

Installation Instructions

Model PSC-12C

12 Amp Power Supply (S24235-B119-A1)

INTRODUCTION

The **SIEMENS** Model PSC-12C is a high current power supply that provides the 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-12C to switch the system power to stand-by batteries during loss or reduction of the AC power.

The PSC-12C 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-12C communicates directly to the PMI-S to report fault conditions and allows the PMI-S 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.

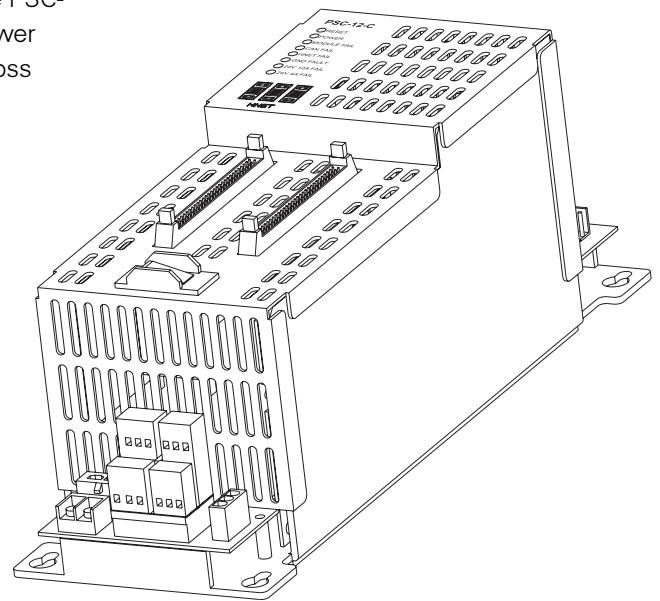


Figure 1
PSC-12C 12 Amp Power Supply

The PSC-12C mounts at the back of the enclosure of the FireFinder-XLS system and occupies one location on the FireFinder-XLS Mounting Plate, CAB-MP.

Features

The PSC-12C features are as follows:

- Universal AC power input 120VAC-240VAC @ 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 CAN 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-12C occupies one network address in the CAN 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-S for system reporting. The Controller also allows the PMI-S to query the state of the power supply and its current load and can send a diagnostics command to the PSC-12C. 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-S 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 50Hz/60Hz 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.

Terminal Blocks, Controls and Indicators

The PSC-12C has one reset switch, seven LEDs, one address switch, one circuit breaker, four terminal blocks, four terminal connections and two 60 pin flat ribbon connections as shown in Figure 2. The ribbon cable connectors are used to connect the PSC-12C with the PSX-12C or a Card Cage (CC-2/CC-5).

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



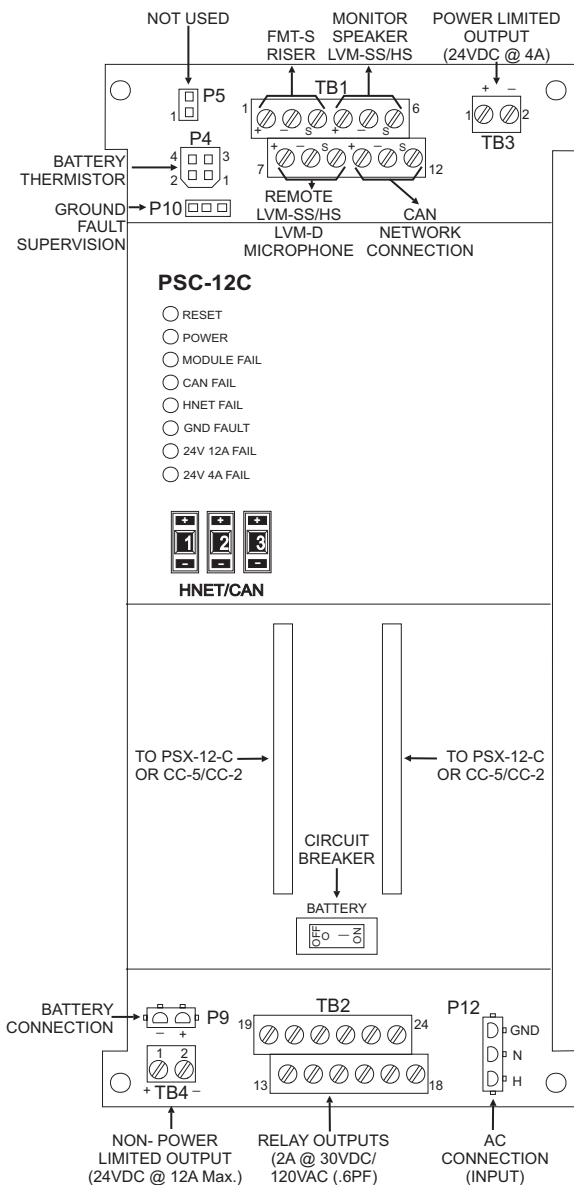


Figure 2
Terminal Blocks, Controls and Indicators

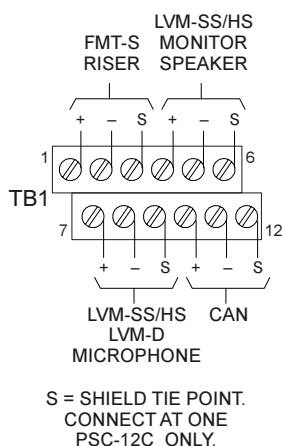


Figure 3
TB1 Wiring Diagram

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-12C is powered from the AC mains. When flashing, indicates that the PSC-12C 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-12C has terminated (applicable only when card resides in a CAN network).
HNET FAIL -	(Yellow) Normally OFF. Not used for E100 applications.
GND FAULT -	(Yellow) Normally OFF. When illuminated, indicates that the PSC-12C 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-12C 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-12C has disconnected the 24VDC power output due to current overload or short circuit.

The terminal blocks of the PSC-12C 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-SS/HS.
	Terminals 7, 8 and 9 provide an input from the microphone of a remotely mounted LVM-SS/HS or LVM-D.
	Terminals 10, 11 and 12 provide external CAN network connection.
	All others are not used.

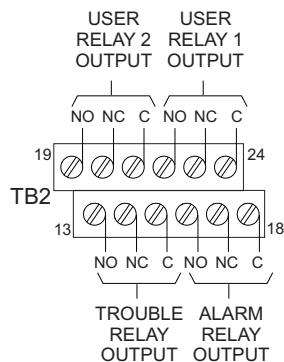


Figure 4
TB2 Wiring Diagram

TB2 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. However, if the CAN fails (and the initiating card cannot communicate with the PMI), the degrade Alarm and Trouble signals will control the ALARM and TROUBLE relays. The User-programmable relays are activated by the PMI-S 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-S.

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 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-S.

This output is normally connected to the inputs of the CC-5. This output must remain within the enclosure. All wiring must be in accordance with local building codes. (See Figure2.)

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-12C shut down.

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

P4 Heat Sensor for Battery.

P5 Not used.

P9 Connects the back-up battery to the PSC-12C. 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.



P10 For systems with multiple PCS-12Cs in a single enclosure, ground fault supervision must be enabled on only one PSC-12C. Set the jumper on P10 to the DISABLE or right-hand position on all but one PSC-12C.

Always apply AC power first followed by the battery.

P12 AC input connector

60-pin Connects the PSC-12C 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 PSX-12C and 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.

Output Voltages: 24VDC , 6.2VDC

Max Current : 2A @ 24VDC

2A @ 6.2VDC

PRE-INSTALLATION

The PSC-12C installation kit has the following components:

The following part is optional:

INSTALLATION KIT COMPONENTS	
1 AC power - cable	C24200-K10-B7
1 DC wire red / blue	C24200-K10-B6
1 Thermistor with cable , l = 3000mm	A5Q00004610
1 SET Battery cable	C24235-A1-K30
1 Ribbon cable 60 Pins, l = 165mm	A5Q00004611
1 Ribbon cable 46 Pins, l = 2200mm	C24235-A1-K8
1 Ribbon cable 46 Pins, l = 850mm	C24235-A1-K9
4 Flat head screws	A5Q00003958
1 Contact washer	H70093-A50-S667

- If the PSC-12C is not located on the same CAB-MP as the PSX-12C, CC-5 and/or CC-2 it is connected to, an extended 60 pin flat ribbon cable, **SIEMENS** Model FCL (C24200-K28-B6), is required.





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

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

- **Battery Circuit Breaker:** Set this circuit breaker to the OFF position.
- **Network Address Switch:** Set the three-digit CAN network address for the PSC-12C using the three-position switch located near the bottom of the front panel. (Refer to Figure 2 for the location of the switch.) The address for the PSC-12C must be the same as the address selected for it in the Zeus Programming Tool. To increment each digit of the address, press the "+" button above the desired digit; to decrement each digit, press the "-" button below the desired digit. The range of allowable addresses is from 001 to 251 (leading zeros must be used).

INSTALLATION



Disconnect BATTERY and AC prior to working on equipment.

The PSC-12C mounts on the Mounting Plate (MP-M). The Mounting Plate may be located either "IN" or "OUT" of the enclosure to perform this installation procedure. If the Mounting Plate is located "IN" 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-12C can occupy any position on the mounting plate. When the PSC-12C is mounted correctly on the 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-C will align with the threaded posts.

1. Install four M5 screws in the threaded posts at the mounting position. Screw each of the M5 screws into the threaded posts 5-6 turns.
2. Place the PSC-12C 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-12C 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.

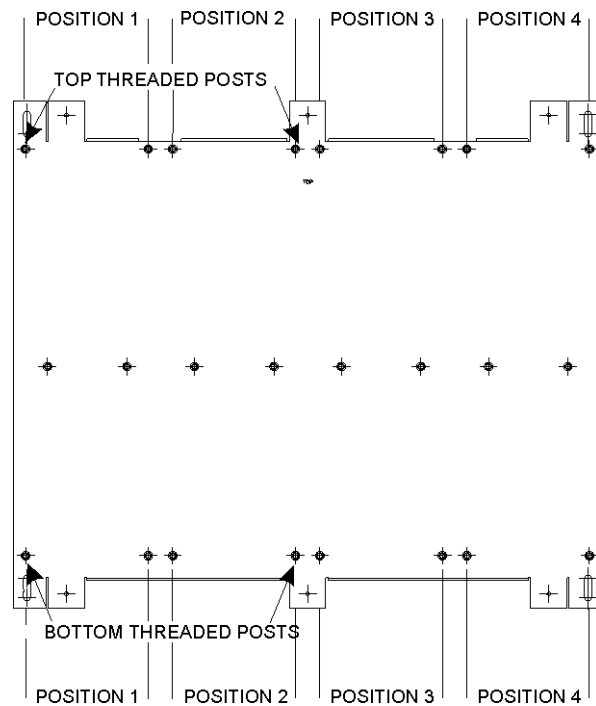


Figure 5
Location Of The PSC-12C On The CAB-MP

WIRING

The PSC-12C has removable terminal blocks and connectors at the top and bottom of the module. The terminals and connectors at the top of the PSC-12C are power limited. The terminals and connectors at the bottom of the PSC-12C 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-12C. Check local requirements.

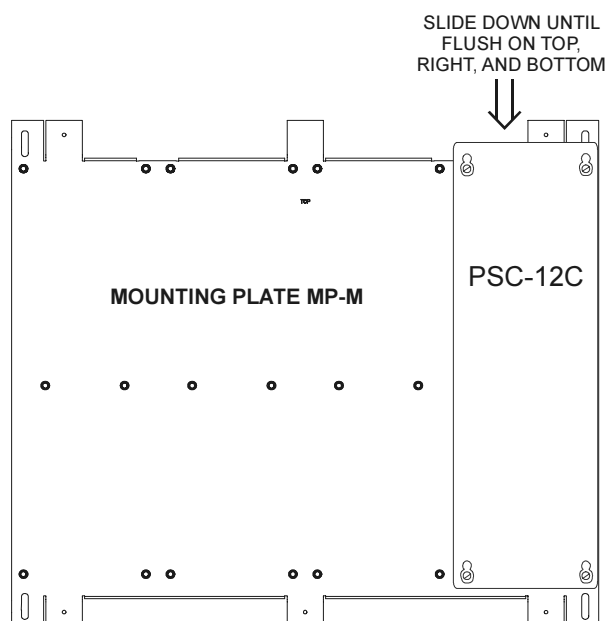


Figure 6
Mounting The PSC-12C On The MP-M



Conduit is not an acceptable Earth Ground Conductor.

Wire in accordance with local codes.

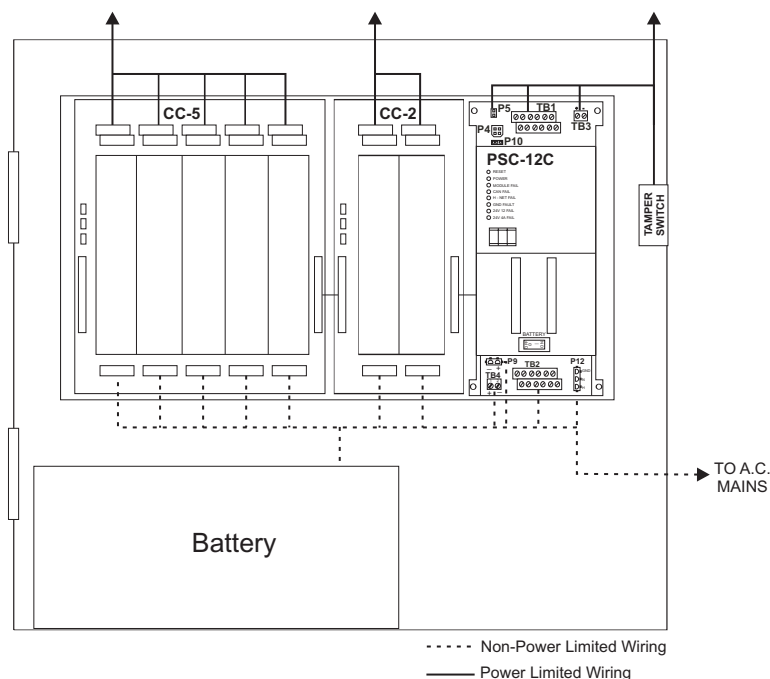


Figure 7
PSC-12C Wiring In The CAB Enclosures

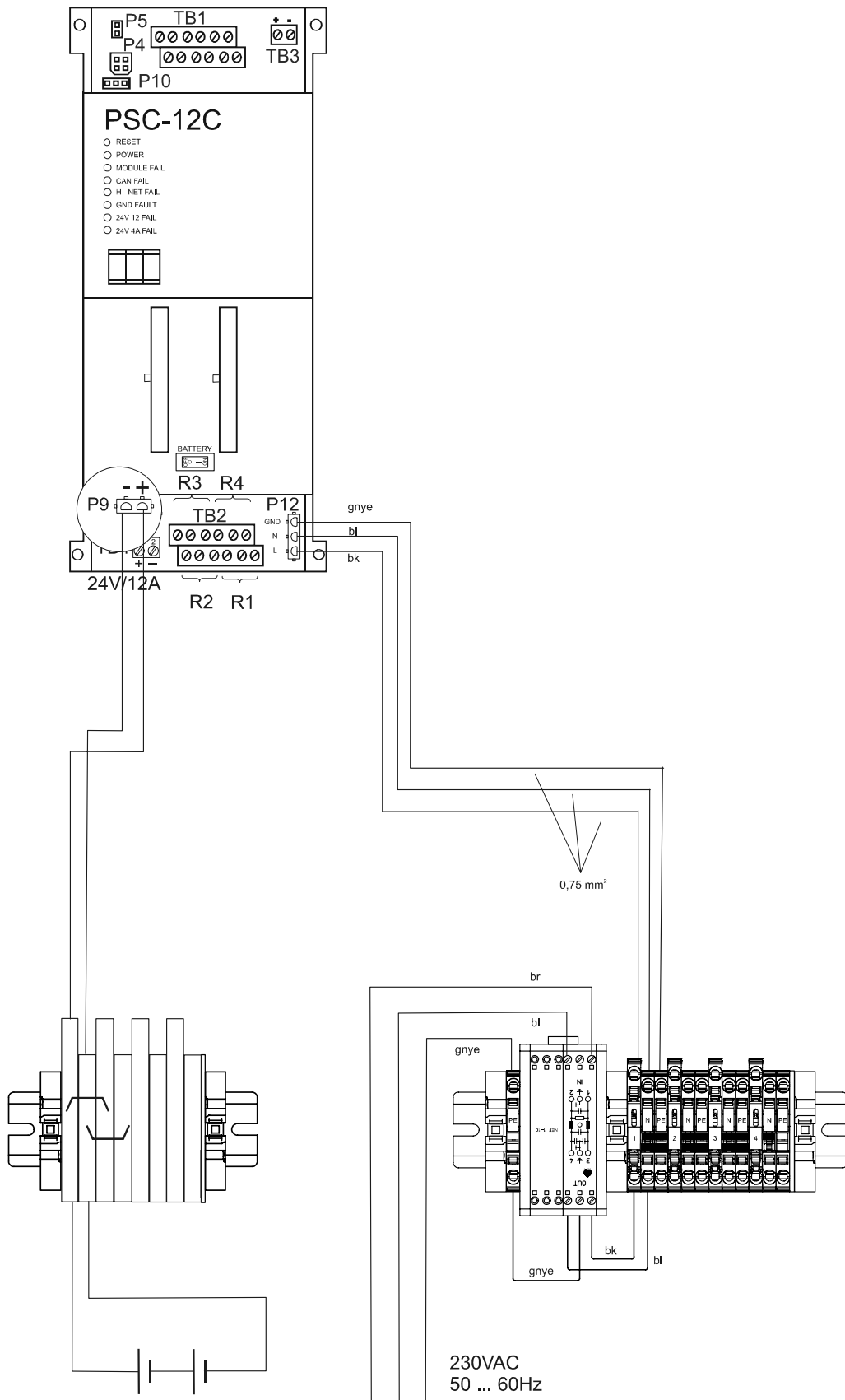


Figure 8
Wiring In The CAB-2 Enclosure

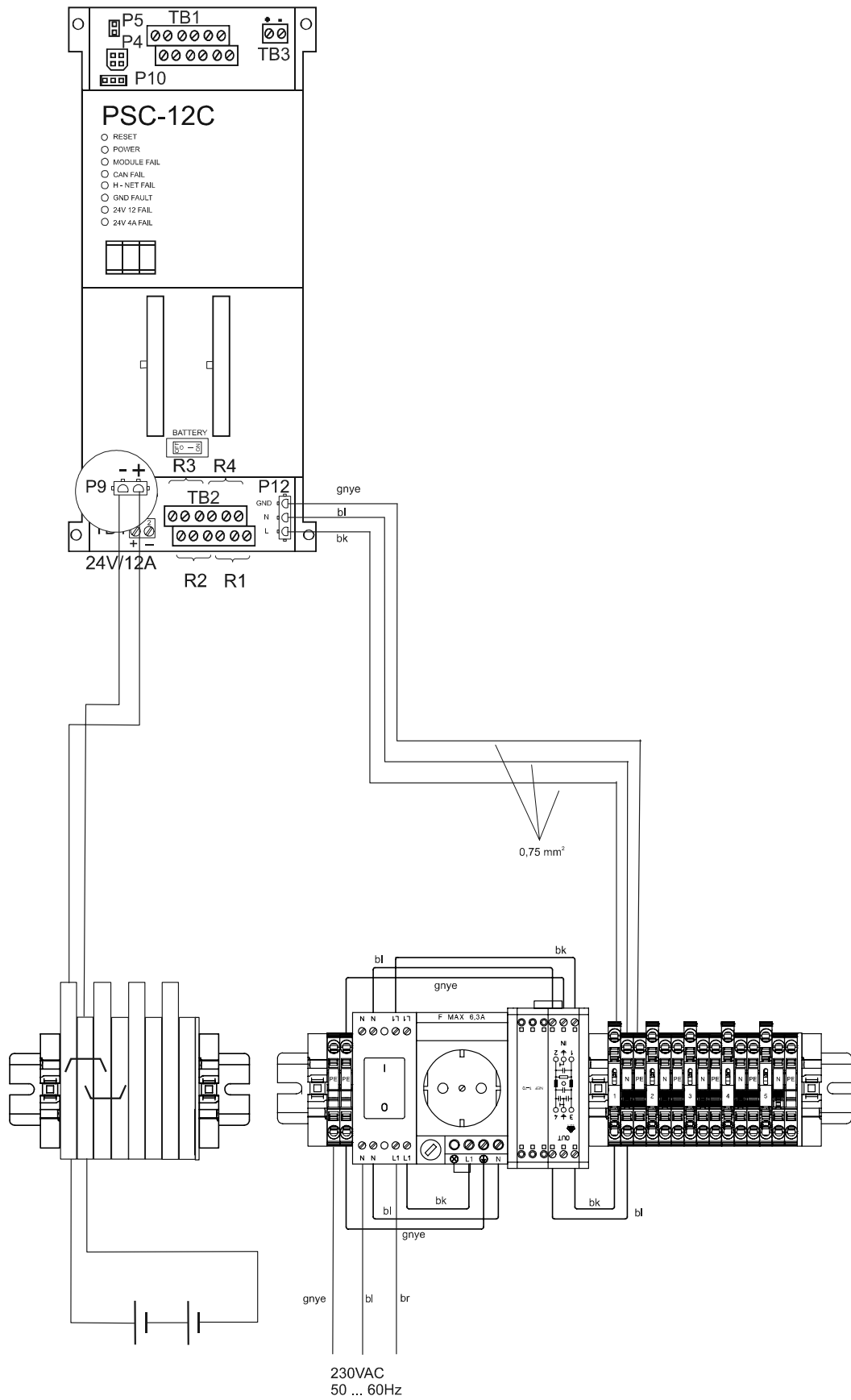


Figure 9
Wiring In The CAB-19 Enclosure

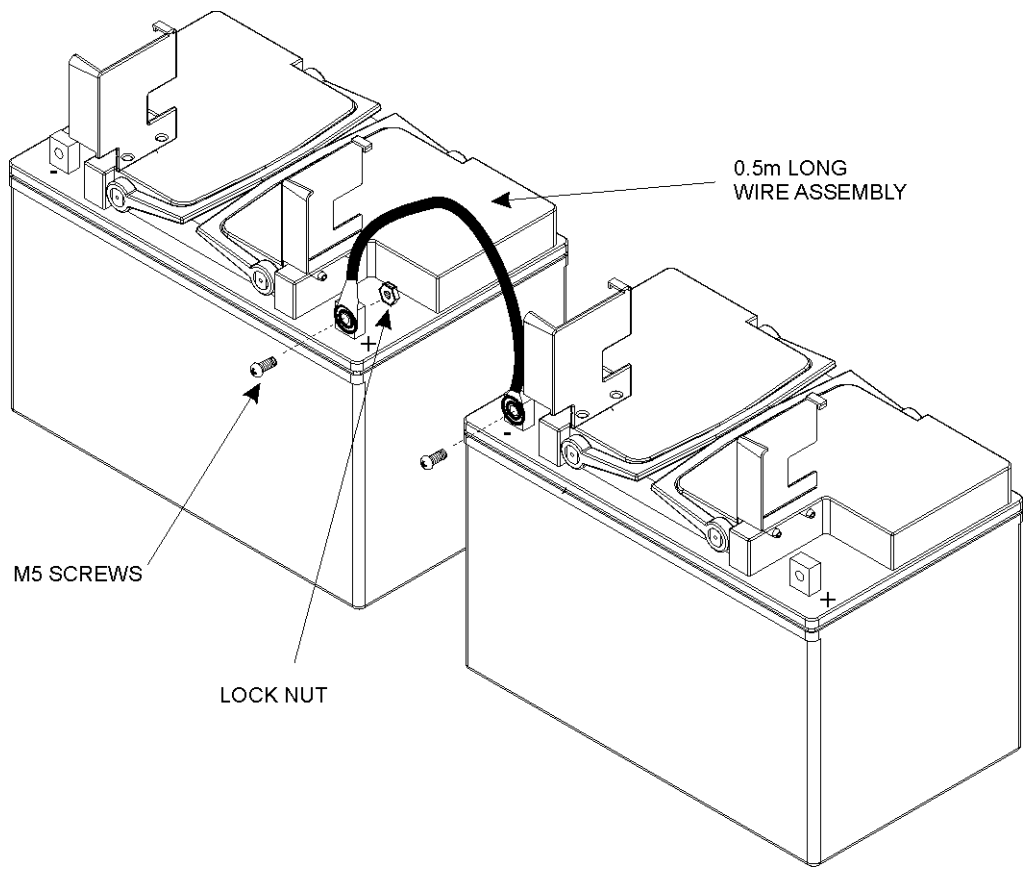


Figure 8
Wiring Batteries To The PSC-12C

Battery Connections

1. Using the 0.5m long wire assembly, connect the two batteries together, as shown in Figure 7. Secure each end of the assembly to the battery with a M5 screw and lock nut.
2. 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.
3. Close the covers of the battery terminals

POWER SUPPLY FULL LOAD CALCULATION FORM

Card / Module	Quantity	Card/Module 24 VDC Current					Card/Module 6.2 VDC Current	
		Back Plane Current		Screw Terminal 24V Current		Total 24 VDC Current (Total 1 + Total 2)	Per Card/Module	Total
		Per Card/Module	Total 1	Per Card/Module	Total 2			
AIC		25mA		0	0		85mA + 50mA per active channel	
DAC-NET		230mA		0	0		0	0
FCM-6S		0	0	14mA + 1mA per active LED			0	0
FMT-S		0	0	150mA			0	0
LCM-8S		0	0	14mA + 1mA per active LED			0	0
LPB		25mA		0	0		95mA + 50mA per active channel	
LVM-SS/HS		0	0	25mA			0	0
LVM-D		0	0	100mA			0	0
NIC-C		120mA		0	0		0	0
OCM-16		0	0	14mA + 10mA per active LED			0	0
PMI-S		230mA		0	0		0	0
RNI		0	0	75mA			0	0
RPM		0	0	150mA			0	0
SCM-8S		0	0	14mA + 1mA per active LED			0	0
SIM-16		0	0	10mA per active relay + 1.2mA per supv. input			0	0
TZC-8B		0	0	355mA			0	0
ZAC-40		0	0	150mA + 53mA per Watt			0	0
ZAM-180		0	0	280mA + 53mA per Watt			0	0
ZIC-4AC		250mA max.		Usage dependant			0	0
TOTAL			(Must not exceed 2 Amps)	TOTAL			① (Must not exceed 12 Amps*)	TOTAL ② (Must not exceed 2 Amps)

*12A max. in the alarm state, 5A max. in standby.

Power Supply Load Calculations

To ensure that the PSC-12C power supply is not overloaded, use the form and follow the procedure listed below.

1. Enter the quantity of each card/module in the enclosure.
2. Calculate both the 24VDC and 6.2VDC loads for each row.
3. Total the Active 24VDC and Active 6.2VDC columns.
4. Ensure that both totals are within the power supply output ratings

Battery Power

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

Use either 14 or 12 AWG (2.5mm² or 4mm²) for the battery connection.

Battery backup is required. The PSC-12C can charge a battery up to 100 amp hours. (12 amp hours is the minimum size for the PSC-12C.) These battery models are for use with the system:

- Battery 12V/12AH (V24069-Z103-A12)
- Battery 12V/25AH (GBI:13013)
- Battery 12V/40AH (V24069-Z103-A6)
- Battery 12V/65AH (V24069-Z103-A7)

Select the battery that meets or exceeds the final calculated battery amp hour rating. To determine the battery size, use the form and follow the procedure listed below.

1. Record quantities of all required cards and modules.
2. Calculate each row across and place the total in the last column: Total Standby 24VDC Module Current.



To determine the battery size, add current supplied to all devices connected to the PSX-12C Power Supply Extenders

STANDBY CURRENT CALCULATION FORM

Module	Quantity	Standby 24 VDC Module/Card Current)	Load Current Per Circuit		
			End of Line Device	Device Current	Total Standby 24 VDC Module Current
AIC		50mA	0	0	
DAC-NET		230mA	0	0	
FCM-6S		14mA	0	1mA per LED	
FMT-S		150mA	0	30mA per active handset	
LCM-8S		14mA	0	1mA per LED	
LPB		50mA	0	0	
LVM-SS/HS		25mA	0	1mA per LED	
LVM-D		50mA	0	0	
NIC-C		120mA	0	0	
OCM-16		14mA	0	10mA per LED	
PMI-S		230mA	0	0	
PSC-12C		150 mA	0	20.0 mA per active relay	
PSX-12C		170mA	0	0	
RNI		75mA max	0	0	
RPM		150mA	0	0	
SCM-8S		14mA	0	1mA per LED	
SIM-16		20mA	1.2mA per supervised input	10mA per active relay	
TZC-8B		280mA	0	0	
ZAC-40		150mA	1mA	0	
ZAM-180		300mA	1mA	0	
ZIC-4AC		90mA	4mA	0	
③ Total Standby Current I _{SB}					

To get the right battery size, refer to the specifications for the batteries. The battery capacity is dependent upon the load. First, calculate the standby battery requirement in the form below, using the Total Standby Current I_{SB} from the Standby Current Calculation Form and the Correction Factor for standby current (F_{SB}).

STANDBY SYSTEM CURRENT

Total Standby System Current I_{SB} in A (mA x 1000)		I_{SB} ③
Standby System Energy in Ah_{SB}	DIN VDE 0833-2: $I_{SB} \times 4h =$	Ah_{SB}
	EN 60849: $I_{SB} \times 6h =$	Ah_{SB}
	EN 60849: $I_{SB} \times 24h =$	Ah_{SB}
	DIN VDE 0833-2: $I_{SB} \times 72h =$	Ah_{SB}
Battery Correction Factor (F_{SB}) Dependent on Standby Current (I_{SB}) and Battery Size - Refer to Battery Correction Factors Table		
Battery Energy Needed for Standby $Ah_{SB} \times F_{SB}$		④

Next, calculate the full load battery requirement in the form below, using ① and ② from the Power Supply Full Load Calculation Form and the Correction Factor for full load current (F_{FL}).

FULL LOAD SYSTEM CURRENT

Total Full Load System Current I_{FL} in A (mA x 1000) $I_{FL} =$ ① + $\frac{1}{4}$ ②		I_{FL}
Full Load System Energy in Ah_{FL}	$I \times \frac{1}{4}h =$	Ah_{FL}
	DIN VDE 0833-2 / EN 60849: $I_{FL} \times \frac{1}{2}h =$	Ah_{FL}
	$I_{FL} \times 1h =$	Ah_{FL}
	$I_{FL} \times 2h =$	Ah_{FL}
Battery Correction Factor (F_{FL}) Dependent on Full Load Current (I_{FL}) and Battery Size - Refer to Battery Correction Factors Table		
Battery Energy Needed for Full Load $Ah_{FL} \times F_{FL}$		⑤

Finally, add the battery energy needed for standby and full load in the form below. The selected battery capacity must exceed this value.

TOTAL

Total battery capacity ④ + ⑤	Ah
------------------------------	----

BATTERY CORRECTION FACTORS (F_{SB}/F_{FL})

Producer: EXIDE																	
Battery Size	Battery Type																
12 Ah	S312 / 12S																
25 Ah	A512 / 25.0 G5																
40 Ah	S312 / 40 G5																
65 Ah	P12 V1575																
Battery Size in Ah		Battery Current I(Batt) in A															
12		1.2	2.4	4.8	7.2	9.6	12	14.4	16.8	19.2	21.6	24	30	36	48		
40		4	8	16	24	32	40	48									
65		7	13	26	39	52											
100		10	20	40	60												
Factor 20°C (20°..40°)		1	1.09	1.25	1.33	1.44	1.56	1.64	1.74	1.83	1.92	2	2.26	2.52	3		
Factor 10°C (10°..20°)		1.03	1.12	1.29	1.37	1.48	1.61	1.69	1.79	1.88	1.98	2.06	2.33	2.6	3.09		
Factor 0°C (0°..10°)		1.10	1.20	1.38	1.46	1.58	1.72	1.80	1.91	2.01	2.11	2.20	2.49	2.77	3.30		
Battery Size in Ah		Battery Current I(Batt) in A															
25		3	5	10	15	20	25	30	35	40	45	50					
Factor 20°C (20°..40°)		1	1.30	1.50	1.82	2.08	2.31	2.38	2.68	3.00	3.17	3.75					
Factor 10°C (10°..20°)		1.03	1.34	1.55	1.88	2.14	2.38	2.45	2.76	3.09	3.27	3.86					
Factor 0°C (0°..10°)		1.10	1.43	1.65	2.00	2.29	2.54	2.62	2.95	3.30	3.49	4.13					
Max. Battery Current I (Batt max) = 1 * PSC-12C plus 3 * PSX-12C / 24V																	
Max. Battery Current I (Batt max) = 4 * 300W / 24V = 50A																	



ELECTRICAL RATINGS		PSC-12C
Input Voltage:		120VAC / 220VAC / 240VAC +10%, -15%
Input Current:		3.3A max. @ 120VAC 2.5A max. @ 220VAC 2.0A max. @ 240VAC
24V Backplane Current:		2A max
Screw Terminal 24V Current:		
Power limited		4A max
Non-Power Limited:		12A max
6.2V Backplane Current:		2A max
24V Standby Current:		150mA + 20mA per active relay

ELECTRICAL RATINGS		Battery System
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)

For CE applications in Cerberus E100 systems refer to
Installation Instruction A24205-A334-B844 (English) or A24205-A334-A844 (German).

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Order No. A24205-A334-B819
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For CE applications in Cerberus E100 systems refer to
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