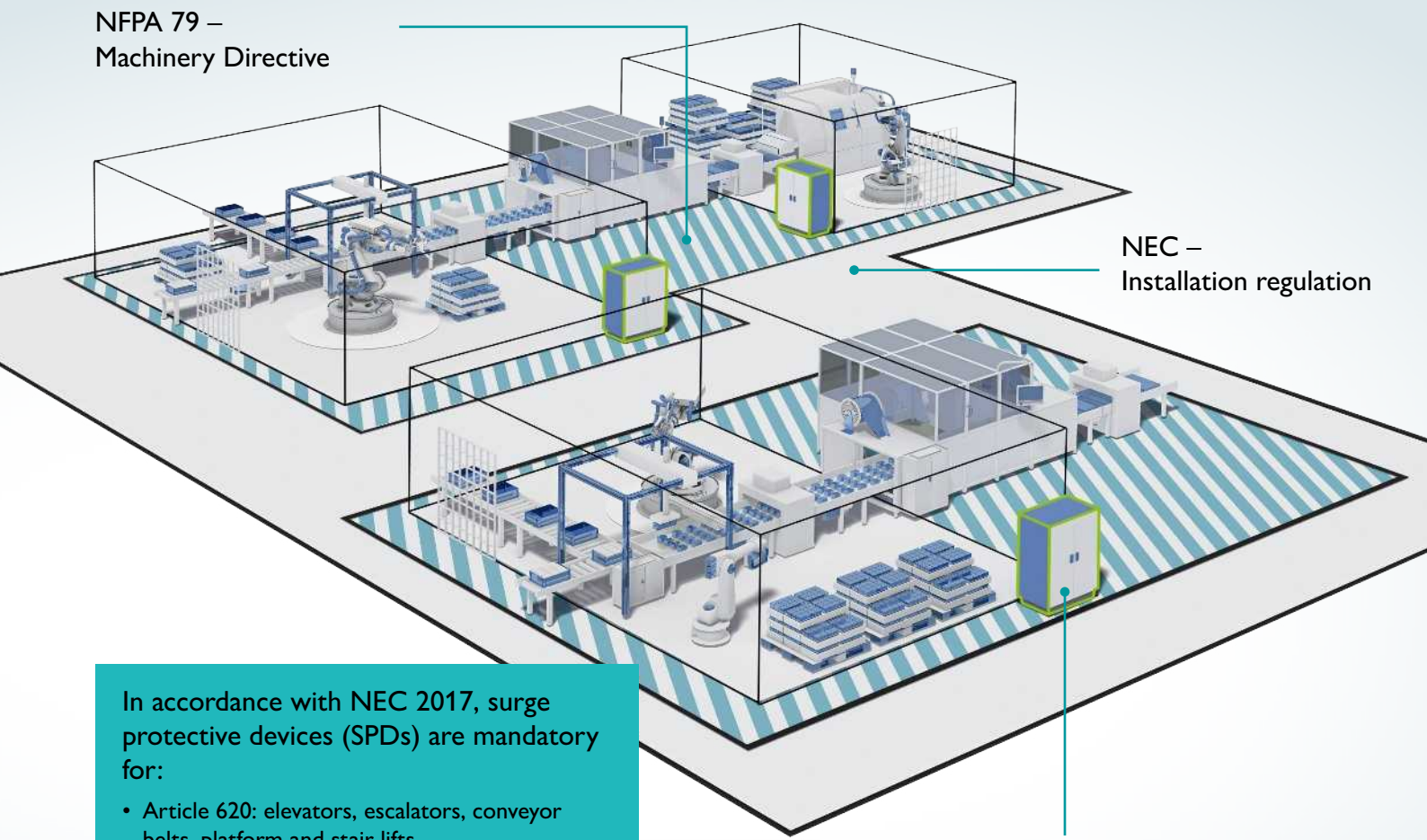

# Ready for NFPA 79

## Surge protection for machines in North America

PHOENIX CONTACT

# Surge protection is mandatory for machines in the USA

The 2018 Edition of NFPA 79 (Electrical Standard for Industrial Machinery) specifies the use of surge protective devices (SPDs) in machines with safety circuits. This specification has been in effect since November 30, 2017 in those areas of the North American market that have adopted NEC 2017. It applies for all industrial machines being placed on the market. SPDs ensure a voltage limitation appropriate for the insulation coordination. This prevents the safety equipment from being disabled by surge voltages.




In accordance with NEC 2017, surge protective devices (SPDs) are mandatory for:

- Article 620: elevators, escalators, conveyor belts, platform and stair lifts
- Article 645: systems for critical factory data
- Article 670: industrial machines with safety interlocks
- Article 695: fire extinguisher pump controllers

Further information can be found at:
www.phoenixcontact.com/NFPA79

# VAL-US surge protective devices

## Requirements under NFPA 79 and our solution

1. The surge protective devices (SPDs) used must be appropriate for the respective installation site. This means:
   - UL type 1 SPDs must be used ahead of the main building circuit breaker
   - UL type 1 and type 2 SPDs can be used downstream from the main building circuit breaker
   - UL type 3 SPDs may be installed starting at a distance of 10 meters downstream from the main building circuit breaker
   - UL type 4 SPDs may be used in machine control cabinets and must be suitable for the location where the machine is in use

**All VAL-US type 1 SPDs can be installed in any of these locations.**

2. Type 1, type 2, and type 3 SPDs must be "listed devices". **All VAL-US products are UL Listed.**

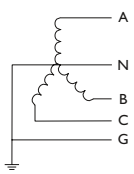
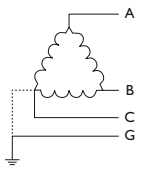
3. The short-circuit current listed on the SPDs may not be exceeded at the installation location. **The VAL-US products deliver a short-circuit current rating (SCCR) of 200 kA (per UL 1449 ed 4).**

4. The SPDs must be connected in accordance with the manufacturer's recommendations. The installation specifications must be complied with. **The same specifications per the packing slip apply for the entire VAL-US series.**

### Note

UL Standard UL 1449 describes where SPDs should be installed using the type classification. This should not be equated with IEC type classification, which describes the device performance.

As UL Listed type 1 SPDs, the VAL-US series SPDs do not require a separate backup fuse. However, the conductor to the SPD may require a fuse (see NFPA 79 [2018], Section 7.2 and 12.5).

| | | | | | |
|---|---|---|---|---|---|
| **Nominal voltage** | | 277/480 V | 347/600 V | 480 V | 600 V |
| **Configuration** | | 3-phase Wye   | | Corner-grounded/ungrounded Delta   | |
| **With neutral conductor** | **Type** | VAL-US-277/40/3+1-FM | VAL-US-347/30/3+1V-FM | | |
| | **Order No.** | 2910374 | 1079099 | | |
| **Without neutral conductor** | **Type** | VAL-US-277/80/3+0-FM | VAL-US-347/30/3+0-FM | VAL-US-480D/30/3+0-FM | VAL-US-600D/30/3+0-FM |
| | **Order No.** | 1075896 | 2910383 | 2910386 | 2910391 |
| **Product list** | | Web code: #1783 | | | |

## Use the protective circuit principle

Surge voltages can also cause damage via signal and data lines. For that reason, all of the conductors that supply the machine should be incorporated in the protection plan. The TERMITRAB complete and

DATATRAB product families include suitable protective devices with UL Listed approval.

| | | | | |
|---|---|---|---|---|
| **Signal** | Digital I/O | Current loop: 4 – 20 mA | Ethernet | Profibus DP/RS485 (3-wire) |
| **Type** | TTC-6P-2X1-F-M-24C-PT-I | TTC-6P-1X2-24C-PT-I | DT-LAN-CAT.6+ | TTC-6P-3-HF-F-M-12C-PT-I |
| **Order No.** | 2906794 | 2906815 | 2881007 | 2906796 |
| **Selection guide** | Web code: #1389 | | Web code: #2079 | |

## Open communication with customers and partners worldwide

Phoenix Contact is a global market leader based in Germany. We are known for producing forward-thinking products and solutions for the comprehensive electrification, networking, and automation of all sectors of the economy and infrastructure. With a global network, we maintain close relationships with our customers, something we believe is essential for our common success.

You can find your local partner at

phoenixcontact.com

TT 02-18.002.L3
MNR 1088181/2018-09-01/00