



ELECTRIC STRIKE SELECTION GUIDE

LOCKING | ACTIVATION | CONTROL | ACCESS



Introduction

Camden Door Controls is dedicated to your success and offers technical support through a library of helpful technical documents, such as this electric strike selection guide. In the following pages, we offer important information on how to select an electric strike.

Electric strikes are one of several kinds of electrically operated locking devices used to secure both inside and outside doors. Electromechanical by nature, they provide a cost-effective way to control foot traffic from one side of a door to the other. The cost of this device can run from under \$100.00 to several hundred dollars, compared to electromagnetic locks that can cost upwards of \$1,500.00 or more when you include all the necessary devices required to comply with local, state, and national fire and building codes.

The task of selecting the right electric strike for specific applications is extremely important because the wrong electric strike will compromise the overall security of the door. "A chain is only as strong as its weakest link," and so the wrong strike can easily become that weak link in an access control or life safety system. Using the wrong electric strike also can reduce the life expectancy of the electric strike, causing premature failure.

Another reason for a possible security failure is the physical and mechanical condition of the door such as sagging and misalignment. For this reason, it's important to double check the mechanical functions associated with each door where an electric strike is used. If it's a retrofit application, it would be prudent to check the door for such issues before you do the work.

There are nine basic factors that you need to know when matching an application to the correct electric strike. In brief, they are:

1. Electric Strike Mechanics
2. Type of Door and Frame
3. Type of Mechanical Door Lock(s)
4. Door Strike Security Grade (1, 2, or 3)
5. Supply Voltage
6. Electric Strike Duty and Fail States
7. Duty (Intermittent Vs. Continuous)
8. Strike and Lock Center Alignment
9. Strike Operation and Preload

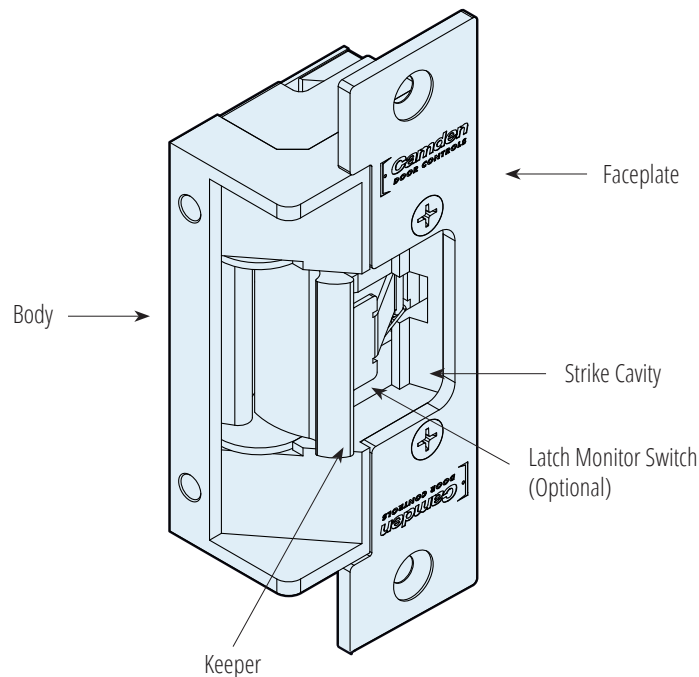


Electric Strike Mechanics

It's important to know the mechanical elements associated with an electric strike to select the right model for a customer's application. Electro-mechanical by nature, electric strikes contain a solenoid; a small, movable keeper; and a specially designed strike cavity made to correspond to specific faceplates for specific types of latchbolt, deadbolts, and dead latches used.

The movable keeper within an electric strike acts as a gate, holding the lockset latch in place until someone energizes or de-energizes the strike's solenoid--depending on what kind of electric strike it is (more about this in a later section). When an authorized action does occur, such as a valid access card presented to a card reader, or someone at a manned kiosk presses a door release button, the electric strike will allow the keeper to move and the door to open.

Some models include an internal means of monitoring the status of the electric strike, such as the door position or the condition of the keeper. This is a useful feature to have because the customer now knows for certain when the door is locked or unlocked (many Camden strikes have this feature as standard). This type of electric strike is commonly employed in applications that require a higher level of security than a common electric strike will provide.



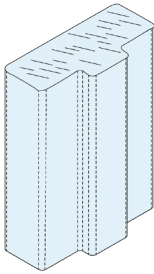
Type of Door and Door Frame

One of many important factors in the selection of an electric strike is the type of door and door frame. This is of great importance in that electric strikes are designed for use with specific kinds of doors and frames, made of specific materials. In all cases, the size and design of the electric strike faceplate is dependent upon the type of door frame material.

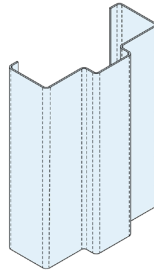
There are three basic materials to consider when working with electric strikes.

- 1. Wood** - Wooden frames typically require electric strikes equipped with a longer face plate than when working with metal frames. A longer face plate promotes additional security and stability.
- 2. Hollow Metal** - Hollow metal doors and frames are common in commercial facilities. The problem with hollow metal frames, is that they are commonly filled with construction materials, such as concrete and grouting. Frames filled with construction material can pose a few difficulties when installing an electric strike. For this reason, some electric strike manufacturers, like Camden Door Controls, make a low-profile electric strike where the solenoid is housed within the strike itself instead of externally.
- 3. Aluminum** - Aluminum door frames usually come with a pane of glass. It's important to pay particular attention to the width of the glass versus the door frame to assure that you do not drill into the edge of the glass window. This can cause it to crack. These aluminum frames usually measure between 1-3/4 and 2 inches wide.

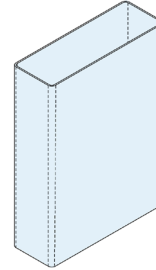
Wood Frame



Hollow Metal Frame



Aluminum Frame



Fire Ratings for Inside and Outside Doors - Outside doors may or may not carry a fire rating. In the past, outside doors did not necessarily have to carry a fire rating. Today, however, this is not always the case due to the advancement of local fire codes. Thus, it is important to match the electric strike to the fire rating of the door. This is especially critical on the inside of a building where you're sure to encounter several fire walls with doors that must be capable of withstanding the heat of a fire for a given period of time.

It is vital that the mechanical lockset is also fire rated to the same standard as the electric strike being installed. Fire ratings on strikes are normally 90 minutes or 3 hours. To confirm what type of rated strike you need, check the fire label on the hinge side of the door frame.

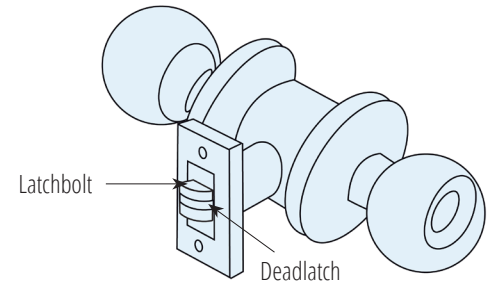
Important Note: Fire rated electric strikes must be fail secure.

Single Versus Double Doors - Another important item to consider is whether the door opening you're working with is comprised of one or two doors. In the case of a double door, you need to know if there is a center mullion present and whether it can be removed. When a center mullion is used, an electric strike can be installed within it. When there is no center mullion present, however, the electric strike can be installed inside of the inactive door. If both doors are active, another method of locking may be required, such as an electromagnetic lock (EML). All of these issues can affect the type of electric strike you use so be sure to do your homework ahead of time.

Type of Mechanical Door Lock(s)

The type of lock on a door figures heavily in the electric strike selection process. It's imperative that you know this information before you make a final decision on the electric strike you will select. There are several common door locks that you'll encounter when installing most electric strikes.

Cylindrical Locks - When dealing with an existing door with a cylindrical lock(s), it's important that you know what kind of locking arrangement you're working with. Think of it this way, if you take the electrical power issue out of the picture, the electric strike must perform the same function in the same manner as the original strike plate. This requires that the latchbolt of the lock and the center line of the electric strike be aligned.



In order to make the right decision, it's important to know what type of cylindrical lock that you are working with. There are three basic types that you'll encounter. Each one is different in how it secures the door and so figures heavily in the kind of electric strike you need.

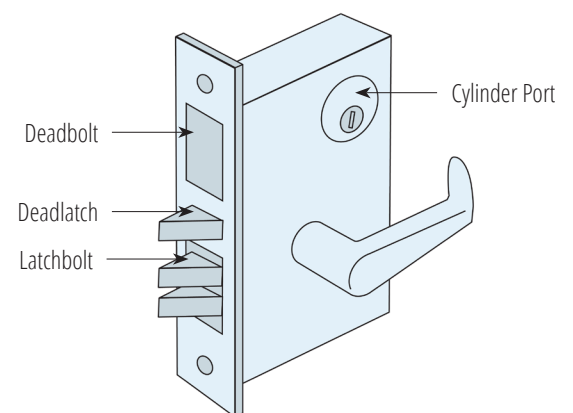
Latchbolt - The latchbolt is a spring-loaded assembly that ramps toward the inside of the door. This ramping effect enables the Latchbolt to move inward when closing the door. When the latchbolt is even with the strike plate/electric strike's inner cavity, it is free to pop out into this space to secure the door.

Deadlatch - The deadlatch is designed to work with the latchbolt so that when locked, the deadlatch remains depressed in the lockset. This assures that the latch cannot be manipulated from outside the door.

Deadbolt - The deadbolt contains a latchbolt that the user manually extends into the strike plate to secure a door. In the same manner, the user must manually retract the deadbolt in order to unlock the door. This type of lock requires a special electric strike, designed with additional depth and, in some instances, a slightly different type of keeper.

Mortise Locks - Choosing an electric strike for use with a mortise lock requires an understanding of the mechanical locking aspects of the lock itself and how each one works with a multi-faceted strike plate.

The dimensions of most, if not all mortise locks are the same because of ANSI standards. However, not all lock manufacturers arrange the latchbolt, deadlatch, and other elements in the same manner. For this reason, there are manufacturers, such as Camden Door Controls, that provides a selection of faceplates to accommodate the various mortise lock products on the market.



For example, like its cylindrical counterpart, some mortise locks contain a deadlatch that must depress and remain so when the door is shut and the lockset is in a locked state. It's essential that the right faceplate be used in order to maintain the deadlatch in its intended depressed state. Otherwise, the latchbolt can be manipulated allowing the door to open. All manufacturers provide a listing of compatible mortise locksets for each of their mortise electric strikes. Installers must reference these guides in all cases.

Please reference page 12 for more information regarding the different centerline applications that should be considered when selecting the correct mortise strike. Camden's range of electric strikes for mortise locksets can accommodate all latch bolt configurations.

Rim Exit Device - The Rim lock is an externally mounted exit/panic locking mechanism installed on the inside surface of a door. It locks using a surface mounted strike assembly, either on the outside of the frame or on the inside edge of the same. Things to watch for here include depth of the cavity within the electric strike as well as the center strike plate/latchbolt alignment (more on this in the next section).



Knowing which one of the above three locks that you're dealing with is important. Electric strikes are engineered with specific locks, doors, and construction materials in mind. It's important to your success that you know as much about these items so your success is assured.

Horizontal Strike Adjustments - A common issue can arise with regard to alignment of the strike and a door lock, due to door warp or door misalignment. To overcome this, some strikes provide horizontal adjustment by providing a movable keeper, capable of providing a horizontal adjustment of up to 1/4 inch.

Another method of horizontal adjustment is with the faceplate itself. In this case the strike is designed with faceplate mounting screws that allow the faceplate to be moved as much as 3/8 of an inch horizontally across the strike body.



Latch Detail

Electric Strike Security Grade (1, 2 or 3)

Like the locking hardware we install on doors of all kinds, electric strikes are rated in the same manner using a grading system. The three grades that we use come from a standard created and published by ANSI.



“The American National Standards Institute (ANSI) is a private nonprofit that administers voluntary performance standards for builder’s hardware. The purpose of ANSI grades is to help identify the quality and durability of locksets through a series of operational and security tests.”

Difference Between Grades:

Grade 1	Grade 2	Grade 3
<ul style="list-style-type: none">• 500,000 Cycles• 1500lb static strength test• 70ft-lb dynamic strength test• Used in commercial installations• Grade 1 offers the best security	<ul style="list-style-type: none">• 400,000 Cycles• 1000lb static strength test• 50ft-lb dynamic strength test• Used in commercial and high-end residential applications• Grade 2 is used where the need for security is not as high as Grade 1	<ul style="list-style-type: none">• 400,000 Cycles• 500lb static strength test• 33ft-lb dynamic strength test• Used in commercial and residential interior doors• Grade 3 is used where robust security is not required

ANSI specializes in the creation and publication of voluntary performance standards for the hardware that builders utilize. The purpose of the ANSI grading system is to assist locksmiths, builders, and consumers in identifying the quality and durability of the locking devices they use. This grading system, which includes both locksets and electric strikes, was determined through a series of tests to determine operability and security.



According to BHMA/ANSI standards, there are three factors that enter into which of the three Grades that a lock or electric locking device fits.

1. Cycle Testing - An indication of endurance, is performed with similar hardware at a rate of up to 30 cycles per second. To qualify as Grade 1, an electric strike must be capable of at least 500,000 cycles; Grade 2 and Grade 3, 400,000.

2. Dynamic Strength - Tested by delivering a specified number of impacts using a ram at a specific spot on a door at specified increments. Grade 1 electric strikes must be capable of withstanding 10 strikes of 75 Ft-lbs. Grade 2, 5 strikes of 75 Ft-lbs of force. Grade 3, 2 strikes of 33 Ft lbs of force.

3. Static Strength - This is another indication of quality, which is done with the electric strike in a locked condition. It begins with the application of a specified amount of force to the door on a continuous basis at a rate of 10 to 20 pounds-force (44N to 90N) per second. This is performed until the hardware's rated static strength is reached. Then the force is applied for another minute before it's removed. Grade 1 strikes must be capable of holding 1,500 lbs, Grade 2, 1,000 lbs, and Grade 3 strikes must be capable of holding 500 lbs.

It's important that you know the Grade of the locking hardware on the door in question. The electric strikes you install should match or exceed the locking hardware on the door. If you have a Grade 2 lock, you should use a Grade 2 strike, and likewise if you have a Grade 1 lock, a Grade 1 strike.

Supply Voltage

The most common voltages used with electric strikes include 12 VDC, 24 VDC, 12 VAC, 16 VAC, and 24 VAC. In retrofit situations, it's important that you know which one is in use because the wrong voltage could easily damage the electric strike or the power supply that it's connected to. Where the existing electric strike fails to show a voltage rating, or where the strike is missing, you should apply a voltmeter to determine the voltage employed.

The use of 16 VAC is common in low-security, Grade 3, wood-type applications. Apartment intercom systems and inside entrances are common applications where you'll find this type of electric strike. Because it's an AC-powered device, the electric latch will buzz when activated.

The most common voltages used by professionals are 12 VDC and 24 VDC. The most efficient selection, however, is 24 VDC. This is because an electric strike using 24 VDC will expend less current than those that use 12 VDC. For example, the Camden model CX-ED1079DL- a traditional Grade 1 electric strike at standard depth - requires 300 mA @ 12 VDC or 150 mA @ 24 VDC. Less current flow using 24 VDC (150 mA) allows us to travel twice as far on the same gauge wire as 12 VDC (300 mA).

Universal electric strikes are available that are field-selectable in voltage and duty, such as 12 VDC or 24 VDC as well as fail-secure/intermittent or fail-safe/continuous duty specifications. Refer to the manufacturer's installation instructions for further advice on wire gauges versus linear distances.



Electric Strike Fail States

One of the most important aspects of selecting an electric strike involves the various effects of power on the electric strike. The first is the “fail state.”

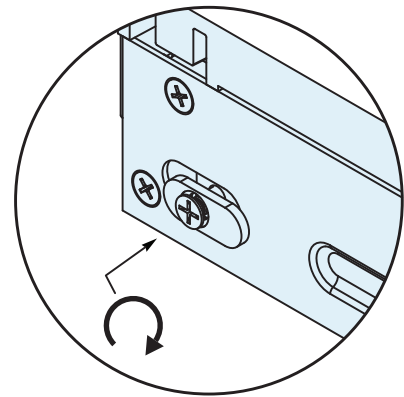
There are two “fail” states:

1. Fail Safe - Unlocked
2. Fail Secure - Locked

“Fail-safe” electric strikes, for example, will unlock a door when power is removed. On the other hand, “Fail-Secure” electric strikes will lock the door when electric power is lost, as when there’s a power failure.

Many times a fail-secure electric strike is associated with the intermittent application of electric power while continuous-duty is associated with fail-safe electric strikes. Fire code requires that fail-secure electric strikes be installed and maintained on critical fire-rated doors so the moment power is lost, the keeper in the electric strike latches, thus preventing the door from opening and allowing fresh oxygen to feed the fire.

Maintaining a latched keeper during fire situations when power fails also is intended to assure the isolation of one area/room from others. Air pressure increases in the area of a fire and unless these doors are kept closed, smoke, heat, and fire will spread to adjacent areas of the structure, thus jeopardizing lives.



Field selection of
fail safe/fail secure operation

Duty (Intermittent vs. Continuous)

One of the most important aspects of selecting an electric strike involves the “duty” rating. The duty rating of an electric strike establishes its basic operating parameters--such as whether voltage can be continually applied or applied intermittently only as needed. There are two basic duty ratings assigned to electric strikes.

1. Intermittent
2. Continuous

In most, if not all access control situations an intermittent-duty electric strike requires that voltage be applied to unlock the door. This means that when the electric strike is de-energized, the door is locked. In this case the mechanical “keeper” inside the electric strike remains in its latched state. By applying power, the “keeper” is unlatched by a solenoid assembly, thus allowing it to move aside when the door is pushed or pulled open.

Continuous-duty electric strikes are different in that the keeper is unlatched and free to move in its de-energized state. When power is applied, the keeper mechanically latches so the door is once again in its locked condition.

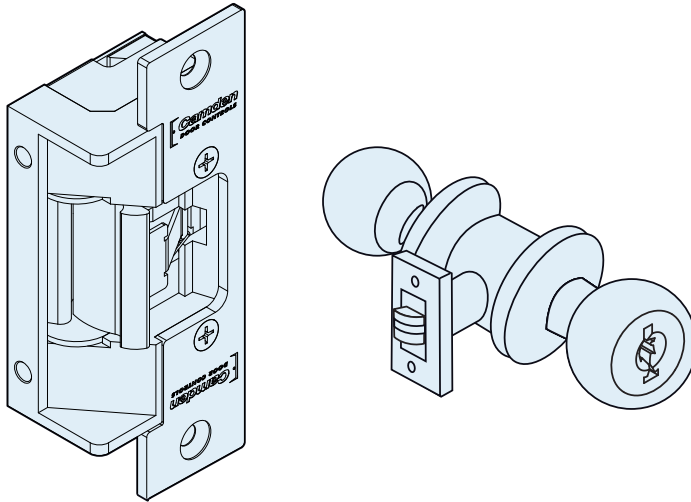
An intermittent-duty electric strike is also referred to as “fail-secure” while a continuous-duty is referred to as “fail-safe.” Fire code requires that fail-secure electric strikes be installed and maintained on critical fire-rated doors so the moment power is lost, the keeper in the electric strike latches, thus preventing the door from opening.

Maintaining a latched keeper during fire situations when power fails is meant to assure the isolation of one area/room from others. Air pressure increases in the area of a fire and unless these doors are kept closed, smoke, heat, and fire will spread to adjacent areas of the structure, thus jeopardizing the lives of others.



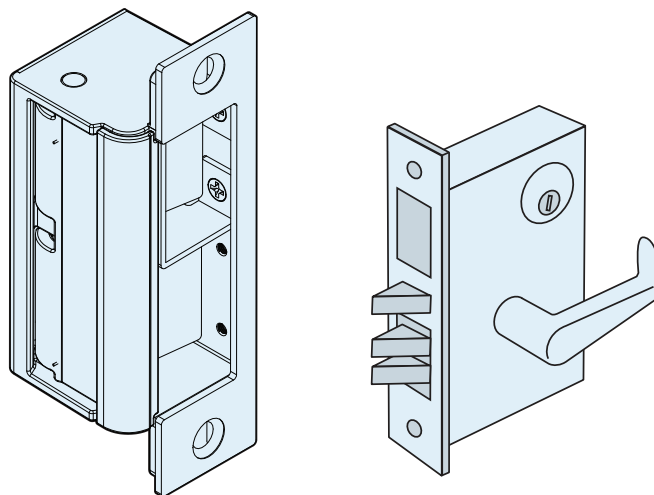
Strike and Lock Center Alignment

The Keeper in the electric strike and the latch of the door lock must be in alignment, for the two to operate properly. In the case of a cylindrical lock, alignment is fairly straight forward and easy to see as the latch is center to the lock body. In the case of a mortise lock, however, alignment is less obvious as the latch and other elements of the lock can be 3/8th of an inch off center.



In the case of a mortise lock the deadlatch and a solid area of the electric strike must align as well as the latch and the open portion behind the keeper in order for the deadlatch to do its job. That job is to prevent someone from forcing the latch to move, thus allowing the door to open.

The deadlatch on a cylindrical lock can usually be found on the backside of the latch. Here, once again, position is important because the keeper is that which contacts the deadlatch while the latch itself remains intact in the open cavity of the electric strike.



Strike Operation and Preload

Even when an electric strike has been selected and installed correctly in all other regards, a common cause of strike failure is preload. Electric strikes are designed so that they will only operate when a small amount of latch pressure is applied against the keeper (jaws) of the strike. If this 'preload' pressure is more than a few pounds, the electric strikes will bind and fail to operate.

Preload pressure on the keeper of an electric strike can be caused by a wide range of issues:

1. Poorly Installed Doors

No electric strike can overcome all of the potential problems associated with a door that is misaligned or in poor repair.

Doors must be hung 'plumb' with the door hardware installed correctly before installing any electric strike.

In addition, installers should always check that the weather seals are installed correctly. Incorrect weather seal installation will cause pressure from the latch on the keeper of the strike.

Next, if the door has a closer, check that the closer isn't pushing the door and causing the latch to push the door latch against the keeper of the strike.

Lastly, some lubrication of the lockset latch will help with a smoother operation and reduce friction between the latch and the strike keeper.

2. Inaccurate Strike Installation

Incorrect alignment of the lockset latch entering the cavity of a strike can cause preload pressure on the keeper. Always check the movement of the latch within the keeper.

Note - Most Camden strikes offer horizontal mechanical adjustment and/or keeper shims that can be used to eliminate this problem.

3. Air Pressure

One of the most common and severe causes of preload is higher air pressure inside a building compared to the outside air. The higher air pressure pushes the door outward, which puts pressure on the strike keeper. This is sometimes referred to as a stacking effect and is typical on exit doors in the stairwells of multi-story buildings.

Electric strikes with preload operation are becoming more prevalent in the industry and Camden offers a 3/4" Rim strike that will operate with up to 15lbs of preload. CX-EPD1289L is the only surface mounted strike (no cut required) with preload on the market.

Electric Strike Cross Reference

DESCRIPTION	CAMDEN	RCI (DORMA KABA)	H.E.S.	ADAMS RITE	TRINE	LOCKNETICS	NOTES
3/4" Surface Mount RIM Strike	CX-EPD1289L	RCI F0162	9500/9600	N/A	4800F	RS-300-F-32D	Preload, Security and Fire Rated
Low Profile 'All in One' Fire Rated Electric Strike	CX-ED1689L-4	N/A	1500	N/A	4100	N/A	Camden Includes 4 Faceplates
Dual Monitor 'All in One' Fire Rated Electric Strike	CX-ED1799L-8	N/A	1600	N/A	N/A	N/A	Camden Includes 8 Faceplates
'All in One' Grade 1 Fire Rated Electric Strike	CX-ED1579L	F2164	1006CLB	N/A	4100CDBM	MS100F	Camden Includes 5 Faceplates and Latch Monitoring as Standard
Cylindrical, Grade 1, Low Profile	CX-ED1079	L65U	5000C	N/A	N/A	CS-450-LBM	Camden Includes 3 Faceplates and Latch Monitoring as Standard
Cylindrical Grade 1, Standard Depth	CX-ED1079D	S65U	5200C	N/A	4200	CS-750LBM	Camden Includes 3 Faceplates and Latch Monitoring as Standard
Cylindrical, Grade 1, Fire Rated	CX-ED1410	F4114	7501	7240	N/A	N/A	Camden Includes 1 Faceplate (ANSI w/ Square Corners) as Standard
Cylindrical, Grade 2, Low Profile	CX-ED2079	L65U	N/A	N/A	4200	CS-450	Camden Includes 3 Faceplates
'Universal' Grade 1, Narrow Stile Aluminum	CX-ED1309 Series	N/A	N/A	7100	N/A	N/A	Camden Includes 2 ANSI Faceplates
Outdoor Rated, Grade 1 Electric Gate Strike	CX-ED1959-MB/ CX-ED1959RM	N/A	N/A	N/A	EN400	N/A	Camden Includes a Free Metal Surface Mounting Box



A COMPLETE LINE OF ELECTRIC STRIKES FOR ANY APPLICATION!

Camden electric strikes offer exclusive features, industry-leading quality, and the best value. Our strikes comply with the latest UL/ULC security and fire standards, offer 'universal' operation, multiple faceplates, and are compatible with all brands of cylindrical or mortise locksets, and RIM exit devices. Camden strikes are also backed by a no-hassle 5 year warranty!



CX-EPD1289L



CX-ED1579L



CX-ED1410



CX-ED1309



CX-ED1959-MB

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