Installation, Operation and Maintenance Instructions

METAL DETECTOR
MODEL 1250-E6
ANALOG

ERIEZ MAGNETICS HEADQUARTERS: 2200 ASBURY ROAD, ERIE, PA 16506–1402 U.S.A.
WORLD AUTHORITY IN SEPARATION TECHNOLOGIES

Introduction

This manual details the proper steps for installing, operating and maintaining the Eriez Model 1250-E6 Metal Detector.

Careful attention to these 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 Model 1250-E6 Metal Detector assistance.

CAUTION

Safety labels must be affixed to this product. Should the safety label(s) be damaged, dislodged or removed, contact Eriez for replacement.

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ERIEZ MODEL 1250-E6 ANALOG METAL DETECTOR

Safety Warnings

THIS DETECTOR SHOULD BE INSTALLED BY QUALIFIED ELECTRICAL AND MECHANICAL PERSONNEL ONLY.

General

- All standard safety procedures should be observed when working on electrically powered equipment.
- Proper care should be taken when connecting or disconnecting the power source.
- When connected to a power source, un-insulated, dangerous voltage is present within the detector's electronics enclosure which may constitute a risk of electric shock.
- Do not allow moisture to collect in the electronics enclosure or near the power connections. Always close the enclosure and secure the locking mechanism after working with the electronics.
- The user should not attempt to service the Detector. All servicing should be referred to certified service personnel qualified to work on electrical equipment.

Installation

- Do not install this Detector near heat sources such as radiators or air ducts.
- Do not install this Detector near sources of electromagnetic interference
- Place the Detector in a location with adequate air circulation to prevent internal heat buildup.

Connections

- As standard, this Detector is set for connection to 115VAC. If specifically requested, the Detector can be set for 220VAC. The Detector must be connected only as supplied.
- The power cable should be routed so that it is not likely to be walked on or pinched by items placed upon or against it, paying particular attention to the point where it exits from the Detector.

General Information

Eriez detectors are custom fabricated to suit each user's particular application. Each detector system is subjected to extensive testing both at the sub-assembly level and after final assembly to ensure compliance with performance and electrical safety standards.

Standard Warranty

(Please refer to full warranty information)
Eriez new metal detectors are warranted against defects in workmanship and materials for three years. This warranty does not cover failures due to misuse, neglect, abuse, improper handling, alteration, improper maintenance or accident, and Eriez shall not be liable for any direct, indirect, consequential or incidental damages from use, results of use or inability to use this product. Repairs by any other than Eriez authorized service personnel will void this warranty.

Within the warranty period, the product will be repaired or replaced at Eriez' option, free of charge; shipping costs will be paid by Eriez. Except as mentioned above, no other warranty, expressed or implied, applies. If Modules are not covered by warranty as mentioned above, Dealer/User will be billed for the repair and shipping. Non warranty repairs, Dealer/User must issue a PO # or Credit Card # prior to any repair.

Installation Assistance

Eriez detectors have been designed for installation by qualified personnel with detailed instructions provided with each shipment. When required, a Eriez Field Engineer will supervise or check the installation, activate the system and provide training on periodic adjustments and care of the Detector for user maintenance personnel. Please contact Eriez for Field Service rates.

Technical/Application Assistance

Eriez welcomes your inquiries concerning metal detectors and their application, installation and servicing. If technical or application assistance is needed, contact:

Eriez Magnetics
2200 Asbury Road, Erie, PA 16506-1402 USA
Phone: 814-835-600 • 800-345-4946
Email: eriez@eriez.com
Website: www.eriez.com

Description

General

The Model 1250 provides protection to downstream processing equipment by detecting the presence of potentially damaging metal objects. It is specifically designed for use on conveyor systems in the plastics, forest, agricultural, rubber, recycling and mining industries. The Detector will discriminate between these conveyed materials and tramp metal of any type: ferrous, nonferrous, magnetic or nonmagnetic.

The Detector makes use of the latest in solid state technology. The design includes a number of innovative features: self-test circuits that monitor the performance of the detection circuitry using light emitting diodes (L.E.D.'s) which indicate the status of the test circuits; wide programming capability to custom tailor the Detector to suit specific application requirements; and solid state relays to provide reliable arc-free switching.

Method of Operation

During normal operation, the transmitter coil is energized to produce a pulsed electromagnetic signal. These signals produce a field that locally permeates the conveyed material. A piece of metal entering this field absorbs energy emitted from the transmitter coil. The metal particle then releases the energy and this change is detected by the receiver coil. This technique provides optimum discrimination between tramp metal and the conveyed material; product effect is non-existent or minimal.

Having detected metal by a waveform change, the signal generated is amplified and filtered. The signal is then compared to a threshold determined by the size of metal that must be detected. When the signal exceeds this threshold, the Detector, at the appropriate time, triggers solid state relays. These solid state relays in turn switch the line voltage to the Detector's output alarm terminals. Various combinations of alarm horns, belt stop relays, alarm beacons, and tramp metal marking devices can then be activated by the switched alarm outputs.

The Detector is influenced only by change. Therefore, stationary structural members, symmetrical idlers and other objects which do not represent a moving mass to the field are not detected. Metal belt repair clips are passed by the unit with an optional clip detector sensor and inhibitor circuit which is properly adjusted to the clip signal.

Physical Description

Main Control Enclosure

This enclosure houses and protects the Electronic and Interface Modules and also serves as a junction box for conduit and cables running to and from the Detector. As standard, the Detector is housed in a steel NEMA 4 enclosure. Other enclosures are available as options.

Visible and accessible on the front panel are: Power On/ Off Switch, Green Power "On" Indicator Lamp, Red Trip Indicator Lamp that lights when the unit has detected metal and a Reset Button. See Figure 1.

Type: NEMA
Size: 16" x 14" x 6"
Weight: 33 Lbs. (Includes All Electronics)

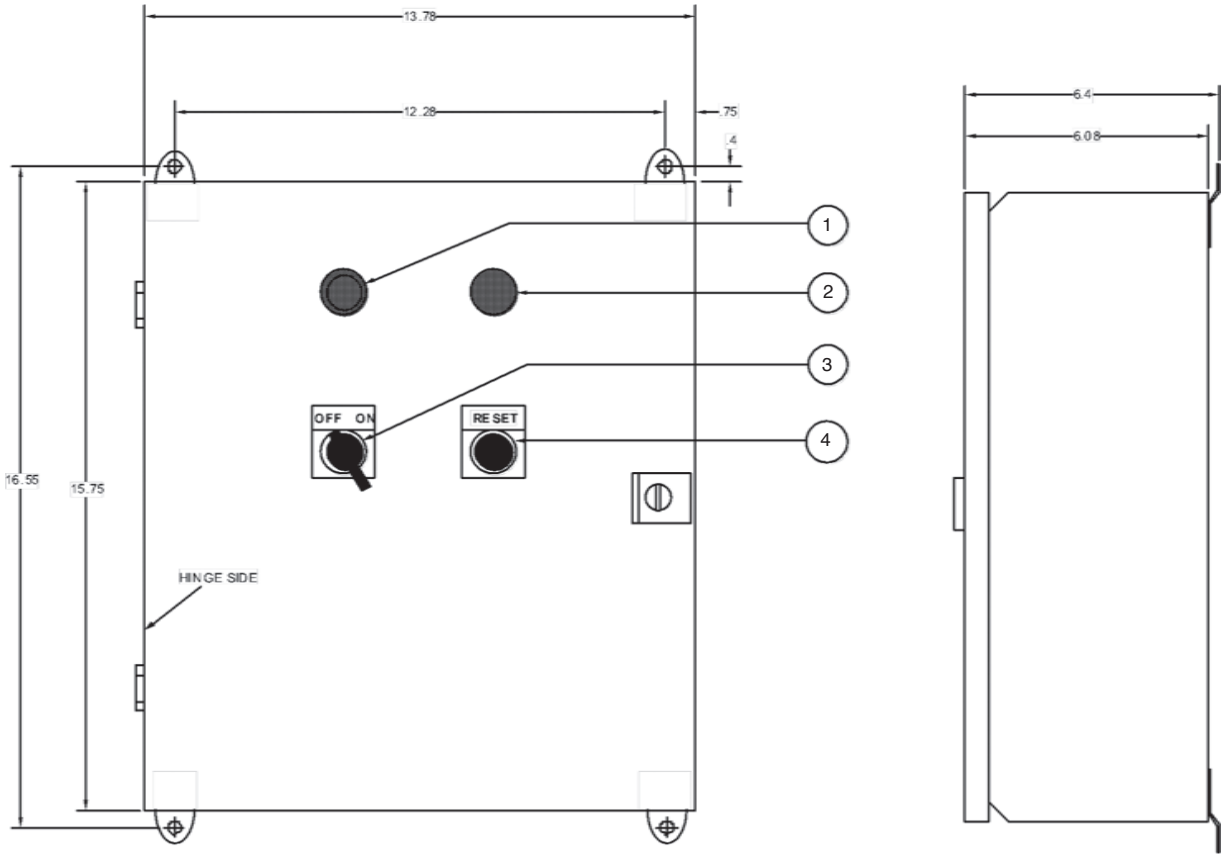


FIGURE 1

Electronic/ Interface Modules

All the electronics and controls for the Detector are contained in two modules, the Electronic Module shown in Figure 2 and the Interface Module shown in Figure 3. The Electronic Module houses the electronic circuitry and components associated with metal signal processing and analysis. Visible on the front panel of the Electronic Module are the “Metal Sensitivity” control knob, “Clip Override” control knob and L.E.D. status indicators used to monitor the status of the Detector’s self-test circuits. By removing the front panel of the module, all of the electronics are exposed for calibration and troubleshooting. All connections for the Electronic Module are made through a 36-pin connector located in the Interface Module. The modules are in place when the edge card connector on the Electronics Module mates with a connector on the Interface Module.

The Interface Module interconnects all external signals and power to the Electronic Module. This module houses the power transformer; solid state relays and interconnecting circuit board. Visible on the face of the Interface Module are system fuses and two terminal blocks for external wiring; all the terminal block positions are clearly identified via silk screen on the top surface of the module.

The right terminal block, a 13-pin, 3/8" center screw type, connects the Detector's external transducers and signals. The left terminal block, a 7-pin, 7/16" center screw type, is used for all connections handling the A.C. line voltage.

Electronic Module

Size: 10.5" x 8" x 1.5"
Weight: 2.5lbs

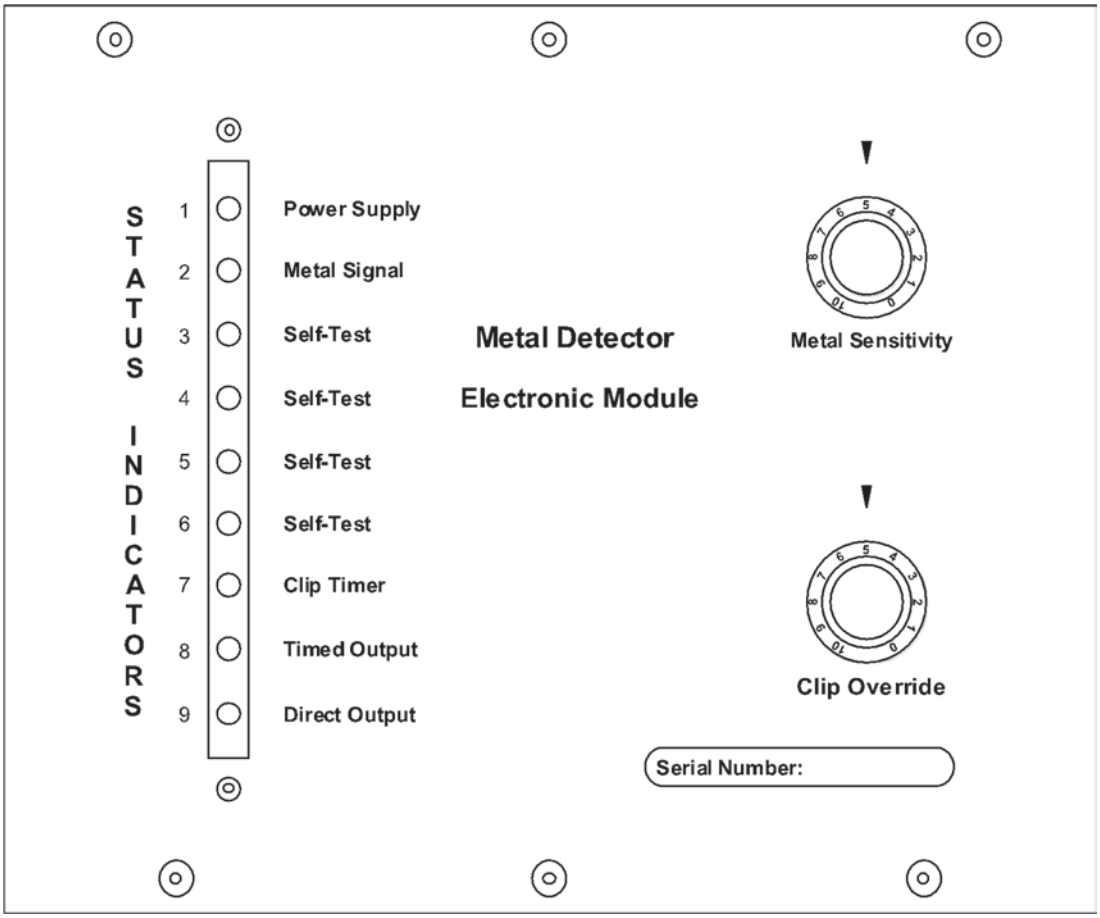


FIGURE 2

Interface Module

Size: 11" x 2.5" x 4"
Weight: 4.75lbs

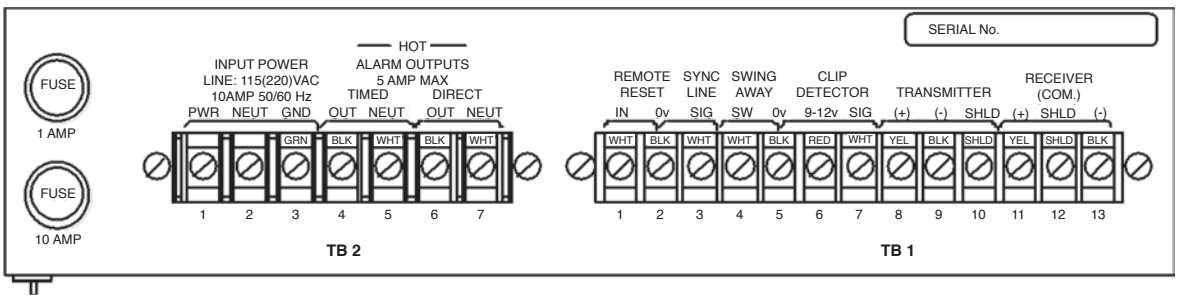


FIGURE 3

Search Coil Assembly

The Search Coil Assembly includes receiver and transmitter antennas, mounting frame and interconnecting cables. Each assembly is custom designed to suit its particular application. Please refer to the Frame Assembly Diagram, Figures 4 & 5.

Receiver Coil

The receiver coil is typically located under the conveyed material within 1" of the loaded conveyor belt. An aluminum enclosure shields the receiver coil from electromagnetic interference. Mounting tabs are located on the aluminum shield to attach it to the material handling structure.

Transmitter Coil

The transmitter coil is generally located above the material, opposite and parallel to the receiver coil. The distance between the transmitter and receiver (aperture) is typically 2" to 4" greater than the maximum burden depth of the processed material. The swing away transmitter is lightweight molded fiberglass and is used for applications that do not have a lot of vibration and there may be an over burden once in a while. The swing away assembly will be pushed out of the way by the overburden; once it passes the antenna will return to its normal position. If over burden is a common occurrence then an optional Rough Guard may be fitted to the swing away assembly in order to protect the transmitter from damage (Appendix B Figure B1 item 6). An alternate shielded transmitter coil may be recommended for applications have excessive electrical noise and where over burden is not a problem.

Mounting Frame

The mounting frame supports the antennas on trough and slider bed conveyors. Special designs are available to accommodate other types of material handling systems. The swing-away assembly, shown in (Figure 4), protects the transmitter from oversized conveyed materials. The fixed assembly, show in (Figure 5), is used for high sensitivity applications and the shielded transmitter in high electrical noise environments.

Interconnecting Cables

Shielded cables connect the receiver and transmitter to the Main Control Enclosure. The cables are cut to a specified length at the factory. **Any alteration to the cable length will degrade the Detector's performance.** Once equipment is at the customer's site, changing cable length will require a field service representative to recalibrate the detector for new length of cable. Call factory for field service rates and charges. Cables are to be routed separately to the electronics enclosure; separation should be about 4". Do not ty-rap cables together; do not run the cables in the same conduit.

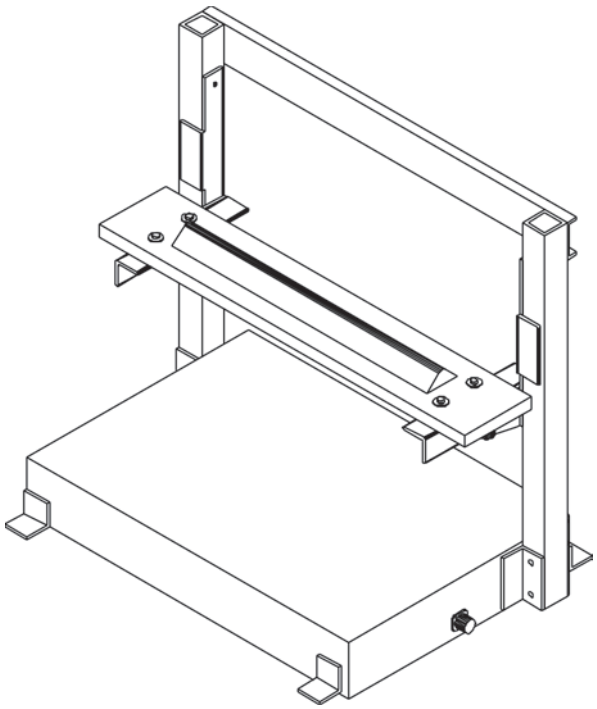


FIGURE 4
Swing Away Frame Assembly Diagram

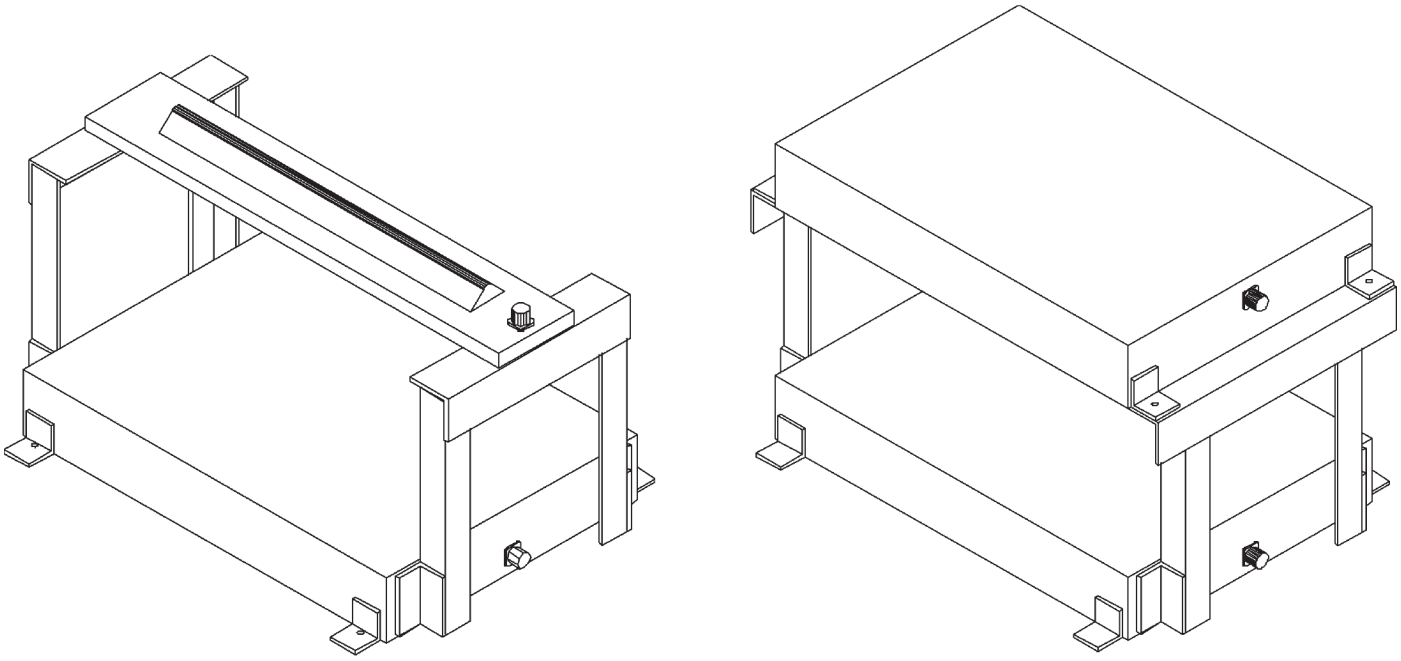


FIGURE 5
Fixed Transmitter Antenna Assemblies

Clip Detector

(if applicable)

The clip detector (see Figure 6), consists of a compact sensor head and mounting bracket. The clip detector senses the proximity of repair clips as they pass over the sensor's head. Once the clips are detected, the Metal Detector is disabled for a period; this period is equal to the distance between the up and down stream idler rollers on either side of the metal detector antenna and the length of time depends on belt speed and the distance between the rollers. Using a clip detector is not recommended for the model 1250. It is also recommended that the belt be vulcanized.

Belt splice clips represent a huge mass of metal for the metal detector. Because of the enhanced sensitivity of this model when the clips passed between the antennas the clip circuitry was swamped with the energy from the clips and it took too long for the energy to dissipate (approx. 30 seconds), even though the detector went into clip mode and the clips passed. When the detector switched back to normal mode the detector would trip because the circuity could not be zeroed. For this reason the clip circuitry was modified so that when the clips are sensed the signal is blocked and the detector is disabled during clip mode. The clip disable circuitry is inactive and the electronics has to be modified at the factory in order for the clip disable circuitry to operate. **When this mod is active there is no metal detection during clip mode.**

Size: 3.5" x 3.5" x 2"
Weight: 1.25 Lbs.

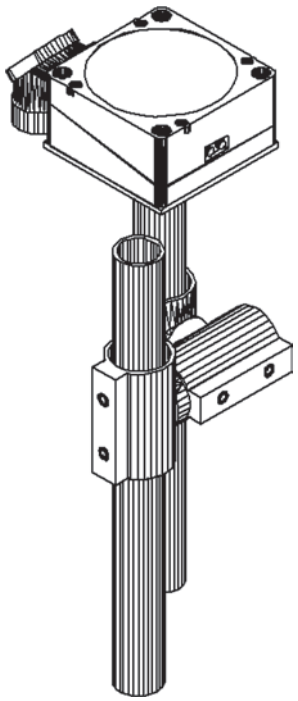


FIGURE 6

Spray Marking Device

(if applicable)

The Spray Marking Device (see Figure 7), is a pressurized, solenoid activated liquid spray system which pinpoints the location of tramp metal to eliminate costly search and down time.

Flag Drop Marker

(if applicable)

The Flag Drop Marker (see Figure 8), is a device which drops a flag onto the belt which pinpoints the location of tramp metal to eliminate costly search and down time.

Multiple Unit Synchronization

(if applicable)

Synchronization is used when two metal detectors are used within 100' of each other and are within a line of sight. Exception is when there is a metal wall or other metal structure between the two metal detectors to absorb the signals from the metal detectors.

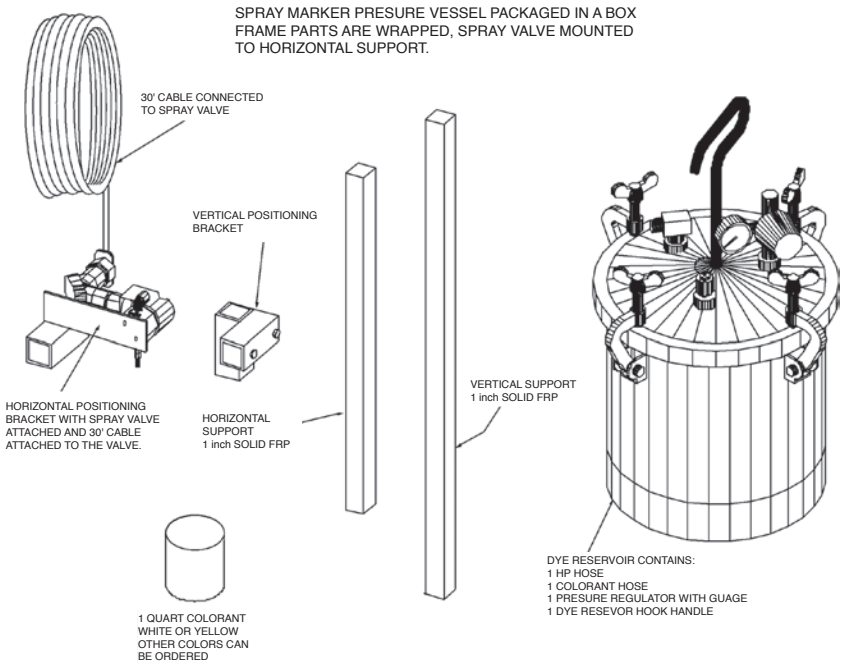


FIGURE 7

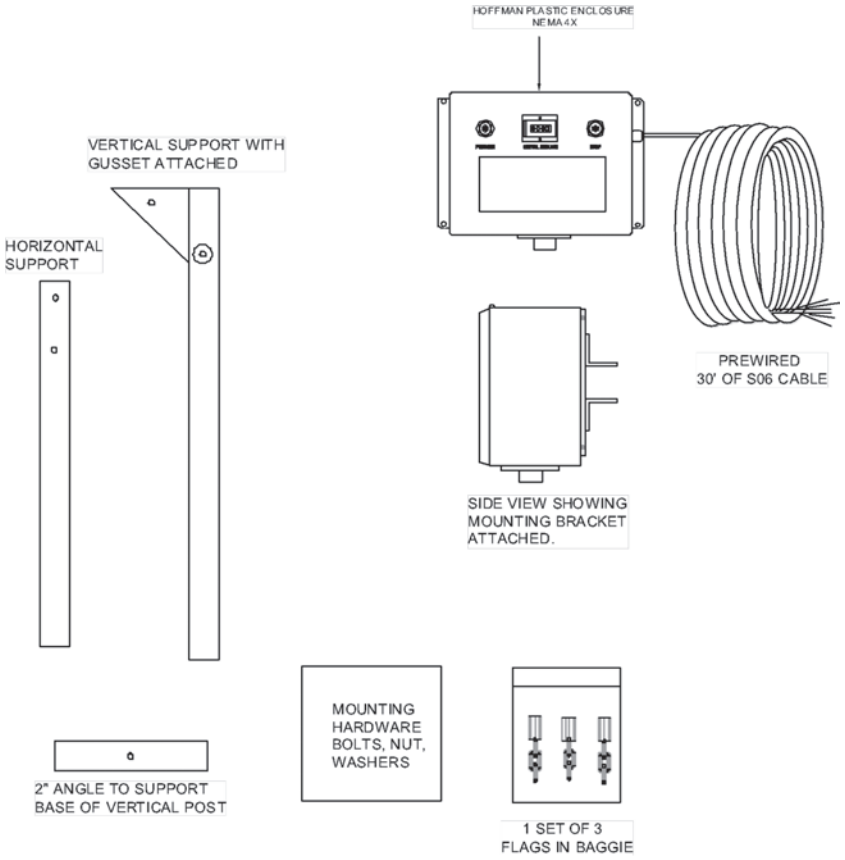


FIGURE 8

Installation

PLEASE READ THROUGH COMPLETELY BEFORE BEGINNING WORK!

Unpacking

Upon receipt of the crate(s) containing the Metal Detector System, inspect the contents for physical damage and missing parts. If anything is broken or missing, please contact the carrier and notify the supplier immediately.

Site Selection & Preparation

While each application is unique, the guidelines listed below apply to most installations. Specific information concerning your installation can be found in the Frame Assembly and Control Connection Diagrams.
Follow the steps listed below to choose the best location for the detector:

Choose a location for the detector so the material handling system has ample time to react to tramp metal. Locate the detector far enough in advance of the head pulley so the belt can come to a stop before the metal falls off the end of the belt. If a diverter is used, consider the reaction time of the system and speed of the conveyor belt.

Select a site with minimum vibration. High vibration areas may degrade detector sensitivity and shorten component life.

Locate the Search Coil Assembly away from sources of airborne electrical interference emitted from variable-speed drives, large motors, ballasts, FM radios, induction furnaces and other radio frequency (RF) sources. Because RF energy travels along a straight line (line-of-sight), position the receiver coil or relocate RF sources so they are out of the direct line-of-sight with the top and bottom of the receiver coil. Cables carrying high voltage or varying loads must be enclosed in steel conduit, grounded at both ends and located at least 4' from the detector coils.

Position (see Figure 9) the entire search coil assembly so that the bottom of the coil (usually the receiver) is equally spaced between the two adjacent idler rollers. Center the receiver coil. **Do not center the 2" x 2" uprights.**

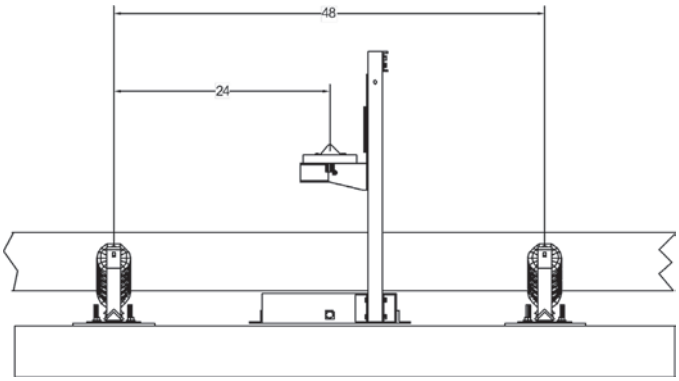


FIGURE 9

Idler Roller Isolation

The magnetic field generated by the transmitter coil induces eddy currents in nearby metal cross bracing, stairways, handrails and pipes. These eddy currents may cause false tripping if the current path intermittently makes contact. Eddy current loops can be broken by cutting the conductive paths in these structures. Use non-metallic hardware as required to restore structural support. If conveyor idlers are used in your application, the idlers adjacent to the Search Coil Assembly may require modification or isolation to break eddy current loops. Refer to the Conveyor Idler Modification Diagram (if applicable) for details. (See Figure 11) The idler isolation kit (see Figure 10), is used to reduce or eliminated unwanted electrical interference from the adjacent idler rollers.

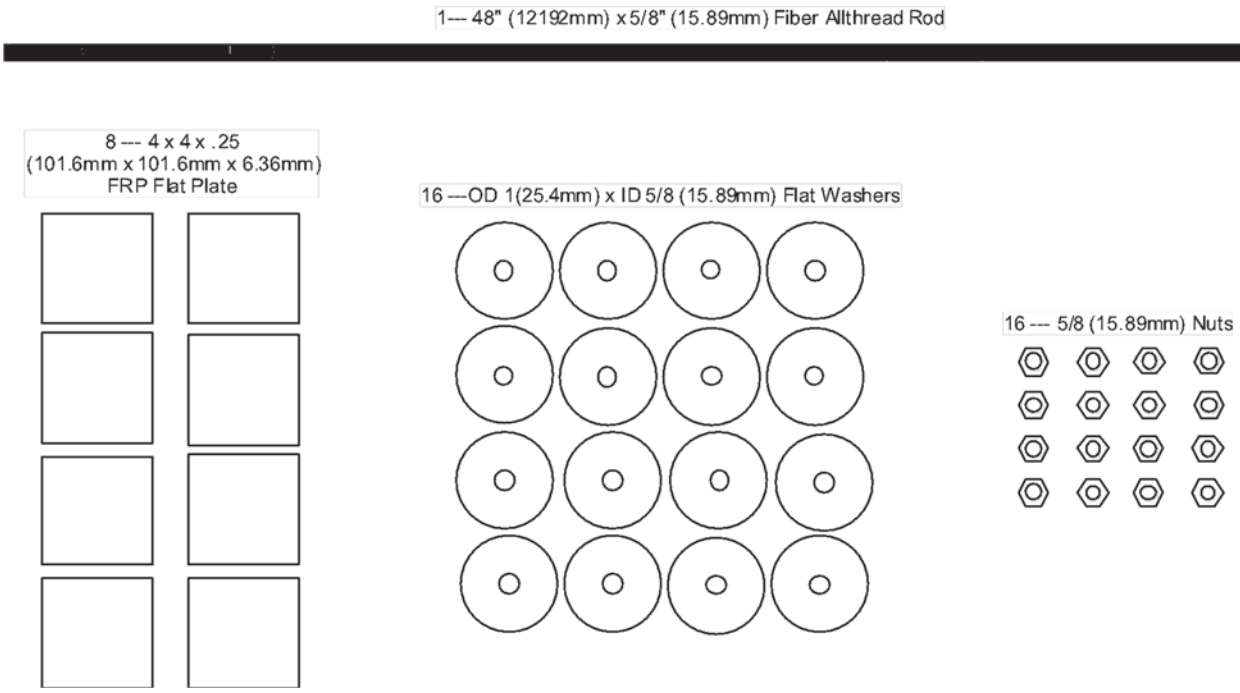


FIGURE 10
Isolation Kit

If the Search Coil Assembly is located where a metal skirt passes through the coils, it must be replaced with a five-foot section of non-metallic material (i.e., wood or plastic).

Remove metallic decking, skirt boards, cross bracing and return idlers below and within 3' of the center line of the receiver coil (upstream and downstream). Relocate or tightly secure moving or vibrating pieces of metal such as cables, conduit and piping within 36" of the Search Coil Assembly.

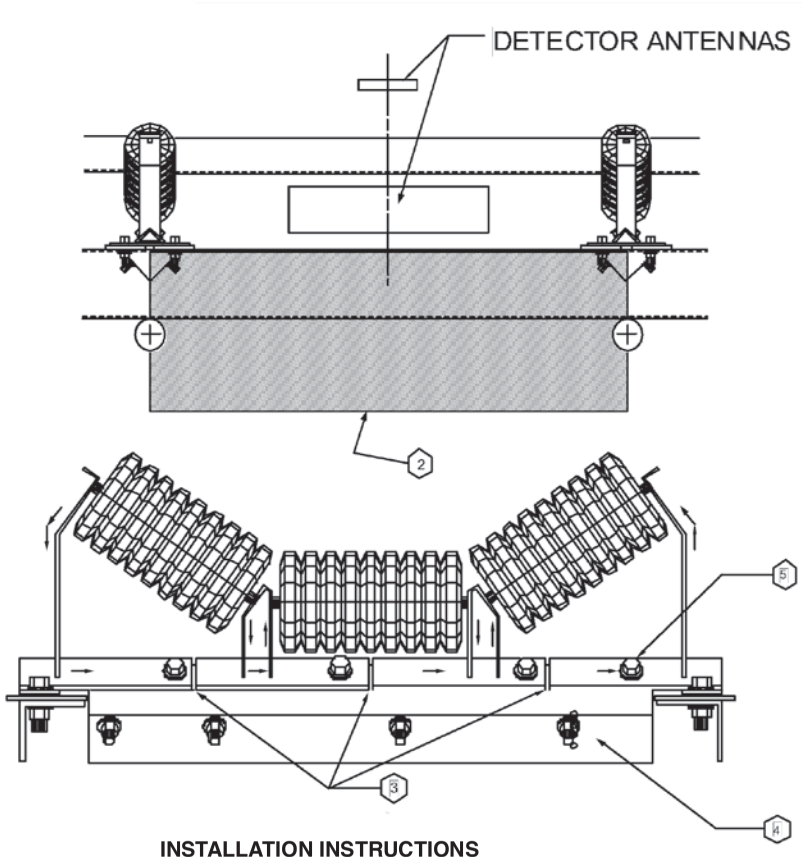
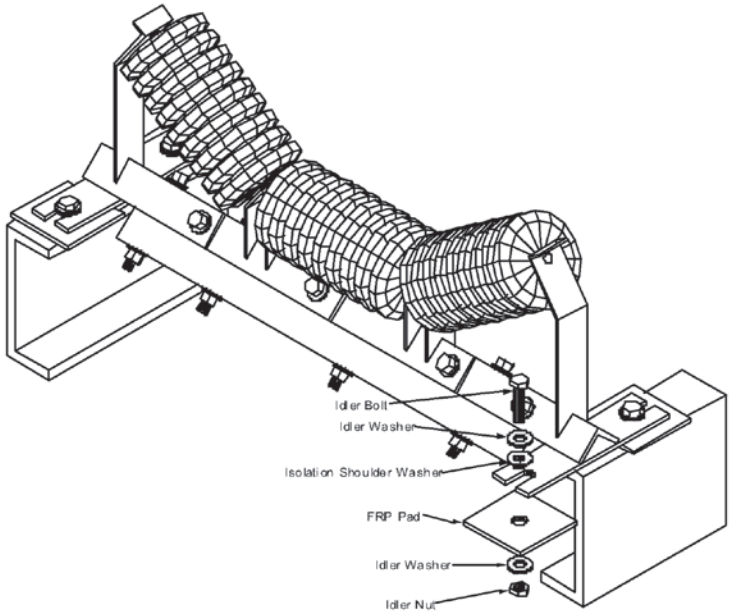


FIGURE 11

ITM	QTY	DESCRIPTION
1	8	SHOULDER WASHER 1/2" ID (12MM)
2	8	SHOULDER WASHER 5/8" ID (16MM)
3	8	SHOULDER WASHER 13/16" ID (20MM)
4	8	ISOLATION PAD, FIBERGLASS 4" X 4" X 1/4" THK SET OF 4
5	A/R	WOOD, FIBERGLASS NON-CONDUCTIVE MATERIAL
6	A/R	FASTENERS - AS REQUIRED FOR STRENGTH



INSTALLATION INSTRUCTIONS

1. Remove the adjacent idler on either side of the detector installation location. Replace adjacent idlers with rubber impact type as shown.
2. No metal decking, cross bracing, or return idlers below between idlers adjacent to receiver antenna.
3. Cut idler base (3) three places as shown along length to break electrical current loops depicted by the arrows. The idler base sections must be supported with a brace.
4. The brace can be wood or plastic. Easiest is a 4" by 4" by (length 1/2" less than frame ID) piece of hard wood placed under the cut sections.
5. Drill holes in the metal sections and use lag bolts to secure base to the wood support. There must be at least 1/4" gap between the cut sections.
6. Select Shoulder Washers that is the closest fit for the idler bolt.
7. Position 4 isolation pads under idler feet (two on each side) so they are centered on the idler foot hole, drill a holes into the four isolation plates large enough to allow the shoulder washer flange to fit the idlers mounting foot and the conveyor frame. Secure the idlers with the bolt, washers, shoulder washer and nuts. When completed, the idler will be electrically isolated from the conveyor frame.

Note: Be sure to use a metal flat washer on top of the nylon shoulder washer to spread the bolt head pressure evenly.

Mounting – Search Coil Assembly

Note the material flow direction arrows, match marks and frame identification letters on the frame components before beginning work. Please refer to the Frame Assembly Diagram for installation. (See Figures 12, 13, &14)

Fasten the coil to the material handling system. Shim the unit as necessary to provide a uniform and sturdy mounting surface. Maintain clearance between the coil and any moving objects. Do not torque, twist or use excessive force when fastening the coil to the structure. Do not drill or weld the coil.

Secure the frame assembly to the receiver coil. Make sure the assembly is aligned. Use the hardware provided as called out in the Frame Assembly Diagram.

Fasten the transmitter coil to the frame assembly. If a swing-away assembly is used, make sure the transmitter brackets rest squarely with the uprights and move freely. Be careful to install the bolts, washers and nuts in the proper sequence to allow free but controlled movement of the brackets.

Inspect the coil for alignment and fit. Tighten all connections. The entire assembly should be rigid and sturdy.

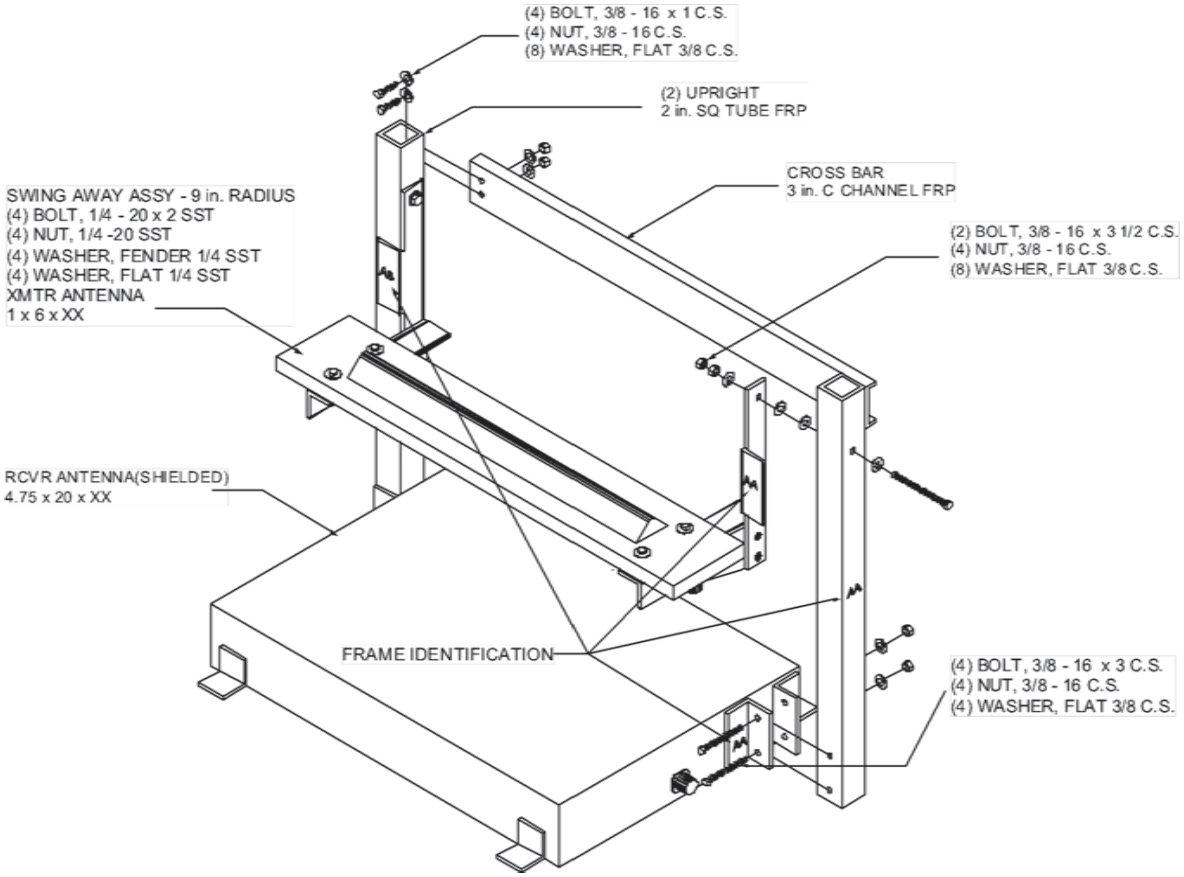


FIGURE 12

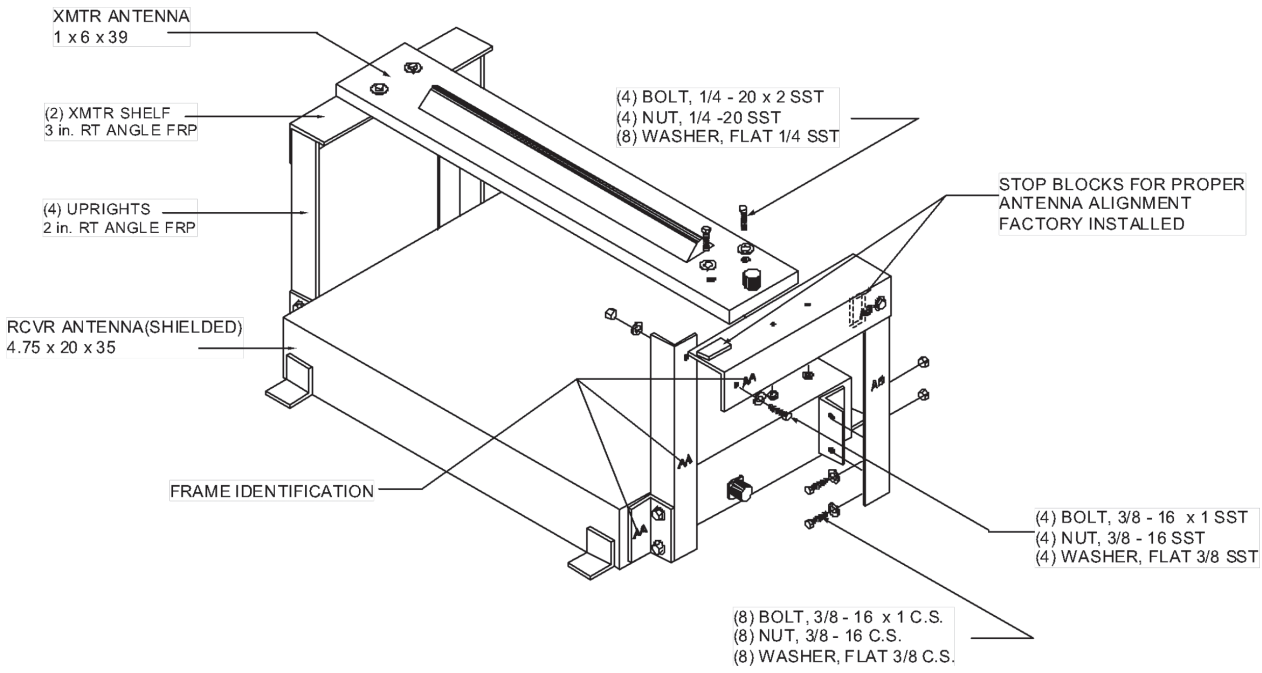


FIGURE 13

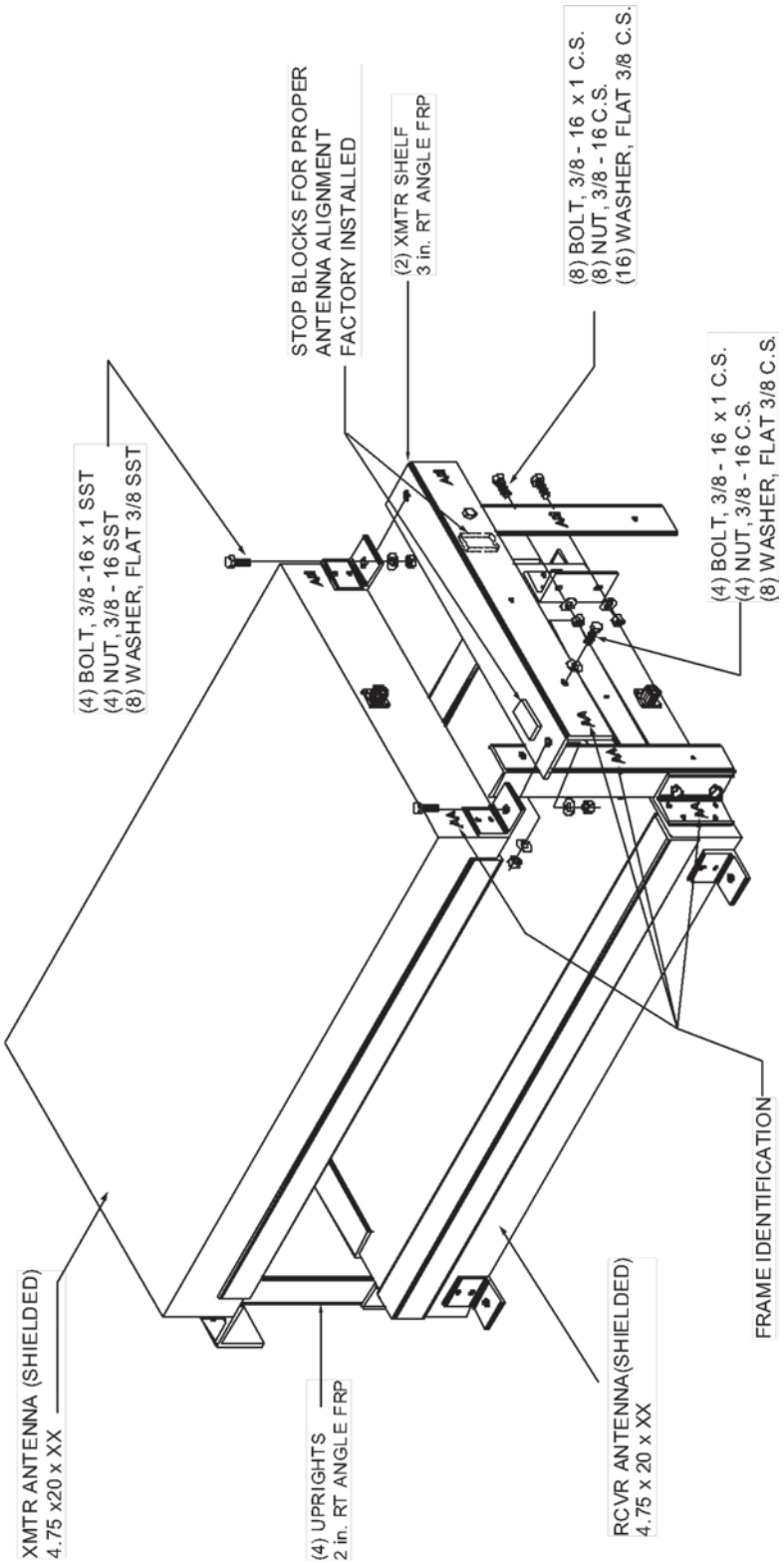

XMTR ANTENNA (SHIELDED)
4.75 x20 x XX
(4) BOLT, 3/8 -16 x 1 SST
(4) NUT, 3/8 - 16 SST
(8) WASHER, FLAT 3/8 SST
STOP BLOCKS FOR PROPER
ANTENNA ALIGNMENT
FACTORY INSTALLED
(2) XMTR SHELF
3 in. RT ANGLE FRP
(8) BOLT, 3/8 - 16 x 1 C.S.
(8) NUT, 3/8 - 16 C.S.
(16) WASHER, FLAT 3/8 C.S.
(4) BOLT, 3/8 - 16 x 1 C.S.
(4) NUT, 3/8 - 16 C.S.
(8) WASHER, FLAT 3/8 C.S.
FRAME IDENTIFICATION
(4) UPRIGHTS
2 in. RT ANGLE FRP
RCVR ANTENNA(SHIELDED)
4.75 x 20 x XX

FIGURE 14

Mounting – Main Control Enclosure

After installing the Search Coil Assembly, select a place to mount the Main Control Enclosure for ease of operation. Avoid high vibration areas. Note the length of interconnecting cables and the location of the connectors on the receiver and transmitter coils. Locate the Control Enclosure on the same side of the conveyor frame as the connectors for ease in routing the cables.

The Enclosure should be positioned so the front panel hinge is on the left side and the indicators are on top.

Fabricate and install a sun/rain shade for added protection over the Enclosure if it is mounted outdoors. Do not obstruct the natural airflow around the Enclosure.

Familiarize yourself with the type of electrical connections required for this installation and any safety precautions before proceeding. Please refer to the Control Connection Diagram (Appendix A) for information about connections and color code hook-up.

Use an electrician's conduit punch or drill to make either 1/2" or 3/4" conduit entries on the bottom of the Enclosure. The Control Connection Diagram shows where to position each entry. Remember to remove all metal shavings when you are finished. Use caution to not damage the electronics and to ensure that no metal particles enter the electronics. Do not run metal conduit along the sides or near the Search Coil Assembly.

Pay close attention to the type of electrical wires routed in each conduit and the location of each connection on the Interface Module. ***The receiver and transmitter cables must be routed in a separate conduit***. Do not run power wiring near the transmitter and receiver cables. Do not run power wiring connected to TB2 with low voltage signal wiring from TB1 in the same conduit.

All line voltage connections terminate at TB2. Install line voltage cables between devices controlled by the Detector including diverters, auxiliary relays, marking devices, alarm horns or motor control equipment and TB2 in the Main Control Enclosure. The direct or timed outputs should not be connected to a Programmable Logic Controller (PLC) or other low voltage computer interface equipment that may require dry contact closures. The direct and timed output contacts are typically programmed as normally "OFF" at the Factory. They may be set to normally "ON" if required. Refer to the System Programming Section for details.

Connect a 115/220 VAC (50/60 Hz), single phase power line with at least 10 amp capacity to TB2. Make sure to connect an electrical ground to terminal #3. The power should be the "cleanest" available and free of significant voltage variations or spikes. Do not connect the Detector to a line which is used for operation of motors or motor controls. Proceed with the Start-Up & Calibration Section before applying power.

⚠ CAUTION

The Interface Module is preset at the Factory for 115 or 220 volt (±10%), 50/60 Hz, and single phase operation. If the voltage source is different, contact the Factory for instructions to select the proper voltage source.

Swing-Away Switch

(if applicable)

The Swing-Away Cutout Switch (Optional) is a pre-wired switch mounted on the swing-away bracket (see Figure 15). Its purpose is to prevent the Metal Detector from tripping when the transmitter antenna is hit by an overburden of material. Route the free end of this cable in the same conduit as the transmitter cable to the Main Control Enclosure. Refer to Appendix A, Control Connection Diagram for hookup.

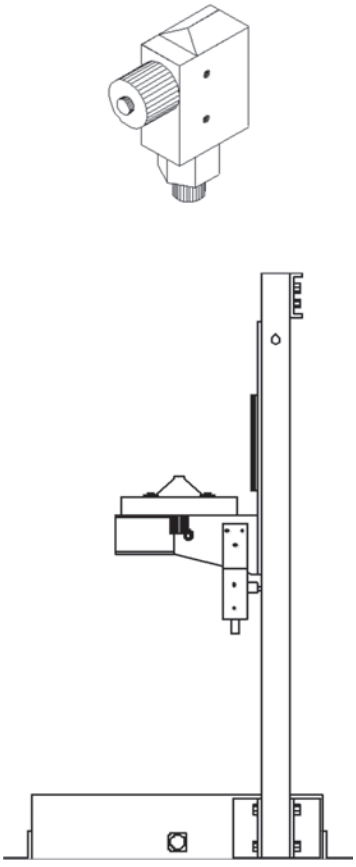


FIGURE 15
Swing Away Switch - In a NEMA 4 Housing

Clip Detector

(if applicable)

Install the clip detector unit as follows:

Refer to Control Connection and Figure 16. If there are idlers adjacent to the search coils, position the Clip Detector Sensor approximately 1" to 3" upstream of the nearest upstream idler before the Search Coil Assembly. For slider bed type conveyors, position the Clip Detector Sensor approximately (but no closer than) 2' from the center line of the receiver antenna on the upstream side of the Antenna Assembly. The flat face of the Clip Detector should be facing toward the belt with approximately 1/2" to 1" of clearance. **This clearance must be maintained in order to assure proper operation.** The Clip Detector should be a few inches from the edge of the belt. Do not mount the Sensor too far from the edge, as tramp metal lying close to the belt may trigger the sensor and pass through the search coils as a repair splice.

With the Clip Detector Sensor in the proper position below the belt, weld the 3/4" support pipe (provided) to the conveyor frame. The pipe may be cut to the proper size for an easier fit. The multi-axis swivel joint will provide adequate movement for proper adjustment.

It is recommended that the Clip Detector cable running to the Main Control Enclosure be installed in conduit. The same conduit that houses the transmitter coil cable may be used.

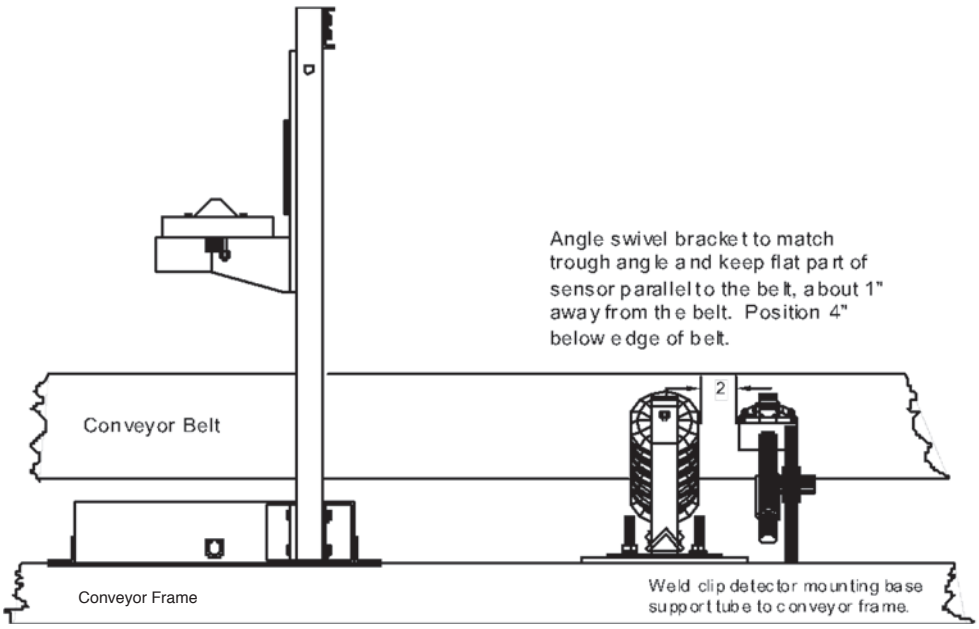


FIGURE 16

Feed the Clip Detector cable into the conduit from the Clip Detector end to the Main Control Enclosure.

Cut off excess cable. Connect wires to terminal block (TB1) using the supplied spade lugs. Refer to the Control Connection Diagram for color code hook-up. Be certain all wires are attached securely and connected to their proper terminals.

When metal repair clips are used, two or more clips close together must pass directly over the Clip Detector Sensor in order to activate it. If a small patch of clips are used on the belt, which would not pass directly over the Clip Detector, reference clips are required. Reference clips are made by installing two or more clips which will pass directly over the Clip Detector to trip it when a small patch passes by (see Figure 17). Numerous repair and reference clips on the belt will degrade the Detector's performance because it will frequently be in a desensitized mode.

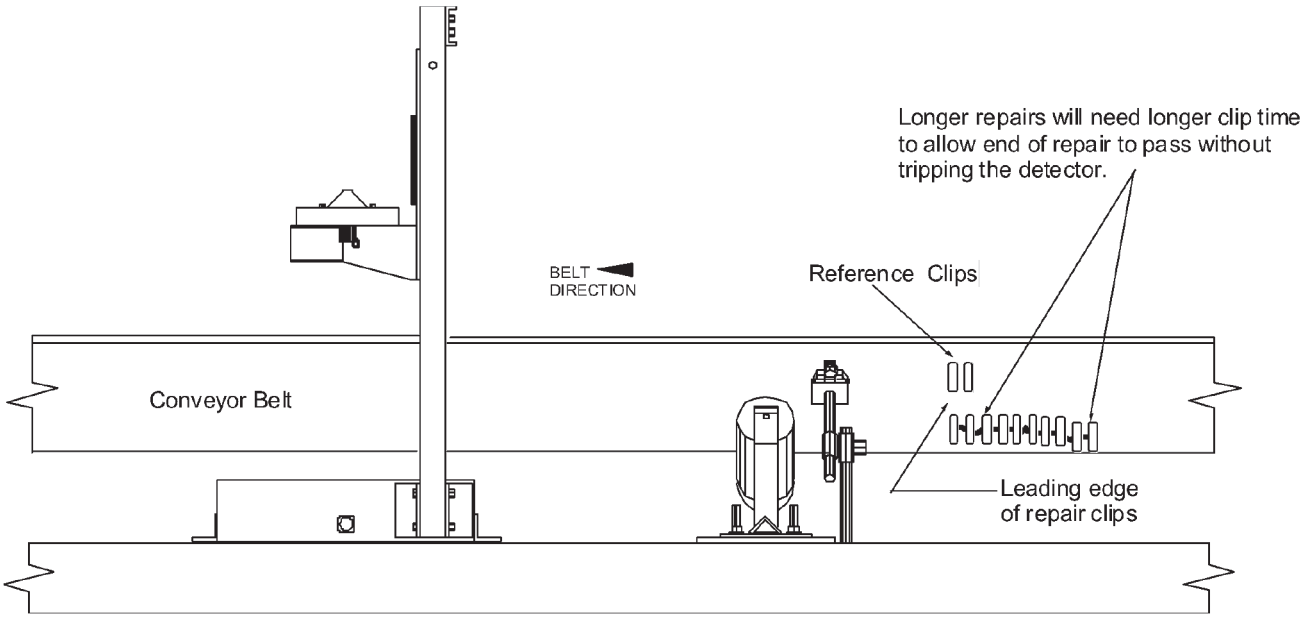


FIGURE 17

Marking Device

(if applicable)

The Marking Device (See Figure 19) is a pressurized, solenoid activated liquid spray system which pinpoints the location of tramp metal to eliminate costly search and down time.

Specifications

Tank Pressure Rating: 150 psig (maximum working pressure)
Tank Capacity: 3 Gallons (liquid)
Operational Voltage: 115/220 VAC (50/60 Hz), 15 Watts
Air: Plant air or any source of 100 to 200 psig inert gas

Installation Instructions

Refer to the Frame Assembly Drawing (See Figure 18) for layout of the Marking Device on the belt.

Position the solenoid support upright and cross arm as shown. Distance from the coils should be 3' to 6'. Clamp in place temporarily.

NOTE

The 1" x 1" support structure is a fiberglass bar.

Position the support bracket of the solenoid spray valve so that the nozzle is pointed directly on the center of the conveyor belt. The nozzle may be positioned as shown or on the opposite side of the arm. Bolt the bottom of the support frame to the conveyor frame.

The solenoid control cable is connected to the Interface Module Timed Output (Terminal TB2, Pins 4 & 5). Route the cable accordingly.

Connect the hose between the tank outlet and the solenoid valve.

Connect the facility air source to the tank regulator inlet. Be sure the facility air source is shut off and no pressure is in the tank.

Remove the top of the spray tank.

The spray solution is supplied by the User. The recommended mixture is five (5) fluid ounces of colorant, Chrome Yellow (or other contrasting color) manufactured by Tenneco Chemical (or equivalent) mixed with a two (2) gallon solution of water and antifreeze appropriate for local climate conditions (minimum of 25% antifreeze). **DO NOT USE PAINT. Paint will clog the spray valve.**

Mix the solution and pour it into the holding tank. Replace the cap.

Verify that the pressure regulator valve is closed prior to turning on the facility air.

Apply the facility air and adjust the pressure regulator between 60 and 100 psig, as noted on the pressure gauge on top of the holding tank.

Calibration of Marking Device

Refer to System Programming section “Delay Before Alarm” and “Time Alarm On” to set the desired timing for marking a predetermined location.

Using a sample piece of tramp metal, with the belt operating at normal load, adjust the Marking Device timing by trial and error.

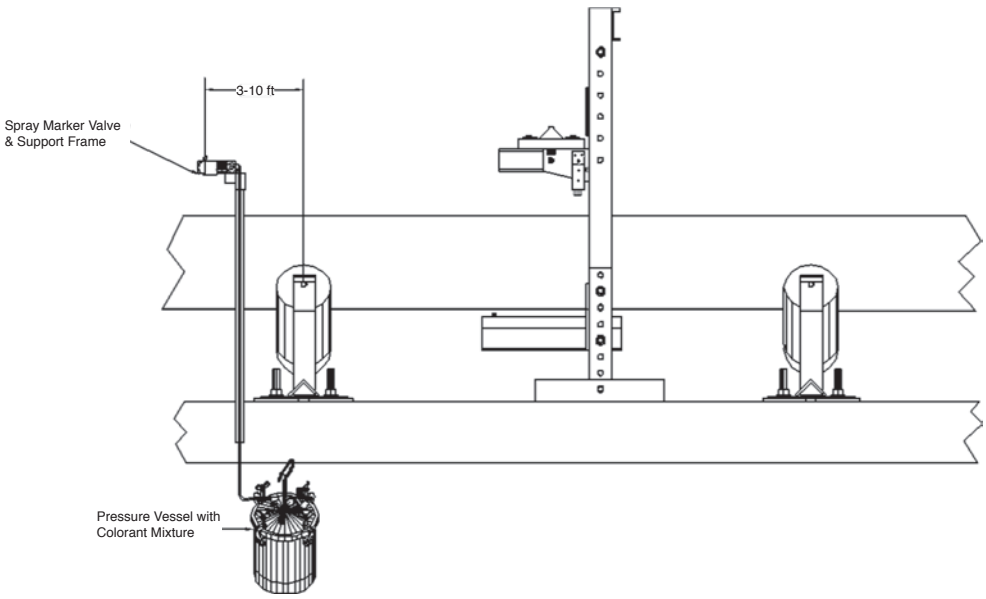


FIGURE 18

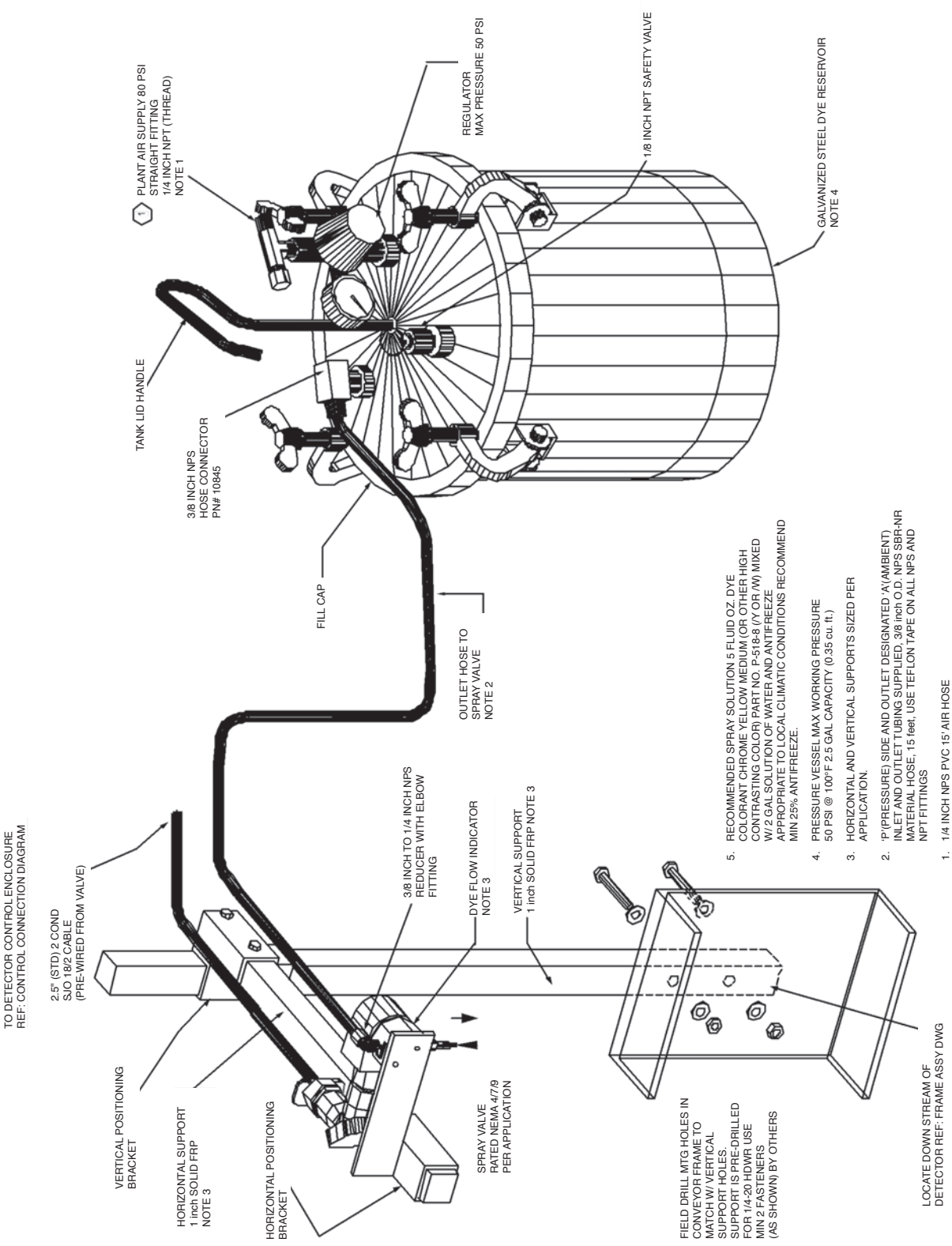

TO DETECTOR CONTROL ENCLOSURE
REF: CONTROL CONNECTION DIAGRAM
2.5" (STD) 2 COND
SJO 18/2 CABLE
(PRE-WIRED FROM VALVE)
VERTICAL POSITIONING
BRACKET
HORIZONTAL SUPPORT
1 inch SOLID FRP
NOTE 3
HORIZONTAL POSITIONING
BRACKET
SPRAY VALVE
RATED NEMA 4/7/9
PER APPLICATION
3/8 INCH TO 1/4 INCH NPS
REDUCER WITH ELBOW
FITTING
DYE FLOW INDICATOR
NOTE 3
VERTICAL SUPPORT
1 inch SOLID FRP NOTE 3
FILL CAP
OUTLET HOSE TO
SPRAY VALVE
NOTE 2
TANK LID HANDLE
3/8 INCH NPS
HOSE CONNECTOR
PN# 10845
PLANT AIR SUPPLY 80 PSI
STRAIGHT FITTING
1/4 INCH NPT (THREAD)
NOTE 1
REGULATOR
MAX PRESSURE 50 PSI
1/8 INCH NPT SAFETY VALVE
GALVANIZED STEEL DYE RESERVOIR
NOTE 4
FIELD DRILL MTG HOLES IN
CONVEYOR FRAME TO
MATCH W/ VERTICAL
SUPPORT HOLES.
SUPPORT IS PRE-DRILLED
FOR 1/4-20 HDWR USE
MIN 2 FASTENERS
(AS SHOWN) BY OTHERS
LOCATE DOWN STREAM OF
DETECTOR REF: FRAME ASSY DWG
5. RECOMMENDED SPRAY SOLUTION 5 FLUID OZ. DYE
COLORANT CHROME YELLOW MEDIUM (OR OTHER HIGH
CONTRASTING COLOR) PART NO. P-518-8 (/Y OR /W) MIXED
W/ 2 GAL SOLUTION OF WATER AND ANTIFREEZE
APPROPRIATE TO LOCAL CLIMATIC CONDITIONS RECOMMEND
MIN 25% ANTIFREEZE.
4. PRESSURE VESSEL MAX WORKING PRESSURE
50 PSI @ 100°F 2.5 GAL CAPACITY (0.35 cu. ft.)
3. HORIZONTAL AND VERTICAL SUPPORTS SIZED PER
APPLICATION.
2. 'P' (PRESSURE) SIDE AND OUTLET DESIGNATED 'A' (AMBIENT)
INLET AND OUTLET TUBING SUPPLIED, 3/8 inch O.D. NPS SBR-NR
MATERIAL HOSE, 15 feet, USE TEFLON TAPE ON ALL NPS AND
NPT FITTINGS
1. 1/4 INCH NPS PVC 15' AIR HOSE

FIGURE 19

Flag Drop Marker

(if applicable)

The Flag Drop Marker is device which drops a tag or flag onto the belt which pinpoints the location of tramp metal to eliminate costly search and down time. Refer to Figure 21 for kit parts, Figure 22 for assembly and Figure 23 for positioning.

Specifications

Plastic NEMA 4X box which holds the electronics and flag
One set of 3 flags
Operational Voltage: 115/220 VAC (50/60 Hz), 15 Watts

Installation Instructions

Refer to the Figures 20 for mounting and Figure 21 for positioning of the Flag Marking Device.

Attach the upright support to the upright. Position the frame upright in front of the first down stream idler roller. Lay the upright support on the top of the C channel and adjust the upright so that it is straight up and down. Clamp in place now drill the a hole in the side of the C channel to secure the bottom of the upright and drill a couple of holes through the upright support and top of C channel and secure the support to the conveyor C channel.

Attach the frame cross bar with gusset to the upright.

Mount the NEMA box to the cross bar. Position the box on the cross bar so that the flag will drop on the product where the edge of the product touches the belt, (if the product comes to the edge of the belt then position the box so the flag is far enough in so that the flag does not fall off of the belt).

Route the power cord across the cross bar and down the upright, secure cord with tyraps. Make connections to the Metal Detector electronics Ref (Appendix A figure A10).

Calibration of Flag Drop Marker

Refer to System Programming section “Delay Before Alarm” and “Time Alarm On” to set the desired timing for marking a predetermined location.

Using a sample piece of tramp metal, with the belt operating at normal load, adjust the Marking Device timing by trial and error.

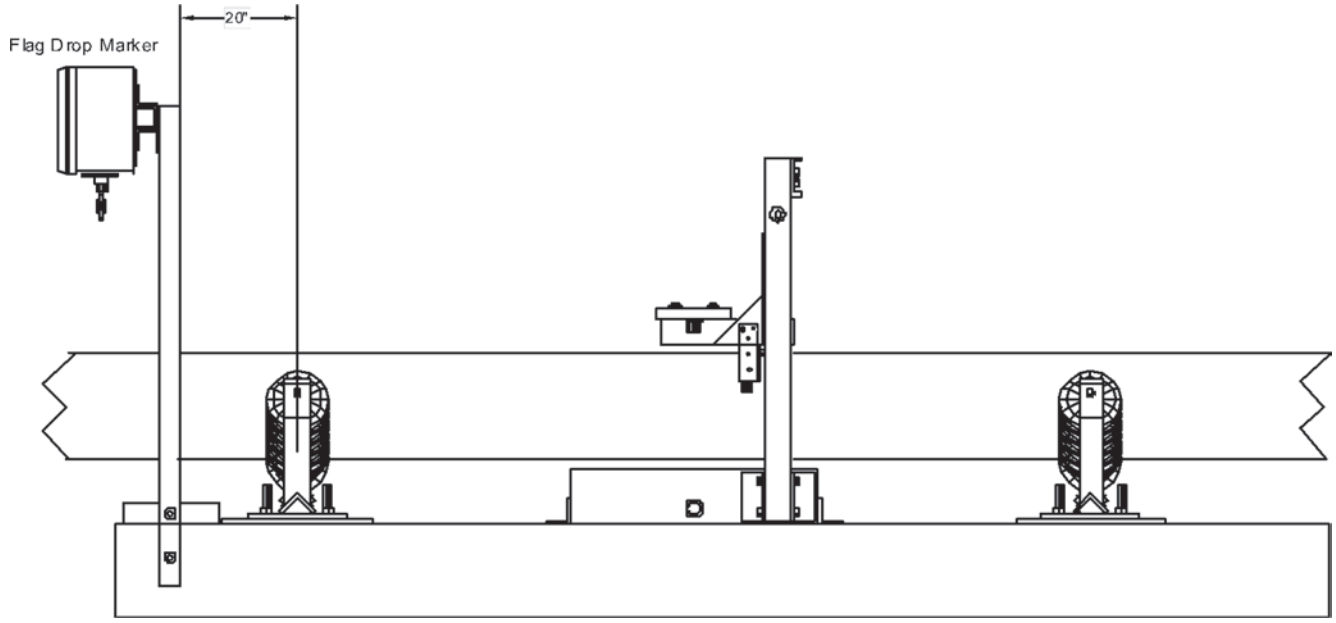


FIGURE 21
Positioning the Flag Marker

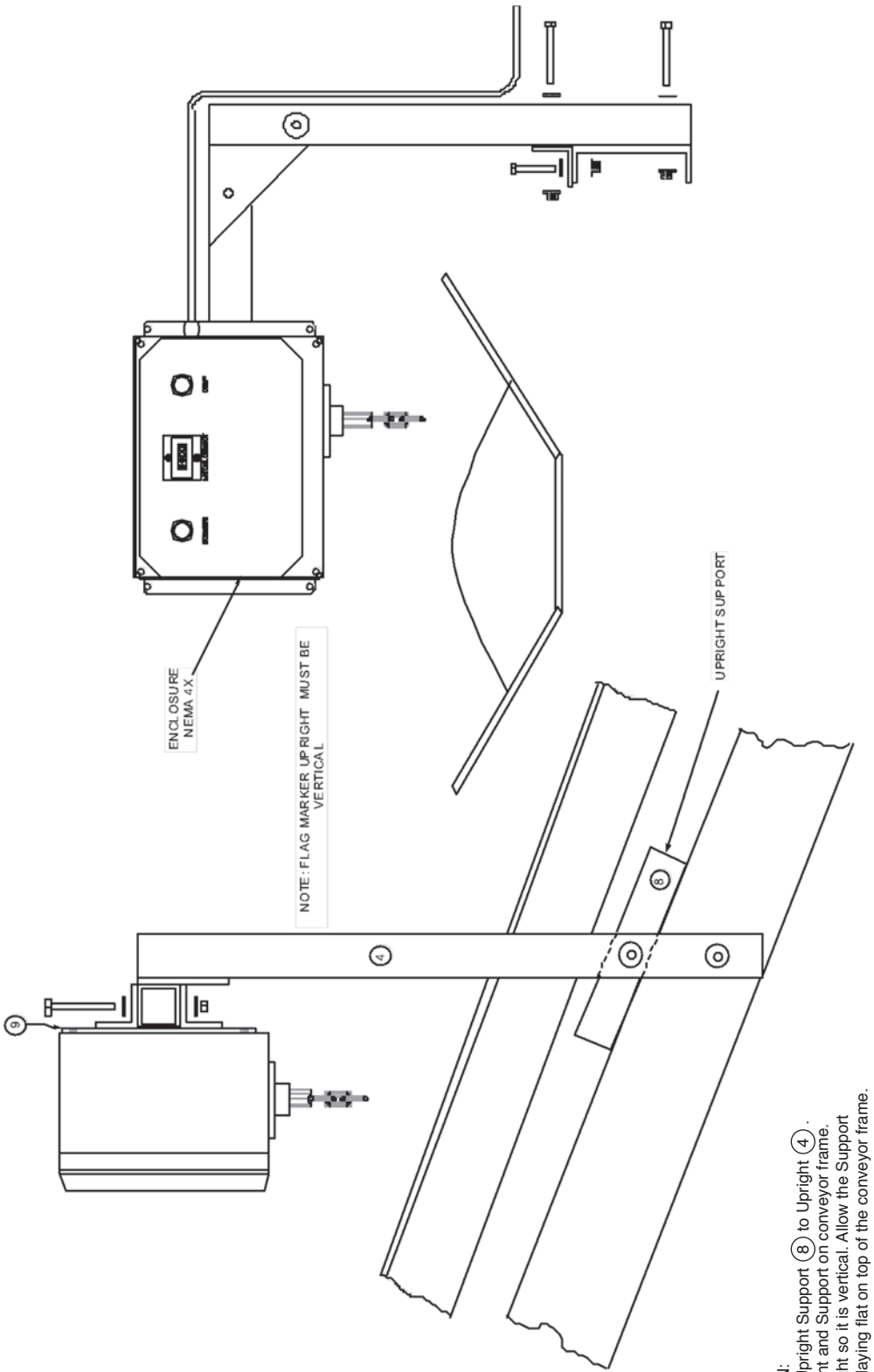


FIGURE 20
Mounting of the Flag Drop Marker

Start-up & Calibration

Start-up

Before turning on the system, locate the switches and lights on the door panel and the controls inside the cabinet.

The power switch is located on the lower left-hand corner of the door panel. Place it on the “ON” position. The green “ON” indicator should light at this time.

If the green “ON” does not come on, return the power switch to the “OFF” position and inspect the light bulb and fuses; also check the power and wiring for proper connections.

Approximately 5 seconds after power “ON”, the No. 1 status indicator (power supply) located on the front panel of the Electronic Module will light (reference Figure 2). This indicates that the power supply is fully operational and all the electronics are enabled.

If the power supply L.E.D. status indicator or the “ON” indicator does not light, refer to Troubleshooting Flow Diagram #1 for instructions. Until the power supply L.E.D. is lit, calibration of the unit cannot begin.

Main Detector Unit – Metal Sensitivity Calibration

Before proceeding with the calibration procedure, obtain a sample of tramp metal to be used during calibration. The piece should be the minimum size to be detected. *The clip timer, L.E.D. No. 7, cannot be lit during calibration. This results in erroneous data.* Calibration adjustments are to be performed using the controls on the Electronic Module in the following manner:

1. Set the “Metal Sensitivity” control knob, located on the front panel of the Electronic Module, to the middle of the dial (reading of 5).
2. The Detector discriminates between interference and a signal given off by tramp metal. The tramp metal must enter the sensing coil at the direction and speed of normal belt flow, before the Detector will alarm. However, the “Metal Signal”, L.E.D. No. 2, will light anytime moving metal is in the sensing field. When calibrating the system, be careful not to introduce extraneous metal into the field in the form of rings, belt buckles, keys, steel-toed shoes, etc. When calibrating the system, it is best to set the metal to be detected on a cardboard box (with no staples) at the appropriate height and pass at the speed and direction of belt flow.
3. If the Detector does not trip on the sample, turn the “Metal Sensitivity” control knob to a higher sensitivity (in direction of ascending numbers), so the Detector will trip just as the metal is passed above the coils.

   In the event that the unit doesn’t trip with the “Metal Sensitivity” control knob on 10, check to see if the metal signal L.E.D. No. 2 lights as the metal is passed through the field. If the L.E.D. does not light as the tramp metal is passed through the field, additional sensitivity may be required. In this case, please refer to System Programming section for “Metal Gain”.
4. Repeat 2 and 3 until the system trips on the piece of metal. When the final setting is determined, note the number on the control knob for future reference. If this number is greater than 8, increase the gain of the Detector as described in the System Programming section for “Metal Gain” and repeat steps 2 and 3.

Main Detector Unit – Clip Detector Calibration

(if applicable)

NOTE

Normally the Clip function is disabled and connecting a clip detector will not activate this function. The #7 light works correctly. This circuitry is activated at the factory. WHEN THE CLIP DETECTOR CIRCUIT IS ACTIVATED THE META DETECTOR’S OUTPUTS ARE DISABLED. The detector will not trip on any size of metal even through the #2 light indicates metal.

Observe the reference clips to see if they are passing within 1" of the Clip Sensor Head when the belt is empty. Adjust the Clip Detector if it is not within this distance making sure that the clips or the belt do not hit the Clip Detector Sensor Head when the belt is fully loaded. If the clip is located properly, the Clip Timer, status indicator No. 7, located on the Electronic Module. The time for the clip timer is variable from .1 seconds to 4.8 seconds and is set using dip switches on S1. Refer to System Programming section “Clip Detector Time Delay”, Table 1.

NOTE

If the Clip Detector is spaced more than 1" from the passing clips, erratic performance may occur.

Operation

The Detector may be programmed to operate in a manual or an automatic reset mode; the standard mode of operation is manual reset.

Manual Reset

In the manual reset mode, once the unit has tripped, the Detector's Direct Output provides a continuous alarm indication to alert the operator of detected metal and/or to stop the belt. To reset the unit, the reset button located on the front panel must be manually depressed.

Automatic Reset

The Detector may be converted to an "Automatic Reset Mode". In this mode the Detector will momentarily signal when tripped then self-reset according to the placement of the programming switches. For complete programming instructions, refer to the System Programming section for "Manual/Auto Resets".

Remote Reset

Provisions have been made to externally reset the Detector from a remote location. Wire a normally open set of contacts across the remote reset terminals TB1 pins 1 & 2 located on the Interface Module. Upon closure of the contacts, the unit will reset.

System Programming

General

The Detector provides a wide range of programming capability. The Detector can be individually tailored to the customer's specific requirements; taking into account the type and size of metal to be detected, the type of material being conveyed and the mode and combination of alarm signals required. Refer to Programming Controls Summary for an overview of switch functions Table 6 and Programming Controls & Test Point Locations Figure 25 for component locations.

Removing/Replacing Cover

To program the Electronic Module, the cover must be removed. Remove the control knobs with the 1/16" Allen wrench (provided). Unscrew the six screws securing the cover with the 5/64" Allen wrench (provided).

When replacing the cover, it is essential to re-index the control knobs. Before tightening the set screw, line it up with the flat of the shaft. The knob, when properly indexed, will indicate 10 in a full clockwise position and 0 in a full counterclockwise position.

Metal Gain

When a piece of tramp metal passes over the search coils, a change in the received signal occurs. This change is extremely small and must be amplified to produce a suitable signal to trigger the relay driver circuitry.

The amount of gain required in the receiver circuitry depends on the following factors:

- Coil Length
- Coil Aperture
- Belt Speed
- Type of Metal to be Detected
- Size, Shape and Orientation of the Metal to the Search Coil

The internal gain of the Detector is adjusted by a rotary switch, S4, located inside the Electronic Module (refer to Figure 25 Programming and Test Point Locations). Each step in gain represents an increase over the last step. Ideally, the gain is adjusted to pick up the desired piece of tramp metal with the "Metal Sensitivity" control knob located on the outside of the Electronic Module set to 5.

If the gain must be changed, use a sample of tramp metal the same size as the piece to be detected and follow the procedures listed below:

Remove the control knobs and cover of the Electronic Module as indicated in the "General" section.

Set the “Metal Sensitivity”: control knob (R101) to its rotational midpoint (if the cover was not removed, the “Metal Sensitivity” would be 5)

Check that the clip timer, status indicator No. 7, is not lit during any portion of this test. If the clip timer is lit, the data will be incorrect.

Pass the sample piece of tramp metal completely through the coils at a height midway between the transmitter and receiver coils and at a speed near that of the conveyed material under normal operating conditions. Increase or decrease the gain of the system with the rotary switch as needed until the Detector will trip just as the sample metal is passed between the coils. The larger numbers on the gain setting switch correlate to a higher gain, the lowest gain being 1 and the highest 0 (representing 10). If the unit never trips, refer to Troubleshooting Flow Diagram #1.

If all other functions are properly programmed, replace the cover and knobs. Re-index the control knobs as indicated in the “General” section.

Recalibrate the “Metal Sensitivity” control knob as instructed in the Start-Up and Calibration section for “Metal Sensitivity Calibration”.

Clip Disable

When belt repair clips are used on a conveyor belt, the repair clips may represent a stronger metal signal than the tramp metal. In this situation, it is necessary to disable the system to allow the clips to pass.

Run the belt at normal running speed and maximum belt load.

Verify that the clip timer, status indicator No. 7, lights each time a clip passes the sensor head. If it does not, adjust the clip sensor head as described in the Installation section “Clip Detector”.

Verify that the clip timer, status indicator No. 7, stays on until the clips have passed downstream idler roller. If the No7 light goes out before the clips are on the other side of the downstream idler roller the metal detector will trip on the clips.

Repair clips will need a reference clip to activate clip detector. Refer to Figure 17.

Clip Detector Time Delay

If the clip detector is used, the length of belt desensitized to permit the clips to pass can be adjusted by properly programming the clip detector time delay switches S1-5, 6 & 7. The locations of these switches are shown in Figure 25 Programming and Test Point Locations. The range of delay times is from .28 seconds to 2.10 seconds as tabulated in Table 1. These switches are set at the factory according to customer requirements but can be adjusted as necessary to ensure correct timing. As long as the Detector is desensitized, the clip timer, status indicator No. 7, will remain lit.

Position				Time
4	5	6	7	sec +- 20%
O	O	O	O	.1
C	O	O	O	.4
O	C	O	O	.6
C	C	O	O	1.0
O	O	C	O	1.4
C	O	C	O	1.8
O	O	O	C	2.4
O	C	O	C	3.0
C	C	O	C	3.4
C	O	C	C	4.2
C	C	C	C	4.8

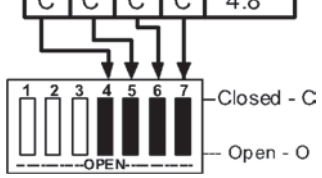


TABLE 1

Clip Time Delay (Switch S1)

Delay Before Alarm

The timed output alarm can be accurately programmed with a time delay before turn on.

This allows the conveyed material to travel for a programmed period before the timed output alarm signal is energized.

Typically this feature is used in conjunction with a marking device or diverter gate to delay the system until the detected tramp metal has reached the auxiliary equipment. Switches S2-1 through S2-5 control this time delay from .01 to 17.0 seconds. Refer to Table 2 for tabulation of the delay time versus switch settings and Table 5 for the switch locations.

Time Alarm On

The timed output can be accurately programmed to remain energized for a timed period once it is switched on. This feature can activate a diverter gate, sound an alarm for a given period, command a marking device to spray a given length of the belt, etc. Switches S3-1 through S3-5 control this time delay from .01 to 17.0 seconds. Refer to Table 2 for a tabulation of the delay time versus switch settings and Table 5 for the switch locations.

Standard or Fail – Safe Output Operation

As standard, the alarm outputs of the Detector will energize when tramp metal is detected. In this mode, the solid state relay is programmed to operate in a Normally "OFF" condition. The outputs will not energize until metal is detected.

Provisions have been made to program the Detector to operate in a fail-safe mode. In this mode, the outputs of the Detector are always energized and de-energize when tramp metal is detected or when power to the Detector is turned off. In the fail-safe mode, the solid state relay is programmed to operate in a Normally "ON" condition.

Both outputs can be independently programmed. The direct output (status indicator No. 9) and timed output (status indicator No. 8) (See Figure 2) will monitor the alarm's output condition. If the status indicator is lit, its associated output is energized. Switch S2-6 controls the direct output and S3-6, the timed output as shown in Table 3. To operate the solid state relay condition in a Normally "OFF" condition, open the appropriate switch. Conversely, to operate the relay in a Normally "ON" condition, close the switch.

Position					Time
1	2	3	4	5	sec + - 20%
C	C	C	C	O	.01
O	C	C	C	O	.14
C	O	C	C	O	.30
O	O	C	C	O	.44
C	C	O	C	O	.52
O	C	O	C	O	.65
C	O	O	C	O	.81
O	O	O	C	O	.94
C	C	C	O	O	1.10
O	C	C	O	O	1.20
C	O	C	O	O	1.40
O	O	C	O	O	1.50
C	C	O	O	O	1.60
O	C	O	O	O	1.70
C	O	O	O	O	1.90
O	O	O	O	O	2.00
C	C	C	C	C	.14
O	C	C	C	C	1.60
C	O	C	C	C	3.30
O	O	C	C	C	4.90
C	C	O	C	C	5.70
O	C	O	C	C	7.10
C	O	O	C	C	8.90
O	O	O	C	C	10.00
C	C	C	O	C	12.00
O	C	C	O	C	13.00
C	O	C	O	C	15.00
O	O	C	O	C	16.00
C	C	O	O	C	17.00
O	C	O	O	C	19.00
C	O	O	O	C	21.00
O	O	O	O	C	22.00

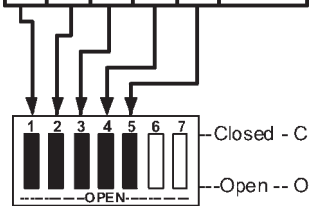


TABLE 2
S2 - Delay Before Alarm
S3 - Time Alarm On

Position	Contact Mode
6	
C	Normally ON
O	Normally OFF

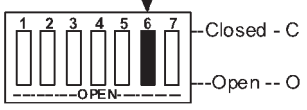


TABLE 3
S2 - Direct Output Normally On/Off Select
S3 - Timed Output Normally On/Off Select

Manual/Auto Resets

Manual Reset

In the manual reset mode, once the unit has tripped, the Detector's Direct Output provides a continuous alarm indication to alert the operator of detected metal and/or to stop the belt. To reset the unit, the reset button located on the front panel must be manually depressed.

Automatic Reset

The Detector may be converted to an “Automatic Reset Mode”. In this mode, the Detector will momentarily signal when tripped then self-reset.

The direct output can be programmed to automatically reset by shorting the remote reset terminals TB1 pins 5 & 6, located on the front of the Interface Module. To “short”, install a jumper from pin 5 to pin 6. Open Switch S2-7.

The operating mode of the timed output is governed by the position of Switch S3-7 as shown in Table 4. With the switch in the open position, the timed output operates in the Automatic Reset Mode. When the switch is closed, the timed output will follow the mode programmed on the direct output.

Position	Mode
7	
C	Manual Reset
O	Automatic Reset

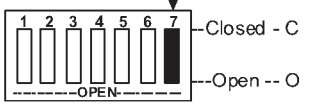


TABLE 4

Timed Output Reset Mode (Switch S3)

Reset Override

If required, the Detector can be programmed so the system is disabled during the reset period.

This means the Detector is prevented from tripping as long as a reset signal is provided, either manually on the front panel or remotely through a set of external contacts.

With S2-7 in the open position, the reset signal does not disable the Detector. Closing S2-7 will program the Detector so it is disabled while a reset signal is applied. Refer to Table 5.

Position	Mode
7	
C	Manual Reset
O	Automatic Reset

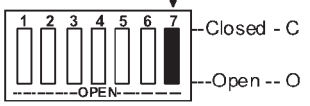


TABLE 5

Belt Reset Override (Switch S2)

Sampling

The Detector Sampling Mode is set at the factory to make the Detector sensitivity selective between various materials as required for each particular application. **Switches S1-1 through S1-4 inclusive are preset and are not to be adjusted by the user.**

Trip Register

The “Trip Register” is used with the Detector’s timed output. The Trip Register accurately tracks up to 128 metal particles concurrently. Each particle’s signal is released to the timed output terminals consistent with the programmed “Delay Before Alarm”. This standard feature is automatically activated when the timed output is used for delayed operation of any device.

Programming Controls Summary

Control	Position	Function	Comment
S1	1	Sampling Mode	Allows the detector to detect metal and ignore conveyed product. Factory preset. **DO NOT ADJUST.**
	2		
	3	TPD Mode	Turns TPD on or off; TPD reduces false trips due to false signals. Factory preset; **DO NOT ADJUST.**
	4	Clip Time Delay	Selects how long the detector remains desensitized to metallic repair clips. Refer to Table 1 for position settings and times.
	5		
	6		
	7		
S2	1	Delay Before Alarm	Controls timed output. Selects the time from when metal is detected until timed output is energized. Refer to Table 2 for position settings and times.
	2		
	3		
	4		
	5		
	6	Direct Output Normal On/Off Select	Sets direct output contacts as normally “ON” or “OFF”. Refer to Table 3 for settings. Be aware of downstream circuit effect before operating this switch.
	7	Belt Reset Override	Used to disable metal detection as reset signal is applied. Refer to Table 5 for settings and times.
S3	1	Time Alarm On	Controls timed output. Selects how long the output remains energized. Refer to Table 2 for position settings and times.
	2		
	3		
	4		
	5		
	6	Timed Output Normally On/Off Select	Sets timed output contacts as normally “ON” or “OFF”. Refer to Table 3 for settings. Be aware of downstream circuit effect before operating this switch.
	7	Timed Output Reset Mode	Determines if timed output will reset manually or automatically. Refer to Table 4 for settings.
S4		Metal Gain	Selects metal signal amplification (gain) without repair clips in sensing zone. “1” least gain; “0” most gain.
S5		Clip Gain	Attenuates metal signal amplification (gain) when repair clips are in sensing zone. “1” least gain; “0” most gain.
R61		Metal Sensitivity	Sets metal “trip” threshold level. “10” most sensitive, “1” least sensitive.
R48		Clip Override	Attenuates (reduces) metal sensitivity to allow repair clips to pass through detector. “10” most attenuation, “1” least attenuation.

TABLE 6

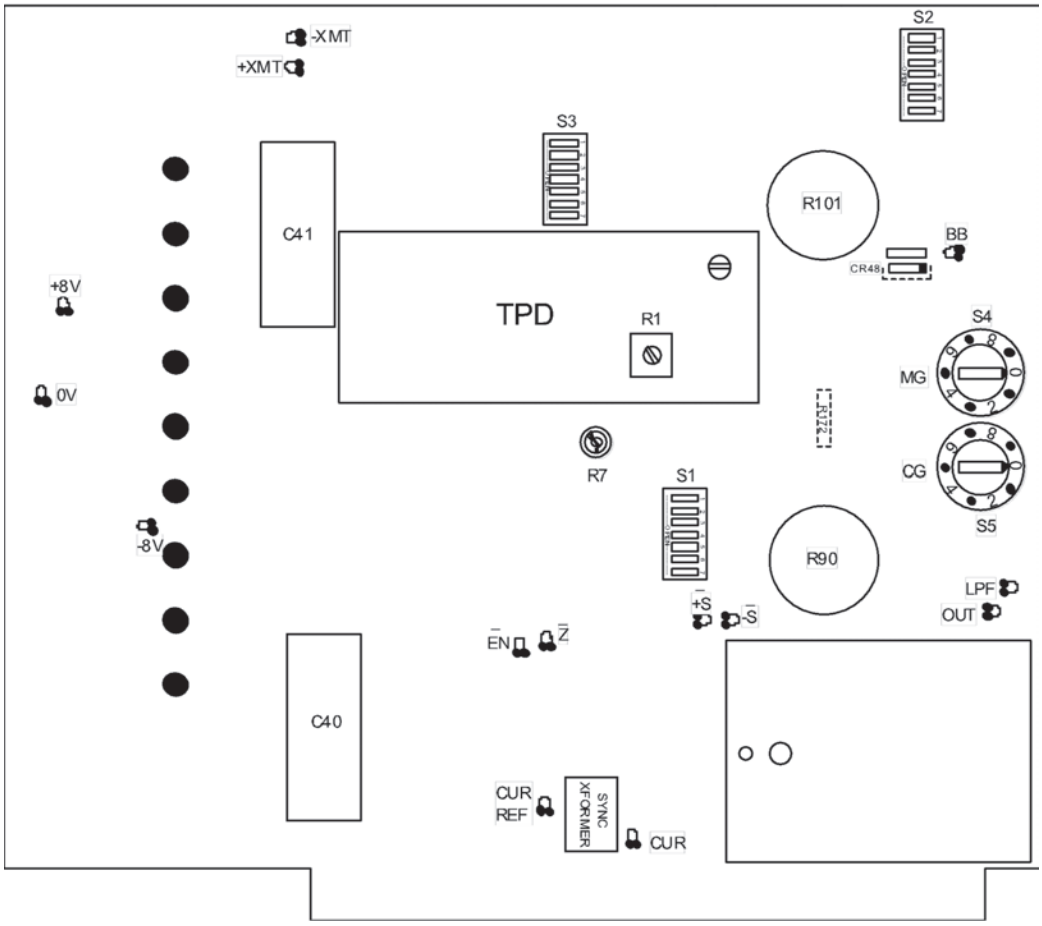


TABLE 7
Programming Controls & Test Point Locations

Troubleshooting

Status Indicators

In order to facilitate troubleshooting of the Detector, a number of self-test circuits have been designed to monitor the condition of the detection circuitry. The results of these test circuits are visible to the operator through L.E.D.'s on the front panel of the Electronic Module (refer to Figure 2). These L.E.D.'s are referred to as Status Indicators. For a description of all L.E.D. monitors and their normal operating condition, refer to the Status Indicator Summary (Table 8) on the following page.

Troubleshooting Flow Diagrams

NOTE

Before working with Troubleshooting Diagrams, check all terminals, connectors and cables for open circuits and correct as required.

To aid in troubleshooting the Detector, two easy to follow, step-by-step, flow diagrams were designed. Troubleshooting Flow Diagram #1 deals with insufficient metal sensitivity. This diagram is used if the unit detects metal, but is not sensitive enough for the required application or if the Detector does not respond to metal at all.

Refer to Troubleshooting Flow Diagram #2, if the unit continually false trips (triggers with no metal in the field).

Electronic Module Troubleshooting

In the event that the unit does not operate and the trouble has been traced to the Electronic Module, further troubleshooting of the Module is possible using the test points provided on the circuit board. Monitoring these points requires a VOM, oscilloscope and frequency counter. If this equipment is available, schematics can be obtained from the factory.

Maintenance Kit

Prior to shipment, a maintenance kit is packed in the Main Control Enclosure.

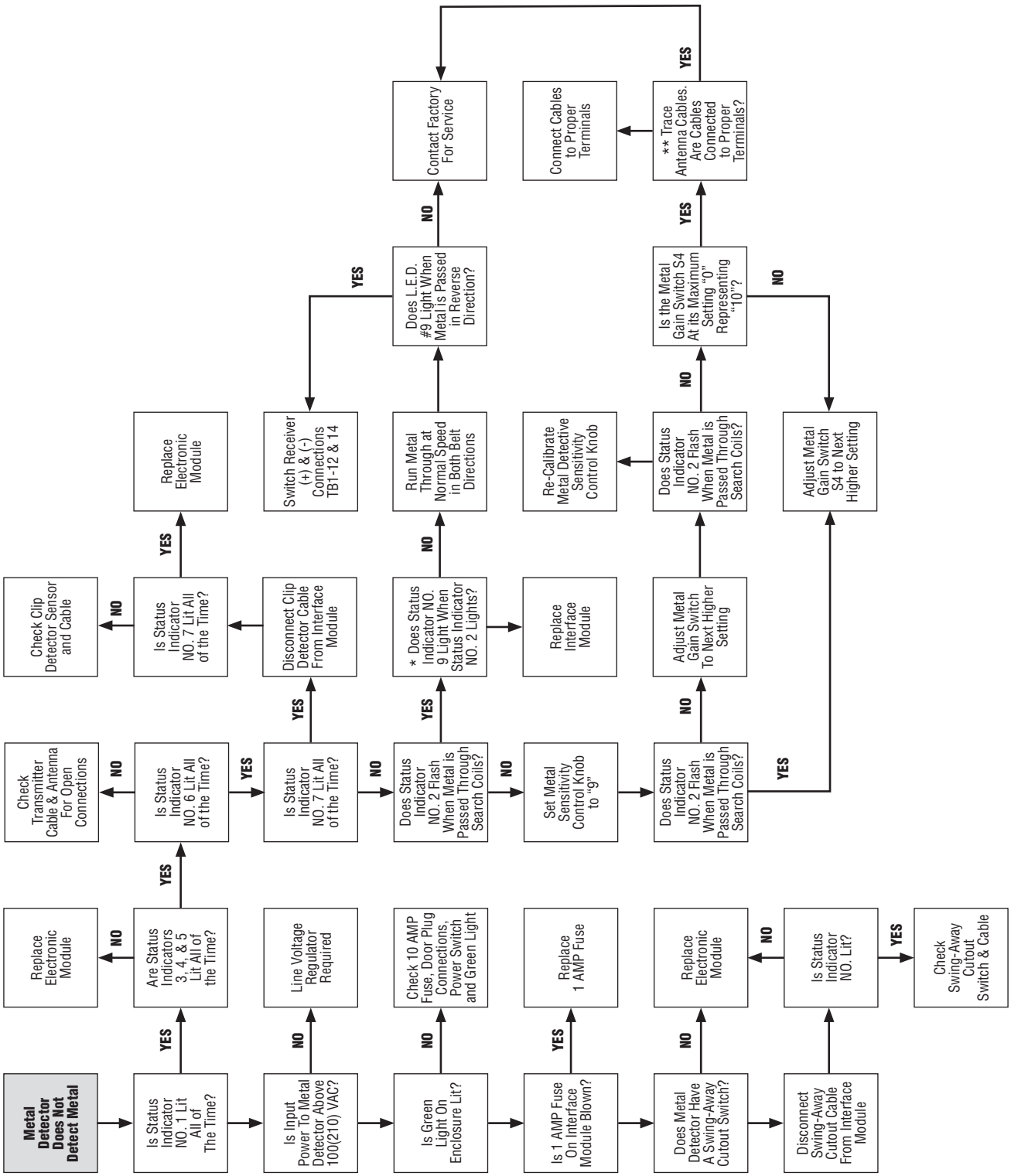
This kit contains all parts necessary for basic maintenance. The items included are as follows:

(1) 1 Amp Fuse
(1) 10 Amp Fuse
(1) 1/16" Allen Key Wrench
(1) 5/64" Allen Key Wrench

L.E.D. Number	Identification	Normal Condition	Comments
1	Power Supply	ON	Indicated detector power supply operational; must be lit for unit to detect metal. Will not light when power supply malfunctions, low line voltage is present or optional transmitter swing-away switch is activated. LED lights approximately 5 seconds after power is turned on.
2	Metal Signal	OFF	Indicated metal is detected in the sensing zone, regardless of its magnetic properties.
3	Self-Test	ON	Indicates specified internal Electronic Module circuits are functioning normally. Must be lit for unit to detect metal.
4	Self-Test		
5	Self-Test		
6	Self-Test		
7	Clip Timer	OFF	Indicated repair clip is in proximity of the clip detector head. LED remains lit for the period detector was programmed to allow clip to clear the sensing zone.
8	Timed Out	OFF	Indicated the condition of the timed alarm output. If the LED is lit the timed alarm output is energized with the line voltage.
9	Direct Out	OFF*	Indicated the condition of the direct alarm output. If the LED is lit, the direct alarm outputs are energized with line voltage.

* When programmed to operate in a fail-safe mode (output normally “ON”), the LED’s will be normally lit.

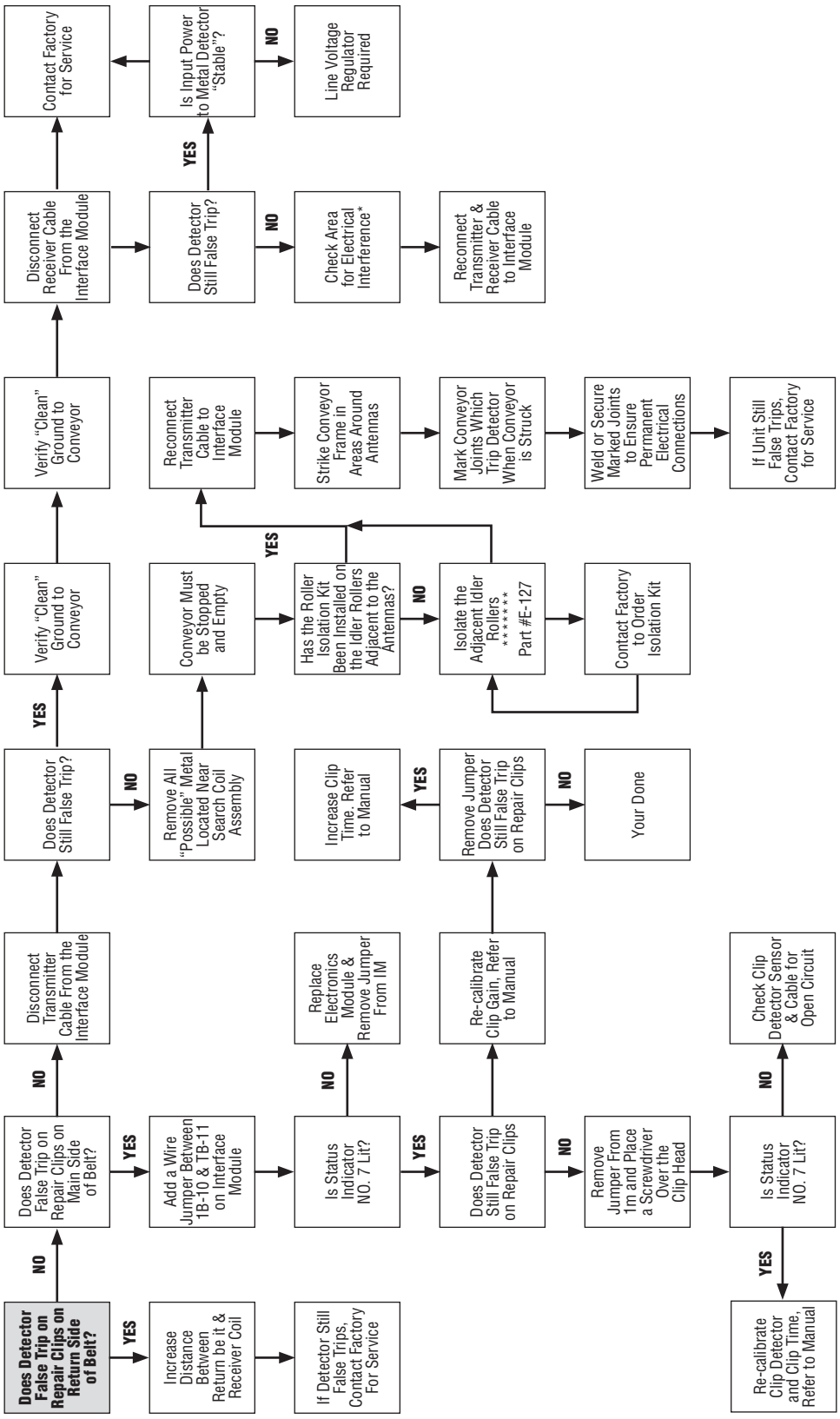
TABLE 8
Electronics Module Status Indicator Summary



* In failsafe operation, the light should extinguish when metal is detected.
** Reference control connection diagram for proper wiring connections.

MODEL 1250 TROUBLE SHOOTING FLOW DIAGRAM #1

Insufficient Metal Sensitivity



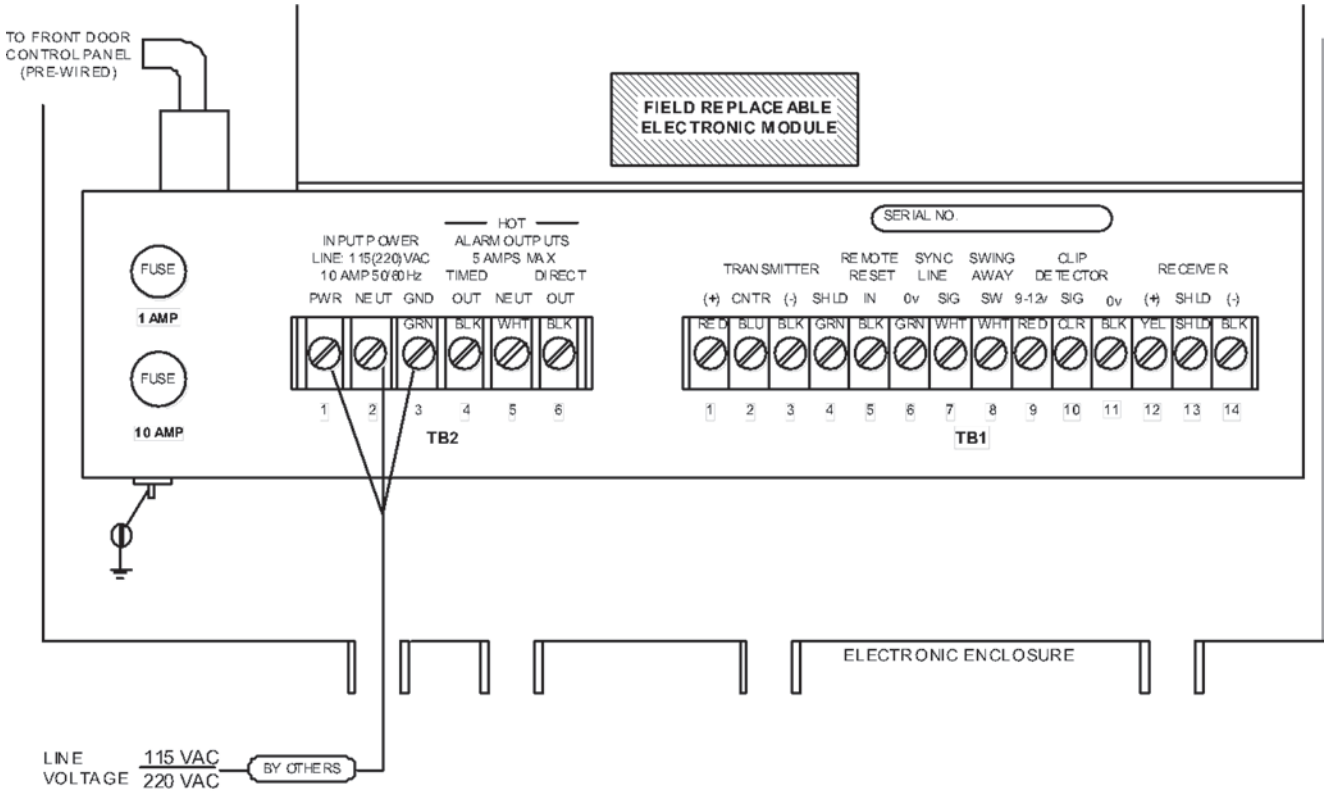
* i.e. Arcing contacts, radio transmissions, or phase to ground short.

MODEL 1250 TROUBLE SHOOTING FLOW DIAGRAM #2

False Tripping

APPENDIX A

Control Connection Diagrams



POWER INPUT CONNECTION

TB 2-1 115 OR 220 VAC

TB 2-2 NEUT OR 220 VAC

TB 2-3 GROUND

NOTE: WIRE COLOR WILL VARY WITH LOCAL ORDINANCES, POWER CABLES NOT SUPPLIED.

FIGURE A1
Power Input

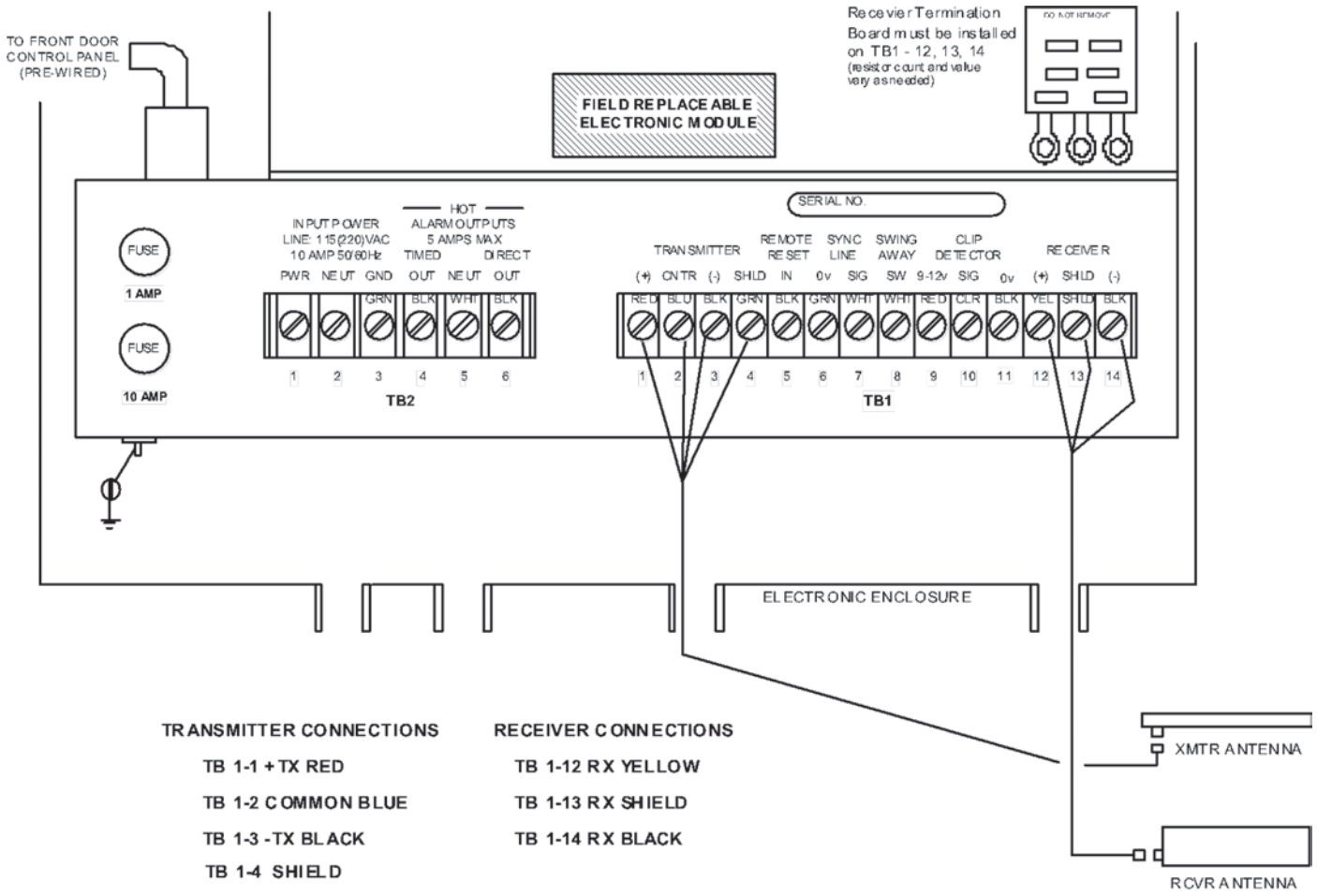


FIGURE A2
Transmitter and Receiver Antenna

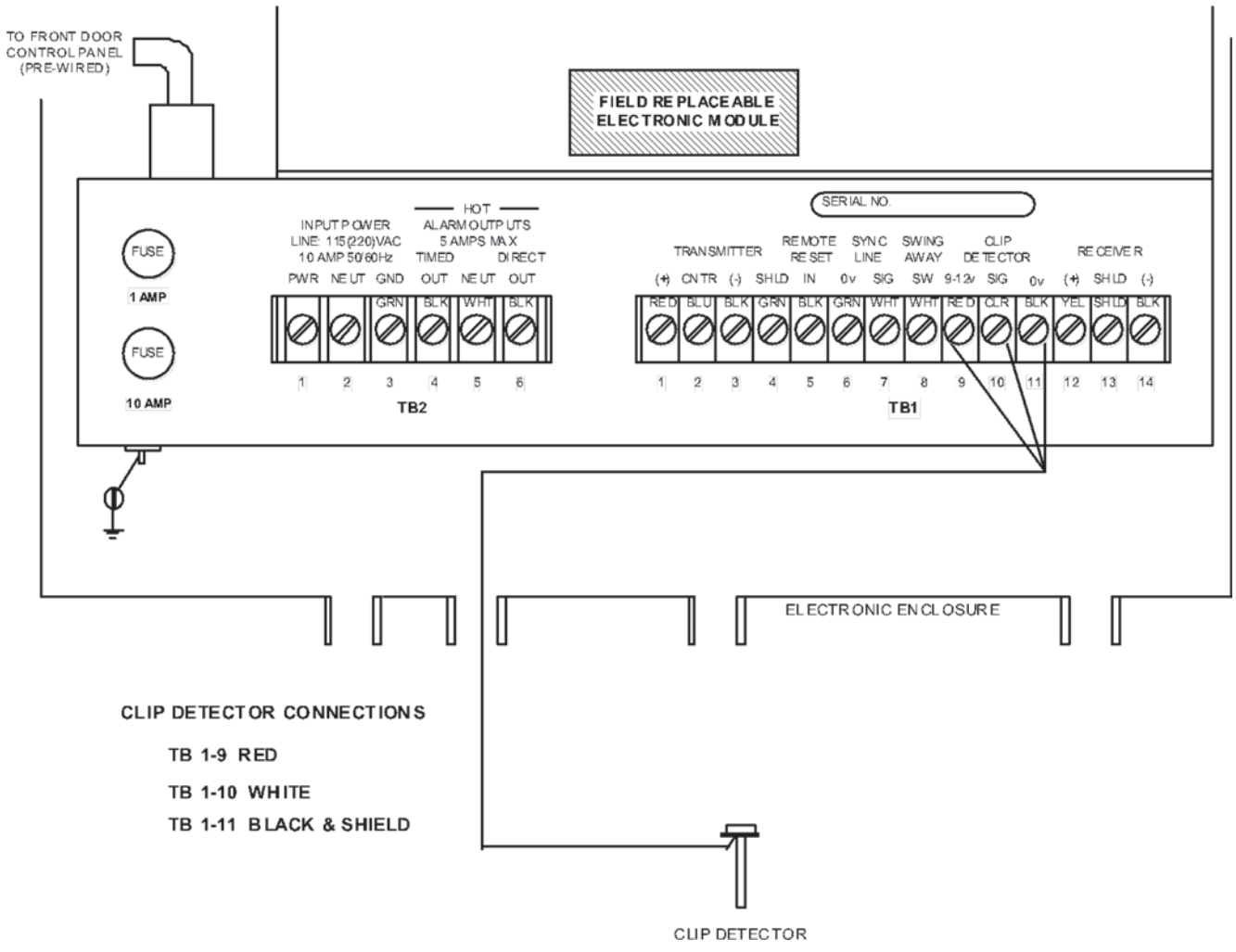
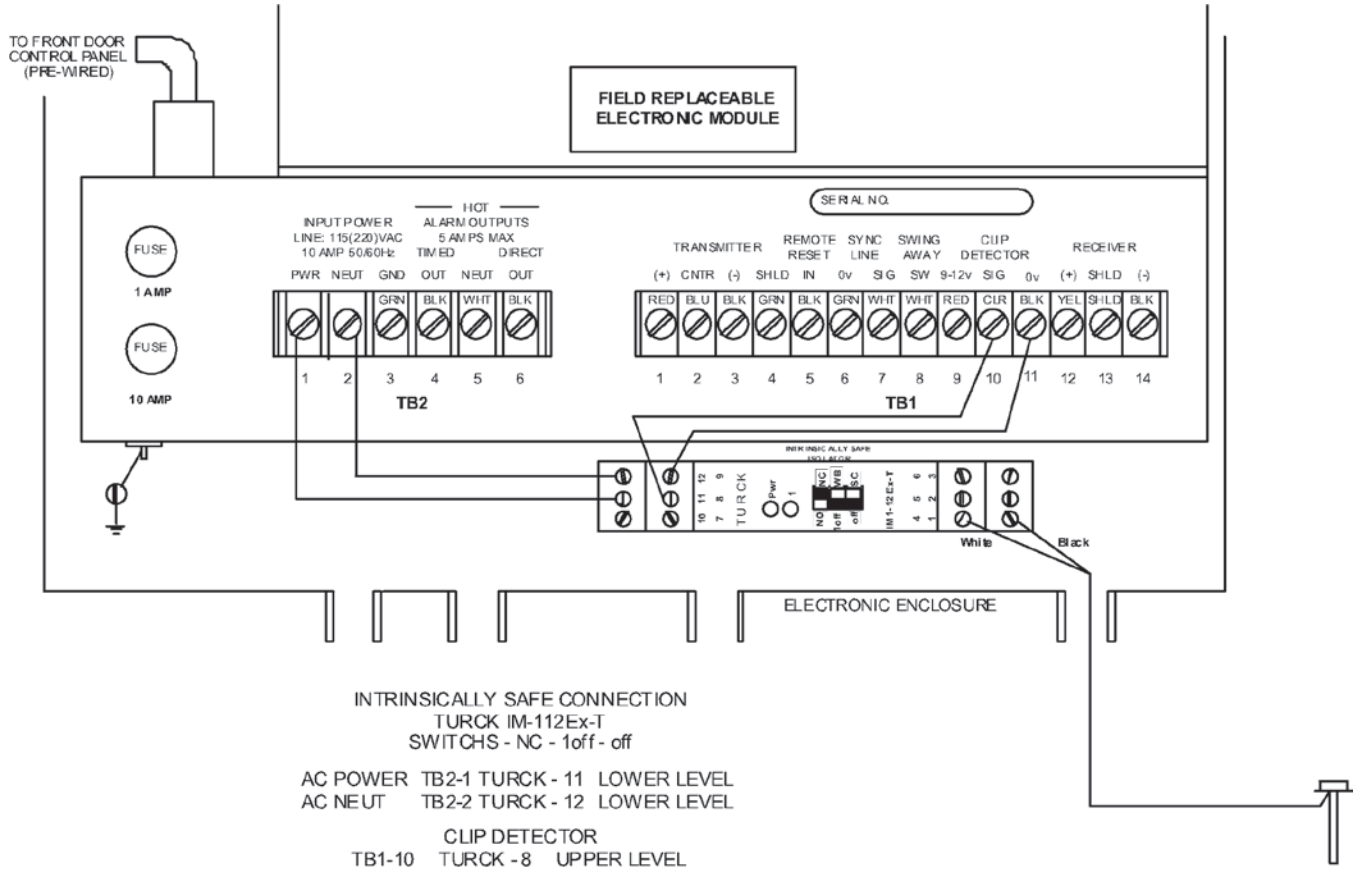


FIGURE A3
Clip Detector



INTRINSICALLY SAFE CONNECTION
TURCK IM-112Ex-T
SWITCHS - NC - 1off - off

AC POWER TB2-1 TURCK - 11 LOWER LEVEL
AC NEUT TB2-2 TURCK - 12 LOWER LEVEL

CLIP DETECTOR
TB1-10 TURCK - 8 UPPER LEVEL
TB1-11 TURCK - 9 UPPER LEVEL

TURCK TO CLIP HEAD
TURCK - 1 LOWER LEVEL CLIP HEAD - 1
TURCK - 4 UPPER LEVEL CLIP HEAD - 2

CLIP HEAD
Ni50-CP80-Y1/S10
TERMINAL 1 BLACK
TERMINAL 2 WHITE

FIGURE A4
Intrinsically Safe Clip Detector

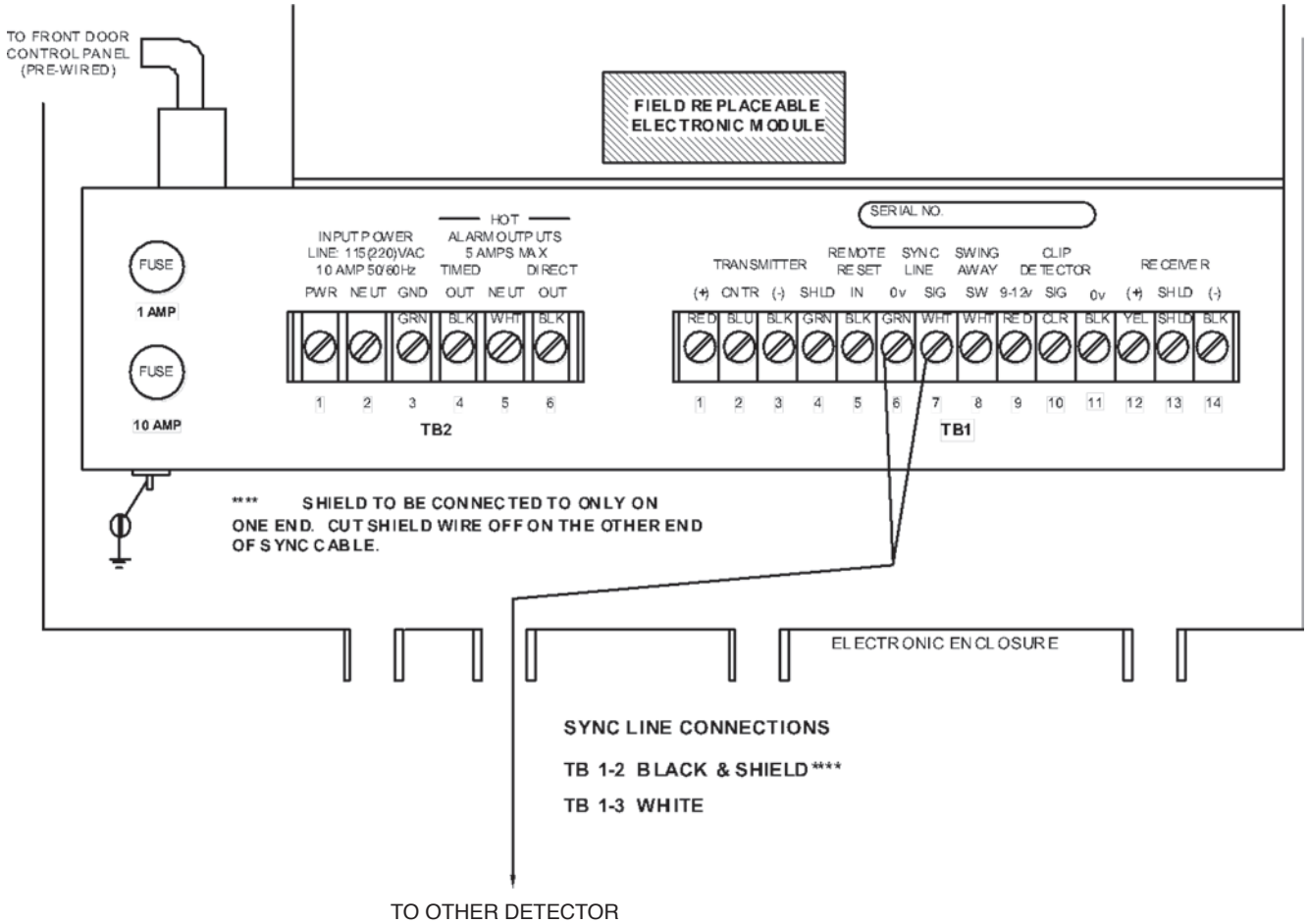


FIGURE A5
Synchronization

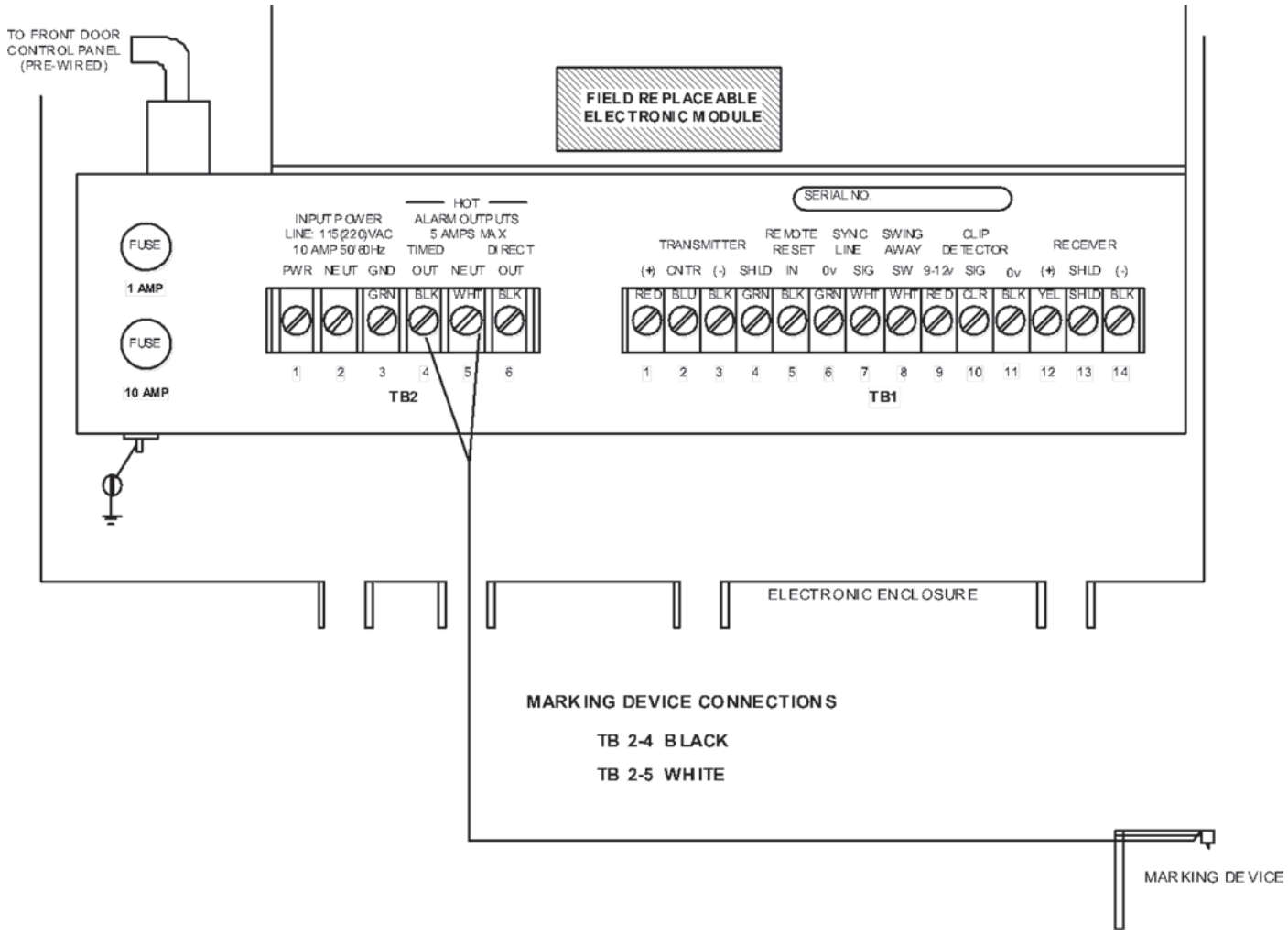


FIGURE A6
Spray Marker

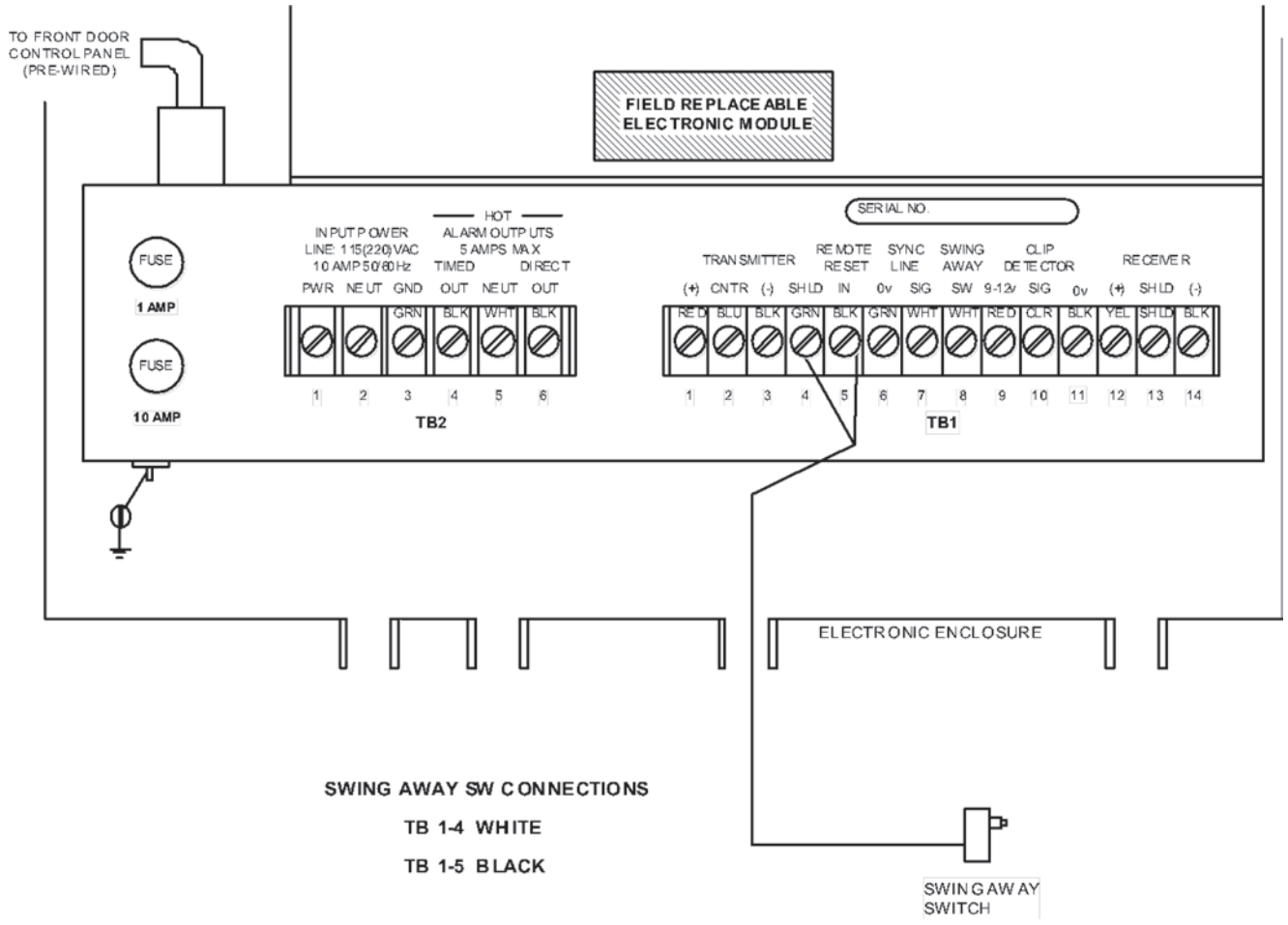


FIGURE A7
Swing Away Switch

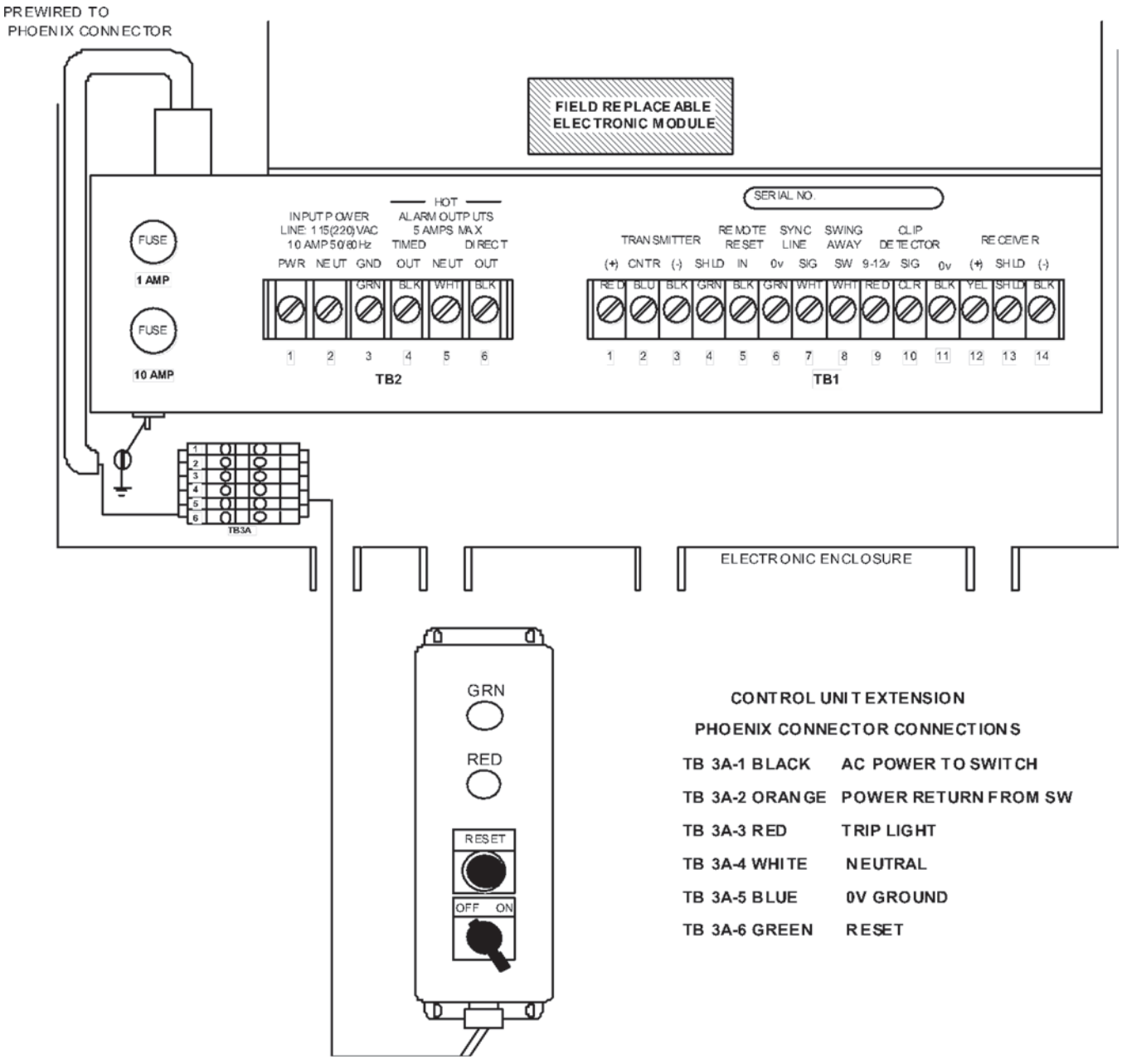


FIGURE A8
Control Unit Extension

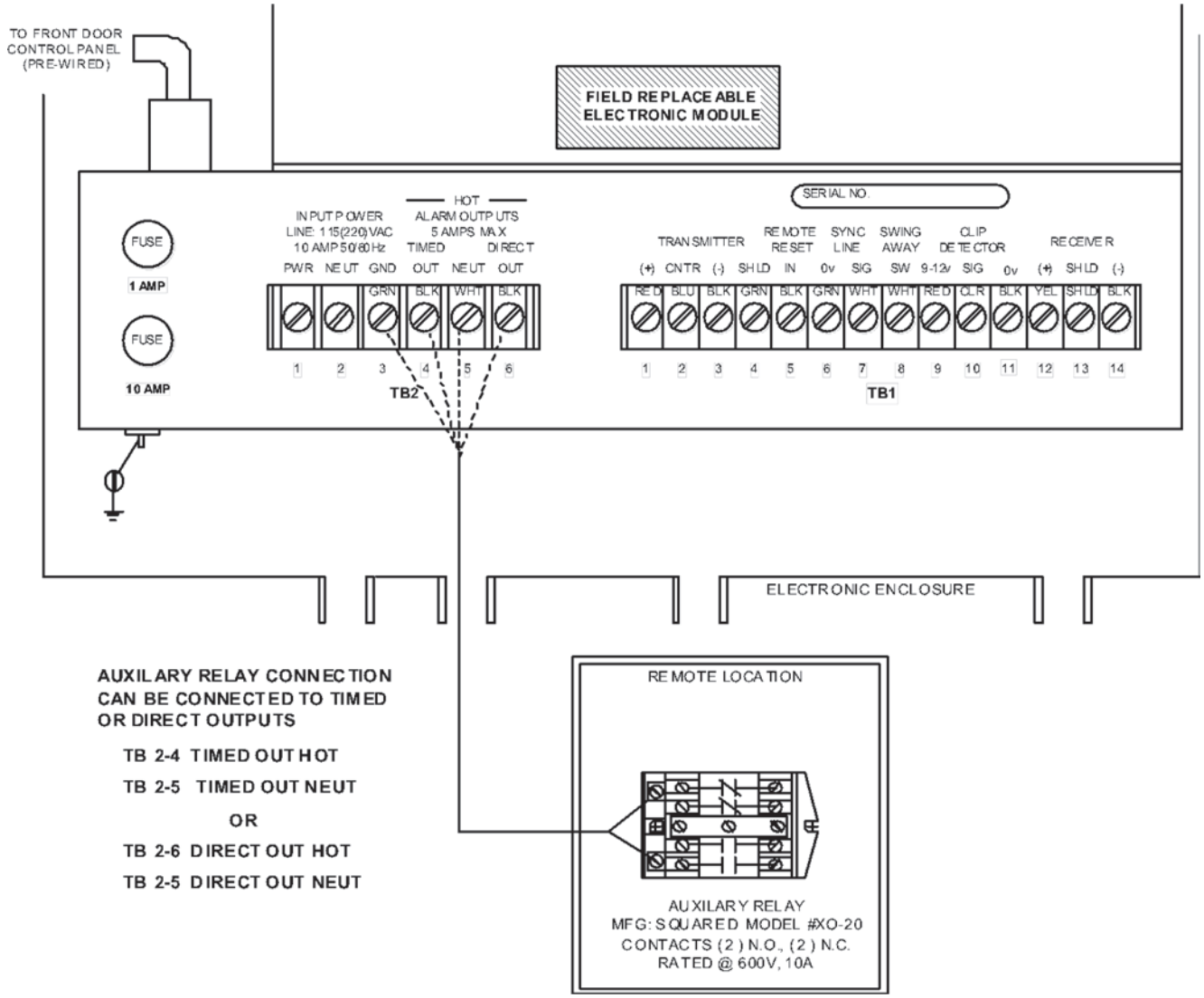
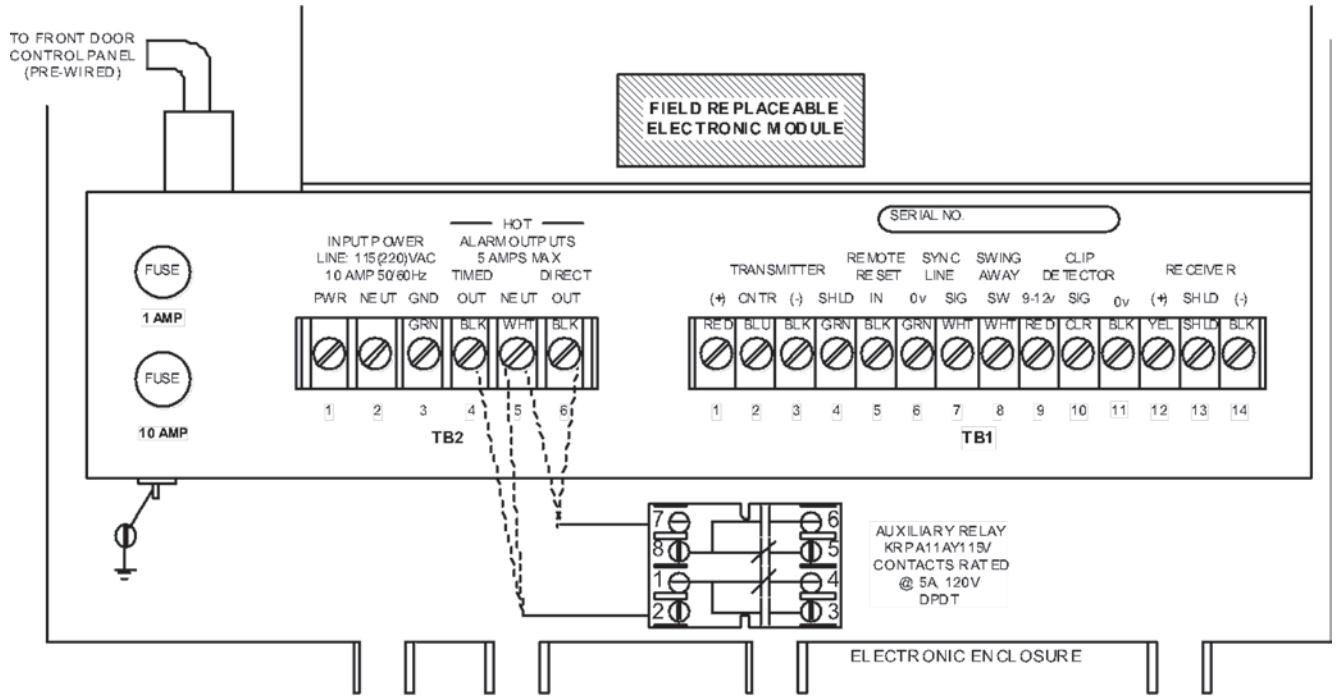


FIGURE A9

Auxiliary 2 or 4 Relay Sq D 115 VAC or 220 VAC



AUXILARY RELAY CONNECTION
CAN BE CONNECTED TO TIMED
OR DIRECT OUTPUTS

TB 2-4 TIMED OUT HOT

TB 2-5 TIMED OUT NEUT

OR

TB 2-6 DIRECT OUT HOT

TB 2-5 DIRECT OUT NEUT

FIGURE A10
Auxiliary Relay KRPA 115 VAC or 220 VAC

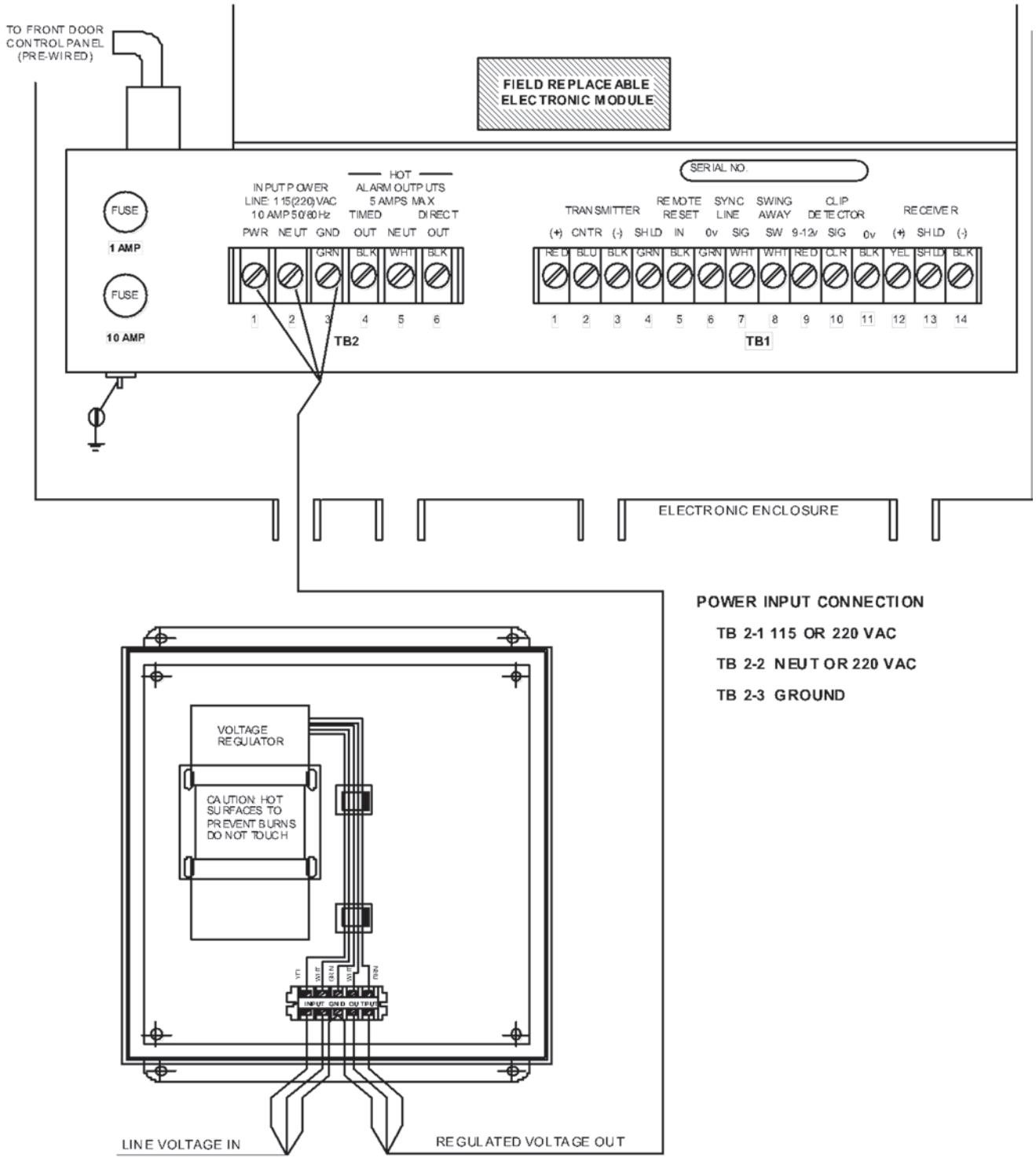
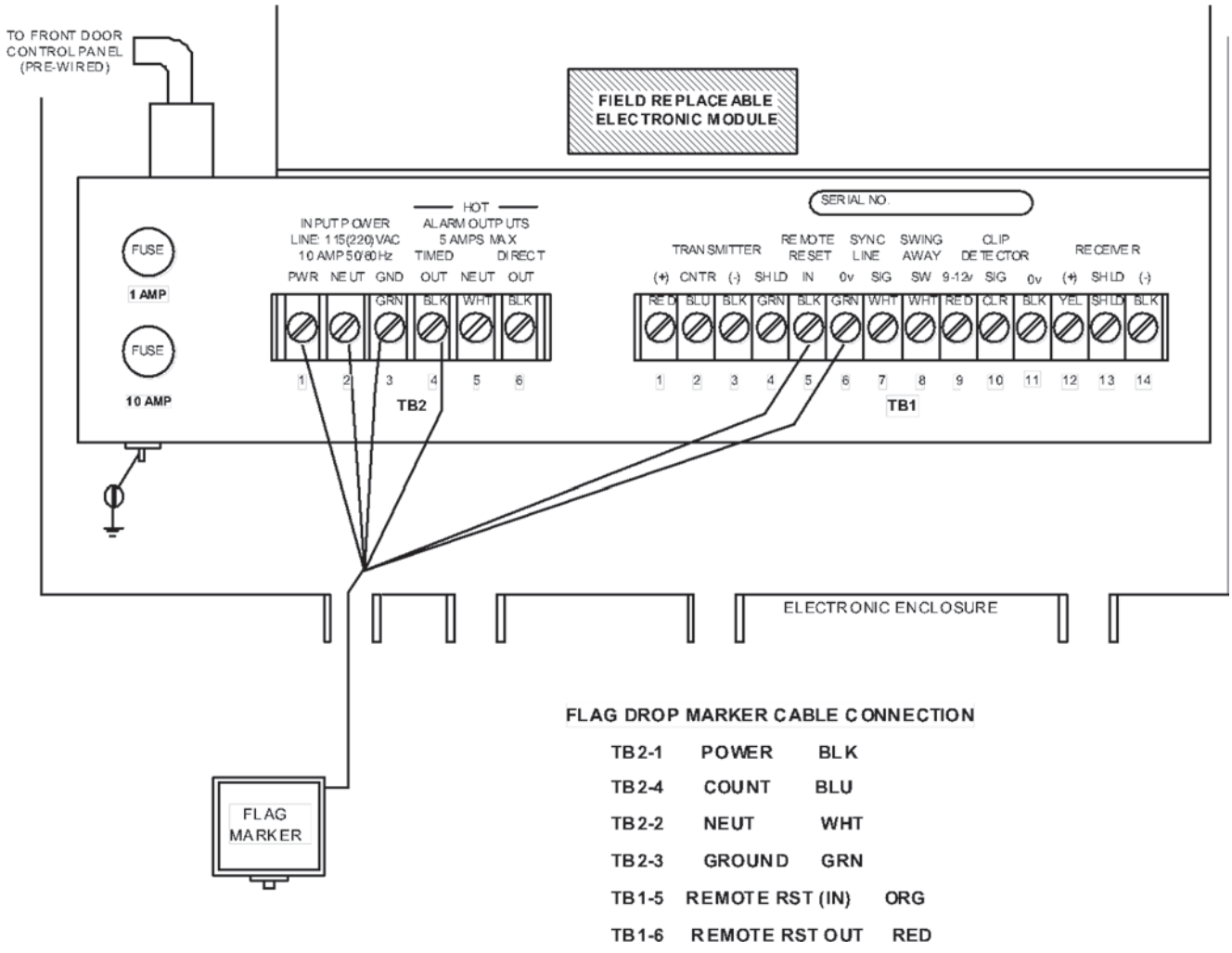


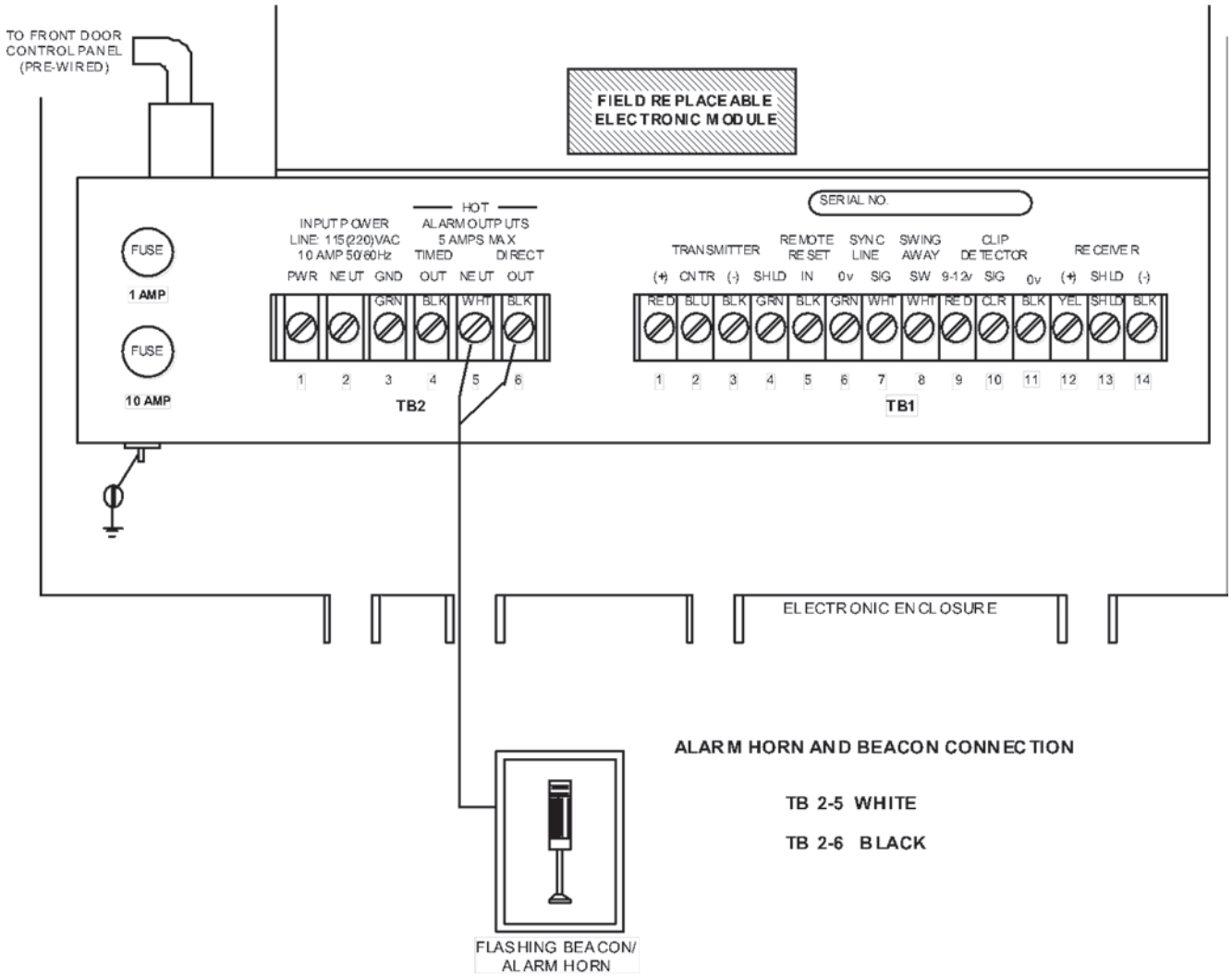
FIGURE A11
Voltage Regulator



FLAG DROP MARKER CABLE CONNECTION

TB2-1	POWER	BLK
TB2-4	COUNT	BLU
TB2-2	NEUT	WHT
TB2-3	GROUND	GRN
TB1-5	REMOTE RST (IN)	ORG
TB1-6	REMOTE RST OUT	RED

FIGURE A12
Flag Drop Marker

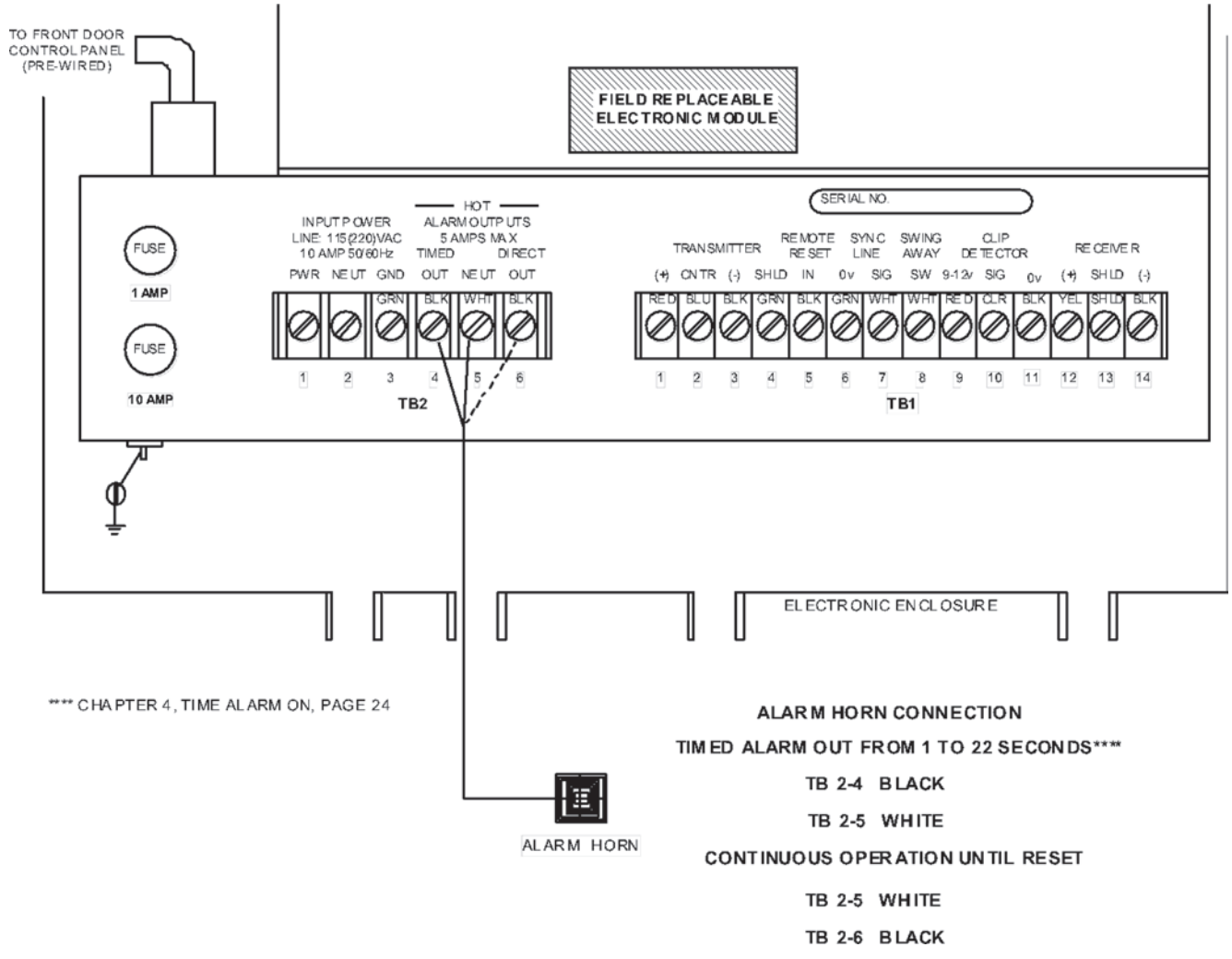


NOTE

The physical appearance of the alarm device may not match the pictorial depiction.

FIGURE A13

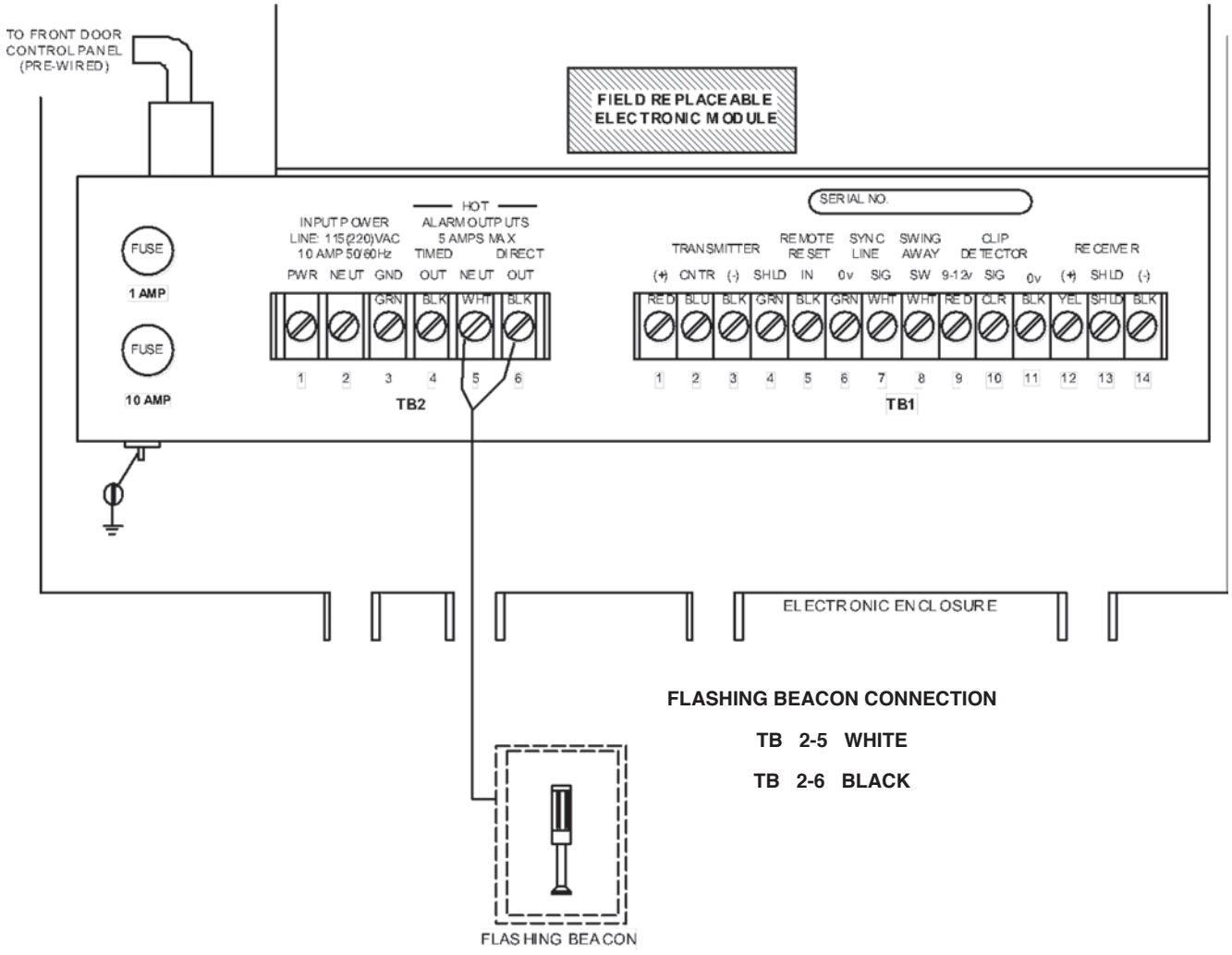
Alarm Horn & Flashing Beacon



NOTE

The physical appearance of the alarm device may not match the pictorial depiction.

FIGURE A14
Alarm Horn



NOTE

The physical appearance of the alarm device may not match the pictorial depiction.

FIGURE A15
Flashing Beacon

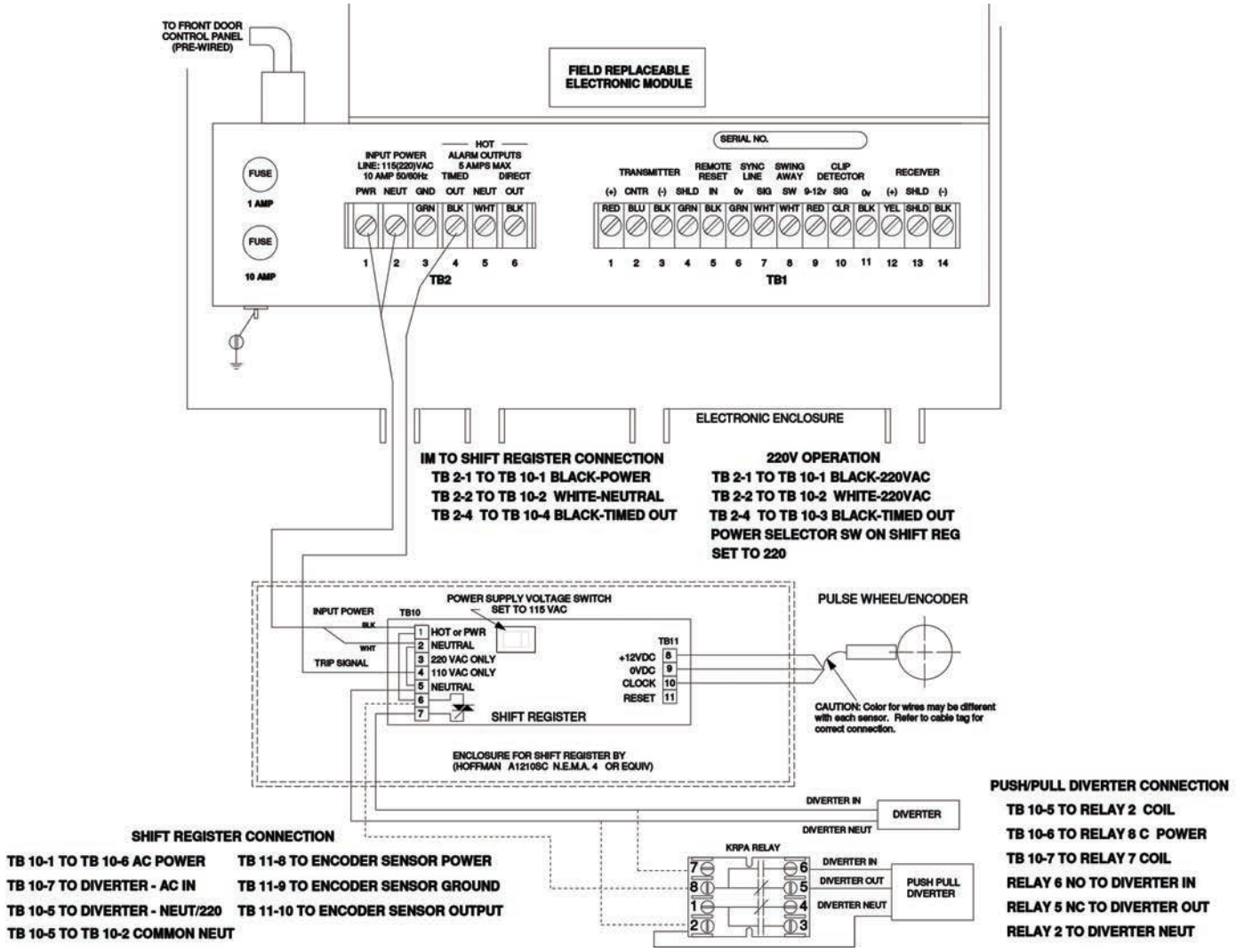


FIGURE A16
Shift Register

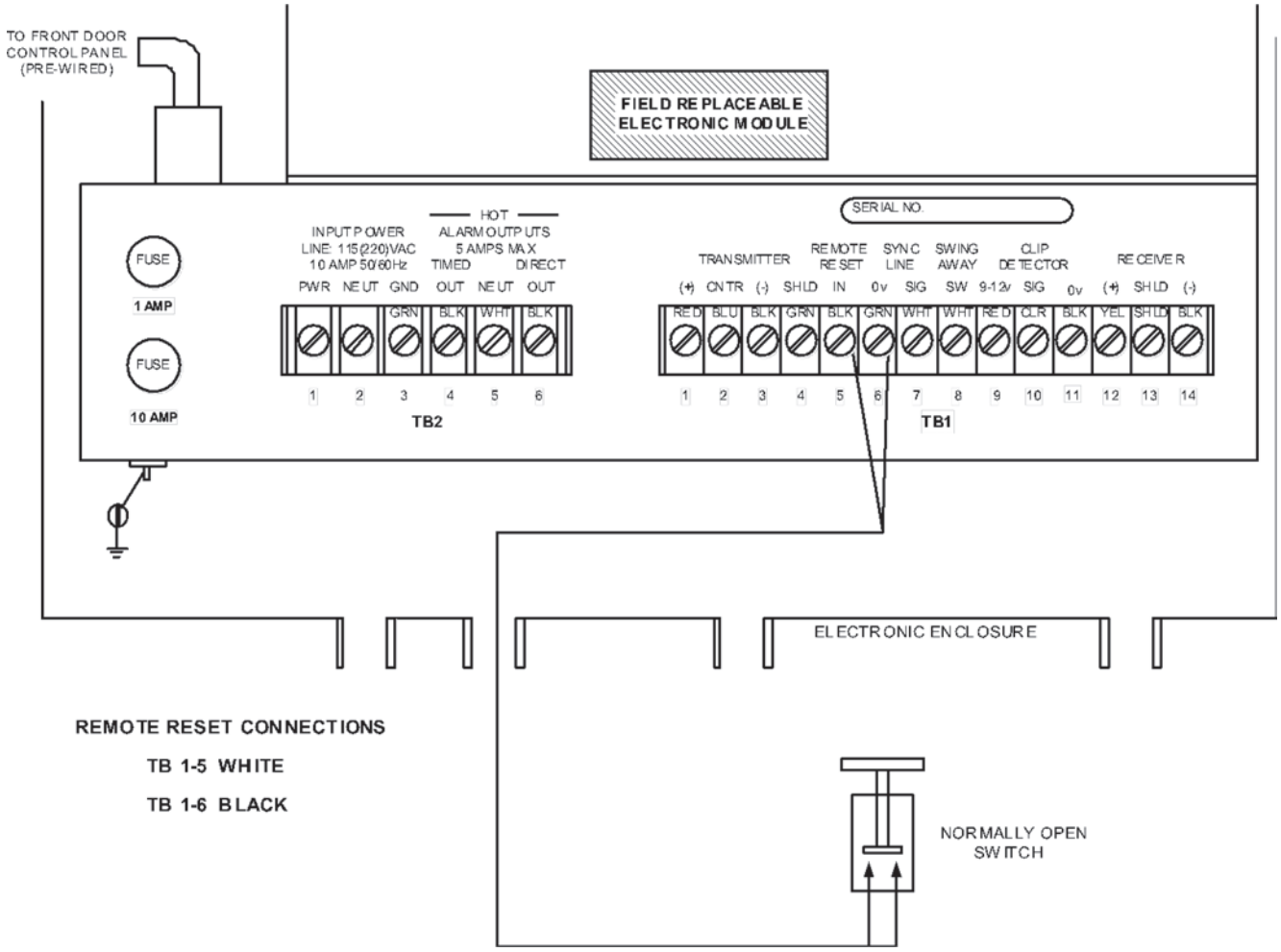
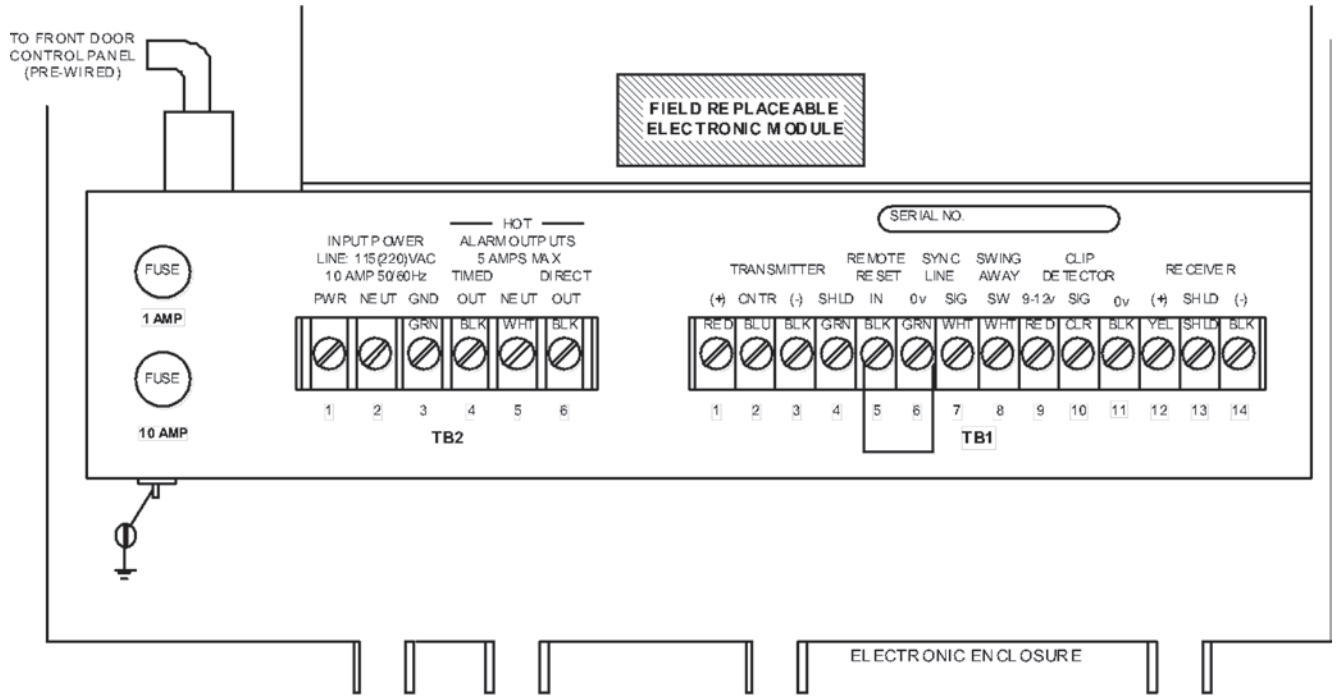


FIGURE A17
Remote Reset Switch



AUTOMATIC RESET CONNECTIONS

TB 1-5 WHITE

TB 1-6 BLACK

WHEN AUTOMATIC RESET IS USED S2-7 HAS TO BE OPEN ON EM. REF SECTION 4.9 PAGE 26. IF S2-7 IS CLOSED THE DETECTOR WILL NOT TRIP WITH THE JUMPER CONNECTED.

FIGURE A18
Automatic Reset

APPENDIX B

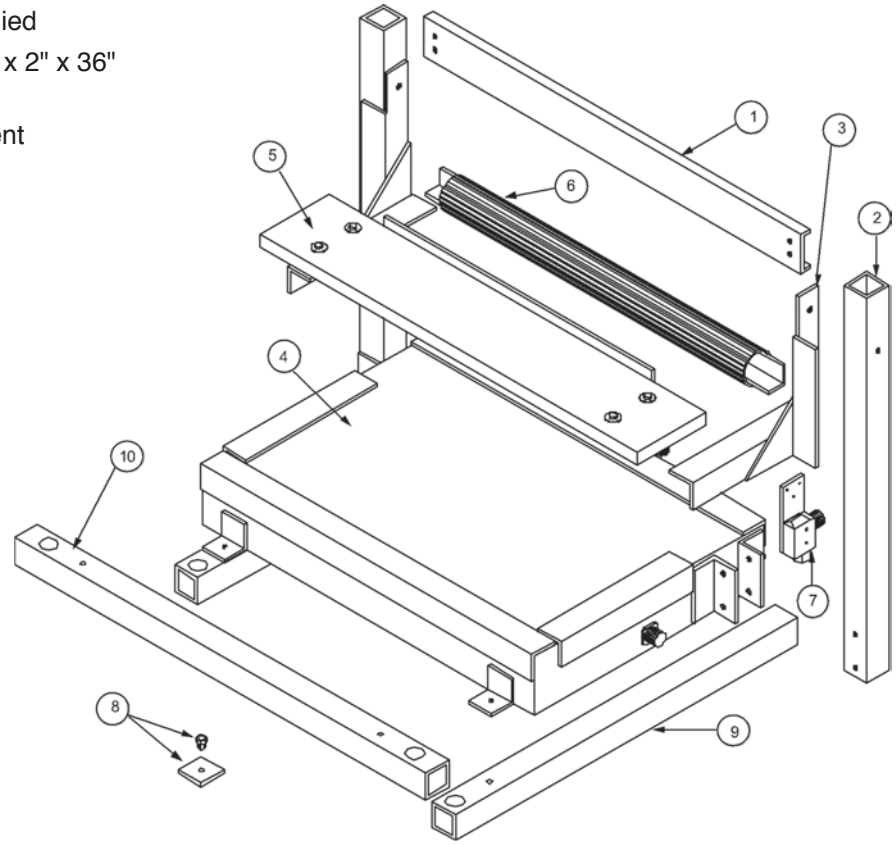
Service, Parts, Repairs

Search Coil Assembly Swing Away

Model 1250 Frame Assembly

Two Uprights & One Crossbar

1 Crossbar
2 Upright Single
Upright Pair
3 Swingaway Transmitter Bracket Pair
4 Shieled Receiver Antenna 0" to 48"
4 Shieled Receiver Antenna 49" to 78"
4 Shieled Receiver Antenna 79" to 150"
5 Transmitter Antenna 0" to 54"
5 Transmitter Antenna 55" to 78"
5 Transmitter Antenna 79" to 150"
6 Roughing Guard Size varies with frame width
7 Swing-Away Switch
8 Mounting Iso pad & bushing 4 supplied
9 Mounting 2" sqr tube longitudinal 2" x 2" x 36"
10 Mounting 2" sqr tube transverse
length = convor outside measurement



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