

Common Misconceptions Regarding Common Mode Chokes

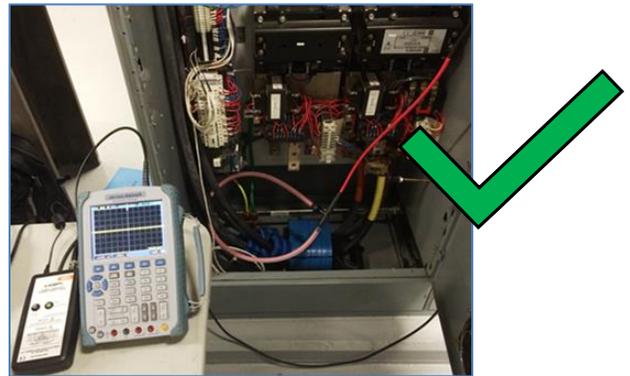
Reality check explains why **CoolBlue** is a smart move

by Sheila Kennedy ~ Kristie Giles

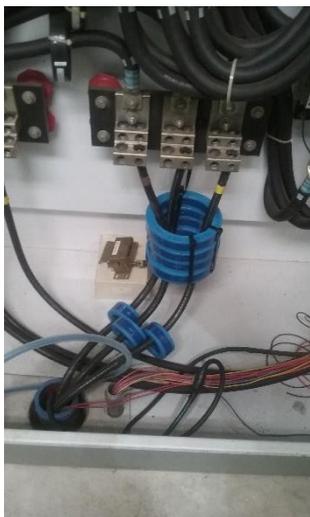
Erroneous expectations about common mode chokes lead some to believe they are inferior to other technologies. Don't get tripped up by incorrect assumptions or fictional claims. The reality of Magnetec's **CoolBlue** nanocrystalline inductive absorbers is that they protect variable frequency drives (VFDs) and motor systems from damaging high-frequency currents and transient voltages. Following are four primary misconceptions and why they are false or misleading:

1. **Misconception:** Common mode chokes will reduce voltage.

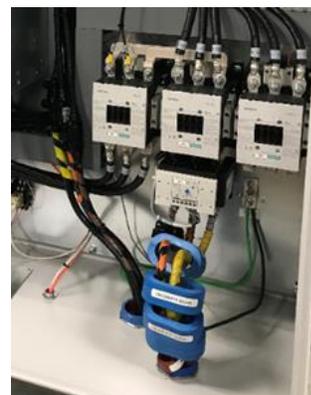
Reality: **CoolBlue** inductive absorbers choke damaging high-frequency current at the VFD; by design, they are not intended to reduce voltage. By absorbing high-frequency current at the source and preventing it from getting to the motor, the entire system will be protected from potential damage. A common mode choke, by definition, is an electrical filter that blocks high-frequency noise common to two or more power lines, while allowing the desired low-frequency current to pass. It is not the intention or design of a common mode choke to have any effect on voltage, so any suggestion that it is important to see a reduction in voltage when using **CoolBlue** is misleading.



2. **Misconception:** Common mode chokes will interfere with symmetrical currents.



Reality: **CoolBlue** inductive absorbers do not affect symmetrical power currents. They do suppress asymmetrical radio frequency noise currents as well as asymmetrical electromagnetic interference (EMI) currents that are generated by the parasitic capacitances of the system itself, including the motor cable. This efficient dampening of destructive asymmetrical currents creates a common mode choke.

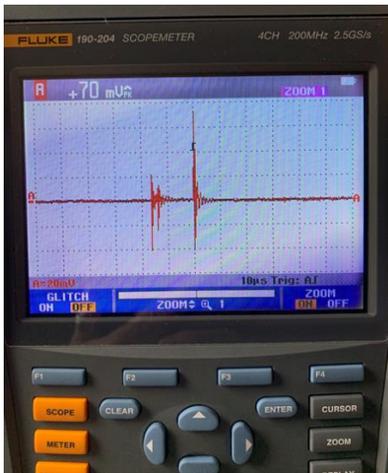


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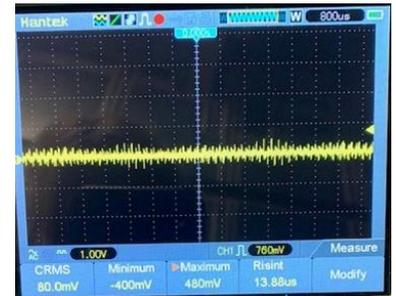
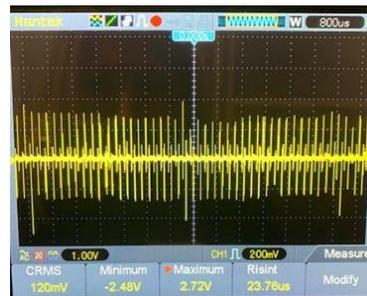
3. **Misconception:** Taking RMS readings will effectively show the reduction in high-frequency currents and the results of using **CoolBlue**.

Reality: Taking root-mean-square (RMS) or “effective” voltage or current readings will not show the reduction of the high-frequency peaks. High-frequency motor bearing currents are best measured using a Rogowski Coil around the cable power lines with a 100MHz or better oscilloscope. **CoolBlue** and Magnetec’s **NaLA** nanocrystalline line absorbers reduce damaging peak spikes and slow the di/dt of the high frequency. **CoolBlue** and **NaLA** work in the 100’s of kilohertz to 5MHz range, so utilizing the proper testing equipment and looking for the reduction in the max readings is paramount to getting true measurements of the reduction in damaging frequency.



4. **Misconception:** Common mode chokes will eliminate all high-frequency currents.

Reality: **CoolBlue**, around all the motor cables, is designed to absorb or “choke” particular current frequencies generated from the VFD’s insulated gate bipolar transistor (IGBT). They also work with the new silicon carbide (SiC) and gallium nitride (GaN) switches currently used in Europe and expected in the U.S. in the coming years. **CoolBlue** is used with **NaLA**, which go around each individual cable, to further reduce the high-frequency current while also slowing the frequency down. Together, they reduce the peak common mode currents and frequency of discharges to levels that are within the safe operating parameters for the entire system. Tests have shown the **CoolBlue** solution reduces common mode current by an average of 65%.



The distinction is clear: **CoolBlue** is an electrical solution to an electrical problem, and it is permanent – no maintenance is required.

Learn more by contacting 201-252-8125 or CoolBLUE@mhw-intl.com, or visiting www.coolblue-mhw.com.