



## Public Input No. 116-NFPA 79-2022 [ Section No. 1.4 ]

### 1.4 Specific Provisions Other Than NFPA 79.

The size and overcurrent protection of the supply conductors to a machine shall be covered by Article 670 of *NFPA 70*. The wiring between component machines of an industrial manufacturing system shall be covered by *NFPA 70*.

*Exception: Wiring of component machines of an industrial manufacturing system that is supplied by the manufacturer and is an integral part of the system, is adequately protected and supported, and meets the requirements of this standard.*

### Statement of Problem and Substantiation for Public Input

Changes have been made to NEC 2023 Article 670 which will now be different than what is stated here. The NFPA 79 committee should be made aware of those changes and provide feedback regarding their opinion of those changes in the NEC. Sections 670.1 and 670.6 have been changed and do not match what is in NFPA 79, 7.8.

### Submitter Information Verification

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**Submittal Date:** Wed Jan 05 11:32:10 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The Public Input does not comply with 4.3.4.1(c) of the Regulations Governing the Development of NFPA Standards as no proposed text is provided.



## Public Input No. 117-NFPA 79-2022 [ New Section after 1.6 ]

### 1.7 Reference Standard Dates

Unless the standard reference includes a date, the reference shall be considered as the latest edition of the standard.

## Statement of Problem and Substantiation for Public Input

Add this provision to NFPA 79 as has been done for the 2023 NEC in 90.5(C).

CMP1 used this as a panel statement: The Panel concludes that this revision provides clarity and improves usability.

The NEMA PI had this for substation:

Revision years for standards or codes should be optional when referenced in Informational Notes or in Annex A. There are several published standards other than NFPA that have removed revision dates when referencing standards with the understanding that the most current edition should be used. Since Informational Notes and Annex's are only for information and are not enforceable a Code Making Panel should have this option. The proposed language clarifies this rule.

The UL LLC PI had this for substation:

The NEC® has references to hundreds of other Standards. As required by the Style Manual, these references are included in either an informative annex (for example, Annex A for Product Safety Standards), or in Informational Notes. Every cycle, a considerable effort is expended to update these references to ensure the latest edition of the standard is identified. In the vast majority of these cases, this is an effort that yields little benefit, as the intent in most cases is to maintain a reference to the latest edition of the Standard. There are limited cases where the CMP makes an intentional decision to cite an older edition of the Standard, but this is by far the exception, not the rule. To reduce the effort needed to maintain an up-to-date citation for an informative reference, this Public Input would note that, unless a date is included, that the reference is to be considered as the latest edition of that standard.

A similar concept needs to be included in NFPA 79 for the same reasons. The words "is to" were changed to "shall" to be more consistent with other items in Chapter 1. This is it slightly different than what is in the NEC because NFPA 79 has no introduction article or chapter

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**Committee:** EEI-AAA

## Committee Statement

**Resolution:** FR-49-NFPA 79-2022

**Statement:** Revision years for standards or codes should be optional when referenced in annex(es). There are several published standards other than NFPA that have removed revision dates when referencing standards with the understanding that the most current edition

should be used.



## Public Input No. 65-NFPA 79-2021 [ Section No. 2.3.6 ]

### 2.3.6 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 50, *Enclosures for Electrical Equipment, Non-Environmental Considerations*, 2015 2020 .

UL 50E, *Enclosures for Electrical Equipment, Environmental Considerations*, 2015 2018,  
revised 2020 .

UL 508, *Industrial Control Equipment*, 2018, revised 2021 .

UL 508A, *Industrial Control Panels*, 2018, revised 2021 .

UL 870, *Wireways, Auxiliary Gutters, and Associated Fittings*, 2016, revised 2018 .

UL 1063, *Machine-Tool Wires and Cables*, 2017, revised ~~2018~~ 2020 .

UL 1581, *Electrical Wires, Cables, and Flexible Cords*, 2001, revised ~~2017~~ 2021 .

## Statement of Problem and Substantiation for Public Input

Update UL standard edition references

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 66-NFPA 79-2021 [Section No. K.1.2.9]</u>	

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**Submittal Date:** Thu Dec 30 13:22:37 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** FR-50-NFPA 79-2022

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard



## Public Input No. 118-NFPA 79-2022 [ New Section after 3.3.41 ]

Energized, Likely to Become. (Likely to Become Energized).

Conductive material that could become energized because of the failure of electrical insulation or electrical spacing. (70:100)

### Statement of Problem and Substantiation for Public Input

The term is used in NFPA 79 and is often misunderstood. Adding the term to Chapter 3 will help in the use and application of NFPA 79.

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**Submission Date:** Wed Jan 05 11:41:22 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-81-NFPA 79-2022

**Statement:** The term Likely to Become Energized is used in NFPA 79 and is often misunderstood. Adding the term to Chapter 3 will help in the use and application of NFPA 79.



## Public Input No. 86-NFPA 79-2022 [ Section No. 3.3.60 ]

### 3.3.60 Industrial Control Panel.

An assembly of two or more components consisting of one of the following: (1) power circuit components only, such as motor controllers, overload relays, fused ~~disconnect switches~~ disconnecting means, and circuit breakers; (2) control circuit components only, such as pushbuttons, pilot lights, selector switches, timers, switches, and control relays; (3) a combination of power and control circuit components. These components, with associated wiring and terminals, are mounted on, or contained within, an enclosure or mounted on a subpanel. The industrial control panel does not include the controlled equipment.- [ ~~70: 100~~ ]

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

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**Submission Date:** Sun Jan 02 09:19:28 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-16-NFPA 79-2022

**Statement:** The term "disconnect switches" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79. The reference to NFPA 70:100 has been deleted since the definition has been revised.

Annex material was added to align with NEC.



## Public Input No. 106-NFPA 79-2022 [ Section No. 3.3.78 ]

### 3.3.78 Overcurrent Protective Device, Branch-Circuit.

A device capable of providing protection for service, feeder, and branch circuits and equipment over the full range of overcurrents between its rated current and its interrupting rating. ~~Such devices are provided with interrupting ratings appropriate for the intended use but no less than 5000 amperes.~~ [70:100]

## Statement of Problem and Substantiation for Public Input

In the Second Draft of the 2023 NEC, this sentence was removed from the definition and relocated to Article 240. This sentence is really just informational material and could be included as an informational note in the definition if desired.

## Submitter Information Verification

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**Submittal Date:** Mon Jan 03 11:03:51 EST 2022

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-11-NFPA 79-2022](#)

**Statement:** The definition was revised for correlation with NFPA 70.



## Public Input No. 38-NFPA 79-2021 [ Section No. 3.3.85 ]

### 3.3.85 Raceway.

An enclosed channel of metal or nonmetallic materials designed expressly for holding wires conductors, cables, or busbars, with additional functions as permitted in this standard. Raceways include, but are not limited to, rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible conduit, flexible metallic tubing, flexible metal conduit, electrical nonmetallic tubing, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

### Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term “wire” and words or phrases containing the term “wire” in the NFPA 79 Standard. This review was conducted to determine if the use of the term “wire” was technically correct or if used in an informal/colloquial manner. In those instances where the term “wire” was considered to be used in a colloquial connotation, “wire” was replaced with the term “conductor” to make the terminology technically correct.

The task group notes that the definition of “Raceway” in NFPA 79 is not the same as the definition of “Raceway” in the NEC, and therefore not extracted material. As such, the proposed revision does not create a conflict with the definition of “Raceway” in the NEC.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	Submitted by Wire Terminology Task Group

[Public Input No. 39-NFPA 79-2021 \[Section No. 3.3.114\]](#)

[Public Input No. 40-NFPA 79-2021 \[Section No. 5.1.5\]](#)

[Public Input No. 41-NFPA 79-2021 \[Section No. 8.2.2.4\]](#)

[Public Input No. 42-NFPA 79-2021 \[Section No. 8.2.3.4\]](#)

[Public Input No. 43-NFPA 79-2021 \[Section No. 11.5.1.1\]](#)

[Public Input No. 46-NFPA 79-2021 \[Section No. 12.6.1.1\]](#)

[Public Input No. 47-NFPA 79-2021 \[Section No. 13.1.6.8\]](#)

[Public Input No. 48-NFPA 79-2021 \[Section No. A.4.5.2\]](#)

[Public Input No. 49-NFPA 79-2021 \[Section No. 12.9.2\]](#)

[Public Input No. 56-NFPA 79-2021 \[Section No. 12.6.1.2\]](#)

## Submitter Information Verification

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**Submittal Date:** Tue Dec 21 22:47:48 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-59-NFPA 79-2022](#)

**Statement:** The term “wires” was considered to be used in a colloquial connotation, and was replaced with the term “conductors” to make the terminology technically correct.

The committee notes that the definition of “Raceway” in NFPA 79 is not the same as the definition of “Raceway” in the NEC, and therefore not extracted material. As such, the revision does not create a conflict with the definition of “Raceway” in the NEC.



## Public Input No. 84-NFPA 79-2022 [ New Section after 3.3.95 ]

### 3.3.96 Safety Instrumentation Circuit.

A circuit used for testing or indication of hazardous states of equipment to ensure the safety of workers while servicing. This equipment is not necessary for the protection of personnel while in normal operation. Should this circuit fail in an unknown state, the risk to service personnel would increase.

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### Statement of Problem and Substantiation for Public Input

The addition of this definition will clarify to the user what are safety instrumentation circuits and allow use of the term throughout the standard.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 83-NFPA 79-2022 [New Section after 7.2.4]</u>	

### Submitter Information Verification

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**Submittal Date:** Sat Jan 01 11:02:16 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The proposed term does not need to be defined because the term is not used in NFPA 79.



## Public Input No. 107-NFPA 79-2022 [ New Section after 3.3.102 ]

### **3.3.102 Short Circuit.**

An abnormal condition (including an arc) of relatively low impedance, whether made accidentally or intentionally, between two or more points of different potential. [70:100]

### **Statement of Problem and Substantiation for Public Input**

Short Circuit was added as a definition in Article 100 of the NEC in the first draft stage of the 2023 NEC. This correlates with the new definition.

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**Submittal Date:** Mon Jan 03 11:18:46 EST 2022

**Committee:** EEI-AAA

### **Committee Statement**

**Resolution:** [FR-82-NFPA 79-2022](#)

**Statement:** The definition is added from NFPA 70 because the term is used in NFPA 79.



## Public Input No. 31-NFPA 79-2021 [ Section No. 3.3.104 ]

### 3.3.104 Surge-Protective Device (SPD).

A protective device for limiting transient voltages by diverting or limiting surge current ;~~it also prevents continued flow of follow current while remaining capable of repeating these functions to the downstream equipment~~ and is designated as follows: Type 1: Permanently connected SPDs intended for installation between the secondary of the service transformer and the line side of the service disconnect overcurrent device. Type 2: Permanently connected SPDs intended for installation on the load side of the service disconnect overcurrent device, including SPDs located at the branch panel. Type 3: Point of utilization SPDs. Type 4: Component SPDs, including discrete components, as well as assemblies. [70:100]

### Statement of Problem and Substantiation for Public Input

The current first line of this section is too generic and does not communicate what is being protected by the SPD.

The proposed text edit better communicates the intended use of the SPD.

Removed line concerning 'follow current'.

Follow current is current that continues to flow to downstream equipment even after the SPD serves its intended purpose.

There is no guarantee that there is no follow current in the system after an SPD event.

The SPD does not unequivocally prevent continued flow of follow current.

If this Public Input is accepted, Public Input 32 is no longer needed, as the term 'follow current' is does not appear.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 32-NFPA 79-2021 [Section No. 3.3.104]</a>	

### Submitter Information Verification

**Submitter Full Name:** William Brungs

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**Submittal Date:** Tue Dec 21 08:57:30 EST 2021

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-17-NFPA 79-2022](#)

**Statement:** The definition of SPD has deleted the reference to "follow current" and added text to identify the purpose of surge protection devices. Follow current is used and defined in UL 1449 Edition 5 but is does not affect the proper selection of an SPD.

The term "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

The reference to NFPA 70:100 has been deleted since the definition has been revised.



## Public Input No. 32-NFPA 79-2021 [ Section No. 3.3.104 ]

### 3.3.104 Surge-Protective Device (SPD).

A protective device for limiting transient voltages by diverting or limiting surge current; it also prevents continued flow of follow current while remaining capable of repeating these functions and is designated as follows: Type 1: Permanently connected SPDs intended for installation between the secondary of the service transformer and the line side of the service disconnect overcurrent device. Type 2: Permanently connected SPDs intended for installation on the load side of the service disconnect overcurrent device, including SPDs located at the branch panel. Type 3: Point of utilization SPDs. Type 4: Component SPDs, including discrete components, as well as assemblies. [70:100]

### Statement of Problem and Substantiation for Public Input

Create definition for Follow Current in Section 3, or use different term.

Follow current is also referred to as follow-through and follow-on.

SPD's are an important inclusion in the NFPA79 standard.

If terms used within this section are not easily understandable and/or recognizable, a definition should be added to Section 3.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 31-NFPA 79-2021 [Section No. 3.3.104]</a>	

### Submitter Information Verification

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**Submittal Date:** Tue Dec 21 09:08:24 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The definition of SPD is being revised to delete the reference to "follow current" and added text to identify the purpose of surge protection devices. Follow current is used and defined in UL 1449 Edition 5 but does not affect the proper selection of an SPD and as such a definition is not required. Additionally, the Public Input does not comply with 4.3.4.1(c) of the Regulations Governing the Development of NFPA Standards as no proposed text is provided.



## Public Input No. 87-NFPA 79-2022 [ Section No. 3.3.104 ]

### 3.3.104 Surge-Protective Device (SPD).

A protective device for limiting transient voltages by diverting or limiting surge current; it also prevents continued flow of follow current while remaining capable of repeating these functions and is designated as follows: Type 1: Permanently connected SPDs intended for installation between the secondary of the service transformer and the line side of the service ~~disconnect~~ disconnecting means overcurrent device. Type 2: Permanently connected SPDs intended for installation on the load side of the service ~~disconnect~~ disconnecting means overcurrent device, including SPDs located at the branch panel. Type 3: Point of utilization SPDs. Type 4: Component SPDs, including discrete components, as well as assemblies.- [ ~~70: 100~~ ]

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacic, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

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**Submittal Date:** Sun Jan 02 09:23:53 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-17-NFPA 79-2022](#)

**Statement:** The definition of SPD has deleted the reference to "follow current" and added text to identify the purpose of surge protection devices. Follow current is used and defined in UL 1449 Edition 5 but it does not affect the proper selection of an SPD.

The term "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

The reference to NFPA 70:100 has been deleted since the definition has been revised.



## Public Input No. 39-NFPA 79-2021 [ Section No. 3.3.114 ]

### 3.3.114 Wireway.

A sheet-metal or flame-retardant nonmetallic trough with hinged or removable covers for housing and protecting ~~electric wires and cable and in which conductors are electrical~~ conductors and cables that are laid in place after the wireway has been installed as a complete system.

## Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term “wire” and words or phrases containing the term “wire” in the NFPA 79 Standard. This review was conducted to determine if the use of the term “wire” was technically correct or if used in an informal/colloquial manner. In those instances where the term “wire” was considered to be used in a colloquial connotation, “wire” was replaced with the term “conductor” to make the terminology technically correct.

The task group notes that the definition of “Wireway” in NFPA 79 is not the same as the definition of “Wireway” in the NEC and not an extract. As such, the proposed revision does not create a conflict with the definition of “Wireway” in the NEC.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</u>	

[Public Input No. 40-NFPA 79-2021 \[Section No. 5.1.5\]](#)

[Public Input No. 41-NFPA 79-2021 \[Section No. 8.2.2.4\]](#)

[Public Input No. 42-NFPA 79-2021 \[Section No. 8.2.3.4\]](#)

[Public Input No. 43-NFPA 79-2021 \[Section No. 11.5.1.1\]](#)

[Public Input No. 46-NFPA 79-2021 \[Section No. 12.6.1.1\]](#)

[Public Input No. 47-NFPA 79-2021 \[Section No. 13.1.6.8\]](#)

[Public Input No. 48-NFPA 79-2021 \[Section No. A.4.5.2\]](#)

[Public Input No. 49-NFPA 79-2021 \[Section No. 12.9.2\]](#)

[Public Input No. 56-NFPA 79-2021 \[Section No. 12.6.1.2\]](#)

## Submitter Information Verification

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**Submission Date:** Tue Dec 21 23:32:48 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-60-NFPA 79-2022](#)

**Statement:** The term “wires” was considered to be used in a colloquial connotation, and was replaced with the term “conductors” to make the terminology technically correct. The sentence format and word usage was revised for clarity.

The committee notes that the definition of “Wireway” in NFPA 79 is not the same as the definition of “Wireway” in the NEC and not an extract. As such, the proposed revision does not create a conflict with the definition of “Wireway” in the NEC.



## Public Input No. 2-NFPA 79-2021 [ Section No. 4.5.1 ]

### 4.5.1\* General.

The electrical equipment shall be suitable for use in the physical environment and operating conditions specified in 4.5.3 through 4.5.6- ~~and~~ , 4.5.8, and 4.5.9 . When the physical environment or the operating conditions are outside those specified, an agreement between the supplier and the user shall be considered.

### Statement of Problem and Substantiation for Public Input

Propose adding new section 4.5.9 to require compliance with seismic regulations at location of installation. This section needs to refer to that.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 3-NFPA 79-2021 [New Section after 4.5.8]	

### Submitter Information Verification

**Submitter Full Name:** Matt Egloff  
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**Zip:**  
**Submittal Date:** Tue Feb 23 12:10:48 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** Seismic rules were not added therefore adding this additional reference is not necessary.



## Public Input No. 3-NFPA 79-2021 [ New Section after 4.5.8 ]

### 4.5.9 Seismic

The installation of equipment shall be in compliance with seismic codes at the location.

### Statement of Problem and Substantiation for Public Input

Some areas have seismic codes that cover installation of equipment, and some don't. Requirements also vary. Rather than enumerate requirements that are subject to change, this just affirms that if there are local seismic requirements, the installation should be in compliance with them.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 2-NFPA 79-2021 [Section No. 4.5.1]</u>	mentions new section if added

### Submitter Information Verification

**Submitter Full Name:** Matt Egloff  
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**Affiliation:** none  
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**City:**  
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**Zip:**  
**Submittal Date:** Tue Feb 23 12:13:05 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** Adding specific location requirements in NFPA 79 would be infeasible to apply when designing and building industrial machines for use in all locations in compliance with Chapter 4. The Inquiry Form in Annex B can be used to deal with these specific local issues.



## Public Input No. 22-NFPA 79-2021 [ New Section after 4.9 ]

### **4.10 Cybersecurity**

Industrial Machinery that is connected to a communication network and permitted to control any part of the machinery shall comply with (1) and (2).

- (1) A Cybersecurity Assessment shall be conducted on the connected system determine vulnerabilities to cyber-attacks.
- (2) A Cybersecurity Commissioning Certification shall be conducted on the connected system to ensure they are designed against cyber-attacks and known vulnerabilities.

Documentation of the assessment and certification shall be made available to those authorized to inspect, operate, and maintain.

Informational note (1): ANSI/ISA 62443 Cybersecurity Standards series can be utilized to meet the assessment requirement. Another way is thru the NIST Framework for Improving Critical Infrastructure Cybersecurity, Version 1.1 and UL 2900-2-3 for Security and Life Safety Signaling Systems.

Informational note (2): Examples the commissioning certification could be one of the following:

- \_\_\_\_\_ (a) The ISA Security Compliance Institute (ISCI) conformity assessment program
- \_\_\_\_\_ (b) Certification of compliance by a nationally recognized test laboratory
- \_\_\_\_\_ (c) Manufacturer certification for the specific type and brand of system provided

### **Statement of Problem and Substantiation for Public Input**

Cybersecurity should be considered as an aspect of safety and reliability in addition to the other factors affecting industrial machinery. If an attacker can affect the machinery control system, individual sensors or other IoT devices to the point of either preventing normal operation or displaying the appearance of normal operation while failing the system, creates an unsafe condition. The increase in cyber-attacks on industrial, utility, and other installations where industrial machinery can be made to create unsafe conditions. Examples of these unsafe conditions can be changing overcurrent protection rating of a circuit breaker, arc energy reduction settings, SCADA systems, emergency stop functions, motor controllers, or Fire Protection Systems. The public input is focused only on electrical systems that can be controlled from external communication networks such as the internet. These connections can be wired, wireless, or use other data media. cybersecurity is essential to expand the safety and security of industrial machinery.

Cybersecurity should be considered as an aspect of safety and reliability in addition to the other factors affecting industrial machinery. If an attacker can affect the machinery control system, individual sensors or other IoT devices to the point of either preventing normal operation or displaying the appearance of normal operation while failing the system, creates an unsafe condition. The increase in cyber-attacks on industrial, utility, and other installations where industrial machinery can be made to create unsafe conditions. Examples of these unsafe conditions can be changing overcurrent protection rating of a circuit breaker, arc energy reduction settings, SCADA systems, emergency stop functions, motor controllers, or Fire Protection Systems. The public input is focused only on electrical systems that can be controlled from external communication networks such as the internet. These connections can be wired, wireless, or use other data media. cybersecurity is essential to expand the safety and security of industrial machinery.

Examples:

<https://www.forbes.com/sites/leemathews/2021/02/15/florida-water-plant-hackers-exploited-old-software-and-poor-password-habits/?sh=6a0e3070334e>

<https://www.eenews.net/stories/1060131769> (Water Treatment facility Cyber Attack)

<https://www.infosecurity-magazine.com/news/water-treatment-plant-hit-by/> (Water treatment plant hit by cyber-attack)

<https://www.osti.gov/servlets/purl/1505628>. (History of Industrial Control System Cyber Incidents)

<https://www.varonis.com/blog/cybersecurity-statistics/>

- 71% of data breaches were financially motivated and 25% were motivated by espionage
- Cybersecurity breaches have increased by 11% since 2018 and 67% since 2014
- 61% of organizations have experienced an IoT security incident
- IoT devices experience an average of 5,200 attacks per month
- The cost of a data breach in the healthcare industry was \$6.5 Million
- Average cost of a malware attack on a company is \$2.6M

## Submitter Information Verification

**Submitter Full Name:** Keith Waters

**Organization:** Schneider Electric

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Mon Nov 29 14:23:10 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** The proposed language is overly broad and restrictive.



## Public Input No. 88-NFPA 79-2022 [ Section No. 5.1.2 ]

### 5.1.2 Machine Supply Circuit Conductor Separation.

Each set of machine supply circuit conductors on the line side of the machine supply circuit disconnecting means shall be separated from all other internal conductors, including conductors of other circuits, by either of the following:

- (1) Mounting the machine supply circuit- ~~disconnect~~ disconnecting means as near as practicable to the top of the enclosure with dedicated wire bending space as required in 5.1.5
- (2) Mounting the machine supply circuit- ~~disconnect~~ disconnecting means other than at the top of the enclosure and by separating the machine supply circuit conductors from other internal conductors with a barrier

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 09:27:06 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-18-NFPA 79-2022](#)

**Statement:** The term "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 40-NFPA 79-2021 [ Section No. 5.1.5 ]

### 5.1.5 Wire-Bending Space.

The wire-bending space provided between the terminals of a supply circuit disconnecting means or terminals described in 5.1.3 and the wall of the enclosure shall not be less than what is required by 430.10(B) of *NFPA 70*. The wire-bending space shall either be determined by the maximum wire-size of the supply circuit conductors or be equal to or larger than the conductors required by 670.4(A) of *NFPA 70*. When the wire-bending space is based on more than one conductor per phase, the intended conductor size and number shall be so identified on interconnection diagrams as required in 17.5.7.

### Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term “wire” and words or phrases containing the term “wire” in the NFPA 79 Standard. This review was conducted to determine if the use of the term “wire” was technically correct or if used in an informal/colloquial manner. In those instances where the term “wire” was considered to be used in a colloquial connotation, “wire” was replaced with the term “conductor” to make the terminology technically correct.

The task group considers the use of the term “wire” in this instance as unnecessary as the term “conductors” is used in the same sentence and removing the term “wire” does not affect the intent and interpretation of the requirement.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	Submitted by Wire Terminology Task Group

[Public Input No. 38-NFPA 79-2021 \[Section No. 3.3.85\]](#)

[Public Input No. 39-NFPA 79-2021 \[Section No. 3.3.114\]](#)

[Public Input No. 41-NFPA 79-2021 \[Section No. 8.2.2.4\]](#)

[Public Input No. 42-NFPA 79-2021 \[Section No. 8.2.3.4\]](#)

[Public Input No. 43-NFPA 79-2021 \[Section No. 11.5.1.1\]](#)

[Public Input No. 46-NFPA 79-2021 \[Section No. 12.6.1.1\]](#)

[Public Input No. 47-NFPA 79-2021 \[Section No. 13.1.6.8\]](#)

[Public Input No. 48-NFPA 79-2021 \[Section No. A.4.5.2\]](#)

[Public Input No. 49-NFPA 79-2021 \[Section No. 12.9.2\]](#)

[Public Input No. 56-NFPA 79-2021 \[Section No. 12.6.1.2\]](#)

## Submitter Information Verification

**Submitter Full Name:** John Kovacik

**Organization:** UL LLC

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Tue Dec 21 23:37:35 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-61-NFPA 79-2022](#)

**Statement:** The use of the term “wire” is unnecessary as the term “conductors” which is the technically correct term as a replacement for “wire”, is used in the same sentence and removing the term “wire” does not affect the intent and interpretation of the requirement.



## Public Input No. 16-NFPA 79-2021 [ Section No. 5.1.6 ]

### 5.1.6 Protection of Line Side Live Parts.

All live parts on the line side of the machine supply circuit disconnecting means shall be protected from unintentional direct contact by use of ~~insulation or obstacle~~ insulating barriers, covers or obstacle (s) when the machine supply circuit disconnecting means is in the open (off) position and the enclosure door is open. Insulating tapes used for protection of line side parts from unintentional contact shall be of sufficient durability for the environment.

### Statement of Problem and Substantiation for Public Input

The use of line side terminal covers are insulating barriers but are not classified as insulation since the NFPA-79 6.2.2.1 states "Live parts protected by insulation shall be completely covered with insulation that is removable only by destruction." Line terminal barrier covers that are similar to ones used for Electrical Service equipment required by NEC 230.62(C) should be permissible to be used to cover the line conductors to prevent accidental contact with energized conductors. These line barriers typically include a hole to insert a tester probe tip so that removal is unnecessary after installed.

### Submitter Information Verification

**Submitter Full Name:** Thomas Kennedy

**Organization:**

**Affiliation:** IBEW 494

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Tue Oct 19 12:47:27 EDT 2021

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-19-NFPA 79-2022](#)

**Statement:** "Insulation" has been revised to "insulating barrier, covers or obstacles(s)" as this better reflects methods use to protect live parts on the line side of the machine supply circuit disconnecting means from unintentional direct contact. Insulating tapes are not a suitable means of protection for the live parts on the line side of the machine supply circuit disconnect.



## Public Input No. 33-NFPA 79-2021 [ Section No. 5.1.9.3 ]

### 5.1.9.3

A machine supply circuit disconnecting means shall be marked as "Machine Supply Circuit Disconnect" if ~~additional disconnecting means are supplied from the supply circuit disconnecting means.~~ near or adjacent to the device. The item used for marking should be fit for heavy industrial use to prohibit degradation or loss from the equipment over time.

### Statement of Problem and Substantiation for Public Input

The requirements of Section 5.1.9.3 should apply even if there are no other disconnecting means. It should always be readily known where the main disconnecting means is located.

Some markings and tags are known to degrade, be lost, or no longer serve their intended purpose. The addition of wording is meant to guard against insufficient tags, labels, etc for something as important as the main disconnecting means.

### Submitter Information Verification

**Submitter Full Name:** William Brungs  
**Organization:** Honeywell Intelligrated System  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Dec 21 09:36:25 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-20-NFPA 79-2022](#)

**Statement:** Requiring all machine supply circuit disconnecting means to be identified with a marking will improve safety. The terms "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 89-NFPA 79-2022 [ Section No. 5.1.9.3 ]

### 5.1.9.3

A machine supply circuit disconnecting means shall be marked as "Machine Supply Circuit Disconnect"– Disconnecting Means " if additional disconnecting means are supplied from the machine \_ supply circuit disconnecting means.

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacic, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc. The word machine was added for consistency.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 09:31:13 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-20-NFPA 79-2022](#)

**Statement:** Requiring all machine supply circuit disconnecting means to be identified with a marking will improve safety. The terms "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 90-NFPA 79-2022 [ Section No. 5.1.9.4 ]

### 5.1.9.4

Where a machine is supplied by more than one supply circuit, a marking shall be installed at each machine supply circuit ~~disconnect~~ circuit disconnecting means location denoting the location of all other machine supply circuit ~~disconnects~~ disconnecting means .

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacic, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
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**Street Address:**  
**City:**  
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**Zip:**  
**Submittal Date:** Sun Jan 02 09:34:54 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-21-NFPA 79-2022](#)

**Statement:** The terms "disconnect" and "disconnects" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 63-NFPA 79-2021 [ Section No. 5.1.10 ]

### 5.1.10 Type.

The machine supply circuit disconnecting means shall be one of the following types:

- (1) A listed motor circuit switch rated in horsepower
- (2) A listed general-use switch rated in amperes and horsepower
- (3) A listed molded case circuit breaker
- (4) A listed molded case switch
- (5) An instantaneous trip circuit breaker that is part of a listed combination motor controller limited to single motor applications
- (6) A listed self-protected combination controller limited to single motor applications
- (7) An attachment plug and receptacle for cord connection

### Statement of Problem and Substantiation for Public Input

UL 98 has three types of disconnect switches:

- 1) General-use switch with ampere ratings
- 2) General-use switch with ampere and HP ratings
- 3) Motor-circuit switch with HP ratings but no general use ampere ratings

5.1.10 only recognizes motor-circuit switch with HP ratings. However, a general-use switch with ampere and HP ratings should be allowed for use as the machine supply circuit disconnect that complies with 5.1.11.1.

There is no revision as indicated in Terra to the new 3) A listed molded case switch.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 62-NFPA 79-2021 [Section No. 5.2.2]</u>	

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
**Organization:** Eaton's Bussmann Division  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Wed Dec 29 12:17:26 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-22-NFPA 79-2022

**Statement:** A listed general-use switch rated in amperes and horsepower was added. This product should be allowed to be used because it is intended to be used as a disconnecting means.



## Public Input No. 126-NFPA 79-2022 [ Section No. 5.1.11.1 ]

### 5.1.11.1\*

Where the machine supply circuit disconnecting means is one of the types in 5.1.10(1) through 5.1.10(5), it shall fulfill all of the following requirements:

- (1) Disconnect the electrical equipment from the machine supply circuit and have one off (open) and one on (closed) position only. Circuit breakers, instantaneous trip circuit breakers, molded-case switches, and self-protected combination motor controllers are permitted to have a reset (tripped) position between off (open) and on (closed).
- (2) Have an external operating means (e.g., handle) that complies with 5.1.12.  
*Exception: Power-operated switchgear need not be operable from outside the enclosure where there are other means to open it.*
- (3) Be provided with a permanent means permitting it to be locked in the off (open) position only (e.g., by padlocks), independent of the enclosure door or enclosure cover position. When so locked, remote as well as local closing into the on position shall be prevented.
- (4) Simultaneously disconnect all ungrounded conductors of the supply circuit.
- (5) Be operable by qualified persons independent of the enclosure door or enclosure cover position without the use of accessory tools or devices.
- (6) Be rated for the application as follows:
  - (7) With an ampere rating at least 115 percent of the sum of the full-load currents required for all equipment that is in operation at the same time under normal conditions of use , design load, and duty cycle.
  - (8) Where rated in horsepower, with a horsepower rating at least equal to that which is defined by Table 430.251(B) of *NFPA 70* for a locked rotor current equal to the largest sum resulting from the locked rotor currents of any combination of motors that can be started simultaneously and the full-load currents of the remaining motor and non-motor loads that can be operated at that time
  - (9) With a voltage rating at least equal to the nominal supply circuit voltage
- (10) Be of a type that indicates whether it is in the off (open) or on (closed) position.

## Statement of Problem and Substantiation for Public Input

The proposed changes align with the nameplate marking requirements in 16.4 to include design load and duty cycle.

## Submitter Information Verification

**Submitter Full Name:** Jay Tamblingson

**Organization:** Rockwell Automation

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Wed Jan 05 16:54:54 EST 2022

**Committee:** EEI-AAA

### **Committee Statement**

**Resolution:** [FR-23-NFPA 79-2022](#)

**Statement:** The wording “design load and duty cycle” was added to be consistent with the nameplate marking requirements in 16.4.



## Public Input No. 17-NFPA 79-2021 [ Section No. 5.1.11.1 ]

### 5.1.11.1\*

Where the machine supply circuit disconnecting means is one of the types in 5.1.10(1) through 5.1.10(5), it shall fulfill all of the following requirements:

- (1) Disconnect the electrical equipment from the machine supply circuit and have one off (open) and one on (closed) position only. Circuit breakers, instantaneous trip circuit breakers, molded-case switches, and self-protected combination motor controllers are permitted to have a reset (tripped) position between off (open) and on (closed).
- (2) Have an external operating means (e.g., handle) that complies with 5.1.12.  
*Exception: Power-operated switchgear need not be operable from outside the enclosure where there are other means to open it.*
- (3) Be provided with a permanent means permitting it to be locked in the off (open) position only (e.g., by padlocks), independent of the enclosure door or enclosure cover position. When so locked, remote as well as local closing into the on position shall be prevented.
- (4) Simultaneously disconnect all ungrounded conductors of the supply circuit.
- (5) Be operable by qualified persons independent of the enclosure door or enclosure cover position without the use of accessory tools or devices.
- (6) Be rated for the application as follows:

With an ampere rating at least 115 percent of the

- (a) Shall not be greater than the sum of the largest rating or setting of the branch-circuit short circuit and ground fault protective device provided with the machine, plus %125 of the full-load current rating of all resistance heating loads, plus the sum of the full-load currents

required for all equipment that is

- (a) of all other motors and apparatus that could be in operation at the same time under normal conditions of use

(a) .

- (b) Where rated in horsepower, with a horsepower rating at least equal to that which is defined by Table 430.251(B) of NFPA 70 for a locked rotor current equal to the largest sum resulting from the locked rotor currents of any combination of motors that can be started simultaneously and the full-load currents of the remaining motor and non-motor loads that can be operated at that time

- (c) With a voltage rating at least equal to the nominal supply circuit voltage

- (7) Be of a type that indicates whether it is in the off (open) or on (closed) position.

### Statement of Problem and Substantiation for Public Input

The proposed change would harmonize NFPA79 article 5.1.11.1(6)(a) with NEC 670.4 (C). They currently do not agree. The NFPA article currently states the machine supply disconnect must be "at least %115 of.." . NEC 670.4 (C) states "shall not be greater than..."

## Submitter Information Verification

**Submitter Full Name:** Craig Twining

**Organization:** Kaufman Engineered Systems

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Wed Oct 20 13:31:22 EDT 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** NEC 670.4(C) is for overcurrent protection. NFPA 79, 5.1.11.1 is for machine supply circuit disconnecting means. They are different requirements and making the change as suggested would create conflicting wording.



## Public Input No. 119-NFPA 79-2022 [ Section No. 5.1.13.2 ]

### 5.1.13.2

Excepted circuits shall be provided with all of the following:

- (1) A disconnecting means, isolating transformer, and overcurrent protection mounted in an enclosure adjacent to or within the control enclosure containing the machine supply circuit disconnecting means
- (2) Line side (of the machine supply circuit disconnecting means) supply circuit conductors, when internal to the control enclosure, that are separate from and do not share a raceway with other conductors and that are encased in a rigid or flexible conduit raceway if longer than 460 mm (18 in.)

### Statement of Problem and Substantiation for Public Input

As presently stated liquid tight nonmetallic conduit is permitted to encase line side conductors based on the use of the terms "rigid or flexible conduit". Electrical metallic tubing is not a conduit, but it is a raceway and should also be allowed for this purpose. The term raceway is presently defined in Chapter 3 and provides a description of conduits, tubings and other products.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Wed Jan 05 11:44:42 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-24-NFPA 79-2022](#)

**Statement:** The word "conduit" is being changed to "raceway" to use a defined term.

The term raceway is defined in Section 3.3.85.

The terms flexible and rigid were removed as unnecessary.



## Public Input No. 18-NFPA 79-2021 [ Section No. 5.1.13.4 ]

### 5.1.13.4

Where the excepted circuits are not disconnected by the machine supply circuit disconnecting means, all of the following requirements shall be met:

- (1) A permanent safety sign(s) shall be placed adjacent to the machine supply circuit disconnecting operating handle(s), indicating that it does not de-energize all exposed live parts when it is in the open (off) position as in 16.2.4.
- (2) A statement containing the information from 16.2.4 shall be included in the machine documentation.
- (3) A permanent safety sign shall be placed on a nonremovable part inside the control enclosure in proximity to each excepted circuit ~~or~~ and shall be identified by color as defined in 13.2.4.

### Statement of Problem and Substantiation for Public Input

The word "or" in the last clause of 5.1.13.4 (3)--"or shall be identified..." gives the impression that the conductor color identification defined in 13.2.4 is optional.

### Submitter Information Verification

**Submitter Full Name:** Craig Twining  
**Organization:** Kaufman Engineered Systems  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Oct 26 13:48:31 EDT 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-26-NFPA 79-2022](#)

**Statement:** The word "or" was changed to "and" because the sign and color orange are both required.



## Public Input No. 91-NFPA 79-2022 [ Section No. 5.1.13.4 ]

### 5.1.13.4

Where the excepted circuits are not disconnected by the machine supply circuit disconnecting means, all of the following requirements shall be met:

- (1) A permanent safety sign(s) shall be placed adjacent to the machine supply circuit disconnecting means \_ operating handle(s), indicating that it does not de-energize all exposed live parts when it is in the open (off) position as in 16.2.4.
- (2) A statement containing the information from 16.2.4 shall be included in the machine documentation.
- (3) A permanent safety sign shall be placed on a nonremovable part inside the control enclosure in proximity to each excepted circuit, or shall be identified by color as defined in 13.2.4.

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submission Date:** Sun Jan 02 09:38:52 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-25-NFPA 79-2022](#)

**Statement:** The word "means" was added for consistency and to use the term "disconnecting means" defined in NFPA 70 and NFPA 79.



## Public Input No. 25-NFPA 79-2021 [ Section No. 5.2.2 ]

### 5.2.2

The following devices shall be permitted to fulfill the function of 5.2.1:

- (1) Devices described in 5.1.10
- (2) A listed manual motor controller additionally marked "suitable as motor disconnect" and in compliance with UL 508 where located on the load side of the last short-circuit protective device in the branch in a single motor branch circuit where located between the last short-circuit protective device and the motor. Listed manual motor controllers additionally marked "suitable as motor disconnect" shall be permitted as a disconnecting means on the line side of the fuses permitted in 7.2.10.1.3. In this case, the fuses permitted in 7.2.10.1.3 shall be considered supplementary fuses, and suitable branch-circuit short-circuit protective devices shall be installed on the line side of the manual motor controller additionally marked "suitable as motor disconnect."
- (3) System isolation equipment that incorporates control lockout stations and is listed for disconnection purposes where located on the load side of the machine supply circuit disconnecting means and overcurrent protection the overcurrent protection and its disconnecting means. The disconnecting means shall be one of the types permitted by 5.1.10(1), (2) or (3).

### Statement of Problem and Substantiation for Public Input

In (2): Added "listed", "additionally marked", and "single motor branch circuit" to clarify that a manual motor controller must be listed and marked "suitable as motor disconnect" and is only suitable as a disconnecting means for a single motor branch circuit. Revised text to clarify the location of the manual motor controller. Added text that suitable branch-circuit short-circuit protective devices must be provided where semiconductor fuses are used to assure proper protection of the manual motor controller. These changes align with similar text in NEC 430.109(A)(6).

In (3): Revised and added text to better align with NEC 430.109(A)(7).

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 26-NFPA 79-2021 [New Section after A.5.1.11.2]</u>	New Annex Note for revision of 5.2.2
<u>Public Input No. 28-NFPA 79-2021 [New Section after 7.2.10.1.2]</u>	Assumes this PI is accepted as it is referenced in this PI
<u>Public Input No. 26-NFPA 79-2021 [New Section after A.5.1.11.2]</u>	

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
**Organization:** Eaton's Bussmann Division  
**Street Address:**  
**City:**

**State:**

**Zip:**

**Submittal Date:** Mon Dec 20 12:09:51 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-80-NFPA 79-2022](#)

**Statement:** In (2): Added "listed", "additionally marked", and "single motor branch circuit" to clarify that a manual motor controller must be listed and marked "suitable as motor disconnect" and is only suitable as a disconnecting means for a single motor branch circuit. Revised text to clarify the location of the manual motor controller. Added text that suitable motor branch-circuit short-circuit and ground-fault protective devices must be provided where semiconductors fuses are used to assure proper protection of the manual motor controller. These changes align with similar text in NEC 430.109(A)(6).

In (3): Revised and added text to better align with NEC 430.109(A)(7).

New list item (4) to 5.2.2 has been added for listed general-use switches as an acceptable disconnecting means, provided they are used within their ratings.

A new annex note has been added for 5.2.2 that indicates the appropriate standard for the manual motor controllers and system isolation equipment.



## Public Input No. 34-NFPA 79-2021 [ Section No. 5.2.2 ]

### 5.2.2

The following devices shall be permitted to fulfill the function of 5.2.1:

- (1) Devices described in 5.1.10
- (2) A manual motor controller marked "suitable as motor disconnect" and in compliance with the latest version of UL 508 where located on the load side of the last short-circuit protective device in the branch
- (3) System isolation equipment that incorporates control lockout stations and is listed for disconnection purposes where located on the load side of the machine supply circuit disconnecting means and overcurrent protection

### Statement of Problem and Substantiation for Public Input

Industry and equipment standards are constantly updated over time, and revision cycles differ between them.

Some organizations do not have assurances that all filed standards are up to date.

To protect against this, any references to other standards should reflect 'the latest version of' in the text of the section.

### Submitter Information Verification

**Submitter Full Name:** William Brungs

**Organization:** Honeywell Intelligrated System

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Tue Dec 21 09:56:22 EST 2021

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** Adding this wording would require compliance with a requirement that can change in the future without knowing what that might be. Additionally, 3.6.2.2.2 of the NFPA Manual of Style states that "the edition shall not be designated in the text, but in Chapter 2 or the last annex."



## Public Input No. 62-NFPA 79-2021 [ Section No. 5.2.2 ]

### 5.2.2

The following devices shall be permitted to fulfill the function of 5.2.1:

- (1) Devices described in 5.1.10
- (2) A manual motor controller marked "suitable as motor disconnect" and in compliance with UL 508 where located on the load side of the last short-circuit protective device in the branch
- (3) System isolation equipment that incorporates control lockout stations and is listed for disconnection purposes where located on the load side of the machine supply circuit disconnecting means and overcurrent protection
- (4) General-use switches listed and used within their ratings

### Statement of Problem and Substantiation for Public Input

UL 98 has three types of disconnect switches:

- 1) General-use switch with ampere ratings
- 2) General-use switch with ampere and HP ratings
- 3) Motor-circuit switch with HP ratings but no general use ampere ratings

5.1.10 only recognizes motor-circuit switch with HP ratings. However, a general-use switch with ampere and HP ratings should be allowed for use as the machine supply circuit disconnect that complies with 5.1.11.1 as well as 5.2.2. General-use switch with ampere ratings should be allowed as a disconnecting means for non-motor loads. This adds the provision for general-use switches as an acceptable disconnecting means, provided used within their ratings.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 63-NFPA 79-2021 [Section No. 5.1.10]</u>	

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
**Organization:** Eaton's Bussmann Division  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Wed Dec 29 12:06:21 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-80-NFPA 79-2022

**Statement:** In (2): Added "listed", "additionally marked", and "single motor branch circuit" to clarify that a manual motor controller must be listed and marked "suitable as motor disconnect" and is only suitable as a disconnecting means for a single motor branch circuit. Revised text to clarify the location of the manual motor controller. Added text that suitable motor branch-circuit short-circuit and ground-fault protective devices must be provided where semiconductor fuses are used to assure proper protection of the manual motor controller. These changes align with similar text in NEC 430.109(A)(6).

In (3): Revised and added text to better align with NEC 430.109(A)(7).

New list item (4) to 5.2.2 has been added for listed general-use switches as an acceptable disconnecting means, provided they are used within their ratings.

A new annex note has been added for 5.2.2 that indicates the appropriate standard for the manual motor controllers and system isolation equipment.



## Public Input No. 78-NFPA 79-2022 [ Section No. 6.2.3.1 ]

### 6.2.3.1\* Enclosure Access.

Opening an enclosure (e.g., door, lid, cover) that contains live parts operating at or above 50 volts rms ac or 60 volts dc shall be permitted only under one or more of the following conditions:

- (1) The use of a key or tool is necessary for access to live parts operating at or above 50 volts rms ac or 60 volts dc. All live parts mounted on the inside of doors or covers that are operating at or above 50 volts rms ac or 60 volts dc shall be protected from unintentional direct contact by the inherent design of components or the application of barriers or obstacles such that a 50- 12 mm (1/ 2 in.) ~~sphere~~ jointed test finger cannot contact any live parts. A safety sign shall be provided in accordance with 16.2.4.
- (2) The disconnecting means supplying the enclosure is interlocked with the enclosure door(s) in accordance with 6.2.3.2.
- (3) Opening without the use of a key or a tool and without disconnection of live parts shall be permitted only when all live parts inside that are operating at or above 50 volts rms ac or 60 volts dc are separately enclosed or guarded such that there cannot be any contact with live parts. A safety sign shall be provided in accordance with 16.2.4.

## Statement of Problem and Substantiation for Public Input

This section will be improved by increasing the protection performance of non-interlocked enclosures containing hazardous voltage from back of hand (25mm) to finger (12mm).

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 79-NFPA 79-2022 [Section No. 6.2.3.3]</a>	

## Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sat Jan 01 10:21:02 EST 2022  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-71-NFPA 79-2022](#)

**Statement:** The committee improved clarity on requirements for protection requirements from live parts where an enclosure can be opened without the use of a key or tool. The public input provided information that was not accepted in (1) but was deemed necessary in (3).

Revisions were made to provide a consistent reference to live parts that are operating at

or greater than 50 volts ac rms or 60 volts dc throughout the Standard which adds clarity. Using “at or greater than” is consistent with other electrical documents such as NFPA 70, the National Electrical Code.



## Public Input No. 79-NFPA 79-2022 [ Section No. 6.2.3.3 ]

### 6.2.3.3 Excepted Circuits.

All parts operating at or above 50 volts rms ac or 60 volts dc that are still energized after switching off the machine supply circuit disconnecting means (see 5.1.13) shall be protected from unintentional contact by the inherent design of components or the application of barriers or obstacles such that a 50- 12 mm (1/2 in.) ~~sphere~~- jointed finger cannot contact any live parts.

## Statement of Problem and Substantiation for Public Input

This section will be improved by increasing the protection performance for access to live parts from back of hand (25mm) to finger (12mm).

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 78-NFPA 79-2022 [Section No. 6.2.3.1]</u>	

## Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submission Date:** Sat Jan 01 10:26:38 EST 2022  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** The proposed change is not needed as FR-71 added additional protection requirements for circuits where access without use of key or tool is provided (6.3.1.2(3)), which includes excepted circuits. Where 6.2.3.1(1) or (2) methods are used, the committee believes the existing requirements in 6.2.3.3 are sufficient.



## Public Input No. 83-NFPA 79-2022 [ New Section after 7.2.4 ]

### 7.2.5 Safety Instrumentation Conductor Protection

7.2.5.1 Safety instrumentation circuit conductors that do not extend beyond the enclosure shall be considered protected as long as the following conditions are met.

- (1) the device contains integral protection
- (2) the conductors do not exceed 36 inches
- (3) the device is listed

7.2.5.2 Safety instrumentation circuit conductors shall not be protected by a branch circuit protective device if the protective device could open and go undetected leading to a hazardous condition for personnel. (e.g. false negative of a voltage presence test)

### Statement of Problem and Substantiation for Public Input

This new section would improve the standard by the addition requirements and allowances for safety instrumentation. Safety instrumentation circuits place a higher priority on the protection of personnel than protection of equipment.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 84-NFPA 79-2022 [New Section after 3.3.95]</u>	

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sat Jan 01 10:41:12 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The proposed revision is unclear if it is focused only on absence of voltage testing as described in NFPA 70E and whether the integral protection would protect the conductors.



## Public Input No. 80-NFPA 79-2022 [ Section No. 7.2.4.2.2 ]

### 7.2.4.2.2 –

Control circuit conductors sizes of 18, 16, and 14 AWG shall be considered as protected by an overcurrent device(s) of not more than a 20-ampere rating.

### Statement of Problem and Substantiation for Public Input

This section would be improved by eliminating the allowance for over-current of control conductors. I experienced a thermal event directly related to this allowance.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 81-NFPA 79-2022 [Section No. 7.2.4.2.3]</a>	
<a href="#">Public Input No. 82-NFPA 79-2022 [Section No. 7.2.4.2.4]</a>	

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sat Jan 01 10:35:33 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-72-NFPA 79-2022](#)

**Statement:** The FR revises the requirements for control circuit conductors to improve alignment with NEC 430.72.



## Public Input No. 81-NFPA 79-2022 [ Section No. 7.2.4.2.3 ]

### 7.2.4.2.3 –

Control circuit conductors that do not extend beyond the control cabinet enclosure shall be considered protected by the load branch-circuit short-circuit and ground-fault protective device(s) where the rating of the protective device(s) is not more than 400 percent of the ampacity of the control circuit conductor for conductors 14 AWG and larger, or not more than 25 amperes for 18 AWG and 40 amperes for 16 AWG.

### Statement of Problem and Substantiation for Public Input

This section would be improved by eliminating the allowance for over-current of control conductors. I experienced a thermal event directly related to this allowance.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 80-NFPA 79-2022 [Section No. 7.2.4.2.2]</a>	
<a href="#">Public Input No. 82-NFPA 79-2022 [Section No. 7.2.4.2.4]</a>	

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
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**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sat Jan 01 10:38:47 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** These requirements are permitted for control circuit conductors tapped from a motor branch circuit per NEC 430.72(B).



## Public Input No. 82-NFPA 79-2022 [ Section No. 7.2.4.2.4 ]

### 7.2.4.2.4 –

Control circuit conductors of 14 AWG and larger that extend beyond the enclosure shall be considered protected by the load branch-circuit short-circuit and ground-fault protective device(s) where the rating of the protective device(s) is not more than 300 percent of the ampacity of the control circuit conductors.

### Statement of Problem and Substantiation for Public Input

This section would be improved by eliminating the allowance for over-current of control conductors. I experienced a thermal event directly related to this allowance.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 81-NFPA 79-2022 [Section No. 7.2.4.2.3]</a>	
<a href="#">Public Input No. 80-NFPA 79-2022 [Section No. 7.2.4.2.2]</a>	

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sat Jan 01 10:39:43 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** These requirements are permitted for control circuit conductors tapped from a motor branch circuit per NEC 430.72(B).



## Public Input No. 122-NFPA 79-2022 [ Section No. 7.2.8 ]

### 7.2.8 Location of Overcurrent Protective Devices.

An overcurrent protective device shall be located at the point where ~~the~~ a conductor to be protected is connected to the supply except as follows:

- (1) Overcurrent protection at the supply shall not be required if all of the following conditions are met:

- (2) The

~~current-carrying capacity of each of the conductors is at least equal to that required for their respective load~~

- (a) ampacity of the conductor is not less than the combined calculated load on the circuits supplied by the conductor , in accordance with Section 12.5 .

~~Each connecting conductor to the overcurrent protective devices is no longer than 3 m~~

- (a) The length of the conductor does not exceed 3 m (10 ft).  
 (b) The conductor is suitably protected from physical damage.  
 (c) The conductor does not extend beyond the control panel enclosure.  
 (d) The conductor terminates in either

- (3) a single

~~branch circuit~~

- (a)

- i. overcurrent protective device ; or  
 ii. a feeder bus-bar assembly of accessory components providing a common line connection to overcurrent protective devices supplying multiple branch circuits and identified for use with the overcurrent protective devices . .

- (4) Overcurrent protection at the supply shall not be required if all of the following conditions are met:

- (5) The conductor has an ampacity of at least one-third that of the conductor from which it is supplied.  
 (6) The conductor is suitably protected from physical damage.  
 (7) The conductor is not over 7.5 m (25 ft) long, and the conductor terminates in a single

~~branch circuit~~

- (a) overcurrent protective device.

### Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
2022-01-05_14-25-03.jpg	Correct view of final proposed text	

## Statement of Problem and Substantiation for Public Input

NOTE: The format of the final proposed text does not align with that shown in TerraView. See attached snapshot.

Many manufacturers of overcurrent protective devices such as miniature circuit breakers, fuse holders, and self protected combination motor controllers offer compact feeder bus-bar accessories to provide a common line side connection to groups of these devices for supplying multiple branch circuits. These bus-bar accessories can reduce the possibility of wiring errors, simplify troubleshooting, and provide easier device replacement. In addition, the use of a larger combined load line conductor rather than individual smaller conductors can increase the robustness of the circuit under short circuit conditions. The existing language in 7.2.8 currently allows use of the traditional tap conductors where small individual tap conductors less than 10ft are used to supply individual overcurrent devices. The proposal modifies the existing requirements in 7.2.8 to allow use of the compact feeder bus-bar accessories to leverage the advantages of a larger shared tap conductor. In addition, some editorial changes were made for clarification and consistency with other areas of NFPA79 and NEC. The term "feeder bus-bar assembly of accessory components" in the proposed text aligns with language in UL508.

Please note that some of the proposed language was adapted from that proposed during the 2012 edition of NFPA79. That proposal also included the option for "daisy chaining" protective devices using general conductors which is not included here.

## Submitter Information Verification

**Submitter Full Name:** Jay Tamblingson  
**Organization:** Rockwell Automation  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Wed Jan 05 12:20:03 EST 2022  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** The proposed text does not address overcurrent protection requirements for the feeder bus-bar accessory and tap conductor.

### 7.2.8 Location of Overcurrent Protective Devices.

An overcurrent protective device shall be located at the point where a conductor to be protected is connected to the supply except as follows:

- (1) Overcurrent protection at the supply shall not be required if all of the following conditions are met:
  - (a) The ampacity of the conductor is not less than the combined calculated load on the circuits supplied by the conductor, in accordance with Section 12.5.
  - (b) The length of the conductor does not exceed 3 m (10 ft).
  - (c) The conductor is suitably protected from physical damage.
  - (d) The conductor does not extend beyond the control panel enclosure.
  - (e) The conductor terminates in either
    - i. a single overcurrent protective device; or
    - ii. a feeder bus-bar assembly of accessory components providing a common line connection to overcurrent protective devices supplying multiple branch circuits and identified for use with the overcurrent protective devices.
- (2) Overcurrent protection at the supply shall not be required if all of the following conditions are met:
  - (a) The conductor has an ampacity of at least one-third that of the conductor from which it is supplied.
  - (b) The conductor is suitably protected from physical damage.
  - (c) The conductor is not over 7.5 m (25 ft) long, and the conductor terminates in a single overcurrent protective device.



**Public Input No. 124-NFPA 79-2022 [ Section No. 7.2.10.1 ]**

**7.2.10.1\***

Each motor controller and its associated wiring shall be protected as an individual branch circuit by a short-circuit protective device (SCPD) as specified by the controller manufacturer. The maximum rating of the designated SCPD shall be as shown in Table 7.2.10.1.

*Exception No. 1: Table 7.2.10.1 shall not apply to Design B energy efficient motor circuits. The provisions of NFPA 70 shall be observed for Design B energy efficient motor circuits.*

*Exception No. 2: Where the controller is an adjustable speed drive that is listed and marked "Suitable for Output Motor Conductor Protection," the maximum rating of the designated SCPD shall be permitted to be determined by replacing the full-load current in Table 7.2.10.1 with the drive's rated input current. The SCPD shall not exceed the rating marked on the adjustable speed drive or in the manufacturer's instructions.*

Table 7.2.10.1 Maximum Rating or Setting of Fuse and Circuit Breakers: Motor, Motor Branch Circuit, and Motor Controller

<b>Fuse Class with Non-Time Delay</b>	<b>AC-2</b>	<b>Full-Load Current (%)</b>	
		<b>AC-3</b>	<b>AC-4</b>
R	300	300	300
CF or J	300	300	300
CC	300	300	300
T	300	300	300
		<b>Type of Application<sup>a</sup></b>	
<b>Fuse Class with Time Delay<sup>b</sup></b>	<b>AC-2</b>	<b>AC-3</b>	<b>AC-4</b>
RK-5 <sup>c</sup>	150	175	175
RK-1	150	175	175
CF or J	150	175	225
CC	150	300	300
Instantaneous trip circuit breaker <sup>d</sup>	800	800	800
Inverse trip circuit breaker <sup>e</sup>	150	250	250

Note: Where the values determined by this table do not correspond to the standard sizes or ratings, the next higher standard size, rating, or possible setting shall be permitted. Where a non-adjustable circuit breaker is used and the next higher standard ampere rating is less than 15 amperes, an ampere rating of 15 amperes shall be permitted.

<sup>a</sup> Types of starting duty are as follows:

(1) AC-2: All light-starting duty motors, including slip-ring motors; starting, switching off

(2) AC-3: All medium starting duty motors including squirrel-cage motors; starting, switching off while running, occasional inching, jogging, or plugging but not to exceed 5 operations per minute or 10 operations per 10 minutes and all wye-delta and two-step autotransformer starting motors

(3) AC-4: All heavy starting duty motors including squirrel-cage motors; starting, plugging, inching, jogging

<sup>b</sup> Where the rating of a time-delay fuse (other than CC type) specified by the table is not sufficient for the starting of the motor, it shall be permitted to be increased but shall in no case be permitted to exceed 225 percent. The rating of a time-delay Class CC fuse and non-time-delay Class CC, J, CF, or T fuse shall be permitted to be increased but shall in no case exceed 400 percent of the full-load current.

<sup>c</sup> Unless a motor controller is listed for use with RK-5 fuses, Class RK-5 fuses shall be used only with NEMA-rated motor controllers.

<sup>d</sup> Instantaneous trip circuit breakers shall be permitted to be used only if they comply with all of

the following:

- (1) They are adjustable.
- (2) Part of the combination controller has motor-running protection, short-circuit protection, and ground-fault protection in each conductor.
- (3) The combination is especially identified for use.
- (4) It is installed per any instructions included in its listing or labeling.
- (5) They are limited to single motor applications; circuit breakers with adjustable trip settings are to be set at the controller manufacturer's recommendation, but not greater than 1300 percent of the motor full-load current.

<sup>e</sup>Where the rating of an inverse time circuit breaker specified in this table is not sufficient for the starting current of the motor, it shall be permitted to be increased but in no case exceed 400 percent for full-load currents of 100 amperes or less or 300 percent for full-load currents greater than 100 amperes.

#### **7.2.10.1.1**

A listed self-protected combination controller shall be permitted in lieu of the devices specified in Table 7.2.10.1 for branch circuit and overload protection of a single motor circuit.

#### **7.2.10.1.2**

Where a listed self-protected combination controller has an adjustable, instantaneous trip setting, the setting shall not exceed 1300 percent of full-load motor current for other than Design B energy efficient motors and not more than 1700 percent of full-load motor current for Design B energy efficient motors.

## **Statement of Problem and Substantiation for Public Input**

The 2023 NEC has accepted revisions to modify Table 240.6 listing standard sizes of fuses and circuit breakers to include 10 amperes as a new standard size for nonadjustable circuit breakers. For circuits utilizing inverse time circuit breakers with small motor controllers, the addition of 10A as a standard size circuit breaker impacts the design of such systems as most controllers have been evaluated for use with 15A devices. The proposed text will permit the continued use of the existing minimum of 15A for nonadjustable circuit breakers in motor circuits.

## **Submitter Information Verification**

**Submitter Full Name:** Jay Tamblingson  
**Organization:** Rockwell Automation  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Wed Jan 05 15:32:48 EST 2022  
**Committee:** EEI-AAA

## **Committee Statement**

**Resolution:** [FR-73-NFPA 79-2022](#)

**Statement:** The revised text standardizes on use of “motor branch-circuit short-circuit and ground-fault protective device” throughout section to be consistent with other sections and NFPA 70 and deleted use of the acronym SCPD. The requirements for selecting protection for power conversion equipment (including use of semiconductor fuses) have been added and the use of the term “adjustable speed drive” with “power conversion equipment” used

for consistency.

The FR also establishes that 15A will continue to be permitted for the minimum size inverse time circuit breaker to address the concern regarding the change to 10A in the NEC as a standard size.

The changes also standardizes on the use of the term “inverse time circuit breaker” rather than “inverse trip circuit breaker”. It also adds a reference to 19.1.1 in 7.2.10.4 which addresses servo drive systems which also fall under power conversion equipment.



## Public Input No. 108-NFPA 79-2022 [ New Section after 7.2.10.1.2 ]

### 7.2.10.1.4

Circuits containing power conversion equipment shall be protected by a branch-circuit short-circuit protective device in accordance with 7.2.10.1, 7.2.10.1.1 or 7.2.10.1.3. If maximum branch-circuit short-circuit protective ratings are stipulated for specific device types in the manufacturer's instructions for the power conversion equipment or are otherwise marked on the equipment, they shall not be exceeded even if higher values are permitted by 7.2.10.1. A self-protected combination motor controller, semiconductor fuses or an instantaneous trip circuit breaker shall only be permitted if specifically identified in the manufacturer's instructions for the power conversion equipment or if otherwise marked on the equipment. If an instantaneous-trip circuit breaker or semiconductor fuses are permitted in accordance with the drive manufacturer's instructions for use as the branch-circuit short-circuit protective device for listed power conversion equipment, they shall be provided as an integral part of a single listed assembly incorporating both the short-circuit protective device and power conversion equipment.

### Statement of Problem and Substantiation for Public Input

Requirements for the branch-circuit short-circuit protective device are added similar to that in NEC 430.130(A).

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 28-NFPA 79-2021 [New Section after 7.2.10.1.2]</u>	Assumes this PI is accepted as referenced in this PI
<u>Public Input No. 109-NFPA 79-2022 [New Section after 7.2.10.1.2]</u>	

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
**Organization:** Eaton's Bussmann Division  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Mon Jan 03 11:39:26 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-73-NFPA 79-2022

**Statement:** The revised text standardizes on use of "motor branch-circuit short-circuit and ground-fault protective device" throughout section to be consistent with other sections and NFPA 70 and deleted use of the acronym SCPD. The requirements for selecting protection for power conversion equipment (including use of semiconductor fuses) have been added and the use of the term "adjustable speed drive" with "power conversion equipment" used

for consistency.

The FR also establishes that 15A will continue to be permitted for the minimum size inverse time circuit breaker to address the concern regarding the change to 10A in the NEC as a standard size.

The changes also standardizes on the use of the term “inverse time circuit breaker” rather than “inverse trip circuit breaker”. It also adds a reference to 19.1.1 in 7.2.10.4 which addresses servo drive systems which also fall under power conversion equipment.



## Public Input No. 109-NFPA 79-2022 [ New Section after 7.2.10.1.2 ]

### 7.2.10.1.5

A branch-circuit short-circuit protective device shall also be provided for a bypass circuit/device(s). Where a single branch-circuit short-circuit protective device is provided for circuits containing both power conversion equipment and a bypass circuit, the branch-circuit short-circuit protective device type and its rating or setting shall be in accordance with those determined for the power conversion equipment and for the bypass circuit/device(s) equipment.

### Statement of Problem and Substantiation for Public Input

Requirements similar to NEC 430.130(B) are added for power conversion equipment with a bypass circuit/device(s).

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 108-NFPA 79-2022 [New Section after 7.2.10.1.2]</u>	Assumes this PI is accepted.

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
**Organization:** Eaton's Bussmann Division  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Mon Jan 03 11:57:59 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-73-NFPA 79-2022

**Statement:** The revised text standardizes on use of "motor branch-circuit short-circuit and ground-fault protective device" throughout section to be consistent with other sections and NFPA 70 and deleted use of the acronym SCPD. The requirements for selecting protection for power conversion equipment (including use of semiconductor fuses) have been added and the use of the term "adjustable speed drive" with "power conversion equipment" used for consistency.

The FR also establishes that 15A will continue to be permitted for the minimum size inverse time circuit breaker to address the concern regarding the change to 10A in the NEC as a standard size.

The changes also standardizes on the use of the term "inverse time circuit breaker" rather than "inverse trip circuit breaker". It also adds a reference to 19.1.1 in 7.2.10.4 which addresses servo drive systems which also fall under power conversion equipment.



## Public Input No. 28-NFPA 79-2021 [ New Section after 7.2.10.1.2 ]

### 7.2.10.1.3

Semiconductor fuses intended for for the protection of electronic devices shall be permitted in lieu of the devices specified in Table 7.2.10.1 for power electronic devices, associated electromechanical devices (such as bypass contactors and isolation contactors), and conductors in a solid-state motor controller system, if the marking for replacement fuses is provided adjacent to the fuses.

### Statement of Problem and Substantiation for Public Input

Semiconductor fuses are commonly used for protection of power electronic devices in industrial machinery. This public input adds text, similar to NEC 430.52(C)(5) that allows the use of these devices in lieu of the devices in Table 7.2.10.1.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 25-NFPA 79-2021 [Section No. 5.2.2]</a>	
<a href="#">Public Input No. 108-NFPA 79-2022 [New Section after 7.2.10.1.2]</a>	

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
**Organization:** Eaton's Bussmann Division  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Mon Dec 20 13:11:47 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-73-NFPA 79-2022](#)

**Statement:** The revised text standardizes on use of “motor branch-circuit short-circuit and ground-fault protective device” throughout section to be consistent with other sections and NFPA 70 and deleted use of the acronym SCPD. The requirements for selecting protection for power conversion equipment (including use of semiconductor fuses) have been added and the use of the term “adjustable speed drive” with “power conversion equipment” used for consistency.

The FR also establishes that 15A will continue to be permitted for the minimum size inverse time circuit breaker to address the concern regarding the change to 10A in the NEC as a standard size.

The changes also standardizes on the use of the term “inverse time circuit breaker” rather than “inverse trip circuit breaker”. It also adds a reference to 19.1.1 in 7.2.10.4 which addresses servo drive systems which also fall under power conversion equipment.





## Public Input No. 58-NFPA 79-2021 [ Section No. 7.2.10.2 ]

### 7.2.10.2

Several motors, each not exceeding 1 hp in rating, shall be permitted on a nominal 120-volt branch circuit protected at not over 20 amperes or a 1000-volt nominal or less branch circuit, protected at not over 15 amperes, where all of the following conditions are met:

- (1) The full-load rating of each motor does not exceed 6 amperes.
- (2) The rating of the branch-circuit short-circuit ~~and ground-fault~~ protective device marked on any of the controllers is not exceeded. The short-circuit ~~and ground-fault protection is provided~~ protective device shall be provided by a single inverse time circuit breaker or single set of fuses.
- (3) Individual overload protection conforms to Section 7.3.

### Statement of Problem and Substantiation for Public Input

The correct term to use is "short-circuit protective device" to correlate with 7.2.10.1

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 59-NFPA 79-2021 [Section No. 7.2.10.3]</a>	
<a href="#">Public Input No. 60-NFPA 79-2021 [Section No. 7.2.10.4]</a>	
<a href="#">Public Input No. 61-NFPA 79-2021 [Section No. 7.2.10.5]</a>	
<a href="#">Public Input No. 110-NFPA 79-2022 [Section No. 16.4.1]</a>	

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
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**Submittal Date:** Wed Dec 29 11:06:57 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-73-NFPA 79-2022](#)

**Statement:** The revised text standardizes on use of "motor branch-circuit short-circuit and ground-fault protective device" throughout section to be consistent with other sections and NFPA 70 and deleted use of the acronym SCPD. The requirements for selecting protection for power conversion equipment (including use of semiconductor fuses) have been added and the use of the term "adjustable speed drive" with "power conversion equipment" used for consistency.

The FR also establishes that 15A will continue to be permitted for the minimum size inverse time circuit breaker to address the concern regarding the change to 10A in the NEC as a standard size.

The changes also standardizes on the use of the term “inverse time circuit breaker” rather than “inverse trip circuit breaker”. It also adds a reference to 19.1.1 in 7.2.10.4 which addresses servo drive systems which also fall under power conversion equipment.



## Public Input No. 59-NFPA 79-2021 [ Section No. 7.2.10.3 ]

### 7.2.10.3

Where the branch-circuit short-circuit ~~and ground-fault~~ protective device is selected not to exceed that allowed by 7.2.10.1 for the smallest rated motor, two or more motors or one or more motors and other loads, with each motor having individual overload protection, shall be permitted to be connected to a branch circuit where it can be determined that the branch-circuit short-circuit ~~and ground-fault~~ protective device will not open under severe normal conditions of service that might be encountered. The short-circuit ~~and ground-fault protection~~ protective devcie shall be provided by a single inverse time circuit breaker or single set of fuses.

### Statement of Problem and Substantiation for Public Input

The correct term to use is "short-circuit protective device" to correlate with 7.2.10.1

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 58-NFPA 79-2021 [Section No. 7.2.10.2]</a>	
<a href="#">Public Input No. 60-NFPA 79-2021 [Section No. 7.2.10.4]</a>	
<a href="#">Public Input No. 61-NFPA 79-2021 [Section No. 7.2.10.5]</a>	

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
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**Submittal Date:** Wed Dec 29 11:11:37 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-73-NFPA 79-2022](#)

**Statement:** The revised text standardizes on use of "motor branch-circuit short-circuit and ground-fault protective device" throughout section to be consistent with other sections and NFPA 70 and deleted use of the acronym SCPD. The requirements for selecting protection for power conversion equipment (including use of semiconductor fuses) have been added and the use of the term "adjustable speed drive" with "power conversion equipment" used for consistency.

The FR also establishes that 15A will continue to be permitted for the minimum size inverse time circuit breaker to address the concern regarding the change to 10A in the NEC as a standard size.

The changes also standardizes on the use of the term "inverse time circuit breaker"

rather than “inverse trip circuit breaker”. It also adds a reference to 19.1.1 in 7.2.10.4 which addresses servo drive systems which also fall under power conversion equipment.



**Public Input No. 60-NFPA 79-2021 [ Section No. 7.2.10.4 ]**

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**7.2.10.4**

Two or more motors, or one or more motors and other loads, and their control equipment shall be permitted to be connected to a single branch circuit ~~where provided the branch circuit short-circuit and ground-fault protection is provided by~~ protective device is a single inverse time circuit breaker or a single set of fuses ~~, provided and~~ the following conditions under 7.2.10.4(1) and either 7.2.10.4(2) or 7.2.10.4(3) are met:

- (1) Each motor controller and overload device is either listed for group installation with specified maximum branch-circuit ~~protection or~~ short-circuit protective device or selected such that the ampere rating of the motor branch short-circuit ~~and ground-fault~~ protective device does not exceed that permitted by 7.2.10.1 for that individual motor controller or overload device and corresponding motor load.
- (2) The rating or setting of the branch circuit short-circuit and ground-fault protection device protective device does not exceed the values in Table 7.2.10.4 for the smallest conductor in the circuit.

*Exception: Where a controller is an adjustable speed drive that is listed and marked "Suitable for Output Motor Conductor Protection," the conductors from the drive to the motor shall not be required to be used when determining the smallest conductor in the circuit. The conductors from the drive to the motor shall have an ampacity in accordance with Sections 12.5 and 12.6.*

- (3) The rating or setting of the branch circuit short-circuit and ground-fault protection does protective device does not exceed the value specified in 7.2.10.1 for the highest rated motor connected to the branch circuit plus an amount equal to the sum of the full-load current ratings of all other motors and the ratings of other loads connected to the circuit. Where this calculation results in a rating less than the ampacity of the branch circuit conductors, it shall be permitted to increase the maximum rating of the fuses or circuit breaker to a value not exceeding that permitted by Sections 12.5 and 12.6. Overcurrent protection for loads other than motor loads shall be in accordance with 7.2.3, 7.2.4, and 7.2.11. Where 16 AWG or 18 AWG conductors are used for branch circuit conductors or tap conductors under 7.2.10.5, the rating and type of the branch ~~short-circuit and ground-fault~~ of overcurrent protection shall be in accordance with 12.6.1.

Table 7.2.10.4 Relationship Between Conductor Size and Maximum Rating or Setting of Branch Circuit Short-Circuit Protective Device for Power Circuits Group Installations

<u>Conductor Size</u>  (AWG)	<u>Maximum Rating</u>
	<u>Fuse or Inverse Time*</u>
	<u>Circuit Breaker</u>  (amperes)
18	See footnote.
16	See footnote.
14	60
12	80
10	100
8	150
6	200
4	250
3	300
2	350
1	400
0	500

<u>Conductor Size</u>  (AWG)	<u>Maximum Rating</u>
	<u>Fuse or Inverse Time*</u>
	<u>Circuit Breaker</u>
	(amperes)
2/0	600
3/0	700
4/0	800

\*Maximum ratings and type of branch short-circuit and ground-fault protective devices of overcurrent protection for 16 AWG and 18 AWG shall be determined in accordance with 12.6.1.

## Statement of Problem and Substantiation for Public Input

The correct term to use is "short-circuit protective device" to correlate with 7.2.10.1. Additional corrections have been made referring to the rating and type of overcurrent protection for 16 and 18 AWG conductors.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 58-NFPA 79-2021 [Section No. 7.2.10.2]</a>	
<a href="#">Public Input No. 59-NFPA 79-2021 [Section No. 7.2.10.3]</a>	
<a href="#">Public Input No. 61-NFPA 79-2021 [Section No. 7.2.10.5]</a>	

## Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
**Organization:** Eaton's Bussmann Division  
**Street Address:**  
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**Submittal Date:** Wed Dec 29 11:17:23 EST 2021  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-73-NFPA 79-2022](#)

**Statement:** The revised text standardizes on use of "motor branch-circuit short-circuit and ground-fault protective device" throughout section to be consistent with other sections and NFPA 70 and deleted use of the acronym SCPD. The requirements for selecting protection for power conversion equipment (including use of semiconductor fuses) have been added and the use of the term "adjustable speed drive" with "power conversion equipment" used for consistency.

The FR also establishes that 15A will continue to be permitted for the minimum size inverse time circuit breaker to address the concern regarding the change to 10A in the NEC as a standard size.

The changes also standardizes on the use of the term “inverse time circuit breaker” rather than “inverse trip circuit breaker”. It also adds a reference to 19.1.1 in 7.2.10.4 which addresses servo drive systems which also fall under power conversion equipment.



## Public Input No. 61-NFPA 79-2021 [ Section No. 7.2.10.5 ]

### 7.2.10.5

For group installations described in 7.2.10.4(3), the conductors of any tap supplying a single motor shall not be required to have an individual branch-circuit short-circuit ~~and ground-fault~~ protective device, provided they comply with one of the following:

- (1) No conductor to the motor shall have an ampacity less than that of the branch-circuit conductors.
- (2) No conductor to the motor shall have an ampacity less than one-third that of the branch-circuit conductors, with a minimum in accordance with Sections 12.5 and 12.6, the conductors to the motor overload device being not more than 7.5 m (25 ft) long and being suitably protected from physical damage in accordance with Chapter 13.
- (3) Conductors from the point of the tap from the branch-circuit to a listed manual motor controller additionally marked "Suitable for Tap Conductor Protection in Group Installations" or to a branch circuit protective device shall be permitted to have an ampacity not less than 1/10 the rating or setting of the branch-circuit short-circuit ~~and ground-fault~~ protective device. The conductors from the controller to the motor shall have an ampacity in accordance with Sections 12.5 and 12.6. The conductors from the point of the tap to the controller shall (1) be enclosed either by an enclosed controller or by a raceway and be not more than 3 m (10 ft) long or (2) have an ampacity not less than that of the branch-circuit conductors.

### Statement of Problem and Substantiation for Public Input

The correct term to use is "short-circuit protective device" to correlate with 7.2.10.1

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 58-NFPA 79-2021 [Section No. 7.2.10.2]</a>	
<a href="#">Public Input No. 59-NFPA 79-2021 [Section No. 7.2.10.3]</a>	
<a href="#">Public Input No. 60-NFPA 79-2021 [Section No. 7.2.10.4]</a>	

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
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**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Wed Dec 29 11:43:57 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-73-NFPA 79-2022](#)

**Statement:** The revised text standardizes on use of “motor branch-circuit short-circuit and ground-fault protective device” throughout section to be consistent with other sections and NFPA 70 and deleted use of the acronym SCPD. The requirements for selecting protection for power conversion equipment (including use of semiconductor fuses) have been added and the use of the term “adjustable speed drive” with “power conversion equipment” used for consistency.

The FR also establishes that 15A will continue to be permitted for the minimum size inverse time circuit breaker to address the concern regarding the change to 10A in the NEC as a standard size.

The changes also standardizes on the use of the term “inverse time circuit breaker” rather than “inverse trip circuit breaker”. It also adds a reference to 19.1.1 in 7.2.10.4 which addresses servo drive systems which also fall under power conversion equipment.



## Public Input No. 76-NFPA 79-2021 [ Section No. 7.8.1 ]

### 7.8.1\* Surge-Protective Devices (SPDs).

Industrial machinery with safety circuits not effectively protected from the effects of overvoltages due to lightning or switching surges shall have surge protection installed.

*Exception: SPDs shall not be required where the risks associated with the effects of overvoltages are mitigated such that the safety performance determined by a risk assessment is met.*

### Statement of Problem and Substantiation for Public Input

This section is improved by deleting the exception, which does not require a measurable alternative to SPD's. This exception is being abused.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 77-NFPA 79-2021 [Section No. 7.8.1]</a>	

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Fri Dec 31 17:01:53 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-74-NFPA 79-2022](#)

**Statement:** The requirements have been revised to clarify that appropriate surge protection shall be provided to protect, at a minimum, the safety circuit devices in industrial machinery.



## Public Input No. 77-NFPA 79-2021 [ Section No. 7.8.1 ]

### 7.8.1\* Surge-Protective Devices (SPDs).

Industrial machinery with safety circuits ~~not effectively protected from~~ shall have surge protection installed to protect from the effects of overvoltages due to lightning hazardous transients or switching surges ~~shall have surge protection installed~~.

Exception: SPDs shall not be required where the risks associated with the effects of overvoltages are mitigated such that the safety performance determined by a risk assessment is met

. The type of SPD will be selected to protect, at a minimum, the safety circuit devices and may be integral to secondary derived voltage sources .

### Statement of Problem and Substantiation for Public Input

This section will be improved by clarifying the need to apply an SPD (external or integrated).

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 76-NFPA 79-2021 [Section No. 7.8.1]	

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Fri Dec 31 17:04:02 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-74-NFPA 79-2022](#)

**Statement:** The requirements have been revised to clarify that appropriate surge protection shall be provided to protect, at a minimum, the safety circuit devices in industrial machinery.



## Public Input No. 92-NFPA 79-2022 [ Section No. 7.8.3.1 ]

### 7.8.3.1 Type 1 SPD.

Where the SPD is located on the line side of the service ~~disconnect~~ disconnecting means overcurrent protection, a Type 1 SPD shall be provided,

## Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

## Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 09:41:11 EST 2022  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-28-NFPA 79-2022](#)

**Statement:** The term "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 93-NFPA 79-2022 [ Section No. 7.8.3.2 ]

### 7.8.3.2 Type 2 SPD.

Where the SPD is located on the load side of the service ~~disconnect~~ disconnecting means overcurrent protection, feeder circuit, or separately derived system, a Type 1 or Type 2 SPD shall be provided. Where Type 2 SPDs are provided, the SPD shall be on the load side of an overcurrent protective device.

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
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**Zip:**  
**Submittal Date:** Sun Jan 02 09:43:18 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-29-NFPA 79-2022](#)

**Statement:** The term "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 35-NFPA 79-2021 [ Section No. 7.8.3.3 ]

### 7.8.3.3 Type 3 SPD.

Where the SPD is located on the load side of the branch-circuit overcurrent protective device, a Type 1, Type 2, or Type 3 SPD shall be provided. Where Type 3 SPDs are provided and where included in the manufacturer's instructions, the Type 3 SPD connection shall be a minimum of 10 m (30-ft 32.8 ft) of conductor distance from the service or separately derived system disconnect.

## Statement of Problem and Substantiation for Public Input

Original text states (30 ft) as an equivalent to 10 m.  
10 m equates to 32.8 ft.  
The difference of 2.8 ft merits the revised equivalent in feet.

## Submitter Information Verification

**Submitter Full Name:** William Brungs  
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**Street Address:**  
**City:**  
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**Zip:**  
**Submittal Date:** Tue Dec 21 10:02:29 EST 2021  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-30-NFPA 79-2022](#)

**Statement:** The dimension of 30 ft to 33 ft for 10 m was made to use a correct value. An approximate conversion is appropriate in this case.

The terms "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 94-NFPA 79-2022 [ Section No. 7.8.3.3 ]

### 7.8.3.3 Type 3 SPD.

Where the SPD is located on the load side of the branch-circuit overcurrent protective device, a Type 1, Type 2, or Type 3 SPD shall be provided. Where Type 3 SPDs are provided and where included in the manufacturer's instructions, the Type 3 SPD connection shall be a minimum of 10 m (30 ft) of conductor distance from the service or separately derived system ~~disconnect~~ disconnecting means .

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 09:45:40 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-30-NFPA 79-2022](#)

**Statement:** The dimension of 30 ft to 33 ft for 10 m was made to use a correct value. An approximate conversion is appropriate in this case.

The terms "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 112-NFPA 79-2022 [ Section No. 7.8.4 ]

### 7.8.4 Short-Circuit Current Rating.

The ~~SPD~~ SPDs shall be marked with a short-circuit current rating and shall not be installed at a point on the system where the available fault current is in excess of that rating.

*Exception: One-port SPDs shall not be required to have a short-circuit current rating.*

### Statement of Problem and Substantiation for Public Input

The proposed text aligns short circuit current rating requirements for one-port SPD's with the requirements in UL508A SB4.2.1.

It may also be beneficial to add definitions of one-port and two-port SPD's or include a description in an Annex note. The following definitions are taken from UL508A:

ONE-PORT SPD – An SPD having provisions (terminals, leads, plug) for connection to the ac power circuit but no provisions (terminals, leads, receptacles) for supplying current to ac power loads.

TWO-PORT SPD – An SPD having provisions (terminals, leads, plug) for connection to the ac power circuit and provisions [terminals, leads, receptacles(s)] for supplying current to one or more ac power loads. SPDs provided with a minimum of two adjacent terminals for each circuit conductor may be considered and tested as a two-port SPD.

### Submitter Information Verification

**Submitter Full Name:** Jay Tamblingson

**Organization:** Rockwell Automation

**Street Address:**

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**Submittal Date:** Tue Jan 04 11:29:02 EST 2022

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The exception in UL 508A SB4.2.1 is in the process of being removed. The existing requirement aligns with NEC 242.8.



## Public Input No. 70-NFPA 79-2021 [ Section No. 8.1.2 ]

### 8.1.2 Separately Derived Systems.

Separately derived systems shall be installed in accordance with 250.30 of *NFPA 70*. This includes the requirement for all separately derived power circuits secondary to be grounded and have a ground conductor traceable to a grounding electrode.

### Statement of Problem and Substantiation for Public Input

This section will be improved by clarifying the NEC / UL508a requirement for secondary derived sources secondary side to grounded (traceable) to a grounding electrode. Use of the ground bonding system is not sufficient.

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
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**Zip:**  
**Submittal Date:** Fri Dec 31 16:10:46 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** NEC 250.30 adequately addresses the grounding requirements for separately derived systems. The proposed language conflicts with 250.30(A)(5) Exception No. 3.



## Public Input No. 57-NFPA 79-2021 [ New Section after 8.2.1.2.3 ]

**8.2.1.2.4 (New) Electrical equipment secured to and in electrical contact with a metal mounting panel, rack or structure provided for its support shall be permitted to be considered as being connected to an equipment grounding conductor if the metal mounting panel, rack or structure is connected to an equipment grounding conductor by one of the means specified in 250.134 of NFPA 70.**

### Statement of Problem and Substantiation for Public Input

NFPA 79, Chapter 8 does not specifically address the bonding and grounding of electrical equipment when secured to a metallic mounting surface. The 2020 Edition of The National Electrical Code (NFPA 70) specifically addresses this issue in Section 250.136. This section considers electrical equipment secured to and in electrical contact with a metal rack or structure provided for its support as being connected to an equipment grounding conductor. The proposed new Section 8.2.1.2.4 is intended to clarify a long-standing practice where non-current-carrying metallic parts of electrical components are grounded when such parts are bonded to a metallic mounting panel, rack or structure where the metallic mounting panel, rack or structure itself is connected to an equipment grounding conductor. The proposed text is based on 250.136 of NFPA 70.

### Submitter Information Verification

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**Organization:** UL LLC  
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**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Mon Dec 27 13:00:58 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-77-NFPA 79-2022

**Statement:** NFPA 79, Chapter 8 does not specifically address the bonding and grounding of electrical equipment when secured to a metallic mounting surface.

The proposed new Section 8.2.1.2.4 is intended to clarify that non-current-carrying metallic parts of electrical components internal to an industrial control panel are grounded when such parts are bonded to a metallic mounting panel, rack or structure if the metallic mounting panel, rack or structure itself is connected to an equipment grounding conductor.

The proposed text is based on 250.136 of NFPA 70



## Public Input No. 14-NFPA 79-2021 [ Section No. 8.2.1.3.4 ]

### 8.2.1.3.4

Where an auxiliary grounding electrode is specified by the industrial machinery manufacturer or provider, a- an equipment grounding terminal shall accommodate this additional grounding electrode conductor.

### Statement of Problem and Substantiation for Public Input

The added wording makes it clear that if an auxiliary electrode is specified by the manufacturer, the terminal that is provided to allow for it cannot be isolated from the equipment grounding or bonding terminations in the machine. All grounding electrodes used within or at a facility must be tied together in accordance with 250.58 of the NEC

### Submitter Information Verification

**Submitter Full Name:** Christine Porter  
**Organization:** Intertek Testing Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Thu Jun 17 17:13:25 EDT 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-78-NFPA 79-2022](#)

**Statement:** The added wording clarifies that if an auxiliary electrode is specified by the manufacturer, the terminal that is provided must be electrically connected to the equipment grounding or bonding terminations in the machine.



## Public Input No. 41-NFPA 79-2021 [ Section No. 8.2.2.4 ]

### 8.2.2.4

Equipment grounding conductors and bonding jumpers ~~of the wire type~~ shall not be smaller than shown in Table 8.2.2.4, but shall not be required to be larger than the circuit conductors supplying the equipment.

Table 8.2.2.4 Minimum Size of Equipment Grounding Conductors and Bonding Jumpers

<u>Rating or Setting of Automatic Overcurrent Device in Circuit Ahead of the Equipment</u>	<u>Copper Conductor Size</u>
<u>(Not Exceeding Amperes)</u>	<u>(AWG or kcmil)</u>
10	16
15	14
20	12
30	10
40	10
60	10
100	8
200	6
300	4
400	3
500	2
600	1
800	1/0
1000	2/0
1200	3/0
1600	4/0
2000	250
2500	350
3000	400
4000	500
5000	700
6000	800

### Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term “wire” and words or phrases containing the term “wire” in the NFPA 79 Standard. This review was conducted to determine if the use of the term “wire” was technically correct or if used in an informal/colloquial manner. In those instances where the term “wire” was considered to be used in a colloquial connotation, “wire” was replaced with the term “conductor” to make the terminology technically correct.

The task group considers the use of the phrase “of the wire type” as unnecessary as the term “conductors” is used in the same sentence and removing the phrase “of the wire type” does not affect the intent and interpretation of the requirement.

## Related Public Inputs for This Document

<b>Related Input</b>	<b>Relationship</b>
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	
<a href="#">Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</a>	
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	
<a href="#">Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</a>	
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	

## Submitter Information Verification

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**Street Address:**  
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**State:**  
**Zip:**  
**Submission Date:** Tue Dec 21 23:51:20 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-62-NFPA 79-2022](#)

**Statement:** The use of the phrase “of the wire type” is unnecessary as the term “conductors” which is the technically correct term as a replacement for “wire”, is used in the same sentence and removing the phrase “of the wire type” does not affect the intent and interpretation of the requirement.



## Public Input No. 42-NFPA 79-2021 [ Section No. 8.2.3.4 ]

### 8.2.3.4

Equipment containing energized conductors shall be provided with a separate ~~wire-type~~ equipment grounding conductor or bonding jumper.

## Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term “wire” and words or phrases containing the term “wire” in the NFPA 79 Standard. This review was conducted to determine if the use of the term “wire” was technically correct or if used in an informal/colloquial manner. In those instances where the term “wire” was considered to be used in a colloquial connotation, “wire” was replaced with the term “conductor” to make the terminology technically correct.

The task group considers the use of the term “wire type” as unnecessary as the term “conductor” is used in the same sentence and removing the term “wire type” does not affect the intent and interpretation of the requirement.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	

[Public Input No. 40-NFPA 79-2021 \[Section No. 5.1.5\]](#)

[Public Input No. 41-NFPA 79-2021 \[Section No. 8.2.2.4\]](#)

[Public Input No. 43-NFPA 79-2021 \[Section No. 11.5.1.1\]](#)

[Public Input No. 46-NFPA 79-2021 \[Section No. 12.6.1.1\]](#)

[Public Input No. 47-NFPA 79-2021 \[Section No. 13.1.6.8\]](#)

[Public Input No. 48-NFPA 79-2021 \[Section No. A.4.5.2\]](#)

[Public Input No. 49-NFPA 79-2021 \[Section No. 12.9.2\]](#)

[Public Input No. 56-NFPA 79-2021 \[Section No. 12.6.1.2\]](#)

## Submitter Information Verification

**Submitter Full Name:** John Kovacik

**Organization:** UL LLC

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Wed Dec 22 00:02:06 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** Removing the term "wire-type" would infer that raceways and some other wiring methods would be acceptable as EGCs.



## Public Input No. 13-NFPA 79-2021 [ Section No. 9.2.5.4.1.1 ]

### 9.2.5.4.1.1

In addition to the requirements for stop, the emergency stop shall have the following requirements:

- (1) It shall override all other functions and operations in all modes.
- (2) Power to the machine actuators, which causes a hazardous condition(s), shall be removed as quickly as possible without creating other hazards (e.g., by the provision of mechanical means of stopping requiring no external power, by reverse current braking for a Category 1 stop).
- (3) The reset of the command shall not restart the machinery but only permit restarting.
- (4) Conductors connected to the emergency stop shall be red with yellow stripe.

### Statement of Problem and Substantiation for Public Input

Machines are being inadvertently shutdown due to unintentional opening of the emergency stop circuit when maintenance or troubleshooting is performed on a machine. The identification of the conductor throughout the length of the conductor will prevent these interruptions in the circuit which can cause property damage or personal injury. The colors used align with current emergency stop identification standards.

NFPA 79: Electrical Standard for Industrial Machinery  
EN/IEC 60204-1: Safety of machinery – Electrical equipment of machines – Part 1: General requirements  
EN/ISO 13850: Safety of machinery –  
Emergency stop function – Principles for design  
The Machinery Directive 2006/42/EC  
General Requirements

NFPA 79 (2015)

“10.7.3 Emergency Stop Actuators. Actuators of emergency stop devices shall be colored RED. The background immediately around pushbuttons and disconnect switch actuators used as emergency stop devices shall be colored YELLOW... The RED/YELLOW color combination shall be reserved exclusively for emergency stop applications.”

EN/IEC 60204 (2006)

“10.7.3 Colour of actuators: Actuators of emergency stop devices shall be coloured RED. If a background exists immediately around the actuator, then this background shall be coloured YELLOW. See also ISO 13850.”

EN/ISO 13850 (2014)

“4.3.5 The actuator of the emergency stop device shall be coloured RED. As far as a background exists behind the actuator and as far as it is practicable, the background shall be coloured YELLOW....

4.3.6 The actuator and the background should not be labelled with text or symbols. Where a symbol is needed for clarification, the symbol from IEC 60417-5638 shall be used.

### Submitter Information Verification

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**Organization:** NECA IBEW Training Center  
**Affiliation:** Self  
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**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Fri Mar 05 13:04:30 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** Color designation of conductors is addressed in Chapter 13. Designated colors other than those listed in 13.2.3 must be permanently posted on the main electrical control panel. The concern expressed in the PI could apply to devices other than emergency stops.



## Public Input No. 72-NFPA 79-2021 [ Section No. 9.2.5.4.1.1 ]

### 9.2.5.4.1.1

In addition to the requirements for stop, the emergency stop shall have the following requirements:

- (1) It shall override all other functions and operations in all modes.
- (2) One of the following stop control methods is applied.
- (3) Power to the machine actuators, which causes a hazardous condition(s), shall be removed as quickly as

~~possible without~~

- (a) necessary per the risk assessment and without creating other hazards (e.g., by the provision of mechanical means of stopping requiring no external power, by reverse current braking for a Category 1 stop).
- (b) Power to the machine actuators, which causes a hazardous condition(s), shall be remove or controlled to a stop as quickly as necessary per the risk assessment and without creating other hazards. Once stopped, power will be removed only if movement is detected
- (4) The reset of the command shall not restart the machinery but only permit restarting.

## Statement of Problem and Substantiation for Public Input

This section is improved as written by clarifying that the stop performance is determined by risk assessment mitigation techniques. Stopping as quickly as possible may not be a requirement. Also, additional text was added to allow energy to the actuators to be maintained.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 73-NFPA 79-2021 [Section No. 9.2.5.4.1.3]	

## Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submission Date:** Fri Dec 31 16:29:20 EST 2021  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** The proposed language does not add clarity. The requirements in 9.2.5.4.1.3 and others adequately address the concerns.



## Public Input No. 73-NFPA 79-2021 [ Section No. 9.2.5.4.1.3 ]

### 9.2.5.4.1.3

The emergency stop shall function as either a Category 0 or a Category 1 stop (see 9.2.2). The choice of the category of the emergency stop shall be determined by the risk assessment of the machine.

*Exception: In some cases, to avoid creating additional risks, it can be necessary to perform a controlled stop and maintain the power to machine actuators even after stopping is achieved. The stopped condition shall be monitored and upon detection of failure of the stopped condition, power shall be removed without creating a hazardous situation.*

### Statement of Problem and Substantiation for Public Input

This section is improved by revising 9.2.5.4.1.1 and deleting the exception listed in 9.2.5.4.1.3.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 72-NFPA 79-2021 [Section No. 9.2.5.4.1.1]</u>	Additional text allows exception to be deleted.

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Fri Dec 31 16:39:07 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** No substantiation is provided that describes how the proposed language will add clarity to the existing text. The relocation of the text in the exception was not accepted, therefore it is necessary to retain the current language.



## Public Input No. 85-NFPA 79-2022 [ Section No. 9.3 ]

### 9.3 Protective Interlocks Safety Functions

**Safety Functions shall apply devices listed for the specific safety application. In the case of the device manufacturer not explicitly stating the application in their documentation, written confirmation of approval of the application is sufficient.**

#### 9.3.1 Interlocks

Where doors or guards have interlocked switches used in safety circuits, the interlocking devices shall be listed, either have direct opening operation or provide similar reliability, and prevent the operation of the equipment when the doors or guards are open (difficult to defeat or bypass) .

##### 9.3.1.1 Reclosing or Resetting of an Interlocking Safeguard.

The reclosing or resetting of an interlocking safeguard shall not initiate machine motion or operation that results in a hazardous condition.

##### 9.3.1.2\* Exceeding Operating Limits.

Movement or action of a machine or part of a machine that can result in a hazardous condition shall be monitored by providing, for example, overtravel limiters, motor overspeed detection, mechanical overload detection, or anti-collision devices. Where an operating limit (e.g., speed, pressure, position) can be exceeded, leading to a hazardous condition, means shall be provided to detect when a predetermined limit(s) is exceeded and initiate an appropriate control action.

##### 9.3.3.2 Operation of Auxiliary Functions.

###### 9.3.3.2.1

Appropriate devices (e.g., pressure sensors) shall check the correct operation of the auxiliary functions.

###### 9.3.3.2.2

Where the nonoperation of a motor or device for an auxiliary function (e.g., lubrication, coolant, swarf removal) causes a hazardous condition or causes damage to the machine or to the work in progress, interlocking shall be provided.

##### 9.3.4.3 Interlocks Between Different Operations and for Contrary Motions.

###### 9.3.4.3.1

All contactors, relays, and other control devices that control elements of the machine that cause a hazardous condition when actuated at the same time (e.g., those that initiate contrary motion) shall be interlocked against incorrect operation.

###### 9.3.4.3.2

Motor contactors and starters that initiate opposing motion shall be both mechanically and electrically interlocked to prevent simultaneous operation. Relays and solenoids that are mechanically interlocked shall be electrically interlocked.

###### 9.3.4.3.3

Where certain functions on the machine are required to be interrelated for safeguarding or for continuous operation, their coordination shall be ensured by interlocks. For a group of machines working together in a coordinated manner and having more than one controller, provision shall be made to coordinate the operations of the controllers as necessary.

**9.3.4 3.4**

Where a failure of a mechanical brake actuator results in the brake being applied when the associated machine actuator is energized and a hazardous situation results, interlocks shall be provided to switch off the machine actuator.

**9.3.5 4** Reverse Current Braking.**9.3.5 4.1**

Where reverse current braking is used on a motor, effective measures shall be taken to prevent the motor starting in the opposite direction at the end of braking where this reversal will cause a hazardous condition or damage to the machine or to the work in progress. For this purpose, the use of a device operating exclusively as a function of time shall not be allowed.

**9.3.5 4.2**

Control circuits shall be arranged so that rotation of a motor shaft, manually or otherwise, shall not result in a hazardous condition.

**9.3.6 – Protective Interlock.**

~~Where doors or guards have interlocked switches used in safety circuits, the interlocking devices shall be listed, either have direct opening operation or provide similar reliability, and prevent the operation of the equipment when the doors or guards are open (difficult to defeat or bypass).~~

**Statement of Problem and Substantiation for Public Input**

This section needs revision in order to identify it as safety circuits performing safety functions. In addition, safety devices are listed for a specific use. Adaptation of devices by equipment manufacturers and integrators is not allowed unless the device manufacturer approves it. This approval would only occur if the device manufacturer tested the device for the application.

**Submitter Information Verification**

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sat Jan 01 11:14:47 EST 2022  
**Committee:** EEI-AAA

**Committee Statement**

**Resolution:** The submitter has not provided substantiation for the proposed changes which could cause unintended consequences.



## Public Input No. 71-NFPA 79-2021 [ Section No. 10.7.2.2 ]

### 10.7.2.2\*

Pushbutton-type devices for emergency stop shall be of the self-latching type and shall have direct opening operation or be an electronic device (OSSD) .

### Statement of Problem and Substantiation for Public Input

The addition of electronic device (OSSD) will update the standard to permit the use of the latest high-reliability devices.

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel

**Organization:** Amazon

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Fri Dec 31 16:21:49 EST 2021

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** Such electronic devices (OSSD) would not satisfy the direct-opening and self-latching requirements of this Standard.



## Public Input No. 95-NFPA 79-2022 [ Section No. 10.7.3 ]

### 10.7.3 Emergency Stop Actuators.

Actuators of emergency stop devices shall be colored RED. The background immediately around pushbuttons and ~~disconnect~~ disconnecting means switch actuators used as emergency stop devices shall be colored YELLOW. The actuator of a pushbutton-operated device shall be of the palm or mushroom-head type and shall effect an emergency stop when depressed. The RED/YELLOW color combination shall be reserved exclusively for emergency stop applications.

*Exception: The RED/YELLOW color combination shall be permitted for emergency stop actuators in accordance with 10.8.4.*

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 09:47:37 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-31-NFPA 79-2022

**Statement:** The term "disconnect switch" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 96-NFPA 79-2022 [ Section No. 10.7.4.3 ]

### 10.7.4.3

Disconnecting ~~(isolating) electrical devices~~ means as described in 5.2.2, where accessible to the operator, shall also be permitted to serve the function of emergency stop.

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 09:50:16 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-32-NFPA 79-2022](#)

**Statement:** The term "disconnecting" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

“(isolating) electrical devices” was deleted as this is not a defined term in the NEC or NFPA 79



## Public Input No. 19-NFPA 79-2021 [ Section No. 11.1.4 ]

### 11.1.4

Any door(s) that permits access to live parts operating at or above 50 volts ac (rms value) or 60 volts ~~dc or more shall~~ dc shall comply with 6.2.3.2 or 6.2.3.1.

### Statement of Problem and Substantiation for Public Input

Revise the reference to the ac and dc voltages for consistency throughout the Standard.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 20-NFPA 79-2021 [Section No. 11.2.1.3]</u>	

### Submitter Information Verification

**Submitter Full Name:** Mark Hilbert  
**Organization:** MR Hilbert Electrical Inspections & Training  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submission Date:** Mon Nov 01 08:04:05 EDT 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-42-NFPA 79-2022

**Statement:** Revisions were made to provide a consistent reference to live parts that are operating at or greater than 50 volts ac rms or 60 volts dc throughout the Standard which adds clarity.

Using "at or greater than" is consistent with other electrical documents such as NFPA 70, the National Electrical Code.



## Public Input No. 75-NFPA 79-2021 [ New Section after 11.2.1.2 ]

### 11.2.1.3

Listed floating terminals and wiring connectors are not required to be mounted. These devices shall be placed in an appropriate enclosure in which wiring and devices do not exceed 25% of the total volume.

### Statement of Problem and Substantiation for Public Input

This new section will improve the standard by giving allowance to new terminals listed as floating terminals and wiring connectors. The volume limitation will promote easy of servicing.

### Submitter Information Verification

**Submitter Full Name:** Robert Gruendel  
**Organization:** Amazon  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Fri Dec 31 16:53:03 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** Floating terminals are not described or defined as a specific product. Splices are permitted under the conditions in Section 13.1.2.1 Exception No. 1.



## Public Input No. 20-NFPA 79-2021 [ Section No. 11.2.1.3 ]

### 11.2.1.3

Exposed, nonarcing, bare, live parts operating at or above 50 volts ac (rms value) or 60 volts dc ~~or more~~ within an enclosure or compartment shall have an air space of not less than 13 mm (½ in.) between them and the uninsulated walls of the enclosure or compartment, including conduit fittings. The air space for uninsulated doors of the enclosure shall be not less than 25 mm (1 in.). Where barriers between metal enclosures or compartments and arcing parts are required, they shall be of flame-retardant, noncarbonizing insulating materials.

### Statement of Problem and Substantiation for Public Input

Revised the reference to the ac and dc voltages for consistency throughout the Standard.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 19-NFPA 79-2021 [Section No. 11.1.4]</a>	
<a href="#">Public Input No. 21-NFPA 79-2021 [Section No. 11.5.1.1]</a>	

### Submitter Information Verification

**Submitter Full Name:** Mark Hilbert  
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**City:**  
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**Zip:**  
**Submittal Date:** Mon Nov 01 08:07:19 EDT 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-43-NFPA 79-2022](#)

**Statement:** Revisions were made to provide a consistent reference to live parts that are operating at or greater than 50 volts ac rms or 60 volts dc throughout the Standard which adds clarity. Using “at or greater than” is consistent with other electrical documents such as NFPA 70, the National Electrical Code.



**Public Input No. 21-NFPA 79-2021 [ Section No. 11.5.1.1 ]**

A large, empty rectangular box with a thin border, intended for public input or comments.

**11.5.1.1**

The depth of the working space in the direction of access to live parts shall not be less than indicated in Table 11.5.1.1. Distances shall be measured from the control cabinet or compartment front or opening.

Table 11.5.1.1 Working Space Depth

<u>Nominal Voltage to Ground</u>	-	<u>Minimum Clear Distance</u>		
		<u>Condition 1</u>	<u>Condition 2</u>	<u>Condition 3</u>
0–150		900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151–600		900 mm (3 ft)	1.0 m (3½ ft)	1.2 m (4 ft)
601–1000		900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

**Condition 1** — Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated busbars operating at not over 300 volts to ground shall not be considered live parts.

**Condition 2** — Exposed live parts on one side and a grounded surface on the other side. Concrete, brick, or tile walls shall be considered as grounded.

**Condition 3** — Exposed live parts on both sides of the working space (not guarded as provided in Condition 1) with the operator between.

*Exception No. 1: Working space shall not be required in back or sides of control cabinets or compartments, where there are no renewable or adjustable parts on the back or sides and where all connections are accessible from locations other than the back or sides. Where rear access is required to work on de-energized parts on the back of enclosed control cabinet and compartment, a minimum working space of 762 mm (2½ ft) horizontally shall be provided.*

*Exception No. 2: By special permission, working space clearance depth of 762 mm (2½ ft) or less shall be permitted where all uninsulated parts are at a voltage ~~no~~ not greater than 50 volts rms ac or 60 volts dc.*

*Exception No. 3: Condition 2 working clearance depth shall be permitted between control cabinets or compartments located across the aisle from each other or across from non-machinery-associated switchgear, panelboards, or motor control centers where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit the affected equipment doors on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.*

*Exception No. 4: Condition 1 working clearance depth shall be permitted between control cabinets or compartments located across the aisle from each other, or across from a grounded surface, where all associated control cabinet or compartment devices and equipment operating at greater than 50 volts rms ac or 60 volts dc are separately enclosed, guarded, or constructed so that openings to live parts of the devices and equipment will not permit the entry of a 12.5 mm (0.5 in.) diameter rod.*

*Exception No. 5: By special permission, the minimum working space clearance depth of 762 mm (2½ ft) shall be permitted where all of the following conditions are met:*

- (1) *The control cabinet or compartment is operating at not over 150 volts line-to-line or line-to-ground.*
- (2) *The conditions of maintenance and supervision ensure that only qualified persons will service the installation.*
- (3) *The control cabinet and compartment require a tool to open.*
- (4) *Where only diagnostic troubleshooting and testing on live parts are involved.*
- (5) *The door(s) of the control cabinet and compartment open at least 90 degrees or are removable.*

## Statement of Problem and Substantiation for Public Input

The word “no” was editorially revised to “not” for clarity.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 20-NFPA 79-2021 [Section No. 11.2.1.3]</u>	

## Submitter Information Verification

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**Street Address:**  
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**State:**  
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**Submittal Date:** Mon Nov 01 08:10:13 EDT 2021  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** FR-44-NFPA 79-2022

**Statement:** Revisions were made to provide a consistent reference to live parts that are operating at or greater than 50 volts ac rms or 60 volts dc throughout the Standard which adds clarity. Using “at or greater than” is consistent with other electrical documents such as NFPA 70, the National Electrical Code.

The term “wire” was considered to be used in a colloquial connotation and was replaced with the term “conductor(s)” to make the terminology technically correct.

The metric measurements in the Table were revised to soft conversions as using hard conversions may have had a negative impact on safety. No matter which measurement is used, the distance should be the same.

The unit millimeter was selected for consistency across the table. The value more precisely reflects the value of inch-pound requirements. When necessary the value was rounded up to above the inch-pound requirements because the table contains minimum clear distances.



**Public Input No. 43-NFPA 79-2021 [ Section No. 11.5.1.1 ]**

A large, empty rectangular box with a thin border, intended for public input or comments.

**11.5.1.1**

The depth of the working space in the direction of access to live parts shall not be less than indicated in Table 11.5.1.1. Distances shall be measured from the control cabinet or compartment front or opening.

Table 11.5.1.1 Working Space Depth

<u>Nominal Voltage to Ground</u>	-	<u>Minimum Clear Distance</u>	
		<u>Condition 2</u>	<u>Condition 3</u>
0–150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151–600	900 mm (3 ft)	1.0 m (3½ ft)	1.2 m (4 ft)
601–1000	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

**Condition 1** — Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated ~~wire or~~ conductors or insulated busbars operating at not over 300 volts to ground shall not be considered live parts.

**Condition 2** — Exposed live parts on one side and a grounded surface on the other side. Concrete, brick, or tile walls shall be considered as grounded.

**Condition 3** — Exposed live parts on both sides of the working space (not guarded as provided in Condition 1) with the operator between.

*Exception No. 1: Working space shall not be required in back or sides of control cabinets or compartments, where there are no renewable or adjustable parts on the back or sides and where all connections are accessible from locations other than the back or sides. Where rear access is required to work on de-energized parts on the back of enclosed control cabinet and compartment, a minimum working space of 762 mm (2½ ft) horizontally shall be provided.*

*Exception No. 2: By special permission, working space clearance depth of 762 mm (2½ ft) or less shall be permitted where all uninsulated parts are at a voltage no greater than 50 volts rms ac or 60 volts dc.*

*Exception No. 3: Condition 2 working clearance depth shall be permitted between control cabinets or compartments located across the aisle from each other or across from non-machinery-associated switchgear, panelboards, or motor control centers where conditions of maintenance and supervision ensure that written procedures have been adopted to prohibit the affected equipment doors on both sides of the aisle from being open at the same time and qualified persons who are authorized will service the installation.*

*Exception No. 4: Condition 1 working clearance depth shall be permitted between control cabinets or compartments located across the aisle from each other, or across from a grounded surface, where all associated control cabinet or compartment devices and equipment operating at greater than 50 volts rms ac or 60 volts dc are separately enclosed, guarded, or constructed so that openings to live parts of the devices and equipment will not permit the entry of a 12.5 mm (0.5 in.) diameter rod.*

*Exception No. 5: By special permission, the minimum working space clearance depth of 762 mm (2½ ft) shall be permitted where all of the following conditions are met:*

- (1) *The control cabinet or compartment is operating at not over 150 volts line-to-line or line-to-ground.*
- (2) *The conditions of maintenance and supervision ensure that only qualified persons will service the installation.*
- (3) *The control cabinet and compartment require a tool to open.*
- (4) *Where only diagnostic troubleshooting and testing on live parts are involved.*
- (5) *The door(s) of the control cabinet and compartment open at least 90 degrees or are removable.*

## Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term “wire” and words or phrases containing the term “wire” in the NFPA 79 Standard. This review was conducted to determine if the use of the term “wire” was technically correct or if used in an informal/colloquial manner. In those instances where the term “wire” was considered to be used in a colloquial connotation, “wire” was replaced with the term “conductor” to make the terminology technically correct.

## Related Public Inputs for This Document

<b><u>Related Input</u></b>	<b><u>Relationship</u></b>
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	
<a href="#">Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</a>	
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	
<a href="#">Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</a>	

Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]

## Submitter Information Verification

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**Submission Date:** Wed Dec 22 00:07:12 EST 2021  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-44-NFPA 79-2022](#)

**Statement:** Revisions were made to provide a consistent reference to live parts that are operating at or greater than 50 volts ac rms or 60 volts dc throughout the Standard which adds clarity. Using “at or greater than” is consistent with other electrical documents such as NFPA 70, the National Electrical Code.

The term “wire” was considered to be used in a colloquial connotation and was replaced with the term “conductor(s)” to make the terminology technically correct.

The metric measurements in the Table were revised to soft conversions as using hard conversions may have had a negative impact on safety. No matter which measurement is used, the distance should be the same.

The unit millimeter was selected for consistency across the table. The value more precisely reflects the value of inch-pound requirements. When necessary the value was rounded up to above the inch-pound requirements because the table contains minimum clear distances.



**Public Input No. 46-NFPA 79-2021 [ Section No. 12.6.1.1 ]**

A large, empty rectangular box with a thin border, intended for public input or comments.

**12.6.1.1**

16 AWG shall be permitted if part of a jacketed multiconductor cable assembly or flexible cord, or individual conductors used in a cabinet or enclosure, under the following conditions:

- (1) Non-motor power circuits of 8 amperes or less, provided all the following conditions are met:
  - (2) Circuit is protected in accordance with Chapter 7.
  - (3) Overcurrent protection does not exceed 10 amperes.
  - (4) Overcurrent protection is provided by one of the following:
    - (5) A listed molded-case circuit breaker marked for use with

16 AWG wire

- (a)
  - i. 16 AWG conductor
  - ii. Listed fuses marked for use with

16 AWG wire

- (a)
  - i. 16 AWG conductor
  - ii. Class CC, Class J, Class CF, or Class T fuses

- (6) Motor power circuits supplying a motor having a full-load current rating of 8 amperes or less, provided all the following conditions are met:

- (7) Circuit is protected in accordance with Chapter 7.
- (8) Circuit is provided with Class 10 overload protection.
- (9) Overcurrent protection is provided by one of the following:
  - (10) A listed molded-case circuit breaker marked for use with

16 AWG wire

- (a)
  - i. 16 AWG conductor
  - ii. Listed fuses marked for use with

16 AWG wire

- (a)
  - i. 16 AWG conductor
  - ii. Class CC, Class J, or Class CF, Class T fuses

- (11) Motor power circuits supplying a motor having a full-load current rating of 5.5 amperes or less, provided all the following are met:

- (12) Circuit is protected in accordance with Chapter 7.
- (13) Circuit is provided with Class 20 overload protection.
- (14) Overcurrent protection is provided by one of the following:

(15) A listed molded-case circuit breaker marked for use with

16 AWG wire

(a)

- i. 16 AWG conductor
- ii. Listed fuses marked for use with

16 AWG wire

(a)

- i. 16 AWG conductor
- ii. Class CC, Class J, or Class CF, Class T fuses

## Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Proposed_revisions_12.6.1.1.docx	Proposed revisions to 12.6.1.1	

## Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term “wire” and words or phrases containing the term “wire” in the NFPA 79 Standard. This review was conducted to determine if the use of the term “wire” was technically correct or if used in an informal/colloquial manner. In those instances where the term “wire” was considered to be used in a colloquial connotation, “wire” was replaced with the term “conductor” to make the terminology technically correct.

The revisions are difficult to identify in Terraview. A separate file is provided for this.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</u>	Submitted by Wire Terminology Task Group

[Public Input No. 47-NFPA 79-2021 \[Section No. 13.1.6.8\]](#)

[Public Input No. 48-NFPA 79-2021 \[Section No. A.4.5.2\]](#)

[Public Input No. 38-NFPA 79-2021 \[Section No. 3.3.85\]](#)

[Public Input No. 39-NFPA 79-2021 \[Section No. 3.3.114\]](#)

[Public Input No. 40-NFPA 79-2021 \[Section No. 5.1.5\]](#)

[Public Input No. 41-NFPA 79-2021 \[Section No. 8.2.2.4\]](#)

[Public Input No. 42-NFPA 79-2021 \[Section No. 8.2.3.4\]](#)

[Public Input No. 43-NFPA 79-2021 \[Section No. 11.5.1.1\]](#)

[Public Input No. 47-NFPA 79-2021 \[Section No. 13.1.6.8\]](#)

[Public Input No. 48-NFPA 79-2021 \[Section No. A.4.5.2\]](#)

[Public Input No. 49-NFPA 79-2021 \[Section No. 12.9.2\]](#)

[Public Input No. 56-NFPA 79-2021 \[Section No. 12.6.1.2\]](#)

Submitted by Wire Terminology Task Group

Submitted by Wire Terminology Task Group

## Submitter Information Verification

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**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Wed Dec 22 11:57:56 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-63-NFPA 79-2022](#)

**Statement:** The term “wire” was considered to be used in a colloquial connotation, and was replaced with the term “conductors” to make the terminology technically correct.

The following revisions are proposed for 12.6.1.1;

16 AWG shall be permitted if part of a jacketed multiconductor cable assembly or flexible cord, or individual conductors used in a cabinet or enclosure, under the following conditions:

[...] (c) Overcurrent protection is provided by one of the following:

i . A listed molded-case circuit breaker marked for use with 16 AWG **wire** conductor

ii. Listed fuses marked with 16 AWG **wire** conductor

[...] (c) Overcurrent protection is provided by one of the following:

i . A listed molded-case circuit breaker marked for use with 16 AWG **wire** conductor

ii. Listed fuses marked with 16 AWG **wire** conductor

[...] (c) Overcurrent protection is provided by one of the following:

i . A listed molded-case circuit breaker marked for use with 16 AWG **wire** conductor

ii. Listed fuses marked with 16 AWG **wire** conductor



**Public Input No. 56-NFPA 79-2021 [ Section No. 12.6.1.2 ]**

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**12.6.1.2**

18 AWG shall be permitted if part of a jacketed multiconductor cable assembly or flexible cord, or individual conductors used in a cabinet or enclosure, under the following conditions:

- (1) Non-motor power circuits of 5.6 amperes or less, provided all the following conditions are met:
  - (2) Circuit is protected in accordance with Chapter 7.
  - (3) Overcurrent protection does not exceed 7 amperes.
  - (4) Overcurrent protection is provided by one of the following:
    - (5) A listed molded-case circuit breaker marked for use with

~~18 AWG wire~~

- (a)
  - i. 18 AWG conductor
  - ii. Listed fuses marked for use with

~~18 AWG wire~~

- (a)
  - i. 18 AWG conductor
  - ii. Class CC, Class J, or Class CF, Class T fuses

- (6) Motor power circuits supplying a motor having a full-load current rating of 5 amperes or less, provided all the following conditions are met:

- (7) Circuit is protected in accordance with Chapter 7.
- (8) Circuit is provided with Class 10 overload protection.
- (9) Overcurrent protection is provided by one of the following:
  - (10) A listed molded-case circuit breaker marked for use with

~~18 AWG wire~~

- (a)
  - i. 18 AWG conductor
  - ii. Listed fuses marked for use with

~~18 AWG wire~~

- (a)
  - i. 18 AWG conductor
  - ii. Class CC, Class J, or Class CF, Class T fuses

- (11) Motor power circuits supplying a motor having a full-load current rating of 3.5 amperes or less, provided all the following are met:

- (12) Circuit is protected in accordance with Chapter 7.
- (13) Circuit is provided with Class 20 overload protection.
- (14) Overcurrent protection is provided by one of the following:

(15) A listed molded-case circuit breaker marked for use with

18 AWG wire

(a)

- i. 18 AWG conductor
- ii. Listed fuses marked for use with

18 AWG wire

(a)

- i. 18 AWG conductor
- ii. Class CC, Class J, or Class CF, Class T fuses

## Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Proposed_revisions_12.6.1.2.docx	Proposed revisions to 12.6.1.2	

## Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term “wire” and words or phrases containing the term “wire” in the NFPA 79 Standard. This review was conducted to determine if the use of the term “wire” was technically correct or if used in an informal/colloquial manner. In those instances where the term “wire” was considered to be used in a colloquial connotation, “wire” was replaced with the term “conductor” to make the terminology technically correct.

The revisions are difficult to identify in Terraview. A separate file is provided for this.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</u>	Submitted by Wire Terminology Task Group
<u>Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</u>	Submitted by Wire Terminology Task Group

[Public Input No. 47-NFPA 79-2021 \[Section No. 13.1.6.8\]](#)

[Public Input No. 48-NFPA 79-2021 \[Section No. A.4.5.2\]](#)

[Public Input No. 38-NFPA 79-2021 \[Section No. 3.3.85\]](#)

[Public Input No. 39-NFPA 79-2021 \[Section No. 3.3.114\]](#)

[Public Input No. 40-NFPA 79-2021 \[Section No. 5.1.5\]](#)

[Public Input No. 41-NFPA 79-2021 \[Section No. 8.2.2.4\]](#)

[Public Input No. 42-NFPA 79-2021 \[Section No. 8.2.3.4\]](#)

[Public Input No. 43-NFPA 79-2021 \[Section No. 11.5.1.1\]](#)

[Public Input No. 46-NFPA 79-2021 \[Section No. 12.6.1.1\]](#)

[Public Input No. 47-NFPA 79-2021 \[Section No. 13.1.6.8\]](#)

[Public Input No. 48-NFPA 79-2021 \[Section No. A.4.5.2\]](#)

[Public Input No. 49-NFPA 79-2021 \[Section No. 12.9.2\]](#)

Submitted by Wire Terminology Task Group

Submitted by Wire Terminology Task Group

## Submitter Information Verification

**Submitter Full Name:** John Kovacik

**Organization:** UL LLC

**Street Address:**

**City:**

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**Zip:**

**Submittal Date:** Mon Dec 27 12:01:27 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-64-NFPA 79-2022](#)

**Statement:** The term “wire” was considered to be used in a colloquial connotation, and was replaced with the term “conductors” to make the terminology technically correct.

The following revisions are proposed for 12.6.1.2;

18 AWG shall be permitted if part of a jacketed multiconductor cable assembly or flexible cord, or individual conductors used in a cabinet or enclosure, under the following conditions:

[...] (c) Overcurrent protection is provided by one of the following:

i . A listed molded-case circuit breaker marked for use with 18 AWG wire conductor

ii. Listed fuses marked with 18 AWG wire conductor

[...] (c) Overcurrent protection is provided by one of the following:

i . A listed molded-case circuit breaker marked for use with 18 AWG wire conductor

ii. Listed fuses marked with 18 AWG wire conductor

[...] (c) Overcurrent protection is provided by one of the following:

i . A listed molded-case circuit breaker marked for use with 18 AWG wire conductor

ii. Listed fuses marked with 18 AWG wire conductor



## Public Input No. 64-NFPA 79-2021 [ New Section after 12.7 ]

### 12.8 Conductors and Cables on the Output of Power Conversion Devices

**12.8.1 General.** Conductors and cables on the output of power conversion devices shall be identified as suitable for the application and in accordance with any instructions provided by the manufacturer(s).

**12.8.2 Variable Speed Drive Systems.** Cables and conductors on the output of variable speed drive systems shall be constructed to protect against or be otherwise protected against corona discharge and insulation breakdown due to the characteristics of the waveform of the drive.

### Statement of Problem and Substantiation for Public Input

This addition to the standard would provide guidance on conductor selection for power conversion devices. NFPA 79 2021 edition A.4.4.2.8 points to "Chapter 12 and A.12.1.1 for information on conductor selection," for power conversion equipment, however, there is currently no guidance for these systems in Chapter 12. This section would provide general guidance, similar to section 4.4.2.8, to follow manufacturers' instructions in most applications as well as additional guidance for variable speed drive systems which can be more susceptible to electrical issues on their output waveforms. The language in this section is written to have the primary consideration be the prevention of electrical issues that can damage cables and conductors on the output of drive systems and allow engineers to utilize a variety of solutions that can mitigate these issues, such as specifically designed VFD cable, reactors, filters and/or other devices.

### Submitter Information Verification

**Submitter Full Name:** William Dorow  
**Organization:** Lutze Inc.  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submission Date:** Wed Dec 29 12:55:23 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** A general rule for all cables and conductors on the output of adjustable speed drives is not warranted. There are conductors which are suitable for use on the output of power conversion devices and not specifically identified as suitable for this application. Each installation involving adjustable speed drive systems must be judged on its own merit as to whether specific conductors and cables need to be used which are identified as suitable for the application. Criteria already exists for determining whether such specific cables and conductors are necessary. Such criteria is provided in 4.4.2.8 supplemented by Appendix material in A.4.4.2.8 and A.12.1.1.



## Public Input No. 49-NFPA 79-2021 [ Section No. 12.9.2 ]

### 12.9.2

Appliance wiring material (AWM) shall be permitted under any of the following conditions:

- (1) Where part of an assembly that has been identified for the intended use
- (2) Where the AWM has been identified for use with approved equipment and is used in accordance with the equipment manufacturer's instructions
- (3) Where its construction meets all applicable requirements of Section 12.2 through Section 12.6 with modifications as follows:

- (4) Stranded

~~conductors with wire sizes smaller~~

- (a) conductors smaller than those listed in 12.2.2 shall have a minimum of seven strands.
- (b) Conductor insulation and cable jacket materials not specified in 12.3.1 shall have flame-resistant properties in compliance with applicable standards for intended use such as FT2 (horizontal wire) flame test or VW-1 (vertical wire) flame test in accordance with UL 1581.
- (c) Minimum insulation thicknesses for single-conductor AWM shall be as specified in 12.3.2. Minimum insulation thickness for conductors that are part of a multiconductor jacketed AWM cable shall be as specified by the AWM style number and by the marked voltage rating of the cable.
- (d) AWM shall be marked in accordance with 12.4.1, 12.4.3, and 12.4.4. The legend shall include manufacturer's name or trademark, AWM style number, voltage rating (unless marking is prohibited by 12.4.2), wire gauge(s), temperature rating, and flame resistance. Additional markings for properties such as oil, water, UV, and chemical resistance identifiers shall be permitted where in compliance with applicable standards for intended use. Where markings alone are insufficient to identify for the intended application, suitable information shall be included with the machine technical documentation.

### Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacic, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term "wire" and words or phrases containing the term "wire" in the NFPA 79 Standard. This review was conducted to determine if the use of the term "wire" was technically correct or if used in an informal/colloquial manner. In those instances where the term "wire" was considered to be used in a colloquial connotation, "wire" was replaced with the term "conductor" to make the terminology technically correct.

The task group considers the use of the phrase "with wire sizes" as unnecessary as the term "conductors" is used in the same sentence and removing the phrase "with wire sizes" does not affect the intent and interpretation of the requirement.

Terraviva has created erroneous underlining of text. The only revision being proposed is the deletion of the the phrase "with wire sizes" in 12.9.2(3)(a).

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	
<a href="#">Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</a>	
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	
<a href="#">Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</a>	
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	

## Submitter Information Verification

**Submitter Full Name:** John Kovacik

**Organization:** UL LLC

**Street Address:**

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**Zip:**

**Submittal Date:** Wed Dec 22 12:25:45 EST 2021

**Committee:** EEI-AAA

### **Committee Statement**

**Resolution:** [FR-65-NFPA 79-2022](#)

**Statement:** The use of the phrase “with wire sizes” is unnecessary as the term “conductors” which is the technically correct term as a replacement for “wire”, is used in the same sentence and removing the phrase “with wire sizes” does not affect the intent and interpretation of the requirement.



## Public Input No. 68-NFPA 79-2021 [ Section No. 13.1.2.1 ]

### 13.1.2.1\*

Conductors and cables shall be run from terminal to terminal without splices or joints. Connections using plug and receptacle combinations with protection against accidental disconnection shall not be considered to be joints for this requirement.

*Exception No. 1: ~~Splices shall be permitted to leads attached to electrical equipment, such as motors and solenoids. Such splices shall be insulated with oil-resistant electrical tape or insulation equivalent to that of the conductors and~~ when a listed wire connector is applied and the splice is installed in a suitable enclosure. Such wire connectors shall be insulated or an additional permanent insulation applied to eliminate exposed live parts.*

*Exception No. 2: Where it is impracticable to provide terminals in a junction box (e.g., on mobile machines, on machines having long flexible cables), the use of splices or joints shall be permitted.*

### Statement of Problem and Substantiation for Public Input

The change improve the section in the following ways.

1. Splice performance is ambiguous. For example, twisting together conductors does not lead to repeatable performance. Application of listed wire connectors will ensure intended performance.
2. Electrical tape adhesive often fails long term when exposed to low or high temperature. Application of an insulated wire connector or a permanent insulation will prevent exposure of live parts.

### Submitter Information Verification

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**Submission Date:** Fri Dec 31 15:48:47 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-66-NFPA 79-2022](#)

**Statement:** Proximity switches were added for further clarity as an example of a product having leads that are permitted to be spliced. A requirement for splicing wire connectors to be listed was added to improve the integrity of the connection. The term “oil resistant electrical tape” was deleted as the required electrical tape performance depends on too many variables.

The addition of “permanent” as a type of insulation was not accepted as the term “permanent” is vague and unenforceable.



## Public Input No. 69-NFPA 79-2021 [ Section No. 13.1.2.1 ]

### 13.1.2.1\*

Conductors and cables shall be run from terminal to terminal without splices or joints. Connections using plug and receptacle combinations with protection against accidental disconnection shall not be considered to be joints for this requirement.

*Exception No. 1: Splices shall be permitted to leads attached to electrical equipment, such as motors and solenoids. Such splices shall be insulated with ~~oil-resistant electrical tape or a permanent~~ insulation equivalent to that of the conductors and installed in a suitable enclosure.*

*Exception No. 2: Where it is impracticable to provide terminals in a junction box (e.g., on mobile machines, on machines having long flexible cables), the use of splices or joints shall be permitted.*

### Statement of Problem and Substantiation for Public Input

This section will be improved by the elimination of electrical tape applied as a consistent performance insulator. Electrical tape performance depends on too many variables (brand, model, temperature, preparation) for it to be guaranteed to last the life of the equipment.

### Submitter Information Verification

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**Submission Date:** Fri Dec 31 16:00:08 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-66-NFPA 79-2022](#)

**Statement:** Proximity switches were added for further clarity as an example of a product having leads that are permitted to be spliced. A requirement for splicing wire connectors to be listed was added to improve the integrity of the connection. The term "oil resistant electrical tape" was deleted as the required electrical tape performance depends on too many variables.

The addition of "permanent" as a type of insulation was not accepted as the term "permanent" is vague and unenforceable.



## Public Input No. 97-NFPA 79-2022 [ Section No. 13.1.4 ]

### 13.1.4 Equipment Supplied from Separate Supply Circuit- ~~Disconnects~~ Disconnecting Means or Two or More Sources of Power.

Where equipment is supplied from two or more sources of power or from two or more independent supply circuit disconnecting means, the power wiring from each supply source or from each supply circuit disconnecting means shall be run in separate raceways and shall not terminate in or pass through common junction boxes.

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacic, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

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**Submittal Date:** Sun Jan 02 09:53:12 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-33-NFPA 79-2022](#)

**Statement:** The term "disconnects" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 47-NFPA 79-2021 [ Section No. 13.1.6.8 ]

### 13.1.6.8

Cables subjected to physical damage shall be protected as follows:

- (1) By alternative routing
- (2) With additional guarding or railings
- (3) When supported by flooring or decking, with walk over or drive over cable protective devices
- (4) By installation in a ~~wire way~~ wireway
- (5) By installation in a floor or deck covering trapezoidal walk over raceway specifically designed for cable protection

### Statement of Problem and Substantiation for Public Input

"Wireway" is the correct term, not "wire way."

This public input is being submitted on behalf of the NFPA 79 Wire Terminology Task Group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services.

The Wire Terminology Task Group identified this editorial error in its review of the standard.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 48-NFPA 79-2021 [Section No. A.4.5.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	Submitted by Wire Terminology Task Group

[Public Input No. 39-NFPA 79-2021 \[Section No. 3.3.114\]](#)

[Public Input No. 40-NFPA 79-2021 \[Section No. 5.1.5\]](#)

[Public Input No. 41-NFPA 79-2021 \[Section No. 8.2.2.4\]](#)

[Public Input No. 42-NFPA 79-2021 \[Section No. 8.2.3.4\]](#)

[Public Input No. 43-NFPA 79-2021 \[Section No. 11.5.1.1\]](#)

[Public Input No. 46-NFPA 79-2021 \[Section No. 12.6.1.1\]](#)

[Public Input No. 48-NFPA 79-2021 \[Section No. A.4.5.2\]](#)

[Public Input No. 49-NFPA 79-2021 \[Section No. 12.9.2\]](#)

[Public Input No. 56-NFPA 79-2021 \[Section No. 12.6.1.2\]](#)

## Submitter Information Verification

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**Submission Date:** Wed Dec 22 12:10:19 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-67-NFPA 79-2022](#)

**Statement:** "Wire way" is changed to "Wireway" which is the correct term.



## Public Input No. 4-NFPA 79-2021 [ Section No. 13.2.3.1 ]

### 13.2.3.1\*

Where an ac circuit includes a grounded conductor, this conductor shall be WHITE, GRAY, or three continuous WHITE stripes on other than GREEN, BLUE, or ORANGE insulation along its entire length.

*Exception: Grounded conductors in multiconductor cables shall be permitted to be permanently identified at their terminations at the time of installation by a distinctive white marking or other equally effective means.*

*Exception: Within a machine enclosure that is manufactured to be installed in the United States or Europe, it shall be permitted to use BLUE for the grounded conductor, if this is documented in accordance with the requirements of Chapter 17 Technical Documentation.*

### Statement of Problem and Substantiation for Public Input

With the use of switching power supplies or transformer tapping, a manufacturer can build a machine that can operate on North American (120V single phase 60Hz or three-phase 60Hz) Voltages and frequencies, or European Voltages (230V single phase 50Hz or three-phase 50Hz). Europe requires that the grounded conductor color is blue, line is brown, or in three-phase, brown, black, and grey. This allows a manufacturer of equipment for the US or Europe to manufacture all machines with one set of conductor colors. European regulations are more stringent on conductor color than US regulations. It also allows an installer of used equipment from Europe, to keep existing European conductor colors. We already allow the European green-yellow conductor for grounding.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 7-NFPA 79-2021 [Section No. 13.2.4.3]</a>	

### Submitter Information Verification

**Submitter Full Name:** Matt Egloff  
**Organization:** Montana Tech, University of Mo  
**Affiliation:** none  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Feb 23 12:42:37 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** Location of installation cannot be controlled by the standard. Additionally, the use of the color blue to identify the grounded conductor would cause confusion in the field as the National Electrical Code requires the grounded conductor to be identified by the color white or grey.



## Public Input No. 15-NFPA 79-2021 [ Section No. 13.2.4.1 ]

### 13.2.4.1\*

The color ORANGE with BLACK or ORANGE with RED stripe shall be used to identify ungrounded ac conductors that remain energized when the main supply circuit disconnecting means is in the off position. The color ORANGE with BLUE stripe shall be used to identify ungrounded dc conductors that remain energized when the main supply circuit disconnecting means is in the off position. This color identification shall be strictly reserved for this application only.

*Exception No. 1: Internal wiring on individual devices purchased completely wired*

*Exception No. 2: Where the insulation used is not available in the colors required (e.g., high temperature insulation, chemically resistant insulation)*

### Statement of Problem and Substantiation for Public Input

To clearly identify the voltage type of the ungrounded conductors that remain energized when the main supply circuit disconnecting means is in the off position.

### Submitter Information Verification

**Submitter Full Name:** Craig Twining

**Organization:** Kaufman Engineered Systems

**Street Address:**

**City:**

**State:**

**Zip:**

**Submission Date:** Wed Sep 22 13:45:09 EDT 2021

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-69-NFPA 79-2022](#)

**Statement:** The color orange has been designated to specifically identify ungrounded ac conductors. The color orange with blue stripe has been added to specifically identify ungrounded dc conductors. These changes will allow for identification of the circuit in which a conductor is located, when that conductor is energized with the main supply circuit disconnecting means in the off position.



## Public Input No. 6-NFPA 79-2021 [ Section No. 13.2.4.1 ]

### 13.2.4.1\*

The color ORANGE shall be used to identify ungrounded conductors that remain energized when the main supply circuit disconnecting means is in the off position. This color identification shall be strictly reserved for this application only.

*Exception No. 1: Internal wiring on individual devices purchased completely wired*

*Exception No. 2: Where the insulation used is not available in the colors required (e.g., high temperature insulation, chemically resistant insulation)*

### Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
nfpa_79_13-2-4-1_public_input_egloff.docx	add nec language to orange conductor requirement	

### Statement of Problem and Substantiation for Public Input

NEC (NFPA 70) 110.15 and 408.3(F)(1) pertain to "high leg" delta connections where the highest voltage requires an "orange" colored conductor.

110.15 High-Leg Marking.

On a 4-wire, delta-connected system where the midpoint of one phase winding is grounded, only the conductor or busbar having the higher phase voltage to ground shall be durably and permanently marked by an outer finish that is orange in color or by other effective means. Such identification shall be placed at each point on the system where a connection is made if the grounded conductor is also present.

408.3(F)(1) High-Leg Identification.

A switchboard, switchgear, or panelboard containing a 4-wire, delta-connected system where the midpoint of one phase winding is grounded shall be legibly and permanently field marked as follows: "Caution \_\_\_\_\_ Phase Has \_\_\_\_\_ Volts to Ground"

### Submitter Information Verification

**Submitter Full Name:** Matt Egloff

**Organization:** Montana Tech, University of Mo

**Affiliation:** none

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Tue Feb 23 12:59:17 EST 2021

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The proposed new exception would create a conflict with the requirement in the charging

paragraph that the color orange shall be used to identify ungrounded conductors that remain energized when the main supply circuit disconnecting means is in the open position. Citing the permission to use the color orange for a “high-leg marking in the National Electrical Code is not justification for including it in NFPA 79.

#### 13.2.4.1 \*

The color ORANGE shall be used to identify ungrounded conductors that remain energized when the main supply circuit disconnecting means is in the off position. This color identification shall be strictly reserved for this application only.

Exception No. 1: Internal wiring on individual devices purchased completely wired

Exception No. 2: Where the insulation used is not available in the colors required (e.g., high temperature insulation, chemically resistant insulation)

Add Exception No. 3: High Leg Marking. On a 4-wire, delta-connected system where the midpoint of one phase winding is grounded, only the conductor or busbar having the higher phase voltage to ground shall be durably and permanently marked by an outer finish that is orange in color or by other effective means. Such identification shall be placed at each point on the system where a connection is made if the grounded conductor is also present (direct copy of NFPA 70 110.15 High Leg Marking).

From NFPA 70:

#### 110.15 High-Leg Marking.

On a 4-wire, delta-connected system where the midpoint of one phase winding is grounded, only the conductor or busbar having the higher phase voltage to ground shall be durably and permanently marked by an outer finish that is orange in color or by other effective means. Such identification shall be placed at each point on the system where a connection is made if the grounded conductor is also present.

#### 408.3(F)(1) High-Leg Identification.

A switchboard, switchgear, or panelboard containing a 4-wire, delta-connected system where the midpoint of one phase winding is grounded shall be legibly and permanently field marked as follows:

“Caution \_\_\_\_\_ Phase Has \_\_\_\_\_ Volts to Ground”



## Public Input No. 7-NFPA 79-2021 [ Section No. 13.2.4.3 ]

### 13.2.4.3

Where color-coding is used for identification of conductors, the following color codes shall be permitted to be used:

- (1) BLACK for ungrounded ac and dc power conductors
- (2) RED for ungrounded ac control or power conductors
- (3) BLUE for ungrounded dc control conductors or ungrounded ac power conductors
- (4) BROWN for ungrounded ac power conductors
- (5) PURPLE for ungrounded ac power conductors
- (6) YELLOW for ungrounded ac power conductors

### Statement of Problem and Substantiation for Public Input

In 208V three phase, black, red, and blue conductors or tape at ends, are typically used to identify the three phases. In 480V three phase, either brown, orange, yellow, or brown, purple, yellow are typically used. Orange has also been used to identify the high leg in a delta 4-wire 3-phase delta configuration. But, NFPA 79 has reserved orange for conductors that remain energized, so orange is not on this proposed list. In Europe, brown is used for ungrounded ac conductors. This modification specifies that the aforementioned colors (except orange) may be used to identify ungrounded ac conductors.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4-NFPA 79-2021 [Section No. 13.2.3.1]	ties brown ungrounded to blue grounded conductor

### Submitter Information Verification

**Submitter Full Name:** Matt Egloff  
**Organization:** Montana Tech, University of Mo  
**Affiliation:** none  
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**City:**  
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**Zip:**  
**Submission Date:** Tue Feb 23 13:00:23 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** Paragraph 13.2.4.4 allows for other colors to be used as a means of identification as an exception to the colors specified in 13.2.4.3. Adding alternate colors to the basic rule for color-coding ac power conductors will introduce uncertainty as to what is the primary color for identification of ac power conductors.



## Public Input No. 98-NFPA 79-2022 [ Section No. 14.2 ]

### 14.2 Conductors Supplied from Separate Disconnects - Disconnecting Means .

Where the equipment has two or more sources of power or two or more independent disconnecting means, power wiring from each disconnecting means shall be run in separate raceways and shall not terminate in or pass through common junction boxes.

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacic, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

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**Zip:**  
**Submittal Date:** Sun Jan 02 09:54:40 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-34-NFPA 79-2022](#)

**Statement:** The term "disconnects" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 99-NFPA 79-2022 [ Section No. 15.1.1 ]

### 15.1.1 Receptacles for Accessory Equipment.

Where the machine or its associated equipment is provided with receptacle outlets to be used for accessory equipment (e.g., handheld power tools, test equipment), the following conditions shall apply:

- (1) Receptacles mounted externally or internally to the enclosure shall be ground-fault circuit-interrupter (GFCI)-protected.
- (2) Receptacles shall be supplied from a grounded 120-volt ac source.
- (3) Receptacles shall be of the parallel blade grounding type, 125-volt, single-phase, 15- or 20-ampere configuration and listed for the applied voltage.
- (4) Receptacles with their associated attachment plugs (plug/sockets) shall be in accordance with 13.4.5.3.
- (5) The continuity of the equipment grounding circuit to the receptacle outlet shall be verified by Section 18.2.

*Exception: Verification is not required for PELV circuits in accordance with Section 18.2.*

- (6) All ungrounded (unearthed) conductors connected to the receptacle outlet shall be protected against overcurrent in accordance with the provisions of 7.2.5, and these circuits shall not be connected to other machine circuits.
- (7) Where the power supply to the receptacle outlet is not disconnected by the supply disconnecting ~~device~~ means for the machine or section of the machine, the safety sign requirements of 5.1.13.4 shall apply.
- (8) Receptacles shall be suitable for the environment, and those mounted external to the enclosure and subject to dirt, dust, oil, or other contaminants shall be provided with a means to cover the receptacle when the plug is removed.

## Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacic, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

## Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
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**Submittal Date:** Sun Jan 02 09:56:52 EST 2022

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-35-NFPA 79-2022](#)

**Statement:** The word "device" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 100-NFPA 79-2022 [ Section No. 15.2.2.2 ]

### 15.2.2.2

Lighting circuits shall have overcurrent protection in accordance with 7.2.6 and shall be supplied from one of the following sources:

- (1) A separate isolating transformer connected to the load side of the supply disconnecting means. Overcurrent protection shall be provided in the secondary circuit.
- (2) A separate isolating transformer connected to the line side of the supply disconnecting means shall be permitted for the supply of a maintenance lighting circuit in control enclosures only. Overcurrent protection shall be provided in the secondary circuit.
- (3) A grounded machine circuit that has separate overcurrent protection and does not exceed 150 volts to ground shall be permitted.
- (4) An isolating transformer connected to the line side of the supply disconnecting ~~device~~ means where a separate primary disconnecting means and secondary overcurrent protection are provided and mounted either externally immediately adjacent to the control enclosure or within the control enclosure adjacent to the supply disconnecting ~~device~~ means.
- (5) An externally supplied lighting circuit (e.g., factory lighting supply). This shall be permitted in control enclosures and for the machine work light(s) where the total power rating does not exceed 3 kW.

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
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**Zip:**  
**Submittal Date:** Sun Jan 02 09:59:15 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-36-NFPA 79-2022

**Statement:** In (2) The word “This” is added in (2) for clarity.

In (3) “shall be permitted” has been deleted as this is required.

In (4) The word “device” was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

In (5) “machine work light(s)” has been deleted as it is vague and can cause confusion. The limitation of 3 kW has been deleted as there is no reason to limit the wattage of the externally supplied lighting.



## Public Input No. 36-NFPA 79-2021 [ Section No. 15.2.2.2 ]

### 15.2.2.2

Lighting circuits shall have overcurrent protection in accordance with 7.2.6 and shall be supplied from one of the following sources:

- (1) A separate isolating transformer connected to the load side of the supply disconnecting means. Overcurrent protection shall be provided in the secondary circuit.
- (2) A separate isolating transformer connected to the line side of the supply disconnecting means. This shall be permitted for the supply of a maintenance lighting circuit in control enclosures only. Overcurrent protection shall be provided in the secondary circuit.
- (3) A grounded machine circuit that has separate overcurrent protection and does not exceed 150 volts to ground ~~shall be permitted~~ .
- (4) An isolating transformer connected to the line side of the supply disconnecting device where a separate primary disconnecting means and secondary overcurrent protection are provided and mounted either externally immediately adjacent to the control enclosure or within the control enclosure adjacent to the supply disconnecting device.
- (5) An externally supplied lighting circuit (e.g., factory lighting supply). This shall be permitted in control enclosures ~~and for the machine work light(s) where the total power rating does not exceed 3 kW~~ with proper overcurrent protection .

### Statement of Problem and Substantiation for Public Input

Some changes made for syntax purposes.

"Machine work lights" is too generic.

If this is to remain, a definition of this term is needed in Section 3.

Dont see where the 3kW total power rating comes from.

Some changes made for syntax purposes.

"Machine work lights" is too generic.

If this is to remain, a definition of this term is needed in Section 3.

Don't see where the 3kW total power rating comes from.

Different control voltages will have different amperages.

If value is important, there should be an explanation of the 3kW value.

### Submitter Information Verification

**Submitter Full Name:** William Brungs

**Organization:** Honeywell Intelligrated System

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Tue Dec 21 10:05:27 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-36-NFPA 79-2022](#)

**Statement:** In (2) The word “This” is added in (2) for clarity.

In (3) “shall be permitted” has been deleted as this is required.

In (4) The word “device” was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

In (5) “machine work light(s)” has been deleted as it is vague and can cause confusion. The limitation of 3 kW has been deleted as there is no reason to limit the wattage of the externally supplied lighting.



## Public Input No. 8-NFPA 79-2021 [ Section No. 16.2 ]

### 16.2 Safety Signs for Electrical Enclosures.

#### 16.2.1\*

Enclosures that do not clearly show that they contain electrical devices shall be marked with a safety sign in accordance with ANSI Z535 series, which deals with product safety signs.

#### 16.2.2—\*\_

Safety signs shall be visible on the enclosure door or cover.

#### 16.2.3\*

Electrical equipment for industrial machines, such as industrial control panels and the enclosures of disconnecting devices, shall be marked with a safety sign in accordance with ANSI Z535.4 to warn qualified persons of potential electric shock and arc flash hazards.

##### 16.2.3.1

The marking shall be located so as to be visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

##### 16.2.3.2

It shall be permitted to omit safety signs where the size of the enclosure precludes placement of the label on the enclosure (e.g., operator-machine interfaces, control stations, position sensors).

#### 16.2.4

A safety sign shall be provided adjacent to the disconnecting operating handle(s) where the disconnect(s) that is interlocked with the enclosure door or cover does not de-energize all exposed live parts when the disconnect(s) is in the open (off) position.

#### 16.2.5

Where an attachment plug is used as the disconnecting means, a safety sign shall be attached to the control enclosure door or cover indicating that power shall be disconnected from the equipment before the enclosure is opened.

#### 16.2.6

Where the disconnecting means is remote from the control enclosure, a safety sign shall be attached to the enclosure door or cover indicating that the power shall be disconnected from the equipment before the enclosure is opened and that the enclosure shall be closed before the power is restored.

## Statement of Problem and Substantiation for Public Input

add annex material

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 9-NFPA 79-2021 [New Section after A.16.2.1]</a>	

## Submitter Information Verification

**Submitter Full Name:** Matt Egloff

**Organization:** Montana Tech, University of Mo  
**Affiliation:** none  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Feb 23 13:23:46 EST 2021  
**Committee:** EEI-AAA

### **Committee Statement**

**Resolution:** The asterisk reference is unnecessary as the recommended annex text was not accepted as it would not add clarity to the Standard and the reference to not using an excessive number of safety signs is vague and unenforceable.



## Public Input No. 113-NFPA 79-2022 [ Section No. 16.2.1 ]

### 16.2.1\*

Enclosures ~~that do not clearly show that they contain electrical devices shall~~ that contain 50V or greater shall be marked with a safety sign in accordance with ANSI Z535 series, which deals with product safety signs.

### Statement of Problem and Substantiation for Public Input

The wording "Enclosures that do not clearly show" is ambiguous. "Clearly" is not defined anywhere and left up to interpretation. I would like to see any electrical enclosure containing 50V or greater require it be marked indicating there is an electrical shock hazard irrespective if the enclosure contains electrical devices or terminal blocks.

### Submitter Information Verification

**Submitter Full Name:** Greg Rasmussen  
**Organization:** Applied Manufacturing  
**Affiliation:** Controls Engineer, P.E.  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Jan 04 13:59:02 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-45-NFPA 79-2022

**Statement:** The term "clearly" was removed as it is vague and unenforceable.

The addition of the word "terminals" is not necessary as they are included in the definition of the term "device" in Section 3.3.30.

The reference to operating at or greater than 50 volts ac rms or 60 volts dc was added to clarify when a safety sign is required.



## Public Input No. 67-NFPA 79-2021 [ Section No. 16.2.1 ]

### 16.2.1\*

Enclosures ~~that do not clearly show that they~~ that contain electrical devices or terminals operating at 50 volts and above shall be marked with a safety sign in accordance with ANSI Z535 series, which deals with product safety signs.

### Statement of Problem and Substantiation for Public Input

The existing text is confusing with a text " that do not clearly show that they contain electrical devices". No where we define or explain what is meant by "Clearly"? The proposed text will make it clear that a safety sign is required if the enclosure contains any electrical devices or terminals operating at 50 volts and above to warn personnel of risk of electrical shock.

### Submitter Information Verification

**Submitter Full Name:** Daleep Mohla  
**Organization:** DCM Electrical Consulting Serv  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Thu Dec 30 14:32:27 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-45-NFPA 79-2022](#)

**Statement:** The term "clearly" was removed as it is vague and unenforceable.

The addition of the word "terminals" is not necessary as they are included in the definition of the term "device" in Section 3.3.30.

The reference to operating at or greater than 50 volts ac rms or 60 volts dc was added to clarify when a safety sign is required.



## Public Input No. 101-NFPA 79-2022 [ Section No. 16.2.3 [Excluding any Sub-Sections] ]

Electrical equipment for industrial machines, such as industrial control panels and the enclosures of disconnecting devices means, shall be marked with a safety sign in accordance with ANSI Z535.4 to warn qualified persons of potential electric shock and arc flash hazards.

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 10:01:18 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-37-NFPA 79-2022](#)

**Statement:** The word "devices" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

The reference to operating at or greater than 50 volts ac rms or 60 volts dc was added to clarify when the arc flash or shock safety sign is required.



## Public Input No. 102-NFPA 79-2022 [ Section No. 16.2.4 ]

### 16.2.4

A safety sign shall be provided adjacent to the disconnecting means \_ operating handle(s) where the ~~disconnect(s)~~ disconnecting \_ means \_ that is interlocked with the enclosure door or cover does not de-energize all exposed live parts when the ~~disconnect(s)~~ disconnecting \_ means \_ is in the open (off) position.

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 10:03:08 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-38-NFPA 79-2022](#)

**Statement:** The word "means" was added after "disconnecting" and the word "disconnect(s)" was changed to "disconnecting" means" for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 10-NFPA 79-2021 [ New Section after 16.4.1 ]

### 16.4.1.1\* Nameplate Markings When Input Voltage Setting Can Be Changed

If a machine's operating Voltage range can be manually changed, internally or externally, the nameplate will indicate which setting is applied.

### Statement of Problem and Substantiation for Public Input

Some machines have internal transformers that can be re-tapped to change the Voltage range. For example, 100V for Japan, 120V for North America, 230V for other countries. This can be accomplished by a switch, wiring changes, or other means, done within or without the enclosure. Some motors are tapped to change from 230V to 460V, etc. In such cases the nameplate should indicate the current setting.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 11-NFPA 79-2021 [New Section after A.16.4.1(3)]</u>	

### Submitter Information Verification

**Submitter Full Name:** Matt Egloff  
**Organization:** Montana Tech, University of Mo  
**Affiliation:** none  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Feb 23 13:35:05 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The rated voltage on the nameplate is the maximum voltage that the machine is rated and intended for use.



## Public Input No. 110-NFPA 79-2022 [ Section No. 16.4.1 ]

### 16.4.1

Control equipment shall be legibly and durably marked in a way that is visible after the equipment is installed. A nameplate giving the following information shall be attached to the outside of the enclosure, or on the machine immediately adjacent to the enclosure:

- (1) Name or trademark of supplier
- (2) Model, serial number, or other designation
- (3) \* Rated voltage, number of phases and frequency (if ac), and full-load current for each supply
- (4) Ampere rating of the largest motor or load
- (5) Maximum ampere rating of the short-circuit and ground-fault protective device, where provided
- (6) Short-circuit current rating of the industrial control panel
- (7) Electrical diagram number(s) or the number of the index to the electrical drawings

## Statement of Problem and Substantiation for Public Input

Correlates with term used in 7.2.10.1

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 58-NFPA 79-2021 [Section No. 7.2.10.2]</a>	Assumes this PI is accepted

## Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
**Organization:** Eaton's Bussmann Division  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Mon Jan 03 12:13:16 EST 2022  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-79-NFPA 79-2022](#)

**Statement:** In (4) An Annex note has been added to provide guidance on the use of this nameplate value.

In (5) the term "branch-circuit short-circuit and ground-fault protective device" is used for consistency with the NEC. An Annex note has been added to provide guidance on the use of this nameplate value.

In (6) an additional Annex note has been added to guidance on the short-circuit current rating of industrial machinery with industrial control panels supplied by the industrial control panel containing the machine supply circuit disconnect.



## Public Input No. 123-NFPA 79-2022 [ Section No. 16.4.2 ]

### 16.4.2

The full-load current shown on the nameplate shall not be less than the full-load currents for all motors and other equipment that can be in operation at the same time under normal conditions of use, design load, and duty cycle. Where ~~unusual loads or duty cycles require~~, and so forth require oversized conductors or permit reduced-sized conductors, the required capacity shall be included in the full-load current specified on the nameplate.

### Statement of Problem and Substantiation for Public Input

The proposed changes align the nameplate full-load current marking requirements with NEC 670.3(A) which includes adjustments for reduced-size conductors and other criteria.

### Submitter Information Verification

**Submitter Full Name:** Jay Tamblingson  
**Organization:** Rockwell Automation  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Wed Jan 05 14:52:14 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The design load of motor(s) can be applied as stated in 16.4.2 to properly size conductors.



## Public Input No. 23-NFPA 79-2021 [ Section No. 16.4.2 ]

### 16.4.2

The full-load current shown on the nameplate shall not be less than the full-load currents for all motors and other equipment that can be in operation at the same time under normal conditions of use, design load, and duty cycle than the maximum current the equipment requires in any possible working condition . Where unusual loads or duty cycles require oversized conductors, the required capacity shall be included in the full-load current specified on the nameplate.

### Statement of Problem and Substantiation for Public Input

The way the language is now stated, in case of a machinery with, let's say, 10 motors that all work at the same time but at reduces power, the FLC has to be the sum of the FLC of all motors. As a consequence, the user has to oversize the feeder line and consequently have a bigger MV/LV transformer. We need to let the equipment manufacturer state the real maximum current its machine can require.

### Submitter Information Verification

**Submitter Full Name:** Marco Tacchini

**Organization:** GT Engineering

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Wed Dec 01 02:43:35 EST 2021

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The design load of motor(s) can be applied as stated in 16.4.2.



## Public Input No. 125-NFPA 79-2022 [ Section No. 19.3.1 ]

### 19.3.1 Servo Drive System Supply Conductors.

Circuit conductors supplying servo drive systems shall be sized to have an ampacity not less than 115 percent of the ~~rated input~~ full-load currents of the equipment under normal conditions of use, design load, and duty cycle .

### Statement of Problem and Substantiation for Public Input

The proposed change aligns the requirements with the full-load current marking requirements in 16.4

### Submitter Information Verification

**Submitter Full Name:** Jay Tamblingson

**Organization:** Rockwell Automation

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Wed Jan 05 16:44:38 EST 2022

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The requirements in 16.4 are for machine nameplate data requirements. The requirements of Section 19.3.1 addresses servo-drive conductors not the machine supply conductors.



## Public Input No. 120-NFPA 79-2022 [ Section No. A.3.3.17 ]

### A.3.3.17 Cableless Operator Control Station.

These stations are not physically connected to the machine by either communications or power conductors. While all cableless devices utilize wireless technology, not all wireless devices are cableless. Examples of cableless devices include cableless teach pendants, cableless crane pendants, ~~and~~ cableless jog pendants, and mobile phones .

## Statement of Problem and Substantiation for Public Input

A mobile phone seems to meeting the definition of cabless operator control station if it is used for that purpose. Applications are available that can be used to control machine functions. Adding it here will provide some guidance in NFPA 79 that they are permitted.

## Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Wed Jan 05 11:47:32 EST 2022  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** Mobile phones are considered wireless devices.



**Public Input No. 48-NFPA 79-2021 [ Section No. A.4.5.2 ]**

A large, empty rectangular box with a thin border, intended for public input or comments.

**A.4.5.2**

The electrical interferences generated by the equipment itself should not exceed levels specified in the relevant equipment standards and others dealing with electromagnetic compatibility (EMC) levels. The levels allowed should be determined for the specific application.

Generated interference signals can be kept to a minimum by the following:

- (1) Suppression at the source by using capacitors, inductors, diodes, Zener diodes, varistors, or active devices, or a combination of these
- (2) Equipment screening in a bonded electrically conductive enclosure to provide segregation from other equipment

Undesirable effects of electrostatic discharge, radiated electromagnetic energy, and supply conductor (mains borne) interference should be avoided (e.g., use of appropriate filters and time delays, choice of certain power levels, suitable wiring types and practices).

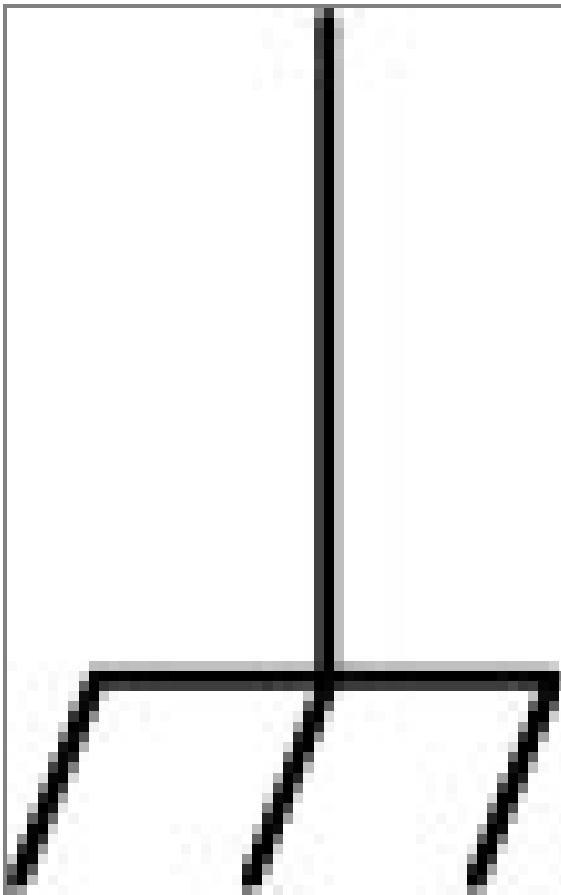
The effects of interference on equipment can be reduced by the following:

- (1) *Use of surge protective devices and filters.* The installation of surge protection devices and/or filters for equipment sensitive to electromagnetic influences is recommended to improve electromagnetic compatibility with regard to conducted electromagnetic phenomena.
- (2) *Reference potential circuit or common connections.* Each common connection treated as a single circuit and connected to one of several central reference points that are connected to ground (~~wired to~~ earth) by insulated conductors of large cross-sectional area.
- (3) *Frame connections.* In each piece of equipment all frame connections are to be taken to a common point with a conductor of large cross-sectional area (e.g., braided conductors, foil strips having a width much greater than the thickness) used between slides and enclosures. The connections to the frame are to be as short as possible.
- (4) *Transmission of signals.* Electrostatic screens, electromagnetic shields, twisted conductors, and orientation (i.e., crossing cable runs at as near to 90 degrees as practicable) as necessary to ensure that the low level signal wiring is not affected by interference from control or power cables, or running the connections parallel to the ground plane as necessary.
- (5) *Separation of equipment.* Separating and/or shielding sensitive equipment (e.g., units working with pulses and/or at low signal levels) from switching equipment (e.g., electromagnetic relays, thyristors); separation of low level signal wiring from control and power cables.
- (6) *Electromagnetic disturbances.* Measures to limit the generation of electromagnetic disturbances — that is, conducted and radiated emissions — include the following:
  - (7) Power supply filtering
  - (8) Cable shielding
  - (9) Enclosures designed to minimize RF radiation
  - (10) RF suppression techniques.
- (11) *Enhance immunity.* Measures to enhance the immunity of the equipment against conducted and radiated RF disturbance using the designs of a functional bonding system include the following:
  - (12) Connection of sensitive electrical circuits to the chassis. Such terminations should be marked or labeled with the IEC Symbol 5020 from IEC 60417-1. [See Figure A.4.5.2(a).]
  - (13) Connection of the chassis to earth (PE) using a conductor with low RF impedance and as short as practicable.
  - (14) Connection of sensitive electrical equipment or circuits directly to the PE circuit or to a functional earthing conductor (FE), to minimize common mode disturbance. This latter

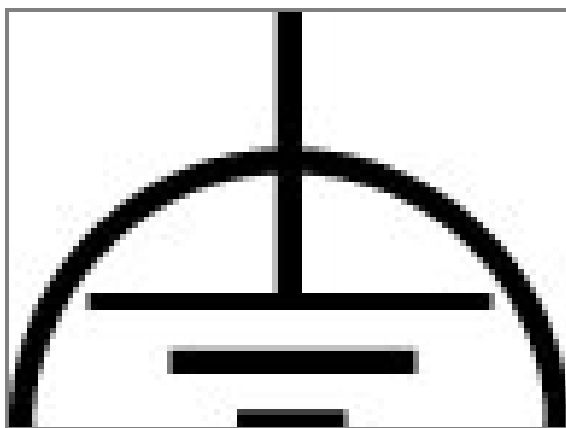
terminal should be marked or labeled with the IEC Symbol 5018 from IEC 60417.  
[See Figure A.4.5.2(b).]

- (15) Separation of sensitive circuits from disturbance sources.
- (16) Enclosures designed to minimize RF transmission.
- (17) EMC wiring practices as follows:
  - (18) Using twisted conductors to reduce the effect of differential mode disturbances
  - (19) Keeping distance between conductors emitting disturbances and sensitive conductors
  - (20) Using cable orientation as close to 90° as possible when cables cross
  - (21) Running the conductors as close as possible to the ground plane
  - (22) Using electrostatic screens and/or electromagnetic shields with a low RF impedance termination

**Figure A.4.5.2(a) Symbol that Represents Functional Equipotential Bonding — IEC Symbol Number 5020.**



**Figure A.4.5.2(b) Symbol that Represents Functional Earthing — IEC Symbol Number 5018.**



## Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the NFPA 79 wire terminology task group. The task group members are John Kovacik, chair, UL ; Marco Tacchini and Guido Zotti, GT Engineering; Mike Dionne, Adaptive Resources; and Steve Douglas QPS Evaluation Services. The task group was charged with reviewing all of the uses of the term “wire” and words or phrases containing the term “wire” in the NFPA 79 Standard. This review was conducted to determine if the use of the term “wire” was technically correct or if used in an informal/colloquial manner. In those instances where the term “wire” was considered to be used in a colloquial connotation, “wire” was replaced with the term “conductor” to make the terminology technically correct.

The task group considers the use of the term “wired to” in the parenthetical phrase as unnecessary as the term “conductors” is used in the same sentence and removing the term “wired to” does not affect the intent and interpretation of the annex material.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 39-NFPA 79-2021 [Section No. 3.3.114]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 40-NFPA 79-2021 [Section No. 5.1.5]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 41-NFPA 79-2021 [Section No. 8.2.2.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 42-NFPA 79-2021 [Section No. 8.2.3.4]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 43-NFPA 79-2021 [Section No. 11.5.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 46-NFPA 79-2021 [Section No. 12.6.1.1]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 56-NFPA 79-2021 [Section No. 12.6.1.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 49-NFPA 79-2021 [Section No. 12.9.2]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 47-NFPA 79-2021 [Section No. 13.1.6.8]</a>	Submitted by Wire Terminology Task Group
<a href="#">Public Input No. 38-NFPA 79-2021 [Section No. 3.3.85]</a>	

[Public Input No. 39-NFPA 79-2021 \[Section No. 3.3.114\]](#)

[Public Input No. 40-NFPA 79-2021 \[Section No. 5.1.5\]](#)

[Public Input No. 41-NFPA 79-2021 \[Section No. 8.2.2.4\]](#)

[Public Input No. 42-NFPA 79-2021 \[Section No. 8.2.3.4\]](#)

[Public Input No. 43-NFPA 79-2021 \[Section No. 11.5.1.1\]](#)

[Public Input No. 46-NFPA 79-2021 \[Section No. 12.6.1.1\]](#)

[Public Input No. 47-NFPA 79-2021 \[Section No. 13.1.6.8\]](#)

[Public Input No. 49-NFPA 79-2021 \[Section No. 12.9.2\]](#)

[Public Input No. 56-NFPA 79-2021 \[Section No. 12.6.1.2\]](#)

## Submitter Information Verification

**Submitter Full Name:** John Kovacik

**Organization:** UL LLC

**Street Address:**

**City:**

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**Submission Date:** Wed Dec 22 12:16:26 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-70-NFPA 79-2022](#)

**Statement:** The use of the term “wired to” in the parenthetical phrase in the second “(2)” paragraph is unnecessary as the term “conductors” which is the technically correct term as a replacement for “wire”, is used in the same sentence and removing the term “wired to” does not affect the intent and interpretation of the annex material



## Public Input No. 103-NFPA 79-2022 [ Section No. A.5.1.9.2 ]

### A.5.1.9.2

When a single disconnecting means is provided, a marking such as “~~main machine disconnect~~” “Machine Supply Circuit Disconnecting Means” is sufficient to convey the purpose. Where multiple supplies are present, a descriptive marking is necessary to clearly indicate the controlled supply voltage or equipment that is disconnected, such as “~~main disconnect~~” “disconnecting means — 480V, 3ph,” or “~~main disconnect~~” “disconnecting means — drive motors.”

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc. The word "main" was deleted for consistency.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
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**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 10:07:14 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-39-NFPA 79-2022](#)

**Statement:** The term “main machine disconnect” has been revised to “machine supply circuit disconnect means” since this is the defined term. The term “main disconnect” has been revised to “disconnecting means” for consistency and to use the term defined in NFPA 70 and NFPA 79.



## Public Input No. 26-NFPA 79-2021 [ New Section after A.5.1.11.2 ]

### TITLE OF NEW CONTENT

A.5.2.2 A manual motor controller marked "suitable as motor disconnect" listed to UL 508 or UL 60947-4-1 is a method of meeting the requirement in 5.2.2(2). System isolation equipment listed to UL 6420 is a method of meeting the requirement in 5.2.2(3).

### Statement of Problem and Substantiation for Public Input

Added Annex note to clarify the UL standard for devices in 5.2.2(2) and 5.2.2(3).

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 25-NFPA 79-2021 [Section No. 5.2.2]</u>	New Annex Note for revisions in 5.2.2
<u>Public Input No. 25-NFPA 79-2021 [Section No. 5.2.2]</u>	
<u>Public Input No. 27-NFPA 79-2021 [Section No. K.1.2.9]</u>	
<u>Public Input No. 29-NFPA 79-2021 [Section No. K.1.2.9]</u>	
<u>Public Input No. 30-NFPA 79-2021 [Section No. K.2]</u>	

### Submitter Information Verification

**Submitter Full Name:** Daniel Neeser  
**Organization:** Eaton's Bussmann Division  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Mon Dec 20 12:29:21 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-80-NFPA 79-2022

**Statement:** In (2): Added "listed", "additionally marked", and "single motor branch circuit" to clarify that a manual motor controller must be listed and marked "suitable as motor disconnect" and is only suitable as a disconnecting means for a single motor branch circuit. Revised text to clarify the location of the manual motor controller. Added text that suitable motor branch-circuit short-circuit and ground-fault protective devices must be provided where semiconductor fuses are used to assure proper protection of the manual motor controller. These changes align with similar text in NEC 430.109(A)(6).

In (3): Revised and added text to better align with NEC 430.109(A)(7).

New list item (4) to 5.2.2 has been added for listed general-use switches as an

acceptable disconnecting means, provided they are used within their ratings.

A new annex note has been added for 5.2.2 that indicates the appropriate standard for the manual motor controllers and system isolation equipment.



## Public Input No. 9-NFPA 79-2021 [ New Section after A.16.2.1 ]

### A16.1.2

Safety signs should address the potential hazards with the machine, but an excessive number of safety signs should not be used as it distracts from reading all of them.

### Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Examples_of_excessive_safety_sign_use.pdf	pictures of a machine with too many safety signs. manufacturer name obscured.	

### Statement of Problem and Substantiation for Public Input

Excessive use of safety signs distracts people from reading them all. There's no practical way to set a limit as a machine may actually need more. A picture is attached showing a machine with far too many signs. No one is going to read all of them. Many more or less duplicate mentioning hazards. Put this as an appendix material as it is guidance.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 8-NFPA 79-2021 [Section No. 16.2]</a>	put asterix to identify appendix material

### Submitter Information Verification

**Submitter Full Name:** Matt Egloff  
**Organization:** Montana Tech, University of Mo  
**Affiliation:** none  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Feb 23 13:25:08 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The recommended text was not accepted as it would not add clarity to the Standard and the reference to not using an excessive number of safety signs is vague and unenforceable.



## Public Input No. 11-NFPA 79-2021 [ New Section after A.16.4.1(3) ]

### A.16.4.1.1

Machines can use different tap settings on an internal transformer to change the operating Voltage. This can be changed by external or internal switches, wiring, or by other means. Motors can also come with internal conductors that allow operation at 230V or 460V, or other combinations, depending on how the internal conductors are connected. The need to manually set the device for a particular Voltage or Voltage range requires that this setting is indicated on the nameplate. Such devices shall indicate how they are currently set up on the nameplate. Devices that can operate automatically at different Voltages can indicate the range of operation.

### Statement of Problem and Substantiation for Public Input

Instruments and machines that still use transformers can often be tapped for 100V (Japan), 120V (North America), or 230V (rest of the world). The nameplates often indicate the allowed Voltage ranges, and the one set up is marked. Others may have an external switch the indicates the Voltage setting. Motors and Transformers can also be tapped to operate at different Voltages, for example a 230V or 460V motor, set up by wiring the windings in parallel or series. Or a Transformer that may be tapped for slight adjustments to the nominal Voltage levels on the primary and or secondary. If it requires a manual action to set the Voltage, the nameplate should indicate the current setting. Obviously it should still be verified.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 10-NFPA 79-2021 [New Section after 16.4.1]</u>	appendix material

### Submitter Information Verification

**Submitter Full Name:** Matt Egloff  
**Organization:** Montana Tech, University of Mo  
**Affiliation:** none  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Feb 23 13:43:09 EST 2021  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** The rated voltage on the nameplate is the maximum voltage that the machine is rated and intended for use in 16.4.1.1. Therefore no annex note is needed.



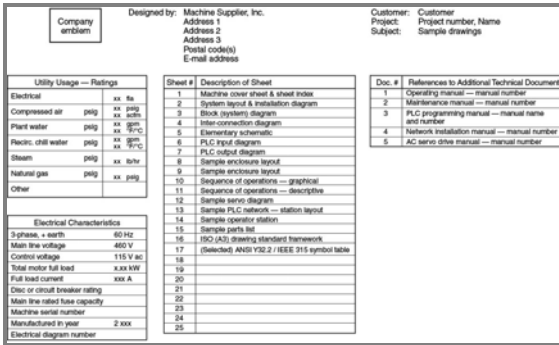
**Public Input No. 104-NFPA 79-2022 [ Section No. D.1 ]**

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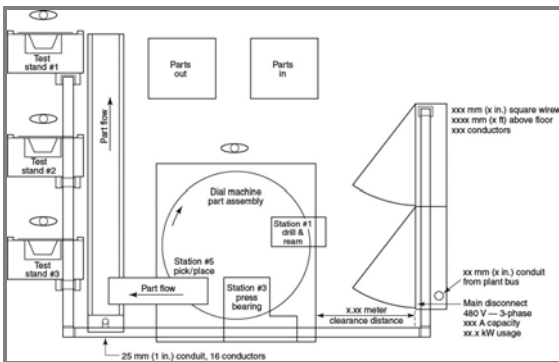
**D.1**

Figure D.1(a) through Figure D.1(q) are not intended to be design guidelines. They are included only to illustrate documentation methods.

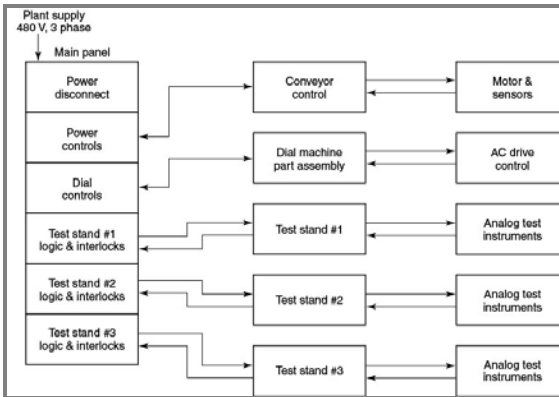
**Figure D.1(a) Cover Sheet and Sheet Index.**



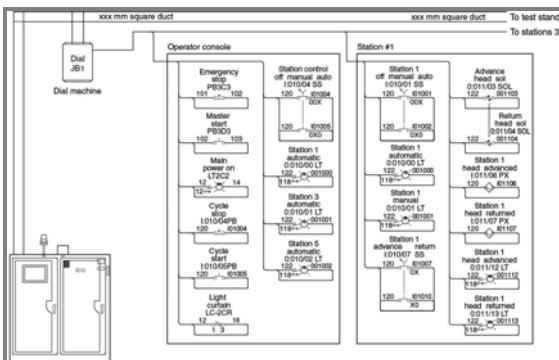
**Figure D.1(b) System Layout and Installation Diagram.**



**Figure D.1(c) Block (System) Diagram.**



**Figure D.1(d) Interconnection Diagram.**



**Figure D.1(e) Elementary Schematic.**

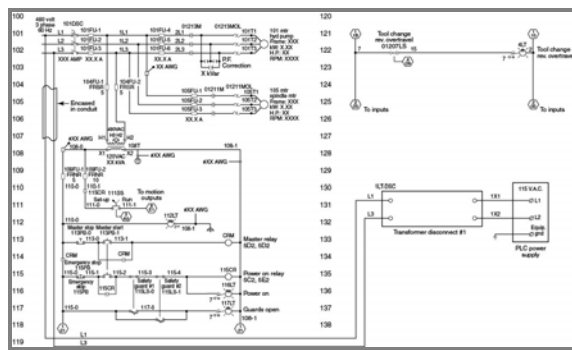
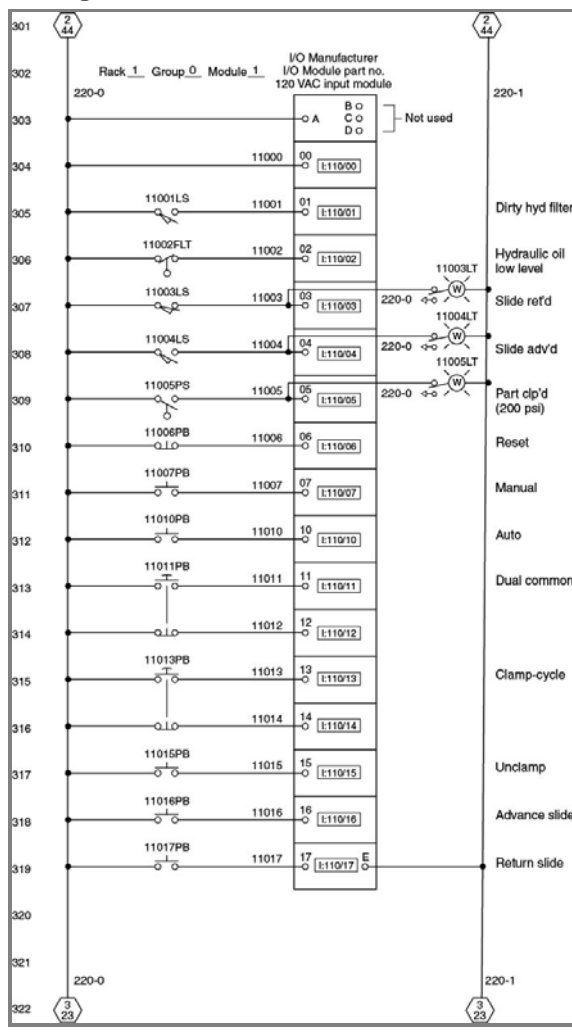


Figure D.1(f) PLC Input Diagram.



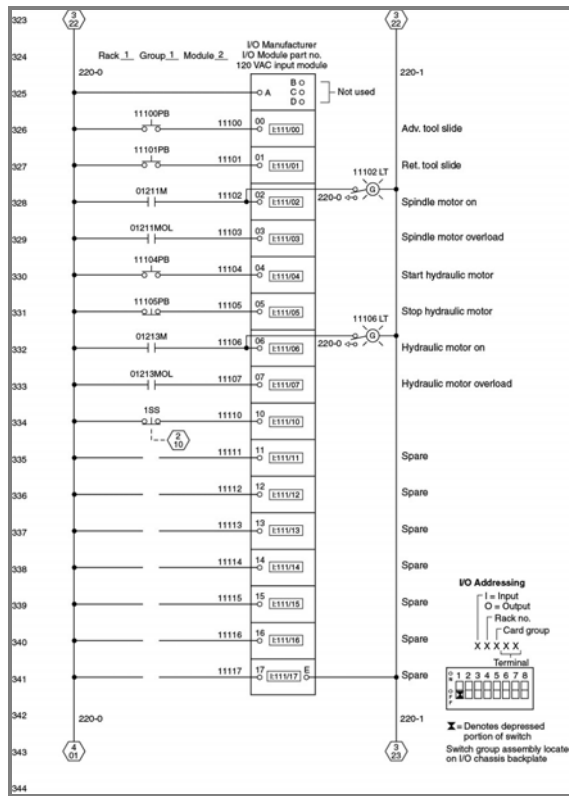
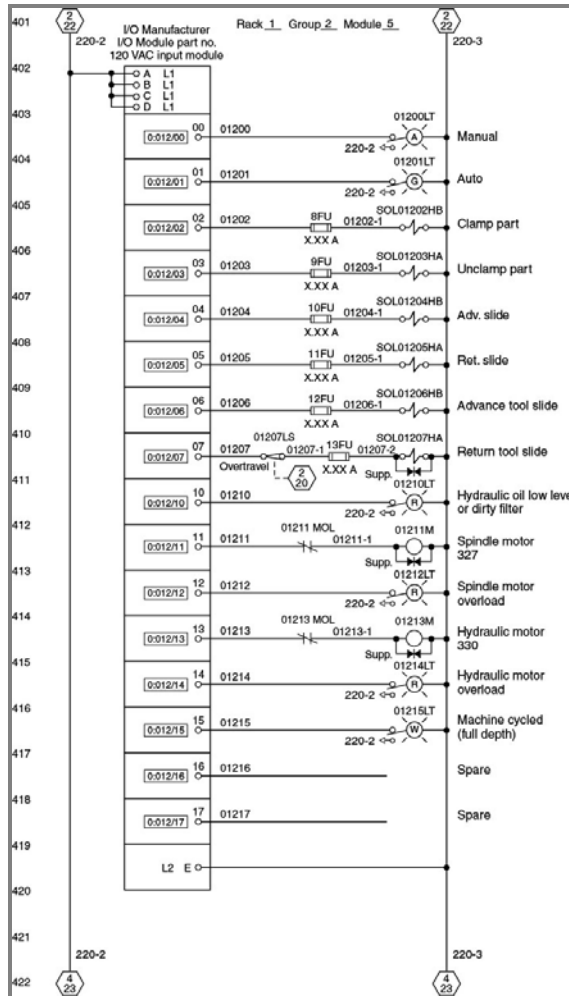


Figure D.1(g) PLC Output Diagram.



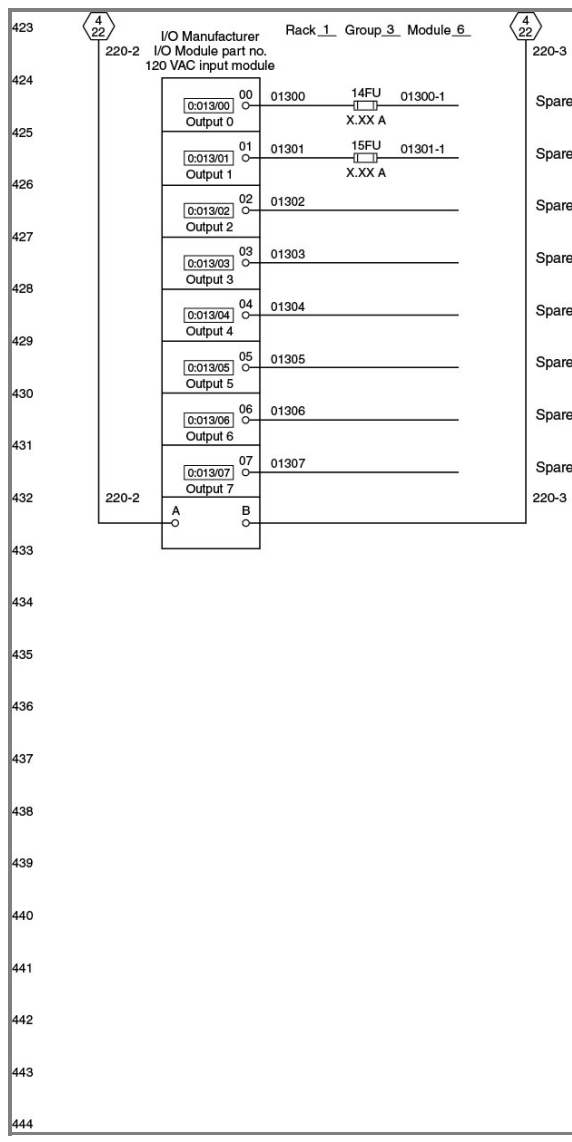


Figure D.1(h) Sample Enclosure Layout — Interior.

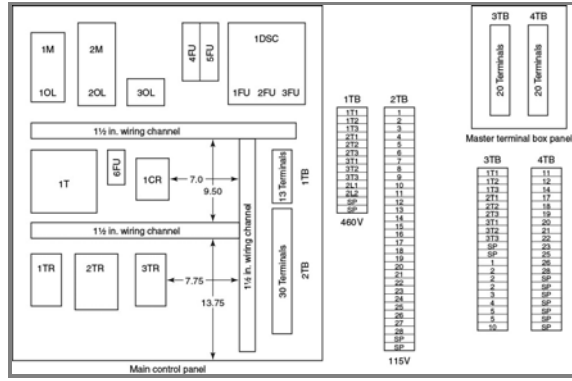


Figure D.1(i) Sample Enclosure Layout — Exterior.

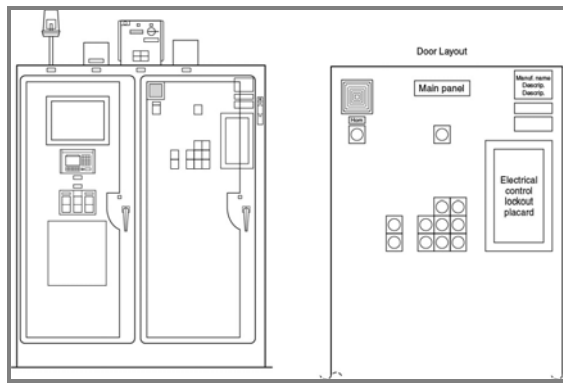


Figure D.1(j) Sequence of Operations — Graphical.

Symbol No.	Ar or Hyd	Action Energized Input Sensor No.	Seq. No.	Sequence Description	Cycle Time (sec)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
---	---	000000 PRB	1	Part present escapement delay	.5																								
000000 SOL	AR	000000 PRB	2	Escapement opens	.75																								
---	---	---	3	Part travel to shuttle	.75																								
---	---	000000 PRB	4	Part present shuttle delay	.5																								
000000 SOL	AR	000000 PRB	5	Escapement closes	.75																								
000000 SOL	AR	000000 PRB	6	Shuttle shifts to track #1	1.0																								
000000 SOL	AR	000000 PRB	7	Part accel track #1 energizes	3.5																								
---	---	000000 PRB	8	Part present loader #1 delay	.5																								
000000 SOL	AR	000000 PRB	9	Shuttle shifts to center	1.0																								
000000 SOL	AR	000000 PRB	10	Loader track #1 advances	1.0																								
---	---	---	11	Loaded track #1 advanced dwell	.5																								
000000 SOL	AR	000000 PRB	12	Loaded track #1 returns	1.0																								
---	---	---	13	Part present escapement delay	.5																								
000000 SOL	AR	000000 PRB	14	Escapement opens	.75																								
---	---	---	15	Part travel to shuttle	.75																								
---	---	000000 PRB	16	Part present shuttle delay	.5																								
000000 SOL	AR	000000 PRB	17	Escapement closes	.75																								
000000 SOL	AR	000000 PRB	18	Shuttle shifts to track #2	1.0																								
000000 SOL	AR	000000 PRB	19	Part accel track #2 energizes	3.5																								
---	---	000000 PRB	20	Part present loader #2 delay	.5																								
000000 SOL	AR	000000 PRB	21	Shuttle shifts to center	1.0																								
000000 SOL	AR	000000 PRB	22	Loader track #2 advances	1.0																								
---	---	---	23	Loaded track #2 advanced dwell	.5																								
000000 SOL	AR	000000 PRB	24	Loaded track #2 returns	1.0																								

Cycle time for one part/one track = 11.0 sec.  
 Cycle time for one part each track = 19.0 sec.

Figure D.1(k) Sequence of Operations — Descriptive Graphical.

Sequence of Operation	Switch Operation
A. Machine operation: press "Motors Start" pushbutton 2PB. Motors start.	1LS (115) actuated by spindle direction lever engaged 1PS (116) operated when spindle clutch engaged 2PS (120) operated by normal lube pressure 1FS (129) operated by adequate lube supply
B. Select spindle speed by turning selector switch to 1SS to 1NC, energizing 3SOL, to increase or to DEC, energizing 4SOL, to decrease setting.	
C. With correct spindle direction selected, limit switch 1LS is actuated. Press "Spindle Start" pushbutton 4PB, energizing relay 1CR, which energizes 1SOL. Spindle starts and pressure switch 1PS is actuated. 1FS energizes 1TR, and after a time delay 2SOL is energized, permitting movement of machine elements at selected feed rates.	For panels and control station layout see <u>Sheet 2</u> For hydraulic diagram see _____ For lubrication diagram see _____
D. Pressing "Spindle Stop" pushbutton 3PB stops spindle and feeds movements simultaneously.	Last wire number used <u>28</u> Last relay number used <u>1CR</u>
E. Lubrication operation.	Supplier's dep. no. _____
F. Pressure switch 2PS is closed.	Supplier's name _____
1. Timer 2TR clutch is energized when motors start.	Purchase order no. <u>P.O. 95011</u>
2. Contact 2TR1 closes and energizes timer motor MTR, starting lube timing period.	Serial no. of machine <u>TYP 121354</u>
3. Contact 2TR2 closes and energizes timer 3TR.	These diagrams used for machine no. _____
G. Timer 2TR times out.	
1. Contact 2TR1 opens, de-energizing timer motor MTR.	
2. Contact 2TR2 closes, energizing 5SOL.	
3. Contact 2TR3 opens, de-energizing timer 3TR.	
4. Lubrication pressure actuates pressure switch 2PS, de-energizing and resetting timer 2TR. Contacts 2TR1, 2TR2, and 2TR3 open.	
5. Contact 2TR2 opening, de-energizes 5SOL.	
H. Reduced lubrication pressure deactuates pressure switch 2PS and sequence repeats.	

Figure D.1(l) Sample Servo Diagram.

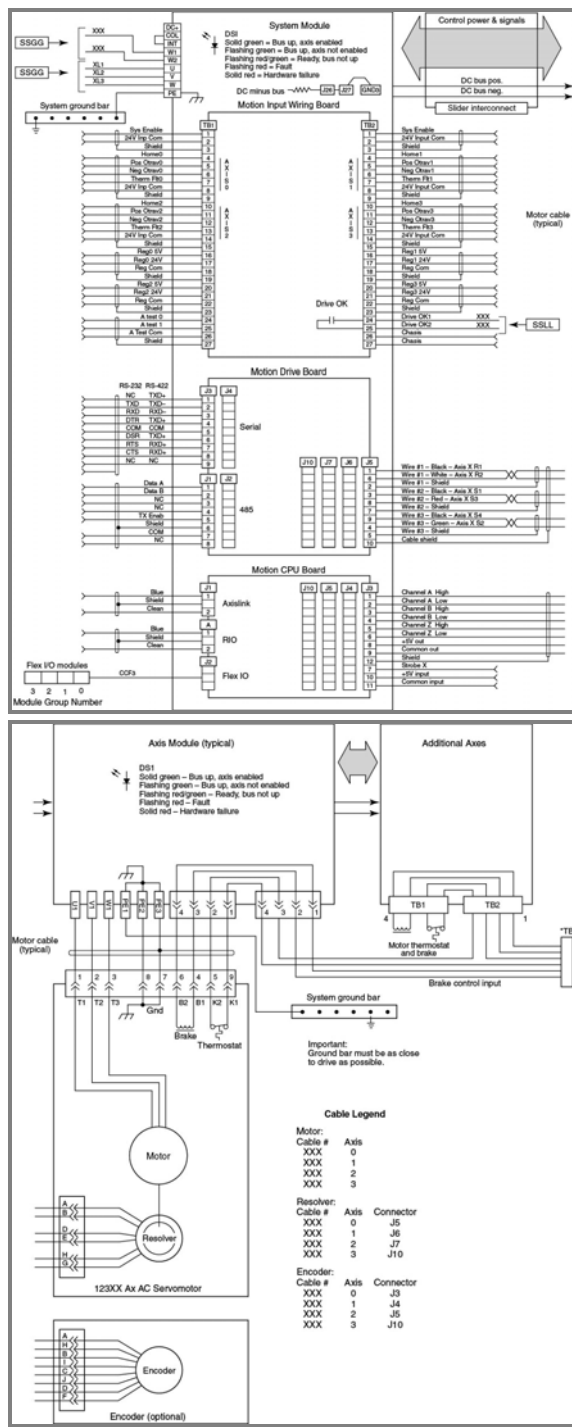


Figure D.1(m) Sample PLC Network — Station Layout.

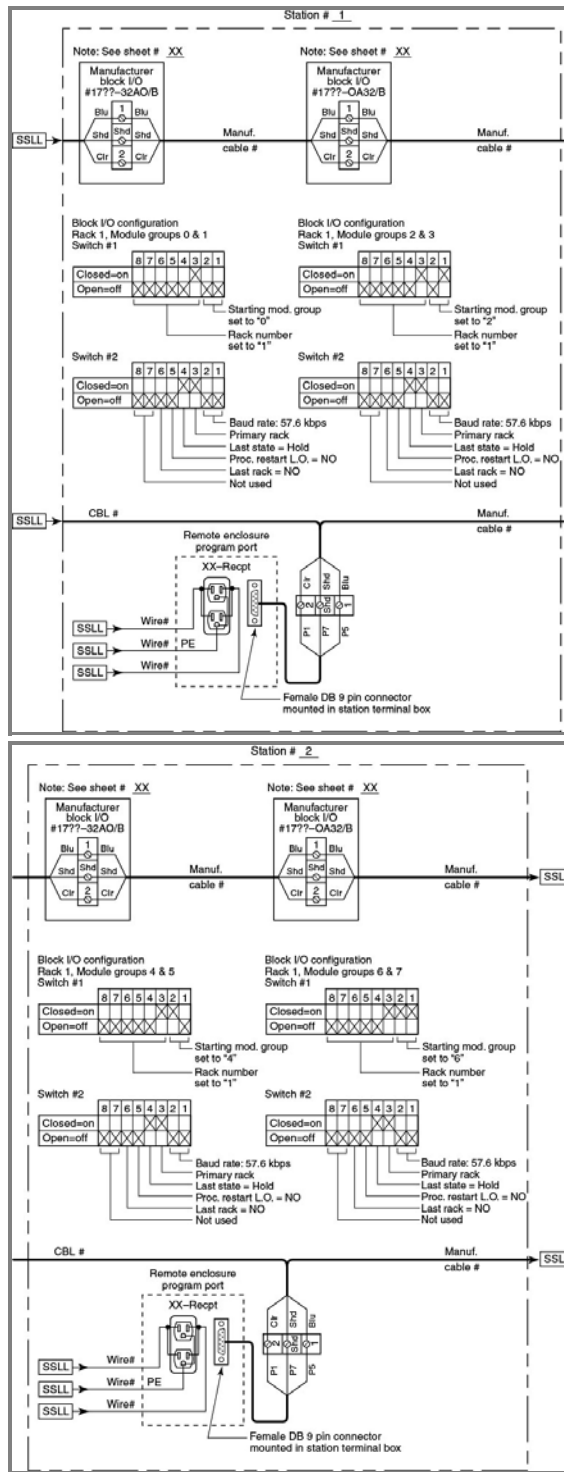


Figure D.1(n) Sample Operator Station.

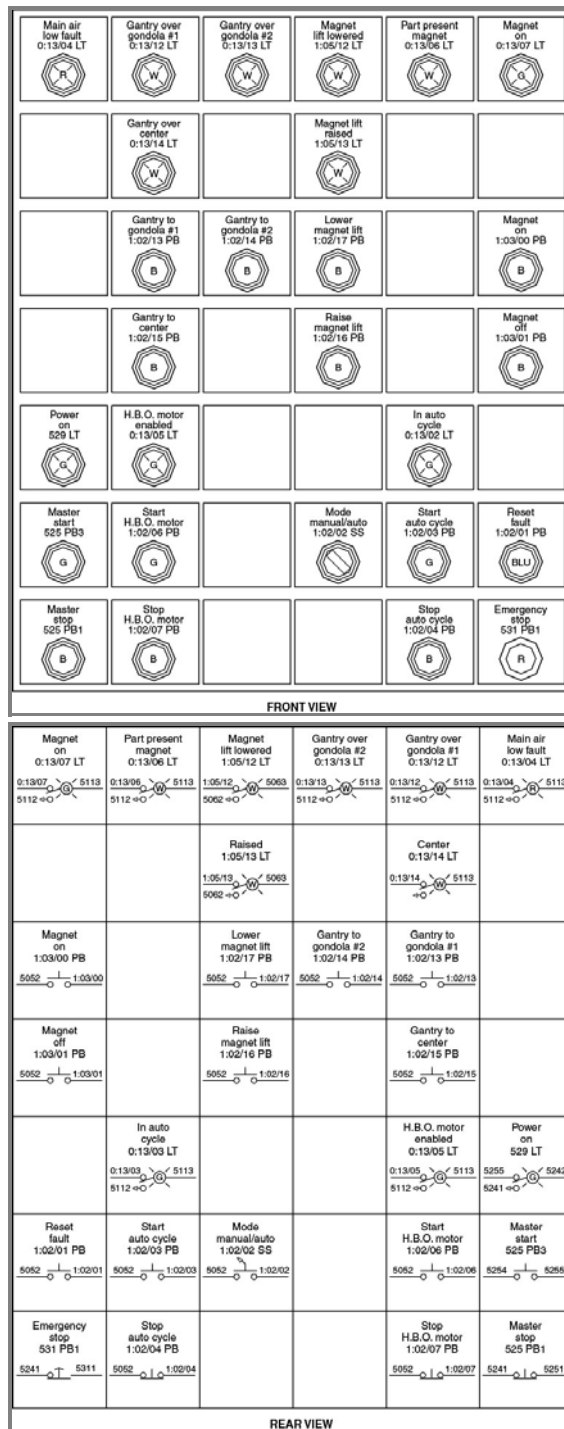


Figure D.1(o) Sample Parts List.

Parts List					
Detail	Qty.	Identifier	Location	Manufacturer	Description
0001	1	Enclosure	---	Supplier name	A-72X7318LP 2-door enclosure, 72 12X73 12X18, 12
0002	1	Panel 1	---	Supplier name	A-72P72 72X72 sub-panel
0003	1	206M	Panel	Supplier name	SE2204L8C2052 Motor, 20KW, 1200 RPM, Fr. 300L, B3 mount
0004	1	119WRPLG	---	Supplier name	GE-6120-4D Bus bar - Fastlok, 100A, 600V
0005	1	204CB	---	Supplier name	SELASA0060 3 pole/100A circuit breaker, SE100 frame
0006	1	206M	---	Supplier name	CL06A311MJ FVNR contactor, 30HP/480V, 48.0A, 120VAC coil
0007	1	211LTDSC	---	Supplier name	TF1000-JFB Lighting disconnect, 1000VA, 480/120V enclosed
0008	12	XXFU	---	Supplier name	Type AGT Fuse, 600V, XX AMP
0009	2	52A3, 52B3	Machine	Supplier name	301AEP115 Proximity switch, 110VAC, 3 pin

In Figure D1(o)

**Lighting disconnect - disconnecting means, 1000VA, 480/120V enclosed**

Figure D.1(p) ISO (A2) Drawing Standard Framework.

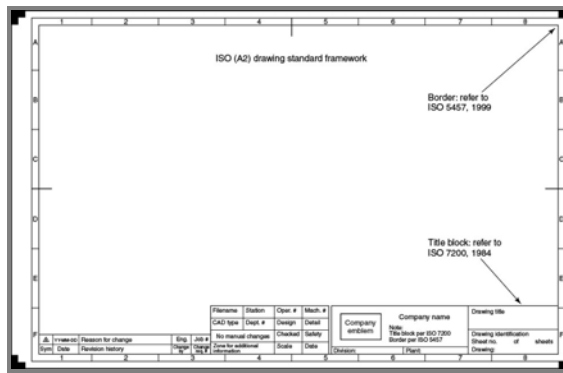


Figure D.1(q) Selections from ANSI Y32.2/IEEE 315 Symbol Table.

ANSI Symbol	ANSI Code	IEC 61346-2 Symbol	IEC Code	Description
	CON		KM	Contactor contact open
	CON		KM	Contactor contact closed
	CR		KA	Relay contact open
	CR		KA	Relay contact closed
	TR		KT	Timed contact, N.O. - on delay (TDE)
	TR		KT	Timed contact, N.C. - on delay (TDE)
	TR		KT	Timed contact, N.C. - off delay (TDD)
	TR		KT	Timed contact, N.O. - off delay (TDD)
	SS		SA	Selector switch
	PB		SB	Pushbutton N.O.
	PB		SB	Pushbutton N.C.
	PB		SB	Pushbutton mushroom head
	FL		SL	Liquid level switch
	FLS		SF	Flow switch
	PS		SP	Pressure switch
	TS		ST	Temperature switch
	LS		SQ	Limit switch
	PRS		SQ	Proximity switch
	LT		HL	Indicating light
	CR		KA	Control relay coil
	CON		KM	Contactor coil
	M		KM	Motor starter coil
	TR		KA	Timer coil
	SOL		YV	Solenoid coil
	CTR		EC	Electromechanical counter
	CB		QF	Circuit breaker
	T1		X1	Terminals (reference)
			XT	Fused terminals (reference)
	FU		FU	Fuse, protective

### Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacic, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Sun Jan 02 10:13:25 EST 2022  
**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-40-NFPA 79-2022](#)

**Statement:** In Figure D.1(o) the term "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

In Figure D.1(e) the word "conduit" is being changed to "raceway" to be consistent with the change made in 5.1.13.2

In Figure D.1(q) IEC standard numbers were revised to reflect current IEC Standard for IEC Symbols and Codes.



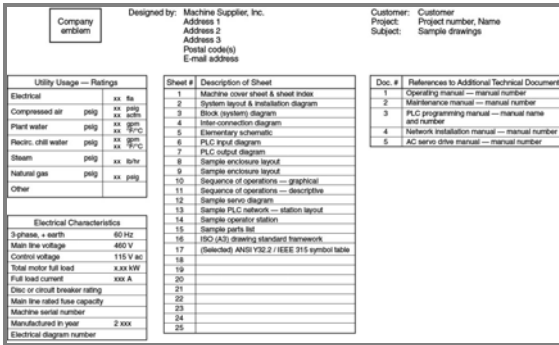
**Public Input No. 121-NFPA 79-2022 [ Section No. D.1 ]**

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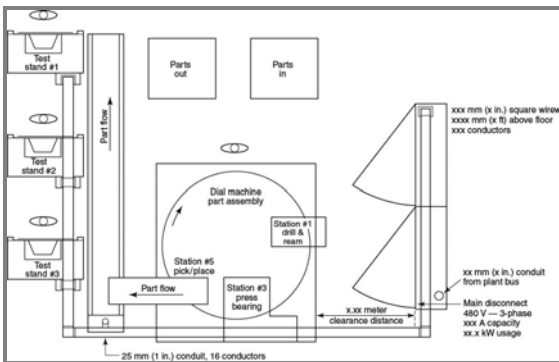
**D.1**

Figure D.1(a) through Figure D.1(q) are not intended to be design guidelines. They are included only to illustrate documentation methods.

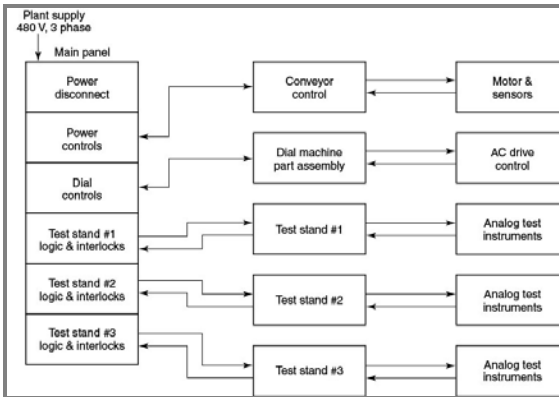
**Figure D.1(a) Cover Sheet and Sheet Index.**



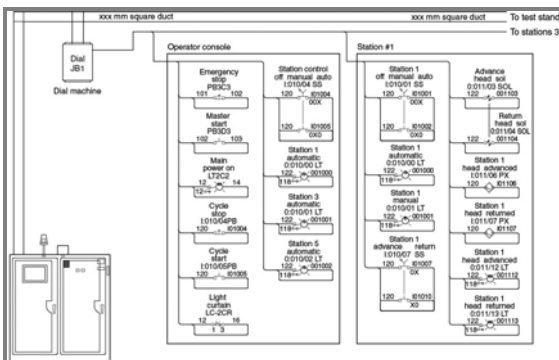
**Figure D.1(b) System Layout and Installation Diagram.**



**Figure D.1(c) Block (System) Diagram.**



**Figure D.1(d) Interconnection Diagram.**



**Figure D.1(e) Elementary Schematic.**

Figure D.1(e)

Change "Encased in conduit" to "Encased in a raceway".

This PI is related to PI 119 for 5.1.13.2(2)

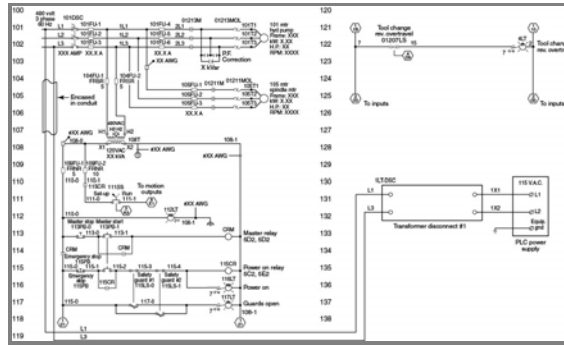
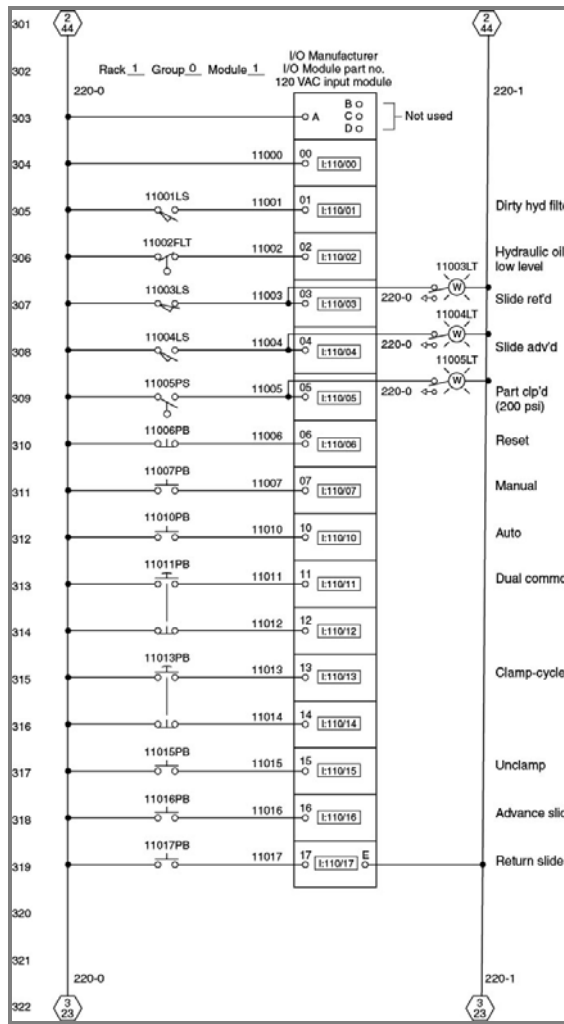


Figure D.1(f) PLC Input Diagram.



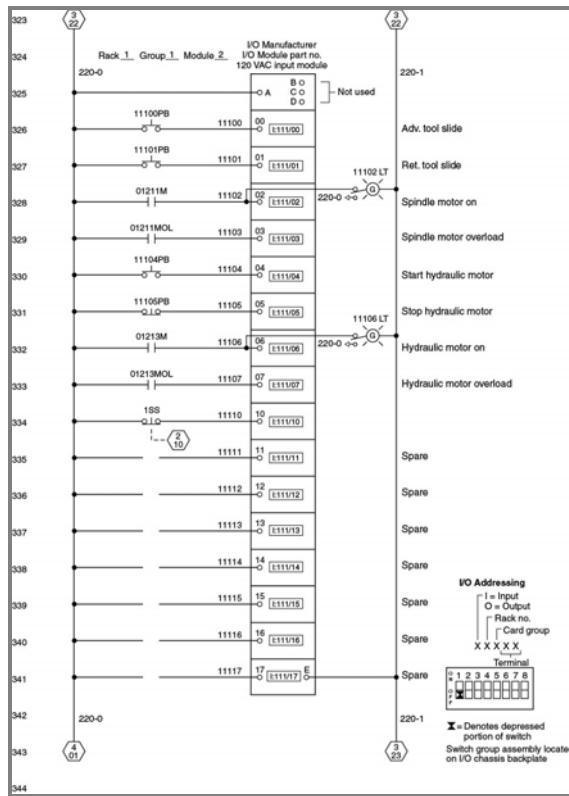
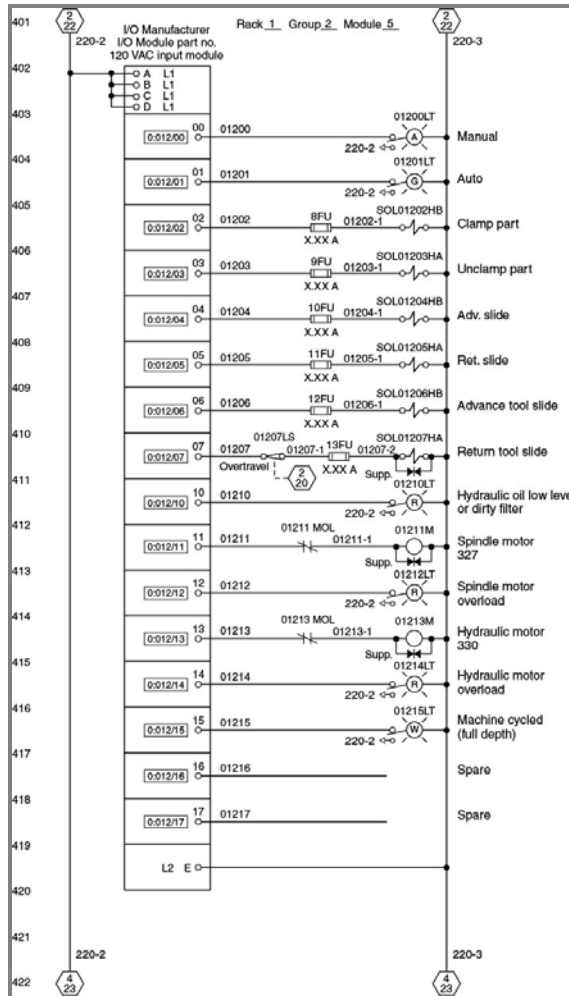


Figure D.1(g) PLC Output Diagram.



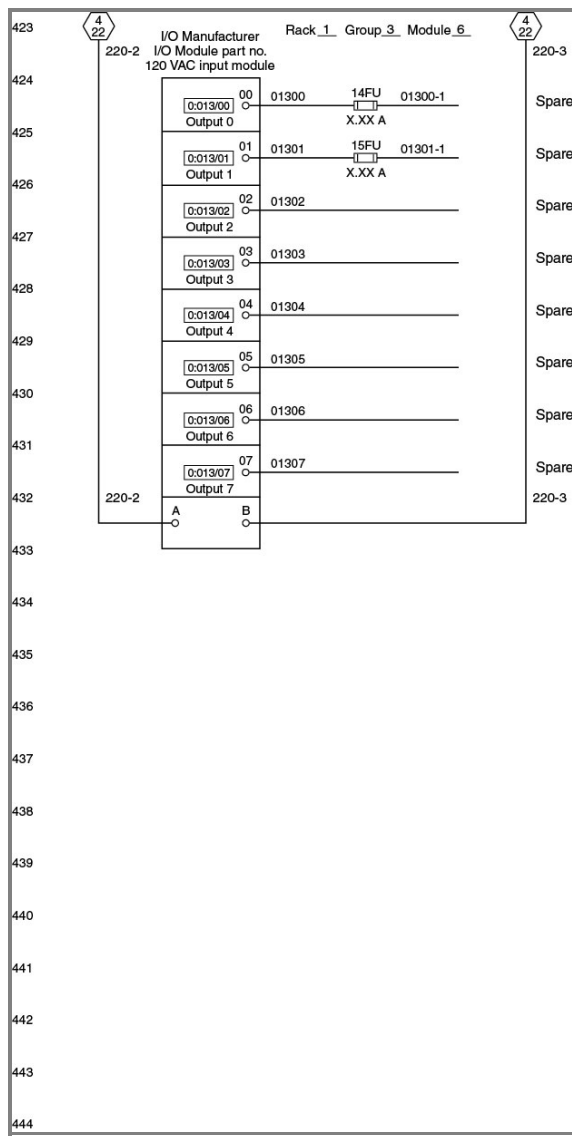


Figure D.1(h) Sample Enclosure Layout — Interior.

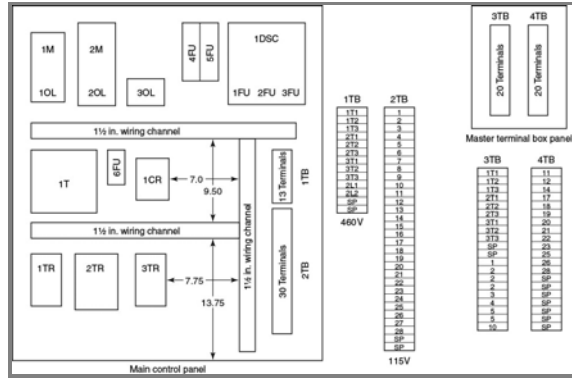


Figure D.1(i) Sample Enclosure Layout — Exterior.

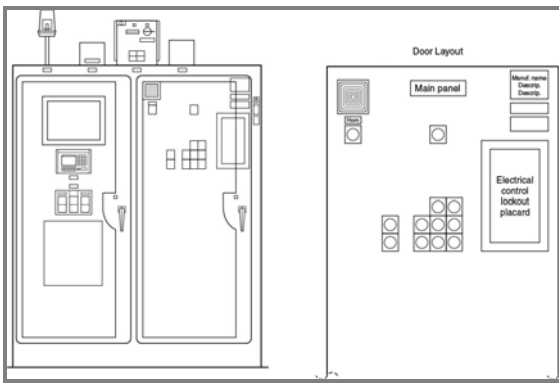


Figure D.1(j) Sequence of Operations — Graphical.

Symbol No.	Ar or Hyd	Action Energized	Seq. No.	Sequence Description	Cycle Time (sec)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
---	---	000000 PRB	1	Part present escapement delay	.5																								
000000 SOL	AR	000000 PRB	2	Escapement opens	.75																								
---	---	---	3	Part travel to shuttle	.75																								
---	---	000000 PRB	4	Part present shuttle delay	.5																								
000000 SOL	AR	000000 PRB	5	Escapement closes	.75																								
000000 SOL	AR	000000 PRB	6	Shuttle shifts to track #1	1.0																								
000000 SOL	AR	---	7	Part accel track #1 energizes	3.5																								
---	---	000000 PRB	8	Part present loader #1 delay	.5																								
000000 SOL	AR	000000 PRB	9	Shuttle shifts to center	1.0																								
000000 SOL	AR	000000 PRB	10	Loader track #1 advances	1.0																								
---	---	---	11	Loaded track #1 advanced dwell	.5																								
000000 SOL	AR	000000 PRB	12	Loaded track #1 returns	1.0																								
---	---	---	13	Part present escapement delay	.5																								
000000 SOL	AR	000000 PRB	14	Escapement opens	.75																								
---	---	---	15	Part travel to shuttle	.75																								
---	---	000000 PRB	16	Part present shuttle delay	.5																								
000000 SOL	AR	000000 PRB	17	Escapement closes	.75																								
000000 SOL	AR	000000 PRB	18	Shuttle shifts to track #2	1.0																								
000000 SOL	AR	---	19	Part accel track #2 energizes	3.5																								
---	---	000000 PRB	20	Part present loader #2 delay	.5																								
000000 SOL	AR	000000 PRB	21	Shuttle shifts to center	1.0																								
000000 SOL	AR	000000 PRB	22	Loader track #2 advances	1.0																								
---	---	---	23	Loaded track #2 advanced dwell	.5																								
000000 SOL	AR	000000 PRB	24	Loaded track #2 returns	1.0																								

Cycle time for one part/one track = 11.0 sec.  
 Cycle time for one part each track = 19.0 sec.

Figure D.1(k) Sequence of Operations — Descriptive Graphical.

Sequence of Operation	Switch Operation
A. Machine operation: press "Motors Start" pushbutton 2PB. Motors start.	1LS (115) actuated by spindle direction lever engaged 1PS (116) operated when spindle clutch engaged 2PS (120) operated by normal lube pressure 1FS (129) operated by adequate lube supply
B. Select spindle speed by turning selector switch to 1SS to 1NC, energizing 3SOL, to increase or to DEC, energizing 4SOL, to decrease setting.	
C. With correct spindle direction selected, limit switch 1LS is actuated. Press "Spindle Start" pushbutton 4PB, energizing relay 1CR, which energizes 1SOL. Spindle starts and pressure switch 1PS is actuated. 1FS energizes 1TR, and after a time delay 2SOL is energized, permitting movement of machine elements at selected feed rates.	For panels and control station layout see <u>Sheet 2</u> For hydraulic diagram see _____ For lubrication diagram see _____
D. Pressing "Spindle Stop" pushbutton 3PB stops spindle and feeds movements simultaneously.	Last wire number used <u>28</u> Last relay number used <u>1CR</u>
E. Lubrication operation.	Supplier's dep. no. _____
F. Pressure switch 2PS is closed.	Supplier's name _____
1. Timer 2TR clutch is energized when motors start.	Purchase order no. <u>P.O. 95011</u>
2. Contact 2TR1 closes and energizes timer motor MTR, starting lube timing period.	Serial no. of machine <u>TYP 121354</u>
3. Contact 2TR2 closes and energizes timer 3TR.	These diagrams used for machine no. _____
G. Timer 2TR times out.	
1. Contact 2TR1 opens, de-energizing timer motor MTR.	
2. Contact 2TR2 closes, energizing 5SOL.	
3. Contact 2TR3 opens, de-energizing timer 3TR.	
4. Lubrication pressure actuates pressure switch 2PS, de-energizing and resetting timer 2TR. Contacts 2TR1, 2TR2, and 2TR3 open.	
5. Contact 2TR2 opening, de-energizes 5SOL.	
H. Reduced lubrication pressure deactuates pressure switch 2PS and sequence repeats.	

Figure D.1(l) Sample Servo Diagram.

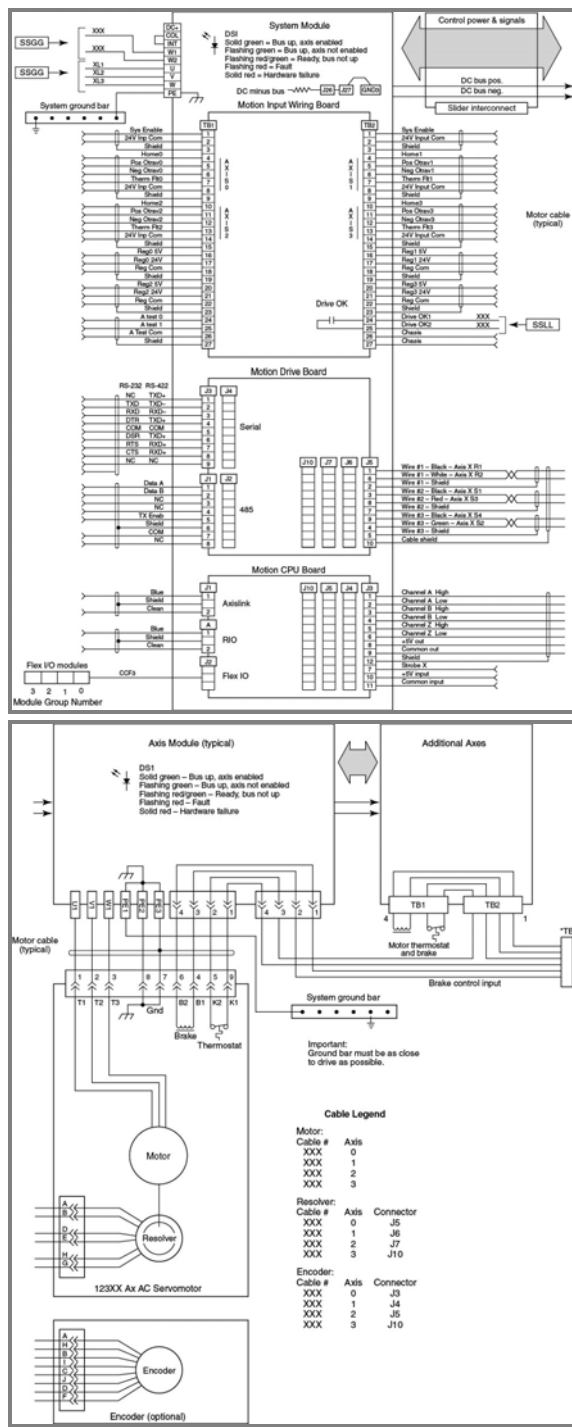


Figure D.1(m) Sample PLC Network — Station Layout.

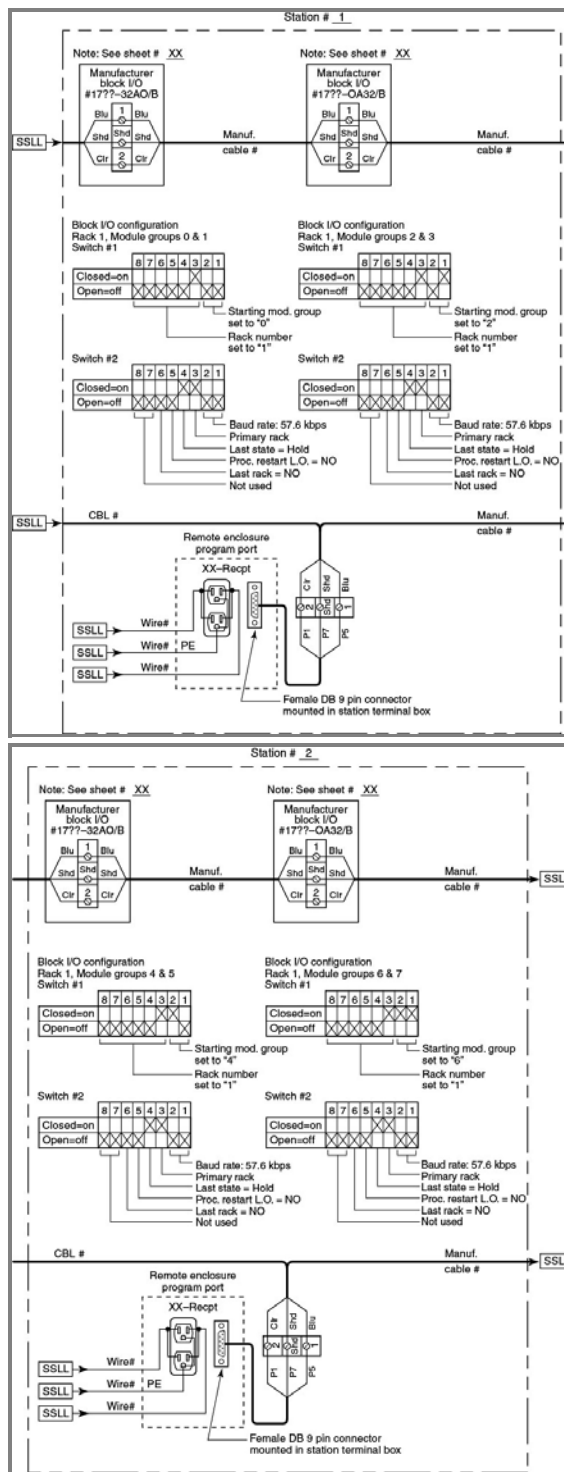


Figure D.1(n) Sample Operator Station.

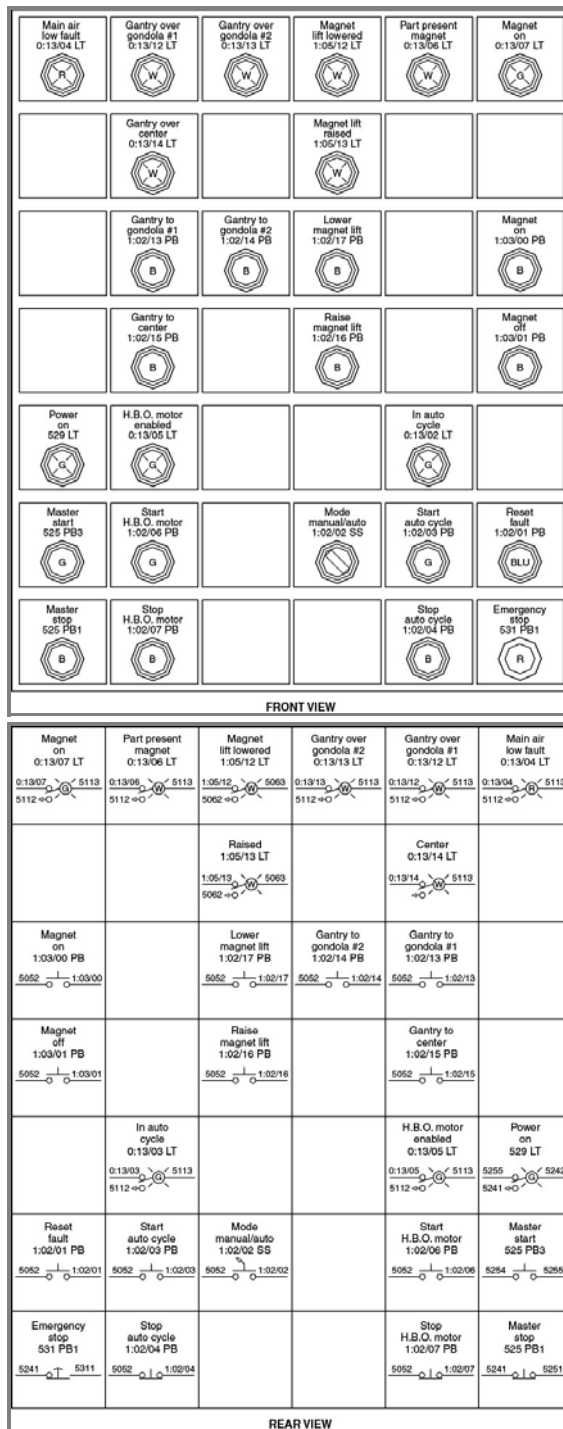


Figure D.1(o) Sample Parts List.

Parts List						
Detail	Qty	Identifier	Location	Manufacturer	Part Number	Description
0001	1	Enclosure	—	Supplier name	A-72X7318LP	2-door enclosure, 72.12X73.12X18.12
0002	1	Panel 1	—	Supplier name	A-72P72	72X72 sub-panel
0003	1	206M	Panel	Supplier name	2K2003R123522	Motor, 220V, 1200 RPM, Fr. 200L, B3 mount
0004	1	1PWRPLG	—	Supplier name	GE-0100-40	Bus fuse — Fuses, 100A, 600V
0005	1	204CB	—	Supplier name	SELA36AT0060	3 pole/100A circuit breaker, SE100 frame
0006	1	206M	—	Supplier name	CL06A311MJ	FVNR contactor, 30HP/460V, 48.0A, 120VAC coil
0007	1	211LTOSC	—	Supplier name	TF1000-JFB	Lighting disconnect, 1000VA, 480/120V enclosed
0008	12	X0FU	—	Supplier name	Type A2T	Fuse, 600V, XX AMP
0009	2	SG2A3, SG2B3	Machine	Supplier name	301AEP115	Proximity switch, 115VAC, 3 pin

Figure D.1(p) ISO (A2) Drawing Standard Framework.

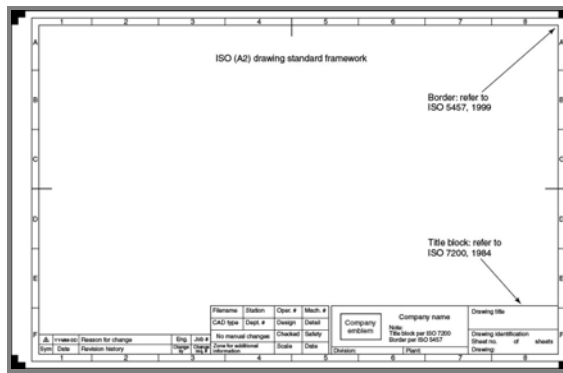


Figure D.1(q) Selections from ANSI Y32.2/IEEE 315 Symbol Table.

ANSI Symbol	ANSI Code	IEC 61346-2 Symbol	IEC Code	Description
	CON		KM	Contactor contact open
	CON		KM	Contactor contact closed
	CR		KA	Relay contact open
	CR		KA	Relay contact closed
	TR		KT	Timed contact, N.O. - on delay (TDE)
	TR		KT	Timed contact, N.C. - on delay (TDE)
	TR		KT	Timed contact, N.C. - off delay (TDD)
	TR		KT	Timed contact, N.O. - off delay (TDD)
	SS		SA	Selector switch
	PB		SB	Pushbutton N.O.
	PB		SB	Pushbutton N.C.
	PB		SB	Pushbutton mushroom head
	FL		SL	Liquid level switch
	FLS		SF	Flow switch
	PS		SP	Pressure switch
	TS		ST	Temperature switch
	LS		SQ	Limit switch
	PRS		SQ	Proximity switch
	LT		HL	Indicating light
	CR		KA	Control relay coil
	CON		KM	Contactor coil
	M		KM	Motor starter coil
	TR		KA	Timer coil
	SOL		YV	Solenoid coil
	CTR		EC	Electromechanical counter
	CB		QF	Circuit breaker
	T1		X1	Terminals (reference)
			XT	Fused terminals (reference)
	FU		FU	Fuse, protective

### Statement of Problem and Substantiation for Public Input

Figure D.1(e)

Change "Encased in conduit" to "Encased in a raceway".

This PI is related to PI 119 for 5.1.13.2(2)

As presently stated liquid tight nonmetallic conduit is permitted to encase line side conductors based on the use of the terms "rigid or flexible conduit". Electrical metallic tubing is not a conduit, but it is a raceway and should also be allowed for this purpose. The term raceway is presently defined in Chapter 3 and provides a description of conduits, tubings and other products.

### Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky

**Organization:** Innovative Technology Services

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Wed Jan 05 11:51:21 EST 2022

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-40-NFPA 79-2022](#)

**Statement:** In Figure D.1(o) the term "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

In Figure D.1(e) the word "conduit" is being changed to "raceway" to be consistent with the change made in 5.1.13.2

In Figure D.1(q) IEC standard numbers were revised to reflect current IEC Standard for IEC Symbols and Codes.



**Public Input No. 24-NFPA 79-2021 [ Section No. D.1 ]**

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**D.1**

Figure D.1(a) through Figure D.1(q) are not intended to be design guidelines. They are included only to illustrate documentation methods.

Figure D.1(a) Cover Sheet and Sheet Index.

	Designed by: Machine Supplier, Inc. Address 1 Address 2 Address 3 Postal code(s) E-mail address	Customer: Customer Project: Project number, Name Subject: Sample drawings
<b>Utility Usage — Ratings</b>	<b>Sheet #</b> Description of Sheet	<b>Doc. #</b> References to Additional Technical Documents
Electrical xx fa	1 Machine cover sheet & sheet index	1 Operating manual — manual number
Compressed air psig xx psig	2 System layout & installation diagram	2 Maintenance manual — manual number
Plant water psig xx psig	3 Block system diagram	3 PLC programming manual — manual name and number
Recirc. chill water psig xx psig	4 Inter-connection diagram	4 Network installation manual — manual number
Steam psig xx psig	5 Elementary schematic	5 AC servo drive manual — manual number
Natural gas psig xx psig	6 PLC input diagram	
Other xx psig	7 PLC output diagram	
	8 Sample enclosure layout	
	9 Sample enclosure layout	
	10 Sequence of operations — graphical	
	11 Sequence of operations — descriptive	
	12 Sample sensor diagram	
	13 Sample PLC network — station layout	
	14 Sample operator station	
	15 Sample parts list	
	16 ISO A3 drawing standard framework	
	17 (Selected) ANSI Y32.2 / IEEE 315 symbol table	
	18	
	19	
	20	
	21	
	22	
	23	
	24	
	25	
<b>Electrical Characteristics</b>		
3-phase, + earth 60 Hz		
Main line voltage 480 V		
Control voltage 115 V AC		
Total motor full load xx kW		
Full load current xxx A		
Over or circuit breaker rating		
Main line rated fuse capacity		
Machine serial number		
Manufactured in year 2 xxx		
Electrical diagram number		

Figure D.1(b) System Layout and Installation Diagram.

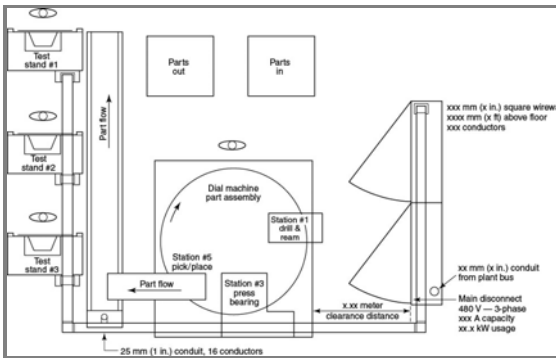


Figure D.1(c) Block (System) Diagram.

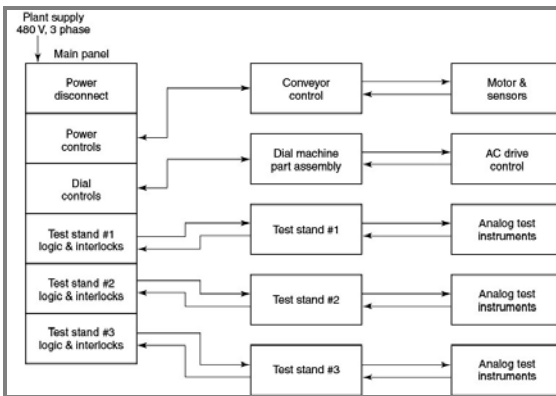


Figure D.1(d) Interconnection Diagram.

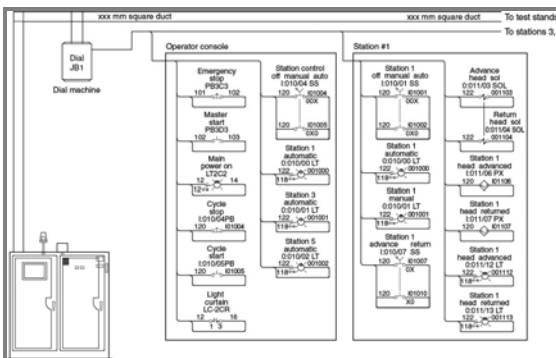


Figure D.1(e) Elementary Schematic.

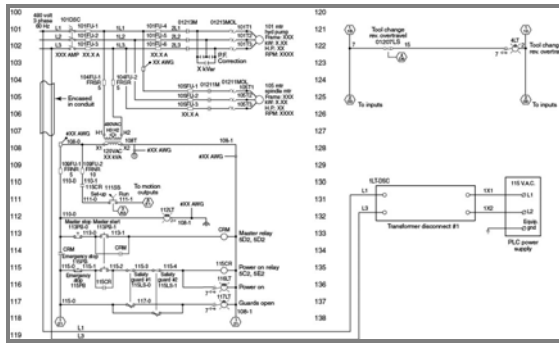
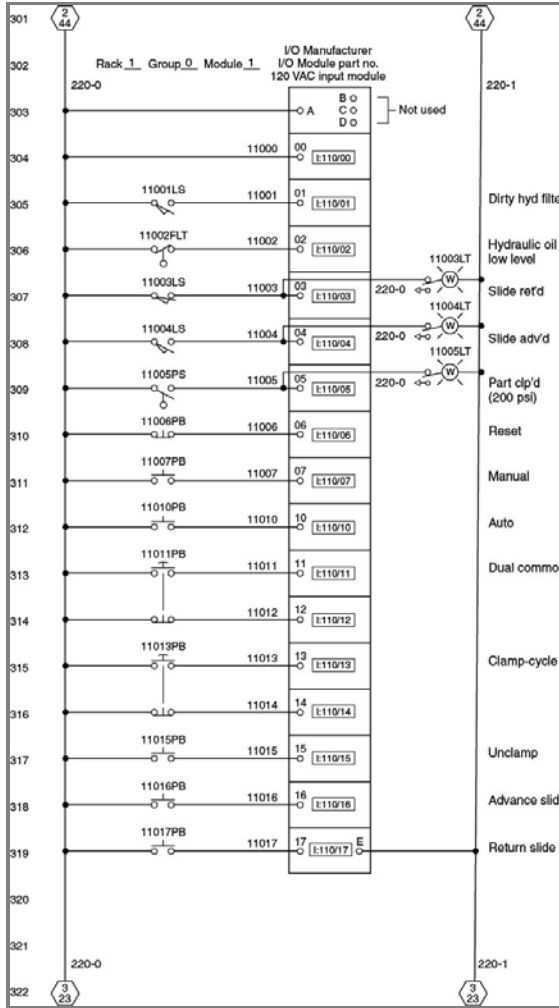


Figure D.1(f) PLC Input Diagram.



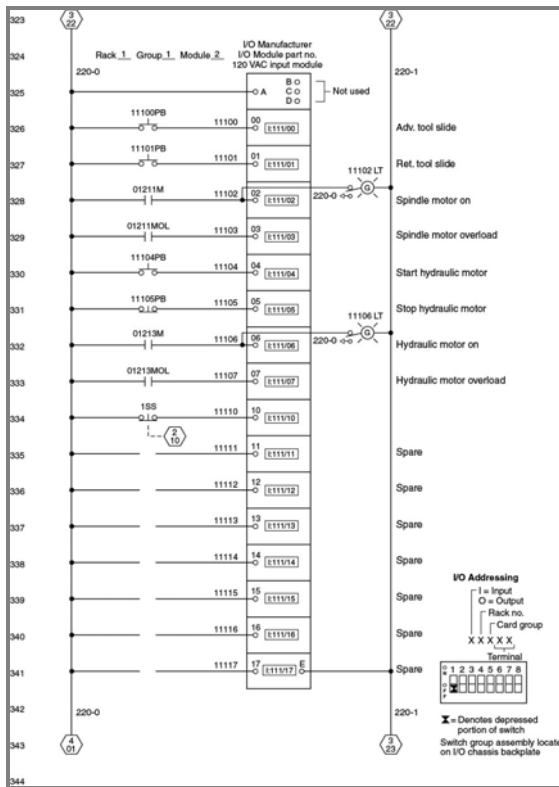
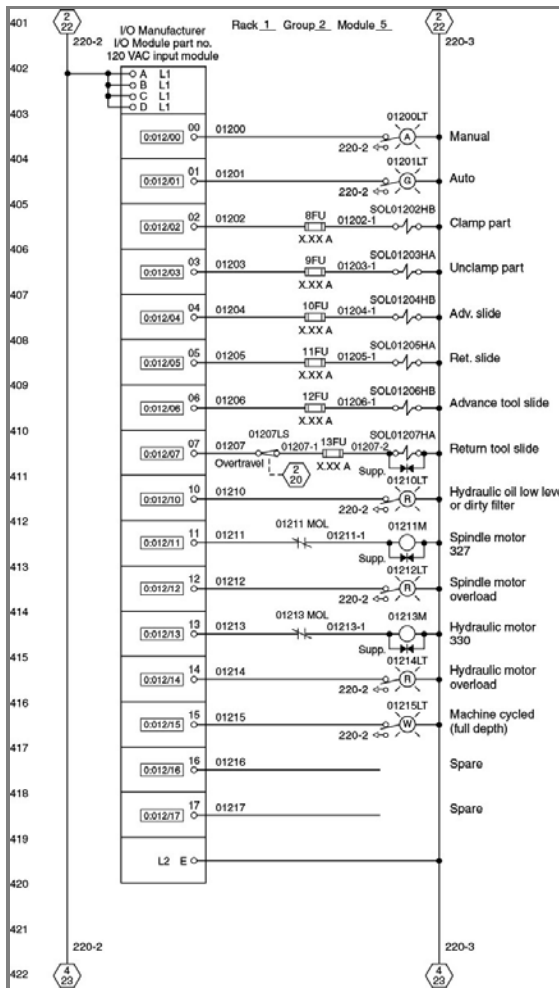


Figure D.1(g) PLC Output Diagram.



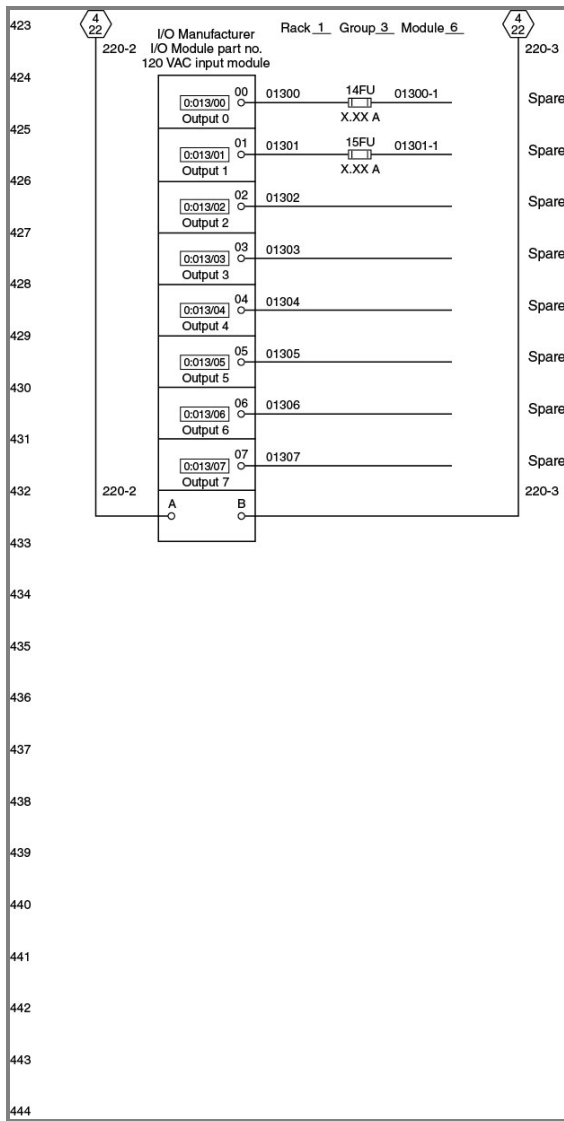


Figure D.1(h) Sample Enclosure Layout — Interior.

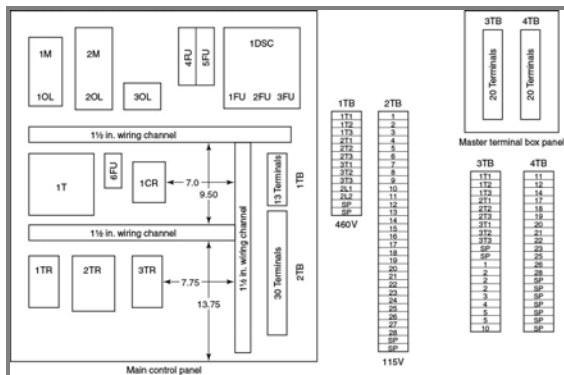


Figure D.1(i) Sample Enclosure Layout — Exterior.

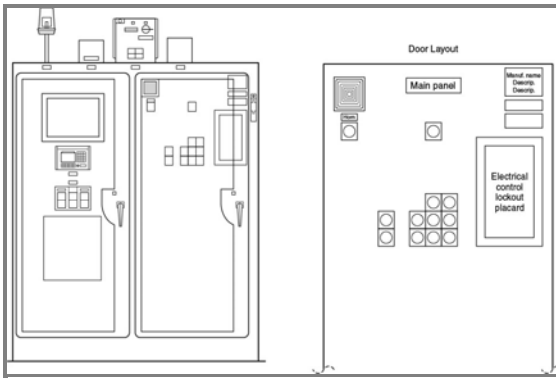


Figure D.1(j) Sequence of Operations — Graphical.

Sequence No.	Act. for	Action Energized	Seq. No.	Sequence Description	Cycle Time (sec)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
---	---	000000 PRS	1	Part present escapement delay	.5																									
000000 SOL	AIR	000000 PRS	2	Escapement opens	.75																									
---	---	---	3	Part travel to shuttle	.75																									
---	---	000000 PRS	4	Part present shuttle delay	.5																									
000000 SOL	AIR	000000 PRS	5	Escapement closes	.75																									
000000 SOL	AIR	000000 PRS	6	Shuttle shifts to track #1	1.0																									
000000 SOL	AIR	---	7	Part accel track #1 energizes	3.5																									
---	---	000000 PRS	8	Part present loader #1 delay	.5																									
000000 SOL	AIR	000000 PRS	9	Shuttle shifts to center	1.0																									
000000 SOL	AIR	000000 PRS	10	Loader track #1 advances	1.0																									
---	---	---	11	Loaded track #1 advanced dwell	.5																									
000000 SOL	AIR	000000 PRS	12	Loaded track #1 returns	1.0																									
---	---	---	13	Part present escapement delay	.5																									
000000 SOL	AIR	000000 PRS	14	Escapement opens	.75																									
---	---	---	15	Part travel to shuttle	.75																									
---	---	000000 PRS	16	Part present shuttle delay	.5																									
000000 SOL	AIR	000000 PRS	17	Escapement closes	.75																									
000000 SOL	AIR	000000 PRS	18	Shuttle shifts to track #2	1.0																									
000000 SOL	AIR	---	19	Part accel track #2 energizes	3.5																									
---	---	000000 PRS	20	Part present loader #2 delay	.5																									
000000 SOL	AIR	000000 PRS	21	Shuttle shifts to center	1.0																									
000000 SOL	AIR	000000 PRS	22	Loader track #2 advances	1.0																									
---	---	---	23	Loaded track #2 advanced dwell	.5																									
000000 SOL	AIR	000000 PRS	24	Loaded track #2 returns	1.0																									

Cycle time for one part/one track = 11.0 sec.  
Cycle time for one part each track = 19.0 sec.

Figure D.1(k) Sequence of Operations — Descriptive Graphical.

Sequence of Operation	Switch Operation
A. Machine operation: press "Motors Start" pushbutton 2PB. Motors start.	1LS (115) actuated by spindle direction lever engaged 1PS (116) operated when spindle clutch engaged
B. Select spindle speed by turning selector switch to 1SS to 1NC, energizing 2SOL, to increase or to DEC, energizing 4SOL, to decrease setting.	2PS (126) operated by normal lube pressure 1FS (129) operated by adequate lube supply
C. With correct spindle direction selected, limit switch 1LS is actuated. Press "Spindle Start" pushbutton 4PB, energizing relay 1CR, which energizes 1SOL. Spindle starts and pressure switch 1PS is actuated, 1PS energizes 1TR, and after a time delay 2SOL is energized, permitting movement of machine elements at selected feed rates.	For panels and control station layout see <u>Sheet 2</u> For hydraulic diagram see _____ For lubrication diagram see _____
D. Pressing "Spindle Stop" pushbutton 3PB stops spindle and feeds movements simultaneously.	Last wire number used <u>2B</u>
E. Lubrication operation.	Last relay number used <u>1CR</u>
F. Pressure switch 2PS is closed.	Supplier's deg. no. _____
1. Timer 2TR clutch is energized when motors start.	Supplier's name _____
2. Contact 2TR1 closes and energizes timer motor MTR, starting lube timing period.	Purchase order no. <u>P.O. 92011</u>
3. Contact 2TR3 closes and energizes timer 3TR.	Serial no. of machine <u>TYP 121544</u>
G. Timer 2TR times out.	These diagrams used for machine no. _____
1. Contact 2TR1 opens, de-energizing timer motor MTR.	
2. Contact 2TR2 closes, energizing 5SOL.	
3. Contact 2TR3 opens, de-energizing timer 3TR.	
4. Lubrication pressure actuates pressure switch 2PS, de-energizing and resetting timer 2TR. Contacts 2TR1, 2TR2, and 2TR3 open.	
5. Contact 2TR2 opening, de-energizes 5SOL.	
H. Reduced lubrication pressure deactuates pressure switch 2PS and sequence repeats.	

Figure D.1(l) Sample Servo Diagram.

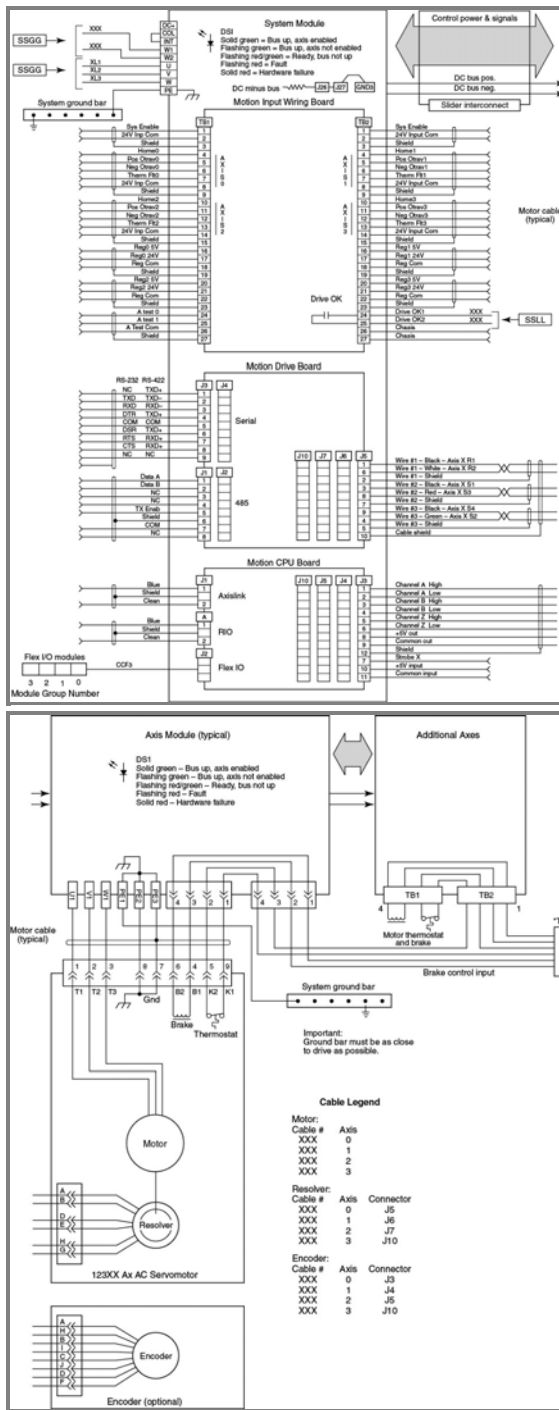


Figure D.1(m) Sample PLC Network — Station Layout.

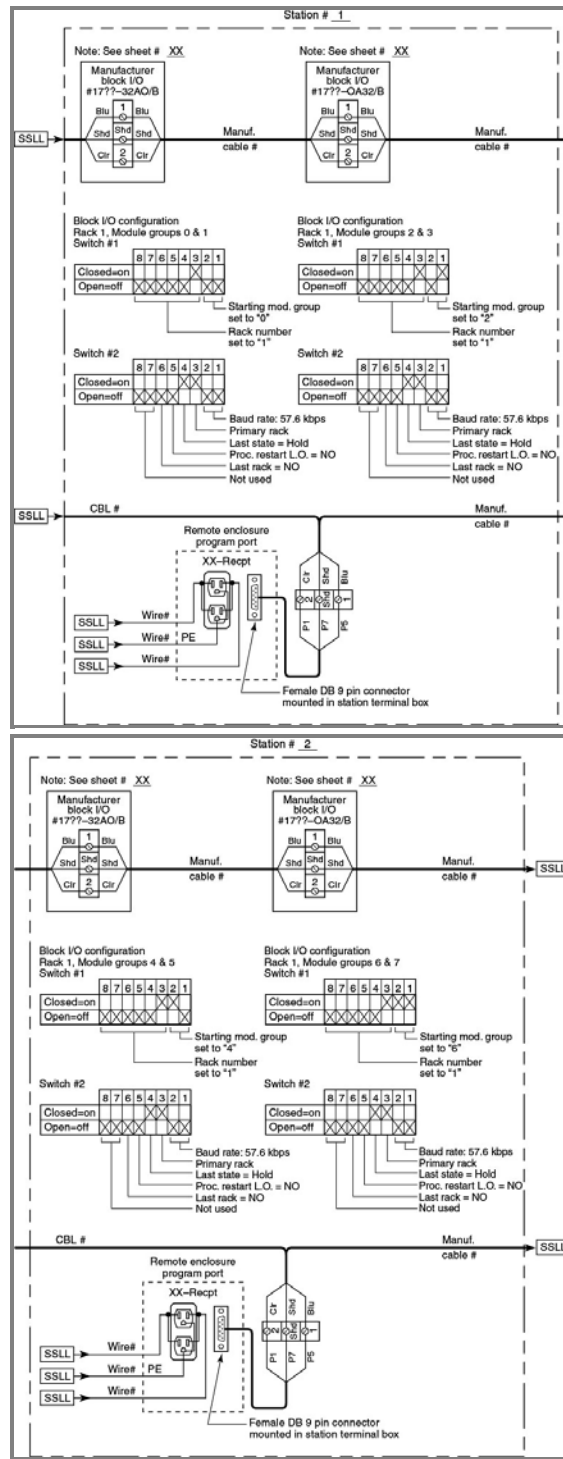


Figure D.1(n) Sample Operator Station.

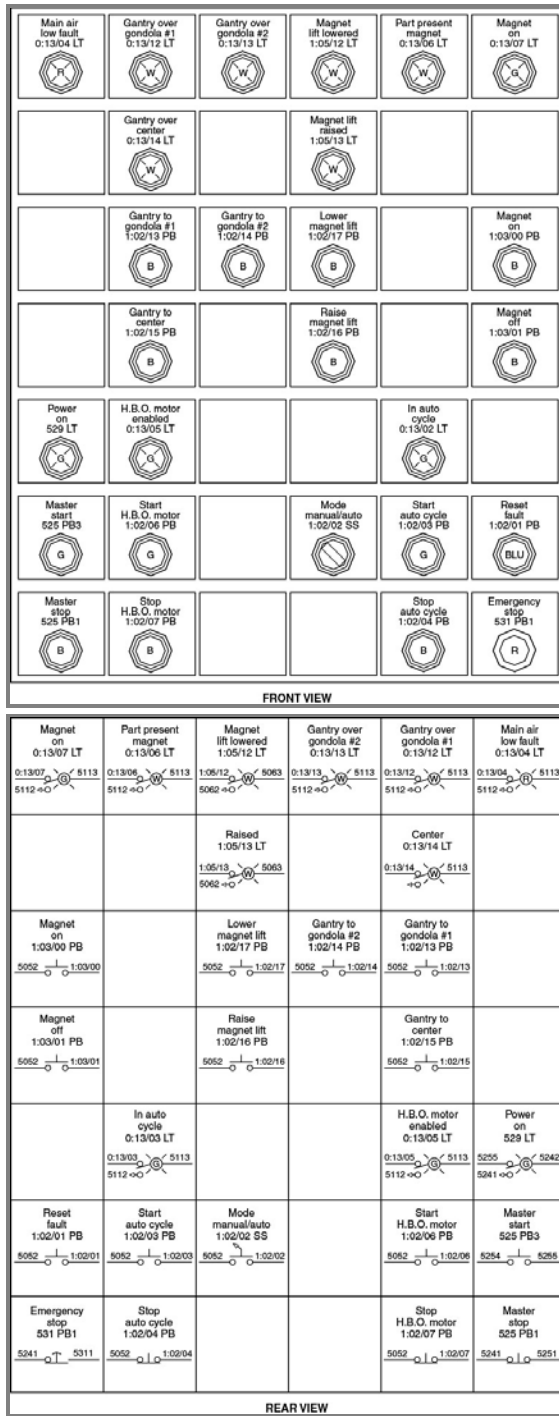


Figure D.1(o) Sample Parts List.

Parts List						
Detail	Qty	Identifier	Location	Manufacturer	Part Number	Description
0001	1	Enclosure	—	Supplier name	A-72X7318LP	2-door enclosure, 72-12X73-12X18-12
0002	1	Panel 1	—	Supplier name	A-72P72	72X72 sub-panel
0003	1	206M	Panel	Supplier name	9KE200LBI03522	Motor, 220W, 1200 RPM, Fr. 200L, B3 mount
0004	1	1PWRPLG	—	Supplier name	GE-0100-40	Bus fuse — Fusible, 100A, 600V
0005	1	204CB	—	Supplier name	SELA36AT060	3 pole/100A circuit breaker, SE 100 frame
0006	1	206M	—	Supplier name	CLOA311MJ	FVNR contactor, 30HP/460V, 48-0A, 120VAC coil
0007	1	211LTDISC	—	Supplier name	TF1000-JFB	Lighting disconnect, 1000VA, 480/120V enclosed
0008	12	XXFU	—	Supplier name	Type AGT	Fuse, 600V, XX AMP
0009	2	SG2A3, SG2B3	Machine	Supplier name	3014EP115	Priority switch, 115VAC, 3 pin

Figure D.1(p) ISO (A2) Drawing Standard Framework.



**Submitter Full Name:** Marco Tacchini  
**Organization:** GT Engineering  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Mon Dec 06 05:37:40 EST 2021  
**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-40-NFPA 79-2022](#)

**Statement:** In Figure D.1(o) the term "disconnect" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

In Figure D.1(e) the word "conduit" is being changed to "raceway" to be consistent with the change made in 5.1.13.2

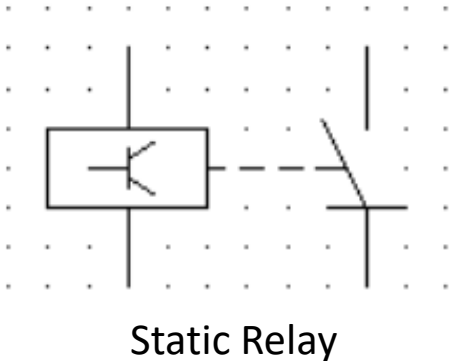
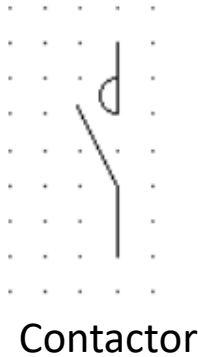
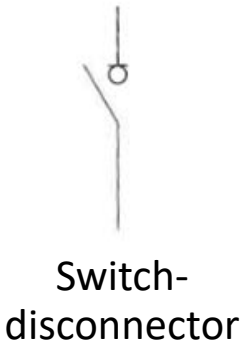
In Figure D.1(q) IEC standard numbers were revised to reflect current IEC Standard for IEC Symbols and Codes.

Figure D.1(q) needs to be updated, since IEC 61346-2 was withdrawn. The new references are:

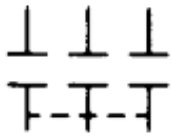
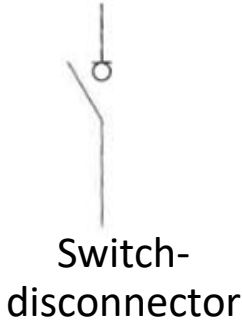
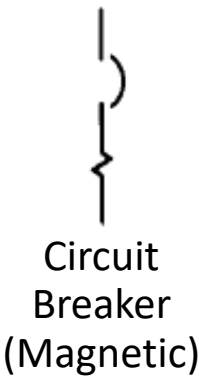
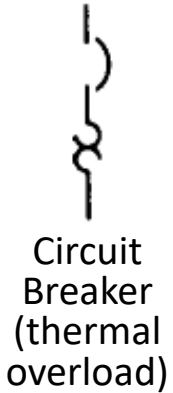
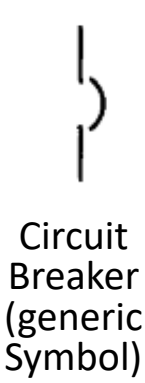
- IEC 60617 for symbols
- IEC 81346-2 for acronyms

### Basic symbology

IEC 60617



ANSI Y32.2





**Public Input No. 105-NFPA 79-2022 [ Section No. E.1 ]**

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**E.1 Device and Compound Designations.**

The device and component designations given in Table E.1 are intended for use on diagrams in connection with the corresponding graphical symbols to indicate the function of the particular device. These device and component designations are based on the assignment of a standard letter or letters to the fundamental function that is performed by a component or device. Suitable numbers (1, 2, 3, etc.) and letters (A, B, C, etc.) can be added to the basic designation to differentiate between devices performing similar functions.

The assignment of a designation to a device on specific equipment is governed by the function of that device on that equipment and not by the type or nature of the device or its possible use for other functions on other equipment. The same type of device can perform different functions on different equipment or even on the same equipment and, consequently, can be identified by different designations.

Table E.1 Device and Component Designations

<u>Designation</u>	<u>Device</u>
ABE	Alarm or Annunciator Bell
ABU	Alarm or Annunciator Buzzer
AH	Alarm or Annunciator Horn
AM	Ammeter
AT	Autotransformer
CAP	Capacitor
CB	Circuit Breaker
CI	Circuit Interrupter
CNC	Computerized Numerical Controller
CON	Contact
COs	Cable-Operated (Emergency) Switch
CPU	Central Processing Unit
CR	Control Relay
CRA	Control Relay, Automatic
CRH	Control Relay, Manual
CRL	Control Relay, Latch
CRM	Control Relay, Master
CRT	Cathode Ray Tube, Monitor or Video Display Unit
CRU	Control Relay, Unlatch
CS	Cam Switch
CT	Current Transformer
CTR	Counter
D	Diode
DISC	<del>Disconnect Switch</del> <u>Disconnecting Means</u>
DISP	Display
DR	Drive
EMO	Emergency (Machine) Off Device
END	Encoder
ESTOP	Emergency Stop
FLD	Field
FLS	Flow Switch
FS	Float Switch

<u>Designation</u>	<u>Device</u>
FTS	Foot Switch
FU	Fuse
GEN	Generator
GRD, GND	Ground
GUI	Graphical User Interface
HM	Hour Meter
HTR	Heating Element
IC	Integrated Circuit
INST	Instrument
IOL	Instantaneous Overload
I/O	Input/Output Device
L	Inductor
LED	Light Emitting Diode
LS	Limit Switch
LT	Pilot Light
LVDT	Linear Variable Differential Transformer
M	Motor Starter
MD	Motion Detector
MF	Motor Starter – Forward
MG	Motor – Generator
MR	Motor Starter – Reverse
MTR	Motor
OIT	Operator Interface Terminal
OL	Overload Relay
PB	Pushbutton
PBL	Pushbutton, Illuminated
PC	Personal Computer
PCB	Printed Circuit Board
PEC	Photoelectric Device
PL	Plug
PLC	Programmable Logic Controller
POT	Potentiometer
PRS	Proximity Switch
PS	Pressure Switch
PWS	Power Supply
Q	Transistor
QTM	Thermistor
REC	Rectifier
RECP	Receptacle
RES	Resistor
RH	Rheostat
S	Switch
SCR	Silicon Controlled Rectifier

<u>Designation</u>	<u>Device</u>
SOL	Solenoid
SNSR	Sensor
SS	Selector Switch
SSL	Selector Switch, Illuminated
SSR	Solid State Relay
ST	Saturable Transformer
SUP	Suppressor
SYN	Synchro or Resolver
T	Transformer
TACH	Tachometer Generator
TAS	Temperature-Actuated Switch
TB	Terminal Block
T/C	Thermocouple
TR	Timer Relay
TSDR	Transducer
TWS	Thumbwheel Switch
V	Electronic Tube
VAR	Varistor
VM	Voltmeter
VR	Voltage Regulator
VS	Vacuum Switch
WLT	Worklight
WM	Wattmeter
X	Reactor
ZSS	Zero Speed Switch

## Statement of Problem and Substantiation for Public Input

This PI is submitted on behalf of a task group (TG) that was established to improve consistency related to "disconnecting means", "isolation" and similar terms. The task group members were: Bill Brungs, David Carpenter, Heath Garrison, John Kovacik, Dino Mariuz, Dan Neeser, and Paul Dobrowsky was the Chair.

The term "Disconnecting Means" is presently defined in NFPA 70 and NFPA 79 and is presently used in NFPA 79 more often than "disconnect, disconnecting switch, isolating means, isolate, isolated, etc." therefore the TG is suggesting that it be the term generally used throughout the standard. In some cases, such as in 5.2.2(2), the term "disconnect" is used and is not being changed because it matches what is required in the product standards. Isolate and its derivatives are typically used for other purposes such as isolating transformer, isolation from coolant, physical separation, etc.

## Submitter Information Verification

**Submitter Full Name:** Paul Dobrowsky  
**Organization:** Innovative Technology Services  
**Street Address:**  
**City:**  
**State:**  
**Zip:**

**Submittal Date:** Sun Jan 02 10:17:38 EST 2022

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-41-NFPA 79-2022](#)

**Statement:** The term "disconnect switch" was changed to "disconnecting means" for consistency and to use the term defined in NFPA 70 and NFPA 79.

The term "Master" was changed to "Main" to include inclusive language per the NIST guide.



**Public Input No. 12-NFPA 79-2021 [ Section No. J.3 ]**

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**J.3** Terms and Definitions Relating to Protective and Functional Bonding Used in IEC 60204-1, 6th Edition.

**Cable Trunking System.** A system of enclosures consisting of a base and a removable cover intended for the complete surrounding of insulated conductors, cables, and cords.

*Discussion.* Cable trunking is commonly used within enclosures to support and contain conductors.

**Duct.** An enclosed channel designed expressly for holding and protecting electrical conductors, cables, and busbars.

**Equipotential Bonding.** Provision of electric connections between conductive parts, intended to achieve equipotentiality.

[IEC 195-1-10]

*Discussion.* Connecting conductive parts together minimizes voltage differences but by itself does not provide an effective fault current path.

**Exposed Conductive Part.** Conductive part of electrical equipment, which can be touched and which is not live under normal operating conditions, but which can become live under fault conditions.

[IEC 826-12-10, modified]

*Discussion.* Often linked with "structural parts"; electrical parts that are not normally live generally do need to be bonded to the protective bonding circuit.

**Extraneous Conductive Part.** Conductive part not forming part of the electrical installation and liable to introduce a potential, generally the earth potential.

[IEC 826-12-11, modified]

**NOTE 1 :** Examples of extraneous conductive parts ~~can~~ may include ladders, handrails, pipes, machine parts, etc., pipes and structural part of a machine, that appear with this definition. *Discussion.* Generally, the machine is considered an extraneous conductive part.

**NOTE 2:** The resistance R between simultaneously accessible exposed-conductive-parts and extraneous-conductive-parts shall fulfil the following condition:

$R \leq 50 \text{ Vac/Ia}$  in a.c. systems or  $R \leq 60 \text{ Vac/Ia}$  in d.c. systems

where Ia is the operating current in A of the protective device; for residual current protective devices ( RCDs ) it is the  $I\Delta n$ ; for BCPD devices it is the 5 s operating current.

**Fault Protection.** Protection against electric shock under single-fault conditions.

[IEC 195-06-02]

*Discussion.* Overcurrent protective devices and double insulation are types of fault protection.

**Functional Bonding.** Equipotential bonding necessary for proper functioning of electrical equipment.

*Discussion.* PLCs and drives generally do not need special bonding, and there are only a few devices that need separate "functional" bonding, such as some scales.

**Live Part.** Conductor or conductive part intended to be energized in normal use, including a neutral conductor, but, by convention, not a PEN conductor.

NOTE: This term does not necessarily imply a risk of electric shock.

**Neutral Conductor N.** Conductor electrically connected to the neutral point of a system and capable of contributing to the distribution of electrical energy.

[IEC 195-02-06, modified]

**Plug/Socket Combination.** Component and a suitable mating component, appropriate to terminate conductors, intended for connection or disconnection of two or more conductors.

NOTE: Examples of plug/socket combinations include:

- connectors which fulfill the requirements of IEC 61984
- a plug-and-socket-outlet, a cable coupler, or an appliance coupler in accordance with IEC

60309-1

– a plug-and-socket outlet in accordance with IEC 60884-1 or an appliance coupler in accordance with IEC 608320-1

**Protective Bonding.** Equipotential bonding for protection against electric shock.

NOTE: Measures for protection against electric shock can also reduce the risk of burns or fire.

*Discussion. The network of protective conductors, along with the necessary bonding jumpers, provide the protective bonding, including the connection to the "main earthing terminal PE."*

**Protective Bonding Circuit.** Protective conductors and conductive parts connected together to provide protection against electric shock in the event of an insulation failure.

**Protective Conductor.** Conductor required for protective bonding by some measures for protection against electric shock for electrically connecting any of the following parts:

- exposed conductive parts
- extraneous conductive parts
- main earthing terminal (PE)

[IEC 826-13-22, modified]

## Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Extraneous_Conductive_Part.docx	Extraneous conductive parts	

## Statement of Problem and Substantiation for Public Input

With today's edition of NFPA 79, Extraneous conductive parts are not properly addressed.

The statement "Generally, the machine is considered an extraneous conductive part" is too generic and, generally, not correct.

Extraneous conductive parts are dangerous since they introduce the earth potential, however not all metallic parts in a machine are considered Extraneous conductive parts. Pipes may be Extraneous conductive parts but it is very unusual for ladders and handrails to be Extraneous conductive parts.

A way to understand if a metal part of a machine is an Extraneous conductive parts is to measure its resistance to ground. If low enough (less than 1000 ohms is a good indication) it has to be considered an Extraneous conductive parts and must be bonded, UNLESS the condition described in this Public Input is satisfied. The language is taken from IEC 60364-4-41 article 415.2.2.

## Submitter Information Verification

**Submitter Full Name:** Marco Tacchini

**Organization:** GT Engineering

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**Submittal Date:** Sat Feb 27 12:04:04 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** The term Extraneous conductive part is not used in this standard.

**Extraneous Conductive Part.** Conductive part not forming part of the electrical installation and liable to introduce a potential, generally the earth potential.

[IEC 826-12-11, modified]

NOTE 1: Examples of extraneous conductive parts may include pipes and structural part of a machine, that appear with this definition.

NOTE 2: The resistance R between simultaneously accessible exposed-conductive-parts and extraneous-conductive-parts shall fulfil the following condition:

$$R \leq \frac{50 V}{I_a} \text{ in a. c. systems}$$

$$R \leq \frac{60 V}{I_a} \text{ in d. c. systems}$$

where

I<sub>a</sub> is the operating current in Ampere of the protective device:

- for residual current protective devices (RCDs) it is the I<sub>Δn</sub>;
- for BCPD devices it is the 5 s operating current.



## Public Input No. 44-NFPA 79-2021 [ Section No. K.1.1 ]

### K.1.1 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

*NFPA 70<sup>®</sup>, National Electrical Code<sup>®</sup>, 2020-2023* edition.

*NFPA 70E<sup>®</sup>, Standard for Electrical Safety in the Workplace<sup>®</sup>, 2021-2024* edition.

*NFPA 77, Recommended Practice on Static Electricity, 2019-edition 2022 edition* .

### Statement of Problem and Substantiation for Public Input

Update of the referenced standard to its latest edition, considering the new edition of NFPA 79 will be published in 2024.

### Submitter Information Verification

**Submitter Full Name:** Marco Tacchini

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**Submittal Date:** Wed Dec 22 05:14:51 EST 2021

**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-51-NFPA 79-2022](#)

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard



## Public Input No. 45-NFPA 79-2021 [ Section No. K.1.2.1 ]

### K.1.2.1 ANSI Publications.

American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.

ANSI B11.0, *Safety of Machinery*, 2015 2020 .

ANSI B11-TR4, *Selection of Programmable Electronic Systems (PES/PLC) for Machine Tools*, 2004, reaffirmed 2015.

ANSI B11-TR6, *Safety Control Systems for Machine Tools*, 2010.

ANSI Z535.4, *Product Safety Signs and Labels*, 2011, reaffirmed 2017.

### Statement of Problem and Substantiation for Public Input

Update of the referenced standard to its latest edition, considering the new edition of NFPA 79 will be published in 2024.

### Submitter Information Verification

**Submitter Full Name:** Marco Tacchini

**Organization:** GT Engineering

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**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-52-NFPA 79-2022](#)

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard



**Public Input No. 50-NFPA 79-2021 [ Section No. K.1.2.4 ]**

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**K.1.2.4 IEC Publications.**

International Electrotechnical Commission, 3, rue de Varembé, P.O. Box 131, CH-1211 Geneva 20, Switzerland.

IEC 60034-1 Ed. 13.0, *Rotating electrical machines — Part 1: Rating and performance*, 2017.

IEC 60072-1 Ed. 6.0, *Dimensions and output series for rotating electrical machines — Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080*, 1991.

IEC 60204-1 Ed. 6.0 1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*, 2016, amendment 1, 2021 .

IEC 60332-1-1 Ed. 1.1, *Tests on electric and optical fibre cables under fire conditions — Part 1-1: Test for vertical flame propagation for a single insulated wire or cable — Apparatus*, 2004, amendment 1, 2015.

IEC 60364-4-41 Ed. 5.1, *Low voltage electrical installations — Part 4-41: Protection for safety — Protection against electric shock*, 2005, ~~corrigendum 1~~ amendment 1 , 2017.

IEC 60364-5-53 Ed. 3 ~~4~~ 2, *Electrical Installations of buildings — Part 5 1, Low-Voltage electrical installations — Part 5 -53: Selection and erection of electrical equipment — Isolation, switching and control, 2015 Devices for protection for safety, isolation, switching, control and monitoring , 2019, amendment 1 , 2020 .*

IEC 60417 DB [Database], *Graphical symbols for use on equipment — Part 1: Overview and application*, 2002.

IEC 60529 Ed. 2.2, *Degrees of protection provided by enclosures (IP Code)*, 2013, corrigendum 2, 2015.

IEC 60621-3 Ed. 1.0, *Electrical installations for outdoor sites under heavy conditions (including open-cast mines and quarries) — Part 3: General requirements for equipment and ancillaries*, 1979 (withdrawn).

IEC 60742 Ed. 1.0, *Isolating transformers and safety isolating transformers*, 1983 (superseded by IEC 61558-1).

IEC 60870-5-1 Ed. 1.0, *Telecontrol equipment and systems — Part 5: Transmission protocols — Section One: Transmission frame formats*, 1990.

IEC 60947-4-1 Ed. 3 ~~4~~ 1 0 , *Low-voltage switchgear and controlgear — Part 4-1: Contactors and motor-starters — Electromechanical contactors and motor-starters*, 2012 2018, corrigendum 2, 2021 .

IEC 60947-5-1 Ed. 4.0, *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices*, 2016, corrigendum 1 2 , ~~2016~~ 2020 .

IEC 60947-7-1 Ed. 3.0, *Low-voltage switchgear and controlgear — Part 7-1: Ancillary equipment — Terminal blocks for copper conductors*, 2009.

IEC 61010-1 Ed. 3.1, *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements*, 2016.

IEC 61310-1 Ed. 2.0, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals*, 2007.

IEC 61310-3 Ed. 2.0, *Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators*, 2007.

IEC 61508 Ed. 2.0, [*Series*] *Functional safety of electrical/electronic/programmable electronic safety-related systems*, 2010.

IEC 61558-1 Ed. 3.0, *Safety of transformers, reactors, power supply units and combinations thereof — Part 1: General requirements and tests*, 2017.

IEC 61800-5-2 Ed. 2.0, *Adjustable speed electrical power drive systems — Part 5-2: Safety requirements — Functional*, 2016.

IEC 62061 Ed. ~~1~~ 2 2 0 , *Safety of machinery — Functional safety of safety-related ~~electrical, electronic and programmable electronic~~ control systems*, 2005, corrigendum 1, 2015 2021 .

*NOTE:* The IEC publishes consolidated editions of its publications with all the amendments and corrigenda included with the base document. For example:

Edition 1.0 is a base document without any amendments.

Edition 1.1 is the base 1.0 edition consolidated with one amendment.

Edition 1.2 is the base 1.0 edition consolidated with two amendments.

Edition 2.0 is the second edition of a base document. This may include new information combined as well as amendments from edition 1.x.

Edition 2.1 is the second edition of a document consolidated with amendment 1 to that edition.

## Statement of Problem and Substantiation for Public Input

Update of the referenced standard to its latest edition, considering the new edition of NFPA 79 will be published in 2024.

## Submitter Information Verification

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**Submittal Date:** Mon Dec 27 05:01:24 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-53-NFPA 79-2022](#)

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard



## Public Input No. 51-NFPA 79-2021 [ Section No. K.1.2.5 ]

### **K.1.2.5** IEEE Publications.

IEEE, 3 Park Avenue, 17th Floor, New York, NY 10016-5997.

IEEE 100 CD, *Standards Dictionary: Glossary of Terms and Definitions*, 2013.

ANSI Y32.2/IEEE 315, *IEEE Graphic Symbols for Electrical and Electronics Diagrams (Including Reference Designation Letters)*, 1993.

IEEE 841, *Petroleum and Chemical Industry — Premium-Efficiency, Severe-Duty, Totally Enclosed Fan-Cooled (TEFC) Squirrel Cage Induction Motors—Up to and Including from 0.75 kW to 370 kW ( 1 hp to 500 hp)*, 2009 ~~2021~~ .

### Statement of Problem and Substantiation for Public Input

Update of the referenced standard to its latest edition, considering the new edition of NFPA 79 will be published in 2024.

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**Resolution:** FR-54-NFPA 79-2022

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## Public Input No. 52-NFPA 79-2021 [ Section No. K.1.2.6 ]

### K.1.2.6 ISO Publications.

International Organization for Standardization, ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland.

ISO 5457, *Technical product documentation — Sizes and layout of drawing sheets*, 1999, amendment 1, 2010 .

ISO 7000, *Graphical symbols for use on equipment — Registered symbols*, 2014 2019 .

ISO 7200, *Technical drawings — Title blocks, 1984 product documentation — Data fields in title blocks and document headers*, 2004 .

ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*, 2010.

ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*, 2015.

ISO 13849-2, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation*, 2012.

ISO 13850, *Safety of machinery — Emergency stop function — Principles for design*, 2015.

## Statement of Problem and Substantiation for Public Input

Update of the referenced standard to its latest edition, considering the new edition of NFPA 79 will be published in 2024.

## Submitter Information Verification

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**Committee:** EEI-AAA

## Committee Statement

**Resolution:** [FR-55-NFPA 79-2022](#)

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard



## Public Input No. 53-NFPA 79-2021 [ Section No. K.1.2.7 ]

### K.1.2.7 NEMA Publications.

National Electrical Manufacturers Association, 1300 North 17th Street, Suite 900, Arlington, VA 22209.

NEMA MG - 1, *Motors and Generators*, 2014 2016 .

NEMA 250, *Enclosures for Electrical Equipment (1000 Volts Maximum)*, 2014 2020 .

### Statement of Problem and Substantiation for Public Input

Update of the referenced standard to its latest edition, considering the new edition of NFPA 79 will be published in 2024.

### Submitter Information Verification

**Submitter Full Name:** Marco Tacchini

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**Committee:** EEI-AAA

### Committee Statement

**Resolution:** FR-56-NFPA 79-2022

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard



## Public Input No. 27-NFPA 79-2021 [ Section No. K.1.2.9 ]

### K.1.2.9 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 50, *Enclosures for Electrical Equipment, Non-Environmental Considerations*, 2015.

UL 62, *Flexible Cord and Cables*, 2018.

UL 248-14, *Low-Voltage Fuses — Part 14: Supplemental Fuses*, 2000, revised 2015.

UL 489, *Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures*, 2016.

UL 498, *Attachment Plugs and Receptacles*, 2017, revised 2018.

UL 508, *Industrial Control Equipment*, 2018.

UL 508A, *Industrial Control Panels*, 2018.

UL 651, *Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings*, 2011, revised 2016.

UL 758, *Appliance Wiring Material*, 2014, revised 2017.

UL 1004-1, *Rotating Electrical Machines — General Requirements*, 2012, revised 2018.

UL 1077, *Supplementary Protectors for Use in Electrical Equipment*, 2015, revised 2016.

UL 1682, *Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type*, 2017.

UL 60950-1, *Information Technology Equipment — Safety — Part I: General Requirements*, 2007, revised 2014.

UL 2237 Outline, *Outline of Investigation for Multi-Point Interconnection Power Cable Assemblies for Industrial Machinery*, 2018.

UL 2238, *Cable Assemblies and Fittings for Industrial Control and Signal Distribution*, 2018.

UL 60947-4-1, *Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-Starters - Electromechanical Contactors and Motor-Starters*, 2014, revised 2017.

UL 61010-1, *Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 1: General Requirements*, 2012, revised 2016.

## Statement of Problem and Substantiation for Public Input

Motor controllers, previously listed to UL 508 are now listed to UL 60947-4-1. A public input has been submitted adding this standard to a new A5.2.2 and thus should be additionally added to K.1.1.2.9.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 26-NFPA 79-2021 [New Section after A.5.1.11.2]</u>	Adds UL standard to Annex K based on PI for new A5.2.2

## Submitter Information Verification

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**Submittal Date:** Mon Dec 20 12:41:50 EST 2021

**Committee:** EEI-AAA

### **Committee Statement**

**Resolution:** [FR-57-NFPA 79-2022](#)

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard

Added UL 60947-4-1 and UL 6420



## Public Input No. 29-NFPA 79-2021 [ Section No. K.1.2.9 ]

### K.1.2.9 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 50, *Enclosures for Electrical Equipment, Non-Environmental Considerations*, 2015.

UL 62, *Flexible Cord and Cables*, 2018.

UL 248-14, *Low-Voltage Fuses — Part 14: Supplemental Fuses*, 2000, revised 2015.

UL 489, *Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures*, 2016.

UL 498, *Attachment Plugs and Receptacles*, 2017, revised 2018.

UL 508, *Industrial Control Equipment*, 2018.

UL 508A, *Industrial Control Panels*, 2018.

UL 651, *Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings*, 2011, revised 2016.

UL 758, *Appliance Wiring Material*, 2014, revised 2017.

UL 1004-1, *Rotating Electrical Machines — General Requirements*, 2012, revised 2018.

UL 1077, *Supplementary Protectors for Use in Electrical Equipment*, 2015, revised 2016.

UL 1682, *Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type*, 2017.

UL 6420, Standard for Equipment Used for System Isolation and Rated as a Single Unit, 2012, revised 2018

UL 60950-1, *Information Technology Equipment — Safety — Part I: General Requirements*, 2007, revised 2014.

UL 2237 Outline, *Outline of Investigation for Multi-Point Interconnection Power Cable Assemblies for Industrial Machinery*, 2018.

UL 2238, *Cable Assemblies and Fittings for Industrial Control and Signal Distribution*, 2018.

UL 61010-1, *Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 1: General Requirements*, 2012, revised 2016.

## Statement of Problem and Substantiation for Public Input

This Public Input moves the reference to UL 6420 from Annex K.2 to K.1.2.9. This assumes the associate Public Input for A.5.2.2 is accepted.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 26-NFPA 79-2021 [New Section after A.5.1.11.2]</u>	
<u>Public Input No. 30-NFPA 79-2021 [Section No. K.2]</u>	

## Submitter Information Verification

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**Submittal Date:** Mon Dec 20 16:51:50 EST 2021

**Committee:** EEI-AAA

### **Committee Statement**

**Resolution:** [FR-57-NFPA 79-2022](#)

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard

Added UL 60947-4-1 and UL 6420



## Public Input No. 54-NFPA 79-2021 [ Section No. K.1.2.9 ]

### **K.1.2.9** UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 50, *Enclosures for Electrical Equipment, Non-Environmental Considerations*, 2015.

UL 62, *Flexible Cord and Cables*, 2018.

UL 248-14, *Low-Voltage Fuses — Part 14: Supplemental Fuses*, 2000, revised ~~2015~~ 2020 .

UL 489, *Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures*, 2016, revised 2019 .

UL 498, *Attachment Plugs and Receptacles*, 2017, revised ~~2018~~ 2021 .

UL 508, *Industrial Control Equipment*, 2018, revised 2021 .

UL 508A, *Industrial Control Panels*, 2018, revised 2021 .

UL 651, *Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings*, 2011, revised ~~2016~~ 2020 .

UL 758, *Appliance Wiring Material*, 2014, revised ~~2017~~ 2021 .

UL 1004-1, *Rotating Electrical Machines — General Requirements*, 2012, revised ~~2018~~ 2020 .

UL 1077, *Supplementary Protectors for Use in Electrical Equipment*, 2015, revised ~~2016~~ 2021 .

UL 1682, *Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type*, 2017.

UL 60950-1, *Information Technology Equipment — Safety — Part I: General Requirements*, 2007, revised ~~2014~~ 2019 .

UL 2237- ~~Outline~~ , *Outline of Investigation for Multi-Point Interconnection Power Cable Assemblies for Industrial Machinery*, ~~2018~~ 2019, revised 2021 .

UL 2238, *Cable Assemblies and Fittings for Industrial Control and Signal Distribution*, 2018, revised 2021 .

UL 61010-1, *Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 1: General Requirements*, 2012, revised ~~2016~~ 2019 .

## Statement of Problem and Substantiation for Public Input

Update of the referenced standard to its latest edition, considering the new edition of NFPA 79 will be published in 2024.

## Submitter Information Verification

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## Committee Statement

**Resolution:** [FR-57-NFPA 79-2022](#)

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard

Added UL 60947-4-1 and UL 6420



## Public Input No. 66-NFPA 79-2021 [ Section No. K.1.2.9 ]

### K.1.2.9 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 50, *Enclosures for Electrical Equipment, Non-Environmental Considerations*, 2015, revised 2020 .

UL 62, *Flexible Cord and Cables*, 2018.

UL 248-14, *Low-Voltage Fuses — Part 14: Supplemental Fuses*, 2000, revised ~~2015~~ 2020 .

UL 489, *Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures*, 2016, revised 2018 .

UL 498, *Attachment Plugs and Receptacles*, 2017, revised ~~2018~~ 2021 .

UL 508, *Industrial Control Equipment*, 2018, revised 2021 .

UL 508A, *Industrial Control Panels*, 2018, revised 2021 .

UL 651, *Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings*, 2011, revised ~~2016~~ 2019 .

UL 758, *Appliance Wiring Material*, 2014, revised ~~2017~~ 2021 .

UL 1004-1, *Rotating Electrical Machines — General Requirements*, 2012, revised ~~2018~~ 2020 .

UL 1077, *Supplementary Protectors for Use in Electrical Equipment*, 2015, revised ~~2016~~ 2021 .

UL 1682, *Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type*, 2017.

UL 60950-1, *Information Technology Equipment — Safety — Part I: General Requirements*, 2007, revised ~~2014~~ 2019 .

UL 2237 ~~Outline~~, *Outline of Investigation for Multi Multi -Point Interconnection Power Cable Assemblies for Industrial Machinery*, ~~2018~~ 2020 .

UL 2238, *Cable Assemblies and Fittings for Industrial Control and Signal Distribution*, 2018, revised 2021 .

UL 61010-1, *Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 1: General Requirements*, 2012, revised ~~2016~~ 2019 .

## Statement of Problem and Substantiation for Public Input

Update UL references, UL 2237 has been changed from an outline of investigation to a UL standard.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 65-NFPA 79-2021 [Section No. 2.3.6]	

## Submitter Information Verification

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**Committee:** EEI-AAA

### **Committee Statement**

**Resolution:** [FR-57-NFPA 79-2022](#)

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard

Added UL 60947-4-1 and UL 6420



## Public Input No. 30-NFPA 79-2021 [ Section No. K.2 ]

### K.2 Informational References.

The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

DOE-HDBK-1003-96, *Guide to Good Practices for Training and Qualification of Maintenance Personnel*, 1996.

IEC 81346-2, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 2: Classification of objects and codes for classes*, 2009 (withdrawn).

IEC 61558-2-6, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1100 V — Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers*, 2009.

ISO 5457, *Technical product documentation — Sizes and layout of drawing sheets*, 1999, amendment 1, 2010.

ISO 7200, *Technical product documentation — Data fields in title blocks and document headers*, 2004.

~~UL 6420, *Equipment Used for System Isolation and Rated as a Single Unit*, 2012.~~

### Statement of Problem and Substantiation for Public Input

This assume the related PIs are accepted and moves UL 6420 to K.1.2.9.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 29-NFPA 79-2021 [Section No. K.1.2.9]</a>	
<a href="#">Public Input No. 26-NFPA 79-2021 [New Section after A.5.1.11.2]</a>	

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**Committee:** EEI-AAA

### Committee Statement

**Resolution:** [FR-58-NFPA 79-2022](#)

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard.

UL 6420 was removed and put in Section K.1.2.9.



## Public Input No. 55-NFPA 79-2021 [ Section No. K.2 ]

### K.2 Informational References.

The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

DOE-HDBK-1003-96, *Guide to Good Practices for Training and Qualification of Maintenance Personnel*, 1996.

IEC 81346-2, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 2: Classification of objects and codes for classes*, 2009 (withdrawn) 2019 .

IEC 61558-2-6, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1100 V — Part 2 combinations thereof — Part 2 -6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers for general applications* , 2009 2021 .

ISO 5457, *Technical product documentation — Sizes and layout of drawing sheets*, 1999, amendment 1, 2010.

ISO 7200, *Technical product documentation — Data fields in title blocks and document headers*, 2004.

UL 6420, *Equipment Used for System Isolation and Rated as a Single Unit*, 2012, revised 2018 .

## Statement of Problem and Substantiation for Public Input

Update of the referenced standard to its latest edition, considering the new edition of NFPA 79 will be published in 2024.

## Submitter Information Verification

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**Submittal Date:** Mon Dec 27 09:15:01 EST 2021

**Committee:** EEI-AAA

## Committee Statement

**Resolution:** FR-58-NFPA 79-2022

**Statement:** The date of publication has been updated to reflect the most recent edition of each standard.

UL 6420 was removed and put in Section K.1.2.9.