HOW TO CORRECTLY EARTH SHIELDS ON VSD CIRCUITS

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Summary...

PRODUCT/SERVICE
Variable Speed Drives

HOW THIS WILL ASSIST
Understand the importance of using the correct type of motor cable and correctly earthing the shield on VSD circuits

Have you ever had issues with variable speed drives (VSDs) creating interference to other equipment?

If you have ever had electronic equipment that is in close proximity to VSD’s malfunctioning, then one of the potential causes could be radio frequency interference (RFI). VSD’s generate RFI due to the high frequency switching of the IGBT’s in the inverter section of the VSD and its therefore very important to use the correct type of motor cable and to earth the motor cable shield at both the VSD and motor end.

You may be surprised that the motor cable shield on VSD circuits should be earthed at both the VSD and the motor end. The reason for this is that on control circuits or on communication networks you only earth the shield at one end to prevent circulating earth currents which can cause the control signal to become corrupted.

However, on VSD motor cable circuits you want to provide electrical noise with a low impedance path to earth to prevent RFI emissions and the fact that you get circulating earth currents does not matter because we are dealing with power and not control signals.

The next point to consider to avoid RFI is to use the correct type of motor cable, and ABB recommend a symmetrical shielded cable: three phase conductors and a concentric or otherwise symmetrically constructed PE conductor, and a shield

In terms of earthing the motor cable shield ABB recommend shield wires must be twisted together into a bundle (the bundle length must be less than five times its width) and connected to the terminal marked earth on the VSD next to where the motor cables are connected.

At the motor end, the motor cable shield must be earthed 360 degrees with an EMC cable gland, or the shield wires must be twisted together into a bundle not longer than five times its width and connected to the PE terminal of the motor.