Proposal Name: COW WWTP#2 LP

Quote Name: COW WWTP#2 LP

Operation and Maintenance

Proposal #: P-210212-2132197
Quote #: Q-2315509
Addendum #: 0
Sales Representative: Steve Vossman
Contractor/Installer: LINDER & ASSOCIATES

Prepared by:
AMERICAN ELECTRIC CO
D: 3162675311

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Conditions of Sale

Except as otherwise provided below, this Quotation is subject to Coordinated Project Terms. See https://www.schneider-electric.us/en/download/document/0100PL0043

Seq #	Qty	Product Description
1	1	**Designation :** **Product Details :**HL4IMA16C-SPD T2 HL I-LINE 160KA 480Y/277V 3P4W

Seq #	Qty	Product Description
2	1	**Designation :** **Product Details :**MA4IMA16-IMA MA Module, 277V, 160kA

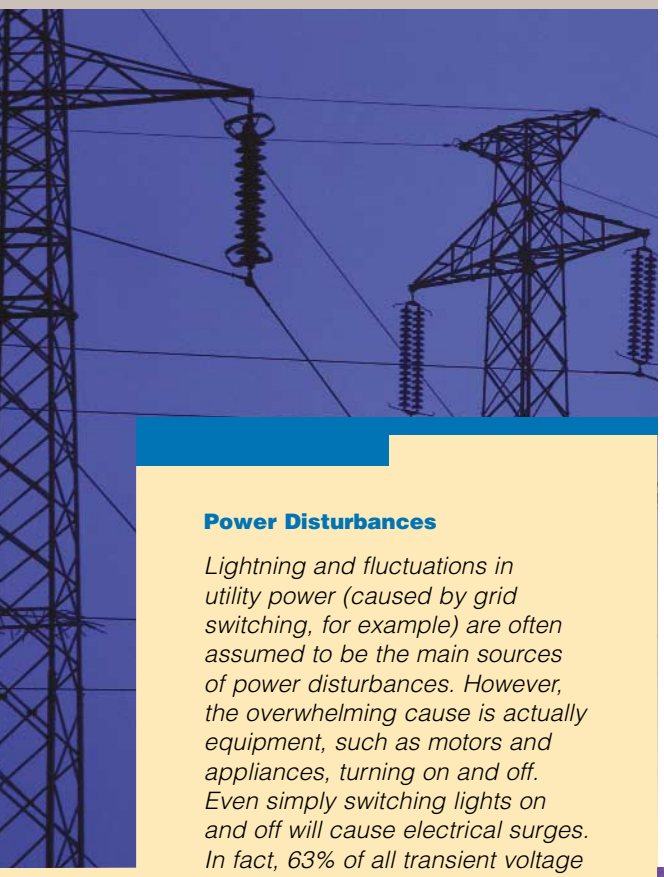
SURGELOGIC™ TVSS Surge Protective Devices

Enhance System Protection and Reduce Equipment Damage

- *Internal and External Mounted TVSS*
- *Retrofit or New Construction*
- *Low Let-through Levels*
- *High Surge Capacities*
- *Internal Fusing Coordinated with Distribution System*
- *Modular Construction for Ease of Maintenance*
- *Thermal Fusing*
- *200kA Short Circuit Current Rating*

Merlin Gerin
Modicon
Square D
Telemecanique

SQUARE D
Schneider Electric
Building a New Electric World



The High Cost of Surge Damage

Utility industry experts estimate that problems resulting from transient voltage surges cost U.S. companies a stunning $26 billion annually. That figure not only includes the high price of direct damage to electrical distribution systems, electronic equipment, software and tools, but also the crippling cost of loss of productivity. Facility downtime, lost data, lost orders and the disruption of critical processes can seriously reduce productivity. This means that minimizing the risk of damage from electrical surges is an absolute priority for companies of all types, all across the globe.

Power Disturbances

Lightning and fluctuations in utility power (caused by grid switching, for example) are often assumed to be the main sources of power disturbances. However, the overwhelming cause is actually equipment, such as motors and appliances, turning on and off. Even simply switching lights on and off will cause electrical surges. In fact, 63% of all transient voltage surges are generated from inside sources, while only 37% come from outside.

Key Causes of Internal Transients:

- *Motor switching*
- *X-ray generators*
- *AC chillers*
- *Production machinery*
- *Robotics*
- *Welders*
- *Laser printers*
- *Copiers*
- *Capacitor bank switching*
- *Pumps*

Location Variables that Increase the Risk of External Transients:

- *Regions of high lightning activity*
- *At the end of a utility line*
- *On a transmission line downstream of industrial facilities*
- *At a higher elevation than surrounding structures*
- *In an open, rural location*

SQUARE D SURGELOGIC TVSS

Unmatched Protection. Unequaled Experience.

With SURGELOGIC TVSS, Square D offers the world's finest array of Transient Voltage Surge Suppression solutions for electrical distribution systems. From simple to mission-critical applications in commercial and industrial construction and OEM design, the comprehensive SURGELOGIC TVSS line provides a Surge Protective Device (SPD) for every need.

Each SURGELOGIC TVSS device is designed, tested and manufactured in-house by Square D/Schneider Electric, ensuring that your solution is:

- Built to the highest standards
- Features the most advanced technologies
- Meets the industry's most rigorous testing criteria
- Backed by the expertise that only 100 years of experience in electrical distribution can bring

We have the knowledge and resources to help you select the system that's right for your specific needs – critical when considering that choosing devices with a higher level of protection than you need can be unnecessarily costly, while too little protection can result in serious equipment damage and power outages.

Product Safety: Industry Leading Testing and Design

Square D/Schneider Electric has two UL-approved laboratories in the U.S. dedicated to testing and evaluating Surge Protective Device (SPD) technologies. We test all of our power protection devices by installing them into environments that take into account all system components and processes to ensure product reliability.

Our Lightning Laboratory is one of the few places in the world where high-energy tests can be performed up to 175,000 amps. As a result, we can simulate worst-case scenarios and use the data to improve product performance and safety. Square D has also committed tremendous resources to improving containment and end-of-life failure modes to assure that our surge protection systems will not introduce additional hazards that could result in catastrophic facility problems. And our product design and development teams constantly evaluate new SPD technologies and regulatory changes to ensure that our products and systems meet your needs, and the needs of your customers, anywhere in the world.

Expertise that Drives Design for Maximum Safety

The Square D family of SPDs incorporates a wealth of electrical distribution and protection expertise that allows you to design with utmost confidence, knowing your customers will receive the best possible protection. We've dedicated extensive resources to advance the power quality industry, including:

- *Understanding the effects of transients and lightning on power systems*
- *Investigating SPD technologies and their coordination with the entire power system*
- *Defining appropriate product installation practices*
- *Driving improvements in the NEC, UL and ANSI codes and standards for the benefit of the industry and protection of users*
- *Designing products for improved performance*
- *Qualifying all SQUARE D SPDs under severe power conditions to improve performance and end-of-life conditions.*

No other company has committed more money, time or resources to improve the SPD industry.

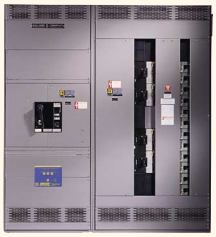
Schneider Electric's lightning generator tests SQUARE D TVSS devices in real-world systems and situations.

A Full Line: Flexibility Across the Board

Integral TVSS

Switchboards

QED-4, QED-6, QED-S



Switchgear

Power-Zone® 4

With SQUARE D SURGELOGIC, you can choose a surge solution that satisfies the precise level of protection you require. Our systems cover all categories of transient severity as described by the IEEE c62.41 standard. These range from transients of the highest level of severity at service entrance switchgear and switchboards (Category C) to distribution panelboards or switchboards (Category B).

SURGELOGIC Integral TVSS: Built-in Performance

No question, the best way to ensure cost-effective power quality (especially important for critical power facilities) is to use surge protective devices that are built directly into end-use equipment. That's why SURGELOGIC Integral TVSS devices are the perfect choice. They are specifically designed for integration with Square D equipment, built-in at the Square D factory for maximum reliability, and fully tested and certified as specified by UL 1449 Second Edition, UL 1283, UL 67, UL 891, UL 1558, UL 845 and UL 857. Square D Integral TVSS systems use leading-edge technologies to protect specific equipment powered by switchgear and switchboards, distribution panelboards, motor control centers, and busway, as well as a variety of specific applications.

Panelboards

NF

I-LINE®

NQOD

Busway

I-LINE® II

Motor Control Centers

Model 6

Reducing Impedance with Integral TVSS Devices

Integral TVSS devices don't require the extra several feet of conductor used by externally mounted devices. That's key because every foot of conductor can increase potentially damaging let-through voltage by as much as 160 volts.

SURGELOGIC Retrofit Reliability: Integral and External TVSS

Retrofitting TVSS units on I-LINE, QMB, MCC and Busway applications is simple. The QMB fusible switch, 6" MCC Bucket, I-LINE and Busway plug-on units come with the TVSS already installed. These units can be easily added to existing equipment to provide the performance of a fully integrated TVSS device.

Square D also offers a full range of externally mountable TVSS devices. These units are typically used to protect a single piece of equipment or for quick retrofit applications and include the following optional features: surge counter, integral disconnect and remote monitor. SQUARE D External TVSS devices are designed to be used alone or in conjunction with internal devices to provide the best possible overall protection.

Diagnostics at a Glance

All SQUARE D SURGELOGIC TVSS systems feature full-time, on-line LED-based diagnostics as standard equipment. These monitor the entire device, so you always know its true status. You can verify the operational integrity of MOVs, overcurrent and thermal protection at a glance. Loss of protection indication and power loss detection are also standard. Switchable audible alarm with test functions and dry contacts come on all internal, EMA and EBA products, and remote monitors and surge event counters are available as well.

Modular Makes It Easy

All integral and EMA external SQUARE D TVSS systems feature a modular design for a flexible, cost-effective way to achieve superior protection at every level of the electrical distribution system. Modularity means lower life cycle costs and fast, easy service or replacement. All SURGELOGIC modular devices share a common architecture, so the same type of module fits NQOD or NF panels, I-LINE or QMB installations, Busway, MCC or EMA external mount suppressors. Each module includes its own internal diagnostics for a redundant system. If there's ever a problem, any module can be quickly changed to restore the device to 100% capability.

The SURGELOGIC TVSS Diagnostic Panel provides quick and clear status indication for the TVSS unit.

External TVSS

EMA

HWA

Retrofit TVSS

I-LINE

MCC

QMB

SQUARE D SURGELOGIC TVSS:

All the Right Reasons...

- Specifically designed for distribution systems and the transient environment
- A comprehensive selection of integral and external devices
- Integral TVSS systems expressly engineered for Square D electrical distribution systems
- Modular systems for flexibility and long-term value
- Duty cycle tested – minimum 5,000 impulses ANSI C62.41, 10kA, 20kV
- UL Listed designs (in accordance with UL 1449, UL 1283, UL 67, UL 891, UL 1558, UL 845, UL 857)
- Low UL 1449 Suppressed Voltage Ratings
- 200kA Short Circuit Current Ratings
- Complete 5 year TVSS warranty coverage
- Unmatched level of safety

The heart of the SQUARE D SURGELOGIC TVSS solution.

Application Guidelines

Exposure Level	Surge Capacity	Environment	Internal Mount	External Mount
High	480kA 320kA	Larger Ampacity Service Entrance High Lightning Area Other Large Industrials in Area Large Facility in Rural Locations	Switchboard Switchgear	Modular (EMA)
High to Medium	240kA 160kA	Lower Lightning Areas High to Medium Ampacity Service Entrance Service Entrance Switchboards Service Entrance Panelboards	Switchboard Switchgear MCC I-LINE/QMB Panel	Modular (EMA) Non-Modular (EBA)
Medium	160kA	Distribution Switchboards Branch Circuits not Protected by a TVSS at Service Entrance Panels Feeding Heavy Industrial Motors Branch Circuits Feeding Loads Outside the Facility	Switchboard MCC I-LINE/QMB Panel NQOD/NF Panel Busway	Modular (EMA) Non-Modular (EBA)
Medium to Low	160kA 120kA	Computer Equipment Loads Branch Circuits with No Upstream TVSS Protection	Switchboard MCC I-LINE/QMB Panel NQOD/NF Panel Busway	Modular (EMA) Non-Modular (EBA)
Low	120kA to 50kA	Branch Circuits Well Inside the Facility Branch Circuits with Very Sensitive Loads and Upstream TVSS Protection	NQOD/NF Panel	Modular (EMA) Non-Modular (EBA) Nipple Mount (HWA)

Advanced Transient Voltage Surge Suppression Product Specifications

Feature	Switchgear	Switchboard	Panelboards	MCC	Busway	External Modular	External Non-modular
Safety Standards	UL 1558 UL 1449	UL 891 UL 1449	UL 67 UL 1449	UL 845 UL 1449	UL 857 UL 1449	UL 1449	UL 1449
UL 1283	Yes	Yes	Yes	Yes	Yes	Yes	Yes
UL 1449 Second Edition	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Surge Current Capacity Per Phase	480kA 320kA 240kA 160kA 120kA	480kA 320kA 240kA 160kA 120kA	240kA 160kA 120kA	240kA 160kA	240kA 160kA	480kA 320kA 240kA 160kA 120kA	240kA 160kA 120kA 80kA 50kA
UL 1449 Suppressed Voltage Rating							
120/240V, 1ph, 3w	400 volts	400 volts	400 volts	400 volts	400 volts	400 volts	400 volts
240/120V, 3ph, 4w High Leg Delta	800/400 volts	800/400 volts	800/400 volts	800/400 volts	800/400 volts	800/400 volts	800/400 volts
208Y/120V, 3ph, 4w	400 volts	400 volts	400 volts	400 volts	400 volts	400 volts	400 volts
480Y/277V, 3ph, 4w	800 volts	800 volts	800 volts	800 volts	800 volts	800 volts	800 volts
600Y/347V, 3ph, 4w	1200 volts	1200 volts	1200 volts	1200 volts	1200 volts	1200 volts	1200 volts
Duty Cycle Tested (minimum) ANSI C62.41, 10kA, 20kV	5,000 impulses	5,000 impulses	5,000 impulses	5,000 impulses	5,000 impulses	5,000 impulses	5,000 impulses
UL Listed Short Circuit Current Rating (NEC Article 285)	200,000 A	200,000 A	200,000 A	200,000 A	200,000 A	200,000 A	200,000 A
Fusing per Mode	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Cutout per Mode	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LED per Phase	Std.	Std.	Std.	Std.	Std.	Std.	Std.
Full-time Online Diagnostics	Std.	Std.	Std.	Std.	Std.	Std.	Std.
Loss of Protection Indication	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audible Alarm	Std.	Std.	Std.	Std.	Std.	Std.	Std.
Dry Contacts	Std.	Std.	Std.	Std.	Std.	Std.	Std.
Surge Counter	Optional	Optional	Optional	Optional	Optional	Optional	Opt. (EBA only)
Remote Monitor	Optional	Optional	Optional	Optional	Optional	Optional	Optional
Integral TVSS Disconnect	Yes	Yes	Yes (I-LINE & QMB)	Yes	Yes	Optional	Optional (EBA only)
Mounting Location	Internal	Internal Plug-on (QMB) Plug-on (I-LINE)	Integral Direct Bus Plug-on (QMB) Plug-on (I-LINE)	Internal Plug-in	Internal Plug-in	External	External
EMI/RFI Filtering (up to) 100Mhz-100kHz	-50dB	-50dB	-50dB	-50dB	-50dB	-50dB	-50dB
Modes of Protection	L-N, L-G, N-G, L-L	L-N, L-G, N-G, L-L	L-N, L-G, N-G, L-L	L-N, L-G, N-G, L-L	L-N, L-G, N-G, L-L	L-N, L-G, N-G, L-L	L-N, L-G, N-G, L-L
Replaceable Modules	Yes	Yes	Yes	Yes	Yes	Yes	No
5 Year TVSS Warranty	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Meeting the World's Needs for Quality Power

With the rapid growth of the Internet and Web-hosting facilities, and an explosion in the use of sensitive electronic equipment and controls in manufacturing plants, offices, hospitals and homes, there is universal demand for absolutely reliable power. Schneider Electric is the world's leader in power protection. From circuit breakers to surge suppressors, Schneider Electric and its major brands – SQUARE D, MERLIN GERIN, MODICON and TELEMECANIQUE – are dedicated to advancing technology to safely deliver and control electrical power for all of our customers around the world.

In addition to the SURGELOGIC TVSS line of devices, you can also rely on these products for a variety of surge protection needs:

SURGELOGIC™ XR Surge Protective Devices

Surge suppression protection with the added benefits of noise filtration capabilities in a compact, hardwired package for protection from surges up to 40,000 amps on single-phase power systems.

SURGELOGIC™ LC Surge Protective Devices

A hybrid device (surge suppression and noise filtration) with up to 40,000 amps surge protection and -75dB of noise filtration; the DinRail mountable LC is ideal for custom control and other applications with microprocessors, PLCs and motion control.

MERLIN GERIN Multi 9 SPD Surge Protective Devices

A DIN-rail mountable, compact device for MERLIN GERIN applications offering multiple configurations for single- and three-phase power systems with surge protection capacities from 20,000 amps to 80,000 amps.

SDSA Secondary Surge Arresters

Designed to protect against lightning in high exposure areas such as antennas and parking lot lighting systems. These devices may also be used for surge protection of irrigation pumps, oil pumps and motors operating below 600V.

POWERLOGIC® Series 4000T Circuit Monitor

A multifunctional monitor designed to provide complete electrical and energy system information including data logging, waveform capture, disturbance recording and high-speed oscillatory and impulse transient detection and capture. These devices are for diagnostic use in critical power or large energy consumption applications.

Visit the SQUARE D Web site at www.SquareD.com

Order Number 1300BR0201 Printed in U.S.A.

SQUARE D
Schneider Electric

Product data sheet
Characteristics

HL4IMA16C
Surge protection device, Surgelogic, HL, 160kA, 480Y/277 VAC, 3 phase, 4 wire, SPD type 2

Main

Product	Surge protection device
Range	Surgelogic
Device Short Name	IMA
Type	HL

Complementary

Surge Current	160 kA
Voltage Rating	480Y/277 V AC
Number of Phases	3 phase
Wiring Configuration	4-wire
Connection	I-Line line Lugs ground AWG 6 copper 35.40 lbf.in (4 N.m) Lugs neutral AWG 6 copper 35.40 lbf.in (4 N.m)
MCOV	150 V
Max Number of Poles	3
Rated Current	60 A
Breaking Capacity	50 kA
Trip Unit Technology	Thermal-magnetic
SCCR	200 kA
Local Signalling	Status LED green per phase normal operation Status LED red per phase fault
Provided Equipment	Alarm enable/disable switch Surge counter Circuit breaker
Mounting Support	Panel mounting
Height	12.16 in (308.9 mm)

* Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Width	13.46 in (341.9 mm)
Depth	5.59 in (142.1 mm)
Cable length	19.02 in (483 mm)

Environment

Enclosure Rating	NEMA 2
Standards	UL 1449:ed. 3 UL 1283:ed. 5 CSA C22.2 No 8:1986 UL 96A:ed. 12 UL 489:ed. 11 CSA C22.2 No 5-09

Ordering and shipping details

Category	08460 - SURGE PROTECTION I-LINE
Discount Schedule	DE1B
GTIN	00785901865179
Nbr. of units in pkg.	10
Package weight(Lbs)	22.14 lb(US) (10.04 kg)
Returnability	Yes
Country of origin	MX

Offer Sustainability

California proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
REACh Regulation	REACh Declaration
EU RoHS Directive	Compliant EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS declaration Product out of China RoHS scope. Substance declaration for your information.

Contractual warranty

Warranty	18 months

8222-0015
Rev. 04, 05/2017

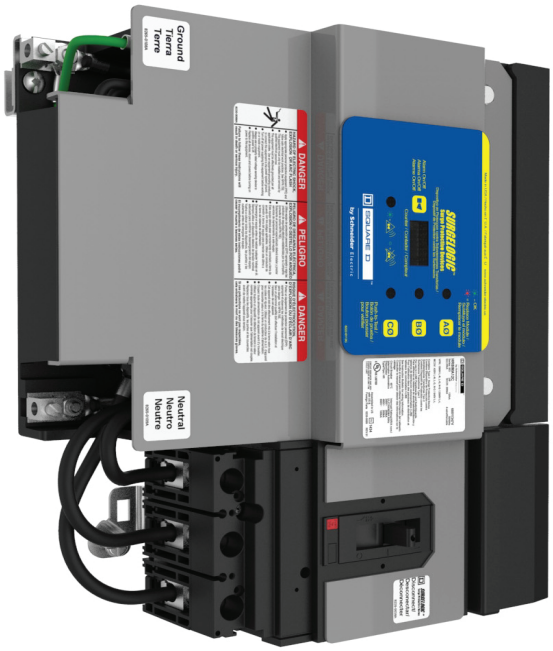
Replaces 8222-0015 Rev. 03, 11/2016

ENGLISH

Surgelogic™

I-Line™ Plug-on Surge Protective Device (SPD)

Retain for future use.



SQUARE D
by Schneider Electric

ENGLISH

Table of Contents

Precautions

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

Introduction

This bulletin provides instructions for installing I-Line™ Plug-on Units with Surgelogic™ Surge Protective Devices (SPDs) into I-Line panelboards and switchboards.

This is a supplement to the information manual provided with each panelboard and the instruction bulletin provided with each switchboard.

Note: For troubleshooting, call the Surgelogic Technical Assistance Group at 1-800-577-7353.

Proper installation is imperative to maximize the surge protective device's effectiveness and performance. To ensure proper installation, follow the steps outlined in this instruction bulletin. Read the entire instruction bulletin before beginning the installation. These instructions are not intended to replace national or local electrical codes. Check all applicable electrical codes to verify compliance. Installation of modular surge suppressors should only be performed by qualified electrical personnel.

Unpacking and Preliminary Inspection

Inspect the entire shipping container for damage or signs of mishandling before unpacking the device. Remove the packing material and further inspect the device for any obvious shipping damage. If any damage is found and is a result of shipping or handling, immediately file a claim with the shipping company.

Storage

The device should be stored in a clean, dry environment. Storage temperature is -40 °F to +149 °F (-40 °C to +65 °C). All of the packaging materials should be left intact until the device is ready for installation.

Safety Labels

English, Spanish, and French versions of all safety labels (Danger, Warning, and Notice) are provided.

ENGLISH

Identification Nameplate

The identification nameplate is located on the front surface next to the diagnostic display.

Figure 1: Surge Protective Device Nameplate Example

⚠ CAUTION

LOSS OF BRANCH CIRCUIT POWER/LOSS OF SURGE SUPPRESSION

- Perform periodic inspection of the Surge Protective Device status indicator lights as part of the preventative maintenance schedule.
- Promptly service the Surge Protective Device when an alarm state exists.
- Use dry contacts to signal an alarm state to the central supervisory system for unmanned, inaccessible, or critical installations.
- Use multiple Surge Protective Devices to achieve redundancy for critical applications.

Failure to follow these instructions can result in injury or equipment damage.

At end-of-life conditions, Surge Protective Devices (SPDs) can lose their ability to block power system voltage and attempt to draw excessive current from the line. This SPD is equipped with overcurrent and overtemperature components that will automatically disconnect the surge suppression elements from the mains should the surge suppression elements reach end of life. Also, at that time, tripping of the branch circuit breaker or fuse feeding the SPD can occur.

⚠ CAUTION

LOSS OF SURGE SUPPRESSION

- Do not energize the Surge Protective Devices until the electrical system is completely installed, inspected, tested, and all conductors have been connected and functional, including the neutral.
- Verify the voltage rating of the device and system before energizing the Surge Protective Device.
- Disconnect the Surge Protective Device, including the neutral, from the power source before performing high-potential insulation testing or any tests where Surge Protective Device components will be subjected to voltages higher than their rated turn-on voltage.

Failure to follow these instructions can result in injury or equipment damage.

Location Considerations

Environment

The device is designed to operate in an ambient temperature range of -4 °F to +149 °F (-20 °C to +65 °C) with a relative humidity of 0 to 95% non-condensing. The operating temperature of the LCD on the diagnostic display panel is +14 °F to +140 °F (-10 °C to +60 °C). Refer to the product catalog for further details on enclosures. All I-Line devices operate normally without reduction in performance when subjected to shock and vibrations described in IEC 60721-3-3, Class 3M4.

Audible Noise

The device background noise is negligible and does not restrict the location of the installation.

Service Clearance

The service clearance should meet all applicable code requirements.

Electrical

Voltage Rating

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Confirm the Surge Protective Device voltage rating on the module or nameplate label is the same as the operating voltage.

Failure to follow these instructions will result in death or serious injury.

Prior to mounting the SPD, verify that the device has the same voltage rating as the power distribution system in which it is installed. Compare the nameplate voltage or model number on the SPD with the nameplate of the electrical distribution equipment.

ENGLISH

The specifier or user of the device must be familiar with the configuration and arrangement of the power distribution system in which any SPD is to be installed. The system configuration of any power distribution system is based strictly on how the secondary windings of the transformer supplying the service entrance main or load are configured. This includes whether or not the transformer windings are referenced to earth via a grounding conductor. The system configuration is not based on how any specific load or equipment is connected to a particular power distribution system. See Table 1 for the service voltage of each SPD.

Table 1: Voltage Ratings

Service Voltage	Peak Surge Current Rating Per Phase	Catalog Numbers [1]	
		HR Breaker SPD	HL Breaker SPD
120/240 V, 1-phase, 3-wire + ground	120	HR1IMA12C	HL1IMA12C
	160	HR1IMA16C	HL1IMA16C
	240	HR1IMA24C	HL1IMA24C
208Y/120 V, 3-phase, 4-wire + ground Wye [2]	120	HR2IMA12C	HL2IMA12C
	160	HR2IMA16C	HL2IMA16C
	240	HR2IMA24C	HL2IMA24C
240/120 V, 3-phase, 4-wire + ground High-leg Delta [3]	120	HR3IMA12C	HL3IMA12C
	160	HR3IMA16C	HL3IMA16C
	240	HR3IMA24C	HL3IMA24C
480Y/277 V, 3-phase, 4-wire + ground Wye [4]	120	HR4IMA12C	HL4IMA12C
	160	HR4IMA16C	HL4IMA16C
	240	HR4IMA24C	HL4IMA24C
480 V Delta, 3-phase, 3-wire + ground Delta [5]	100	HR5IMA10C	HL5IMA10C
	120	HR5IMA12C	HL5IMA12C
	160	HR5IMA16C	HL5IMA16C
	200	HR5IMA20C	HL5IMA20C
	240	HR5IMA24C	HL5IMA24C
240 V Delta, 3-phase, 3-wire + ground Delta	100	HR6IMA10C	HL6IMA10C
	120	HR6IMA12C	HL6IMA12C
	160	HR6IMA16C	HL6IMA16C
	200	HR6IMA20C	HL6IMA20C
	240	HR6IMA24C	HL6IMA24C
600Y/347 V, 3-phase, 4-wire + ground Wye	120	HR8IMA12C	—
	160	HR8IMA16C	—
	240	HR8IMA24C	—
600 V Delta, 3-phase, 3-wire + ground Delta [6]	100	HR9IMA10C	—
	120	HR9IMA12C	—
	160	HR9IMA16C	—
	180	HR9IMA18C	—

1 For Type 1 systems include a "1" at the end of the catalog numbers listed above.

2 208Y/120 series also applies to the following voltage 220Y/127.

3 Phase B modules are different than Phase A and Phase C modules.

4 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

5 480 V Delta series also applies to the following voltages: 480Y/277V HRG.

6 600 V Delta series also applies to the following voltages: 600Y/347V HRG.

General

The I-Line device has SPD elements connected from phase to ground. To prevent hazardous touch voltage on the I-Line enclosure during normal operation or during SPD end-of-life, it is critical that there be a robust and effective connection to the building grounding structure. The grounding connection must utilize an equipment grounding conductor run with the phase and neutral (if present) connection of the power system. Do not connect the I-Line device to a separate isolated ground.

For best overvoltage suppression by the I-Line device, use a single-point ground system where the service entrance grounding electrode system is connected to and bonded to all other available electrodes, building steel, metal water pipes, driven rods, etc. (for reference, see NEC Art 250). The ground impedance measurement should be in compliance with all applicable codes.

Solidly-Grounded Power Systems

⚠ CAUTION

SURGE PROTECTIVE DEVICE DAMAGE AND POWER SYSTEM OVERVOLTAGE

- Do not connect devices rated for use on solidly-grounded power systems to resistance-grounded (for example, High Resistance Ground) or ungrounded power systems.
- Verify that the service entrance equipment is bonded to ground in accordance with all applicable codes.
- Verify that the neutral terminal of the power system transformer feeding the device is bonded to system ground in accordance with all applicable codes.

Failure to follow these instructions can result in equipment damage.

SPDs rated for use on solidly-grounded power systems must not be connected to resistance-grounded or ungrounded power systems. Such a connection can result in damage to the SPD.

Always verify the power system grounding configuration prior to application of power to the device. Confirm that all ground bonds are installed at both the service entrance equipment and power system transformer prior to application of power.

ENGLISH

Delta and Resistance-Grounded Power Systems

⚠ CAUTION

SURGE PROTECTIVE DEVICE DAMAGE AND POWER SYSTEM OVERVOLTAGE

- Ungrounded power systems are inherently unstable and can produce excessively high line-to-ground voltages during certain fault conditions. During these fault conditions any electrical equipment, including an SPD, may be subjected to voltages which exceed their designed ratings. This information is being provided to the user so that an informed decision can be made before installing any electrical equipment on an ungrounded power system.
- Resistance-grounded power systems must be maintained in an over-damped state to limit voltage overshoot and duration during operation.
- Perform verification and adjustment of correct power system damping:
  - — Periodically as part of normal system maintenance.
  - — Following power system modifications.

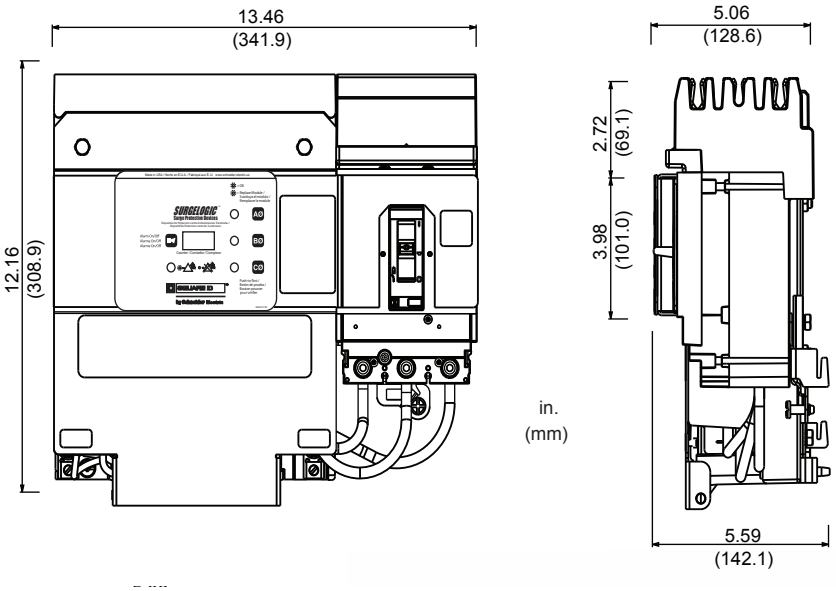
Failure to follow these instructions can result in equipment damage.

The I-Line product is intended for use on resistance-grounded power systems where the power system has been set for, and is maintained in, an over-damped state. For the power system to be over-damped, the current through the grounding resistor during a bolted phase-to-ground fault must be significantly greater than the total charging current of the system.

Periodic engineering evaluation of the power system is required to determine the worst-case charging current of the system and to adjust the grounding resistance accordingly. As the power system is modified, the value of the grounding resistor must be evaluated and adjusted to maintain the system in the over-damped state.

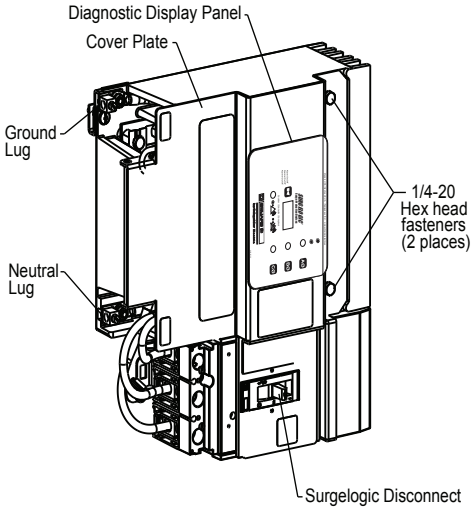
Dimensions

Figure 2: Dimensions.



I-Line Surgelogic Installation

Figure 3: I-Line Surgelogic Components



⚠ DANGER

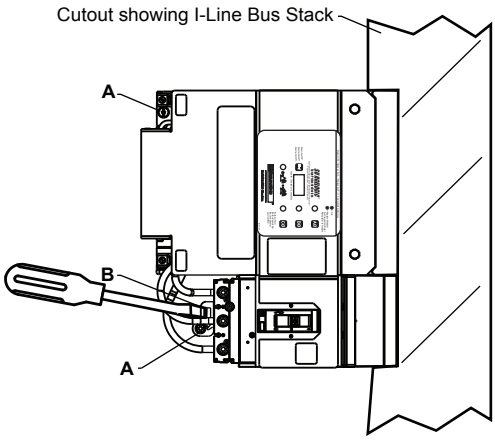
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

ENGLISH

Figure 4: Racking the Device onto the Bus



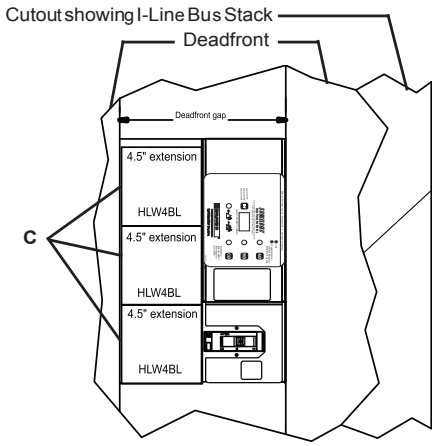
⚠ CAUTION

LOSS OF SURGE SUPPRESSION

- Verify that the service entrance equipment is bonded to ground in accordance with all applicable codes.
- Verify that the neutral bonding jumper is installed at the service entrance in accordance with all applicable codes.
- When neutral is not present at the I-Line panel, connect Surge Protective Device neutral and ground together with a minimum 10 AWG wire.

Failure to follow these instructions can result in equipment damage.

Figure 5: Blank Extensions in Deadfront



Turn off all power supplying the panelboard or switchboard before working on or installing the I-Line Surgelogic device.

1. Turn off all power supplying the panelboard or switchboard before working on or installing the I-Line Surgelogic device.
2. Loosen the retaining screws (**A**) (see Figure 4).
3. Place the device on the I-Line pan with the jaws pushed against the bus.
4. Insert a flat-head screwdriver into the screwdriver slot (**B**). Rack the device onto the bus.
5. Tighten the two retaining screws (**A**).
6. Use 6 AWG copper wire to connect the ground and neutral assembly from the SPD to the panelboard or switchboard neutral and ground.

   Note: The wires should be as short as possible. Torque each neutral and ground connection to 35 lb-in. (4 N•m).
7. Close all openings around the Surgelogic device.
8. Ensure blank extensions (**C**) are installed into the deadfront whenever the I-Line Surgelogic device is placed on the wide side of the bus stack (see Figure 5).

Access to MA Modules and Back of Diagnostic Display Panel

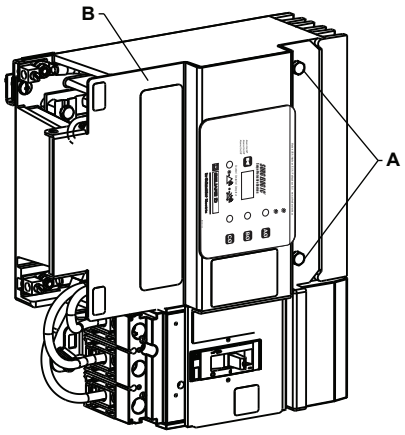
⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

Figure 6: I-Line Surgelogic Components



1. Turn off all power supplying the panelboard or switchboard before working on the I-Line Surgelogic device.
2. Remove the two 1/4-20 hex head fasteners (**A**) shown in Figure 6 and open the cover plate (**B**).
3. When finished accessing the MA modules, close the cover plate and replace fasteners. Torque fasteners to 32 lb-in. (3.6 N•m).

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Operation

⚠ DANGER

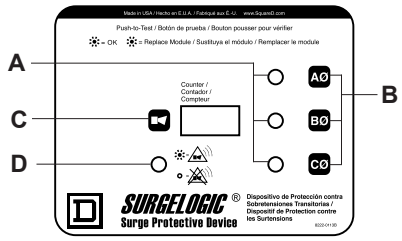
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

LED Status Indicators

Figure 7: Three-Phase Diagnostic Display Panel with Surge Counter (TVS3DSPHIC; TVS1DSPHIC for TVS1 series devices)

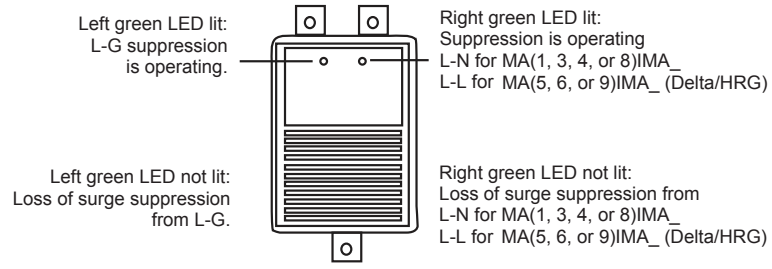


Note: Phase B is not present on single-phase application.

The SPD diagnostic display panel shows the status of each MA module with diagnostically controlled green/red LEDs (**A**). If a unit is operating correctly, all the phase LEDs will be illuminated green. To test the integrity of the diagnostics for each phase, push the corresponding phase button **(B)** on the diagnostic display panel. If the alarm is enabled, the green LEDs will turn red, the dry contacts will change state, and the alarm will sound. Releasing the test button (**B**) will complete the test; the LEDs will turn green, the dry contacts will change back to a normal state, and the alarm will shut off (see Figure 7).

If an inoperable condition occurs on any phase, the audible alarm sounds (if enabled), the dry contacts will switch to an error state and the corresponding phase LED (**A**) on the diagnostic display panel is illuminated red. This indicates that the device needs service by qualified electrical personnel. The audible alarm can be silenced by pressing the alarm enable/disable button (**C**). The alarm will silence and the green alarm LED (**D**) will not be illuminated. The red phase LED will continue to be illuminated until the inoperative condition has been cleared (see Figure 7).

Figure 8: MA Module LEDs



On an MA module (see Figure 8), when the power is applied, if the left green LED is not lit, it indicates a loss of suppression from line-to-ground for that phase. If the right green LED is not lit, it indicates a loss of suppression from line-to-neutral for that phase. If either LED is not lit the module should be replaced.

When power is applied to the SPD and one or more of the diagnostic display panel LEDs are red, and one or more MA module LEDs are out, the appropriate MA module should be replaced. (see Table 2).

Refer to “Maintenance and Troubleshooting” on page 16 for proper troubleshooting procedures. If the module LEDs are green and the diagnostic display LEDs are red, please call SPD TAG at 1-800-577-7353.

Power System Grounding

In addition to the power system configuration and voltage, the power system grounding method must be considered when selecting the appropriate I-Line device. Refer to the following chart for information concerning the suitability of I-Line device to specific power system grounding method.

Table 2: I-Line Series Replacement Modules

Service Voltage	Peak Surge Current Rating Per Phase	Catalog Numbers[1]		
		A	B	C
120/240 V, 1-phase, 3-wire + ground	120	MA1IMA12	—	MA1IMA12
	160	MA1IMA16	—	MA1IMA16
	240	MA1IMA24	—	MA1IMA24
208Y/120 V, 3-phase, 4-wire + ground Wye [2]	120	MA1IMA12	MA1IMA12	MA1IMA12
	160	MA1IMA16	MA1IMA16	MA1IMA16
	240	MA1IMA24	MA1IMA24	MA1IMA24
240/120 V, 3-phase, 4-wire + ground High-leg Delta [3]	120	MA1IMA12	MA3IMA12	MA1IMA12
	160	MA1IMA16	MA3IMA16	MA1IMA16
	240	MA1IMA24	MA3IMA24	MA1IMA24
480Y/277 V, 3-phase, 4-wire + ground Wye [4]	120	MA4IMA12	MA4IMA12	MA4IMA12
	160	MA4IMA16	MA4IMA16	MA4IMA16
	240	MA4IMA24	MA4IMA24	MA4IMA24
480 V Delta, 3-phase, 3-wire + ground Delta [5]	100	MA5IMA10	MA5IMA10	MA5IMA10
	120	MA5IMA12	MA5IMA12	MA5IMA12
	160	MA5IMA16	MA5IMA16	MA5IMA16
	200	MA5IMA20	MA5IMA20	MA5IMA20
	240	MA5IMA24	MA5IMA24	MA5IMA24
240 V Delta, 3-phase, 3-wire + ground Delta	100	MA6IMA10	MA6IMA10	MA6IMA10
	120	MA6IMA12	MA6IMA12	MA6IMA12
	160	MA6IMA16	MA6IMA16	MA6IMA16
	200	MA6IMA20	MA6IMA20	MA6IMA20
	240	MA6IMA24	MA6IMA24	MA6IMA24
600Y/347 V, 3-phase, 4-wire + ground Wye	120	MA8IMA12	MA8IMA12	MA8IMA12
	160	MA8IMA16	MA8IMA16	MA8IMA16
	240	MA8IMA24	MA8IMA24	MA8IMA24
600 V Delta, 3-phase, 3-wire + ground Delta [6]	100	MA9IMA10	MA9IMA10	MA9IMA10
	120	MA9IMA12	MA9IMA12	MA9IMA12
	160	MA9IMA16	MA9IMA16	MA9IMA16
	180	MA9IMA18	MA9IMA18	MA9IMA18

1 For Type 1 systems include a "1" at the end of the catalog numbers listed above.

2 208Y/120 series also applies to the following voltage 220Y/127.

3 Phase B modules are different than Phase A and Phase C modules.

4 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

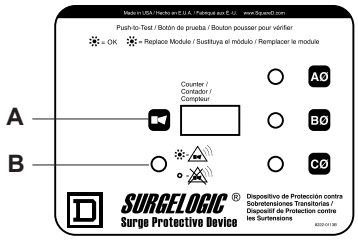
5 480 V Delta series also applies to the following voltages: 480Y/277V HRG.

6 600 V Delta series also applies to the following voltages: 600Y/347V HRG.

ENGLISH

Audible Alarm

Figure 9: Alarm Enable/Disable



Note: Phase B is not present on single-phase application.

Push the alarm enable/disable button (**A**, Figure 9), to enable or disable the alarm.

- If the green LED (**B**) is illuminated the alarm is enabled.
- If the green LED (**B**) is not illuminated the alarm is disabled.

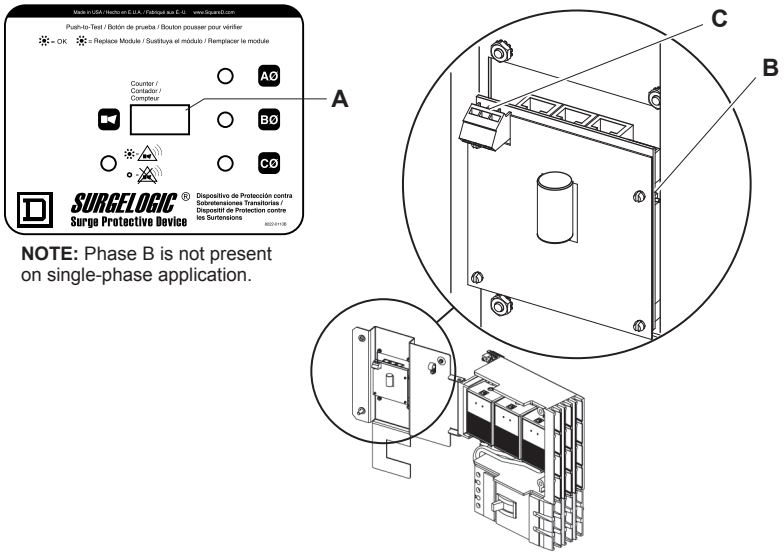
Surge Counter

Note: Refer to “Access to MA Modules and Back of Diagnostic Display Panel” on page 11, for instructions on accessing the rear of the diagnostic display panel to reset the surge counter.

The surge counter (**A**, Figure 10), displays the number of transient voltage surges since the counter was last reset. The counter is battery powered to retain memory in the event of a power loss to the diagnostic display panel.

To reset the counter to zero, press the counter reset button (**B**) located inside the unit on the underside of the diagnostic circuit board.

Figure 10: Three-Phase Diagnostic Display Panel with Surge Counter



NOTE: Phase B is not present on single-phase application.

Dry Contacts

The I-Line series Surge Protective Device (SPD) is provided with dry contacts. The connection for the dry contacts (**C**, Figure 10), is located and labeled on the back of the diagnostic display panel and will accept 22-14 AWG stranded or solid wire. The dry contacts are three-position, Form “C” type with Normally Open, Normally Closed and Common connections. The unpowered state shall be closed between terminals NC and COM. This is also the alarm condition. The opposite state, closed between terminals NO and COM, indicates that power is on to the unit and that no alarm condition exists (see Table 3).

ENGLISH

Table 3: Dry Contact Configuration

Alarm Contact Terminals	Contact State with Power Applied
NO to COM	Closed
NC to COM	Open

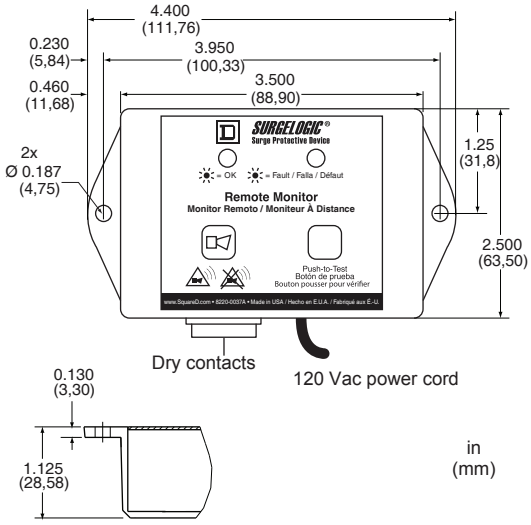
These contacts can be used for remote indication of the SPD's operating status to a computer interface board or emergency management system. Also, these contacts are designed to work with the SPD remote monitor option described below.

Care must be taken when installing the dry contact wiring because the terminals are on a moving door. Avoid the door hinge, any switches, and the high voltage areas of the enclosure when routing the wiring. To avoid the door hinge, tie wrap any dry contact wiring to the existing cable harness which crosses the hinge. Once the dry contact wiring is secured on a non-moving point of the enclosure, it is the user's responsibility to maintain at least 1.0 in. (25 mm) separation between 600 Vac rated dry contact wiring and the power wiring in the enclosure.

The contacts are designed for a maximum voltage of 24 Vdc / 24 Vac and a maximum current of 2 A. Higher energy applications may require additional relay implementation outside the SPD. Damage to the SPD's relay caused by use with energy levels in excess of those discussed in this instruction bulletin are not covered by warranty. For application questions, contact the Surgelogic Technical Assistance Group at 1-800-577-7353.

Remote Monitor Option

Figure 11: Remote Monitor Option (TVS12RMU)



The remote monitor option has two LEDs, one red and one green, and an audible alarm with an enable/disable switch. Normal status is an illuminated green LED, and no audible alarm. To test the integrity of the remote monitor, press the pushto-test switch. If the alarm is enabled, the green LED will turn off, the red LED will turn on, and the alarm will sound. Releasing the switch will complete the test; the red LED will turn off, the green LED will turn on and the alarm will shut off.

If suppression on any phase is lost, the green LED will turn off, the red LED will turn on and an alarm will sound. The audible alarm can be silenced by pushing the alarm enable/disable button. The alarm will silence and the green alarm LED will not be illuminated. The red LED will continue to be illuminated until the inoperative condition has been cleared.

The remote monitor includes a 120 Vac to 12 Vdc adapter with a six-foot power cord. Connections are made to the SPD diagnostic panel with Form "C", three-position dry contacts (provided), and the appropriate length of solid or stranded 22–14 AWG wire up to 1000 ft. (305 m), not provided.

ENGLISH

Maintenance and Troubleshooting

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

Preventive Maintenance

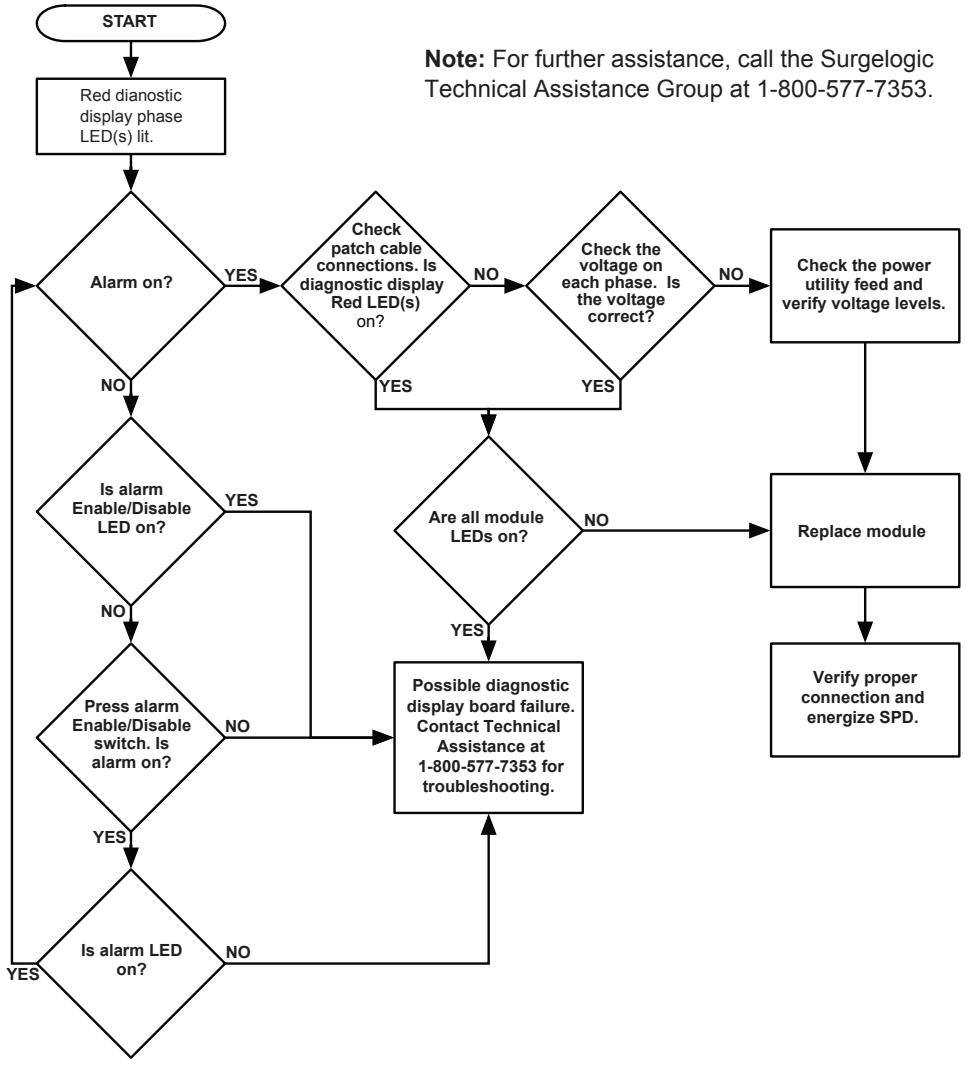
Inspect the SPD periodically to maintain reliable system performance and continued surge protection. Periodically check the state of the diagnostic display panel LED status indicators. Routinely use the built-in diagnostics to inspect for inoperative modules.

Troubleshooting

If a module shows two green indicator lights and the diagnostic display panel shows a red phase indicator light, follow the Troubleshooting Flow Chart in Figure 12 below.

ENGLISH

Figure 12: Troubleshooting Flowchart



Note: For further assistance, call the Surgelogic Technical Assistance Group at 1-800-577-7353.

Replacement Parts

The following replacement parts are available. For ordering information please contact your local distributor or refer to the product catalog.

- **MA modules**. Replacement instructions are included with the replacement parts.
- **Diagnostic display panel assemblies**. Replacement instructions are included with the replacement parts.

ENGLISH

Schneider Electric USA, Inc.
800 Federal Street
Andover, MA 01810 USA
888-778-2733
www.schneider-electric.us

Product data sheet
Characteristics

MA4IMA16
Surge protection module, Surgelogic, MA, 160kA, 480Y/277 VAC, 3 phase, 4 wire, SPD type 2

Main

Product	Surge protection module
Range	Surgelogic
Device Short Name	IMA
Accessory Category	Replacement part

Complementary

Surge Current	160 kA per phase
Voltage Rating	480Y/277 V AC
Number of Phases	3 phase
Wiring Configuration	4-wire
Connection	Terminals
MCOV	320 V
Nominal Discharge Current	20 kA
SCCR	200 kA
Local Signalling	Status LED green normal operation
Provided Equipment	Alarm enable/disable switch
Mounting Support	Panel mounting
Height	6.25 in (158.8 mm)
Width	3.26 in (82.8 mm)
Depth	2.69 in (68.3 mm)

Environment

Enclosure Rating	NEMA 2
Enclosure Material	Black Plastic

* Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Standards	UL 1449:ed. 4 UL 1283:ed. 5 CSA C22.2 No 8:1986 ANSI/IEEE C62.41 ANSI/IEEE C62.45 NEC 285
Ambient Operating	149 °F (65 °C)

Ordering and shipping details

Category	08467 - SURGE PROTECTION REPLACEMENT
Discount Schedule	DE1B
GTIN	00785901292982
Nbr. of units in pkg.	1
Package weight(Lbs)	2 lb(US) (0.91 kg)
Returnability	Yes
Country of origin	US

Packing Units

Package 1 Height	5.30 in (13.462 cm)
Package 1 width	7.80 in (19.812 cm)
Package 1 Length	11.00 in (27.940 cm)

Offer Sustainability

California proposition 65	WARNING: This product can expose you to chemicals including: DINP, which is known to the State of California to cause cancer, and DIDP, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
REACh Regulation	REACh Declaration
EU RoHS Directive	Compliant EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS declaration Product out of China RoHS scope. Substance declaration for your information.

Contractual warranty

Warranty	18 months

Modular Surge Protective Device (SPD) Replacement
Replacement Instructions for Modular Products
Sustitución del dispositivo de protección contra sobretensiones transitorias (SPD) modular
Instrucciones de sustitución de productos modulares
Remplacement du dispositif modulaire de protection contre les surtensions transitoires (SPD)
Directives de remplacement pour les produits modulaires

Retain for future use. / Conservar para uso futuro. / À conserver pour usage ultérieur.

Precautions	Precauciones	Précautions

⚠ DANGER / PELIGRO / DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

PELIGRO DE DESCARGA ELÉCTRICA, EXPLOSIÓN O DESTELLO POR ARQUEO

- Utilice equipo de protección personal (EPP) apropiado y siga las prácticas de seguridad en trabajos eléctricos establecidas por su Compañía, consulte la norma 70E de NFPA o Z462 de CSA y NOM-029-STPS.
- Solamente el personal eléctrico calificado deberá instalar y prestar servicio de mantenimiento a este equipo.
- Desenergice el equipo antes de realizar cualquier trabajo dentro o fuera de él.
- Siempre utilice un dispositivo detector de tensión nominal adecuado para confirmar la desenergización del equipo.
- Vuelva a colocar todos los dispositivos, las puertas y las cubiertas antes de volver a energizar el equipo.

El incumplimiento de estas instrucciones podrá causar la muerte o lesiones serias.

RISQUE D'ÉLECTROCUTION, D'EXPLOSION OU ÉCLAIR D'ARC ÉLECTRIQUE

- Portez un équipement de protection personnelle (ÉPP) approprié et observez les méthodes de travail électrique sécuritaire. Voir NFPA 70E ou CSA Z462.
- Seul un personnel qualifié doit effectuer l'installation et l'entretien de cet appareil.
- Coupez toutes les alimentations de l'appareil avant d'y travailler.
- Utilisez toujours un dispositif de détection de tension à valeur nominale appropriée pour vous assurer que l'alimentation est coupée.
- Replacez tous les dispositifs, les portes et les couvercles avant de mettre l'appareil sous tension.

Si ces directives ne sont pas respectées, cela entraînera la mort ou des blessures graves.

⚠ CAUTION / PRECAUCIÓN / ATTENTION

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH Ungrounded power systems are inherently unstable and can produce excessively high line-to-ground voltages during certain fault conditions. During these fault conditions any electrical equipment, including an SPD, may be subjected to voltages which exceed their designed ratings. This information is being provided to the user so that an informed decision can be made before installing any electrical equipment on an ungrounded power system. **Failure to follow these instructions can result in injury or equipment damage.**	**PELIGRO DE DESCARGA ELÉCTRICA, EXPLOSIÓN O DESTELLO POR ARQUEO** Los sistemas de alimentación sin conexión a tierra son intrínsecamente inestables y pueden producir tensiones de línea a tierra demasiado altas durante ciertas condiciones de falla. Durante estas condiciones de falla cualquier equipo eléctrico, incluyendo un SPD, puede someterse a tensiones que excedan sus valores nominales designados. Esta información es suministrada al usuario para que tome una decisión informada antes de instalar cualquier equipo eléctrico en un sistema de alimentación sin conexión a tierra. **El incumplimiento de estas instrucciones puede causar lesiones personales o daño al equipo.**	**RISQUE D'ÉLECTROCUTION, D'EXPLOSION OU ÉCLAIR D'ARC ÉLECTRIQUE** Les systèmes d'alimentation sans mise à la terre (systèmes flottants) sont, par inhérence, instables et peuvent produire des tensions phase-terre excessivement hautes pendant certaines conditions de défaut. Pendant ces conditions de défaut, tout appareillage électrique, y compris un dispositif de protection contre les surtensions (SPD), peut être soumis à des tensions qui dépassent ses capacités nominales. Ces informations sont fournies à l'utilisateur de sorte qu'une décision fondée puisse être prise avant d'installer un appareillage électrique sur un système d'alimentation non mis à la terre (systèmes flottants). **Si ces directives ne sont pas respectées, cela peut entraîner des blessures ou des dommages matériels.**

Introduction

Verify that each replacement module catalog number matches the existing module catalog number. The catalog number is found on the identification label of the existing module and on the replacement module identification label (See Figure 1).

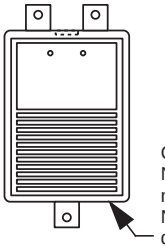
Introducción

Verifique que el número de catálogo de cada módulo de repuesto coincida con el número de catálogo del módulo existente. El número de catálogo se encuentra en la etiqueta de datos del módulo existente y en la etiqueta del módulo de repuesto (vea la figura 1).

Introduction

S'assurer que le numéro de catalogue de chaque module de rechange correspond au numéro de catalogue du module existant. Le numéro de catalogue se trouve sur l'étiquette d'identification du module existant et sur l'étiquette d'identification du module de rechange (voir la figure 1).

Figure / Figura / Figure 1 : Module Identification Label / Etiqueta de datos del módulo / Étiquette d'identification du module



Catalog number on module identification label / Número de catálogo en la etiqueta de datos del módulo / Numéro de catalogue sur l'étiquette d'identification du module

Note: Use Tables 1–3 to determine the correct replacement catalog number based on the existing system voltage and peak surge current rating. For Type 1 replacement modules, add a "1" to the end of the catalog numbers found using Tables 1–3.

Nota: Utilice las tablas 1 a 3 para determinar el número de catálogo correcto de módulo de repuesto en base a los valores nominales de tensión del sistema y la corriente transitoria máxima existentes. Para los módulos de repuesto de tipo 1, agregue un "1" al final de los números de catálogo que figuran en las tablas 1 a 3.

Remarque : Utiliser les tableaux 1 à 3 pour déterminer le bon numéro de catalogue des modules de rechange en fonction de la tension et du courant nominal de la surtension de crête du système existant. Pour les modules de rechange type 1, ajouter un « 1 » à la fin du numéro de catalogue indiqué aux tableaux 1 à 3.

Table / Tabla / Tableau 1 : MA Module Replacements / Módulos MA de repuesto / Modules MA de rechange

System Voltage / Tensión del sistema / Tension du système	Peak Surge Current Rating / Valor nominal de la corriente transitoria máx. / Courant nominal de surtension de crête	Catalog Number[1] / Número de catálogo / Nº de catalogue		
		Phase / Fase A	Phase / Fase B	Phase / Fase C
120/240 V, 1-phase, 3-wire + ground / 1 fase, 3 hilos + tierra / Monophasée, 3 fils + terre	120 kA	MA1IMA12_	—	MA1IMA12_
	160 kA	MA1IMA16_	—	MA1IMA16_
	240 kA	MA1IMA24_	—	MA1IMA24_
	320 kA	MA1IMA16[2]_	—	MA1IMA16[2]_
	480 kA	MA1IMA24[2]_	—	MA1IMA24[2]_
208Y/120 V , 3-phase, 4-wire + ground Wye [3] / 3 fases, 4 hilos + tierra, en estrella[3] / Triphasée, 4 fils + terre, en étoile[3]	120 kA	MA1IMA12_	MA1IMA12_	MA1IMA12_
	160 kA	MA1IMA16_	MA1IMA16_	MA1IMA16_
	240 kA	MA1IMA24_	MA1IMA24_	MA1IMA24_
	320 kA	MA1IMA16[2]_	MA1IMA16[2]_	MA1IMA16[2]_
	480 kA	MA1IMA24[2]_	MA1IMA24[2]_	MA1IMA24[2]_
240/120 V, 3-phase, 4-wire + ground, High-Leg Delta [4] / 3 fases, 4 hilos + tierra, en delta con extremo alto [4] (High Leg Delta) / Triphasée, 4 fils + terre, sommet du triangle [4] (High Leg Delta)	120 kA	MA1IMA12_	MA3IMA12_	MA1IMA12_
	160 kA	MA1IMA16_	MA3IMA16_	MA1IMA16_
	240 kA	MA1IMA24_	MA3IMA24_	MA1IMA24_
	320 kA	MA1IMA16[2]_	MA3IMA16[2]_	MA1IMA16[2]_
	480 kA	MA1IMA24[2]_	MA3IMA24[2]_	MA1IMA24[2]_
480Y/277 V, 3-phase, 4-wire + ground Wye [5] / 3 fases, 4 hilos + tierra, en estrella[5] / Triphasée, 4 fils + terre, en étoile[5]	120 kA	MA4IMA12_	MA4IMA12_	MA4IMA12_
	160 kA	MA4IMA16_	MA4IMA16_	MA4IMA16_
	240 kA	MA4IMA24_	MA4IMA24_	MA4IMA24_
	320 kA	MA4IMA16[2]_	MA4IMA16[2]_	MA4IMA16[2]_
	480 kA	MA4IMA24[2]_	MA4IMA24[2]_	MA4IMA24[2]_
480 V, 3-phase, 3-wire + ground Delta [6] / 3 fases, 3 hilos + tierra, en delta[6] / Triphasée, 3 fils + terre, en triangle[6]	100 kA	MA5IMA10_	MA5IMA10_	MA5IMA10_
	120 kA	MA5IMA12_	MA5IMA12_	MA5IMA12_
	160 kA	MA5IMA16_	MA5IMA16_	MA5IMA16_
	200 kA	MA5IMA20_	MA5IMA20_	MA5IMA20_
	240 kA	MA5IMA24_	MA5IMA24_	MA5IMA24_
	320 kA	MA5IMA16[2]_	MA5IMA16[2]_	MA5IMA16[2]_
	480 kA	MA5IMA24[2]_	MA5IMA24[2]_	MA5IMA24[2]_
240 V, 3-phase, 3-wire + ground Delta / 3 fases, 3 hilos + tierra, en delta / Triphasée, 3 fils + terre, en triangle	100 kA	MA6IMA10_	MA6IMA10_	MA6IMA10_
	120 kA	MA6IMA12_	MA6IMA12_	MA6IMA12_
	160 kA	MA6IMA16_	MA6IMA16_	MA6IMA16_
	200 kA	MA6IMA20_	MA6IMA20_	MA6IMA20_
	240 kA	MA6IMA24_	MA6IMA24_	MA6IMA24_
	320 kA	MA6IMA16[2]_	MA6IMA16[2]_	MA6IMA16[2]_
	480 kA	MA6IMA24[2]_	MA6IMA24[2]_	MA6IMA24[2]_
600Y/347 V, 3-phase, 4-wire + ground Wye / 3 fases, 4 hilos + tierra, en estrella / Triphasée, 4 fils + terre, en étoile	120 kA	MA8IMA12_	MA8IMA12_	MA8IMA12_
	160 kA	MA8IMA16_	MA8IMA16_	MA8IMA16_
	240 kA	MA8IMA24_	MA8IMA24_	MA8IMA24_
	320 kA	MA8IMA16[2]_	MA8IMA16[2]_	MA8IMA16[2]_
	480 kA	MA8IMA24[2]_	MA8IMA24[2]_	MA8IMA24[2]_

Continued—

Table / Tabla / Tableau 1 : MA Module Replacements / Módulos MA de repuesto / Modules MA de rechange

System Voltage / Tensión del sistema / Tension du système	Peak Surge Current Rating / Valor nominal de la corriente transitoria máx. / Courant nominal de surtension de crête	Catalog Number[1] / Número de catálogo / Nº de catalogue		
		Phase / Fase A	Phase / Fase B	Phase / Fase C
600 V, 3-phase, 3-wire + ground Delta [7] / 3 fases, 3 hilos + tierra, en delta[7] / Triphasée, 3 fils + terre, en triangle[7]	100 kA	MA9IMA10_	MA9IMA10_	MA9IMA10_
	120 kA	MA9IMA12_	MA9IMA12_	MA9IMA12_
	160 kA	MA9IMA16_	MA9IMA16_	MA9IMA16_
	180 kA	MA9IMA18_	MA9IMA18_	MA9IMA18_
	200 kA	MA9IMA10[1]_	MA9IMA10[2]_	MA9IMA10[2]_
	240 kA	MA9IMA12[2]_	MA9IMA12[2]_	MA9IMA12[2]_
	320 kA	MA9IMA16[2]_	MA9IMA16[2]_	MA9IMA16[2]_

1 For redundant module systems, two replacement modules per phase are required. / Para los sistemas de módulos redundantes, son necesarios dos módulos de repuesto por fase. / Pour les systèmes à module redondant, deux modules de rechange par phase sont requis.

3 208Y/120 V series also applies to 230Y/127 V / 208Y/120 V también es aplicable para la siguiente tensión: 230Y/127 V/ 208Y/120 V s'applique aussi à la tension 230Y/127 V.

4 Phase B modules are different than Phase A and Phase C modules. / Los módulos para la fase B son diferentes que los módulos para las fases A y C. / Les modules phase B sont différents des modules phase A et phase C.

5 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, 415Y/240 / 480Y/277 es aplicable para las siguientes tensiones 380Y/220, 400Y/230, 415Y/240 / 480Y/277 s'applique aux tensions suivantes : 380Y/220, 400Y/230, 415Y/240.

6 480 V Delta series also applies to the following voltages: 480Y/277V HRG. / 480 V en delta es también aplicable para las siguientes tensiones: 480Y/277V HRG. / 480 V en triangle s'applique également aux tensions suivantes : 480Y/277V HRG.

7 600 V Delta series also applies to the following voltages: 600Y/347V HRG. / 600 V en delta es también aplicable para las siguientes tensiones: 600Y/347V HRG. / 600 V en triangle s'applique également aux tensions suivantes : 600Y/347V HRG.

Table / Tabla / Tableau 2 : L-L Enhanced MA (L-N and L-G) / Módulo MA, L-L mejorada (L-N y L-G) / Module MA, L-L amélioré (L-N et L-G)

System Voltage / Tensión del sistema / Tension du système	Peak Surge Current Rating / Valor nom. de la corriente transitoria máx. / Courant nominal de surtension de crête	Catalog Number[1] / Número de catálogo / Nº de catalogue		
		Phase / Fase A	Phase / Fase B	Phase / Fase C
208Y/120 V[2], 3-phase, 4-wire + ground, L-L Enhanced Wye / 3 fases, 4 hilos + tierra, L-L mejorada, en estrella / Triphasée, 4 fils + terre, L-L renforcée, en étoile	120 kA 180 kA 270 kA 360 kA	MA1IMA12_ MA1IMA16_ MA1IMA16_ MA1IMA24_	MA1IMA12_ MA1IMA16_ MA1IMA16_ MA1IMA24_	MA1IMA12_ MA1IMA16_ MA1IMA16_ MA1IMA24_
480Y/277 V[3], 3-phase, 4-wire + ground, L-L Enhanced Wye/ 3 fases, 4 hilos + tierra, L-L mejorada, en estrella / Triphasée, 4 fils + terre, L-L renforcée, en étoile	120 kA 180 kA 270 kA 360 kA	MA4IMA12_ MA4IMA16_ MA4IMA16_ MA4IMA24_	MA4IMA12_ MA4IMA16_ MA4IMA16_ MA4IMA24_	MA4IMA12_ MA4IMA16_ MA4IMA16_ MA4IMA24_

1 Catalog numbers are representational. Actual catalog numbers require a suffix to indicate UL Type. / Los números de catálogo son de ejemplo. Los números de catálogo reales requieren un sufijo para indicar el tipo UL. / Les numéros de catalogue sont représentatifs. Les numéros de catalogue réels exigent un suffixe pour indiquer le type UL.

2 208Y/120 V series also applies to 230Y/127 V / 208Y/120 V también es aplicable para la siguiente tensión: 230Y/127 V / 208Y/120 V s'applique aussi à la tension 230Y/127 V.

3 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, 415Y/240 / 480Y/277 es aplicable para las siguientes tensiones 380Y/220, 400Y/230, 415Y/240 / 480Y/277 s'applique aux tensions suivantes : 380Y/220, 400Y/230, 415Y/240.

Table / Tabla / Tableau 3 : L-L Enhanced L-L Module Replacements / Módulos L-L de repuesto, L-L mejorada / Modules L-L de rechange, L-L amélioré

System Voltage / Tensión del sistema / Tension du système	Peak Surge Current Rating / Valor nom. de la corriente transitoria máx. / Courant nominal de surtension de crête	Catalog Number[1] / Número de catálogo / Nº de catalogue		
		Phase / Fase A	Phase / Fase B	Phase / Fase C
208Y/120 V[2], 3-phase, 4-wire + ground, L-L Enhanced Wye / 3 fases, 4 hilos + tierra, L-L mejorada, en estrella / Triphasée, 4 fils + terre, L-L renforcée, en étoile	120 kA 180 kA 270 kA 360 kA	MA2IMA40LL_ MA2IMA60LL_ MA2IMA90LL_ MA2IMA12LL_	MA2IMA40LL_ MA2IMA60LL_ MA2IMA90LL_ MA2IMA12LL_	MA2IMA40LL_ MA2IMA60LL_ MA2IMA90LL_ MA2IMA12LL_
480Y/277 V[3], 3-phase, 4-wire + ground, L-L Enhanced Wye / 3 fases, 4 hilos + tierra, L-L mejorada, en estrella / Triphasée, 4 fils + terre, L-L renforcée, en étoile	120 kA 180 kA 270 kA 360 kA	MA4IMA40LL_ MA4IMA60LL_ MA4IMA90LL_ MA4IMA12LL_	MA4IMA40LL_ MA4IMA60LL_ MA4IMA90LL_ MA4IMA12LL_	MA4IMA40LL_ MA4IMA60LL_ MA4IMA90LL_ MA4IMA12LL_

1 Catalog numbers are representational. Actual catalog numbers require a suffix to indicate UL Type. / Los números de catálogo son de ejemplo. Los números de catálogo reales requieren un sufijo para indicar el tipo UL. / Les numéros de catalogue sont représentatifs. Les numéros de catalogue réels exigent un suffixe pour indiquer le type UL.

2 208Y/120 V series also applies to 230Y/127 V / 208Y/120 V también es aplicable para la siguiente tensión: 230Y/127 V/ 208Y/120 V s'applique aussi à la tension 230Y/127 V.

3 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, 415Y/240 / 480Y/277 es aplicable para las siguientes tensiones 380Y/220, 400Y/230, 415Y/240 / 480Y/277 s'applique aux tensions suivantes : 380Y/220, 400Y/230, 415Y/240.

Existing Module Removal

1. Turn off all power supplying this equipment before working on or inside any enclosure containing this equipment.
2. Confirm the SPD voltage rating and configuration is the same as the system voltage and power system configuration to which it will be connected.
3. If not already labeled, label each diagnostic display panel cable and module phase cable with the appropriate phase letter (A, B, or C) as shown in Figure 2.
4. Unplug the phase diagnostic display cable from the module to be replaced.

Note: It is not necessary to remove the phase cable from the lug.

5. Use a suitable tool to prevent each 1/2 in. hex standoff from turning and remove the three 1/4-20 hex head bolts and corresponding washers. See Figure 2.
6. Carefully remove the module.

Desmontaje del módulo existente

1. Desenergice el equipo antes de realizar cualquier trabajo dentro o fuera del gabinete que contiene este equipo.
2. Asegúrese de que la tensión nominal y configuración del SPD sean las mismas que la tensión y la configuración del sistema de alimentación al que será conectado.
3. Si todavía no han sido etiquetados, coloque una etiqueta a cada cable de la pantalla de diagnóstico y al cable de fase del módulo con la letra apropiada de la fase (A, B o C) como se ilustra en la figura 2.
4. Desenchufe el cable de la pantalla de diagnóstico de fase del módulo que va a sustituir.

Nota: No es necesario retirar el cable de fase de la zapata.

5. Utilice una herramienta adecuada para evitar que gire el separador hexagonal de 12 mm (1/2 pulg), extraiga los tres tornillos de cabeza hexagonal de 1/4-20 y las roldanas correspondientes. Vea la figura 2.
6. Retire cuidadosamente el módulo.

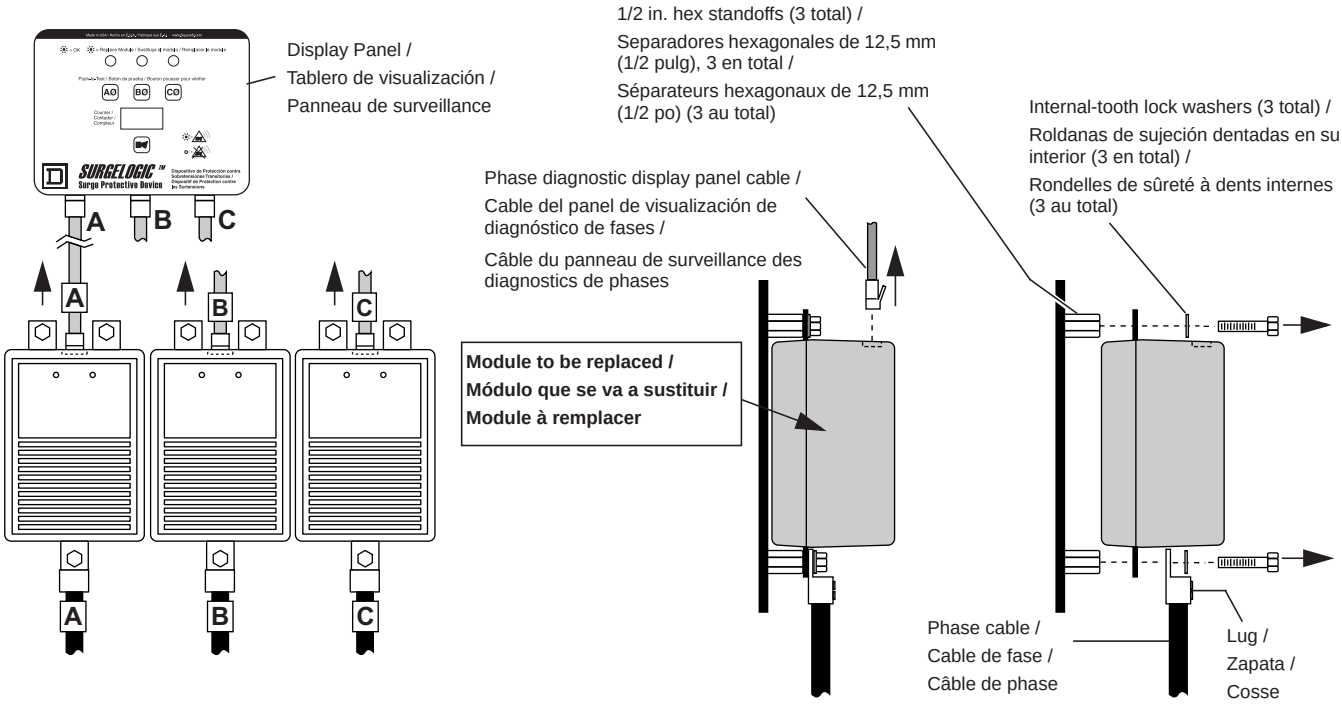
Retrait du module existant

1. Couper toute alimentation vers cet appareil avant de travailler sur ou à l'intérieur du coffret contenant cet appareil.
2. S'assurer que la tension nominale et la configuration du SPD sont les mêmes que la tension et la configuration du système d'alimentation auquel il sera raccordé.
3. Si une étiquette n'a pas déjà été placée, étiqueter chaque câble de phase du panneau de surveillance des diagnostics et du module avec la phase appropriée (A, B ou C) comme indiqué à la figure 2.
4. Débrancher le câble du panneau de surveillance des diagnostics de phase du module à remplacer.

Remarque : Il n'est pas nécessaire de retirer le câble de phase de la cosse.

5. Utiliser un outil qui convient pour empêcher chaque séparateur hexagonal de 12,5 mm (1/2 po) de tourner, puis retirer les trois boulons à tête hexagonale de 1/4-20 et les rondelles correspondantes. Voir la figure 2.
6. Retirer soigneusement le module.

Figure / Figura / Figure 2 : Module Removal / Desmontaje del módulo / Retrait du module



New Module Installation

1. Turn off all power supplying this equipment before working on or inside any enclosure containing this equipment.
2. Confirm the replacement modules have the same voltage rating and configuration as the power system voltage and power system configuration to which it will be connected.
3. Using the new hardware supplied, install the module and appropriate phase cable. See Figure 3.
4. Plug the appropriate phase diagnostic display panel cable into the new module. See Figure 3.
5. Check that all connections are secure. Remove all tools and discarded hardware from the unit.

Instalación del módulo nuevo

1. Desenergice el equipo antes de realizar cualquier trabajo dentro o fuera del gabinete que contiene este equipo.
2. Asegúrese de que los módulos de repuesto tengan la misma tensión nominal y configuración que la tensión y configuración del sistema de alimentación al que serán conectados.
3. Con los herrajes nuevos incluidos, instale el módulo y el cable de fase apropiado. Vea la figura 3.
4. Enchufe el cable de la pantalla de diagnóstico, apropiado para la fase, en el módulo nuevo. Vea la figura 3.
5. Asegúrese de que las conexiones estén bien sujetadas. Quite todas las herramientas y los herrajes que retiró de la unidad.

Installation du nouveau module

1. Couper toute alimentation vers cet appareil avant de travailler sur ou à l'intérieur du coffret contenant cet appareil.
2. S'assurer que les modules de rechange ont la même configuration et la même tension nominale que la tension et configuration du système d'alimentation auquel ils seront raccordés.
3. À l'aide de la nouvelle quincaillerie fournie, installer le module et le câble de phase approprié. Voir la figure 3.
4. Brancher le câble de phase du panneau de surveillance des diagnostics approprié dans le nouveau module. Voir la figure 3.
5. Vérifier si tous les raccordements sont sûrs. Enlever tous les outils et la quincaillerie éliminée de l'unité.

6. Ensure that the phase diagnostic display cables are not touching any internal components.
7. Replace the barrier, cover/door, and/or trim to the equipment.
8. Equipment may be re-energized after all of the above steps are complete.

6. Asegúrese de que los cables de la pantalla de diagnóstico de fase no estén tocando ningún componente interno.
7. Vuelva a colocar la barrera, puerta/cubierta, y/o el marco del equipo.
8. Una vez realizados todos los pasos anteriores ya podrá volver a energizar el equipo.

6. S'assurer que les câbles du panneau de surveillance des diagnostics de phase ne touchent aucun composant interne.
7. Replacer la cloison, la porte/le couvercle ou la garniture de l'appareil.
8. L'appareil peut être remis sous tension après l'achèvement de tous les points ci-dessus.

Figure / Figura / Figure 3 : New Module Installation / Instalación del módulo nuevo / Installation du nouveau module

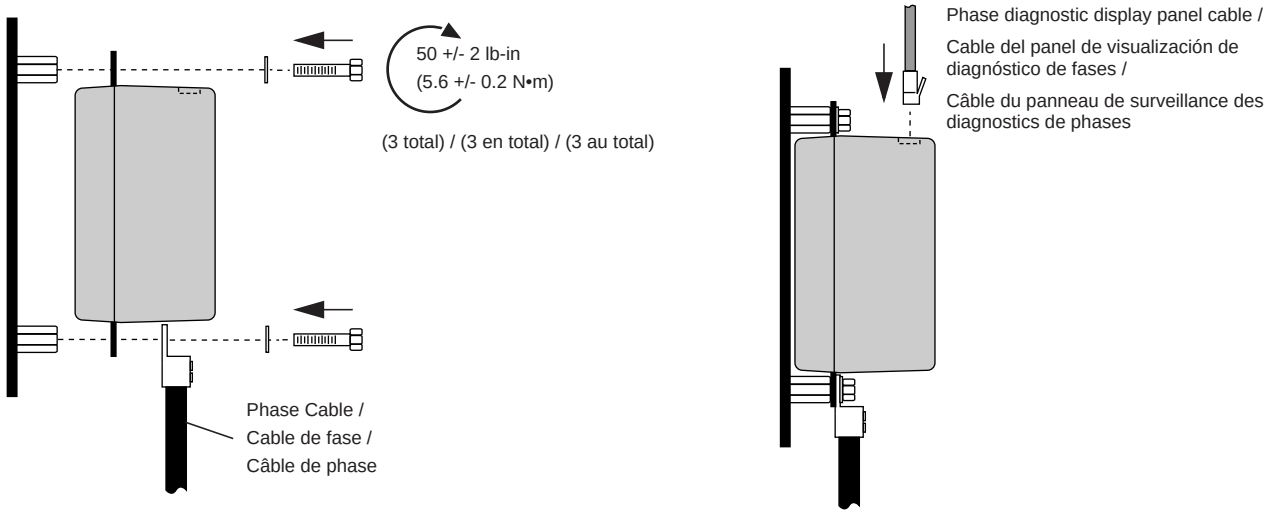


Figure / Figura / Figure 4 : Module removal and installation for MCC systems / Desmontaje e instalación de módulos del sistema CCM / Retrait et installation du module pour les systèmes de centres de commande de moteurs

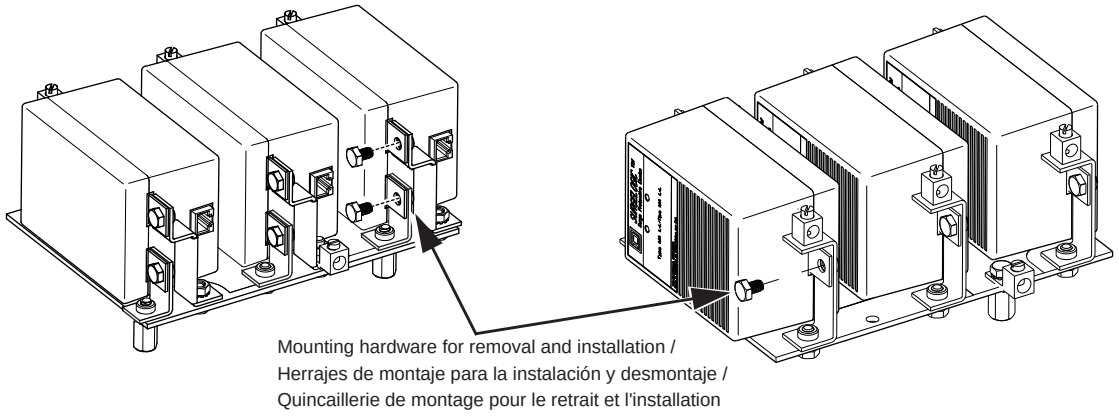
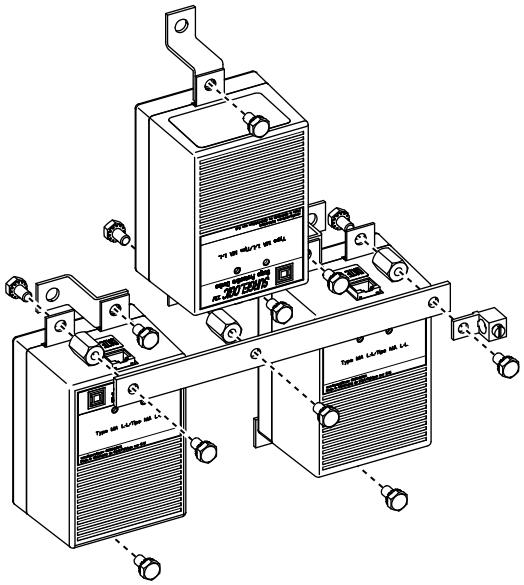


Figure / Figura / Figure 5 : Module removal and installation for NQ panelboard systems / Desmontaje e instalación de los módulos del sistema de tableros NQ / Retrait et installation du module pour les systèmes de panneaux de distribution NQ



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I-Line™ Surgelogic™ SPD Unit

QMB Surgelogic™ SPD Unit

Busway Surgelogic™ SPD Unit

MCC Surgelogic™ SPD Unit

Internally Mounted—Retrofit/Ready to Install

To ensure high-performance surge suppression at critical power locations, a variety of Surgelogic™ products have been designed specifically for retrofitting into commonly used Square D™ systems. The QMB fusible switch, 6 in. MCC bucket, I-Line & Busway plug-on units and the SurgeLoc for the NQ panelboards come ready to install. Retrofitting SPD units into I-Line, QMB, MCC, Busway and NQ Panelborad applications is simple.

- Audible alarm with enable/disable switch, dry contacts and surge counter standard
- 200 kA SCCR
- Indicator LEDs
- EMI/RFI filtering

Table 6.3: Internally Mounted—Retrofit / Ready To Install

Voltage	Surge Current Rating	I-Line Branch Units *[1]*		QMB Branch Units *[2]*	Busway Units	Model 6 MCC Units *[3]*
		Cat. No.	Cat. No.	Cat. No.	Cat. No. *[4]*	Cat. No. *[4]*
120/240 V, 1-phase, 3-wire + ground	120 kA	HL1IMA12C( )	HR1IMA12C( )	QMB1IMA12	—	—
	160 kA	HL1IMA16C( )	HR1IMA16C( )	QMB1IMA16	—	—
	240 kA	HL1IMA24C( )	HR1IMA24C( )	QMB1IMA24	—	—
208Y/120 V, 3-phase, 4-wire + ground *[5]* *[6]* Wye	120 kA	HL2IMA12C( )	HR2IMA12C	QMB2IMA12	—	MCC2IMA12
	160 kA	HL2IMA16C( )	HR2IMA16C( )	QMB2IMA16	PIU2IMA16	MCC2IMA16
	240 kA	HL2IMA24C( )	HR2IMA24C( )	QMB2IMA24	PIU2IMA24	MCC2IMA24
240/120 V, 3-phase, 4-wire + ground High-leg Delta	120 kA	HL3IMA12C( )	HR3IMA12C( )	QMB3IMA12	—	MCC3IMA12
	160 kA	HL3IMA16C( )	HR3IMA16C( )	QMB3IMA16	PIU3IMA16	MCC3IMA16
	240 kA	HL3IMA24C( )	HR3IMA24C( )	QMB3IMA24	PIU3IMA24	MCC3IMA24
240 V, 3-phase, 3-wire + ground, Delta	120 kA	HL6IMA12C( )	HR6IMA12C( )	—	—	—
	160 kA	HL6IMA16C( )	HR6IMA16C( )	—	—	—
	240 kA	HL6IMA24C( )	HR6IMA24C( )	—	—	—
480Y/277 V, 3-phase, 4-wire + ground *[5]* *[7]* Wye	120 kA	HL4IMA12C( )	HR4IMA12C( )	QMB4IMA12	—	MCC4IMA12
	160 kA	HL4IMA16C( )	HR4IMA16C( )	QMB4IMA16	PIU4IMA16	MCC4IMA16
	240 kA	HL4IMA24C( )	HR4IMA24C( )	QMB4IMA24	PIU4IMA24	MCC4IMA24
480 V, 3-phase, 3-wire + ground, Delta *[8]*	120 kA	HL5IMA12C( )	HR5IMA12C( )	—	—	—
	160 kA	HL5IMA16C( )	HR5IMA16C( )	—	—	—
	240 kA	HL5IMA24C( )	HR5IMA24C( )	—	—	—
600Y/347 V, 3-phase, 4-wire + ground *[5]* Wye	120 kA	—	HR8IMA12C( )	QMB8IMA12	—	MCC8IMA12
	160 kA	—	HR8IMA16C( )	QMB8IMA16	PIU8IMA16	MCC8IMA16
	240 kA	—	HR8IMA24C( )	QMB8IMA24	PIU8IMA24	MCC8IMA24
600V, 3-phase, 3-wire + ground, *[9]* Delta	120 kA	—	HR9IMA12C( )	—	—	—
	160 kA	—	HR9IMA16C( )	—	—	—
	180 kA	—	HR9IMA18C( )	—	—	—

( ) For a Type 1 SPD, add a “1” suffix to the catalog number.

[1] Requires 13.5-inch mounting height.
[2] Requires 9-inch mounting height.
[3] Requires 6-inch mounting height.
[4] PE7 Discount Schedule.
[5] Can be used on 4-wire or 3-wire grounded wye systems with or without neutral.
[6] 208Y/120 series also applies to the following voltage 220Y/127.
[7] 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.
[8] 480 V Delta series also applies to the following voltage: 480Y/277V HRG.
[9] 600 V Delta series also applies to the following voltage: 600Y/347V HRG.

MA Replacement Module

Surgelogic™ MA Replacement Modules

All module assemblies are US and Canadian UL® Recognized to UL 1449 standards.

Complies with requirements of NEC® Article 285 and CSA C22.2 No. 8-M1986 as appropriate.

Table 6.2: MA Replacement Modules

System Voltage	Peak Surge Current Rating (kA)	Catalog Numbers *[8]*		
		Phase A	Phase B	Phase C
120/240 V, 1-phase, 3-wire + ground	120	MA1IMA12	—	MA1IMA12
	160	MA1IMA16	—	MA1IMA16
	240	MA1IMA24	—	MA1IMA24
208Y/120 V, 3-phase, 4-wire + ground *[9]* Wye	120	MA1IMA12	MA1IMA12	MA1IMA12
	160	MA1IMA16	MA1IMA16	MA1IMA16
	240	MA1IMA24	MA1IMA24	MA1IMA24
240/120 V, 3-phase, 4-wire + ground *[10]* High-Leg Delta	120	MA1IMA12	MA3IMA12	MA1IMA12
	160	MA1IMA16	MA3IMA16	MA1IMA16
	240	MA1IMA24	MA3IMA24	MA1IMA24
240 V, 3-phase, 3-wire + ground Delta	100	MA6IMA10	MA6IMA10	MA6IMA10
	120	MA6IMA12	MA6IMA12	MA6IMA12
	160	MA6IMA16	MA6IMA16	MA6IMA16
	200	MA6IMA20	MA6IMA20	MA6IMA20
	240	MA6IMA24	MA6IMA24	MA6IMA24
480Y/277 V, 3-phase, 4-wire + ground *[11]* Wye	120	MA4IMA12	MA4IMA12	MA4IMA12
	160	MA4IMA16	MA4IMA16	MA4IMA16
	240	MA4IMA24	MA4IMA24	MA4IMA24
480 V, 3-phase, 3-wire + ground *[12]* Delta	100	MA5IMA10	MA5IMA10	MA5IMA10
	120	MA5IMA12	MA5IMA12	MA5IMA12
	160	MA5IMA16	MA5IMA16	MA5IMA16
	200	MA5IMA20	MA5IMA20	MA5IMA20
	240	MA5IMA24	MA5IMA24	MA5IMA24
600Y/347 V, 3-phase, 4-wire + ground Wye	120	MA8IMA12	MA8IMA12	MA8IMA12
	160	MA8IMA16	MA8IMA16	MA8IMA16
	240	MA8IMA24	MA8IMA24	MA8IMA24
600 V, 3-phase, 3-wire + ground *[13]* Delta	100	MA9IMA10	MA9IMA10	MA9IMA10
	120	MA9IMA12	MA9IMA12	MA9IMA12
	160	MA9IMA16	MA9IMA16	MA9IMA16
	180	MA9IMA18	MA9IMA18	MA9IMA18

[8] For UL 1449 Type 1 Modules, add suffix (1). Example: MA1IMA121
[9] 208Y/120 series also applies to the following voltage 220Y/127.
[10] High-leg delta (Phase B modules are different than Phase A and Phase C modules).
[11] 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.
[12] 480 V Delta series also applies to the following voltage 480Y/277V HRG.
[13] 600 V Delta series also applies to the following voltage 600Y/347V HRG.