Danfoss
VLT Drives
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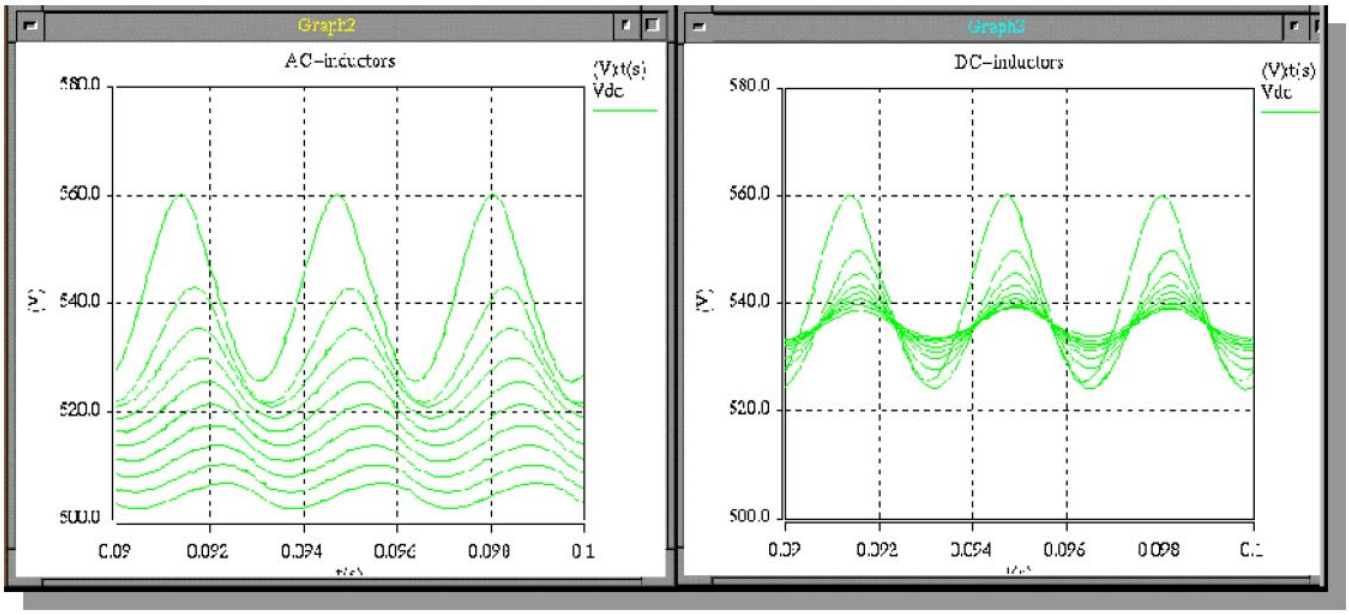
Re—No need for AC line reactors with Danfoss FC 102

Danfoss VLT Drives has the following comments on the use of our standard DC link reactor vs. an AC line rector.

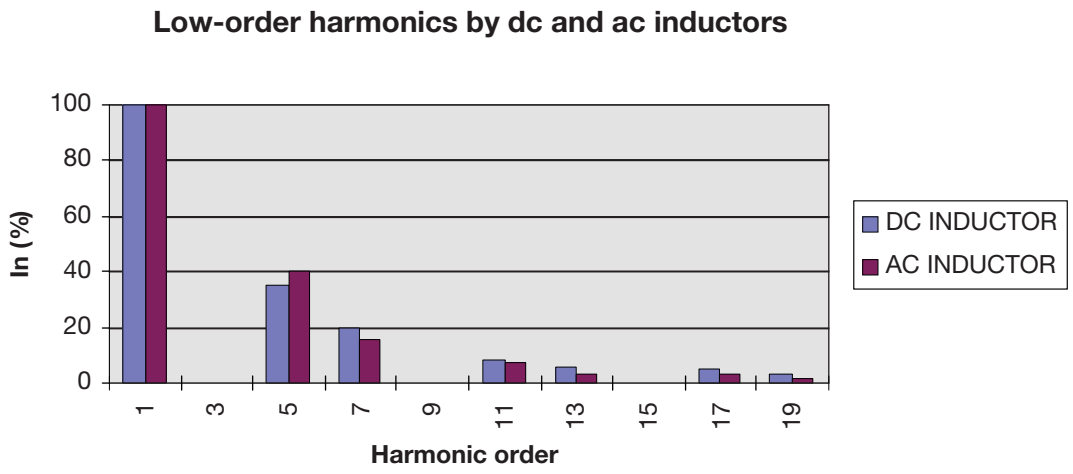
Danfoss has designed a Variable Frequency Drive that meets the most stringent standards in the world. Part of that design is the VDE 160 standard which states that a VFD must be able to withstand 2.3 times line voltage for 1.3 ms. To comply with this standard, Danfoss has incorporated a very “strong” (high voltage withstand) diode rectifier, MOV’s and Zener diodes. In addition, the DC capacitors are designed for a 900V DC capacity vs. about 800V DC that most of our competitors use. These features allow the Danfoss VFD to ride through most surges and transients with no damage.

Secondly, by adding a line side AC reactor, the line voltage to the VFD is reduced. This will affect the output performance of most VFD’s. By using a DC link reactor, impedance is still available, but the DC bus voltage is less affected by the impedance. Impedance can be increased, with little effect on the DC bus voltage, while the AC reactor will reduce the DC bus voltage and thus effect the VFD’s output.



Each graphed line is an increase in % impedance starting with 0%

From a performance stand point, both AC & DC reactors reduce harmonics:



Here, the DC reactor reduces harmonics about the same as the AC reactor, thus helping to reduce overall harmonics.

Another important issue is the lowered voltage from the line reactor. If a 3% line reactor is inserted in front of a VFD, and if we have 480V available, the VFD will only see 465 Volts. If the VFD is not efficient, then the motor may not get the nameplate voltage and thus will draw more current.

Lastly, is the size issue; since we incorporate the impendence and line protection, we do not need additional protection. This allows for a smaller and more efficient VFD, a smaller footprint, and the need for less wasted space.