

HVAC

Shaft Gouging Solutions



INPRO/SEAL[®]

A **DOVER** COMPANY

PROTECT YOUR HVAC ENERGY EFFICIENT INVESTMENT

The VFD Challenge

With energy costs on the rise, creating comfortable, “green” buildings has become an increasingly difficult task for designers and managers of these environments. To meet this challenge, the HVAC industry is turning to the use of Variable Frequency Drives (VFDs) in their search for greater energy efficiency and lower costs. These ‘smart’ air handling systems provide maximum air flow with minimal energy use. However, these systems may also contribute to unplanned downtime.

VFDs are capable of inducing high frequency voltages on the shaft that seek a path to ground through the motor’s bearings or the bearings of the coupled equipment. When these voltages exceed the insulation breakdown of the lubricant, they discharge through the bearings to ground.



Stray shaft currents discharging through the bearings on rotating equipment can cause fluting on the bearing race, resulting in premature bearing failure.

The Cost of Electrical Damage

This discharge, called electrical discharge machining (EDM), causes fusion craters, pitting, frosting, and fluting. These effects make EDM a leading cause of premature bearing failure in VFD-driven motors.

Even if the motor itself has insulated bearings, shaft currents can travel to the coupled equipment, such as pumps, pillow blocks and gearboxes, and damage those bearings. The results are costly and include reduced equipment reliability, increased maintenance costs, unscheduled downtime and lost revenue.

SHAFT GROUNDING OPTIONS						
	CDR®	OTHER GROUNDING RINGS	CERAMIC BEARING	CARBON BRUSH	CONDUCTIVE GREASE	FILTERS ON VFD
EASY MOUNTING	✓	✓			✓	✓
MAINTENANCE FREE	✓	✓	✓			
ROBUST DESIGN	✓					
REPLACEABLE BUNDLES	✓				✓	
LONG LIFE	✓					
NO RPM LIMIT	✓	✓	✓			✓
HIGH ROI	✓	✓	✓			
CUSTOM ENGINEERED	✓					
LOW INITIAL COST	✓	✓		✓		

Reducing Electrical Damage

Diverting shaft currents and controlling EDM needs to be a priority for your business. Various methods have been used over the years to mitigate shaft currents, but they have all had limitations...until now.



The Inpro/Seal® Current Diverter Ring™ and Motor Grounding Seal™ protect bearings from harmful stray shaft currents.

SAME-DAY SHIPPING AVAILABLE

PRESS-IN

The Inpro/Seal® Solution

The Inpro/Seal Current Diverter Ring® (CDR®) uses proprietary conductive filaments to protect bearings from stray shaft currents by providing a low impedance path to ground – drawing the currents safely away from the bearings.

For severe duty applications, the Inpro/Seal Motor Grounding Seal® (MGS®) combines proven shaft-grounding technology with the patented VBXX® Bearing Isolator to provide complete bearing protection against stray shaft currents and contamination ingress.

Benefits:

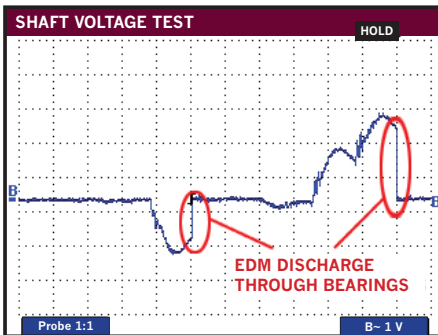
- Proprietary conductive filaments provide a low impedance path to ground away from the bearings
- Densely packed fiber bundles keep the shaft clean and maintain continuous contact for better conduction
- Replaceable fiber bundles allow for easy in the field repair and replacement
- Robust, corrosion resistant structure maintains function
- Multiple mounting configurations and split designs available including Press-In, Clip-On, Side-Mount, Epoxy, Bolt-Through and FlexBracket Mounting Kits
- Field tested by leading motor manufacturers.
- Can be installed by OEMs or retrofitted on site
- Maintenance free at all RPMs
- Modular design allows for use with any size motor
- Can accommodate shaft sizes of 0.625 – 48.0 in. (1,59 – 121,92 cm)

CLIP-ON

SIDE-MOUNT

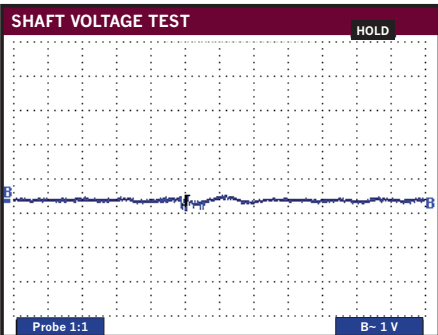
EPOXY

FLEXBRACKET MOUNT



Stray shaft currents discharging through the motor's bearings.

5HP 3PH MOTOR VFD DRIVEN
SHAFT VOLTAGE 1200 RPM



No discharges with the Inpro/Seal® CDR® installed.

SHAFT VOLTAGE WITH CDR® INSTALLED

GUARANTEED PERFORMANCE

The Inpro/Seal® CDR® and MGS® are backed by a performance guarantee. See our website for complete details.

Unmatched Customer Service

Inpro/Seal's responsive global sales network is committed to making sure you have the right technology for your application, right when you need it. We know that time means money for you. That's why we offer same-day shipping on most products, even new designs. No matter what your application, we can deliver a custom engineered solution designed to meet your specific needs.

Technology you can rely on, supported by customer service you'll appreciate.

"When one of our customers decided to install VFDs on their chiller equipment pumps and motors, we turned to Inpro/Seal to provide a solution to their concerns of premature bearing failure. Since we installed the CDR devices there have not been any issues— the original bearings are still operating with the new VFDs."

William Thompson
Gardiner Trane
Solon, Ohio

Experience You Can Trust

Reducing EDM damage requires a custom engineered solution that takes into account all these factors:

- Motor size
- Bearing type
- Bearing insulation
- Existing circulating currents
- Existing system grounding configuration
- Operating equipment
- Coupled equipment

You don't need to be an expert; our knowledgeable team will help. You can count on Inpro/Seal®, the leader in bearing and system protection, to maximize the uptime of your rotating equipment. We've been the trusted source for bearing isolator technology for more than 30 years, and now we're expanding our product offerings to deliver protection from electrical damage. Inpro/Seal's line of complete shaft grounding solutions is ideal for HVAC, industrial, and wind energy applications.

The Inpro/Seal Advantage

Inpro/Seal is committed to delivering innovative technology and superior customer support...standard with every solution. When you work with Inpro/Seal, you can expect:

- Same-day shipments available on most products, including new designs
- Custom engineered solutions for your application and operating environment
- Knowledgeable sales network providing localized support
- Performance guarantee— see website for complete details

Engineering Specifications

To ensure that your equipment is protected by Inpro/Seal's shaft grounding technology, simply include the following with your specifications:

"All motors driven by variable frequency drives (VFD) shall include bearing protection in the form of a device to divert shaft currents to ground. The device shall be maintenance free and constructed of highly conductive bronze. Recommended device: Inpro/Seal Current Diverter Ring™ (CDR®)."

"All VFD driven motors operating in harsh environments shall employ complete bearing protection through the use of a non-contact or non-contacting-while-rotating type seal to obtain an IP55 degree of protection as well as an integrated device to divert shaft currents to ground. Recommended device: Inpro/Seal Motor Grounding Seal™ (MGS®)."

READY TO GET STARTED?
Visit www.inpro-seal.com to contact your local Inpro/Seal representative or request a quote.

The Inpro/Seal® CDR® is a custom engineered solution and some designs may be protected by US patents and pending patent applications as installed including US Pat. #D615,996 and #7,521,827.



www.inpro-seal.com | info@inpro-seal.com | +1 309-787-4971