

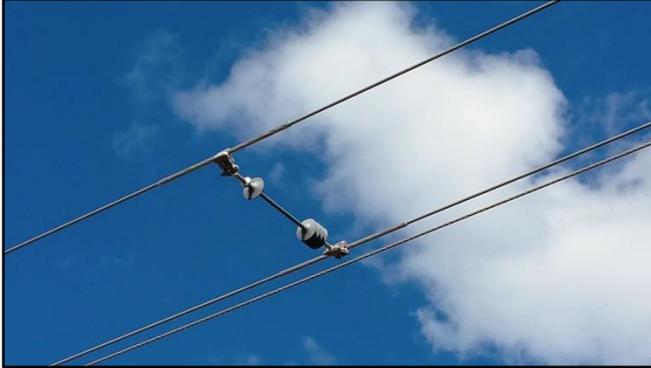


## AR Products

*Solutions for Galloping and Vibration Control*

### AR® Spacer | Twister for Distribution Lines

Spacing and Galloping Control for Distribution Lines and Underbuilds



An anti-galloping spacer damper, this solution for distribution lines addresses the unique requirements of phase spacing, galloping and vibration control. Used on underbuilds or distribution lines, the Spacer Twister can work alone or in concert with AR anti-galloping dampers for transmission lines. The AR Spacer Twister has two articulating clamps at each end of a polymer insulator.

Distribution and feeder lines are characterized by several common features

- Radial feeds are subject to load loss at any point
- Clearance between phase conductors is only a few feet.
- Conductor attachment points are rigid.
- Spans can be short.

#### APPLICATIONS

New transmission and distribution lines have lighter weight conductors (outer diameters of less than 1.0) and shorter spans. Anti-galloping dampers used on higher voltage/longer span transmission lines can be too heavy or too cumbersome for distribution lines. Rebuild lines or underbuilds having narrow clearances can experience galloping when ice foils form and the wind angle causes lift forces on the conductor. AR Spacer Twisters combine twisting for galloping control with phase spacing; dampers can be used alone or paired with the AR anti-galloping Twister in a dual damper solution.

AR clamps act as eccentric weights and use gravity to twist the conductor by inertia offset, both statically and dynamically. The polymer insulator of the Spacer Twister provides a light weight solution for guarding against clashing when the predicted galloping amplitude may exceed the available clearance.

#### HOW IT WORKS

The AR Spacer Twister combines the benefits of the twisting action with the Euler buckling behavior properties of the

polymer insulators. Insulators have a good track record for eliminating flashovers during galloping but they do not prevent galloping motion. AR clamps swivel and articulate 180°. Twisting is integral to the AR Products anti-galloping methodology. By forcing the conductor to twist, aerodynamic lift is unloaded and galloping motion is interrupted.

**Protection from Flashover.** The primary purpose of the AR Spacer Twister is to guard against flashover when there is a deficit in phase clearance. The articulating clamp fitted at both ends is how the AR Spacer Twister provides the twist necessary to control galloping.

**Clamps are sized to the conductor** and installed over line guards. The articulating feature lets the clamp rotate through large angles, twisting the conductor and reducing conductor motion.

The Spacer|Twister has eliminated breaker operations on treated spans up to 345kV and has been installed in vertical or horizontal configurations

## PERFORMANCE TESTED

AR Clamps have been strength tested at independent laboratories. Slipping tests found clamp strength to exceed 4000 lbs.

Insulator rods used in the AR Spacer Twister have been tested for compressive strength to establish column-buckling behavior. The tensile test of the 5/8" rod revealed an ultimate load of 35,000 lbs. The rods behave as an elastic column under compression load.

## SPECIFICATIONS

Component	Weight	Conductor	Clamp Sizes	Insulator Lengths	Application
AR Clamps	4 lbs.	0.50" - 1.00"	0.75" to 1.43"	3 ft. – 7 ft.	Single conductor Distribution or Feeder horizontal or vertical underbuilds
Insulator	~5-15 lbs.				
Hardware	1 lb.	1.75" flat washers; 5/8–3" bolts, ANCO pin, lock washers			

## CONSTRUCTION

Clamps are aluminum castings; insulator is comprised of polymer core with high grade forged steel fittings; hardware is HDG steel. End fittings are tongue-tongue.



AR Clamps are sized to the conductor and installed over line guards. The articulating feature lets the clamps rotate through large angles, allowing the conductor to twist. This dynamic motion dumps off aerodynamic lift and reduces galloping motion.

In collaboration with the client's project engineer, up to 3 models of varying lengths can be customized to accommodate span lengths, phase clearance, sag depths and other unique characteristics of the line.

**Note: The AR Spacer Twister is designed for use with line guards. Aluminum line guard specifications will be included in the recommendations for the galloping control solution together with specifications for the AR Spacer Twister model, number of units and placement on the phases of the transmission line.**