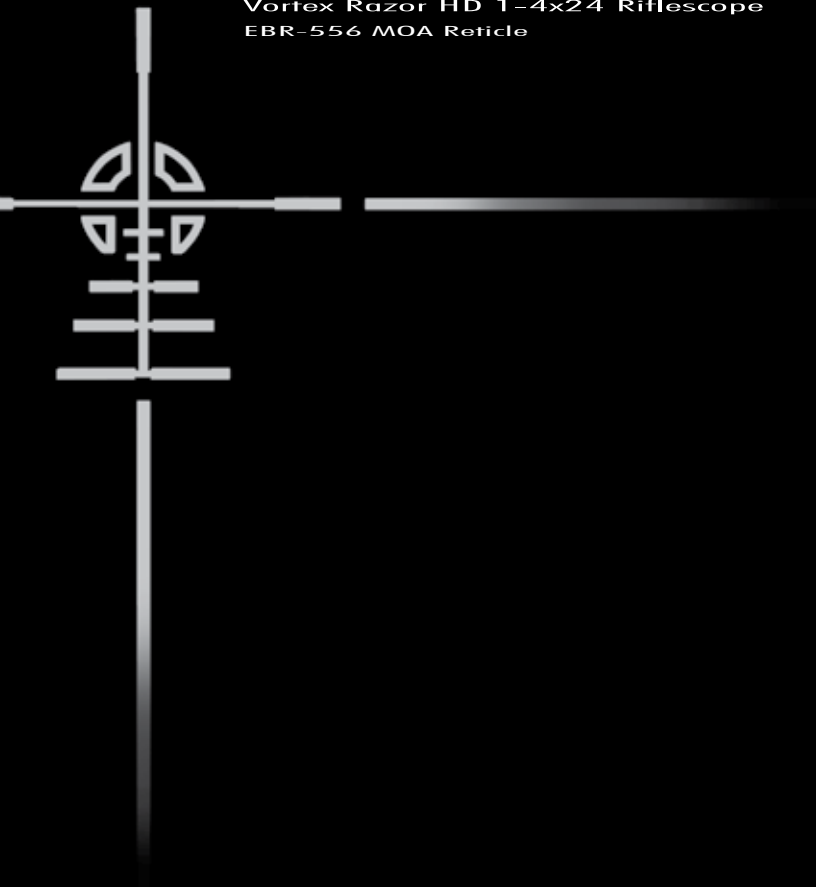
RAZOR HD
RIFLESCOPE

Vortex Razor HD 1-4x24 Riflescope
EBR-556 MOA Reticle



RAZOR HD RIFLESCOPE

At Vortex Optics, the need for high-performance, precision optics is the driving force behind all that we do.

That's why we carefully built the Razor™ HD riflescope to provide shooters with the ultimate short and medium range tactical riflescope. Specifically designed for the 55 gr. 5.56 mm round (also .223 Remington) and the popular AR15 platform, Vortex Razor 1-4x24 EBR-556 is a unique, compact high performance riflescope intended for close range CQB situations as well as longer range precision shooting out to 700 yards using the patented Vortex EBR-556 reticle.

The Vortex Razor HD 1—4x24 Riflescope

Elevation Knob

Dual Use: Shooting Tactical / Hunting

Razor 1—4x24 Riflescope Specifications

Waterproof	**Yes**
Fogproof	**Argon gas purging**
Length	**10.3 inches (269.2mm)**
Mounting Length	**6.5 inches (165.1mm)**
Weight	**20.2 ounces (572.66g)**
Eye Relief	**3.9 inches (99.6 mm)**
Field of View	**94.5—24.2 feet/100 yards (18—4.6°)**
Reticle Style	**EBR-556**
Windage	**200 MOA Total Travel**
Elevation	**200 MOA Total Travel**
Turret Adjustment	**24 MOA Per Rotation** **1/4 MOA Per Click**
Recoil Tested	**Rated for 50 BMG**
Battery	**CR2032**

Dimensions

Accessories included with the Razor HD

Flip cap lens cover with killFLASH® ARD
Cleaning cloth

Riflescope Adjustments

Reticle Focus Adjustment

The Vortex Razor HD 1–4x24 riflescopes use a fast focus eyepiece, designed to quickly and easily adjust the focus on the riflescopes reticle.

To adjust the reticle focus, look through the riflescope at a blank white wall or up at the sky. Turn the eyepiece focus knob in or out until the reticle image is as crisp as possible. Try to do this quickly, as your eye will try to compensate for an out of focus reticle.

Once this adjustment is complete, it is not necessary to re-focus every time the scope is used. However, as your eyesight may change over time you should re-check this adjustment periodically.

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

Windage and Elevation Adjustments

The Vortex Razor HD 1–4x24 riflescope incorporates precision finger adjustable elevation and windage dials with audible clicks.

To make adjustments:

- Turn the adjustment dial in the appropriate direction Up/Down or Left/Right indicated by the arrows.
- Move the dials in the direction you wish the bullets point of impact to change.

The Razor 1–4x24 riflescope uses clicks scaled in ¼ minute of angle measurements (MOAs) so each small click will move the point of impact 1/4 MOA. One full MOA equals 1.05 inches at a 100 yard distance: ¼ MOA will equal .26 inches at 100 yards, .52 inches at 200 yards, .78 inches at 300 yards, etc.

Example: *At a 100 yard sight-in distance, it will take four clicks of the knob to move a bullet's point-of-impact 1.05 inches.*

Radius Bar

The Vortex Razor HD riflescopes incorporate the patented *Radius Bar* to visually assist in keeping track of the correct turret knob position at the rifle's zero. By watching the position of the bar during field use, the shooter can quickly verify the correct turret knob position.

In a CQB type of situation, the shooter can also use the Radius Bar as a quick visual aiming reference.

To benefit from the Radius Bar, the turret cap must be indexed with the zero reference line on turret post. See the ***Sight In*** section for details on indexing cap.

Variable Power Adjustment

To change magnifications, turn the magnification ring to the desired level. The patented Vortex ***MagView*** will provide a low light reference for magnification level.

Illumination Adjustment

The Vortex Razor 1–4x24 riflescopes use a variable intensity reticle illumination system to aid in low light performance. Illumination intensity levels will vary from bright to ultra low intensity compatible with night vision devices at the lowest setting.

The illumination knob allows for 11 levels of brightness intensity; an ***off click*** between each level allows the shooter to turn the illumination off and return to a favored intensity level with just one click. The top six settings (6, 7, 8, 9, 10 and 11) are visible in the daytime, depending on the background color. Settings below 6 are for low light use when the user's eyes have adjusted to lower light levels. Lowest settings are for use with night vision devices.

Illumination Knob

To change the battery, unscrew outer cap with a coin. Remove the battery and replace with a new one.

Parallax Adjustment

The Razor 1-4x24 series riflescopes are non-adjustable for parallax correction and are set from the factory to be parallax-free at 100 yards.

- At distances under 100 yards, parallax error is less than 1 inch.
- At distances over 100 yards parallax error is minimal; using good consistent shooting form and cheek weld will prevent most problems with parallax.

Riflescope Mounting

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

Centering of the Reticle

The Vortex Razor HD riflescope is pre-set from the factory with the reticle in the center of the adjustment ranges. If you have changed the settings and wish to reset the reticle to the center, this can be done easily:

1. Turn the dial (windage or elevation) fully in either direction until stopped. *Do not force the dial—as soon as any resistance is felt, stop turning.*

2. Carefully counting the dial rotations, turn the dial in the other direction until stopped. *Again, stop turning as soon as resistance is felt.*

3. Turn the dial back again half the amount of rotations counted and that adjustment will be centered.

After this procedure is completed for both windage and elevation dials, the reticle will be approximately centered.

Rings and Bases

Following the manufacturers instructions, mount a high quality base and rings to your firearm. The Vortex Razor 1–4x24 riflescopes require 30mm rings. Vortex Optics recommends using premium quality rings mounting to a one-piece Picatinny base.

Ring height for Vortex Razor HD 1–4x24 riflescopes will depend on the firearm and mount being used. Consult the ring and base manufacturer for suggested heights.

AR15 style rifles will usually require a specialized extra-high mounting height on a cantilever style mount. Most other traditional rifle or shotgun applications will use a low or medium ring height.

Eye Relief and Reticle Alignment

Before the final tightening of the scope ring screws, adjust for maximum eye relief to avoid injury from recoil.

To make the adjustment:

1. Set the riflescope to the middle of its magnification range.

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 the shooter's face—paying attention to the field of view. *Just as the full view is visible, stop.*

4. Without disturbing the front-back placement, rotate the riflescope until the vertical crosshair exactly matches the vertical axis of the rifle. Use a reticle leveling tool, plumb bob, or an adjustable set of feeler gauges placed between a one-piece base and the flat bottom of the riflescope's center section for this procedure.

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

Square the riflescope to the base using flat feeler gauges.

Use of an adjustable set of feeler gauges between a one-piece base and flat bottom section of the riflescope to square the riflescope (and reticle) to the base.

Sighting in the Rifle

Bore Sighting

Initial bore sighting of the riflescope will save time and money at the range. This can be done using a mechanical or laser bore sighter according to the manufacturer's instructions. On some rifles, bore sighting can be accomplished by removing the bolt and visually sighting through the barrel.

To visually bore sight a rifle:

1. Place the rifle solidly on a rest and remove the bolt.

2. Sight through the bore at a target approximately 100 yards away.

3. Move the rifle and rest until you can visually center the target 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.

Note: *If you are using rings which permit windage adjustments, make your initial bore sighting windage adjustments with the rings as much as possible.*

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 hunt or shoot with. The Razor 1–4x24 EBR-556 scope is specifically calibrated for the popular 5.56x45mm cartridge using 55 gr. bullets and a 100 yard zero range. The Razor 1–4 can be used with other cartridges, but be aware that the bullet drop references used on the EBR-556 reticle may not accurately match.

Before range shooting, be sure the reticle is in focus (see *Reticle Focus Adjustment*).

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 (see section on *Windage and Elevation Adjustment*).

3. 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.

4. Carefully fire another three-shot group and see if the bullet group is centered on the bullseye.

If necessary, make another adjustment to the riflescope and fire another group to verify zero. This procedure can be repeated as many times as necessary to achieve a perfect zero.

After the rifle has been zeroed at 100 yards, the elevation and windage knobs should be re-indexed to their zero indicators. This is a useful feature which allows you to quickly and accurately keep track of elevation or windage corrections dialed on the turrets in the field and quickly return to an original zero point setting.

After completing the final sight-in:

- Loosen the three elevation turret cap retaining screws using the 2.0 mm hex wrench and carefully rotate turret cap until the "0" mark on cap matches up with reference line on turret post. *Be sure that the cap is turning freely and that you don't rotate the actual turret mechanism.*

Correct elevation and windage cap placement.

- Re-tighten retaining screws using thumb and forefinger on short end of hex wrench.

Repeat procedure with the windage turret.

After this adjustment, the turret cap zero marks will correspond with the 100-yard zero on the rifle.

Shooting the EBR-556 Reticle

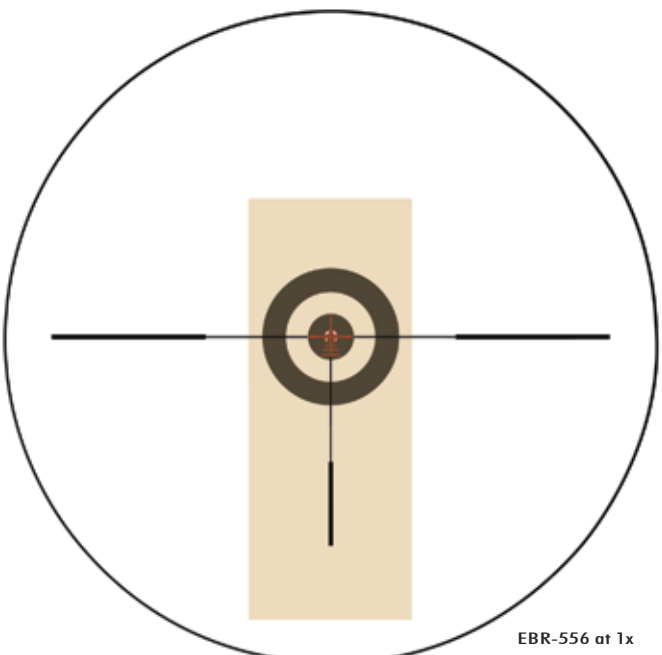
The Vortex Razor 1-4x24 EBR556 riflescope is equipped with the patented Vortex EBR-556 MOA glass etched reticle. Although this precision reticle has been specifically designed around the 5.56x45 (.223 Remington) cartridge using a 55 gr. FMJBT bullet, it can also be used with similar cartridges. Be aware that the further other cartridges vary ballistically from the 5.56 round, the further off the bullet drop and windage reference lines will be.

Because of it's unique dual purpose design, the EBR-556 MOA reticle can be used at 1x magnification in CQB (close quarters battle) applications or it may be turned up to 4X magnification and used as a precision crosshair for longer distance shooting.

These features are a function of the first focal plane (FFP) reticle design used in this riflescope. Other benefits to the FFP reticle are accurate use of the ranging and windage features at all magnification levels and increased reticle durability due to being located at the spring suspended end of the internal erector tube mechanism. Also, because of the reticle location a FFP riflescope will have zero point-of-impact shift as magnification is changed.

For distances inside of 50 yards

For CQB type applications, use the EBR-556 reticle at 1x magnification with a high intensity illumination level. Shoot with both eyes open for maximum speed in target acquisition. Your eye should view the reticle as simply a large illuminated central dot.



EBR-556 at 1x

Note: *Heavy non-illuminated lines extend vertically and horizontally in the field of view to ensure that the shooter still has a rapid aiming point of reference in case of battery failure.*

For distances inside of 50—175 yards

More magnification may be used if desired and main crosshairs should be used in a dead-on hold. Actual point-of-impact will typically be .2 inches below the crosshair intersection at 50 yards, dead on at 100 yards and 2.4 inches below crosshair intersection by 175 yards.

EBR-556 at 4x

For distances 200 yards and beyond

For distance shooting applications, use the EBR-556 reticle at higher magnifications. With the FFP design used in the Razor 1-4x24 any magnification will allow use of the ranging and holdover features, but setting the scope at its highest 4x magnification will provide the greatest accuracy level. The EBR-556 reticle is calibrated to give the shooter accurate bullet drop compensation from 100-700 yards as well as 10 mph wind drift hold-offs.

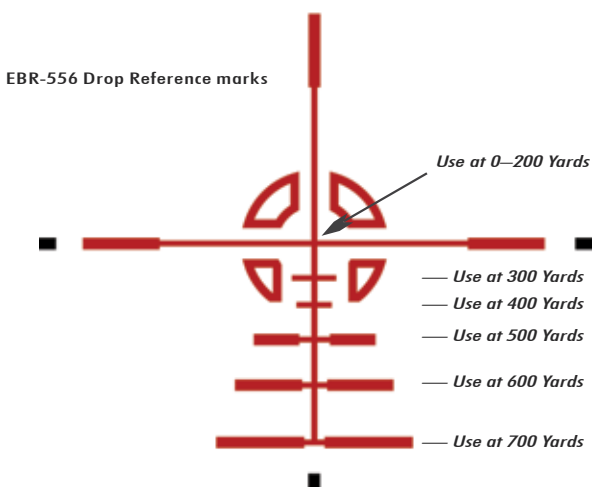
The main crosshair intersection of the EBR-556 reticle should be zeroed at 100 yards (see *Range Sight-In* instructions). Due to the flat trajectory of the 5.56mm round, this will allow the central crosshair to be used effectively from 0-200 yards on man sized targets.

Note: *If you are using the EBR-556 for precision shooting at small targets, be aware that there is not a 200-yard drop line. When shooting at 200 yards using center crosshair, the bullet will drop approximately three inches when the rifle is zeroed at 100 yards.*

The five horizontal lines below the central crosshair provide hold-over references at 300, 400, 500, 600 and 700 yards.

EBR-556 at 4x

Close-up of EBR-556 Reticle



Using the EBR-556 with Other Calibers and Loads

Although the Razor 1-4 EBR556 uses a reticle calibrated specifically for the 55gr. 5.56mm round, it can still be easily used with many other popular calibers and loads. MOA drop numbers used on the reticle are listed below. Generating a custom ballistic drop chart for other calibers and loads being used will allow the MOA drops to be compared for compatibility.

EBR556 Reticle

200 Yards – No drop number supplied
300 Yards – 4.4 MOA
400 Yards – 8.0 MOA
500 Yards – 12.5 MOA
600 Yards – 18.4 MOA
700 Yards – 25.8 MOA

Example

The following drop chart for a .308 (7.62mm) Sierra 165 gr. HPBT bullet shot at 2700 fps. was generated on a ballistic website (JBM Ballistics). As you can see, the drops are quite close to those used on the EBR-556 reticle. Up to 500 yards, the difference is generally 1/2 MOA or less, and for many applications would allow the reticle to be effectively used with the Sierra .308 HPBT 165 gr. bullet.

Custom Drop Chart for Sierra .308 165 gr.

Range (Yards)	Drop (MOA)
0	—
25	-2.5
50	-0.2
75	0.2
100	-0.0
125	-0.4
150	-0.9
175	-1.4
200	-2.0
225	-2.7
250	-3.4
275	-4.2
300	-5.0
325	-5.8
350	-6.7
375	-7.6
400	-8.5
425	-9.5
450	-10.5
475	-11.6
500	-12.7
550	-15.1
600	-17.7
650	-20.5
700	-23.5

Ranging Distances with the EBR-556 Reticle

There are several unique man-sized ranging features used in the EBR-556 reticle. By matching a man's shoulder width (or any other object spanning 19 inches) to the most closely matched reticle image, approximate range can be determined. The following estimations are based on an average 19-inch shoulder width. These range estimations will also work with any other object spanning 19 inches.

100 Yards

The outer ring dimension of the illuminated circle (19 MOA) approximately corresponds to 19 inches (a man's shoulder width) at 100 yards.

200 Yards

The inner ring dimension of the illuminated circle (8.8 MOA) approximately corresponds to 19 inches (a man's shoulder width) at 200 yards.

300 Yards

300-yard drop reference line width (5.7 MOA) approximately corresponds to 19 inches (a man's shoulder width) at 300 yards.

400 Yards

400-yard drop reference line width (4.7 MOA) approximately corresponds to 19 inches (a man's shoulder width) at 400 yards.

500—700 Yards

The fine inner line section approximately corresponds to 19 inches (a mans shoulder width) at these yardages: 500 (3.8 MOA), 600 (3.1MOA), 700 (2.7 MOA).

500-yard example shown.

Estimating 10 MPH Wind Drift with the EBR-556 Reticle

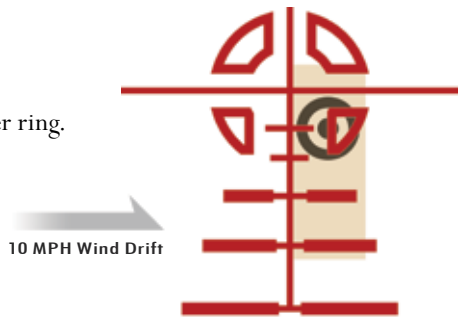
The EBR-556 reticle also helps estimate wind drift using the following references:

100 to 200 Yards

Due to minimal 10 mph wind drift, no reference is provided.

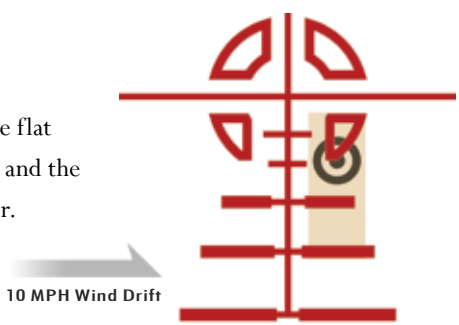
300 Yards

Flat sides of the inner ring.
(2.9 MOA)



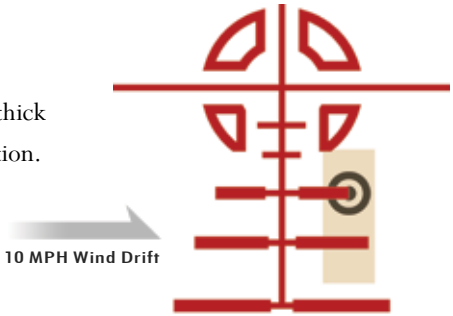
400 Yards

Corners between the flat bottom of the circle and the outer circle diameter.
(6 MOA)



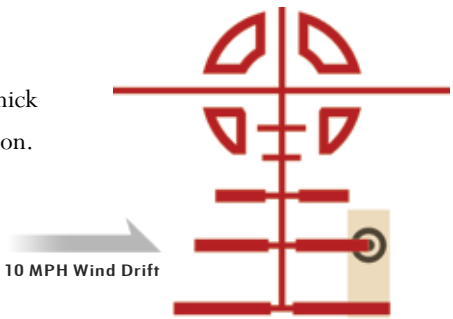
500 Yards

Outer edge of the thick horizontal line section. (8 MOA)



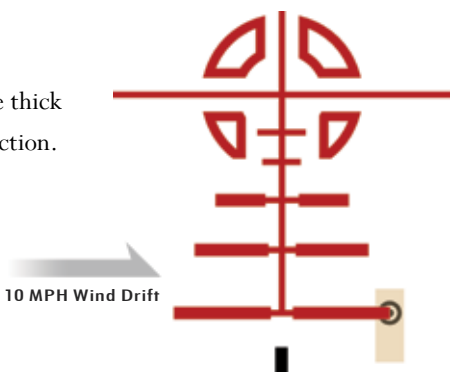
600 Yards

Outer edge of the thick horizontal line section. (10.4 MOA)



700 Yards

Outer edge of the thick horizontal line section. (12.9 MOA)



Maintenance

Cleaning

The Vortex Razor riflescope requires very little routine maintenance other than periodically cleaning the exterior lenses. The exterior of the scope 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 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 to remove the turret caps, do not attempt to disassemble any components of the riflescope. Disassembling of riflescope may void warranty.*

Troubleshooting

Sighting-in Problems

Many times, problems thought to be with the scope are actually mount problems. Be sure the mounts are tight 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. Re-center the scope reticle (see *Centering of the Reticle*).

2. Attach bore sighter, or remove bolt and visually boresight rifle.

3. Look through the scope. If the reticle appears way off center on the boresighter image or when compared to the visually centered target when looking through rifle's bore, there may be a problem with the bases or rings being used. Confirm that correct base and rings are being used—and in the proper orientation.

Grouping Problems

There are many issues that can cause poor bullet grouping.

- Maintain a good shooting technique and use a solid rest.
- Check 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.
- Check that rings are correctly torqued per the manufacturer's instructions.
- Some rifles and ammunition don't work well together—try different ammunition and see if accuracy improves.

Vortex Service and Repair Policy

Unconditional Lifetime Warranty

Vortex Optics wants you to shoot and use your Razor HD riflescope under any conditions with complete confidence—that's why our warranty is straightforward and simple:

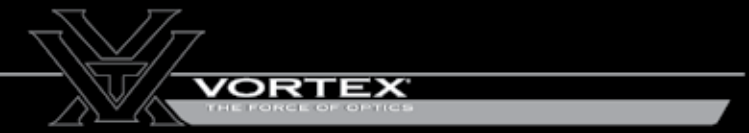
- Fully transferable
- No warranty card needed
- No receipt needed

Unconditional Lifetime Warranty

Rest assured, if this riflescope should ever require repair, all you need to do is contact Vortex for absolutely free service. Call 800-426-0048 or e-mail service@vortexoptics.com.

Vortex Optics
2120 West Greenview Drive
Middleton, Wisconsin 53562
USA

Patents Pending
Dual Use: Shooting Tactical / Hunting



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