

Dependence of Common Mode Current peaks in Motor-Inverter-Systems

Question: NaLA-cores before CoolBLUE- cores or NaLA-cores after CoolBlue

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Introduction: When powering three-phase-Motors, Inverters create peaks of high current in regular intervals. These peaks can damage motor bearings and should be avoided. Using MAGNETEC NaLA-cores and CoolBLUE-cores can greatly reduce the amplitude of these peaks by filtering high frequencies.

The goal is to measure the Common mode Peak currents with NaLA before CoolBLUE and NaLA after CoolBLUE. We did put in all variants of cores and deactivated only the NaLA on each side to confirm the like function.

Measuring Setup:

A Motor-Inverter-System is powered by three-phase-current and connected by a shielded cable of 150m length. Measurements are done using a Rogowski-coil with a mobile Oscilloscope. The motor cable is surrounded by four M-967 as CoolBLUE-cores over all three phases and two M-102 per phase as NaLA-cores before and after the CoolBLUE cores. On the following picture you can see the setup.



Analysis

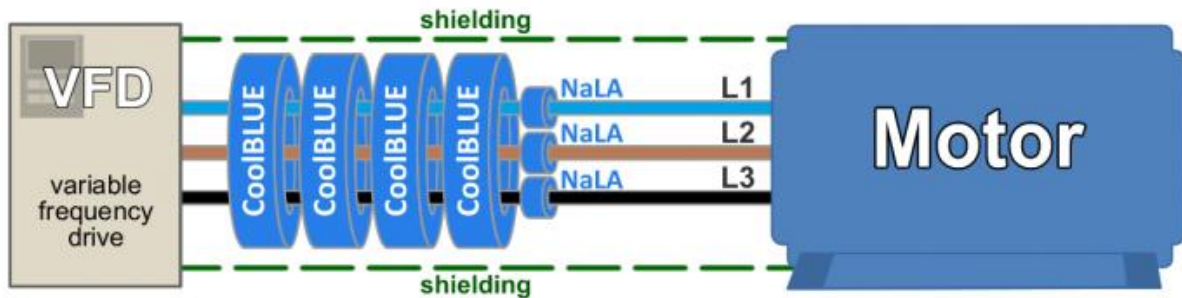
With deactivated CoolBLUE Cores the Common Mode Peak current was 6,5 A.

With activated CoolBLUE Cores and NaLA it was 2,3 A (Reduction over 65% !)

We did check the following situations:

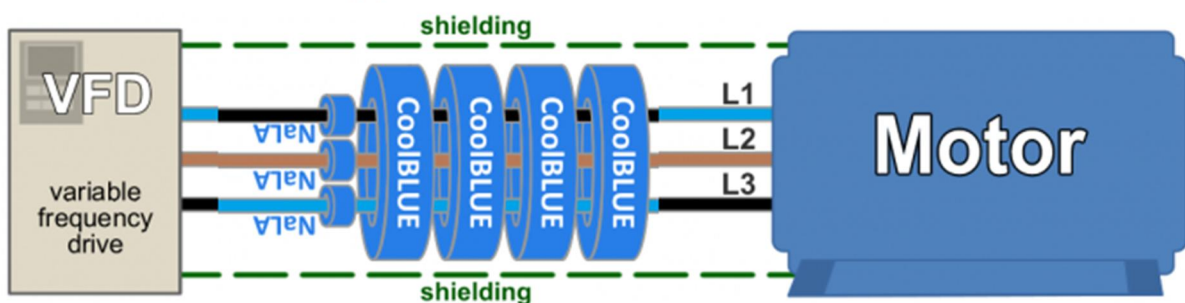
1.

VFD Application Core Selection Guide



2.

VFD Application Core Selection Guide



Conclusion:

It is not important if NaLA or CoolBLUE is first in the Motor cable to the VFD.

When using MAGNETEC NaLA-cores and CoolBLUE-cores in a Motor-Inverter-System to control motor bearings by reducing current-peaks the orientation and order of the cores doesn't matter.

This study was carried out by Stefan Heiden September 21, 2018 at Magnetec GmbH in Langenselbold, Germany.

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