

CoolTUBE®

A MORE Powerful Solution

Radiated Emissions Absorber

MH&W presents **CoolTUBE®** Radiated Emissions Absorber for the highest reliability and longevity of your VFD motor system!

Variable Frequency Drives create Electromagnetic interference (EMI), conducted and radiated, in VFD motor systems. Without the use of some type of filter, or choke, system related failures will result. Unique to the industry, **CoolTUBE®** absorbs this high frequency before it gets to the motor system.

CoolTUBE® mitigates radiated EMI Issues in all VFD motors, including servo and DC motors.



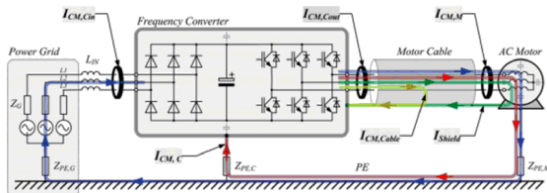
*High Frequency Noise
Generated by VFD
Above requested
standard limits*

*CoolTUBE® installed
Well within the requested
standard limits*

What is a choke?

In electronics, a choke is a specially designed inductor used to 'choke' high frequency alternating current in an electrical circuit, while passing designed frequency currents. The name "choke" comes from "choking" or absorbing higher unwanted frequencies.

In common mode noise situations, such as the noise generated from a VFD (IGBT switching), noise is going out simultaneously from all outputs, but it's also coupling back to earth ground. The only solution is to absorb the unwanted noise and keep it from being transmitted and coupling back to earth ground. To do this, high frequency currents should be captured through a magnetic core. **CoolTUBE®** is used to dampen this unwanted high frequency.



Common mode currents will cause bearing damage in the motor, and electromagnetic interference will affect control signals, encoder feedback, communication links for programmable logic controllers, Remote I/O, metal detectors, pump monitors, and other types of sensors including, ultrasonic sensors, bar code/vision systems, weight and temperature sensors. Conducted ground current leads to radiated emissions, with the drive cables acting as antennas.

CoolTUBE® acts as a common mode choke by absorbing the damaging high frequency noise (frequencies from approximately 5MHZ-1GHz), so you can maximize equipment reliability, reduce maintenance costs, and avoid unscheduled downtime.

CoolTUBE® solutions are used in:

- OEM manufacturers of HVAC equipment
- Paper/bottling/food/chemical manufacturing
- Hospital, office, and commercial buildings
- Automotive manufacturing
- Electric vehicle (EV) applications
- All types of pumps and fans
- Wind, solar, and other renewable energies

No Maintenance!

The **CoolTUBE®** cores are used instead of shielded motor cabling.

To achieve an effective reduction in radiated emissions, the appropriate amount and type of **CoolTUBE®** cores must be placed in series over the VFD output power cables.

This method significantly reduces EMI, thereby reducing electronic interference, maintenance costs, and standstill periods.

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Reduce noise level without shielded motor cable

Benefits of CoolTUBE®

- No need for shielded cabling in VFD motor systems.
- Special design for easy installation, especially when compared to shielded cable.
- Should be used with existing unshielded cable.
- Lasts a lifetime.
- Absorbs high frequency.
- 5 sizes cover all motor sizes.
- Solid device.
- CoolTUBE® absorbs the high frequency noise with low losses.
- Can be used in conjunction with CoolBLUE® / NaLA® or standalone.

VFD Application Guide - CoolTUBE® per horsepower/cable length

CoolTUBE®	Power Range			Number of CoolTUBE® per cable length (ft)			
Part #	HP	Finished Dimensions (in)	Isat	1-150	151-300	301-450	451-900*
M-1207	1/4-10	$\leq 1.42 \times \geq 0.7 \times \leq 5.31$	8	1	2	3	4
M-1230	11-40	$\leq 2.58 \times \geq 1.38 \times \leq 9.45$	14	1	2	3	4
M-1275	41-100	$\leq 3.54 \times \geq 2.13 \times \leq 14.17$	18	1	2	3	4
M-1231	101-428	See Datasheet	40	1	2	3	4
M-1212	429-1600	See Datasheet	50	1	2	3	4

Notes:

1 - Data above is for information/guideline purposes.

2 - All cables/phases must travel through the CoolTUBE® cores. No ground or shielding through cores!

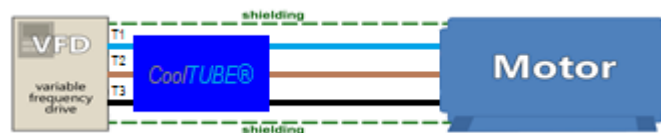
3 - One CoolTUBE® per 150 feet.

4 - It is important to use the correct number and type of each CoolTUBE®.

6 - Install cores on load side of drive for typical motor applications.

7 - Please call CoolTUBE® Engineering for more information.

** For cable runs over 900ft, contact CoolTUBE® Engineering.

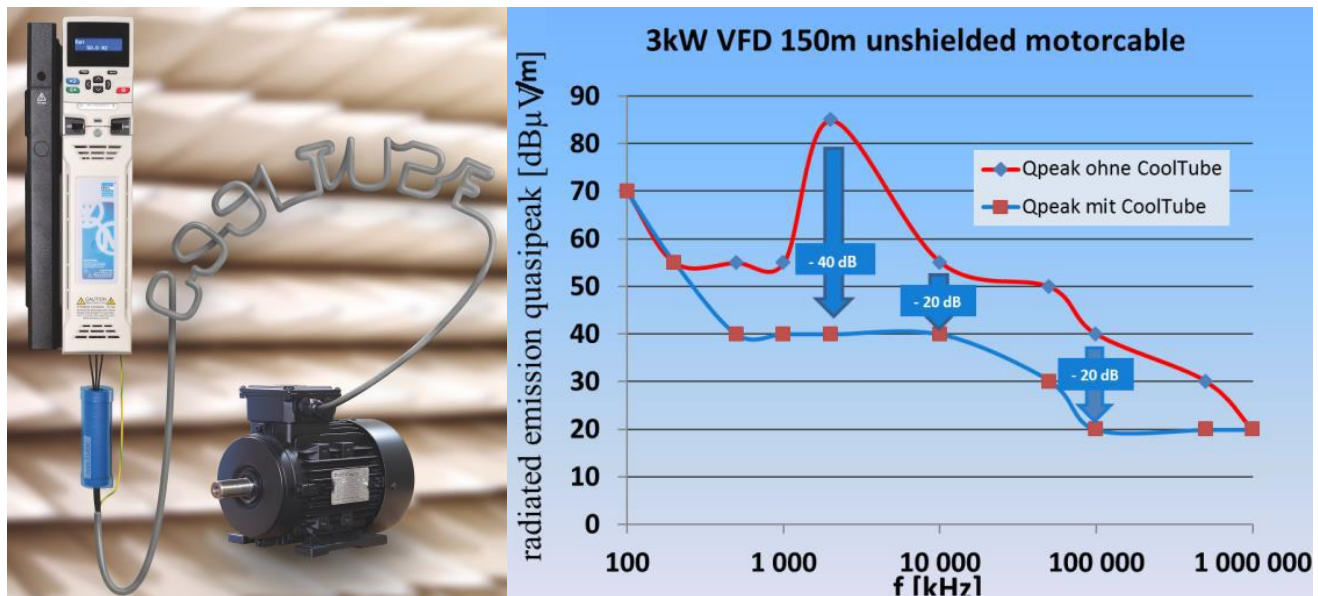


Call CoolBLUE® at 201-252-8125, visit at <http://www.CoolBLUE-MHW.com> or email CoolTUBE@MHW-Intl.com

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A special note on EMI - Electromagnetic Interference is a disturbance in the radio frequency spectrum that affects fields even if their frequencies are not aligned. This is because electromagnetic radiation can still interfere with each other even if they are not on the same frequency, and this is exacerbated by the fact that devices emitting electromagnetic waves tend to also transmit at lower power on harmonic side bands, which is why an FM radio might pick up powerful signals from a nearby CB radio.

EMI is a problem on electronic devices since electronic circuits are very susceptible to EMI because electromagnetic radiation can easily be picked up by any conductor. Therefore, speakers sometimes make noise when a nearby cell phone is receiving a call or text message. This is because the coil in the speakers is acting like an antenna which captures the EMI emitted by the cell phone.

EMI can be a serious problem in critical systems that use radios. An airplane, for example, require electronic devices to be turned off during takeoff and landing, as they might cause interference with communication between the pilot and ground control or other critical systems being used by the plane.

For more information on EMI, radiated and conducted emissions, visit the MH&W knowledge center at www.coolblue-mhw.com.