



Considering Signal Pair VFD Cable?

Faulty cable design leads to unexpected failures and unnecessary downtime. Variable frequency drive (VFD) cables are designed to harness and contain potentially harmful noise currents and isolate drive system noise from sensitive circuits. It is possible to package VFD cables with other components, such as signal pairs, if that packaging provides the necessary isolation. However, unaware of the risks and methods for effective cable designs, some manufacturers create products that are harmful to equipment.

Belden's signal pair VFD cables are designed with application issues in mind and are proven for 25 years of reliable service.

When to Choose Signal Pair VFD Cable

Signal pair VFD cables provide added functionality in a single cable and are ideal for systems where a single cable pull can simplify the installation. These cables are used for applications such as:

- Monitoring the status of an auxiliary contact to disable the drive as the disconnect opens and while open
- Remote starting of the motor and drive
- Monitoring the motor thermistor status
- Operating a motor fan or motor heater
- Releasing a motor brake
- Tying in an emergency stop button

Belden Offers a Broad VFD Cable Portfolio

- Premium Industrial-Grade
- Premium + Signal Pair
- High-Flex
- Machine-Grade
- Low-Smoke, Zero-Halogen



For more information, visit
belden.com/products/industrial/cable/vfd

What are the Risks?

Proper care must be taken to understand the potential for and mitigation of electrical interference within the cable components.

The drive may stop if the noise currents generated lead to false readings on the enable circuits or the motor thermistor circuits. Though the thermistor reading may be indicated as a drive fault, if properly configured, the noise on the enable or control signals would lead to an unexplained stop without a fault code. Noise on an emergency stop circuit could also lead to a trip of the safety systems and may or may not be easily diagnosed, depending on how the circuit is designed.

Design Matters

Properly designed VFD cables have very heavy shielding to prevent emissions and induction of noise currents. Noise currents can be generated within the signal pair by the drive outputs or on the motor leads by current in the signal pair. Belden Signal pair VFD cables uniquely place the signal pair outside the heavy main power cable shielding, effectively isolating the pair from the motor leads.

Designs that place the pair inside the main power cable shielding leave only a weak shield that is easily overcome by the magnitude of noise present.

A Costly Mistake

One vehicle assembly plant suffered repeated catastrophic drive failures and extensive downtime because of the wrong cable chosen by the equipment OEM. This costly issue was ultimately diagnosed by the drive manufacturer who was initially blamed for the repeated failures. The drive manufacturer demonstrated that the deactivation of the motor brake and the resulting surge of voltage in the signal pair induced a voltage sufficient to damage the IGBT power circuits and create explosive failures. Subsequent testing demonstrated that 3 of the 4 cables pictured directly caused drive failures in this application.

In this example, Belden cable was specified but substituted for cost and space savings. Ultimately, only Belden provided a solution that was suitably engineered for the application.

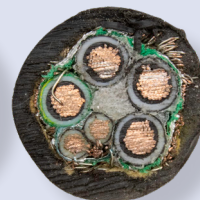
This is just one example of the benefits of 25 years of experience making the best VFD cables available.



Belden



Competitor 1



Competitor 2



Competitor 3