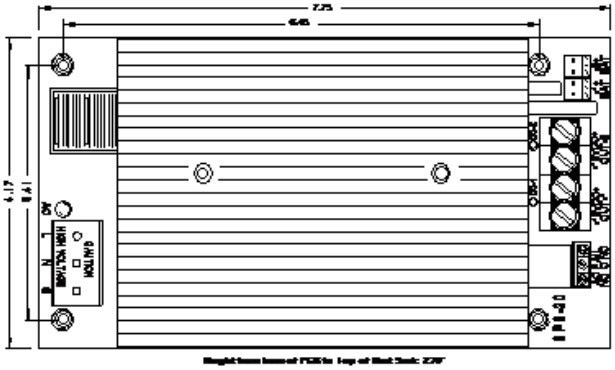
AQM20 Supervised Power Supply/Charger 12vdc 20Amp/24vdc 10Amp

Life Time Warranty – Quality Manufactured in the USA



AQM20 Features:

- **The AQM20 has two 12vdc 8Amp rated Outputs that can be connected in Parallel or Series to provide 12vdc, 24vdc, or 12vdc & 24vdc.**
- **Outputs 1 and 2 are fully isolated, Independent Power Supplies.**
- **Efficient Off-Line Switching Power Supply**
- **Self Contained, No External Transformer required**
- **120/240VAC Selectable AC input**
- **Extraordinary Brown Out Capability**
- **Precise Battery Regulation for Lead Acid Battery(s)**
- **LED's Indicate AC and DC Outputs 1 & 2**
- **Relay Contacts Indicates AC Power Status**
- **Battery Online, No Drop or Switch Over with AC Power Fail**
- **Auto Resetting circuit breaker for battery(s) Over Current Protection with Reverse battery protection**
- **Electronic Power Limited and Short Circuit Protection on each output**
- **Each output has Thermal shut down with auto restart**



Partial list of ordering examples:

AQM20	20A 12/24 Power Supply/ Charger Module mounted in a 14" x 14" metal Enclosure.
-8F	AQM20 with PDB-8F (fuses) Distribution Module
-8C	AQM20 with PDB-8C (circuit breakers) Distribution Module
-16F	AQM20 with two PDB-8F (fuses) Distribution Modules
-16C	AQM20 with two PDB-8C (circuit breakers) Distribution Modules
-8F8R	AQM20 with Smart Fan and PDB-8F8R Supervised Distribution Module (Fuses)
-8C8R	AQM20 with Smart Fan and PDB-8C8R Supervised Distribution Module (circuit breakers)

Description

The AQM20 supervised power supply with battery charger is two high powered, fully isolated, independent power supplies enclosed in one small self contained aluminum package. Each power supply, outputs 1 and 2, are a nominal 12vdc at 10 Amps with 12v lead acid battery charger. These outputs can be used as separate isolated 12vdc power supplies, or they can be connected in parallel or series to provide 12vdc, 24vdc or both 12vdc and 24vdc at the same time. When outputs 1 & 2 are connected in parallel, the output is 13.75vdc at 20 Amps. When outputs 1 & 2 are connected in series, the output is 27.5vdc at 10 Amps. Because each output is independently regulated, you may draw additional current from the 12V output 1,

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while using the 24vdc output at the same time. The 12v current used has to be subtracted from the 10 Amps available on the 24vdc. Figures 1 - 4 illustrate each of these four hookups for the SPS-20. Charging two 12v batteries independently is also a very big benefit for long battery life.

Specifications/Instructions

AC Input: L, N, G - 3P Terminal block

Safety Cover, snap or hinge is provided

L= Line, N= Neutral, and G = Ground

The G terminal must be connected to Earth Ground.

Optional 3 wire line cord P/N: HA-LC3SZIP

AC input/Hz/Watts default 90-132vac/47-63Hz/400w

AC input/Hz/Watts (set 240) .. 133-250vac/47-63Hz/400w

UL evaluated at 60Hz 120/240vac

Caution: Never apply 240vac when AQM20 is set for 120vac this will void warrantee and damage unit.

The AC input default is 120vac. You can cut the PCB trace marked "CUT 240" on the bottom of the PCB under the input inductor above and toward the inside of the AC input terminal block.

AC LED Indicator *(Next to AC Input Terminal Strip)*

The AC indicator is a bi-color green and red led. This led off with AC at the terminals would indicate a blown fuse link. *A blown AC fuse link would indicate catastrophic failure and must me returned to the factory for repair.*

AC Status Output Relay: 3P Terminal block

AC fail "C" contacts 2A/120vac

Three position AC fail terminal block marked "NO, C, NC" are shown in the Normal, energized, AC ON condition.

DC OUTPUTS: 4P Terminal block (2 per output)

Output-1 & 2 continuous rating ..... 12vdc at 8A ea

Output 1 & 2 Typical Output Voltage ..... 13.72vdc ea

Load regulation no load to max ..... .25%Typ

AC Line regulation 85-136vac/170-264vac ..... .03%Typ

Each Output ripple & noise at full load ..... 400mv pp

Current Overload Short Circuit Protection ..... Yes

Thermal runaway Protection ..... Yes

Current Overload and Thermal shutdown will auto-restart without removing load.

Ambient operating temperature range .. -30°F to +130°F

Storage Temperature ..... -60°F to 190°F

Switching Frequency 66KHz

DC LED Indicator *(Adjacent to each output pair)* ..... Red

Battery Standby

Two 12" battery cable assemblies that plug from AQM20 to battery are provided. Red (+) 12vdc, Black (–)Neg.

Optional 36" battery cable (1) P/N: WA-36IBAT

-Battery(s), any type of lead acid 12v 4AH-100AH

Battery(s) recharge1 & 2 ..... 13.72vdc at 2A max

Battery(s) 1 & 2 recharge PTC self resetting 1.04A

Battery(s) 1 & 2 discharge PTC self resetting 8A

Battery)s) 1 & 2 Reverse hookup protection ..... Yes

In standby mode each battery is limited to 8 Amps of continuous current. When both outputs are connected in parallel, and standby current will be greater than 8 Amps, you must use 2 batteries connecting one to battery 1 and one to battery 2. *Paralleling (2) battery cables to (1) battery will not double the current*.

Review application note 3, Battery Standby table to calculate battery size.

To estimate the recharge time in hours for depleted battery(s), multiply the AH rating times 1.2. (AH x 1.2). As an example, 2 12v 10AH batteries would take about 12 hours to re-charge.

Physical

AQM20 Module Dimensions .. 7.75"L x 4.17"W x 3.23"H

Height includes 7/16" standoffs

Mounting Holes Center to Center ..... 6.45"W x 3.41"H

AQM20 module only Weight ..... 2.4lbs.

AQM20 (in Large enclosure) ..... 14" x 14" x 4.75"

AQM20Weight with enclosure 11.4lbs

Approvals

AQM20 meets requirements of . UL1950 3rd & EN60950

AQM20 is UL R/C UL603, UL294

Output Terminal Block Configurations

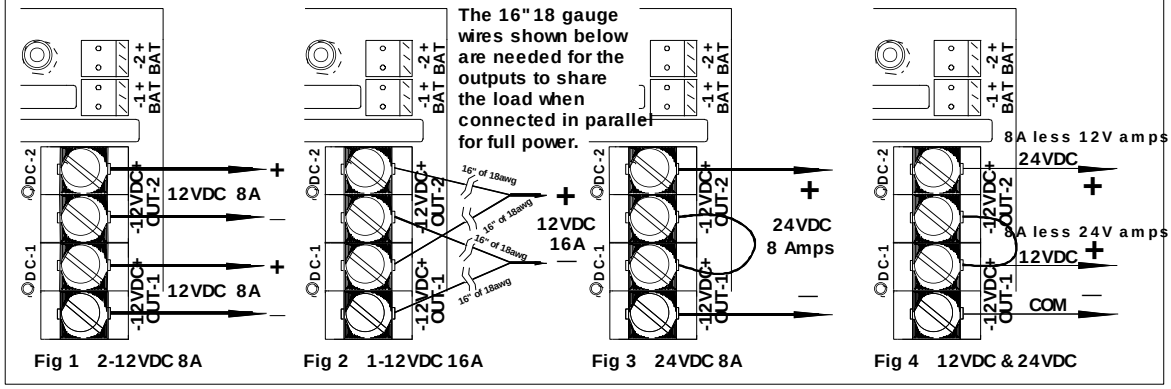


Fig 1 2-12VDC 8A Fig 2 1-12VDC 16A Fig 3 24VDC 8A Fig 4 12VDC & 24VDC

Maintenance

The power supply and stand by battery(s) should be tested at least once a year as follows:

1. Check LED's for normal state. AC ON Green, DC #1 ON Red, and DC #2 ON Red.
2. Check output voltage with normal load. DC Output #1 and DC Output #2 should read between 13.60 and 13.80vdc.
3. Disconnect AC input. AC LED should be off, DC Output LED's #1 and #2 should be ON.
4. Check DC Outputs #1 and #2 to be above 12.0vdc. This checks standby batteries to be operational. Sealed lead acid batteries have a typical life of 3 to 5 years.
5. Re Apply AC and verify AC LED ON.

Battery Selection

The table below shows typical standby time in hours for various loads and batteries. The table works for either 12vdc or 24vdc. The AQM20 was evaluated at UL with a 7AH sealed lead acid battery with a 1 hour stand by.

Approximate Battery Standby Time Table with a reserve of 3 Amps for 5 minutes for Alarm

Total Output Amps	4Ah Battery Standby	7Ah Battery Standby	12Ah Battery Standby	24Ah Standby	40Ah Standby
.5A	5.5 Hrs	12 Hrs	20 Hrs	40 Hrs	65 Hrs
1A	2.5 Hrs	5 Hrs	9 Hrs	19 Hrs	32 Hrs
1.3A	2 Hrs	4 Hrs	7.2 Hrs	15.5 Hrs	24 Hrs
2A	1 Hrs	2 Hrs	5 Hrs	10 Hrs	15 Hrs
3A	.5 Hrs	1 Hrs	3 Hrs	6 Hrs	9.5 Hrs
4A	.5 Hrs	.8 Hrs	2 Hrs	4 Hrs	8 Hrs
5A	NA	.6 Hrs	1.4 Hrs	3 Hrs	7 Hrs
6A	NA	.4 Hrs	1 Hrs	2 Hrs	4 Hrs

The recharge table below gives approximate recharge times for different loads and battery sizes. The table is based on batteries depleted to battery cut-off and recharged back to approximately 90% capacity.

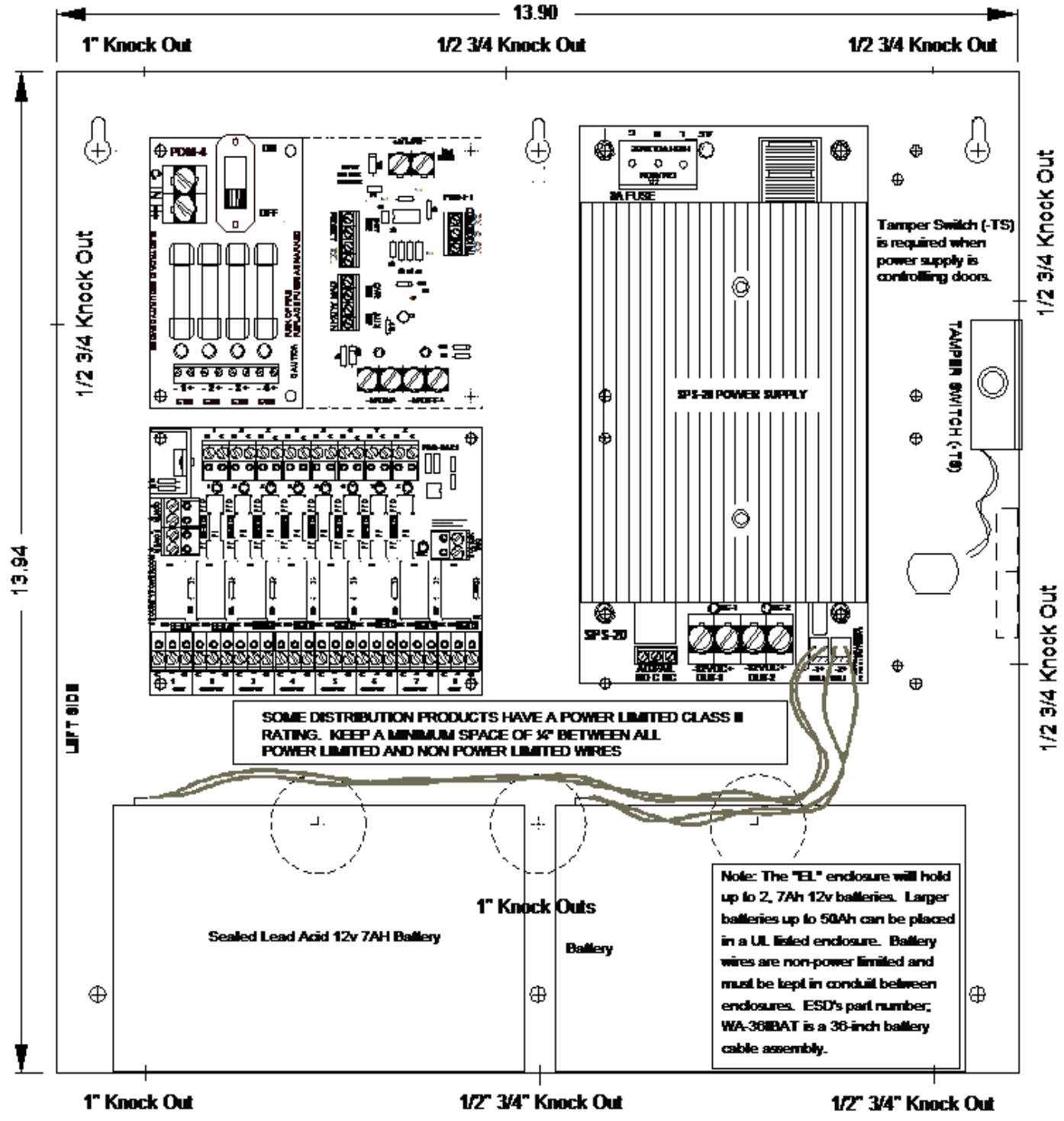
Ordering Guide with fuse sizes

Part Number	Description
AQM20	AQM20 Power Supply Charger Module Mounted in a 14" x 14" x 4.75" Enclosure
AQM20-8F	AQM20 with PDB-8F (fuses) Distribution Module
AQM20-8C	AQM20 with PDB-8C (circuit breakers) Distribution Module
AQM20-16F	AQM20 with two PDB-8F (fuses) Distribution Modules
AQM20-16C	AQM20 with two PDB-8C (circuit breakers) Distribution Modules
AQM20-8F8R	AQM20 with Smart Fan and PDB-8F8R Supervised Distribution Module (Fuses)

CAUTION Reduce the risk of fire replace fuses as marked

Note: Keep a minimum space of ¼" between Power Limited Outputs and non Power Limited wiring

AQM20 Series Power Supplies



Due to the variations with AQM20, the power supplies are not pre-wired to the accessories.

PDB-8C / PDB-8F
Multi Output
Low Voltage Power Distribution Modules
Life Time Warranty

PDB-8F
PDB-8C

c UL LISTED

UL 294 – Access Control System Unit
UL 603 – Power Supplies for Use with Burglar-Alarm Systems
ULC S318-96 – Power supplies for Burglar Alarm Systems
ULC S533-02 – Standard for Egress Door Securing and Releasing Devices

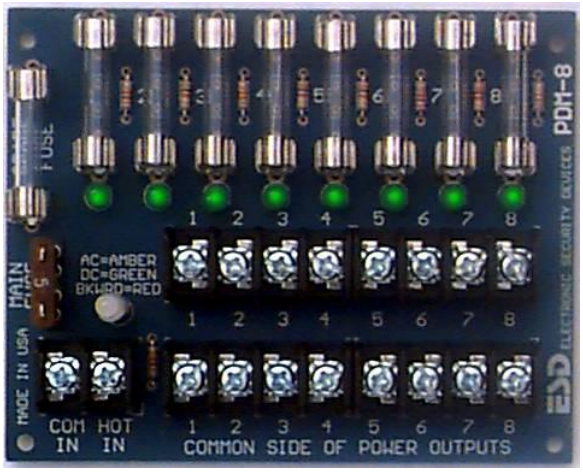
Features/Specifications:

- Converts a single AC or DC (12 or 24v) Input to 8 or 16 protected outputs with fuses or circuit breakers
- 1500 Watt surge protection on PDB-8F Input rated 22 Amps @ 32 volts AC or DC
- All PTC circuit breaker ratings are holding current at 130^{o}F per UL Standards
- Main Power Green/Red LED Indicates AC, DC or Reversed DC Input on PDB-8 and PDB-9
- Each output has a green status LED indictor
- Current Draw is 6ma max per LED
- Main Fuse / Power Pull is standard ATO Automotive size on PDB-8
- ON / OFF Power Switch on PDB-4F
- Circuit Breaker Models with Rated Output 1.42 Amps or below are Power Limited
- PDB-8F & PDB-8C are c UL us LISTED As configured in UL listed products.
- PDF-8F, & PDB-8C are UL listed Sub Assemblies As configured in UL listed products
  suitable for Access Control and Burglar alarm systems
- All Input Terminal blocks and output terminal blocks on the PDB-8F module are rated 40A with a wire range of 10 – 18AWG
- Size: PDB-8F 3.87”H x 4.84”W x 1”D Mounting: 3.41”H x 4.49”W
  Quality Manufactured in the USA

RoHS COMPLIANT

Custom Order details NOT UL LISTED

PDB-8F-MMM-FFF	8 Fused Outputs with ATO Main/power pull fuse, status LED’s and 1500 watt surge protector.
PDB-8C-MMM-CCC	8 PTC Circuit Breaker Outputs with ATO Main/power pull fuse, status LED’s and 1500 watt surge protector.
FFF Fuse Options	FFF = Fuse Rating in Amps (x.xx) standard 3agc Size: (050 = 500ma); (100 = 1A); (200 = 2A); (300 = 3A); (400 = 4A); (500 = 5A)
CCC Circuit Breaker options	CCC = PTC part number equaling the holding current in Amps at UL rating 50C: (090 = .7A); (135 = 1.04A); (160 = 1.23A); (185 = 1.42A); (250 = 1.93A); (400 = 3.08A); (500 = 3.85A); (600 = 4.62A)
MMM Main Fuse options	MMM = Main Fuse Rating in Amps (xx.x) – Standard Automotive ATO Size: (050 = 5A); (075 = 7.5A); (100 = 10A); (150 = 15A); (200 = 20A); (250 = 25A)



Specifications

Input Voltage ..... 10.5 to 12.4vdc or 22.7 to 25.2vdc
Output Voltage ..... virtually the same as Input
Current, Typical, with No Output Load 90-160mA
Outputs 1–8 continuous duty each ..... 1.23 Amps
Voltage Trigger ..... 20% < Input min. 30vdc max.
Voltage Trigger isolation ..... Optical
EOL (End of Line) Trigger ..... Trip +-50% of 2.2K Ω
Transfer Relay Contacts 15Amps
Trouble Form C Contacts 2A 120vac/1A 220vac
Triggered Form C Contacts 2A 120vac/1A 220vac

UL Approvals

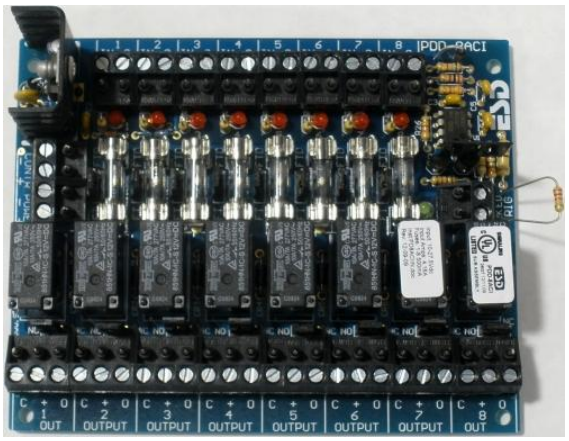
UL 294 – Access Control System Unit
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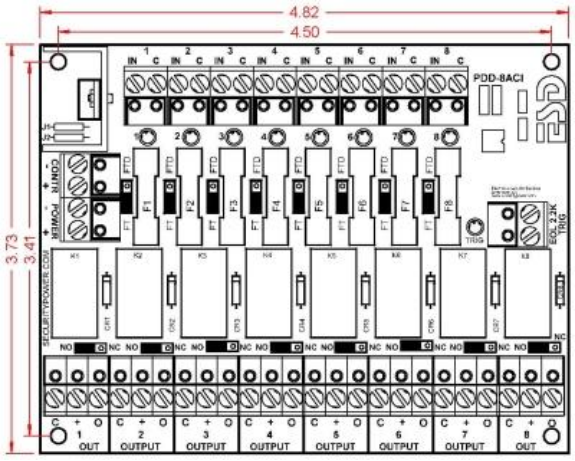
PDB-8F8R Power Distribution for Access Control with Fire Interface module

Controls and Distributes Power with 8 Control Relays with an EOL Fire trigger Interface

Power Interface for Access Control, CCTV, Fire, HVAC, Elevator, and general low voltage system control

Note: Fire, HVAC and Elevator Control has not been evaluated by UL





- **Features:**
- **8 Heavy duty Relays with individual Inputs and Status LED's**
- **Each Relay Input can be Activated from Low Current Open Collector, Normally Closed or Normally Open Switch**
- **EOL End of Line Resistor Fire Interface Master Trigger de-energizes all Output Relays that are Enabled**
- **Universal 11 – 27.5Vdc power input**
- **Available with Fuses or PTC Circuit Breakers**
  Note: Only the 500mA fuse version of the board has been evaluated by UL
  Note: The outputs of the PDB-8F8Rare power limited when connected to the AQD3 power-Limited power supply
- **Each Output may be Individually Configured for:**
  - **Fire Trigger (FT) Enabled or (FTD) Disabled**
  - **FUSE model can provide optional Dry Contacts**
  - **N/O or N/C Option Configures the Relay Switched Output**
- **Each Output 1-8 has a protected, continuous Output and a Relay controlled Output**
- **TRG LED Green Indicates Trigger Status**
- **Control Power and Main Lock Power may be Isolated (Separate Power Supplies) at Users Option**
  Note: Dual/separate power source configuration has not been evaluated by UL and cannot be configured for UL Listed products
- **All Terminal Blocks are Pluggable by Channel & Function**
- **Made in the USA with a Lifetime Warranty**

Description / Instructions

The PDB-8F8Ris a versatile, compact way to distribute and control power for Access Control Systems with Fire Alarm Interface. The PDB-8F8Ris an 8 position power distribution board with individual Relays with input (IN) control for each output (OUT). An EOL resistor trigger input (TRIG), will force all output relays to de-energize that are selected (FT). In a typical installation, the TRIG would be connected to a Fire Alarm panel via a set of contacts. When the Fire Alarm trips, all enabled relays would be forced to be de-energized to unlock electric doors, shut down air systems, and or return elevators to ground floor.

Input / Output Terminals, Jumpers and LED Details and Specifications

Control Power (- CONTR +) Two position un-pluggable terminal block is used to power the coils of the relays. The control voltage must be between 11 and 27.5 Vdc. Each relay energized will draw 20ma of current. By default, Control Power and Main Power are connected together with jumpers J1 & J2 so no connection would be made here unless you were using Dual/separate power as described below. Note Dual/separate power source configuration has not been evaluated by UL and cannot be configured for UL Listed products.

Main Power (- POWER +) Two position un-pluggable terminal block provides the power to the outputs to be distributed and power to Control through J1 & J2. In a normal application the Power must be between 11 and 27.5 Vdc and would be connected here.

Dual/Separate Power J1 & J2 Jumpers Note Dual/separate power source configuration has not been evaluated by UL and cannot be configured for UL Listed products. J1 Connects (-) Power to (-) Control, J2 Connects (+) Power to (+) Control. By default J1 & J2 are

connected together. When J1 & J2 are cut, you must supply 11 to 27.5Vdc to Control power, then you may connect any voltage to 32V AC or DC to the Main Power Terminals. See Dual/Separate Power application figure below.

Inputs (1-8 IN C) Eight, two position un-pluggable terminal blocks. When IN & C are shorted together, the like number output relay will energize. Each relay can also be energized by an open collector that is common to the control power, sinking 20ma for each input. Each of the C's (common) are connected to control negative power.

Input LED's (1-8) Whenever an input is active (relay energized) the associated input red LED will illuminate.

FDT/FT (1-8) Jumpers - These are three pin headers adjacent to each fuse with a shunt with handle that shorts the center pin to FTD or FT.

FTD = Fire Trigger Disabled - When selected, the Trigger will not effect that output.

FT = Fire Trigger – When selected Triggering will force that Input Relay to De-Energize.

Dry/Wet Option (1-8 Fuse Models) Through a Fuse, the (+ Power) is connected to the swing arm of each Relay to distribute power to its output. Removing the Fuse, removes the power from the relay. The (+) now becomes the Common Swing Arm and the "O" is the N/O or N/C contact as selected with jumper.

Outputs (1-8 OUTPUT C, +, O) Eight, Three position un-pluggable terminal blocks. "C" is Power Common and is connected to (- power). "+" is connected to fused (+power) and the relay swing arm. "O" is the relay switched output as selected with N/O or N/C selector jumper

Output Relay Contacts Selector (1-8 NC/NO) Jumpers These 3 pin headers with shunt selectors are located just above each output which selects whether the N/C or N/O contacts are connected to the "O" switched output terminal. With N/C selected, output would be normally ON, or connected to swing arm. With N/O selected, output would turn ON, or close when input is activated. **Fire Alarm Interface Trigger (2.2K EOL TRIG)** Two position un-pluggable terminal block. This input must see the 2.2K ohm EOL (End Of Line) resistor to be in the normal condition. The EOL is to be placed in a Listed fire alarm panel. See Fig 1 illustrating that shorting or opening the EOL will cause the PDB-8F8R to trigger.

TRIG LED (TRIG) Green LED normally ON. Whenever the Trigger is active the LED will be OFF.

Ordering Information

PDB-8F8R "ACI" module only with 500ma Fuses Note: Only the 500ma fuse version of the board has been evaluated by UL No other fuse size or PTC's can be used with a AQD3 .

Specifications

Control (-contr+) ..... 11–27.5Vdc @ 160mA

Normally no connection is made here. Note: You must add this current to your total device load calculations to be sure your load will be within the rating of the power supply as configured

Main Power (-power+) 11-27.5Vdc

Note: Must cut J1 & J2 when not using 11-27Vdc power See Dual/Separate power source configuration Note Dual/separate power source configuration has not been evaluated by UL and cannot be configured for UL Listed products.

Total Amps would be equal to the total current of the outputs load plus the module draw of 160ma

Fused/Wet Outputs (12v operation):
Max. Output Current..... 330mA,12V (each output)
2.64 A (total all outputs)

Fused/Wet Outputs (24V (each output):
Max. Output Current ..... 155mA, 24V (each output):
1.24 A (total all outputs)

Dry Outputs:
Max. Output Current 3A, 30V

As evaluated with UL with 500ma fuses

Terminal blocks un-pluggable ... 5mm spacing 14–22 awg

Fused Outputs 1-8 ..... 500mA

Littlefuse P/N 217.500 20mm replacement

The fused outputs of the PDB-8F8Rare power limited when connected to the AQD3 power-Limited power supply

Output Relays 1-8 Dry Contacts are not to exceed ..... 7A or 100VA

Trigger Input ..... 2.2K EOL

Operating Temperature ..... 0^{o} to $+49^{o}$C

Mounting Holes ..... (4) 3.4" x 4.5"

Module Size: ..... 4.82"w x 3.84h x 1.4"d

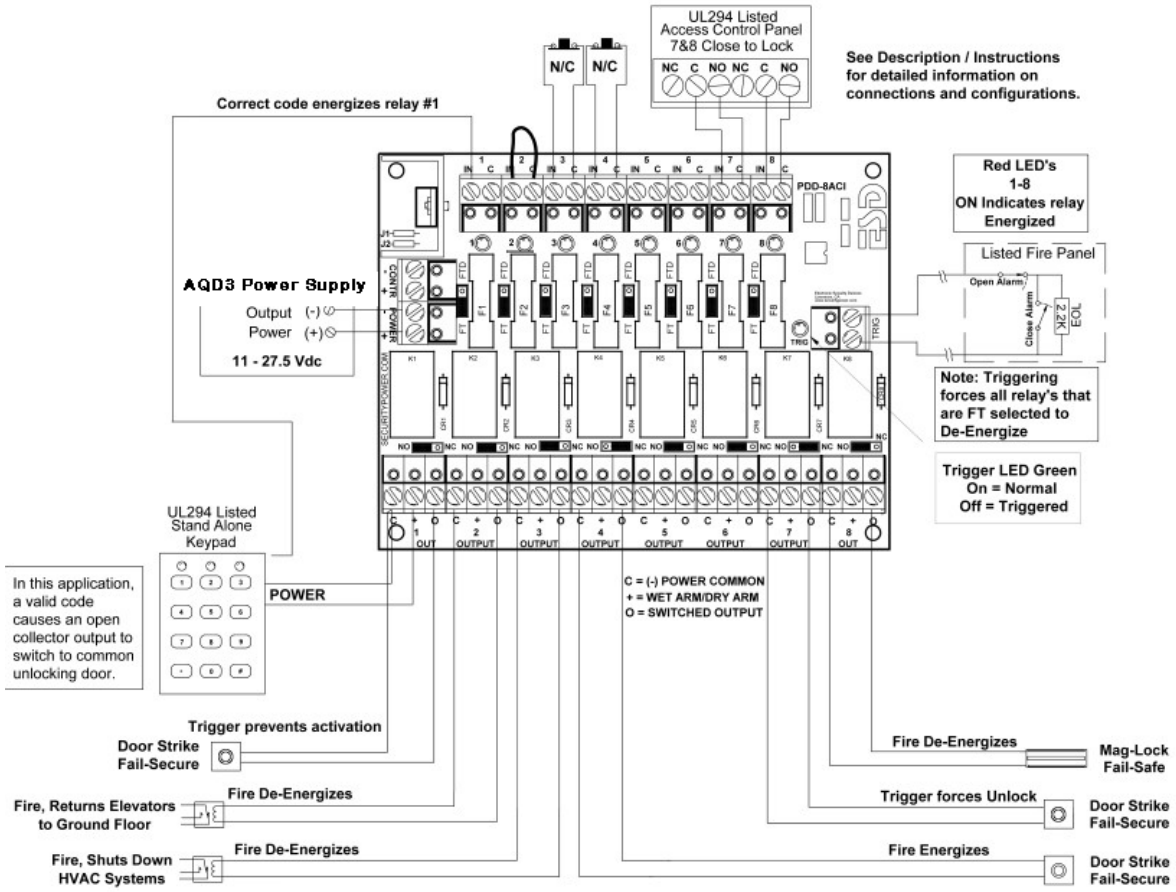
Weight: 8oz

Mounting Note: Secure 4, #6-32 female/female hex standoffs 7/16" long onto 4, #6-32 studs provided in distribution option space to the right of AQD3 inside E-1485 cabinet back. Place PDB-8F8Ron stand offs with input terminals on top. Secure module with 4, #6-32 x ¼" pan head screws. No metal hardware should be larger than .28" in Diameter.

Note: All interconnected devices must be UL Listed.

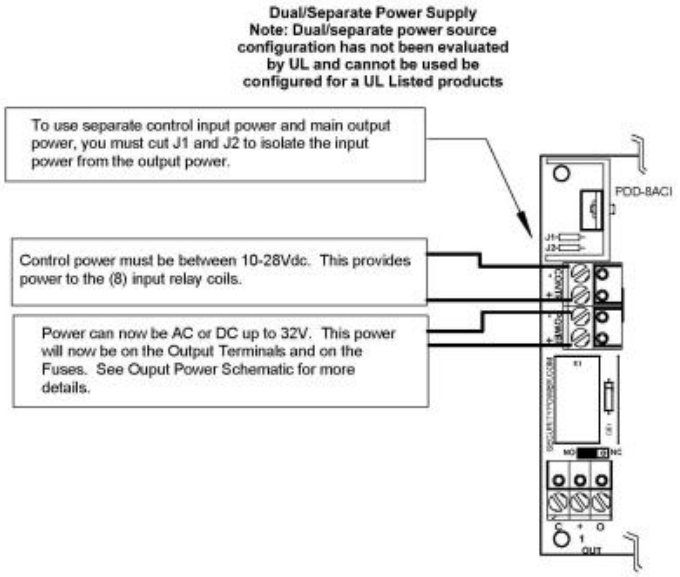
UL Approvals for PDB-8F8R
UL 294 Access Control System Unit

PDB-8F8R Typical Applications
Single Power Source Application Fig 1



Single Power Source Application Fig 1

Dual/Separate Power Supplies Fig 3



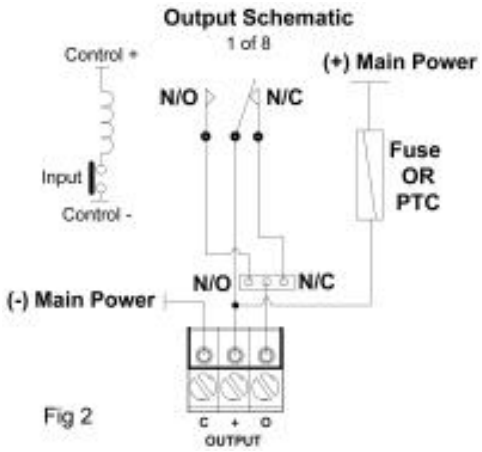


Fig 2