



PRODUCT MANUAL

VIPER[®] HD

RIFLESCOPES

SPECIFICATIONS

CONFIGURATION	2-10x42	3-15x44		
SKU	VPR-21001	VPR-31501	VPR-31502	VPR-31503
RETICLE	Dead-Hold® BDC MOA	Dead-Hold® BDC MOA	VMR-3 MOA	VMR-3 MRAD
FOCAL PLANE	SFP	SFP		
ILLUMINATION SETTINGS	10 Daylight	10 Daylight		
EYE RELIEF	3.4"	3.4"		
LINEAR FIELD OF VIEW (@100 YDS.)	61.6' - 11.9'	39.9' - 8.0'		
ZERO STOP SYSTEM	N/A	N/A	RevStop®	
TURRET STYLE	Capped	Capped	Elevation - Exposed Windage - Capped	
TUBE SIZE	30mm	30mm		
ADJUSTMENT GRADUATION	1/4 MOA	1/4 MOA		0.1 MRAD
TRAVEL PER ROTATION	25 MOA	25 MOA		10 MRAD
MAX ELEVATION ADJUSTMENT	135 MOA	92 MOA	102 MOA	30.5 MRAD
MAX ELEVATION ADJUSTMENT W/ REVSTOP® INSTALLED	N/A	N/A	47 MOA	18.9 MRAD
MAX WINDAGE ADJUSTMENT	135 MOA	92 MOA	92 MOA	27 MRAD
PARALLAX SETTING	100 yds.	20 yds. - ∞		
LENGTH	12.1"	13.2"		
WEIGHT	19.9 oz.	21.3 oz.	22.3 oz.	

CONFIGURATION	5-25x50			
SKU	VPR-52501	VPR-52502	VPR-52503	VPR-52504
RETICLE	VMR-4 MOA	VMR-4 MRAD	VMR-3 MOA	VMR-3 MRAD
FOCAL PLANE	FFP		SFP	
ILLUMINATION SETTINGS	10 Daylight			
EYE RELIEF	3.4"			
LINEAR FIELD OF VIEW (@100 YDS.)	23.6' - 4.7'		24.0' - 4.7'	
ZERO STOP SYSTEM	RevStop®			
TURRET STYLE	Elevation - Exposed Windage - Capped			
TUBE SIZE	30mm			
ADJUSTMENT GRADUATION	1/4 MOA	0.1 MRAD	1/4 MOA	0.1 MRAD
TRAVEL PER ROTATION	25 MOA	10 MRAD	25 MOA	10 MRAD
MAX ELEVATION ADJUSTMENT	68 MOA	20 MRAD	68 MOA	20 MRAD
MAX ELEVATION ADJUSTMENT W/ REVSTOP® INSTALLED	47 MOA	18.9 MRAD	47 MOA	18.9 MRAD
MAX WINDAGE ADJUSTMENT	42 MOA	12.4 MRAD	42 MOA	12.4 MRAD
PARALLAX SETTING	20 yds. - ∞			
LENGTH	15.2"			
WEIGHT	24.4 oz.		24.3 oz.	

2-10x42



3-15x44



5-25x50



DIMENSIONS		2-10x42	3-15x44	5-25x50
OVERALL LENGTH	L1	12.1"	13.2"	15.2"
FRONT MOUNTING SURFACE	L2	2.1"	2.1"	2.1"
REAR MOUNTING SURFACE	L3	1.8"	1.8"	1.8"
OVERALL MOUNTING SURFACE	L4	5.5"	5.5"	5.5"
OBJECTIVE LENGTH	L5	3.5"	4.3"	6.3"
EYEPIECE LENGTH	L6	3.4"	3.4"	3.4"
OUTSIDE DIAMETER OBJECTIVE	H1	1.95"	2.03"	2.3"
OUTSIDE DIAMETER EYEPIECE	H2	1.7"	1.7"	1.7"
MAGNIFICATION RING OUTSIDE DIAMETER	H3	1.8"	1.8"	1.8"
TURRET SADDLE DEPTH	H4	0.21"	0.21"	0.21"

VIPER® HD RIFLESCOPES

When success rides on the perfect shot, rely on the exceptional optical performance and versatility of the Viper® HD. Ruggedly built for all hunting disciplines, predator to big game, it packs outstanding image clarity along with essential features for hair-splitting accuracy no matter the distance on unpredictable game.



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

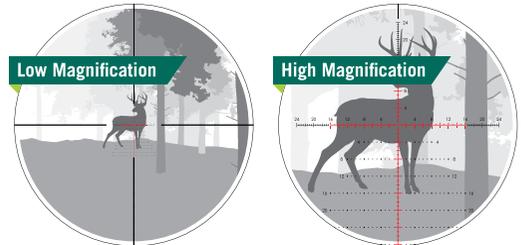
INITIAL SET UP

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

All rifle scope 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.

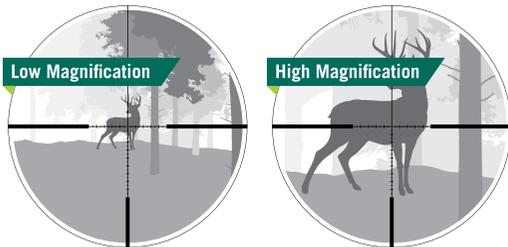
First Focal Plane Reticle

The Viper® HD 5-25x50 VMR-4 riflescopes feature a first focal plane (FFP) reticle. FFP reticles are located within the riflescope near the windage and elevation turrets. This style of reticle will appear to grow and shrink as you change the magnification.



Second Focal Plane Reticle

The remaining Viper® HD riflescopes feature a second focal plane (SFP) reticle. SFP reticles are located within the riflescope near the magnification ring. This style of reticle will appear consistent throughout the entire magnification range.



Note: The Viper® HD 5-25x50 SFP riflescope's reticle is calibrated to 20x. For a hashmark's value to be true, it would need to be used on 20x. There will be a detent on the magnification ring at 20x.

For all other Viper® HD SFP riflescopes, you would need to be on the highest magnification (2-10x and 3-15x).

Ocular Focus – Fast-Focus Eyepiece

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 riflescope, 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 - Fast-Focus Eyepiece Adjustment

The Viper® HD riflescopes use a Fast-Focus Eyepiece designed to easily adjust the focus of the riflescope's reticle.

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

Adjusting the reticle focus to your eye:

1. Turn the Magnification Adjustment Ring to the highest power and the Parallax Adjustment Knob to infinity (only on models with an adjustable parallax). Looking through the optic, turn the Fast-Focus Eyepiece counterclockwise until the reticle is slightly blurry.
2. While looking at a white wall or a clear blue sky, taking short glances through the optic, turn the Fast-Focus Eyepiece clockwise until the reticle is clear and crisp as soon as you look through the optic. This may take several attempts.

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 Fast-Focus Eyepiece 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 riflescope. 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.

Fixed Parallax

The Viper® HD 2-10x42 riflescope comes equipped with a fixed parallax setting at 100 yards. There is no adjustment on this model.

With a fixed 100 yard parallax, the shooter may experience small amounts of parallax error inside and outside of 100 yards, or if the shooter is off-axis behind the optic. If the shooter is perfectly aligned behind the optic, or at 100 yards, there should be no parallax error.

Adjustable Parallax

The remaining Viper® HD riflescopes 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 yardage 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 Fast-Focus Eyepiece. See Ocular Focus – Fast-Focus Eyepiece Adjustment section.

Magnification Adjustment

The Magnification Adjustment Ring is used to change the riflescope's "power." The Viper® HD riflescopes are variable powered optics with a 5x optical design. (E.g. 2-10x, 3-15x, 5-25x)

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

Note: The Viper® HD 5-25x50 SFP VMR-3 has a detent at 20x to indicate the subtended magnification for the reticle. All other Viper® HD SFP riflescope's reticles will be accurate at the highest power.



TURRETS

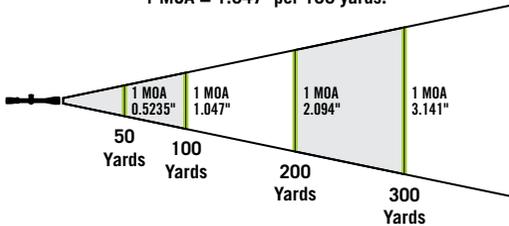
The Viper® HD riflescopes are offered in either Minute of Angle (MOA) or Milliradian (MRAD). All Viper® HD riflescopes will have a matching reticle/turret configuration.

Note: The top of both the windage and elevation turret will state what unit the riflescope is laid out in.

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 riflescope for bullet drop or windage corrections is extremely easy.

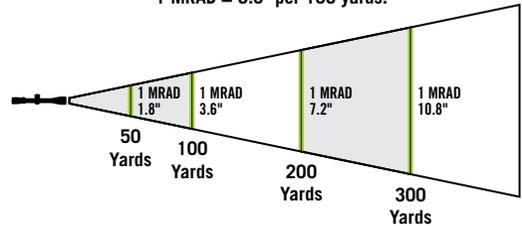
1 MOA = 1.047" per 100 yards.



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 values 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 riflescope for bullet drop or windage corrections is extremely easy.

1 MRAD = 3.6" per 100 yards.



Elevation and Windage Turrets

Use turrets to adjust the bullet's point of impact. The Viper® HD 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 top of the riflescope is the Elevation Turret, which is used to adjust the bullet's point of impact up and down. The turret on the right-hand side of the riflescope is the Windage Turret and is used to adjust the bullet's point of impact left and right.



Capped Turrets

All Viper® HD riflescopes come equipped with capped Windage Turrets and the Viper® 2-10x42 and 3-15x44 riflescopes come with capped Elevation Turrets. This protects the turrets from accidental adjustment while out in the field, in transit, or in storage. You will need to remove the caps prior to making any adjustments on the turrets.

Note: The riflescope is still waterproof with the caps removed.



Adjusting Capped Turrets:

1. Remove the turret caps by spinning them 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 high, dial down. If you hit low, dial up. If you hit right, dial left. If you hit left, dial right.)
3. When finished adjusting, replace the turret caps.

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.

Exposed Elevation Turrets

Certain Viper® HD riflescopes come equipped with an Exposed Locking Elevation Turret and Capped Windage Turret. This allows the shooter to quickly dial in their elevation adjustment while still having protection from accidental adjustments on both turrets.

Adjusting Exposed 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. If you hit right, dial left. If you hit left, dial right.)
3. When finished adjusting, push down to lock the turret in place.

Illumination

The Viper® HD riflescopes use a variable intensity illuminated reticle to aid in low-light performance.

To Turn Illumination On

Push the Illumination Control Button located on the left-hand side of the riflescope.

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.



Illumination Control Button

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 side (+) facing out.

Replacing the Battery

1. Unscrew the 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.



Battery Cap

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 riflescope mounting procedure, go to VortexOptics.com/vortex-nation-videos for a video tutorial.

Riflescope Mounting Checklist

- Gun vise or a solid platform for your rifle
- Riflescope 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® riflescope and rings.



Rings and Bases

The Viper® HD riflescopes feature a 30mm main tube. Be sure to select a base and matching rings appropriate for your rifle's 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. A ring's height 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 riflescope 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

SIGHTING IN YOUR RIFLESCOPE

Bore Sighting

Initial bore sighting of the riflescope will save time and money at the range by roughly aligning the riflescope to the rifle. This can be done several ways, either by 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.

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 pages 14 and 15 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, riflescope, 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 and Setting the RevStop®

After the rifle and riflescope 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. Grasp the dial and pull upward against spring pressure.
2. While holding the dial up, rotate the turret to reposition the zero mark on the index line.
Note: If proper upward pressure is maintained, you will not feel any clicking as you rotate the dial. This will not change your point of aim.
3. Once indexed, gently allow the spring pressure to pull dial back down into position.

To Reindex Exposed Elevation Turret and Set the RevStop® Zero System

1. Loosen and remove the Elevation Turret cap using the included turret tool. Gently pull the turret dial straight up and off the turret post, being careful not to rotate the post.
2. Place the RevStop® Zero Ring over the turret post.
3. Push the RevStop® Zero Ring down until seated, then rotate the ring clockwise until it stops.
4. Reinstall the turret dial, lining up the "0" mark with indexing line on the scope body.
5. Replace and tighten the Elevation Turret cap.

Note: Installing the RevStop® Zero Ring will reduce the total elevation adjustment. Although installing the RevStop® Zero Ring is recommended, it is not required to operate the riflescope. 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 riflescope'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, zero ring, and battery 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 riflescope 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 riflescope, 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 (see p. 18), 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 riflescope from the rings and visually check the riflescope 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 riflescope 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 pages 17 and 18 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 – Fast-Focus Eyepiece Adjustment on page 9.

Reticle is Moving 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.

NOTICE

Virtual Patent Marking Notice by Vortex Optics

This product may be protected by patents in the U.S. and elsewhere for Vortex Optics. <http://vtx.legal> website is provided to satisfy the virtual patent marking provisions of various jurisdictions including the virtual patent marking provisions of the America Invents Act and provide notice under 35 U.S.C. §287(a). Please visit <http://vtx.legal> to view list of products that may be covered by one or more U.S./ Foreign patents or published patent applications.



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- ▶ **Lifetime Warranty.**

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For the most up to date manual visit VortexOptics.com



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