Installation, Operation and Maintenance Manual

PN 750-0072-002

SELect®

Selenium-Enhanced Suppression Filter System

Current Technology®

THE #1 NAME IN SURGE SUPPRESSION™

A member of the MasterPlan™ family of products

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Your Guide to Installation of the SELect Selenium-Enhanced Surge Suppression System

Today's sophisticated electronic equipment requires superior suppression filter systems. By selecting Current Technology® devices, you have taken a critical step toward decreasing down-time and ensuring longer product life for your equipment.

The SELect® Selenium-Enhanced Suppression Filter System is designed to be connected to your electrical distribution system to protect connected sensitive electrical and electronic equipment against the harmful effects of lightning strikes, internally generated transients and high frequency noise. The reliable SELect fulfills the single-pulse surge current capacity testing recommendations per NEMA LS1-1992, paragraphs 2.2.9 and 3.9.

The SELect system is a hybrid design incorporating Selenium Cells along with Metal Oxide Varisiors (MOVs) and Polypropylene filtering capacitors. Selenium, a naturally occurring element, extends the life of the MOVs and provides unprecedented durability in installations exposed to severe transient activity.

Additionally, SELect is the only product capable of surviving intermittent voltage swells without degradation to the suppression elements.

The Current Technology® SELect combines easy and flexible installation with many special features to deliver more performance than any other device in its class.

The SELect offers a full range of monitoring options from the most basic phase indicator lights, audible alarm and counters to the most sophisticated power quality monitoring features offered in any surge suppression product. These features include the following:

- Display of true RMS phase voltages
- Display of neutral-to-ground voltage and current
- Counting of swells, surges, sags and outages
- Display of percent available protection remaining

The SELect incorporates the patented "Failure Free ISB" (Integrated Suppression Bus). Redundant MOV fusing prevents individual component failure from rendering the protection mode useless. Instead, the failed component safely removes itself from the circuit and all remaining protection is allowed to continue operating as designed. Special circuitry allows the percent remaining protection to be measured and automatically alarmed if capacity drops below 50 percent.

The SELect is enclosed in a metallic NEMA 12 enclosure. It is available with or without an integral disconnect.

Installation Assistance

SELect is available in an open-frame configuration that allows the components of the SELect to be mounted without an enclosure inside switchgear or other user-provided enclosures.

Thank you for choosing the Current Technology SELect Surge Suppression System. We look forward to fulfilling your facility-wide surge suppression filter system needs.

Monday through Friday, 8:00 a.m. to 5:00 p.m. (EST):
800.238.5000 or 804.236.3300

Nights, weekends and U.S. holidays:
888.200.6400

Ten-Year Limited Warranty

Current Technology SELect products are warranted for a period of ten years from date of purchase.

Patent Notice

The Current Technology, Inc. SELect is protected by patents which may be issued after the publication of this document, as well as by one or more of the following patents: 5,023,746; 4,835,650; 4,675,538; 4,675,772; 5,191,502; 4,860,502; 4,127,888; 5,146,357; 4,794,490; 5,257,157. Current Technology, Inc will enforce and protect its patent rights as provided by Section 35 USC and a $500,000 litigation protection insurance policy.

Purpose and Applications of the SELect Surge Suppression Products

The SELect product family is designed to provide surge suppression to all connected loads within a distribution system. In addition to Selenium-Enhancement, the SELect uses proven Metal Oxide Varistors (MOVs) and an efficient capacitive filter system to reduce or eliminate transients, impulses, and high-frequency noise within a building's electrical system.

The Importance of Correct Installation

This manual provides guidelines for the proper installation of the SELect family of devices. Proper product selection and compliance with these guidelines will help your new suppression system provide years of reliable service. If installers are unsure about the facility electrical configuration or have other installation-related questions, it is recommended they consult with a master electrician or other qualified electrical professional.

When shortcuts are taken or installation procedures are not followed, the SELect system may be damaged or may not provide adequate protection. Improper installation may also void the warranty. It is extremely important to follow these installation procedures carefully.

This manual is designed to step you through the procedure of installing the SELect product and connecting it to your electrical system. However, should you have questions about installing the SELect please call Current Technology Technical Support at 800.238.5000.

W A R N I N G !

WARNING! The SELect's warranty is voided if the unit is damaged as a result of improper installation or the installer's failure to verify the following conditions prior to installation.

Pre-Installation Checklist

Before beginning

➤ Confirm that the voltage(s) and service configuration shown on the SELect product label are consistent with the voltage and service configuration of the facility to which it is being attached. A model number is printed on the label affixed to the inside of the SELect. Each model number corresponds to the voltage and service configurations printed in the table below:

PRODUCT LABEL DESIGNATION	SYSTEM VOLTAGE, SERVICE CONFIGURATION
SELxx-120/240-2G	120/240VAC, 1ø 3-wire SPLIT-PHASE, w/ground
SELxx-120/208-3GY	120/208VAC, 3ø 4-wire WYE, w/ground
SELxx-220/380-3GY	220/380VAC, 3ø 4-wire WYE, w/ground
SELxx-277/480-3GY	277/480VAC, 3ø 4-wire WYE, w/ground
SELxx-347/600-3GY	347/600VAC, 3ø 4-wire WYE, w/ground
SELxx-120/240-3GHD	120/240VAC, 3ø 4-wire high-leg DELTA, w/ground (B phase must be 208V)
SELxx-240-3DG	240VAC, 3ø 3-wire DELTA, w/ground
SELxx-480-3DG	480VAC, 3ø 3-wire DELTA, w/ground
SELxx -600-3DG	600VAC, 3ø 3-wire DELTA, w/ground

Note: Indicate SELect surge current rating by substituting 100, 150, 200, 250, or 300 for "xx" in the above model numbers.

➤ Check to ensure that a proper Xo bond is installed between the neutral and ground terminals at the transformer upstream from all 3ø WYE, 3ø high-leg DELTA, or 1ø SPLIT-PHASE SELect devices (see NEC article 250.) Lack of a proper bond will damage the SELect and void the warranty.

➤ Confirm that the environmental conditions are consistent with the following ranges:

- Ambient Temperatures: The SELect must be installed in an area with a temperature between -40° and +140°F.
- Humidity: The SELect must be installed in an area with relative humidity between 5% and 95% non-condensing.
- Altitude: The SELect must be installed in a location whose altitude is below 13,000 feet.

W A R N I N G !

WARNING! Discontinue installation if (1) your conditions are inconsistent with the checklist above or (2) your conditions cannot be verified. Call Current Technology Technical Support at 800.238.5000 if you have any questions.

Installation Methods for Common Service Configurations, for the Design Engineer and the Installer

The SELect is to be connected in parallel with the electrical system. It may be connected via a circuit breaker, molded case switch, fused switch, or connected directly to the bus of the panelboard or switchboard it is protecting. If direct bus connection is used, Current Technology, Inc. recommends that the SELect be equipped with the optional integral disconnect switch.

- Do not connect the SELect to the line side of the main service breaker or disconnecting means.
- Do not install the SELect where the available short circuit current to the SELect unit is less than 1500 RMS symmetrical amperes.

The SELect Surge Suppression System is also available in an open frame configuration – i.e. without an enclosure and with its component parts mountable in the user's equipment – e.g. switchgear. Instructions for both the enclosed and open frame configurations of the SELect are found in this manual.

Service Configurations

Figures 1-4 show the electrical relationship between the SELect and these four basic service configurations: WYE, DELTA, High-Leg DELTA and SPLIT-PHASE.

FIG. 1:
3-Phase, 4-Wire WYE

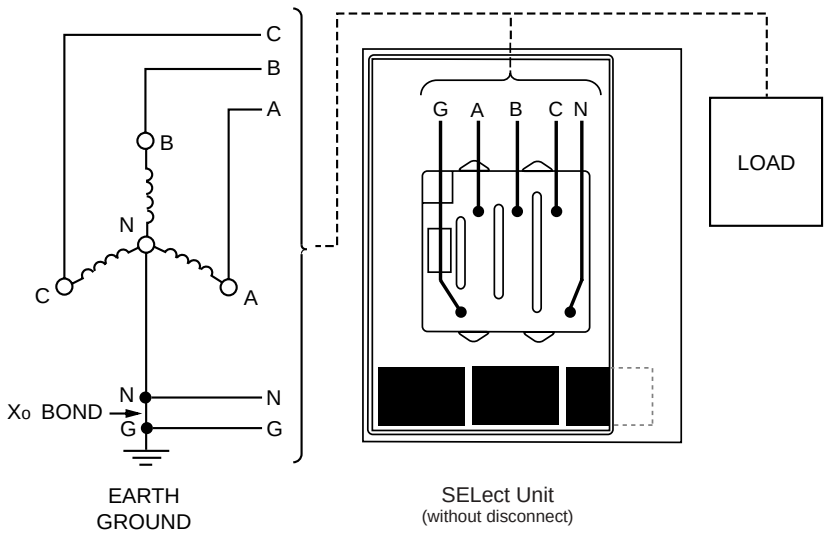


FIG. 2:
3-Phase, 3-Wire DELTA

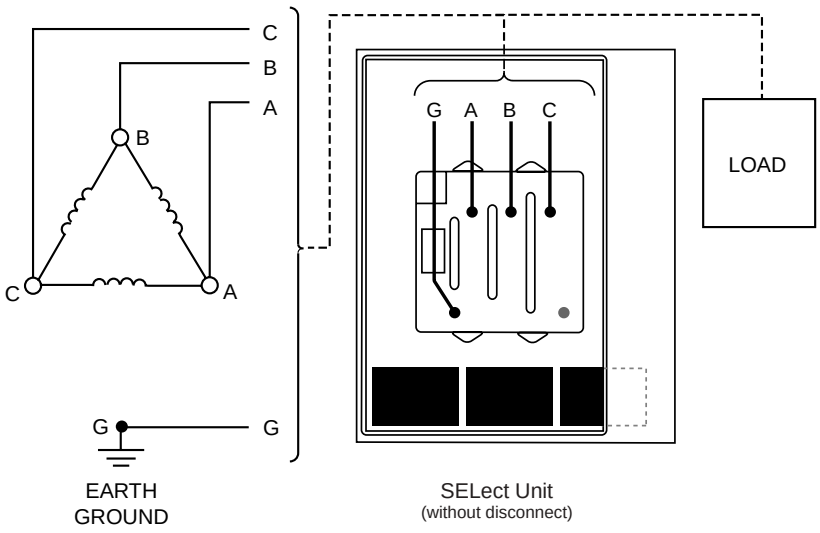
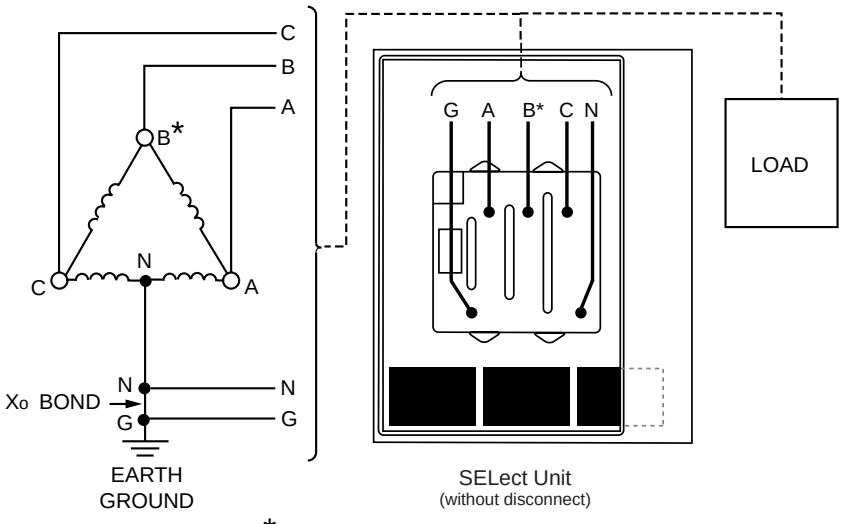
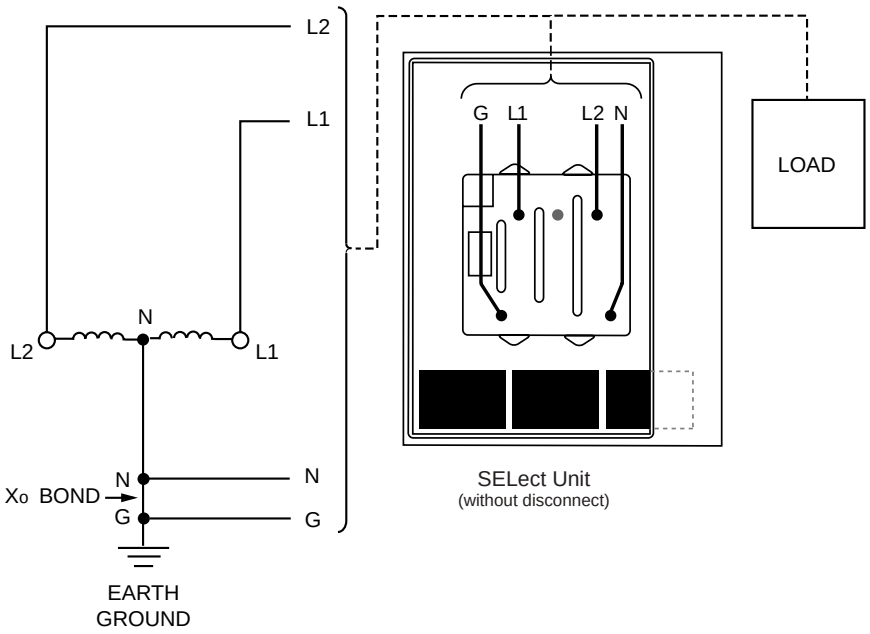


FIG. 3:
3-Phase, 4-Wire High-Leg DELTA



* NOTE: HIGH LEG MUST BE B PHASE

FIG. 4:
1-Phase, 3-Wire
SPLIT-PHASE



Plan Your Installation

WARNING: The performance of the SELect will be severely limited if the conductors are too long, are of too small a wire gauge, have too many bends or have sharp bends.

Conductor Routing: The above factors should be addressed during the design of an installation to ensure that there is a suitable place for the SELect reserved next to its point of connection to the electrical system. The selected mounting location should ensure short conductor runs providing a direct route with a minimum of bends. If bends are required they should be sweeping bends. Do not make sharp 90˚ bends for "aesthetic" purposes.

Conductor Length / Sizing and Overcurrent Protection

Conductor Length and Sizing: Conductor length **must** be kept as short as possible and avoid sharp bends. Conductor length **must** never exceed 10 feet in length from phase bus through the SELect to the neutral bus or ground bus. The following conductor sizes for phase, ground and neutral connections are recommended. However, where space and bending radii permit, use a larger conductor size.

Model	Use conductor lengths less than 10 feet
SEL100	#6 AWG
SEL150	#6 AWG
SEL200	#2 AWG
SEL250	#2 AWG
SEL300	#2 AWG

NOTE: The above conductor sizing recommendations ensure that the effective clamping voltage of the SELect at the point of connection is kept to a minimum in order to maximize protection. Increasing conductor size to compensate for increased distance has a negligible effect on minimizing clamping voltage. Additionally, conventional voltage-drop calculations appropriate for 60 Hz do not apply to transients.

Overcurrent Protection: The design may require or the installer may choose to connect the SELect to a circuit breaker, molded case switch or fused disconnect.

Current Technology recommends feeding all SELects not equipped with an integral disconnect with a circuit breaker, molded case switch or fused switch.

If a breaker or molded case switch is used for connecting the phase conductors Current Technology recommends a 100 amp rating.

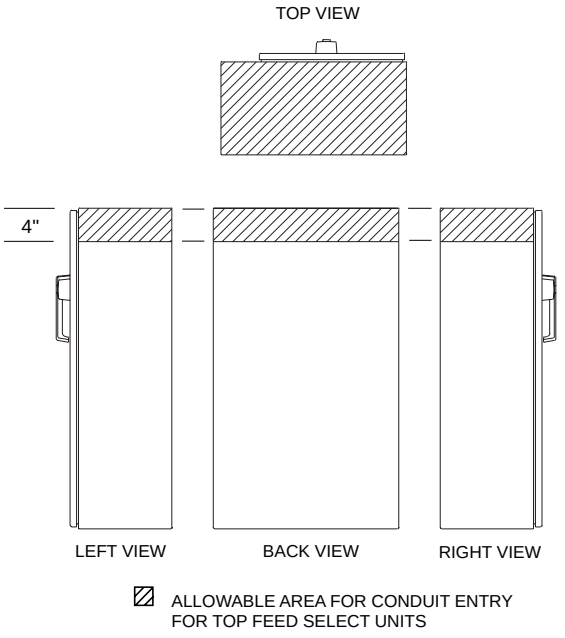
W A R N I N G !

WARNING: If the available short circuit current at the SELect is less than 1500 RMS symmetrical amperes do not install the SELect. Examples of systems with available short circuit currents less than 1500 amperes include the outputs of small UPS systems and small AC inverters.

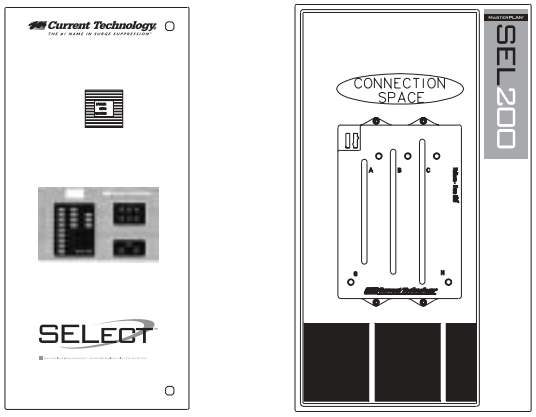
Conduit Openings

If desired, punch holes at this time for the conduit or nipple or wait until the SELect is mounted to the building structure.

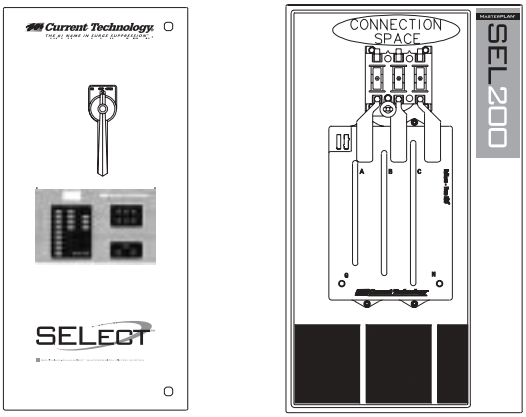
Punch holes only in the shaded areas as shown in the following illustration.



Typical Enclosure Configurations for All SELect Products (All are NEMA 4/12)



Top-Feed SELect without Disconnect

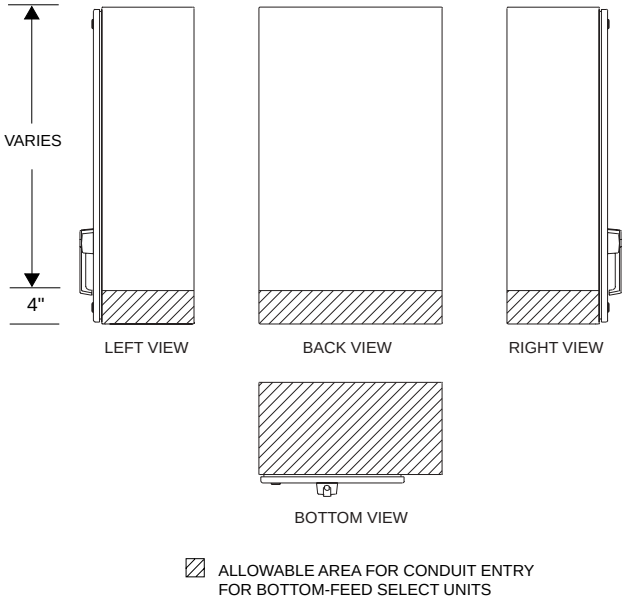


Top-Feed SELect with Disconnect

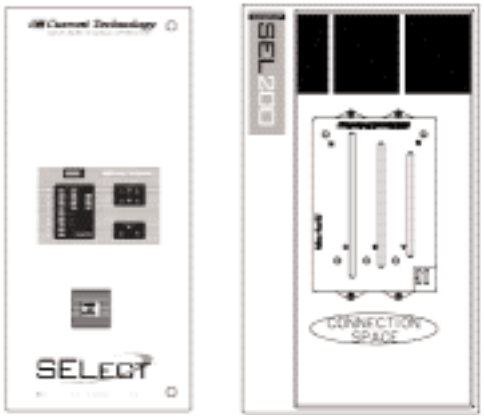
Option: Bottom-Feed SELect® Products

Conduit Openings for Bottom-Feed SELect Products

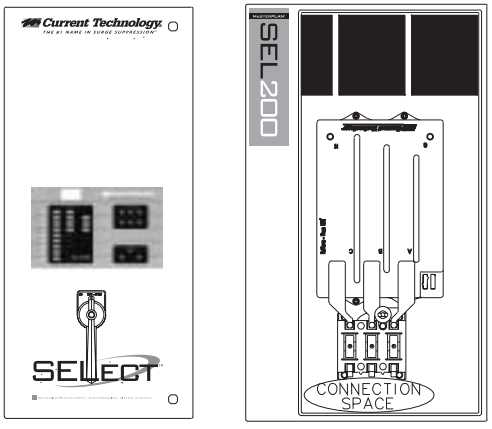
Punch holes only in the shaded areas as shown in the following illustration.



Typical Enclosure Configurations for Bottom-Feed SELect Products (All are NEMA 4/12)



Bottom-Feed SELect without Disconnect



Bottom-Feed SELect with Disconnect

Mounting

Mount the SELect to the building structure using construction methods and hardware appropriate for your site. Install the conduit and pull the conductors as specified above or according to the engineer's design.

Open-Frame Mounting

If your SELect is of the Open-Frame type – i.e. provided without an enclosure and designed for mounting inside switchgear or other user-provided enclosures, refer to the appendix for detailed dimensional data. This data is provided to aid in the design and fabrication of custom mounting arrangements unique to each type of open frame installation.

Electrical Connections

Phases, Neutral* and Ground: Connect the phase, neutral and ground conductors.

For SELects equipped with an integral disconnect switch connect the phase conductors to the line-side lugs on the disconnect and the ground and neutral* conductors to the lugs labled "G" and "N" lugs on the yellow device (ISB).

For SELects without an integral disconnect switch, connect the phase conductors to the lugs labeled "A", "B", and "C" on the ISB and the ground and neutral* conductors to the lugs labeled "G" and "N".

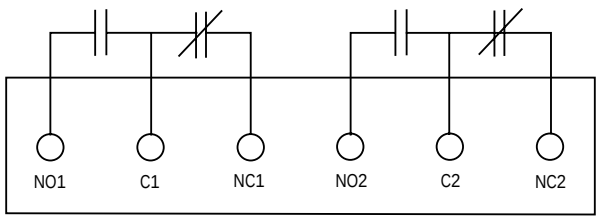
* DELTA-connected SELects do not have a neutral conductor.

Connecting Form C Dry Contacts

Dry Contacts: SELects equipped with Advanced Monitoring options have a dual set of Form "C" dry contacts available for connection to user-provided remote alarm and monitoring circuits.

The installer must provide the appropriate raceway and wiring for this circuit observing the restrictions on conduit openings illustrated in an earlier section of this manual. The installer must route the monitoring conductors via the SELect's door hinge to the blue terminal blocks on the door-mounted circuit board. Select the appropriate materials and routing to allow the door to open and close.

The following diagram shows the Form "C" contact configuration. The annotations on the diagram match the markings on the blue terminal block.



FCC TERMINAL BLOCK

Before Applying Power: Checklist

➤ Field Testing: Your SELect has been carefully tested before leaving the factory. However, the performance of this unit as a surge suppression device can be confirmed in the field prior to startup using a portable DTS-2 Tester.

The optional DTS-2 Tester may have been purchased along with your SELect or Field Startup Testing Service may have been specified during the purchase of the SELect. Check with the owner or owner's representative to see if this test is required at your site.

If you have questions about Field Startup Testing or would like to arrange for this service call Current Technology, Inc. Technical Support at 800.238.5000.

• **Confirm Pre-Installation Checklist:** Confirm that the "Pre-Installation Checklist" found in the beginning of this manual was completed correctly before proceeding.

• **Battery Installation:** Your SELect will be equipped with a 9-volt battery if you purchased "L2 Advanced Monitoring" or "L3 MasterMIND" monitoring. Look at the circuit board behind the door. If there is a 9-volt battery present it will need to be removed, turned around and reinserted into the holder so that the contacts "snap" into place. If the alarm sounds, press the "ALARM DISABLE" button on the front of the door. The battery is installed backwards for shipping purposes.

• **Confirm Line Voltage:** Measure the line to line voltages feeding the panelboard and be sure they are within ±10% of the rated line voltage of the SELect. Use the following table to determine the range of acceptable voltages for each model of the SELect.

Acceptable Voltage Ranges for All SELect Models

SELECT MODEL NO.	NOMINAL L-L VOLTAGE	-10% TO +10% L-L VOLTAGE
SELxx-120/240-2G	240	216 to 264
SELxx-120/208-3GY	208	188 to 228
SELxx-220/380-3GY	380	342 to 419
SELxx-277/480-3GY	480	432 to 528
SELxx-347/600-3GY	600	540 to 660
SELxx-120/240-3GHD	240	216 to 264
SELxx-240-3DG	240	216 to 264
SELxx-480-3DG	480	432 to 528
SELxx-600-3DG	600	540 to 660

Note: "xx" specifies rating of 100, 150, 200, 250, 300 kA

W A R N I N G !

WARNING! Do not apply power if the measured voltage is not within the range specified for the SELect model being installed.

➤ Apply power to the SELect by closing the circuit breaker or switch (if any) feeding the SELect or closing the SELect's integral disconnect.

➤ If you have either the L2 or L3 Advanced Monitoring options, be sure to re-enable the alarm by pressing the "ALARM DISABLE" button. The "ALARM DISABLED" light should not be illuminated and the alarm should not be audible.

Verify Proper Operation

Depending on which monitoring option your SELect came with, you can verify proper operation of the unit as follows:

SELect with base monitoring.

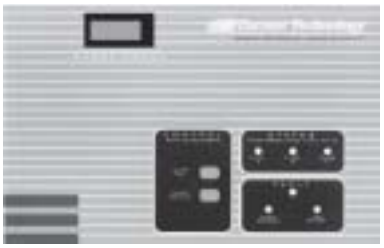
➤ **If your SELect has Base Monitoring** *(see picture)*: Verify that the green indicating lights are illuminated. Three-phase units have three (3) green indicating lights labeled "A", "B", and "C". Split-phase units should only have lights "A" and "C" illuminated.

SELect with L1 Advanced monitoring.

➤ **If your SELect has L1 Advanced Monitoring** *(see picture)*: Verify that only the green indicating lights are illuminated and that there are no red lights illuminated. Green lights indicate a normal condition for each phase. Red lights indicate a fault condition. Three-phase units have three (3) green indicating lights labeled "A", "B", and "C". Split-phase units should only have lights "A" and "C" illuminated.

The L1 Advanced Monitoring option is equipped with 2 sets of Form "C" contacts. The relay containing the contacts is in the "alarm condition" when the power is off to the unit, when the unit is encountering loss of power to one or more phases, or the SELect is encountering more than 50% loss of capacity due to internal fuse operation. Test the operation of the Form "C" contacts by de-energizing the SELect and checking the state of the contacts with a continuity tester or observing the effect of the contacts on the user-provided remote alarm circuits.

For additional information about the L1 Advanced Monitoring option, see the *Advanced Monitoring Operating Manual.*



SELect with L2 Advanced monitoring.

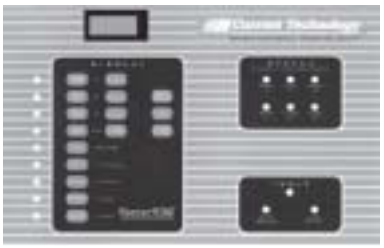
➤ **If your SELect has L2 Advanced Monitoring** *(see picture)*: Verify that the green indicating lights are illuminated and that the red "fault" light is off. Three-phase units have three (3) green indicating lights labeled "A", "B", and "C". Split-phase units should only have lights "A" and "C" illuminated.

The L2 Advanced Monitoring option contains an audible alarm that should not operate under normal conditions. The alarm can be tested by pressing the "ALARM TEST" button on the front of the door. The "LOW BATTERY" light should not be illuminated. If it is, change the 9 volt battery on the circuit board behind the door.

The L2 Advanced Monitoring option is also equipped with 2 sets of Form "C" contacts. The relay containing the contacts is in the "alarm condition" when the power is off to the unit, when the unit is encountering loss of power to one or more phases, or the SELect is encountering more than 50% loss of capacity due to internal fuse operation. Test the operation of the Form "C" contacts by de-energizing the SELect and checking the state of the contacts with a continuity tester or observing the effect of the contacts on the user-provided remote alarm circuits.

The L2 Advanced Monitoring option is equipped with a surge counter. The number of surges detected by the counter is displayed on a 6 digit LCD display on the front of the SELect door. The surge counter will also increment each time power is applied to the unit after being in the "off" state.

For additional information about the L2 Advanced Monitoring option, see the *Advanced Monitoring Operating Manual.*



SELect with L3 MasterMIND monitoring.

➤ **If your SELect has L3 MasterMIND Monitoring** *(see picture)*: Verify that the green indicating lights are illuminated and that the red "fault" light is off. Three-phase units have three (3) green indicating lights labeled "A", "B", and "C" for each phase, three (3) green indicating lights labeled "A", "B", and "C" for the filter capacitors, and three (3) green indicating lights labeled "A", "B", and "C" for the selenium cells. Split-phase units should only have lights "A" and "C" illuminated for each group.

The L3 MasterMind Monitoring option contains an audible alarm that should not operate under normal conditions. The alarm can be tested by pressing the ""ALARM TEST" button on the front of the door. The "LOW BATTERY" light should not be illuminated. If it is, change the 9-volt battery on the circuit board behind the door.

The L3 MasterMind Monitoring option is equipped with 2 sets of Form "C" contacts. The relay containing the contacts is in the "alarm condition" when the power is off to the unit, when the unit is encountering loss of power to one or more phases, when one or more filter capacitors has failed, when one or more of the selenium fuses has operated, or the SELect is encountering more than 50% loss of capacity due to internal fuse operation. Test the operation of the Form "C" contacts by de-energizing the SELect and checking the state of the contacts with a continuity tester or observing the effect of the contacts on the user-provided remote alarm circuits.

The L3 MasterMIND Monitoring option has the same features as the L2 Advanced Monitoring plus these additional features:

- RMS Voltage readout
- % Protection Available
- Swell Counter
- Surge Counter
- Sag Counter
- Outage Counter

For additional information about the L3 MasterMind Monitoring option, see the *Advanced Monitoring Operating Manual.*

Troubleshooting

Your Current Technology SELect surge suppression system does not require periodic maintenance. The unit's heavy-duty design should preclude the need for any repairs; however, the following indications and procedures may be appropriate:

INDICATION	PROCEDURE
One or more phase indicator lights are off.	1. Check that the external power source supplying power to unit is energized. 2. Check that the circuit breaker or switch (if appropriate) feeding the SELect is turned "on." 3. Check the cables connecting the door-mounted devices to the suppression module. 4. If all of above are O.K., contact factory. 5. If breaker is tripped, use a portable Diagnostic Test Set (DTS-2) to verify unit integrity before resetting the breaker.
MasterTest hand-held test unit or MasterMind Advanced Monitoring indicates less than 50% available capacity.	Contact factory.
Portable Diagnostic Test Set (Current Technology Model DTS-2) indications are not in range for the product.	Contact factory.

Installation Assistance

Our staff is available to support you around the clock.

Monday through Friday, 8:00 a.m. to 5:00 p.m. (EST):
800.238.5000 or 804.236.3300

Nights, weekends and U.S. holidays:
888.200.6400

Operation / Maintenance

The SELect Surge Suppression System should provide years of uninterrupted service.

With several levels of monitoring available, the user should be able to verify the normal operation of the SELect and confirm that it is connected correctly to the power system.

Current Technology, Inc. recommends two periodic tests to:

- Verify that the unit is able to clamp surges to an acceptable level.
- Verify that the unit has acceptable surge handling capacity.

These tests should be coordinated with scheduled maintenance events in your facility. They can be performed in house with the aid of the DTS-2 Portable Test Set and the MasterTEST Portable Set or requested as a service from Current Technology, Inc. or their authorized service representative.

Options

The SELect Surge Suppression System is available with the following options:

- L1 Advanced Monitoring
- L2 Advanced Monitoring
- L3 MasterMIND Monitoring
- DTS-2 Portable Test Kit
- MasterTEST Portable Test Kit

10-Year Warranty

The SELect is warranted to be defect-free and performance-guaranteed for up to 10 years.

Specifications

Size and Weight:

MODEL	ENCLOSURE SIZE / WEIGHT
SEL200-300	38”H x 22”W x 12”D / 150 lbs
SEL100-150	27”H x 22”W x 12”D / 100 lbs

Note: See Appendix for Open frame dimensions and weights.

Single-Pulse Surge Ratings: The following single pulse surge ratings are measured and presented in accordance with NEMA LS1-1992 and can be verified with independent laboratory test reports:

SEL100 – 100 kA: All modes
SEL150 – 150 kA: All modes
SEL200 – 200 kA: All modes
*SEL250 – 250 kA: All modes
*SEL300 – 300 kA: All modes

*In compliance with NEMA LS1-1992, SELect suppression filter systems are single pulse surge current tested in all modes at rated currents of the product by an industry-recognized independent test laboratory. Single pulse surge current capacities of 200,000 amps or less are established by single-unit testing of all components or sub-assemblies within a mode. Due to present industry test equipment limitations, single pulse surge current capacities over 200,000 amps are established via testing of individual conponents or sub-assemblies within a mode. Per ANSI/IEEE C62.41-1991 and ANSI/IEEE C62.45-1992, SELect suppression filter systems are repetitive surge current capacity tested per mode utilizing a 1.2 x 50 µsec 20KV open circuit voltage, 8 x 20 µsec 10 kA short circuit current Category C3 bi-wave at one minute intervals without suffering either performance degradation or more than 10% deviation of clamping voltage at a specified surge current.

Repetitive Surge Rating: The following repetitive surge current capacities were achieved in all modes utilizing a 1.2 x 50 µsec, 20 kV open circuit voltage, 8 x 20 µsec, 10 kA short circuit current Category C3 bi-wave at one minute intervals without performance degradation of more than 10% deviation of clamping voltage.

REPETITIVE SURGE CURRENT CAPACITY PER MODE	
MODEL	**IMPULSES**
SEL100	> 11,000
SEL150	> 12,000
SEL200	> 13,000
SEL250	> 14,000
SEL300	> 15,000

Operating Frequency: 47 to 63 Hertz

Noise Attenuation: The following EMI-RFI noise rejection, or attenuation values, for SELect are in compliance with test and evaluation procedures outlined in NEMA LS1 –1992, paragraphs 2.2.11 and 3.11.:

EMI-RFI FILTER ATTENUATION (dB)				
	ATTENUATION FREQUENCY			
PRODUCT	100 KHz	1MHz	10MHz	100MHz
SEL200, 250, 300	41 dB	31 dB	35 dB	53 dB
SEL100, 150	44 dB	33 dB	36 dB	53 dB

Note: Standardized insertion loss data obtained utilizing MIL-STD-220A 50 ohm insertion loss methodology. Noise source path = 100' to model maximum average circuit distance, filter connection distance = 6".

Standards and Listings

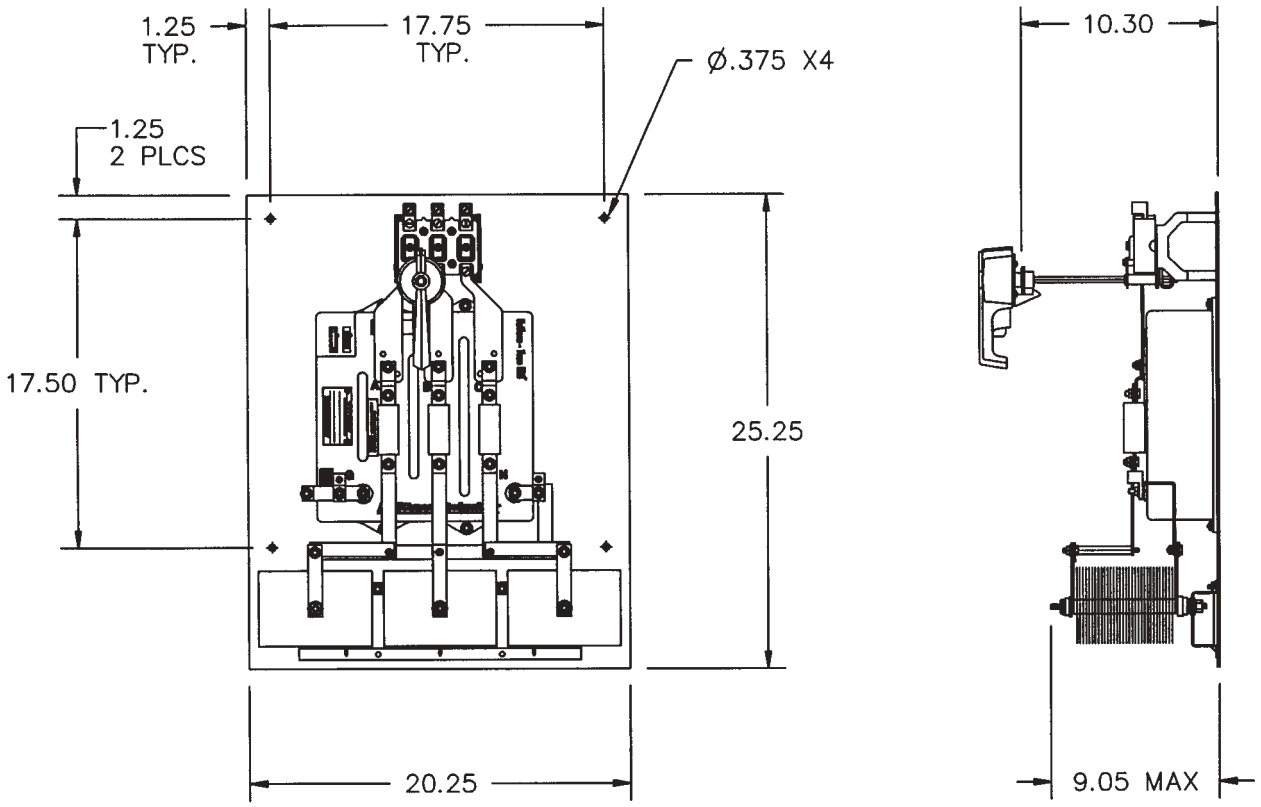
The following standards and listings apply to the SELect product line:

ANSI/IEEE C62.41 – 1991 and C62.45 – 1992
ANSI/IEEE C62.1 and C62.11
Canadian Standards (CUL)
FIPS PUB 94
NEMA LS1-1992 Guidelines
NFPA (NEC), 75 and 78
UL 1449 2nd Edition, 1283, 489, 198

For additional information see the SELect Suppression Filter System Guide Specifications.

Appendix: Open-Frame Drawings

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
1	ENGINEERING RELEASE	10/07/99	PJ | MFG
2	ENGINEERING RELEASE	10/14/99	PJ | MFG
3	ENGINEERING RELEASE	12/5/99	FS | MFG



NOTES: UNLESS OTHERWISE SPECIFIED

1. WEIGHT: 100 LBS MAX.
2. OPTIONAL LENGTH SHAFT KITS AVAILABLE FROM MANUFACTURER.

QTY REQ'D	SHT. NO.	ITEM NO.	PART NUMBER	DESCRIPTION/NOMENCLATURE

DRAWN BY: M.F. GOMES DATE 09/30/99
CHECKED BY: DATE 12/2/99
ENGINEERING: DATE 12/5/99
MANUFACTURING: DATE
QUALITY CONTROL: DATE
FORMAL RELEASE: DATE
REVISION BY: M.F. GOMES DATE 12/02/99
PLOT DATE: 12/02/99

CURRENT TECHNOLOGY, INC.
3001 WEST STORY RD. IRVING, TEXAS 75038

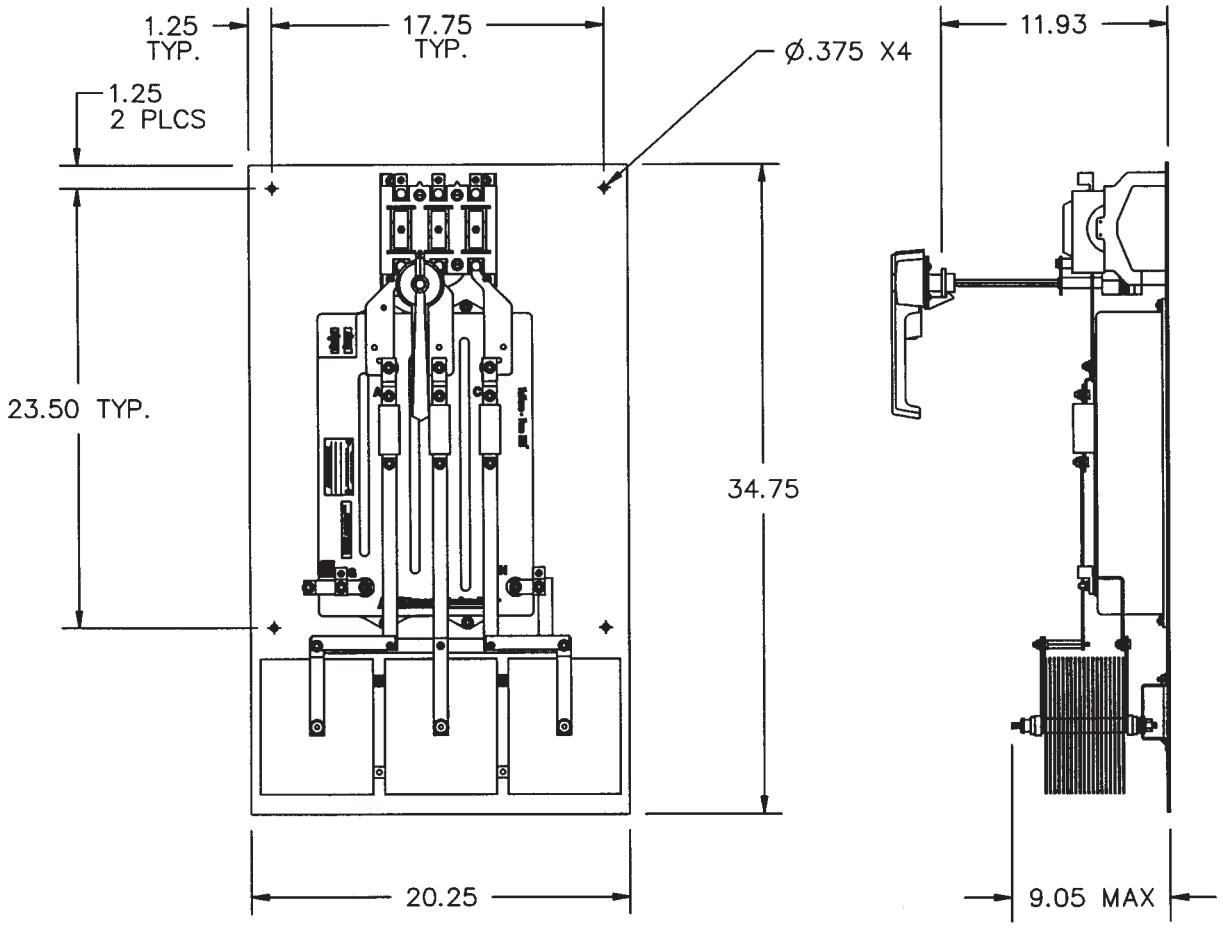
TITLE: DWG, OUTLINE, OPEN FRAME, SEL100–150, WITH DISCONNECT

SIZE	DRAWING NO.	REV.
A	780–0008–009	3

SCALE: NONE | CAD FILE NO. 00080093 | SHT 1 OF 1

Appendix: Open-Frame Drawings

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
1	ENGINEERING RELEASE	10/07/99	PJ | MFG
2	ENGINEERING RELEASE	10/14/99	PJ | MFG
3	ENGINEERING RELEASE	12/5/99	FS | MFG



NOTES: UNLESS OTHERWISE SPECIFIED

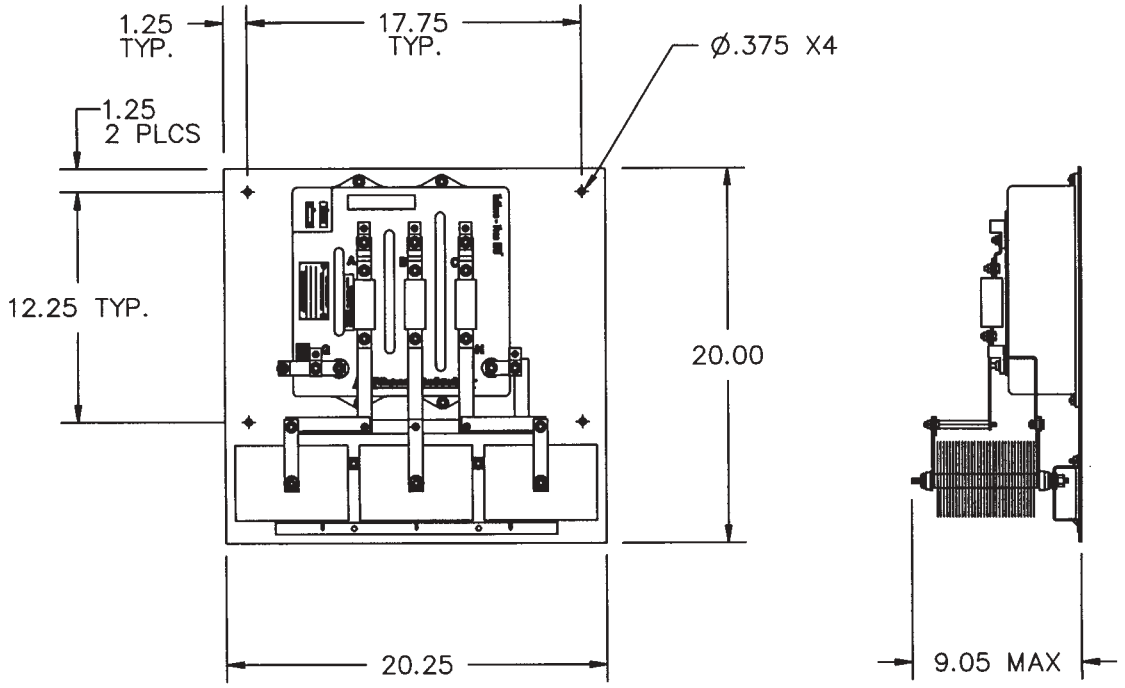
1. WEIGHT: 150 LBS MAX.
2. OPTIONAL LENGTH SHAFT KITS AVAILABLE FROM MANUFACTURER.

QTY REQ'D	SHT. NO.	ITEM NO.	PART NUMBER	DESCRIPTION/NOMENCLATURE

DRAWN BY: JERRY D. BATES DATE 09/30/99	CURRENT TECHNOLOGY, INC.
CHECKED BY: Jerry D Bates 12/3/99 DATE	3001 WEST STORY RD. IRVING, TEXAS 75038
ENGINEERING: F. Shutes 12/5/99 DATE	TITLE: DWG, OUTLINE, OPEN FRAME, SEL200–300, WITH DISCONNECT
MANUFACTURING: DATE	
QUALITY CONTROL: DATE	
FORMAL RELEASE: DATE	SIZE A | DRAWING NO. 780–0008–010 | REV. 3
REVISION BY: M.F. GOMES DATE 12/03/99	
PLOT DATE: 12/03/99	SCALE: NONE | CAD FILE NO. 00080103 | SHT 1 OF 1

Appendix: Open-Frame Drawings

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
1	ENGINEERING RELEASE	10/07/99	PJ | MFG
2	ENGINEERING RELEASE	10/14/99	PJ | MFG
3	ENGINEERING RELEASE	12/5/99	FS | MFG



NOTES: UNLESS OTHERWISE SPECIFIED

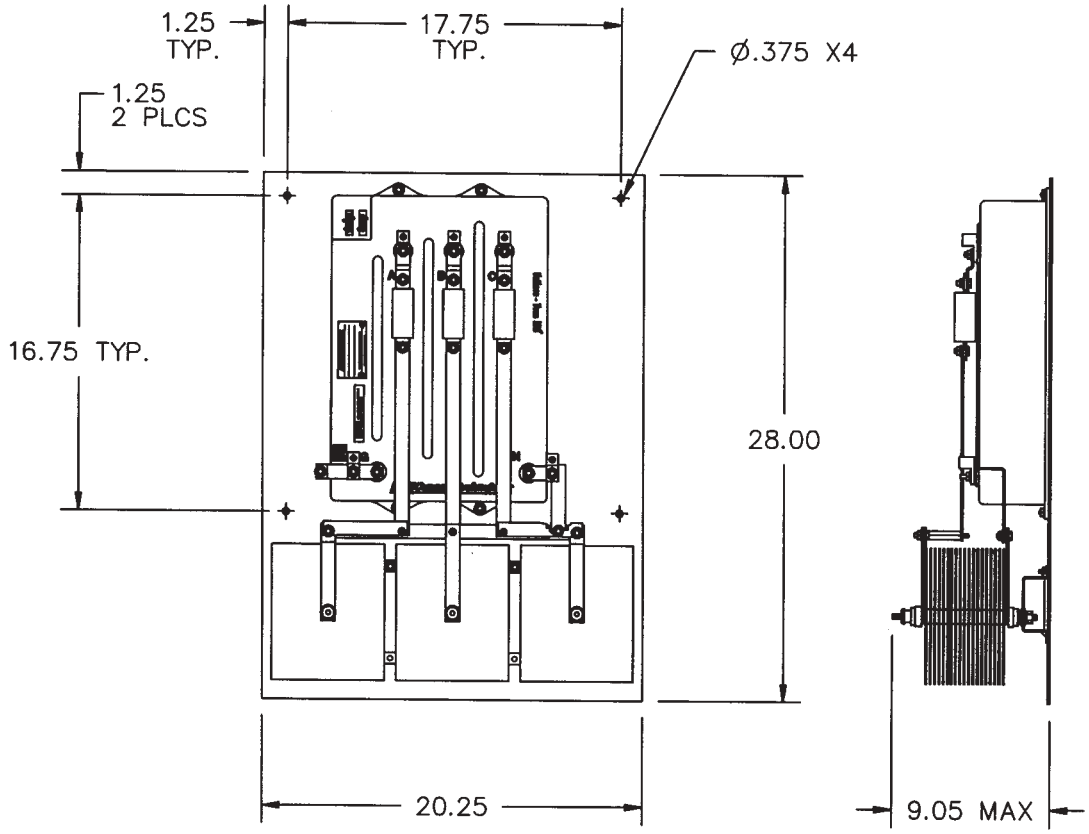
1. WEIGHT: 100 LBS MAX.

QTY REQ'D	SHT. NO.	ITEM NO.	PART NUMBER	DESCRIPTION/NOMENCLATURE

DRAWN BY: M.F. GOMES DATE 09/30/99	CURRENT TECHNOLOGY, INC.
CHECKED BY: DATE 12/6/99	3001 WEST STORY RD. IRVING, TEXAS 75038
ENGINEERING: F. Schatz DATE 12/5/99	TITLE: DWG, OUTLINE, OPEN FRAME, SEL100–150, W/O DISCONNECT
MANUFACTURING: DATE	
QUALITY CONTROL: DATE	
FORMAL RELEASE: DATE	
REVISION BY: M.F. GOMES DATE 12/02/99	SIZE A | DRAWING NO. 780–0008–007 | REV. 3
PLOT DATE: 12/02/99	SCALE: NONE | CAD FILE NO. 00080073 | SHT 1 OF 1

Appendix: Open-Frame Drawings

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
1	ENGINEERING RELEASE	10/07/99	PJ | MFG
2	ENGINEERING RELEASE	10/14/99	PJ | MFG
3	ENGINEERING RELEASE	12/5/99	FS | MFG



NOTES: UNLESS OTHERWISE SPECIFIED

1. WEIGHT: 150 LBS MAX.

QTY REQ'D	SHT. NO.	ITEM NO.	PART NUMBER	DESCRIPTION/NOMENCLATURE

DRAWN BY: JERRY D. BATES DATE 09/30/99
CHECKED BY: DATE 12/2/99
ENGINEERING: F. Shetty DATE 12/5/99
MANUFACTURING: DATE
QUALITY CONTROL: DATE
FORMAL RELEASE: DATE
REVISION BY: M.F. GOMES DATE 12/02/1999
PLOT DATE: 12/02/1999

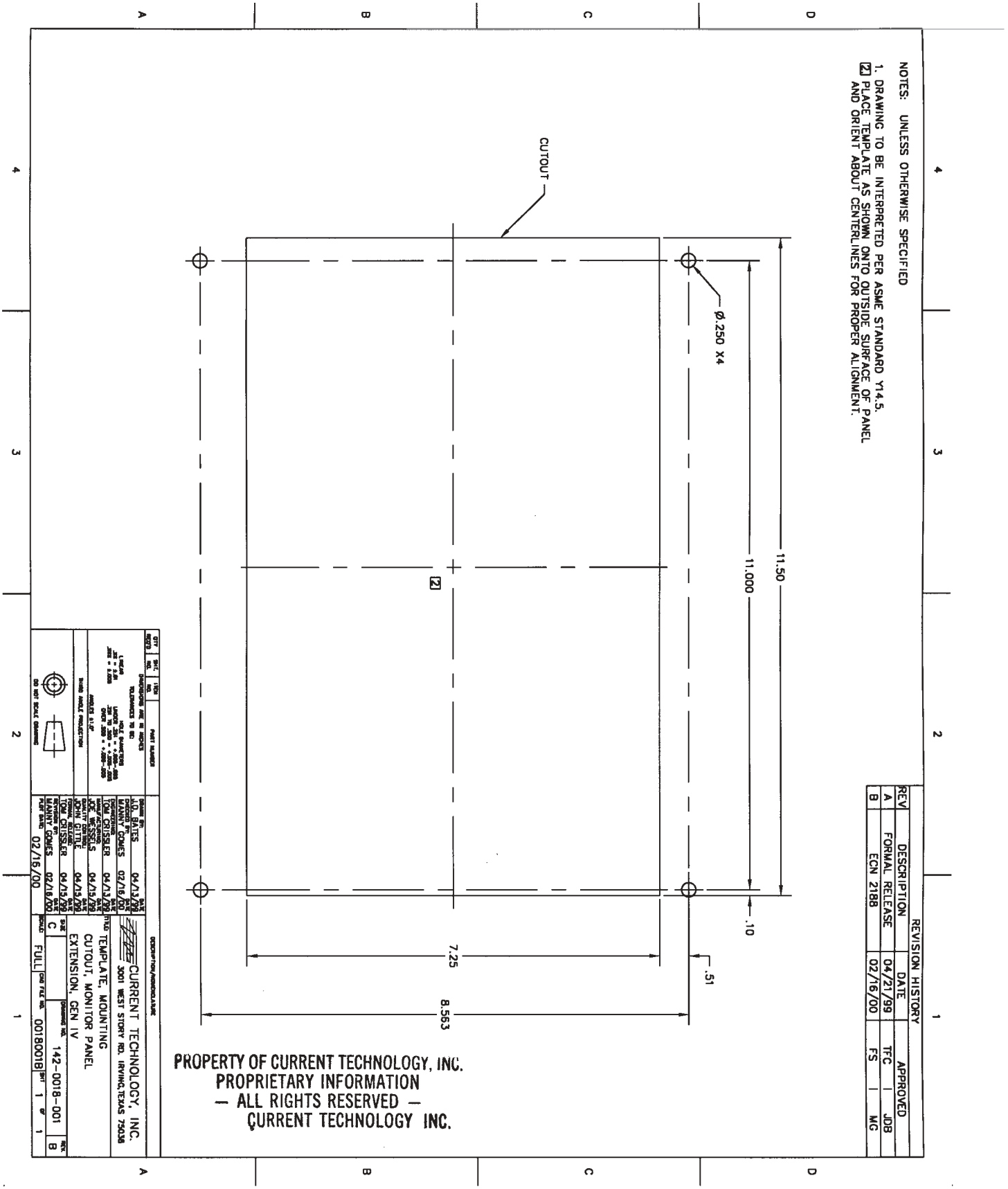
CURRENT TECHNOLOGY, INC.
3001 WEST STORY RD. IRVING, TEXAS 75038

TITLE: DWG, OUTLINE,
OPEN FRAME, SEL200–300,
W/O DISCONNECT

SIZE	DRAWING NO.	REV.
A	780–0008–008	3

SCALE: NONE | CAD FILE NO. 00080083 | SHT 1 OF 1

Appendix: Template, Mounting Cutout



Notes

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Danaher Power Solutions
Current Technology Products
5900 Eastport Blvd.
Richmond, VA 23231

Tel: 804.236.3300
800.238.5000
www.currenttechnology.com
info@currenttechnology.com