

# PSN-106, PSN-64, PSB-10

## Installation, Operation, and Instruction Manual



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Contents

<b>Section 1: PSN-106</b> .....	PSN-106:1
General Description .....	PSN-106:3
System Features .....	PSN-106:3
Mounting Instructions .....	PSN-106:3
Operating Instructions .....	PSN-106:3
Alarm Condition .....	PSN-106:3
Trouble Condition .....	PSN-106:4
Standby Operation .....	PSN-106:4
Testing and Maintenance .....	PSN-106:5
Battery Maintenance .....	PSN-106:5
Electrical Operating Characteristics .....	PSN-106:5
Notification Power Supply .....	PSN-106:6
Wiring Options .....	PSN-106:7
Class B Trigger and Class B Notification Circuit Trigger .....	PSN-106:7
Class A Trigger and Class A Notification Circuit .....	PSN-106:7
Class B - Multiple Supply Trigger .....	PSN-106:8
Class A - Multiple Supply Trigger .....	PSN-106:8
Pass Thru Mode .....	PSN-106:9
Wire Routing .....	PSN-106:10
Reference EOL .....	PSN-106:10
Dip Switch Programming .....	PSN-106:11
Input Trigger Type .....	PSN-106:11
Bulk Supply Options .....	PSN-106:11
Class A/B Selection .....	PSN-106:12
Door Holder AC Dropout delay .....	PSN-106:12
DC Output is Door Holder .....	PSN-106:12
Trouble Memory Enabled .....	PSN-106:12
Individual NAC Options .....	PSN-106:13
Battery Calculation Worksheet .....	PSN-106:15
 <b>Section 2: PSN-64</b> .....	 PSN-64:1
General Description .....	PSN-64:3
System Features .....	PSN-64:3
Mounting Instructions .....	PSN-64:3
Operating Instructions .....	PSN-64:3
Alarm Condition .....	PSN-64:3
Standby Operation .....	PSN-64:4
Trouble Condition .....	PSN-64:4
Testing and Maintenance .....	PSN-64:5
Battery Maintenance .....	PSN-64:5
Electrical Operating Characteristics .....	PSN-64:5
Notification Power Supply .....	PSN-64:6
Wiring Options .....	PSN-64:7
Class A Trigger and Class A Notification Circuit .....	PSN-64:7
Class B - Multiple Supply Trigger .....	PSN-64:8
Class A - Multiple Supply Trigger .....	PSN-64:8
Pass Thru Mode .....	PSN-64:9
Wire Routing .....	PSN-64:10
Reference EOL .....	PSN-64:10
Dip Switch Programming .....	PSN-64:11
Input Trigger Type .....	PSN-64:11
Bulk Supply Options .....	PSN-64:11
Class A/B Selection .....	PSN-64:12
Door Holder AC Dropout delay .....	PSN-64:12
DC Output is Door Holder .....	PSN-64:12
Trouble Memory Enabled .....	PSN-64:12
Individual NAC Options .....	PSN-64:13
Battery Calculation Worksheet .....	PSN-64:15

<b>Section 3: PSB-10</b> .....	PSB-10:1
General Description .....	PSB-10:3
Product Features .....	PSB-10:3
Mounting Instructions .....	PSB-10:3
Operating Instructions .....	PSB-10:3
Normal Operation .....	PSB-10:3
Trouble Condition .....	PSB-10:3
Testing and Maintenance .....	PSB-10:4
Battery Maintenance .....	PSB-10:4
Electrical Operating Characteristics .....	PSB-10:4
Wire Routing .....	PSB-10:5
Dip Switch Programming .....	PSB-10:6
Indicator LED Behavior .....	PSB-10:6
Bulk Power Supply .....	PSB-10:7
Battery Calculation Worksheet .....	PSB-10:8

# **Section 1: PSN-106** Installation, Operation, and Instruction Manual

## Notification Power Supplies

(All specifications subject to revision.)

## **WARNING**

The fire alarm system employing this power supply must be designed by people trained and competent in the design and layout of fire alarm systems. The system shall be designed and installed in accordance with all local and national codes and ordinances as well as the approval of the Authority Having Jurisdiction. Only trained, qualified and competent individuals should install, program and/or service the POTTER FIRE POWER SUPPLY. Competent people would be aware of these warnings, limitations, and requirements.

High voltage electrocution hazard. Do not handle live AC wiring or work on the device while AC power is active.

This manual is designed to help with the specification, installation, and programming of the POTTER FIRE POWER SUPPLY. It is imperative that this manual be completely read and understood before the installation or programming of the power supply. Save this manual for future reference.

## General Description

The Potter PSN series of power supplies is designed to provide the power and flexibility needed for the most demanding fire system installations. The PSN-106 is a 10 Amp 24Vdc switch mode power supply design which is up to 50% more efficient than linear mode supplies. The PSN series is your best choice for powering fire system notification appliances and accessories. New and retrofit construction requirements for ADA compliance are easily accomplished with ample power for additional notification appliances along with the ability to synchronize the notification appliances using built in sync generation for Potter, System Sensor®, Gentex® and Wheelock® notification appliances. The PSN series goes even further to make retrofits easier with the advanced QuadraSync feature which allows notification appliances from different manufacturers to sync with each other. You also have the option to monitor an existing circuit by placing a reference resistor of the same value on the power supply and continuing to monitor the circuit without changing the field EOL.

## System Features

- Input voltage: 120/240VAC 50/60Hz
- Output voltage 24VDC @ 10A
- Six class “B” Style “Y” notification circuits on the PSN-106
  - Rated at 3 amps max each
  - Can be configured as up to three class “A” Style “Z” notification circuits
- Supervised Battery Charger: 27.3 @ 1A (supports 7-55 Ahr batteries)
- Integrated battery cut-off circuitry to protect batteries from deep discharge
- Two Trouble Relays (5A at 30VDC)
  - General System Trouble (programmable for AC delay via dip-switch)
  - Low AC Trouble
- Diagnostic LED’s
  - Status LED’s for Active NAC and NAC trouble conditions
  - Status LED’s for Earth Fault (Amber), AC (Green), Battery Fault (Amber)
  - Trouble Memory feature captures troubles which have previously restored.
- Synchronized notification appliance circuits
  - Potter
  - Wheelock®
  - Gentex®
  - System Sensor®
- Configurable output circuits (D.I.P. switch sets options for each circuit)
  - ANSI temporal-coded
  - Constant Power
  - Door-Holder Power
- Separate DC Power Output (3A)
- Two Trigger Inputs (Class A, Style Z or Class B, Style Y)
- Reference EOL terminals, allows 2K – 27K EOL value to be used
- QuadraSync panel wide synchronization of same or multiple brands.
- PassThru mode copies input signals to output (can be used in conjunction with QuadraSync)

## Mounting Instructions

The standard mounting is a surface mount cabinet. The unit must be securely attached to a permanent partition using suitable fasteners. Five mounting holes are provided to accept ¼ inch diameter screws maximum. There are seven knock outs provided.

## Operating Instructions

### *Alarm Condition*

Notification Appliance Circuit:

Alarm devices operate in unison with the Trigger inputs from the main Fire Alarm Control Panel (FACP). When activated by the corresponding trigger input the associated Notification Appliance Circuit (NAC) will reverse polarity from a supervision state to the alarm state and supply power to the associated notification appliances until the trigger is removed. Each activated NAC will also power the L.E.D. associated with it, the L.E.D. will follow the steady or pulsing state of the NAC. The alarm-activated outputs are reset through the operation of the reset function of the Main FACP.

*Trouble Condition***NOTICE**

If the trouble memory feature has been enabled the L.E.D. will provide two brief pulses every second to indicate a trouble condition has occurred but is now restored. This can be useful when troubleshooting brief trouble conditions that come and go over a period of time

**Notification Appliance Circuit:**

If a trouble occurs on a NAC the associated L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

**DC Power Circuit:**

If a trouble occurs on the DC Power output the DC L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

**AC:**

When the Power supply detects the A.C. power input has fallen below an acceptable level the AC Power L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type and after a programmed delay the Low AC relay will also activate. When the trouble condition has been restored the L.E.D. and trouble relays will return to their normal state. (See notice.)

**Low Battery:**

When the Power supply detects the Battery is no longer functioning properly the Low Battery L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

**Ground Fault:**

When the Power supply detects a ground Fault condition which indicates a short between the Power Supply ground and the Earth Ground circuits the Ground Fault L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

**Communication Trouble:**

If the Bulk Power Supply and Control Board lose communication with each other the Comm L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

*Standby Operation***Notification Appliance Circuit:**

When in standby operation the NAC will be in the reversed supervision polarity and the associated L.E.D. will be off. Exception: When the NAC is programmed to be an DC Power Output the associated L.E.D. will be on during normal standby operation.

**DC Power Circuit:**

When in standby operation the DC Power will be on and the DC Power L.E.D. will be illuminated.

**AC:**

When in normal operation the AC Power L.E.D. will be on steady.

**Low Battery:**

When in normal operation the Low Battery L.E.D. will be off.



**Ground Fault:**

When in normal operation the Ground Fault L.E.D. will be off

**Communication**

When in normal operation the Comm L.E.D. will flash occasionally to indicate normal communication traffic is occurring.

*Testing and Maintenance*

System Testing should be performed periodically to insure proper operation.

Test the indicating circuits by initiating an alarm or test at the Main FACP.

Test for proper operation by actuating the notification appliance circuit the PSN-106 is monitoring.

Standby batteries and AC transfer are tested by interrupting the AC power line while an alarm condition exists.

**Battery Maintenance**

The PSN-106 should be tested at least once a year for proper operation as follows:

*Output Voltage Test:* Under normal load conditions, the DC output voltage should be checked for proper voltage level. Refer to the Power Supply Output Specifications Chart).

*Battery Test:* Under normal load conditions, check that the battery is fully charged. Check specific voltage both at the battery terminal and at the board terminals marked [+BAT-] to ensure there is no break in the battery connection wires.

Note: Maximum charging current is 1 Amp.

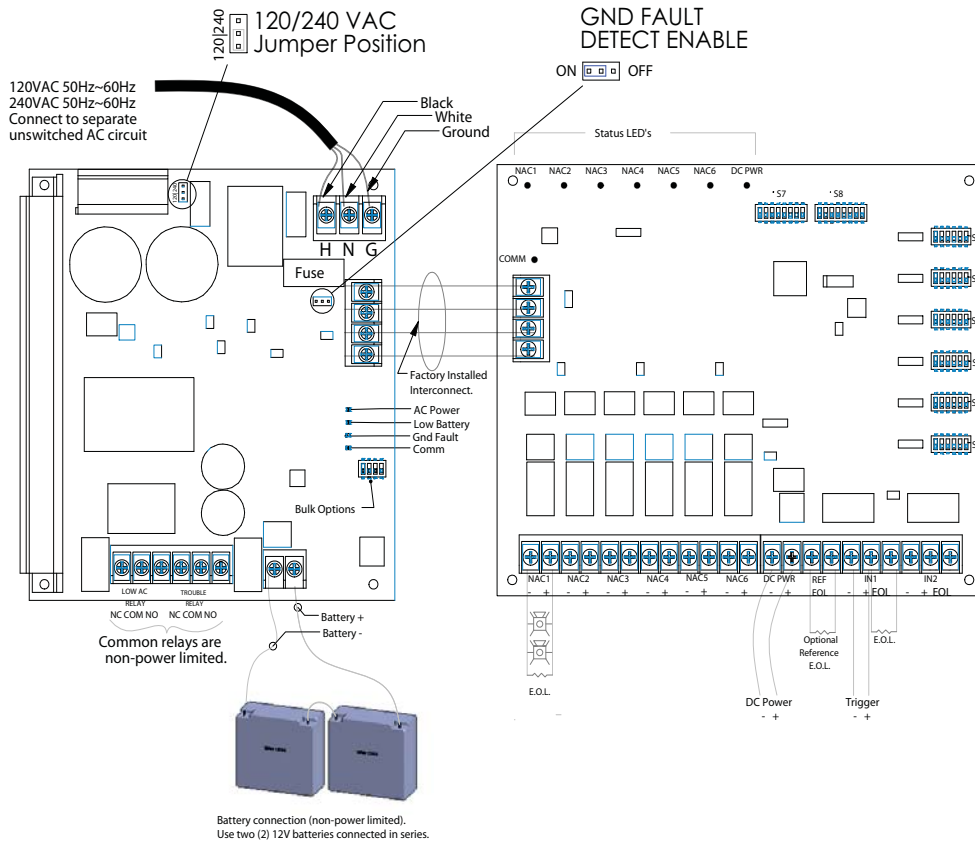
Note: Expected battery life is 5 years; however it is recommended changing batteries in 4 years or less if needed.

**Electrical Operating Characteristics**

Input Voltage	120 VAC @ 5.1 Amps or 240 VAC @ 2.5 Amps (Jumper selected) 50/60 Hz
Input Trigger	8 VDC to 33 VDC (15 ma) filtered or full wave rectified. Polarity reversal or continuous voltage
Output Voltage	24 VDC @ 10 Amps
Notification Outputs	24 VDC 3.0 Amps Maximum, Polarity Reversal
DC Power	3.0 Amps
Total System Current	PSN-106 = 10 Amps (total system load from all output circuits must not exceed 10 amps total_

The system uses a "Sealed Lead Acid" or "Gel-Cell" type of battery with a capacity of from 7 to 55 amp-hours. Fuse must be replaced with same size and rating (8A-250VAC, Time Lag).

## Notification Power Supply



### Primary AC

120VAC 50Hz~60Hz, 5.1AMP

Min Low AC Detect 97VAC

240VAC 50~60Hz 2.5AMP

Min Low AC Detect 190VAC

### Common Relays

3A @ 125VAC (Resistive)

3A @ 30VDC (Resistive)

### Battery Charging

27.3VDC @ 1A

Low Battery Detect @20.4VDC

### Earth Fault to Any Terminal

0 Ohms

### Notification Appliance Circuits 1-6

24VDC @3A Power Limited

Regulated

Synchronization supported on NAC 1-6

### DC Power Circuit

20.4VDC - 27.3VDC @3A Power Limited

Special Application RSG-DH1224

Listed Door Holder

### Fuse Specification

8A-250VAC Time-Lag

Note: Total current draw from NAC 1-6 and DC Power must not exceed 10 amps.

### F.C.C.

This device has been verified to comply with FCC Rules Part 15, Class A Operation is subject to the following conditions:

1. This device may not cause radio interference.
2. This device must accept any interference received including any that may cause undesired operation.

### Requirements

System must be fully tested after installation.

Intended for indoor use in dry locations only.

Separation of power limited wiring from non-power limited wiring must be at least 1/4".

For proper operation the voltage drop to the farthest connected device must not exceed 3 volts. This can be calculated using the following formula:

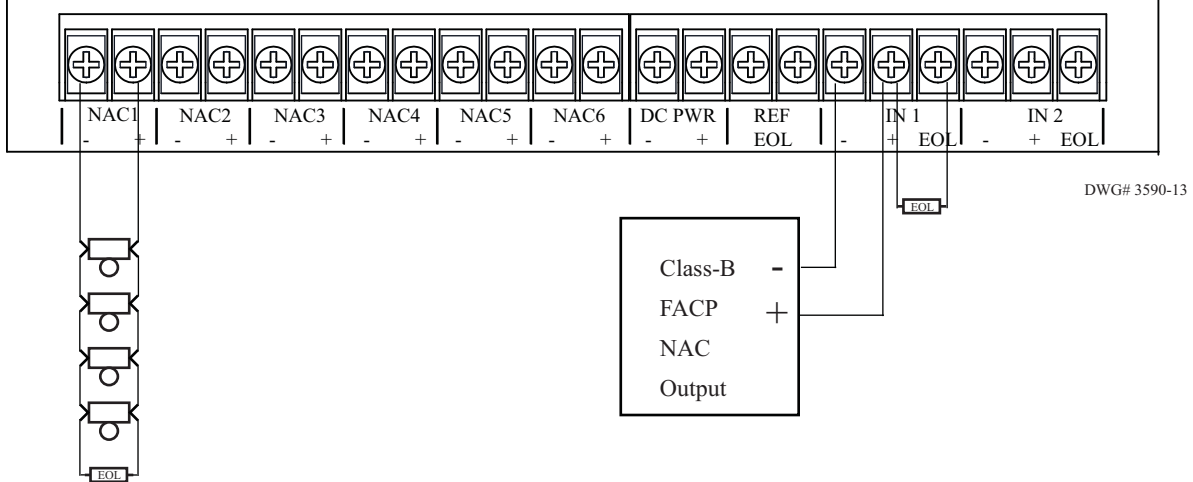
$$\frac{\text{(Alarm Current of Notification Appliances)}}{\text{x (Wire Resistance)}} < 3 \text{ volts}$$

Install in accordance with installation manual Part Number 5403590 Rev A, NFPA 70, and NFPA 72

## Wiring Options

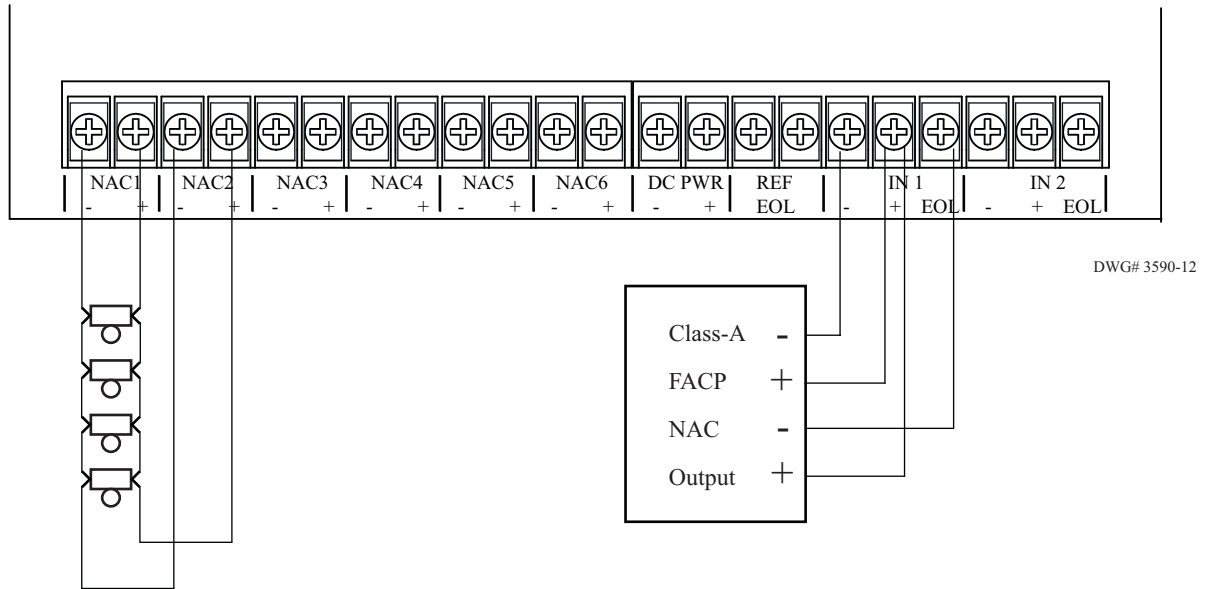
### Class B Trigger and Class B Notification Circuit Trigger

Class B Style Y Trigger and Class B Style Y Notification Circuit Trigger inputs IN1 & IN2 can be connected to a Class B Style Y NAC trigger circuit as shown below. The PSN-106 provides 6 Class B Style Y NAC circuits, each rated for 3 amps. Each NAC circuit is individually selectable for Class A Style Z/ Class B Style Y operation, refer to the Dip Switch Programming for information on dip switch programming.



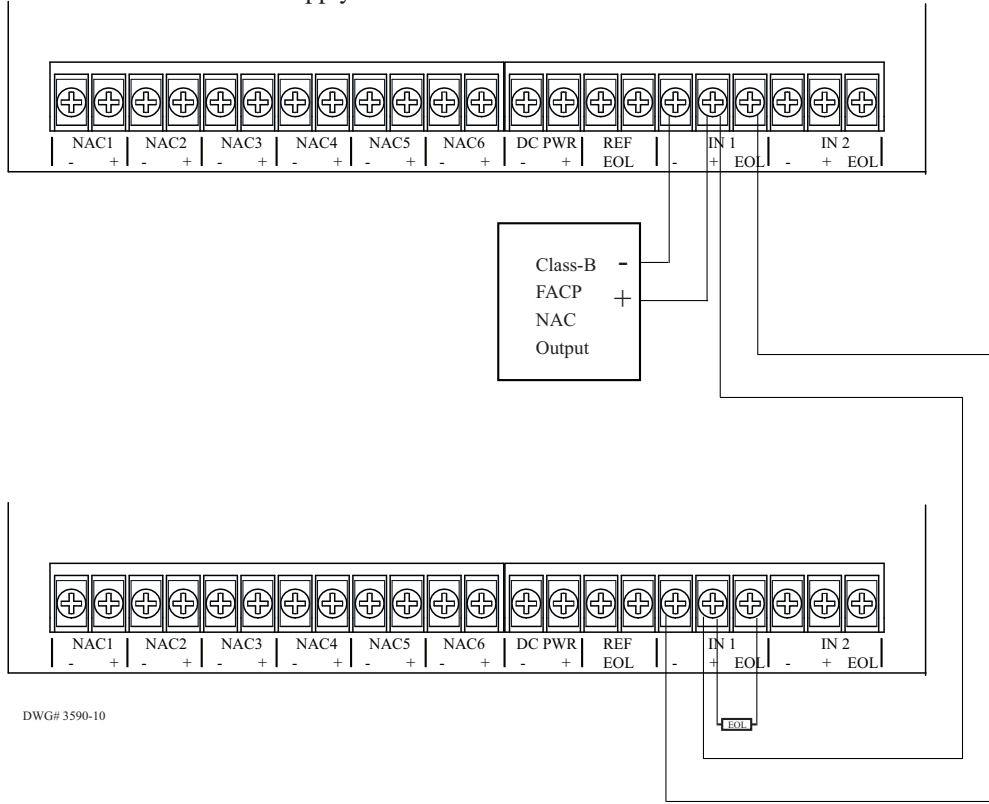
### Class A Trigger and Class A Notification Circuit

Trigger inputs IN1 & IN2 can be connected to a class A NAC trigger circuit as shown below. The PSN-106 provides 3 Class A NAC circuits, each rated for 3 amps. Each NAC circuit is individually selectable for Class A/B operation, refer to the Dip Switch Programming section for information on dip switch programming.



*Class B - Multiple Supply Trigger*

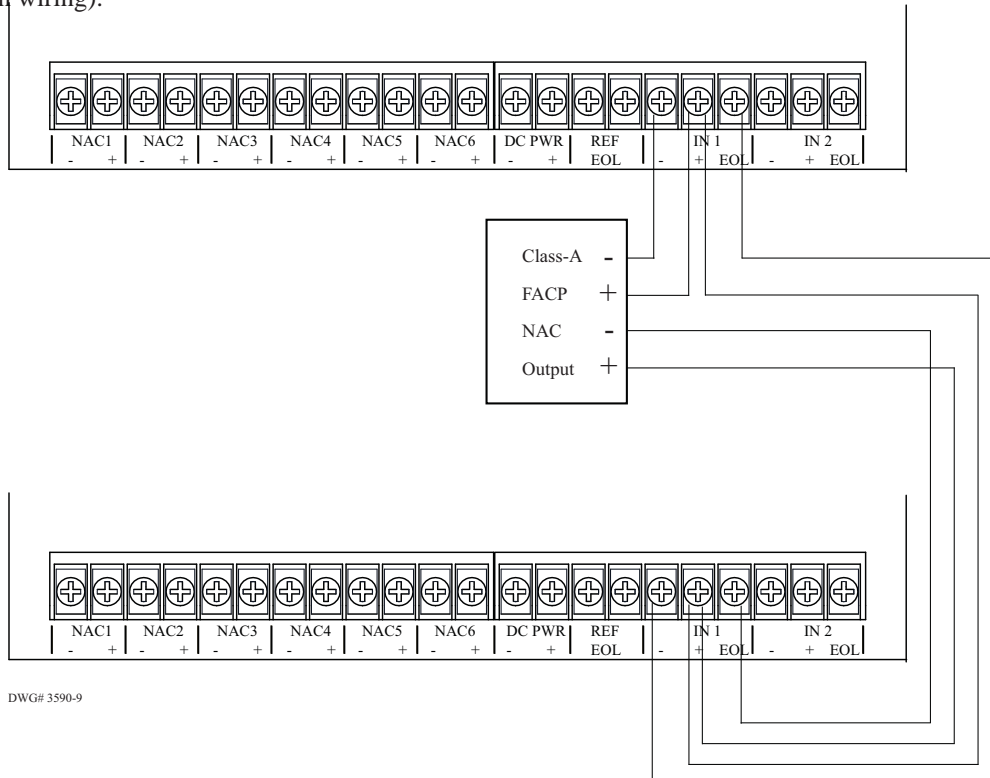
A single Class B Style Y trigger can be used to activate multiple supplies as shown below. The minimum wire gauge between supplies is 18 AWG. A maximum wiring distance of 10,000 feet is allowed from the triggering FACP and the last supply in the chain. The EOL resistor is located on the last supply in the chain.



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*Class A - Multiple Supply Trigger*

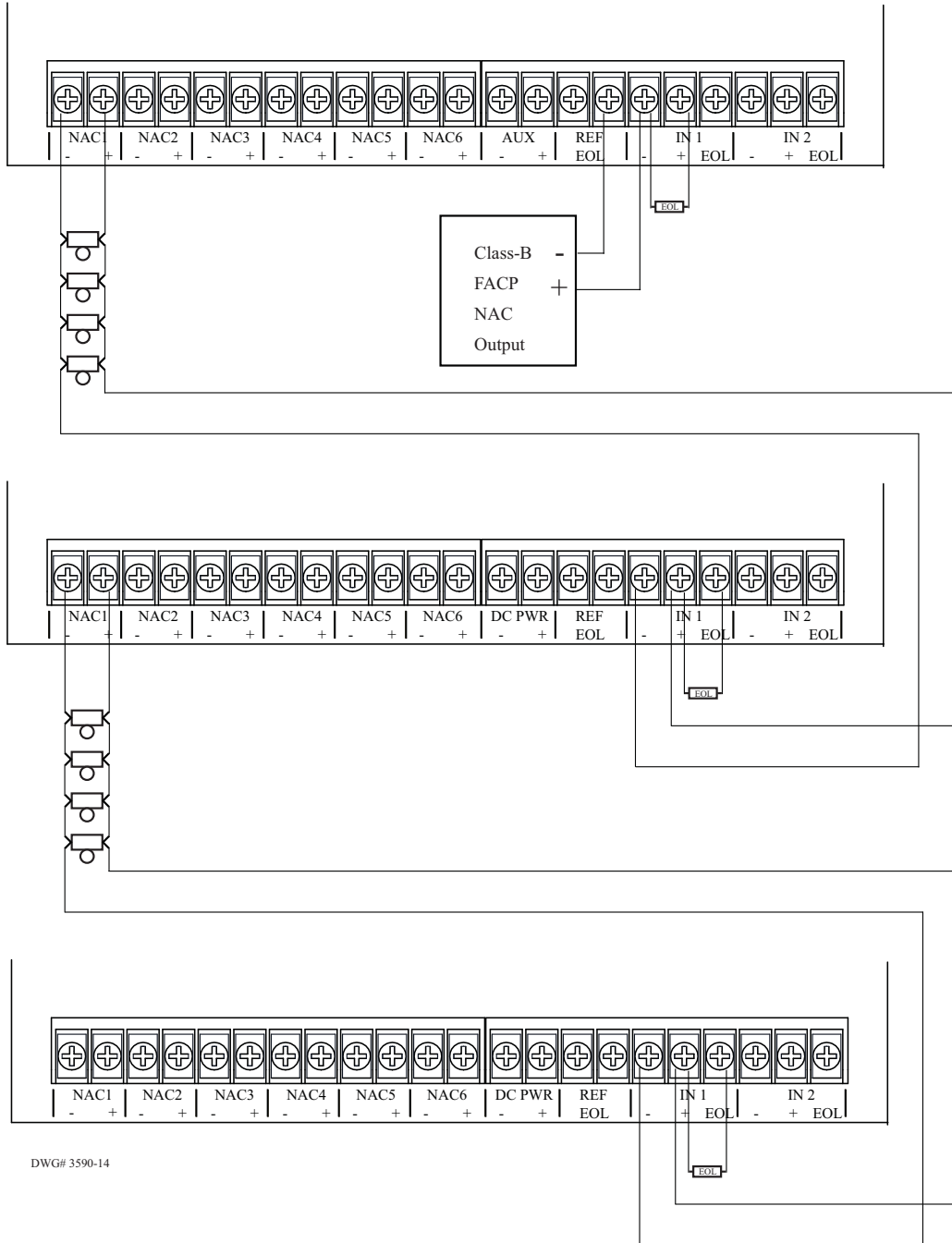
A single Class A Style Z trigger can be used to activate multiple supplies as shown below. The minimum wire gauge between supplies is 18 AWG. A total wiring distance of 10,000 feet is allowed from the triggering FACP to the last supply in the chain (including the return wiring).



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*Pass Thru Mode*

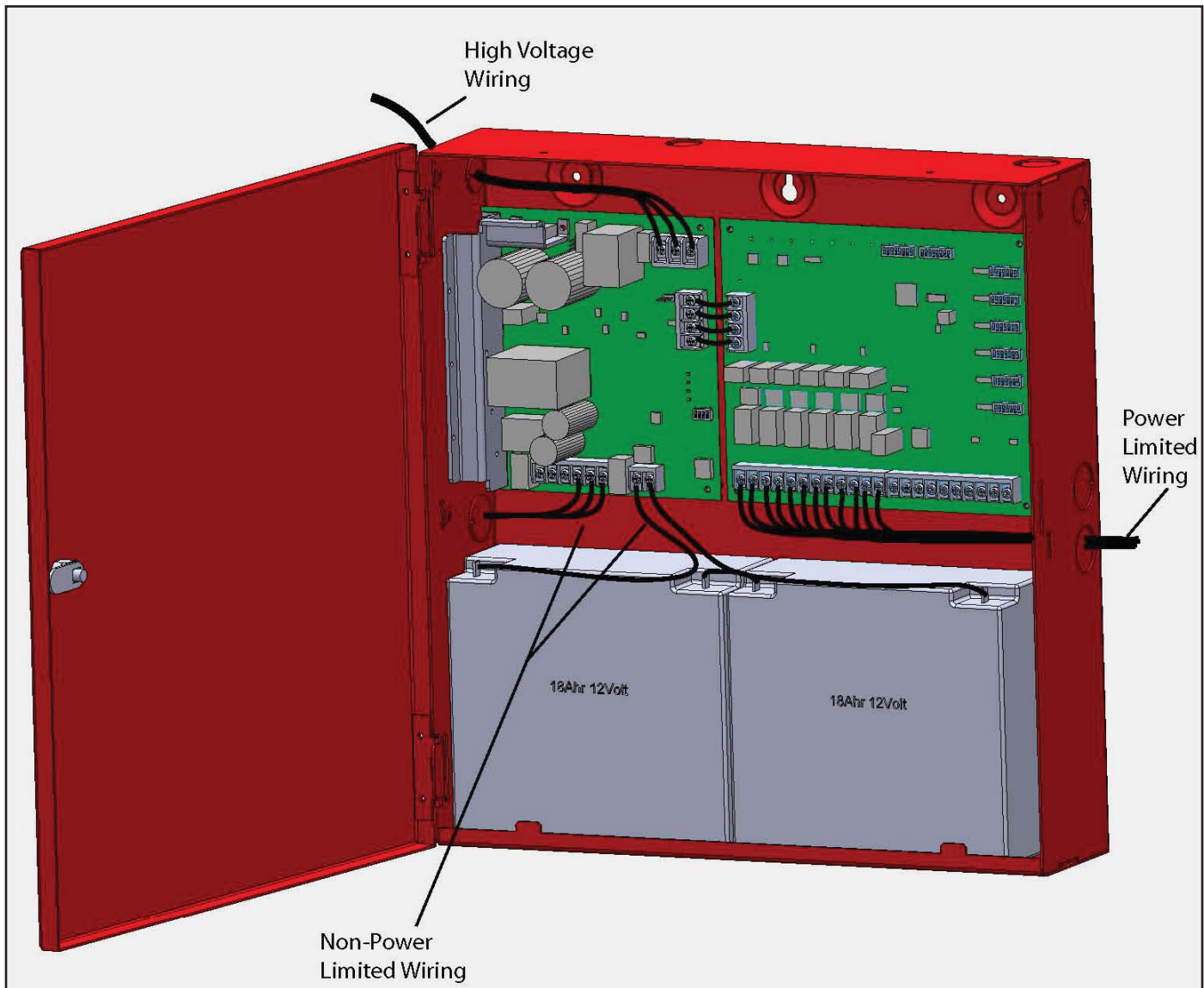
The NAC output of the PSN-106 can be used to trigger additional supplies. Up to 3 supplies maximum can be configured in this manner. Full system synchronization is maintained. The minimum wire gauge between supplies is 18 AWG. A maximum wiring distance of 10,000 feet is allowed between each supply.



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## Wire Routing

A minimum of ¼ inch separation must be maintained between Power Limited, Non-Power Limited, and High Voltage wiring. See illustration for suggested wire routing



## Reference EOL

The PSN-106 uses a standard 5.1k EOL resistor (Potter part number 3005013).

In retrofit applications where a value other than 5.1k is already in use, a reference EOL input is provided. Simply connect a matching EOL resistor to the reference EOL input. All NAC wiring will then be supervised based on this value. Any EOL value from 2.0k to 27k can be used.

If no reference EOL is connected, 5.1k is assumed.

## Dip Switch Programming

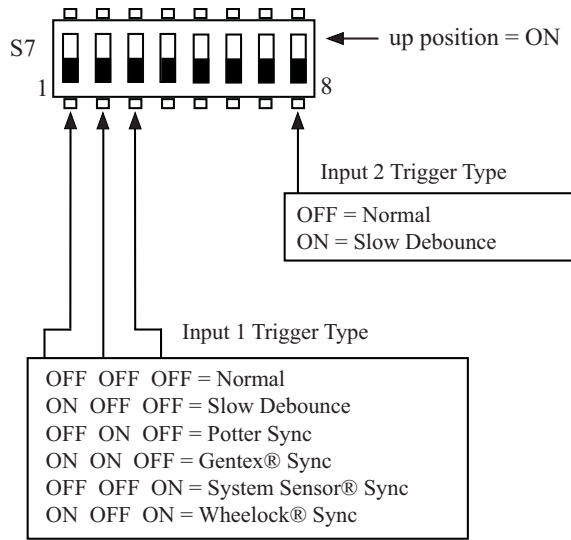
### **⚠ WARNING**

Remove power before servicing or changing DIP switch programming selections

#### Input Trigger Type

(Selects the behavior of trigger inputs.)

- **Normal Trigger:** Trigger input is sampled at a high rate. Used for simple DC triggers, as well as for sync follow and pass-thru mode. A NAC configured as constant output will follow triggered and immediately activate.
- **Slow Debounce (Slow Trigger):** Allows a non-standard trigger signal to be used for activation. The slower response allows the outputs to remain active when the trigger signal is changing. This trigger will operate with ANSI Temporal Code 3.
- **Synchronization Triggers (Potter, Gentex®, Wheelock®, System Sensor®):** Used with QuadraSync to maintain synchronization of devices from different manufacturers.



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#### Bulk Supply Options

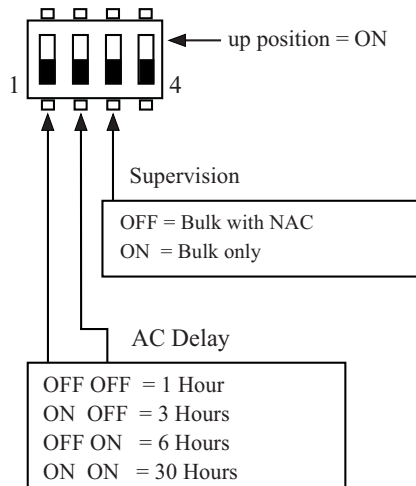
##### AC Report Delay:

Selects number of hours to delay before activating the general trouble relay in response to a low AC condition. Note that the Low AC relay is activated immediately.

##### Supervision:

This should always be in the OFF position to allow supervision of the wiring between the 24 VDC bulk supply board and the NAC control board.

NAC control board global options



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*Class A/B Selection*

Each pair of NACs can be individually configured for class A/B operation. When class A is selected, the individual NAC options for the first NAC in the pair will apply. For example, if the circuit pair 1&2 is programmed for class A operation, then only the individual NAC option dip switch for circuit 1 will be used.

*Door Holder AC Dropout delay*

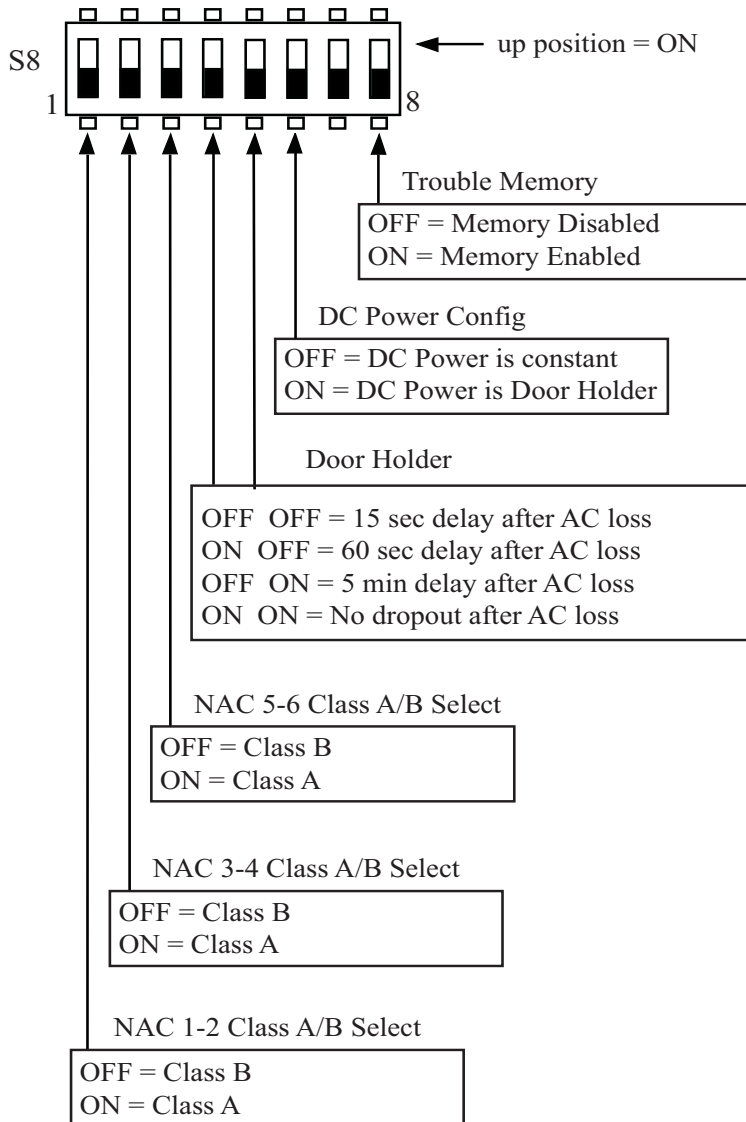
If the DC power output is used as door holder power, it can be configured to drop out in response to a low AC condition in order to minimize standby current. To minimize nuisance conditions a selectable AC dropout delay is provided. If “No doorholder dropout on AC Loss” is selected, door holder power will drop out in response to an alarm condition only.

*DC Power Output is Door Holder*

Specifies whether the DC power output will act as door holder power. If selected, the DC power will drop out in response to an alarm condition and optionally a low AC condition.

*Trouble Memory Enabled*

When enabled, any trouble conditions will be stored in memory after the condition has been corrected. Stored trouble conditions are indicated on the LED associated with the original trouble condition.



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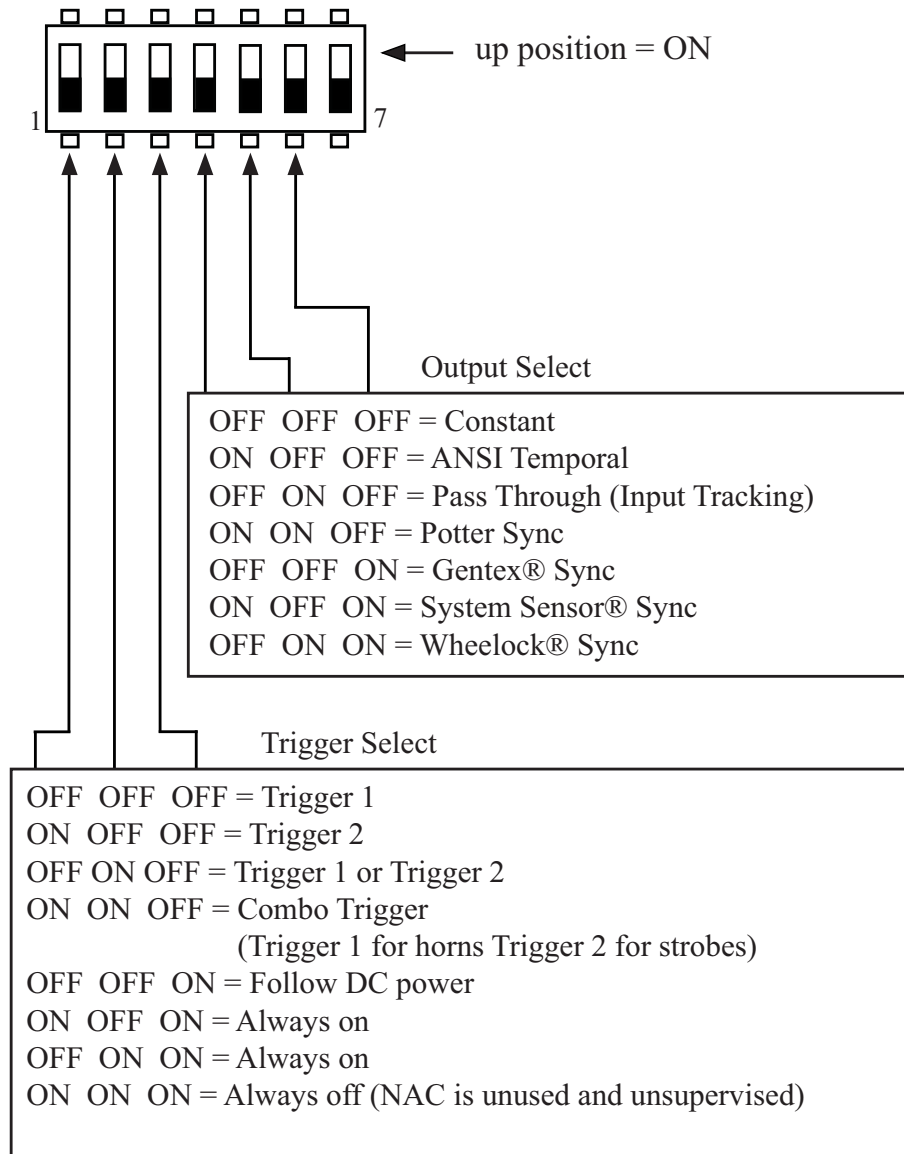


### Individual NAC Options

Conditions for activating each NAC are individually programmed.

Trigger Selection: specifies which trigger input(s) to respond to.

- Trigger 1: NAC will activate when Trigger 1 is activated
- Trigger 2: NAC will activate when Trigger 2 is activated
- Trigger 1 or Trigger 2: NAC will activate when either Trigger 1 or Trigger 2 is activated.
- Combo: Can be used to separately control horns & strobes when used with one of the supported synchronization protocols. If Trigger 1 is present, both horns and strobes will be activated. If only Trigger 2 is present, horns will be disabled, and strobes will be activated.
- Follow DC Power: When selected, the NAC will exactly follow the activation/deactivation of the DC power output. Can be used to create additional door-holder power circuits.
- Always ON: Used to create a constant ON power output.
- Unused: NAC circuit will be unused .
- Output Selection: Specifies the output pattern to be generated when the output is activated.



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## Indicator LED Behavior

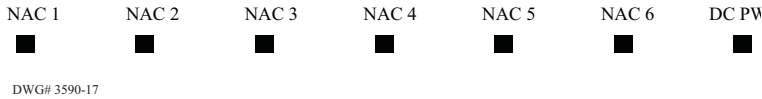
The NAC control board contains an indicator LED for each NAC circuit and a comm LED:

- NAC Led: Fast Flashing = NAC trouble (EOL missing, EOL shorted, or current limit condition)
- NAC Led: Solid or Pattern = NAC active. LED will follow pattern of NAC
- Comm: Used only to indicate supervision activity between bulk and control boards.

If the trouble memory option is enabled (Trouble Memory dip switch option on) the LEDs indicate if any previous trouble conditions are stored in memory.

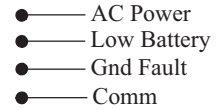
Example: Suppose Trouble Memory is enabled and a NAC circuit EOL is detected as missing. While the EOL is missing, the LED associated with the NAC will flash continuously to indicate the trouble. If the EOL is replaced and the trouble condition is no longer present, the LED will begin issuing the trouble memory flash. This flash indicates that a trouble existed previously, but is no longer present. The trouble memory indication consists of two short flashes issued once per second.

Clear/reset Trouble Memory by setting the Trouble Memory dip switch off, and then back on to enable the feature.



The bulk supply board contains four indicator LEDs:

- AC Power: ON = AC Present, OFF = AC not present).
- Low Battery: Fast Flashing = Low battery condition. ON = Battery Charger Failure
- Earth Ground Fault: Flashing = Earth fault detected.
- Comm: Used only to indicate supervision activity between bulk and control boards (about one per second).



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### Battery Calculation Worksheet

Standby current for the PSN-106 is 75 milli-amps.

**Secondary Power Supply Requirements Table**

Service Use	Standby Time	Alarm Time
NFPA 72 <ul style="list-style-type: none"> <li>• Central Station (PPU)</li> <li>• Local</li> </ul>	24 hours 24 hours	5 minutes 5 minutes

**Calculation Table**

1	2	3	4	5	6
Module/Device	Quantity	Standby mA Per Unit	Total Standby Current	Alarm mA Per Unit	Total Alarm Current
PSN-106	1	75	75	75	75

	Total mA		Total mA		
	Convert to A	x 0.001	Convert to A	x 0.001	
(* Refer to Maximum allowable standby current)	Total A		Total A		
	Multiply by hours	x ____	5 min/12 or 10 min/6	÷ ____	
	Total Standby AH		Total Alarm AH		
			+ Total Standby AH		
			Total AH		
			Efficiency Factor	÷ 0.85	
			Required AH		

*Use a battery with a higher AH rating than Required AH*

**\* Maximum Allowable Standby Current (24-hour standby time)**

Battery Size	UL 24-hour	ULC 24-hour
7 AH	.213 Amps	.213 Amps
18 AH	.603 Amps	.603 Amps
33 AH	1.134 Amps	.603 Amps
55 AH	1.913 Amps	.603 Amps

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# **Section 2: PSN-64** Installation, Operation, and Instruction Manual

## Notification Power Supplies

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- Output voltage 24VDC @ 6A
- Four class “B” initiating circuits on the PSN-64
  - Rated at 3 amps max each
  - Can be configured as up to two class “A” Style “Z” notification circuits
- Supervised Battery Charger: 27.3 @ 1A (supports 7-55 Ahr batteries)
- Integrated battery cut-off circuitry to protect batteries from deep discharge
- Two Trouble Relays (5A at 30VDC)
  - General System Trouble (programmable for AC delay via dip-switch)
  - Low AC Trouble
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## Operating Instructions

### *Alarm Condition*

Notification Appliance Circuit:

Alarm devices operate in unison with the Trigger inputs from the main Fire Alarm Control Panel (FACP). When activated by the corresponding trigger input the associated Notification Appliance Circuit (NAC) will reverse polarity from a supervision state to the alarm state and supply power to the associated notification appliances until the trigger is removed. Each activated NAC will also power the L.E.D. associated with it, the L.E.D. will follow the steady or pulsing state of the NAC. The alarm-activated outputs are reset through the operation of the reset function of the Main FACP.

*Trouble Condition***NOTICE**

If the trouble memory feature has been enabled the L.E.D. will provide two brief pulses every second to indicate a trouble condition has occurred but is now restored. This can be useful when troubleshooting brief trouble conditions that come and go over a period of time.

**Notification Appliance Circuit:**

If a trouble occurs on a NAC the associated L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

**DC Power Circuit:**

If a trouble occurs on the DC Power output the DC Power L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

**AC:**

When the Power supply detects the A.C. power input has fallen below an acceptable level the AC Power L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type and after a programmed delay the Low AC relay will also activate. When the trouble condition has been restored the L.E.D. and trouble relays will return to their normal state. (See notice.)

**Low Battery:**

When the Power supply detects the Battery is no longer functioning properly the Low Battery L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

**Ground Fault:**

When the Power supply detects a ground Fault condition which indicates a short between the Power Supply ground and the Earth Ground circuits the Ground Fault L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

**Communication Trouble:**

If the Bulk Power Supply and Control Board lose communication with each other the Comm L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

*Standby Operation***Notification Appliance Circuit:**

When in standby operation the NAC will be in the reversed supervision polarity and the associated L.E.D. will be off.

Exception: When the NAC is programmed to be an DC Power Output the associated L.E.D. will be on during normal standby operation.

**DC Power Circuit:**

When in standby operation the DC Power Circuit will be on and the DC Power L.E.D. will be illuminated.

**AC:**

When in normal operation the AC Power L.E.D. will be on steady.



**Low Battery:**

When in normal operation the Low Battery L.E.D. will be off.

**Ground Fault:**

When in normal operation the Ground Fault L.E.D. will be off

**Communication**

When in normal operation the Comm L.E.D. will flash occasionally to indicate normal communication traffic is occurring.

*Testing and Maintenance*

System Testing should be performed periodically to insure proper operation.

Test the indicating circuits by initiating an alarm or test at the Main FACP.

Test for proper operation by actuating the notification appliance circuit the PSN-64 is monitoring.

Standby batteries and AC transfer are tested by interrupting the AC power line while an alarm condition exists.

**Battery Maintenance**

The PSN-64 should be tested at least once a year for proper operation as follows:

*Output Voltage Test:* Under normal load conditions, the DC Power output voltage should be checked for proper voltage level. Refer to the Power Supply Output Specifications Chart).

*Battery Test:* Under normal load conditions, check that the battery is fully charged. Check specific voltage both at the battery terminal and at the board terminals marked [+BAT-] to ensure there is no break in the battery connection wires.

Note: Maximum charging current is 1 amp.

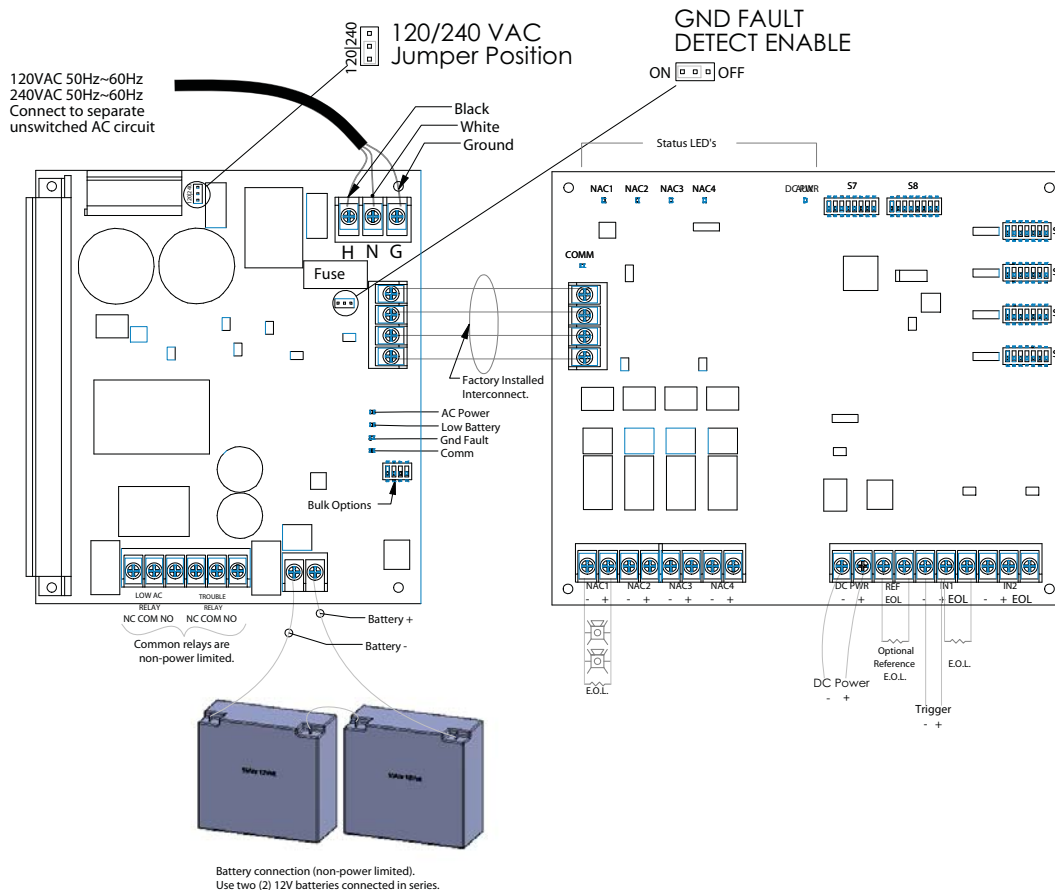
Note: Expected battery life is 5 years; however it is recommended changing batteries in 4 years or less if needed.

**Electrical Operating Characteristics**

Input Voltage	120 VAC @ 5.1 Amps or 240 VAC @ 2.5 Amps (Jumper selected) 50/60 Hz
Input Trigger	8 VDC to 33 VDC (15 ma) filtered or full wave rectified. Polarity reversal or continuous voltage
Output Voltage	24 VDC @ 6 Amps
Notification Outputs	24 VDC 3.0 Amps Maximum, Polarity Reversal
DC Power	3.0 Amps
<b>Total System Current</b>	PSN-64 = 6 Amps (total system load from all output circuits must not exceed 6 amps total)

The system uses a "Sealed Lead Acid" or "Gel-Cell" type of battery with a capacity of from 7 to 55 amp-hours. Fuse must be replaced with same size and rating (8A-250VAC, Time Lag).

## Notification Power Supply



### Primary AC

- 120VAC 50Hz~60Hz, 5.1AMP
- Min Low AC Detect 97VAC
- 240VAC 50~60Hz 2.5AMP
- Min Low AC Detect 190VAC

### Common Relays

- 3A @ 125VAC (Resistive)
- 3A @ 30VDC (Resistive)

### Battery Charging

- 27.3VDC @ 1 A
- Low Battery Detect @20.4VDC

### Earth Fault to Any Terminal

0 Ohms

### Notification Appliance Circuits 1-4

- 27.3VDC @3A Power Limited
- Regulated
- Synchronization supported on NAC 1-4

### DC Power Circuit

- 20.4VDC - 27.3VDC @3A Power Limited
- Special Application RSG-DH1224
- Listed Door Holder

### Fuse Specification

8A-250VAC Time-Lag

Note: Total current draw from NAC 1-4 and DC Power must not exceed 6 amps.

### F.C.C.

This device has been verified to comply with FCC Rules Part 15, Class A Operation is subject to the following conditions:

1. This device may not cause radio interference.
2. This device must accept any interference received including any that may cause undesired operation.

### Requirements

System must be fully tested after installation.  
 Intended for indoor use in dry locations only.  
 Separation of power limited wiring from non-power limited wiring must be at least 1/4".

For proper operation the voltage drop to the farthest connected device must not exceed 3 volts. This can be calculated using the following formula:

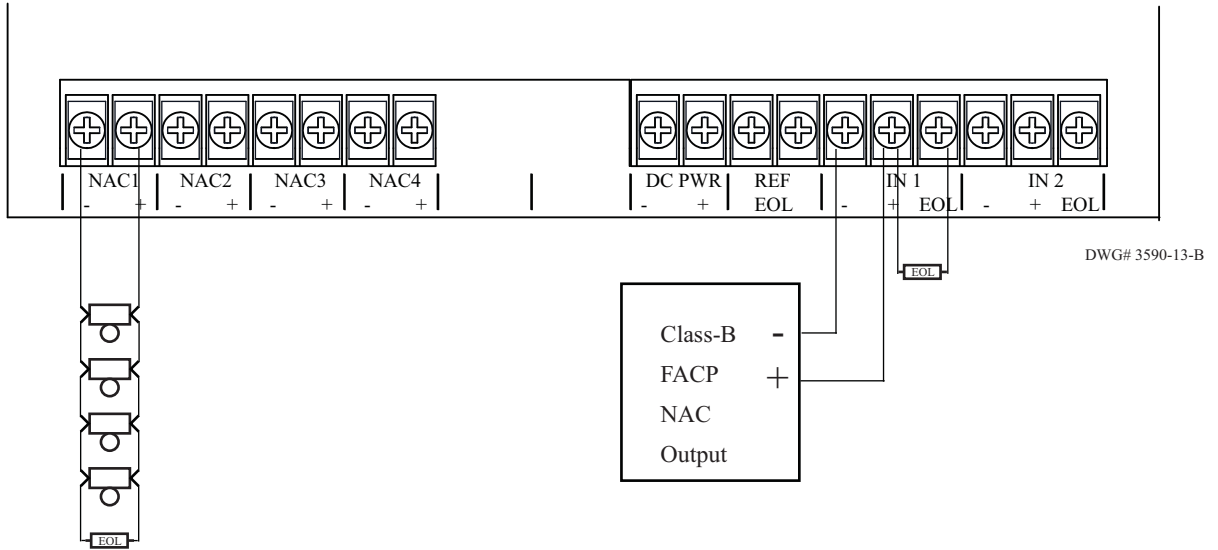
$$\frac{\text{(Alarm Current of Notification Appliances)} \times \text{(Wire Resistance)}}{< 3 \text{ volts}}$$

Install in accordance with installation manual Part Number 5403590 Rev A, NFPA 70, and NFPA 72

## Wiring Options

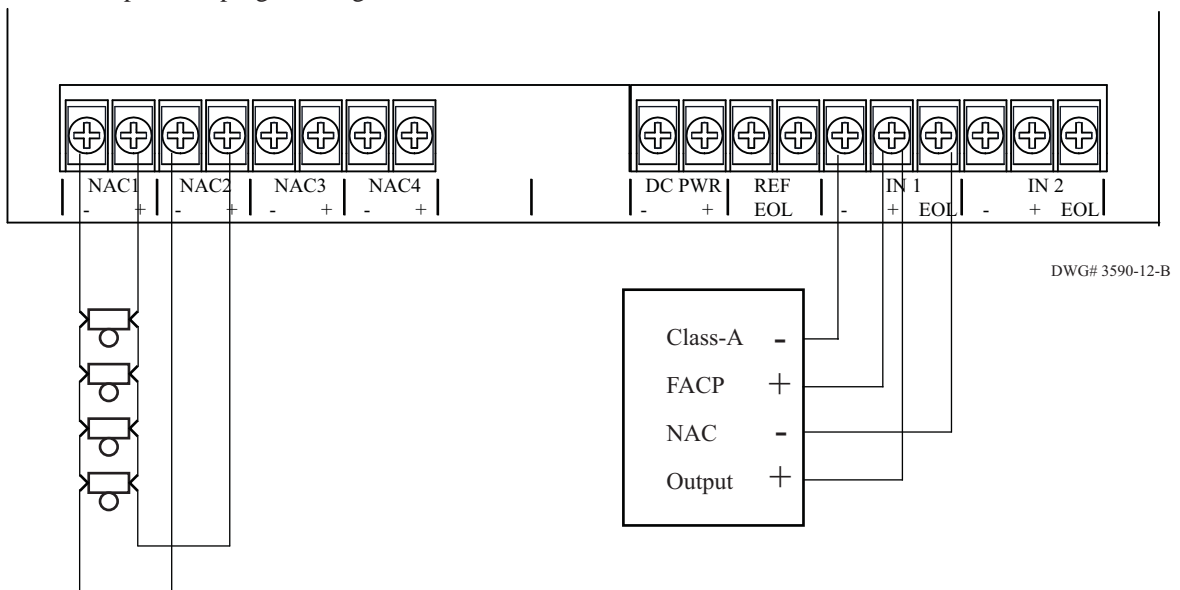
### Class B Trigger and Class B Notification Circuit Trigger

Class B Style Y Trigger and Class B Style Y Notification Circuit Trigger inputs IN1 & IN2 can be connected to a Class B Style Y NAC trigger circuit as shown below. The PSN-64 provides 4 Class B Style Y NAC circuits, each rated for 3 amps. The PSN-64 provides 4 Class B Style Y NAC circuits, each rated at 3 amps. Each NAC circuit is individually selectable for Class A Style Z/ Class B Style Y operation, refer to the Dip Switch Programming section for information on dip switch programming.



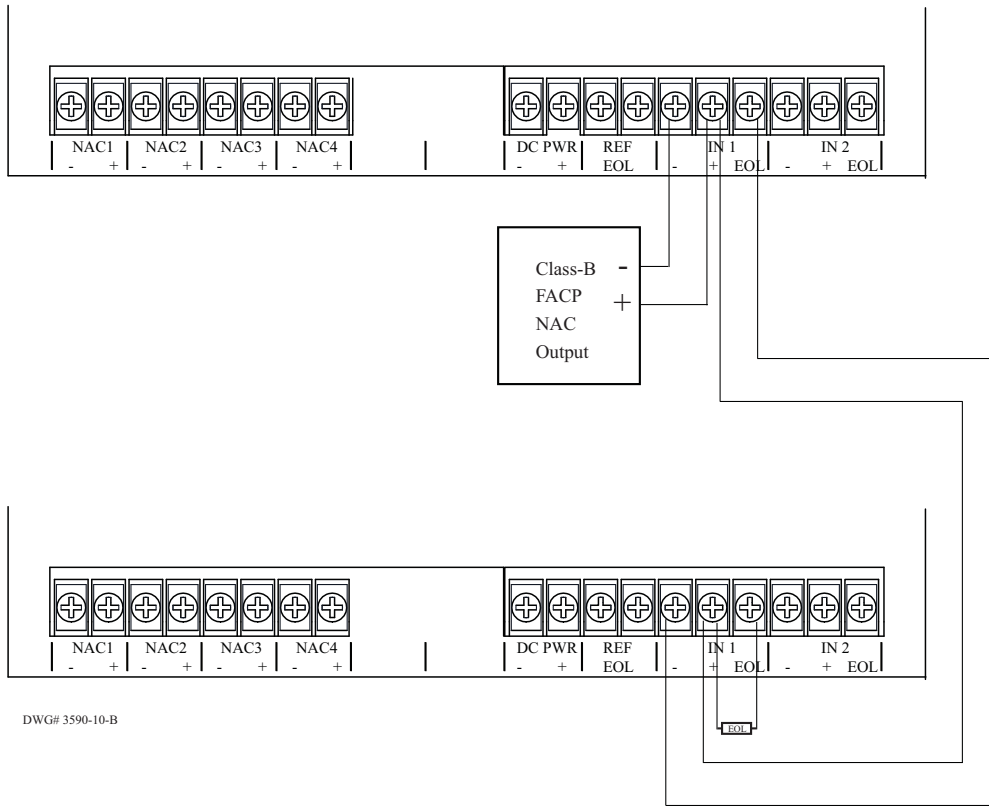
### Class A Trigger and Class A Notification Circuit

Trigger inputs IN1 & IN2 can be connected to a class A NAC trigger circuit as shown below. The PSN-64 provides 3 Class A Style Z NAC circuits, each rated for 3 amps. The PSN-64 provides 4 Class B Style Y NAC circuits, each rated at 3 amps. Each NAC circuit is individually selectable for Class A Style Z/Class B Style Y operation, refer to the Dip Switch Programming section for information on dip switch programming.



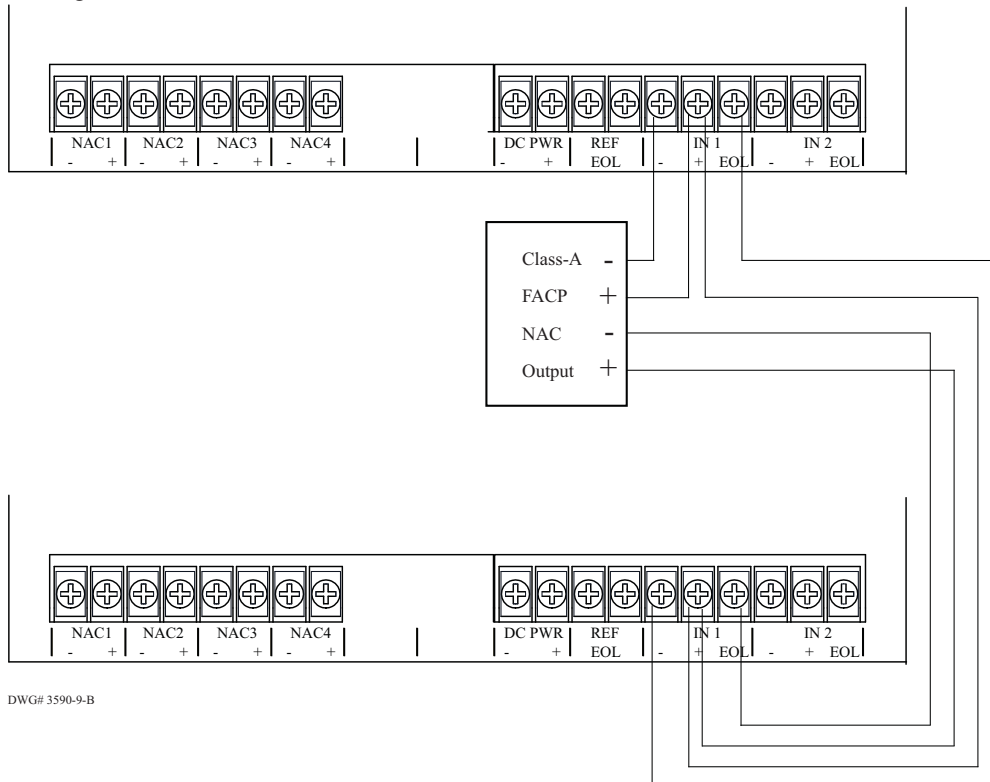
*Class B - Multiple Supply Trigger*

A single Class B Style Y trigger can be used to activate multiple supplies as shown below. The EOL resistor is located on the last supply in the chain. The minimum wire gauge between supplies is 18 AWG. A maximum wiring distance of 10,000 feet is allowed from the triggering FACP and the last supply in the chain.



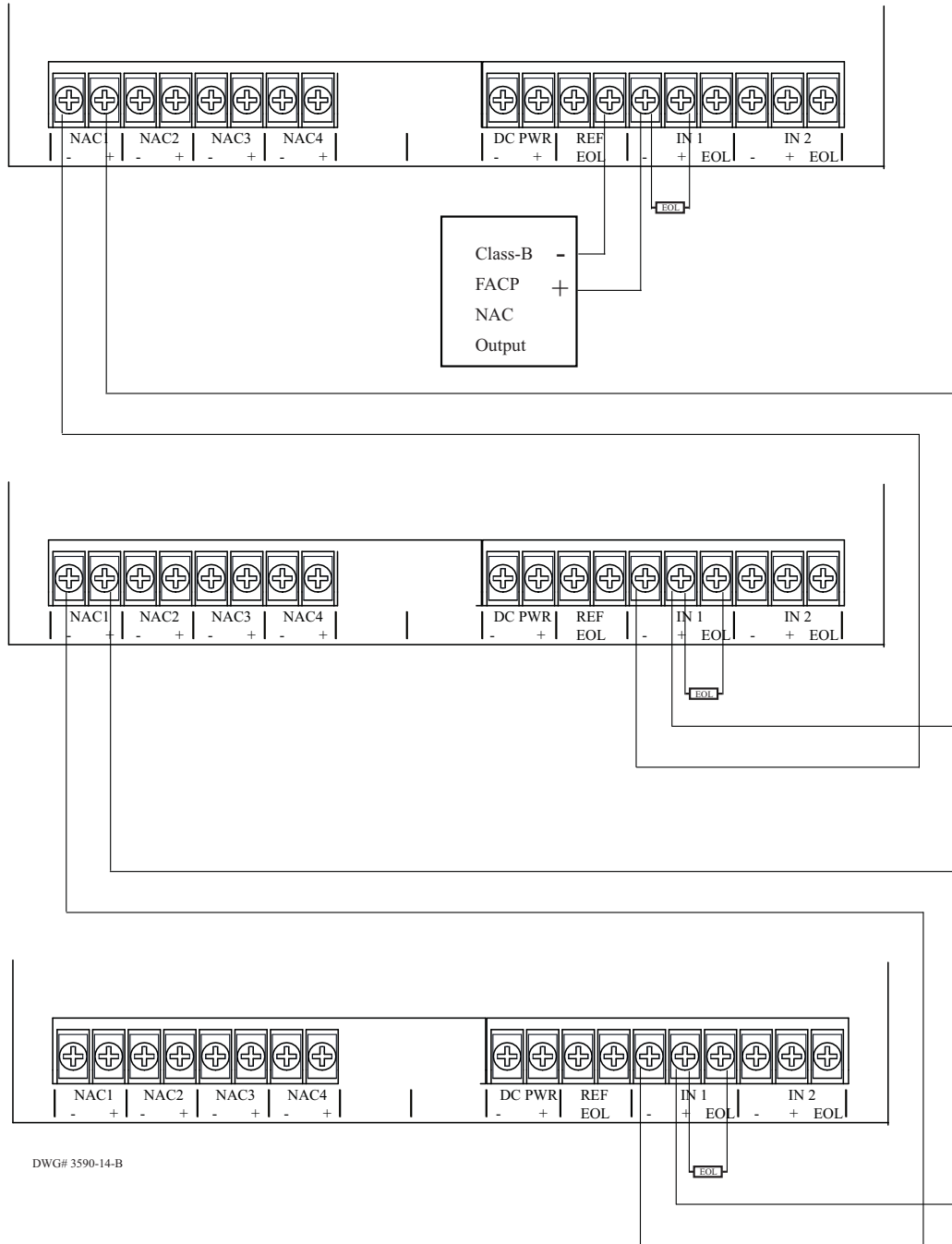
*Class A - Multiple Supply Trigger*

A single Class A Style Z trigger can be used to activate multiple supplies as shown below. The minimum wire gauge between supplies is 18 AWG. A total wiring distance of 10,000 feet is allowed from the triggering FACP to the last supply in the chain (including the return wiring).



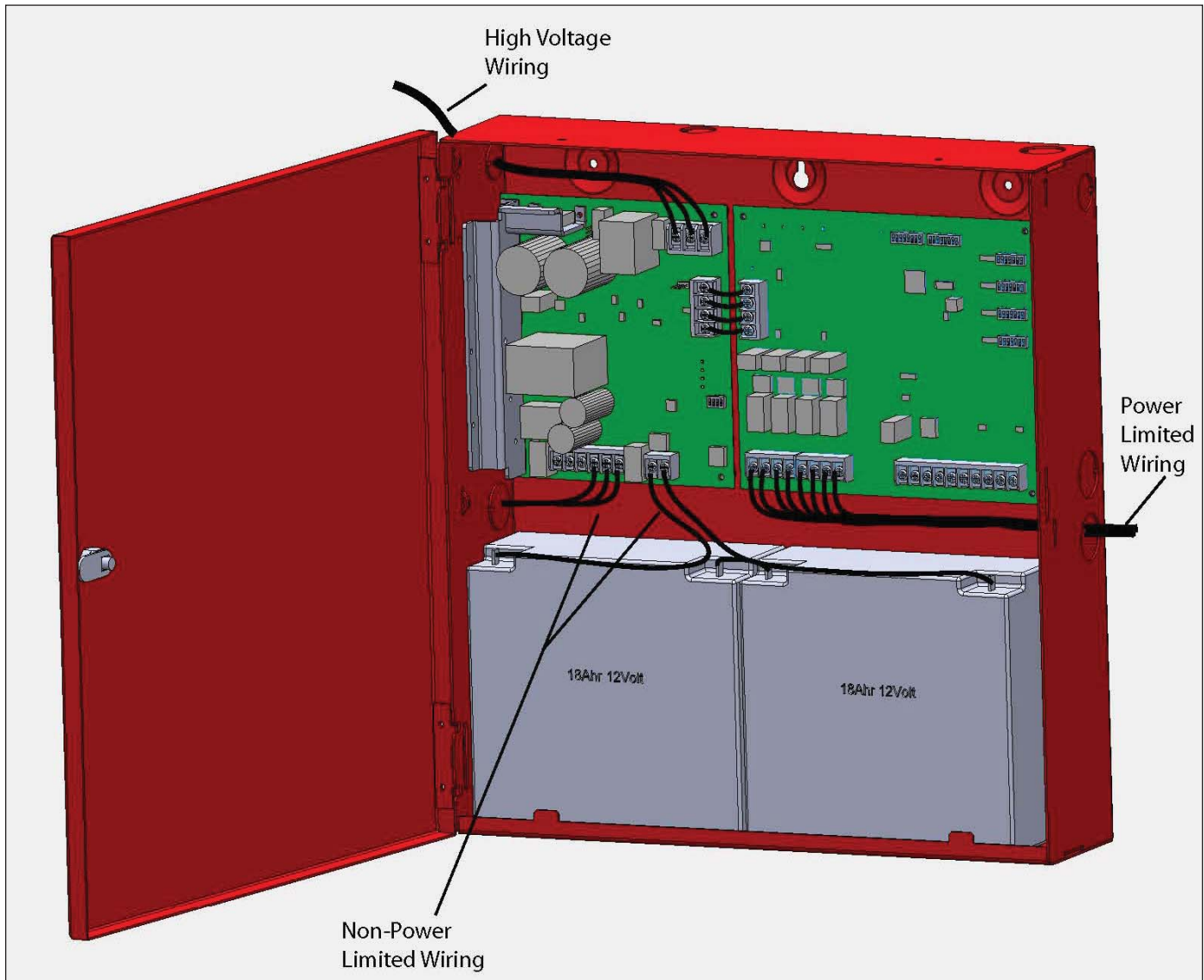
*Pass Thru Mode*

The NAC output of the PSN-64 can be used to trigger additional supplies. Up to 3 supplies maximum can be configured in this manner. Full system synchronization is maintained. The minimum wire gauge between supplies is 18 AWG. A maximum wiring distance of 10,000 feet is allowed between each supply.



## Wire Routing

A minimum of ¼ inch separation must be maintained between Power Limited, Non-Power Limited, and High Voltage wiring. See illustration for suggested wire routing



## Reference EOL

The PSN-64 uses a standard 5.1k EOL resistor (Potter part number 3005013).

In retrofit applications where a value other than 5.1k is already in use, a reference EOL input is provided. Simply connect a matching EOL resistor to the reference EOL input. All NAC wiring will then be supervised based on this value. Any EOL value from 2.0k to 27k can be used.

If no reference EOL is connected, 5.1k is assumed.

## Dip Switch Programming

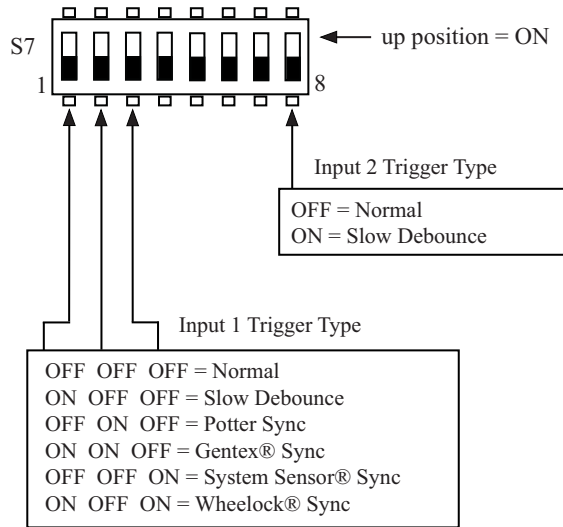
### **WARNING**

Remove power before servicing or changing DIP switch programming selections

### Input Trigger Type

(Selects the behavior of trigger inputs.)

- **Normal Trigger:** Trigger input is sampled at a high rate. Used for simple DC Power triggers, as well as for sync follow and pass-thru mode. A NAC configured as constant output will follow triggered and immediately activate.
- **Slow Debounce (Slow Trigger):** Allows a non-standard trigger signal to be used for activation. The slower response allows the outputs to remain active when the trigger signal is changing. This trigger will operate with ANSI Temporal Code 3.
- **Synchronization Triggers (Potter, Gentex®, Wheelock®, System Sensor®):** Used with QuadraSync to maintain synchronization of devices from different manufacturers.



DWG# 3590-15

### Bulk Supply Options

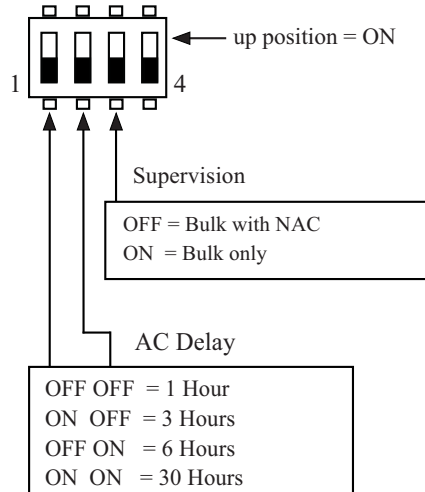
#### AC Report Delay:

Selects number of hours to delay before activating the general trouble relay in response to a low AC condition. Note that the Low AC relay is activated immediately.

#### Supervision:

This should always be in the OFF position to allow supervision of the wiring between the 24 VDC bulk supply board and the NAC control board.

NAC control board global options



DWG# 3590-1

*Class A/B Selection*

Each pair of NACs can be individually configured for class A/B operation. When class A is selected, the individual NAC options for the first NAC in the pair will apply. For example, if the circuit pair 1&2 is programmed for class A operation, then only the individual NAC option dip switch for circuit 1 will be used.

*Door Holder AC Dropout delay*

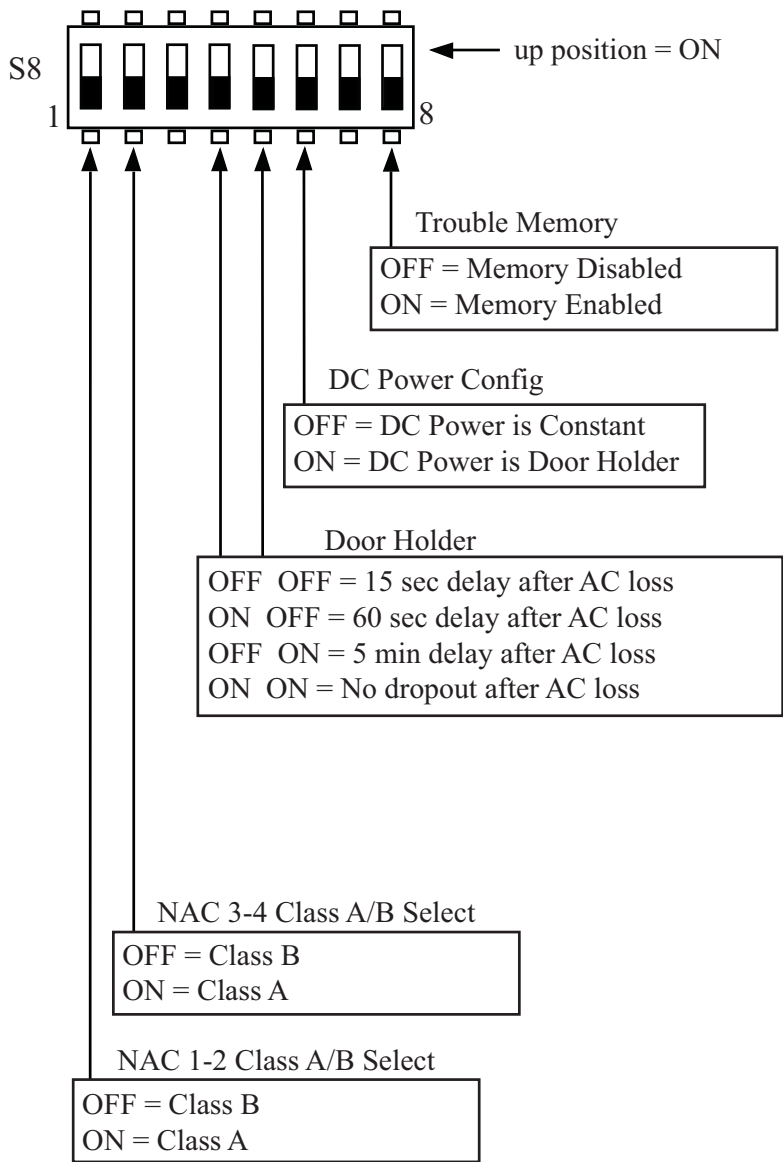
If the DC power output is used as door holder power, it can be configured to drop out in response to a low AC condition in order to minimize standby current. To minimize nuisance conditions a selectable AC dropout delay is provided. If “No doorholder dropout on AC Loss” is selected, door holder power will drop out in response to an alarm condition only.

*DC Output is Door Holder*

Specifies whether the DC power output will act as door holder power. If selected, the DC power will drop out in response to an alarm condition and optionally a low AC condition.

*Trouble Memory Enabled*

When enabled, any trouble conditions will be stored in memory after the condition has been corrected. Stored trouble conditions are indicated on the LED associated with the original trouble condition.



DWG# 3590-16-B

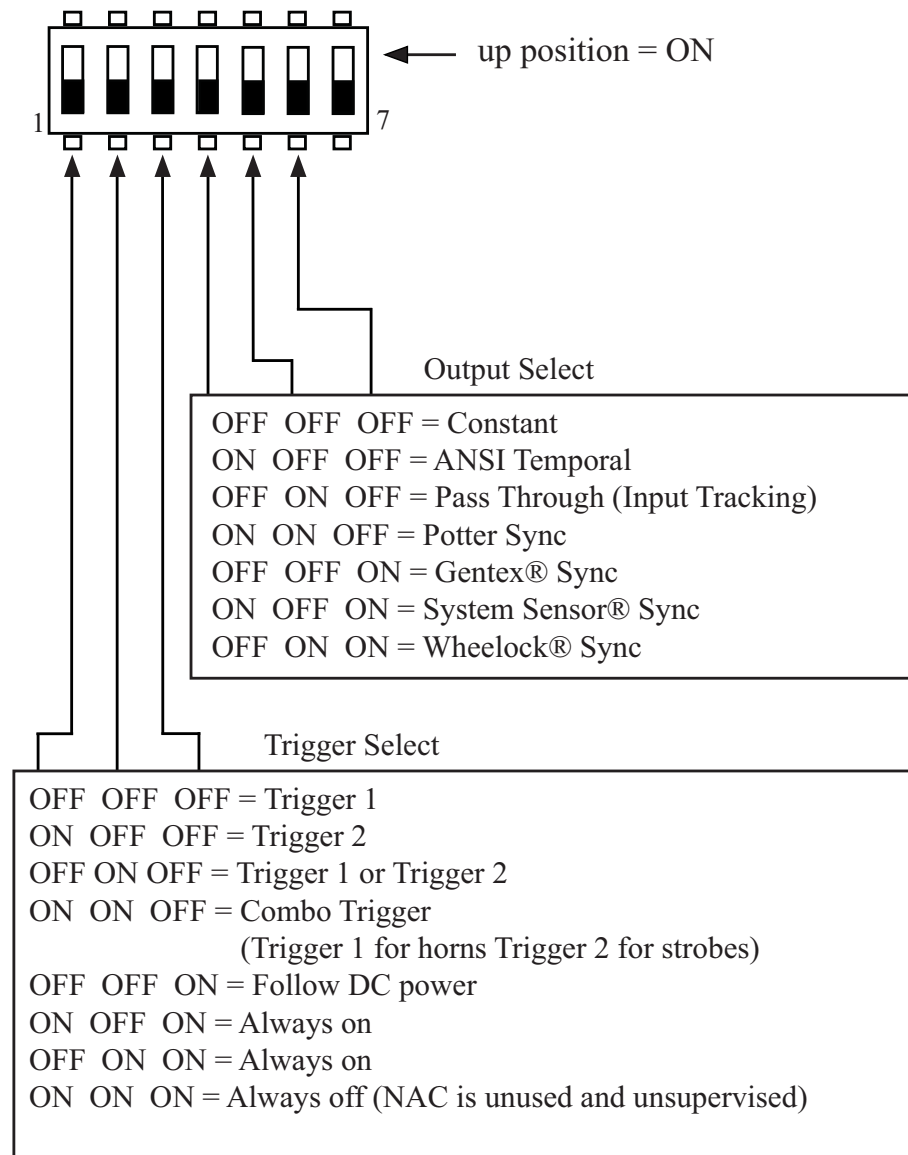


### Individual NAC Options

Conditions for activating each NAC are individually programmed.

Trigger Selection: specifies which trigger input(s) to respond to.

- Trigger 1: NAC will activate when Trigger 1 is activated
- Trigger 2: NAC will activate when Trigger 2 is activated
- Trigger 1 or Trigger 2: NAC will activate when either Trigger 1 or Trigger 2 is activated.
- Combo: Can be used to separately control horns & strobes when used with one of the supported synchronization protocols. If Trigger 1 is present, both horns and strobes will be activated. If only Trigger 2 is present, horns will be disabled, and strobes will be activated.
- Follow DC Power: When selected, the NAC will exactly follow the activation/deactivation of the DC power output. Can be used to create additional door-holder power circuits.
- Always ON: Used to create a constant ON power output.
- Unused: NAC circuit will be unused .
- Output Selection: Specifies the output pattern to be generated when the output is activated.



DWG# 3590-11

## Indicator LED Behavior

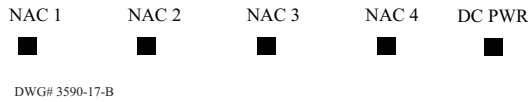
The NAC control board contains an indicator LED for each NAC circuit and a comm LED:

- **NAC Led:** Fast Flashing = NAC trouble (EOL missing, EOL shorted, or current limit condition)
- **NAC Led:** Solid or Pattern = NAC active. LED will follow pattern of NAC
- **Comm:** Used only to indicate supervision activity between bulk and control boards.

If the trouble memory option is enabled (Trouble Memory dip switch option on) the LEDs indicate if any previous trouble conditions are stored in memory.

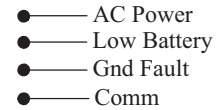
Example: Suppose Trouble Memory is enabled and a NAC circuit EOL is detected as missing. While the EOL is missing, the LED associated with the NAC will flash continuously to indicate the trouble. If the EOL is replaced and the trouble condition is no longer present, the LED will begin issuing the trouble memory flash. This flash indicates that a trouble existed previously, but is no longer present. The trouble memory indication consists of two short flashes issued once per second.

Clear/reset Trouble Memory by setting the Trouble Memory dip switch off, and then back on to enable the feature.



The bulk supply board contains four indicator LEDs:

- **AC Power:** ON = AC Present, OFF = AC not present).
- **Low Battery:** Fast Flashing = Low battery condition. ON = Battery Charger Failure
- **Earth Ground Fault:** Flashing = Earth fault detected.
- **Comm:** Used only to indicate supervision activity between bulk and control boards (about one per second).



DWG# 3590-18

### Battery Calculation Worksheet

Standby current for the PSN-64 is 75 milli-amps.

**Secondary Power Supply Requirements Table**

Service Use	Standby Time	Alarm Time
NFPA 72 <ul style="list-style-type: none"> <li>• Central Station (PPU)</li> <li>• Local</li> </ul>	24 hours 24 hours	5 minutes 5 minutes

**Calculation Table**

1	2	3	4	5	6
Module/Device	Quantity	Standby mA Per Unit	Total Standby Current	Alarm mA Per Unit	Total Alarm Current
PSN-64	1	75	75	75	75

	Total mA		Total mA	
	Convert to A	x 0.001	Convert to A	x 0.001
(* Refer to Maximum allowable standby current)	Total A		Total A	
	Multiply by hours	x ____	5 min/12 or 10 min/6	÷ ____
	Total Standby AH		Total Alarm AH	
			+ Total Standby AH	
			Total AH	
			Efficiency Factor	÷ 0.85
			Required AH	

*Use a battery with a higher AH rating than Required AH*

**\* Maximum Allowable Standby Current (24-hour standby time)**

Battery Size	UL 24-hour	ULC 24-hour
7 AH	.213 Amps	.213 Amps
18 AH	.603 Amps	.603 Amps
33 AH	1.134 Amps	.603 Amps
55 AH	1.913 Amps	.603 Amps

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# **Section 3: PSB-10** **Installation, Operation, and** **Instruction Manual**

## **Bulk Power Supplies** (All specifications subject to revision.)

## **WARNING**

The fire alarm system employing this power supply must be designed by people trained and competent in the design and layout of fire alarm systems. The system shall be designed and installed in accordance with all local and national codes and ordinances as well as the approval of the Authority Having Jurisdiction. Only trained, qualified and competent individuals should install, program and/or service the POTTER FIRE POWER SUPPLY. Competent people would be aware of these warnings, limitations, and requirements.

High voltage electrocution hazard. Do not handle live AC wiring or work on the device while AC power is active.

This manual is designed to help with the specification, installation, and programming of the POTTER FIRE POWER SUPPLY. It is imperative that this manual be completely read and understood before the installation or programming of the power supply. Save this manual for future reference.

## General Description

The Potter PSB series of Bulk power supplies provides continuous power to devices which require 24VDC power. The PSB supply features an efficient switch mode power supply design which is up to 50% more efficient than linear mode supplies. The PSB is used whenever power is needed to power a device which requires up to 10 amps continuously (PSB-10), which is best accomplished by mounting the PSB near the load being serviced, this minimizes voltage drops caused by long cable lengths. Backup power is provided via batteries which can range in size from 7-55 Ahr (17Ahr in cabinet, larger batteries require accessory battery box). Battery integrity is monitored via the built in charger which features a low battery cut-off circuit to protect against damage to the batteries during deep discharge.

## Product Features

- Input voltage: 120/240VAC 50/60Hz
- Output voltage 27.3VDC @10A
- Supervised Battery Charger: 27.3 @ 1A (supports 7-55 Ahr batteries)
- Integrated battery cut-off circuitry to protect batteries from deep discharge
- Two Common Trouble Relays (5A at 30VDC)
  - General System Trouble (programmable for AC delay via dip-switch)
  - Low AC Trouble
- Diagnostic LED's
  - Status LED's for Active NAC and NAC trouble conditions
  - Status LED's for Earth Fault (Amber), AC (Green), Battery Fault (Amber)
- Trouble Memory feature captures troubles which have previously restored.

## Mounting Instructions

The standard mounting is a surface mount cabinet. The unit must be securely attached to a permanent partition using suitable fasteners. Five mounting holes are provided to accept ¼ inch diameter screws maximum. There are seven knockouts provided.

## Operating Instructions

### *Normal Operation*

The PSB-10 provides constant power to the devices which are connected to it. In the event of a loss of AC the PSB-10 will switch to battery backup and indicate a trouble condition.

### *Trouble Condition*

#### NOTICE

If the trouble memory feature has been enabled the L.E.D. will provide two brief pulses every second to indicate a trouble condition has occurred but is now restored. This can be useful when troubleshooting brief trouble conditions that come and go over a period of time.

### AC:

When the Power supply detects the A.C. power input has fallen below an acceptable level the AC Power L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type and after a programmed delay the Low AC relay will also activate. When the trouble condition has been restored the L.E.D. and trouble relays will return to their normal state. (See notice.)

### Low Battery:

When the Power supply detects the Battery is no longer functioning properly the Low Battery L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

**Ground Fault:**

When the Power supply detects a ground Fault condition which indicates a short between the Power Supply ground and the Earth Ground circuits the Ground Fault L.E.D. will flash at a 50% rate to indicate a trouble condition, the trouble relay will also activate during a trouble condition of this type. When the trouble condition has been restored the L.E.D. and trouble relay will return to their normal state. (See notice.)

*Testing and Maintenance*

System Testing should be performed periodically to insure proper operation. Standby batteries and AC transfer are tested by interrupting the AC power line while an alarm condition exists.

**Battery Maintenance**

The PSB-10 should be tested at least once a year for proper operation as follows:

*Output Voltage Test:* Under normal load conditions, the DC output voltage should be checked for proper voltage level. Refer to the Power Supply Output Specifications Chart).

*Battery Test:* Under normal load conditions, check that the battery is fully charged. Check specific voltage both at the battery terminal and at the board terminals marked [+BAT-] to ensure there is no break in the battery connection wires.

Note: Maximum charging current is 1 amp.

Note: Expected battery life is 5 years; however it is recommended changing batteries in 4 years or less if needed.

**Electrical Operating Characteristics**

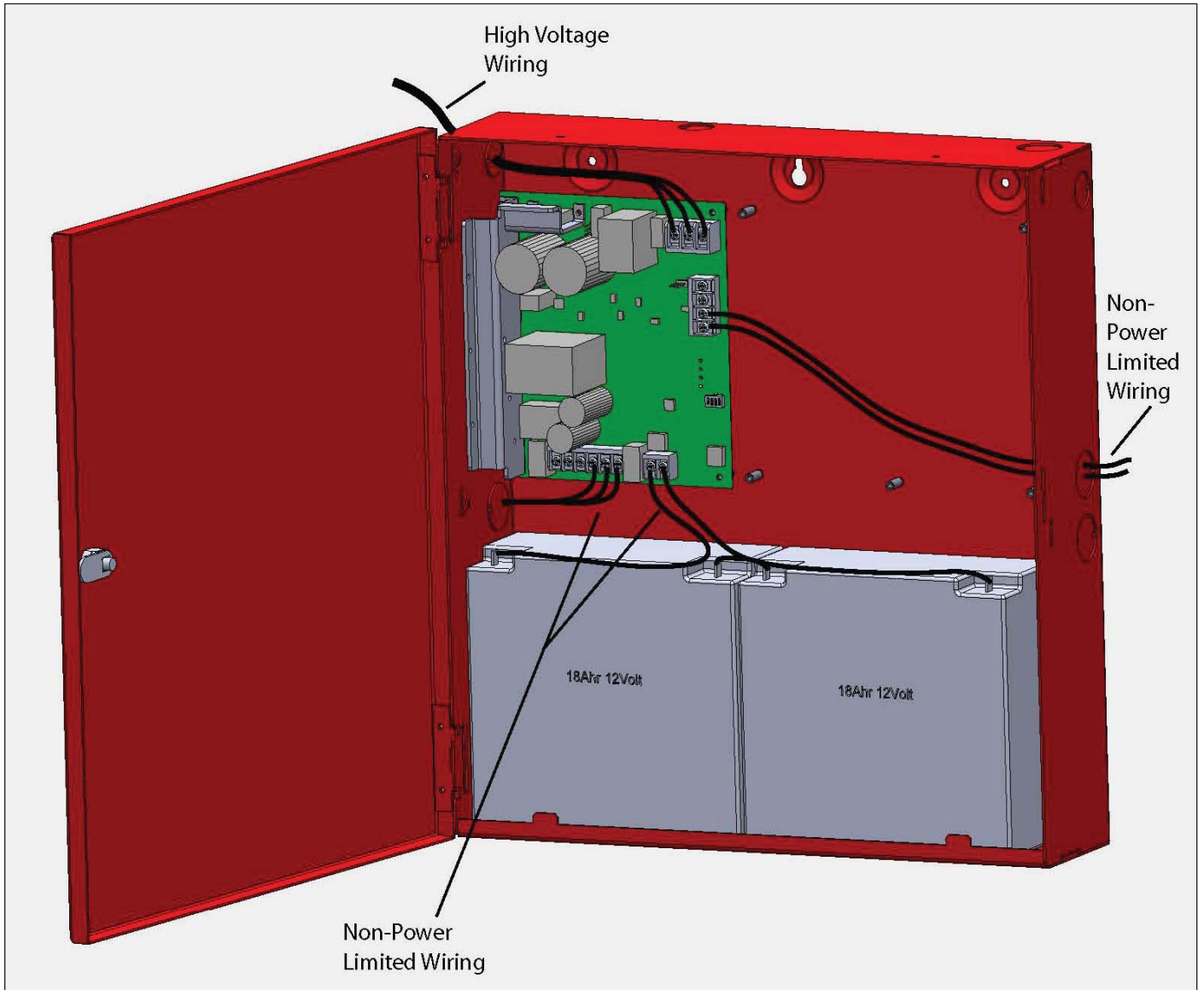
Input Voltage	120 VAC @ 5.1 Amps or 240 VAC @ 2.5 Amps (Jumper selected) 50/60 Hz
Output Voltage	24 VDC @ 10 Amps
Total System Current	PSB-10 = 10 Amps

The system uses a "Sealed Lead Acid" or "Gel-Cell" type of battery with a capacity of from 7 to 55 amp-hours. Fuse must be replaced with same size and rating (8A-250VAC, Time Lag).



### Wire Routing

A minimum of ¼ inch separation must be maintained between Power Limited, Non-Power Limited, and High Voltage wiring. See illustration for suggested wire routing



**Note:** The output of the bulk power supply is not power limited. All field wiring must be a minimum of 18 AWG and installed in conduit. All wiring connections must be made within 20 feet (6.1 meters) of the bulk supply.

## Dip Switch Programming

### **WARNING**

Remove power before servicing or changing DIP switch programming selections

### *Bulk Supply Options*

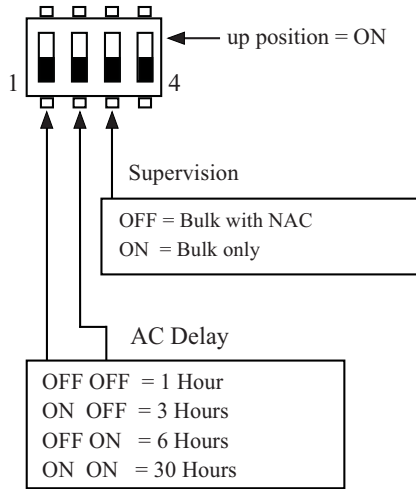
#### AC Report Delay:

Selects number of hours to delay before activating the general trouble relay in response to a low AC condition. Note that the Low AC relay is activated immediately.

#### Supervision:

This should always be in the OFF position to allow supervision of the wiring between the 24 VDC bulk supply board and the NAC control board.

NAC control board global options



DWG# 3590-1

## Indicator LED Behavior

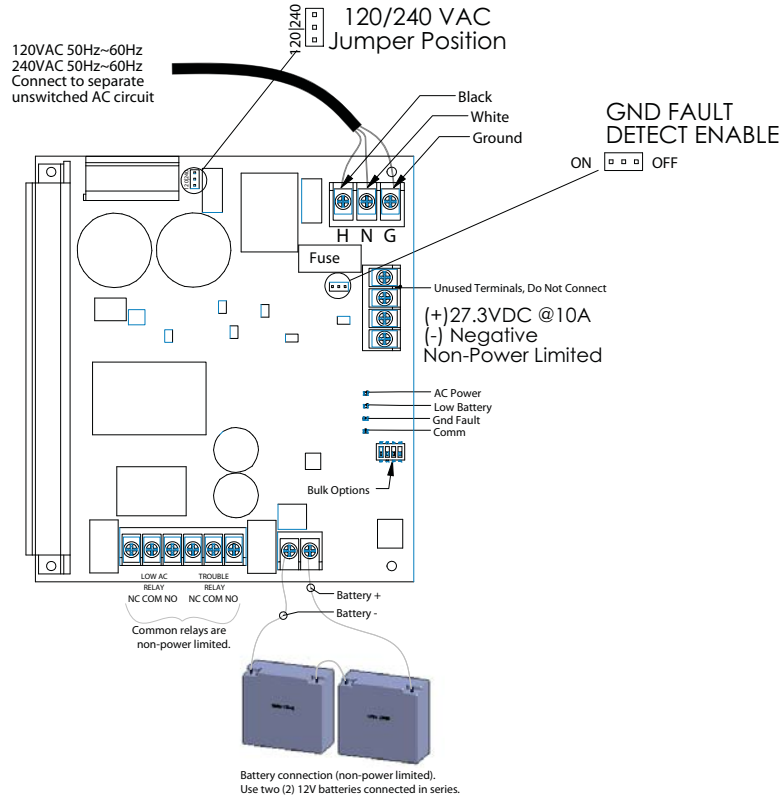
The bulk supply board contains four indicator LEDs:

- AC Power: ON = AC Present, OFF = AC not present).
- Low Battery: Fast Flashing = Low battery condition. ON = Battery Charger Failure
- Earth Ground Fault: Flashing = Earth fault detected.
- Comm: Not Used

- — AC Power
- — Low Battery
- — Gnd Fault
- — Comm

DWG# 3590-18

## Bulk Power Supply



### Primary AC

120VAC 50Hz~60Hz, 5.1AMP  
 Min Low AC Detect 97VAC  
 240VAC 50~60Hz 2.5AMP  
 Min Low AC Detect 190VAC

### Common Relays

3A @ 125VAC (Resistive)  
 3A @ 30VDC (Resistive)

### Battery Charging

27.3VDC @ .75A  
 Low Battery Detect @20.4VDC

### Earth Fault to Any Terminal

0 Ohms

### Output Power

20.4VDC-27.3VDC @10A Non-Power Limited  
 Special Application RSG-DH1224  
 Listed Door Holder

### Fuse Specification

8A-250VAC Time-Lag

### F.C.C.

This device has been verified to comply with FCC Rules Part 15, Class A Operation is subject to the following conditions:

1. This device may not cause radio interference.
2. This device must accept any interference received including any that may cause undesired operation.

### Requirements

System must be fully tested after installation.  
 Intended for indoor use in dry locations only.  
 Separation of power limited wiring from non-power limited wiring must be at least 1/4".

Install in accordance with installation manual Part Number 5403590 Rev A, NFPA 70, and NFPA 72

### Battery Calculation Worksheet

Standby current for both the PSB-10 is 30 milli-amps.

**Secondary Power Supply Requirements Table**

Service Use	Standby Time	
NFPA 72 <ul style="list-style-type: none"> <li>• Central Station (PPU)</li> <li>• Local</li> </ul>	24 hours 24 hours	

**Calculation Table**

1	2	3	4
Module/Device	Quantity	mA Per Unit	Total Current
PSB-10	1	30	30
		Total mA	
		Convert to A	x 0.001
(* Refer to Maximum allowable standby current)		Total A	
		Multiply by hours	x ____
		Total AH	
		Efficiency Factor	÷ 0.85
		Required AH	

Use a battery with a higher AH rating than Required AH

\* Maximum Allowable Standby Current (24-hour standby time)

Battery Size	UL 24-hour	ULC 24-hour
7 AH	.213 Amps	.213 Amps
18 AH	.603 Amps	.603 Amps
33 AH	1.134 Amps	.603 Amps
55 AH	1.913 Amps	.603 Amps



# WARRANTY INFORMATION

The essential purpose of any sale or contract for sale of any of the products listed in the POTTER catalog or price list is the furnishing of that product. It is expressly understood that in furnishing said product, POTTER does not agree to insure the Purchaser against any losses the Purchaser may incur, even if resulting from the malfunction of said product.

POTTER warrants that the equipment herein shall conform to said descriptions as to all affirmation of fact and shall be free from defects of manufacture, labeling and packaging for a period of one (1), one and one half (1.5), three (3), or five (5) year'(s), depending on the product, from the invoice date to the original purchaser, provided that representative samples are returned to POTTER for inspection. The product warranty period is stated on the exterior of the product package. Upon a determination by POTTER that a product is not as warranted, POTTER shall, at its exclusive option, replace or repair said defective product or parts thereof at its own expense except that Purchaser shall pay all shipping, insurance and similar charges incurred in connection with the replacement of the defective product or parts thereof. This Warranty is void in the case of abuse, misuse, abnormal usage, faulty installation or repair by unauthorized persons, or if for any other reason POTTER determines that said product is not operating properly as a result of causes other than defective manufacture, labeling or packaging.

*The Aforesaid Warranty Is Expressly Made In Lieu Of Any Other Warranties, Expressed Or Implied, It Being Understood That All Such Other Warranties, Expressed Or Implied, Including The Warranties Of Merchantability And Fitness For Particular Purpose Are Hereby Expressly Excluded. In No Event Shall Potter Be Liable To Purchaser For Any Direct, Collateral, Incidental Or Consequential Damages In Connection With Purchaser's Use Of Any Of The Products Listed Herein, Or For Any Other Cause Whatsoever Relating To The Said Products. Neither Potter Nor Its Representatives Shall Be Liable To The Purchaser Or Anyone Else For Any Liability, Claim, Loss, Damage Or Expense Of Any Kind, Or Direct Collateral, Incidental Or Consequential Damages Relative To Or Arising From Or Caused Directly Or Indirectly By Said Products Or The Use Thereof Or Any Deficiency, Defect Or Inadequacy Of The Said Products. It Is Expressly Agreed That Purchaser's Exclusive Remedy For Any Cause Of Action Relating To The Purchase And/or Use Of Any Of The Products Listed Herein From Potter Shall Be For Damages, And Potter's Liability For Any And All Losses Or Damages Resulting From Any Cause Whatsoever, Including Negligence, Or Other Fault, Shall In No Event Exceed The Purchase Price Of The Product In Respect To Which The Claim Is Made, Or At The Election Of Potter, The Restoration Or Replacement Or Repair Of Such Product.*

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