



# SONORA™

RIFLESCOPE



PRODUCT MANUAL

## THE SONORA™ RIFLESCOPES

Specifically designed for discriminating hunters and shooters, the Sonora™ series of riflescopes offer high levels of performance and reliability. With features such as generous long eye relief, rugged construction and precise, smooth controls, the Sonora™ riflescopes are ready for any situation.



Dual Use: Shooting Tactical / Hunting

## Riflescope Adjustments

The Sonora™ riflescope has a locking diopter eyepiece. This allows you to set and lock the eyepiece once and forget it.

To adjust the eyepiece:

- Look through the riflescope at a blank white wall or up at the sky.
- Loosen the diopter lock ring and rotate the eyepiece until it is in focus. Try to make this particular adjustment quickly, as the eye will try to compensate for an out-of-focus reticle.
- Once the reticle is in focus, tighten the diopter lock ring snug.



Adjust the reticle focus

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

## Magnification Adjustment

To change magnifications, turn the magnification ring to the desired level.

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

Magnification Scale



## Windage and Elevation Adjustments

The Sonora™ riflescope incorporates adjustable elevation and windage dials with audible clicks. Each audible click moves the bullet's point-of-impact 1/4 of a minute of angle (MOA).

1/4 MOA closely corresponds to 1/4 inch at 100 yards, 1/2 inch at 200 yards, 3/4 inch at 300 yards...taking four (4) clicks to move the bullet's point-of-impact approximately one inch at 100 yards.

## How to Adjust Windage and Elevation Settings

Begin adjusting the windage and elevation settings by first removing the turret caps. Then, move the turrets in the direction you wish the bullet's point-of-impact to change. To make the adjustments, rotate the adjustment dial in the appropriate direction (up/down or left/right) as indicated by the arrows.

After sight-in, you can re-align the zero marks on the turret dials with the reference dots if you wish (see *Resetting Adjustment Dials with Zero Reset* on page 8). Replace the turret caps when done.



To adjust settings, turn dials:

- Up / Down
- Left / Right

## RIFLESCOPE MOUNTING

To get the best performance from your Sonora™ 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.



## Rings and Bases

Mount an appropriate base and matching rings to your rifle according to the manufacturer's instructions. Your new Sonora™ riflescope will require 1-inch rings.

Use the lowest ring height that will provide complete clearance of scope and rifle. Once the scope is mounted in the scope rings, the scope should not be in contact with the barrel, receiver, bolt handle or any other part of the rifle. A low mounting will help assure proper cheek weld, aid in establishing a solid shooting position, and promote fast target acquisition.

## Eye Relief and Reticle Alignment

Begin with riflescope loosely installed in rings on the rifle. Before tightening the scope ring screws, adjust scope position for maximum eye relief to avoid injury from recoil.

- Set the riflescope to the highest power of its magnification range.
- Slide the riflescope as far forward as possible in the rings.
- 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.*
- Without disturbing the front-back placement, rotate the riflescope until the vertical crosshair exactly matches the vertical axis of the rifle. Use of bubble levels, a reticle leveling tool, a weight hung on a rope, or a flat feeler gauge will help with this procedure.
- After aligning the reticle, tighten and torque the ring screws down per the manufacturer's instructions.



Use of bubble levels to square the riflescope (and reticle) to the base.

## Bore Sighting

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

To visually bore sight a rifle:

- Place the rifle solidly on a rest and remove the bolt.
- Sight through the bore at a target approximately 100 yards away.
- Move the rifle and rest until the target is visually centered inside the barrel.
- With the target centered in the bore, make windage and elevation adjustments until the reticle crosshair is also centered over the target.



Visually bore-sighting a rifle.

## 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 yards is the most common zero distance, although a 200 yard zero may be preferred for long range applications.

Be sure the reticle is in focus (see page 3). If scope is equipped, set the parallax adjustment to match the distance being used for sight-in:

- Following all safe shooting practices, fire a three-shot group as precisely as possible.
- Next, adjust the reticle to match the approximate center of the shot group (see section on *Windage and Elevation Adjustment* on page 5).

**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.

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

This procedure can be repeated as many times as necessary to achieve a perfect zero.

## Resetting Adjustment Dials with Zero Reset

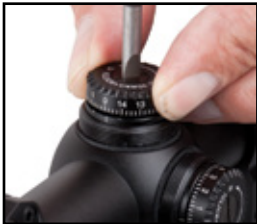
Sonora™ riflescopes feature windage/elevation dials that allow you to re-index the zero indicator after sight-in without disturbing your settings. Though not required to do, this process will allow you to quickly return to your original zero if temporary corrections are dialed in the field. Reset the windage and elevation dials in this way:



Remove the outer cap. While firmly holding the dial, loosen and remove center screw.



Lift dial off of scope. Orient dial to reposition the zero mark on the index line.



Install dial and reinstall and tighten center screw while firmly holding the dial.

## MAINTENANCE

### Cleaning

The fully waterproof and fogproof Sonora™ 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, such as the Vortex® Fog Free cleaning products or Lens Pen, 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 Sonora™ riflescopes are permanently lubricated, so no additional lubricant should be applied.

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

### Storage

If possible, avoid exposing your Sonora™ riflescope to direct sunlight or any very hot location for long periods of time.

## TROUBLESHOOTING

### Sighting-in Problems

Many times, problems thought to be with the scope are actually mount problems. Be sure that correct base and rings are being used in the correct orientation, and that the base screws and rings are tight. Insufficient windage or elevation adjustment range may indicate problems with rings, base, base alignment, base mount holes drilled in the rifle's receiver, or barrel/receiver alignment.

### Check for Correct Base and Ring Alignment

- Roughly center the reticle by adjusting both windage and elevation turrets to the mid point of their travel ranges.
- Attach bore sighter, or remove bolt and visually boresight rifle.
- 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.

### Tips for Solving Bullet Grouping Problems

- 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.



## VIP WARRANTY

OUR UNCONDITIONAL PROMISE TO YOU.

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

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

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