

CASE STUDY



ROOFTOP FAN MOTOR

Preventing Damage with Bearing Protection

Failure as an opportunity

When a rooftop fan motor bearing failed due to electrical charges, a Wisconsin manufacturer's plant maintenance department installed a new bearing. The team recognized this was only a temporary solution. They still had a number of challenges to overcome:

- The risk of repeat bearing failure was imminent, despite installing a new bearing. VFD controlled motors used in HVAC applications, such as a rooftop fan motor, are susceptible to bearing damage from induced currents.
- There was not much space to install a kit, due to a pulley attached to the motor.
- The retrofit kit needed to be quick to install, because the fan could not be down for long.
- Since the motor was relatively small, the solution needed to be cost-efficient.

"... the risk of repeat bearing failure was still imminent...

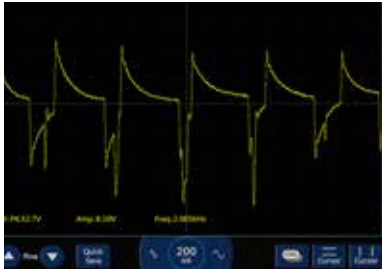
there was not much space to install a kit."



Analyzing the situation

Helwig engineers were allowed access to this rooftop unit to look at the situation with the maintenance team.

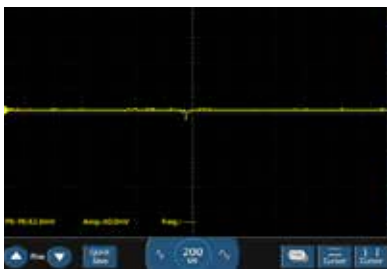
The premium motor was a **WEG™** 143/5T frame motor with 1HP, 208-230/460V, 3.34-3.02/1.51A, 1760 RPM. This motor was run on a VFD (Variable Frequency Drive). The rooftop unit was made by **Greenheck™**.



Both BPK Probe (17.4v) and Oscilloscope (32.7v) confirmed the high risk at different occurrences or instances



The BPK-IM2 was selected due to limited space. Installation was finished within 15 minutes.



Measurements after install of BPK-IM2 on WEG motor.

After measuring the shaft voltage with a BPK probe, it was quickly confirmed that this motor needed bearing protection. Peak discharges of 17.4 and 32.7 Volts were recorded at the time of measurement with probe and digital oscilloscope respectively.

This risk needed to be mitigated with an effective shaft grounding in order to protect the motor bearings.

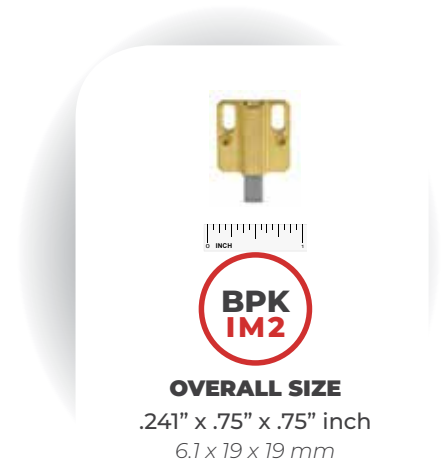
BPK-IM2 to the rescue

The BPK-IM2 was selected due to limited space. Installation was finished within 15 minutes, as the maintenance department used 3M™ VHB tape and ground wire. The ground wire was soldered to the BPK-IM2 and then run to a proper ground location. The kit fit perfectly in the tight space.

The voltage measurements on shaft of the motor confirmed the effectiveness of the BPK. The peak voltage was reduced from 32.7 volts to less than 1 volt!

Peace of mind

Ultimately, the plant maintenance department found this to be an affordable and effective solution for protecting the motor bearings of their rooftop HVAC unit. They went on to install Helwig BPKs on all their HVAC motors, just for peace of mind.



“Installation was finished within 15 minutes...”



HELWIG CARBON PRODUCTS, Inc.

8900 West Tower Avenue • Milwaukee, WI 53224-2849
 1.414.354.2411 • Toll Free Phone: 800.962.4851
 Toll Free Fax: 800.365.3113 • www.helwigcarbon.com

ISO Certified • MADE IN AMERICA