# SECO-LARM®

## Electromagnetic Locks

### With LED, Bond Sensor
**E-941SA-600PQ** 600-lb. (272kg)
**E-941SA-1K2PQ** 1200-lb. (545kg)

### Weatherproof
**E-941SA-300** 300-lb. (136kg)*

## Manual

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LISTED



*E-941SA-300 is not UL listed.

SECO-LARM® SLI™

R&HS CE

**SECO-LARM Electromagnetic Locks**

## Table of Contents:

## Introduction:

The E-941SA series of electromagnetic locks is the ideal way to secure a door against unauthorized entry. When power is applied to the electromagnetic lock, it creates an extremely strong magnetic field. The electromagnet is strongly attracted to the steel armature plate which is mounted on the secured door. Once the electromagnet is deactivated, the secured door will function normally without any residual magnetism.

## Features:

- Anodized aluminum.
- No residual magnetism.
- MOV surge protection.
- Adjustable mounting bracket.
- Complete mounting hardware for typical installations.
- "L" bracket and "Z" brackets available for easy mounting.*
- 12/24VDC selectable.*
- Detachable faceplate.*

**E-941SA-1K2PQ** and **E-941SA-600PQ** also feature:

- Built-in dual-colored status LED and bond sensor to show locking status:

| Green | Door is closed and locked |
|-------|---------------------------|
| Red | Door not closed and/or locked |
| Off | Door in use / No power |

**E-941SA-300** features:

- Weatherproof for outdoor use.
- Pre-installed 36" (91cm) hookup wire included.

*E-941SA-300 does not have this feature.

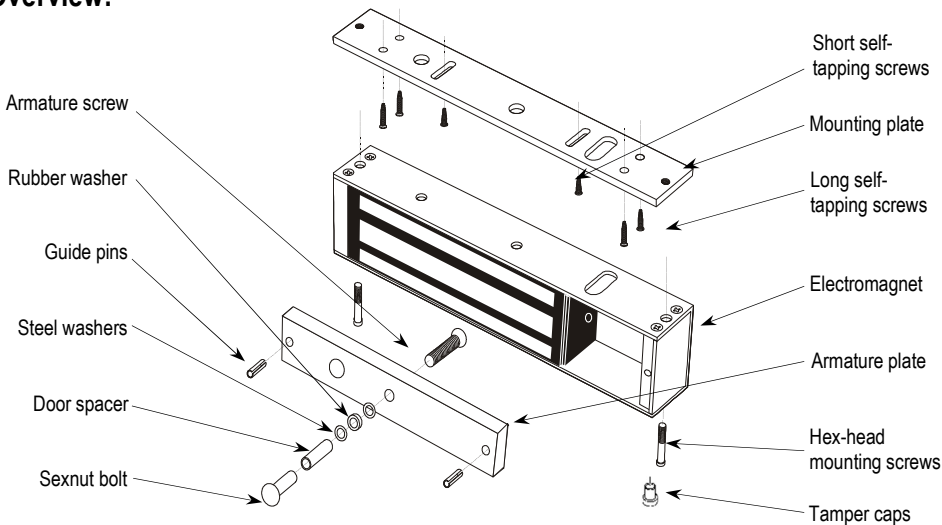## Parts List:

1 x Mounting plate

1 x Electromagnet

1 x Armature plate

1 x Armature screw

2 x Steel washers

1 x Rubber washer

1 x Door spacer

1 x Sexnut bolt

2 x Guide pins

4 x Long self-tapping screws

2 x Short self-tapping screws

2 x Hex-head mounting screws

2 x Tamper caps

2 x Hex wrenches

## Specifications:

| | | 300-lb | 600-lb | 1,200-lb |
|---|---|---|---|---|
| Operating voltage | | 12VDC ±10% | 12 or 24 VDC ±10% | |
| Current draw | 12VDC | 315mA@ | 500mA | |
| | 24VDC | N/A | 250mA | |
| Coil resistance | | 38Ω±10% | 48Ω±10%(see page 8) | |
| Bond sensor relay | | N/A | 3A@12VDC | |
| Dimensions | Magnet | $6^3/_4$"x1"x1$^1/_4$" (170x23x32 mm) | $9^7/_8$"x1$^1/_{16}$"x1$^5/_8$" (250x26x40 mm) | $10^1/_2$"x1$^5/_8$" x2$^5/_8$" (268x42x67 mm) |
| | Armature plate | $6^1/_4$"x$^9/_{16}$"x1$^5/_8$" (159x14x41 mm) | $7^1/_4$"x1$^1/_2$"x1$^1/_2$" (185x12x38 mm) | $7^1/_4$"x$^5/_8$"x2$^3/_8$" (185x16x61 mm) |
| Operating temperature | | 14°~131° F (-10°~55° C) | | |
| Weight | | 2-lb 13.5-oz (1.3kg) | 4-lb 6-oz (2kg) | 11-lb (5kg) |
| UL Listed | | No | Yes | Yes |

## Overview:

Short self-tapping screws

Mounting plate

Armature screw

Long self-tapping screws

Rubber washer

Electromagnet

Guide pins

Steel washers

Armature plate

Door spacer

Hex-head mounting screws

Sexnut bolt

Tamper caps

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## Installation Applications:

**NOTE**: When mounting the electromagnet, it may be necessary to use a "Z"-bracket, 1 or 2 "L"-brackets, and/or plate spacers, depending on the location and the type of door and frame. Use the diagram below to help decide whether or not an optional bracket will be necessary for installation.
**See page 7 for a complete list of SECO-LARM accessories.**

### Typical Installation
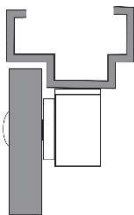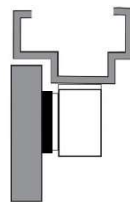
### Plate Spacers
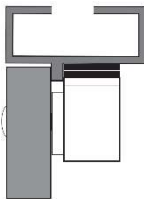
### "L" Bracket
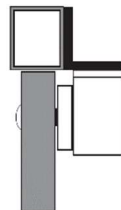
### "L"-Bracket and "Z"-Bracket
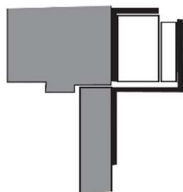
### "U" Bracket
(Typically for glass doors)
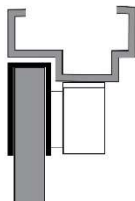
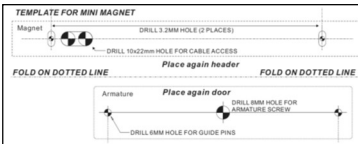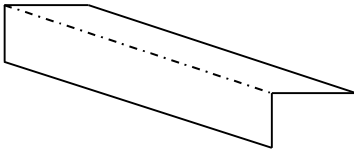### Armature-Mounting Plate

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## Installation Notes:

1. Read this installation manual thoroughly. A clear understanding of the product and this manual will make installation much easier.
2. The electromagnetic lock is designed for indoor use ONLY.
3. The most suitable mounting location for the electromagnetic lock may require the use of additional SECO-LARM accessories such as Z-brackets, L-brackets, and/or spacer plates. Please see the diagram on page 3 to decide if a particular application requires any mounting accessories. See page 7 for a complete list of SECO-LARM accessories.
4. Do not run power wires and signal wires in the same conduit as this may cause interference.
5. Do not install a diode in parallel with the electromagnetic lock as this may cause a delay when releasing the door as well as cause residual magnetism.
6. The best location to install the electromagnetic lock is on the inside of the door that is being secured with the wiring concealed in the frame to prevent tampering with the unit.

## Installation:

**1.** Fold the mounting template along the dotted line to form a 90-degree angle.

TEMPLATE FOR MINI MAGNET
Magnet
DRILL 3.2MM HOLE (2 PLACES)
DRILL 10x22mm HOLE FOR CABLE ACCESS
FOLD ON DOTTED LINE
Place again header
FOLD ON DOTTED LINE
Armature
Place again door
DRILL 6MM HOLE FOR
ARMATURE SCREW
DRILL 6MM HOLE FOR GUIDE PINS

**2.** Close the door. Find a mounting location on the door frame near the upper free-moving corner of the door, or as close as possible to the upper corner of the door frame opposite the hinges.
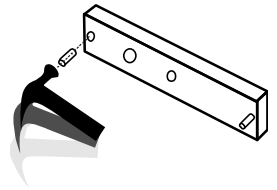
Door Frame

Ideal
Mounting
Location
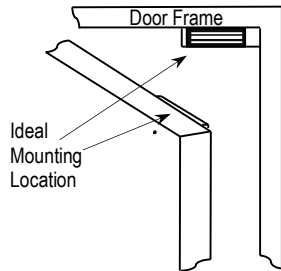
**3.** Place the template against the door and frame. Mark where the holes are to be drilled.

Door Frame
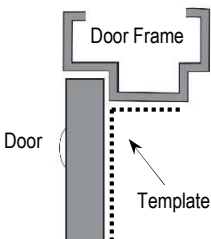
Door

Template

**4.** Drill two holes in the frame and three holes in the door as shown on the template.
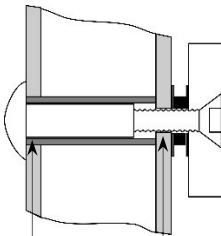
Door Frame
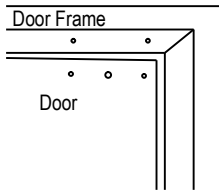
Door

**5.** Use a hammer to lightly tap the guide pins into the guide pin holes on the armature plate.

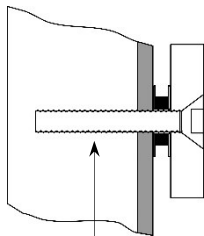**6.** Depending on the type of door being protected, drill holes according to the diagrams below:
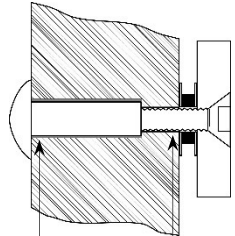
| Hollow Metal Door | Reinforced Door | Solid Core Door |
|---|---|---|



5/8" (16mm)     5/16" (8mm)        1/4" (6.8mm) for M8x1.25 thread        1/2" (12 .7mm)     5/16" (8mm)

Drill a 5/16" (8mm) dia. hole through the armature-plate side of the door for the armature screw. Then drill a 5/8" (16mm) dia. hole for sexnut screw on the opposite side of the door.

Drill a 1/4" (6.8mm) dia. and 1" (25mm) deep hole, tap for M8x1.25 thread.

Drill an 5/16" (8mm) dia. hole on the door for the armature screw, and drill a 1/2" (12.7mm) dia. and 1" (25mm) deep hole for the sexnut screw.

**7.** Put a rubber washer between the two metal washers, and place them over the armature screw between the armature plate and the door. This allows the plate to pivot around the screw to compensate for door misalignment.



*The rubber washer will be sandwiched between the two metal washers.*

Metal washers
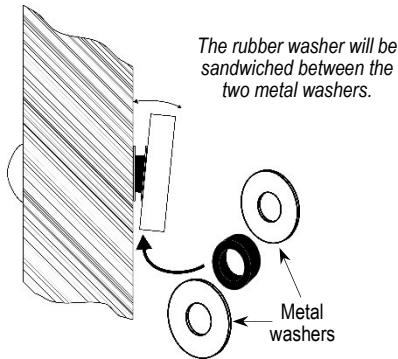
**8.** Tighten the armature screw enough so that the armature plate can withstand a break-in attempt, but loose enough so that the armature plate can pivot slightly. Make sure the anti-spin guide pins are in the two guide pin holes.
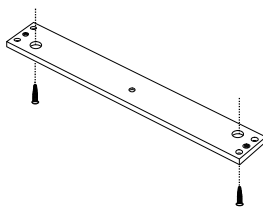


Armature screw

Guide pins
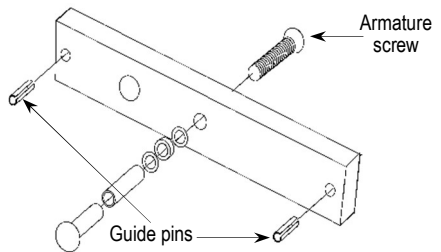
***Tip:*** *Use a thread-locking compound on the armature screw to ensure a long-lasting installation.*

**9.** Screw the two short self-tapping screws through the mounting plate's slotted holes, but do not over-tighten them. Keeping them loose will allow for adjustment of the plate left or right so that the mounting plate and the armature plate form a 90-degree angle. See the diagram below.
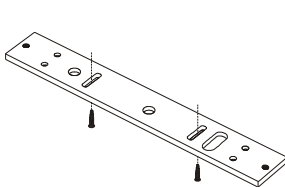


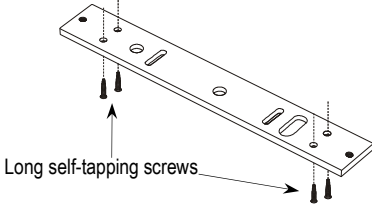300-lb and 600-lb mounting plate

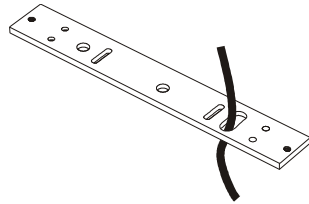300-lb mounting plate
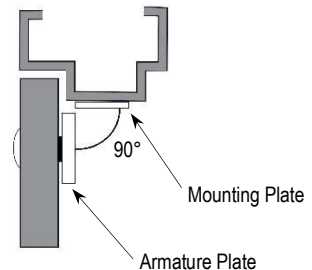
90°

Mounting Plate

Armature Plate

**10.** Once the position of the mounting plate is correct, use the four long self-tapping screws to permanently mount the mounting plate.

Long self-tapping screws

**11.** Drill the cable access hole. Run the power leads through the cable access hole in the mounting plate and through the hole in the door frame.

**12.** Remove the cover from the front of the electromagnet. Run the power leads through the large cable access hole .
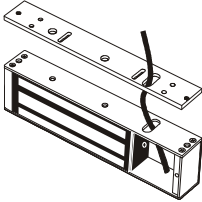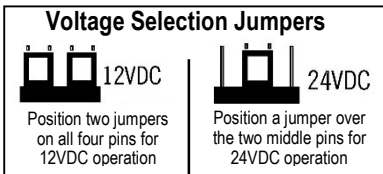
**Skip this step for E-941SA-300. Power leads are pre-installed. Faceplate does not detach.**

**13**. Push the electromagnet against the mounting plate so the electromagnet ends are flush with the ends of the mounting plate. Use the Allen wrench to screw the hex-head mounting screws through the bottom of the electromagnet into the mounting bracket.
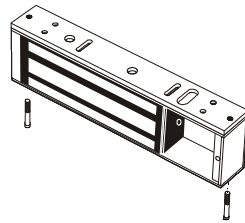
**14.** Cut the wires so they are long enough to connect with the terminal block. Set the voltage using the selection jumpers based on your input voltage.

### Voltage Selection Jumpers

12VDC

Position two jumpers on all four pins for 12VDC operation

24VDC

Position a jumper over the two middle pins for 24VDC operation

**NOTE**: Failure to correctly set the input voltage may cause damage to the lock.

**NOTE**: Connect switching devices like push-to-exit switches between the power source and the positive terminal on the lock. Connecting switching devices to the negative terminal may cause a delay in unlocking.

**15.** Connect the power wires according to the wiring diagram on page 7. Test the unit. Then replace the front cover and install the hex-head tamper caps.
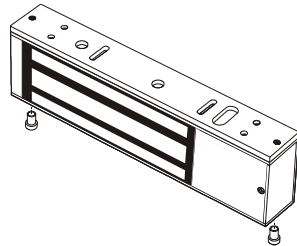
**NOTE:** This should be the very last step, as once the tamper caps are in place they are very difficult to remove.
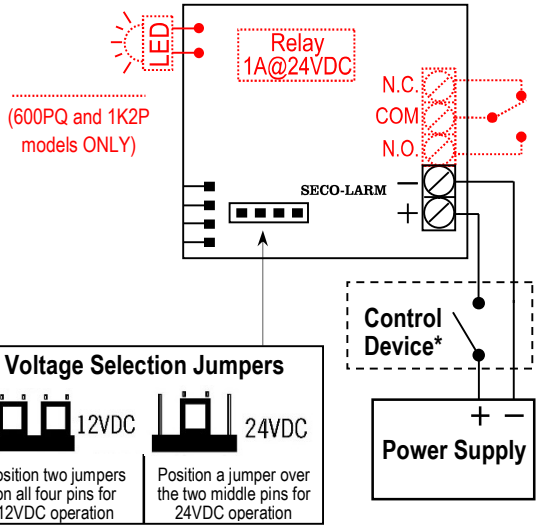
# Wiring Diagram:

### Bond Status Sensor:

The Bond Status Sensor checks to make sure the door is closed, and the electromagnet is locked.
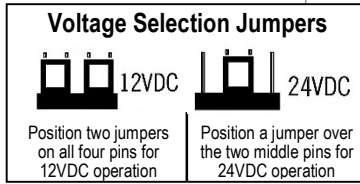
#### LED Indicators:

| Green | Door is closed and locked |
|-------|---------------------------|
| Red   | Door not closed and/or locked |
| Off   | Door in use / No power |

**600PQ and 1K2P models ONLY**

LED

(600PQ and 1K2P models ONLY)

Relay
1A@24VDC

N.C.
COM
N.O.

SECO-LARM

Control
Device*

+  —
**Power Supply**

*\*NOTE*: Connect switching devices like push-to-exit switches between the power source and the positive terminal on the lock. Connecting switching devices to the negative terminal may cause a delay in unlocking.

### Voltage Selection Jumpers

12VDC          24VDC

| Position two jumpers on all four pins for 12VDC operation | Position a jumper over the two middle pins for 24VDC operation |
|---|---|

# Maximum Distance from Power Source to Electromagnetic Lock:

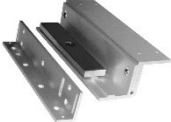For a complete chart, please visit www.seco-larm.com

**12VDC Minimum Wire Gauge:**

| Wire Length | 25ft. | 50ft. | 75ft. | 100ft. | 150ft. | 200ft. | 250ft. | 300ft. | 400ft. | 500ft. | 1000ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wire Gauge @ 500mA | 20 | 18 | 18 | 18 | 16 | 14 | 14 | 12 | 10 | -- | -- |

**24VDC Minimum Wire Gauge:**

| Wire Length | 25ft. | 50ft. | 75ft. | 100ft. | 150ft. | 200ft. | 250ft. | 300ft. | 400ft. | 500ft. | 1000ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wire Gauge @ 250mA | 24 | 24 | 22 | 20 | 18 | 18 | 16 | 16 | 14 | 14 | 14 |

**Note: E-941SA-300 is pre-wired.**

# Optional **SECO-LARM** Electromagnetic Lock Accessories:

| | Does not include armature plate | | | | |
|---|---|---|---|---|---|
| Description | "Z" Brackets (includes 1 "L" Bracket) | "L" Brackets | Plate Spacers | Glass Door "U" Brackets | Armature Plate Holders |
| 600-lb. Models | **E-941S-600/ZQ** | **E-941S-600/LQ** | **E-941S-600/PQ** | **E-941S-600/UQ** | **E-941S-600/HQ** |
| 1200-lb. Models | **E-941S-1K2/ZQ** | **E-941S-1K2/LQ** | **E-941S-1K2/PQ** | **E-941S-1K2/UQ** | **E-941S-1K2/HQ** |

**Note: Brackets and spacers are not available for E-941SA-300.**

## Troubleshooting:

| | |
|---|---|
| Door does not lock<br>Bond status LED does not Illuminate | • Check to make sure the wires are securely tightened to the terminal block.<br>• Check that the power supply is connected and operating.<br>• Use a meter to check the resistance of coils inside the lock. See below.<br>• Make sure the rubber washer is installed and free from damage. |
| Door locks, but can easily be forced open | • Make sure the electromagnet and armature plate are properly aligned.<br>• Make sure the contact surfaces of the electromagnet and armature plate are clean and free from rust.<br>• Check the power leads with a meter, and make sure 12VDC or 24VDC is present.<br>• Use a meter to check the resistance of coils inside the lock. See below.<br>• Make sure the rubber washer is installed and free from damage. |
| Delay in door releasing | • The electromagnet is fitted with a metal oxide varistor to prevent interference, so do not install a second diode. |
| No relay output | • Check that the power is connected properly and turned on.<br>• Make sure the lock is aligned properly.<br>• Make sure the NO/NC/COM are wired properly. |

**If the Electromagnet has low or no holding force, check the resistance of the coils by performing the following steps:**

1. *Remove the faceplate from the lock.*
2. *Disconnect the wire harness from the circuit board.*
3. *Using a meter, measure the resistance across: Red / Green wires, and the Black / White wires.*
4. *Each coil should test 48Ω±10%.*
5. *If one or both of coils shows an open, short, or incorrect resistance, replace the electromagnet.*

**Wire Harness:**

$48\Omega \pm 10\%$ { White, Black
$48\Omega \pm 10\%$ { Green, Red