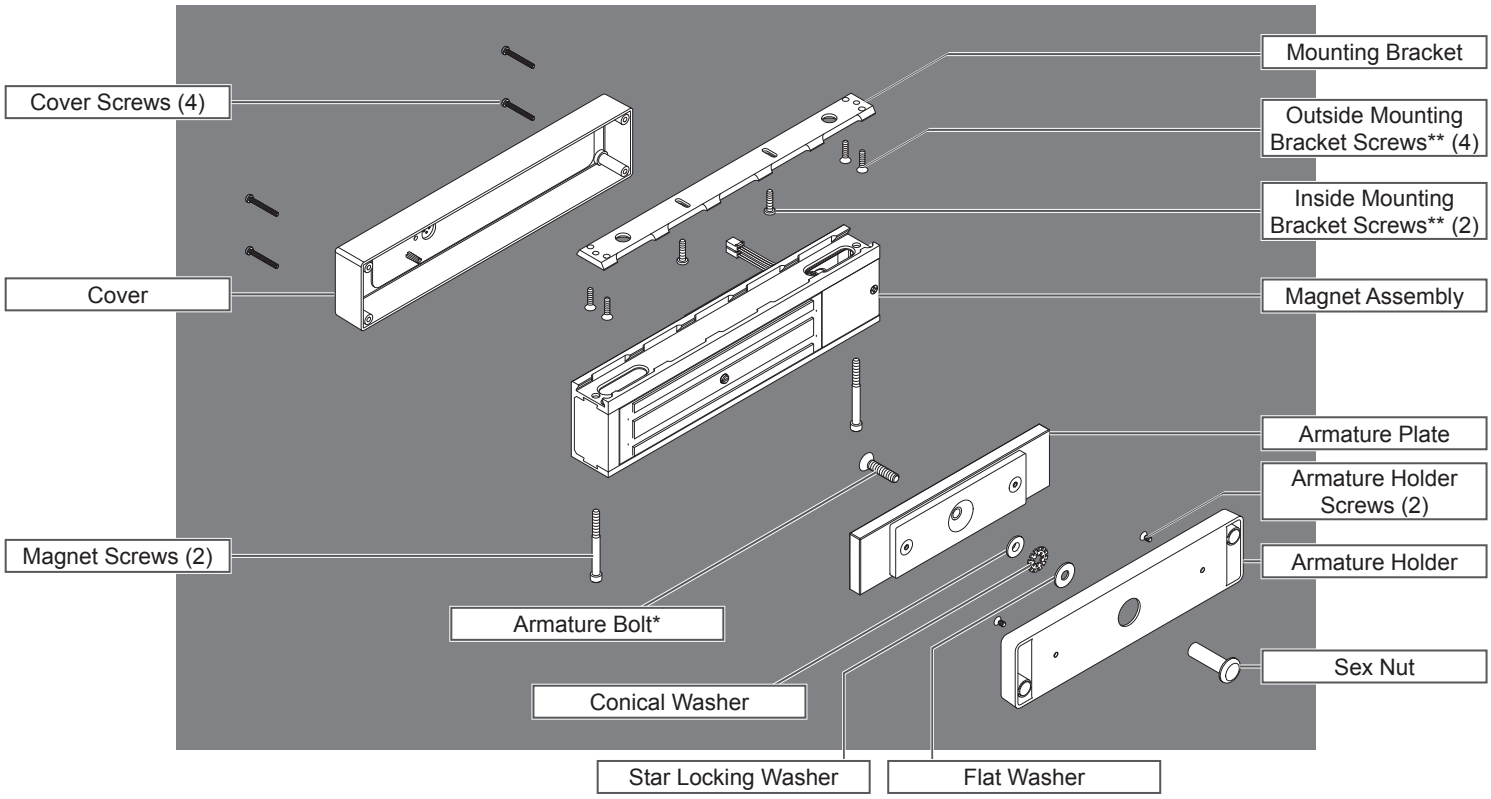
23697279

M490DE

Electromagnetic Locks

Installation Instructions



* Two armature bolts may be included in the package, but only one is used. There may be one left over after proper installation.

** Screws for both reinforced metal and sheet metal are included. Some screws will be left over after proper installation. See individual steps for screw identification.

Features

Delayed Egress
Unlocking is delayed 15 seconds while an alarm sounds.

Automatic Voltage Selection
Magnet immediately detects 12VDC or 24VDC when power is connected.

Fire Unlock
Input from fire system that will unlock the magnet immediately.

Auxiliary Inputs
Allows use of an auxiliary switch such as an exit device or push button.

Alarm Output
Activates external alarm, when in alarm state.

***Indicators**
LED Status and Audible Alarm

***Magnetic Bond Sensor (MBS)**
Detects proper bond between magnet and armature. It can be monitored remotely and locally with an LED.

***Door Position Switch (DPS)**
Indicates whether door is open or closed. This feature is used in conjunction with the MBS.

***Relock Time Delay**
Relock time can be changed. Range is 1 - 30 seconds.

***Door Prop Timer**
Allows adjustment of the amount of time a door can be propped open before alarm sounds. Range is 0 - 150 seconds.

* Plus Version Only

Models

M490DE (Single Lock Basic)
Delayed Egress, Automatic Voltage Selection

M490DEP (Single Lock Plus)
Basic features + Magnetic Bond Sensor (MBS), Door Position Switch (DPS), Relock Time Delay, Door Prop Timer, and Indicators

M490DE-2 (Double Lock Basic)
Double lock with same features as the Basic single lock

M490DEP-2 (Double Lock Plus)
Double lock with same features as the Plus single lock

Notes:
- BOCA is a Plus only lock option.
- If BOCA option model is provided, see page 12 for operational description.

UL Requirements

- Units shall not impair operation of panic hardware mounted on door.
- Units shall not impair intended operation of an emergency exit.
- Not to be used without UL approved latching hardware.
- Units/Models are intended to be connected to UL Listed Equipment, not intended for Burglar or Fire Alarm Initiating or Indicating Devices.
- Ambient Conditions - “For Indoor Use Only”.
- Wiring methods shall be in accordance with the National Electrical Code, ANSI/NFPA 70.
- **This device complies with part 15 of FCC rules.**

Operation is subject to following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including any interference that may cause undesired operation. Changes or modifications not expressly approved by party responsible for compliance could void user’s authority to operate equipment.

Electrical Specifications

	Model	
	M490DE M490DEP	**M490DE-2 M490DEP-2**
Input Current @ 12VDC Input	.75ADC	1.25ADC
Input Current @ 24VDC Input	.45ADC	.76ADC
Holding Force Per Door Leaf	1500 lbs.	1500 lbs.
Size	3” x 12 1/2”	3” x 25 1/16”

Wire Gauge and Length Specifications

	Max. Wire Length			
	Single Lock		Double lock	
Wire Gauge	**12VDC**	**24VDC**	**12VDC**	**24VDC**
14	1000 feet	4000 feet	500 feet	2000 feet
18	400 feet	1600 feet	200 feet	800 feet

Warnings and Cautions

WARNING

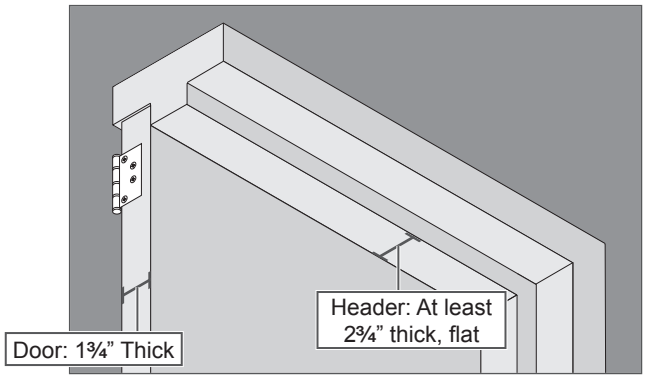
Warnings indicate potentially hazardous conditions, which if not avoided or corrected, may cause death or serious injury.

CAUTION

Cautions indicate potentially hazardous conditions, which if not avoided or corrected, may cause minor or moderate injury. Cautions may also warn against unsafe practices.

Pre-Installation Considerations

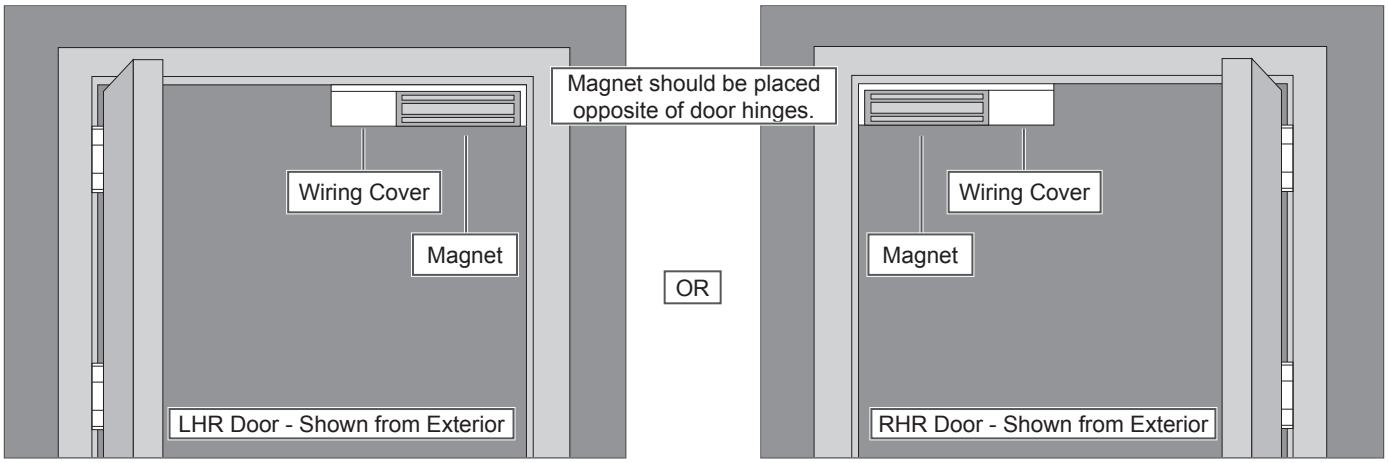
- Use ONLY the hardware provided for mounting this product (NOTE: Non-standard Door thickness may require different sex nut hardware - see specific instructions for required hardware).
- Follow the installation procedure as described in this manual.
- Check door thickness. If the door is not 1¾” thick, a different sex nut will be required. Contact customer service at 1-877-671-7011.
- Check door header. A minimum 2¾” thick, flat surface is needed to securely mount all screws for the magnet. If you do not have the required surface, you will need filler plates and/or angle brackets to properly mount the magnet.
  Contact customer service at 1-877-671-7011.



1 Prepare for installation.

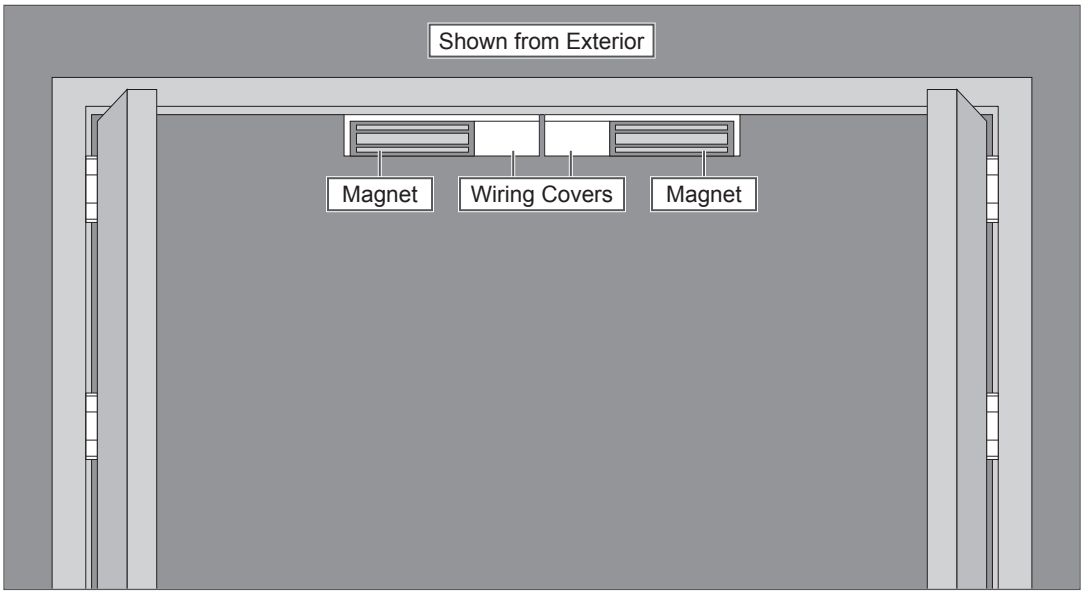
1a Determine proper magnet orientation.

Single Door

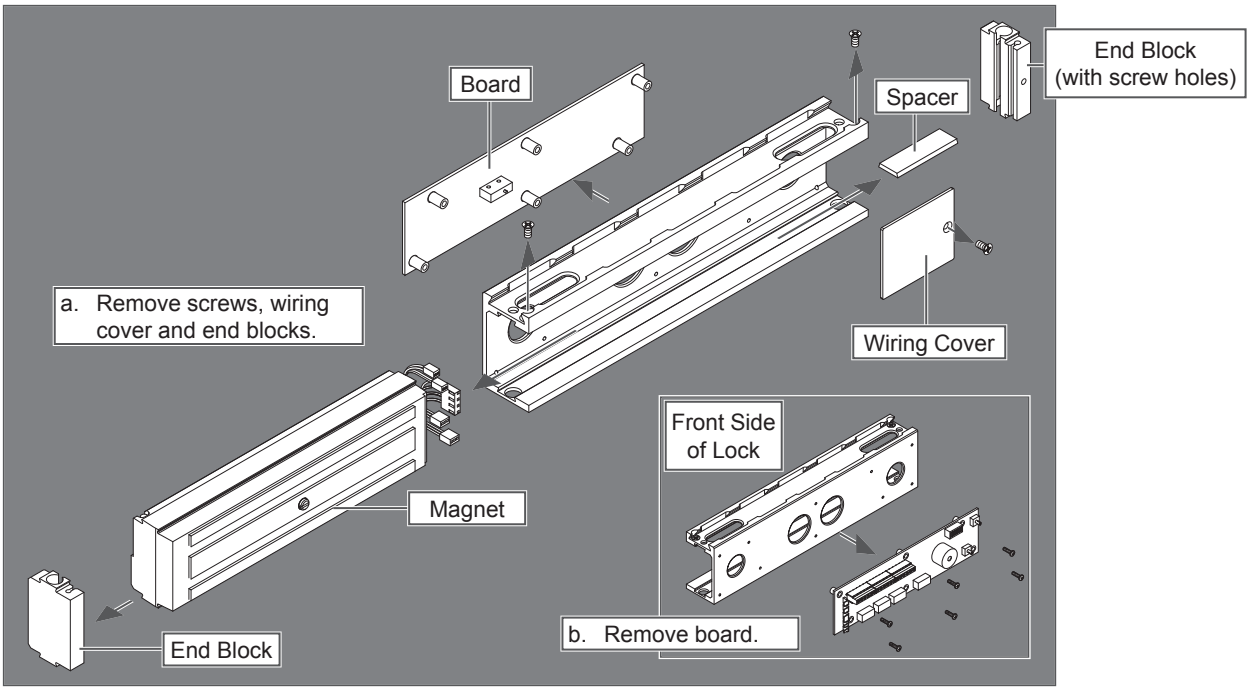


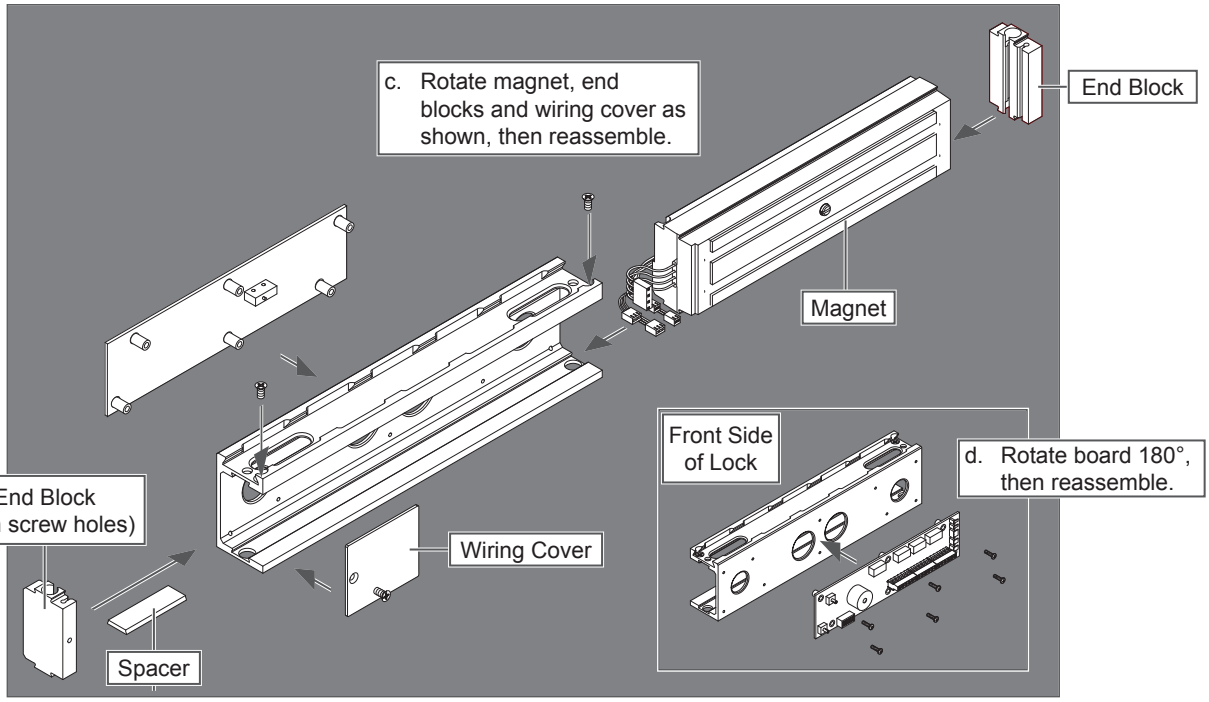
Double Door

Locks should be installed with wiring covers in the middle, so the magnet in one of the locks must be reoriented.



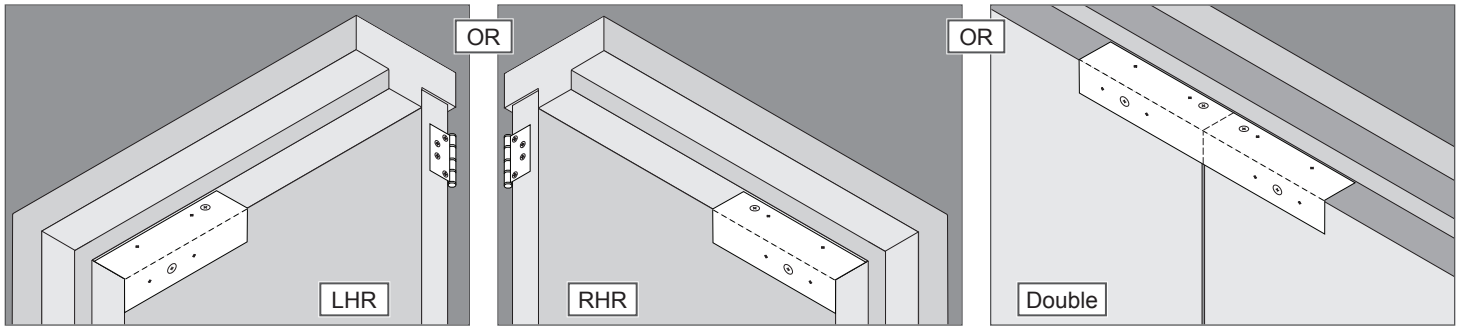
1b Reorient magnet and board (if necessary).





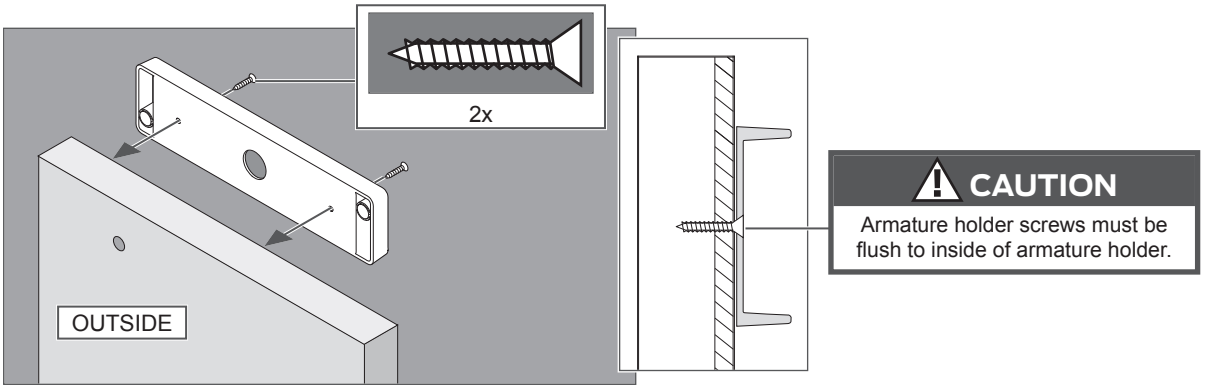
1c Place template and mark holes.

a. Place template on top corner, opposite of hinges.
b. Mark holes and prepare them per template.



2 Attach armature to door.

2a Install armature holder.



CAUTION

Armature holder screws must be flush to inside of armature holder.

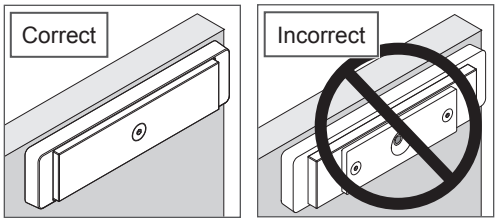
2b Install armature plate as shown for door type (M420/M450 shown).

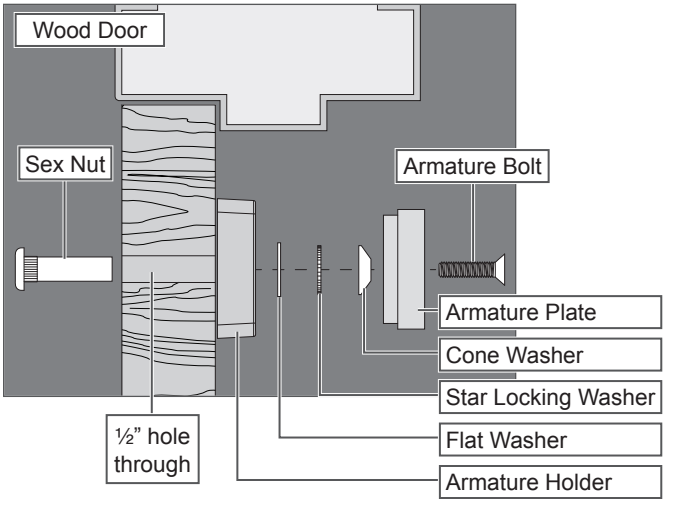
WARNING

Armature bolt must be tightened to at least 120 in.-lbs. for all doors except composite wood doors. For composite wood doors, tighten only to tight and flush. 120 in.-lbs. may damage composite wood doors.

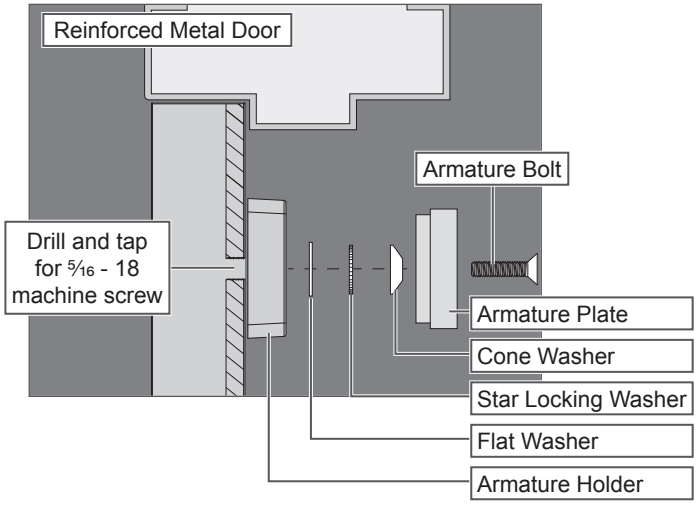
DO NOT back off bolt after tightening! Backing off the bolt after tightening will loosen the thread-locking patch, which may allow the bolt to loosen over time.

The included sex nut is for 1¾" (45 mm) doors ONLY. For other door thicknesses, please contact customer service, 1-877-671-7011. Using the incorrect sex nut for your door thickness will lead to improper function and possible injury.

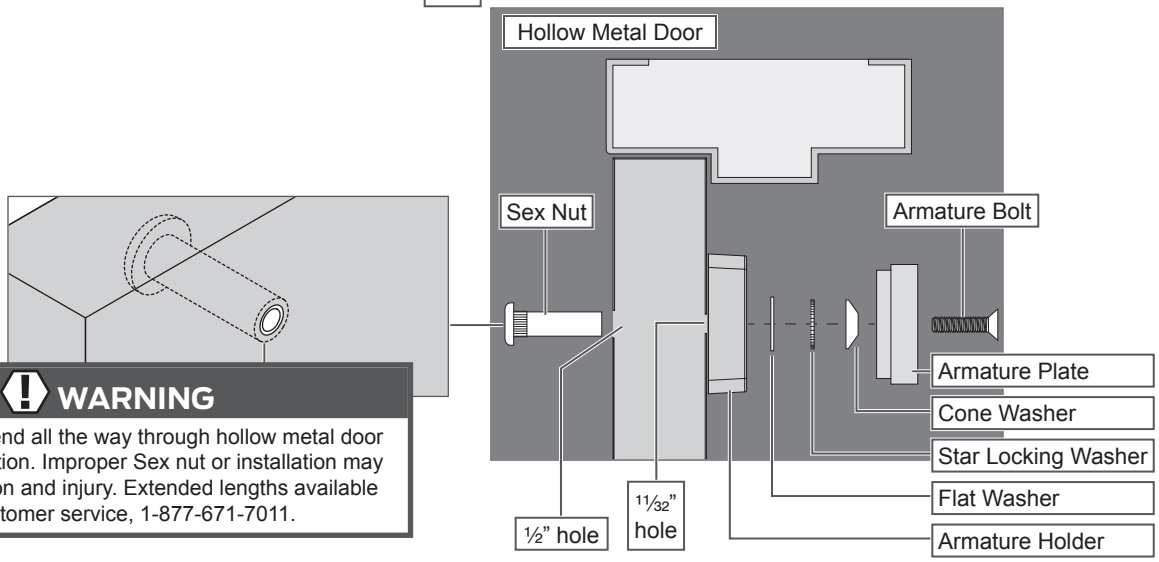




OR



OR



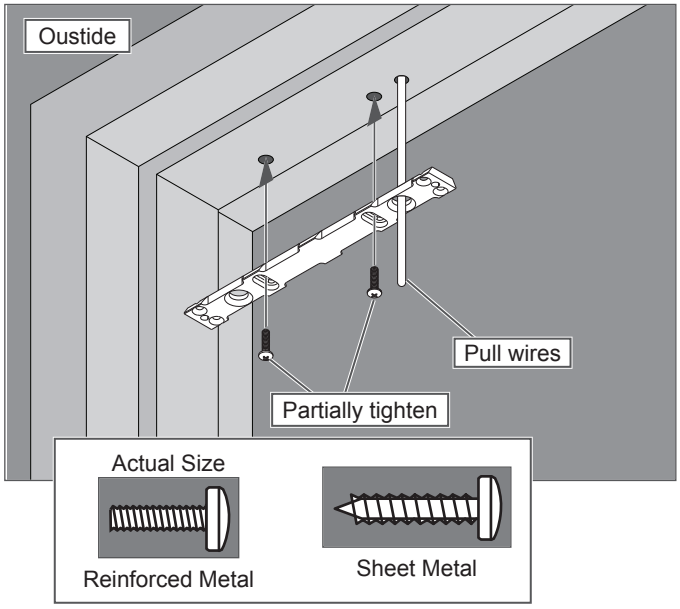
WARNING

Sex nut must extend all the way through hollow metal door for proper installation. Improper Sex nut or installation may lead to malfunction and injury. Extended lengths available from customer service, 1-877-671-7011.

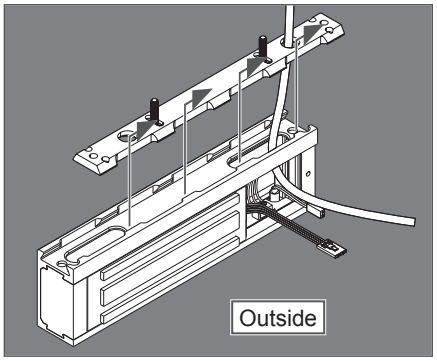
3 Install mounting bracket into frame.

3a Attach mounting bracket temporarily.

Install two middle screws into slots and partially tighten.

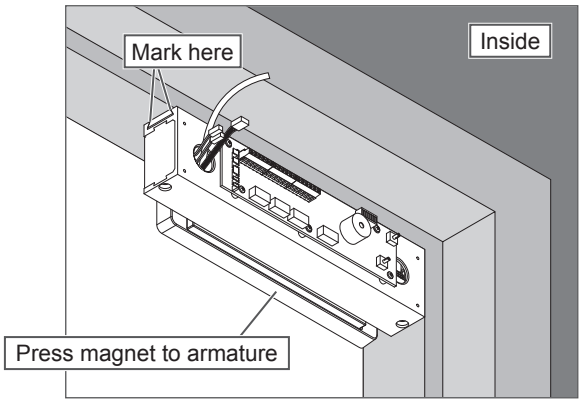


3b Slide magnet onto bracket.

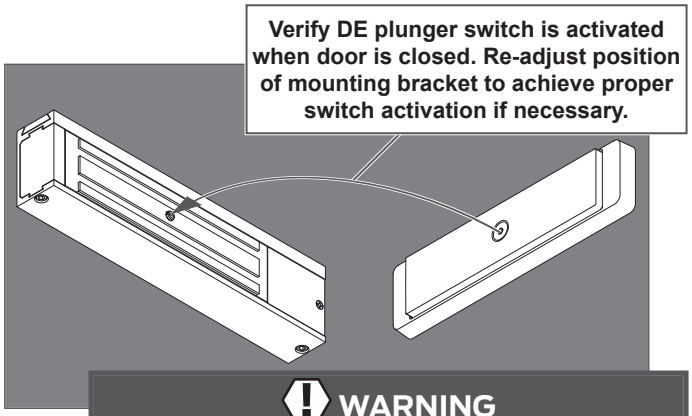


3c Align magnet to armature.

a. Close door.
b. Press magnet to fully engage with armature.
c. Mark bracket location.



3d Verify that DE plunger aligns with screw head on armature.



⚠ WARNING

Do not loosen the armature bolt in an attempt to adjust activation of plunger switch. Only re-adjust the mounting bracket.

Backing off the bolt after tightening will loosen the thread-locking patch, which may allow the bolt to loosen over time.

3e Fully attach bracket.

a. Remove magnet from bracket.
b. Check bracket alignment with marks.
c. Fully tighten two screws in slotted holes.
d. Drill four (4) remaining holes.
e. Fully tighten all screws.

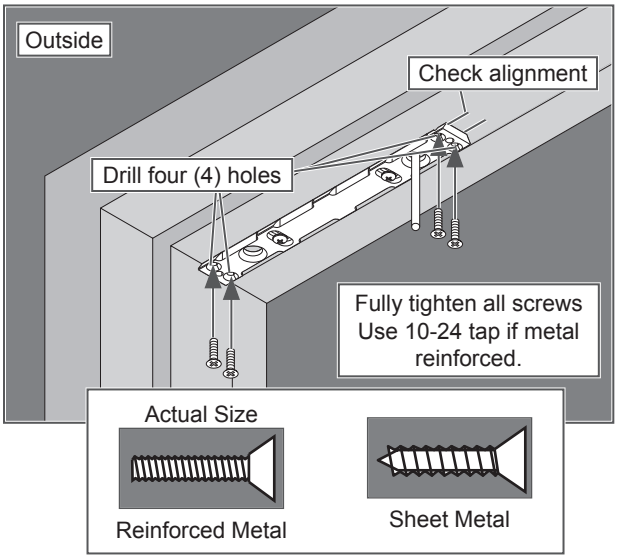
⚠ CAUTION

All four screws MUST be installed for proper operation and safety!

If you do not have enough room to securely fasten all screws, you will need filler plates and/or angle brackets to properly mount the magnet.

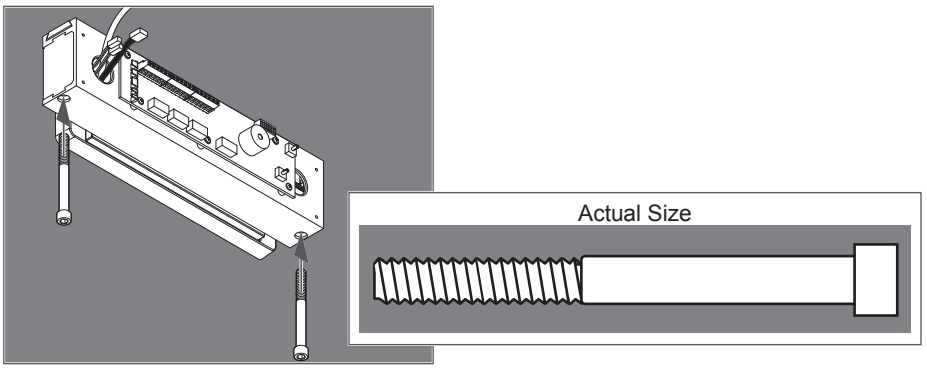
Failure to properly install the screws may lead to injury or property damage.

Contact customer service at 1-877-671-7011.



4 Install lock

4a Install magnet and secure with screws.



5 Connect wiring to board (basic model).

5a Connect plug and wires to board.

Power Input 12/24V DC UL 294 Listed, power limited, Class 2, power supply must be used

Fire Alarm Input Apply a normally closed dry contact or a jumper if not connected to fire alarm.

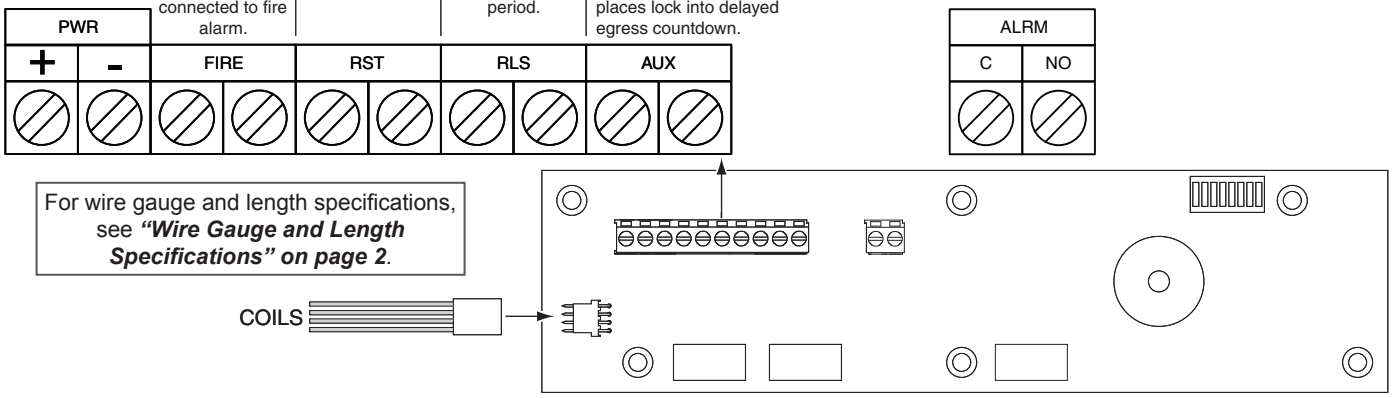
Reset Input Dry contact closure resets lock in alarm condition.

Release Input Dry contact closure will release lock for the time delay period.

Auxiliary Input Apply a normally closed dry contact or a jumper if not using. Opening dry contact places lock into delayed egress countdown.

Alarm Output (Optional) Contacts change state during an alarm condition.

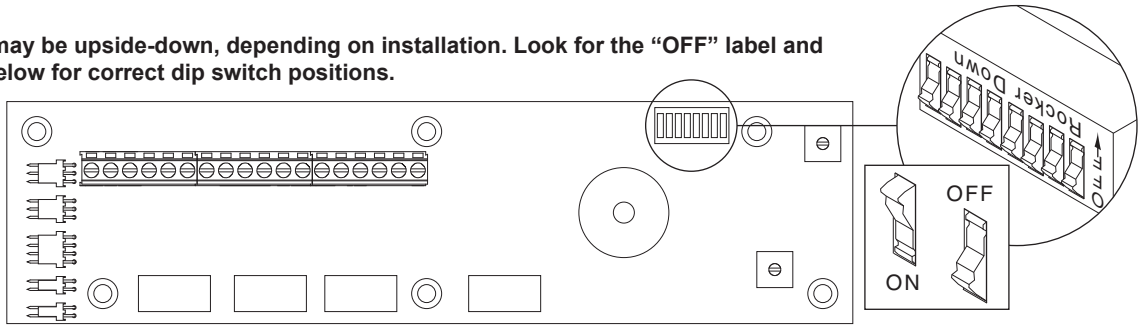
30V@1A resistive



For wire gauge and length specifications, see ***"Wire Gauge and Length Specifications" on page 2***.

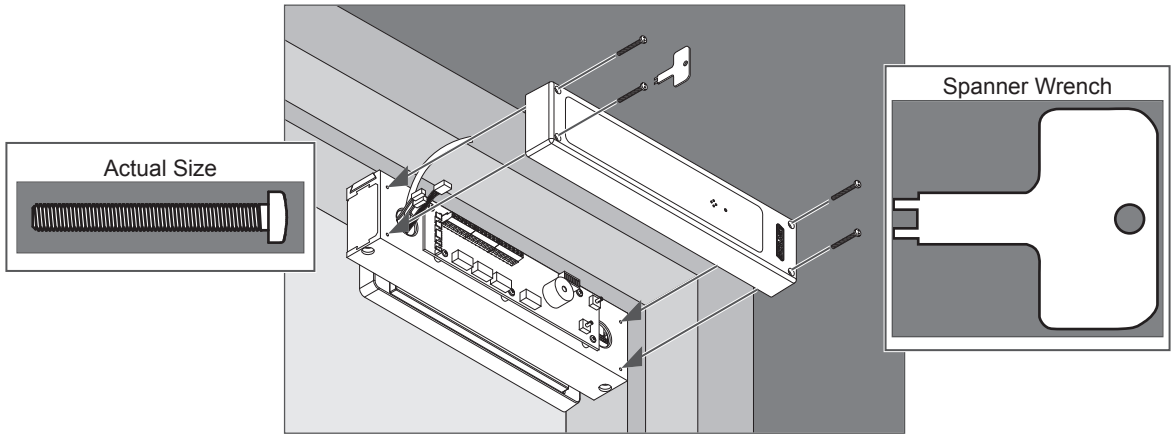
5b Set SW2 dip switches.

ⓘ **NOTE: Dip switch panel may be upside-down, depending on installation. Look for the "OFF" label and compare to the images below for correct dip switch positions.**



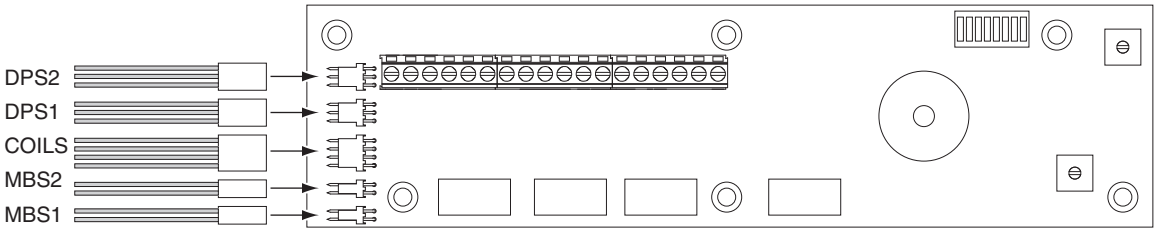
Feature	Switch	Setting				Description
Nuisance Delay		0 seconds	1 second	2 seconds	3 seconds	Nuisance delay is the amount of time the door must be pushed or aux input must be pressed before triggering the Delayed Egress Cycle. Programmable to 0-3 seconds.
	1	Off	On	Off	On	
	2	Off	Off	On	On	
Nuisance Alert	3	Off=Disabled		On=Enabled		Causes horn to sound during nuisance delay
Auto Relock	4	Off=Disabled		On=Enabled		When enabled, lock will energize upon regaining power or after a fire alarm condition clears.
Anti-Tailgate (Plus Model Only)	5	Off=Disabled		On=Enabled		Door will relock as soon as it closes – even if the relock time delay has not ended.
Door Propped/Forced (Plus Model Only)	6	Off=Disabled		On=Enabled		Enables door propped and door forced alarms
Unlock Alert	7	Off=Disabled		On=Enabled		Horn sounds whenever door is unlocked and power is still applied to the door
DEL Enabled	8	Off=Disabled		On=Enabled		Enables or disables the DEL plunger switch. Aux Input will always function even if DEL plunger switch is disabled.

5c Install cover using spanner wrench and security screws.



6 Connect wiring to board (plus model).

6a Connect plugs to board.



6b Connect wires to board.

Power Input
12/24V DC

UL 294 Listed, power limited, Class 2, power supply must be used

Fire Alarm Input
Apply a normally closed dry contact or a jumper if not connected to fire alarm.

Reset Input
Dry contact closure resets lock in alarm condition.

Release Input
Dry contact closure will release lock for the time delay period.

Auxiliary Input
Apply a normally closed dry contact or a jumper if not using. Opening dry contact places lock into delayed egress countdown.

DPS Output
(Optional)
Contacts change state when door is closed.

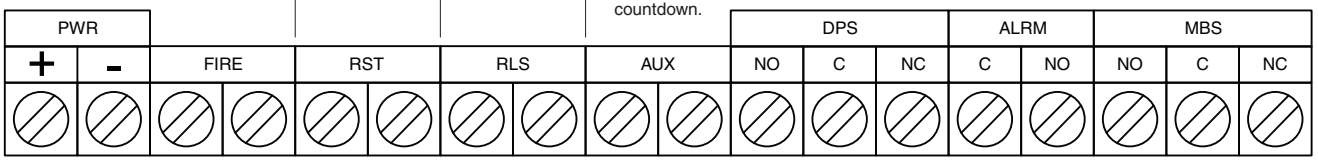
12V@200mA
24V@100mA
resistive

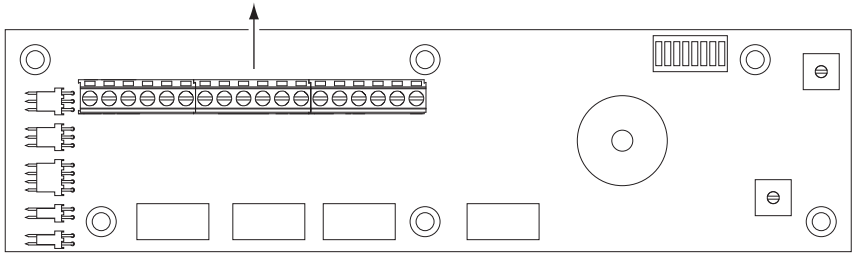
Alarm Output
(Optional)
Contacts change state during an alarm condition.

30V@1A
resistive

MBS Output
(Optional)
Contacts change state when magnet is properly bonded to its armature. Poor bond can be caused by low voltage, misalignment, or damaged mating surfaces.

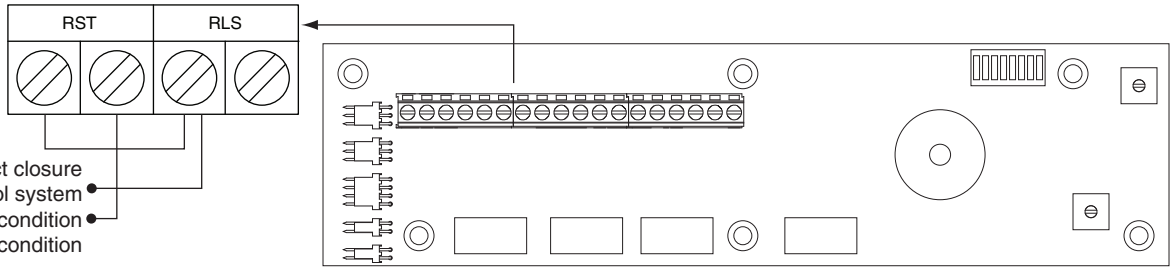
30V@1A
resistive





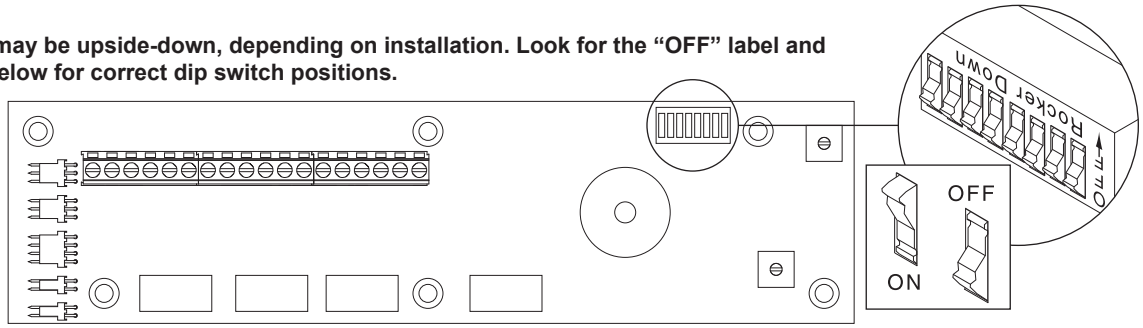
For wire gauge and length specifications, see ***"Wire Gauge and Length Specifications" on page 2***.

6c (Optional) To use one access control for both Reset and Release, wire as shown.



6d Set SW2 dip switches.

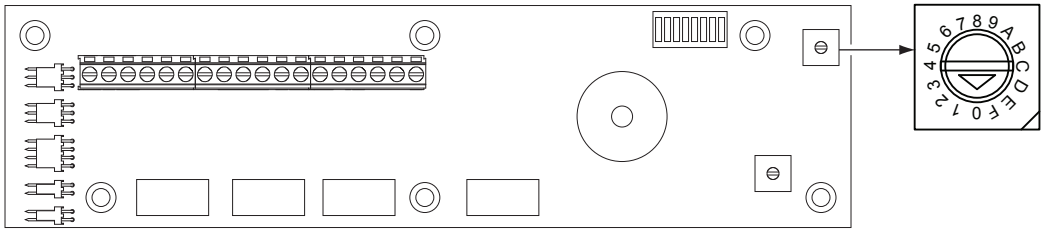
ⓘ **NOTE: Dip switch panel may be upside-down, depending on installation. Look for the "OFF" label and compare to the images below for correct dip switch positions.**



Feature	Switch	Setting				Description
Nuisance Delay		0 seconds	1 second	2 seconds	3 seconds	Nuisance delay is the amount of time the door must be pushed or aux input must be pressed before triggering the Delayed Egress Cycle. Programmable to 0-3 seconds.
	1	Off	On	Off	On	
	2	Off	Off	On	On	
Nuisance Alert	3	Off=Disabled		On=Enabled		Causes horn to sound during nuisance delay
Auto Relock	4	Off=Disabled		On=Enabled		When enabled, lock will energize upon regaining power or after a fire alarm condition clears.
Anti-Tailgate	5	Off=Disabled		On=Enabled		Door will relock as soon as it closes – even if the relock time delay has not ended.
Door Propped/Forced	6	Off=Disabled		On=Enabled		Enables door propped and door forced alarms
Unlock Alert	7	Off=Disabled		On=Enabled		Horn sounds whenever door is unlocked and power is still applied to the door
DEL Enabled	8	Off=Disabled		On=Enabled		Enables or disables the DEL plunger switch. Aux Input will always function even if DEL plunger switch is disabled.

6e Set relock time - SW4.

Relock time is the amount of time the lock is de-energized after a valid release. If auto relock is enabled, it also controls the amount of time the lock is unlocked before it automatically relocks after a power-on or fire alarm reset. Programmable 0-30 seconds in 2 second increments.



Setting	Delay in Seconds
0	0
1	2
2	4
3	6

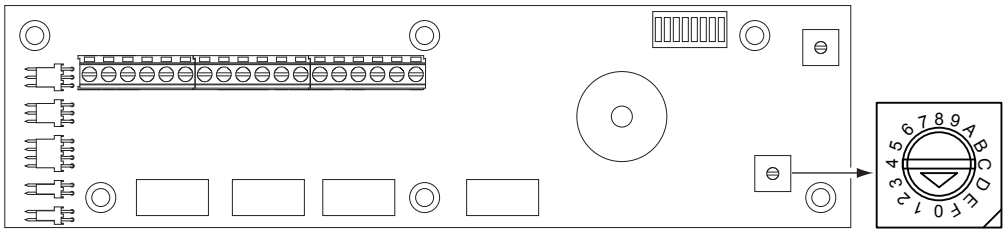
Setting	Delay in Seconds
4	8
5	10
6	12
7	14

Setting	Delay in Seconds
8	16
9	18
A	20
B	22

Setting	Delay in Seconds
C	24
D	26
E	28
F	30

6f Set door prop time - SW3.

The amount of time the door must be propped open (after normal release time delay has ended) before triggering the alarm. The alarm will clear as soon as the door closes again. Programmable 0-150 seconds in 10 second increments.



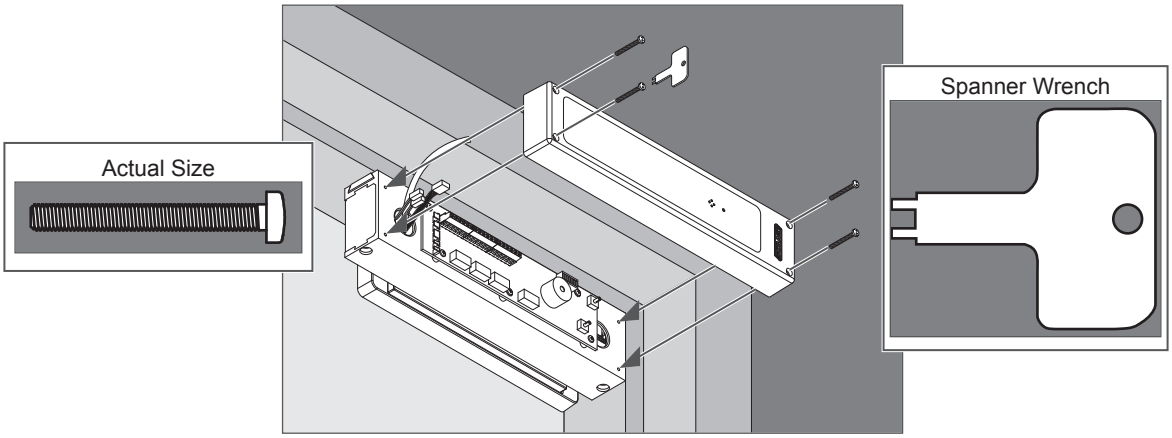
Setting	Delay in Seconds
0	0
1	10
2	20
3	30

Setting	Delay in Seconds
4	40
5	50
6	60
7	70

Setting	Delay in Seconds
8	80
9	90
A	100
B	110

Setting	Delay in Seconds
C	120
D	130
E	140
F	150

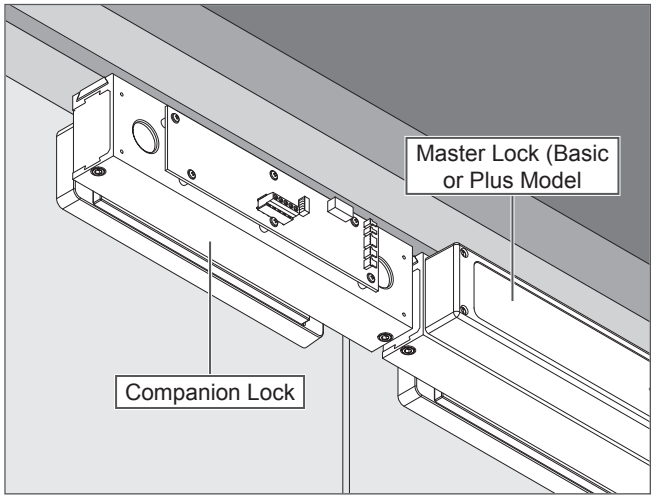
6g Install cover.



7 If double door, install second lock (M490DE-2 or M490DEP-2).

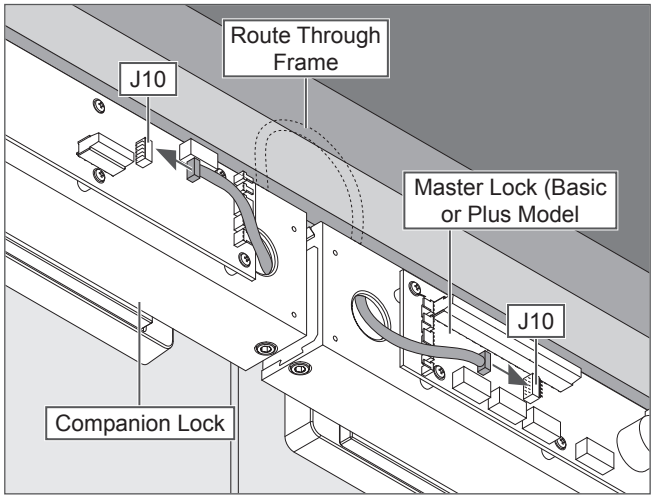
7a Install second lock.

a. Reorient as needed as shown in step ***1b***.
b. Install lock as shown in steps ***2***-***4***.

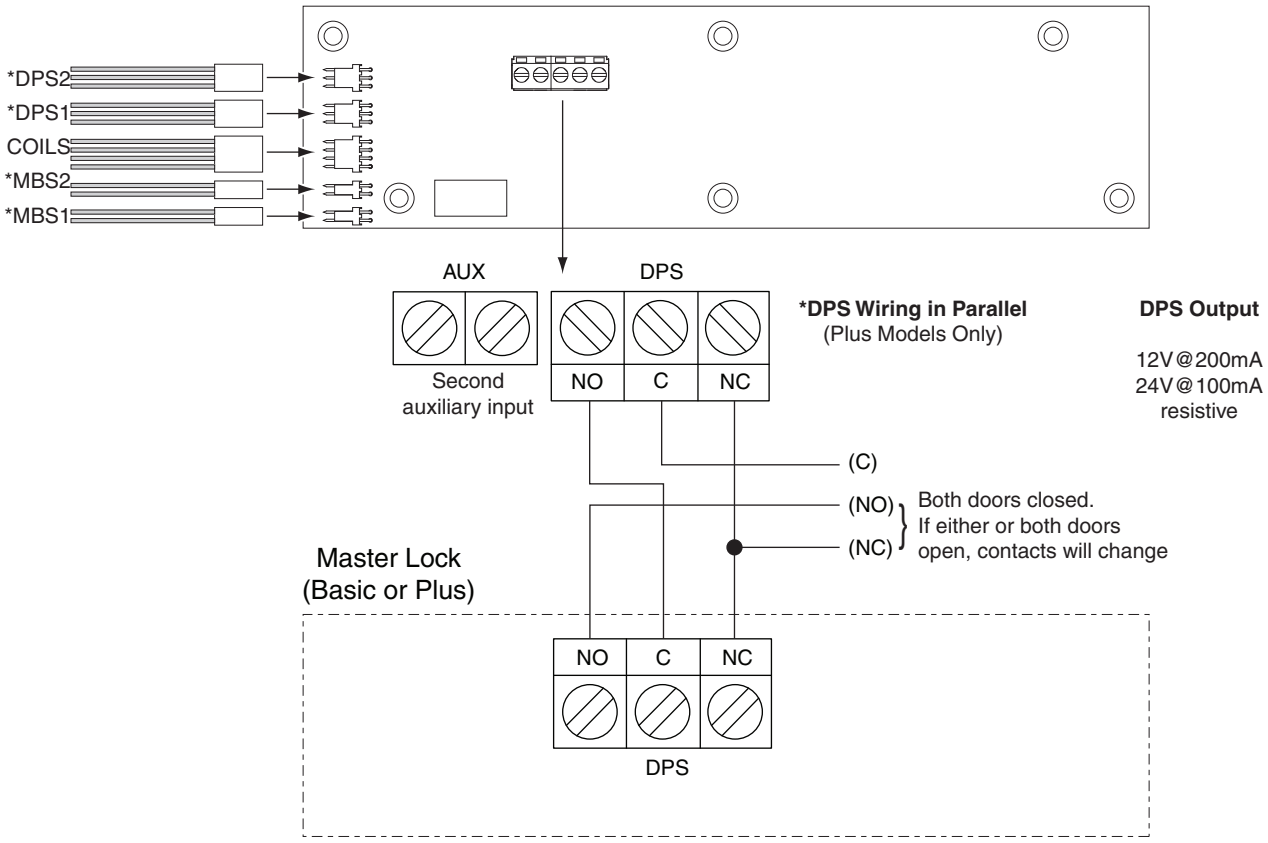


7b Install communication cable.

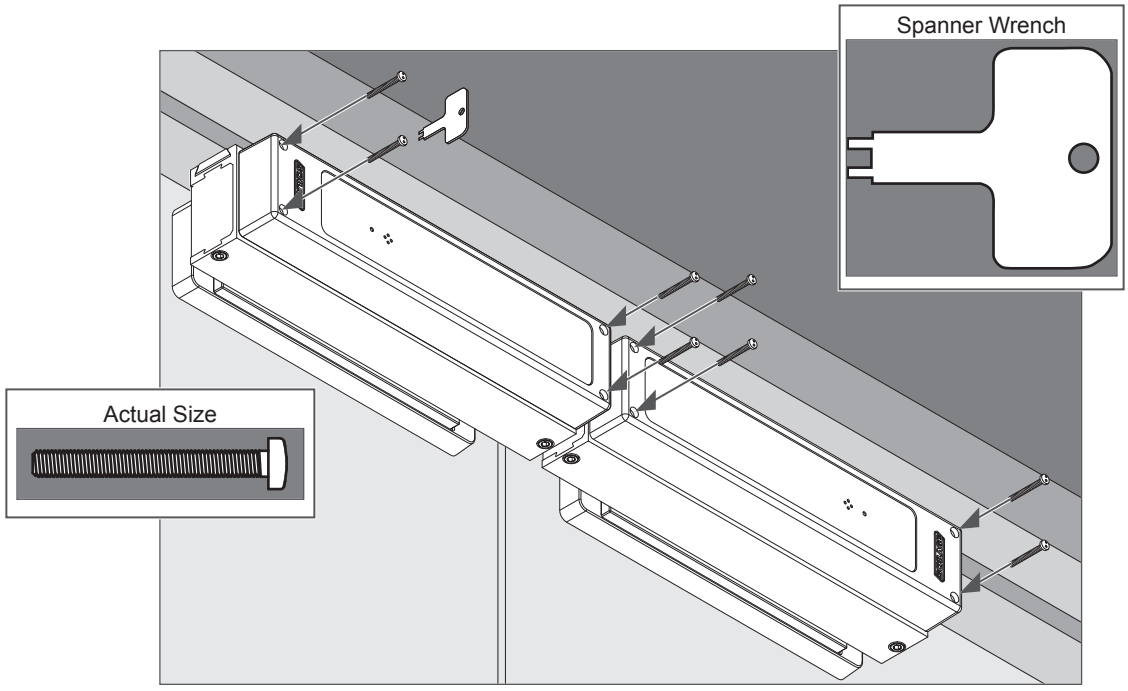
a. Route cable (supplied) through frame.
b. Connect cable to each lock.



7c Connect wiring to second lock.



7d Install covers.



ⓘ **Note: Some warming of the device under routine operation is normal.**

Indicator Table

Condition	LED Indicator	Audible	Alarm Relay State
Standard Features			
Lock Secure	Off	Off	Open
Authorized Release Input	Steady Green	Off	Open
During Nuisance Delay	Steady Red	Off (Default) Set by SW2-3	Open
During Fire Alarm	Steady Green	Off	Closed
During Delayed Egress	Flashing Red	Beeping	Closed
After Delayed Egress	Steady Green	Steady Tone	Closed
Switch Selectable Features			
SW2-7 "ON" = Unlock Alert whenever lock is unlocked	Steady Green	Steady Tone	Open
SW2-3 "ON" = Horn will sound during nuisance alert	Steady Red	Steady Tone	Open
Optional Switch Selectable Features - Plus Model Required			
Door Propped Open Alarm	Flashing Green	Beeping	Closed
Door Forced Open Alarm	Flashing Red	Steady Tone	Closed
Door Forced Open Alarm followed by Delayed Egress Input	Steady Green + Flashing Red	Steady Tone	Closed

Troubleshooting

Condition	LED Indicator
Lock has power but won't lock. LED (on lock) is Green.	Fire alarm not connected or open connection. SW4-7 not ON (set switch, remove and re-apply power).
Won't go into delayed egress.	Check dipswitch settings
	Armature washers not installed properly
	Magnet not properly aligned with armature.
Goes into delayed egress upon powerup.	Armature washers not installed properly
	Improper gap between magnet and armature
Lock can be pushed open with minimal resistance.	Magnet/Armature/washers not installed properly
Lock "hums" or vibrates noisily when energized.	Magnet/Armature/washers not installed properly
LED(s) flash once quickly.	Relock delay set to 0 sec.
	Keypad not initialized
MBS doesn't change state when locked.	Low voltage. Mechanical misalignment. Debris between lock and armature. Armature/ magnet not installed properly
DPS option not working properly.	Armature holder not aligned with DPS switch.
	Switch not plugged into correct jack

BOCA Operational Description

ⓘ **BOCA Option is Applicable in United States Jurisdictions Only**

a. Lock the door and start the release process by pushing on the actuating bar (or door if no actuating bar provided) for at least 1 second. The door will release within 15 seconds.
b. The door will not relock until the door has been opened, and returned to the closed position for not less than 30 seconds. Any reopening of the door during this time will restart the 30 second relocking cycle.
c. A 30 second release time delay may be provided with code official approval.

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