



VFD Cable Selection: Understand the Changes to NFPA 79

Machine designers who want to take advantage of the precision and energy efficiency offered by variable frequency drives (VFDs) need to make sure the cable that connects the drive to the motor performs reliably. Choosing a poorly constructed VFD cable can hinder a machine's performance, or the cable may break down and compromise safety.

The National Fire Protection Association's NFPA 79 Electrical Standard for Industrial Machinery 2018 Edition includes an important update to the design requirements of VFD cable, which is believed to have been created to address problematic insulation materials. In long cable runs or wet environments, certain materials exhibit high capacitance characteristics which cause high charging currents, or corona discharges that, when moisture is present, can generate nitric acid that can cause them to melt.

NFPA 79 2018 Edition Article 4.4.2.8 Circuits Supplied From Power Conversion Equipment states:

*Electrical conductors and equipment supplied by power conversion equipment as part of adjustable speed drive systems and servo drive systems shall be listed flexible motor supply cable marked RHH, RHW, RHW-2, XHH, XHHW, or XHHW-2.**

How to Select NFPA 79-Compliant VFD Cables

For any new installations and machinery going to U.S. states that have adopted NEC 79/NFPA 79 2018 Edition as their electrical standard to meet, the VFD cable must be marked RHH, RHW, RHW-2, XHH, XHHW or XHHW-W. SAB North America designs its VFD cables with cross-linked polyethylene (XLPE) insulation, which is rated for RHW-2 and XHHW-2, making it compliant to NFPA 79 2018.

XLPE insulation offers improved capacitance for longer installations and is extremely flexible and oil resistant. XLPE performs in VFD applications where increases in voltage can occur, such as spikes in harmonics, in-rush current and wave reflection. It is also particularly suited for wet environments because heat generated by nitric acid creation actually forms a thermally isolating charred layer on the XLPE surface that can prevent further degradation.

Updating VFD Specifications Assures Clarity

The latest edition of NFPA 79 can add difficulty to selecting the right cable for your VFD application, especially because not all U.S. states have adopted the standard. SAB North America recommends updating your VFD specifications to reflect the new standards to avoid any inspection issues. We can even provide cross references to ensure the correct cable is specified. Although staying current with the latest standard requires some time and attention, you'll have peace of mind knowing that the cable you select will not give rise to the issues associated with unsatisfactory insulation, and it will ensure the best protection for people and equipment.

**Source: NFPA.ORG NFPA79 2018 archived revised information.*

For more information about SAB North America VFD cables, visit <http://sabcable.com/products/tray-and-vfd-cables/vfd-cables-ul-csa>.