VORTEX®

PRODUCT MANUAL

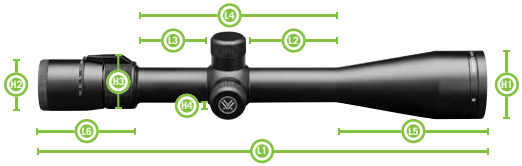
VIPER®

6.5-20x50 SFP RIFLESCOPES

SPECIFICATIONS

CONFIGURATION	6.5-20x50	6.5-20x50
SKU	VPR-M-06BDC	VPR-M-06MD
RETICLE	Dead-Hold® BDC MOA	Mil Dot MOA*
FOCAL PLANE	SFP	
EYE RELIEF	3.1"	
LINEAR FIELD OF VIEW (@100 YDS.)	17.4' – 6.2'	
TURRET STYLE	Capped	
TUBE SIZE	30mm	
ADJUSTMENT GRADUATION	1/4 MOA	
TRAVEL PER ROTATION	12 MOA	
MAX ELEVATION ADJUSTMENT	65 MOA	
MAX WINDAGE ADJUSTMENT	65 MOA	
PARALLAX SETTING	50 yds. - ∞	
LENGTH	14.4"	
WEIGHT	21.6 oz.	

**MRAD Reticle/MOA Turrets*

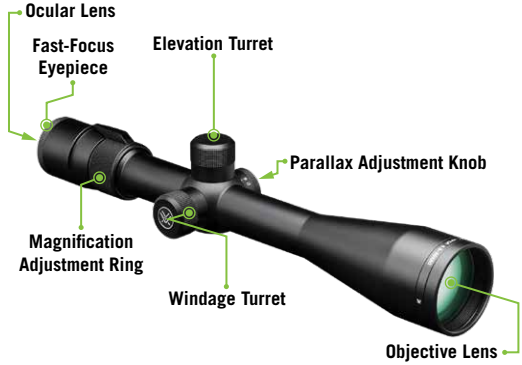


	L1	L2	L3	L4	L5	L6
LENGTHS	14.4" (365.8mm)	2.8" (71.1mm)	2.2" (55.9mm)	6.4" (162.6mm)	4.8" (121.9mm)	3.2" (81.3mm)

	H1	H2	H3	H4
DIAMETERS & HEIGHTS	2.3" (57.5mm)	1.7" (43.5mm)	1.8" (46.5mm)	0.1" (2.5mm)

VIPER® 6.5-20x50 SFP

The Viper® 6.5-20x50 SFP riflescopes turn versatility into the dedicated hunter's most lethal weapon. With a low end that keeps western game in range, the 20x high end lets you reach out to predators over decoys, wary big game, and even small varmints. Capped turrets and a rugged, 30mm aircraft-grade aluminum tube protect your zero in any terrain. Powered by advanced lens coatings, the 50mm objective provides superior resolution and contrast in all light conditions. Near and far, the Viper® 6.5-20x50 has you covered.



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

INITIAL SET UP

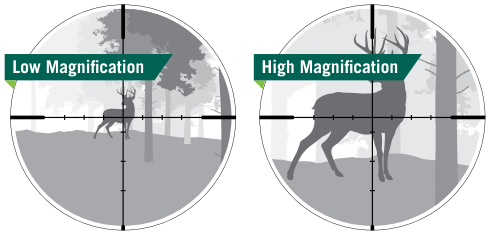
Reticle Focal Plane (Second Focal Plane vs First Focal Plane)

All 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.

Second Focal Plane Reticle

The Viper® 6.5-20x50 SFP 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® 6.5-20x50 SFP Dead-Hold BDC MOA riflescope's reticle is calibrated to 20x. For a hashmark's value to be true, it would need to be used on 20x. The Viper® 6.5-20x50 SFP Mil Dot MOA riflescope's reticle is calibrated to 14x. For a dot's value to be true, it would need to be used on 14x. There will be a mark on the magnification ring at 14x.



Ocular Focus – Fast-Focus Eyepiece

Adjust the 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® 6.5-20x50 SFP riflescopes use a Fast-Focus Eyepiece designed to easily adjust the focus on 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. 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.

Adjustable Parallax

The Viper® 6.5-20x50 SFP riflescopes come equipped with a Parallax Adjustment Knob located on the left-hand side of the turret saddle. When the parallax is properly adjusted, the shooter should experience no parallax error.

Adjust the Parallax Adjustment Knob

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 section.

Magnification Adjustment

The Magnification Adjustment Ring is used to change the riflescope's "power." The Viper® 6.5-20x50 SFP riflescopes are variable powered optics with a 3x 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.

Note: The Viper® 6.5-20x50 SFP Mil Dot MOA riflescope has a mark at 14x to indicate the subtended magnification for the reticle.

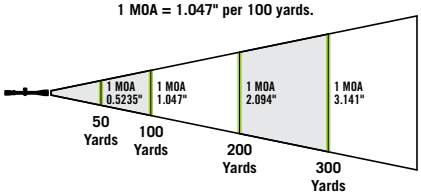
TURRETS

The Viper® 6.5-20x50 SFP riflescopes' turrets are offered in Minute of Angle (MOA). The 6.5-20x50 SFP Dead-Hold® BDC MOA riflescope has a matching reticle/turret configuration. The 6.5-20x50 SFP Mil Dot MOA model has an MRAD Reticle and MOA turrets.

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

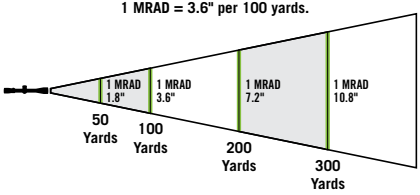
Minute of Angle (MOA) Adjustment

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. In the Dead-Hold® BDC model, both the reticle and turrets will be laid out in specific MOA values. In the Mil Dot model, only the 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.



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. The Mil Dot reticle is 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.



Elevation and Windage Turrets

Use turrets to adjust the bullet's point of impact. The Viper® 6.5-20x50 SFP riflescopes use a 1/4 MOA turret adjustment on the Elevation and Windage Turrets. Each click will move the bullet's point of impact roughly .25" at 100 yards for MOA. 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

The Viper® 6.5-20x50 SFP riflescopes come equipped with capped Elevation and Windage 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.

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® riflescopes and rings.

Rings and Bases

The Viper® 6.5-20x50 SFP riflescopes feature a 30mm main tube. Be sure to select a base and matching rings appropriate for your riflescope'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 page 8 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

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. Remove the outer cap.
2. Pull the adjustment dial outward against the spring tension until it stops.
3. With the dial pulled fully outwards, rotate the dial to align the “0” with the etched indicator line on the riflescope.
4. Release the dial, allowing it to return to the normal inward position.
5. Replace the turret cap.

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, 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 riflescope 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. Make sure you're using the correct rings and bases 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, and no thread-locking compound or lubricants should be applied. Over-torqueing 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 specification.
- 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 and 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 10 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 5.

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

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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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