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The power of control. Automated.

Zone Monitor 3008

Installation and Operation Manual

ATEK ACCESS TECHNOLOGIES
ISO 9001
QUALITY SYSTEM CERTIFIED

Table of Contents

Declaration of Conformity

Declaration of Conformity

We, the undersigned,

Manufacturer:	**ATEK Access Technologies**
Address:	**210 10th Ave N.E.**
	Brainerd, Minnesota 56401
Country:	**U.S.A.**
Phone Number:	218-829-4719

certify and declare under sole responsibility that the following product:

Description:	Zone Monitor
Product Name:	**ZM3008, ZM3008QD**
Part Numbers:	0023512700, 0023512800

conforms with the following standards:

Safety:
- EN 60950-1: 2001, First Edition; IEC 60950-1:2001; UL 60950-1:2003; CAN/CSA-C22.2 No. 60950-1-03.
- EN 954-1:1997 Category 4

Radiate Emissions:
- EN 61326-1:1997, with A1:1998 & A2:2001
- EN 55011:1998, with Amendment A1:1999 & Amendment A2:2002
- FCC Part 15 Subpart B
- CISPR 11 (1997) w/A1: 1999

Immunity:
- EN 61326-1:1997, with A1:1998 & A2:2001
- EN 61000-4-2:1995 Electrostatic Discharge Immunity
- EN 61000-4-3:2002 Radiated Electromagnetic Field Immunity
- EN 61000-4-4:1995 Burst Immunity
- EN 61000-4-5:1995 Surge Immunity
- EN 61000-4-6:1996 Conducted RF Immunity
- EN 61000-4-8:1993 + Amendment A1:2001 Magnetic Field
- EN 61000-4-11:1994 Voltage Dips, Interruptions, & Variations

Environmental:
- EN 60529:2001 Degree of Protection
- EN 60721 Classification of Environmental Conditions
  - EN 60068-2-2 Climatic Dry Heat
  - EN 50178 Section 9.4.2.2 Climatic Damp Heat
  - EN 60068-2-6 Mechanical Vibration
  - EN 60068-2-31 Mechanical Shock

Manufacturer:

Bradley Briggs
Director Product Development
December 12, 2012

Important Safety Message

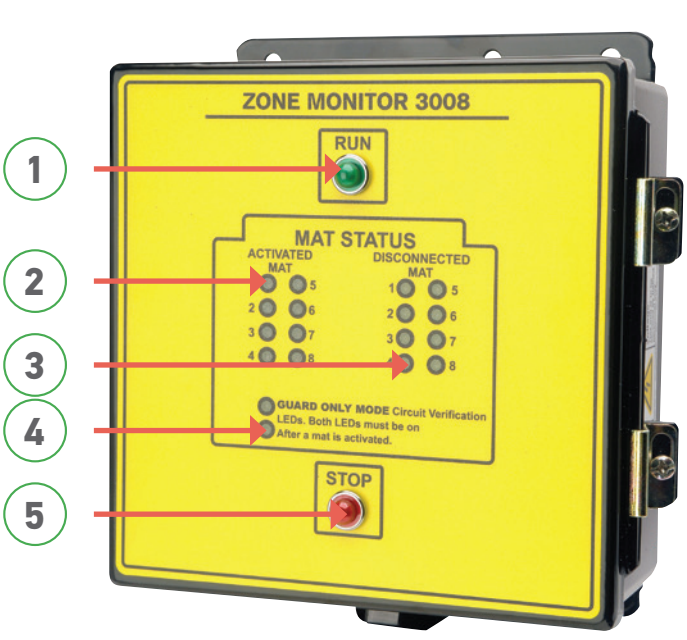
Minimizing the hazards surrounding heavy automated equipment and industrial machinery can be a complex and difficult task. With every advance in machinery design and increased levels of automation, the task becomes more difficult. The dangers and hazards created by these machines can be made safer through the use of Larco Industrial Safety Mat Systems, including the Larco Zone Monitor 3008 control unit.

The information contained in this manual will help with installation and make full use of the Larco Zone Monitor 3008 in combination with Larco safety mats. **This manual should be read in its entirety prior to beginning the installation.**

The Larco Safety Mat and Zone Monitor 3008 control system should not be used as a substitute for machine guarding requirements set forth by local and national organizations, such as OSHA. The installer must be appropriately qualified for the installation task and familiar with the requirements for the particular application, as well as any local codes or ordinances, before attempting to install any safeguarding systems. Proper ESD practices and procedures should be followed during installation to protect against possible electronic damage to the Zone Monitor 3008.

Le Larco Safety Mat and Zone Monitor 3008 ne doit pas être utilisé comme un substitut pour les besoins en protection des équipements visés par des organisations locales et nationales, telles que l'OSHA. Vous devez être dûment qualifié pour la tâche d'installation et familier avec les exigences de votre application en particulier, ainsi qu'avec tous les codes ou règlements locaux, avant de tenter d'installer des systèmes de protection. De bonnes pratiques et procédures pour éviter les décharges électrostatiques (DES) doivent être suivies lors de l'installation pour prévenir contre des dommages électroniques possibles au Zone Monitor 3008.

Zone Monitor 3008 Overview



1. Green **Run** LED
   Indicates normal operation. The machine control relays will be energized to allow machine operation.
2. Red **Activated Mat** LEDs.
   The red **Stop** LED will also be lit.
3. Yellow **Disconnected Mat** LEDs.
   Eight yellow LEDs indicate mat fault condition.
   The red **Stop** LED will also be lit.
4. Green **Guard Only Mode Latching Circuit** Diagnostic LEDs
   Indicates normal operation in green **Guard Only Mode**.
   \When both green lights are lit after a mat activation, circuit operation is verified.
5. Red **Stop** LED
   Indicates normal operation. The machine control relays will be de-energized due to mat activation or detected system fault.

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Zone Monitor 3008 Overview

6 Redundant Safety Relay Pack
Removable relay pack allows for easy field replacement.

7 Machine Control Connector

8 Remote Restart Connector
Connection point for remote restart switch option.

9 Option Jumpers (under relay pack – not shown)
Used for choosing automatic restart or guard only mode of operation.

10 Mat Connectors
Eight removable mat connectors make wiring faster and easier.
Optional quick disconnects available.

11 **Relay Fault** LED
Used in normal operation to indicate a detected relay fault,or temporary line power drop out.

12 Manual Restart Switch
Momentary contact switch used to restart the Zone Monitor 3008 and/or associated equipment.

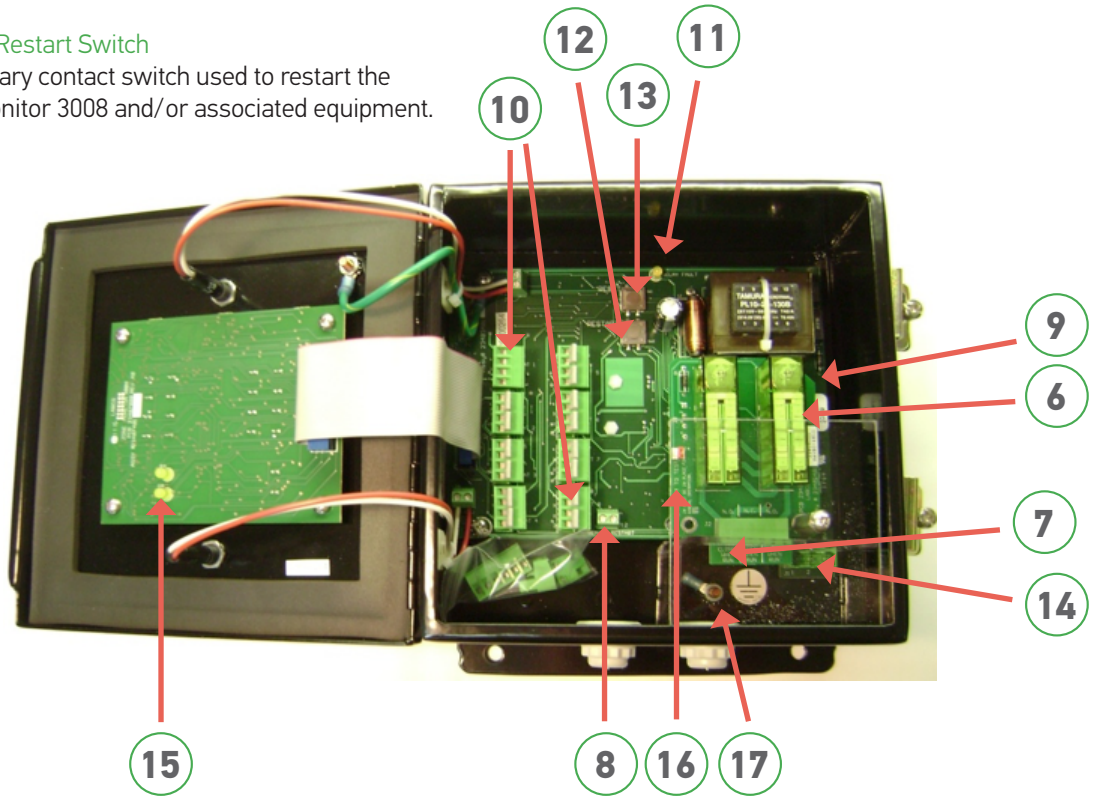
13 Manual Reset Switch
Momentary contact switch used to reset the Zone Monitor 3008. Will clear the Relay Fault Latch if fault has been removed.

14 AC Power Connector J1
For incoming 110/230 VAC power.

15 Yellow **Relay Pack Check** LEDs
Diagnostic LEDs indicate proper feedback from the relay pack when relay pack check jumper is removed.

16 Relay Pack Check Jumper
Used to test relay pack for proper function. Removing the jumper should cause the yellow **Relay Fault** LED and two yellow **Relay Pack Check** LEDs to activate.

17 Ground Lug



Zone Monitor Installation Instructions

The Larco Zone Monitor 3008 was designed with safety and convenience in mind. Unpack and become familiar with the unit before installing it.

WARNING! Always use proper ESD (Electrostatic Discharge) avoidance practices by wearing the appropriate grounding apparel whenever opening or working inside the Zone Monitor 3008 enclosure.

AVERTISSEMENT! Utilisez toujours de bonnes pratiques pour éviter les décharges électrostatiques (DES) en portant des vêtements avec mise à la terre appropriée lors de l'ouverture ou du travail à l'intérieur de l'enceinte du Zone Monitor 3008.

1 Choose the Safety Mat Locations

Refer to the safety mat installation guidelines that accompany the Larco safety mats.

If there is more than one safety mat in the system, it may be helpful to identify and label the mats by number according to the connection point in the Zone Monitor that it will be wired to in step 4. Identification of the mats will allow full advantage of the Zone Monitor 3008's mat diagnostic capabilities.

The Zone Monitor 3008 is designed to operate with Larco's standard mat cord. It is possible to order mats with longer leads to reach the control box, as long as the total length of each mat cord connected does not exceed 40 feet.

The Zone Monitor 3008QD is designed for use with Larco mats that have molded plug connectors (Turck RSC4.4T-*) already installed. Use of any other connector will void the UL rating of the ZM3008QD.

2 Mount the Zone Monitor

Locate the Zone Monitor outside of the safeguarded space and, whenever possible close enough to the mats to allow all of the mat leads to be routed directly into the control enclosure.

Select a sturdy horizontal or vertical mounting surface that has enough room to allow the cover door to open after installation. The machine operator should be able to view the status lights easily on the face of the control.

Access holes have been provided at the bottom of the enclosure for safety mat wires, incoming power, and control signal wires. If additional holes are required, remove the internal electronics prior to drilling. The circuit board mounted on the inside of the cover should also be removed and reinstalled along with the main board.

Mount the unit using the mounting holes provided on the upper and lower mounting flange.

3 Select Operating Options

Two optional modes of operation are available with the Zone Monitor 3008. They are enabled or disabled by changing option jumpers, (which are located on the main board, under the relay module) refer to figure 4.

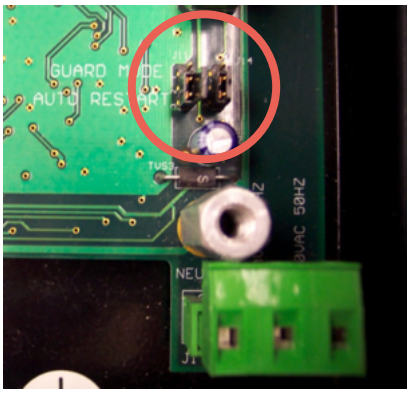


Figure 3 – Option Jumpers

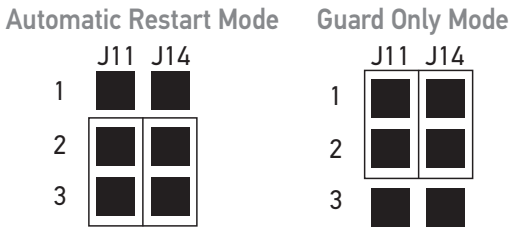


Figure 4 – Option Jumper Selections

WARNING! Always ensure the Zone Monitor's power is off before making or changing selections. Power should be removed from the unit, then operating changes completed and power restored.

AVERTISSEMENT! Assurez-vous toujours que l'alimentation de votre Zone Monitor est coupée avant d'effectuer ou de modifier les sélections. Coupez l'alimentation de l'unité, puis terminez les changements d'opération et remettez l'alimentation.

Refer to figure 4 to select the desired mode of operation.

- Option 1: **Guard Only Mode** requires pressing the restart switch to resume operation each time the control enters a stop condition or the power is cycled to the Zone Monitor. The Zone Monitor 3008 is shipped from the factory in **Guard Only Mode**.

- Option 2: **Automatic Restart Mode** allows the machine to resume operation immediately once an activated mat is cleared.

WARNING! The automatic restart mode of operation should not be used unless the machinery has its own "control reliable" latching stop circuitry to prevent unexpected restart. Selecting the automatic restart mode of operation will allow the Zone Monitor and associated machinery to automatically restart upon clearing an activated mat.

AVERTISSEMENT! Le mode d'opération de redémarrage automatique ne doit pas être utilisé à moins que votre équipement ne dispose de son propre « contrôle fiable » par un circuit de verrouillage d'arrêt pour prévenir tout redémarrage inattendu. La sélection du mode d'opération de redémarrage automatique permet au Zone Monitor et à l'équipement associé de redémarrer automatiquement après la remise en service d'un tapis activé.

4 Connect the Safety Mats

a. Prepare the Mat Lead Wires

Remove approximately 1" (25mm) of the outer jacket from the four-wire mat cord, being careful not to cut the insulation on the four individual mat wires.

Next, strip off approximately 3/16" (5mm) of insulation from the ends of the four individual mat wires. If there is more than one safety mat, the installer will want to make sure that each mat lead is labeled to indicate the corresponding mat.

b. Become Familiar with the Connector Positions

When viewing the eight mat connectors, note that the wiring sequence begins with connector number 1 being the highest connector on the left, see figure 5. The sequence travels down, with the lowest connector on the left being number 4, then travels back up with the highest connector on the right being number 5, and then travels down again, with the lowest connector on the right being number 8.

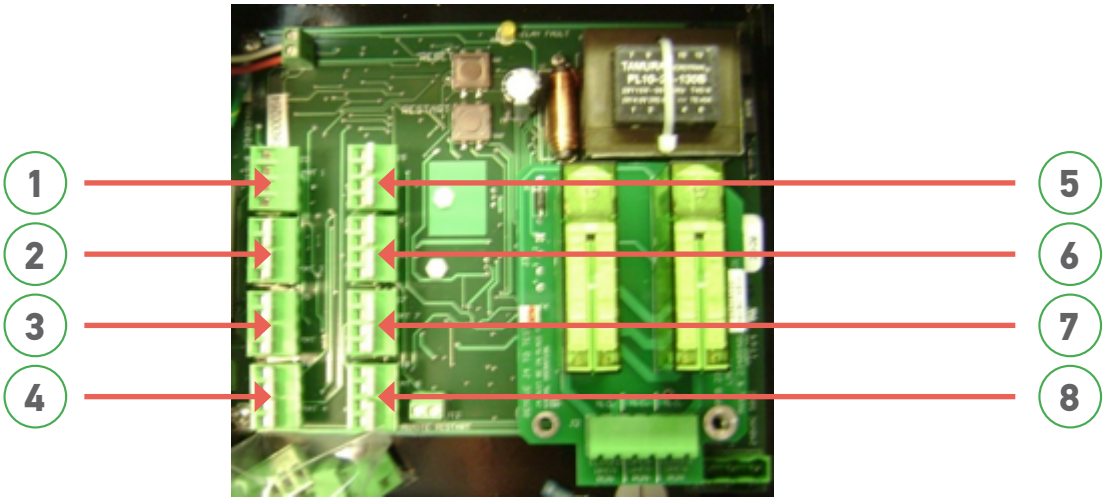


Figure 5 – Mat Connectors with positions indicated

c. Route the Mat Lead Wires

Route the mat lead wires into the control box through watertight conduits and the wiring entry holes, making sure to use watertight fittings to maintain the Type 12/IP 65 rating.

4 Connect the Safety Mats (cont.)

d. Connect Mats

While wiring the mats, use caution not to insert the insulation of the mat wires into the connector by pushing too far in.

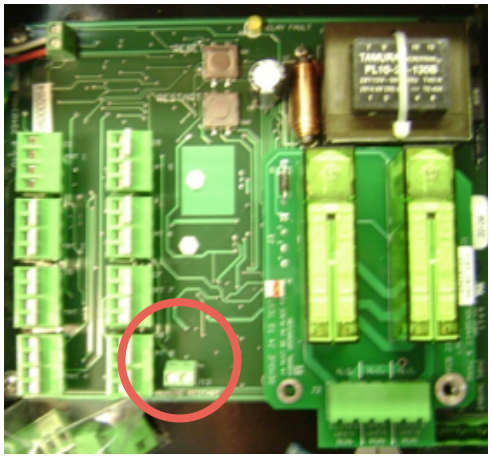
Starting with the mat connector at the top left, connect the black mat wires from mat number one into the first and second screw terminals of that connector, and the white wires from mat number one into the third and fourth screw terminals of that connector. Tighten the terminal block screws until the wires are compressed and cannot be pulled out with a slight tug. A tightening torque of 4 to 5 lb-in is recommended.

If there are additional mats in the system, remove the factory-installed jumpers and make mat connections as done for mat number one. NOTE: Any unused mat connectors must have the jumpers left in them (black must be jumped to black and white to white).

NOTE: When wiring the mats, ensure the mat clamps in the terminal blocks are in the fully open position by turning the screws counterclockwise several turns. Once the mat wires in the terminal blocks are secured, gently pull on the mat wire to ensure it is securely and properly installed.

5 Connect Optional Remote Restart Switch

In the **Guard Only Mode** of operation, the restart switch is used to re-energize the machine control relays and allow the machinery to operate after the Zone Monitor has changed to a stop condition. A remote restart switch may be added to the Zone Monitor for ease of use and to avoid entry into the enclosure for each restart. If a switch is added, it must be a normally-open, momentary contact switch with a contact rating of 0.5 A at 24 VDC minimum. Connect the switch to the connector positions marked **Remote Restart** (see figure 6). Tighten the terminal block screws until the wires are compressed and cannot be pulled out with a slight tug. A tightening torque of 4 to 5 lb-in is recommended.



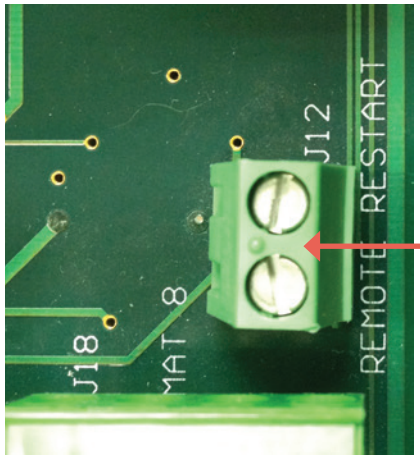


Figure 6 – Remote Restart Connector

6 Connect Machine to Control Wiring

Two sets of isolated, normally-open contacts and one normally-closed set of contacts are provided for machine control, see figure 7. Connect to the machine's control as required to maintain proper safety. The contact positions are as follows. Tighten the terminal block screws until the wires are compressed and cannot be pulled out with a slight tug. A tightening torque of 4 to 5 lb-in is recommended.

Position 1 & 2	Normally Open (Closed When Run)
Position 3 & 4	Normally Closed (Open When Run)
Position 5 & 6	Normally Open (Closed When Run)

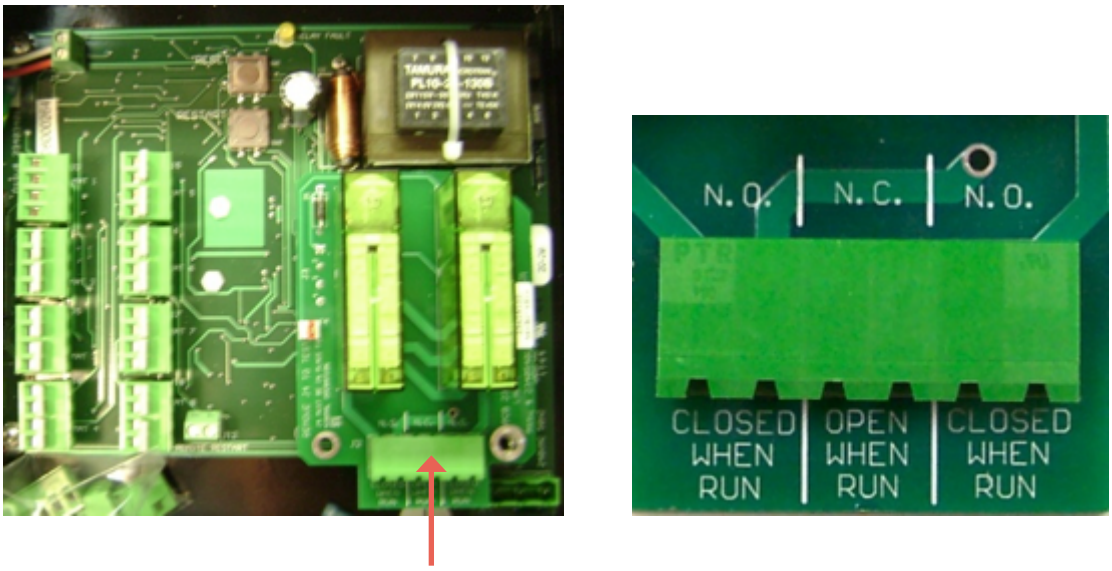


Figure 7 – Machine Control Connector

A Note Regarding Inductive Loads

Inductive loads from the machine's control circuit can greatly affect the life of the Zone Monitor 3008's machine control relays. An effective and proven method for extending the life of the relays is to use a varistor for surge suppression installed across the inductive load. Size the varistor according to the specific load characteristics. A good general formula for sizing the varistor is to add 20 percent to the maximum voltage.

WARNING! Never install a varistor across the machine control contacts of the Zone Monitor 3008. Failure of the varistor to a shorted condition in this position would allow the machinery to continue to operate regardless of the Zone Monitor's output signals.

AVERTISSEMENT! Ne jamais installer une varistance à travers les contacts de commande de la machine du Zone Monitor 3008. L'échec de la varistance à une condition de court-circuit dans cette position permettrait à l'équipement de continuer à fonctionner indépendamment des signaux de sortie du Zone Monitor.

7 Connecting Input Power

Electrical connections must be made by qualified service personnel. The enclosure must be permanently attached to a surface and the wiring must run through water tight conduit as specified below.

Les connexions électriques doivent être effectuées par un personnel de service qualifié. L'enceinte doit être fixée de façon permanente à une surface et le câblage doit cheminer dans des conduits étanches à l'eau comme spécifiés ci-dessous.

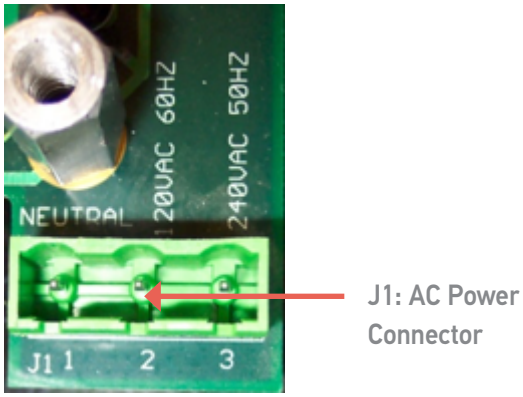
The standard Zone Monitor 3008 can be powered with either 110 VAC, 230 VAC or 24 VDC, see figure 8.

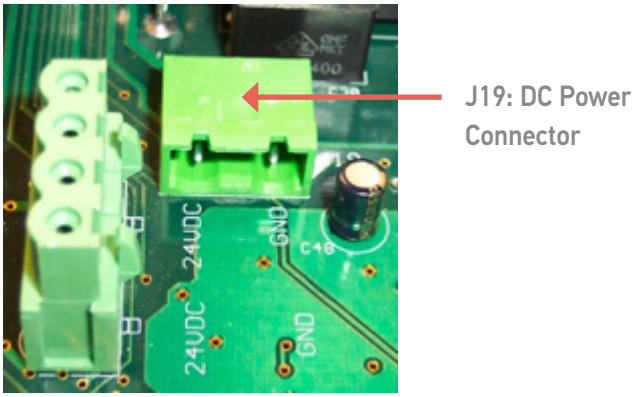
A minimum of 18 gauge (1 mm^2) wire should be used to connect the Zone Monitor 3008 to the main power. Use 1/2" (12.7mm) steel or malleable iron liquid-tight conduit and fittings to connect the Zone Monitor 3008 to the main power junction box. This will maintain the Type 12/IP 65 rating.

Figure 8 – Input Power Connections

The minimum length of line and neutral wires inside the enclosure is to be 3-1/4" (82.6mm) with 1/4" (6mm) stripped from the ends. The length of the earth ground wire is to be 4-1/4" (108mm) with 5/16" (8mm) stripped from the ends. **Do not tin the ends of the wires.** If using stranded wire, twist the strands tightly.

Insert the line and neutral wires into the terminal block using the following guide. (See manual sections 7a, 7b, 7c.) Tighten the terminal block screws until the wires are compressed and cannot be pulled out with a slight tug. A tightening torque of 4 to 5 lb-in is recommended.





7 Connecting Input Power (cont.)

a. 110 VAC Configuration (J1)

Position 1: Neutral
Position 2: 110 VAC Hot
Position 3: Not Used

b. 230 VAC Configuration (J1)

NOTE: 230 VAC is designed for use in Europe. If this power input is used in the U.S., install a fuse in the second 230 V hot line (i.e. L2) before hooking it to the neutral input (position 3).

Position 1: Neutral
Position 2: Not Used
Position 3: 230 VAC Hot

c. 24 VDC Configuration (J19)

Position 1: DC Common
Position 2: 24 VDC

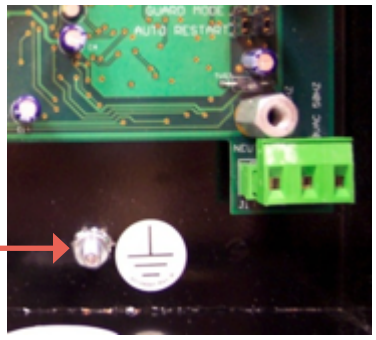
d. Ground Connection

The AC earth ground wire must be connected to the chassis ground stud. This position should also be used for providing a good ground path for ESD (Electro-Static Discharge) when using 24 VDC.

Use a crimping tool specified for use with 14-16 AWG PIDG connectors, such as the TE Connectivity AMP part number 47387 or equivalent. Follow the manufacturer's instructions for its use.

Insert the stripped end of the ground wire into the supplied terminal lug located on the grounding stud, see figure 9. Crimp the wire lug so the wire will not slip out. Insert the ground wire lug onto the ground stud over the star washer. Place the nut over the ground lug and tighten the lug securely.

Figure 9 – Earth Ground Lug



An earth ground wire must be used from the junction box to this equipment. Do not rely on the connecting conduit to supply the earthing connection.

Un fil de la terre terre doit être employé de la boîte de jonction à cet équipement. Ne comptez pas sur la conduite de communication pour assurer la connexion de mise à la terre.

Testing and Using the System

1 Use Extreme Caution to Verify Equipment

The installer is about to find out if the system and associated machinery acts as expected. Until system check out and verification is complete, assume that the equipment could start at any moment.

Vous êtes sur le point de savoir si le système et les équipements associés agissent comme vous le prévoyez. Jusqu'à ce que le système soit certifié et que la vérification soit terminée, présumez que l'équipement peut démarrer à n'importe quel moment.

2 Clear the Area

Make sure that all personnel are out of and cannot enter the hazardous area during the testing procedure.

3 Become Familiar with the Indicator and Diagnostic Lights

During testing of the system the installer will be asked to observe the lights that are part of the Zone Monitor 3008. All of these lights are on the face of the unit, except for the internally mounted yellow **Relay Fault** LED and the two yellow **Relay Pack Check** LEDs. Refer to Figures 1 and 2 to become familiar with the location of the lights.

4 Check Operation

a. Checking Operation in Guard Only Mode

(If **Automatic Restart Mode** of operation was chosen, skip to step 4b.) After making sure that the machinery is not powered and that the machine control wiring connector is unplugged, apply power to the Zone Monitor 3008 while observing the indicator and diagnostic lights.

1. In the **Guard Only Mode** of operation the red **Stop** LED should turn on.
2. Next, press and release the restart switch and verify that the red **Stop** LED turns off and the green **Run** LED turns on. The two machine control relays energize.
3. Next, apply and release pressure to safety mat 1 in the system and verify that the green **Run** LED turns off and the red **Stop** LED turns on. Verify that the appropriate red **Activated Mat** LED for mat number is on. The machine control relays de-energize.
4. Now press and release the **Restart** switch to return to a green **Run** condition and check each of the safety mats in the system the same way as was done for mat 1.
5. Next, while in a green **Run** condition, carefully disconnect one of the safety mats by removing one of the mat wires from any of the mat connectors and verify that the unit changes to a red **Stop** condition. Verify the **Disconnected** LED of the disconnected mat is on and that the unit remains in a red **Stop** condition. Reconnect the mat, press the **Restart** switch and verify that the unit changes to a green **Run** condition.

If the unit does not function as described, note the condition of the indicator lights and refer to the troubleshooting guide on pages 15 - 16.

4 Check Operation (cont.)

b. Checking Operation in Automatic Restart Mode

Make sure the machinery is not powered and that the control output wiring connector is unplugged. Apply power to the Zone Monitor 3008. Observe the indicator lights.

1 In the **Automatic Restart Mode** of operation, verify that the green **Run** LED turns on. The two machine control relays energize.
2 Next, while in the green **Run** condition, apply continuous pressure to safety mat 1 in the system and verify that the green **Run** LED turns off and the red **Stop** LED turns on. Verify that the appropriate red **Activated Mat** LED for mat number 1 is on. Now release the pressure to the safety mat and verify that the unit changes to a green **Run** condition automatically. If there is more than one mat in the system, continue by checking all of the mats in the system in the same way as mat 1 was tested, noting that the activated mat corresponds to the number of the **Activated Mat** LED that turns on. NOTE: If more than one mat is activated, the mat with the lowest number will be displayed.
3 Next, while in a green **Run** condition, carefully disconnect one of the safety mats by removing one of the mat wires from any of the mat connectors and verify that the unit changes to a red **Stop** condition and the **Disconnected Mat** LED of the mat disconnected is on. Reconnect the mat, and verify that the unit changes to a green **Run** condition automatically.

If the unit does not function as described, note the condition of the indicator lights and refer to the troubleshooting guide on pages 15 -16.

c. Check the Relay Pack

Remove the relay pack jumper and verify that the yellow **Relay Fault** LED and both of the **Relay Pack Check** LEDs are on. Replace the jumper and press the reset button. (If the unit is in **Guard Only Mode**, press the restart button as well.) Verify that the unit returns to a green **Run** condition.
NOTE: Perform this check monthly.

d. Checking the Machinery

Use Extreme Caution. Be aware that with some machinery, sudden stopping and starting could be a hazard in itself. Take every precaution when entering the protected area to activate and test the safety mat system. If all is working as expected, plug the control wiring connector back into the relay pack and apply drive power to the machine. Check that the equipment stops and starts as expected when stepping on and off the safety mats.

Soyez extrêmement prudent. Soyez conscient qu'avec certains équipements, un arrêt soudain et départ brusque peuvent être un danger en soi. Prenez toutes les précautions nécessaires lors de l'entrée dans la zone protégée pour activer et tester le système de tapis de sécurité. Si tout fonctionne comme prévu, vous pouvez maintenant brancher le connecteur du câblage de contrôle dans le bloc de relais et appliquer la puissance d'entraînement à l'équipement. Vérifiez que l'équipement s'arrête et démarre normalement quand vous embarquez et débarquez des tapis de sécurité.

5 Periodic Checkout Procedure

The functioning of the safety mat monitoring system must be verified periodically to ensure proper operation of the safety relays.

Troubleshooting Guide

WARNING! If diagnosing the installation, be aware that some of the following instructions for clearing fault conditions may cause the machinery to start. Make sure the area is clear of personnel and the machinery is powered down before proceeding with caution.

AVERTISSEMENT! Si vous faites un diagnostic de l'installation, sachez que certaines des instructions suivantes pour dégager les conditions de faute peuvent occasionner un démarrage de l'équipement. Assurez-vous que la zone est libre de personnel et que l'équipement est hors tension avant de procéder avec prudence.

Condition: All lights are off

Probable Cause:

- No power to the Zone Monitor 3008
- Poor (loose) connections
- Relay pack is loose

Solution:

- Test for incoming power
- Recheck terminal block for screw-clamp tightness & receptacle position
- Refer to step 7 and recheck configuration
- Check to ensure relay pack is securely seated

Condition: Red **Stop** LED stays on

Probable Cause:

- The unit is in guard only mode and is waiting for a restart signal
- A relay fault or intermittent power failure occurred

Solution:

- Refer to installation instructions regarding restart in guard only mode
- Open the case and observe the yellow **Relay Fault** LED. If it is lit, press the reset button (and the restart button if in **Guard Only Mode**) and test one of the mats. If the internal yellow **Relay Fault** LED stays on, or comes back on at any time during this test, replace the relay pack.

Condition: Yellow **Relay Pack Check** LEDs stay on

Probable Cause:

- Machine control relay pack has failed
- Jumper is not in place

Solution:

- Replace the relay pack
- Put jumper back into place

Troubleshooting Guide (continued)

Condition: Internal Yellow Fault LED is on.

Probable Cause:

- Machine control relay pack has failed.
- Temporary line power drop occurred.

Solution:

- Press the reset button (and the restart button if in **Guard Only Mode**) and test a mat. If the internal yellow **Relay Fault** LED stays on or comes back on at any time during this test, replace the relay pack.

Condition: Yellow Mat Disconnected and Red Stop LED stay on.

Probable Cause:

- Broken or intermittent mat wire connection.

Solution:

- For mat or mat wire problems, refer to the **Mat Status** LEDs on the unit's front. The number of the LED that is on corresponds to the disconnected safety mat.

Condition: Green Run LED stays on but the machine will not operate.

Probable Cause:

- The machine control relay signal is not reaching the machine control.
- A different device or machine interlock is preventing operation.

Solution:

- Check the wiring to the machine from the machine control connector to the machine's control connection point.
- Replace the machine control relays of the Zone Monitor 3008.
- Check for other machine interlocks that may be preventing operation.

Condition: Green Guard Only Mode Latching Circuit LEDs stay on.

Probable Cause:

- The unit is in **Guard Only Mode** and is waiting for a restart signal.

Solution:

- Refer to step 3A and 5A regarding restart in **Guard Only Mode**.

Condition: Only one green Guard Only Mode Latching Circuit LED is on.

Probable Cause:

- A relay fault or intermittent power failure occurred.
- Machine control relay pack has failed.

Solution:

- Press the reset and restart button.
- Open the unit and check the yellow **Relay Fault** and yellow **Relay Pack Check** LEDs. If they are lit, follow the instructions for these conditions.

Condition: Only one yellow Relay Pack Check LED is on.

Probable Cause:

- Machine control relay pack has failed.

Solution:

- Replace the relay pack.

Controller Specifications

DESCRIPTION	PART NUMBER
Response Time	<30 ms
Indicators	**Run** = Green LED **Stop** = Red LED **Mat Status** = 8 mat Activated Red LEDs and 8 Mat Disconnects Yellow LEDs **Relay Fault** =Internal Yellow LED **Relay Pack Check Circuit** = 2 Internal Yellow LEDs **Guard Only Mode Latching Circuit** = 2 Green LEDs
Operational Modes	Selectable **Automatic Restart** or **Guard Only**
Power Input	110 VAC (for 60Hz); 230 VAC (for 50Hz) or 24 VDC
Rated Supply Current	0125A AC, 0.75A DC
Safety Inputs	Removable Connectors for up to Eight 4-wire safety Mats with up to 40' Cord Length Each (quick disconnect mat connections available)
Safety Output Relays	Removable Connectors for up to Eight 4-wire Safety Mats with up to 40' Cord Length Each (quick disconnect mat connections available)
Safety Output Relays	Two Captive Contact Relays with Two Closed when Run (NO) and One Open when Run (NC) Sets of Contacts Rated 8 Amps at 230 VAC
Standards of Conformity	Designed to meet UL 508-1999 Standard for Industrial Control Equipment, ANSI B11-2003 Performance Criteria for Machine Guarding, ANSI/RIA 15.06-1999 Industrial Robots and Robots Systems-Safety Requirements, EN/IEC 60204-1998 Safety of Machinery, Pressure Sensitive Protective Devices. Designed to meet Category 4 safety device requirements.*
Relay Life	Mechanical 10,000,000 Operations; Electrical 500,000 Operations at 1 Amp at 240 VAC
Electrostatic Discharge SD)	+/-10kV(air discharge); +/-6kV (contact discharge)
Radiated RF Field	10 Volts/Meter, 100 to 1,000 MHz
Electrical Fast Transients EFT)	+1kV (power supply); 0.5kV (control signal)
Operating Temperature	32°F - 122°F
Relative Humidity	20-90% Acceptable Range
Restart Function	Selectable Manual or Automatic Restart; Internal/Lockout Restart and External/Remote Restart Available
Reset Function	Power-up/Relay Fault Reset Internal Manual Push Button
Enclosure	Steel, Powder Coat
Enclosure Rating	Type 12, IP65
Mounting	Surface Mount
Shipping Weight	11 lbs

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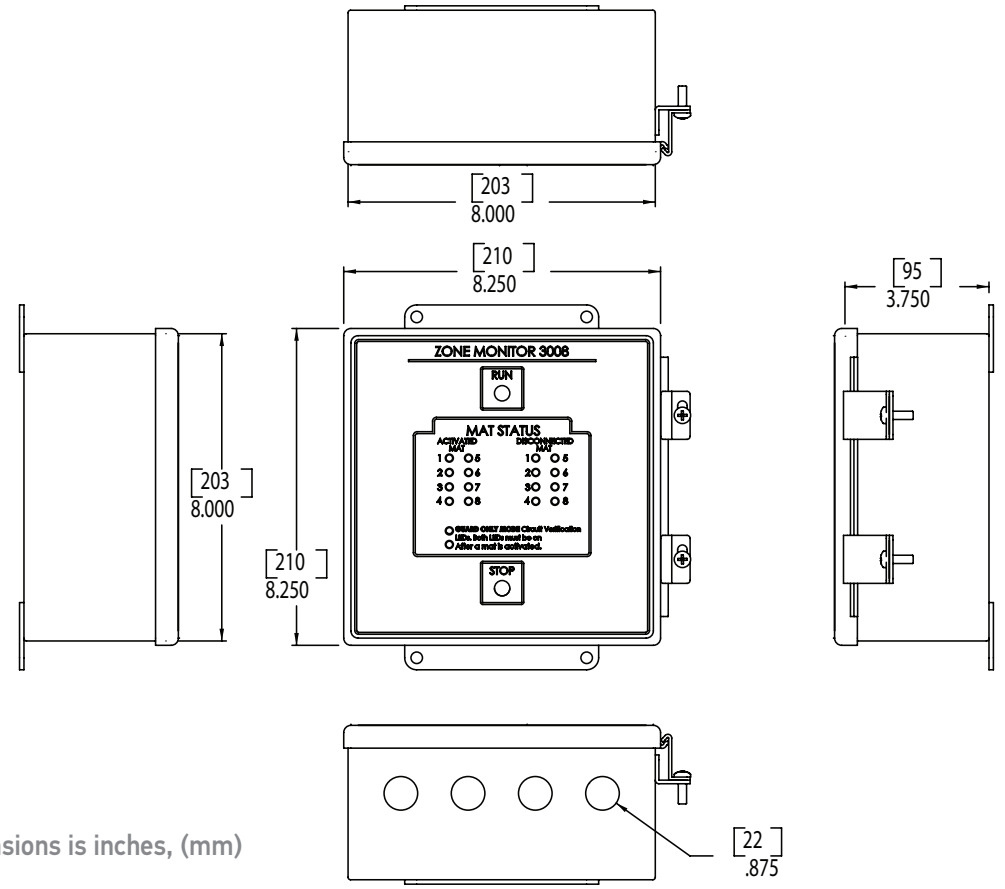
LISTED
PRESENCE SENSING DEVICE
85PB
UL File Number: E236269

Details and Dimensions



Dimensions is inches, (mm)

Warning! Usage of safety mats and safety mat devices is governed by each user's local codes and applicable industry standards. Improper usage of these devices could result in severe injuries. Applications must be limited to machines that can be stopped consistently. In the event that Larco Safety Mats do not prevent all access to the hazardous operation, the unprotected access must be guarded by other appropriate safeguarding devices or barriers.

Avertissement! L'utilisation des tapis de sécurité et des dispositifs de tapis de sécurité est régie par les codes locaux et les standards de l'industrie applicables de chaque utilisateur. L'utilisation inexacte de ces dispositifs a pu avoir comme conséquence des blessures graves. Des applications doivent être limitées aux machines qui peuvent être arrêtées uniformément. Au cas où les tapis de sécurité de Larco n'empêcheraient pas tout l'accès à l'opération dangereuse, l'accès non protégé doit être gardé par d'autres dispositifs ou barrières de sauvegarde appropriés.

For more information on Larco Industrial Safety products and accessories, visit www.larco.com.

Notes

Larco®

The power of control. Automated.

Industrial Safety Products

Installation and Operation

223-0121-000 Rev. D 5/19

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

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