CASPER ELECTRIC
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Kelly Walsh High School

Operation and Maintenance Manuals

Division 26 – Electrical – Volume II

Project: Kelly Walsh High School
3500 East 12th street
Casper, Wyoming 82609
(307) 253-2000

Owner: Natrona County School District
1038 North Glenn Road
Casper, Wyoming 82601
(307) 253-5317

Electrical Contractor: Casper Electric

Construction Manager: Sampson Construction
2701 Westland Court, Suite A
Cheyenne, Wyoming 82001
(307) 426-4050

Architect: RB+B Architect's
315 E. Mountain Avenue Suite 100
Fort Collins, Colorado 80524-2913
(970) 484-0117

Commissioning Authority: Beaudin Ganze Consulting Engineers
1626 Cole Boulevard, Suite 300
Lakewood, Colorado 80401
(303) 278-3820 Ext. 5407

Electrical Engineer: Engineering Design Associates
1607 CY Avenue
Casper, WY 82604
(307) 266-5033

October, 2015

Kelly Walsh High School

Operation and Maintenance Manual

Factory Order #: 34765053

12/16/2014

Casper, Wyoming

Distributor:
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Schneider Electric

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Schneider Electric Conditions of Sale
Proposal-based Projects

Note
The following Conditions of Sale are subject to change. All transactions for all products sold by Schneider Electric USA ("Schneider Electric"), including all Schneider Electric brand products, are subject to the latest published Conditions of Sale of Schneider Electric and to any Special Conditions of Sale which may be contained in applicable Schneider Electric quotations and acknowledgments.

Schneider Electric Standard conditions of Sale will apply in all transactions between customers and Schneider Electric, unless the Proposal-based Project Conditions of Sale, apply as defined in the following paragraph.

Proposal-based Projects Definitions

Transactions that exhibit some or all of the following attributes: Unique customer requirements that are typically negotiated and quoted, requires approval drawings and project management by Schneider Electric, and for which there is a specific direct-ship address.

Governing Provisions and Acceptance

All quotations are subject to these conditions of sale. Acceptance of an order by Schneider Electric shall be expressly conditioned on Purchaser's assent to these conditions. Purchaser's direction to proceed with engineering, manufacture or shipment by Schneider Electric shall be deemed evidence of this assent. No modified or other conditions will be applicable unless those conditions are so stated in Schneider Electric's proposal or are specifically agreed to in writing and signed by an authorized official of Schneider Electric. Failure to object to provisions contained in any Purchase Order or other communication from the Purchaser (including, without limitation, penalty clauses of any kind) shall not be construed as a waiver of these Conditions nor an acceptance of any other provisions. These terms are a complete statement of the parties' agreement and may only be modified in writing signed by both parties. These terms may not be modified by course of dealing, course of performance or usage of trade. These terms supersede all previous written or oral quotations, statements or agreements. Any contract for sale by and between the parties shall be governed by and construed according to the laws of the State of Illinois without regard to its rules on the conflict of laws. The Convention on the International Sale of Goods is expressly excluded.

Quotations

Quotations shall be valid for no more than thirty (30) days from the date quotation is communicated from seller to purchaser, unless otherwise stated in the quotation. All quotations are subject to change by Schneider Electric Company at any time upon notice to Purchaser. Quotations are made based on Schneider Electric's interpretation of the plans and specifications submitted to Schneider Electric by the Purchaser. It is Purchaser's obligation to review the quotation carefully and to immediately advise Schneider Electric of any differing interpretation Purchaser has so any necessary change can be made.

Order Entry

A complete, signed purchase order must be received before entry of an order into Schneider Electric's system. Considerable detail is involved in the manufacture of power equipment. To facilitate timely shipment, complete details and information, including Purchaser's requested on-site dates must be provided at the time of order entry. Shipment dates are approximate and are based upon timely receipt of all necessary information from the Purchaser. Lack of complete information may result in delays of drawings or manufacture. Such delays shall relieve Schneider Electric from compliance with the quoted delivery dates and may lead to price escalation. Failure to provide a complete signed purchase order within twenty (20) days of notification of award may result in renegotiation of price or shipment dates.

Approval Drawings

When required by a specific Purchase Order, drawings will be submitted for approval per agreed upon schedules, and price policy, below, to assure Schneider Electric has designed the equipment as described in Purchaser's specifications, as modified by Schneider Electric's quotation. If at time of drawing approval Schneider Electric has not designed the equipment to meet the specifications, as modified by Schneider Electric's quotation, Schneider Electric will make the appropriate changes at no charge to Purchaser. Where the Purchaser's specification is not definitive, Schneider Electric shall have the right to design the product in line with good commercial practice, without further obligation to Purchaser. If at drawing approval, Purchaser makes changes outside the design as stated in the specifications, such changes shall be treated as a change order as provided below.

Price Policy

Quoted prices are firm provided: A) The order is received with complete engineering details and is released for manufacture within sixty (60) calendar days from the originally anticipated release date. B) All required approval drawings are returned and equipment released by Purchaser no later than sixty (60) calendar days from the original date of issuance of approval drawings by Schneider Electric. The returned drawings must be released for manufacture for shipment on the agreed date. Drawing re-submittals which are required for any reason other than to correct Schneider Electric errors will not extend the sixty (60) day deadline. If the Purchaser causes delay of shipment in any way or returns approval drawings beyond the time stated above, Purchaser may be subject to charges which shall not exceed 2% of the purchase order price for each full month or fraction thereof that shipment is delayed, as compensation to Schneider Electric for expenses created by such delay and not as a penalty. In addition to the 2% charge per month, if shipment is delayed through the fault of Purchaser for more than 180 days from the original date of issuance of approval drawings, the price may be subject to revision.

Pricing-Purchaser Changes

All prices cover a bill of material as described in Schneider Electric specifications or quotations to be designed and manufactured to Schneider Electric standard designs, unless otherwise agreed in writing between the parties. Purchaser may make minor changes not affecting the time or cost of performance without charge prior to the start of manufacture. If any changes are requested by the Purchaser after submission of the original Purchase Order which affect the cost or time of performance, additional billing will be made with the amount of price adder dependent on the change and status of the order when the change is made. Changes may also result in an extension of time for shipment. All changes will be agreed to by the parties, in writing, prior to implementation. Purchaser's rescheduling shipment will be considered a change. All expenses incurred by Schneider Electric in connection with the storage of equipment, including demurrage, packing, storage charges, insurance and handling charges by Schneider Electric will be paid by the Purchaser upon submission of invoices by Schneider Electric. Schneider Electric will issue price changes for any change requested by the Purchaser that affects modification of equipment, changes the bills of material, engineering or drawings or delivery schedule as follows: A) If Purchaser makes a change to an order prior to being released to engineering, the net price will be adjusted by re-pricing the equipment with prices in effect at the time of the change. A commensurate delay in the shipping date will be based on the changes involved. B) For changes made after the order is released to engineering, the net price and ship date will be adjusted as described in paragraph A above. An additional charge based on Schneider Electric standard engineering billing charges and cost of parts ($250 minimum) will be made to cover any extra engineering and drafting, scrap or rework of parts, or cost of modification. C) If during the drawing approval process, the Purchaser makes changes outside the design covered by the specifications, Schneider Electric will be reimbursed as described in paragraph A and B above, plus any additional charges for any extra cost incurred as a direct result of the changes and allowed a commensurate delay in shipping date based on the changes involved. Changes to the order can not be processed until a formal signed change order is received from the Purchaser.

Substitutions

Schneider Electric may furnish suitable substitutes for material unobtainable because of priorities or regulations established by governmental authority or non-availability of materials from suppliers, provided such substitutions do not adversely affect the technical soundness of the equipment. Schneider Electric assumes no liability for deviation from published dimensions and descriptive information not essential to proper performance of the product.

Taxes

Any manufacturer's tax, retailer's tax, occupation tax, use tax, sales tax, excise tax, (except federal excise tax on vehicles), duty, customs, inspecting or testing fee, or other tax, fee or charge of any nature whatsoever, imposed by any governmental authority or measured by any transaction between Schneider Electric and Purchaser, shall be paid by the Purchaser in addition to the prices quoted or invoiced, and such charges will appear as a separate line item on the invoice. In the event Schneider Electric will be required to pay any such tax, fee, or charge, Purchaser shall reimburse Schneider Electric or, in lieu of such payment, Purchaser shall supply Schneider Electric at the time the order is submitted with an exemption certificate or other document acceptable to the tax authority. Purchase Orders must state the existence and amount of any such tax, fee or charge for which Purchaser claims an exemption.

Terms of Payment

Acceptance of all Purchase Orders is subject to Purchaser meeting Schneider Electric credit standards. Terms are subject to change for failure to meet such standards. Terms are net thirty (30) days from date of invoice of each shipment, unless otherwise stated in Schneider Electric's quotation. For an authorized distributor or authorized reseller order, applicable terms of payment are stated in the quotation or applicable discount schedule. Schneider Electric reserves the right at any time to demand full or partial payment before proceeding with a contract of sale if, in its sole judgment, as a result of changes in the financial condition of the Purchaser the terms of payment originally specified are no longer justified.

Progress Payments/ Payment Term

All proposal-based projects are Net 30 days from date of invoice of each shipment. On projects exceeding $1,000,000 Net, progress payments are payable according to the following milestones:

- 30% Release to manufacturing
- 70% (balance) due at shipment

Payments

If delivery is delayed or deferred by the Purchaser beyond the scheduled date, payment shall be due in full when Schneider Electric is prepared to ship. The equipment may be stored at the risk and expense of the Purchaser. If the Purchaser defaults when any payment is due, then the whole contract price shall become due and payable upon demand, or Schneider Electric at its option, without prejudice to other lawful remedies, may defer delivery or cancel the contract for sale. If Purchaser become insolvent, or bankrupt or in the event any proceeding is brought against the Purchaser, voluntarily or involuntarily under the bankruptcy or any insolvency law, Schneider Electric may cancel any order then outstanding at any time and recover its proper cancellation charges from the Purchaser or the Purchaser's estate.

Delivery

F.O.B. Point of Shipment

When the Schneider Electric quotation is based on delivery F.O.B. point of shipment, freight prepaid and allowed for delivery within the continental United States, Product is sold F.O.B. point of shipment, freight prepaid and allowed for orders over $2000 net. Delivery by Schneider Electric to the point of shipment constitutes delivery to the Purchaser; and title and all risk of loss or damage in transit shall pass to the Purchaser at time of delivery at the F.O.B. point. Schneider Electric is not responsible for breakage or delays by carrier after having received "in good order" receipts from the carrier. Purchaser is responsible for pursuing any damage claims with the carrier. For orders under $2000 net the above terms apply except freight is prepaid not allowed. No allowance will be made in lieu of transportation if the Purchaser accepts shipment at factory, warehouse or freight station or otherwise supplies its own transportation. Freight prepaid is defined as: a) Shipments to destinations within the continental United States to the accessible common carrier point nearest the first destination. b) Shipments to U.S. destinations outside the continental United States shall be to the common carrier free delivery point in the United States nearest the original port of embarkation. All charges associated with F.A.S., C.I.F., or other charges such as pier transfer, lift, ocean freight, and marine or war insurance shall be paid by the Purchaser, unless otherwise specifically agreed in a specific Purchase Order. In no event will Schneider Electric be responsible for demurrage or detention charges.

Delivery: F.O.B. Destination

When the Schneider Electric quotation is based on delivery F.O.B. Destination, for shipments for delivery within the continental United States, Schneider Electric will retain title and all risk of loss or damage in transit to the common carrier free delivery point in the United States nearest the first destination for a price addition of 2% of the net price. If the Purchaser elects this Option, Purchaser's obligations shall be as follows: a) Purchaser shall have the responsibility of inspecting the equipment for apparent loss or damage immediately upon its arrival at the free delivery point. b) In the event of apparent shipping loss or damage, Purchaser shall make written notation of the loss on the carrier's delivery receipt and, within 72 hours of delivery shall notify the Schneider Electric Customer Information Center. Purchaser shall not remove product from the point of examination and shall retain the shipping container and packing

material. Purchaser shall request the carrier to make an inspection and send Schneider Electric a copy of the carrier's inspection report. c) In the event of concealed damage which occurred during transit and is discovered by the Purchaser after delivery, Purchaser shall report such damage immediately, but in no event later than 15 days after delivery, to the delivering carrier, and within 72 hours of discovery, shall notify the local Schneider Electric field office. If such notification is not made, Schneider Electric shall not be liable for loss or damage in transit.

Shipment and Routing
Schneider Electric shall select the point of origin of shipment, the method of transportation and the routing of the shipment. Purchasers that request expedited or special modes of transportation or routing involving air, premium or any other non-standard Schneider Electric shipping shall be assessed additional charges for shipping, handling, freight and expediting. Any rebates, allowances, discounts, or incentives received by Schneider Electric from its carriers shall be retained by Schneider Electric. All prices include domestic packaging only. When other than domestic packaging is required, contact your local Schneider Electric field office. Purchaser specified packaging and marking may be subject to additional charges.

Shortages

Claims for shortages or errors must be submitted to Schneider Electric within 30 days after invoice date, and failure to give such notice shall constitute unqualified acceptance and a waiver of all such claims by the Purchaser.

Installments

Schneider Electric reserves the right to make shipments in installments, unless otherwise expressly stipulated in a specific Purchase Order; and all such installments when separately invoiced shall be paid for when due per invoice without regard to subsequent shipments. Delay in shipment of any installment shall not relieve Purchaser of its obligation to accept remaining shipments.

Force Majeure

Schneider Electric shall not be liable for any damages as a result of any delays due to any causes beyond Schneider Electric's control, including, without limitation, an act of God; act of Purchaser or Schneider Electric supplier; embargo or other governmental act, regulation or request; fire; accident; strike; slowdown; flood; fuel or energy shortage; sabotage; war; riot; delay in transportation and inability to obtain necessary labor, materials or manufacturing facilities from usual sources. In the event of any such delay, the date of delivery shall be extended for a period of time reasonably necessary to overcome the effect of such delay.

Standard Warranty

Schneider Electric warrants equipment manufactured by it and sold through authorized sales channels to be free from defects in materials and workmanship for 12 months from the issuance of the customer provisional acceptance letter or 18 months from the invoice date of the last component of the order whichever occurs first. If within such period, any such equipment shall be proved to Schneider Electric's satisfaction to be non-conforming, such equipment shall be repaired or replaced at Schneider Electric's option. This warranty shall not apply (a) to equipment not manufactured by Schneider Electric, (b) to equipment that has been repaired or altered by other than Schneider Electric so as, in its judgment, to affect the same adversely, or (c) to equipment that has been subjected to negligence, accident, or damage by circumstances beyond Schneider Electric's control, or improper operation, maintenance or storage, or to other than normal use or service. With respect to equipment not manufactured by Schneider Electric, the warranty obligations of Schneider Electric shall in all respects conform and be limited to the warranty actually extended to Schneider Electric by its supplier. Non-conforming products must be returned at Schneider Electric's expense for evaluation unless this is waived in writing. Replacement products may be new or reconditioned. The foregoing warranties do not cover reimbursement for labor, transportation, removal, installation, temporary power, or any other expenses that may be incurred in connection with repair or replacement. Any part or component changed or repaired in the context of the contractual warranty will itself benefit of a 3 month warranty but shall not cause the warranty duration of the overall System / Solution to be extended.

Optional Warranties

(Only available on equipment to be located in the U.S.)
Option 1—Extended: 2 to 5 years from Shipment. If requested by the Purchaser, and specifically accepted in writing by Schneider Electric, the standard warranty will be extended to two (2) years from date of invoice for a price addition of 1% of the net face value of the Purchase Order, will be extended to three (3) years from date of invoice for a price addition of 3% of the net face value of the Purchase Order, will be extended to four (4) years from date of invoice for a price addition of 5% of the net face value of the Purchase Order, or will be extended to five (5) years from date of invoice for a price addition of 7% of the net face value of the Purchase Order.
Option 2—Special Warranty: If requested by the Purchaser, and specifically accepted in writing by

Schneider Electric, the standard warranty will be extended, for a price addition of 3% of the net face value of the Purchase Order, to cover reimbursement of the direct costs of: a) Removal of non-conforming equipment or part thereof; b) Transporting equipment or parts to and from the place of repair; c) Off-loading of truck and reinstallation at the original site. Such special warranty, which may be chosen to cover a period not exceeding that of the standard or extended warranty (see above) selected, will not include the cost of providing temporary power or removing or replacing other apparatus or structures, or costs of transportation beyond a common carrier free delivery point in the continental United States. Further, the obligation of Schneider Electric for expenses and costs arising under this special warranty coverage will not exceed 50% of the net invoice price on the equipment being repaired. This warranty does not change or affect the allocation of risk or loss during shipment.
Option 3—Extended Warranty: Preventative Maintenance Agreements. If requested by the Purchaser, and specifically accepted by Schneider Electric, a Preventative Maintenance Agreement is available to provide preventative maintenance on equipment covered by the agreement. Terms of the preventative maintenance agreement shall be as defined in a separate Services Agreement agreed to by the parties.

Software

Any software or computer information, in whatever form, provided with equipment manufactured by Schneider Electric is licensed to Purchaser solely pursuant to standard licenses of Schneider Electric or its supplier of such software or computer information, which licenses are, hereby incorporated by reference. Schneider Electric does not warrant that such software or computer information will operate error free or without interruption, and warrants only that during the warranty period applicable to the equipment that the software will perform its essential functions. If such software or computer information fails to conform to such warranty, Schneider Electric will, at its option, provide an update to correct the non-conformance or replace the software or computer information with the latest available version containing a correction. Schneider Electric shall have no other obligation to provide updates or revisions.

Limitations

These disclaimers and limitations of remedies apply to all warranties offered to Purchaser and to all Purchase Orders. **The warranties set forth above are exclusive and in lieu of all other expressed or implied warranties (except warranties of title), including, but not limited to implied warranties of merchantability and fitness for a particular purpose.** Except as may be expressly provided in an authorized writing by Schneider Electric, Schneider Electric shall not be subject to any other obligations or liabilities whatsoever other than as stated above with respect to equipment sold or services rendered by Schneider Electric. Notwithstanding anything to the contrary herein contained **Schneider Electric Company, its contractors and suppliers of any tier, shall not be liable in contract, in tort (including negligence or strict liability) or otherwise for lost time, lost profits, or special, indirect, incidental or consequential damages of any kind whatsoever.** The remedies of the Purchaser are exclusive and the total cumulative liability of Schneider Electric, its contractors and suppliers of any tier, with respect to this contract or anything done in connection therewith, such as the use of any product covered by or furnished under the contract, whether in contract, in tort (including negligence or strict liability) or otherwise, shall not exceed the price of the product, part, or service on which such liability is based.

Intellectual Property

As to equipment proposed and furnished by Schneider Electric, Schneider Electric shall defend any suit or proceeding brought against Purchaser so far as based on a claim that such equipment constitutes an infringement of any copyright, trademark or patent of the United States.

This obligation shall be effective only if Purchaser shall have made all payments then due hereunder and if Schneider Electric is notified promptly in writing and given authority, information, and assistance at Schneider Electric's expense for the defense of the same. In the event the use of such equipment by Purchaser is enjoined in such a suit, Schneider Electric shall, at its expense, and at its sole option, either (a) procure for the Purchaser the right to continue using such equipment (b) modify such equipment to render it non-infringing (c) replace such equipment with non-infringing equipment, or (d) refund the purchase price (less depreciation) and the transportation and installation costs of such equipment. Schneider Electric will not be responsible for any compromise or settlement made without its written consent. The foregoing states the entire liability of Schneider Electric for patent, trademark or copyright infringement, and in no event shall Schneider Electric be liable if any infringement charge is based on the use of Schneider Electric equipment for a purpose other than that for which it was sold by Schneider Electric. As to any equipment furnished by Schneider Electric to Purchaser and manufactured in accordance with designs proposed by Purchaser, the Purchaser shall indemnify Schneider Electric against any award made against Schneider Electric for patent, trademark, or copyright infringements.

Witness of Tests and Factory Inspections

Normal production schedules do not provide the opportunity for Purchaser to witness routine factory tests on equipment or make factory inspections. Witnessing of tests or factory inspections by the Purchaser may result in delays of production for which Schneider Electric will not be responsible. Witness testing and factory inspections must be requested at time of quotation and confirmed at order entry. Standard Schneider Electric factory testing and inspection will apply. Schneider Electric will notify Purchaser fourteen (14) calendar days prior to scheduled witness testing or inspection. In the event Purchaser is unable to attend, the Parties may mutually agree on a rescheduled date. However, Schneider Electric, at its sole option, may consider the witness tests and/or inspection waived, and ship and invoice the Products. Purchaser will be responsible for paying for all scheduled witness testing, whether or not Purchaser attends.

Return of Equipment

No equipment may be returned without first obtaining Schneider Electric's written permission and a returned material identification tag. Returned equipment must be of current manufacture, in the original packaging, unused, undamaged and in saleable condition, securely packed to reach Schneider Electric without damage and labeled with the return authorization number. Any cost incurred by Schneider Electric to put equipment in first class condition will be charged to the Purchaser. Returns will be credited at price invoiced by Schneider Electric less a restocking fee of 25% invoice price. Special Order and Custom equipment is not returnable. Schneider Electric shall bear the cost of returns resulting from Schneider Electric error, and method and route of return will be at the discretion of Schneider Electric. Costs incurred by failure to follow Schneider Electric direction will be borne by the Purchaser.

Nuclear Applications Terms and Conditions

Unless otherwise agreed in writing by a duly authorized representative of Schneider Electric, products sold hereunder are not intended for use in or in connection with any nuclear facility or activity. If so used, Schneider Electric disclaims all liability for any damage, injury or contamination; and Purchaser shall indemnify Schneider Electric against any such liability, whether arising as a result of breach of contract, warranty or tort (including negligence) or otherwise.

Patterns and Tools

Notice will be given if special patterns or tools are required to complete any order. Charges for such patterns or tools do not convey title thereto or the right to remove them from Schneider Electric's plant. If patterns or tools are not used for a period of two years, Schneider Electric shall have the right to scrap them without notice.

Product Notices

Purchaser shall promptly supply the user (including its employees) of the product with all Schneider Electric supplied product notices, warnings, instructions, recommendations and similar materials.

Errors

Schneider Electric reserves the right to correct errors or omissions in quotations, acknowledgments, invoices, or other documents.

OSHA Compliance

Compliance with OSHA or similar federal, state or local laws during the operation or use of the product(s) is the sole responsibility of the Purchaser.

Termination

Any order may be terminated by the Purchaser only upon written notice to Schneider Electric will be subject the following cancellation schedule:

- 20% after issuance of approval drawings
- 50% at release to manufacturing
- 100% at start of fabrication

Cancellation

Schneider Electric shall have the right to cancel any order or contract at any time by written notice for any material breach of the contract by the Purchaser, including material delays in releasing equipment for manufacture or approval drawings and excessive changes to specifications or drawings.

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Palatine, IL 60067 USA
1-888-778-2733
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0100PL0043R12/12
Replaces 0100PL0043R11/11

Square D by Schneider Electric
Surgelogic Surge Protective Devices (SPDs)

WARRANTY

Warranty to customers purchasing through authorized Square D distributors and customers purchasing directly from Square D. This warranty includes the following products: EMA, EBA, L-L Enhanced, IMA and HWA.

Protection Limits
With regard to any Square D Surgelogic Surge Protective Device ("SPD") that has been properly installed in compliance with all applicable electrical code requirements, Square D warrants the SPD to be free from defects in materials and workmanship for a period of ten (10) years from date of invoice from Square D or its authorized sales channel. If within the applicable warranty period, purchaser discovers such item was not as warranted and promptly notifies Square D in writing, Square D shall repair or replace the items or refund the purchase price, at Square D's option. This warranty shall not apply (a) to electrical equipment in which the SPD is installed, including, but not limited to panelboards, motor control centers, busway, switchboards, switchgear, (b) to equipment not manufactured by Square D, (c) to SPDs which shall have been repaired or altered by others, other than Square D, (d) to SPDs which shall have been subjected to negligence, accident, or damage by circumstances beyond Square D's control, or to improper operation, maintenance or storage, or to other than normal use or service. The foregoing warranty does not cover reimbursement for labor, transportation, removal, installation, or other expenses which may be incurred in connection with repair or replacement.

Except as may be expressly provided in an authorized writing by Square D, Square D shall not be subject to any other obligations or liabilities whatsoever with respect to equipment manufactured by Square D or services rendered by Square D.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESSED AND IMPLIED WARRANTIES EXCEPT WARRANTIES OF TITLE, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Limitation of Liability
Notwithstanding anything to the contrary contained herein, SQUARE D COMPANY, ITS CONTRACTORS AND SUPPLIERS OF ANY TIER SHALL NOT BE LIABLE IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER. The remedies of the purchaser set forth herein are exclusive where so stated and the total cumulative liability of Square D, its contractors and suppliers of any tier, whether in contract, in tort (including negligence or strict liability) or otherwise, shall not exceed the price of the product or part on which such is based.

Item No.	Qty.	Catalog Number / Details

BILL OF MATERIALS

001-00 2

Designation: MAIN / UCT
Square D Standard Swbd
QED Switchboard

Square D Standard Swbd
Designed and Tested in accordance with:
UL 891/NATIONAL ELECTRIC CODE/NEMA PB-2
System Voltage - 480Y/277V 3Ph 4W 60Hz
Source Description - Single Main
System Ampacity - 3000A
Bussing - Aluminum Plated w/Tin and Copper Plated w/Silver
Neutral Bus - 100%
Max Available Fault Current (RMS) - 35kA
Enclosure - Type 3R Non-Walk-in
Accessibility: Front Only
Equipment Nameplate White Surface/Black Letters, Adhesive (Field Installed)
Rodent Barrier
Exterior Paint Color - ANSI 49
Mimic Nameplate - Power Flow Plastic
Ground Lug provided for each device
Aluminum Ground Bus
Lineup 1 BTU: 13801

Dimensions
---
1 - 48" Wide Section(s)
1 - 42" Wide Section(s)
1 - 36" Wide Section(s)
1 - Dimensions: 126.00" W X 47.5" D X 91.5"H
3 - 47.5" Deep Enclosure(s)
Approximate Weight: 3458.00

Incoming Requirements

Suitable for Use As Service Entrance
Entry Point: Left of Lineup, Through the Bottom
Connection Type: Cable in Bussed Auxiliary
Hot Sequence Utility: Rocky Mountain
Standard Door Pattern 15in Blank Top, 15in Blank Btm

Mains
---
1 - 3000AF/3000AT 100% 3 Pole Stored Energy, Fixed Mounted Circuit Breaker, UL: Type NW
Ammeter Trip Unit, Long Time, Short Time, Instantaneous, Ground Fault
Overcurrent Trip Switch 1A/1B Form C Contact (SDE)
Auxiliary Switches 4A-4B
Padlock Attachment
Contact Wear Indication - Visual

002-00 2

URSTS132C
MTR SKT 20A/13T HCP 2PC COVER

Item No.	Qty.	Catalog Number / Details
003-00	1	**Designation:** MDPH1 Square D Custom Swbd Series 2 QED Switchboard --- Square D Custom Swbd Series 2 Designed and Tested in accordance with: UL 891/NATIONAL ELECTRIC CODE/NEMA PB-2 System Voltage - 480Y/277V 3Ph 4W 60Hz Source Description - Main is Remote System Ampacity - 3000A Bussing - Aluminum Plated w/Tin and Copper Plated w/Silver Neutral Bus - 100% Max Available Fault Current (RMS) - 35kA Enclosure - Type 1 Accessibility: Front Only Equipment Nameplate White Surface/Black Letters, Adhesive (Field Installed) Exterior Paint Color - ANSI 49 Mimic Nameplate - Power Flow Plastic Ground Lug provided for each device Aluminum Ground Bus Lineup 1 BTU: 9980 Dimensions --- 1 - 48" Wide Section(s) 1 - 36" Wide Section(s) 2 - 36" Deep Enclosure(s) Dimensions: 84.00" W X 36" Max D X 91.5" H Approximate Weight: 2015.00 lbs / 914.00 kgs Incoming Requirements --- UL Dead Front Entry Point: Left of Lineup, Through the Bottom Connection Type: Cable Feeders --- Devices Associated with Remote Main: 3 - 70AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type HG 1 - 200AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type JG 1 - 225AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type JG 1 - 400AS/400AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Electronic Trip Circuit Breaker: Type LG Standard Trip Unit, Long Time, Instantaneous 1 - 600AS/500AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Electronic Trip Circuit Breaker: Type LG Standard Trip Unit, Long Time, Instantaneous

Item No.	Qty.	Catalog Number / Details
		1 - 1000AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Basic Electronic Trip Circuit Breaker: Type PG Specials: no neural lug required Special no neural lug required #: 5979581 1 - 600AS/450AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Electronic Trip Circuit Breaker: Type LG Standard Trip Unit, Long Time, Instantaneous 1 - 400AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Electronic Prepared Space: Type LG Specials: provide 2 neutral lugs Special provide 2 neutral lugs #: 5979581 2 - 225AT 480V 80% Rated 3 Pole UL, Group Mounted Thermal Magnetic Prepared Space: Type JG 1 - 50AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type HG 1 - 60AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type HG 2 - 100AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type HG 1 - 150AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type HG 1 - 80AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type HG
004-00	1	**Designation:** SDPL1 Square D Custom Swbd QED Switchboard --- Square D Custom Swbd Designed and Tested in accordance with: UL 891/NATIONAL ELECTRIC CODE/NEMA PB-2 System Voltage - 208Y/120V 3Ph 4W 60Hz Source Description - Single Main System Ampacity - 2000A Bussing - Aluminum Plated w/Tin and Copper Plated w/Silver Neutral Bus - 100% Max Available Fault Current (RMS) - 35kA Enclosure - Type 1 Accessibility: Front Only Equipment Nameplate White Surface/Black Letters, Adhesive (Field Installed) Exterior Paint Color - ANSI 49 Mimic Nameplate - Power Flow Plastic Ground Lug provided for each device Aluminum Ground Bus Lineup 1 BTU: 7485 Dimensions --- 2 - 36" Wide Section(s) 2 - 24" Deep Enclosure(s) Dimensions: 72.00" W X 24" Max D X 91.5" H Approximate Weight: 1697.00

Item No.	Qty.	Catalog Number / Details
		Incoming Requirements --- Suitable for Use As Service Entrance Entry Point: Left of Lineup, Through the Bottom Connection Type: Cable SPD with Surge Rating 120kA SPD Dry Contacts Includes Surge Counter Mains --- 1 - 2000AT 208V 80% Rated 65 kA 3 Pole UL, Fixed Mounted Basic Electronic Trip Circuit Breaker: Type RG Feeders --- 3 - 125AT 208V 80% Rated 65 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type QG 1 - 100AT 208V 80% Rated 65 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type FH 2 - 225AT 208V 80% Rated 65 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type QG 3 - 225AT 208V 80% Rated 3 Pole UL, Group Mounted Thermal Magnetic Prepared Space: Type QG 2 - 600AS/600AT 208V 80% Rated 65 kA 3 Pole UL, Group Mounted Electronic Trip Circuit Breaker: Type LG Standard Trip Unit, Long Time, Instantaneous 1 - 400AS/400AT 208V 80% Rated 65 kA 3 Pole UL, Group Mounted Electronic Trip Circuit Breaker: Type LG Standard Trip Unit, Long Time, Instantaneous Specials: two neutral lugs Special two neutral lugs #: 5979581
005-00	1	**Designation:** MDPH2 Square D Custom Swbd Series 2 QED Switchboard --- Square D Custom Swbd Series 2 Designed and Tested in accordance with: UL 891/NATIONAL ELECTRIC CODE/NEMA PB-2 System Voltage - 480Y/277V 3Ph 4W 60Hz Source Description - Main is Remote System Ampacity - 3000A Bussing - Aluminum Plated w/Tin and Copper Plated w/Silver Neutral Bus - 100% Max Available Fault Current (RMS) - 35kA Enclosure - Type 1 Accessibility: Front Only Equipment Nameplate White Surface/Black Letters, Adhesive (Field Installed) Exterior Paint Color - ANSI 49 Mimic Nameplate - Power Flow Plastic

Item No.	Qty.	Catalog Number / Details

Ground Lug provided for each device
Aluminum Ground Bus
Lineup 1 BTU: 9980

Dimensions
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1 - 48" Wide Section(s)
1 - 36" Wide Section(s)
2 - 36" Deep Enclosure(s)
Dimensions: 84.00" W X 36" Max D X 91.5" H
Approximate Weight: 2045.00 lbs / 927.61 kgs

Incoming Requirements

UL Dead Front
Entry Point: Left of Lineup, Through the Bottom
Connection Type: Cable

Feeders

Devices Associated with Remote Main:

2 - 225AT 480V 80% Rated 3 Pole UL, Group Mounted Thermal Magnetic Prepared Space: Type JG
1 - 400AS/400AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Electronic Trip Circuit Breaker: Type LG
Standard Trip Unit, Long Time, Instantaneous
1 - 400AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Electronic Prepared Space: Type LG
1 - 600AS/600AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Electronic Trip Circuit Breaker: Type LG
Standard Trip Unit, Long Time, Instantaneous
Specials: no neutral lug
Special no neutral lug #: 5979581
2 - 1000AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Basic Electronic Trip Circuit Breaker: Type PG
1 - 600AS/450AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Electronic Trip Circuit Breaker: Type LG
Standard Trip Unit, Long Time, Instantaneous
1 - 400AS/400AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Electronic Trip Circuit Breaker: Type LG
Standard Trip Unit, Long Time, Instantaneous
Specials: 2 neutral lugs
Special 2 neutral lugs #: 5979581
1 - 225AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type JG
1 - 50AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type HG
2 - 60AT 480V 80% Rated 35 kA 3 Pole UL,

Item No.	Qty.	Catalog Number / Details
		Group Mounted Thermal Magnetic Circuit Breaker: Type HG 1 - 150AT 480V 80% Rated 35 kA 3 Pole UL, Group Mounted Thermal Magnetic Circuit Breaker: Type HG
006-00	2	**Designation:** MDPH1 MDPH2 SPDS TVS4EMA32A EMA TVSS, 480Y/277V, 3 ph, 4 wire, 320kA
007-00	1	**Designation:** SDPH21 I-Line ML Panel (Interior) I-Line Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 22kA Fully Rated Main Lug Only: 1000A Incoming Conductors: 1 - (4) 3/0 - 500kcmil Bus: Copper: Tin Plated CU Ground Bar 99" of Mounting Inches Type 1,Box: 86H x 42W x 9.5D Incoming: Bottom Trim: Surface - Hinged Box Cat No: HC4286DBP Ref. Drawing: PBA419HR Type: HCP Feeders: 1 - 50A/3P FH 4 - 100A/3P FH 1 - 600A/3P MG Prepared Space 1 - 600AS/600AT/3P LG STD LI 1 - 60A/3P FH 2 - 225A/3P JG Prepared Space Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: SDPH21 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
339-00	CANCLD	**Designation:** SDPH21 HC4286DBP (Box) I-Line Standard TYPE 1 Box 86 H
340-00	CANCLD	**Designation:** SDPH21 HC4286TSHR (Trim) Trim Surface Hinged 86"H
407-00	1	**Designation:** SDPH21 HC4286DBP (Box) I-Line Standard TYPE 1 Box 86 H
408-00	1	**Designation:** SDPH21 HC4286TSHR (Trim) Trim Surface Hinged 86"H

Item No.	Qty.	Catalog Number / Details
008-00	1	**Designation:** SDPH22 I-Line ML Panel (Interior) I-Line Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 20kA Fully Rated Main Lug Only: 1000A Incoming Conductors: 1 - (4) 3/0 - 500kcmil Bus: Copper: Tin Plated CU Ground Bar 99" of Mounting Inches Type 1,Box: 86H x 42W x 9.5D Incoming: Bottom Trim: Surface - Hinged Box Cat No: HC4286DBP Ref. Drawing: PBA419HR Type: HCP Feeders: 2 - 100A/3P FH 1 - 600AS/600AT/3P LG STD LI 1 - 600A/3P MG Prepared Space 2 - 60A/3P FH 1 - 50A/3P FH 1 - 125A/3P HG 2 - 225A/3P JG Prepared Space Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: SDPH22 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
337-00	1	**Designation:** SDPH22 HC4286DBP (Box) I-Line Standard TYPE 1 Box 86 H
338-00	CANCLD	**Designation:** SDPH22 HC4286TSHR (Trim) Trim Surface Hinged 86"H
409-00	1	**Designation:** SDPH22 HC4286DBP (Box) I-Line Standard TYPE 1 Box 86 H
410-00	1	**Designation:** SDPH22 HC4286TSHR (Trim) Trim Surface Hinged 86"H
009-00	2	**Designation:** SDPH21 SDPH22 SPDS TVS4EMA12A EMA TVSS, 480Y/277V, 3 ph, 4 wire, 120kA
010-00	1	**Designation:** SDPL2 I-Line SPD Panel (Interior) I-Line Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 42kA Fully Rated

Item No.	Qty.	Catalog Number / Details
		SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Single Main: 1200A/3P PG Circuit Breaker Incoming Conductors: 1 - (4) 3/0 - 500kcmil Bus: Copper: Tin Plated CU Ground Bar 108" of Mounting Inches Type 1,Box: 86H x 44W x 9.5D Incoming: Bottom Trim: Surface - Hinged Box Cat No: HC4486DBP Ref. Drawing: PBA414HR Type: HCR-U Feeders: 1 - 400AS/400AT/3P LG Std. LI 80% 1 - 600AS/600AT/3P LG Std. LI 80% 1 - 100A/3P QG 3 - 225A/3P QG Prepared Space 1 - 225A/3P QG Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: SDPL2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
341-00	1	**Designation:** SDPL2 HC4486DBP (Box) I-Line Standard TYPE 1 Box 86 H
342-00	1	**Designation:** SDPL2 HC4486TSHR (Trim) Trim Surface Hinged 86"H
010-01	1	SL I-LINE SPD PANEL (INTERIOR)
011-00	1	**Designation:** SDPL21 I-Line SPD Panel (Interior) I-Line Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 35kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Single Main: 1200A/3P PG Circuit Breaker Incoming Conductors: 1 - (4) 3/0 - 500kcmil Bus: Copper: Tin Plated CU Ground Bar 108" of Mounting Inches Type 1,Box: 86H x 44W x 9.5D Incoming: Bottom Trim: Surface - Hinged Box Cat No: HC4486DBP Ref. Drawing: PBA414HR Type: HCR-U

Item No.	Qty.	Catalog Number / Details
		Feeders: 1 - 60A/3P FH 1 - 100A/3P FH Prepared Space 7 - 150A/3P QG 3 - 225A/3P QG Prepared Space 2 - 225A/3P QG Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: SDPL21 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
343-00	1	**Designation:** SDPL21 HC4486DBP (Box) I-Line Standard TYPE 1 Box 86 H
344-00	1	**Designation:** SDPL21 HC4486TSHR (Trim) Trim Surface Hinged 86"H
011-01	1	SL I-LINE SPD PANEL (INTERIOR)
012-00	1	**Designation:** SDPL22 I-Line SPD Panel (Interior) I-Line Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 30kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Single Main: 1200A/3P PG Circuit Breaker Incoming Conductors: 1 - (4) 3/0 - 500kcmil Bus: Copper: Tin Plated CU Ground Bar 108" of Mounting Inches Type 1,Box: 86H x 44W x 9.5D Incoming: Bottom Trim: Surface - Hinged Box Cat No: HC4486DBP Ref. Drawing: PBA414HR Type: HCR-U Feeders: 1 - 60A/3P FH 1 - 100A/3P FH Prepared Space 10 - 150A/3P QG 3 - 225A/3P QG Prepared Space 1 - 225A/3P QG Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate:

Item No.	Qty.	Catalog Number / Details
		Engraved as Follows Line 1: SDPL22 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
345-00	1	**Designation:** SDPL22 HC4486DBP (Box) I-Line Standard TYPE 1 Box 86 H
346-00	1	**Designation:** SDPL22 HC4486TSHR (Trim) Trim Surface Hinged 86"H
012-01	1	SL I-LINE SPD PANEL (INTERIOR)
013-00	1	**Designation:** E1BL1 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Single Main: 100A/3P QOB Circuit Breaker Incoming Conductors: 1 - #4 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 38H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH38P Front Cat No: NC38SHR Ref. Drawing: PBA707HR Feeders: 1 - 60A/3P QOB 12 - 20A/1P QOB 1 - 30A/3P QOB Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E1BL1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
189-00	1	**Designation:** E1BL1 MH38P (Box) NQ Standard TYPE 1 Box 38 H
190-00	1	**Designation:** E1BL1 NC38SHR (Trim) NQ Standard TYPE 1 Box 38 H

Item No.	Qty.	Catalog Number / Details
014-00	1	**Designation:** E1L2 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 14kA Fully Rated Main Lug Only: 60A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 30 Circuit Interior Type 1,Box: 32H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH32P Front Cat No: NC32SHR Ref. Drawing: PBA550HR Feeders: 1 - 20A/3P EDB 27 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E1L2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
191-00	1	**Designation:** E1L2 MH32P (Box) NF Standard TYPE 1 Box 32 H
192-00	1	**Designation:** E1L2 NC32SHR (Trim) NF Standard TYPE 1 Box 32 H
015-00	1	**Designation:** E1BL2 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 60A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 30 Circuit Interior Type 1,Box: 32H x 20W x 5.75D Incoming: Top Trim: Surface - Hinged Box Cat No: MH32P Front Cat No: NC32SHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/3P QOB 12 - 20A/1P QOB 1 - 20A/3P QOB Optional Features: Standard Panel (Box Ahead),SPD Model

Item No.	Qty.	Catalog Number / Details
		BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E1BL2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
187-00	1	**Designation:** E1BL2 MH32P (Box) NQ Standard TYPE 1 Box 32 H
188-00	1	**Designation:** E1BL2 NC32SHR (Trim) NQ Standard TYPE 1 Box 32 H
016-00	1	**Designation:** H1L4 NF ML PNLB (INT,BOX,FRT) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 18kA Fully Rated Main Lug Only: 600A Incoming Conductors: 1 - (2) 1/0 - 600 kcmil Bus: Copper: Silver/Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 80H x 20W x 8.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH80D9P Front Cat No: NC80VSHR Ref. Drawing: PBA551HR Feeders: 1 - Sub-Feed One: 225A/3P JD STD LSI 1 - 125A/3P EDB 33 - 20A/1P EDB Optional Features: Ship Completely Assembled,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H1L4 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
017-00	1	**Designation:** G/GA NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 22kA Fully Rated Main Lug Only: 225A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Top Trim: Surface - Hinged

Item No.	Qty.	Catalog Number / Details
		Box Cat No: MH50P Front Cat No: NC50SHR Ref. Drawing: PBA701HR Feeders: 1 - 100A/3P QOB-VH 1 - 20A/2P QOB-VH 74 - 20A/1P QOB-VH 2 - 20A/1P QOB-VH-GFI 1 - 30A/3P QOB-VH Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: G/GA Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
349-00	1	**Designation:** G/GA MH50P (Box) NQ Standard TYPE 1 Box 50 H
350-00	1	**Designation:** G/GA NC50SHR (Trim) NQ Standard TYPE 1 Box 50 H
018-00	1	**Designation:** H1L1 ILINE MB PNLB (INT,BOX,FRT) I-Line Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 25kA Series Rated w/ LG Circuit Breaker Single Main: 400AS/400AT/3P LG Circuit Breaker 80% Rated Main Trip Function: LSI Main Trip Unit: Standard Trip Unit Main Acc: Shunt Trip 120Vac Incoming Conductors: 1 - (2) 2/0 - 500 kcmil Bus: Copper: Tin Plated CU Ground Bar 72" of Mounting Inches Type 1,Box: 91H x 32W x 9.5D Incoming: Bottom Trim: Flush - Hinged Box Cat No: HC3291DB9P Ref. Drawing: PBA403HR Type: HCM Feeders: 25 - 20A/1P FY 4 - 20A/3P FA 1 - 80A/3P FA 2 - 200A/3P JJ Optional Features: Ship Completely Assembled,Copper Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H1L1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on

Item No.	Qty.	Catalog Number / Details
221-00	CANCLD	**Designation:** H1L1 MH80P (Box) NF Standard TYPE 1 Box 80 H
222-00	CANCLD	**Designation:** H1L1 NC80VFHR (Trim) NF Standard TYPE 1 Box 80 H
019-00	1	**Designation:** H1L2 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 18kA Fully Rated Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA550HR Feeders: 1 - 50A/3P EDB 5 - 20A/3P EDB 24 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H1L2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
223-00	1	**Designation:** H1L2 MH44P (Box) NF Standard TYPE 1 Box 44 H
224-00	1	**Designation:** H1L2 NC44FHR (Trim) NF Standard TYPE 1 Box 44 H
020-00	1	**Designation:** L1L6 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 125A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar

Item No.	Qty.	Catalog Number / Details
		72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/2P QOB 58 - 20A/1P QOB Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L1L6 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
264-00	1	**Designation:** L1L6 MH44P (Box) NQ Standard TYPE 1 Box 44 H
265-00	1	**Designation:** L1L6 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
021-00	1	**Designation:** L1M1 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 125A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/3P QOB 52 - 20A/1P QOB 1 - 20A/1P QOB-GFI 1 - 30A/2P QOB 1 - 20A/2P QOB Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L1M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters

Item No.	Qty.	Catalog Number / Details
		Plastic/Adhesive - Screw-on
266-00	1	**Designation:** L1M1 MH44P (Box) NQ Standard TYPE 1 Box 44 H
267-00	1	**Designation:** L1M1 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
022-00	1	**Designation:** L1L2 NQ MB PNLB (INT,BOX,TRIM) - A NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 22kA Series Rated w/ LG Circuit Breaker Single Main: 600AS/600AT/3P LG Circuit Breaker 80% Rated Main Trip Function: LI Main Trip Unit: Standard Trip Unit Main Acc: Shunt Trip 120Vac Main Acc: Feed Thru Lugs Incoming Conductors: 1 - (2) 3/0 - 500 kcmil Bus: Copper: Silver/Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 74H x 20W x 8.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH74D9P Front Cat No: NC74VFHR Ref. Drawing: PBA713HR Feeders: 1 - 30A/3P QOB-VH 7 - 20A/3P QOB-VH 18 - 20A/1P QOB Optional Features: Ship Completely Assembled,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L1L2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
028-00	CANCLD	**Designation:** L1L2 NQ ML PNLB (INT,BOX,TRIM) - B NQ Panelboard
252-00	1	**Designation:** L1L2 NQ ML PNLB (INT,BOX,TRIM) - B NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 22kA Series Rated w/ LG Circuit Breaker Main Lug Only: 600A Incoming Conductors: 1 - (2) 3/0 - 500 kcmil Bus: Copper: Silver/Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 74H x 20W x 8.75D

Item No.	Qty.	Catalog Number / Details
		Incoming: Top Trim: Flush - Hinged Box Cat No: MH74D9P Front Cat No: NC74VFHR Ref. Drawing: PBA709HR Feeders: 36 - 20A/1P QOB 1 - Sub-Feed One: 225A/3P QD 1 - Sub-Feed Two: 125A/3P QD Optional Features: Ship Completely Assembled,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L1L2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
023-00	1	**Designation:** L1L3 NQ MB PNLB (INT,BOX,FRT) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 22kA Series Rated w/ LD Circuit Breaker Single Main: 400AS/400AT/3P LD Circuit Breaker 80% Rated Main Trip Function: LI Main Trip Unit: Standard Trip Unit Main Acc: Shunt Trip 120Vac Incoming Conductors: 1 - (2) 3/0 - 500 kcmil Bus: Copper: Silver/Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 86H x 20W x 8.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH86D9P Front Cat No: NC86VFHR Ref. Drawing: PBA713HR Feeders: 1 - 150A/3P QOB-VH 2 - 20A/3P QOB-VH 4 - 20A/2P QOB 57 - 20A/1P QOB 1 - 40A/3P QOB-VH 2 - 30A/2P QOB Optional Features: Ship Completely Assembled,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L1L3 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
024-00	1	**Designation:** L1L31 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 22kA Series Rated w/ QOB-VH Circuit Breaker Main Lug Only: 150A

Item No.	Qty.	Catalog Number / Details
		Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 38H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH38P Front Cat No: NC38FHR Ref. Drawing: PBA701HR Feeders: 6 - 20A/2P QOB 30 - 20A/1P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L1L31 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
254-00	1	**Designation:** L1L31 MH38P (Box) NQ Standard TYPE 1 Box 38 H
255-00	1	**Designation:** L1L31 NC38FHR (Trim) NQ Standard TYPE 1 Box 38 H
025-00	1	**Designation:** L1L4 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 225A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/3P QOB 55 - 20A/1P QOB 1 - 30A/2P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L1L4 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
353-00	1	**Designation:** L1L4

Item No.	Qty.	Catalog Number / Details
		MH44P (Box) NQ Standard TYPE 1 Box 44 H
354-00	1	**Designation:** L1L4 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
026-00	1	**Designation:** L1L1 NQ MB PNLB (INT,BOX,FRT) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 25kA Series Rated w/ LD Circuit Breaker Single Main: 600AS/600AT/3P LD Circuit Breaker 80% Rated Main Trip Function: LI Main Trip Unit: Standard Trip Unit Main Acc: Shunt Trip 120Vac Incoming Conductors: 1 - (2) 3/0 - 500 kcmil Bus: Copper: Silver/Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 86H x 20W x 8.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH86D9P Front Cat No: NC86VFHR Ref. Drawing: PBA713HR Feeders: 2 - 150A/3P QOB-VH 2 - 50A/2P QOB 2 - 20A/2P QOB 52 - 20A/1P QOB 1 - 30A/3P QOB-VH 3 - 20A/3P QOB-VH Optional Features: Ship Completely Assembled,Copper Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L1L1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
251-00	CANCLD	**Designation:** L1L1 NQ ML PNLB (INT,BOX,TRIM) - B NQ Panelboard
027-00	3	TVS2EBA12A EBA TVSS, 208Y/120V, 3 ph, 4 wire, 120kA 120KA SPD FOR PANELS MD/G, G/GA AND L1L5
029-00	1	**Designation:** L2B1 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 25kA Series Rated w/ QG Circuit Breaker Main Lug Only: 100A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior

Item No.	Qty.	Catalog Number / Details
		Type 1,Box: 38H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH38P Front Cat No: NC38SHR Ref. Drawing: PBA701HR Feeders: 1 - 40A/2P QOB 38 - 20A/1P QOB 2 - 20A/1P QOB-EPD Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L2B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
317-00	1	**Designation:** L2B1 MH38P (Box) NQ Standard TYPE 1 Box 38 H
318-00	1	**Designation:** L2B1 NC38SHR (Trim) NQ Standard TYPE 1 Box 38 H
030-00	1	**Designation:** L2B2 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 14kA Series Rated w/ QG Circuit Breaker Main Lug Only: 225A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 38H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH38P Front Cat No: NC38SHR Ref. Drawing: PBA701HR Feeders: 6 - 20A/2P QOB 30 - 20A/1P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L2B2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
319-00	1	**Designation:** L2B2 MH38P (Box) NQ Standard TYPE 1 Box 38 H

Item No.	Qty.	Catalog Number / Details
320-00	1	**Designation:** L2B2 NC38SHR (Trim) NQ Standard TYPE 1 Box 38 H
031-00	CANCLD	**Designation:** L2M1 ILINE ML PNLB (INT,BOX,TRIM) - A I-Line Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 30kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 600A Incoming Conductors: 1 - (2) #2 - 500kcmil Bus: Copper: Tin Plated CU Ground Bar 99" of Mounting Inches Type 1,Box: 86H x 42W x 9.5D Incoming: Bottom Trim: Surface - Hinged Box Cat No: HC4286DBP Front Cat No: HC4286TSHR Ref. Drawing: PBA418HR Type: HCP Feeders: 1 - SL800 Feeds Next Panel 41 - 20A/1P FH 1 - 400AS/300AT/3P LG Std. LI 80% 2 - 50A/3P FH Optional Features: Ship Completely Assembled,Standard Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L2M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
078-00	CANCLD	**Designation:** L2M1 ILINE ML PNLB (INT,BOX,TRIM) - B I-Line Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 30kA Fully Rated Main Lug Only: 600A Bus: Copper: Tin Plated CU Ground Bar 63" of Mounting Inches Type 1,Box: 73H x 32W x 8.25D Incoming: Top Trim: Surface - Hinged Box Cat No: HC3273BP Front Cat No: HC3273TSHR Ref. Drawing: PBA402HR Type: HCM Feeders: 31 - 20A/1P FH Optional Features: Ship Completely Assembled,Standard Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate:

Item No.	Qty.	Catalog Number / Details
		Engraved as Follows Line 1: L2M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
032-00	1	**Designation:** L2M11 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 22kA Series Rated w/ LG Circuit Breaker Main Lug Only: 400A Incoming Conductors: 1 - 1/0 - 750, (2) 1/0 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 68H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH68P Front Cat No: NC68VFHR Ref. Drawing: PBA709HR Feeders: 3 - 30A/3P QOB-VH 2 - 20A/3P QOB-VH 2 - 20A/2P QOB 47 - 20A/1P QOB 14 - 20A/1P QOB-GFI 2 - 30A/2P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L2M11 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
326-00	1	**Designation:** L2M11 MH68P (Box) NQ Standard TYPE 1 Box 68 H
327-00	1	**Designation:** L2M11 NC68VFHR (Trim) NQ Standard TYPE 1 Box 68 H
033-00	1	**Designation:** L2M2 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 20kA Series Rated w/ LG Circuit Breaker Main Lug Only: 400A Incoming Conductors: 1 - 1/0 - 750, (2) 1/0 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 68H x 20W x 5.75D

Item No.	Qty.	Catalog Number / Details
		Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH68P Front Cat No: NC68VFHR Ref. Drawing: PBA709HR Feeders: 1 - 100A/3P QOB-VH 1 - 20A/3P QOB-VH 26 - 20A/1P QOB 5 - 30A/2P QOB 4 - 20A/2P QOB 31 - 20A/1P QOB-GFI 1 - 60A/3P QOB-VH Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Branch User Placement Standard Nameplate: Engraved as Follows Line 1: L2M2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
357-00	CANCLD	**Designation:** L2M2 MH68P (Box) NQ Standard TYPE 1 Box 68 H
358-00	CANCLD	**Designation:** L2M2 NC68VFHR (Trim) NQ Standard TYPE 1 Box 68 H
401-00	1	**Designation:** L2M2 MH68P (Box) NQ Standard TYPE 1 Box 68 H
402-00	1	**Designation:** L2M2 NC68VFHR (Trim) NQ Standard TYPE 1 Box 68 H
034-00	1	**Designation:** L2M21 NQ MB Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 14kA Series Rated w/ HD Circuit Breaker Single Main: 60A/3P HD Circuit Breaker Main Acc: Shunt Trip 120Vac Incoming Conductors: 1 - #14 - 3/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 38H x 20W x 5.75D Incoming: Top Trim: Flush - Hinged Box Cat No: MH38P Front Cat No: NC38FHR Ref. Drawing: PBA705HR Feeders: 8 - 20A/1P QOB-GFI 10 - 20A/1P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate:

Item No.	Qty.	Catalog Number / Details
		Engraved as Follows Line 1: L2M21 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
333-00	CANCLD	**Designation:** L2M21 MH38P (Box) NQ Standard TYPE 1 Box 38 H
334-00	CANCLD	**Designation:** L2M21 NC38SHR (Trim) NQ Standard TYPE 1 Box 38 H
371-00	1	**Designation:** L2M21 MH38P (Box) NQ Standard TYPE 1 Box 38 H
372-00	1	**Designation:** L2M21 NC38FHR (Trim) NQ Standard TYPE 1 Box 38 H
035-00	1	**Designation:** L21M1 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 225A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 68H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH68P Front Cat No: NC68FHR Ref. Drawing: PBA701HR Feeders: 1 - Sub-Feed One: 100A/3P QG 1 - 30A/3P QOB 72 - 20A/1P QOB 2 - 20A/1P QOB-EPD 2 - 20A/2P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
270-00	1	**Designation:** L21M1 MH68P (Box) NQ Standard TYPE 1 Box 68 H
271-00	1	**Designation:** L21M1 NC68FHR (Trim)

Item No.	Qty.	Catalog Number / Details
		NQ Standard TYPE 1 Box 68 H
036-00	1	**Designation:** L21M11 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 14kA Series Rated w/ QG Circuit Breaker SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 100A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 38H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH38P Front Cat No: NC38FHR Ref. Drawing: PBA701HR Feeders: 27 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21M11 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
272-00	1	**Designation:** L21M11 MH38P (Box) NQ Standard TYPE 1 Box 38 H
273-00	1	**Designation:** L21M11 NC38FHR (Trim) NQ Standard TYPE 1 Box 38 H
037-00	1	**Designation:** L21M2 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 14kA Series Rated w/ QG Circuit Breaker Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH50P Front Cat No: NC50FHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/3P QOB 78 - 20A/1P QOB 3 - 20A/1P QOB-EPD

Item No.	Qty.	Catalog Number / Details
		Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21M2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
274-00	1	**Designation:** L21M2 MH50P (Box) NQ Standard TYPE 1 Box 50 H
275-00	1	**Designation:** L21M2 NC50FHR (Trim) NQ Standard TYPE 1 Box 50 H
038-00	1	**Designation:** L21M3 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 225A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH50P Front Cat No: NC50FHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/3P QOB 74 - 20A/1P QOB 3 - 20A/1P QOB-EPD 1 - 50A/2P QOB 1 - 30A/2P QOB Optional Features: Standard Panel (Box Ahead),Copper Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21M3 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
276-00	1	**Designation:** L21M3 MH50P (Box) NQ Standard TYPE 1 Box 50 H
277-00	1	**Designation:** L21M3 NC50FHR (Trim) NQ Standard TYPE 1 Box 50 H
039-00	1	**Designation:** L21M4

Item No.	Qty.	Catalog Number / Details
		NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 20kA Series Rated w/ QD Circuit Breaker SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 57 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21M4 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
278-00	1	**Designation:** L21M4 MH44P (Box) NQ Standard TYPE 1 Box 44 H
279-00	1	**Designation:** L21M4 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
040-00	1	**Designation:** H22B1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 14kA Fully Rated Main Lug Only: 60A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH26P Front Cat No: NC26SHR Ref. Drawing: PBA550HR Feeders: 1 - 25A/3P EDB 15 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box

Item No.	Qty.	Catalog Number / Details
		Standard Nameplate: Engraved as Follows Line 1: H22B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
233-00	1	**Designation:** H22B1 MH26P (Box) NF Standard TYPE 1 Box 26 H
234-00	1	**Designation:** H22B1 NC26SHR (Trim) NF Standard TYPE 1 Box 26 H
041-00	1	**Designation:** H22M1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 60A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH26P Front Cat No: NC26FHR Ref. Drawing: PBA550HR Feeders: 18 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H22M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
235-00	1	**Designation:** H22M1 MH26P (Box) NF Standard TYPE 1 Box 26 H
236-00	1	**Designation:** H22M1 NC26FHR (Trim) NF Standard TYPE 1 Box 26 H
042-00	1	**Designation:** H22U1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 14kA Fully Rated Main Lug Only: 125A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated

Item No.	Qty.	Catalog Number / Details
		CU Ground Bar 42 Circuit Interior Type 1,Box: 38H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH38P Front Cat No: NC38FHR Ref. Drawing: PBA550HR Feeders: 3 - 20A/3P EDB 33 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H22U1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
237-00	1	**Designation:** H22U1 MH38P (Box) NF Standard TYPE 1 Box 38 H
238-00	1	**Designation:** H22U1 NC38FHR (Trim) NF Standard TYPE 1 Box 38 H
043-00	1	**Designation:** L22M1 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 14kA Series Rated w/ QD Circuit Breaker Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH50P Front Cat No: NC50FHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/3P QOB 78 - 20A/1P QOB 3 - 20A/1P QOB-EPD Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
295-00	1	**Designation:** L22M1 MH50P (Box) NQ Standard TYPE 1 Box 50 H

Item No.	Qty.	Catalog Number / Details
296-00	1	**Designation:** L22M1 NC50FHR (Trim) NQ Standard TYPE 1 Box 50 H
044-00	1	**Designation:** L22M2 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 2 - 20A/2P QOB 53 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22M2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
297-00	1	**Designation:** L22M2 MH44P (Box) NQ Standard TYPE 1 Box 44 H
298-00	1	**Designation:** L22M2 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
045-00	1	**Designation:** L22M3 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar

Item No.	Qty.	Catalog Number / Details
		72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 56 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC 1 - 20A/1P QOB-EPD Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22M3 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
299-00	1	**Designation:** L22M3 MH44P (Box) NQ Standard TYPE 1 Box 44 H
300-00	1	**Designation:** L22M3 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
046-00	1	**Designation:** L22M4 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 57 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),Copper Solid Neutral,SPD Model BIA,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22M4 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on

Item No.	Qty.	Catalog Number / Details
301-00	1	**Designation:** L22M4 MH44P (Box) NQ Standard TYPE 1 Box 44 H
302-00	1	**Designation:** L22M4 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
047-00	1	**Designation:** L22M5 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 225A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH50P Front Cat No: NC50FHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/3P QOB 1 - 30A/2P QOB 75 - 20A/1P QOB 2 - 50A/2P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22M5 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
303-00	1	**Designation:** L22M5 MH50P (Box) NQ Standard TYPE 1 Box 50 H
304-00	1	**Designation:** L22M5 NC50FHR (Trim) NQ Standard TYPE 1 Box 50 H
048-00	1	**Designation:** L22M6 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar

Item No.	Qty.	Catalog Number / Details
		72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 57 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22M6 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
305-00	1	**Designation:** L22M6 MH44P (Box) NQ Standard TYPE 1 Box 44 H
306-00	1	**Designation:** L22M6 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
049-00	1	**Designation:** L22U1 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH50P Front Cat No: NC50FHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/3P QOB 78 - 20A/1P QOB 3 - 20A/1P QOB-GFI Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22U1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
307-00	1	**Designation:** L22U1 MH50P (Box) NQ Standard TYPE 1 Box 50 H

Item No.	Qty.	Catalog Number / Details
308-00	1	**Designation:** L22U1 NC50FHR (Trim) NQ Standard TYPE 1 Box 50 H
050-00	1	**Designation:** L22U2 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 56 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC 1 - 20A/1P QOB-EPD Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22U2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
309-00	1	**Designation:** L22U2 MH44P (Box) NQ Standard TYPE 1 Box 44 H
310-00	1	**Designation:** L22U2 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
051-00	1	**Designation:** H2M1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 22kA Series Rated w/ JG Circuit Breaker Main Lug Only: 225A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 66 Circuit Interior Type 1,Box: 62H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH62P Front Cat No: NC62FHR

Item No.	Qty.	Catalog Number / Details
		Ref. Drawing: PBA550HR Feeders: 8 - 20A/3P EDB 36 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H2M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
243-00	1	**Designation:** H2M1 MH62P (Box) NF Standard TYPE 1 Box 62 H
244-00	1	**Designation:** H2M1 NC62FHR (Trim) NF Standard TYPE 1 Box 62 H
052-00	1	**Designation:** H2B1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 22kA Fully Rated Main Lug Only: 60A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 30 Circuit Interior Type 1,Box: 32H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH32P Front Cat No: NC32SHR Ref. Drawing: PBA550HR Feeders: 1 - 25A/3P EGB 27 - 20A/1P EGB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H2B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
239-00	1	**Designation:** H2B1 MH32P (Box) NF Standard TYPE 1 Box 32 H
240-00	1	**Designation:** H2B1 NC32SHR (Trim) NF Standard TYPE 1 Box 32 H

Item No.	Qty.	Catalog Number / Details
053-00	1	**Designation:** H2B2 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 25kA Series Rated w/ LG Circuit Breaker Main Lug Only: 400A Incoming Conductors: 1 - 1/0 - 750, (2) 1/0 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 56H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH56P Front Cat No: NC56VSHR Ref. Drawing: PBA551HR Feeders: 1 - 90A/3P EDB 1 - 70A/3P EDB 4 - 20A/3P EDB 21 - 20A/1P EDB 1 - 80A/3P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H2B2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
241-00	1	**Designation:** H2B2 MH56P (Box) NF Standard TYPE 1 Box 56 H
242-00	1	**Designation:** H2B2 NC56VSHR (Trim) NF Standard TYPE 1 Box 56 H
054-00	1	**Designation:** H2M2 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 22kA Series Rated w/ LG Circuit Breaker Main Lug Only: 400A Incoming Conductors: 1 - 1/0 - 750, (2) 1/0 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 66 Circuit Interior Type 1,Box: 74H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH74P Front Cat No: NC74VFHR Ref. Drawing: PBA551HR Feeders: 2 - 50A/3P EDB 1 - 40A/3P EDB 8 - 20A/3P EDB 27 - 20A/1P EDB Optional Features:

Item No.	Qty.	Catalog Number / Details
		Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Branch User Placement Standard Nameplate: Engraved as Follows Line 1: H2M2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
245-00	1	**Designation:** H2M2 MH74P (Box) NF Standard TYPE 1 Box 74 H
246-00	1	**Designation:** H2M2 NC74VFHR (Trim) NF Standard TYPE 1 Box 74 H
055-00	1	**Designation:** H21M1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 100A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 30 Circuit Interior Type 1,Box: 32H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH32P Front Cat No: NC32FHR Ref. Drawing: PBA550HR Feeders: 1 - 20A/3P EDB 27 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H21M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
229-00	1	**Designation:** H21M1 MH32P (Box) NF Standard TYPE 1 Box 32 H
230-00	1	**Designation:** H21M1 NC32FHR (Trim) NF Standard TYPE 1 Box 32 H
056-00	1	**Designation:** H21U1 NF ML Panel (Interior) NF Panelboard Consisting of

Item No.	Qty.	Catalog Number / Details
		480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 100A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 30 Circuit Interior Type 1,Box: 32H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH32P Front Cat No: NC32FHR Ref. Drawing: PBA550HR Feeders: 2 - 20A/3P EDB 24 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H21U1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
231-00	1	**Designation:** H21U1 MH32P (Box) NF Standard TYPE 1 Box 32 H
232-00	1	**Designation:** H21U1 NC32FHR (Trim) NF Standard TYPE 1 Box 32 H
057-00	1	**Designation:** H21B1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 14kA Fully Rated Main Lug Only: 60A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH26P Front Cat No: NC26SHR Ref. Drawing: PBA550HR Feeders: 18 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: H21B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on

Item No.	Qty.	Catalog Number / Details
227-00	1	**Designation:** H21B1 MH26P (Box) NF Standard TYPE 1 Box 26 H
228-00	1	**Designation:** H21B1 NC26SHR (Trim) NF Standard TYPE 1 Box 26 H
058-00	1	**Designation:** L21B1 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 14kA Fully Rated Main Lug Only: 60A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH26P Front Cat No: NC26SHR Ref. Drawing: PBA701HR Feeders: 2 - 30A/2P QOB-VH 14 - 20A/1P QOB-VH Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
268-00	1	**Designation:** L21B1 MH26P (Box) NQ Standard TYPE 1 Box 26 H
269-00	1	**Designation:** L21B1 NC26SHR (Trim) NQ Standard TYPE 1 Box 26 H
059-00	1	**Designation:** L21U5 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 14kA Series Rated w/ QD Circuit Breaker SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged

Item No.	Qty.	Catalog Number / Details
		Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 1 - 40A/3P QOB-VH 54 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21U5 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
355-00	1	**Designation:** L21U5 MH44P (Box) NQ Standard TYPE 1 Box 44 H
356-00	1	**Designation:** L21U5 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
060-00	1	**Designation:** L21U1 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 14kA Series Rated w/ QD Circuit Breaker SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH50P Front Cat No: NC50FHR Ref. Drawing: PBA701HR Feeders: 66 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC 3 - 20A/1P QOB-EPD Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21U1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on

Item No.	Qty.	Catalog Number / Details
359-00	1	**Designation:** L21U1 MH50P (Box) NQ Standard TYPE 1 Box 50 H
360-00	1	**Designation:** L21U1 NC50FHR (Trim) NQ Standard TYPE 1 Box 50 H
061-00	1	**Designation:** L21U2 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 57 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),Copper Solid Neutral,SPD Model BIA,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21U2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
285-00	1	**Designation:** L21U2 MH44P (Box) NQ Standard TYPE 1 Box 44 H
286-00	1	**Designation:** L21U2 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
062-00	1	**Designation:** L21U3 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated

Item No.	Qty.	Catalog Number / Details
		CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 57 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21U3 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
287-00	1	**Designation:** L21U3 MH44P (Box) NQ Standard TYPE 1 Box 44 H
288-00	1	**Designation:** L21U3 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
063-00	1	**Designation:** L21U4 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 56 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC 1 - 20A/1P QOB-GFI Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L21U4 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on

Item No.	Qty.	Catalog Number / Details
289-00	1	**Designation:** L21U4 MH44P (Box) NQ Standard TYPE 1 Box 44 H
290-00	1	**Designation:** L21U4 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
064-00	1	**Designation:** L22U3 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 1 - 20A/3P QOB 54 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22U3 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
311-00	1	**Designation:** L22U3 MH44P (Box) NQ Standard TYPE 1 Box 44 H
312-00	1	**Designation:** L22U3 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
065-00	1	**Designation:** L22U4 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect

Item No.	Qty.	Catalog Number / Details
		w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 56 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC 1 - 20A/1P QOB-EPD Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22U4 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
313-00	1	**Designation:** L22U4 MH44P (Box) NQ Standard TYPE 1 Box 44 H
314-00	1	**Designation:** L22U4 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
066-00	1	**Designation:** L22U5 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 72 Circuit Interior Type 1,Box: 44H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH44P Front Cat No: NC44FHR Ref. Drawing: PBA701HR Feeders: 1 - 35A/3P QOB 54 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box

Item No.	Qty.	Catalog Number / Details
		Standard Nameplate: Engraved as Follows Line 1: L22U5 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
315-00	1	**Designation:** L22U5 MH44P (Box) NQ Standard TYPE 1 Box 44 H
316-00	1	**Designation:** L22U5 NC44FHR (Trim) NQ Standard TYPE 1 Box 44 H
067-00	1	**Designation:** E2B2 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 100A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 38H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH38P Front Cat No: NC38SHR Ref. Drawing: PBA550HR Feeders: 1 - 60A/3P EDB 2 - 40A/3P EDB 21 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2B2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
195-00	1	**Designation:** E2B2 MH38P (Box) NF Standard TYPE 1 Box 38 H
196-00	1	**Designation:** E2B2 NC38SHR (Trim) NF Standard TYPE 1 Box 38 H
068-00	1	**Designation:** E2B1 NF MB Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 20kA Fully Rated Single Main: 150A/3P JG Circuit Breaker

Item No.	Qty.	Catalog Number / Details
		Incoming Conductors: 1 - #4 - 4/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 30 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Top Trim: Surface - Hinged Box Cat No: MH50P Front Cat No: NC50SHR Ref. Drawing: PBA553HR Feeders: 2 - 100A/3P EGB 21 - 20A/1P EGB 1 - 40A/3P EGB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
193-00	1	**Designation:** E2B1 MH50P (Box) NF Standard TYPE 1 Box 50 H
194-00	1	**Designation:** E2B1 NC50SHR (Trim) NF Standard TYPE 1 Box 50 H
069-00	1	**Designation:** E2M1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 40A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH26P Front Cat No: NC26SHR Ref. Drawing: PBA550HR Feeders: 18 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
207-00	1	**Designation:** E2M1 MH26P (Box)

Item No.	Qty.	Catalog Number / Details
		NF Standard TYPE 1 Box 26 H
208-00	1	**Designation:** E2M1 NC26SHR (Trim) NF Standard TYPE 1 Box 26 H
070-00	1	**Designation:** E2B3 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 60A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH26P Front Cat No: NC26SHR Ref. Drawing: PBA550HR Feeders: 2 - 40A/3P EDB 12 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2B3 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
197-00	1	**Designation:** E2B3 MH26P (Box) NF Standard TYPE 1 Box 26 H
198-00	1	**Designation:** E2B3 NC26SHR (Trim) NF Standard TYPE 1 Box 26 H
071-00	1	**Designation:** E2M2 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 40A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH26P Front Cat No: NC26FHR Ref. Drawing: PBA550HR Feeders: 18 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid

Item No.	Qty.	Catalog Number / Details
		Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2M2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
209-00	1	**Designation:** E2M2 MH26P (Box) NF Standard TYPE 1 Box 26 H
210-00	1	**Designation:** E2M2 NC26FHR (Trim) NF Standard TYPE 1 Box 26 H
072-00	1	**Designation:** E2M3 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 40A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH26P Front Cat No: NC26FHR Ref. Drawing: PBA550HR Feeders: 18 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2M3 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
211-00	1	**Designation:** E2M3 MH26P (Box) NF Standard TYPE 1 Box 26 H
212-00	1	**Designation:** E2M3 NC26FHR (Trim) NF Standard TYPE 1 Box 26 H
073-00	1	**Designation:** E2U1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 40A

Item No.	Qty.	Catalog Number / Details
		Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH26P Front Cat No: NC26FHR Ref. Drawing: PBA550HR Feeders: 18 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2U1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
213-00	1	**Designation:** E2U1 MH26P (Box) NF Standard TYPE 1 Box 26 H
214-00	1	**Designation:** E2U1 NC26FHR (Trim) NF Standard TYPE 1 Box 26 H
074-00	1	**Designation:** E2U2 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 40A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH26P Front Cat No: NC26FHR Ref. Drawing: PBA550HR Feeders: 18 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2U2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
215-00	1	**Designation:** E2U2 MH26P (Box) NF Standard TYPE 1 Box 26 H

Item No.	Qty.	Catalog Number / Details
216-00	1	**Designation:** E2U2 NC26FHR (Trim) NF Standard TYPE 1 Box 26 H
075-00	1	**Designation:** E2BL1 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Single Main: 200A/3P JD Circuit Breaker Incoming Conductors: 1 - 3/0 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 54 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH50P Front Cat No: NC50SHR Ref. Drawing: PBA707HR Feeders: 1 - 150A/3P QOB-VH 24 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Branch User Placement Standard Nameplate: Engraved as Follows Line 1: E2BL1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
199-00	1	**Designation:** E2BL1 MH50P (Box) NQ Standard TYPE 1 Box 50 H
200-00	1	**Designation:** E2BL1 NC50SHR (Trim) NQ Standard TYPE 1 Box 50 H
076-00	1	**Designation:** E2BL2 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 150A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar

Item No.	Qty.	Catalog Number / Details
		42 Circuit Interior Type 1,Box: 38H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH38P Front Cat No: NC38SHR Ref. Drawing: PBA701HR Feeders: 1 - 100A/3P QOB 24 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2BL2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
201-00	1	**Designation:** E2BL2 MH38P (Box) NQ Standard TYPE 1 Box 38 H
202-00	1	**Designation:** E2BL2 NC38SHR (Trim) NQ Standard TYPE 1 Box 38 H
077-00	1	**Designation:** E2BL3 NQ SPD Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 100A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 38H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH38P Front Cat No: NC38SHR Ref. Drawing: PBA701HR Feeders: 27 - 20A/1P QOB 1 - 30A/3P QOB SPD DISC Optional Features: Standard Panel (Box Ahead),SPD Model BIA,Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: E2BL3 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on

Item No.	Qty.	Catalog Number / Details
203-00	1	**Designation:** E2BL3 MH38P (Box) NQ Standard TYPE 1 Box 38 H
204-00	1	**Designation:** E2BL3 NC38SHR (Trim) NQ Standard TYPE 1 Box 38 H
079-00	6	TVS2EBA12A EBA TVSS, 208Y/120V, 3 ph, 4 wire, 120kA
080-00	1	**Designation:** L22B1 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 60A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH26P Front Cat No: NC26SHR Ref. Drawing: PBA701HR Feeders: 2 - 30A/2P QOB 14 - 20A/1P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L22B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
293-00	1	**Designation:** L22B1 MH26P (Box) NQ Standard TYPE 1 Box 26 H
294-00	1	**Designation:** L22B1 NC26SHR (Trim) NQ Standard TYPE 1 Box 26 H
081-00	1	**Designation:** E1B1 NF MB Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 14kA Series Rated w/ EDB Circuit Breaker Single Main: 100A/3P EDB Circuit Breaker Incoming Conductors: 1 - #14 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior Type 1,Box: 38H x 20W x 5.75D

Item No.	Qty.	Catalog Number / Details
		Incoming: Top Trim: Surface - Hinged Box Cat No: MH38 Front Cat No: NC38SHR Ref. Drawing: PBA552HR Feeders: 1 - 60A/3P EDB 2 - 50A/3P EDB 1 - 40A/3P EDB 2 - 20A/3P EDB 15 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar Standard Nameplate: Engraved as Follows Line 1: E1B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
183-00	1	**Designation:** E1B1 MH38 (Box) NF Standard TYPE 1 Box 38 H
184-00	1	**Designation:** E1B1 NC38SHR (Trim) NF Standard TYPE 1 Box 38 H
082-00	1	**Designation:** E1L1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 14kA Fully Rated Main Lug Only: 40A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 18 Circuit Interior Type 1,Box: 26H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH26 Front Cat No: NC26FHR Ref. Drawing: PBA550HR Feeders: 18 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar Standard Nameplate: Engraved as Follows Line 1: E1L1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
185-00	1	**Designation:** E1L1 MH26 (Box) NF Standard TYPE 1 Box 26 H
186-00	1	**Designation:** E1L1 NC26FHR (Trim)

Item No.	Qty.	Catalog Number / Details
		NF Standard TYPE 1 Box 26 H
083-00	1	**Designation:** H1L3 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 18kA Fully Rated Main Lug Only: 225A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 66 Circuit Interior Type 1,Box: 62H x 20W x 5.75D Incoming: Bottom Trim: Flush - Hinged Box Cat No: MH62 Front Cat No: NC62FHR Ref. Drawing: PBA550HR Feeders: 6 - 20A/3P EDB 42 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar Standard Nameplate: Engraved as Follows Line 1: H1L3 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
225-00	1	**Designation:** H1L3 MH62 (Box) NF Standard TYPE 1 Box 62 H
226-00	1	**Designation:** H1L3 NC62FHR (Trim) NF Standard TYPE 1 Box 62 H
084-00	1	**Designation:** H1B1 NF ML Panel (Interior) NF Panelboard Consisting of 480Y/277V 3Ph 4W 60Hz SCCR: 22kA Series Rated w/ EGB Circuit Breaker Main Lug Only: 100A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 30 Circuit Interior Type 1,Box: 32H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH32 Front Cat No: NC32SHR Ref. Drawing: PBA550HR Feeders: 30 - 20A/1P EDB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar Standard Nameplate: Engraved as Follows Line 1: H1B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters

Item No.	Qty.	Catalog Number / Details
		Plastic/Adhesive - Screw-on
219-00	1	**Designation:** H1B1 MH32 (Box) NF Standard TYPE 1 Box 32 H
220-00	1	**Designation:** H1B1 NC32SHR (Trim) NF Standard TYPE 1 Box 32 H
085-00	1	**Designation:** L1L5 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 225A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 84 Circuit Interior Type 1,Box: 50H x 20W x 5.75D Incoming: Bottom Trim: Surface - Hinged Box Cat No: MH50 Front Cat No: NC50SHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/2P QOB 66 - 20A/1P QOB 1 - 30A/3P QOB 3 - 20A/3P QOB 4 - 20A/1P QOB-GFI Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar Standard Nameplate: Engraved as Follows Line 1: L1L5 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
262-00	1	**Designation:** L1L5 MH50 (Box) NQ Standard TYPE 1 Box 50 H
263-00	1	**Designation:** L1L5 NC50SHR (Trim) NQ Standard TYPE 1 Box 50 H
086-00	1	**Designation:** L1B1 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 22kA Series Rated w/ QD Circuit Breaker Main Lug Only: 125A Incoming Conductors: 1 - #6 - 350 kcmil Bus: Aluminum: Tin Plated CU Ground Bar 42 Circuit Interior

Item No.	Qty.	Catalog Number / Details
		Type 1,Box: 38H x 20W x 5.75D Incoming: Top Trim: Surface - Hinged Box Cat No: MH38 Front Cat No: NC38SHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/2P QOB 40 - 20A/1P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar Standard Nameplate: Engraved as Follows Line 1: L1B1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
247-00	1	**Designation:** L1B1 MH38 (Box) NQ Standard TYPE 1 Box 38 H
248-00	1	**Designation:** L1B1 NC38SHR (Trim) NQ Standard TYPE 1 Box 38 H
087-00	1	**Designation:** L1B2 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 10kA Fully Rated Main Lug Only: 100A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 30 Circuit Interior Type 1,Box: 32H x 20W x 5.75D Incoming: Top Trim: Surface - Hinged Box Cat No: MH32 Front Cat No: NC32SHR Ref. Drawing: PBA701HR Feeders: 1 - 30A/2P QOB 28 - 20A/1P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar Standard Nameplate: Engraved as Follows Line 1: L1B2 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
249-00	1	**Designation:** L1B2 MH32 (Box) NQ Standard TYPE 1 Box 32 H
250-00	1	**Designation:** L1B2 NC32SHR (Trim) NQ Standard TYPE 1 Box 32 H

Item No.	Qty.	Catalog Number / Details
088-00	1	TVS2EBA12A EBA TVSS, 208Y/120V, 3 ph, 4 wire, 120kA
089-00	1	EE45T3H42DB TRFMR DRY TYPE 3PH 45KVA 480D208Y
090-00	1	DASKP100 LUG KIT
091-00	1	DASKGS250 MECHANICAL LUG KITS
092-00	1	EE75T3H47DB Transformer Dry Type 75kVA 480D208Y120
094-00	1	DASKP250 LUG KIT
095-00	1	DASKGS250 MECHANICAL LUG KITS
093-00	3	EE500T68H57DB Transformer Type: Energy Efficient Transformer Rating: 500kVA Transformer Phase: Three Phase Primary Voltage: 480V Delta Secondary Voltage: 208Y/120V Transformer Taps: 4 - 2.5% 2+2- Taps Frequency: 60Hz Transformer Winding Material: Aluminum Electrostatic Shield:Non-Shielded Sound Level: 57DB Insulation & Temperature: Class 220 (H), 150 Deg C Enclosure Material: Standard Enclosure Type: NEMA 2 Ventilated Indoor Enclosure UL Labeled Revision: 082912 - (01292014/01292014)
097-00	3	DASKGS2000 MECHANICAL LUG KITS
096-00	1	EE750T68H61DB Transformer Type: Energy Efficient Transformer Rating: 750kVA Transformer Phase: Three Phase Primary Voltage: 480V Delta Secondary Voltage: 208Y/120V Transformer Taps: 4 - 2.5% 2+2- Taps Frequency: 60Hz Transformer Winding Material: Aluminum Electrostatic Shield:Non-Shielded Sound Level: 61DB Insulation & Temperature: Class 220 (H), 150 Deg C Enclosure Material: Standard Enclosure Type: NEMA 2 Ventilated Indoor Enclosure UL Labeled Revision: 082912 - (01292014/01292014)
098-00	3	DASKP600

Item No.	Qty.	Catalog Number / Details
		LUG KIT
099-00	1	DASKGS2000 MECHANICAL LUG KITS
101-00	12	H221N SWITCH FUSIBLE HD 240V 30A 2P NEMA1 Enclosure Type: Type 1 Interrupting Rating (AIR): 50kA Fuse Capability: Class R Max System Voltage: 240 VAC Switch Current Rating: 30 Amp Number of Switching Poles: 2 Pole w/ Neutral Neutral Kit: Field or Factory Installed: Factory Fuse Kits: Class R Fuse Kit Field or Factory Installed: Field Fuse Puller: Include as kit Ground Lug: AL/CU Ground Lug: Field or Factory Installed: Field Processed by ACE 2.0 - 020114
129-00	12	RFK03H KIT CLASS R FUSE REJECTION
130-00	12	FPK03 HD SWITCH FUSE PULLER KIT 30A SERIES F
131-00	12	GTK03 KIT EQUIPMENT GROUND CU/AL
102-00	5	FRNR15 Class RK5 15A 250V Fuse (25413-00310)
103-00	15	FRNR20 Class RK5 20A 250V Fuse (25413-00330)
104-00	5	FRNR25 Class RK5 25A 250V Fuse (25413-00340)
105-00	5	FRNR10 Class RK5 10A 250V Fuse (25413-00290)
106-00	1	H362N SWITCH FUSIBLE HD 600V 60A 3P NEUTRAL Enclosure Type: Type 1 Interrupting Rating (AIR): 50kA Fuse Capability: Class R Max System Voltage: 600 VAC Switch Current Rating: 60 Amp Number of Switching Poles: 3 Pole w/ Neutral Neutral Kit: Field or Factory Installed: Factory Fuse Kits: Class R Fuse Kit Field or Factory Installed: Field Fuse Puller: Include as kit Ground Lug: AL/CU Ground Lug: Field or Factory Installed: Field Processed by ACE 2.0 - 020114
126-00	1	RFK06H KIT CLASS R FUSE REJECTION

Item No.	Qty.	Catalog Number / Details
127-00	1	FPK0610 HD SWITCH FUSE PULLER KIT 60A SERIES F
128-00	1	GTK03 KIT EQUIPMENT GROUND CU/AL
107-00	6	FRSR60 Class RK5 60A 600V Fuse (25414-00400)
108-00	16	8538SBA66V80CFF4P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA66V80CFF4P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing single phase 2 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 1/4 HP @ 230V 1Ph Type 12/3R Enclosure - external reset Melting alloy overload Starter will require 1 thermal unit Standard with NC overload contact Specified for 230V 1Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
109-00	1	8538SBA66V80CFF4P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA66V80CFF4P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing single phase 2 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 1/3 HP @ 230V 1Ph Type 12/3R Enclosure - external reset Melting alloy overload Starter will require 1 thermal unit Standard with NC overload contact Specified for 230V 1Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity

Item No.	Qty.	Catalog Number / Details
		240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
110-00	10	8538SBA66V80CFF4P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA66V80CFF4P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing single phase 2 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 1/2 HP @ 230V 1Ph Type 12/3R Enclosure - external reset Melting alloy overload Starter will require 1 thermal unit Standard with NC overload contact Specified for 230V 1Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
111-00	2	8538SBA66V80CFF4P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA66V80CFF4P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing single phase 2 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 3/4 HP @ 230V 1Ph

Item No.	Qty.	Catalog Number / Details
		Type 12/3R Enclosure - external reset Melting alloy overload Starter will require 1 thermal unit Standard with NC overload contact Specified for 230V 1Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
112-00	3	8538SBA66V80CFF4P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA66V80CFF4P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing single phase 2 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 1 HP @ 230V 1Ph Type 12/3R Enclosure - external reset Melting alloy overload Starter will require 1 thermal unit Standard with NC overload contact Specified for 230V 1Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
113-00	3	8538SBA42V80CFF4H30P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA42V80CFF4H30P51P52TY75

Item No.	Qty.	Catalog Number / Details
		NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 1.5 HP @ 230V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 6-18 amps Standard with NC overload contact Specified for 230V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
114-00	1	8538SCA43V80CFF4H30P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SCA43V80CFF4H30P51P52TY75 NEMA Size 1 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 7.5 HP @ 230V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 9-27 amps Standard with NC overload contact Specified for 230V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED)

Item No.	Qty.	Catalog Number / Details
		P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
115-00	1	8538SDA42V80CFF4H30P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SDA42V80CFF4H30P51P52TY75 NEMA Size 2 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 10 HP @ 230V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 15-45 amps Standard with NC overload contact Specified for 230V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
116-00	4	8538SBA43V81CFF4H309P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA43V81CFF4H309P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 2 HP @ 460V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 3-9 amps Standard with NC overload contact Specified for 460V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 480 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse

Item No.	Qty.	Catalog Number / Details
		Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
117-00	4	8538SBA43V81CFF4H309P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA43V81CFF4H309P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 3 HP @ 460V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 3-9 amps Standard with NC overload contact Specified for 460V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 480 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
118-00	4	8538SBA43V81CFF4H309P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA43V81CFF4H309P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 5 HP @ 460V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 3-9 amps Standard with NC overload contact Specified for 460V 3Ph power system

Item No.	Qty.	Catalog Number / Details
		Fused control transformer selected with 120V 60Hz coil T - Standard capacity 480 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
119-00	4	8538SCA44V81CFF4H300P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SCA44V81CFF4H300P51P52TY75 NEMA Size 1 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 7.5 HP @ 460V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 6-18 amps Standard with NC overload contact Specified for 460V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 480 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
120-00	1	8538SEG33V81CFF4H30P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SEG33V81CFF4H30P51P52TY75 NEMA Size 3 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase

Item No.	Qty.	Catalog Number / Details
		3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 40 HP @ 460V 3Ph Type 1 Enclosure H3xx - SSOLR - Class 10/20 trip Range of 30-90 amps Standard with NC overload contact Specified for 460V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 480 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
121-00	1	8538SEG33V81CFF4H30P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SEG33V81CFF4H30P51P52TY75 NEMA Size 3 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 50 HP @ 460V 3Ph Type 1 Enclosure H3xx - SSOLR - Class 10/20 trip Range of 30-90 amps Standard with NC overload contact Specified for 460V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 480 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
122-00	43	2510FG1 MANUAL STARTER 277VAC
123-00	1	8903LG60V02 LIGHTING CONTACTOR 600VAC 30A L

Item No.	Qty.	Catalog Number / Details
		Class 8903 Multi-pole lighting contactor 8903LG60V02 Contactor rating - 20 amps Non-combination lighting contactor 6 pole device With 6 NO and 0 NC contacts. Type 1 Enclosure Separate control source selected with 120V 60Hz coil Auxiliary contacts - None Control units supplied None Pilot lights supplied None Revision: 120607 - (140129/140129)
124-00	1	8903LG42V02C6P51 Class 8903 Multi-pole lighting contactor Class 8903 Multi-pole lighting contactor 8903LG42V02C6P51 Contactor rating - 20 amps Non-combination lighting contactor 6 pole device With 4 NO and 2 NC contacts. Type 1 Enclosure Separate control source selected with 120V 60Hz coil Auxiliary contacts - None Control units supplied C6 - ON-OFF selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) Revision: 120607 - (140430/140129)
125-00	3	8903LG42V02C6P51 Class 8903 Multi-pole lighting contactor Class 8903 Multi-pole lighting contactor 8903LG42V02C6P51 Contactor rating - 20 amps Non-combination lighting contactor 6 pole device With 4 NO and 2 NC contacts. Type 1 Enclosure Separate control source selected with 120V 60Hz coil Auxiliary contacts - None Control units supplied C6 - ON-OFF selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) Revision: 120607 - (140430/140129)
132-00	2	H221N SWITCH FUSIBLE HD 240V 30A 2P NEMA1 Enclosure Type: Type 1 Interrupting Rating (AIR): 10kA Fuse Capability: Class R Max System Voltage: 240 VAC Switch Current Rating: 30 Amp Number of Switching Poles: 2 Pole w/ Neutral

Item No.	Qty.	Catalog Number / Details
		Neutral Kit: Field or Factory Installed: Factory Fuse Kits: Class R Fuse Kit Field or Factory Installed: Field Fuse Puller: Include as kit Ground Lug: AL/CU Ground Lug: Field or Factory Installed: Field Processed by ACE 2.0 - 020114
142-00	2	RFK03H KIT CLASS R FUSE REJECTION
143-00	2	FPK03 HD SWITCH FUSE PULLER KIT 30A SERIES F
144-00	2	GTK03 KIT EQUIPMENT GROUND CU/AL
133-00	7	FRNR20 Class RK5 20A 250V Fuse (25413-00330)
134-00	3	8538SBA66V80CFF4P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA66V80CFF4P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing single phase 2 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 1/4 HP @ 230V 1Ph Type 12/3R Enclosure - external reset Melting alloy overload Starter will require 1 thermal unit Standard with NC overload contact Specified for 230V 1Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
135-00	1	8538SBA66V80CFF4P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA66V80CFF4P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips

Item No.	Qty.	Catalog Number / Details
		(Fuses not included) Non-reversing single phase 2 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 3/4 HP @ 230V 1Ph Type 12/3R Enclosure - external reset Melting alloy overload Starter will require 1 thermal unit Standard with NC overload contact Specified for 230V 1Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
136-00	3	8538SBA66V80CFF4P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA66V80CFF4P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing single phase 2 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 1 HP @ 230V 1Ph Type 12/3R Enclosure - external reset Melting alloy overload Starter will require 1 thermal unit Standard with NC overload contact Specified for 230V 1Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)

Item No.	Qty.	Catalog Number / Details
137-00	6	8538SBA42V80CFF4H30P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA42V80CFF4H30P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 1.5 HP @ 230V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 6-18 amps Standard with NC overload contact Specified for 230V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 240 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
138-00	1	8538SBA43V81CFF4H309P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA43V81CFF4H309P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 2 HP @ 460V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 3-9 amps Standard with NC overload contact Specified for 460V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 480 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot

Item No.	Qty.	Catalog Number / Details
		light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
139-00	2	8538SBA43V81CFF4H309P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SBA43V81CFF4H309P51P52TY75 NEMA Size 0 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 3 HP @ 460V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 3-9 amps Standard with NC overload contact Specified for 460V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity 480 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
140-00	1	8538SCA44V81CFF4H300P51P52TY75 Class 8538 Fused Combination Starter Class 8538 Fused Combination Starter 8538SCA44V81CFF4H300P51P52TY75 NEMA Size 1 Fused combination starter with Class R fuse clips (Fuses not included) Non-reversing 3 phase 3 pole device Y75 - DPDT auxiliary contact on disconnect Selected for 7.5 HP @ 460V 3Ph Type 12/3R Enclosure - external reset H3xx - SSOLR - Class 10/20 trip Range of 6-18 amps Standard with NC overload contact Specified for 460V 3Ph power system Fused control transformer selected with 120V 60Hz coil T - Standard capacity

Item No.	Qty.	Catalog Number / Details
		480 Volt primary 120 Volt secondary Fusing F4 - 2 primary control fuses F - 1 secondary control fuse Auxiliary contacts - None Internal NC auxiliary contact for off pilot light Control units supplied C - HAND-OFF-AUTO selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) P52 - Power OFF green pilot light (LED) Revision: 120607 - (140129/140129)
141-00	15	2510FG1 MANUAL STARTER 277VAC
145-00	1	POWERBUSFOOTAGEFITTINGS POWERBUS FOOTAGE & FITTINGS
146-00	10	PBCE4A225AST120B 225A Busway Straight 10ft Blk 600V max
147-00	2	PBCF4A225ATBB Busway Tap Box 225A Blk 600V max
148-00	14	PB225FH Busway Standard Hanger 225 A
149-00	2	PB225AEC Busway End Closure 225A 600V
150-00	4	PBPQO4A100 Busway Plug-in Unit Enclosure
151-00	1	PBPFA4A100A050 Busway Circuit Breaker Plug-in Unit
152-00	8	PBPFA4A100A020 Busway Circuit Breaker Plug-in Unit
153-00	3	PBPFA4A100A030 Busway Circuit Breaker Plug-in Unit
154-00	12	QOB120 MINIATURE CIRCUIT BREAKER 120/240V 20A
155-00	1	POWERBUSFOOTAGEFITTINGS POWERBUS FOOTAGE & FITTINGS
162-00	9	PBCE4A225AST120B 225A Busway Straight 10ft Blk 600V max
163-00	2	PBCF4A225ATBB Busway Tap Box 225A Blk 600V max
164-00	13	PB225FH Busway Standard Hanger 225 A
165-00	2	PB225AEC Busway End Closure 225A 600V
166-00	5	PBPQO4A100

Item No.	Qty.	Catalog Number / Details
		Busway Plug-in Unit Enclosure
156-00	1	POWERBUSFOOTAGEFITTINGS POWERBUS FOOTAGE & FITTINGS
157-00	10	PBCE4A225AST120B 225A Busway Straight 10ft Blk 600V max
158-00	2	PBCF4A225ATBB Busway Tap Box 225A Blk 600V max
159-00	14	PB225FH Busway Standard Hanger 225 A
160-00	2	PB225AEC Busway End Closure 225A 600V
161-00	18	PBPFA4A100A020 Busway Circuit Breaker Plug-in Unit
167-00	5	QOB150 MINIATURE CIRCUIT BREAKER 120/240V 50A
168-00	8	QOB120 MINIATURE CIRCUIT BREAKER 120/240V 20A
169-00	4	H222N SWITCH FUSIBLE HD 240V 60A 2P NEMA1 Enclosure Type: Type 1 Interrupting Rating (AIR): 50kA Fuse Capability: Class R Max System Voltage: 240 VAC Switch Current Rating: 60 Amp Number of Switching Poles: 2 Pole w/ Neutral Neutral Kit: Field or Factory Installed: Factory Fuse Kits: Class R Fuse Kit Field or Factory Installed: Field Fuse Puller: Include as kit Ground Lug: AL/CU Ground Lug: Field or Factory Installed: Field Processed by ACE 2.0 - 020114
171-00	4	RFK06H KIT CLASS R FUSE REJECTION
172-00	4	FPK03 HD SWITCH FUSE PULLER KIT 30A SERIES F
173-00	4	GTK03 KIT EQUIPMENT GROUND CU/AL
170-00	11	FRNR60 Class RK5 60A 250V Fuse (25413-00400)
175-00	1	SIBS STARTUP
		Q2C or Reference Number - 34765053
		At your request and based upon the information you have provided, we are pleased to submit the following proposal for Schneider Electric Services to provide start-up and commissioning

Item No.	Qty.	Catalog Number / Details
		services on the electrical equipment being installed in your facility at in Casper, WY. Scope of Work ---------- Specifically, experienced field service technician(s) will perform visual, mechanical and electrical tests on the following equipment, as outlined in our Procedures for the Startup and Commissioning of Electrical Equipment (attached). You will receive a copy of the test reports which can serve as a benchmark for future preventive maintenance and testing activities. Workscopes to be Performed (On applicable Equipment) ---------- Circuit Breakers: Low Voltage Insulated Case/Molded Case Ground Fault Protection Systems Switchgear and Switchboard Assemblies: Low and Medium Voltage Additional Items ---------- Relavent Designations of Equipment Workscopes Listed Above ---------- 34765053-1, Equipment: Switchboards, Designation: MAIN / UCT Notes: ---------- Please refer to formal quote document for full details.
176-00	1	ES158929-ENGINEERING ANALYSIS SC TCC & AF
177-00	1	ES158929-LABEL COMP AF Bdy Lbl
182-00	1	**Designation:** L2M1 ILINE ML PNLB (INT,BOX,TRIM) - A I-Line Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 30kA Fully Rated SPD 120kA per Phase/60kA per Mode SPD line to grd protect w/SPD Surge Counter w/SPD Dry Contacts Main Lug Only: 600A Incoming Conductors: 1 - (2) #2 - 500kcmil Bus: Copper: Tin Plated CU Ground Bar 99" of Mounting Inches Type 1,Box: 86H x 42W x 9.5D Incoming: Bottom Trim: Flush - Hinged Box Cat No: HC4286DBP Ref. Drawing: PBA418HR Type: HCP

Item No.	Qty.	Catalog Number / Details
		Feeders: 1 - SL800 Feeds Next Panel 32 - 20A/1P FH 2 - 20A/3P FH-GFI GF 1 - 400AS/300AT/3P LG STD LI 1 - 30A/3P FH 2 - 50A/3P FH Optional Features: Ship Together,Standard Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L2M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
406-00	1	**Designation:** L2M1 ILINE ML PNLB (INT,BOX,TRIM) - B I-Line Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 30kA Fully Rated Main Lug Only: 600A Bus: Copper: Tin Plated CU Ground Bar 63" of Mounting Inches Type 1,Box: 73H x 32W x 8.25D Incoming: Top Trim: Flush - Hinged Box Cat No: HC3273BP Ref. Drawing: PBA402HR Type: HCM Feeders: 38 - 20A/1P FH Optional Features: Ship Together,Standard Solid Neutral,Copper Ground Bar,Standard Mains and Feeders Mechanically Restrained ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L2M1 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
347-00	1	**Designation:** 750 KVA TRANSFORMER DASKP1200 LUG KIT
348-00	1	8903LG42V02C6P51 Class 8903 Multi-pole lighting contactor Class 8903 Multi-pole lighting contactor 8903LG42V02C6P51 Contactor rating - 20 amps Non-combination lighting contactor 6 pole device With 4 NO and 2 NC contacts.

Item No.	Qty.	Catalog Number / Details
		Type 1 Enclosure Separate control source selected with 120V 60Hz coil Auxiliary contacts - None Control units supplied C6 - ON-OFF selector switch Pilot lights supplied P51 - Power ON red pilot light (LED) Revision: 120607 - (140430/140129)
366-00	1	**Designation:** L2M22 NQ ML Panel (Interior) NQ Panelboard Consisting of 208Y/120V 3Ph 4W 60Hz SCCR: 14kA Series Rated w/ HD Circuit Breaker Main Lug Only: 100A Incoming Conductors: 1 - #6 - 2/0 AWG Bus: Aluminum: Tin Plated CU Ground Bar 30 Circuit Interior Type 1,Box: 32H x 20W x 5.75D Incoming: Top Trim: Flush - Hinged Box Cat No: MH32P Front Cat No: NC32FHR Ref. Drawing: PBA701HR Feeders: 3 - 20A/1P QOB-GFI 25 - 20A/1P QOB 1 - 30A/2P QOB Optional Features: Standard Panel (Box Ahead),Standard Solid Neutral,Copper Ground Bar ANSI 49 grey box Standard Nameplate: Engraved as Follows Line 1: L2M22 Size: 3.50" Wide x 1.00" High (Std) Color: White Surface / Black Letters Plastic/Adhesive - Screw-on
397-00	1	**Designation:** L2M22 MH32P (Box) NQ Standard TYPE 1 Box 32 H
398-00	1	**Designation:** L2M22 NC32FHR (Trim) NQ Standard TYPE 1 Box 32 H
411-00	1	FFTKRPTV10 FFTK REPORT GENERATOR CD **Markings:** MARK: CASEPR ELECTRIC KELLY WALSH HS PO 103619418 MARK: CASEPR ELECTRIC KELLY WALSH HS PO 103619418

Surgelogic®

External Brick Assembly (EBA) Surge Protective Device (SPD)

Instruction Bulletin /
Boletín de instrucciones /
Directives d'utilisation

8222-0013D

Retain for Future Use. /
Conservar para uso futuro. /
À conserver pour usage ultérieur.

SQUARE D
by Schneider Electric

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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.
- 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.

⚠ CAUTION

LOSS OF BRANCH CIRCUIT POWER/LOSS OF SURGE SUPPRESSION

- Ensure that the branch circuit breaker or fuse trip characteristic has been coordinated with the overcurrent components inside the SPD (See Tables 1 and 2).
- Perform periodic inspection of the SPD status indicator lights as part of the preventative maintenance schedule.
- Promptly service the SPD 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 SPDs 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. Tripping of the branch circuit breaker or fuse feeding the SPD can occur. Mitigate the tripping of the branch circuit breaker or fuse feeding the SPD by coordinating the surge suppression elements with the branch circuits.

For the purposes of coordination, the SPD is equipped with overcurrent components that will limit the per phase I^2t, $I_{apparent}$, I_p, and I_{th} values to those listed in tables 1 and 2 when connected to a power system with a short-circuit current rating not exceeding 200,000 A.

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

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Table 1: SPD Without Optional Sine Wave Tracking Module

SPD Device	Per Phase I^2t	$I_{apparent}$	I_p	I_{th}
TVS_EBA12 through TVS_EBA24	175 kA^2 seconds	17,000 A RMS	40,000 A RMS	220 A

Table 2: SPD With Optional Sine Wave Tracking Module

SPD Device	Per Phase I^2t	$I_{apparent}$	I_p	I_{th}
TVS_EBA12 through TVS_EBA24	240 kA^2 seconds	21,500 A RMS	48,000 A RMS	260 A

⚠ CAUTION

LOSS OF SURGE SUPPRESSION

- Do not energize the SPDs 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 SPD.
- Disconnect the SPD, including the neutral, from the power source before performing high-potential insulation testing or any tests where SPD 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.

Introduction

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- 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.

NOTE: Type 2 SPDs are designed for use on the load side of the service entrance Overcurrent Protection Device (OCPD).

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

Proper installation is imperative to maximize the EBA surge protective device's effectiveness and performance. The installer should follow the steps outlined in this instruction bulletin to ensure proper installation. 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 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, caution) are provided.

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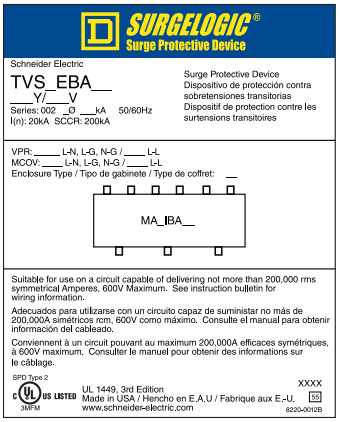
Identification Nameplate

The identification nameplate is located on the inside of the door/cover.

Figure 1: SPD Nameplate Example



Installation 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. Refer to the product catalog for further details on enclosures. All EBA 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.

Mounting

The device is designed to be surface or flush mounted. Refer to the device submittal drawings or the product catalog for typical mounting dimensions and weight.

Service Clearance

The service clearance should meet all applicable code requirements.

Equipment Performance

To obtain the maximum system performance, locate the device as close to the circuit being addressed as possible to minimize the interconnecting wiring length. For every foot of wire length, approximately 160 volts (6 kV / 3 kA, 8/20 microsecond) is added to the suppressed voltage. The Voltage Protection Rating (VPR) is located on the device nameplate and is measured 6 inches from the device terminals, according to UL 1449 Third Edition.

ENGLISH

Electrical

Voltage Rating

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Confirm the SPD 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.

The specifier or user of the device should 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 3 for the service voltage of each SPD.

Table 3: Voltage Ratings

Service Voltage	Peak Surge Current Rating Per Phase	Catalog Number[1]
120/240 V, 1 phase, 3 wire	120 kA	TVS1EBA12*_
	160 kA	TVS1EBA16*_
	240 kA	TVS1EBA24*_
208Y/120 V, [2] 3 phase, 3-4 wire	120 kA	TVS2EBA12*_
	160 kA	TVS2EBA16*_
	240 kA	TVS2EBA24*_
240/120 V, 3 phase, 4 wire (high-leg delta)	120 kA	TVS3EBA12*_
	160 kA	TVS3EBA16*_
	240 kA	TVS3EBA24*_
480Y/277 V, [3] 3 phase, 3-4 wire	120 kA	TVS4EBA12*_
	160 kA	TVS4EBA16*_
	240 kA	TVS4EBA24*_
600Y/347 V, 3 phase, 3-4 wire	120 kA	TVS8EBA12*_
	160 kA	TVS8EBA16*_
	240 kA	TVS8EBA24*_

1 * = enclosure option, _ = other options

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

3 480Y/277 series also applies to the following voltages 380Y/220, 400Y/230, 415Y/240

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

ENGLISH

Terminals, Wire Size, and Installation Torque

Terminals are provided for phase (line), neutral, and equipment ground connections. The EBA terminals accept a range of 12 AWG (3 mm^2) to 2 AWG (34 mm^2) copper wire for phase, neutral, and ground connectors. Torque connections to the following values.

Table 4: Terminal Torque

Power Connection	Torque
AØ, BØ, CØ and N	35 lb-in. (4 N•m)
Ground	

Branch Circuit Overcurrent Protection and Disconnect Means

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Use conductors rated for the Overcurrent Protection Device (OCPD) per applicable codes.
- Use conductors rated for the application per applicable codes.

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

A branch circuit Overcurrent Protection Device (OCPD) either in the form of a circuit breaker or fuse, must be provided for the EBA device. The branch circuit OCPD should either provide or include a disconnecting means.

Since the current drawn by the EBA device during standby operation is negligible, the EBA device can be connected to a dedicated, separate branch circuit or connected to a suitable existing branch circuit.

- When connected to a separate, dedicated branch circuit, the OCPD setting must be selected to protect the conductors feeding the EBA device.
- When connected to an existing branch circuit, the conductors connected to the EBA device must have an ampacity not less than the setting of the existing OCPD. Refer to Terminals, Wire Size, and Installation Torque section above, for the maximum conductor cross-section that can be connected to the EBA device.

During overvoltage surge diversion, current will flow through the EBA device. The branch circuit OCPD must pass this current without tripping for the EBA device to function properly.

For further information concerning coordination of the OCPD with the EBA device, refer to the Caution statement “Loss of Branch Circuit Power/Loss of Surge Suppression” on page 3.

Integral Switch

The integral switch is a mechanical means for qualified electrical personnel to isolate the entire surge suppressor to service the device's components. The switch opens the phase and neutral connections to the surge protective device.

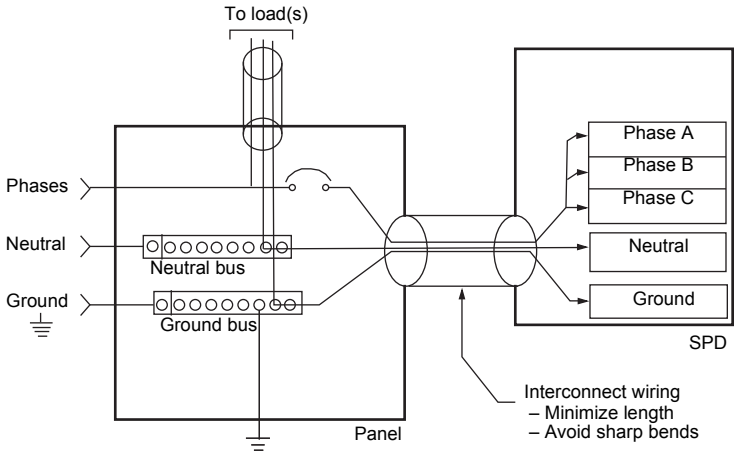
The integral switch feature allows the EBA device to be isolated for service without the necessity of interrupting power on the entire branch circuit. Turn switch handle to the OFF (O) position prior to opening the door of the unit. With the handle in the OFF (O) position, the SPD will be disconnected from the circuit and the circuit will not have surge suppression. Once the absence of voltage is verified, maintenance may now be performed inside the EBA enclosure. Upon completion of repairs, close the door of the unit and turn the handle to the ON (I) position.

Location of SPD

Install Type 2 SPDs on the load side of the main Overcurrent Protection Device (OCPD) to comply with NEC Article 285 for Type 2 SPDs.

Locate the SPD as close as possible to the circuit being addressed to minimize the wire length and optimize SPD performance. Avoid long wire runs so that the device will perform as intended. To reduce the impedance that the wire displays to surge currents, the phase, neutral, and ground conductors must be routed within the same conduit and tightly bundled or twisted together to optimize device performance. Avoid sharp bends in the conductors. See Figure 2.

Figure 2: SPD Wiring



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

ENGLISH

Grounding

⚠ WARNING

HAZARDOUS TOUCH VOLTAGE

- Connect the SPD ground terminal to the building grounding grid structure.
- Use an appropriately sized equipment grounding conductor.
- When using metallic raceway or conduit:
  - — Do not use the EBA device ground unless augmented with an insulated equipment grounding conductor installed inside the metallic raceway or conduit.
  - — Do not use isolated bushings to interrupt the metallic raceway or conduit.
  - — Maintain electrical continuity at all raceway and conduit connections using appropriate bonding devices.
- Do not use a separate isolated ground for the EBA device.
- Verify proper equipment connection to the grounding system.
- Verify ground grid continuity by performing regularly scheduled inspections and testing as part of a comprehensive electrical maintenance program.

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

The EBA product has leakage current to ground when energized and can present a hazardous touch voltage.

The EBA device has SPD elements connected from phase to ground. To prevent hazardous touch voltage on the EBA 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. The EBA device should not be connected to a separate isolated ground.

When metallic raceway is used as the wiring method, an insulated grounding conductor should be run inside the raceway and sized in accordance with all applicable codes. Maintain electrical continuity at all raceway connections using appropriate bonding devices and do not install isolating bushings to interrupt a metallic raceway run.

For best overvoltage suppression by the EBA 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 IEEE 142-2007). The ground impedance measurement of the electrical system should be as low as possible, and in compliance with all applicable codes.

EBA devices rated for use on solidly-grounded power systems must not be connected to resistance-grounded (for example HRG) or ungrounded power systems. Such a connection can result in damage to the SPD within the EBA product.

Installation

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- 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.

Conduit Location and Recommendations

The recommended conduit entry is at the bottom of the device enclosure. Use a conduit seal that is appropriate for the enclosure rating.

Special Enclosure Considerations

Removing and Reconnecting the RJ45 Patch Cables

The RJ45 patch cables are marked with matching phase connections. If any of the cables are removed, reconnect the cables as marked.

NEMA 3R Applications

Remove screws from the bottom of the enclosure to create drain holes.

Optional Flush Mounting

The flush mount collar option provides a mechanical means to install the surge suppressor flush to the surface of sheetrock or firewall construction.

Optional Integral Switch

After making electrical cable connections to the SPD integral switch and prior to energizing the SPD, ensure that the line barrier is in place and intact.

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Wiring

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- 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.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Confirm the SPD 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.

Follow the steps listed below when making wiring connections.

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. Identify proper location for surge protective device. Locate as close as possible to the panel being addressed so the wires are as short as possible. Mount unit securely.
4. Install in accordance with National Electrical Code® (NEC®) and local electrical codes for overcurrent protection recommendations and wire ampacity considerations.
5. Twist conductors 1/2 turn or more for every 12 inches of length. Do not loop or coil wires. Be sure to maintain adequate wire bending space per NEC.
6. If the remote signaling contacts of the diagnostic display panel are to be used, refer to the section, “Dry Contacts”, on page 17 for wiring instructions.
7. On a high-leg delta installation, note the high leg connection per wiring diagram. See Figure 5.
8. Replace all devices, doors, and covers, including the line barrier for the optional integral disconnect, before turning on power to the equipment. If the SPD is properly installed and functioning, the green LED indicators on the display will be lit.

If you have any questions pertaining to the installation of this device, contact the Surgelogic Technical Assistance Group at 1-800-577-7353.

NOTE: The surge protective device must be installed in an accessible location as described in the NEC®.

NOTE: The neutral connection is not present on 3-wire, 3-phase wye ground or 2-wire single-phase mid-point ground power systems. For these systems, bond the neutral and ground lugs together in the SPD. For installing wiring see Figures 3 through 8.

NOTE: See “Terminals, Wire Size, and Installation Torque” section for the acceptable wire size and installation torque on page 8.

NOTE: Always install the SPD on the LOAD side of the main Overcurrent Protection Device (OCPD).

ENGLISH

Wiring Diagrams without Integral Switch

Figure 3: SIngle-Phase, 3-Wire, Grounded Installation

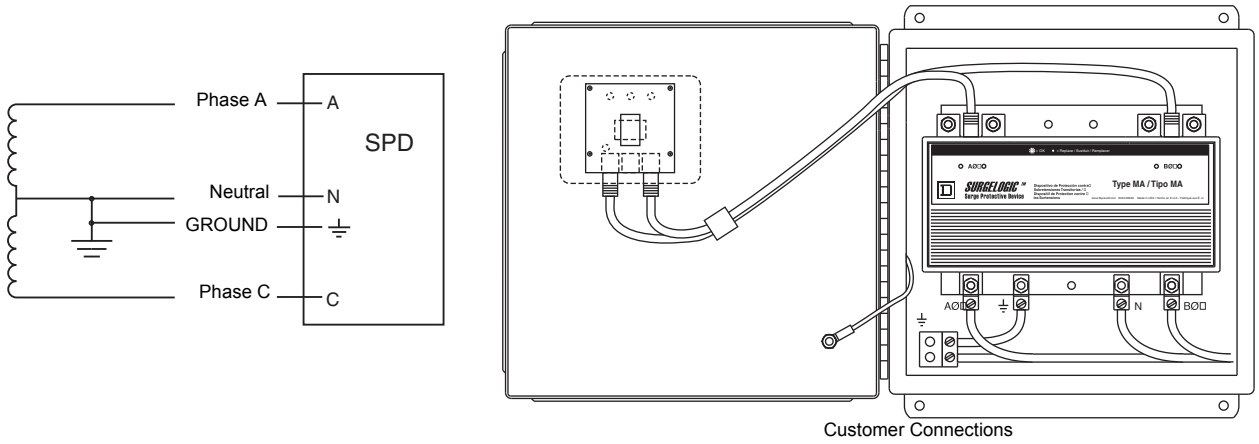
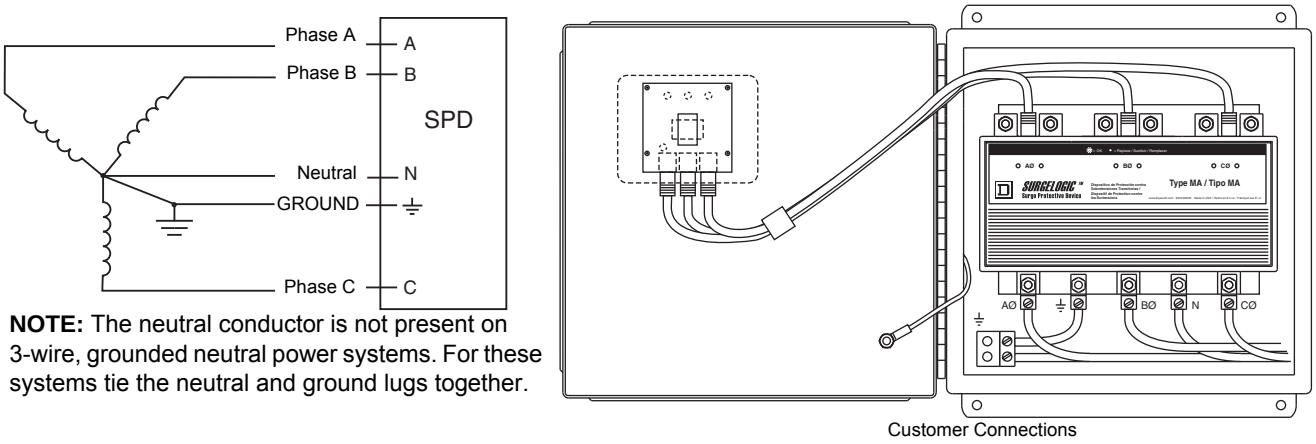
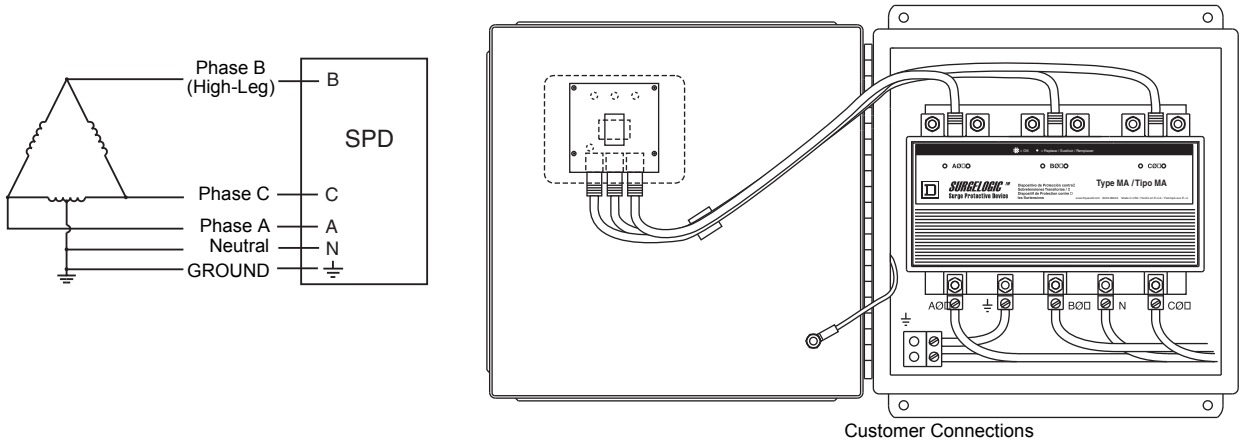


Figure 4: Three-Phase, 3- or 4-Wire, Grounded Wye Installation



NOTE: The neutral conductor is not present on 3-wire, grounded neutral power systems. For these systems tie the neutral and ground lugs together.

Figure 5: Three-Phase, 3- or 4-Wire, High-Leg Delta Installation



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

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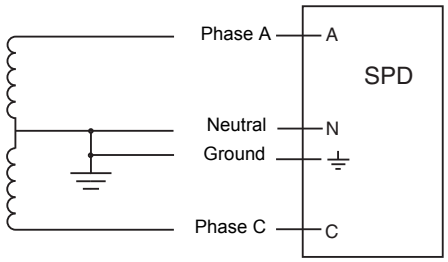
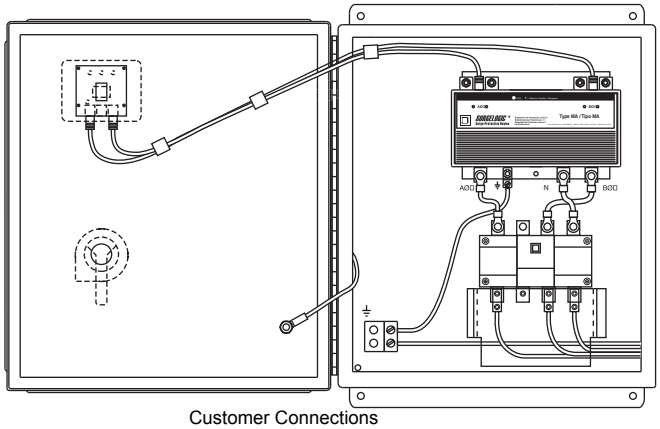
Wiring Diagrams with Integral Switch

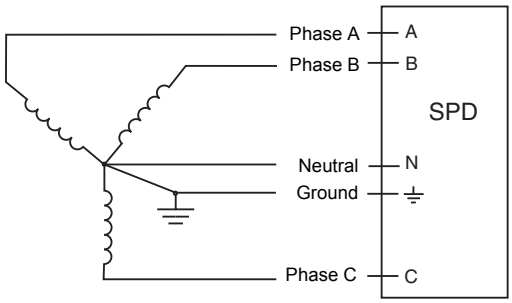
Figure 6: Single-Phase, 3-Wire, Grounded Installation with Integral Switch



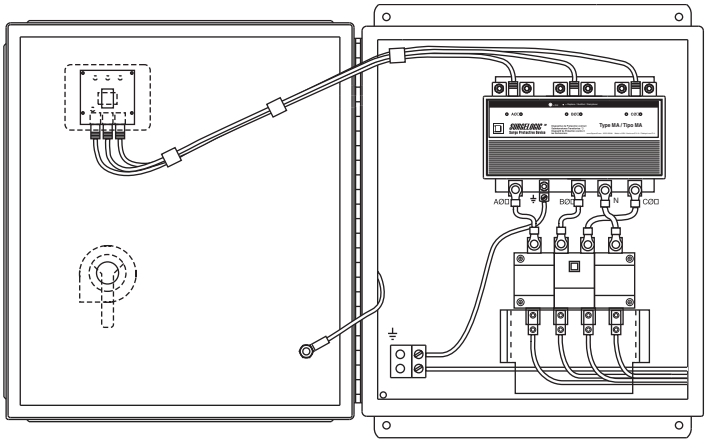


Customer Connections

Figure 7: Three-Phase, 3- or 4-Wire, Grounded Wye Installation wIth Integral Switch

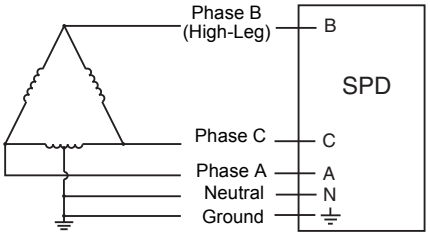


NOTE: The neutral conductor is not present on 3-wire, grounded neutral power systems. For these systems tie the neutral and ground lugs together.

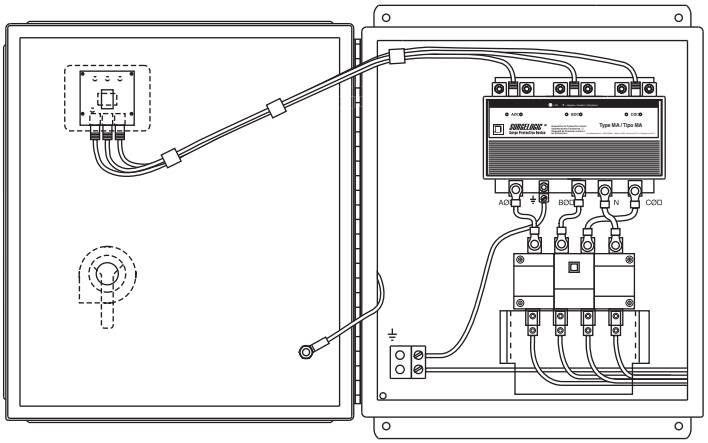


Customer Connections

Figure 8: Three-Phase, 3- or 4-Wire, High-Leg Delta Installation with Integral Switch



NOTE: The high-leg of the power system must connect to phase B of the SPD. The neutral conductor is not present on 3-wire, grounded neutral power systems. For these systems tie the neutral and ground lugs together.



Customer Connections

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

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.
- 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.

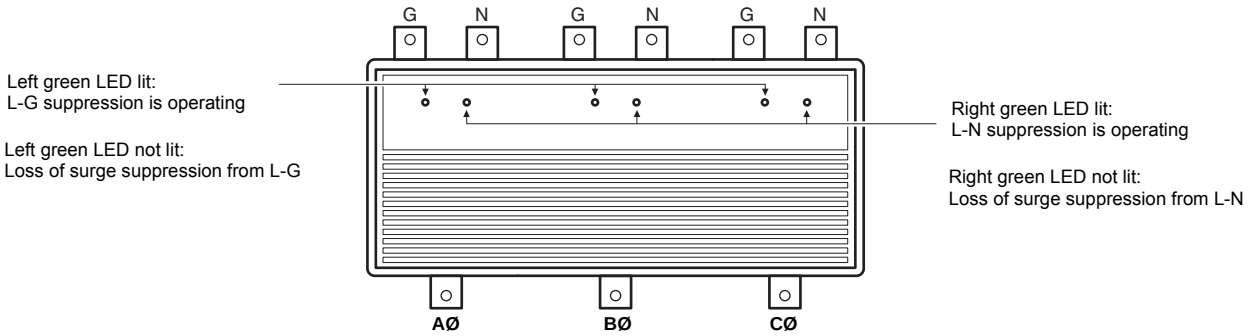
LED Status Indicators

The diagnostic display panel shows the status of the SPD module with diagnostically controlled green/red LEDs. 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 button below the phase LEDs on the diagnostic display panel. The green LED will turn red and the alarm will sound, if the alarm is enabled. Releasing the test button will complete the test; the red LED will turn green and the alarm will shut off.

If an inoperable condition occurs on any phase, the audible alarm sounds and the corresponding phase LED 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. The alarm will silence and the green alarm LED will not be lit. The red phase LED will continue to be illuminated until the inoperative condition had been cleared.

On an IBA module (see Figure 9), 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 the diagnostic display has power and both green LEDs are not lit the module should be replaced.

Figure 9: IBA Module LEDs



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

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When power is applied to the SPD device and one or more of the diagnostic display panel LEDs are red, and one or more module LEDs are out, the module should be replaced. Refer to “Maintenance and Troubleshooting” on page 19 for proper troubleshooting procedures.

Table 5: EBA Series Replacement Modules

System Voltage	Peak Surge Current Rating (kA)	Catalog Numbers
120/240 V, 1-phase, 3-wire	120	MA1IBA12
	160	MA1IBA16
	240	MA1IBA24
208Y/120 V, [1] 3-phase, 3-4 wire	120	MA2IBA12
	160	MA2IBA16
	240	MA2IBA24
240/120 V, 3-phase, 4-wire, high-leg delta	120	MA3IBA12
	160	MA3IBA16
	240	MA3IBA24
480Y/277 V, [2] 3-phase, 3-4 wire	120	MA4IBA12
	160	MA4IBA16
	240	MA4IBA24
600Y/347 V, 3-phase, 3-4 wire	120	MA8IBA12
	160	MA8IBA16
	240	MA8IBA24

1 208Y/120 series also applies to the following voltage 220Y/127.

2 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240

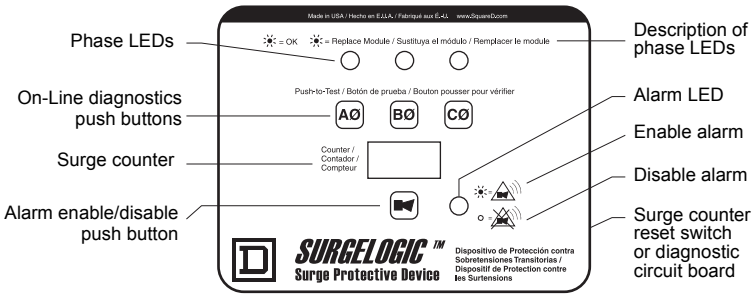
Audible Alarm

Push the alarm enable/disable button to enable or disable the alarm (see Figure 10). If the green alarm LED is lit the alarm is enabled. If the green alarm LED is not lit the alarm is disabled.

Surge Counter

The surge counter 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 surge counter remove all power and press the small switch located inside the unit on the underside of the diagnostic circuit board near the RJ45 connectors (also refer to Figure 11). This will reset the counter to zero.

Figure 10: Three-Phase Diagnostic Display Panel with Surge Counter (TVS3DSPHC; TVS1DSPHC for TVS1 series devices)



NOTE: Phase B is not present on single-phase applications

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

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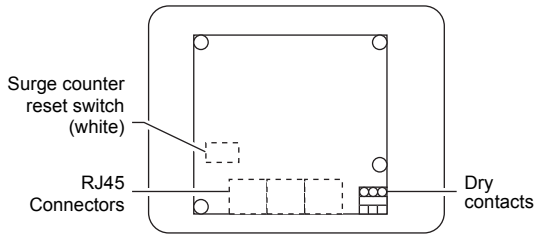
Figure 11: Rear of Diagnostic Circuit Board



Dry Contacts

The EBA series SPD is provided with dry contacts. The connection for the dry contacts is located on the back of the diagnostic display panel (lower right corner). The dry contacts are 3-position, Form “C” type with Normally Open, Normally Closed and Common connections. In the unpowered state the contact is 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 6). 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.

The dry 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.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Use 600 Vac rated dry contact wiring.
- Dry contact wiring must have less than 1/16 in. (1.6 mm) exposed wire from the dry contact block.
- Maintain at least 1.0 in. (25 mm) separation between dry contact wiring and the power wiring in the enclosure.

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

Care must be taken in 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.

Table 6: Dry Contact Configuration

Alarm Contact Terminals	Contact State with Power Removed
NC	Normally closed
COM	Common
NO	Normally open

ENGLISH

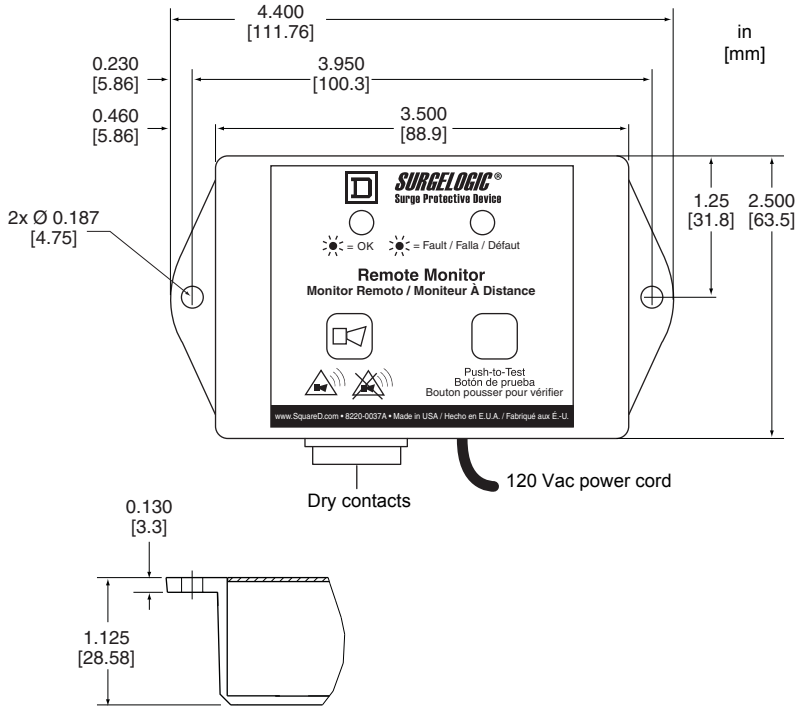
Remote Monitor Option

The remote monitor option (Figure 12) has two LEDs, one red and one green, and an audible alarm with an enable/disable switch. Normal status is a lit green LED, and no audible alarm. To test the integrity of the remote monitor, press the push-to-test switch. If the alarm in 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 lit. 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 3-position Form “C” type dry contacts (provided) and the appropriate length of solid or stranded 22 to 14 AWG wire (not provided).

Figure 12: Remote Monitor Option (TVS12RMU)



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

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.
- 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 transient voltage surge suppression. Periodically check the state of the diagnostic display panel LED status indicators. Routinely use the built-in diagnostics to inspect for inoperative modules

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

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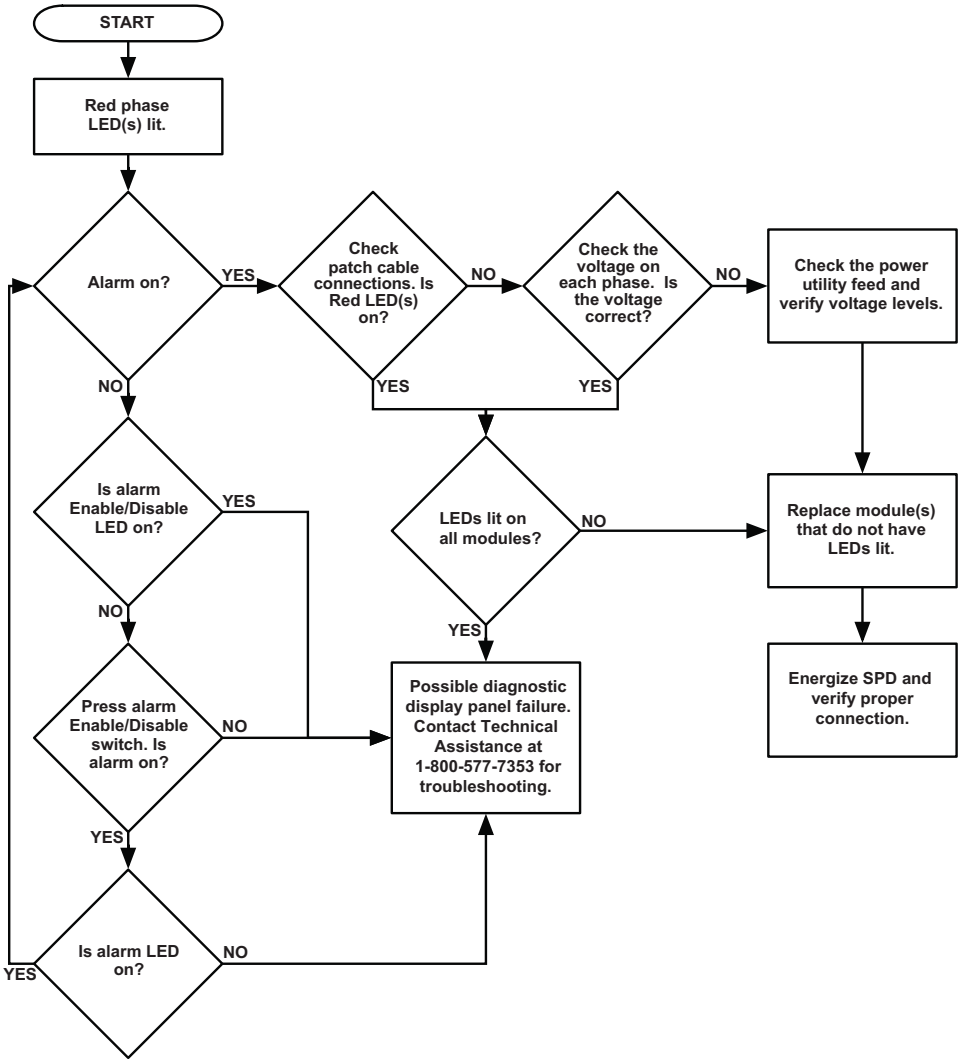
Troubleshooting

If a module shows two green indicator lights and the display panel shows a red phase indicator light, follow the Troubleshooting Flow Chart in Figure 13 below.

Figure 13: Troubleshooting Flowchart



Replacement Parts

The following replacement parts are available. For ordering information refer to the product catalog.

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

8222-0013D 01/2010
Replaces 8222-0013C

Schneider Electric USA, Inc.
1751 S. 4800 W.
Salt Lake City, UT 84104 USA
1-888-SquareD
(1-888-778-2733)
www.schneider-electric.us

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

Surgelogic™
External Modular Assembly (EMA) Surge Protective Devices (SPDs)

Instruction Bulletin

8222-0014F

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SQUARE D™
by Schneider Electric

Table of Contents

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

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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.
- 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.

⚠ CAUTION

LOSS OF BRANCH CIRCUIT POWER/LOSS OF SURGE SUPPRESSION

- Ensure that the branch circuit breaker or fuse trip characteristic has been coordinated with the overcurrent components inside the SPD (See Tables 1 and 2).
- Perform periodic inspection of the SPD status indicator lights as part of the preventative maintenance schedule.
- Promptly service the SPD 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 SPDs to achieve redundancy for critical applications.

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

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. Tripping of the branch circuit breaker or fuse feeding the SPD can occur when the surge suppression elements reach end of life. Mitigate the tripping of the branch circuit breaker or fuse feeding the SPD by coordinating the surge suppression elements with the branch circuits.

For the purposes of coordination, the SPD is equipped with overcurrent components that will limit the per phase I^2t, $I_{apparent}$, I_p, and I_{th} values to those listed in Tables 1 and 2 when connected to a power system with a short-circuit current rating not exceeding 200,000 A.

ENGLISH

Table 1: SPD Without Optional Sine Wave Tracking (SWT) Module

SPD Device	Per Phase I^2t	$I_{apparent}$	I_p	I_{th}
TVS_EMA12 through TVS_EMA24	175 kA^2 seconds	17,000 A RMS	40,000 A RMS	220 A
TVS_HEMA12 through TVS_HEMA20				
TVS_MEMA12 through TVS_MEMA27				
TVS_EMA32 through TVS_EMA48	700 kA^2 seconds	34,000 A RMS	80,000 A RMS	440 A
TVS_MEMA32 TVS_MEMA36				

Table 2: SPD With Optional Sine Wave Tracking (SWT) Module

SPD Device	Per Phase I^2t	$I_{apparent}$	I_p	I_{th}
TVS_EMA12 through TVS_EMA24	240 kA^2 seconds	21,500 A RMS	48,000 A RMS	260 A
TVS_HEMA12 through TVS_HEMA20				
TVS_MEMA12 through TVS_MEMA27				
TVS_EMA32 through TVS_EMA48	825 kA^2 seconds	37,500 A RMS	88,000 A RMS	480 A
TVS_MEMA32 TVS_MEMA36				

⚠ CAUTION

LOSS OF SURGE SUPPRESSION

- Do not energize the SPDs 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.
- Perform high-potential insulation testing, or any other tests where SPD components will be subjected to voltages higher than their rated turn-on voltage, with the neutral and SPD disconnected from the power source.

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

ENGLISH

Introduction

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- 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.

NOTE: Type 2 SPDs are designed for use on the load side of the service entrance Overcurrent Protection Device (OCPD) only.

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

Proper installation is imperative to maximize the EMA modular Surge Protective Device's (SPD's) effectiveness and performance. The installer should follow the steps outlined in this instruction bulletin to ensure proper installation. 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 -4 °F to +149 °F (-20 °C to +65 °C). All of the packaging materials should be left intact until the device is ready for installation.

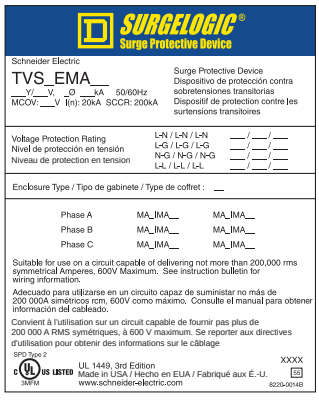
Safety Labels

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

Identification Nameplate

The identification nameplate is located on the inside of the door/cover.

Figure 1: Surge Protective Device Nameplate Example



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Surge Protective Device (SPD) 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 EMA 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.

Mounting

The device is designed to be surface or flush mounted. Refer to the device submittal drawings or the product catalog for typical mounting dimensions and weight.

Service Clearance

The service clearance should meet all applicable code requirements.

Equipment Performance

To obtain the maximum system performance, locate the device as close to the circuit being addressed as possible, to minimize the interconnecting wiring length. For every foot of wire length, approximately 160 Volts (6 kV / 3 kA, 8/20 microsecond) is added to the suppressed voltage. The Voltage Protection Rating (VPR) is located on the device nameplate and is measured six inches from the enclosure sidewall, according to UL® 1449 Third Edition.

Electrical

Voltage Rating

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Confirm the SPD 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.

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 3 for the service voltage of each SPD.

Table 3: Voltage Ratings

Service Voltage	Peak Surge Current Rating Per Phase	Catalog Number
120/240 V, 1-phase, 3-wire + ground	120 kA	TVS1EMA12
	160 kA	TVS1EMA16
	240 kA	TVS1EMA24
	320 kA	TVS1EMA32
	480 kA	TVS1EMA48
208Y/120 V[1], 3-phase, 4 wire + ground Wye	120 kA	TVS2EMA12
	160 kA	TVS2EMA16
	240 kA	TVS2EMA24
	320 kA	TVS2EMA32
	480 kA	TVS2EMA48
208Y/120 V[1], 3-phase, 4 wire + ground L-L Enhanced Wye	120 kA	TVS2MEMA12
	180 kA	TVS2MEMA18
	270 kA	TVS2MEMA27
	360 kA	TVS2MEMA36
240/120 V, 3-phase, 4-wire + ground High-leg Delta	120 kA	TVS3EMA12
	160 kA	TVS3EMA16
	240 kA	TVS3EMA24
	320 kA	TVS3EMA32
	480 kA	TVS3EMA48
240 V, 3-phase, 3-wire + ground Delta	120 kA	TVS6EMA12
	160 kA	TVS6EMA16
	240 kA	TVS6EMA24
	320 kA	TVS6EMA32
	480 kA	TVS6EMA48
480Y/277 V[2], 3-phase, 4-wire + ground Wye	120 kA	TVS4EMA12
	160 kA	TVS4EMA16
	240 kA	TVS4EMA24
	320 kA	TVS4EMA32
	480 kA	TVS4EMA48
480Y/277 V[2], 3-phase 4-wire + ground L-L Enhanced Wye	120 kA	TVS4MEMA12
	180 kA	TVS4MEMA18
	270 kA	TVS4MEMA27
	360 kA	TVS4MEMA36
480Y/277 V[2], 3-phase, 3-wire + ground High-Resistance Ground	120 kA	TVS4HEMA12
	160 kA	TVS4HEMA16
	200 kA	TVS4HEMA20
480 V, 3-phase, 3-wire + ground Delta	120 kA	TVS5EMA12
	160 kA	TVS5EMA16
	240 kA	TVS5EMA24
	320 kA	TVS5EMA32
	480 kA	TVS5EMA48
600Y/347 V, 3-phase, 4-wire + ground Wye	120 kA	TVS8EMA12
	160 kA	TVS8EMA16
	240 kA	TVS8EMA24
	320 kA	TVS8EMA32
	480 kA	TVS8EMA48
600Y/347 V, 3-phase, 3-wire + ground High-Resistance Ground	120 kA	TVS8HEMA12
	160 kA	TVS8HEMA16
	180 kA	TVS8HEMA18
	240 kA	TVS8HEMA24
	320 kA	TVS8HEMA32
600 V, 3-phase, 3-wire + ground Delta	120 kA	TVS9EMA12
	160 kA	TVS9EMA16
	180 kA	TVS9EMA18
	240 kA	TVS9EMA24
	320 kA	TVS9EMA32

1 208Y/120 series also applies to the following voltage 220Y/127.

2 480Y/277 series also applies to the following voltages 380Y/220, 400Y/230, 415Y/240.

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

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Terminals, Wire Size, and Installation Torque

Terminals are provided for phase (line), neutral, and equipment ground connections. The EMA terminals accept a range of 10 AWG (6 mm^2) to 2 AWG (34 mm^2) copper wire for phase, neutral, and ground connectors. Torque connections to the following values.

Table 4: Terminal Torque

Power Connection	Torque
AØ, BØ, CØ and N	35 lb-in. (4 N•m)
Ground	

Branch Circuit Overcurrent Protection

A branch circuit Overcurrent Protection Device (OCPD) either in the form of a circuit breaker or fuse, must be provided for the EMA device. The branch circuit OCPD should either provide or include a disconnecting means.

Since the current drawn by the EMA device during standby operation is negligible, the EMA device can be connected to a dedicated, separate branch circuit or connected to a suitable existing branch circuit.

- When connected to a separate, dedicated branch circuit, the OCPD setting must be selected to protect the conductors feeding the EMA device.
- When connected to an existing branch circuit, the conductors connected to the EMA device must have an ampacity not less than the setting of the existing OCPD.

During overvoltage surge diversion, current will flow through the EMA device. The branch circuit OCPD must pass this current without tripping for the EMA device to function properly.

For further information concerning coordination of the OCPD with the EMA device, refer to the Caution statement “Loss of Branch Circuit Power/Loss of Surge Suppression” on page 3.

Integral Switch

The integral switch is a mechanical means for qualified electrical personnel to isolate the entire surge suppressor to service the device’s components. The switch opens the phase and neutral connections to the surge protective device. The integral switch feature allows the EMA device to be isolated for service without the necessity of interrupting power on the entire branch circuit.

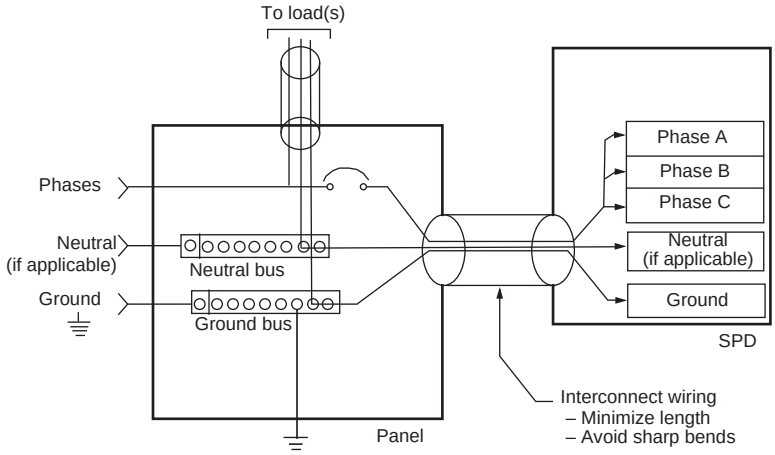
Turn switch handle to the OFF (O) position prior to opening the door of the unit. With the handle in the OFF (O) position, the SPD will be disconnected from the circuit and the circuit will not have surge suppression. Once the absence of voltage is verified, maintenance may then be performed inside the EMA enclosure. Upon completion of repairs, close the door of the unit and turn the handle to the ON (I) position.

Location of Surge Protective Device (SPD)

Install SPDs on the load side of the main overcurrent protection to comply with NEC® Article 285 for Type 2 SPD.

Locate the SPD as close as possible to the circuit being addressed to minimize the wire length and optimize SPD performance. Avoid long wire runs so that the device will perform as intended. To reduce the impedance that the wire displays to surge currents, the phase, neutral, and ground conductors must be routed within the same conduit and tightly bundled or twisted together to optimize device performance. Avoid sharp bends in the conductors. See Figure 2.

Figure 2: Surge Protective Device Wiring Practice



Grounding

⚠ WARNING

HAZARDOUS TOUCH VOLTAGE

- Connect the SPD ground terminal to the building grounding grid structure.
- Use an appropriately sized equipment grounding conductor.
- When using metallic raceway or conduit:
  - — Do not use the EMA device ground unless augmented with an insulated equipment grounding conductor installed inside the metallic raceway or conduit.
  - — Do not use isolated bushings to interrupt the metallic raceway or conduit.
  - — Maintain electrical continuity at all raceway and conduit connections using appropriate bonding devices.
- Do not use a separate isolated ground for the EMA device.
- Verify proper equipment connection to the grounding system.
- Verify ground grid continuity by performing regularly scheduled inspections and testing as part of a comprehensive electrical maintenance program.

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

The EMA product has leakage current to ground when energized and can present a hazardous touch voltage.

ENGLISH

General

The EMA device has SPD elements connected from phase to ground. To prevent hazardous touch voltage on the EMA 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. The EMA device should not be connected to a separate isolated ground.

When metallic raceway is used as the wiring method, an insulated grounding conductor should be run inside the raceway and sized in accordance with all applicable codes. Maintain electrical continuity at all raceway connections using appropriate bonding devices and do not install isolating bushings to interrupt a metallic raceway run.

For best overvoltage suppression by the EMA 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 IEEE 142-2007). The ground impedance measurement of the electrical system should be as low as possible, and in compliance with all applicable codes.

Power System Grounding

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

Table 5: Grounding Methods

EMA Device Catalog Number	Power System Grounding Method
TVS1EMA__	Solidly-Grounded
TVS2EMA__ and TVS2MEMA__	
TVS3EMA__	
TVS4EMA__ and TVS4MEMA__	
TVS8EMA__	
TVS5EMA__	Ungrounded
TVS6EMA__	
TVS9EMA__	
TVS4HEMA__ and TVS8HEMA__	Resistance Grounded Wye (for example, HRG) [1]

[1] HRG refers to a High Resistance Ground system. The increased system resistance is from the neutral connection to the ground connection. However, the ground connection is solidly-grounded.

Solidly-Grounded Power Systems

CAUTION

SPD DAMAGE AND POWER SYSTEM OVERVOLTAGE

- Do not connect devices rated for use on solidly-grounded power systems to resistance-grounded (for example, HRG) 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 (for example, HRG) 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.

Resistance-Grounded Power Systems

CAUTION

SPD DAMAGE AND POWER SYSTEM OVERVOLTAGE

- Do not connect devices rated for use on resistance-grounded power systems to ungrounded power systems.
- Resistance-grounded power systems must be maintained in an over-damped state to limit voltage overshoot and duration during operation.
- Verification and adjustment of correct power system damping should be done:
  - — Periodically as part of normal system maintenance.
  - — Following power system modifications.

Failure to follow these instructions can result in equipment damage.

The HRG EMA 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.

Installation

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- 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

Conduit Location and Recommendations

The recommended conduit entry is at the bottom of the device enclosure. Use a conduit seal that is appropriate for the enclosure rating.

Special Enclosure Considerations

Removing and Reconnecting the RJ45 Diagnostic Cables

The RJ45 diagnostic cables are marked with matching phase connections. If any of the cables are removed, reconnect the cables as marked.

NEMA 3R Applications

Remove screws from the bottom of the enclosure to create drain holes.

Optional Flush Mounting

The flush mount collar option provides a mechanical means to install the surge suppressor flush to the surface of sheetrock or firewall construction.

Optional Integral Switch

After making electrical cable connections to the SPD integral switch and prior to energizing the SPD, ensure that the line barrier is in place and intact.

Optional Sine Wave Tracking (SWT) Module

The addition of a dedicated Sine Wave Tracking (SWT) module may necessitate a larger enclosure. Please review product data sheet for enclosure size information.

Wiring

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- 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.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Confirm the SPD 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.

Follow the steps listed below when making wiring connections:

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. Identify proper location for surge protective device. Locate as close as possible to the panel being addressed so the wires are as short as possible. Mount unit securely.

   NOTE: The surge protective device must be installed in an accessible location as described in the NEC.

4. Install in accordance with national and local electrical codes for overcurrent protection recommendations and wire ampacity considerations.

   NOTE: The neutral connection is not present on 3-wire, 3-phase wye ground or 2-wire single-phase mid-point ground power systems. For these systems, bond the neutral and ground lugs together in the SPD. For a High Resistance Ground (HRG) or Delta SPD, no neutral connection exists. For installation wiring see Figures 3 through 10.

   NOTE: See “Terminals, Wire Size, and Installation Torque” and Table 4 on page 8 for acceptable wire size and installation torque.

5. Twist conductors ½ turn or more for every 12 inches of length. Do not loop or coil wires. Be sure to maintain adequate wire bending space per NEC.
6. If the remote signaling contacts of the diagnostic display panel are to be used, refer to the section, “Dry Contact”, on page 25 for wiring instructions.
7. On a high-leg delta installation, note the high leg connection per wiring diagram. See Figure 9.
8. Replace all devices, doors, and covers, including the line barrier for the optional integral disconnect, before turning on power to the equipment. If the SPD is properly installed and functioning, the green LED indicators on the display will be lit.

   NOTE: Always install the SPD on the LOAD side of the main Overcurrent Protection Device (OCPD).

If you have any questions pertaining to the installation of this device, contact the Surgelogic Technical Assistance Group at 1-800-577-7353.

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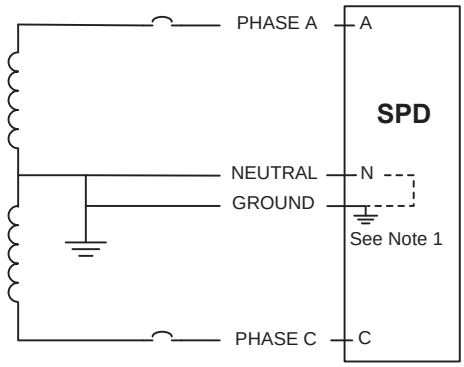
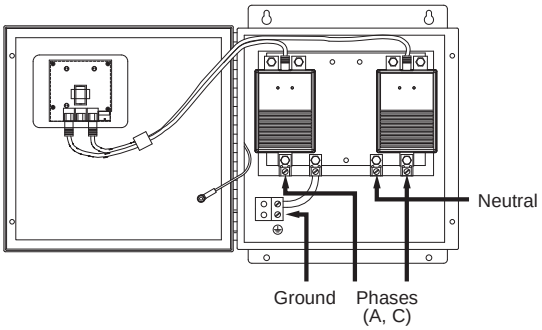
Wiring Diagrams Without Integral Switch

Figure 3: Single-Phase Three-Wire Grounded Installation

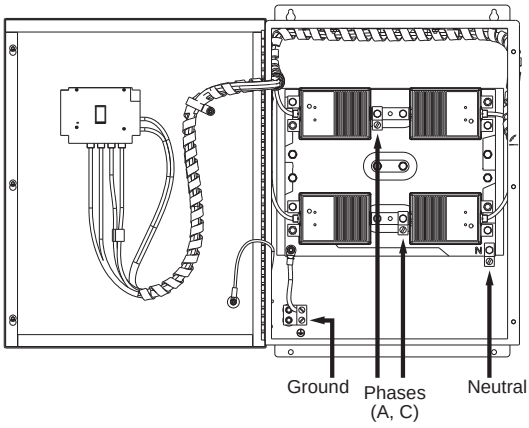
NOTE 1: The neutral conductor is not present on two-wire grounded power systems. For these systems, bond the neutral and ground lugs together inside the SPD using 10 AWG wire.



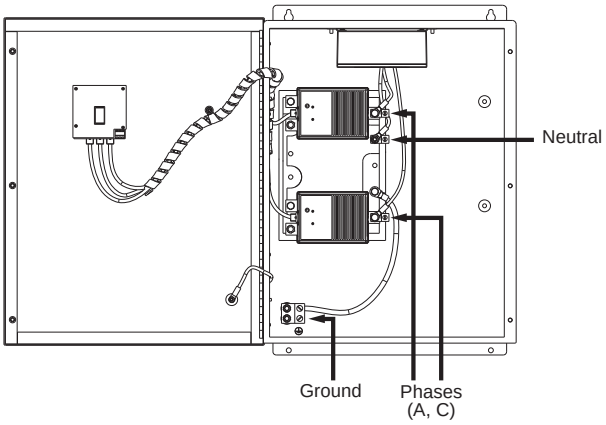
Customer Connections 120–240 kA



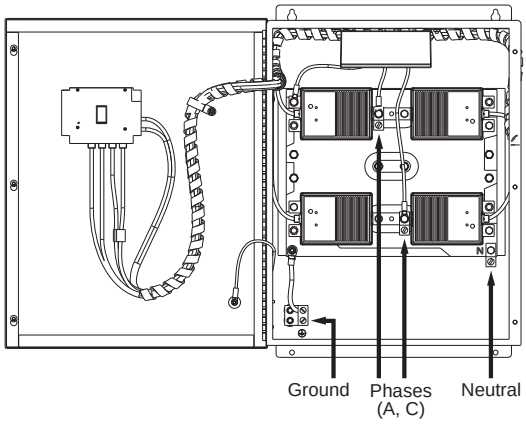
Customer Connections 320–480 kA



Customer Connections 120–240 kA with SWT



Customer Connections 320–480 kA with SWT



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

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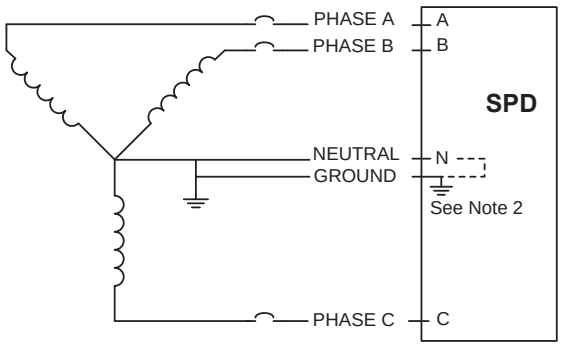
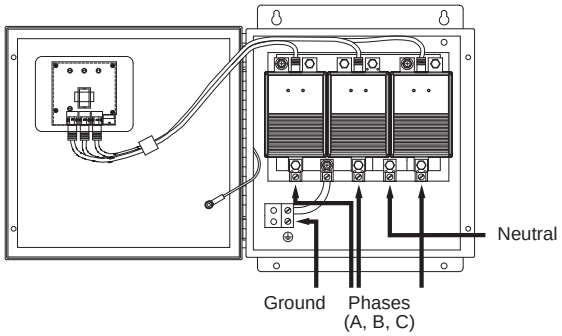
Figure 4: Three-Phase, Three- or Four-Wire, Grounded Wye Installation

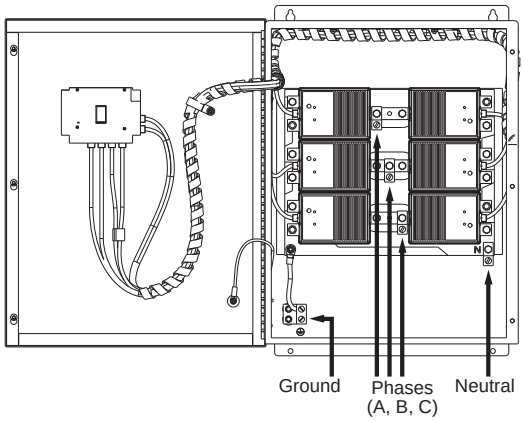
NOTE 2: The neutral conductor is not present on three-wire grounded power systems. For these systems, bond the neutral and ground lugs together inside the SPD using 10 AWG wire.



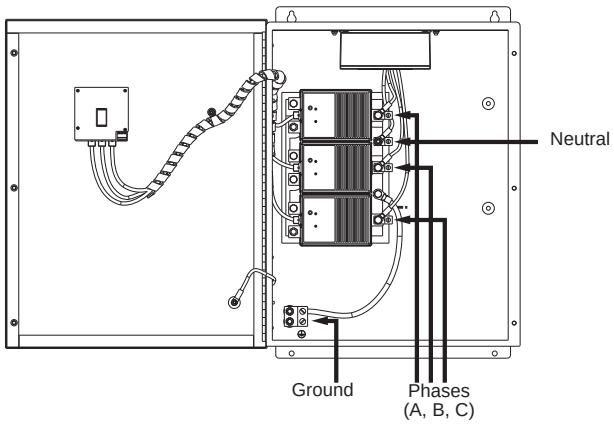
Customer Connections 120–240 kA



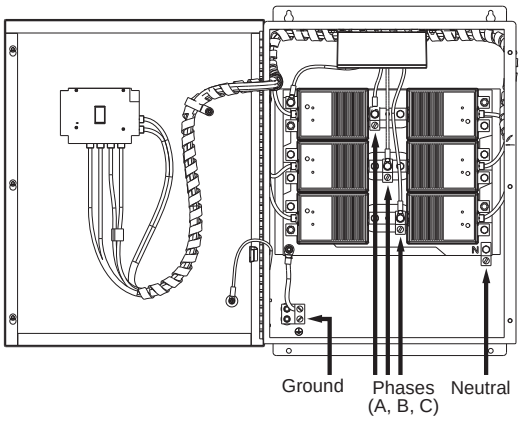
Customer Connections 320–480 kA



Customer Connections 120–240 kA with SWT



Customer Connections 320–480 kA with SWT

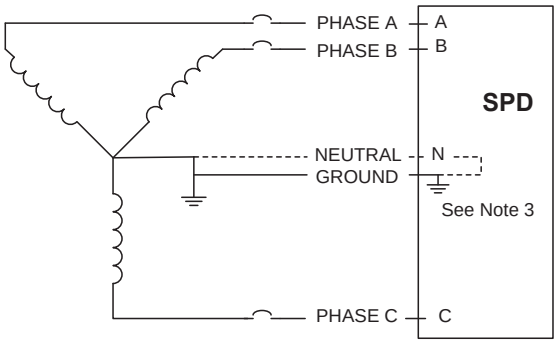


For troubleshooting, call the Surgelogic Technical Assistance Group at 1-800-577-7353.

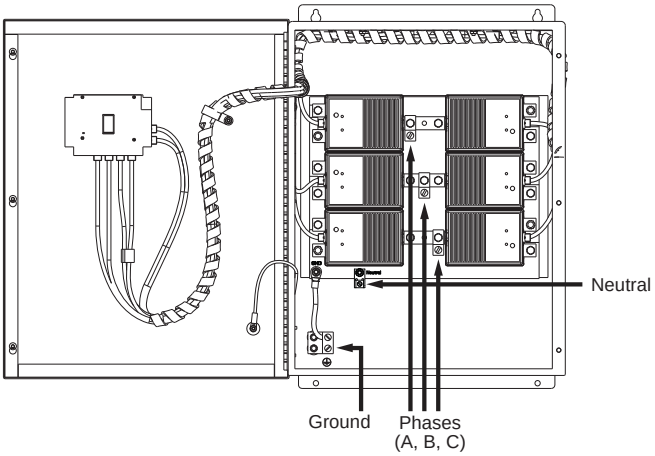
ENGLISH

Figure 5: L-L Enhanced Three-Phase, Three- or Four-Wire, Grounded Wye Installation

NOTE 3: The neutral conductor is not present on three-wire grounded power systems. For these systems, bond the neutral and ground lugs together inside the SPD using 10 AWG wire.



Customer Connections 120–360 kA



Customer Connections 120–360 kA with SWT

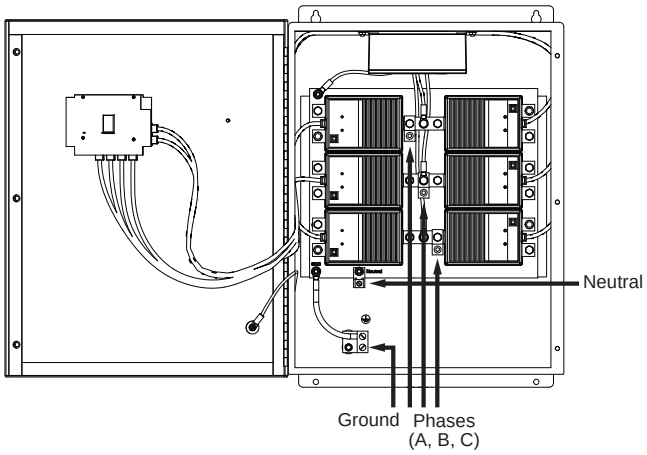


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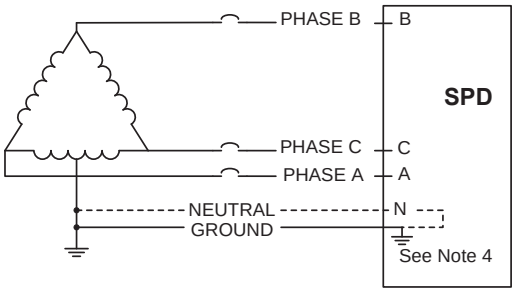
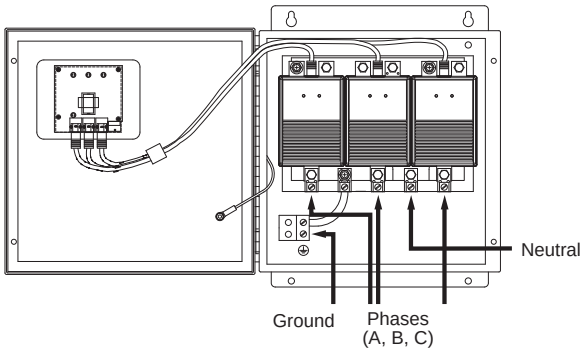
Figure 6: Three-Phase, Three- or Four-Wire, High-Leg Delta Installation

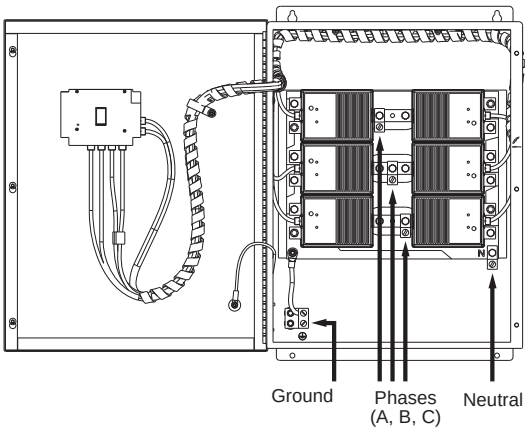
NOTE 4: The high-leg of the power system must connect to phase B of the SPD. The neutral conductor is not present on three-wire grounded power systems. For these systems, bond the neutral and ground lugs together inside the SPD using 10 AWG wire.



Customer Connections 120–240 kA



Customer Connections 320–480 kA



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

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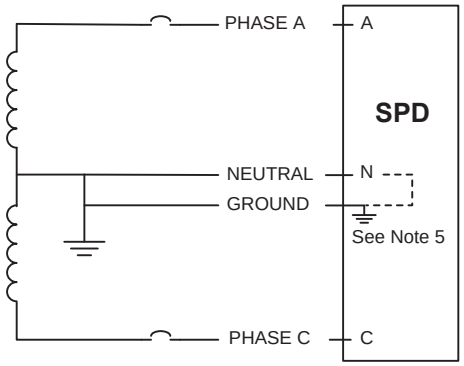
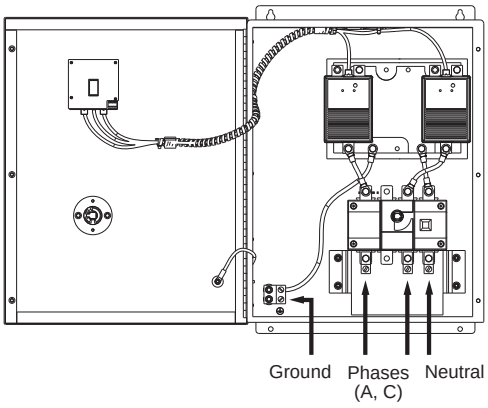
Wiring Diagrams With Integral Switch

Figure 7: Single-Phase, Three-Wire, Grounded Installation Integral Switch

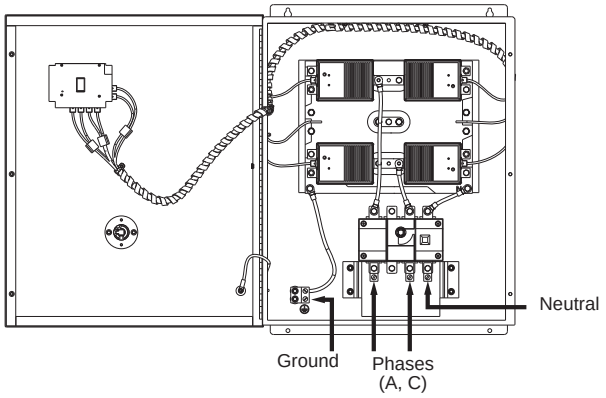
NOTE 5: The neutral conductor is not present on two-wire grounded power systems. For these systems, bond the neutral and ground lugs together inside the SPD using 10 AWG wire.



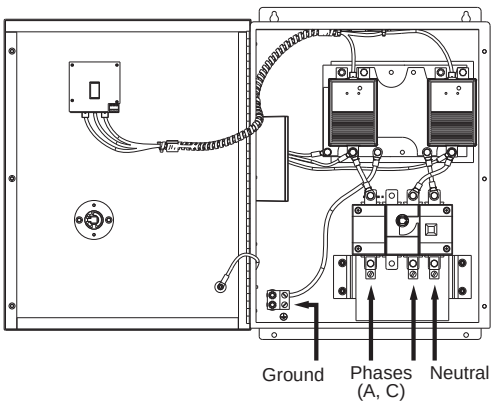
Customer Connections 120–240 kA



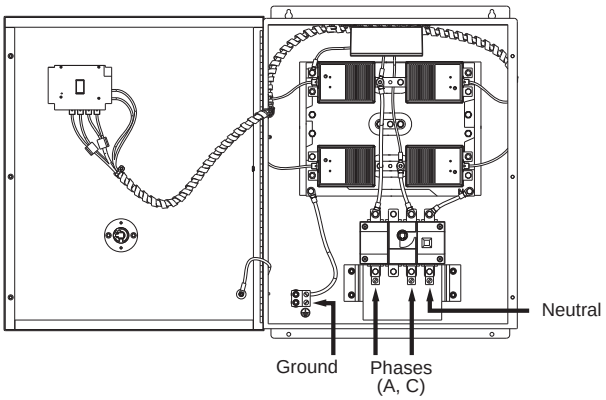
Customer Connections 320–480 kA



Customer Connections 120–240 kA with SWT



Customer Connections 320–480 kA with SWT



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

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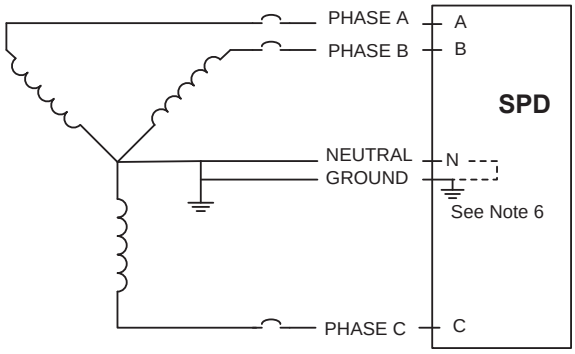
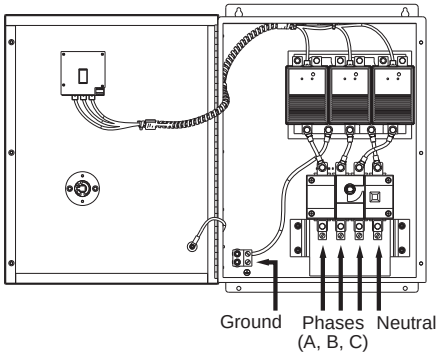
Figure 8: Three-Phase, Three- or Four-Wire, Grounded Wye Installation with Integral Switch

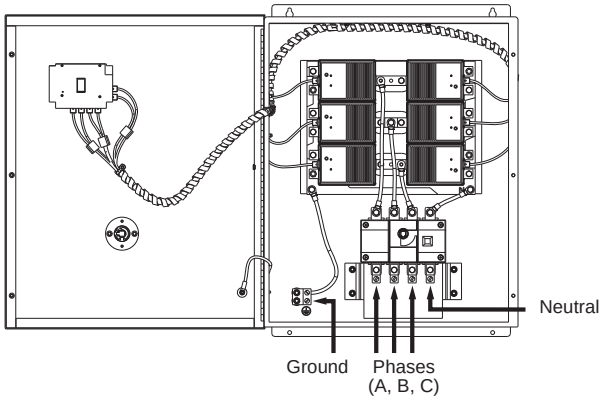
NOTE 6: The neutral conductor is not present on three-wire grounded power systems. For these systems, bond the neutral and ground lugs together inside the SPD using 10 AWG wire.



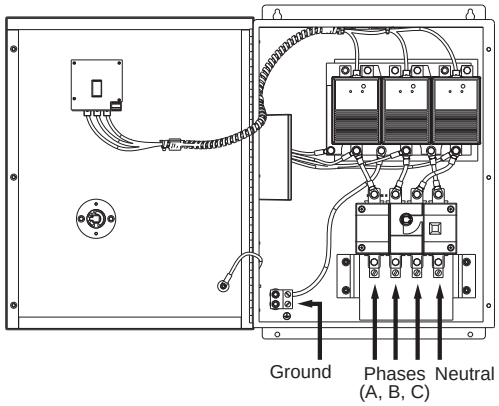
Customer Connections 120–240 kA



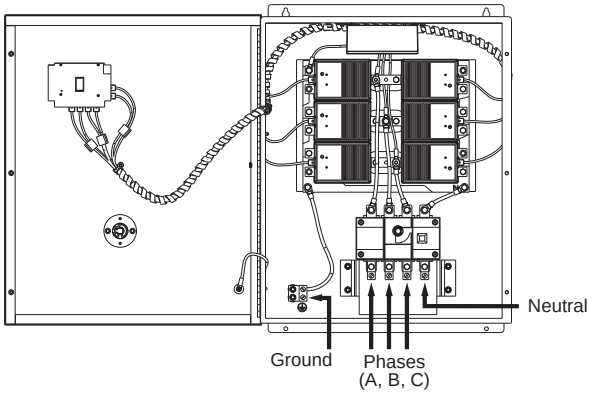
Customer Connections 320–480 kA



Customer Connections 120–240 kA with SWT



Customer Connections 320–480 kA with SWT



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

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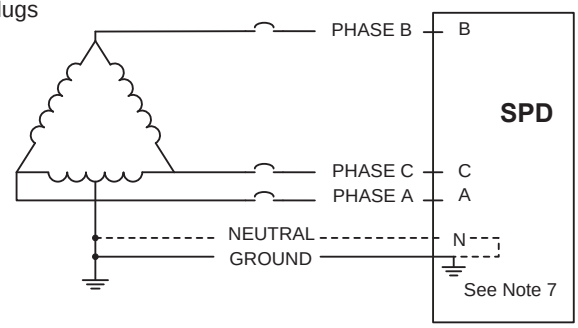
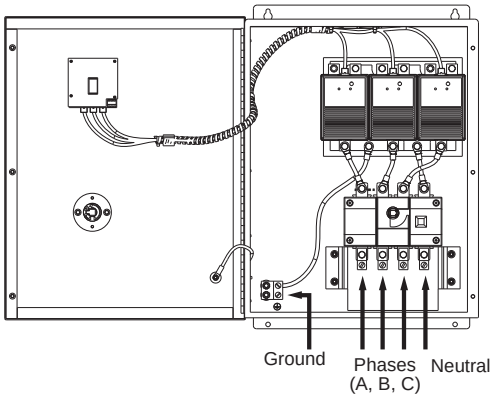
Figure 9: Three-Phase Three- or Four-Wire High-Leg Delta Installation with Integral Switch

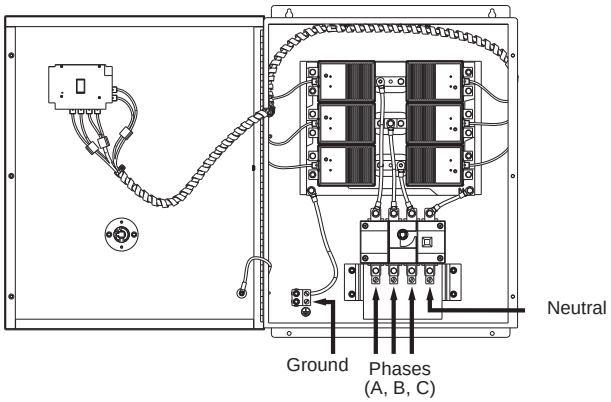
NOTE 7: The high-leg of the power system must connect to phase B of the SPD. The neutral conductor is not present on three-wire grounded power systems. For these systems, bond the neutral and ground lugs together inside the SPD using 10 AWG wire.



Customer Connections 120–240 kA



Customer Connections 320–480 kA



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

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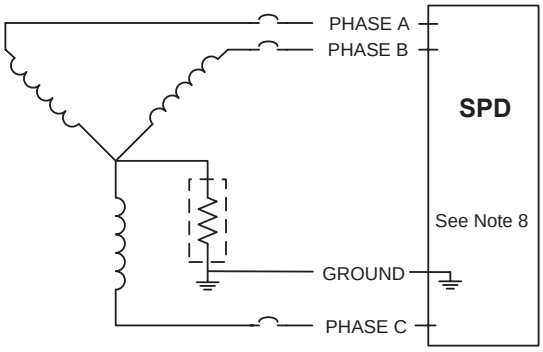
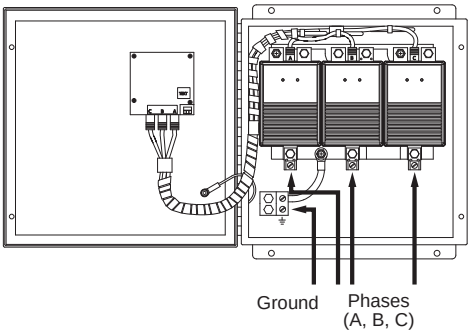
Wiring Diagrams for HRG and Delta Systems

Figure 10: High Resistance Ground (HRG) Wye Installation

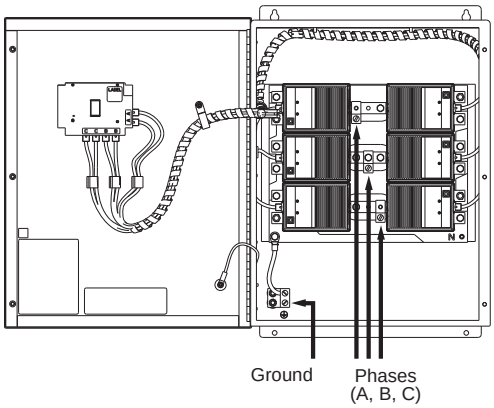
NOTE 8: The neutral conductor is not present on HRG wye grounded power systems.



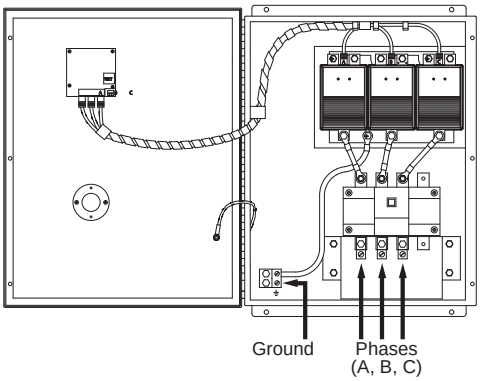
Customer Connections 120–240 kA



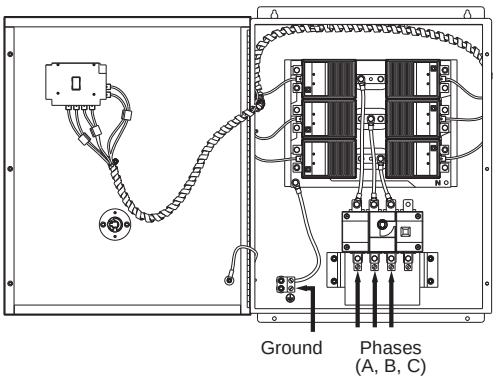
Customer Connections 320–480 kA



Customer Connections 120–240 kA with Integral Switch



Customer Connections 320–480 kA with Integral Switch



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

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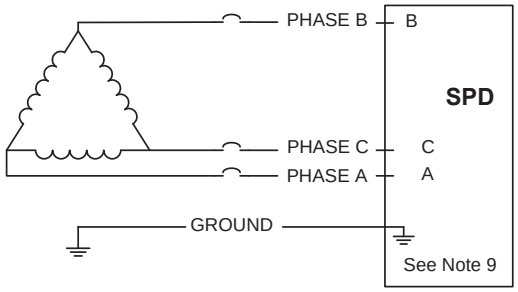
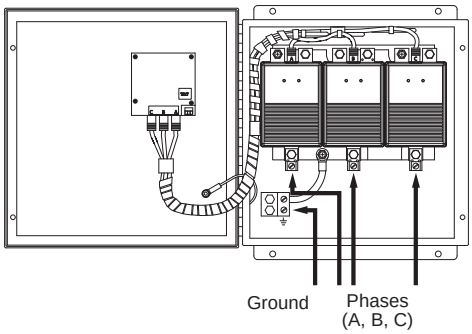
Figure 11: Three-Phase Three-Wire + Ground, Delta Installation

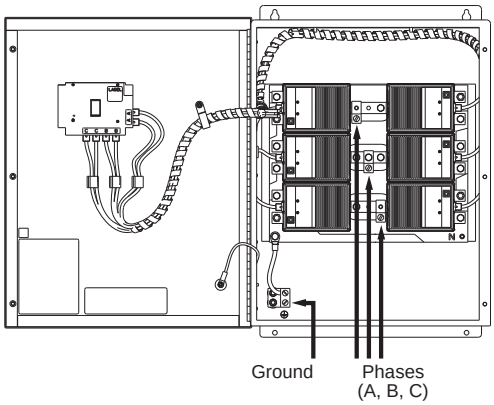
NOTE 9: The ground connection of the Delta SPD shall be connected to the system ground conductor. The neutral conductor is not present on Delta systems.



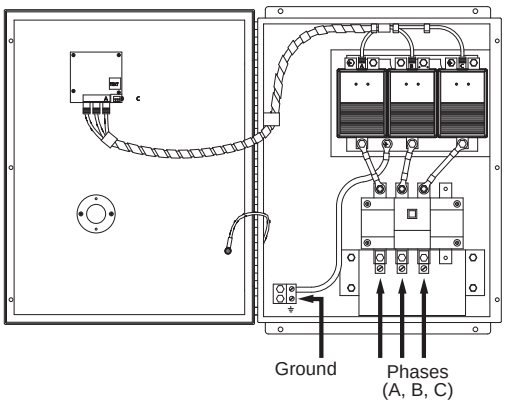
Customer Connections 120–240 kA



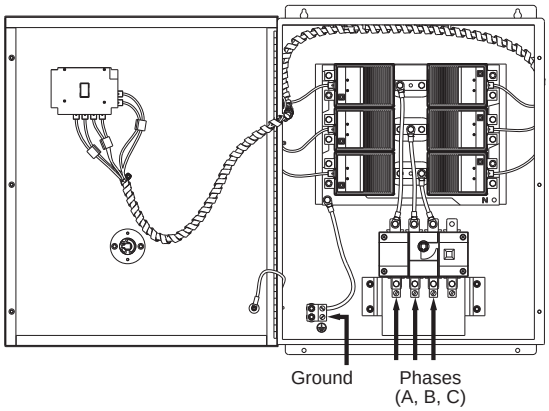
Customer Connections 320–480 kA



Customer Connections 120–240 kA with Integral Switch



Customer Connections 320–480 kA with Integral Switch



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.
- 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

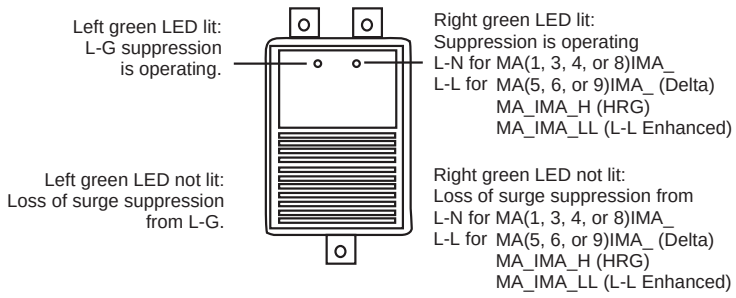
The SPD diagnostic display panel shows the status of each MA module with diagnostically controlled green/red LEDs (see Figure 12). If a unit is operating correctly, all of the phase LEDs will be illuminated green. To test the integrity of the diagnostics for each phase, push the button below the phase LEDs on the diagnostic display panel. The green LED will turn red and the alarm will sound, if the alarm is enabled. Releasing the test button will complete the test; the red LED will turn green and the alarm will shut off.

If an inoperable condition occurs on any phase, the audible alarm sounds and the corresponding phase LED 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, until a qualified person is able to evaluate and service the SPD, by pressing the alarm enable/disable button. The alarm will silence and the green alarm LED will not be lit. The red phase LED will continue to be illuminated until the inoperative condition had been cleared.

On an MA module (see Figure 12), if either LED is not lit, the module should be replaced. If both green LEDs are not lit and the diagnostic display panel has power, then power has been lost to that phase or the module should be replaced (refer to Table 3 on page 7). Refer to the final equipment instruction bulletin for MA module disconnection and access instructions.

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. Refer to “Maintenance and Troubleshooting” on page 27 for proper troubleshooting procedures and Tables 6, 7, and 8 for replacement modules.

Figure 12: MA Module LEDs



ENGLISH

Replacement Modules

Table 6: EMA Replacement Modules

System Voltage	Peak Surge Current Rating (kA)	Catalog Numbers		
		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 [1] Wye	120	MA1IMA12	MA1IMA12	MA1IMA12
	160	MA1IMA16	MA1IMA16	MA1IMA16
	240	MA1IMA24	MA1IMA24	MA1IMA24
120/240 V, 3-phase, 4-wire + ground [2] High-Leg Delta	120	MA1IMA12	MA3IMA12	MA1IMA12
	160	MA1IMA16	MA3IMA16	MA1IMA16
	240	MA1IMA24	MA3IMA24	MA1IMA24
240 V, 3-phase, 3-wire + ground Delta	120	MA6IMA12	MA6IMA12	MA6IMA12
	160	MA6IMA16	MA6IMA16	MA6IMA16
	240	MA6IMA24	MA6IMA24	MA6IMA24
480Y/277 V, 3-phase, 4-wire + ground [3] Wye	120	MA4IMA12	MA4IMA12	MA4IMA12
	160	MA4IMA16	MA4IMA16	MA4IMA16
	240	MA4IMA24	MA4IMA24	MA4IMA24
480Y/277 V, 3-phase, 3-wire + ground [3] High-Resistance Ground	120	MA4IMA12H	MA4IMA12H	MA4IMA12H
	160	MA4IMA16H	MA4IMA16H	MA4IMA16H
	240	MA4IMA24H	MA4IMA24H	MA4IMA24H
480 V, 3-phase, 3-wire + ground Delta	120	MA5IMA12	MA5IMA12	MA5IMA12
	160	MA5IMA16	MA5IMA16	MA5IMA16
	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
600Y/347 V, 3-phase, 3-wire + ground High-Resistance Ground	120	MA8IMA12H	MA8IMA12H	MA8IMA12H
	160	MA8IMA16H	MA8IMA16H	MA8IMA16H
	180	MA8IMA18H	MA8IMA18H	MA8IMA18H
600 V, 3-phase, 3-wire + ground Delta	120	MA9IMA12	MA9IMA12	MA9IMA12
	160	MA9IMA16	MA9IMA16	MA9IMA16
	180	MA9IMA18	MA9IMA18	MA9IMA18

1 208Y/120 series also applies to the following voltage 220Y/127.

2 High-leg delta (Phase B modules are different than Phase A and Phase C modules).

3 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

Table 7: L-L Enhanced MA (L-N, L-G) Replacement Modules

System Voltage	Peak Surge Current Rating (kA)	Catalog Numbers		
		Phase A	Phase B	Phase C
208Y/120 V, 3-phase, 4-wire + ground [1] Wye	120	MA1IMA12	MA1IMA12	MA1IMA12
	180	MA1IMA16	MA1IMA16	MA1IMA16
	270	MA1IMA16	MA1IMA16	MA1IMA16
	360	MA1IMA24	MA1IMA24	MA1IMA24
480Y/277 V, 3-phase, 4-wire + ground [2] Wye	120	MA4IMA12	MA4IMA12	MA4IMA12
	180	MA4IMA16	MA4IMA16	MA4IMA16
	270	MA4IMA16	MA4IMA16	MA4IMA16
	360	MA4IMA24	MA4IMA24	MA4IMA24

1 208Y/120 series also applies to the following voltage 220Y/127.

2 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

Table 8: L-L Enhanced (L-L) Replacement Modules

System Voltage	Peak Surge Current Rating (kA)	Catalog Numbers		
		Phase A	Phase B	Phase C
208Y/120 V, 3-phase, 4-wire + ground [1] Wye	120	MA2IMA40LL	MA2IMA40LL	MA2IMA40LL
	180	MA2IMA60LL	MA2IMA60LL	MA2IMA60LL
	270	MA2IMA90LL	MA2IMA90LL	MA2IMA90LL
	360	MA2IMA12LL	MA2IMA12LL	MA2IMA12LL
480Y/277 V, 3-phase, 4-wire + ground [2] Wye	120	MA4IMA40LL	MA4IMA40LL	MA4IMA40LL
	180	MA4IMA60LL	MA4IMA60LL	MA4IMA60LL
	270	MA4IMA90LL	MA4IMA90LL	MA4IMA90LL
	360	MA4IMA12LL	MA4IMA12LL	MA4IMA12LL

1 208Y/120 series also applies to the following voltage 220Y/127.

2 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

Audible Alarm

Push the alarm enable/disable button to enable or disable the alarm (see Figure 13). If the green alarm LED is lit the alarm is enabled. If the green alarm LED is not lit the alarm is disabled.

Surge Counter

The surge counter 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 EMA module. To reset the surge counter, remove all power and press the small switch located inside the unit on the underside of the diagnostic circuit board near the RJ45 connectors (also refer to Figure 14). This will reset the counter to zero.

Dry Contacts

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Use 600 Vac rated dry contact wiring.
- Dry contact wiring must have less than 1/16 in. (1.6 mm) exposed wire from the dry contact block.
- Maintain at least 1.0 in. (25 mm) separation between dry contact wiring and the power wiring in the enclosure.

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

The EMA series SPD is provided with dry contacts. The connection for the dry contacts is located on the back of the diagnostic display panel (lower right corner, refer to Figure 14). The dry contacts are three-position, Form “C” type with Normally Open, Normally Closed, and Common connections.

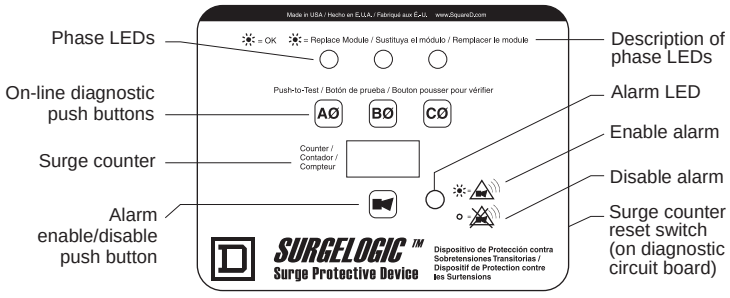
In the unpowered state the contact is closed between terminals NC and COM. This is also the alarm condition. The opposite state, closed between terminals NO and COM, indicates that power is on to the unit and that no alarm condition exists (See Table 9).

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 in the next section.

Table 9: Dry Contact Configuration

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

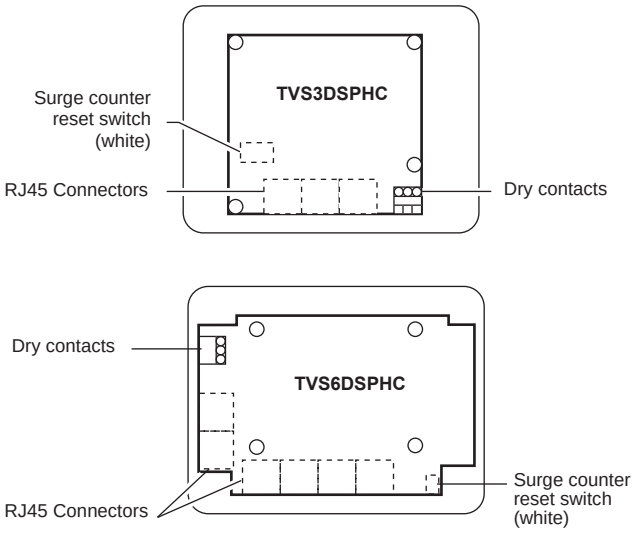
Figure 13: Three-Phase Diagnostic Display Panel with Surge Counter



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

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

Figure 14: Rear of Diagnostic Circuit Board



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 dry 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 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.

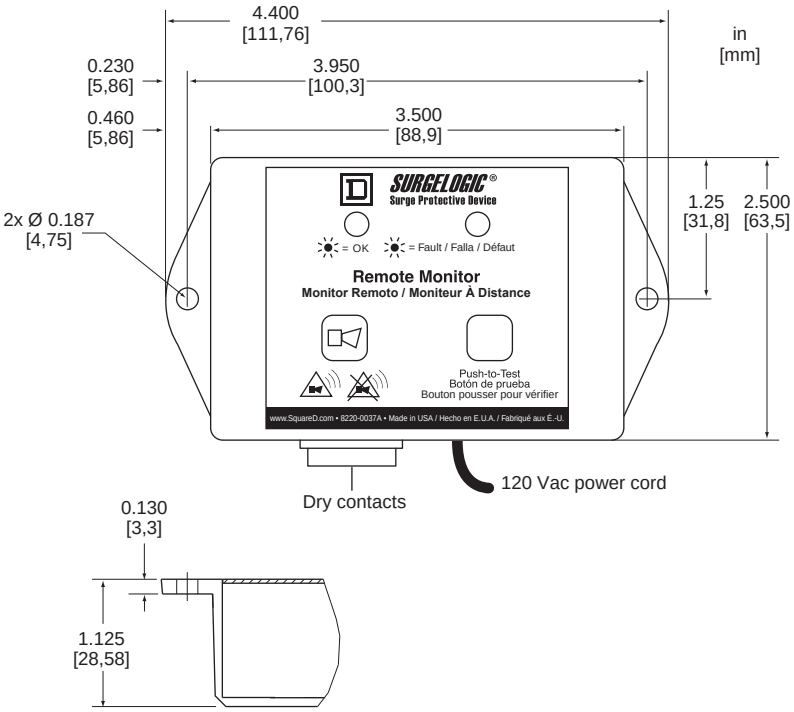
Remote Monitor Option

The remote monitor option has two LEDs, one red and one green, and an audible alarm with an enable/disable switch. Normal status is a lit green LED, and no audible alarm. To test the integrity of the remote monitor, press the push-to-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 lit. 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”, 3-position dry contacts (provided) and the appropriate length of solid or stranded 22–14 AWG wire up to 1000 ft. (305 m) not provided.

Figure 15: Remote Monitor Option (TVS12RMU)



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.
- 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.

Preventative Maintenance

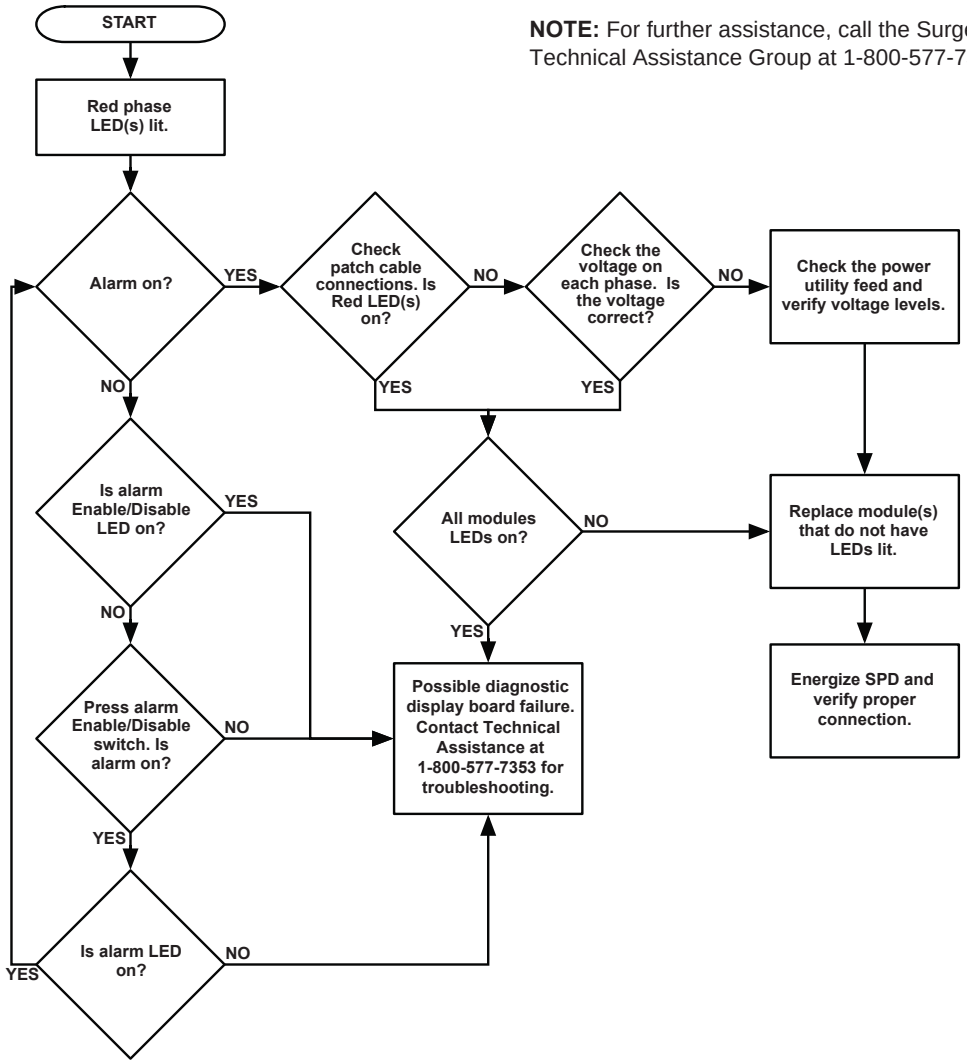
Inspect the SPD periodically to maintain reliable system performance and continued transient voltage surge suppression. Periodically check the state of the diagnostic display panel LED status indicators. Routinely use the built-in diagnostics to inspect for inoperative modules.

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

Troubleshooting

If a module shows two green indicator lights and the display panel shows a red phase indicator light, follow the Troubleshooting Flow Chart in Figure 16 below.

Figure 16: Troubleshooting Flow Chart



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.

Schneider Electric
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1-888-778-2733
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8222-0014F 10/2011
Replaces 8222-0014E, 11/2009

Surgelogic®

IMA Surge Protective Device (SPD)
Dispositivo de protección contra sobretensiones transitorias IMA
Dispositif de protection contre les surtensions transitoires IMA

Instruction Bulletin
Boletín de instrucciones
Directives d'utilisation

8222-0050E

Retain for Future Use. /
Conservar para uso futuro. /
À conserver pour usage ultérieur.

SQUARE D
by Schneider Electric

ENGLISH

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.
- 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.

⚠ CAUTION

LOSS OF BRANCH CIRCUIT POWER/LOSS OF SURGE SUPPRESSION

- Ensure that the branch circuit breaker or fuse trip characteristic has been coordinated with the overcurrent components inside the SPD (See Tables 1 and 2).
- Perform periodic inspection of the SPD status indicator lights as part of the preventative maintenance schedule.
- Promptly service the SPD 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 SPDs to achieve redundancy for critical applications.

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

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. Tripping of the branch circuit breaker or fuse feeding the SPD can occur when the surge suppression elements reach end of life. Mitigate the tripping of the branch circuit breaker or fuse feeding the SPD by coordinating the surge suppression elements with the branch circuits.

For the purposes of coordination, the SPD is equipped with overcurrent components that will limit the per phase I2t, Iapparent, Ip, and Ith values to those listed in tables 1 and 2 when connected to a power system with a short-circuit current rating not exceeding 200,000 A.

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Table 1: SPD Without Optional Sine Wave Tracking Module

SPD Device	Per Phase I^2t	$I_{apparent}$	I_p	I_{th}
TVS_IMA12 through TVS_IMA24	175 kA^2 seconds	17,000 A RMS	40,000 A RMS	220 A
TVS_IMA32 through TVS_IMA48	700 kA^2 seconds	34,000 A RMS	80,000 A RMS	440 A

Table 2: SPD With Optional Sine Wave Tracking Module

SPD Device	Per Phase I^2t	$I_{apparent}$	I_p	I_{th}
TVS_IMA12 through TVS_IMA24 and	240 kA^2 seconds	21,500 A RMS	48,000 A RMS	260 A
TVS_IMA32 through TVS_IMA48	825 kA^2 seconds	37,500 A RMS	88,000 A RMS	480 A

⚠ CAUTION

LOSS OF SURGE SUPPRESSION

- Do not energize the SPDs until the electrical system is completely installed, inspected, tested, and all conductors connected and functional, including the neutral.
- Verify the voltage rating of the device and system before energizing the surge protective device.
- Perform high-potential insulation testing, or any other tests where SPD components will be subjected to voltages higher than their rated turn-on voltage, with the neutral and SPD disconnected from the power source.

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

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

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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.
- 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.

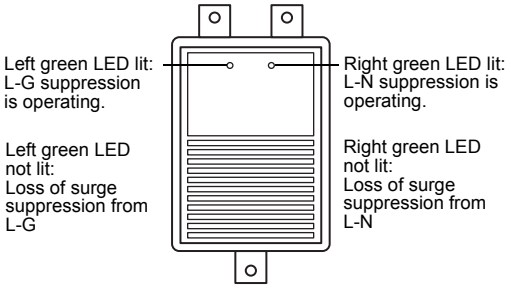
Failure to follow these instructions will result in death or serious injury.

LED Status Indicators

The SPD diagnostic display panel shows the status of each MA module with diagnostically controlled green/red LEDs. 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 button below the phase LEDs on the diagnostic display panel. The green LED will turn red and the alarm will sound, if the alarm is enabled. Releasing the test button will complete the test; the red LED will turn green and the alarm will shut off.

If an inoperable condition occurs on any phase, the audible alarm sounds and the corresponding phase LED 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, until a qualified person is able to evaluate and service the SPD, by pressing the alarm enable/disable button. The alarm will silence and the green alarm LED will not be lit. The red phase LED will continue to be illuminated until the inoperative condition has been cleared.

Figure 1: MA Module LEDs



On an MA module (see Figure 1), if either LED is not lit, the module should be replaced. If both green LEDs are not lit and the diagnostic display panel has power, then power has been lost to that phase or the module should be replaced (refer to Table 4 on page 7). Refer to the final equipment instruction bulletin for MA module disconnection and access instructions.

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. Refer to “Troubleshooting” on page 8 for proper troubleshooting procedures.

Surge Counter

The surge counter 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 surge counter to zero:

1. Remove all power from this equipment.
2. Remove covers as necessary to gain access to the diagnostic circuit board.
3. Press the small switch located on the underside of the diagnostic circuit board (near the RJ45 connectors; see Figure 3:). This will reset the counter to zero.

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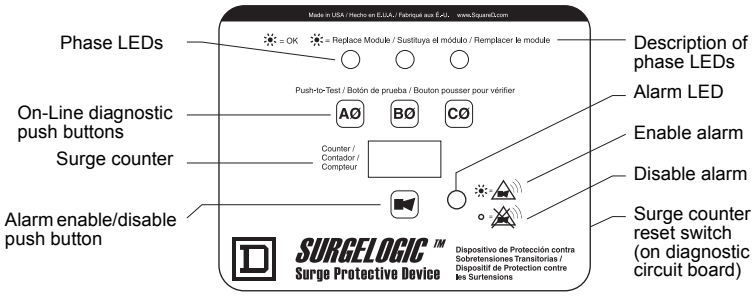
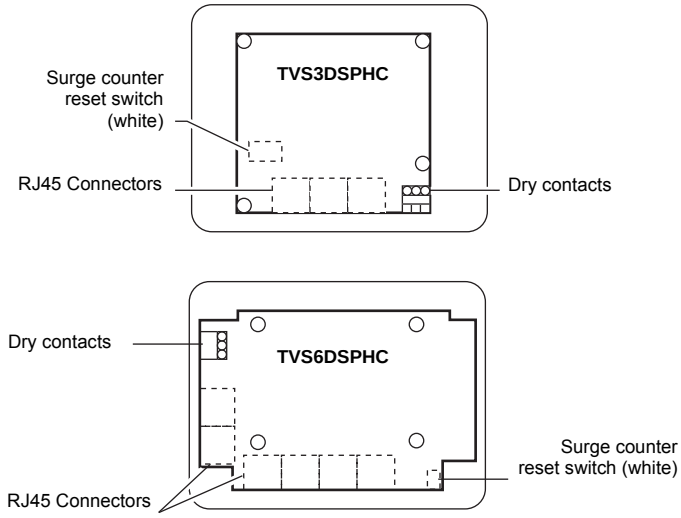
Figure 2: Three-Phase Diagnostic Display Panel with Surge Counter



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

Figure 3: Rear of Diagnostic Circuit Board



Dry Contacts

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Use 600 Vac rated dry contact wiring.
- Dry contact wiring must have less than 1/16 in. (1.6 mm) exposed wire from the dry contact block.
- Maintain at least 1.0 in. (25 mm) separation between dry contact wiring and the power wiring in the enclosure.

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

The IMA series SPD is provided with dry contacts. The connection for the dry contacts is located on the back of the diagnostic display panel (lower right corner). The dry contacts are 3-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).

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

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Table 3: Dry Contact Configuration

Alarm Contact Terminals	Contact State with Power Removed
NC	Normally closed
COM	Common
NO	Normally open

These contacts can be used for remote indication of the SPD device'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.

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.

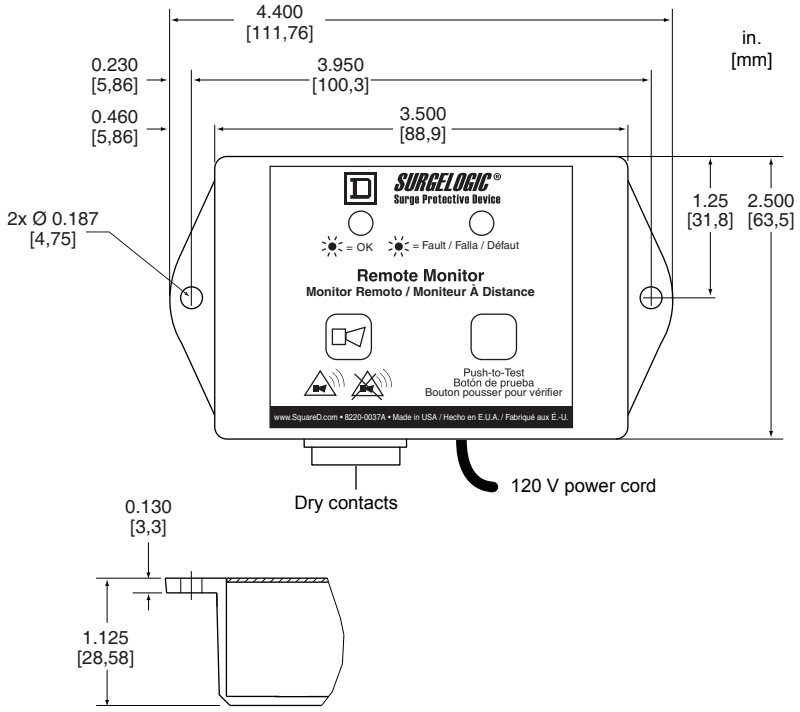
Remote Monitor Option

The option has two LEDs, one red and one green, and an audible alarm with an enable/disable switch. Normal status is a lit green LED, and no audible alarm. To test the integrity of the remote monitor, press the push-to-test switch.

The green LED will turn off, the red LED will turn on, and the alarm will sound, if the alarm is enabled. 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 sounds. The audible alarm can be silenced by moving the alarm enable/disable switch to the disable position. The alarm will silence and the green alarm LED will not be lit. The red LED will continue to be illuminated until the inoperative condition had 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 display panel with Form "C", 3-position dry contacts (provided) and the appropriate length of solid or stranded 30 to 14 AWG wire (not provided).

Figure 4: Remote Monitor Option (TVS12RMU)



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

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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.
- 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 transient voltage surge suppression. Periodically check the state of the diagnostic display panel LED status indicators. Routinely use the built-in diagnostics to inspect for inoperative modules.

Replacement Modules

Table 4: EMA Series Replacement Modules

System Voltage	Peak Surge Current Rating (kA)	Phase A	Phase B	Phase C
120/240 V, 1-phase, 3-wire	120	MA1IMA12	—	MA1IMA12
	160	MA1IMA16	—	MA1IMA16
	240	MA1IMA24	—	MA1IMA24
208Y/120 V, 3-phase, 4-wire [1]	120	MA1IMA12	MA1IMA12	MA1IMA12
	160	MA1IMA16	MA1IMA16	MA1IMA16
	240	MA1IMA24	MA1IMA24	MA1IMA24
120/240 V, 3-phase, 4-wire [2]	120	MA1IMA12	MA3IMA12	MA1IMA12
	160	MA1IMA16	MA3IMA16	MA1IMA16
	240	MA1IMA24	MA3IMA24	MA1IMA24
480Y/277 V, 3-phase, 4-wire [3]	120	MA4IMA12	MA4IMA12	MA4IMA12
	160	MA4IMA16	MA4IMA16	MA4IMA16
	240	MA4IMA24	MA4IMA24	MA4IMA24
600/347 V, 3-phase, 4-wire	120	MA8IMA12	MA8IMA12	MA8IMA12
	160	MA8IMA16	MA8IMA16	MA8IMA16
	240	MA8IMA24	MA8IMA24	MA8IMA24

1 208Y/120 series also applies to the following voltage 220Y/127.

2 High-leg delta (Phase B modules are different than Phase A and Phase C modules).

3 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

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

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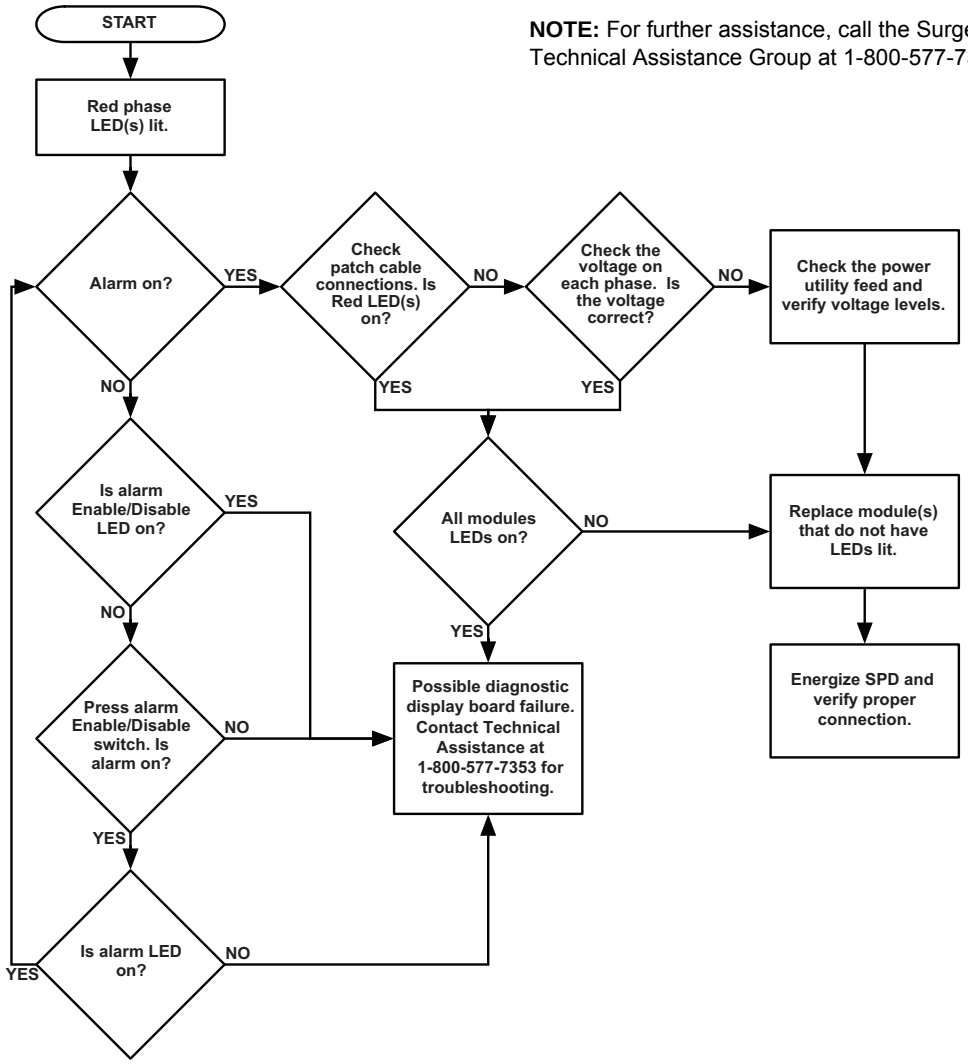
Troubleshooting

If a module shows two green indicator lights and the display panel shows a red phase indicator light, follow the Troubleshooting Flow Chart in Figure 5 below.

Figure 5: Troubleshooting Flow Chart



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.

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8222-0050E 11/2009
Replaces 8222-0050D, 10/2002

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Instruction Bulletin

Replaces 8222-0071B, 05/2007

Diagnostic Display Panel Replacement

IMA Series Surge Protective Devices (SPD)

Retain for future use.

Precautions

⚠ DANGER

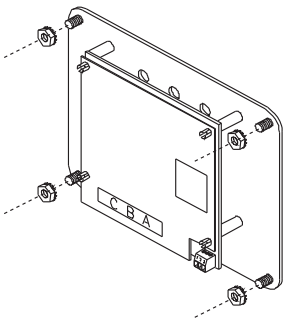
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- 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.

Installation

Figure 1: Diagnostic Display Assembly Installation



1. Turn off all power supplying this equipment before working on or inside any enclosure containing this equipment.
2. Remove the barrier, cover/door, and/or trim to the equipment.
3. Verify that the replacement diagnostic display has the correct catalog number. The catalog number is found on the back of the diagnostic display assembly. See Table 1.
4. Mark the RJ45 patch cables (if they are not already marked) with the appropriate A, B and C phase. Unplug the RJ45 patch cables from the diagnostic display assembly (and dry contact wires if used).
5. Remove the four nuts holding the diagnostic display panel to the cover/door.
6. Carefully remove the old diagnostic circuit board assembly.
7. For TVS1DSPVC and TVS3DSPVC only: inspect the foam gasket attached to the panel for rips or tears and verify that the gasket is fully attached to the panel face. If a replacement gasket is needed contact Technical Assistance at 1-800-577-7353.
8. Install the new diagnostic circuit board assembly, using the new nuts that are provided. See Figure 1.
9. Plug the RJ45 patch cables into the new diagnostic display assembly. Make sure that the patch cables labeled A, B and C are connected to the correct RJ45 jacks.
10. Check that all connections are secure.
11. Replace the barrier, cover/door, and/or trim to the equipment.
12. Equipment may be re-energized after all of the above steps are complete.
13. If at any time telephone assistance is required, call Technical Assistance at 1-800-577-7353.

Table 1: Diagnostic Display Replacements

Catalog Number [1]	System Voltage	Peak Surge Current/Phase	Applications
TVS1DSPHC	120/240 V, 1-phase 3-wire	120 kA 160 kA 240 kA	Panelboards Switchboards Busway
TVS3DSPHC	208Y/120 V, 3-phase 4-wire 120/240 V, 1-phase 3-wire high leg delta 480Y/277 V, 3-phase 4-wire 600Y/347 V, 3-phase 4-wire	120 kA 160 kA 240 kA	Panelboards Switchboards PZ4 Switchgear Busway
TVS4DSPHC	120/240 V, 1-phase 3-wire	320 kA 480 kA	Switchboards
TVS6DSPHC	208Y/120 V, 3-phase 4-wire 120/240 V, 1-phase 3-wire high leg delta 480Y/277 V, 3-phase 4-wire 600Y/347 V, 3-phase 4-wire	320 kA 480 kA	Switchboards PZ4 Switchgear
TVS1DSPVC	120/240 V, 1-phase 3-wire	120 kA 160 kA 240 kA	MCC
TVS3DSPVC	208Y/120 V, 3-phase 4-wire 120/240 V, 1-phase 3-wire high leg delta 480Y/277 V, 3-phase 4-wire 600Y/347 V, 3-phase 4-wire	120 kA 160 kA 240 kA	MCC
TVS1DSPHIC	120/240 V, 1-phase 3-wire	120 kA 160 kA 240 kA	I-Line® Plug-on Unit
TVS3DSPHIC	208Y/120 V, 3-phase 4-wire 120/240 V, 1-phase 3-wire high leg delta 480Y/277 V, 3-phase 4-wire 600Y/347 V, 3-phase 4-wire	120 kA 160 kA 240 kA	I-Line Plug-on Unit

[1] Includes dry contacts, audible alarm, LED indicators, and surge counter.

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Replaces / Reemplaza / Remplace 8222-0010C, 01/2011

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.
- 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 y NOM-029-STPS.
- Solamente el personal eléctrico especializado 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 D'ÉCLAIR D'ARC

- Portez un équipement de protection personnelle (ÉPP) approprié et observez les méthodes de travail électrique sécuritaire. Voir NFPA 70E.
- 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.

Introduction

Verify that each replacement module has the correct 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).

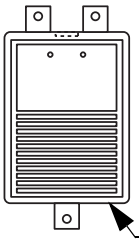
Introducción

Asegúrese de que cada módulo de repuesto coincida con el número de catálogo correcto. 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 chaque module de rechange a le numéro de catalogue correct. 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 1–4 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 1–4.

NOTA: Utilice las tablas 1 a 4 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 4.

REMARQUE : Utiliser les tableaux 1 à 4 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 4.

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 / 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 [1]	—	MA1IMA16 [1]
	480 kA	MA1IMA24 [1]	—	MA1IMA24 [1]
208Y/120 V [2], 3-phase, Wye, 4-wire + Ground / 3 fases, en estrella, 4 hilos + tierra / triphasée, en étoile, 4 fils + terre	120 kA	MA1IMA12	MA1IMA12	MA1IMA12
	160 kA	MA1IMA16	MA1IMA16	MA1IMA16
	240 kA	MA1IMA24	MA1IMA24	MA1IMA24
	320 kA	MA1IMA16 [1]	MA1IMA16 [1]	MA1IMA16 [1]
	480 kA	MA1IMA24 [1]	MA1IMA24 [1]	MA1IMA24 [1]
380Y/220 V, 400Y/230 V, 415Y/240 V 3-phase, Wye, 4 wire + Ground / 3 fases, en estrella, 4 hilos + tierra / triphasée, en étoile, 4 fils + terre	120 kA	Use 480Y/277 V (MA4 series) modules for replacement in 380Y/220, 400Y/230, and 415Y/240 systems. / Utilice los módulos de repuesto de 480Y/277 V (serie MA4) para los sistemas de 380Y/220, 400Y/230 y 415Y/240 / Utiliser les modules de rechange de 480Y/277 V (série MA4) pour les systèmes de 380Y/220, 400Y/230 et 415Y/240		
	160 kA			
	240 kA			
	320 kA			
	480 kA			
120/240 V, 3-phase, High-leg Delta, 4-wire + Ground [3] / 3 fases, conexión en delta con extremo alto, 4 hilos + tierra [3]/ triphasée, sommet du triangle, 4 fils + terre [3]	120 kA	MA1IMA12	MA3IMA12	MA1IMA12
	160 kA	MA1IMA16	MA3IMA16	MA1IMA16
	240 kA	MA1IMA24	MA3IMA24	MA1IMA24
	320 kA	MA1IMA16 [1]	MA3IMA16 [1]	MA1IMA16 [1]
	480 kA	MA1IMA24 [1]	MA3IMA24 [1]	MA1IMA24 [1]
480Y/277 V [4], 3-phase, Wye, 4-wire + Ground / 3 fases, en estrella, 4 hilos + tierra / triphasée, en étoile, 4 fils + terre	120 kA	MA4IMA12	MA4IMA12	MA4IMA12
	160 kA	MA4IMA16	MA4IMA16	MA4IMA16
	240 kA	MA4IMA24	MA4IMA24	MA4IMA24
	320 kA	MA4IMA16 [1]	MA4IMA16 [1]	MA4IMA16 [1]
	480 kA	MA4IMA24 [1]	MA4IMA24 [1]	MA4IMA24 [1]
480 V, 3-phase, Delta, 3-wire + Ground / 3 fases, Delta, 3 hilos + tierra / triphasée, en triangle, 3 fils + terre	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 [1]	MA5IMA16 [1]	MA5IMA16 [1]
	480 kA	MA5IMA24 [1]	MA5IMA24 [1]	MA5IMA24 [1]
240 V, 3-phase, Delta, 3-wire + Ground / 3 fases, Delta, 3 hilos + tierra / triphasée, en triangle, 3 fils + terre	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 [1]	MA6IMA16 [1]	MA6IMA16 [1]
	480 kA	MA6IMA24 [1]	MA6IMA24 [1]	MA6IMA24 [1]
600Y/347 V, 3-phase, Wye, 4 wire + Ground / 3 fases, en estrella, 4 hilos + tierra / triphasée, en étoile, 4 fils + terre	120 kA	MA8IMA12	MA8IMA12	MA8IMA12
	160 kA	MA8IMA16	MA8IMA16	MA8IMA16
	240 kA	MA8IMA24	MA8IMA24	MA8IMA24
	320 kA	MA8IMA16 [1]	MA8IMA16 [1]	MA8IMA16 [1]
	480 kA	MA8IMA24 [1]	MA8IMA24 [1]	MA8IMA24 [1]

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

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 / Número de catálogo / Nº de catalogue		
		Phase / Fase A	Phase / Fase B	Phase / Fase C
600 V, 3-phase, Delta, 3-wire + Ground / 3 fases, Delta, 3 hilos + tierra / triphasée, en triangle, 3 fils + terre	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 [1]	MA9IMA10 [1]
	240 kA	MA9IMA12 [1]	MA9IMA12 [1]	MA9IMA12 [1]
	320 kA	MA9IMA16 [1]	MA9IMA16 [1]	MA9IMA16 [1]

1 Quantity of two. / Cantidad de dos. / Quantité : 2

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

3 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.

4 480Y/277 V series applies to the following voltages 380Y/220 V, 400Y/230 V, 415Y/240 V /
La serie 480Y/277 es aplicable para las siguientes tensiones 380Y/220, 400Y/230, 415Y/240 /
La série 480Y/277 s'applique aux tensions suivantes : 380Y/220, 400Y/230, 415Y/240

Table / Tabla / Tableau 2 : HRG Module Replacements / Módulos HRG de repuesto / Modules HRG 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 / Número de catálogo / No de catalogue		
		Phase / Fase A	Phase / Fase B	Phase / Fase C
480Y/277 V [1], 3-phase, High-Resistance Ground, 3-wire + Ground / 3 fases, alta resistencia a tierra, 3 hilos + tierra / triphasée, mise à la terre à résistance élevée, 3 fils + terre	100 kA	MA4IMA10H	MA4IMA10H	MA4IMA10H
	120 kA	MA4IMA12H	MA4IMA12H	MA4IMA12H
	160 kA	MA4IMA16H	MA4IMA16H	MA4IMA16H
	200 kA	MA4IMA20H	MA4IMA20H	MA4IMA20H
	240 kA	MA4IMA24H	MA4IMA24H	MA4IMA24H
	320 kA	MA4IMA16H [2]	MA4IMA16H [2]	MA4IMA16H [2]
	480 kA	MA4IMA24H [2]	MA4IMA24H [2]	MA4IMA24H [2]
600Y/347 V, 3-phase, High-Resistance Ground, 3-wire + Ground / 3 fases, alta resistencia a tierra, 3 hilos + tierra / triphasée, mise à la terre à résistance élevée, 3 fils + terre	100 kA	MA8IMA10H	MA8IMA10H	MA8IMA10H
	120 kA	MA8IMA12H	MA8IMA12H	MA8IMA12H
	160 kA	MA8IMA16H	MA8IMA16H	MA8IMA16H
	180 kA	MA8IMA18H	MA8IMA18H	MA8IMA18H
	200 kA	MA8IMA10H [2]	MA8IMA10H [2]	MA8IMA10H [2]
	240 kA	MA8IMA12H [2]	MA8IMA12H [2]	MA8IMA12H [2]
	320 kA	MA8IMA16H [2]	MA8IMA16H [2]	MA8IMA16H [2]

1 480Y/277 V series applies to the following voltages 380Y/220 V, 400Y/230 V, 415Y/240 V /
La serie 480Y/277 es aplicable para las siguientes tensiones 380Y/220, 400Y/230, 415Y/240 /
La série 480Y/277 s'applique aux tensions suivantes : 380Y/220, 400Y/230, 415Y/240

2 Quantity of two. / Cantidad de dos. / Quantité : 2

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

Table / Tabla / Tableau 3 : 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 nominal de la corriente transitoria máx. / Courant nominal de surtension de crête	Catalog Number / Número de catálogo / Nº de catalogue		
		Phase / Fase A	Phase / Fase B	Phase / Fase C
208Y/120 V [1], 3-phase / 3 fases / triphasée, 3-4 wire / 3-4 hilos / 3-4 fils	120 kA	MA1IMA12	MA1IMA12	MA1IMA12
	180 kA	MA1IMA16	MA1IMA16	MA1IMA16
	270 kA	MA1IMA16	MA1IMA16	MA1IMA16
	360 kA	MA1IMA24	MA1IMA24	MA1IMA24
380Y/220 V, 400Y/230 V and 415Y/240 V 3-phase / 3 fases / triphasée, 3-4 wire / 3-4 hilos / 3-4 fils	120 kA 180 kA 270 kA 360 kA	Use 480Y/277 V (MA4 series) modules for replacement in 380Y/220, 400Y/230, and 415Y/240 systems. / Utilice los módulos de repuesto de 480Y/277 V (serie MA4) para los sistemas de 380Y/220, 400Y/230 y 415Y/240 / Utiliser les modules de rechange de 480Y/277 V (série MA4) pour les systèmes de 380Y/220, 400Y/230 et 415Y/240		
480Y/277 V [2] 3-phase / 3 fases / triphasée, 3-4 wire / 3-4 hilos / 3-4 fils	120 kA	MA4IMA12	MA4IMA12	MA4IMA12
	180 kA	MA4IMA16	MA4IMA16	MA4IMA16
	270 kA	MA4IMA16	MA4IMA16	MA4IMA16
	360 kA	MA4IMA24	MA4IMA24	MA4IMA24

[1] 208Y/120 V series also applies to 230Y/127 V / La serie 208Y/120 también es aplicable para la siguiente tensión: 230Y/127 V/ La série 208Y/120 s'applique aussi à la tension 230Y/127

[2] 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, 415Y/240 / La serie 480Y/277 es aplicable para las siguientes tensiones 380Y/220, 400Y/230, 415Y/240 / La série 480Y/277 s'applique aux tensions suivantes : 380Y/220, 400Y/230, 415Y/240

Table / Tabla / Tableau 4 : 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 nominal de la corriente transitoria máx. / Courant nominal de surtension de crête	Catalog Number / Número de catálogo / Nº de catalogue		
		Phase / Fase A	Phase / Fase B	Phase / Fase C
208Y/120 V [1], 3-phase / 3 fases / triphasée, 3-4 wire / 3-4 hilos / 3-4 fils	120 kA	MA2IMA40LL	MA2IMA40LL	MA2IMA40LL
	180 kA	MA2IMA60LL	MA2IMA60LL	MA2IMA60LL
	270 kA	MA2IMA90LL	MA2IMA90LL	MA2IMA90LL
	360 kA	MA2IMA12LL	MA2IMA12LL	MA2IMA12LL
380Y/220 V, 400Y/230 V, 415Y/240 V 3-phase / 3 fases / triphasée, 3-4 wire / 3-4 hilos / 3-4 fils	120 kA 180 kA 270 kA 360 kA	Use 480Y/277 V (MA4 series) modules for replacement in 380Y/220, 400Y/230, and 415Y/240 systems. / Utilice los módulos de repuesto de 480Y/277 V (serie MA4) para los sistemas de 380Y/220, 400Y/230 y 415Y/240 / Utiliser les modules de rechange de 480Y/277 V (série MA4) pour les systèmes de 380Y/220, 400Y/230 et 415Y/240		
480Y/277 V [2] 3-phase / 3 fases / triphasée, 3-4 wire / 3-4 hilos / 3-4 fils	120 kA	MA4IMA40LL	MA4IMA40LL	MA4IMA40LL
	180 kA	MA4IMA60LL	MA4IMA60LL	MA4IMA60LL
	270 kA	MA4IMA90LL	MA4IMA90LL	MA4IMA90LL
	360 kA	MA4IMA12LL	MA4IMA12LL	MA4IMA12LL

[1] 208Y/120 V series also applies to 230Y/127 V / La serie 208Y/120 también es aplicable para la siguiente tensión: 230Y/127 V/ La série 208Y/120 s'applique aussi à la tension 230Y/127

[2] 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, 415Y/240 / La serie 480Y/277 es aplicable para las siguientes tensiones 380Y/220, 400Y/230, 415Y/240 / La série 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 equipment. Always use a properly rated voltage sensing device to confirm power is off.
2. 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.
3. Unplug the phase diagnostic display panel cable from the module to be replaced.

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

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

Desmontaje del módulo existente

1. Desenergice el equipo antes de realizar cualquier trabajo en él. Siempre utilice un dispositivo detector de tensión nominal adecuado para confirmar la desenergización del equipo.
2. 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.
3. Desenchufe el cable de fase de la pantalla de diagnóstico del módulo que va a sustituir.

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

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

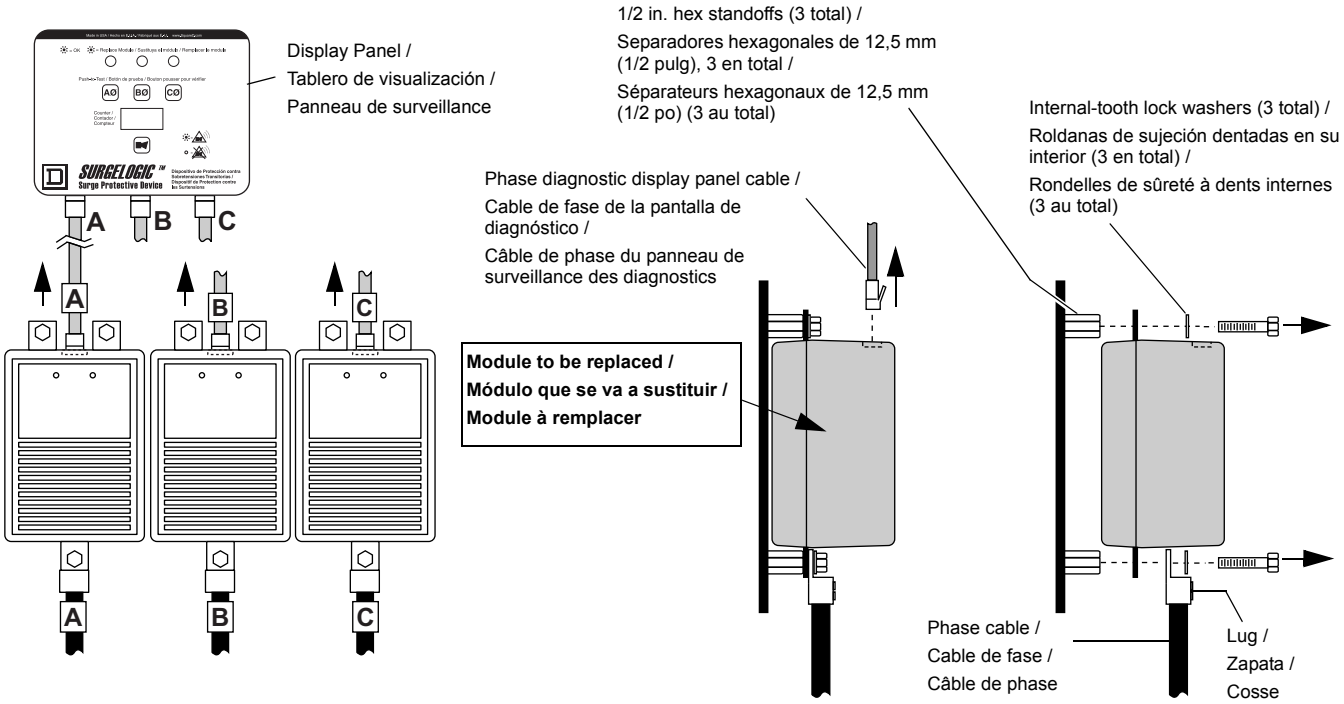
Retrait du module existant

1. Couper l'alimentation de l'appareil avant d'y travailler. Toujours utiliser un dispositif de détection de tension à valeur nominale appropriée pour vous assurer que l'alimentation est coupée.
2. 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.
3. Débrancher le câble de phase du panneau de surveillance des diagnostics du module à remplacer.

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

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

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



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

New Module Installation

1. Verify all power supplying this equipment is turned off before working on or inside equipment. Always use a properly rated voltage sensing device to confirm power is off.
2. Confirm the new replacement modules have the same SPD 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.
6. Ensure that the phase diagnostic display panel 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.

Instalación del módulo nuevo

1. Asegúrese de que el equipo esté completamente desenergizado 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.
2. Asegúrese de que los nuevos módulos de repuesto tengan la misma tensión nominal y configuración que el SPD así como la misma 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.
6. Asegúrese de que los cables de fase de la pantalla de diagnóstico 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.

Installation du nouveau module

1. Vérifier que toute alimentation de cet appareil est coupée avant d'y travailler. Toujours utiliser un dispositif de détection de tension à valeur nominale appropriée pour vous assurer que l'alimentation est coupée.
2. S'assurer que les nouveaux modules de rechange ont la même configuration et la même tension nominale du SPD 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. S'assurer que les câbles de phases du panneau de surveillance des diagnostics ne touchent à 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

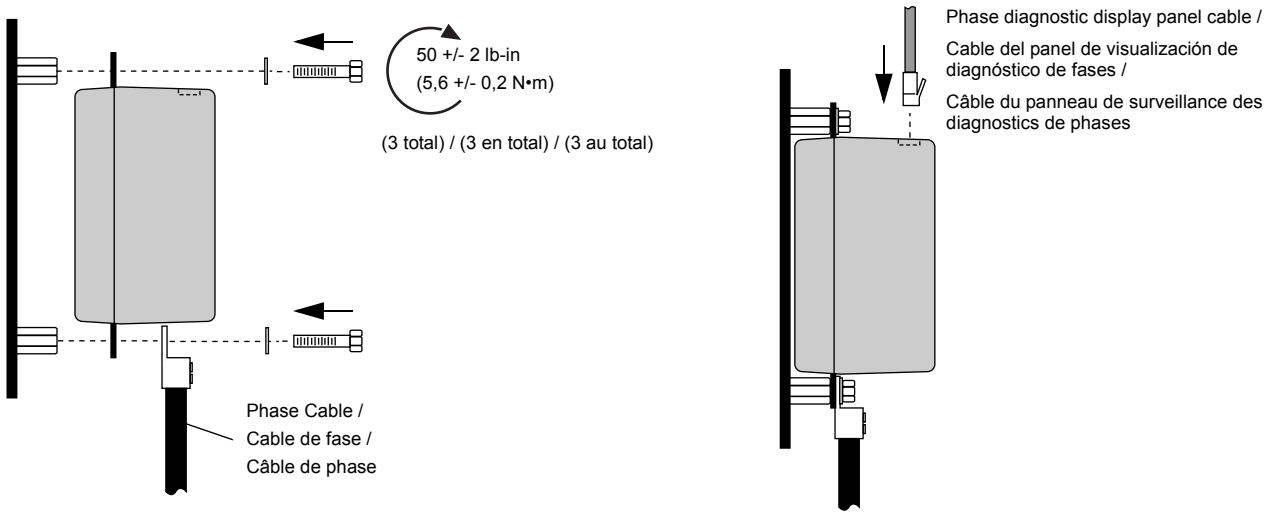
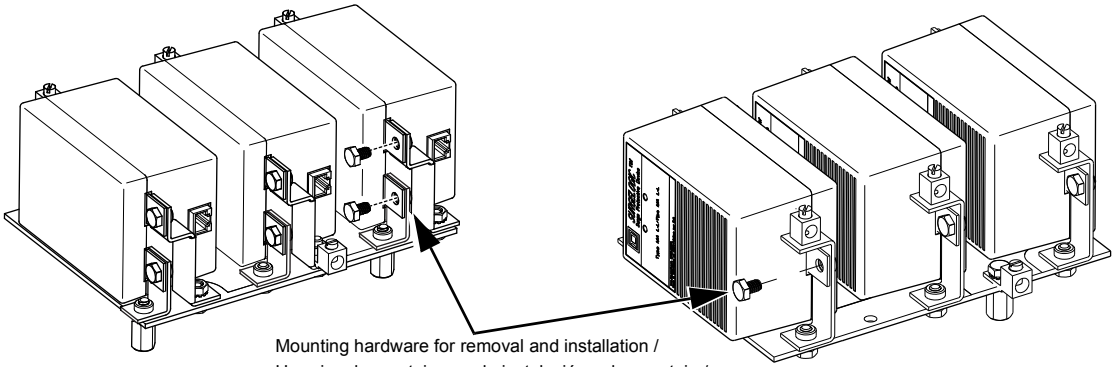
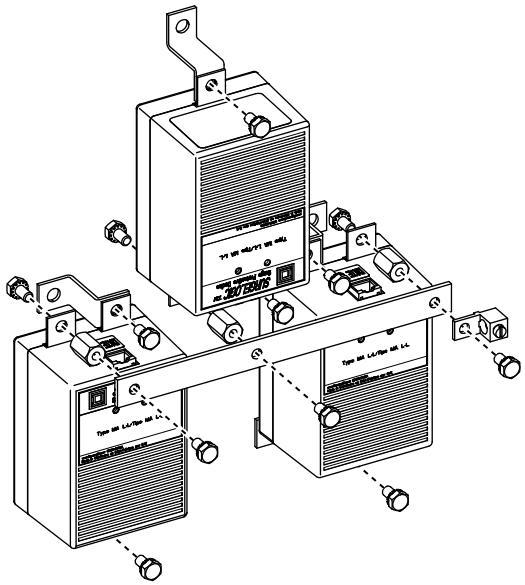


Figure / Figura / Figure 4 : Module removal and installation for MCC systems / Desmontaje e instalación de módulos del sistema CCM / Retrait et installation du module pour les systèmes de centres de commande de moteurs



Mounting hardware for removal and installation /
Herrajes de montaje para la instalación y desmontaje /
Quincaillerie de montage pour le retrait et l'installation

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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