reticle travel in the opposite direction as listed on the turrets. This is completely normal.



Visually bore sighting

## Final Range Sight-In

After the riflescope has been bore sighted, final sight-in should be done at the range using the exact ammunition you expect to use while hunting or shooting competitively. Sight-in and zero the riflescope at the preferred distance. 50 to 200 yards are the most common zero distances.

1. Following all safe shooting practices, fire a three-shot group as precisely as possible to determine an average point of impact to correct from. This will also help you establish the accuracy potential of the weapon system.
2. Adjust the turrets to correct for any offset in your point of impact. Be sure to read page 10 prior to adjusting.
3. Fire another three-shot group to establish another average point of impact. This procedure may be repeated as many times as necessary until your point of impact and your point of aim are in the same place, and you have achieved a perfect zero.

**Note:** Vortex® does not recommend the use of a weighted gun vise, as it can put extreme stress on the gun, stock, scope, and mounts. It is best practice to use a combination of sandbags or a bipod and sandbags. Letting your weapon recoil naturally also provides consistency from shot to shot.

## Reindexing the Elevation and Windage Turrets & Setting Zero Stop

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.

### To Reindex Capped Turrets

1. Remove the turret cap.
2. While holding the Windage Turret firmly between thumb and forefinger to prevent any rotation, use a coin to loosen and remove the set screw on top of the dial.
3. Gently pull the turret dial straight up and off of the turret post, being careful not to rotate the post.
4. Reinstall the turret dial, lining up the "0" mark with indexing mark on the scope body, and replace the set screw on top of dial.
5. Replace the turret cap.





## To Reindex Exposed Elevation Turret and Installing RevStop™ Zero Ring

After your riflescope is sighted in, the RevStop™ Zero Ring can be installed. Once in place, the RevStop™ Zero Ring will only allow the turret to dial .5 MRAD or 1.25 MOA past the sight-in zero.

1. With the Elevation Turret in the locked position (down), unscrew the cap using the coin slot on the top of the turret.
2. Install the RevStop™ Zero Ring, rotating clockwise until it comes to a stop.
3. Reinstall turret dial lining up the “0” mark with the indexing mark on the scope body and reinstall turret cap. Tighten using the coin slot with the turret in the locked position.

**Note:** Installing the RevStop™ Zero Ring will reduce the total elevation adjustment from 75 MOA or 22 MRAD to 27 MOA or 11 MRAD. Although installing the RevStop™ Zero Ring is recommended, it is not required to operate the scope. The Elevation Turret can still be indexed to zero after sighting-in even if the RevStop™ Zero Ring is not installed.



## 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 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 dried water spots.

### Lubrication

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

**Note:** Other than removing the turret caps, turret indicators, RevStop™ Zero Ring, and Illumination Control Button cap, 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.

## TROUBLESHOOTING

Please consult the following list prior to returning a riflescope for service. Many times, a problem thought to be with the scope is a mounting issue. Be sure the correct rings and bases are being used and that they are properly torqued to the rifle. Be sure there is no free play in the scope, base, or rings.

### Common Issues

#### Point of Impact is Inconsistent or Changes Drastically After Turret Adjustment

- Verify that the ring screws are not over-torqued. Ring screws should only be torqued to Vortex® recommendations, and no thread locking compound or lubricants should be applied. Over-torquing ring screws will cause excess pressure on the tube, which may cause problems when making turret adjustments.
- Remove the scope from the rings and visually check the scope tube for slide marks, and/or indentations from over-torqued, or out-of-spec rings.
- Ensure the rifle's action screws are tightened to the rifle manufacturer's specification.
- Be sure that the base is tightened using thread-locking compound to the top of the rifle's receiver to manufacturer's specs.
- If using the scope on an AR style rifle, ensure that the cantilever mount/rings are mounted only to the top of the receiver. The cantilever mount/rings need to be mounted to a single, solid surface. Make sure the forward connection of the cantilever mount, or ring, is not mounted to the fore-end of the rifle.
- Be sure the rifle barrel and action are clean and free of excessive oil, or copper and powder fouling.
- Some rifles and particular ammunition do not work well together. Try different ammunition and see if accuracy improves.

#### Insufficient Windage & Elevation Adjustment Range

- Be sure you have the proper base and rings for your rifle. If you need assistance, contact a local gunsmith or the Vortex® Technical Department.
- Once you have verified you have the correct base and mounts, and that you have been properly fitted for your gun, make sure you have followed the correct mounting procedure. See Riflescope Mounting Section on page 12 for this procedure.
- Insufficient windage or elevation adjustment range usually indicates problems with the mounting, base mount holes drilled in the rifle's receiver, or barrel/receiver misalignment.

#### Cannot Focus on the Reticle and Target

- Check and reset the ocular focus for the shooter's eye. See Riflescope Adjustment Section, Ocular Focus – Reticle Focus Adjustment Section on page 6.

#### Reticle is Moving in the Wrong Direction

- The reticle will always move opposite of the turrets. Markings on the turrets indicate point of impact change. If you dial down on the turret, the reticle will move upward, forcing you to move the gun down, to change your point of impact downward.

#### Illumination Flickers or Does Not Work

- Replace battery and check tightness of the Illumination Control Button cap. The illumination may not work if the cap is over tightened.



## **VIP WARRANTY**

**OUR UNCONDITIONAL PROMISE TO YOU.**

We promise to repair or replace the product.  
Absolutely free - no matter the cause.

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

You do not have to register, save the box, or a receipt for the Warranty to be honored.

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

[service@VortexOptics.com](mailto:service@VortexOptics.com) • 1-800-4VORTEX

*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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