



Maintenance Bypass Panel For 827E Inverter Plant

6310408P
6310408P-1

This document issue 10ge is updated with GE brand and contact information only, no other content change from issue 10. Issue 10 release date: July 2010.

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Foreword

This manual is intended to help the user of the maintenance bypass panel to understand and install the panel. If you should have any questions or problems, please contact one of the following sources:

SERVICE - If for any reason further assistance is needed on any power equipment, complete engineering and field service groups are available at Phone: +1 972 244 WATT (9288) or toll-free at 888-LINEAGE (546-3243)

PARTS ORDERING - Replacement parts for power equipment may be obtained by forwarding a Purchase Order to:

GE
1376 State Route 598
Galion, Ohio 44833

OR Fax to: 419.468.9780

Include the following information:

- A. GE part number and engineering level of equipment
- B. If part is electrical, give circuit reference numbers and GE part numbers.
- C. If part is mechanical in nature, give description as to where it is used.

RETURN & REPAIR - Equipment may be returned to the Factory for repair. In order to do this, the procedure must be as follows:

- A. Call: +1 972 244 9288 or toll-free at 888-546-3243
- B. Request a Returned Material Authorization (RMA) number for the defective equipment.
- C. Return material prepaid to:

GE
1376 State Route 598
Galion, Ohio 44833

Attn: RS & R Dept

Product Information

Please take a moment when the product is new to fill in this information. This data will allow faster service when calling Lineage Power to order accessories, spare parts, or request field service.

First, locate the product information label. This is typically located on the upper front of the equipment frame, or on the rear of the frame. Fill in the part number, as it appears on the label, in the space below.

PART NUMBER	DATE CODE:
SERIAL NUMBER	ECN Level:

WARNINGS

1. Electrical shock hazard. Do not attempt to remove, maintain, or install this equipment with power applied. Personnel that attempt to work on this equipment with the power applied may subject themselves or others to electrical shock that may cause serious injury or death.

Le danger électrique de choc. Pas la tentative pour enlever, maintenir, ou installer cet équipement avec le pouvoir appliqué. Le personnel qui tente traiter cet équipement avec le pouvoir appliqué peut s'exposer ou les autres au choc électrique qui peut causer la blessure ou la mort sérieuse

2. The use of this equipment by unauthorized or untrained personnel should not be attempted. Personnel that work on this equipment without the proper training may subject themselves or others to electrical shock that may cause serious injury or death.

L'usage de cet équipement par le personnel inautorisé ou sans formation ne devrait pas être tenté. Le personnel qui traite cet équipement sans l'entraînement correct peut s'exposer ou les autres au choc électrique qui peut causer la blessure ou la mort sérieuse

3. Do not attempt to work on this equipment if it is, or has been, exposed to a high moisture condition. It is recommended the equipment be returned to LINEAGE POWER to be properly tested. Working on this equipment during a high moisture condition subjects the user to electrical shock that may cause serious injury or death.

Pas la tentative pour traiter cet équipement si c'est, ou a été, exposé à une haute condition d'humidité. Il est recommandé l'équipement s'est retourné à LINEAGE POWER deux être convenablement essayé. Traiter cet équipement pendant une haute condition d'humidité expose l'utilisateur au choc électrique qui peut causer la blessure ou la mort sérieuse

CAUTIONS

1. Follow proper grounding instructions.

Suivre fonder correctes les instructions

2. If connecting batteries, remove the battery-box-fuse or trip the circuit breaker. Check batteries and connections for proper polarity and power before connecting the batteries to the system.

Si connectant des piles, enlever la pile-boîte-le fusible ou trébuche le disjoncteur. Vérifier des piles et des connexions pour la polarité et le pouvoir correcte avant de connecter les piles au système

3. To remove the circuit breakers or fuses, the DC and/or AC input to the system will need to be disconnected, thereby disabling the system output to the load(s). Take the necessary precautions and inform the plant engineer that the system output power to the loads will be disabled.

Pour enlever les disjoncteurs ou les fusibles, les données de courant alternatif de et/ou de DC au système auront besoin d'être débranché, de cette façon rendant infirme la production de système au chargement (les chargements). Prendre les précautions nécessaires et informer l'ingénieur de plante que le pouvoir de production de système aux chargements seront rendus infirme.

4. Before performing any maintenance, ensure AC or DC power is not applied to the system.

Avant d'exécuter n'importe quel entretien, assurer que le pouvoir de courant alternatif ou DC n'est pas appliqué au système.

5. Fuse holders, fuses, and circuit breakers are not to be loaded to more than 80 percent of their ampere rating.

Fondez les supports, fusibles, et des disjoncteurs ne doivent pas être chargés à plus de 80 pour cent de leur estimation d'ampère.

4. Use of an attachment other than one approved by LINEAGE POWER will void any and all warranties, implied or other, and will increase risk of fire, or may possibly cause electrical shock, injury, or death to personnel

L'usage d'un attachement autrement qu'un approuvé par LINEAGE POWER annulera n'importe quel et toutes garanties, implicites ou autres, et augmentera le risque de feu, ou probablement peut causer le choc électrique, la blessure, ou la mort au personnel.

5. Do not operate this equipment if it has been dropped or otherwise damaged. Trying to operate this equipment if it has been damaged subjects yourself or others to electrical shock that may cause serious injury or death.

L'usage d'un attachement autrement qu'un approuvé par LINEAGE POWER annulera n'importe quel et toutes garanties, implicites ou autres, et augmentera le risque de feu, ou probablement peut causer le choc électrique, la blessure, ou la mort au personnel

6. Before you proceed, ensure the input source is not live and the input circuit breaker(s)/fuse(s) has been tripped or removed. If these procedures have not been followed and the input/output power is live, serious personnel injury or death may occur.

Avant que vous procédiez, assurez que la source d'entrée n'est pas en vie et le circuit d'entrée breaker(s)/fuse(s) a été trébuché ou a été enlevé. Si ces procédures n'ont pas été suivies et le pouvoir input-output est la blessure de personnel ou la mort en vie et sérieux peut arriver

7. A rack/shelf may contain several operating systems. If there is another system in the general area you want to install this system, be cautious of any exposed connectors or wires and, with permission, remove power to the other systems. Failure to take the necessary safety precautions subjects the installer or maintenance personnel to severe electrical shock that may cause serious injury or death.

Une étagère/étagère peut contenir plusieurs systèmes d'exploitation. S'il y a un autre système dans le secteur général que vous voulez installer ce système, êtes prudent de connecteurs ou de fils exposés et, avec la permission, enlevez le pouvoir aux autres systèmes. L'échec pour prendre les précautions de sûreté nécessaires exposent le personnel d'installateur ou entretien au choc électrique sévère qui peut causer la blessure ou la mort sérieuse

6. This equipment is intended for restricted access locations only.

Cet équipement est projeté pour les emplacements d'accès limités seulement

8. This equipment may connect to lead-acid batteries. Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. **Wash hands after touching batteries.**

Cet équipement peut connecter des piles mène-acides. Les postes de pile, les terminaux, et les accessoires apparentés contiennent l'avance et les premiers composés, les produits chimiques connus à l'état de Californie pour causer les défauts de cancer et naissance ou l'autre mal reproducteur. Laver des mains après avoir touché des piles.

1: Theory of Operation

The maintenance bypass panel (MBS) is designed to be used with the LINEAGE POWER 827E inverter plant. The main purpose of the MBS is to allow an AC load to be switched from its primary source (Inverters) to an alternate source (commercial AC) and back to the primary source (Inverters) again. This may be required, for example, when doing maintenance or upgrades to the Inverter Plant. The transfer is done with a front panel mounted switch. The Inverter source and AC Line source are not phase locked and the transfer is asynchronous, i.e., it occurs at random phase. For more information, refer to schematic 4391036SD and 4391036SD-1 attached to the rear of this document.

A manual front panel "BYPASS" switch is used to select the load source. The "INVERTER." mode selects the Inverter source and is the normal state. The unit is said to be in "BYPASS" mode when the "UTILITY" (commercial AC) source is selected. There are front panel LEDs to indicate if the "INVERTER" and "commercial AC" voltages are present, and to indicate if the unit is in BYPASS mode. While the INVERTER and AC LEDs indicate the presence of those source voltages, they do not prevent the load transfer from occurring. **It is the operator's responsibility to know if the source that is being transferred to is an energized source.**

An alternate purpose of the MBS is to collect alarms from the inverter shelves and to extend these alarms to the plant monitor. The status of the consolidated alarms is indicated by the upper three LEDs on the front panel. Any Major alarm will light the Major LED and extend a form C transfer to the plant monitor via a terminal block on the rear panel (see system schematic for details). A single Minor alarm extend a minor alarm, however, two or more Minor alarms will generate a Major alarm and retire (turn off) the Minor alarm. A Capacity alarm is an indication that an inverter shelf has exceeded its programmed and/or equipped capacity. This alarm may be used as a prompt to add more inverter capacity (i.e. shelves and modules). The load sharing capabilities of the 827E inverters will typically cause multiple shelves to provide a Capacity Alarm at the same time, if configured and equipped similarly. The Minor and Capacity alarms are extended to the plant monitor as form C transfers.

NOTE:

The MBS is powered by a -48VDC battery input at the rear. If this input is not present, there will be no LEDs lit on the front panel.

2: Installer Information

2.1 General

This section contains information that is intended to help the user install the maintenance bypass panel. Included are physical and electrical specifications.



FIGURE 2-1: Front View of the 6310408P 10KVA Bypass Panel



FIGURE 2-2: Front View of the 6310408P-1 30KVA Bypass Panel

2.2 Maintenance Bypass Panel Description

The maintenance bypass panel provides a means to move a load from the inverter plant to utility (commercial AC) source.

2.3 Mechanical Dimensions

- HEIGHT: 6.97 inches
- WIDTH: 23.00 inches
- DEPTH: 14.88 inches

2.4 Electrical Specifications

CAPACITY:

6310408P 10KVA Model

Utility AC Power Input	Input 1: 120 VAC, 60 Hz, 60 Amp max. AC, 1 Phase
Inverter Output AC Power Input	Input 2: 120 VAC, 60 Hz, 60 Amp max. AC, 1 Phase
48VDC Input	Input 3: 48VDC, 1.3 Amp
Maintenance Bypass Output	Out put 1: 120 VAC, 60 Hz, 60 Amp max. AC, 1 Phase

6310408P-1: 30KVA Model

Utility AC Power Input	Input 1: 120 VAC, 60 Hz, 240 Amp max. AC, 1 Phase
Inverter Output AC Power Input	Input 2: 120 VAC, 60 Hz, 240 Amp max. AC, 1 Phase
48VDC Input	Input 3: 48VDC, 1.3 Amp
Maintenance Bypass Output	Out put 1: 120 VAC, 60 Hz, 240 Amp max. AC, 1 Phase

2.5 827e Inverter System E/W MBS Wiring Diagram

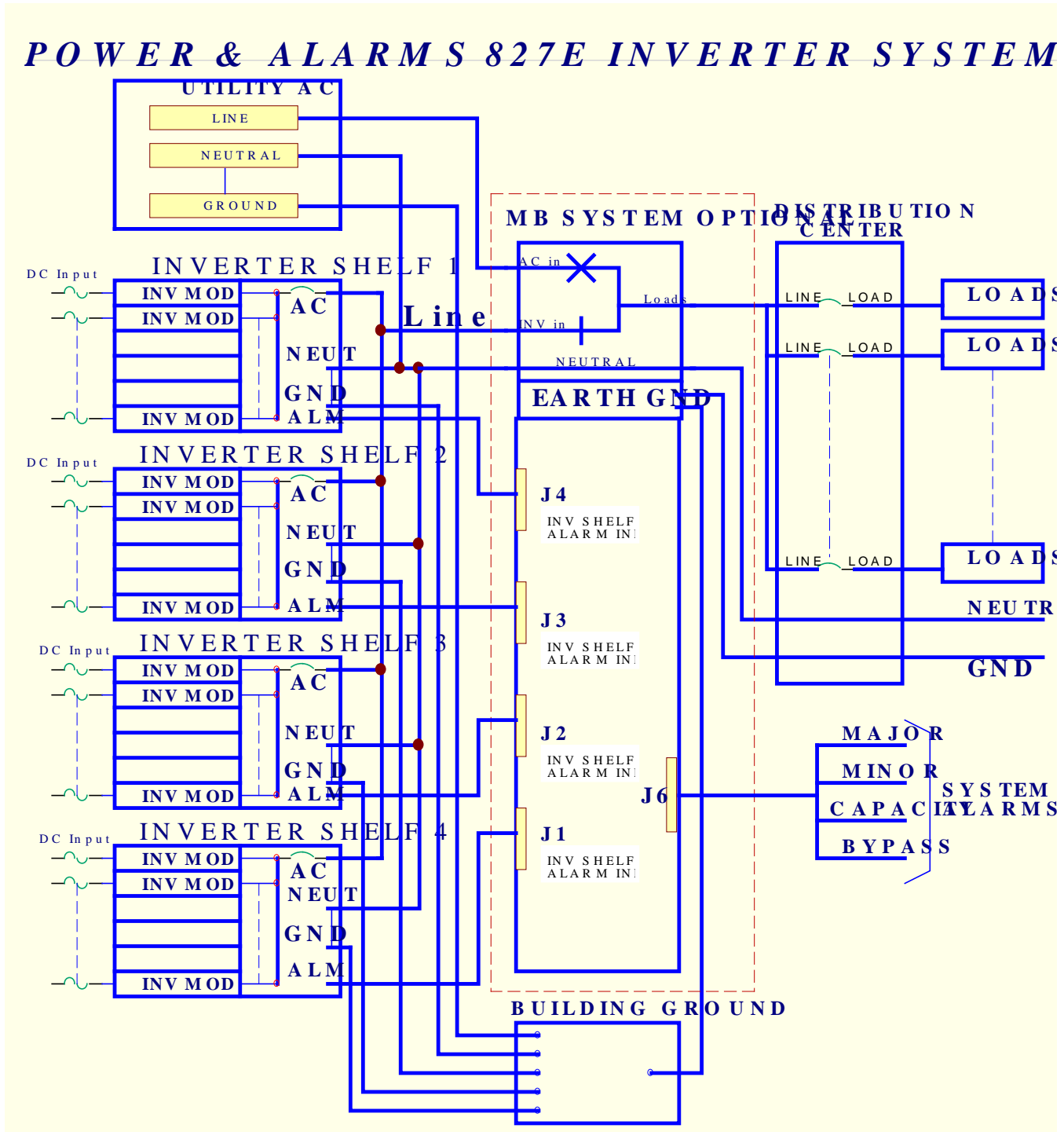


FIGURE 2-3: MBS Wiring Diagram

3: System Installation

3.1 General

NOTE: LINEAGE POWER recommends that the Maintenance Bypass Panel is installed above the top-most 827E Inverter Shelf (refer to Figure 3-1). LINEAGE POWER recommends leaving one rack mounting space between the MBS and the first Inverter shelf as well as from Inverter shelf to inverter shelf to allow air flow between units for proper heat dissipation (refer to Figure 3-1).

CABLING:

- A. Remove the maintenance bypass panel from the shipping container.
- B. Install the panel as follows:
 - 1. Ensure there is proper clearance in the rack to install the maintenance bypass panel.
 - 2. Put the panel into position and secure with the screws located at each outside corner (four screws total).

NOTE: The maintenance bypass panel is designed to be either flush or mid mounted.

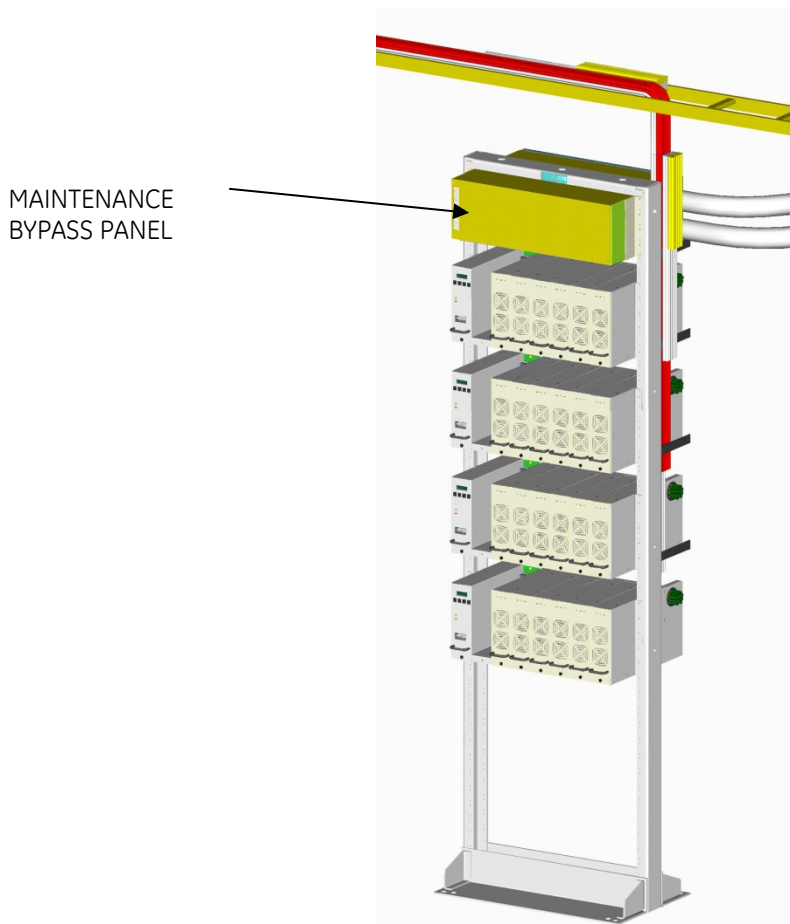


FIGURE 3-1: TYPICAL MAINTENANCE BYPASS PANEL INSTALLATION

NOTE: The NEC dictates that Commercial AC will have the Neutral strapped to ground. No other neutral to ground straps are required unless the 827E inverter is installed as a separately derived system (see NEC Article 100 for definition).

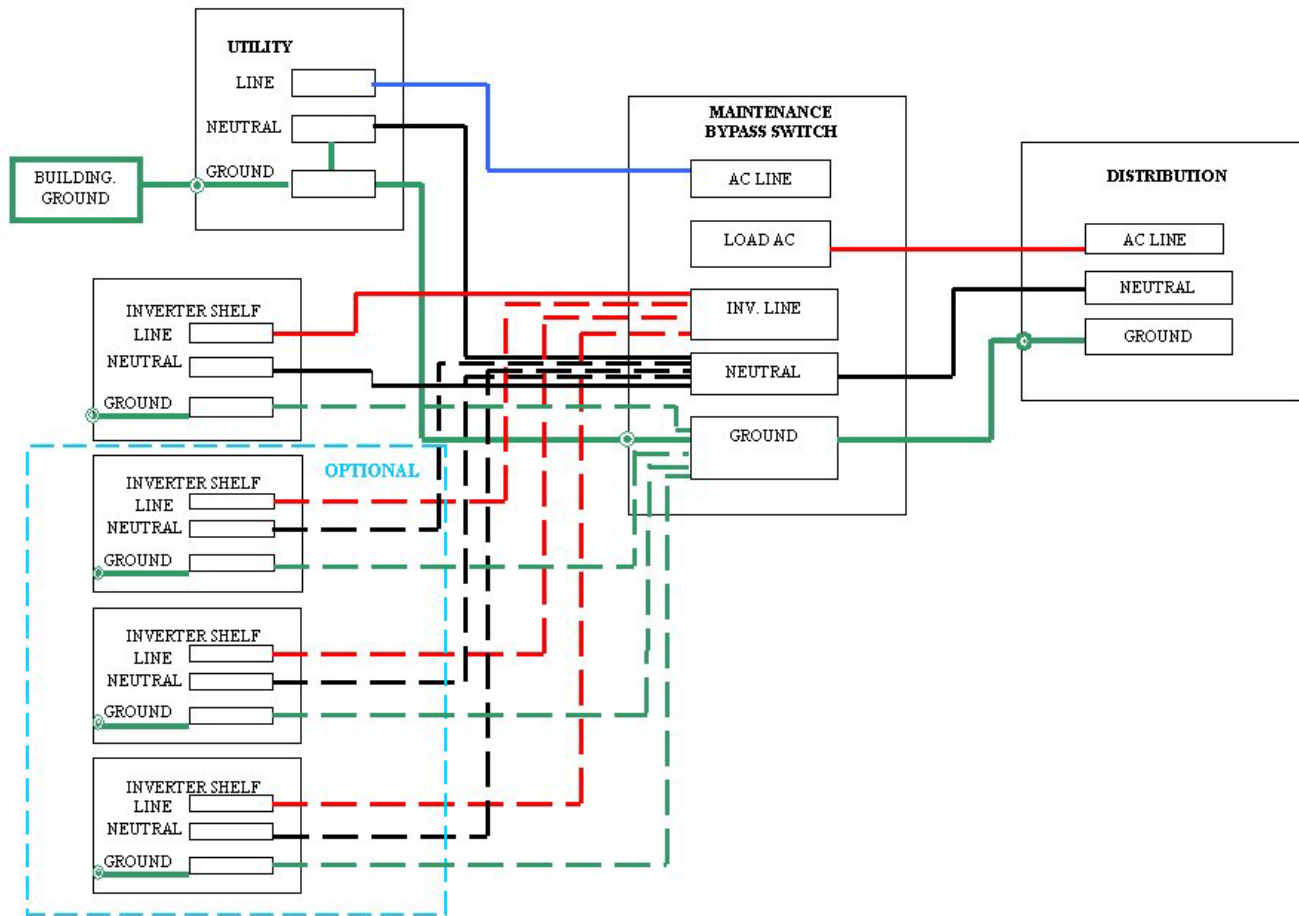


Figure 3-2: Model 827 Inverter System With Maintenance Bypass Switch And Optional Inverter Shelves

3.2 Utility (Commercial AC) Input Connections

WARNING: All power should remain in the **OFF** position for the entire installation section. Serious injury or death could occur from live AC circuits. LINEAGE POWER recommends that Licensed Electricians wire all AC connections into the MBS.

- A. Remove the rear cover to access the AC input connections. Refer to Figure 3-3.
- B. Connect the commercial 120VAC power to the input connections as shown in Figure 3-3. Each input connection is made via a compression screw. Maximum size cable is 350 MCM.
- C. Ensure that commercial AC power is protected from the customer side of the bypass panel.
- D. If used with an 827E Inverter Plant, a circuit breaker is provided in the inverter shelf to provide over current protection or disconnect means between the inverter and MBS.
- E. Over current protection for Commercial AC fed to the MBS is to be provided by the customer per the National Electrical Code.



Figure 3-3: Commercial AC Input Connections (view from top)

3.3 Inverter Input Connections

WARNING: Ensure that all DC input power is removed from the inverter system before beginning to perform the maintenance bypass panel input connections. Serious injury or death could occur from live AC circuits.

A. With the rear cover still removed, connect the output power from the inverter system to the inverter input connections on the maintenance bypass panel as shown in Figure 3-4. Each input connection is made via a compression screw. Maximum size cable is 6 GA.



Figure 3-4: Inverter Input Connections

3.4 AC Load Output Connections

WARNING: Ensure that all input power is removed from the maintenance bypass panel before beginning to perform the load connections from the maintenance bypass panel. Serious injury or death could occur from live AC circuits.

A. With the rear cover still removed, connect the LOAD (output power) from the maintenance bypass panel to the load connections. Refer to Figure 3-5. Each LOAD output connection is made via a compression screw. Maximum size cable is 350 MCM.



Figure 3-5: Load Connections from Maintenance Bypass Panel

3.5 Input Alarm Connections From The 827E Inverter Plant

The maintenance bypass panel provides input alarm connections for each of the four inverter shelves.

Inverter Shelf Number	Input Connection on Maintenance Bypass Panel
Inverter Shelf 1	J4
Inverter Shelf 2	J3
Inverter Shelf 3	J2
Inverter Shelf 4	J1

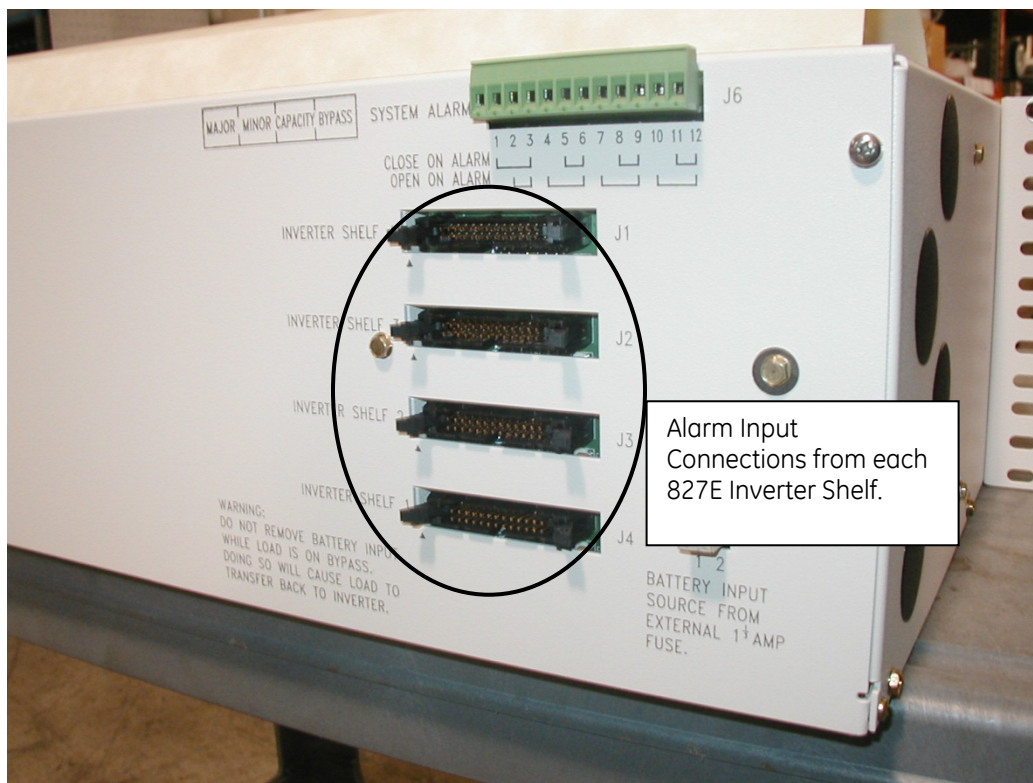


Figure 3-6: Alarm Input Connections (from 827E Inverter Shelves)

3.6 Output Alarm Connections from the Bypass Panel

The maintenance bypass panel combines alarms from each inverter shelf and extends them from a common set of alarm contacts. The four alarms include: Major, Minor, Capacity, and Bypass. Refer to Table 3-1 for the alarm pin out connections.

Table 3-1: Alarm Pin Out Connections for J6.

ALARM	PIN NUMBER ON J6	ALARM STATE	ALARM EXPLANATION
MAJOR	1	CLOSE ON ALARM	Any Major Alarm from inverter shelves 1, 2, 3, or 4. or Two or more Minor Alarms from any inverter shelf.
	3	COMMON	
	2	OPEN ON ALARM	
MINOR	4	OPEN ON ALARM	Any Minor Alarm from inverter shelves 1, 2, 3, or 4.
	6	COMMON	
	5	CLOSE ON ALARM	
CAPACITY	7	OPEN ON ALARM	A Capacity Alarm from any of the inverter shelves (1, 2, 3, or 4).
	9	COMMON	
	8	CLOSE ON ALARM	
BYPASS	10	OPEN ON ALARM	This alarm is extended when the maintenance bypass panel has been placed into bypass mode. It will extinguish when the inverter shelves are placed back on-line.
	12	COMMON	
	11	CLOSE ON ALARM	

Connector Part Number	Connector Type	Connector Wire Size
3090125P-12	Compression	14 - 20 AWG

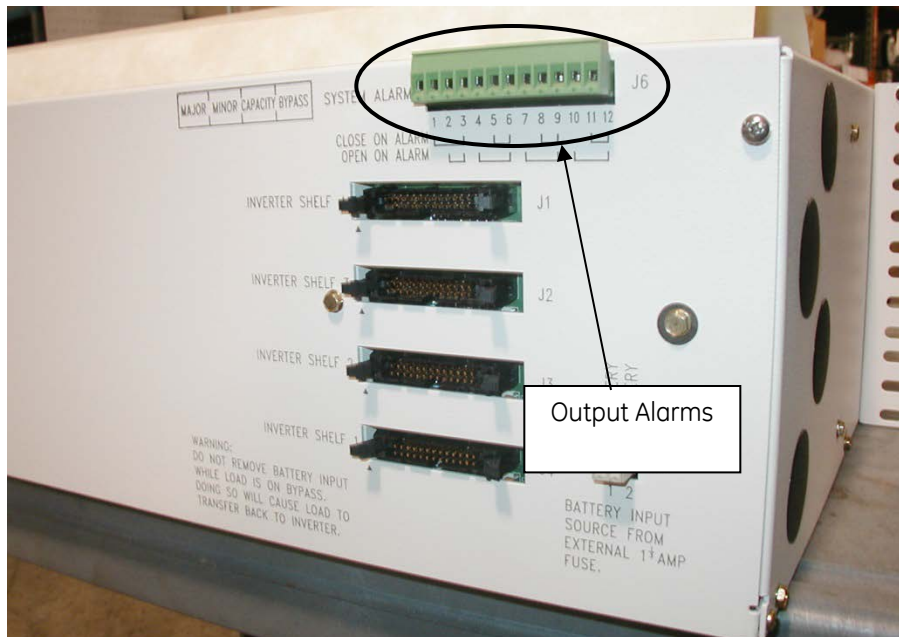


Figure 3-7: Alarm Output Connections (To customer alarms)

3.7 Bat Input

The maintenance bypass panel requires an input voltage of -48VDC protected with a 1 1/3 Amp fuse from an external source.

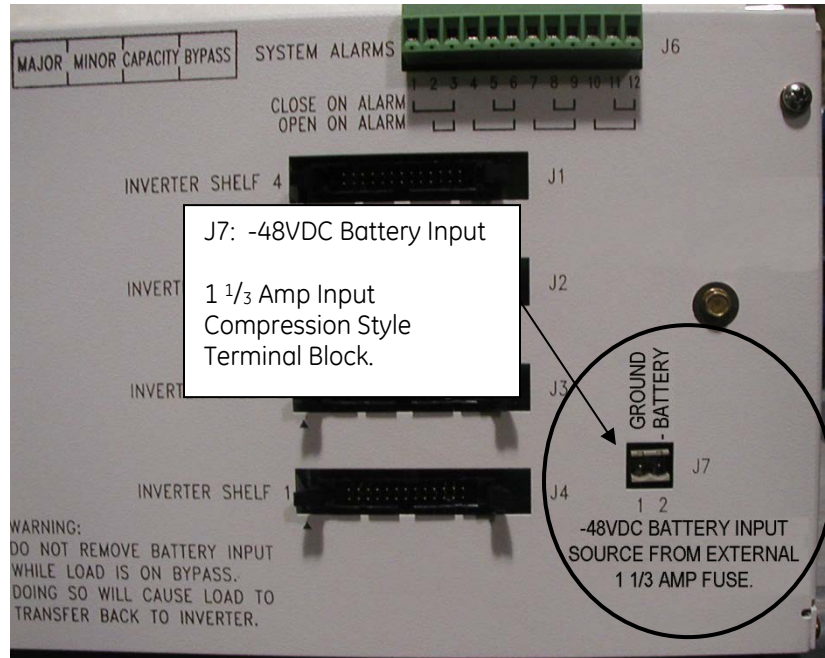


Figure 3-8: BAT Input Connections

J7:	Connection:	Connector Part Number:	Connector Type:	Connector Wire Size:
Pin 1	GROUND	3090125P-2	Compression	14 – 20 AWG
Pin 2	-BATTERY			

3.8 Verify Installation Is Complete

Once the input power has been applied, verify that no alarms are present. Activate the bypass switch to the utility position and verify that the commercial AC power takes over the loads. Move the switch back to the inverter position and verify that the inverter shelves take over the loads. If no alarms are present, the maintenance bypass panel installation is complete.