

Short Circuit Current Rating

Customer Need

There has been a significant increase in the misapplication of control panel products that brings into question the safety of those installing and using this equipment.

No Standard Way to Appropriately Identify the Short Circuit Current Rating

Article 409 impacts control panel equipment design and construction so that the entire panel and all its components inside meet a defined Short Circuit Current Rating (SCCR) and that the panel is appropriately labeled with the SCCR.

Before now, industrial control panels could have been installed based upon general electrical requirements from several different articles in the NEC. The new standards include the entire combined power circuit in requirements for the SCCR.

The 409 standard is complementary to the Arc flash standard for electrical safety.

However this standard is aimed at the point of assembly rather than afterward within the buyer's workplace.

No Standard Measure for Inspection

Previous editions of the NEC, NFPA-70 provided no guidance to the electrical inspector to ensure electrical safety for industrial control panels since there wasn't a standard way to derive minimum requirements for safe installation.



What is Short Circuit Current Rating (SCCR)?

NEC Article 409 provides minimum requirements to facilitate the safe installation and inspection of industrial control panels for general use that operate at a voltage of 600V or less.

This change to NEC addresses the fact that if an over-current situation arises, the energy level may be higher than the lowest level SCCR on a component within the panel. When ratings on components are less than the available fault current, the safe performance of the panel comes into question. Further analysis of the panel and component combinations may be necessary to ensure a safe electrical installation.

Article 409 also recognizes that industrial control panels may be constructed and installed for use in applications covered by other articles in the NEC. Examples can be found in Article 440 for air-conditioning and refrigeration equipment, Article 610 for cranes and hoists and Article 670 for industrial machinery.

Affected Customers and Components

In essence NFPA-70 (also known as the National Electrical Code or NEC) sections 409 and 670 will impact **End Users, OEM's, Systems Integrators, Panel builders and Contractors who build or maintain Industrial Control Panels**. According to UL an assembly incorporating two or more pieces of industrial control equipment or related control circuit devices, provided with interconnecting wiring and terminals for connections in the field need to comply with the NEC.

Examples:

- Power circuit components
- branch circuit protective devices
- branch circuit fuse holders
- disconnect switches
- load controllers
- motor overload relays
- terminal block
- bus bars



What Must Panel Builders and Others do to Comply?

National Electrical Code (NEC) and other codes, electrical ratings and instructions are to be clearly explained on the panel in order for the installer to properly install the panel.

- The NEC® is asking industrial control panel builders to determine an overall SCCR for the panel.
- UL also has the UL508A appendix SB which is also targeting the labeling of industrial control panels for SCCR.

Labeling Requirements

Industrial control panels rated not more than 600 volts

Industrial control panels rated not more than 600 volts and for installation in ordinary locations are specified in the Standard for Industrial Control Panels, UL 508A. The requirements in the Outline are based on the Standard for Industrial Control Equipment, UL 508, the National Electrical Code, NFPA 70, and the Standard for Industrial Machinery, NFPA 79.

Industrial control panels rated more than 600 volts

Panels operating from a source of supply greater than 600 volts will be required to comply with UL 508, Standard for Industrial Control Equipment (up to 1500V) or UL 347, Standard for High Voltage Industrial Control Equipment (2.2-7.2 kV).

Industrial control panels intended for hazardous location installation

Panels intended for installation in a hazardous location or having circuits that will extend into a hazardous location are required to comply with different requirements. Please see the hazardous locations section at the UL website for more information (<http://www.ul.com>).

Brady Short Circuit Current Rating Labeling Solutions

Label Printing Systems

Printer Selection

<i>Brady 300MVP Plus Thermal Transfer Printer</i>	<i>Brady Tagus T300 Thermal Transfer Printer</i>
<ul style="list-style-type: none">▫ Tight registration creates less label waste▫ Higher Volume: Up to 5,000 labels per day▫ Heavier Industrial Environments	<ul style="list-style-type: none">▫ One-button calibration for easy user set up▫ Medium Volume: Up to 3,000 labels per day▫ Lighter Manufacturing Environments

Brady 300MVP Plus Thermal Transfer Printer



Application(s): Circuit Board Labeling, Data Communications Labeling, General & Industrial Labeling, Laboratory Identification, Panel Identification, Security Identification, Wire & Cable Marking

Catalog #: BP300MVP-PLUS
Product #: 60754

Compatible with LabelMark and BradySoft



Brady Tagus T300 Thermal Transfer Printer



Application(s): Data Communications Labeling, General & Industrial Labeling, Laboratory Identification, Panel Identification, Security Identification, Wire & Cable Marking

Catalog #: BP-T300
Product #: 60754

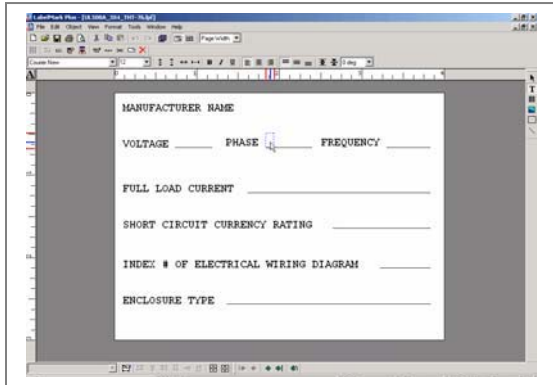
Compatible with LabelMark and BradySoft



Software Selection

LabelMark	Features in BradySoft and its "for-purchase Add-Ons".
<ul style="list-style-type: none"> ▫ Label Design: <ul style="list-style-type: none"> ○ One touch wire marker mode ▫ User Access: <ul style="list-style-type: none"> ○ Unrestricted ▫ Data Management: <ul style="list-style-type: none"> ○ Excel, Database, ASCII File extraction ▫ Printing: <ul style="list-style-type: none"> ○ Prints to Brady Thermal and Portables ▫ Tracking: <ul style="list-style-type: none"> ○ 1D/2D Barcodes available with LabelMark Plus 	<ul style="list-style-type: none"> ▫ Label Design: <ul style="list-style-type: none"> ○ Wire marker capabilities with filler formula ▫ User Access: <ul style="list-style-type: none"> ○ Single or multi-level password protection ▫ Data Management: <ul style="list-style-type: none"> ○ Excel, Database, ASCII File extraction ○ Database Management tool ○ Automatic Data Extraction ▫ Printing: <ul style="list-style-type: none"> ○ Prints to Brady Thermal and Portables ○ Automated printed available ○ Native Printer Language Capabilities ▫ Tracking: 1D/2D Barcodes, RFID Tags
<p>See your Brady Territory Manager for more feature clarification</p>	

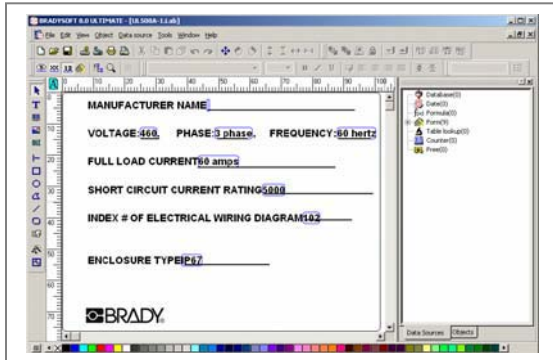
LabelMark



- Application(s): Electrical Identification
- Wire & Cable Markers – Adhesive Wrap Around
 - Wire & Cable Markers – Self Laminating
 - Wire & Cable Markers – Permasleeve™ Sleeves
 - Automation & Electrical Component Markers
 - Terminal Block Markers
 - Control Panel and Component Marking
 - Circuit Board and Component Tracking
 - Rating Plate Identification

Catalog #: LM3
Product #: 60721

BradySoft



- Application(s): Electrical Identification
- Asset Identification
 - Circuit Board and Component Tracking
 - Conduit and Voltage Marking
 - Control Panel and Component Marking
 - Inventory Control
 - Inventory Tracking
 - Quality Assurance Labeling
 - Rating Plate Identification
 - Terminal Block Identification

Catalog #: BS80STND
Product #: 105132

Labels

Label Part#: THTEL-161-483-1-WA

Label Part#: THTEL-184-483-1-WA

- Size: 4" W x 4" H (101.6 mm W x 101.6 mm H)
- Material Description: Polyester
- QTY/UOM: 1,000/Roll

- Size: 3" W x 3" H (76.2 mm W x 76.2 mm H)
- Material Description: Polyester
- QTY/UOM: 1,000/Roll



Label Part#: THT-161-483-1

Label Part#: THTEP-178-593-.5
Raised Panel Labels for Thermal Transfer Printers

- Size: 4.000" W x 4.000" H
- Material Description: Polyester
- QTY/UOM: 1,000/Roll

- Size: 3.000" W x 3.500" H (76.20 mm W x 63.50 mm H)
- Adhesive-Taped
- Material: Polyester, B-593
- 500/Roll

MANUFACTURER NAME _____


VOLTAGE _____, PHASE _____, FREQUENCY _____

FULL LOAD CURRENT _____

SHORT CIRCUIT CURRENT RATING

INDEX # OF ELECTRICAL WIRING DIAGRAM _____

ENCLOSURE TYPE _____

 **BRADY**
 RAISED PANEL LABELS
 THTEP-178-593-3

Educational References

- UL Laboratories - UL 508 Practical Application Guidelines On-Line Service (PAGOS): <http://www.ul.com/ul508pag/paglist.htm>
- Panel Builders FAQ: <http://www.ul.com/controlpanel/FAQ.html>
- Hazardous Locations Industrial Control Panel Program (Hazloc): <http://www.ul.com/hazloc/panel.htm>