



RAZOR[®] HD LHT[™]

RIFLESCOPE

PRODUCT MANUAL

SPECIFICATIONS	Configuration	3-15x42	3-15x50
	Waterproof	Yes	
	Fogproof	Argon gas purged	
	Length	13.3" (337.8mm)	13.6" (345.4mm)
	Mounting Length	4.6" (116.84mm)	4.1" (104.1mm)
	Weight	19.1 oz. (w/o battery)	20.5 oz. (w/o battery)
	Eye Relief	4.1" (104mm)	
	Field of View	3x = 24.6' @ 100 yds (6.74°) 15x = 6.3' @ 100 yds (1.34°)	
	Battery	CR2032	

THE RAZOR® HD LHT™ RIFLESCOPES

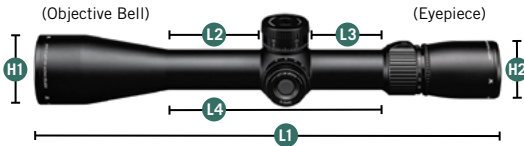
One scope to rule them all. From dark-timber whitetails, to executing precision, long-range shots on an open-country mule deer—and everything in between—there's the Razor® HD LHT™. A stunning, High Definition optical system delivers a crystal-clear sight picture with tack-sharp resolution. Turn every 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



- 1** Eyepiece/
Ocular Lens
- 2** Reticle Focus
- 3** Locking Elevation
Turret
- 4** Parallax
Adjustment Knob/
Side Focus Knob
- 5** Illumination
Control Button
- 6** Objective Lens
- 7** Windage Turret
- 8** Magnification
Adjustment Ring
- 9** Zero Stop Ring

Razor® HD LHT™	MOA	MRAD
Adjustment Graduation	1/4 MOA	0.1 MRAD
Elevation Adjustment	80 MOA	23 MRAD
Windage Adjustment	80 MOA	23 MRAD
Travel Per Rotation	15 MOA	6 MRAD



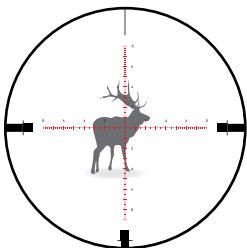
Lengths	L1	L2	L3	L4
42	13.3"	2.6"	2.0"	6.2"
50	13.6"	2.1"	2.0"	6.2"
Heights	H1	H2		
42	2.01"	1.7"		
50	2.3"	1.7"		

Dual Use: Shooting Tactical / Hunting
 Patent Pending
 Images are for representation only. Product may vary slightly from what is shown.

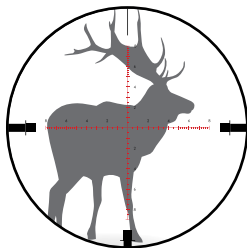
Reticle Focal Plane

All riflescope reticles can be termed either First Focal Plane (FFP) or Second Focal Plane (SFP) according to the internal location of the reticle within the scope. This model features a Second Focal Plane reticle design.

Second Focal Plane reticles are located near the eyepiece behind the image-erecting and magnifying lenses. This style of reticle does not visually change in size when you change the magnification. The advantage of an SFP reticle is that it always maintains the same ideal visual appearance.



Low Magnification



High Magnification

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. *(For instruction on adjusting the ocular focus, see Ocular Focus in the Riflescope Adjustments section on page 12.)*

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.

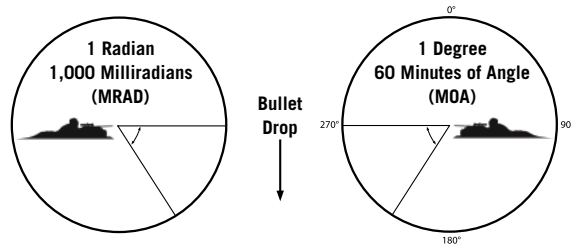
Arc Measurements

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

Milliradians (MRAD) arc measurements are based on the concept of the radian. A radian is the angle subtended at the center of a circle by an arc equal in length to the radius of the circle. 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" at 1000". 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).

Minute of Angle (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 for a total of 21,600 minutes in a circle. 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. than it was at 100 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 Minute of Angle (MOA) or Milliradian (MRAD).

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 elevation turret is a locking turret, which prevents accidental adjustment. The turret on the right-hand side of the riflescope 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 knobs with audible and tactile clicks.



Depending on which version you have purchased, your riflescope will feature adjustments scaled in MOA or MRAD. If you are unsure of which scale is used, reference the top of the adjustment turret.



MOA Models
"1 Click =
0.25 MOA"

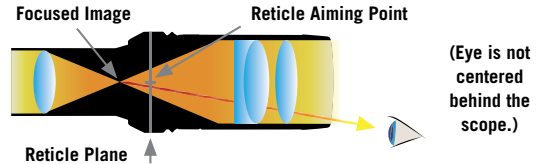


MRAD Models
"1 Click =
0.10 MRAD"

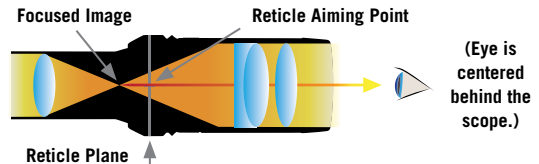
The Razor® HD LHT™ riflescopes incorporate a zero stop system. After the rifle is sighted in, the zero stop ring allows fast, sure return to the original zero point when large, multi-revolution elevation corrections have been dialed into the riflescope.

Image Sharpness—Parallax

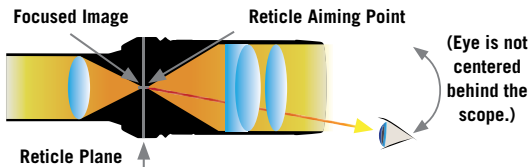
Parallax is a phenomenon that results when the target image does not fall on the same optical plane as the reticle within the scope. This can cause an apparent movement of the reticle in relation to the target if the shooter's eye is off-center.



- When the target image is not focused on the reticle plane and your eye is **off-center** behind the scope, parallax occurs. This is because the line of sight from the eye to the focused target image **does not coincide** with the reticle aiming point.



- When the target image is **not focused** on the reticle plane and your eye is **centered directly** behind the scope, no parallax occurs. This is because the line of sight from the eye to the focused target image **coincides** with the reticle aiming point.



- When the target image **is focused** on the reticle plane, parallax cannot occur – even if your eye is **not centered** behind the scope. This is because the line of sight from the eye to the focused target image **always coincides** with the reticle aiming point no matter where the shooter’s eye is positioned.

Side Focus Adjustment / Parallax Adjustment

Your scope comes equipped with a Side Parallax Adjustment. This adjustment dial is marked with approximate yardages to aid in initial setting and should be matched to the target’s distance. Final focus setting should be checked by moving your head back and forth slightly while looking through the scope and watching for any shift of the reticle on the target (parallax). If shift is observed, the dial should be adjusted slightly until shift is removed. Once this focus is correctly set for target distance, shooting errors due to parallax will be eliminated.



RIFLESCOPE MOUNTING

To get the best performance from your Vortex® rifle scope, proper mounting is essential. Although not difficult, the correct steps must be followed. Please follow the instructions in the next pages for the proper scope mounting procedure, or go to vortexoptics.com/vortex-nation-videos for a video tutorial.

If you are unsure of your abilities, it would be best to 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

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



Rings and Bases

Your Vortex® riflescope features a 30mm main tube. Be sure to select a base and matching rings appropriate for your rifle and mount according to the manufacturer's instructions.



NOTE: Vortex Optics recommends not exceeding 18 in/lbs (inch/pounds) of torque on the ring screws.

TIP: Select the lowest ring height that will provide complete clearance between the riflescope and rifle in order to avoid contact with barrel, receiver, bolt handle, or any other part of the rifle. A low mounting height will help assure proper cheek weld, aid in establishing a solid shooting position, and promote fast target acquisition.

RECOMMENDATION: Vortex Optics highly recommends the Vortex® Precision Matched Rings to mount your riflescope. To check out the full line of Vortex® riflescope rings go to vortexoptics.com.

Eye Relief and Reticle Alignment

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 from recoil:

1. Set the riflescope to the maximum 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 towards 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. Using a reticle leveling tool, a weight hung on a rope, flat feeler gauges, or a bubble level will help.

NOTE: After aligning the reticle, tighten and torque the ring screws down. Vortex Optics recommends a torque setting of 15-18 in/lbs on the ring screws. **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, do not exceed 11 in/lbs.



RIFLESCOPE ADJUSTMENTS

Reticle Focus Adjustment

Your Razor® HD LHT™ riflescope uses a locking eyepiece designed to quickly and easily adjust the focus on the riflescope's reticle.

To adjust the reticle focus:

1. Loosen the lock ring several turns.
2. Look through the scope at a blank white wall or up at the sky.
3. Turn the eyepiece in or out until the reticle image is as crisp as possible.
4. Tighten the lock ring.



Adjust the reticle focus

NOTE: Try to make this adjustment quickly, as the eye will try to compensate for an out-of-focus reticle.

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.

Magnification Adjustment

Rotate the indicator bar to the desired magnification.



Adjust the magnification

Turret Adjustments

Your Razor® HD LHT™ riflescope features adjustable Elevation and Windage Turrets with audible clicks. Each click moves the bullet's point of impact 1/4 of a minute of angle (for a MOA designated scope). 1/4 MOA closely corresponds to 1/16" at 25 yds., 1/8" at 50 yds., 1/4" at 100 yds., and 1/2" at 200 yds.

EXAMPLE: It will take four (4) clicks to move the bullet's point of impact approximately one inch at 100 yds.

To make turret adjustments:

1. Pull the Locking Elevation Turret dial up to disengage the lock, or remove the Windage Turret cap.
2. Turn the turret in the desired direction: Up or down for elevation adjustments; left or right for windage adjustments.
3. Push Locking Elevation Turret knob down to return to the locked position, or replace the Windage Turret cap.



Unlocked position view



Locked position view

After the shot, return dials to the zero position. The Locking Elevation Turret can simply be spun clockwise until reaching a hard stop against the zero stop.

Then, turn the Locking Elevation Turret just slightly (1/2 MRAD or 1.25 MOA) in a counter-clockwise direction until the 0 mark on the cap lines up with the indicator mark on the turret body.

Indexing The Elevation Turret

After your riflescope is sighted in, the zero stop ring should be installed. Once in place, the zero stop ring will only allow the turret to dial 0.5 MRAD or 1.25 MOA past the sight-in zero to accommodate shots that are closer than the sight-in zero.

1. While firmly holding the turret knob, loosen and remove the center screw and turret dial. DO NOT allow the turret to rotate.
2. Place zero stop ring over turret column with small silver pin facing down.
3. Push ring down until seated, then rotate the ring clockwise until it stops.
4. Reinstall the dial, lining up the “0” mark with indexing dot on the scope body.
5. Reinstall the center screw.

NOTE: Installing the zero stop ring will reduce the total elevation adjustment from 80 MOA or 23 MRAD to 29 MOA or 11.6 MRAD. Although installing the zero stop ring is highly recommended, it is not required to operate the scope. The Elevation Turret can still be indexed to zero after sight-in even if the zero stop ring is not installed.



Indexing The Windage Turret

Razor® HD LHT™ riflescopes feature a Windage Turret that allows you to reindex the zero indicator after sight in without disturbing your zero setting. Though not a required process, reindexing the Windage Turret allows you to quickly return to your original zero setting if temporary windage corrections are dialed in the field.

To reset the Windage Turret:

1. Remove the outer cap.
2. While firmly holding the turret knob, loosen and remove the center slotted screw and turret cap. DO NOT allow turret to rotate.
3. Reinstall the turret dial, aligning the “0” mark with the indicator dot on scope body and pushing downward until seated.
4. Reinstall the center screw and outer turret cap.

Parallax Adjustment – Image Sharpness

Your riflescope uses a side focus Parallax Adjustment knob which, when properly set, eliminates parallax errors. Properly setting a side focus parallax adjustment is a quick procedure. When properly set, the target image should be sharp and crisp.

To set the parallax:

1. First, be sure the reticle is correctly focused (see *Reticle Focus Adjustment on page 12*).
2. Using the numbers on the parallax knob as a reference, adjust the knob to your target's approximate distance.
3. Check the setting for accuracy by moving your head back and forth while looking through the scope. The setting is correct if there is no apparent shift between the reticle and target. If there is apparent shift, adjust the focus knob slightly until the shift is eliminated.

Illumination Control

Your Razor® HD LHT™ riflescope uses a variable intensity illuminated center dot to aid in low light performance.

To Activate:

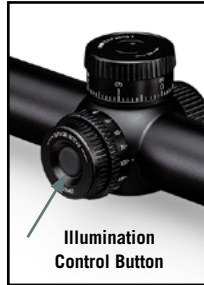
Push the Illumination Control button located on the parallax adjustment knob.

To Adjust Brightness:

Once activated, 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 Off:

Push and hold the Illumination Control button for 4 seconds. Illumination will shut off automatically in 6 hours after last adjustment. When turned on, illumination will return to previously set brightness.



Bore Sighting

Initial bore sighting of the riflescope will save time and money at the range. This can be done 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.

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 yds. 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 shooting. Sight in and zero the riflescope at the preferred distance. 100 yds. is the most common zero distance, although a 200 yd. zero may be preferred for long range applications.

WARNING: The zero stop ring should be removed from the scope prior to range sighting.

Be sure the reticle is in focus (see *Reticle Focus Adjustment section on page 12*) and adjust the side focus knob if present until the target image is sharp and without parallax error (see *Using the Side Focus section on page 8-9*).

1. Following all safe shooting practices, fire a three-shot group as precisely as possible.
2. Next, adjust the reticle to match the approximate center of the shot group. Be sure to read pages 12–13 prior to making adjustments.

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 fired group.

3. Carefully fire another three-shot group and 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.

MAINTENANCE

Cleaning

The Vortex® Razor® HD LHT™ 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 Vortex® Razor® HD LHT™ are permanently lubricated, so no additional lubricant should be applied. If possible, avoid exposing your Vortex® riflescope to direct sunlight or any very hot location for long periods of time.

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

Replacing the Battery:

1. Unscrew the outer cap cover.
2. Remove the battery.
3. Replace with new CR2032 battery, text on battery facing outwards.
4. Reinstall outer cap and tighten firmly.



TROUBLESHOOTING

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

Sight In Problems

Many times, problems thought to originate 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.
2. Attach bore sight or remove bolt and visually bore sight rifle (*see steps in Bore Sighting section on page 17*).
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. 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.
- Some rifles and ammunition don't work well together—try different ammunition and see if accuracy improves.

Common Problems

Point of Impact Changes Drastically After Turret Adjustment

- Verify that the ring screws are not over torqued. Ring screws should only be torqued to 18 in/lbs, and no thread locking component applied. Over torquing the ring screws will cause excess pressure on the tube, which will cause problems when adjusting the reticle.

Point of Impact is Inconsistent

- Ensure the cantilever mount/rings are mounted only to the receiver. The cantilever mount/rings need to be mounted to one, solid surface. Make sure the forward connection of the cantilever mount, or ring, is not mounted to the fore end of the rifle.
- Verify the ring screws are not over torqued. Ring screws should only be torqued to 18 in/lbs, and no thread locking component applied. Over torquing the ring screws will cause excess pressure on the tube, which will cause problems when adjusting the reticle.

Insufficient Adjustment Ranges

- Check that you have the proper base and rings for your rifle and for your size. If you need assistance, contact a local gunsmith.
- Once you have verified you have the correct base and mounts, and you have been properly fitted to your gun, make sure the correct mounting procedure has been followed. (See *Riflescope Mounting section on pages 9-11 for this procedure.*)

Reticle Appears to Come in and out of Focus

- Check and reset the ocular focus of the reticle for the shooter's eye. (See *Riflescope Adjustments section, Ocular Focus – Reticle Focus Adjustment on page 12.*)



VIP WARRANTY

OUR UNCONDITIONAL PROMISE TO YOU.

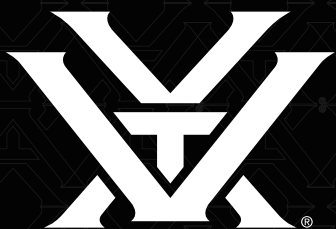
We promise to repair or replace the product. Absolutely free.

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

Learn more at VortexOptics.com

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



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