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# Installation, Operation and Maintenance Instructions



## **METALARM SERIES 6301 CE METAL DETECTOR SYSTEM**

**ERIEZ MAGNETICS** HEADQUARTERS: 2200 ASBURY ROAD, P.O. BOX 10608, ERIE, PA 16514-0608 U.S.A.  
*WORLD AUTHORITY IN ADVANCED TECHNOLOGY FOR MAGNETIC, VIBRATORY and METAL DETECTION APPLICATIONS*

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# Introduction

Careful attention to the following requirements will assure the most efficient and dependable performance of this equipment.

If there are any questions or comments about the manual, please call Eriez at 814/835-6000 for metal detection assistance.

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 **CAUTION**

**Metal Detectors emit electromagnetic fields. Contact the American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, U.S.A. ([www.acgih.org](http://www.acgih.org)) for additional information.**

 **CAUTION**

**If you use a medical implant or similar device, you must never approach the equipment because your device may malfunction in the electromagnetic field, with consequences up to and including death.**

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# Important Information from Eriez

This information is provided to assemblers and electricians due to the importance of proper methods for wiring of controls. These methods are revised and updated from time to time as Eriez perceives necessary. This information covers distances from various categories of cables and Eriez Metal Detector wiring standards. The cable categories are:

1. AC Power cables
2. DC Distribution (thermocouple, power supplies)
3. Signal and Logic
  - 3a. Analog (low level)
  - 3b. Digital logic

Category 1 cables are to be routed along frame members and panels. Avoid open space hanging.

Category 2 cables are routed as (1) but separate from (1).

Category 3 cables are routed separately from 1 and 2.

Category 3b are to be spaced 2.5 cm (1") from Category 1 for each meter of run.

Category 3a cables are to be spaced 25 cm (10") from category 1 for each meter of run.

Use separate machine entry holes for categories 1, 2 and 3 cables.

When Eriez Metal Detectors are being installed in plants using VFC drives, the following precautions are recommended:

1. Route VFC wiring and Eriez Metal Detector wiring in to separate metallic conduits.
2. Separate power sources should be used for VFC drives and Eriez Metal Detectors.
3. The use of a Harmonic Neutralized Constant Voltage Transformer for the Eriez Metal Detector power is recommended. Use separate conduits for in and out wiring.
4. Twist AC common circuit run wires together to minimize electromagnetic field interference.
5. Follow cable category separations as detailed above.



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# Description

The Metalarm 6301 CE has been developed primarily for the Plastics and Rubber Processing Industries to prevent metal from entering granulators and other molding machinery.

The Metalarm 6301 CE will normally be conveyor mounted, but it can also be used around tubes, under slides, etc.

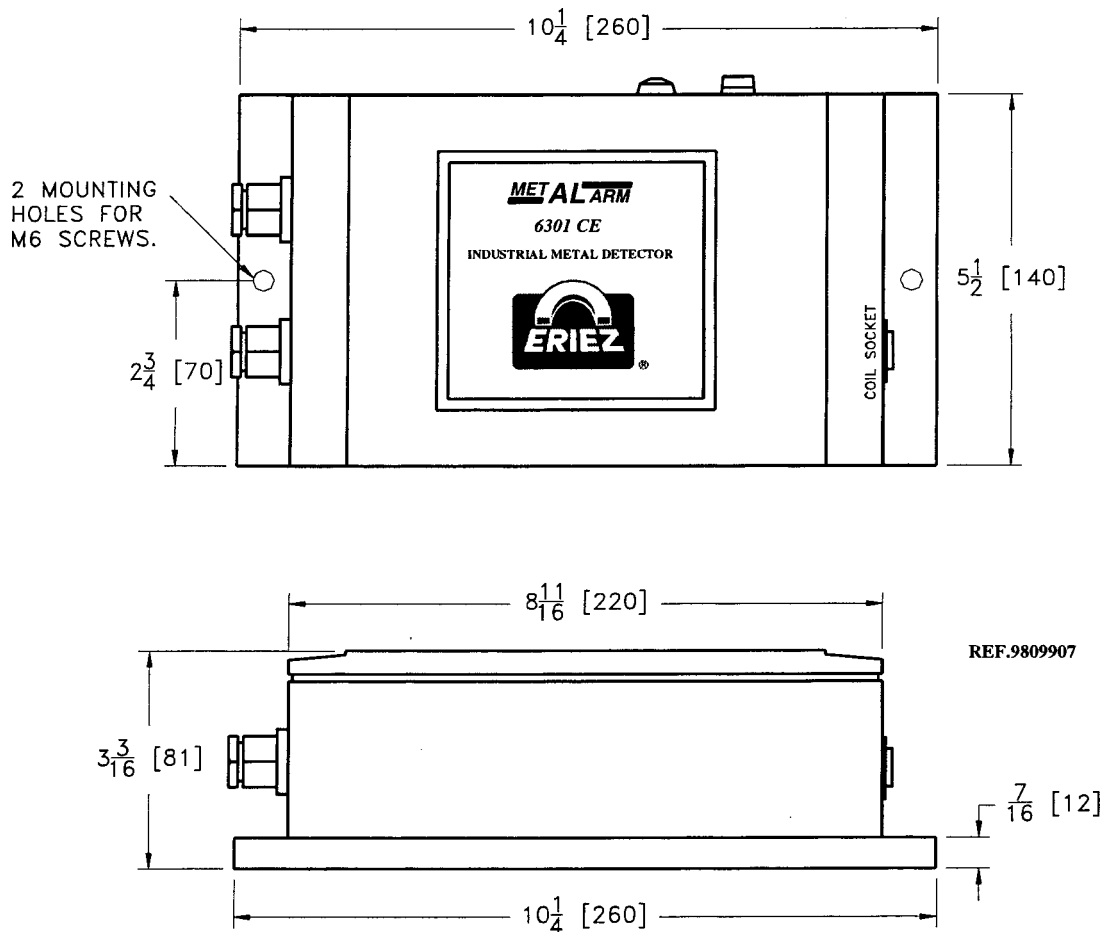


FIGURE 1

# Installation

## Control Unit Mounting

The Control Unit should be mounted in close proximity to the search coil on the side of the conveyor as shown in (Figure 1) below, using the two mounting holes at 9-7/16 inches (240mm) centers.

Please Note: To comply with 'CE' EIVIC regulations, the control unit must remain mounted on the HDPE mounting plate provided. This electrically isolates the control unit from the conveyor frame.

## Search Coil Mounting

The search coil should be installed as shown in (Figure 2) below.

The search coil can be held in position by use of brackets at each of its four corners, or by drilling through the sides of the conveyor into the sides of the search coil, never nearer than 2 inches (50mm) from the search coil windings.

### PLATE SEARCH COIL FOR FLAT BED CONVEYOR.

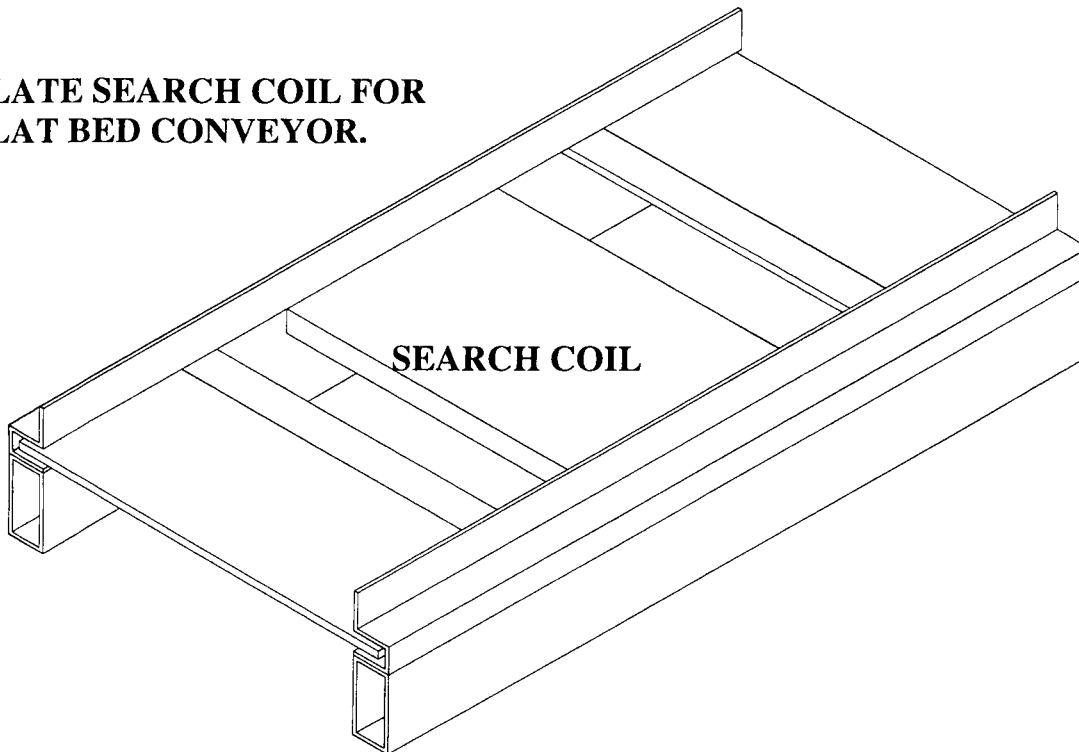


FIGURE 2

# Electrical Connections

Remove the cover of the detector by undoing the four captive screws.

Note: VR1 (Frequency) is set by the factory, do not adjust.

## MAINS CONNECTION

Check the mains voltage select switch is in the appropriate position for the voltage supply available, either 110V or 230V - 50/60Hz.

A cable for the mains supply is taken through the case cable gland and connected to TB1.

## MAINS FUSE

The fuse is mounted in the holder along side TB1 and is rated at 0.5A A/S.

## COIL CONNECTION

The Metalarm 6301 CE is supplied with a cable to connect to the search coil. Each end of the cable already has a plug on it for ease of installation.

## CONTROL RELAY CONTACTS

Two sets of relay contacts are provided one for tripping the conveyor motor contactor and the other for remote alarms. The contact rating is 240V 5A max. These contacts are available at terminal block TB2.

Please Note: The 6301 CE Metal Detector is a fail safe unit, such that if power is lost to the unit, the output relay releases.

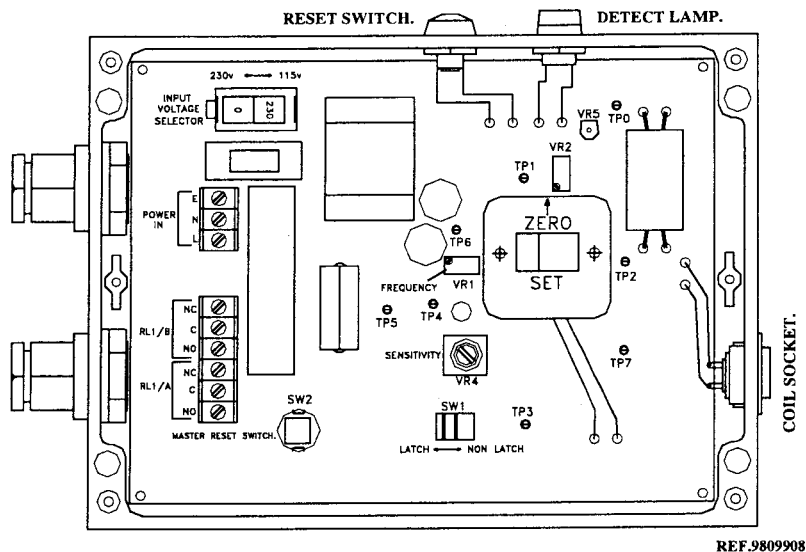


FIGURE 3

# Operating Instructions

## GENERAL OPERATION

In normal operation, the control unit is monitoring the search coil and if any metal passes over the coil, the red lamp on top of the unit will illuminate. Also, the relay will de-energize and stop the conveyor.

When the metal has been removed from the conveyor, the reset button along side the lamp can be pressed to extinguish the lamp and re-start the conveyor.

## COIL FAULT

The control unit continually checks the condition of the search coil. That is, if the coil is not connected to the control unit or if in operation it becomes open circuit or short circuit, then the red lamp on top of the unit will illuminate as a warning.

Also, the relay will de-energize to stop the conveyor and prevent operation until the coil fault is rectified.

## 'LATCH' OR 'NON LATCH' OPERATION

Normally the detector is supplied with the electronics arranged such that the detector 'latches' on detection of metal, ie. the relay remains released until reset by the 'reset' switch on the face of the detector.

If it is required for the detector only to provide a signal for the period of time that the metal is over the search face of the detector, the detector should be run in the 'non latch' mode.

This is achieved by switching the DIL switch SW2 to the right position, see (Figure 3) for the position of the switch on the printed circuit board.

## ADJUSTMENT

Note: Do not adjust VR1, as this is preset by the factory.

Switch on the supply to the detector and after approximately 2 seconds, the detector is ready for use.

Examine the meter mounted on the circuit board and if the needle is in the middle of the scale, then no further adjustment is required. If the needle is to the right then adjust the control (indicated by the arrow under the meter) counter-clockwise until is in the middle. A plastic alignment tool must be used to adjust VR2.

Conversely, if the needle is to the left, then adjust the control unit clockwise. If the red lamp is now on, then press the red master reset switch mounted on the circuit board.

## SENSITIVITY

The sensitivity can be adjusted by means of VR4 as shown in (Figure 3) . Full clockwise is maximum sensitivity.

The Metalarm 6301 CE Metal Detectors are supplied with average settings of sensitivity, if higher sensitivity is required please contact us.

## OPERATIONAL CHECK

The operation of the detector can be checked by passing a piece of metal over the search coil and checking that the red lamp mounted on the detector illuminates.

When in the 'latch' mode, the lamp will remain illuminated until the reset button is pressed. In the 'non latch' mode, the lamp will only illuminate when the metal is passed over the top of the search coil.

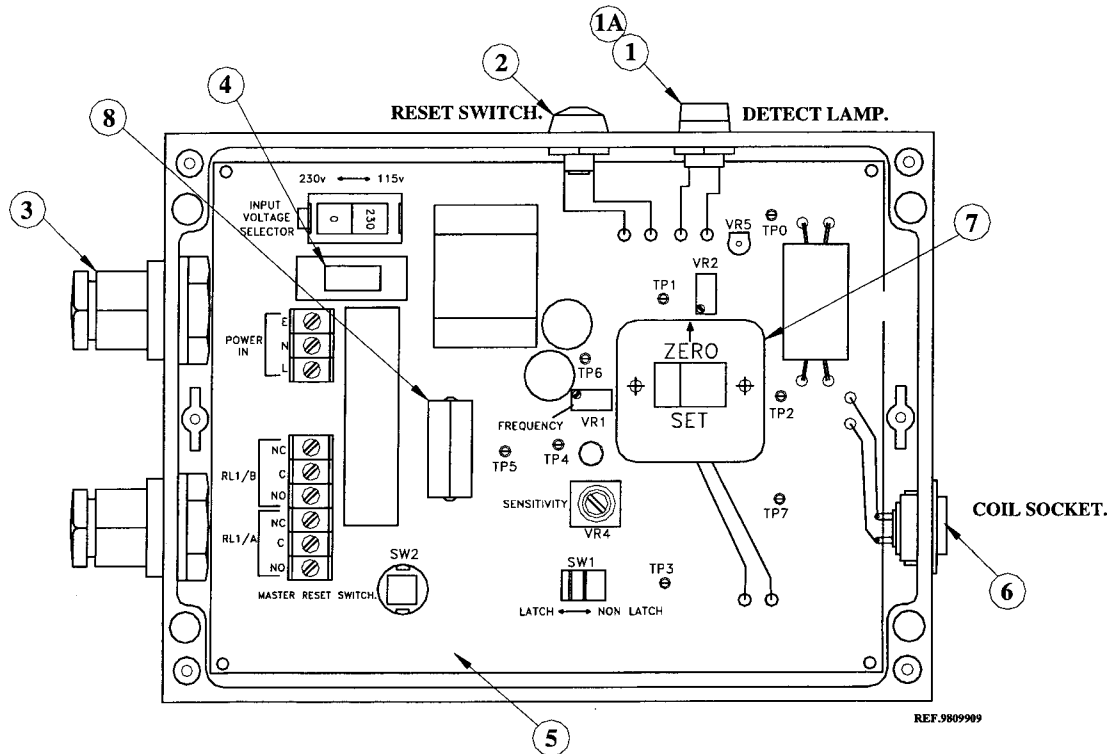
Note that after the reset switch is depressed, there is a 2 second delay before the unit is active again. When the detector is operating satisfactorily, replace the lid and tighten the four lid screws.

## DETECTOR INOPERATIVE

Should the detector not operate as described, please the Service Department at Eriez.



# Parts List



ITEM NUMBER	DESCRIPTION	PART NUMBER	QUANTITY
1	Red LES Lamp Holder	816562	1
1A	14V0.7w Filament Lamp	816207	1
2	Push Button Sealed	816563	1
3	M20 Cable Gland	816564	2
4	As 0.5A Fuse	816201	1
5	PTL 128D Printed Circuit Board	816208	1
6	Socket	816565	1
7	Meter	816566	1
8	P.C.B. Mounted DPDT 12V	816206	1
9	Cable 1 Meter w/Connectors- Control to Search Coil	816209	1

NOTE: VR1 (Frequency) is set by the factory, do not adjust.

# E.C. Declaration of Conformity

Authorized by: C. Giermak

Eriez Manufacturing Company  
2200 Asbury Road  
Erie, PA 16506  
USA

Pulse Technology Ltd.  
Unit 2 Radley Road Industrial Estate  
Abingdon, Oxon, OX14 3RY  
United Kingdom

Equipment Description:

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Directive Reference:

EMC Electromagnetic Compatibility Directives 89/336, 91/263, 92/31

Standards Used Reference:

EN 55011 General Emission Standard Class A

EN 50082 General Immunity Standard Part 2

Location of Technical file:

Pulse Technology Ltd

Certificate of Adequacy Reference:

Retained at the above address.

Approved by: David Harverson

Position: Managing Director

Date of Issue: 1st May 1996

The above equipment is manufactured in accordance with the essential Health & Safety requirements of the E.C.







**World Authority in Advanced Technology for Magnetic, Vibratory and Metal Detection Applications**

**HEADQUARTERS: 2200 ASBURY ROAD, P.O. BOX 10608, ERIE, PA 16514-0608 U.S.A.**

**Telephone 814/835-6000 • 800/345-4946 • Fax 814/838-4960 • International Fax 814/833-3348**

**Web Site: <http://www.eriez.com>**

**e-mail: [eriez@eriez.com](mailto:eriez@eriez.com)**

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