

SIEMENS

Installation Instructions

Model PSC-12

12 Amp Power Supply

INTRODUCTION

The Model PSC-12 from Siemens Industry, Inc., is a high current power supply that provides the FireFinder-XLS/Desigo Fire Safety Modular/Cerberus PRO Modular system with primary regulated 24VDC. It is rated at 12A and has a built-in charger that is capable of charging up to 100AH batteries. It also has a microprocessor-controlled transfer circuit that allows the PSC-12 to switch the system power to stand-by batteries during loss or reduction of the AC power.

The PSC-12 incorporates a 18A circuit breaker on the battery input. It provides connection to a tamper switch and terminal tie points for system signals.

The PSC-12 communicates directly to the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular) to report fault conditions and allows the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular) to query the status of the power supply. It has 1 common alarm relay, 1 common trouble relay, and 2 programmable relays. The common alarm and common trouble relays are defaulted to activate when the degrade ALARM bus or degrade TROUBLE bus is asserted.

The PSC-12 mounts at the back of the enclosure of the FireFinder-XLS/Desigo Fire Safety Modular/Cerberus PRO Modular system and occupies one location on the studs in the backbox or on the optional FireFinder-XLS/Desigo Fire Safety Modular/Cerberus PRO Modular Mounting Plate, CAB-MP.

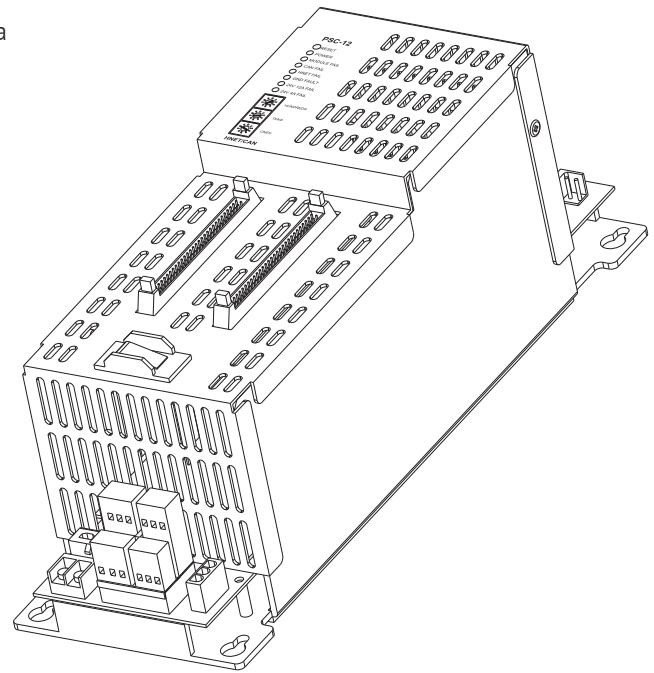


Figure 1
PSC-12 12 Amp Power Supply

Features

The PSC-12 features are as follows:

- AC power input 120VAC - 240VAC +/- 10% @ 60Hz / 50Hz
- Off-line Switch Mode Power Converter
- Power Factor Correction
- Built-in Battery Charger
- Total Output power of 12A@24VDC

- Two separate power output terminals: one power limited terminal with 4A max @ 24VDC capacity and one non-power limited terminal with 12A max @ 24VDC capacity (total not to exceed 12A)
- Both output terminals have current measurement capability
- Auto resettable current protection circuits for overload and short circuit
- Access to CC-5/CC-2 System bus
- Supplies 6.2VDC @ 2A (power limited) to the system bus
- Supplies 24VDC @ 2A (power limited) to the system bus (subject to a 12A total current limit)
- Communicates via HNET protocol
- Provides termination for the tamper switch
- One common alarm relay, one common trouble relay and two programmable relays with 2A ratings

OPERATION

The PSC-12 occupies one network address in the HNET network and has four functional components: the Controller, the Charger, the Power Supply and the Interface Board.

The Controller determines the activation of the Charger and monitors the status of the Power Supply (ground fault conditions, loss of network communication, 24VDC terminal overload and the status of the battery). This information is relayed to the User Interface, where applicable, and is communicated to the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular) for system reporting. The Controller also allows the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular) to query the state of the power supply and its current load and can send a diagnostics command to the PSC-12. It also provides the control of the relays.



The degrade ALARM bus and degrade TROUBLE bus will override the command that is sent by the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular) to the Alarm and Trouble relays.

The Power Supply has an Off-line switch mode power converter and power factor correction circuit to improve conductive RF emission at low frequency. It is designed to take voltage inputs of 120VAC-240VAC at 60Hz/50Hz and has one resettable circuit breaker that can also be used as a battery power switch.

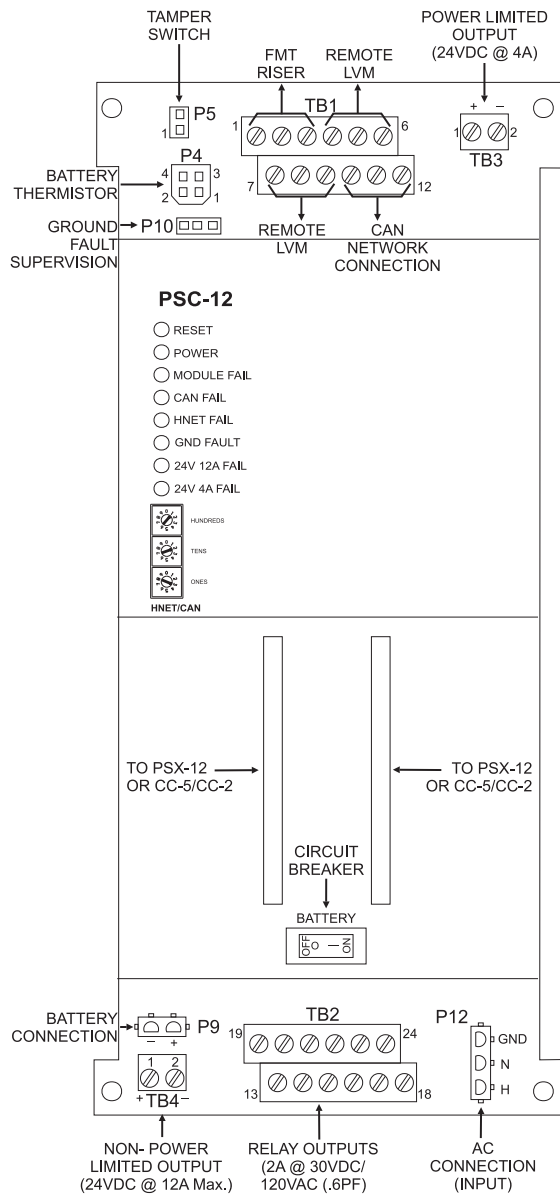
The Charger monitors and maintains the battery. This circuitry utilizes three charge modes, depending upon the state of the batteries: Bulk (Full) Charge State, Trickle Charge State and Float (maintenance) State. The Charger monitors the batteries and determines which of the charging modes to activate. It also has the capability to check the state of the battery through diagnostic testing.

The Interface Board provides diagnostics LEDs, system connections and the terminal connections on the PSC-12.

Terminal Blocks, Controls and Indicators

The PSC-12 has one reset switch, seven LEDs, three HNET/CAN address switches, one circuit breaker, four terminal blocks, four terminal connections and two 60 pin flat ribbon connections as shown in Figure 2.

A reset switch is located on the top of the front panel. Pushing the reset switch re-initializes the PSC-12 operation.



NOTE:
 Positive and negative ground fault detected at:
 <50K ohms for TB3 terminals 1,2
 <60K ohms for TB4 terminals 1,2
 <40K ohms for TB1 terminals 10,11
 <20K ohms for TB1 terminals 4,5,7,8
 <30K ohms for TB1 terminals 1,2

Figure 2
 Terminal Blocks, Controls and Indicators

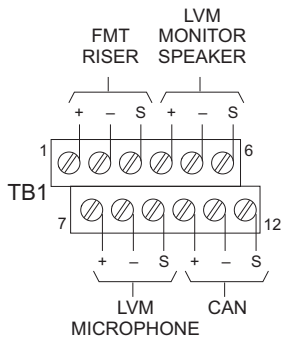
The LEDs located at the top left of the module and are defined as follows:

- POWER - (Green) Normally ON. When illuminated, indicates that the PSC-12 is powered from the AC mains. When flashing, indicates that the PSC-12 is powered from the battery.
- MODULE FAIL - (Yellow) Normally OFF. When illuminated indicates that the module microprocessor has failed.
- CAN FAIL - (Yellow) Normally OFF. When illuminated, indicates that CAN communication with the PSC-12 has terminated (applicable only when PSC-12 resides in a CAN network).
- HNET FAIL - (Yellow) Normally OFF. When illuminated, indicates that the HNET communication with the PSC-12 has terminated and the PSC-12 goes to degrade mode (applicable only when the card resides in the HNET network).
- GND FAULT - (Yellow) Normally OFF. When illuminated, indicates that the PSC-12 has detected either a negative or positive ground fault on its outputs.
- 24V 12A FAIL - (Yellow) Normally OFF. When illuminated, indicates that the 24VDC non-power limited output has a trouble condition or the PSC-12 has disconnected the 24VDC output due to current overload or short circuit.
- 24V 4A FAIL - (Yellow) Normally OFF. When illuminated, indicates that the 24VDC power limited output has a trouble condition or the PSC-12 has disconnected the 24VDC power output due to current overload or short circuit.

Three rotary dial switches located directly below the LEDs are used to set the HNET/ CAN network address of the PSC-12.

The terminal blocks of the PSC-12 are defined as follows (See Figures 2, 3 and 4):

- TB1 Terminals 1, 2 and 3 provide connection to the FMT riser.
 Terminals 4, 5 and 6 provide an output to the monitor speaker in a remotely mounted LVM.
 Terminals 7, 8 and 9 provide an input from the microphone of a remotely mounted LVM.



S = SHIELD TIE POINT.
CONNECT AT ONE
PSC-12 ONLY.

Figure 3
TB1 Wiring Diagram

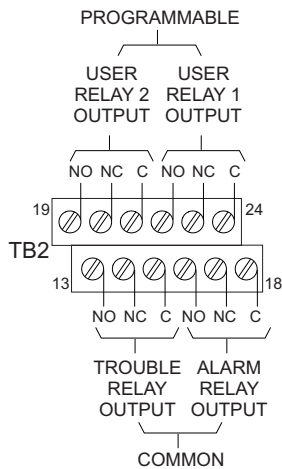


Figure 4
TB2 Wiring Diagram

TB2

Terminals 10, 11 and 12 provide external CAN network connection. All others are not used.

Relay outputs; 1 for Alarm, 1 for Trouble and 2 User-programmable relays that are set to NOT USED by default. These outputs are rated 2A @ 30VDC/120VAC (.6 PF).

Under normal system operation, the alarm and trouble relays are controlled by the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular). However, if the HNET fails (and the initiating card cannot communicate with the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular), the DLC will control the ALARM and TROUBLE relays. The User programmable relays are activated by the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular) output logic as programmed by the Zeus tool. When the system is operating normally, these relays are controlled by the output logic only. (See Figure 4.)

TB3

24VDC Power Limited Output Terminal. This terminal output is limited to 4A. When it is exceeded, it will shut down, light its associated diagnostics LED and send a fault condition to the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular).

This output is normally connected to the modules and cards located on the door of the enclosure or to remote CAN network modules. This output is power limited to NFPA 70 per 760. All wiring must be in accordance with Article 760 of NEC or local building codes. (See Figure 2.)

Output Voltage: 24VDC +10%, -15%

Output Current: 4A max

TB3-1: (+) terminal

TB3-2: (-) terminal

TB4

24VDC Non-Power Limited Output Terminal. This terminal is non-power limited and can supply up to 12A. When the current draw is exceeded, it shuts down, lights its associated LED and sends a fault condition to the PMI/PMI-2/PMI-3 (XLS), FCM2041-U2 (Desigo Fire Safety Modular), FCM2041-U3 (Cerberus PRO Modular).

This output is normally connected to the input terminals of the CC-5. This output must remain within the enclosure or within 20 feet in rigid conduit. All wiring must be in accordance with Article 760 of NEC or local building codes. (See Figure 2.)

Output Voltage: 24VDC +10%, -15%

Output Current: 12A max

TB4-1: (+) terminal

TB4-2: (-) terminal



The total cumulative sum of the 24VDC output (power limited + non-power limited) must not exceed 12A. Over current draw will initiate a PSC-12 shut down.



The main AC power line must be turned OFF prior to installation.

P4 Contains a factory installed plug. Do not remove the plug from P4.



This plug must be installed at all times to allow the charger section of the PSC-12 to properly control the battery charging process.

P5 Connects the HTSW-1 Tamper Switch to the PSC-12 to determine the position of the panel door. The door position status is then transmitted to the system bus. (See Figure 2.)

This circuit is intended for 24 hour circuit monitoring and is configured by the Zeus tool. Refer to HTSW-1 Installation Instructions, P/N 315-033350.



There can be only one Tamper Switch connection per enclosure.

P9 Connects the back-up battery to the PSC-12. Battery size has to be calculated to ensure that the battery size can support the system load during battery back-up condition. Refer to the Battery Calculation form to determine the required battery size of the system.



Always apply AC power first followed by the battery.

P10 Set the jumper on P10 to the ENABLE (left-hand) position to enable ground fault supervision.

P12 AC input connector from the PTB, P4/P5.

60-pin Connects the PSC-12 to the system. It is a straight- through connection between the two connectors and provides the 24VDC rated at 2A and 6.2VDC rated at 2A that powers the CC-5/CC-2 modules. It also contains all the communication signals and system signal bus that is necessary for the proper operation of the system.

These connectors are power limited. If the PSC-12 is located in a different row in the enclosure, an optional extended ribbon cable, Model BCL (P/N 599-633997), must be used.

Output Voltages: 24VDC , 6.2VDC

Max Current : 2A @ 24VDC
2A @ 6.2VDC

PRE-INSTALLATION

The PSC-12 installation kit has the following components:

INSTALLATION KIT COMPONENTS

PSC-12 / PTB Kit	PSX-12	PTB (Only)
Four #10-32 ½" Phillips Screws (for PSC-12)	Four #10-32 ½" Phillips Screws (for PSX-12)	
Four #10 Hex Nuts (for PTB)		Four #10 Hex Nuts
AC Wire Assembly, P/N 600-134264	AC Wire Assembly, P/N 600-134264	
Battery Wire Assembly, P/N 465-633943	Battery Wire Assembly, P/N 465-633943	
Battery Cable Conversion Kit P/N 545-634222	60-pin Flat Ribbon Cable, P/N 555-133036	
Anti-Interference Capacitor P/N A5Q00038368	Anti-Interference Capacitor P/N A5Q00038368	

The following part is optional:

- If the PSC-12 is not located in the same row in the backbox (or on the same optional CAB-MP) as the CC-5, an extended 60 pin flat ribbon cable, Model BCL (P/N 599-633997) from Siemens Industry, Inc., is required.



The following components must be set prior installing the module in the enclosure:

Verify that the dedicated circuit breaker for the PSC-12 is turned OFF at the mains.

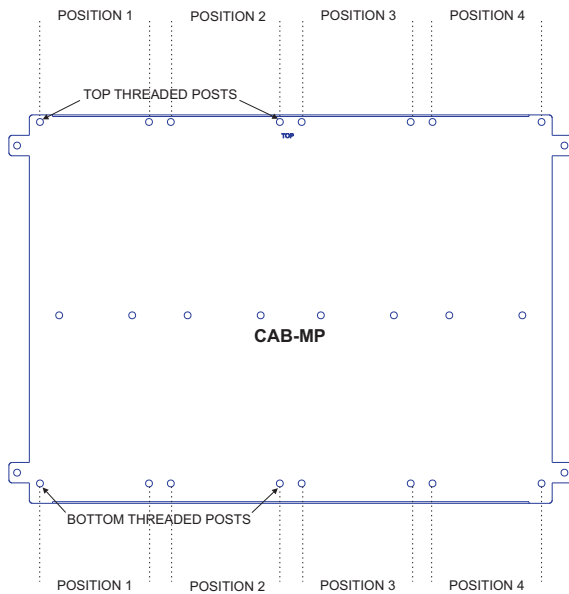
- **Battery Circuit Breaker:** Set this circuit breaker to the OFF position.
- **Network Address Switch:** Set the three-digit HNET network address for the PSC-12 using the three rotary dial address switches located below the LEDs on the front panel. (Refer to Figure 2 for the location of the switches.) The address for the PSC-12 must be the same as the address selected for it in the Zeus Programming Tool. To set the address, turn the pointers on each of the three dials to the numbers for the selected address. For example, if the address is 123, set the pointer for the HUNDREDS dial to "1," set the pointer for the TENS dial to "2," and set the pointer for the ONES dial to "3." The range of allowable addresses is from 001 to 251 (leading zeros must be used).

INSTALLATION



Remove all system power before installation, first battery then AC. (To power up, connect the AC first, then the battery.)

The PSC-12 mounts on studs in the backbox or on the optional Mounting Plate (CAB-MP). The Mounting Plate may be located either inside or outside of the enclosure to perform this installation procedure. If the Mounting Plate is located inside the enclosure you will have to gain access to it by opening the enclosure Inner and Outer doors. If the Mounting Plate is located outside of the enclosure, place it in front of you so that the word "TOP" is at the top and away from you.



The PSC-12 can occupy any position in the backbox or on the mounting plate, but it should be installed in the row and position that is located directly above the PTB to which it is connected. (Refer to Figures 5 and 7). When the PSC-12 is mounted correctly on the optional Mounting Plate it will be flush on the top, bottom, and right with the Mounting Plate and the mounting screw holes of the PSC-12 will align with the threaded posts.

1. Install four 10-32 screws in the threaded posts at the mounting position. Screw each of the 10-32 screws into the threaded posts 5-6 turns.
2. Place the PSC-12 over the four screws on the Mounting Plate and slide it down or towards you to rest on the four screws. (Refer to Figure 6.) When the PSC-12 is in the correct position it will be flush with the top, bottom and right side of the Mounting Plate.
3. Tighten the four screws.

Figure 5
Location Of The PSC-12 On The Optional CAB-MP

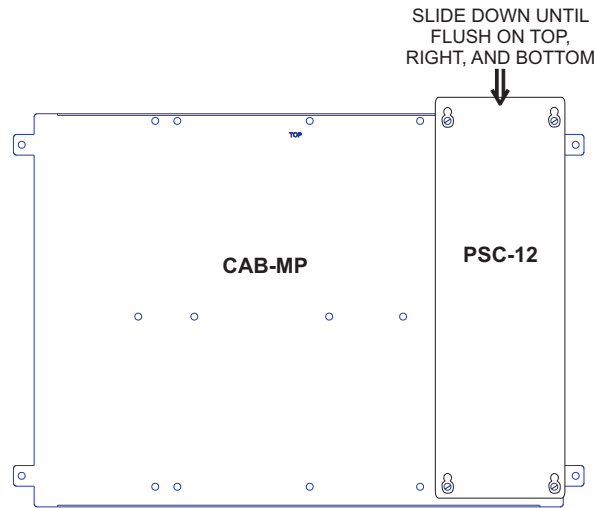


Figure 6
Mounting The PSC-12 On The Optional CAB-MP

WIRING

The PSC-12 has removable terminal blocks and connectors at the top and bottom of the module. The terminals and connectors at the top of the PSC-12 are power limited. The terminals and connectors at the bottom of the PSC-12 are non-power limited. (Refer to Figure 7.)

Use a separate or dedicated circuit breaker and run the earth ground from a suitable source to the PSC-12. Check local requirements.



Conduit is not an acceptable Earth Ground Conductor.

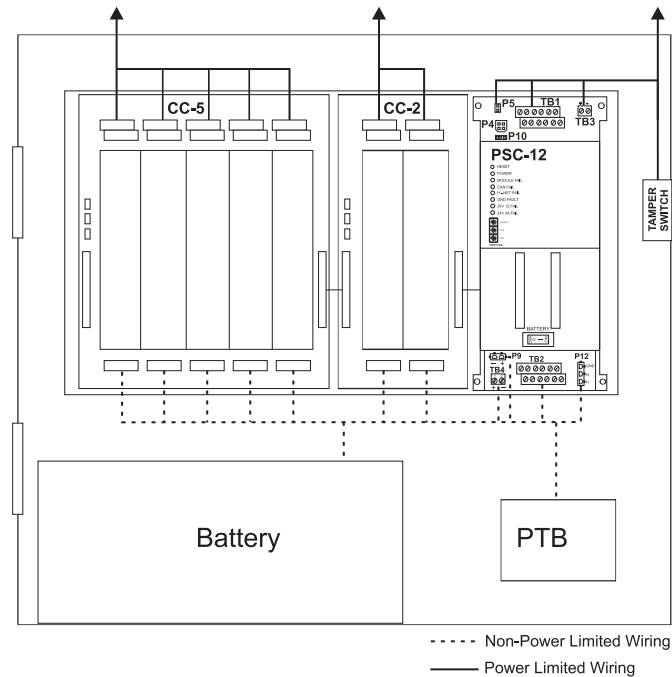


Figure 7
PSC-12 Wiring In The CAB Enclosures

Wire in accordance with local codes and Article 760 of the NEC, NFPA latest edition. In compliance with NEC, all power limited fire protective signaling conductors must be separated a minimum of a 1/4" from all of the following wiring located within a control panel:

- Electric light
- Power
- Class 1 or non-power limited fire protective signaling conductor

Refer to the CAB2-BB Installation Instructions, P/N 315-033009-1 for wiring requirements to comply with NEC codes.

Battery Connections

When BTX-1, BTX-2 or BTX-3 batteries are required, connect them to the system with the Battery Cable Conversion Kit, P/N 545-634222, following the steps listed below.

1. Using the 12 in. long wire assembly, connect the two batteries together, as shown in Figure 7. Secure each end of the assembly to the battery with a 10-32 x 3/4" screw and lock nut.
2. Attach the quick disconnects to the positive and negative battery terminals with the 10-32 x 3/4" screws and lock nuts supplied.
3. Attach the red battery wire to the quick disconnect on the positive terminal and the black battery wire to the quick disconnect on the negative terminal.

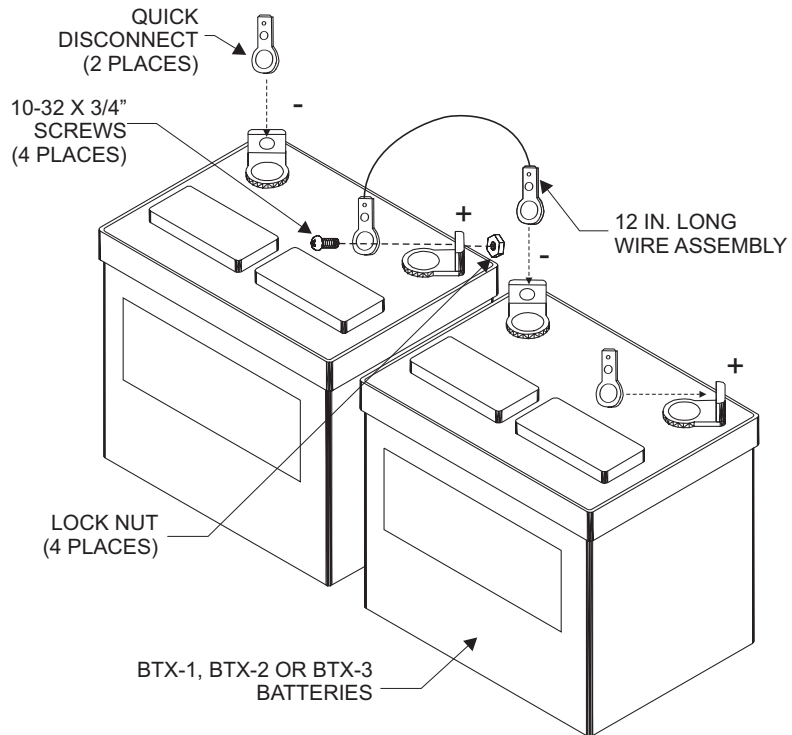


Figure 8
Wiring BTX-1/-2/-3 Batteries To The PSC-12

Anti-Interference Capacitor Install the 6.8uF, 100V bipolar Anti-Interference Capacitor as shown in Figure 9. It has to be connected between System Ground and Earth Ground.

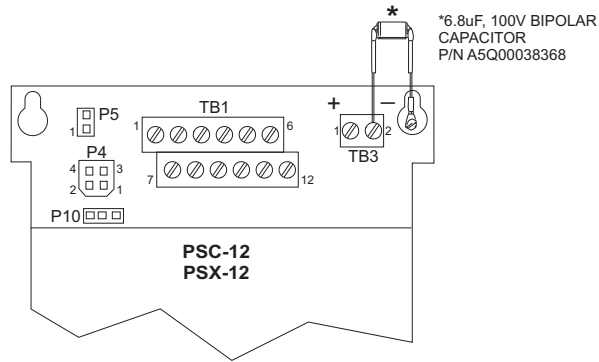


Figure 9
Wiring the Anti-Interference Capacitor

Power Supply Load and Battery Calculations

The PSC-12 power supply load and battery size calculations are performed by the Zeus tool based on the equipment in the physical view. Once all of the equipment is inserted into the physical view for each enclosure and a successful compile is performed, the results of the calculations are shown in the report view.

From the Tools menu, select Report Generation and then select System Power & Battery Calculation Report. The report contains power supply loading and battery size results for each enclosure. This report can be printed for a permanent record.

Battery Power

Make sure that the battery circuit breaker is in the OFF position.

Use either 14 or 12 AWG for battery connection.

Battery backup is required for compliance to UL864. The PSC-12 can charge a battery up to 100 amp hours. (15 amp hours is the minimum size for the PSC-12.)

These battery models are UL listed for use with the FireFinder-XLS/Desigo Fire Safety Modular/Cerberus PRO Modular system:

- BP-61 — 24V, 15 AH
- BTX-1 — a set of 12V, 31 AH
- BTX-2 — a set of 12V, 75 AH
- BTX-3 — a set of 12V, 100AH

Select the battery that meets or exceeds the final calculated battery amp hour rating. Use an external battery box, **SIEMENS** Model CAB-BATT, P/N 500-633917, with the BTX-2 and BTX-3 models.

Battery System Electrical Rating:

Input Voltage: 24VDC +10%, -15%

Input Current: 15A max.

Minimum Battery size: 15AH

Maximum Battery size : 100AH

Battery Max Charge Current: 5A (full charge mode)

ELECTRICAL RATINGS

Input Voltage	120VAC @ 50/60Hz 220VAC @ 50/60Hz 240VAC @ 50/60Hz
Input Current	3.5A Max. @ 120VAC 2.5A Max. @ 220VAC 2.0A Max. @ 240VAC
24V Back Plane Current	2A Max.
Screw Terminal 24V Current	Power Limited: 4A Max.
	Non-Power Limited: 12A Max.
6.2V Back Plane Current	2A Max.
24V Standby Current	150mA + 20mA per active relay
Output Power	
Each HNET/XNET and CAN Network Pair	8V peak to peak max.
	75mA max. (during msg transmission)

Cyber security disclaimer

Siemens products and solutions provide security functions to ensure the secure operation of building comfort, fire safety, security management and physical security systems. The security functions on these products and solutions are important components of a comprehensive security concept.

It is, however, necessary to implement and maintain a comprehensive, state-of-the-art security concept that is customized to individual security needs. Such a security concept may result in additional site-specific preventive action to ensure that the building comfort, fire safety, security management or physical security system for your site are operated in a secure manner. These measures may include, but are not limited to, separating networks, physically protecting system components, user awareness programs, defense in depth, etc.

For additional information on building technology security and our offerings, contact your Siemens sales or project department. We strongly recommend customers to follow our security advisories, which provide information on the latest security threats, patches and other mitigation measures.

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