24200669

# M390RFK ELECTROMAGNETIC LOCK INSTALLATION INSTRUCTIONS

PLEASE DELIVER ALL INSTALLATION INSTRUCTIONS TO THE END-USER UPON COMPLETION OF THE INSTALLATION.

## Pre-Installation Instructions

1. This product must be installed according to all applicable building and life safety codes.
2. Due to the variety of mounting configurations available with this product, a survey and assessment of the physical area in which the product will be installed must be performed.
3. The door frame must be inspected and deemed structurally sound prior to installation of the electromagnetic lock. The structural integrity of the mounting surfaces must be strong enough to meet or exceed the holding force of the product.
4. The product must be protected from potential damage due to intruders or tampering.
5. The product should be installed in a location that will not hinder or create a potential safety hazard to authorized personnel accessing the protected area.
6. Because electromagnetic locks are used in a variety of applications and different door frame configurations, an experienced installer with knowledge of this product must make a determination of the optimal mounting method for this specific application.
7. The components, hardware, installation instructions and mounting template included with this product are intended for use on outswinging doors.
8. Do not install this product on the exterior of buildings.
9. Do not use as a doorstop. This will void warranty.
10. Installation of this product should be done by an experienced installer with knowledge of this product.

**NOTE:** It is highly recommended that thread locking compound be applied to all screws during installation to reduce chance of screws loosening over extended time.

## Mounting Instructions

Installation of this product should be done by an experienced installer with knowledge of this product.

Step 1a) **Read Pre-Installation Instructions.**

Step 1b) **Prepare Door & Frame (for new installs)**
Place against closed door and header with allowance for Allen key clearance from the edge (1 -1/4").
Drill the middle hole in the door and 2 holes in the header as indicated. Center mark the two holes to mount armature holder.
NOTE: Different hole sizes required for the different materials.
Do not use as a doorstop. This will void warranty.

Step 1c) **Mount Armature Plate**
Position bolt with rubber head through the armature plate.
Carefully apply thread locking compound to exposed thread.
Secure armature plate to door and armature holder by threading into sexnut.

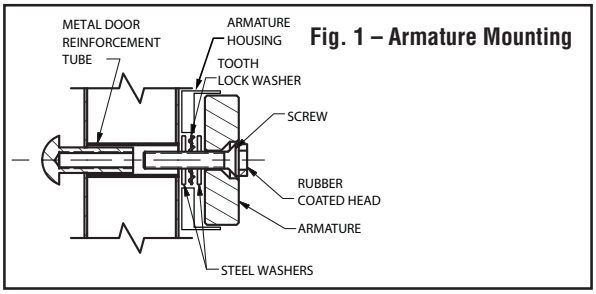


**Fig. 1 – Armature Mounting**

**NOTE:** During the installation of the armature plate to the door it is essential that the armature plate remains movable. The armature plate must be allowed to pivot on the center-mounting bolt to allow proper alignment with the magnet surface. If the plate is not aligned with the magnet surface, the lock may lose holding force or not lock at all.

The head of the armature mounting bolt ships with a rubber washer affixed to it. This washer should project slightly beyond the surface of the armature plate. This is to allow the washer to expand when power is removed and break the air vacuum between the plate and magnet surface. If this washer is removed or trimmed, the lock will appear to have some holding force even when power is removed.

Step 1d) **Mount Electromagnetic Lock**
Remove blocking screws from front of lock.
Remove electromagnetic lock from mounting bracket by loosening captive screws and sliding off keyholes.

**New Installation:**
Attach bracket to header with the 2 panhead machine screws or the self drilling screws provided through the slots.
NOTE: Do not over tighten these screws as the bracket may need adjustment.
Slide electromagnetic lock onto mounting bracket keyholes.
Engage 1 captive screw at each end through bottom to fix lock position on bracket.
Adjust alignment to ensure full contact of magnet with armature plate.
Carefully remove electromagnetic lock without shifting mounting bracket.
Secure mounting bracket in position with either 9 TEK™ screws, or 4 flat counter sunk machine screws.
Drill ¾ (19mm) wire access hole using mounting bracket as a guide. Tip the electromagnetic lock to expose the 4 captive mounting screws. Carefully apply thread locking compound to exposed threads. Slide the electromagnetic lock onto mounting bracket keyholes.
Secure with 4 captive mounting screws.

**Retrofit Installation:**
Attach bracket to header with 9 TEK (tm) screws or 4 flat counter sunk machine screws utilizing holes from previous installation.
Additional TEK screws may be used for added strength.

**Retrofit Installation Continued**

Tip the electromagnetic lock to expose the 4 captive mounting screws.

Carefully apply thread locking compound to exposed threads. Slide the electromagnetic lock onto mounting bracket keyholes. Secure with 4 captive mounting screws.

**WARNING: Improper installation, maintenance, inspection or usage of the product or any related accessories or parts may cause the electromagnetic lock, armature plate and associated hardware to disengage and fall, causing serious bodily injury and property damage. Schlage will not be liable to the installer, purchaser, end user or anyone else for damage or injury to person or property due to improper installation, care, storage, handling, maintenance, inspection, abuse, misuse or act of God or nature involving this product or any related accessories or parts.**

**2.** Route the power supply connecting wire through the door frame and into the wire access hole in the top of the magnet housing. Connecting wire should be of sufficient gauge for the lock being installed and the distance being run. See table on page 4 for current draw specifications and wiring gauge chart.

NOTE: UL LISTED ELECTROMAGNETIC LOCKING DEVICES MUST BE USED WITH UL APPROVED POWER SUPPLIES (SCHLAGE OFFERS A FULL LINE OF POWER SUPPLIES). THIS M390RFK ELECTROMAGNETIC LOCK IS cULus LISTED.

**3.** Once wiring has been routed into the lock cavity, connect wire to terminal blocks as shown in Fig. 3. If Door Status Monitor (DSM) and/or Magnetic Bond Sensor (MBS) features are being used, these can also be wired at this time as shown in Fig. 3.

**4.** Relocking Time Delay (RTD) Feature -

The RTD feature can be used to momentarily release the lock and keep it unlocked for a time period from 0 to 110 seconds. The time delay for this feature can be adjusted by carefully turning the potentiometer (RW1) in a clockwise direction to increase delay time. Factory setting is zero seconds.

**NOTE:** If RW1 is not set to zero seconds, the lock will enter delayed relock mode each time power is applied.

**5. Anti-Tamper Feature**

Two screws prevent insertion of an Allen wrench into the captive mounting screw opening on the bottom of the lock. Fig. 2 shows their location. One screw also secures the wiring cavity cover. The mounting plate cannot be separated from the lock without removing these two screws.

**Fig. 2 – Lock Mounting**

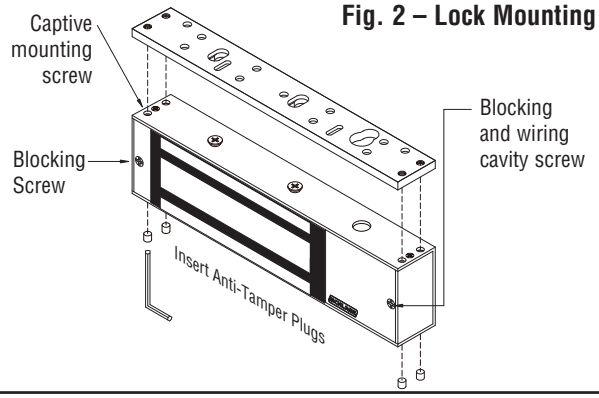
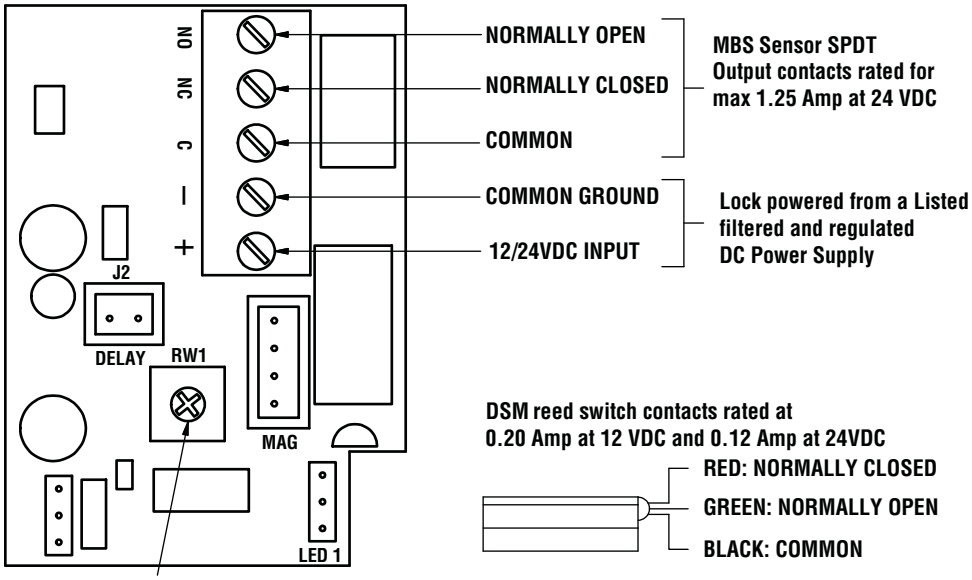


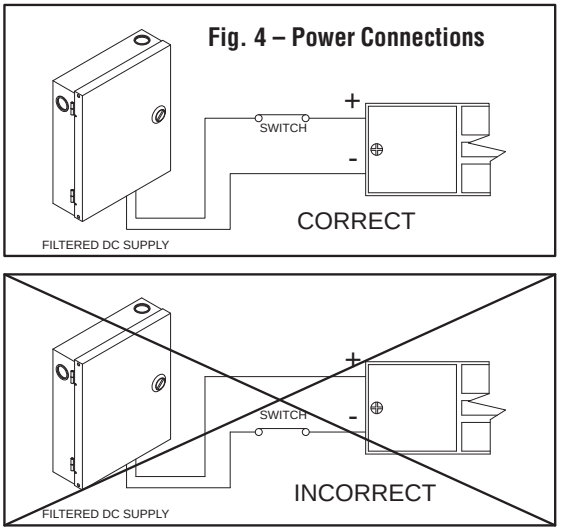

**Fig. 3 – Lock Wiring**



6. **To Ensure Instant Release** All switching devices must be wired in between the DC power source and the positive terminal of the lock in Fig. 4. Switching the negative power supply line will not allow the lock to release immediately.

   This Schlage Lock contains TVS for surge suppression and does not require any additional suppression to be added during installation.

**Fig. 4 – Power Connections**




## Lock Monitoring Features

The M390RFK lock is equipped with remote indication features that operate as follows. Each of these features will provide indication as to the lock status. See Fig. 3 for wiring diagram.

**MBS– Magnetic Bond Sensor**
This feature can detect the quality of the locking bond between the surface of the magnet and the armature plate. The sensitivity of this feature is such that a foreign object with a thickness of .007" (.18mm) is sufficient to allow the sensor to detect a problem.

Due to the sensitivity of this feature and the necessity to maintain a reliable locking bond, these surfaces must be kept free of contaminating materials. Both the lock surface and the armature plate must be cleaned periodically with a non-abrasive cleanser. Alignment of armature plate and magnet is required to ensure proper function of sensor. Status is indicated locally via an LED mounted on the bottom of the lock housing.

**DSM – Door Status Monitor**
The DSM feature monitors the position of the door upon which the lock is installed. A SPDT reed switch mounted within the lock cavity eliminates the need for extra sensors to be installed on the door for notification of security or access control systems.

# Listings

These products have been successfully tested and evaluated by UL in two separate categories for use in both the United States and Canada.

Auxiliary Lock. The GWXT fire listing qualifies the M390RFK lock for use with UL Classified fire doors maximum 4' in width and 8' in height, rated up to and including 3 hours.

Component for use in Special Locking Arrangements. Additionally, these products are qualified components for the purpose of locking outward-swinging exit doors against unauthorized egress.They are designed to release automatically in case of a power failure or upon activation of an automatic fire alarm system wired to the power supply fire panel relay.

**The Following Conditions of Acceptability Apply:**

**1)** This product is intended for use with Special Locking Arrangements which are installed in accordance with the manufacturer's installation and operation instructions, the Life Safety Code, NFPA 101 of the National Fire Protection Association and the local authority having jurisdiction.

**2)** The power for this unit is to be provided by a Listed (ALVY, ALVY7 FULA, FULA7, FUPPC, UEHX7, APHV or APHV7) Class 2 power supply when designated as a Special Locking Arrangement (FWAX or FWAX7).

**3)** The suitability of the lead wires is to be evaluated per the requirements for the end-use product.

**4)** When this product is installed in conjunction with a fire alarm control panel, the wiring from the control unit to this product device shall be for fail-safe operation.

**5)** For Canadian Installations, this product is to be installed in accordance with the manufacturer's installation and operation instructions, The Canadian Electrical Code C22.1-02, and the local authority having jurisdiction.

**6)** To qualify for use in a delayed-egress locking system, the relock delay must be set to 0 seconds.

**Note:** These locks are not intended or tested for use as a UL Listed Burglar Alarm System Unit.

These models have also been independently tested to the ANSI/BHMA A156.23-2010 American National Standard for Electromechanical Locks.
**Holding Force:** 1500lbf
**Cycle Test:** Grade 1 = 1 million cycles

Power Supply:

| Voltage | M390RFK |
|---|---|
| 12VDC | 0.65A |
| 24VDC | 0.45A |

# Specifications

**MECHANICAL** (Including 1/4" [6.4mm] mounting bracket):

M390RFK Lock Dimensions:
1-5/8"D x 2-7/8"W x 10-1/2"L (41mm x 73mm x 268mm)

Armature Dimensions:
Plate: 5/8"D x 2-3/8"W x 7-7/16"L (16.5mm x 61mm x 190mm)
Housing: 3/4"D x 2-11/16"W x 10-3/8"L

**ENVIRONMENTAL:** Not for use in outdoor environments.
Circuit board operating temperature: 14 to 140˚F (-10 to 60˚C)

**ELECTRICAL:**
**Voltage:** Auto sensing 12VDC or 24VDC
**Current:** 0.65A at 12VDC
0.45A at 24VDC

**MBS Output Relay*:** SPDT relay. Contacts rated at 1.25A at 24VDC
**DSM Reed Switch*:** Magnetically actuated SPDT switch. Contacts rated for 0.20A at 12VDC and 0.12A at 24VDC

***** Effective for either resistive or inductive loads (power factor ≥ 0.6 with inductive loads)

**NOTE:** Specifications may change without notice.

## M390RFK CURRENT REQUIREMENTS:

**12VDC** 650 milliamps
**24VDC** 450 milliamps

| | 0-100' | 200' max | 300' max |
|---|---|---|---|
| **12VDC** | 16 Gauge | 12 Gauge | 12 Gauge |
| **24VDC** | 18 Gauge | 18 Gauge | 16 Gauge |

***NOTE:** Wire gauges shown reference the load of a single M390RFK electromagnetic lock.

**NOTE:** All Schlage electromagnetic locks must be powered with a Listed filtered and regulated DC power supply such as the Schlage PS900 Series of UL Listed power supplies.
Schlage offers a full line of power supplies and switching devices that are suitable for use with the M390RFK lock.

## Inspection and Maintenance

This product must be inspected and maintained on a **quarterly basis**. Contacting surfaces of the electromagnetic lock and armature plate must be kept free of contaminating materials. Surfaces must be cleaned periodically with a non-abrasive cleaner.

PLEASE DELIVER ALL INSTALLATION INSTRUCTIONS TO THE END-USER UPON COMPLETION OF THE INSTALLATION.

All mounting fasteners must be inspected on a **quarterly basis**. When properly installed, the ends of the armature plate allow a slight movement but the plate will feel secure when grasped at the bolt. There should be no movement to the mounting bracket or housing of the electromagnetic lock.

For added safety, thread locking compound has been provided for the armature plate bolt and the four captive electromagnetic lock mounting screws.

**WARNING: Improper installation, maintenance, inspection or usage of the product or any related accessories or parts may cause the electromagnetic lock, armature plate and associated hardware to disengage and fall, causing serious bodily injury and property damage.**

**For product support and additional information, please call or visit:**
**Toll-Free:** 1.877.671.7011
www.schlage.com/support

## M390RFK Series Troubleshooting Guide

| Problem | Solution |
|---|---|
| Cannot remove the lock mounting bracket from top of magnet for installation. | Remove blocking screw. Insert supplied Allen wrench into mounting bolt holes in the bottom of the lock housing and turn. (See Fig.2) |
| Lock is installed but has no holding force at all. | Check connections at power supply, connected releasing devices, lock terminals and lock circuit board to magnet core. |
| Lock has enough holding force to lightly hold a screwdriver or set of pliers but door will not lock. | Check to see that armature plate is correctly aligned with the electromagnetic lock. If there is improper alignment, make a 1/4" turn of the armature plate mounting bolt and check for alignment. **CAUTION:** The armature plate must remain affixed securely to the door or serious bodily injury or property damage may occur. Bolt should be tight enough to hold the armature plate to the door while still allowing for alignment with the electromagnetic lock. |
| Lock is operating and locking but the armature plate is "humming" against the surface of the lock. | This generally indicates that the lock is either operating on AC voltage or there is some AC voltage present in the DC supply. A properly filtered and regulated DC power supply is required to achieve optimal operation from the lock. |
| Lock is not releasing immediately upon removal of power. | Ensure that switching devices are interrupting the DC power and not the AC power supply voltage.<br>Ensure rubber washer on armature plate mounting bolt has not been removed or damaged.<br>Check that switching device interrupts the positive wire and not the negative wire (See Fig. 4).<br>Remove any Diodes or other suppression devices that may be installed. |

©2012 Schlage Lock Company
(877) 671-7011
Printed in U.S.A.
24200669 Rev. 10/12-a