VFD CABLE SELECTION:
NFPA79 Compliance

ServiceDRIVE® VFD Cable System

VFD Cable and NFPA79

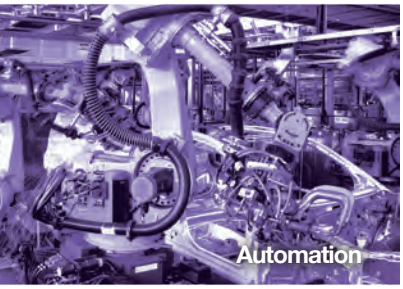
The increase in variable frequency drives *(VFDs)* over the past decade has made apparent the need for specifically engineered wire and cable solutions in order to achieve long-term performance and operation.

Many industry groups, standards and specifications exist to advise VFD cable system designs and use. One important tool used is NFPA79: Electrical Standard for Industrial Machinery, which is part of the standards portfolio of the National Fire Protection Agency *(NFPA)*. The latest version of NFPA79 establishes very specific wire and cable requirements for VFD applications in an effort to accumulate the decades of industry experience into a wire and cable design document.

ALWAYS COMPLIANT.

ServiceDrive® VFD Cable designs have always met the New 2018 NFPA79 cable requirements.

Beyond the NFPA79, our cable systems for VFD appllications include proper overall cable design and proper shield termination methodology *(cable, connectors and termination kits)* to ensure long-term viability of VFD circuit requirements.



NEW 2018 NFPA79 Requirements

INSULATION: NFPA79 now discourages the use of thermoplastic insulations *(THW, THWN-2)* and encourages the use of thermoset insulations *(XHHW-2, RHW-2)*.

Rationale: Thermoplastics exhibit a higher dielectric constant and a lower resistance to corona inception voltage. High dielectric constant results in higher cable capacitance and higher charging currents, which can be electrically demanding to the insulation over time. Lower resistance to corona inception can lead to premature dielectric breakdown, which results in cable failure.

In addition to these issues, thermoplastic insulations do not perform well in DC applications or in applications such as VFDs, that mimic the function of a DC circuit. Furthermore, thermoplastic insulations can deform and melt when exposed to excessive temperatures, such as those that occur electrically when standing voltage waves exist within a VFD cable circuit.

FLEXIBLE MOTOR SUPPLY CABLE: NFPA79 now specifies flexible motor supply cable, referring to the stringent requirements of UL1277 *(Power and Control Tray Cable)* as well as UL 2277 *(Outline of Investigation for Flexible Motor Supply Cable and Wind Turbine Tray Cable)*, **not to be confused with flexible motor lead wire or hook-up wire**.

Rationale: The combination of demanding requirements of UL 44 *(Rubber Insulated Wire)* and UL 1277/2277 results in a VFD cable of outstanding performance ***if*** the proper cable design/system design is also used. Shielded cables, multiple grounds, tight construction geometry tolerance and termination methods are all critical to long-term viability and performance of the VFD circuit.

2018 NFPA79 – 4.4.2.8:

"Electrical conductors and equipment supplied by power conversion equipment as part of adjustable speed drive systems and servo drive systems shall be listed flexibile motor supply cable marked RHH, RHW, RHW-2, XHH, XHHW2 or XHHW-2."*

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RECAP: When specifying your cable systems for VFD applications, keep the requirements of NFPA79 in mind.

- **Avoid Thermoplastic Wires**
  (THW, THW-2, THHN, THWN, THWN-2, UF)
- **Specify Thermoset Wires**
  (printed RHH, RHW-2, XHHW, XHHW-2)
- **Require Tray Rated Products Listed to UL 1277/2277**
  (type TC, CT rated jacketed cables)
- **Ensure Cable System Includes:**
  - *Multiple Grounds*
  - *Proper Shielding*
  - *Proper Shield Termination*

For more information, visit **servicewire.com** *or call:*

800-624-3572 *Culloden, WV*

800-231-9473 *Houston, TX*

877-623-9473 *Phoenix, AZ*

ServiceDrive® VFD Cable System

ServiceDrive® VFD Cable System PLUS

Patented VFD **Interlocked Armor Cable** System

ServiceDrive® VFD Interlocked Armor Cable

#14AWG - 750 Kcmil, 600V or 2kV copper and shielded interlocked armor with overall ServiceDrive® (PVC) or ServiceDrive Plus® (Factory Mutual Group 1 LSZH) jacket

ServiceDrive® VFD Interlocked Armor Connectors

Nickel clad aluminum connector for use with ServiceDrive® and ServiceDrive Plus® Interlocked Armor Cable Systems

ServiceDrive® VFD Termination Kit

Our termination kits are specifically designed to terminate ServiceDrive® and ServiceDrive Plus® Interlocked Armor Cable Systems

Many sizes are in stock. Ask your Service Wire representative for a complete stock list.

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ServiceDrive® VFD Tray Cable

#14 AWG - 750 Kcmil, 600V or 2kV copper, shielded Tray Cable with overall ServiceDrive® (PVC) or ServiceDrive Plus® (Factory Mutual Group 1 LSZH) jacket

ServiceDrive® VFD Tray Cable Connectors

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ServiceDrive® VFD Termination Kit

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