WARNING
ACTIVE ALARM!
THIS COIL HAS BEEN ELECTRICALLY AND CHEMICALLY TREATED TO PREVENT REUSE OR RESALE FOR SCRAP
This manual describes the steps to install and operate the Marvair® Coil Cop® operator panel. This operator panel provides power, control, and monitoring functions for up to two Marvair® Coil Cop® anti-theft systems installed in Marvair wall mount HVAC units. The Coil Cop® system offers visual and audible warnings and remote notification in the event of an attempted theft of HVAC components.

The following materials are provided in the Coil Cop® Operator panel package:

- Coil Cop® Operator Panel
- 75 ft. (22.8 m) of prewired cable (connects the operator panel to the microcontroller in the HVAC unit and the grey wire to the Loss of Charge switch.)
- Installation and Operations Manual (this manual)

The following materials should be provided by the installer:

- TelcoFlex®III or KS24194®L3 wire for power from DC plant to Coil Cop® operator panel
- DC plant breaker, 2A
- Cat3, Cat5e, or Cat6 cable for alarms from Coil Cop® Operator panel to Shelter alarm block
- Electrical conduit (3/4”), conduit fittings, mounting straps
- Mechanical and electrical installation hand tools (wire cutters & strippers, drill, drill bits)

**Important Safety Information**

1. Turn Electrical Power OFF at the breaker or fuse box BEFORE installing or working on the operator panel. LINE VOLTAGES ARE HAZARDOUS or LETHAL.
2. OBSERVE and COMPLY with ALL applicable ELECTRICAL AND BUILDING CODES and ORDINANCES.
3. INSTALLATION and SERVICE should be performed ONLY by QUALIFIED and EXPERIENCED PEOPLE.
4. USE COMMON SENSE and BE SAFETY CONSCIOUS.

This is the safety alert symbol ⚠️. When you see this symbol in the manual, be alert to the potential for personnel injury or equipment damage. Understand the signal word DANGER, WARNING and CAUTION. These words are used to identify levels of the seriousness of the hazard.

**DANGER**
Failure to comply will result in death or severe personal injury and/or property damage.

**WARNING**
Failure to comply could result in death or severe personal injury and/or property damage.

**CAUTION**
Failure to comply could result in minor personal injury and/or property damage.

**IMPORTANT** is used to point out helpful suggestions that will result in improved installation, reliability or operation.

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**General Description**

The Marvair® Coil Cop® is a theft-deterrent system for Marvair® wall mount HVAC units. In addition to the mechanical protection of the HVAC unit condenser and evaporator coils provided by stainless steel channels and anti-theft fasteners, the Coil Cop® system offers electronic detection with both local alarming and remote alarm notification.

The Marvair® Coil Cop® system consists of the Coil Cop® operator panel installed inside the shelter and a microcontroller and speaker installed in each Marvair HVAC unit. The speaker and microcontroller are mounted in a heavy-duty aluminum enclosure. A 16-gauge galvanized speaker grille prevents physical damage and isolates the electronics from rain and snow. An accelerometer on the microcontroller panel measures force impact in three dimensions and triggers an alarm if the value in any axis exceeds a threshold. Activation of the alarm requires three blows within 10 seconds. Four selectable sensitivity levels are available to suit local conditions. The intelligent sensing algorithm continuously measures and adapts to ambient noise to suppress false alarms from external sources, for example, trains or aircraft. The microcontroller also monitors refrigerant pressure through a Loss of Charge switch (LoC) and triggers an alarm if the pressure drops below a preset threshold.

If an alarm is triggered on the Coil Cop®, a pre-recorded message announces in English and Spanish that authorities have been notified to investigate a potential theft. This message repeats for three minutes. The alarm additionally provides a set of normally closed dry contacts to the Coil Cop® operator panel, which can then be used to notify the Network Operations Center (NOC) or a monitoring service. Cutting the cable between the speaker enclosure inside the HVAC unit and the operator panel in the shelter will also trigger the alarm to the NOC. Although the audible message stops after three minutes, the alarm indication to the NOC remains active until reset locally from operator panel inside shelter.

![Figure 1. Marvair® Coil Cop® System Overview](image-url)
**WARNING**

Failure to follow safety warnings exactly could result in serious injury, death, and/or property damage.

Turn off electric power at service panel or fuse box BEFORE making any electrical connections and ensure a proper ground connection is made.

Mechanical and Electrical Installation

The speaker with the microcontroller and the loss of charge switch have been factory installed in the Marvair HVAC units. The Coil Cop® operator panel can be mounted directly on the wall in any suitable location on the inside of the shelter. The recommended location is on the wall midway between the two HVAC units at a height of 5 ft (1.5 m) above the floor provided that this location is not behind any equipment or a grounding bar. If another location is chosen verify that the pre-wired cable from each HVAC unit does not exceed 75 ft. (22.8 m) including all necessary conduit routing. The operator panel is installed as follows:

- Turn power Off to the air conditioners at the shelter’s breaker panel and at the breakers in the air conditioners.
- Remove the four screws holding the top cover to the box and place the cover to one side.
- Position the box on the wall in the desired location with the cutout for the conduit entry facing downwards and screw the box to the wall with two screws through the flange at the top and bottom of the box.
- Install the cable between the DC plant and the operator panel and terminate the cable on the appropriate terminals inside the DC plant. On the rear of the operator panel’s top cover, terminate the other end of the cable on the +24V or +48V and -24V or -48V terminals on terminal block TB1. Note that TB1-1 and TB1-2 are internally connected. Only connect to one terminal. This same is true for TB1-3 and TB1-4.
- Run the cable from the air conditioner into the shelter. This cable may be installed in the low voltage conduit. Tie wrap excess cable in the base of the condenser compartment of the air conditioner. Do NOT install in the high voltage conduit.
- Plug the cable from the Marvair HVAC unit #1 into the RJ45 female connector J1 on the rear of the operator panel’s top cover. This cable can be installed in the low voltage conduit to the HVAC unit. **Note:** If the CoolLinks™ controller is used to operate the air conditioners, be careful NOT to connect the CoolLinks Ethernet cable to the Coil Cop® board.
- Plug the cable from the Marvair HVAC unit #2 into the RJ45 female connector J3 on the rear of the operator panel’s top cover.
- Use two pairs from a standard Cat3, Cat5 or Cat6 Ethernet cable to connect the Coil Cop alarm signals from the Operator Panel to the shelter alarm punch down block. As indicated in Table 2, connect one pair to pins A1 on the terminal block (Coil Cop Alarm #1) and connect the other pair to pins A2 (Coil Cop Alarm #2). For example, with a blue and white/blue pair, the blue would connect to one of the A1 pins and the white/blue to the other A1 pin. The connection order is not important. The other ends of the pairs of cables would be punched down to the shelter alarm block.
- Turn the breakers to the ON position to provide power to the air conditioners and the Coil Cop® system.
• Install the 2A breaker in the DC plant with the breaker in the OFF position. Turn ON the breaker. Press the ARM push button for Unit 1 on the front of the operator panel top cover. If the System Active LED turns on the polarity is correct. If the LED does not turn on, turn the breaker off then swap the wires on terminal block TB1. Press the ARM push button for Unit 1 again and the System Active LED should now turn on. Press the ARM push button for Unit 1 to disarm the unit.

• Screw the top cover of the operator panel back onto the box with the four screws.

**Operation**

The front cover of the Coil Cop® operator panel has two status LEDs and one push button for each HVAC unit. Each of the units is independently controlled and the operation of one unit has no effect on the other unit. The Coil Cop alarm on each unit can be individually disabled to allow a maintenance technician to work on one unit. The front cover controls are as follows:

• The green System Active LED indicates if the Coil Cop® is armed or disarmed. LED ON means the system is armed and LED OFF means the system is disarmed.

• The red Alarm LED indicates whether the alarm has been triggered on the Coil Cop®. LED ON means that either the accelerometer or the LOC (loss of charge switch) has been activated (alarm active) and LED OFF means that there is no alarm present.

• The push button arms and disarms the Coil Cop®. Press once to arm and press again to disarm. The System Active LED will turn ON/OFF to indicate the arm/disarm state. Disarming the system will also reset an alarm if it is active.

*Note: If the Marvair® air conditioner has the CoolLinks™ controller, be careful NOT to connect the CoolLinks Ethernet cable to the Coil Cop board.*
Note that if a technician forgets to arm the system after performing maintenance on the HVAC units, the system will automatically re-arm after a period of four hours. If the cable between the operator panel and the Coil Cop® anti-theft system in the HVAC unit is cut, the system will automatically trigger a remote alarm to the shelter alarm block.

Figure 3: Front of Operator Panel's Top Cover

Technical Specifications

Power Requirements: 24VDC, 1A or 48VDC, 1A
Power Supply Minimum: 24VDC
Power Supply Maximum: 60VDC
Polarity Protection: Yes

Connections:
TB1, Terminal Block, Power Feed
J1, RJ45 Female, Coil Cop® #1
J3, RJ45 Female, Coil Cop #2
TB2, Terminal Block, Alarm Block

Dimensions: 6 1/8 inches x 4 5/8 inches x 2 1/2 inches (155 mm x 117 mm x 64 mm)
Weight: 1.5 lbs (.68 kg)
Conduit Cutout Size: 3/4 inches
Construction Material: ABS Thermoplastic (flammability rating UL94V-A)
Electrical Connections

J1 Marvair HVAC unit #1, J3 Marvair HVAC unit #2 RJ45 Female Connector Pin-Out:

![RJ45 Female Connector Diagram](image)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire Color</th>
<th>Signal</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>White/Orange</td>
<td>+VDC</td>
<td>To Coil Cop®</td>
</tr>
<tr>
<td>2</td>
<td>Orange</td>
<td>+VDC</td>
<td>To Coil Cop®</td>
</tr>
<tr>
<td>3</td>
<td>White/Green</td>
<td>Alarm Enable</td>
<td>To Coil Cop®</td>
</tr>
<tr>
<td>4</td>
<td>Blue</td>
<td>-VDC</td>
<td>To Coil Cop®</td>
</tr>
<tr>
<td>5</td>
<td>White/Blue</td>
<td>-VDC</td>
<td>To Coil Cop®</td>
</tr>
<tr>
<td>6</td>
<td>Green</td>
<td>Enabled, N/C</td>
<td>From Coil Cop®</td>
</tr>
<tr>
<td>7</td>
<td>White/Brown</td>
<td>N/O</td>
<td>From Coil Cop®</td>
</tr>
<tr>
<td>8</td>
<td>Brown</td>
<td>N/C</td>
<td>From Coil Cop®</td>
</tr>
</tbody>
</table>

Table 1: J1 and J3 RJ45 Pin-Out

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Table 2: TB2 Alarm Terminal Block Pin-Out

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Alarm Coil Cop #1, N/C</td>
<td>Shelter Alarm Block Pair 1 Base</td>
</tr>
<tr>
<td>A1</td>
<td>Alarm Coil Cop #1, N/C</td>
<td>Shelter Alarm Block Pair 1 Stripe</td>
</tr>
<tr>
<td>A2</td>
<td>Alarm Coil Cop #2, N/C</td>
<td>Shelter Alarm Block Pair 2 Base</td>
</tr>
<tr>
<td>A2</td>
<td>Alarm Coil Cop #2, N/C</td>
<td>Shelter Alarm Block Pair 2 Stripe</td>
</tr>
</tbody>
</table>

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TB1 Terminal Block Power Input Connector Pin-Out:

![Terminal Block TB1 Diagram](image)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Functions</th>
<th>Signal</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB1-1</td>
<td>+VDC</td>
<td>+24VDC or +48VDC</td>
<td>From DC Plant</td>
</tr>
<tr>
<td>TB1-2</td>
<td>+VDC</td>
<td>+24VDC or +48VDC</td>
<td>From DC Plant</td>
</tr>
<tr>
<td>TB1-3</td>
<td>-VDC</td>
<td>-24VDC or -48VDC</td>
<td>From DC Plant</td>
</tr>
<tr>
<td>TB1-4</td>
<td>-VDC</td>
<td>-24VDC or -48VDC</td>
<td>From DC Plant</td>
</tr>
</tbody>
</table>

Table 3: TB1 Terminal Block Pin-Out
LED Status Indicators:

<table>
<thead>
<tr>
<th>LED</th>
<th>State</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Active</td>
<td>On</td>
<td>Green</td>
<td>System is Armed</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td></td>
<td>System is Not Armed</td>
</tr>
<tr>
<td>Alarm</td>
<td>On</td>
<td>Red</td>
<td>Accelerometer or Loss of Charge Switch Triggered</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td></td>
<td>No Alarm Active</td>
</tr>
</tbody>
</table>

Table 4: LED Status Indicators

**Coil Cop® Configuration Options:**

Loss of Charge (LoC) Jumper JP1 (Note: See photo on next page for location of LoC jumper):

The Coil Cop® system includes a loss of charge switch which monitors the refrigerant pressure. If there is a loss of refrigerant, e.g., a refrigerant line is cut, the pressure will drop below the set point and the audio alarm will be activated and contact closure can be used to provide remote notification. To enable the LoC switch, place the jumper on 1 & 2. To disable the LoC switch, position the jumper between 2 & 3. Factory setting is with the LoC switch enabled.

![Enable LoC Diagram](image)

Enable LoC

![Disable LoC Diagram](image)

Disable LoC

Table 5: Jumper JP1 Options
Sensitivity Switch S1:

<table>
<thead>
<tr>
<th>Switch</th>
<th>Sensitivity Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1-1</td>
<td>Least Sensitive</td>
</tr>
<tr>
<td>S1-2</td>
<td>Moderate Sensitive</td>
</tr>
<tr>
<td>S1-3</td>
<td>Default</td>
</tr>
<tr>
<td>S1-4</td>
<td>Most Sensitive</td>
</tr>
</tbody>
</table>

Table 6: Switch S1 Sensitivity Levels

Note:
1. Factory setting is all switches in the OFF position which selects the default sensitivity level.
2. If sensitivity is changed from the default only one switch should be in the ON position.
3. All four switches in the ON position disables the accelerometer and an alarm is triggered only on the Loss of Charge (LoC) switch.
4. If a Coil Cop is disarmed, press and hold the Arm button for four seconds. The System Active LED will flash to indicate the selected sensitivity level (for example, two flashes for Moderate Sensitivity, S1-2 On). If all four switches are ON, the LED will not flash.
Dimensional Drawing