Spacer Dampers
For Effective Protection of Conductor Bundles

www.pfisterer.com
Best Solution for Each Bundle Configuration

General

For high voltage transmission lines, conductor bundles are used for each phase to fulfill electrical requirements.

Spacing devices are installed on the bundles to maintain subconductor separation. Elastic and damping elements are introduced into the spacing devices for distributing the damping effect along the spans which prevents entrapment of vibration between Spacer Dampers and avoids bending stresses at the clamps.

Key Data

PFISTERER has been developing Spacer Dampers since 1980 to provide the correct damping of wind-induced vibrations for bundled conductor lines. Modern Spacer Dampers are characterized by an accurate coordination between the inertial and elastic damping properties. This provides maximum effectiveness in controlling the levels of subconductor motions.

Features

- Maintain the design spacing between subconductors under normal service conditions
- Control the levels of aeolian vibrations and subspan oscillations within the internationally accepted safety limits
- Preserve mechanical, elastic and damping properties over the entire service temperature range and for the expected lifetime of the line
- Maintenance-free for the whole lifetime of the line
- Permit movement of the subconductors in any direction without damaging the spacer components or the subconductors strands
- Maintain a suitable clamp grip
- Guarantee high corona extinction voltage due to proper clamp design and manufacturing
- Withstand minimum short circuit current of 63 kA for 1 sec
History PFISTERER's Spacer Damper

1973
Development of PFISTERER first semi flexible Spacer

1979
Setup of PFISTERER outdoor test span for self damping measurements

1980
Development of PFISTERER first Spacer Dampers

1982
First field vibration measurements made by PFISTERER

1986
Introduction of PFISTERER Software for analytical vibration damping studies

1991
Field vibration measurements made by first generation PFISTERER field vibration recorder

2001
New double frame Spacer Damper design developed

2002
Upgrade of PFISTERER internal laboratory for mechanical type testing as acc. to IEC 61854

2006
Spacer Damper for UHV hex bundle applications developed

2008
World first subspan oscillation recorder introduced

2009
World first wireless field vibration measurement device developed

2014
Upgrade of PFISTERER Spacer Damper designs

2016
High temperature boltless spacer damper clamp type developed
Analytical Vibration Damping Study

The analytical vibration damping studies are made at the design stage to predict the vibration behaviour of single and bundled conductors. The calculations are based on the energy balance between the energy introduced by the wind and the energy dissipated by the conductors with and without the relevant damping units. As a result, the most suitable damping system including the right type, numbers of dampers and their exact position can be provided.

PFISTERER runs its own laboratory for vibration damper and conductor self-damping testing since 1979. In this laboratory, design, type and sample testing is carried out in accordance with the appropriate standards and in the presence of inspectors if required.

The laboratory personnel are in charge of research and development as well as routine quality testing. This ensures that the products are in a worldwide leading position in terms of service, performance and quality consistency, even for large quantities supplies.

Test Facilities

PFISTERER has developed an unique, wireless, conductor vibration recorder, the VIBREC500, for aeolian and subsan oscillation field measurements. These recorders are used to verify the conductor vibration severity and to confirm that the damping system installed on the transmission line is correct.

Field Vibration Measurements
Reliable Clamp Designs

General

The PFISTERER Spacer Dampers are available with two different clamp designs. Both, the nut cracker and the cantilever clamp type designs provide a firm but gentle and permanent grip while protecting the conductor against the local static and dynamic stresses occurring during normal operation conditions. The weight of the clamps are as light as possible in order to maintain their mobility at the highest frequencies of aeolian vibrations and to avoid nodal points on the conductors that would impair the damping unit performance and increase bending strain at the clamp attachment. They provide sufficient clamp grip to restrain the subconductor from slipping and rotating inside the clamp during the normal service conditions. The fastening systems consider an appropriate anti-unscrewing to prevent any loosening of the clamp due to conductor vibrations and oscillations. Moreover, great care has been taken in selecting the clamp materials to avoid any corrosion.

Nut Cracker Clamp Type

The nut cracker clamp type is rubber lined and boltless. For the correct installation, an additional assembling tool is required to finally lock the clamp system with a quarter turn locking latch.

Materials
- Body and clamps: high pressure die cast aluminium alloy
- Rubber elements: elastomer
- Locking latch: stainless steel

Cantilever Clamp Type

The cantilever clamp type is directly attached to the conductor. For the correct installation and tightening of the bolt, the use of a calibrated torque wrench is mandatory.

Materials
- Body and clamps: high pressure die cast aluminium alloy
- Rubber elements: elastomer
- Bolts, nuts, plain washers: galvanized steel
- Belleville washers: mechanically galvanized steel
- Safety plates: stainless steel
# Twin Spacer Damper

## Nut Cracker Clamp Type

![Diagram of Twin Spacer Damper](image)

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## Quad Spacer Damper

**Nut Cracker Clamp Type**

![Diagram of Quad Spacer Damper](image)

### Order Information

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Twin Spacer Damper

Cantilever Clamp Type

Clamp option
Component code:
B  Shear head caps
S  Stainless steel bolts
BS  Shear head caps and stainless steel bolts

Orders with clamp option
Orders for clamp option must be indicated with the component code of the desired option at the end of the part number.

Order Information

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<tr>
<th>Ø Conductor Range “A” [mm]</th>
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Triple Spacer Damper

Cantilever Clamp Type

Clamp option
Component code:
B  Shear head caps
S  Stainless steel bolts
BS  Shear head caps and stainless steel bolts

Orders with clamp option
Orders for clamp option must be indicated with the component code of the desired option at the end of the part number.

Order Information

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<th>Ø Conductor Range &quot;A&quot; [mm]</th>
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Bundle Spacing "S" [mm]
Quad Spacer Damper

Cantilever Clamp Type

Clamp option
Component code:
B Shear head caps
S Stainless steel bolts
BS Shear head caps and stainless steel bolts

Orders with clamp option
Orders for clamp option must be indicated with the component code of the desired option at the end of the part number.

Order Information

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More Service

Vibration Analysis and Damper Studies

PFISTERER experts prepare on customers behalf vibration analysis and damper studies. Thus, the arrangement for an optimal performance of the damping system can be calculated already in the planning phase of the overhead line. With the given line and conductor parameters an experienced PFISTERER engineer compares the vibration behavior with and without damping system. At the same time the optimal solution with PFISTERER Spacer Dampers and Stockbridge Dampers for the damping system of the transmission line will be calculated.

Vibration Measurement on OHL Conductors

**VIBREC500**
- Measurement of aeolian vibrations and subspan oscillations
- Including wind and temperature measurement
- Readout of data via wireless connection possible
- Quick and easy evaluation of the measurement data
- In accordance with the IEEE/EPRI and CIGRE guidelines

**Services provided by PFISTERER**
- Performing measurements of the aeolian conductor vibrations and subspan oscillation
- Training for the measuring system VIBREC500 and the analysis software LIFE500
- Rental of the measuring system VIBREC500
- Evaluation of the measurement data
The PFISTERER Group is amongst the world’s leading specialist equipment and system suppliers in the energy infrastructure industry. Around 2,100 employees develop, produce and distribute components and complete solutions for the particularly sensitive interfaces in modern energy networks. With a complete range of products and services, the PFISTERER Group provides customised solutions for the complete transmission chain from low and medium to high and ultra-high voltage. Everything from a single source. Worldwide.