

# TOP 10 QUESTIONS ON ELECTRIC STRIKES

**S**ince the beginning of electronic access control, electric strikes have dominated the function of unlocking doors. They by far out-sell any other type of electric lock in the market place. With their popularity there are still many questions about operation, application and function. Our goal in this article is to let you know what questions as a wholesaler we usually ask our customers about electric strikes and the reasons behind them.

## Question 10

The last but usually the most important question is:  
**What function are you trying to achieve with this lock?**

Is the lock going to be controlled by card access, pushbutton, keyless entry, phone actuated, fire alarm unlock, etc., or just a simple pushbutton actuated by a secretary to let someone in the front door? It is possible that an electric strike may not fill the need of your application and that an alternate mean of electrically locking or unlocking the door(s) is necessary. This alternate mean may be an electromagnetic lock, electric deadbolt, electrified exit device or exit alarm.

## Question 9

**What is the door and frame like?**

This is a very broad question because of the many different openings in existence. The most common openings fall into three categories: tubular aluminum, steel hollow metal and wood. All can pose their own certain installation problems.

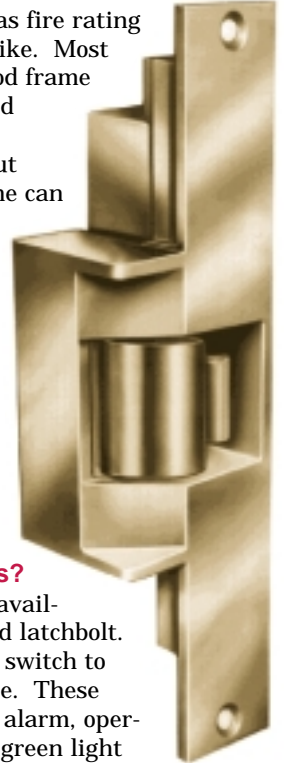
**Aluminum frames** may not be deep enough to accept an electric strike, especially if there is a glass side lite (window) next to the door. The normal frame depth is usually 1¼" to 2" - but many times glass protrudes into the aluminum frame thus decreasing the depth needed to install an electric strike. On pairs of doors, if you choose to mount an electric strike in the inactive leaf, you should pay particular attention to the style width of the door because this is where the strike will mount and it may be too shallow. With pairs of doors you need to make sure that the inactive leaf is properly locked by flush or surface bolts or by a vertical rod exit device.

**Hollow metal doors and frames** have some interesting installation problems also. Many of the frames are filled with cement or plaster making the installation a real chore. The best way we've seen to "cut in" a strike in this application is with the use of an industrial die grinder with a "cut off" wheel. This tool will cut through the metal and the masonry behind it. Then all you need is a chisel or cement drill to clear out the channel. Most hollow metal doors are prepped for the ANSI cutout which usually incorporates a dust box behind the cutout that interferes with all installations. With hollow metal doors you should be concerned about using fire rated components to meet UL and FM requirements. **Note:** If you make modifications to "fire rated" doors and frames it usually will void the UL or FM label. Also, modifications on products being applied may have to be approved by the "authority having jurisdiction" (Fire Marshall).

Occasionally you'll encounter odd frame conditions and other problems such as; an extended lip for use on a center pivoted door, milled ramps for a deadlocking rim exit device, a thin faceplate for use when a rim exit device is very close to the frame, etc. If you have a door where the frame or door itself is something out of the ordinary, you may have to send details to the manufacturer to see if they have or can make an electric strike that will work properly.

**Wood doors** pose problems as well as fire rating problems when choosing an electric strike. Most strikes will have to be designed for wood frame use in order to be installed properly and securely.

Strike installations may look good but removing too much wood from the frame can cause the door to get very weak. It's very easy to kick in a door prepared this way so you should consider some type of anchor method to secure the electric strike into the wall or studs behind the wooden frame. Normally a good electric drill or router and a sharp set of chisels is all you'll need to prepare a wood frame for most electric strikes.



## Question 8

**Do you need any monitoring options?**

Many electric strikes have switches available to monitor the locking solenoid and latchbolt. These can be used with a door position switch to indicate that a door is closed and secure. These switches can also be used to trigger an alarm, operate an automatic door or light a red or green light to show "door locked."

Folger Adam  
310-2 3/4

**Switches available for electric strikes:**

- Latchbolt Monitor Switch. This tells you when the latch bolt is projected into the strike pocket.
- Lock Status Monitor Switch. This tells you that the locking mechanism in the electric strike is locked and the door will not open.
- Door Position Monitor Switch. This is a switch that indicates if the door is in the open or closed position.
- Deadbolt Position Switch. This is available only on electric strikes that accommodate a deadbolt. It tells if the deadbolt is projected in the strike deadbolt pocket.

You can use one or any combination of these switches to help coordinate use with different types of applications. Automatic doors will benefit from the Lock Status Monitor Switch by letting the operator know that the electric strike is unlocked and it is OK to open the door. Security systems can use the Latchbolt Monitor and the Lock Status Monitor Switches in addition to a Door Position Monitor Switch to indicate whether the door is locked, closed and the latchbolt is in the pocket of the strike, thus showing that the door is secure. Jail applications can use these switches to control interlocked doors so that when one door is open, the other door cannot be unlocked until the other door is closed. There are many applications for these switches and with a little practice and experience you can provide many new forms of security concepts.

## Question 7

### Do you need any other options?

Most electric strikes can be made to accommodate odd frame conditions and other problems; an extended lip for use on a center pivoted door, milled ramps for a deadlocking rim exit device, a thin faceplate for use when a rim exit device is very close to the frame, etc. If you have a door where the frame or door itself is something out of the ordinary, you may have to send details to the manufacturer to see if they have or can make an electric strike that will work properly.



**HES 5000  
Electric Strike**

## Question 6

### What type of lock or hardware is on the door?

Each type of lock has different advantages or disadvantages when trying to apply an electric strike. There are cylindrical, mortise, unit and rim type locks. Rim, mortise, surface and concealed vertical rod devices, latch locks, maximum security deadbolts, tubular deadbolts, rim deadbolts, automatic and flush bolts, astragals, coordinators, etc. On any job you may be asked to supply an electric strike to operate with any of these types of products. On all types of locks pay particular attention to the latchbolt projection. This may range anywhere from  $\frac{3}{8}$ " -  $\frac{7}{8}$ " and will usually help determine what type of strike to use.

### Cylindrical or Bored Type Locks

A cylindrical lock is identified by the lock having the key in the knob itself and is usually mounted in a cylindrical cutout of  $2\frac{1}{8}$ " diameter. Usually these are the easiest type of lock to electrify. Most "ANSI" (ANSI A 115.1) strikes will install with only minor frame cutting to the face of the frame and operate very satisfactorily. The center line of the lock lines up with the center line of the ANSI prep and likewise the electric strike. Since the electric strike is designed to fit in this type of cutout, the installation goes very smoothly. All you need to do is cut out the face of the frame to accommodate the strike lip. Also, pay attention to the deadlatch finger behind the latchbolt, this can fall behind the keeper of the electric strike and bind it. This also compromises the security of the deadlocking latchbolt.



### Mortise Locks

A mortise lock is usually identified by the key being above the knob set and by a long rectangular cutout in the edge of the door where the lock is mortised in. Mortise locks are usually more difficult to deal with because many manufacturers offset the latchbolt center line opposed to the center line of the strike plate. This usually disqualifies the use of an "ANSI" type electric strike because when moving the strike up or down to accommodate this offset centralize, you create a pocket or hole you will have to fill in order to achieve a finished look.



The best type of electric strike is one with an extended faceplate that is long enough to cover any gap created by moving the center line up or down. This will usually cover you in most installations, but needless to say, this requires extra cutting and more work.

To our knowledge, there are only three manufacturers that make true "ANSI" electric strikes that work with a standard mortise lock and strike prep, they are: Adams Rite, Hanchett Entry Systems and Precision. All three are designed to operate in a different way but each will fit into a ANSI prep with only cutting the face of the frame while keeping the existing ANSI prep center line the same.

### Unit Locks

Unit locks require special types of electric strikes but are similar to the installation of a strike for a mortise lock. A unit lock is preassembled at a factory. Installation of a unit lock is done by notching a "U" channel in the edge of the door, sliding the lock into place and securing. The latchbolt on a unit lock is similar to some rim exit devices like the Corbin 29 with a pullman latchbolt and deadlocking finger either above or below the main latchbolt. This latchbolt deadlocking finger combination is where you need a special electric strike keeper. To our knowledge, only the Folger Adam Company makes an electric strike to work with this type of lock (Folger Adam Model 310-2 3/4U).



### Rim Latches

Rim latches are usually easier to work with because they are surface mounted. However, this lock requires a special type of strike. This type of lock is mounted on the inside of an inswinging door. The electric strike is mounted on the frame of door adjacent to the lock on the surface. These locks are usually old but are very durable and include a thumbturn on the inside to get out. Rather than doing away with this type of lock or opting to put in a new mortise or cylindrical lock, you should consider reusing the rim latch.



## Exit Devices

Rim exit devices require a different type of electric strike to unlock them, which semi-surface mount on top of a standard or applied stop. These are usually fairly easy to install and give good results. On doors with vertical rod devices, the bottom rod is always deactivated and locking occurs only at the top of the door. A very important bit of information needed is what type of latchbolt is at the top of the door (pin type, carriage, pullman, etc.). This helps determine what type of keeper in the electric strike to use. The exit device bolt must remain extended and then snap back into place when the door is closed. This is called a pullman or electric strike latchbolt and must be provided to verify that the latchbolt relocks when the door is closed. On pairs of doors you will frequently run into vertical rod exit devices. This type of application leave little to be desired and I have never felt comfortable with the security of this type of application. The door is only locked at the top which causes the door to warp over time from people pulling on it all day. We have seen doors that are over 7' tall able to be propped open because of the warpage. Therefore, whenever possible we try to go with some other locking arrangement such as a center mullion with an electric strike,



an electric rim device with a mullion or a magnetic lock.

## Narrow Style Deadbolts

Most aluminum store fronts have an Adams Rite MS Series deadbolt lock or something similar installed as standard equipment at the factory. These work very well except for when it comes to electrifying the door. The only way to apply an electric strike is to first replace the deadbolt with a latch lock (see latch lock section). Manufacturers make these latchbolt locks with the same cutout dimensions as the MS Series bolts so installation is very simple. You'll also have to supply a lever or paddle so people can exit without having to unlock the electric strike.



## Latch Locks

This type of lock is almost always mounted in aluminum and glass doors with narrow stiles. The faceplate is usually 6 to 8 inches tall and the depth of the lock is approximately 1 $\frac{3}{4}$ ". These locks are relatively easy to find an electric strike for. Many latch lock manufacturers make electric strikes to work primarily with latch locks. Most "ANSI" strikes will work with these locks as well. If you replace an MS Series lock with a latch lock you will have to watch the strike cutout to see if the cutout for the deadbolt is not too big for the electric strike you choose.



## Question 5

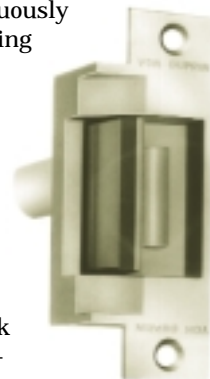
### Fail Safe or Fail Secure?

About 90% of the strikes we sell are fail secure or non fail safe. This means that when the power fails or is turned off the lock will stay locked and will not open. Fail safe is just the opposite. When power is cut the fail safe lock will unlock allowing the door to be opened. (Note: You are not allowed to use fail safe electric strikes on fire labeled doors and frames.) Most applications use fail secure and still meet life safety codes since the hardware used provides immediate egress (ie. panic bar, store room function lockset, etc.)

## Question 4

### AC or DC Current?

This is probably the least understood question we ask. Most people don't seem to know the difference or the ramifications when the wrong current is used. "AC" stands for alternating current which is a pushing and pulling type of energy. "DC" stands for direct current which is a continuously pushing type of energy. This is why an AC electric strike will buzz and a DC one will not. (The buzzing is caused by the alternating current pushing and pulling the locking plunger 60 times per second and causing a "mechanical" buzz.) Not matching the strike current to the supply current can cause problems. A DC strike being powered by an AC power supply will result in a strike that buzzes but does not unlock. This happens because the DC solenoid in the strike will not continuously pull on the locking plunger with an alternating (push/pull) current being applied. On the other hand, using an AC strike with a DC power supply will seem to work properly but the AC solenoid in the electric strike is constructed with less coil wire causing the unit to have lower resistance. This causes excessive heat and eventual failure. So you MUST know what type of current is being used to avoid a problem. Some manufacturers make electric strikes that will work with AC and DC current with the same solenoid. This is good because you're covered either way you go.



VON DUPRIN  
6211WF

## Question 3

### Price?

In the real world this is usually the bottom line on the selection of any product. Prices are usually reflective of the quality and/or reliability of most electric strikes. Pricing ranges from \$20.00 to \$350.00. Obviously you can't expect the options or performances of a \$45 strike to be comparable to a \$200 strike.

Cycle life is a factor to consider. If an opening gets 10-20 cycles per day then, we could say to use a little less expensive strike. If it gets more use, then choose a more expensive strike. Also, physical strength should be considered for applications where abuse or attempted entries are the norm, here again price reflects durability.



## Question 2

### What color or finish do you need?

This is a fairly obvious question but we still have many customers that don't know (or don't care) what "color" they want. I think this is due mainly to nonstandard use of the codes used for the different finishes. For example, BHMA 626, US26D and C26D all refer to "dull chrome". To add to this confusion, some manufacturers use their own coding systems. The aluminum and glass industry is where this can get you into trouble. For instance, "bronze" doesn't always mean US10 Dull Bronze (a copper gold color); it means Dark Bronze Anodized (a dark brown color). It seems minor knowledge of these codes will usually allow you to make the correct purchase with some additional assistance from the sales person.

## Question 1

### What Voltage Do You Need?

This is the question that we always have to ask. The answer is usually a long pause followed by the question, "What's standard?" Manufacturers make electric strikes available in many different voltages to suit YOUR needs according to the system that is controlling the electric strike. Most card reader and keyless entry systems supply a contact output that is used to unlock and lock the electric strike. In this case you should provide a transformer or power supply to operate each strike. Some card readers have both voltage output (usually 12VDC or 24VDC) and a contact output. The only problem with this is that if you plan to use the power source in the card reader, sometimes the current available is less than your electric strike needs. Make sure your power supply has enough current to operate all locks or supply a transformer or power supply for each lock. We like to stick to DC when a card reader or similar electronic equipment is used because this type of power is "less noisy" and is less likely to harm electronic components used by these systems. If your requirements require the use of AC electric locks, it would be advised to use shielded cable to protect sensitive equipment. If your electric strike has to be unlocked continuously for long periods of time, use a strike that is listed continuous duty or silent operation to prevent premature failure. Some control systems have "on board" power. In this case you should be sure the voltage on the electric strike matches the systems output as well as making sure the system can put out as much current as your strike will draw. To do this, total up all the current requirements of all the products in the system and be sure to allow a 25% margin for safety. For example, if you have 4 electric strikes drawing .25 amps each, *equalling 1.0 amps altogether*, then make sure the power supply puts out at least 1.25 amps.

This details some of the questions we may ask you when you call. If you know most of the answers we can almost guarantee you a smoother installation without unwanted surprises. Above all, when installing an electric strike or any other piece of equipment, patience is they key to a proper installation and job satisfaction. But there is one more subject we would like to cover, Wiring and Voltage Lost. *See next column for info.*

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## Wiring and Voltage Loss

Wiring is usually the most disregarded subject associated with electric locks. Most people use a wire gage that they are familiar with, usually 18 or 22 gage. Recently I was reminded of the importance of proper wire size. This was on a project where over 800 low voltage locks were used. The electrical contractor specified a gage wire that was sufficient for the continuous current draw but he neglected to calculate the voltage drop during the inrush cycle. This resulted in a 10 volt drop in a 24 volt circuit and the lock would not properly unlock. The original blame was put on the lock manufacturer but after expending many hours of time (and money) the truth came out: the problem was with the wiring.

We have a simple formula for figuring out the voltage drop in a given current. You take the resistance per 1000 feet of wire and multiply it by the current. This equals the voltage loss.

Gage Wire	Resistance / 1000 Feet in Ohms @ 77°F
12 Gage	1.62
14 Gage	2.58
16 Gage	4.09
18 Gage	6.51
20 Gage	10.4
22 Gage	16.5

(Figures from the Circ. 31, U.S. Bureau of Stds.)



#### Problem:

1500 ft. of 18 gage wire w/ an electric strike drawing .3 amps.

#### Formula:

Ohms x (Wire Length/1000) x Current = Voltage Drop

**Equation:** 6.51 x (1500/1000) x .3 Amps =

**Simplified:** .51 x 1.5 x .3 = 2.91 Volts

**Solution:** 2.91 Voltage Drop

#### Example:

If you have an electric strike that takes .3 amps at 24 volts, by the time you send the power out you only have 21.09 volts at the strike. This would usually fall within the tolerances of the electric strike and not be a problem. But, if you had a 12 volt electric strike at the same current and wire length, you would only have 9.09 volts at the strike which would not fall within the nominal 10%+15% variance given by most manufacturers. In this case you would only have 75% of the rated voltage needed to power the strike. Obviously its operation would be marginal.

As a rule of thumb, if you increase your wire length you must increase your wire gage. Likewise, the lower your voltage, the larger your wire gage must be. In any case you should calculate the voltage loss and make your wire selection based on your findings.

If you have any technical questions or need more information please feel free to call us.

Sincerely,

Ray Baldwin  
CEO, JLM Wholesale

