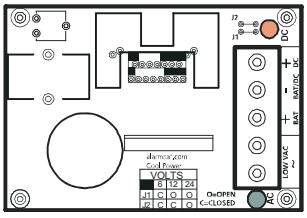

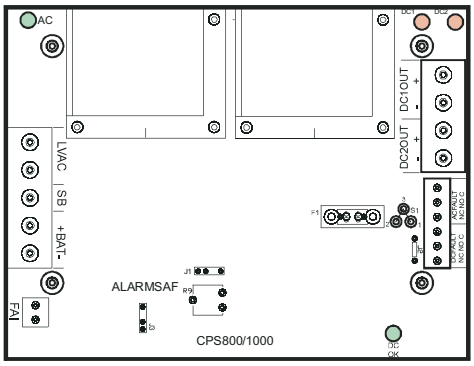

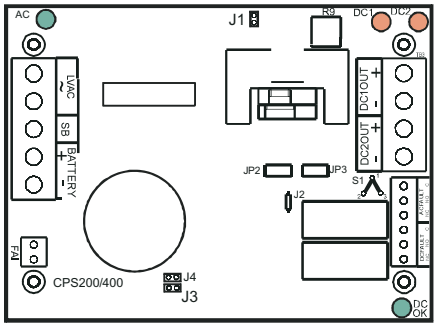

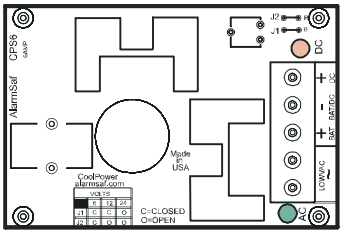

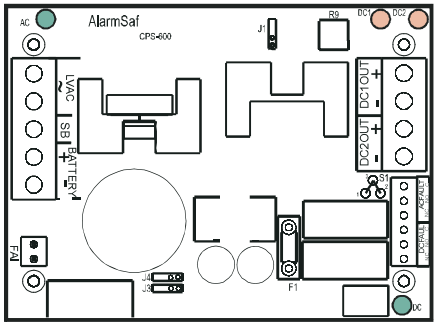

Model CPS2 - CPS1000

Power Supply / Battery Charger

Operating and Installation Instructions

52-209 Rev B.03

I. 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 qualified service personnel and should conform to all local codes

- NOTICE - This equipment shall be installed in a manner which prevents unintentional operation from employees or other personnel working about the premises, by falling objects, 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

AlarmSaf 6 Omni Way, Chelmsford, MA 01824-4141, 978.658.6717, www.alarmsaf.com

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Section 1
Introduction

The CPS line of power supplies provides a field selectable 12VDC or 24VDC at 2.5A to 10A (depending on model) using buck topology switching technology.

Features:

- Field-selectable output voltage of 12V or 24VDC - Specific models also provide a 6V setting
- Units will charge a maximum 7AH to 18AH (depending on model) battery set within 48 hours
- All listed units employ full fault detection with dual Form-C relay outputs
- Non-listed units are optionally available with fault detection also with dual Form-C relay outputs
- Cabinet-level systems are optionally available with one or more APD8 or APD8F distribution boards. See www.alarmsaf.com for details.
- Fault conditions monitored include:
  - Low or missing AC
  - High or low output / battery
  - Reversed Battery
  - Internal Power Supply failure
- Visual indicators include:
  - AC Presence (Green) - Units with Fault Detection only
  - DC OK (Green) - Units with Fault Detection only
  - One or two DC Output Present LEDs (Red)

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

UL Standards (Applies to model numbers ending in "-UL/CSA" only)
UL 294 Access Control System Units

Canadian Standards (Applies to model numbers ending in "-UL/CSA" only)
CSA C22.2

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

Product Use
When installed in accordance with all standards listed in Section 2 of this document, the CPS line provides power for use with typical 12 or 24VDC devices as used in the access control or security industries such as, but not limited to, mag locks, door strikes, door holders, card readers, keypads, etc.

Section 3
System Overview

3.1 Electrical Ratings and Specifications

Manufactured By

AlarmSaf
6 Omni Way
Chelmsford, MA 01824-4141

Tel: 978.658.6717
Tel: 800.987.1050
Fax: 978.658 8638
www.alarmsaf.com

Model Numbers and Electrical Ratings

Model (Note 1)	Order Number	Enclosure	Input Voltage	Max Input Current or Transformer Required.		Max Output Current (Note 4)	Max Battery	Fault/FAI/ DC2/SB? (Note 5)	Listed?
				12V Only	12/24V				
CPS2	00850	None	Note 2	T24V40	T29V120	2.5A	7AH	No	No
CPS20	00857	None	Note 2	T24V40	T29V120	2.5A	7AH	Yes	No
CPS200-UL/CSA	01372	None	28VAC	Note 3	Note 3	2.5A Class 2	7AH	Yes	Note 3
CPS4	00852	None	Note 2	T24V4A	T29V196	4.0A	14AH	No	No
CPS40	00860	None	Note 2	T24V4A	T29V196	4.0A	14AH	Yes	No
CPS400-UL/CSA	01373	None	28VAC	Note 3	Note 3	4.0A Class 2	14AH	Yes	Note 3
CPS6	00854	None	Note 2	T24V4A	T24V5A	6.0A	18AH	No	No
CPS60	00862	None	Note 2	T24V4A	T24V5A	6.0A	18AH	Yes	No
CPS600-UL/CSA	01374	None	28VAC	Note 3	Note 3	6.0A	18AH	Yes	Note 3
CPS80	00864	None	Note 2	28V360	28V360	8.0A	18AH	Yes	No
CPS800-UL/CSA	01375	None	28VAC	Note 3	Note 3	8.0A	18AH	Yes	Note 3
CPS100	00866	None	Note 2	28V360	28V360	10.0A	18AH	Yes	No
CPS1000-UL/CSA	01367	None	28VAC	Note 3	Note 3	10.0A	18AH	Yes	Note 3
CPS2C	00851	8x7x3.5	120VAC	1.00A		2.5A	7AH	No	No
CPS20C	00858	8x7x3.5	120VAC	1.00A		2.5A	7AH	Yes	No
CPS20C-7	00859	12x12x4	120VAC	1.00A		2.5A	7AH	Yes	No
CPS200C-UL/CSA	01365	8x7x3.5	120VAC	1.00A		2.5A Class 2	7AH	Yes	Yes
CPS200C-7-UL/CSA	01364	12x12x4	120VAC	1.00A		2.5A	7AH	Yes	Yes
CPS4C	00853	8x7x3.5	120VAC	1.50A		4.0A	14AH	No	No
CPS4C-14	00856	12x12x4	120VAC	1.50A		4.0A	14AH	No	No
CPS40C	00861	12x12x4	120VAC	1.50A		4.0A	14AH	Yes	No
CPS400C-UL/CSA	01366	12x12x4	120VAC	1.50A		4.0A Class 2	14AH	Yes	Yes
CPS6C	00855	11x15x4	120VAC	2.50A		6.0A	18AH	No	No
CPS60C	00863	11x15x4	120VAC	2.50A		6.0A	18AH	Yes	No
CPS600C-UL/CSA	01368	11x15x4	120VAC	2.50A		6.0A	18AH	Yes	Yes
CPS80C	00865	11x15x4	120VAC	3.00A		8.0A	18AH	Yes	No
CPS800C-UL/CSA	01369	11x15x4	120VAC	3.00A		8.0A	18AH	Yes	Yes
CPS100C	00867	11x15x4	120VAC	3.50A		10.0A	18AH	Yes	No
CPS1000C-UL/CSA	01363	11x15x4	120VAC	3.50A		10.0A	18AH	Yes	Yes
CPS240D-UL/CSA	02901	11x15x4	120VAC	2.00A		2.5A + 4.0A	14AH x 2	Yes	Yes
CPS240DX-UL/CSA	02902	15x18x4	120VAC	2.00A		2.5A + 4.0A	14AH x 2	Yes	Yes
CPS440D-UL/CSA	02903	11x15x4	120VAC	3.00A		4.0A + 4.0A	14AH x 2	Yes	Yes
CPS440DX-UL/CSA	02904	15x18x4	120VAC	3.00A		4.0A + 4.0A	14AH x 2	Yes	Yes
CPS640D-UL/CSA	02905	11x15x4	120VAC	3.50A		6.0A + 4.0A	14AH x 2	Yes	Yes
CPS640DX-UL/CSA	02906	15x18x4	120VAC	3.50A		6.0A + 4.0A	14AH x 2	Yes	Yes

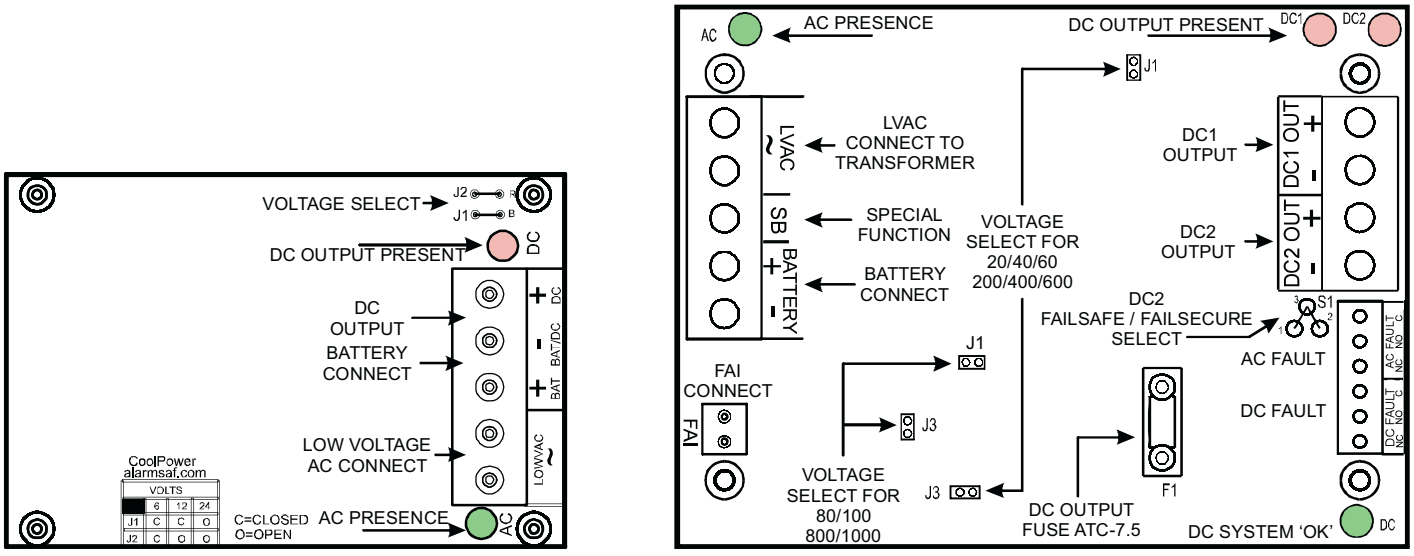
Table 3.1

Note 1 - Some of the above models are available with one or two APD8(F) Advanced Power Distribution modules - www.alarmsaf.com for details
Note 2 - Minimum input AC voltage is 3V above the desired output voltage setting. Maximum transformer voltage is not to exceed 30VAC
Note 3 - This model is a UL recognized component. It is only approved for use as a replacement board using the existing transformer and enclosure
Note 4 - Models which state “Class 2” next to the output current have Class 2 Power Limited DC Outputs
Note 5 - Models marked “Yes” have Fault Outputs, an FAI Input, a DC2 Output, and an SB Terminal. Models marked “No” do not have these features.

3.2 CPS Board Terminal Descriptions and Electrical Ratings

Terminal / Connector	Description	Rating
TB1 - Low Voltage AC Input and Battery Output		
LVAC	Low voltage AC input	28.2VAC - See Table 3.1 for Ratings
LVAC		
SB	Special Battery Terminal	See Appendix B for details on the SB terminal
BAT +	Positive Battery Connection	12VDC or 24VDC at 7AH - 18AH maximum - See Table 3.1 for Ratings
BAT -	Negative Battery Connection	
TB2 - Fire Alarm Input - Units with FAI Input ONLY		
FAI	Fire Alarm Input	Dry Contact Input - See Appendix A
FAI		
TB3 - DC Output (DC2 Present on Units with FAI Input ONLY)		
DC1 OUT +	DC1 Positive Output	12VDC or 24VDC at full output current of supply - See Table 3.1 for ratings.
DC1 OUT -	DC1 Common Output	
DC2 OUT +	DC2 Positive Output - FAI Controlled	12VDC or 24VDC at full output current of supply - FAI Controlled - See Table 3.1 and Appendix A.
DC2 OUT -	DC2 Common Output - FAI Controlled	
TB4 - Fault Outputs - Units with Fault Outputs ONLY		
DC FAULT NC	DC Fault Relay Normally Closed	1 Amp at 24VDC (Resistive) - Contacts are labeled in the non-powered (Fault) condition
DC FAULT NO	DC Fault Relay Normally Open	
DC FAULT C	DC Fault Relay Common	
AC FAULT NC	AC Fault Relay Normally Closed	1 Amp at 24VDC (Resistive) - Contacts are labeled in the non-powered (Fault) condition
AC FAULT NO	AC Fault Relay Normally Open	
AC FAULT C	AC Fault Relay Common	

Figure 3.2



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

3.3 AC Input Connection

3.3.1 Board-Level Supplies

Board-level units are connected to an appropriate low-voltage AC supply voltage of a sufficient VA rating (See Table 3.1). The connection is made on TB1 at the terminals labeled "LVAC." The phase of this connection is not important.

3.3.2 Cabinet-Level Supplies

Cabinet-level supplies are supplied with a hardwired transformer of the correct voltage. The connections should be made as follows:

- Black Hot
- White Neutral
- Green Earth Ground

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

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 than non-power limited wiring.*

3.4 Battery Terminals

The CPS has one set of battery terminals labeled BAT +/- which will charge a sealed lead acid / gel cell battery set for backup of the output voltage. The battery terminals are fuse protected.

Caution - Observe the polarity of the 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.

3.5 DC1 Output Terminals

The DC1 output terminals provide a constant output of either 12VDC or 24VDC. See Section 5.1 for additional information on output voltage selection on board-level units.

Caution - Observe the polarity of the output terminals with respect to the load or damage to the load may occur.

3.6 DC2 Output Terminals

The DC2 output terminals provide a controlled output of either 12VDC or 24VDC. Control is provided through the FAI input. The operation of the DC2 output is set by jumper S1. See Appendix A for more information on using the FAI Input and DC2 output.

Note - Not all models of CPS have a DC2 output.

Caution - Observe the polarity of the output terminals with respect to the load or damage to the load may occur.

3.7 FAI Input Terminals

The FAI input accepts either a normally open or normally closed set of dry contacts to provide control to the DC2 output. The operation of the FAI input is set by jumper J1. See Appendix A for more information on using the FAI Input and DC2 output.

Note - Not all models of CPS have an FAI input - See Table 3.1 for details.

3.8 Fault Reporting Terminals

Some models of CPS have two integral sets of Form-C fault relay outputs. See Table 3.1 to determine whether the Fault Outputs are present for a particular model number. Fault conditions indicated include:

- Low or missing AC
- High Battery Voltage
- High Output Voltage
- Blown Fuse (AC or Battery)
- Low Battery Voltage
- Low Output Voltage

NOTE - The CPS line of power supplies does NOT detect battery presence. If battery presence detection is required, AlarmSaf also manufactures supplies with integral battery presence detection.

The integral relay outputs provide fail-safe, Form-C relay outputs rated at 1A at 24VDC. Terminals are labeled in the unpowered (fault) state.

3.9 Fusing

Some models of CPS contain one replaceable fuse - the Battery Fuse. When replacing this fuse, only the equivalent type and rating are to be used. Battery Fuses are blade-type automotive fuses (ATC).

Section 4
Installation

4.1 Mounting

The CPS line is available in either board-level or cabinet level versions.

4.1.1 Mounting a Cabinet-Level Supply

If the CPS is provided in a wall mount enclosure, use #8 hardware minimum in four locations. Use an appropriate fastening system for the mounting surface.

Cabinet Mounting:

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

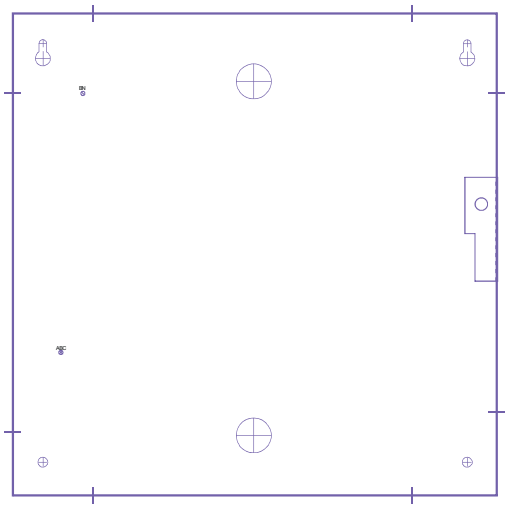


Figure 4.1.1

4.1.2 Mounting a Board-Level Supply

Board-level, supplies can be mounted either with the provided double-sided tape or by using nylon standoffs and hardware (not included). Replacement boards for a listed supply must reuse the existing hardware to maintain the listing.

4.2 Wiring

4.2.1 Wire Routing

All wiring must be installed in accordance with NFPA70, NFPA72, and all local code requirements.

Power Limited wiring requires that power limited and non-power limited wiring remain physically separated. Any power limited circuit entering the enclosure must remain at least one quarter inch (¼") away from any non-power limited circuit wiring. Any power limited circuit wiring must enter and exit the enclosure through different knockouts than non-power limited circuit wiring. Wiring within the enclosure should be routed around the perimeter of the cabinet. It should not be routed across the circuit boards.

4.2.2 AC Input

4.2.2.1 Cabinet Level Supplies

Connection should be made via an approved method. AC mains wiring should be no smaller than 14 AWG. See Section 3.3 for details.

4.2.2.2 Board-Level Supplies

Locate the LVAC Input terminals. These terminals are non-removable and accept wire sizes between #12 and #22 AWG. Phasing of the LVAC input is not important on the CPS. See Section 3.1 for Transformer requirements.

4.2.3 Output Wiring (DC1 / DC2)

Locate the output terminals. These terminals are non-removable and accept wire sizes between #12 and #22 AWG. Polarity is marked on the PCB, and on the supporting documentation.

4.2.4 Battery Wiring

Locate the battery terminals. These terminals are non-removable and accept wire sizes between #12 and #22 AWG. Polarity is marked on the PCB. If the CPS is set for 12VDC, connect a single 12V battery to the terminals. If the CPS is set for 24VDC, connect two 12V batteries in series to the terminals.

CAUTION - A lead-acid battery has the capability of producing extremely high current. Personal or property damage can occur if the batteries are shorted or improperly connected.

4.2.5 Fault Output Wiring

Locate the Fault Output relay terminals. These terminals are non-removable and accept wire sizes between #14 and #22 AWG. The relay terminals are marked in the non-powered (fault) state (In a normal (non-fault) condition, there is a connection between C and NO).

Section 5
Operating the CPS

5.1 Setting the Jumpers

Before powering a system containing a CPS, the jumpers should be set for proper operation. Be sure to reference the proper section of the manual (5.1.1 or 5.1.2) for the model of CPS you are using.

5.1.1 Units WITH Fault Relay Output

Jumper	Description	Settings	Default
J1 & J3	Output voltage Setting	Both ON - 12V Both OFF - 24V	Both ON
J2	DC2 Battery Backup	Intact - Backup Enabled Cut - Backup Disabled	Intact
J4	Not Used	Leave Jumper Off	Off
S1	DC2 Operation	See Section 5.1.1.3	Fail-Safe

WARNING - *BOTH* voltage setting jumpers must be set for proper operation of the CPS. Failure to set both jumpers will result in damage to the CPS board.

5.1.1.1 Output Voltage Setting (J1 & J3)

J1 and J3 control the output voltage setting of the CPS. With both jumpers ON, the output voltage will be 12VDC nominal. With both jumpers OFF, the output voltage will be 24VDC. ***BOTH jumpers must be set****, or damage to the CPS will occur.*

5.1.1.2 DC2 Battery Backup (J2)

J2 is a wire jumper that controls whether or not the DC2 output is backed up by the standby battery set. This is useful for installations that require maglocks to open upon AC power loss. Cutting this jumper removes the battery backup from the DC2 output. This jumper does not affect the DC1 output.

5.1.1.3 DC2 Operation (S1)

On units with Fault Relay Output, the DC2 output is the FAI controlled output of the power supply. The S1 jumper determines the operation of the DC2 output when there is an FAI (Fire Alarm Interface) input. The default setting on all units is **FAIL-SAFE**. Jumper positions are:

JUMPER S1 - DC2 OUTPUT SETTINGS				
DESCRIPTION		S1 POSITION		
		CPS20/40 & CPS200/400	CPS60 & CPS600	CPS80/100 & CPS800/1000
FAIL-SAFE (DEFAULT)	Power to the DC2 output is removed when an FAI input is received. Power to the DC2 output returns when the FAI input is removed	**1 - 3**	**3 - 2**	**3 - 2**
FAIL-SECURE	There is no power to the DC2 output until an FAI input is received. DC2 remains powered during the FAI event. Power is removed from DC2 when the FAI input is removed.	**1 - 2**	**3 - 1**	**3 - 1**

5.1.2 Units WITHOUT Fault Relay Output

Jumper	6V Output	12V Output*	24V Output
J1	N/A	Closed	Open
J2	N/A	Open	Open

*Factory default

5.1.2.1 Output Voltage Setting (J1 & J2)

J1 and J2 control the output voltage setting of the CPS. CPS models without Fault Relays may be set for 12VDC, or 24VDC output. Set the jumpers as shown in the table for the desired output voltage.

5.2 Visual Indicators

The CPS contains one or four visual status indicators, depending on model. Models with fault outputs have four visual indicators, while models without fault outputs only have one visual indicator.

5.2.1 AC (Green) - Units with Fault Outputs ONLY

This LED lights when Low Voltage AC is present.

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

5.2.2 DC OK (Green) - Units with Fault Outputs ONLY

This LED lights when there is no trouble condition detected by the CPS. The LED extinguishes under one of the fault conditions listed in Section 3.8.

5.2.3 DC (Red) - Models without Fault Outputs ONLY

This LED lights when output voltage is present at the DC Output terminals

5.2.4 DC1 / DC2 - Models with Fault Outputs ONLY

These LEDs light when output voltage is present on the DC1 and DC2 outputs respectively. The DC2 LED may switch on or off depending on the state of the FAI input and jumper S1

5.3 Troubleshooting

Condition	Possible Cause	Solution
The output voltage of the CPS is incorrect or missing	Incorrect jumper settings	Verify proper jumper settings
	Excessive loading on output	Verify that output current is less than rated current
	AC trouble	Verify presence of AC voltage
	Bad / Incorrect Battery Set	Verify that a good battery set of the proper voltage is connected to the CPS
	Internal problem with CPS	Contact AlarmSaf
The DC OK LED is extinguished, indicating a fault condition	Blown battery fuse	Verify fuse is intact - Check wiring integrity before replacing fuse
	Excessive loading on output	Verify that output current is less than the rated current
	Damaged, Incorrect, or Missing Battery Set	Verify that a good battery set of the proper voltage is connected to the CPS
	Low or Missing AC	Verify the presence of at least 102VAC on the primary of the Transformer
	Internal problem with CPS	Contact AlarmSaf

AlarmSaf 6 Omni Way, Chelmsford, MA 01824-4141, 978.658.6717, www.alarmsaf.com

Section 6
Specifications

6.1 Electrical Specifications

6.1.1 Input Voltage	See Section 3.1
6.1.2 Input Power	See Section 3.1
6.1.3 Output Voltage	12 or 24VDC Nominal - See Section 5.1
6.1.4 Output Current	See Section 3.1
6.1.5 Maximum Battery Charger Capacity	See Section 3.1

6.2 Temperature Specifications

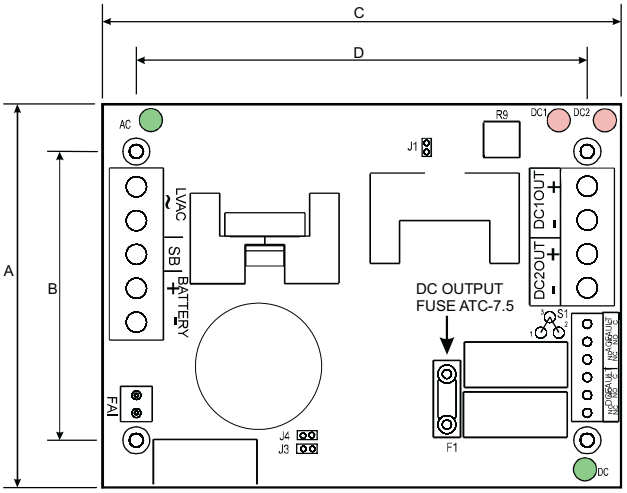
6.2.1 Ambient Temperature Range: 0ºC to 49ºC (32ºF to 120ºF)
6.2.2 Ambient Humidity: 85% at 30 ºC (86ºF) Maximum

6.3 Mechanical Specifications

All dimensions in inches; all weights in pounds. Reference drawing below table for more details.

Model	Width (A)	Length (C)	Height	Mounting Width (B)	Mounting Length (D)	Approximate Board Weight
CPS2	2.75	4.00	1.125	2.45	3.60	0.60 LBS
CPS4	2.75	4.00	1.50	2.45	3.60	0.60 LBS
CPS20 / 200	4.25	5.75	1.50	3.20	5.00	1.25 LBS
CPS40 / 400	4.25	5.75	2.25	3.20	5.00	1.25 LBS
CPS6	3.00	4.50	2.125	2.70	4.00	1.25 LBS
CPS60 / 600	4.25	5.75	2.25	3.20	5.00	1.5 LBS
CPS80 / 800	4.75	6.25	2.25	3.20	5.00	1.5 LBS
CPS100 / 1000	4.75	6.25	2.25	3.20	5.00	2.20 LBS

NOTE: ALL DIMENSIONS IN INCHES AND ARE APPROXIMATE

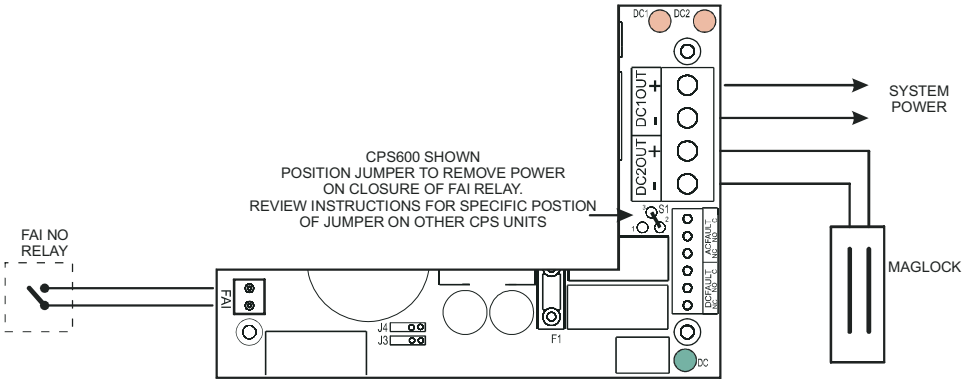


UL 294 Performance Levels:
Line Security: I
Endurance: I
Attack: I
Standby: IV

Appendix A
Using the FAI Input and DC2 Output

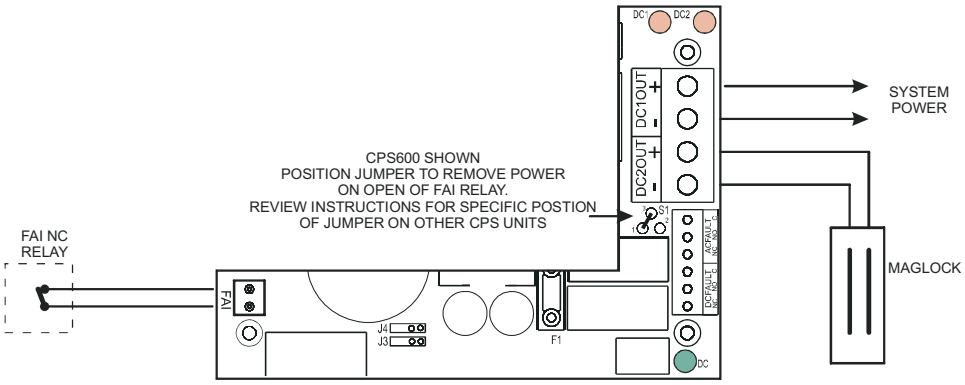
Some models of CPS have an FAI input and a DC2 output, which is controlled by the FAI input. The FAI input may be activated by either a Normally Open or a Normally Closed contact, and the DC2 output can operate either as Fail-Safe of Fail-Secure by setting the S1 jumper appropriately (See Section 5.1).

The diagrams below show the common methods of using and wiring the FAI input and DC2 output.



This diagram shows a system which removes power from the DC2 output when the NO contact on the FAI terminals closes. Power returns when the contact is opened.

If the NO contact was replaced with an NC contact, the DC2 output would normally be unpowered and the output would power up when the NC contact opens.

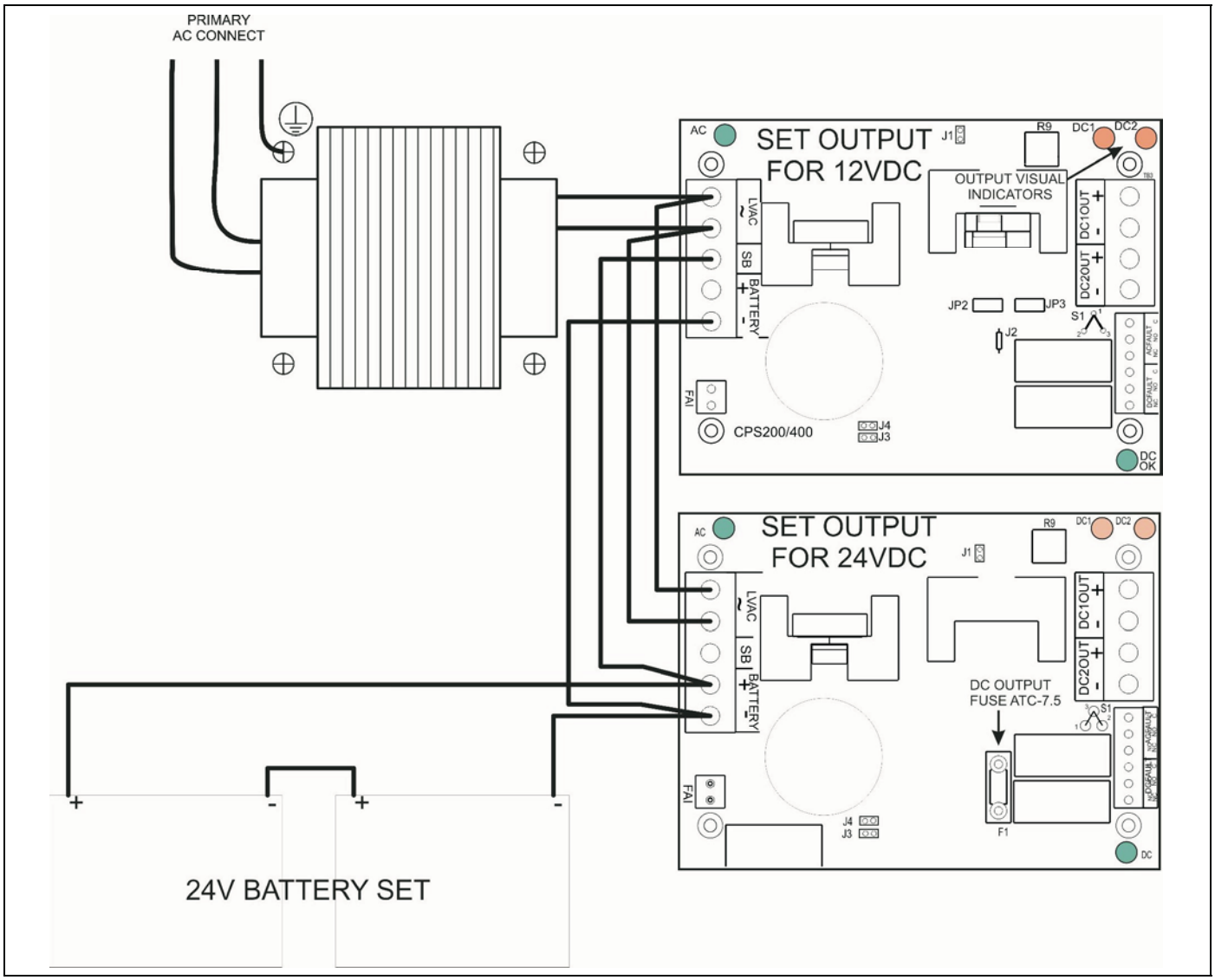


This diagram shows a system which removes power from the DC2 output when the NC contact on the FAI terminals opens. Power returns when the contact is opened.

If the NC contact was replaced with an NO contact, the DC2 output would normally be unpowered and the output would power up when the NO contact closes

Appendix B
Using the SB (Special Battery) Terminal

The SB Terminal allows the use of a single battery set in dual voltage systems utilizing multiple power supplies. A 24V battery set is connected to the 24V power supply as normal, then also connected to the 12V supply using the BAT- terminal and the SB terminal. Upon loss of AC power, the 12V supply will then draw power from the 24V battery set and regulate it down to 12VDC. See the diagram below for an example of wiring to the SB terminal.



Appendix C
Using the (Optional) APD8(F)

Some models of CPS are available with one or two APD8(F) Advanced Power Distribution modules. This Appendix provides a quick reference for jumper and switch settings for the APD8(F) and assumes a basic knowledge of the APD8(F) - for full APD8(F) instructions, refer to document number 52-254, available from www.alarmsaf.com.

Input Configuration (S1-S8)

Each input has one set of DIP switches, labeled S1 through S8. On each switch block, only the top six switches are used - the bottom two are not used.

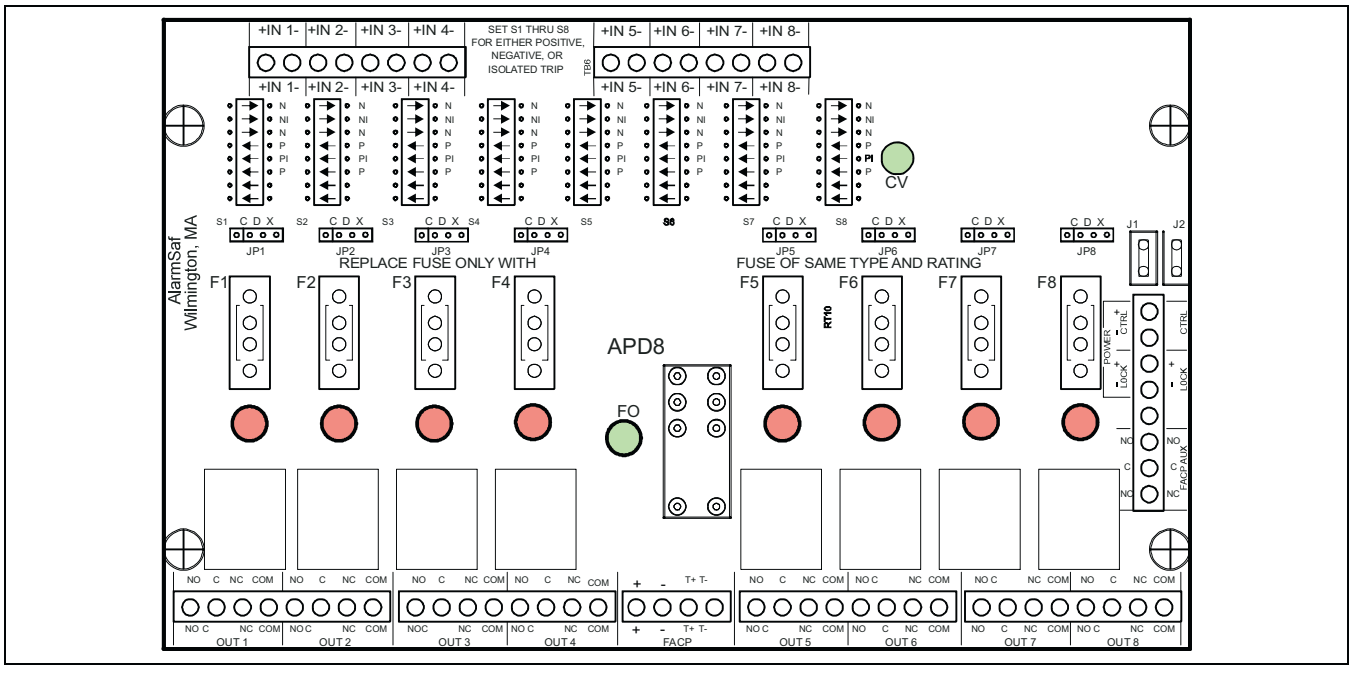
Note - Due to inconsistencies by the manufacturers of DIP switches in the labeling of switch numbers and ON and OFF positions, AlarmSaf indicates switch settings visually and descriptively.
Note - All switch settings shown below are indicated with the board positioned so that the edge of the board with two 8-pin terminal strips is at the top, as shown in the diagram below

	Negative Trip	Positive Trip	12V External Trip
Top Switch	Right (On / Closed)	Left (Off / Open)	Left (Off / Open)
Second Switch	Right (On / Closed)	Left (Off / Open)	Right (On / Closed)
Third Switch	Right (On / Closed)	Left (Off / Open)	Left (Off / Open)
Fourth Switch	Left (Off / Open)	Right (On / Closed)	Left (Off / Open)
Fifth Switch	Left (Off / Open)	Right (On / Closed)	Right (On / Closed)
Sixth Switch	Left (Off / Open)	Right (On / Closed)	Left (Off / Open)

Output Configuration (JP1-JP8)

Each output has one jumper which may be set to one of three positions - C, D, or X. These three positions correspond to **C**onstant Output, **D**isable Output on FAI, or Dry Contact output (**X**), respectively.

Power Source Setup (J1 and J2)

These jumpers select whether the APD8(F) uses one source for control power and output power or separate sources.

- With both jumpers IN, the APD8(F) uses the same source of power for both output power and internal relay & control power. Input power can be wired to either the “Lock Power” input or the “CTRL Power” input. This is the normal setting.
- With both jumpers OUT, the APD8(F) requires separate control and output power. This setting is not normally required.