



THE BEARING PROTECTOR™



The industry's best shaft grounding solution.



Fluting damage on bearings caused by induced currents passing through the bearings

Prevent Bearing Damage

Premature bearing failure is a major cause of motor downtime and costly repairs. Helwig Carbon uses proven carbon brush technology in a variety of bearing protection kits for motor shafts. Our kits effectively divert induced electrical currents away from the bearings, protecting them from damage and failure.

What causes bearing damage?

Variable frequency drives (VFD) used on AC motors and PWM drives used on DC motors produce induced electrical currents on the motor shaft. This current seeks the path of least resistance to ground which is typically through the motor bearings. When the current passes through the bearings arcing takes place leading to fluting, pitting, and bearing damage. The fluted or damaged bearing surface causes noise, vibration, and premature bearing failure. Bearing failure due to these induced electrical currents is one of the most common causes of motor downtime.

Where do you need bearing protection?

- HVAC units
- Pump motors
- Fans
- Air handling
- Wind Pitch Motor
- Propulsion System
- Compressors
- Elevators
- Data Centers
- Chillers
- Conveyors

Helwig Carbon is your best choice for dependable bearing protection.

Effective bearing protection from Helwig Carbon will divert the current from the motor shaft and provide the lowest resistance path to ground in an economical product. The result is the lowest shaft voltage and maximum discharge to ground through the kit rather than through the bearings or other components.

Major OEMs choose Helwig Carbon's solution as their preferred method to protect motor bearings. Unlike other options, this carbon brush technology uses a proprietary silver graphite material that provides superior voltage minimization. Advantages include:

- Longevity: **will outlast the warranty of the motor**
- Most effective technology proven to minimize shaft voltage and damaging currents
- Provides lowest resistance path to ground
- Low to high current carrying capacity
- Stock kits fit most motors and multiple shaft sizes
- Easy to install and maintain
- Internal mount and sealed options avoid exposure to contaminated environments
- Applicable for reversing applications

Four stock kits UL Approved 



BPK-IM2
mounted on
5/8-inch motor shaft

Case Study: Shaft Grounding Test on a 0.75 HP 230V Motor

Testing on a 0.75 HP motor proved that a Helwig Bearing Protection Kit (BPK) is an effective shaft grounding solution. A Helwig BPK was applied to the 0.75 HP motor. It consisted of an internal mounted grounding brush holder, with a proprietary silver graphite brush.

Measurements were taken for peak-to-peak voltage, number of discharges.

Readings:	Without BPK	With BPK	Comparison
Number of Discharges	475	310	# of discharges reduced by 35%
Peak-to-Peak Voltage	8V	< 1V	Peak-to-peak voltage reduced from 8V to < 1V

Shaft Voltage Unprotected



More Effective at Reducing Shaft Voltage

Helwig Carbon's bearing protection minimizes shaft voltage and electrical noise. This graph shows induced shaft voltage with the Helwig BPK-4 vs. a carbon fiber ring. Lower value equals more effective bearing protection. Peak-to-peak voltage for Helwig's solution is more than 5 times lower than the fiber ring, which significantly reduces the risk of current flowing through the bearing.

Shaft Voltage with Fiber Ring



Shaft Voltage BPK



These results illustrate that a Helwig BPK effectively insures against the risk of bearing damage therefore improving the life of the motor. In this particular case, the customer reduced bearing failure risk by more than 8 times by installing a BPK-4 shaft grounding unit.

UL Approved Helwig Carbon Bearing Protection Kits (BPK)

Helwig BPKs fit motors of all sizes, offer several mounting options, and are easy to install and maintain. These units typically outlast the motor on which they are installed. A 3M Dual-Lock option is available for easy field installation.

BPK-IM2



**Small Motor Option
Dimensions:**
.241" x .75" x .75" inch
6.1 x 19 x 19 mm

BPK-4



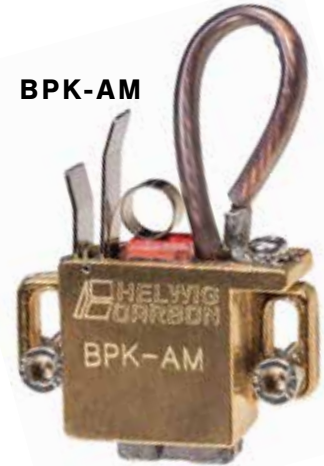
**Standard Option
Dimensions:**
.5" x 1.5" x 1.38" inch
12.7 x 38 x 35 mm

BPK-S



**Sealed Option
Dimensions:**
.45" x 1.63" x 1.50" inch
11.4 x 41.4 x 38 mm

BPK-AM



**Large Motor Option
Dimensions:**
.63" x 2.09" x 1.26" inch
16 x 53 x 32 mm

Bearing Protector Kit Selection Guide

Shaft Diameter	0" / 0mm	1.25" / 32mm	2" / 50mm	3" / 75mm	4" / 100mm	5" / 125mm	6" / 150mm	7" / 175mm	8" / 200mm	9" / 225mm
BPK-IM 2	Single Kit	2 Kits								
BPK-4/BPK-S		Single Kit			2 Kits				3 Kits	
BPK-AM					Single Kit				2 Kits	

Mount 2 kits at 90° or 3 kits at 120° for reliable contact in the case of vibration or shaft run out.

For larger diameter shafts, the contact area can be increased with more kits or a larger kit.

More contact surfaces increases assurance of optimal grounding protection. Choose your priority for economical grounding and maximum grounding reliability.

About Helwig Carbon

Helwig Carbon Products, Inc. has produced a full line of precision-machined carbon brushes, brush holders and mechanical carbons for over 89 years. Headquartered in Milwaukee, Wisconsin, Helwig Carbon remains one of the last American-owned carbon companies.

Contact Helwig Carbon today for bearing protection
that will extend the life of your motors.

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