PS1240x Series

Dual Voltage Access Control Power Supply Systems

Operating and Installation Instructions

52-232 Rev E.01

Warnings and Notices

- WARNING - To reduce the risk of fire or electric shock, do not expose this product to rain or moisture

- WARNING - This installation and all servicing should be made by a qualified service person and should conform to all local codes

- NOTICE - This equipment shall be installed in a manner which prevents unintentional operation from employees, janitors and cleaners working about the premesis, by falling objects, by customers, by building vibration and by similar causes

- NOTICE - This equipment is not intended for use within the patient care areas of a Health Care Facility

Symbol Definitions

WARNING - Read the instruction manual to avoid personal injury or property damage

WARNING - Risk of electric shock. Service to be performed by a qualified service person

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Section 1
Introduction

The PS1240x Series of power supply systems provides 12VDC and 24VDC power with multiple fused and controllable outputs for use with access control systems of 4 through 16 doors. Integrated battery charger for up to 34AH (Space for 12AH in enclosure) of battery backup - a single battery set will will provide backup to both voltages. All units allow FAI control, selectable by zone, for all lock outputs. Separate AC and DC fault contacts and integral tamper switch provide trouble notification to the access control panel. Pre-wired harnesses allow easy interconnect to popular access control panels, such as the Software House APC.

- PS12404UL-45 Provides 4A @ 12V and 24VDC for a four door access control system
- PS12404UL-810 Provides 4A @ 12V and 24VDC for an eight door access control system
- PS12408UL-810 Provides 8A @ 12V and 24VDC for an eight door access control system
- PS12408UL-1215 Provides 8A @ 12V and 24VDC for a twelve door access control system
- PS12408UL-1620 Provides 8A @ 12V and 24VDC for a sixteen door access control system

Section 2
Applicable Standards / Documents

NFPA Standards
NFPA 72 National Fire Alarm Code
NFPA 70 National Electrical Code
NFPA 731 Standard for the Installation of Electronic Premises Security Systems

US Standards
UL 294 Access Control System Units

Other
Applicable Local and State Building Codes
Requirements of the Local Authority Having Jurisdiction (LAHJ)

UL 294 Performance Levels:
Access Control Line Security: I
Destructive Attack: I
Endurance:N/A
Standby Power: IV

Section 3
System Overview

3.1 Electrical Ratings and Specifications

Manufactured By

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Product Use

When installed in accordance with all standards listed in Section 2 of this document, the PS1240x Series provides DC power for access control equipment or other DC powered devices.

Model Numbers and Specifications

Model Number	Maximum System Current		No. Of Constant Outputs	No. Of Controlled Outputs	Maximum Input Power	Maximum Battery Storage
	V1 - 12VDC	V2 - 24VDC				
PS12404UL-45	4.0A	4.0A	5	4	204 Watts	Two 12AH, 12VDC
PS12404UL-810	4.0A	4.0A	10	8	204 Watts	Two 12AH, 12VDC
PS12408UL-810	8.0A	8.0A	10	8	360 Watts	Four 12AH, 12VDC
PS12408UL-1215	8.0A	8.0A	15	12	360 Watts	Four 12AH, 12VDC
PS12408UL-1620	8.0A	8.0A	20	16	360 Watts	Four 12AH, 12VDC
PS12408UL-810N	8.0A	8.0A	10	8	360 Watts	Four 12AH, 12VDC
PS12408UL-1215N	8.0A	8.0A	15	12	360 Watts	Four 12AH, 12VDC
PS12408UL-1620N	8.0A	8.0A	20	16	360 Watts	Four 12AH, 12VDC

Replacement Parts

Order Number	Part Number	Description
00009	Tamper Switch Kit	Tamper Switch with mounting hardware
00635	T29V500	PS12408 Replacement Transformer
00634	TC-28V360	PS12404 Replacement Transformer
97432	PS12408-UL-BD	PS12408 Replacement Power Supply Board
97424	PS12404-UL-BD	PS12404 Replacement Power Supply Board
97422	FB124UL-5	Replacement FB124UL-5 distribution board
97444	RB24UL-4P	Replacement positive trip relay distribution board
97420	RB24UL-4N	Replacement negative trip relay distribution board
97483	4-BIC-S	Replacement four conductor cable - Short
97484	4-BIC-L	Replacement four conductor cable - Long
97445	HARN-2	Replacement zone input cable for RB24UL-P/-N
97461	HARN-3	Replacement Fault / Panel Power cable
97486	BH-2	Replacement Battery Cable for PS12404
97487	BH-3	Replacement Battery Cable for PS12408

3.2 Terminal Descriptions

Wire should be sized appropriately for voltage drop and current carrying capability. All terminals are labelled for polarity where appropriate.

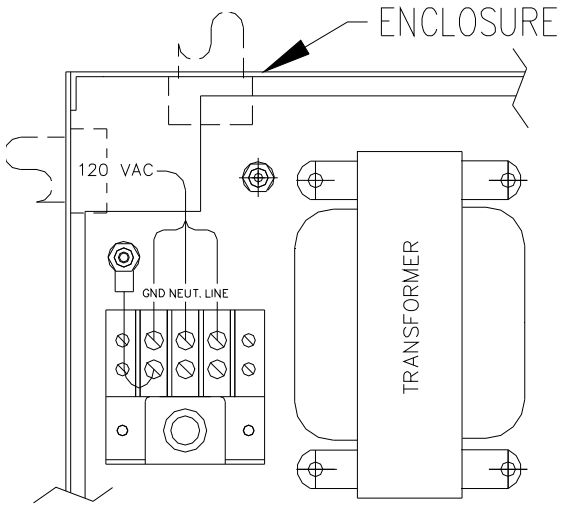


Figure 3.2.1.1

3.2.1 AC Input (System)
The primary AC input voltage connects to the three position terminal block with the label "Warning High Voltage" located near the transformer. The wire connected must be 14 through 12 AWG. See Figure 3.2.1.1.

Note - *All wiring should be installed in accordance with (NEC760) NFPA70, NFPA72, and all local code requirements. Power limited wiring requires that power limited and non-power limited wiring remain physically separated. All power limited circuits must remain at least one quarter inch (¼") away from any non-power limited circuit wiring. All power limited circuit wiring must enter and exit the cabinet through different knockouts then non-power limited wiring.*

Note - *The earth ground wire should always be connected first or disconnected last for safety.*

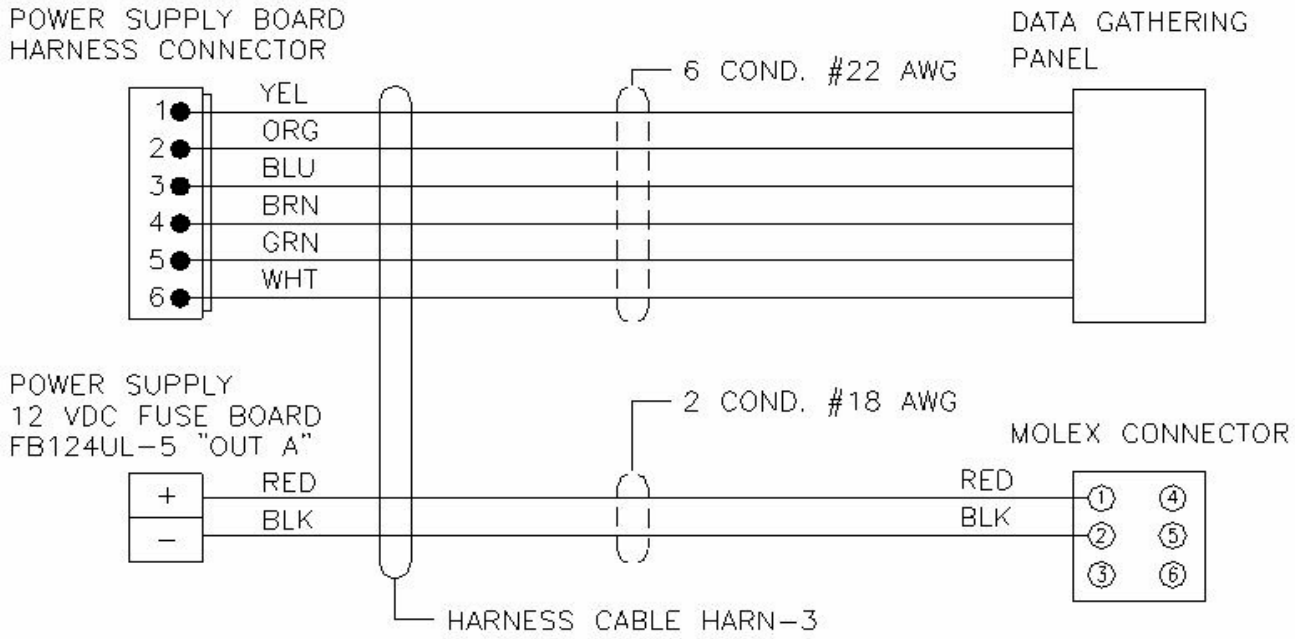
3.2.2 Bulk DC Outputs (12V & 24V) (PS1240x Power Supply Board)
The full current for each voltage is available from the bulk DC output terminals located on the main power supply board. These terminals accept 22 through 12 AWG wire. See Section 3.1 for output current specifications by model number.

3.2.3 Battery Terminals (24V BAT +/-) (PS1240x Power Supply Board)
The PS1240x has one set of battery terminals labelled 24V BAT+/- which will charge up to 34 amphours within 48 hours. These terminals accept 22 through 12 AWG wire. The battery set MUST be 24VDC and provides backup to both the 24V and 12V outputs.

Caution - *Observe the polarity of the PS1240x battery terminals with respect to the battery set or damage to the load, power supply, or battery set may occur.*

Note - *Series-connected batteries should always be of the same amphour capacity, age, and state-of-charge to prevent battery / system damage.*

Note - *It is the responsibility of the installer to determine the minimum battery requirement for the particular application in which the supply is being used. Backup batteries should be serviced at regular intervals as determined by local and/or national codes.*



TECHNICAL NOTE: Wire colors may vary. In some systems the #22 AWG WHT wire on the harness connector may be RED and/or the #18 AWG RED + wire may be WHITE.

Figure 3.2.4.1

3.2.4 APC Fault and Power Cable (PS1240x Power Supply Board)

The PS1240x power supply is supplied with a cable for connection to an APC panel. The connector at the end of the cable provides power to the panel, while the six colored wires provide fault and tamper switch status to the panel. The yellow and orange wires are the AC fault contact, the blue and brown wires are the DC fault contact, and the green and white (or RED) wires are the tamper switch.

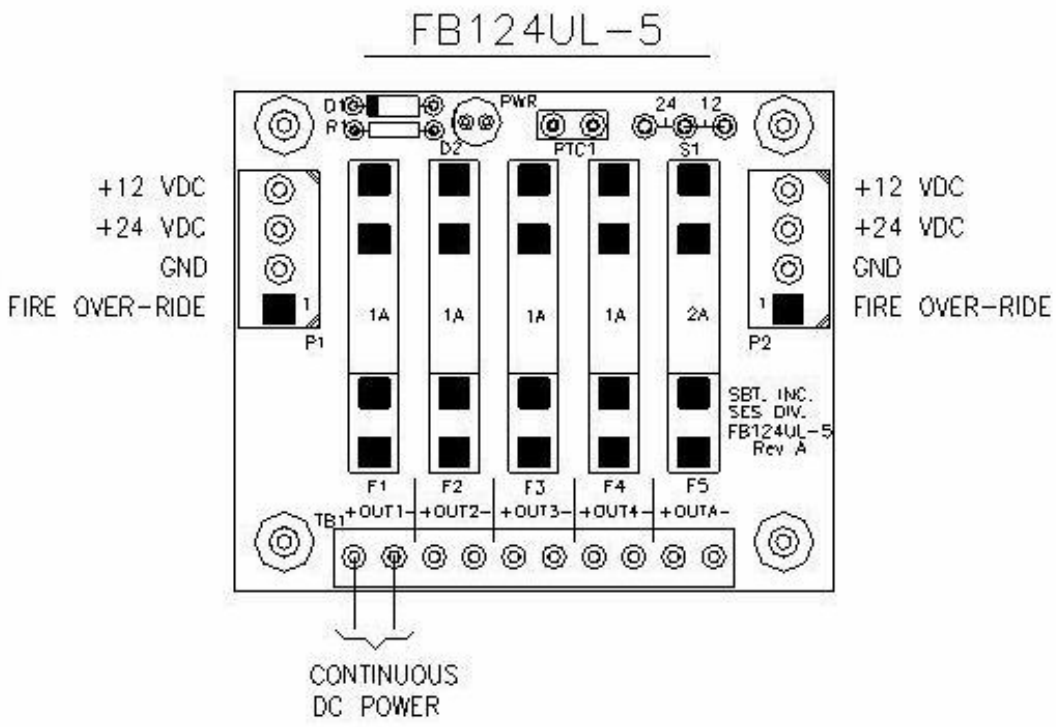


Figure 3.2.5.1

3.2.5 Distributed Outputs (FB124UL-5 Boards)
The FB124UL-5 board(s) provide constant 12 or 24VDC to loads requiring constant power. Each output is labeled "Out x +/-". "Out 1-4" are fused at 1A, while "Out A" is fused at 2A. OutA of the first FB124UL-5 board is wired to the APC Fault and Power Cable (See Section 3.2.5)

3.2.6 Lock Outputs (RB24UL-4x Boards)
The RB24UL-4N or -4P boards provide controllable 24VDC power to locks. Each output is jumper selectable for FAI control (See Section 5) and has four terminals associated with its output. "RETx" is the DC common for the output. "COMx" provides constant power (FAI Controlled). "NOx" provides power when the relay is active, while "NCx" provides power when the relay is relaxed.

3.2.7 Access Control Inputs (RB24UL-4x Boards)
The zone inputs for the RB24UL-4x board is via the supplied eight wire harness which plugs into connector P2 of the RB24UL board. Each zone pair accepts a dry contact input.

Zone 1 - Red & Black
Zone 2 - Green & White
Zone 3 - Blue & Brown
Zone 4 - Yellow & Orange

3.2.8 Fire In (RB24UL-4x Boards)
Each RB24UL-4x board has its own fire alarm input. This input accepts a normally closed contact and disables selected outputs when the contact opens. Jumpers S1-S4 select which outputs disable on a fire alarm input. See Section 5 for details on jumpers S1-S4.

3.2.9 Fire Out (RB24UL-4x Boards)

Each RB24UL-4x board also has a normally closed relay output which can be used to activate the fire alarm input of other RB24UL-4x boards in the system.

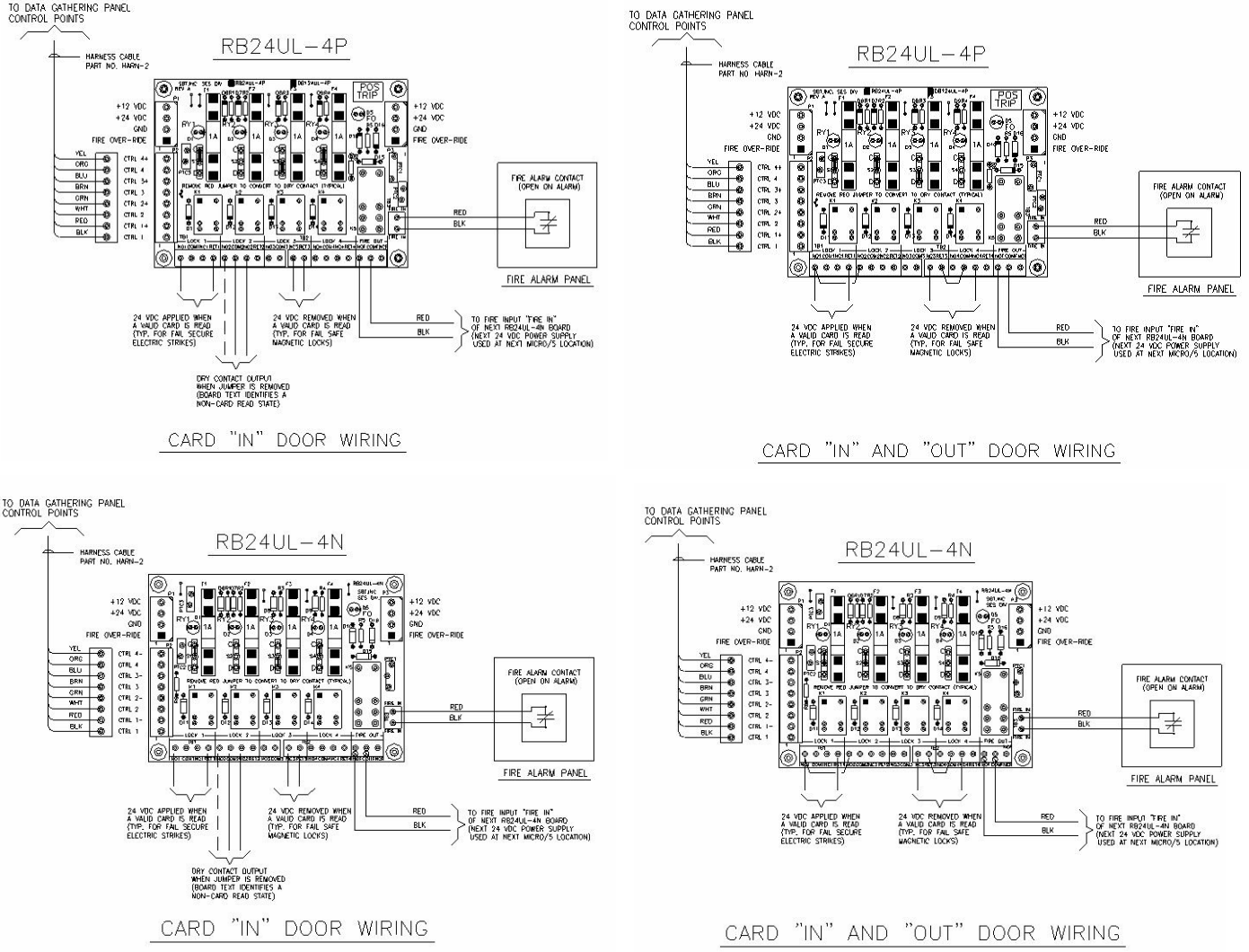


Figure 3.2.6.1

3.3 Fusing

When replacing fuses in a PS1240x system, only the equivalent type and rating are to be used. The PS1240x system utilizes commonly available AGC fast-blow fuses.

Main AC Input: AGC-5
FB124UL-5
- Outputs 1-4: AGC-1
- Output 5: AGC-2

RB124UL-4x
- Outputs 1-4: AGC-2

Section 4
Installation

4.1 Mounting

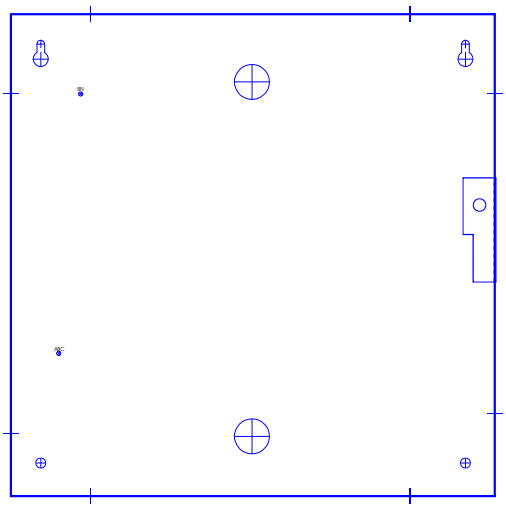
4.1.1 Mount the unit in locations that meet the following temperature and humidity requirements. Do not expose to conditions outside of these ranges.

Temperature	0 °C to 49 °C (32 °F to 120 °F)
Humidity	32 °C (90 °F) @ 93%

Use #8 hardware minimum in four locations. Use an appropriate fastening system for the mounting surface.

Cabinet Mounting:

1. Remove backplate assembly (optional).
2. Mark and predrill two holes for the top keyhole mounting screws
3. Install two fasteners in the mounting wall leaving screwheads protruding approximately ¼ inch
4. Using the two upper keyholes, mount the cabinet over the two screws
5. Mark the two lower holes, remove the cabinet and drill the lower mounting holes
6. Mount the cabinet, install the remaining fasteners, and tighten all fasteners



4.2 Wiring

4.2.1 Wire Routing

All wiring must be installed in accordance with NFPA70 [NEC760] and all local code requirements.

Power Limited wiring requires that power limited and nonpower limited wiring remain physically separated. All power limited circuits must remain at least one quarter inch (¼") away from any nonpower limited circuit wiring.

4.2.2 AC Power Connection

Before making the AC connection, ensure that the electrical power to the location of the unit is off.

The primary AC input voltage connects to the three position terminal block with the label "Warning High Voltage" located near the transformer. The wire connected must be 14 through 12 AWG. To make the connection, remove the protective cover from the terminal strip. The cover is labeled with the phasing and earth ground connections. Replace the cover after connecting the primary wiring.

4.2.3 Field Wiring

Field wiring is connected either to the terminal strips located on the individual boards or via premade harnesses supplied with the unit. Wire sizing and terminal information is provided in Section 3 of this manual.

Section 5
Operating the PS1240x Series

5.1 Jumper Configuration

Before powering the system, the jumpers on the internal boards must be set for proper operation.

5.1.1 PS1240x Main Power Supply Board Jumpers

5.1.1.1 24V Battery Backup Jumper (S1)

This jumper selects whether the 24V outputs are backed up by the battery set. This jumper can be used to allow release of the locks on loss of AC power if required.

Jumper In: 24V and 12V power is maintained upon loss of AC
Jumper Out: 24V power is dropped upon loss of AC, 12V power is maintained

5.1.2 FB124UL-5 Board Jumpers

5.1.2.1 Voltage Select Jumper (S1)

This jumper selects the voltage source for all five outputs of the FB124UL-5 board.

Left (24) - All five outputs set for 24VDC
Right (12) - All five outputs set for 12VDC

5.1.3 RB124UL-4N and -4P Board Jumpers

5.1.3.1 FAI Mode Jumpers (S1-S4)

Each output has a jumper associated with it to control the FAI mode for the output.

Up (C) - Constant Output - the voltage output does not drop on a fire alarm input
Down (D) - Disable on Fire Alarm - the voltage output will drop power on a fire alarm input
Removed - The output does not provide voltage and acts as a dry contact output which is unaffected by the fire alarm input.

5.2 Visual Indicators

5.2.1 PS1240x Main Power Supply Board Visual Indicators

5.2.1.1 AC (D15)

This is a green LED which lights when low voltage AC is present at the PC board.

CAUTION - Always check for AC presence with a volt meter before servicing

5.2.1.2 FLT (D9 or D2)

This is a yellow LED which lights on a DC fault condition. These conditions incluse high or low output or battery voltage or tripped PTC.

5.2.1.3 12V (D6)

This is a red LED which indicates presence of DC voltage at the 12V DC output.

5.2.1.4 24V (D11 or D10)

This is a red LED which indicates presence of DC voltage at the 24V DC output.

5.2.2 FB124UL-5 Board Visual Indicators

5.2.2.1 Voltage Input (D2)

This is a red LED which indicates presence of voltage to the input of the FB124UL-5 board

5.2.3 RB124UL-4x Board Visual Indicators

5.2.3.1 FO (D5)

This is a red LED which indicates that the FAI relay is energized, indicating that voltage is available at all outputs set for a voltage output. When the FAI input is activated, this LED extinguishes, indicating power is dropped to any output whose jumper is set in the "D" position.

5.2.3.2 RY1-RY4 (D1-D4)

These are red LEDs associated with each output zone indicating that the zone's relay is energized.

5.3 Troubleshooting

WARNING - Installation and service should only be performed by a qualified service person and should conform to all local codes

Condition	Possible Cause	Solution
Green "AC" LED is not lit	No AC, Low AC, or blown AC fuse	Verify that primary AC voltage is present and within the range of 102-132VAC. Replace AC input fuse if necessary.
	Loss of transformer	Check for transformer secondary voltage at the power supply board's input (TB4).
	Internal problem	Contact AlarmSaf
One or more output voltage not present (12V and/or 24V LED not lit)	Short circuit or overload	Remove J1 and J2 and any wiring from TB1 and TB2 from power supply board and check output at TB1 and TB2.
	Internal problem	Contact AlarmSaf
The output voltage is incorrect	Excessive loading on output	Verify that individual and total output current is less than rated current
	AC trouble	Verify presence of at least 102VAC on the input
	Bad / Incorrect Battery Set	Verify that a good battery set of the proper voltage is connected
The Common Fault relay is indicating a fault condition	Excessive loading on output	Verify that output current is less than the rated current
	Bad, Incorrect, or Missing Battery Set	Verify that a good battery set of the proper voltage is connected properly
	Internal problem	Contact AlarmSaf
The AC Fault relay is indicating a fault condition	Low or Missing AC	Verify the presence of at least 102VAC on the input and the input fuse is not blown

Section 6
Specifications

6.1 Electrical Specifications

6.1.1 Input Voltage	120VAC nominal
6.1.2 Input Power	204W Max - PS12404 360W Max - PS12408
6.1.3 Input Frequency	60Hz
6.1.4 Minimum Battery Charge Capacity	4 Amphours
6.1.5 Maximum Battery Charge Capacity	34 Amphours

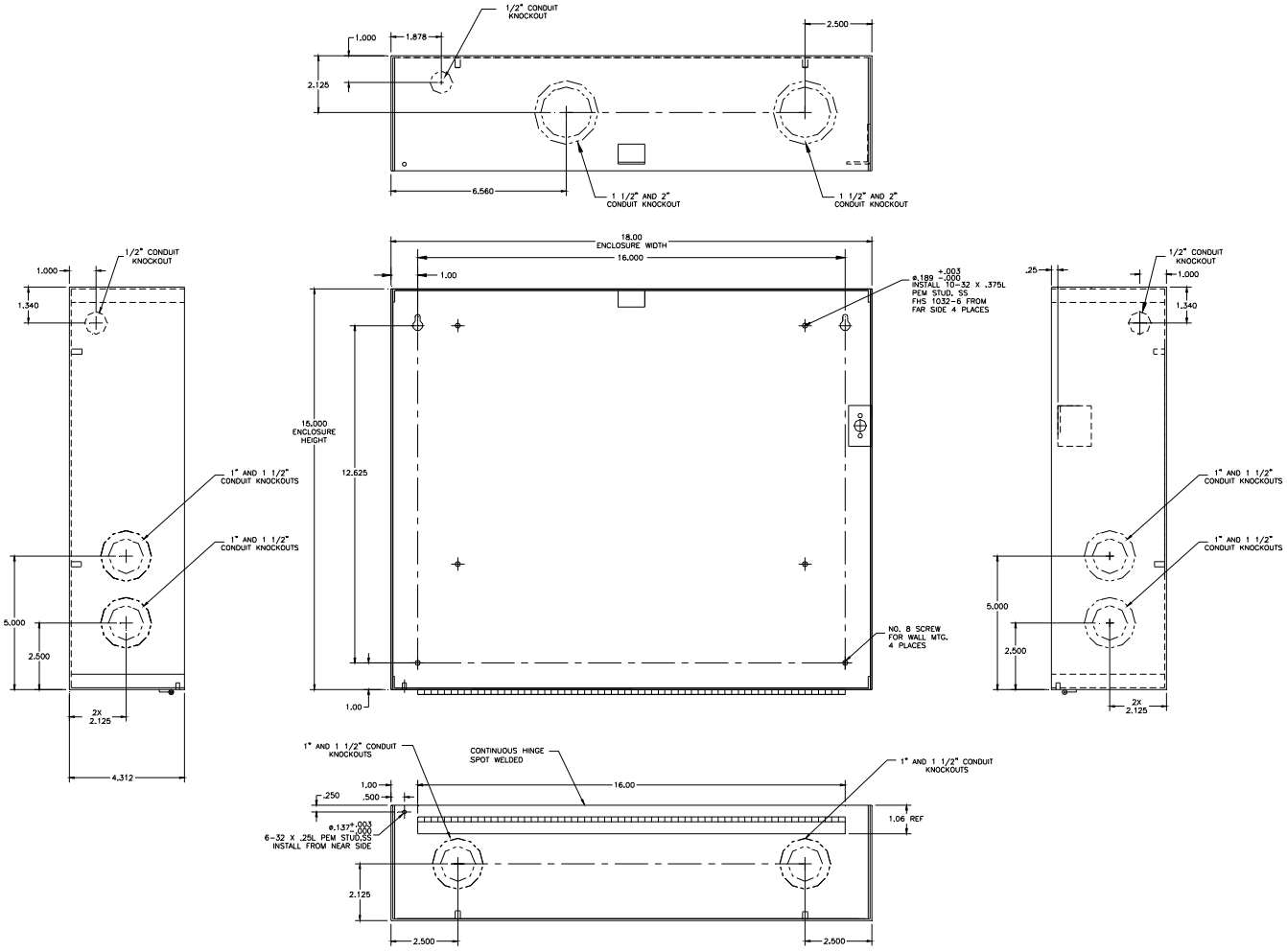
6.2 Temperature Specifications

6.2.1 Ambient Temperature Range	0°C to 49°C (32°F to 120°F)
6.2.2 Ambient Humidity	93% at 32°C (90°F) maximum
6.2.3 BTU Output	140 BTU - PS12404 116 BTU - PS12408

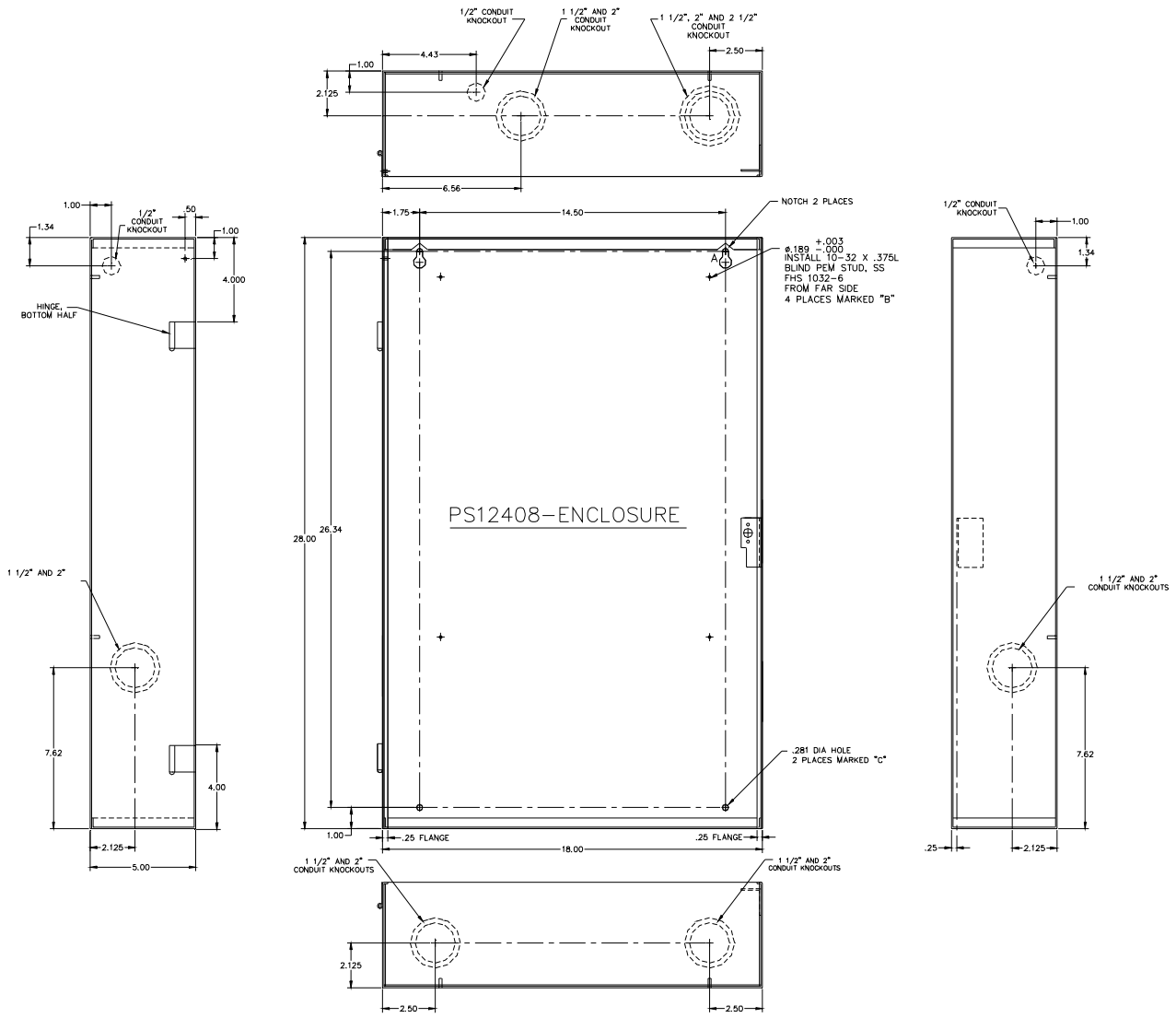
6.3 Mechanical Specifications

6.3.1 Weight	Approx. 52 lbs. (PS12408 - Model Dependent) Approx. 26 lbs. (PS12404 - Model Dependent)
6.3.2 Overall Size	18.00”W x 28.00”H x 5.00”D - PS12408 18.00”W x 15.00”H x 4.00”D - PS12404

6.3.3 CAD Drawings



PS12404–ENCLOSURE


1/2" CONDUIT KNOCKOUT
1 1/2" AND 2" CONDUIT KNOCKOUT
1 1/2", 2" AND 2 1/2" CONDUIT KNOCKOUT
4.43
2.50
1.00
2.125
6.56
1.00
.50
1.34
1.00
4.000
HINGE, BOTTOM HALF
1 1/2" AND 2"
7.62
4.00
2.125
5.00
1.75
14.50
NOTCH 2 PLACES
+.003
ø.189 -.000
INSTALL 10-32 X .375L
BLIND PEM STUD, SS
FHS 1032-6
FROM FAR SIDE
4 PLACES MARKED "B"
A
PS12408-ENCLOSURE
26.34
28.00
.281 DIA HOLE
2 PLACES MARKED "C"
1.00
.25 FLANGE
.25 FLANGE
18.00
1 1/2" AND 2" CONDUIT KNOCKOUTS
1 1/2" AND 2" CONDUIT KNOCKOUTS
2.125
2.50
2.50
1/2" CONDUIT KNOCKOUT
1.00
1.34
1 1/2" AND 2" CONDUIT KNOCKOUTS
7.62
.25
2.125

Glossary

ABC	See "Accessory Board Connector"
Accessory Board Connector	Connector present on some AlarmSaf power supplies and accessory boards, allowing plug-in expansion of the system
Accessory Board	An AlarmSaf product for use with AlarmSaf power supplies containing an ABC connector. These boards allow plug-in expansion of the functionality of the system. Examples of accessory boards include, but are not limited to, voltage distribution (simple and controlled), secondary DC-DC power supplies, and NAC Circuit expanders.
AC-DC Converter	A DC power supply whose voltage input is either direct from the AC line or though a step-down AC transformer
Buss 1 (B1)	The primary DC voltage in a system. Typically the higher of the two voltages in dual voltage systems
Buss 2 (B2)	The secondary DC voltage in a system. Only dual voltage systems use this voltage.
Class 2 Power Limited	A voltage output or wiring which conforms to NEC Article 725.
Controlled Distribution	Voltage distribution providing on/off control for the outputs. Control can be from FAI, an access control panel, card reader, or other device. The MB8(F) and CMB8(F) accessory boards, and the APD8(F) are examples of controlled distibution.
DC-DC Converter	A DC power supply whose voltage input comes from another DC source. DC-DC converters allow multi-voltage system backup with a single battery set.
FAI	See "Fire Alarm Interface"
Fire Alarm Interface	Input present on some AlarmSaf products allowing control of output(s) in the system. Typically used for dropping power to maglocks on egress doors during a fire alarm condition, but can also be used for other control functions, such as resetting smoke detectors
Negative Trip	An input which is activated upon the switching of a DC Common to its terminals. The DC Common may either be from an external (common grounded) source, or may be provided as one of the terminals of the input, depending on the product. This input type is used with a dry contact or open collector input.
Positive Trip	An input which is activated upon the switching of a positive DC voltage to its terminals. The positive voltage may either be from an external (common grounded) source, or may be provided as one of the terminals of the input, depending on the product. This input type is used with a dry contact or voltage input.
Power Limited	A voltage output or wiring which conforms to NEC Article 725.
PTC	A resettable overcurrent protection device, similar to a fuse or circuit breaker.
Rack Mount	A product which has an enclosure that allows mounting in a standard 19 inch equipment rack
Simple Distribution	Voltage distribution without any control function for the distributed outputs. Power is always available to the outputs. The PD8(F) accessory board is an example of simple distribution.
Voltage Distribution	Splitting a bulk power supply output into multiple, current limited outputs to prevent a single circuit failure from talking down an entire system. The multiple terminal outputs also simplify wiring by providing a pair of terminals for each circuit, rather than wiring several circuits to a single pair of terminals.

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