



Powerwerx, Inc.

263 N Berry St, Brea, CA 92821 • 714-674-0073 Phone • 714-674-4949 Fax

PO3

The APO3 is a black box designed to prevent a vehicle battery from being discharged and damaged by a DC load. Typically it is used to switch a radio transceiver off 10 minutes after the vehicle is shut off.

The APO3 is designed for 12 volt vehicle electrical systems with negative ground. It can switch up to 20 amps and carry up to 30 amps. The shutdown voltage can be set to one of four preprogrammed voltages (11.8, 12.1, 12.7, 13.05 volts) using two DIP switches and the shutdown delay can be set to one of four preprogrammed times (0, 5, 10, 20 minutes). The device is housed in a sturdy ABS plastic case.

Installation with Powerpoles

If you have an APO3 with Anderson Power Pole connectors, the installation is as easy as connecting the APO3 in series with your load. Make sure to match the red and black connectors correctly. The APO3 is not a sealed unit and should be installed inside the passenger compartment.

Operation

The APO3 is basically a voltage controlled switch. When the vehicle voltage is higher than the APO3 set point, the relay is turned on and power is provided to the load side. When the voltage drops below the APO3 voltage set point and stays there for longer than the time set point, the APO3 relay turns off and power is removed from the load side.

The voltage and time set points are adjustable using miniature slide switches inside the APO3 case. To access those switches, the power should be removed from the APO3 and the four black screws removed. The switch settings are printed on the bottom of the circuit board.

The yellow LED indicates the APO3 status. When power is first applied to the APO3, the LED will flash 10 times in four seconds. After flashing, the APO3 begins normal operation. The override is on when the front switch is nearest to the case edge. In override mode, the APO3 will always apply power to the load.

When the override switch is off, the LED will be lit when the voltage is below the set point and the shutdown count is in progress. The LED will turn off after the load has been disconnected (see Fig. 1 on reverse side).

Specifications

Operation:

- Voltage set points: 11.8, 12.1, 12.7, 13.05 volts DC.
- Time delays: 0, 5, 10, 20 minutes

Selectable by DIP switches

Physical dimensions and materials:

- Weight: 159g (5.6 oz) with wire leads
- Weight: 164g (5.8 oz) with Anderson Power Poles
- Overall Dimensions: 121mm wide, 84mm long, 34mm deep (4.75 x 3.3 x 1.35 in)
- Case Material: Flame retardant ABS plastic; UL's best flame rating of 9405VA (case only)
- RoHS compliant, no lead used in manufacturing

Power:

- 7 to 20 volt DC
- 1.85 mA @ 13.8 volts with relay off, LED off
- 90.5 mA @ 13.8 volts with relay on, LED off

Warranty:

Powerwerx, Inc. support policy is simple; we want you to be happy! If you have a problem, please feel free to contact us and we will do our best to get you up and running as soon as possible.

The APO3 has a one-year limited warranty. We will repair or replace your APO3 if you encounter any problems within one year of purchase. We reserve the right to charge a reasonable fee for repairing units with user-inflicted damage. It is your responsibility to ship the defective unit back to APRS World, LLC. We will pay for shipping the replacement to you. We reserve the right to upgrade your equipment to an equivalent or better model.

APO3 Voltage vs. Time

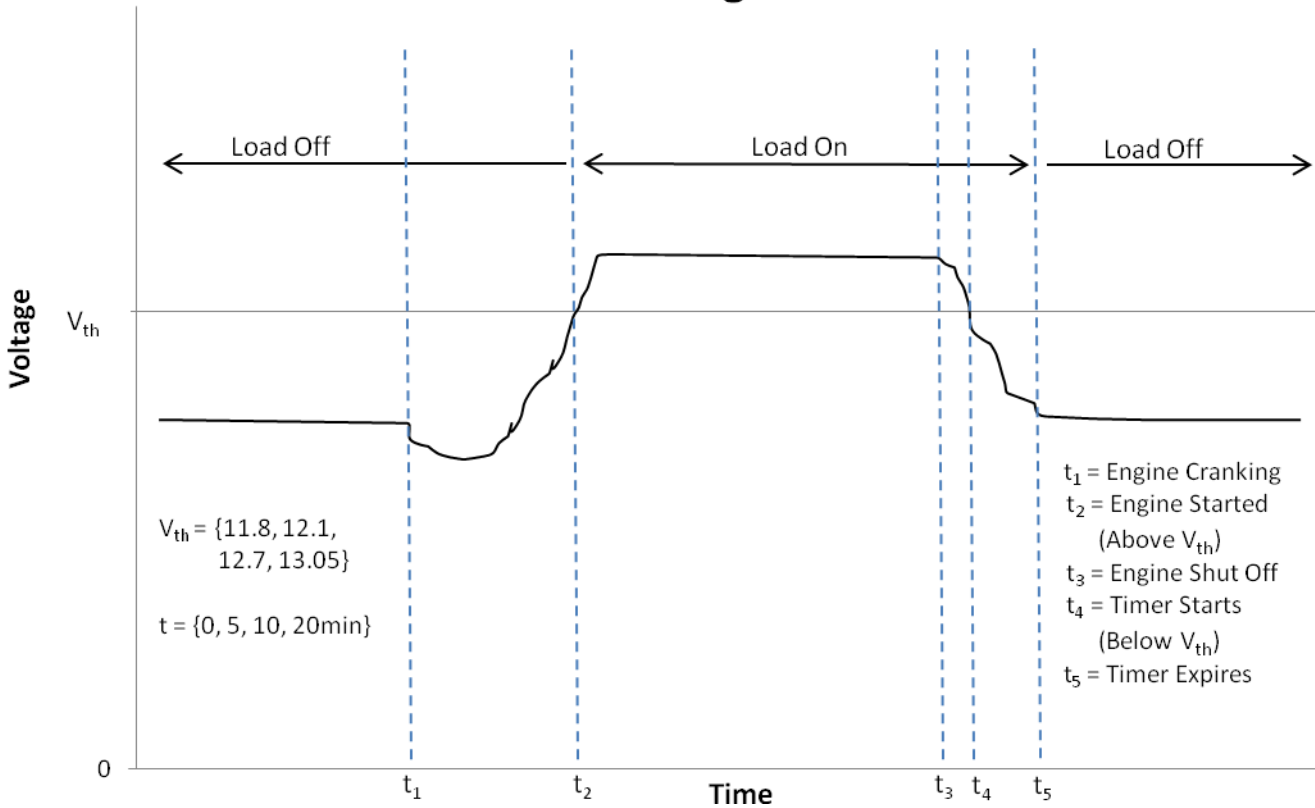


Figure 1: APO3 voltage vs. time. Once vehicle voltage crosses the APO3 threshold voltage (V_{th}), power is provided and the load is on. After the vehicle voltage drops below the threshold voltage and remains there for longer than the time set point, the APO3 relay expires and the load is turned off.

t_1 = Engine Cranking

t_2 = Engine Started

(Above V_{th})

t_3 = Engine Shut Off

t_4 = Timer Starts

(Below V_{th})

t_5 = Timer Expires

$V_{th} = \{11.8, 12.1, 12.7, 13.05\}$

$t = \{0, 5, 10, 20\text{min}\}$

Voltage Threshold		
SW1.1	SW1.2	Volts
Off	Off	11.8
Off	On	12.1
On	Off	12.7
On	On	13.05 (Default)

Shutdown Delay		
SW1.3	SW1.4	Minutes
Off	Off	0
Off	On	5
On	Off	10 (Default)
On	On	20