Solution Profile



Motor Bearing Protection Guide

Defining the added benefits of the dV Sentry[®] versus a shaft grounding brush.

What's a Shaft Grounding Brush?

A common method across industries is to use a shaft grounding brush or ring to protect motor bearings from common mode over voltage. A shaft grounding brush is not a filter, so it does not help reduce or protect equipment from the actual problem. The current is detected around the motor bearing to an alternative route, thus the current still exists and can cause widespread damage in many other areas in the system.

Effects of Using a Shaft Grounding Brush

Due to their design and placement on motors, shaft grounding brushes have long term costs. The position and contact of these products with the shaft make them prone to wear and a shorter life span, and are not always easy to replace. A shaft grounding brush is also subjected to high levels of oxidation which causes the product to reduce its ability to divert currents from VFDs. All of which result in higher maintenance costs.

One of the most problematic issues in using a shaft grounding brush is that it does not reduce the effects associated with common mode over voltage, fast rise times, and peak voltages. This issue can cause failures to surrounding equipment such as: erratic behavior of VFDs and PLCs, insulation failure leading to motor overheating, and unwanted ground faults.

Unresolved Issues Associated with a Shaft Grounding Brush:

- Unexpected ground fault trips
- Erratic behavior of VFDs and PLCs
- Premature motor insulation failure
- Cable damage

Destructive Waveforms

Common Mode Over Voltage

VFDs give off power in a continuous generation of pulses, which on average achieve a sinewave. However, the sum at any point is not always zero, which results in damaging common mode over voltage. This can cause motors to break down over time.

Peak Voltages

The pulse of VFDs is not a clear square pulse. Each rise and fall of the pulse has an over shoot or transient over voltage. This phenomenon can lead to a "reflected wave" in long cable leads. These voltage spikes can reach dangerous levels and damage drives and motors.

Rise Time

Modern VFDs, which can increase motor performance, utilize IGBT systems that create extremely fast rise times. This can also result in increased motor insulation heating, which can reduce motor life in the long run.

The Best Solution for Motor Protection is the dV Sentry®

The dV Sentry[®] is the only filter on the market that features a one of a kind patented Triple Defense Core that is proven to reduce common mode current by up to 50%. The Triple Defense Core also helps reduce peak voltages and improve rise times. No other filter on the market can make the same claim.



Solution Profile

The dV Sentry[®] is the only proven filter to provide common mode reduction, improved rise times, and peak voltage protection - all in one unit.

The dV Sentry's Unique Patented **Triple Defense Core**

The patented design of the dV Sentry[®] and its Triple Defense Core are like nothing you've seen before.

- Common mode reduction: Filters power through the outer core and reduces common mode current.
- Peak voltage protection and rise time improvement: Power filters through inner core, improves rise time, and gives peak voltage protect

dV Sentry vs. the Rest

The dV Sentry outperforms the compe proven results. Of the three filters test dV/dt filter, a common mode choke, and filter, the dV Sentry showed that it was among the competition. Each filter was 480V, 50hp drive system with 1,000 fee switching frequency, and at full load. W competitors claim to reduce common r they fail to back it up.

Want to learn more?

Visit mtecorp.com to view the fo

- White paper for detailed specification Common Mode and its effects
- dV Sentry video

DID YOU KNOW

More power quality solutions from MTE

our system could experience peak voltages and rise times that exceed the NEMA
G-1, Part 31 Standard for inverter duty motors. Look for Motor Protection at
tecorp.com to learn more about what can be done to protect against this.

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tition with ed, a typical d the dV Sentry a standout t of cable, 8 kHz /hile many of the mode voltage,	Filtering	Filter Common Mode Dampening	Change in Common Mode Current	Note
	Typical dV/dt Filter	N/A	-5%	Negligible Common Mode Filtering
	Common Mode Choke	None	18%	Unreliable Common Mode Filtering
	Shaft Grounding Brush	N/A	0%	Can Protect Bearings
	MTE dV Sentry Filter	Optimal	-47%	Reliable Common Mode Filtering

