

Replace Toe-to-Toe Brush Holders



- A Reputation for Quality
- Reliability and Consistency
- Best Prices, Best Value
- Warranty and Performance Guarantee
- Immediate Delivery

Toe-to-Toe Brush Holder



Helwig's Constant Force Brush Holders



Replace Toe-to-Toe Brush Holders With Helwig Constant Force Brush Holders

- **Better performance with just one brush—Helwig's Constant Force Brush Holder design eliminates the need for a two-pocket holder**
- **Improved performance—Brushes last longer. Brush changes are faster and more convenient.**

Improve motor and generator performance

Helwig's Constant Force Brush Holders are an innovative replacement for standard, hard-to-use tension spring brush holders. With Constant Force Brush Holders, carbon brushes last longer, perform better and brush changes are faster and more convenient. The following chart details the advantages of the Helwig Constant Force Brush Holder over Toe-to-Toe Holders.

It's easy to switch

Simply remove the old holder and install the new Helwig Holder. A single unit multi section brush replaces the double brush arrangement found on the Toe-to-Toe series brush holders to give you a replacement that reduces maintenance increases brush and commutator life.

Comparison of Toe-to-Toe and Helwig's Constant Force Brush Holders

Brush Contact

Toe-to-Toe Brush Holder

- There is a large potential difference in the stability of the contact of the brushes, depending on the direction of rotation, with one leading and the other trailing. One of the brushes can be more stable and could take a larger amp load.
- There is a tolerance of $\pm 10\%$ on the coil springs used in the holders, allowing a possible variance in the contact drop of each wafer, which results in a current imbalance even with tandem replacement.
- Under higher loads, this current imbalance can exceed the rating of any typical EG grade used.

Helwig Constant Force Brush Holder

- The bottom bevel is set to between 20 and 25 degrees (typically 22.5 degrees.)
- Provides an optimum, continuous, smooth surface sliding contact in either direction of rotation.
- Multi section brush provides at least comparable commutating ability.

Distribution of Current

Toe-to-Toe Brush Holder

- The effect of the rotational forces on one bevel versus the opposing bevel results in a current imbalance.

Helwig Constant Force Brush Holder

- Since the current is equally distributed in each holder, brush and commutator life dramatically increase.
- Arcing caused by a current imbalance accelerates brush life. It also causes commutator wear, similar in effect to EDM machining.

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- **A Reputation for Quality**
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Helwig Carbon Products

Stock Carbon Brushes

Custom Carbon Brushes

Industrial Size Brush Holders

Mechanical Carbons

Spring Assemblies

Helwig Carbon Services

12 hour turnaround for custom orders

Brush holder refurbishment programs

Same day shipping for over 2,500 in-stock brushes

Motor testing

Technical Services—the best brush and holder for your application

Plant surveys and inventory stocking

Technical staff available for diagnostic calls

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Brush Wear Rate

Toe-to-Toe Brush Holder

- Toe-to-toe holders tend to have very large diameter springs that lose force prematurely.
- If one brush is allowed to wear to the point where the spring is uncoiled less than a full diameter, there will be a dramatic loss of spring tension on that wafer and the opposing longer wafer will carry more of the current load. This situation occurs frequently when only the shorter brush in the holder is changed, a very common practice.

Helwig Constant Force Brush Holder

- Helwig holders are equipped wear indicators, which require only a cursory observation to determine when brushes need to be changed.
- Helwig Constant Force Brush Holders accept longer brushes than standard holders.
- There is only one spring to apply force, so the pressure across the entire brush is constant and the current, evenly distributed. Higher load currents can be handled when the proper brush and grade are applied. Brush life and running times are extended, and brush changes are less frequent.

Commutator Distance

Toe-to-Toe Brush Holder

- Quite often, after the commutator has been turned, the holders are not readjusted to the proper distance from the commutator. The result can be wafer interference—the wafers make contact with each other before or at the surface of the commutator.

Helwig Constant Force Brush Holder

- Helwig replacement holders allow height adjustment to maintain stable brush support.

Tension Adjustment

Toe-to-Toe Brush Holder

- Tension Spring Holders must be adjusted as the brush wears.

Helwig Constant Force Brush Holder

- Helwig Brush Holders do not need adjustment, because they maintain constant force on the brush at all times. Periodic spring adjustments are completely eliminated.

Changing Brushes

Toe-to-Toe Brush Holder

- The toe-to-toe holder has awkward spring clips with twice as many carbons and springs to change, as well as hard-to-set, notched adjusters, and terminals to install.

Helwig Constant Force Brush Holder

- The smooth, sliding action of the Helwig spring assembly makes even the most challenging change fast and easy.
- Additional maintenance time can be saved with the Helwig Quick Disconnect.
- Helwig brushes and brush holders can be equipped with Helwig quick disconnects to facilitate a positive connection at each terminal as well as reduce maintenance time for brush changes.

Cost

Toe-to-Toe Brush Holder

- Two brushes cost more than one.
- Operation issues result in more frequent brush replacement.

Helwig Constant Force Brush Holder

- A longer brush can be used to extend time between brush changes.
- Increased brush life, commutator life and reduced maintenance costs dramatically reduce overall costs.

Note: Toe to toe holders are not supplied on GE motors or generators that were built in the USA. Toe to toe holders are only used on motors built in Canada.