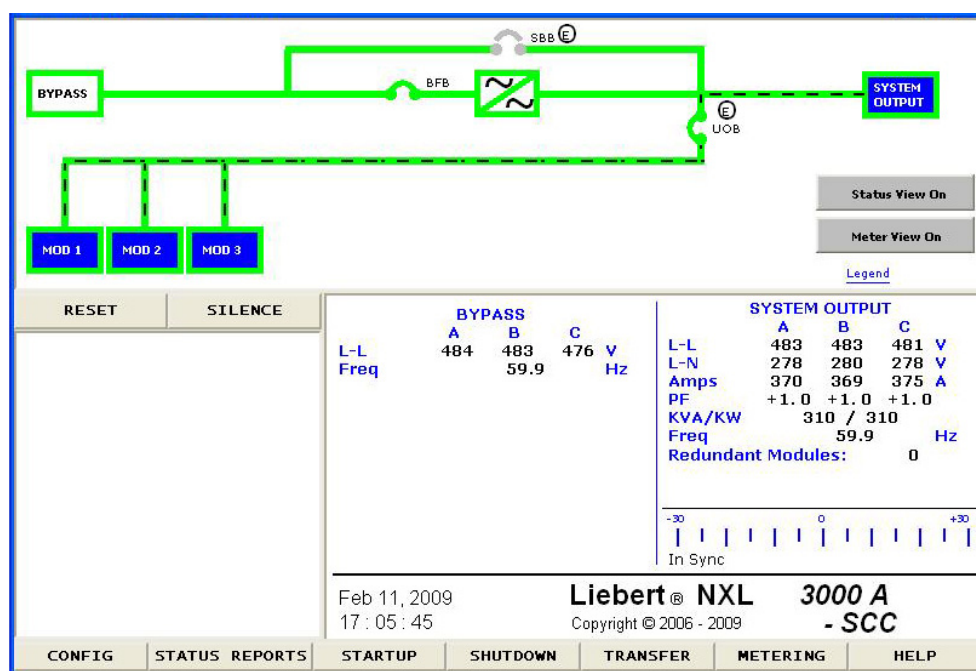


# Liebert® NXL™ System Control Cabinet , SCCi

Installation Manual – 1600A-5000A, 60Hz, Three-Phase



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## CONTACTING EMERSON NETWORK POWER<sup>®</sup> FOR SUPPORT

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Contact Emerson Network Power Liebert<sup>®</sup> Services for information or repair service in the United States at 1-800-LIEBERT (1-800-543-2378).

For repair or maintenance service outside the 48 contiguous United States, contact Liebert Services, if available in your area. For areas not covered by Liebert Services, the authorized distributor is responsible for providing qualified, factory-authorized service.

Have the following information available before calling Liebert Services:

Part Numbers: \_\_\_\_\_

Serial Numbers: \_\_\_\_\_

kVA Rating: \_\_\_\_\_

Date Purchased: \_\_\_\_\_

Date Installed: \_\_\_\_\_

Location: \_\_\_\_\_

Input Voltage/Frequency: \_\_\_\_\_

Output Voltage/Frequency: \_\_\_\_\_

Battery Reserve Time: \_\_\_\_\_

### Product Warranty Registration

To register for warranty protection, visit the **Service and Support** section of our Web site at:

[www.liebert.com](http://www.liebert.com)

Click on **Product Registration** and fill out the form.

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## IMPORTANT SAFETY INSTRUCTIONS

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### SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation of your Liebert NXL™ SCCi Bypass Static Switch and Ebox. Read this manual thoroughly, paying special attention to the sections that apply to your installation, before working with the unit. **Retain this manual for use by installing personnel.**



### WARNING

Risk of electrical shock. Can cause personal injury or death.

Only properly trained and qualified personnel wearing appropriate safety headgear, gloves, shoes and glasses should be involved in installing the modules or preparing the modules for installation. When performing maintenance with any part of the equipment under power, service personnel and test equipment should be standing on rubber mats.

In case of fire involving electrical equipment, use only carbon dioxide fire extinguishers or those approved for use in fighting electrical fires.

Extreme caution is required when performing installation and maintenance.

Special safety precautions are required for procedures involving handling, installation and maintenance of the UPS system. Observe all safety precautions in this manual before handling or installing the module. Observe all precautions in the Operation and Maintenance Manual, SL-25414, before as well as during performance of all maintenance procedures.



### AVERTISSEMENT

Risque de décharge électrique pouvant causer des blessures graves, voire mortelles.

Seuls des employés qualifiés et dûment formés portant un casque, des gants, des chaussures et des lunettes de sécurité adéquats doivent se charger d'installer le système ASC ou de le préparer pour l'installation. Les responsables de l'entretien et l'équipement d'essai doivent reposer sur des tapis de caoutchouc lors de toute intervention sur une pièce d'équipement sous tension.

En cas d'incendie associé à du matériel électrique, n'utilisez que des extincteurs à dioxyde de carbone ou homologués pour la lutte contre les incendies d'origine électrique.

Les opérations d'installation et d'entretien requièrent une extrême prudence.

Des précautions de sécurité spéciales sont requises pour les procédures associées à la manutention, à l'installation et à l'entretien du système ASC. Observez toutes les précautions de sécurité décrites dans le présent manuel avant de manipuler ou d'installer le système ASC. Observez également toutes les précautions décrites dans le manuel d'utilisation et d'entretien, SL-25414, avant et pendant toutes les procédures d'entretien. Observez toutes les précautions de sécurité appropriées lorsque vous travaillez sur à proximité d'une source c.c.



### WARNING

Risk of heavy unit falling over. Improper handling can cause equipment damage, injury or death.

Exercise extreme care when handling UPS cabinets to avoid equipment damage or injury to personnel. The Bypass Static Switch module's weight is approximately 1000lb (455kg).

Locate center of gravity symbols  and determine unit weight before handling each cabinet. Test lift and balance the cabinets before transporting. Maintain minimum tilt from vertical at all times.

Read all of the following instructions before attempting to move, lift, or remove packaging from unit, or prepare unit for installation.



## AVERTISSEMENT

Le centre de gravité élevé de l'appareil présente un risque de renversement. Une mauvaise manutention peut entraîner des dommages matériels, des blessures et même la mort. Faites preuve d'une extrême prudence lors de la manutention des armoires ASC afin d'éviter de les endommager ou de blesser le personnel. Le module ASC pèse jusqu'à 3 455 kg (1 000 lb). Identifiez les symboles de centre de gravité  et déterminez le poids de l'appareil avant de manipuler chaque armoire. Testez le levage et l'équilibre des armoires avant de transporter l'appareil. Maintenez en tout temps l'inclinaison verticale minimale.

Les fentes situées à la base des armoires du module sont conçues pour utiliser le chariot élévateur. Les fentes situées à la base peuvent soutenir le système seulement si les fourches se trouvent complètement sous le système.

Lisez toutes les instructions ci-dessous avant de tenter de déplacer, lever, déballer ou préparer le système en vue de son installation.



## WARNING

Risk of electrical shock and fire. Can cause equipment damage, personal injury or death. Under typical operation and with all doors closed, only normal safety precautions are necessary. The area around the system should be kept free of puddles of water, excess moisture and debris.

Only test equipment designed for troubleshooting should be used. This is particularly true for oscilloscopes. Always check with an AC voltmeter to ensure safety before making contact or using tools. Even when the power is turned Off, dangerously high potential electric charges may exist at the capacitor banks.

All wiring must be installed by a properly trained and qualified electrician. All power and control wiring must comply with all applicable national, state and local codes.

One person should never work alone, even if all power is disconnected from the equipment. A second person should be standing by to assist and to summon help in case of an accident.



## AVERTISSEMENT

Risque de décharge électrique et d'incendie. pouvant entraîner des dommages matériels, des blessures et même la mort.

Les précautions de sécurité habituelles suffisent lorsque le système ASC est en mode de fonctionnement normal et que toutes les portes sont fermées. La zone entourant le système ASC doit être exempte de flaques d'eau, d'humidité excessive et de débris.

Seuls des équipements d'essai conçus pour le dépannage doivent être utilisés. Cette mise en garde couvre notamment les oscilloscopes. Utilisez toujours un voltmètre c.a. et c.c. pour vérifier les tensions avant d'établir un contact ou d'utiliser des appareils. Des tensions dangereusement élevées peuvent demeurer dans les batteries de condensateurs et au niveau des raccords c.c., même une fois l'alimentation coupée.

Tous les raccords doivent être effectués par un électricien dûment formé et qualifié. Tous les câbles d'alimentation et de commande doivent être conformes aux codes nationaux et locaux en vigueur.

Une personne ne devrait jamais travailler seule, même si toute l'alimentation d'entrée est coupée. Une deuxième personne devrait toujours être présente pour porter assistance ou chercher de l'aide en cas d'accident.



## NOTE

*Materials sold hereunder cannot be used in the patient vicinity (e.g., use where UL, cUL or IEC 60601-1 is required). Medical applications, such as invasive procedures and electrical life support equipment, are subject to additional terms and conditions.*

## NOTICE

This unit complies with the limits for a Class A digital device, pursuant to Part 15 Subpart J of the FCC rules. These limits provide reasonable protection against harmful interference in a commercial environment. This unit generates, uses and radiates radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this unit in a residential area may cause harmful interference that the user must correct at his own expense.

## **1.0 MECHANICAL INSTALLATION**

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### **1.1 Introduction**

The Liebert NXL SCCi switchgear cabinet can be used to interconnect multiple Liebert NXL UPS units into a single power system. The system of Liebert NXL modules provides continuous, high-quality AC power to your business-critical equipment, such as telecommunications and data processing equipment.

The Liebert NXL UPSs will supply power that is free of the disturbances and variations in voltage and frequency common to utility power, which is subject to brownouts, blackouts, surges and sags.

The Liebert SCCi will permit the user to switch the entire system into maintenance bypass simultaneously for maintenance or repair without interruption in service.

### **1.2 Preliminary Checks**

This chapter is a guide to general procedures and practices that should be observed by the installing personnel. The particular conditions of each site will determine the applicability of such procedures.

Before installing the Liebert NXL SCCi, please carry out the following preliminary checks:

- Examine the Liebert NXL SCCi for transit damage, both internally and externally. Report any damage to the shipper immediately.
- Verify that the correct equipment is being installed. The Liebert NXL SCCi cabinet has an identification tag on the interior doors listing the type, size and main calibration parameters of the UPS.
- Verify that the UPS room satisfies the environmental conditions stipulated in the equipment specification, paying particular attention to the ambient temperature and air exchange system.

### **1.3 Bypass Backfeed Breaker**

For systems using the 4000A or 5000A 480V static switch at 150kAIC, the Bypass Backfeed Breaker (BFB) must be Listed UL 489 (Molded Case Circuit Breaker) or UL 1066 (Low Voltage AC Power Circuit Breaker) that is required to be used in UL-listed switchgear or switchboards. The circuit breaker must have a short-time rating not exceeding 480V at 150,000 amperes, for five cycles.

### **1.4 Neutral Connections**

All UPS output neutrals in a Liebert NXL system must be tied together. This keeps any unbalanced currents or circulating currents off the ground path. If the system is a 3-wire system, Emerson recommends putting the neutral-ground bond at this tie point.

## 1.5 Static Switch Installation



### WARNING

Risk of heavy object falling suddenly. Can cause equipment damage, personal injury or death.



### AVERTISSEMENT

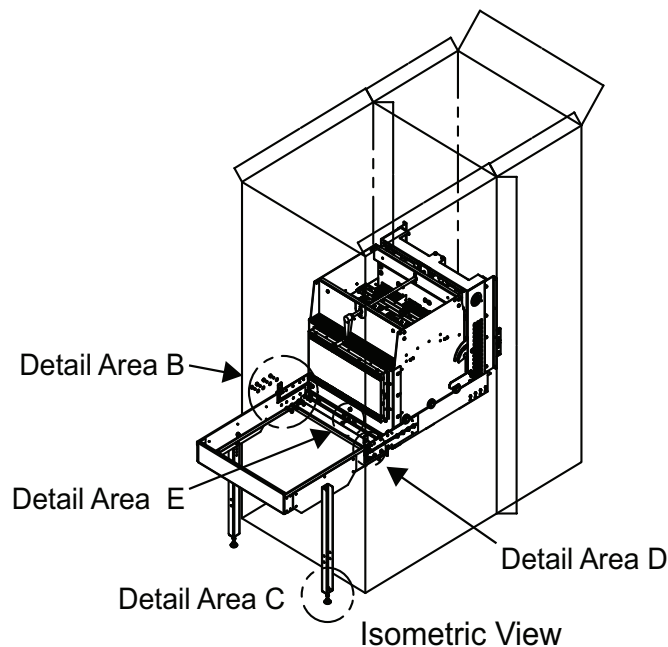
Le centre de gravité élevé de l'appareil présente un risque de renversement. Une mauvaise manutention peut entraîner des dommages matériels, des blessures et même la mort.

The static switch is heavy (975lb. [442kg]) and could fall if it is not properly supported when it is extended. Do not attempt to rack out static switch before all hardware is installed as instructed in the steps below.

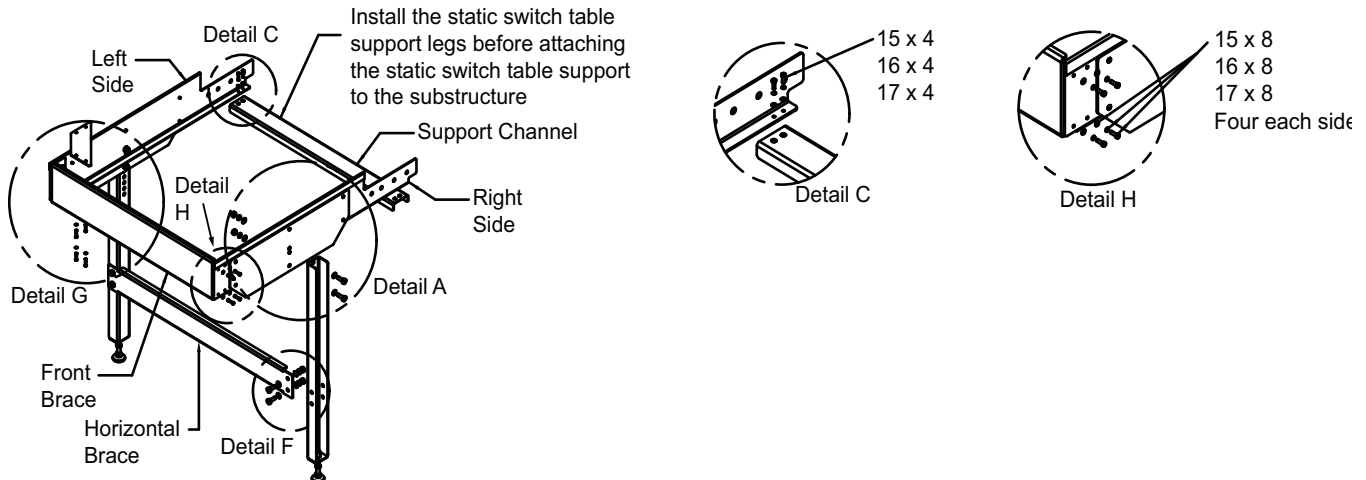
When the front support plate is removed the static switch is free to roll onto the static switch support table. The support table must be leveled before the static switch is racked out of the cabinet.

Ensure that no one gets under the static switch for any reason when it is racked out of the cabinet and supported by the static switch table support. Refer to **Figure 1** and to the following steps to install the static switch.

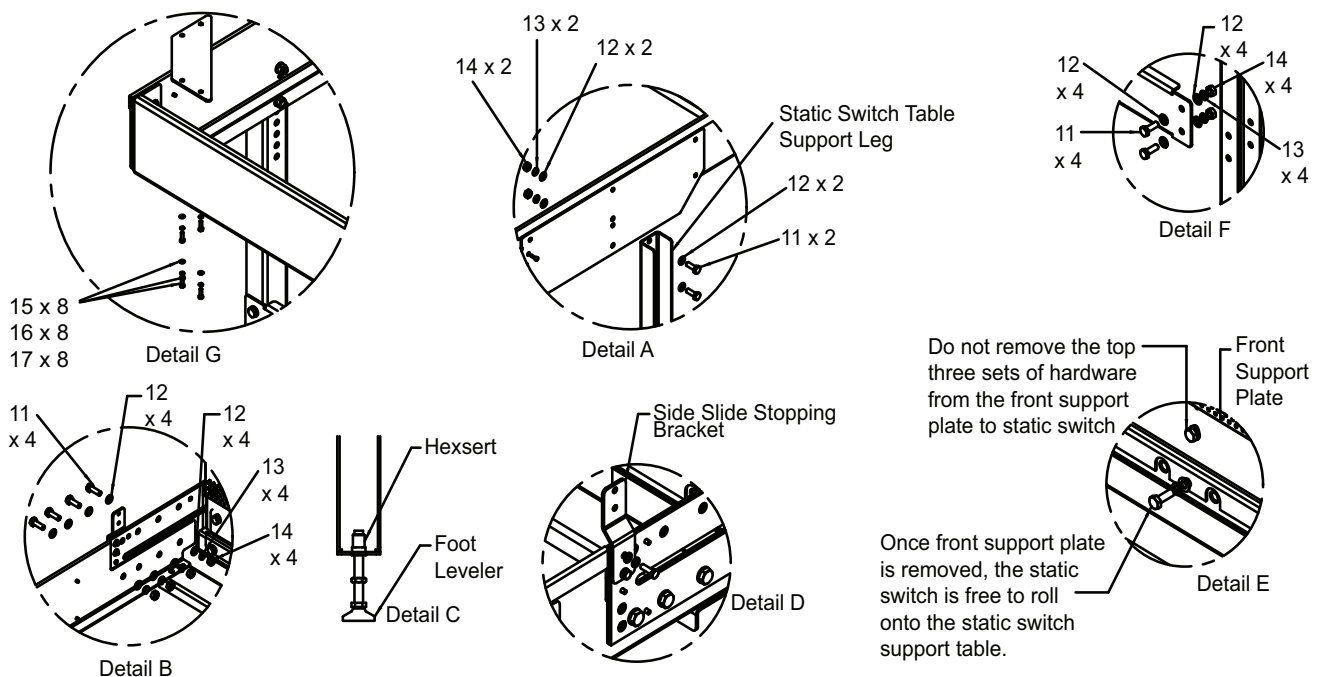
**Figure 1 Static switch installation**



1. Remove the static switch support table kit from under the static switch.
2. Attach the support channel to the left and right sides using the hardware shown in Detail C in **Figure 2**.
3. Attach the front brace to the left and right sides with the hardware shown in Detail H in **Figure 2**.

**Figure 2 Static switch installation, steps 1 through 3**

4. Attach the support angles to the front brace and sides using the hardware shown in Detail G in **Figure 3**.
5. Prior to installing static switch table support to the substructure, install the static switch table support legs using the hardware as shown in Detail A in **Figure 3**.
6. Attach horizontal brace using hardware as shown in Detail F in **Figure 3**.
7. Pull out the substructure slides and attach the static switch table support to substructure slides using hardware as shown in Detail B in **Figure 3**.
8. Level the static switch table support to the floor using the foot levelers attached to each static switch table support leg. ensure that a minimum of (2) full threads are showing past the hexsert when leveling the static switch support table in Detail C in **Figure 3**.
9. Remove the hardware from side slide stopping brackets as shown in Detail D in **Figure 3**.
10. Remove only the hardware that attaches the front support plate to the substructure. Leave the support plate and associated hardware attached to the static switch as shown in Detail E in **Figure 3**. The static switch can be moved forward after removal of the side slide stopping brackets and front support plate.
11. Rack out the static switch. After the static switch has been disengaged, move it forward to the front of the static switch table support.

**Figure 3 Static switch installation, steps 4 through 10**

## 2.0 CONTROL CABLE CONNECTIONS AND COMMUNICATION

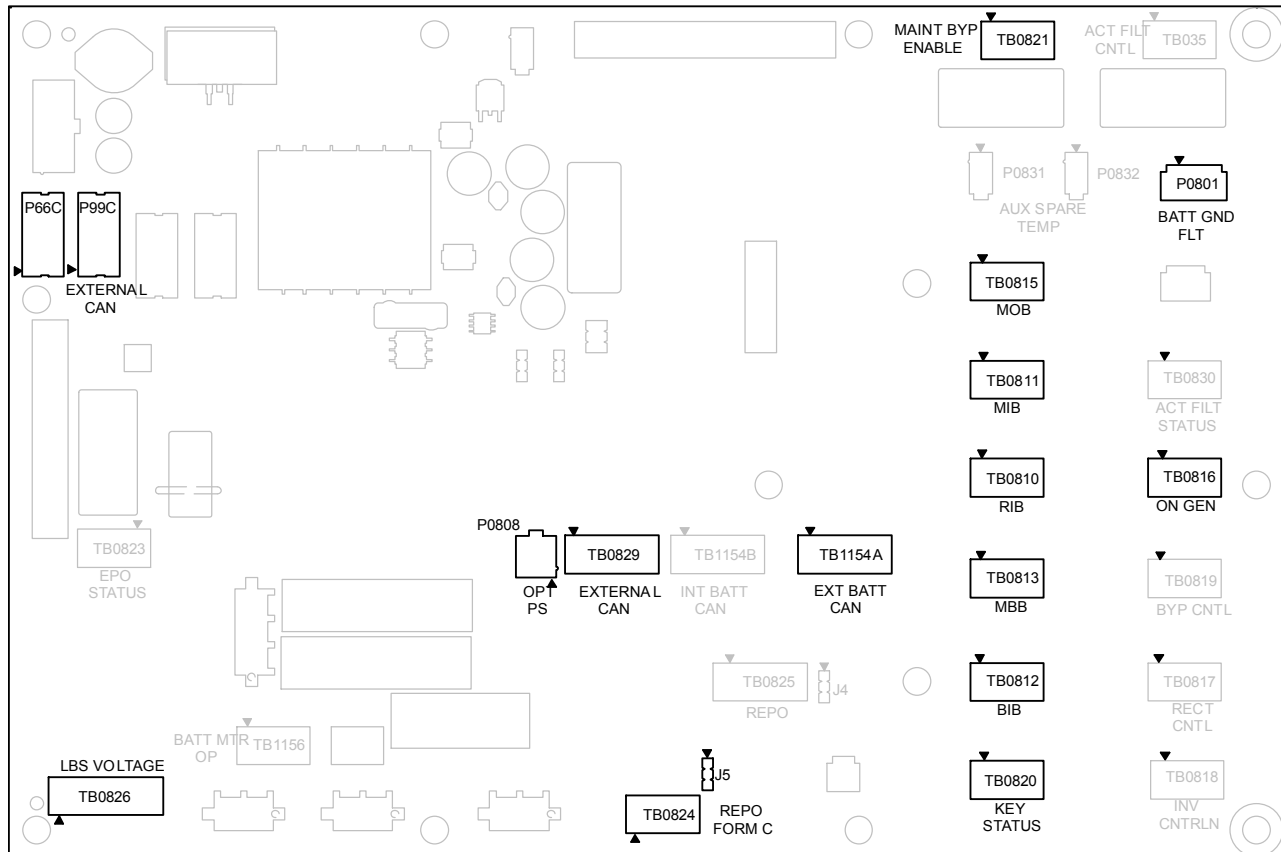
Based on your site's specific needs, the SCC may require auxiliary connections to communicate with a personal computer, provide alarm signaling to external devices or for Remote Emergency Power Off (REPO). The External Interface Board, arranged for this purpose, is next to the option box in the Rectifier section (refer to **3.0 - Installation Drawings**).



### NOTE

*Unless otherwise noted, use copper or aluminum conductors suitable for at least 75°C.*

**Figure 4 External Interface Board connections layout**



## 2.1 Dry Contacts



### NOTE

*If connection to more than one module is required, use a separate contact for each module.*

**Table 1 SCC input dry contacts**

| Item                         | Terminal Block | Pin | Connects to<br>(Description of External Item)                                      | Wire Size/<br>Max Length   |
|------------------------------|----------------|-----|------------------------------------------------------------------------------------|----------------------------|
| Remote EPO<br>Input Form C   | TB0824         | 1   | REPO Switch, normally open contact                                                 | 14AWG/<br>500ft.<br>(150m) |
|                              |                | 2   | REPO Switch, common contact                                                        |                            |
|                              |                | 3   | REPO Switch, normally closed contact, set jumper J5: 1-2 to enable, 2-3 to disable |                            |
| On Generator<br>Input Form C | TB0816         | 1   | On Generator switch, closed = On Generator                                         |                            |
|                              |                | 2   | On Generator switch, common                                                        |                            |
|                              |                | 3   | On Generator switch, closed = Not On Generator                                     |                            |

**Table 2 SCC control contacts with maintenance bypass**

| Item                                       | Terminal Block | Pin | Connects to<br>(Description of External Item)             | Wire Size/<br>Max Length |
|--------------------------------------------|----------------|-----|-----------------------------------------------------------|--------------------------|
| Maintenance Isolation Breaker (MIB) Form C | TB0811         | 1   | CB aux. contact, closed = CB is closed                    | 14AWG/500ft.<br>(150m)   |
|                                            |                | 2   | CB aux. contact, common                                   |                          |
|                                            |                | 3   | CB aux. contact, closed = CB is open                      |                          |
| Maintenance Bypass Breaker (MBB) Form C    | TB0813         | 1   | CB aux. contact, closed = CB is closed                    | 14AWG/500ft.<br>(150m)   |
|                                            |                | 2   | CB aux. contact, common                                   |                          |
|                                            |                | 3   | CB aux. contact, closed = CB is open                      |                          |
| Maintenance Bypass Enable Form C           | TB0821         | 1   | Maintenance Bypass Cabinet, closed = load not on inverter | 14AWG/500ft.<br>(150m)   |
|                                            |                | 2   | Maintenance Bypass Cabinet, common                        |                          |
|                                            |                | 3   | Maintenance Bypass Cabinet, closed = load on inverter     |                          |
| Remote EPO Input                           | TB0825         | 1   | REPO Switch, normally open contact                        | 14AWG/500ft.<br>(150m)   |
|                                            |                | 2   | REPO Switch, common contact                               |                          |
| Key Status Input Form C <sup>1</sup>       | TB0820         | 1   | Key status switch, closed = key removed                   | 14AWG/500ft.<br>(150m)   |
|                                            |                | 2   | Key status switch, common                                 |                          |
|                                            |                | 3   | Key status switch, closed = key inserted                  |                          |
| Module Output Breaker (MIB) Form C         | TB0815         | 1   | CB aux. contact, closed = CB is closed                    | 14AWG/500ft.<br>(150m)   |
|                                            |                | 2   | CB aux. contact, common                                   |                          |
|                                            |                | 3   | CB aux. contact, closed = CB is open                      |                          |
| Rectifier Input Breaker (RIB) Form C       | TB0810         | 1   | CB aux. contact, closed = CB is closed                    | 14AWG/500ft.<br>(150m)   |
|                                            |                | 2   | CB aux. contact, common                                   |                          |
|                                            |                | 3   | CB aux. contact, closed = CB is open                      |                          |
| Bypass Input Breaker (BIB) Form C          | TB0812         | 1   | CB aux. contact, closed = CB is closed                    | 14AWG/500ft.<br>(150m)   |
|                                            |                | 2   | CB aux. contact, common                                   |                          |
|                                            |                | 3   | CB or Switch aux. contact, closed = CB or switch is open  |                          |

1. Key Status Input can be either Form-C, N.O. or N.C. contact

**Table 3 SCC control contacts to remote alarm status panel**

| Item                         | Terminal Block | Pin | Connects to<br>(Description of External Item) | Wire Size/<br>Max Length |
|------------------------------|----------------|-----|-----------------------------------------------|--------------------------|
| CAN Bus and 24V Power Supply | TB0829         | 1   | Remote Status Panel TB-2                      | 18AWG/1000ft.<br>(300m)  |
|                              |                | 2   | Remote Status Panel TB-1                      |                          |
|                              |                | 3   | Remote Status Panel TB-3                      |                          |
|                              |                | 4   | Remote Status Panel TB-4                      |                          |

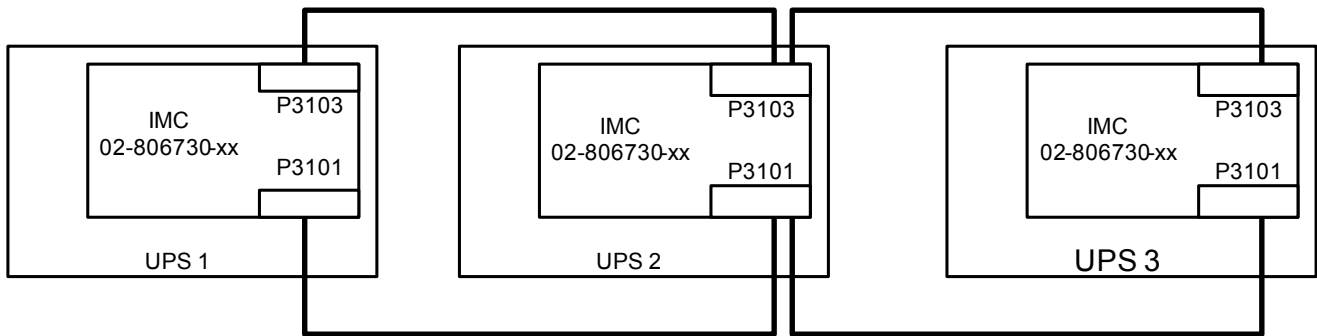
## 2.2 Multi-Module Communication

Paralleling cables that connect the module to the system are connected to terminals P3101 and P3103 on the Inter-Module Communication (IMC) board (refer to **3.0 - Installation Drawings**).

**Table 4 Parallel from SCC module Inter-Module Communication Board to other Inter-Module Communication Board in system**

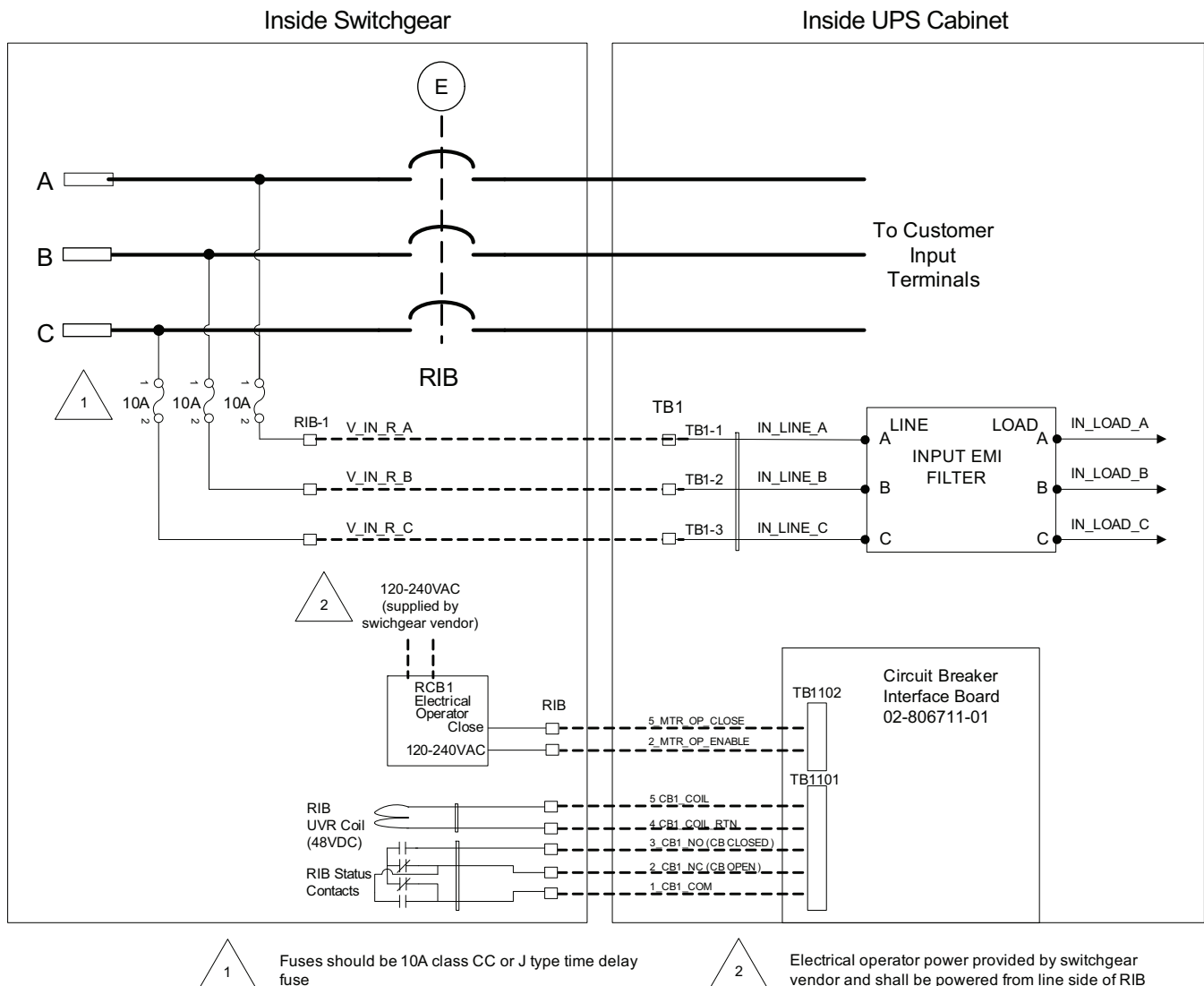
| Terminal Designation  |          | Signal Name                    | Wire Size/<br>Max Length     |
|-----------------------|----------|--------------------------------|------------------------------|
| From                  | To       |                                |                              |
| Primary Connections   |          |                                |                              |
| P3101-1               | P3101-1  | Share CAN +24V                 | #24AWG/<br>1000ft.<br>(300m) |
| P3101-2               | P3101-2  | Share CAN common               |                              |
| P3101-3               | P3101-3  | System CAN +24V                |                              |
| P3101-4               | P3101-4  | System CAN common              |                              |
| P3101-5               | P3101-5  | SER synch CAN+24V              |                              |
| P3101-6               | P3101-6  | SER synch CAN common           |                              |
| P3101-7               | P3101-7  | Ground                         |                              |
| P3101-14              | P3101-14 | Ground                         |                              |
| P3101-8               | P3101-8  | PWM synch CAN +24V             |                              |
| P3101-9               | P3101-9  | PWM synch CAN common           |                              |
| P3101-10              | P3101-10 | MMS synch CAN +24V             |                              |
| P3101-11              | P3101-11 | MMS synch CAN common           |                              |
| Redundant Connections |          |                                |                              |
| P3103-1               | P3103-1  | Redundant share CAN +24V       | #24AWG/<br>1000ft.<br>(300m) |
| P3103-2               | P3103-2  | Redundant share CAN common     |                              |
| P3103-3               | P3103-3  | Redundant system CAN +24V      |                              |
| P3103-4               | P3103-4  | Redundant system CAN common    |                              |
| P3103-5               | P3103-5  | Redundant SER synch CAN +24V   |                              |
| P3103-6               | P3103-6  | Redundant SER synch CAN common |                              |
| P3103-7               | P3103-7  | Ground                         |                              |
| P3103-14              | P3103-14 | Ground                         |                              |
| P3103-8               | P3103-8  | Redundant PWM synch CAN +24V   |                              |
| P3103-9               | P3103-9  | Redundant PWM synch CAN common |                              |
| P3103-10              | P3103-10 | Redundant MMS synch CAN +24V   |                              |
| P3103-11              | P3103-11 | Redundant MMS synch CAN common |                              |

1. Belden 810x or Belden 89901 cables are the only approved cables.
2. Belden 89901 cable can be used for underground installations.
3. If using multiple parallel cables for each run, all cables must be run in the same conduit.
4. Each cable group should be run in a separate grounded conduit to ensure redundancy.
5. The maximum lengths must include all the parallel cables from the first module to the last module. The primary and redundant cable lengths can be counted separately.
6. The ground pins on the Inter-Module Communication Board (Pins 7 and 14) are connected together on the board. If using cable with only one (1) drain wire, then connect the ground (drain wire) to Pin 7.
7. Care must be taken so drain wire does not touch any other component in module.
8. Attach control wires to side of control door where Inter-Module Board (IMC) is attached. Do not run wires across IMC board.

**Figure 5 Inter-Module Communication Board wiring diagram—Multi-modules**

### 2.3 Remote Input Breaker (RIB)

For systems that use Remote Input Breakers (RIB), the controls for the Aux contacts, UVR, Motor Operator (optional) and voltage sense will go between the Remote breaker and the SCC Input I/O section. See **Figure 6**.

**Figure 6 Remote Input Breaker diagram**

RIB must be Listed UL 489 (Molded Case Circuit Breaker) or UL 1066 (Low Voltage AC Power Circuit Breaker) that are required to be used in UL-listed switchgear or switchboards. The circuit breaker must have a short-time rating not exceeding 480 Volts at 150K Amperes, for 5 cycles.

See **Table 12** for required current ratings.

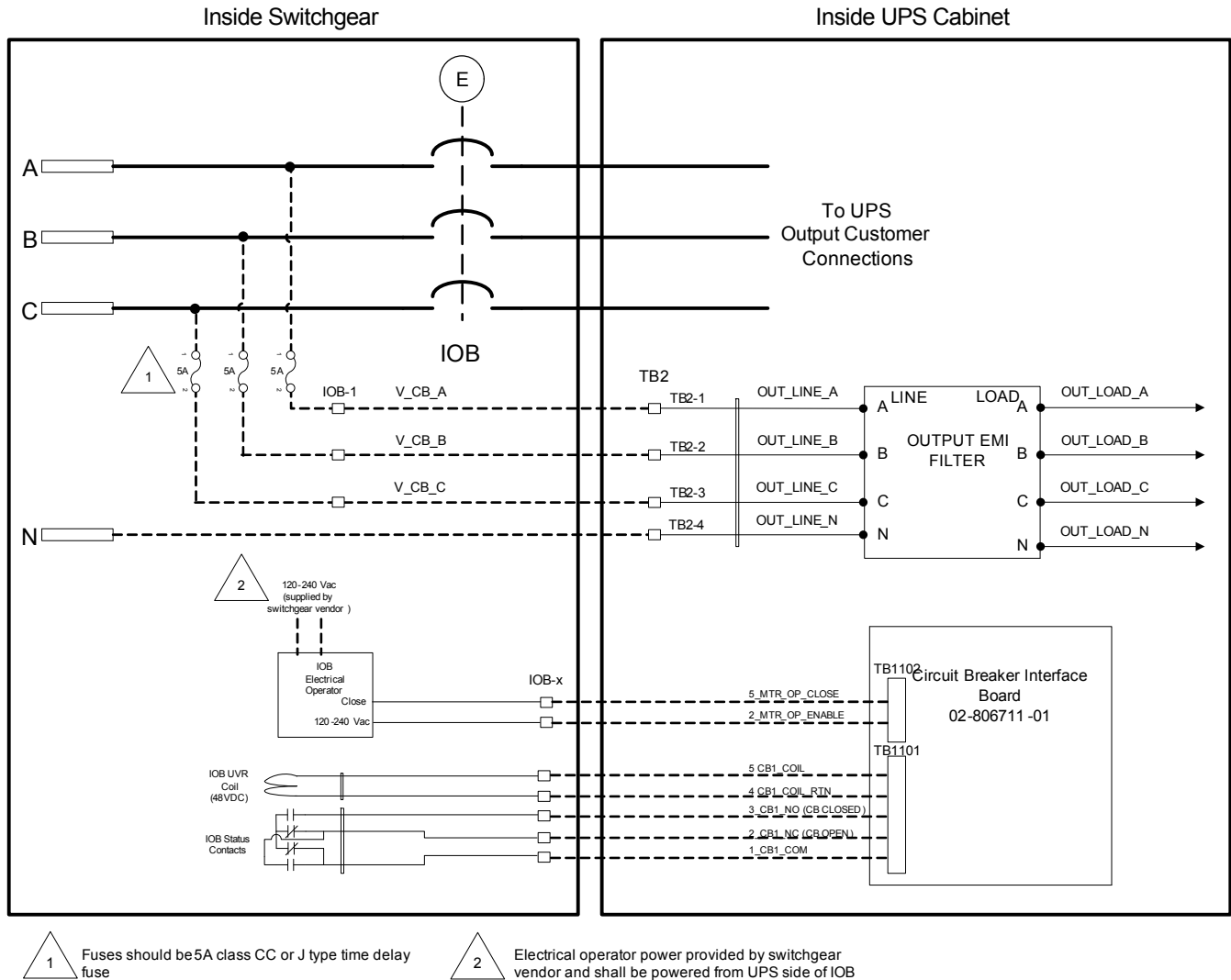
**Table 5 RIB UV coil, aux. contacts from SCC RIB CB interface board to remote CB1**

| Terminal Designation                                                                                    |          | Signal Name                           | Wire Size/<br>Max Length |
|---------------------------------------------------------------------------------------------------------|----------|---------------------------------------|--------------------------|
| From                                                                                                    | To       |                                       |                          |
| Remote Breaker<br>Contacts                                                                              | TB1101-1 | RIB aux. common                       | #14AWG/<br>500ft. (150m) |
|                                                                                                         | TB1101-2 | RIB aux. N.C. (closed = CB is open)   |                          |
|                                                                                                         | TB1101-3 | RIB aux. N.O. (closed = CB is closed) |                          |
|                                                                                                         | TB1101-4 | RIB trip coil (-)                     |                          |
|                                                                                                         | TB1101-5 | RIB trip coil (+)                     |                          |
| Remote RIB motor operator control contacts from remote breaker to SCC RIB CB interface board (optional) |          |                                       |                          |
| Remote Breaker Motor<br>Operator Contacts                                                               | TB1102-2 | AC line                               | #14AWG/<br>500ft. (150m) |
|                                                                                                         | TB1102-5 | Motor operator close                  |                          |
| Remote RIB voltage sense from remote breaker to SCC                                                     |          |                                       |                          |
| Remote Breaker<br>Voltage Sense                                                                         | TB1-1    | Voltage sense PH A                    | #14AWG/<br>500ft. (150m) |
|                                                                                                         | TB1-2    | Voltage sense PH B                    |                          |
|                                                                                                         | TB1-3    | Voltage sense PH C                    |                          |

## 2.4 Inverter Output Breaker (IOB)

For systems that use Inverter Output Breakers (IOB), the controls for the Aux contacts, UVR, Motor Operator (optional) and voltage sense will go between the Remote breaker and the SCC Output I/O section. See **Figure 7**.

IOB must be Listed UL 489 (Molded Case Circuit Breaker) or UL 1066 (Low Voltage AC Power Circuit Breaker) that are required to be used in UL-listed switchgear or switchboards. The circuit breaker must have a short-time rating not exceeding 480 Volts at 150K Amperes, for 5 cycles.

**Figure 7 Remote Output Breaker diagram**

See **Table 13** for required current ratings.

**Table 6 Remote IOB contacts from remote breaker to SCC IOB CB interface board**

| Terminal Designation                                                  |          | Signal Name                           | Wire Size/<br>Max Length |
|-----------------------------------------------------------------------|----------|---------------------------------------|--------------------------|
| From                                                                  | To       |                                       |                          |
| Remote Breaker<br>Contacts                                            | TB1101-1 | IOB aux. common                       | #14AWG/<br>500ft. (300m) |
|                                                                       | TB1101-2 | IOB aux. N.C. (closed = CB is open)   |                          |
|                                                                       | TB1101-3 | IOB aux. N.O. (closed = CB is closed) |                          |
|                                                                       | TB1101-4 | IOB trip coil (-)                     |                          |
|                                                                       | TB1101-5 | IOB trip coil (+)                     |                          |
| Remote IOB contacts from remote breaker to SCC IOB CB interface board |          |                                       |                          |
| Remote Breaker Motor<br>Operator Contacts                             | TB1102-2 | AC line                               | #14AWG/<br>500ft. (300m) |
|                                                                       | TB1102-5 | Motor operator close                  |                          |
| Remote IOB contacts from remote breaker to SCC IOB CB interface board |          |                                       |                          |
| Remote Breaker<br>Voltage Sense                                       | TB1-1    | Voltage sense PH A                    | #14AWG/<br>500ft. (300m) |
|                                                                       | TB1-2    | Voltage sense PH B                    |                          |
|                                                                       | TB1-3    | Voltage sense PH C                    |                          |

## 2.5 Digital LBS

The Load Bus Sync interface enables independent SCC units to remain in sync when operating on battery or when supplied by unsynchronized input sources.

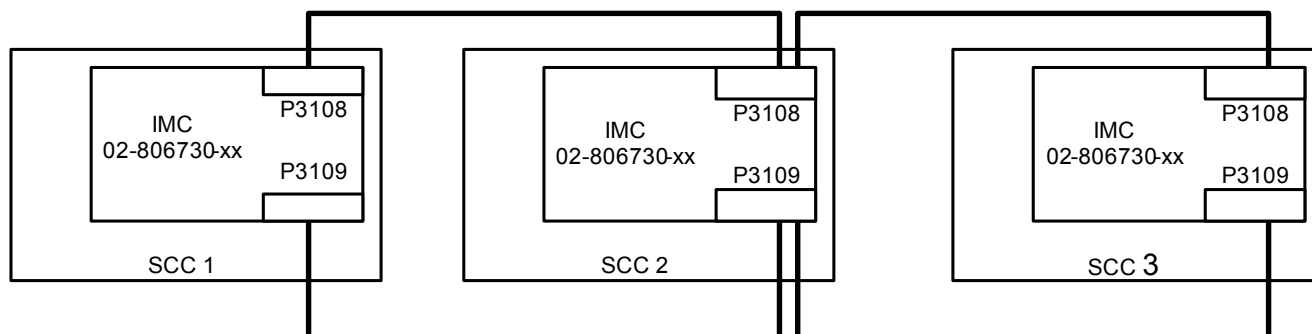
Digital LBS cables that connect the module to the system are connected to terminals P3108 and P3109 on the Inter-Module Communication (IMC) board. See **Figure 8**.

**Table 7 Wire size, length for digital LBS connection of SCC Inter-Module Communication Boards**

| Terminal Designation                                                                                          |         | Signal Name              | Wire Size/<br>Max Length |
|---------------------------------------------------------------------------------------------------------------|---------|--------------------------|--------------------------|
| From                                                                                                          | To      |                          |                          |
| Digital LBS from SCC Inter-Module Communication Board to other SCC Inter-Module Communication Board           |         |                          |                          |
| P3108-1                                                                                                       | P3108-1 | LBS SYNCH CANH           | #24AWG/3000ft<br>(900m)  |
| P3108-2                                                                                                       | P3108-2 | LBS SYNCH CANL           |                          |
| P3108-3                                                                                                       | P3108-3 | GROUND                   |                          |
| Redundant Digital LBS from SCC Inter-Module Communication Board to Other SCC Inter-Module Communication Board |         |                          |                          |
| P3109-1                                                                                                       | P3109-1 | REDUNDANT LBS SYNCH CANH | #24AWG/3000ft<br>(900m)  |
| P3109-2                                                                                                       | P3109-2 | REDUNDANT LBS SYNCH CANL |                          |
| P3109-3                                                                                                       | P3109-3 | GROUND                   |                          |

1. Belden 810x or Belden 89901 cables are the only approved cables
2. Each cable group should be run in a separate, grounded conduit to ensure redundancy.
3. The maximum lengths must include all the LBS cables from the first module to the last module.
4. The primary and redundant cable lengths can be counted separately.
5. Belden 89901 cable can be used for underground installations.
6. Attach the control wire to the side of control door where the Inter-Module Board (IMC) is attached. Do not run the wire across IMC board.

**Figure 8 Inter-Module Communication Board wiring diagram—Digital LBS**



## 2.6 Input Contact Isolator Board

The Input Contact Isolator Board (ICI) provides a Liebert NXL module interface for up to eight external user alarm or message inputs to be routed through the NXL's alarm network. The eight contacts are normally open dry contacts. When a contact closes, an event is triggered.



### NOTE

*Up to two (2) ICIs can be installed in a Liebert NXL.*

The Input Contact Isolator options are configured through the Input Contact Isolator dialog box, which is accessed from the Internal Option Settings under Config dialog box on the HMI touchscreen display. The Input Contact Isolator dialog box contains eight choices to match the eight channel input board. You can label each button to identify the event associated with the contact. When the dialog box is accessed, each button flashes to display the Input Contact Isolator number and the user entered label. This label also appears in the Display Panel when an event related to an Input Isolator Connector is triggered.

The Input Contact Isolator dialog box allows you to:

- Label the input contact assignments for your setup.
- Set the delay for an external event triggering an alarm.
- Review the isolator contact assignments, once the labels are entered.

The delay allows setting the number of seconds that a condition must exist before it will trigger an alarm. To configure the Input Contact Isolator relays:

1. Press **Internal Option Settings** from the **Config** menu.
2. Press which Input Contact Isolator is to be configured. The Input Contact Isolator dialog box is displayed.

**Figure 9 Input contact isolator dialog box**

| Channel | Assignment | Message          | Delay |
|---------|------------|------------------|-------|
| Ch #1   | Custom     | Input Contact 11 | 0.0   |
| Ch #2   | Custom     | Input Contact 12 | 0.0   |
| Ch #3   | Custom     | Input Contact 13 | 0.0   |
| Ch #4   | Custom     | Input Contact 14 | 0.0   |
| Ch #5   | Custom     | Input Contact 15 | 0.0   |
| Ch #6   | Custom     | Input Contact 16 | 0.0   |
| Ch #7   | Custom     | Input Contact 17 | 0.0   |
| Ch #8   | Custom     | Input Contact 18 | 0.0   |

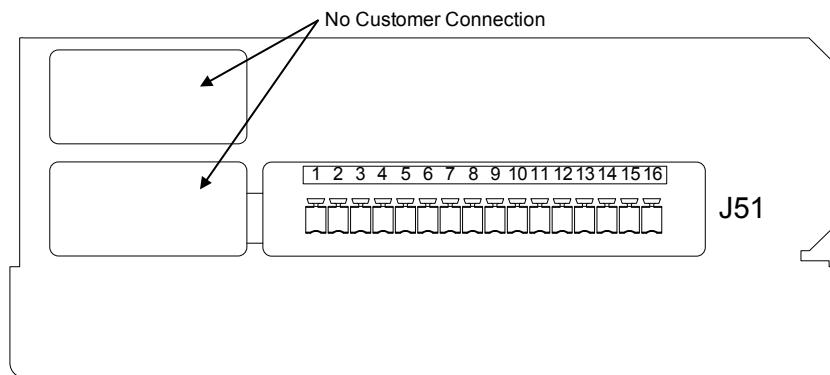
Save Cancel

- Assignment—Custom, Pre-assigned (default: “Input Contact” XY)
- Delay, sec—0 to 99.9 (default: 0)
- Message—Custom: 0-19 characters

3. To assign labels for each channel:
  - a. Press **Pre-assigned** for default labels on Channels 1-6 (See **Table 8**)
  - b. For Custom labels
    1. Press **Custom** to unique labels.
    2. Click on **Input Contact XX** button. A keyboard is displayed to allow naming alarms.
    3. Enter the name of the alarm set for that input. For example, a fan problem could be indicated by naming the button FAN.
    4. Press OK on the keyboard to keep your label.
4. Press **DELAY**.
  - a. A keypad is displayed prompting you for a delay time, in seconds, for a condition to exist before the alarm is triggered.
  - b. Enter the delay value. The range for the values are from 0 (zero) to 99.9 seconds.
  - c. Press OK on the keypad to keep your setting. The value you entered is displayed in the field adjacent to the corresponding input contact.
5. Repeat **Steps 3** and **4** for each input contact.
6. Press **SAVE** after you have configured all input contacts.  
Be sure to press Save even if you have accessed this dialog only to change a setting.
7. This information is not saved if control power is removed.

**Table 8 Input Contact Isolator Board pre-assigned values**

| Channel Number | ICI #1<br>Pre-Assigned Label | ICI #2<br>Pre-Assigned Label |
|----------------|------------------------------|------------------------------|
| 1              | Reduced Rect I Limit         | Stop Battery Charge          |
| 2              | Reduced Batt I Limit         | Stop Battery Charge          |
| 3              | Stop Battery Charge          | Stop Battery Charge          |
| 4              | Inhibit Rect Restr           | Stop Battery Charge          |
| 5              | Inhibit Byp Restr            | Stop Battery Charge          |
| 6              | Inhibit Inv Restr            | Stop Battery Charge          |
| 7              | Input Trap Filter Disconnect | Inhibit IP Standby           |
| 8              | Suspend ECO Mode             |                              |

**Figure 10 Optional Input Contact Isolator Board****Table 9 Input Contact Isolator Board control wiring connections**

| Input Contact | Pin No. |
|---------------|---------|
| 1             | 1       |
|               | 2       |
| 2             | 3       |
|               | 4       |
| 3             | 5       |
|               | 6       |
| 4             | 7       |
|               | 8       |
| 5             | 9       |
|               | 10      |
| 6             | 11      |
|               | 12      |
| 7             | 13      |
|               | 14      |
| 8             | 15      |
|               | 16      |

1. Customer control wiring connection points are terminals 1 through 16 (see **Table 9**).
2. Customer provided normally open dry contacts for user alarm messages.
3. All control wiring (by others) must be run separate from power wiring. Control wiring runs should not be combined in the same conduit.
4. Signal voltage: 100mA @ 12VDC.
5. Maximum cable length 500 ft. (152m) with #16AWG and flexible stranded cable.
6. All wiring must be in accordance with national and local electrical codes.

## 2.7 Programmable Relay Board

The Programmable Relay Board (PRB) provides a means to trigger an external device when an event occurs in the Liebert NXL. Each PRB has eight channels. Each channel has Form-C dry contacts rated at 1A @ 30VDC or 125VAC @ 0.45A.

Any alarm/event can be programmed to any channel or channels. Up to four (4) events can be programmed to a relay. If multiple events are grouped to one relay, group the events logically to simplify troubleshooting when an event is triggered. The same alarm/event can be programmed to more than one channel. Up to two Programmable Relay Boards can be installed in the Liebert NXL for a total of 16 channels. Programming is performed through the HMI touchscreen display.



### NOTE

*Up to two (2) PRB's can be installed in the Liebert NXL.*

**Figure 11 Control wiring, Programmable Relay Board**



1. Customer control wiring connection points are terminals 1 through 15. (Pin 16 not used on J71, J72, and J73.)
2. Programmable Relay Board option includes eight signal channels with two Form-C dry contacts per channel (see **Table 10**).
3. All control wiring (by others) must be run separate from power wiring. Control wiring runs should not be combined in the same conduit.
4. Contact ratings: 1A @ 30VDC or 125VAC @ 0.45A
5. Maximum cable length 500 ft. (152m) with #16AWG and flexible stranded cable.
6. All wiring must be in accordance with national and local electrical codes.

**Table 10 Programmable Relay Board pinout**

| Terminal Block | Channel | Pin No. | Common | Normally Closed | Normally Open |
|----------------|---------|---------|--------|-----------------|---------------|
| J71            | CH1     | A 1-3   | 1      | 2               | 3             |
|                |         | B 4-6   | 4      | 5               | 6             |
|                | CH2     | A 7-9   | 7      | 8               | 9             |
|                |         | B 10-12 | 10     | 11              | 12            |
|                | CH3     | A 13-15 | 13     | 14              | 15            |
|                |         | B 1-3   | 1      | 2               | 3             |
| J72            | CH4     | A 4-6   | 4      | 5               | 6             |
|                |         | B 7-9   | 7      | 8               | 9             |
|                | CH5     | A 10-12 | 10     | 11              | 12            |
|                |         | B 13-15 | 13     | 14              | 15            |
|                | CH6     | A 1-3   | 1      | 2               | 3             |
|                |         | B 4-6   | 4      | 5               | 6             |
| TB3            | CH7     | A 7-9   | 7      | 8               | 9             |
|                |         | B 10-12 | 10     | 11              | 12            |
|                | CH8     | A 13-15 | 13     | 14              | 15            |
|                |         | B 1-3   | 1      | 2               | 3             |
| J74            | CH8     | A 1-3   | 1      | 2               | 3             |
|                |         | B 4-6   | 4      | 5               | 6             |

Note: Pin 16 not used on J71, J72, and J73.

### 2.7.1 Configuring the Programmable Relay Board Settings

1. Press **Internal Option Settings** from the **Config** menu.
2. Press which Programmable Relay Board will be configured. The Programmable Relay Board dialog box is displayed.
3. Press the Relay channel
4. Press up to four (4) events. Selected events will show up under Relay 1 Assignment.

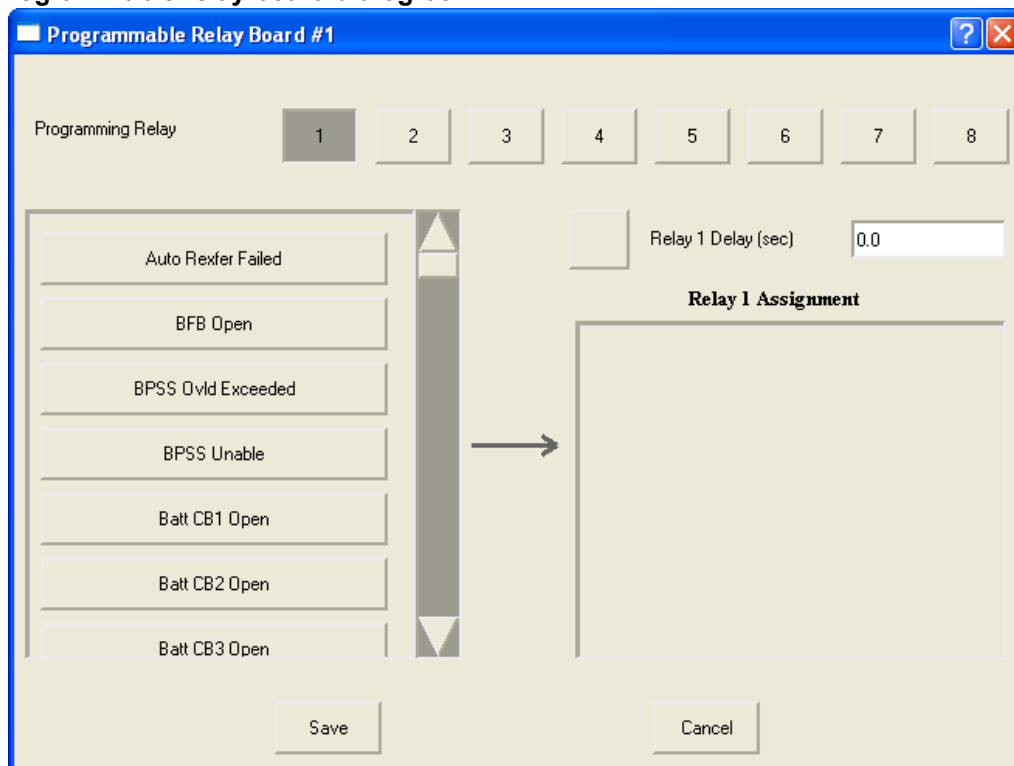


#### NOTE

*To deselect an event, click on the event.*

5. Repeat **Steps 3** and **4** for each relay.
6. Press **SAVE** to keep the settings.

**Figure 12 Programmable relay board dialog box**



- Assignment—0 to 4 event (default: 0)
- Delay, sec—0 to 99.9 (default: 0)

# 3.0 INSTALLATION DRAWINGS

Figure 13 Control wiring layout for Liebert NXL SCC

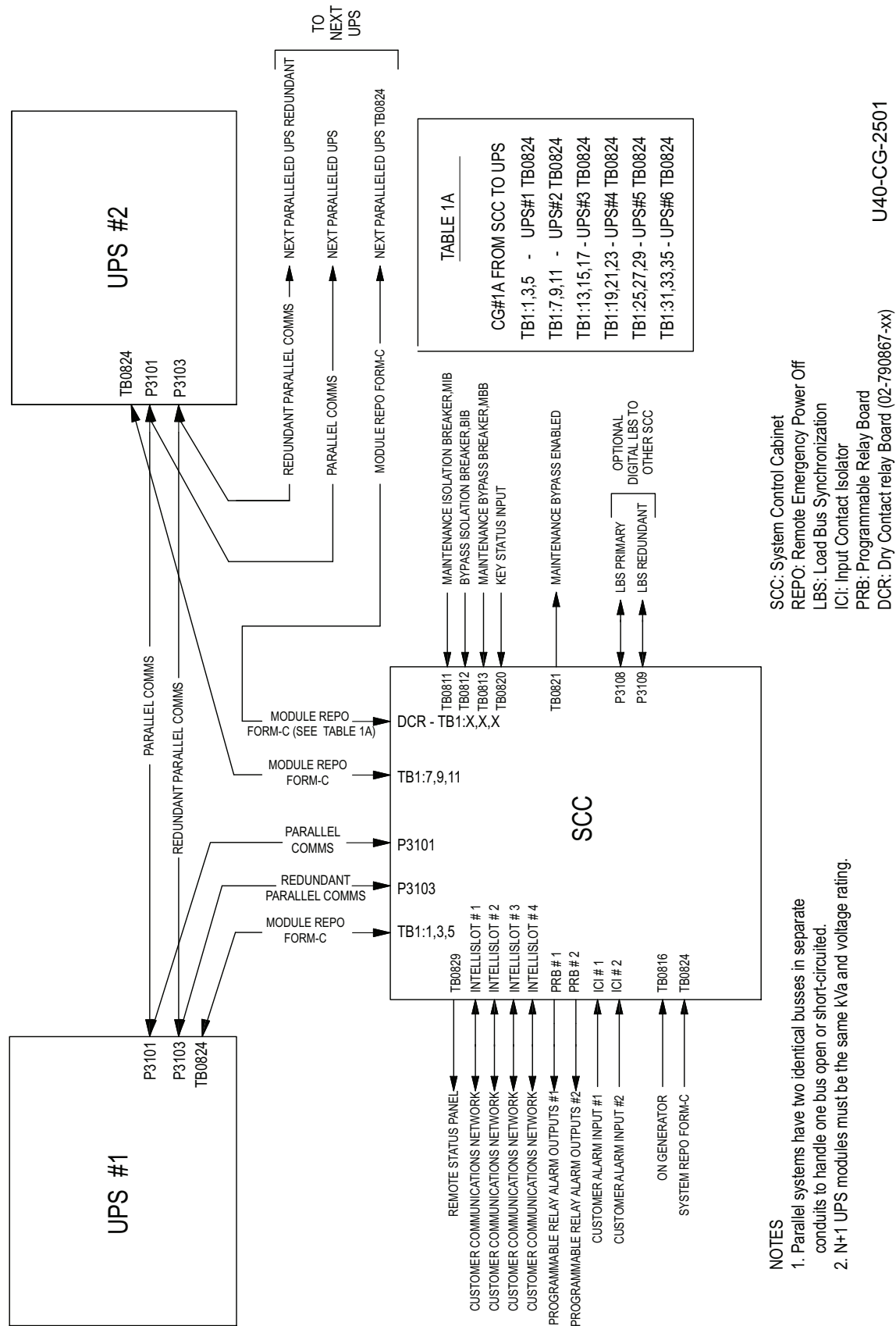
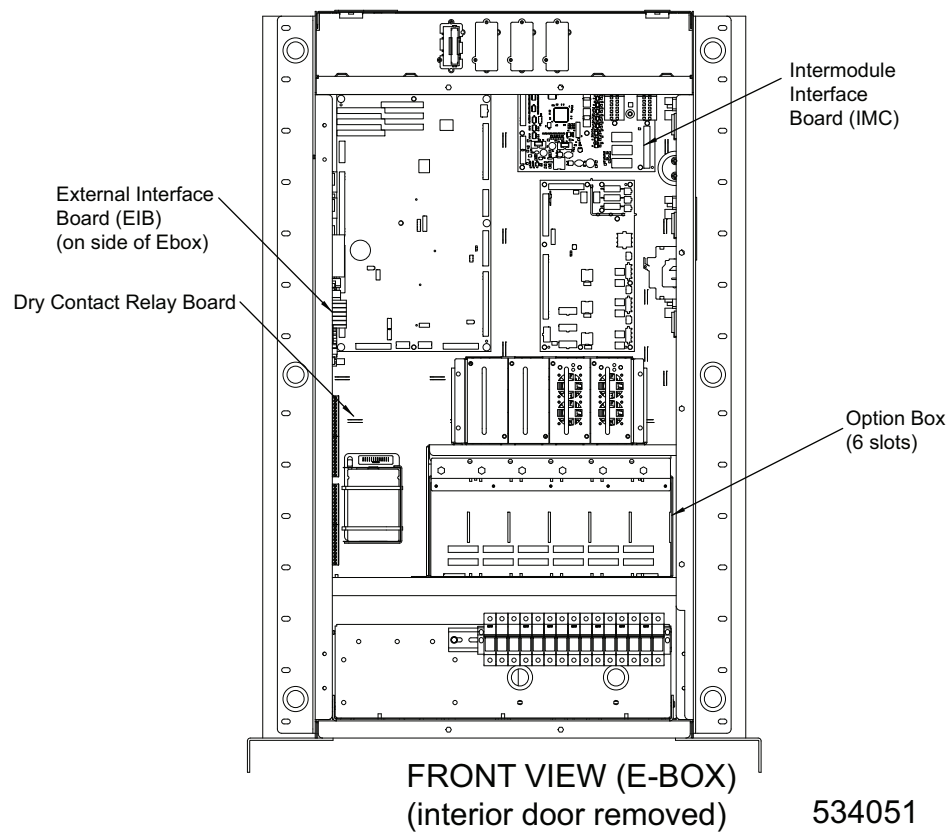
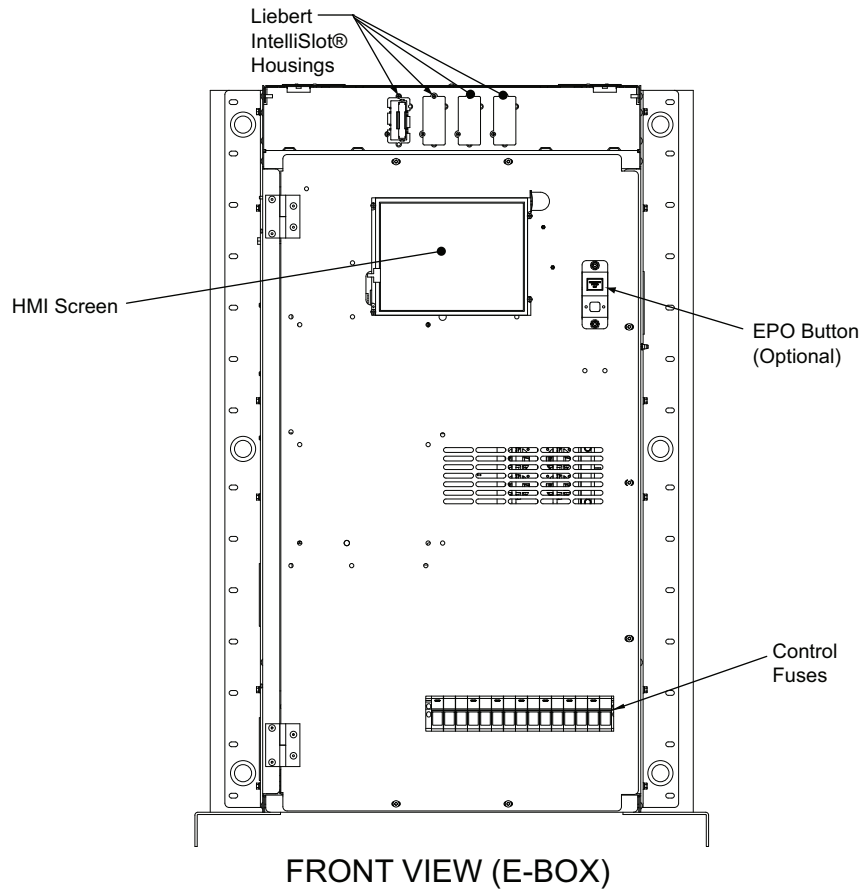


Figure 14 Main Components, Liebert NXL SCC Ebox



534051

## 4.0 SPECIFICATIONS

**Table 11 Liebert NXL SCCi Bypass Static Switch and Ebox specifications**

| Input Parameters                                   | 1600A - 4000A                                                                                                                                                                                                                                                                                  | 5000A |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Voltage, VAC, 3-phase, 3-wire or 4-wire            | 480V / 575V / 600V                                                                                                                                                                                                                                                                             | 480V  |
| Input Voltage Range, VAC                           | +15% to -20%                                                                                                                                                                                                                                                                                   |       |
| Input Frequency, Hz                                | 60                                                                                                                                                                                                                                                                                             |       |
| Permissible Input Frequency Range, Hz              | 55 to 65                                                                                                                                                                                                                                                                                       |       |
| Physical Parameters and Standards, in (mm)         |                                                                                                                                                                                                                                                                                                |       |
| Static Bypass Weight, Unpackaged, lb (kg), approx. | 1000 (454)                                                                                                                                                                                                                                                                                     |       |
| Maximum Heat Dissipation, Full Load, BTU/hr (kWH)  | 189,000 (55.3)                                                                                                                                                                                                                                                                                 |       |
| Cooling Air, CFM (m³/s)                            | 15,760 (7.4)                                                                                                                                                                                                                                                                                   |       |
| Standards and Conformities                         | UL 1778, 4th Ed.<br>CSA 22.2 107.3<br>FCC Part 15, Class A<br>IEC62040-2, Level 4, Criteria A<br>EN61000-4-3, Level 3, Criteria A<br>EN61000-4-6, Level 4, Criteria A<br>EN61000-2-2, Criteria A<br>EN61000-4-4, Level 4, Criteria A<br>ANSI C62.41, Category A3 &B3 ISTA Procedure 1H<br>WEEE |       |
| Environmental Parameters                           |                                                                                                                                                                                                                                                                                                |       |
| Storage Temperature Range, °F (°C)                 | -13 to 158 (-25 to 70)                                                                                                                                                                                                                                                                         |       |
| Operating Temperature Range, °F (°C)               | 32 to 104 (0 to 40) (UPS)                                                                                                                                                                                                                                                                      |       |
| Relative Humidity                                  | 95% or Less Non-Condensing<br>(Operating and Non-Operating)                                                                                                                                                                                                                                    |       |
| Maximum Altitude Above mean sea level, ft (m)      | 4920 (1500) (per IEC 62040/3) - 1% Max kW derate / 328 rise<br>between 4921-9842 (100m rise between 1500-3000m)                                                                                                                                                                                |       |

**Table 12 UPS current ratings—rectifier input**

| UPS Rating |      | Voltage<br>VAC | Nominal<br>Current | Maximum<br>Current |
|------------|------|----------------|--------------------|--------------------|
| kVA        | kW   |                |                    |                    |
| 500        | 450  | 480            | 643                | 804                |
| 625        | 625  | 480            | 907                | 952                |
| 625        | 625  | 575            | 753                | 791                |
| 625        | 625  | 600            | 722                | 758                |
| 750        | 675  | 480            | 975                | 1219               |
| 750        | 675  | 575            | 815                | 1018               |
| 750        | 675  | 600            | 759                | 949                |
| 800        | 800  | 480            | 1139               | 1195               |
| 1100       | 1100 | 480            | 1534               | 1611               |
| 1100       | 1100 | 575            | 1313               | 1379               |
| 1100       | 1100 | 600            | 1252               | 1314               |

**Table 13 UPS current ratings—output**

| UPS Rating |      | Voltage<br>VAC | Nominal<br>Current |
|------------|------|----------------|--------------------|
| kVA        | kW   |                |                    |
| 500        | 450  | 480            | 601                |
| 625        | 625  | 480            | 752                |
| 625        | 625  | 575            | 628                |
| 625        | 625  | 600            | 601                |
| 750        | 675  | 480            | 902                |
| 750        | 675  | 575            | 753                |
| 750        | 675  | 600            | 722                |
| 800        | 800  | 480            | 962                |
| 1100       | 1100 | 480            | 1323               |
| 1100       | 1100 | 575            | 1104               |
| 1100       | 1100 | 600            | 1058               |

**Notes on Tables**

1. Nominal input current (considered continuous) is based on full-rated output load. Maximum current includes nominal input current and maximum battery recharge current (considered noncontinuous). Continuous and noncontinuous current are defined in NEC 100.
2. Maximum input current is controlled by the current limit setting, which is adjustable. Values shown are for maximum current limit. If a smaller input feed breaker is used, the input current limit can be adjusted. Contact your Emerson representative for more information.
3. The Rectifier Input Feed Breaker must be set to handle the ®NXL transformer inrush of up to eight times the nominal current.

## **Notes**





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### Europe

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+39 049 9719 111

Fax: +39 049 5841 257

### Asia

29/F, The Orient Square Building

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Philippines

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