

Technical Bulletin: 3107

## Which Type of Power Supply Should You Use? Switching, Linear or Hybrid?

One of the most common troubleshooting calls customer service representatives receive is about intermittent or failed power supply operation. As it turns out, most of these are due to the incorrect choice of power supply technology used for electric lock operation.

When it is time to specify a power supply for use with an electric lock, the question of what type of power supply must be considered. The proper choice will often determine the success or failure of the installation.

### **SWITCHING:**

Switching Power Supplies are typically used for resistive or capacitive loads (alarm panels, cameras, etc.). They are lighter in weight, efficient (less heat generated) and are cheaper to manufacture.

*SDC does not recommend this type of power supply for several reasons. Standard switching power supplies handle inductive loads (locking devices with coils or solenoids) poorly because of the limited current reserve available to handle periods of high inrush. Excessive current draw (even for a short period of time) will briefly stop a switching supply from operating and may even permanently damage it.*

Another byproduct of the switching power supply is a high frequency noise component that appears in the DC voltage output. A properly designed supply includes a filter circuit to reduce or eliminate this noise. Some manufacturers do not include good output filtering in their power supplies due to cost constraints. The filter part of the supply can cost as much as the regulator circuit so a good high frequency filter is often left out. Although the noise will not harm a simple device like an electric strike, the noise may cause erratic operation of electronic equipment such as access controls, electronically controlled locks, panic bars and door controllers causing them to malfunction and may even damage these units.

These "low cost" switching supplies often require that you supply your own power transformer and assemble these two components in your own box. The result will be a NON UL listed power supply allowing an opportunity for local inspectors to not approve an installation.

### **LINEAR:**

Linear Power supplies have been used for years for powering resistive, capacitive and inductive loads (devices with coils or solenoids, such as electromechanical and electromagnetic locks and strikes) because of their ability to handle large inrush currents. Since most of the DC filtering is done with large filter capacitors, there is plenty of reserve power and can provide extra current for short periods of time without damage to the power supply. The output is also free of high frequency noise. *The penalty in using a linear power supply is the heat generated by the regulator component of the supply due to its moderate efficiency. The heat generated can lead to early failure of the temperature sensitive components housed near to the supply board.*

### **HYBRID:**

SDC access control power supplies are Hybrid Switching Power Supplies and are ideal for powering resistive, capacitive and inductive loads. They combine the efficiency of a switching supply and the ruggedness of a linear supply. Extra filtering is added to the output stage of the SDC 600 series power supplies to provide clean noise free power and enough current reserve is available to reliably power inductive loads. Built in inductive kickback protection is also provided to allow for the powering of bare coils (such as electric strikes or some non-SDC bolt locks) without damage to the supply. This type of power supply is a good overall choice for most installations.

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