

SHEPHERD SCOPES

a Division of Salvo Technologies

BRS SERIES

BALLISTIC RANGEFINDING SCOPE

4-16x44 IR

INSTRUCTION MANUAL


Objective Lens
Parallax Adjustment Knob
Elevation Turret
Illumination Adjustment Knob
Windage Turret
Magnification Adjustment Knob
Eyepiece Adjustment Knob

Fast Focus Eyepiece Adjustment
Turn the eyepiece knob counter-clockwise until it is fully out. Look through the scope at a blank, light colored wall. Slowly turn the eyepiece knob clockwise until the reticle is in focus. As you turn the knob, look away every few seconds so your eye does not adjust to the reticle. When the reticle is clear and sharp with a quick glance, the eyepiece is set to your eye.

Illumination Adjustment
Install the included CR 2032 battery with the "+" side out. To adjust the illumination, rotate the dial; there are 6 red brightness levels with an off setting between each one.

Parallax
The parallax adjustment is used to focus the target image. Aim the scope at the target and rotate the left side parallax focus knob to match the target's range. The reticle should stay on target even if you move your eye or head slightly. If the reticle shifts in relation to the target, make slight adjustments until the reticle stays on target.

Elevation and Windage Turrets
Pull up on the knob to unlock and adjust the elevation and windage knobs. The turrets are marked 'U' for up, "D" for down (elevation) and 'R' for right, "L" for left (windage). Turning the knob in the direction of the arrow will move the bullet impact point in that direction. Push the knob down to lock the knob. To reset each turret knob to zero; remove the turret cap screw with a coin, pull off the turret cap knob, rotate the cap so the "0" will line up with the dot on the scope, push the knob back down, and replace the turret cap screw.

Mounting the Scope
Mount the scope into 30mm scope rings on the rifle leaving the top half of the rings loose enough to allow the scope to slide forward and back. Start with the scope as far forward in the rings as possible and with the scope at its highest magnification (16). Assume a proper shooting position and adjust the scope to get a full field of view with a sharp edge. This will ensure that the scope is at the proper eye relief.

Secure the rifle on sand bags or a gun rest and level it. Without moving the rifle, rotate the scope until it is level. This can be done with a bubble level set on top of the elevation knob. Tighten the scope rings in a crisscross pattern one to two turns at a time to ensure a firm, even grip on the scope that will not induce torque on the tube or tilt the crosshair.

WARNING: Do not over-tighten any of the scope ring screws as you may cause damage to the scope body or the mounts. Such damage would not be covered under warranty.

Bore Sighting
Bore sighting the scope will ensure that the scope is mounted properly to retain full erector travel. This can be done by following the manufacturer's instructions for a laser bore sighter, or by following the instructions below to bore sight visually.

Remove the bolt (for ARs, separate the lower receiver first) and set the rifle on sand bags or a gun rest. With a target about 50 yards away, look through the bore and adjust the rifle until the target appears centered in the barrel.

Now look through the scope. The scope should be aligned to the weapon so that the center of the reticle is within a 4-inch circle on the target from your aiming point. If you are not within a 4-inch circle, you may need to shim or adjust your scope rings so that the scope is better aligned with your rifle's barrel. When the scope is aligned as closely as possible to the barrel, it is ready to be zeroed.

Zeroing Your Scope

At a range, place a target at 50 yards. When safe to do so, fire a shot from a solid rest while aiming at the center of the target. Your shot should land within a few inches of the target's aim point when properly bore sighted. Pull up on the knob to unlock and adjust the elevation and windage knobs appropriately to get the scope on target. Push the knob down to lock.

The turrets are marked 'U' for up (elevation) and 'R' for right (windage). Turning the knob in the direction of the arrow will move the bullet impact point in that direction.

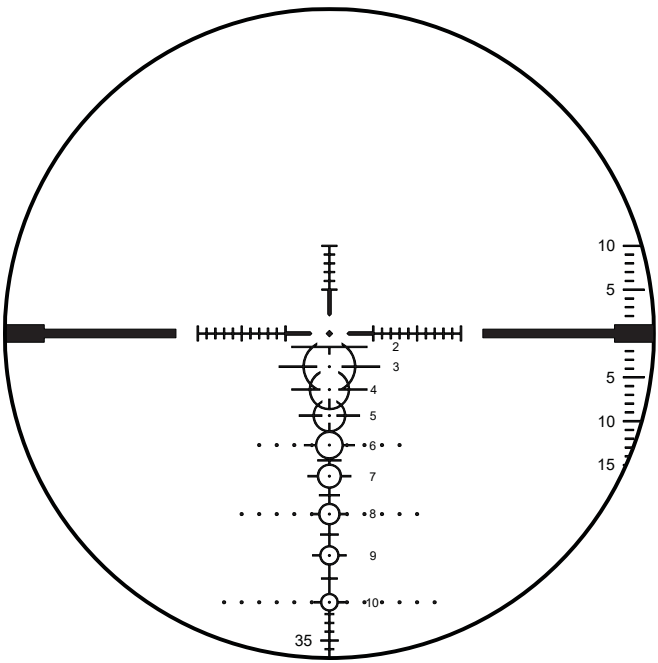


After your initial adjustments, fire another shot to make sure you are on target. Then move to your desired zero range and continue the process of adjusting the turrets to zero in the scope. Fire a three shot group and make any final adjustments based on the center of that group. To reset each turret knob to zero, remove the turret cap screw, pull off the turret cap knob, rotate the cap so the "0" will line up with the dot on the scope, push the knob back down, and replace the turret cap screw.

Note: Changes to ammunition, weather, and elevations can all affect the bullet trajectory which may require an adjustment to your zero.

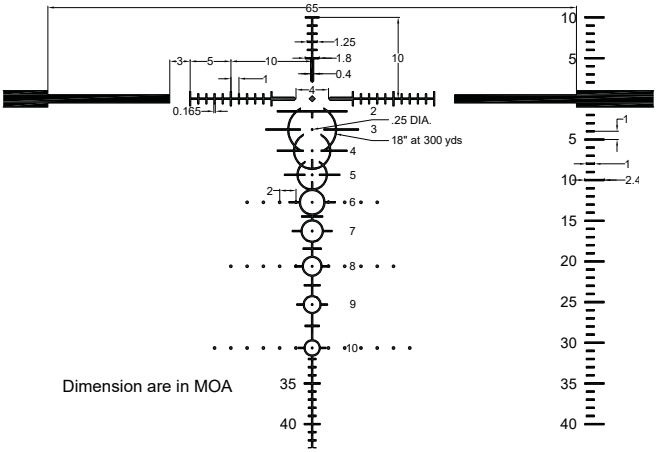
Reticle

The BRS reticles combine ranging circles and bullet drop compensation to give you a fast and easy target-acquisition system for long-range shooting. Starting with a 100-yard zero, there are aiming points on the reticle based on the bullet impact for every 100 yards of distance. These aiming points give you the proper holdover allowing for quick, accurate shots without the need to make turret adjustments. Each reticle in the BRS series is designed for different trajectories. See the chart on page 11 for the bullet drops of each reticle.



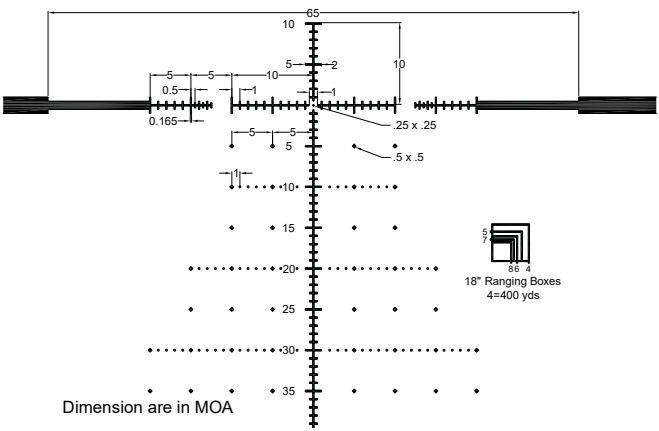
The BRS-1 reticle is shown above at full (16x) magnification. The BRS Series scopes have first-focal-plane reticles that give you accurate subtensions across the magnification range.

BRS reticles have an MOA (minute of angle) scale on the right side of the reticle that can be used for rangefinding (see pages 8 & 9). MOA is an angular measurement, so the vertical length it represents increases with distance. One MOA is equal to about 1” at 100 yards or 10” at 1000 yards.



MOA Reticle

The MOA reticle has 18” ranging boxes that can be used as a passive range finder from 400 to 800 yards.



Range Finding and Bullet Drop Compensating

The Shepherd BRS is a fast, easy approach to passive range finding. There are a series of 18" circles in the first focal plane reticle that are based on a specific target size at distances. As long as you know the approximate size of the target you can use the circles to find its range.

COMMON TARGET SIZES	
DEER	18" FROM SHOULDER TO BRISKET
ELK / LARGE GAME	18" FROM NOSE TO BACK OF HEAD OR 3/4 OF BODY MASS
COYOTE	9" CHEST AREA / 18" STANDING, FROM GROUND TO TOP OF BACK
PRARIE DOG	STANDING ADULT 9" LONG / HALF OF 18" CIRCLE
MILITARY	SILHOUETTE TARGET IS 18" - 20" ACROSS THE SHOULDERS

As an example, let's say there is a deer standing at an unknown distance away from a hunter (see picture page 9). Using the series of decreasingly smaller circles, match the chest area of the deer in the circle that fits. The number beside that circle is the range, in this case 4 for 400 yards. By using the circles, the scope is automatically compensating for the bullet drop. Just Fit and Fire - it's that simple!

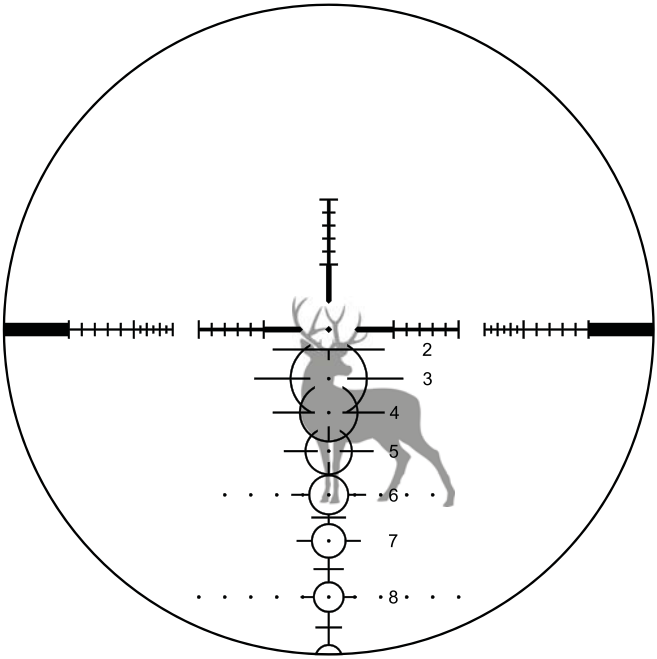
To estimate the range of objects of a known size:

$$\frac{\text{Actual Target Size(in)}}{\text{Target Measurement (MOA)}} \text{ X } 100 = \text{ Range to Target (yds)}$$

Say the shooter has a known target that is 30" and that target covers 6 MOA in the MOA scale of the reticle. Enter the numbers into the equations:

$$\frac{30"}{6 \text{ MOA}} \text{ X } 100 = 500 \text{ (yds)}$$

The shooter can then put the "5" circle on the target and fire. The system has been designed with the range finding circles set on the same focal plane as the target. This means that as you zoom in and out the circles increase and decrease proportionally. They are always accurate!



The shooter can also use the reticle to estimate the range of objects of an unknown size.

$$\frac{\text{Range to Target (yds) X Target (MOA)}}{100} = \text{Target Size (in)}$$

Using the equation above for example, if you have a deer that fits the 500-yard circle and his rack covers 6 MOA on the MOA scale in the scope

$$\frac{\text{500 yds X 6 MOA}}{100} = 30”$$

Therefore, the buck has a 30-inch rack.

BRS Ballistic Reticle Chart
The chart on the next page can be used as a starting point for finding the reticle that matches a particular ammunition. Remember that higher elevations will “flatten” the trajectory at longer ranges; and weather, barrel length, and scope mounting height will also affect the ballistics. Use the ballistic calculator at shepherdscopes.com to find the best matching scope for your ammo and rifle.

Care and Maintenance
Take care not to drop, knock, or subject the scope to heavy impacts.

Keep the protective lens covers in place when not in use.

Do not over-tighten scope rings on scope tube body. Follow scope ring manufacturer’s torque recommendations.

Maintain the metal surface of the scope by removing dirt, dust, etc. with a soft brush to avoid scratching the surface.

If necessary, clean the exterior lenses of the scope with the supplied cloth. First, make sure the lenses and cloth are clean of debris to avoid scratching the lens surface and coatings. Never use fingers or tissue paper.

Do not allow the scope to come into contact with acid, alkaline, or corrosive materials or substances.

Do not disassemble the scope, remove screws or parts, or lubricate any part of the scope.

BRS Ballistic Reticle Chart

	BRS-1A		BRS-1C		BRS-1		BRS-2B		BRS-2	
yds	Inches	MOA	Inches	MOA	Inches	MOA	Inches	MOA	Inches	MOA
100	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
200	-2.10	-1.00	-2.60	-1.24	-3.22	-1.54	-3.50	-1.67	-3.98	-1.90
300	-8.20	-2.61	-9.90	-3.15	-11.88	-3.78	-12.90	-4.11	-14.25	-4.54
400	-18.80	-4.49	-22.80	-5.44	-26.78	-6.39	-29.50	-7.04	-31.86	-7.61
500	-34.40	-6.57	-42.00	-8.02	-49.00	-9.36	-54.00	-10.31	-58.05	-11.09
600	-56.00	-8.91	-68.90	-10.97	-79.62	-12.67	-87.20	-13.88	-94.20	-14.99
700	-85.40	-11.65	-104.80	-14.30	-119.24	-16.27	-133.00	-18.14	-142.13	-19.39
800	-121.00	-14.44	-149.60	-17.67	-172.46	-20.59	-191.00	-22.80	-203.98	-24.35
900	-166.00	-17.61	-207.00	-21.96	-238.47	-25.30	-265.40	-28.16	-282.39	-29.96
1000	-224.00	-21.39	-280.00	-26.74	-320.90	-30.64	-360.00	-34.38	-380.90	-36.37
BC	Velocity (fps)									
0.40	3530		3230		3050		2920		2850	
0.45	3450		3150		2950		2830		2750	
0.50	3400		3100		2890		2760		2680	
	7mm Wby Mag*		7mm Rem Mag*		6.5 Creedmoor*		6.5 Crmr (AR)*		5.56 68-75 gr*	
	300 Wby Mag		.270 Win		300 Wim Mag		30-06 SPRG		30-06 SPRG	
	30-378 Wby M				338 Lapua		.308 Win		.308 Win	

	BRS-22LR	
yds	Inches	MOA
50	0	0.00
100	-5.60	-5.35
150	-19.60	-12.48
200	-43.60	-20.82
250	-78.80	-30.10
300	-126.50	-40.27
350	-188.00	-51.29
400	-266.00	-63.50
BC	Velocity (fps)	
0.125	1280	
0.139	1255	
	22LR	

*Note: This Caliber list is only a guideline. The actual ammo/rifle characteristics used should be verified by the user. The bullet drops can then be checked by using a ballistic calculator like the one found on ShepherdScopes.com.

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