BELDEN
SENDING ALL THE RIGHT SIGNALS



Why Belden Doesn't Sell Termination Kits

Some VFD cable manufacturers actively promote products that generate issues and work against the purpose of a VFD cable. VFD cables are designed to harness and contain potentially harmful noise currents, yet incorrect termination can release all the noise current that a properly-designed VFD cable worked to contain. Worse still, it is released at exactly the place where it can do the most harm and create the biggest issues.

Save Money with the Right Product

When developing VFD cable, Belden and the development partner set specific parameters for performance and goals to mitigate the issues associated with variable frequency drives.

Belden Recommendations:

- Choose products that effectively seal and isolate the cable grounds through the cable jacket and carry ratings based on industry standards.
- Commercially-available cable glands with UL-certifications and listings for the environments specified. Accurate gland selection depends on the environment and hazards present. The correct cable glands are a fraction of the cost of "termination kits" being marketed.
- Use Isolating (pass through) glands to prevent the release of harmful noise currents from the shields and grounds.
  - Crouse Hinds CGB, or ADE Series, and CMP TC or A2 Series are just a few of the many good options that have been used effectively with Belden VFD cables.

Fundamental Rules for Effective VFD Cable Termination:

1. Avoid intermediate ground terminations.
2. Only terminate the grounds at the drive and motor if safely possible.
3. Do not terminate shields or grounds at enclosure ingress.

Each intermediate termination creates a common mode noise current loop. At enclosure ingress, that noise current will be released next to the most sensitive equipment in the system. This can cause issues with process reliability and safety that are easily avoidable by terminating the ground system directly on the drive.

For more details on avoiding costly termination errors, download the Belden termination guide, developed with 25 years of experience in providing effective VFD cable solutions.

The Myth of Termination Kits

The idea that a costly and special termination kit is required for VFD cables is simply not true. This represents a fundamental misunderstanding of the role the VFD cable plays in reducing system issues associated with stray ground currents and common mode noise.

Here's What Happens

Fundamental errors in VFD cable applications essentially cause the system to perform like pipe and wire, releasing damaging currents where they can do the most harm and negating the benefits for which VFD cables are specifically designed.

Belden has measured as much as 15 amps of ground current on drive systems of 50 hp. Imagine that a conductive cable gland is used where that VFD cable enters an enclosure; containing drives, a PLC with analog I/O, digital networks, safety circuits and load cell amplifiers. Each of the devices may depend on a stable ground reference to produce accurate readings and safe reliable process control.

If each of these sensitive components is bonded to a backplane now polluted with high-frequency ground noise and current feeding through the conductive cable gland, it displaces the ground reference and generates interference on any circuit on its path.

In this example, the remaining VFD cable in the enclosure is no longer protected by a jacket but instead has a metallic surface and leaks current noise in every incidental contact with any metal. Should you opt not to recover the cable in the enclosure, it will leak EMI and RFI; again in close proximity to sensitive equipment.

Phone: **1.800.BELDEN1**

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