PREFORMED LINE PRODUCTS
The connection you can count on.

CUSHION-GRIP™ Spacer Damper

General Information

The CUSHION-GRIP™ Spacer Damper for Tri, Quad, and Hex Bundles feature elastomer damping elements engineered to absorb maximum energy. This design provides the greatest possible resistance to conductor fatigue by eliminating the need for additional vibration dampers.

Patented Damping Elements

The design employs a unique damping element which is captured in a way which assures the elastomer is always in compression, providing maximum service life.

Field Proven

This type of Spacer damper design has been used extensively throughout Europe and Brazil since their introduction in the early 1990s.

Helical Attachment

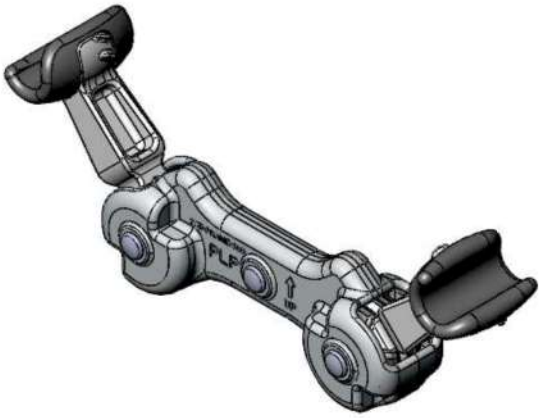
The arms feature a neoprene lined saddle attached to the conductor with helical rods for ease of installation and maximum conductor protection.

Placement is the key to Performance

PLPs extensive experience and laboratory and field testing allow us to provide you with placement recommendations that will minimize the motion of conductor bundles and maximize the longevity of the Spacer Damper.

CUSHION-GRIP™ Triple Spacer

CUSHION-GRIP™ Quad Spacer



CUSHION-GRIP™ Twin Spacer

CUSHION-GRIP™ Hex Spacer

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Armor-Grip® Spacer

General Recommendations

Intended Use: The ARMOR-GRIP® Spacer is intended primarily for use on three and four conductor bundles, and all two conductor vertical bundles. Since the ARMOR-GRIP® Spacer is designed for high fault currents. It is also recommended for substation networks and horizontal, two conductor bundle where high fault currents are expected. Spacer designs are also available for applications involving more than four conductors. The HELICAL ROD Spacer is normally recommended for horizontal, two conductor bundles.

The functions of the ARMOR-GRIP® Spacer are: to maintain uniform spacing of the subcontractors, to ensure consistent electrical characteristics; to minimize the effects of wind-induced motions, such as subconductors oscillation and aeolian vibrations, so that no abrasion nor conductor damage results; to keep the subconductors from entangling due to galloping, ice unloading and fault currents.

Installation and Inspections: The ARMOR-GRIP® Spacer is easy to install by hand and can be installed with hot line tools. These spacers are easily inspected from the ground since there are no bolts requiring special torque during installation.

Materials: The standard ARMOR-GRIP® Spacer for aluminium based conductors is composed of high strength aluminium alloy wire formed into helical rods, extruded aluminium tubing and an elastomeric cushion. There are no loose parts or troublesome articulated joints to create radio noise through looseness. To avoid galvanic corrosion spacer rod material is always designed to be compatible with the conductor. Materials other than aluminium are available for special application to copper based conductors and galvanised steel cables.

Stress Reductions: Use of the elastomeric cushion and helical rods incorporates the components of two field proven products, the ARMOR-GRIP® Suspension and PREFORMED HELICAL ROD Spacer. The result is low stress concentrations so that aeolian vibration and subconductor oscillation will cause virtually no conductor or spacer damage.

Riv-Corona: ARMOR-GRIP® Spacers are designed to be corona free at 10-12% above operating voltages up to 765 kV.

Fault Currents: Full scale fault current tests were conducted using 2, 3 and 4 conductor ARMOR-GRIP® Spacers. Fault currents up to 60 000 amperes RMS symmetrical for 520 milli-seconds were recorded without spacer or conductor damage.

Spacer Placement: As a result of experimental work done on some of the early EHV lines the normal distance between ARMOR-GRIP® Spacers should not exceed 75 metres. However, in some geographical areas exposed to constant high winds and heavy ice accumulation experience suggests that the spacing should be shortened in order to stabilize the conductor bundle. Results of laboratory and field experiments indicate that one of the most effective methods to reduce subconductor oscillation and increase bundle stability is by reducing subspan lengths and placing spacers in a non-symmetrical pattern. Asymmetrical spacing detunes the entire spacer-conductor system and thereby reduces the incidence of sympathetic vibration between subspans.

Specific recommendations for spacer design and spacer placement should be based on an evaluation of the electrical characteristics, the line design parameters, and the environmental conditions. Refer to PLP in case of need and we will help determine the most suitable spacer design and placement pattern for your line conditions.

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