SHAFT GROUNDING SPECIFICATION

Construction Specification Institute Section 23 05 13

Common Motor Requirements for HVAC Equipment

1.1 GENERAL SUMMARY

A. Provide shaft grounding devices for electric motors to prevent bearing damage caused by induced shaft voltages and circulating currents.

1.2 PERFORMANCE REQUIREMENTS

A. Shaft grounding assemblies to protect motor bearings from electrical damage caused by induced shaft currents in motors operated by:
    1. Variable Frequency Drives (VFDs).
    2. Pulse Width Modulation (PWM) controllers.
B. Shaft grounding system shall:
    1. Provide a low-impedance path from motor shaft to ground.
    2. Prevent bearing damage caused by electrical discharge machining (EDM).
    3. Maintain continuous contact during motor operation.
    4. Be suitable for industrial applications where contamination is present.
    5. Work on reversing direction applications.

2.1 PRODUCTS

A. Shaft grounding system as manufactured by:
    1. **Helwig Carbon Products, Inc.**
B. Construction Requirements:
    1. Brush Material: High-conductivity and self-lubricating silver graphite brush grade K007.
    2. Contact Resistance: Ultra-low contact resistance suitable for high frequency switching.
    3. Spring System: Constant force or helical spring to engage continuous contact between the brush and contact surface.
    4. Holder Assembly: Engineered to ensure proper spring and brush function under vibration.
    5. Mounting Options: Suitable for horizontal or vertical motor applications.
        i. Device can be mounted internally or externally.

3.1 INSTALLATION

A. Install shaft grounding device in accordance with manufacturer's written instructions.
B. Verify:
    1. Brush track is free of keyways, scratches, nicks, varnish, any foreign material.
    2. Proper alignment of brush with shaft surface.
C. For larger diameters (typically more than 6” or 152mm) the installation of 2 or more kits should be mounted at 90 or 120 degrees of the shaft to avoid the same vibrational plane that occurs at 180 degrees.
D. For motors utilizing one insulated bearing (commonly on the Non-Drive End for motors typically 100 HP and larger), shaft grounding device shall be installed on the Drive End.