INSTALLATION

EML330/EML340

Electromagnetic Locks

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 must 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. Separate accessories not included with this product must be used in the following applications:
    - Glass or Herculite doors that do not have a door frame
    - Doors that do not permit the armature plate to be mounted low enough to meet the magnet surface

    Refer to the Product Accessories Guide section of the Installation Instructions for further information. Accessories may impact holding force.
11. 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.

Installation Instructions

1. Mount the electromagnetic lock to the door frame as outlined on the installation template included with the product.

NOTE: During 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 the magnet surface. If this washer is removed or trimmed the lock will appear to have some holding force even when power is removed.

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. DORMA 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 for current draw specifications and wiring gauge chart.

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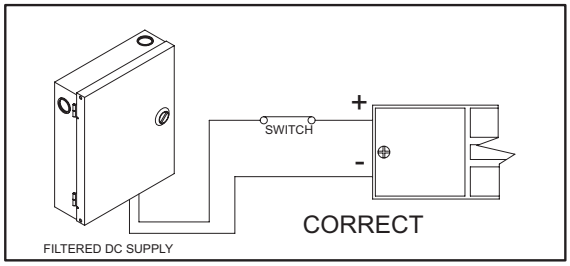
3. Once wiring has been routed into the lock cavity, connect wire to terminal blocks as shown in Fig. 1. If optional Bond Alert (BA) and/or Door Position Switch (DP) features are used these can also be wired at this time as shown in Fig. 1.

4. **Delayed Relock Feature** - Should the built-in delayed relock feature be required for the installation, a Normally Open Momentary switch such as a DORMA 3909 will need to be installed and connected to the two blue wires from J4 on the circuit board as illustrated in Fig.1.

The delayed relock 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 (R11) in a counterclockwise direction to increase delay time. Factory setting is zero seconds.

If the delayed relock feature is not required the blue wires may be unplugged from the circuit board @ J4. **NOTE:** If R11 is not set to zero seconds, the lock will enter delayed relock mode each time power is applied even if J4 has been removed.



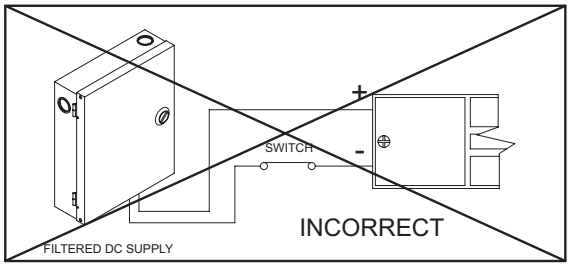
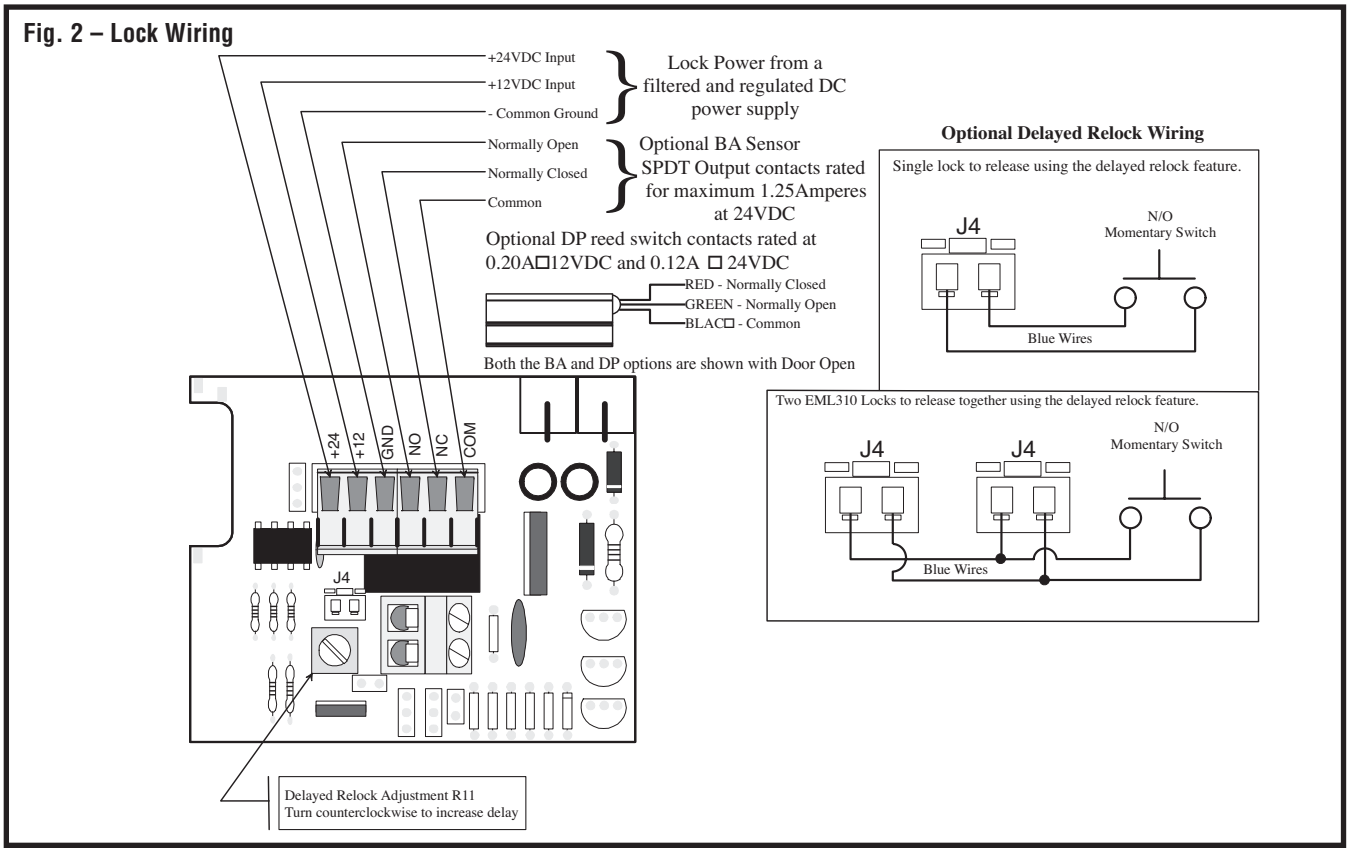


Fig. 2 – Power Connections

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 2.

Switching the negative power supply line will not allow the lock to release immediately. These DORMA electromagnetic locks contain MOV's for surge suppression and do not require any additional suppression to be added during installation. The installation of diodes across the lock input terminals will cause a delay in release.

Fig. 2 – Lock Wiring



Anti-Tamper Feature - Two screws prevent insertion of an Allen wrench into the captive mounting screw opening on the bottom of the lock. Fig. 3 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.

Lock Options

The EML330 and EML340 locks can each be equipped with remote indication features that operate as follows. See Fig.1 for wiring diagram. Each of these features will provide indication of the lock status. Status is indicated locally via an LED mounted on the bottom of the lock housing. Remote notification can also be achieved by connecting a monitoring device to the SPDT relay included on the lock circuit board.

Bond Alert (BA) - 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.

Low Voltage Detection - Each BA circuit board also includes a low voltage detection circuit when shipped from the factory. This feature will cause the alarm relay and status LED to activate should the lock input voltage drop below 10.3VDC if wired for 12VDC or 20.5VDC if wired for 24VDC. That signals a monitored system or guard station that the holding force of the lock may have been compromised.

Door Position Switch (DP) - The DP option 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. The DP option comes with a magnet pre-installed into the lock armature plate for signaling the reed switch in the housing when the door is closed. Care should be taken during the final testing of the lock to ensure that the DP option is operating in the desired manner.

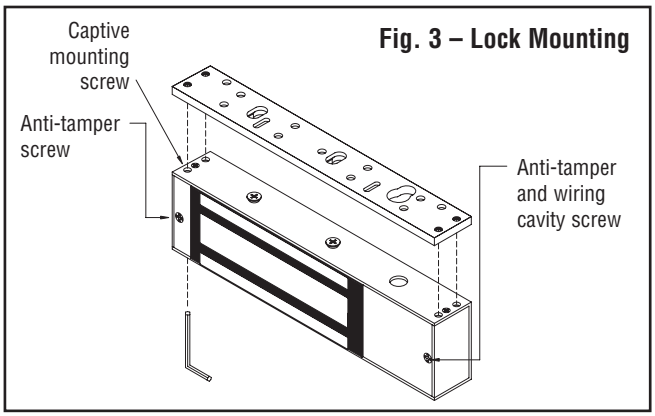


Fig. 3 – Lock Mounting

Inspection and Maintenance

This product and all related accessories or parts 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.

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.

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For product support, parts and ordering information contact:

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Specifications

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

EML330 Lock Dimensions:
1 5/8"D x 2 7/8"W x 34 1/2"L (41mm x 73mm x 876mm)
EML340 Lock Dimensions:
1 5/8"D x 2 7/8"W x 46 1/2"L (41mm x 73mm x 1181mm)
NOTE: Both EML330 and EML340 housings may be cut to length on site.
Standard Armature plate dimensions:
5/8"D x 2 3/8"W x 7 7/16"L (16mm x 60mm x 189mm)
DP Armature plate is 10"L (254mm)

ELECTRICAL:
Voltage: 12VDC or 24VDC
(Selected by choosing appropriate wiring terminals)
Current: 0.28A @ 12VDC
0.28A @ 24VDC

BA Output Relay: SPDT relay. Contacts rated at 1.25A@24VDC
DP Reed Switch: Magnetically actuated SPDT switch. Contacts rated for 0.20A @12VDC and 0.12A @ 24VDC

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

NOTE: Specifications may change without notice.

Power Supply

Voltage	EML330	EML340
12VDC	0.28A	0.28A
24VDC	0.28A	0.28A

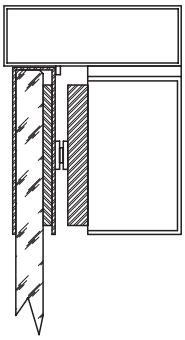
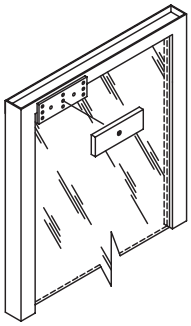
NOTE: All DORMA electromagnetic locks must be powered with filtered and regulated DC power supplies such as the DORMA PS Series UL Listed power supply. DORMA offers a full line of power supplies and switching devices that are suitable for use with the EML300 Series locks.

EML300 Series Troubleshooting Guide

Problem	Solution
Cannot remove the lock mounting bracket from top of magnet for installation.	Remove anti-tamper screw and cavity screw. Insert supplied Allen wrench into mounting bolt holes in the bottom of the lock housing and turn. (See Fig.3)
Lock is installed but has no holding force at all.	Check power supply. DC power should be slightly over the voltage specifications outlined on the packaging. eg: for 12VDC operation supply should be set at 12VDC-13VDC. Check connections at power supply, connected releasing devices, lock terminals and lock circuit board to magnet core. Check delayed relock wiring and time setting. Check that the momentary switch does not include a shunted light option.
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. Ensure rubber washer on armature plate mounting bolt has not been removed or damaged. Check that switching device interrupts the positive wire and not the negative wire (See Fig. 2) Remove any Diodes or other suppression devices that may be installed.

Product Accessories Guide

(Accessories may impact holding force. Separate installation instructions provided with accessories.)

Part	Usage	Example
Glass Door Bracket (GDB)	Allows an armature plate to be mounted to a glass or Herculite door that does not have a frame. The Glass Door Bracket is a "U"-shaped piece of 1/16" thick material that slips over the top of the glass panel and tightens to the glass with setscrews. The armature plate mounts directly to the surface of the bracket by means of a threaded hole in the bracket assembly plate. Available for both 1/2" and 3/4" thick glass doors.	
Armature Plate Holder (APH)	For use with doors that do not permit the armature plate to be mounted low enough to meet the magnet surface. Eg: Some aluminum framed commercial glass doors. The armature holder can be mounted to whatever frame is available and the armature plate in turn mounted to the holder. Available in both flat (shown) and pocket styles.	

WIRE GAUGE SELECTIONS

Total One-Way Length of Wire Run (ft.)	Load Current @ 24V							
	1/4A	1/2A	3/4A	1A	1-1/4A	1-1/2A	2A	3A
100	20	18	16	16	14	14	12	10
150	20	16	14	14	12	12	10	-
200	18	16	14	12	12	10	10	-
250	18	14	12	12	10	10	-	-
300	16	14	12	10	10	-	-	-
400	16	12	10	10	-	-	-	-
500	14	12	10	-	-	-	-	-
750	12	-	-	-	-	-	-	-
1000	12	-	-	-	-	-	-	-

Total One-Way Length of Wire Run (ft.)	Load Current @ 12V					
	1/4A	1/2A	3/4A	1A	1-1/4A	1-1/2A
100	18	16	14	12	12	10
150	16	14	12	10	10	-
200	16	12	10	10	-	-
250	14	12	10	-	-	-
300	14	10	-	-	-	-
400	12	10	-	-	-	-
500	12	-	-	-	-	-
750	10	-	-	-	-	-

These recommended wire gauge selection tables are based on the 2008 National Electrical Code (2008 NEC), assume 60°C (140°F) rated wire, include a 25% safety factor, and define the amperage ratings at the listed distances that result in 5% voltage drop due to wire resistance. Five percent is normally acceptable in low voltage systems.

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