

*Specializing in galloping and vibration control  
transmission, distribution and wind*

## AR TECHNOLOGY

Twisting of the conductor is a proven remedy to control galloping. Tests have shown that a small amount of twist - as little as 10 degrees – will reduce gallop amplitudes to harmless levels.

### I. Galloping Control for Single Conductors

#### WINDAMPER®

700' – 3000' SPANS



#### SPANS LONGER THAN 800' AND VERY LONG SPANS LIKE RIVER CROSSINGS SHIELD WIRES AND OPTICAL GROUND WIRES

Uses aerodynamic lift and drag to cause variation in the wind angle of attack along the conductor. This action creates stability for the entire span by reducing or eliminating galloping motion. By twisting at the attachment point to the conductor, the Windamper® uses gravity and wind force to induce twisting when galloping occurs. For more than 40 years, the Windamper® has been protecting long spans, hard-to-reach locations (river crossings), power lines serving large manufacturing operations (steel mills), and the nine circuits serving Niagara Falls.

MODEL	APPLICATION
WD A4N   WD A4C	69kV –345kV transmission conductors
WD A6N   WD A6C	69kV –345kV transmission conductors
WD A4N	Shield wires and OPGWires (uses breakaway bolts)

#### AR® TWISTERS

250' - 800' SPANS



#### SHORTER SPANS AND DISTRIBUTION LINES SMALLER HORIZONTAL AND VERTICAL TRANSMISSION LINES

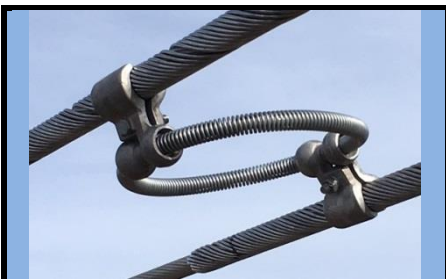
A torsion damper, Twisters set as eccentric weights that use inertia, acceleration and twist to control galloping. A solution for **shorter spans**, it twists a single conductor, by inertia offset, both statically and dynamically. Vibration control is achieved by allowing the eccentric weight to move against the vibration. The initial twist angle alters the wind angle of attack to control galloping. Used on power line conductors with shorter spans, it has been installed by helicopter at hot line voltages up to 161kV, and by bucket truck at voltages up to 345kV. The AR Twister has eliminated breaker operations on treated lines.

MODEL	APPLICATION
MOD2, MOD3, MOD4	250' – 800' spans, 69kV-345kV
Twister   Slider	Lighter-weight conductors & distribution lines

### II. Galloping Control for Bundled Conductors

#### MOD2 SPACER DAMPER

500'- 1800' SPANS



#### DOUBLE, TRIPLE AND QUAD BUNDLES HORIZONTAL AND VERTICAL BUNDLES RIVER CROSSINGS AND VERY LONG SPANS

An impact damper, the MOD2 controls galloping and rolling of the bundled conductor. Installed at specified distances, the AR Spacer Damper system provides proper separation of the bundle, increased torsional stiffness, effective vibration damping, and galloping control on twin, triple or quad bundled lines. Galloping control is achieved by allowing the conductors to twist independently as each starts to gallop up and down. Tested at NEETRAC for strength, corona, RIV and vibration control.

MODEL	APPLICATION
AR Spacer Damper	12", 18", 24" and 30" Bundled Conductors
MOD2	18" Twin Bundle Spacer Damper

## LIGHTWEIGHT SPACER DAMPER

400' – 1000' SPANS



### LIGHTER-WEIGHT SOLUTION FOR TWIN-BUNDLED LINES SEPARATES THE BUNDLE & CONTROLS GALLOPING

Articulating clamps rotate and twist the conductor through large angles to achieve effective galloping control of the twin bundled conductor, while maintaining separation of the bundle. Installed on the conductor at 60 degrees, the clamp is free to rotate about a hinge axis up to a 120 degree range of rotation. This design eliminates the potential for corona because the nut(s) at both ends of the stabilizer rod remain inside the bundle. Unlike rigid spacers that separate the bundle but without galloping control, the Lightweight has the widest possible angle of total rotation to facilitate a greater twisting ability of the conductor, and therefore greater galloping control. Rated strength @ 5000 lbs.

MODEL	APPLICATION
LW-12	12" bundle
LW-18	18" bundle

## III. Galloping Control for Limited Phase Clearance and Distribution Systems

### SPACER TWISTER

270' – 1500' SPANS



### SEPARATE PHASES WITH GALLOPING CONTROL PROTECTS AGAINST FLASH-OVER WHEN PHASE CLEARANCE DEFICIT

Combines the benefits of the twisting action by AR Clamps with the features of the polymer insulators. Insulators have a good track record for eliminating flashovers during galloping but they do not prevent galloping motion. Insulator rods used in the AR Spacer Twister have been tested for compressive strength to establish column-buckling behavior. Shorter lengths suitable for underbuilds.

MODEL	APPLICATION
STx-X	3' – 18' Phase Spacing combined with galloping control

### TWISTER SLIDER

240' – 800' SPANS



### DISTRIBUTION SYSTEMS SMALLER OVERHEAD TRANSMISSION

Light weight and ultra-lightweight conductors and distribution lines where precise weight is required to set the twist. Using clusters of loose, galvanized iron washers this damper design controls galloping of the smaller conductor, distribution systems, static lines, OPGW, or steel shield wires. Total weight is adjustable in 3 oz. increments.

MODEL	APPLICATION
TS-X	Distribution Systems

## ABOUT AR PRODUCTS

AR Products specializes in galloping control solutions by analyzing sections of at-risk electric transmission systems and recommending the appropriate product and application for the environment. Patented, tested and proven as reliable solutions for the long term, AR Products are made in the USA.

AR supports the needs of project engineers and consulting engineers developing viable solutions to a galloping problem. Grounded in fundamental, scientific and engineering principles, AR Products technology provides cost-effective, galloping control that is Intent on asset protection. Applications are designed to interrupt high-amplitude galloping.