

Civacon 8030 Ground Verification Rack Monitor System and Associated Equipment

Installation and Wiring Instructions Manual

Manual Part Number: H52497PA



API = American Petroleum Institute
IS = Intrinsically Safe

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Table of Contents

Section	Description	Page
1	Product Description.....	3
1.1	Products.....	4
1.2	Voltage Selection	4
2	Mounting Diagram.....	5
3	Wiring Instructions - Power.....	6
3.1	Power Wiring.....	8
4	Wiring Instructions - Intrinsic Safety (IS) Signals.....	9
5	Monitor Indicators.....	11
5.1	Checkout Procedure.....	12
5.2	Replacement Parts	13
6	Warranty.....	16

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1. Product Description

This manual describes the installation, operation, and troubleshooting of the Civacon 8030 GROUND VERIFICATION Rack Monitoring System. It is intended to help operators, maintainers, and specifiers understand the operation and features of the GV system. This manual should be read before installation of any equipment.

The overall GV system contains a rack control monitor (GV Model 8030), junction box (Model 7560 Series), and either the 7720 Ground Clamp or the 7620 Dual Ball Ground Plug. Please consult the factory for the current availability of all optional products.

The 8030 has a RED non-permissive and a GREEN permissive indicator. The 8030 system has BYPASS capability when used with the optional BCU-2 bypass unit.

The 8030 incorporates truck-to-load rack Ground Verification. The Ground Verification circuit detects the presence of a ground on the trailer frame from four possible sources. The primary source of a ground is through a plug connected to two separate points on the trailer.

The 8030 system uses self-checking principles to provide a continuous check on all system components. If at any time the circuit detects a failure in any of the components, it reverts to a fail safe condition, NON-PERMISSIVE. The unit must then be repaired before it can return to an operational condition.

1.1 Products

All CIVACON Loading Rack Monitors are suitable for Class I, Division 1, Groups C & D hazardous locations with intrinsically safe outputs, and housed in an Explosion Proof Enclosure. All monitors are UL approved. Please consult the factory for the availability of special models.

8030-120 Ground Verify Monitor – 120 VAC

8030-240 Ground Verify Monitor – 240 VAC

OPTIONAL ACCESSORIES

BCU-2 Bypass Unit for 8X30 Monitors

7560-7560 Junction Box for 8030

1.2 Voltage Selection

Depending on the model used, two different input voltages are available for installation. The standard model is rated at 120 VAC, 50/60 Hz., but a 240 VAC, 50/60 Hz., model is available. Both voltage models provide a relay output with a SPDT set of contacts, rated at 240 VAC, 5 Amps. Determine which voltage model was purchased by the voltage rating on the nameplate; and wire according to the proper line voltage.

Voltage selection is made at the factory by jumpers on the PCB. Please do not attempt to alter these settings.

SAFETY FIRST!

POWER MUST BE OFF WHEN INSTALLING OR REMOVING THE PRODUCT FROM SERVICE. THE WIRES FOR THE POWER TERMINALS FROM THE POWER PANEL MUST BE KEPT TURNED OFF DURING WIRING, CHECKOUT AND THE BOARD REPLACEMENT! This is important to maintain safe repair practices.

2. Mounting Diagram

Maximum diameter bolt holes for mounting the enclosure are 7/16" diameter.

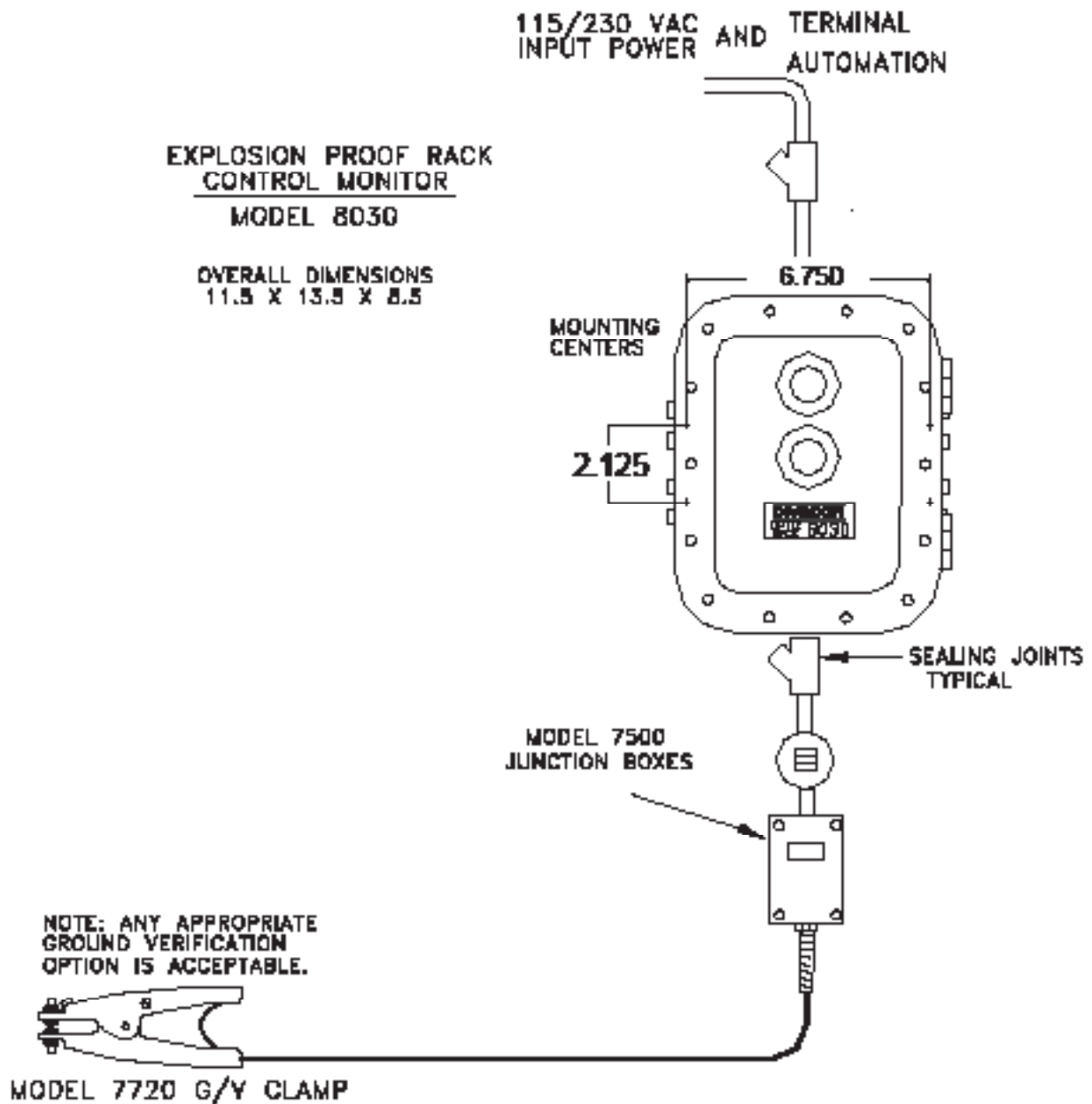


FIGURE 1 - Mechanical Installation

3. Wiring Instructions - Power

All wiring entering the rack monitor enclosure must enter through the NPT conduit openings provided by the factory. Use weather tight conduit fittings and thread sealant on pipe threads to keep out external moisture. Ensure that the proper sealing fittings are installed, and potted (sealed) appropriately.

CAUTION:

The control monitor's wiring and terminal strips on one side are intrinsically safe, and are separated from the AC power wiring by barriers. This separation of wires must be maintained. All sensor wires must enter the bottom (intrinsically safe side) of the monitor enclosure, and not mix with the AC power wiring or any other wiring at the top. AC power and control circuit wiring must enter through the conduit openings in the top of the enclosure. Wires should be cut to length with no excessive wire coiled inside the enclosure.

The power supply circuit should contain a disconnect switch and an appropriate fuse or circuit breaker with a minimum current rating of 1 Amp. for proper monitor operation. We strongly suggest the use of a high quality stranded and tinned copper wire with a minimum thickness of 18 gauge for all electrical connections. It is recommended that the power be switched off when servicing the electrical system. See Section 6 for proper monitor fuse replacement values.

SAFETY FIRST!

POWER MUST BE OFF WHEN INSTALLING OR REMOVING POWER LEADS TO THE MONITOR.
THE WIRES FOR THE POWER FROM THE POWER PANEL MUST BE KEPT SEPARATE FROM THE PLUG
(SENSOR) WIRING! THEY CANNOT BE RUN TOGETHER IN THE SAME CONDUIT!

50 mm (approx. 2 inches) of separation must be maintained between this wiring. This is important to maintain safe current levels in the Intrinsically Safe wiring.

Do not apply power to the monitor without reading this manual and thoroughly checking all connections. If the power wires pass through a Class I, Division 1, Groups C & D area, the conduit and wire type must be suitable for this use.

ATTENTION:

Be sure to check the local electrical and fire codes for proper installation. Many localities require an inspection to be performed before circuits are energized.

Three terminals are provided on the power input terminal strip on the monitor. These are L1 (LINE), L2 (NEUTRAL), and GROUND. The proper power source must be wired to these terminals, including a GREEN ground wire. In all cases, the appropriate NEC or CEC code should be followed.

Three terminals are provided for the control channel output on the monitor. These are C1 (COMMON 1), NC1 (Normally Closed 1), and NO1 (Normally Open 1), Form C type contacts. The proper control signal source must be wired to these terminals. It is suggested that the control signal source be wired into the C1 (COMMON 1) terminal, as it is the fused control terminal. The wire going to the controlled device should then be connected to the NO1 (or NC1 if applicable) contact of the terminal strip. See notes for Figure 3 concerning contacts C1, NC1, & NO1.

IMPORTANT:

The control monitor's enclosure has a grounding terminal. Connect a 12 AWG (minimum conductor size) solid copper wire from the terminal to an earth ground. The ground connection must be within one (1) ohm of true ground. There must be only one earth ground for the system to maintain an intrinsically safe circuit.

3.1 Power Wiring

The monitor must be wired according to Figure 3.

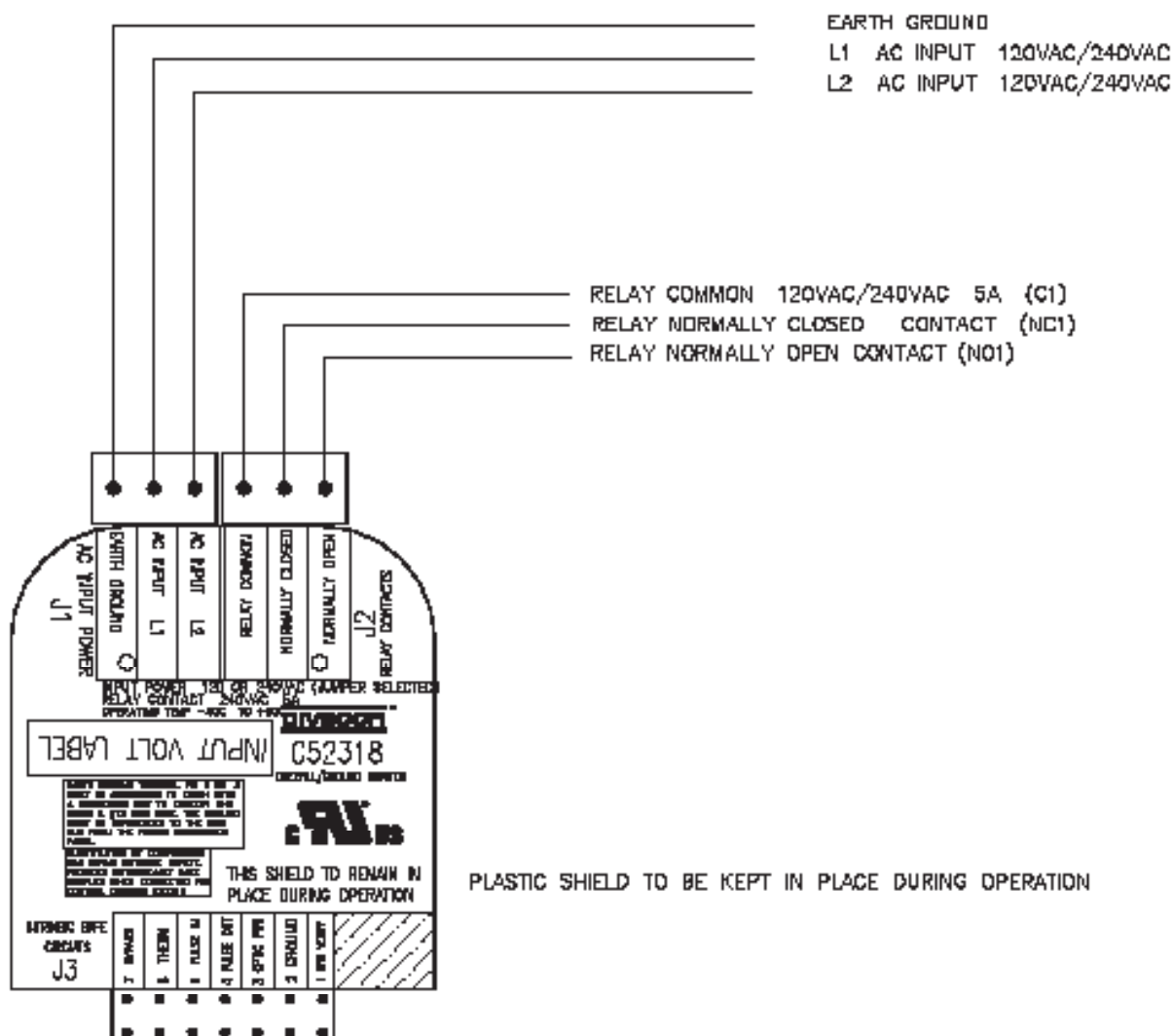


FIGURE 3 - Power Wiring

Additional Notes:

- Installation should be in accordance with NEC ANSI/NFPA 70 and ANSI/ISA RP12.6. In Canada, the system must be installed in accordance with the Canadian Electrical Code, CEC Part I.

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4. Wiring Instructions - Intrinsic Safety (IS) Signals

We strongly suggest the use of a high quality stranded and tinned copper wire with a minimum thickness of 18 gauge for all electrical connections to the intrinsically safe area connections. For wire lengths greater than 1000 feet (300 m.), please consult the factory.

WARNING:

These recommendations must be followed to limit the inductance and capacitance of the IS field wiring. Failure to do so will impair the intrinsic safety and approvals of the system.

CAUTION:

Hazardous conditions exist in fixed tank or large open rack installations. For lightning protection, above ground wiring runs must be in metal conduit, which must be weather-proof and have grounding rods to earth at each end. Underground wiring runs can be in non-metal liquid-tight conduit, however, such runs must terminate in a metal weather-proof junction box upon surface transition. It is suggested that underground wiring runs be run in metal conduit. This junction box must have a ground rod to earth. Lightning suppression equipment can be added at each sensor and control monitor. If additional protection is desirable, consult the factory.

Additional installation information can be obtained from Civacon for the other products used in the IS wiring portion of this installation. This information is usually shipped with the other products when they are purchased. If you misplace or lose this information, use the following information for obtaining replacements.

Use CIVACON Instruction Sheet or Manual H50457PA for additional information on installing Model 7500 series Junction Boxes.

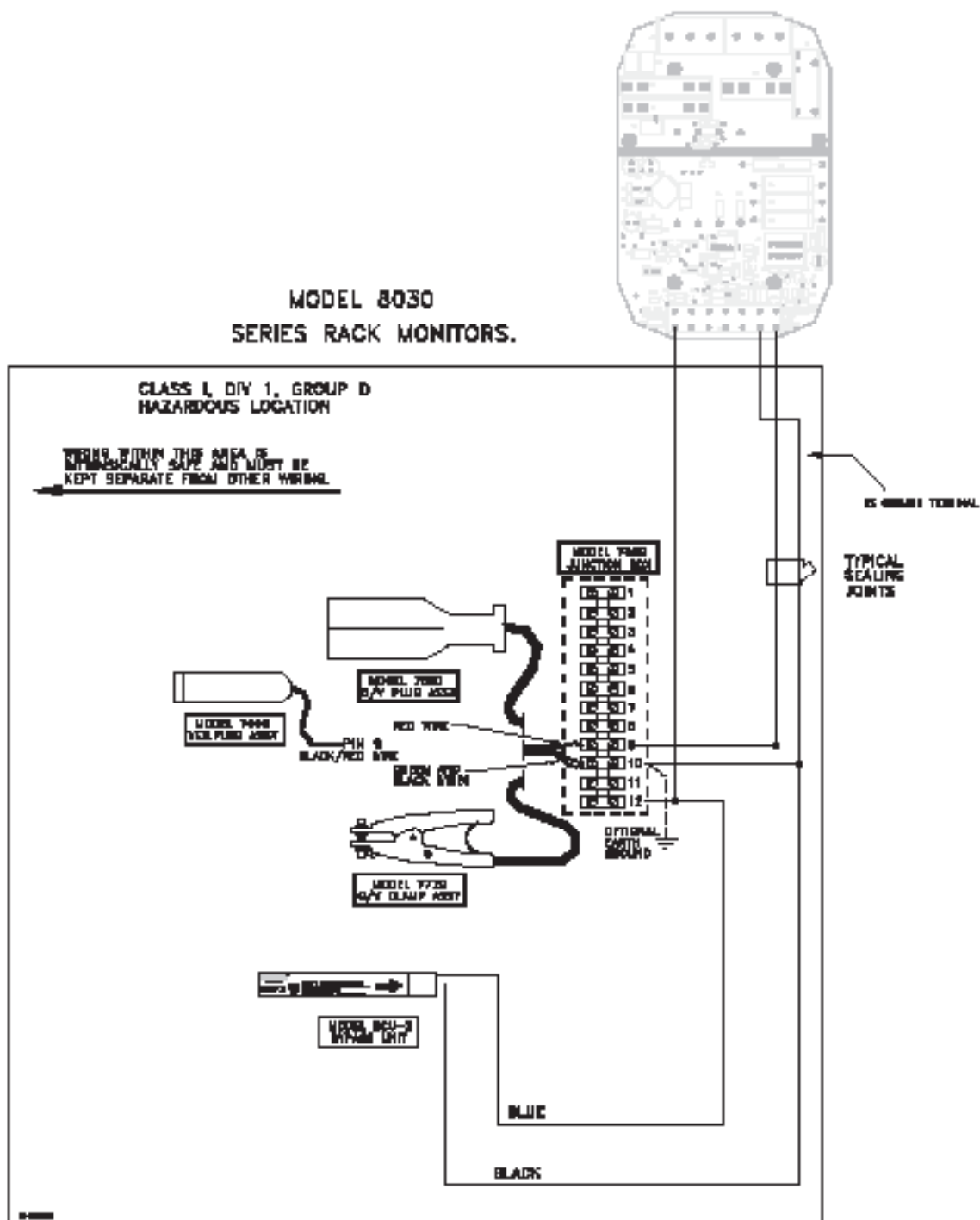


FIGURE 4 - Intrinsic Safety (IS) Wiring

5. Monitor Indicators

RED indicator ON means NON-PERMISSIVE; while a GREEN indicator ON means PERMISSIVE. When the BYPASS is activated, both RED and GREEN will come on indicating this mode. If there is no GROUND VERIFY signal, the RED lamp will flash.

If the cover to the rack monitor is opened, a PERMIT LED may be viewed for operational functions.

Function Table

MODEL	8030			
OPERATORS				
TEST CONDITIONS	NO GROUND	GOOD GROUND	BYPASS	
	ON	OFF	ON	
	OFF	ON	ON	

CAUTION:

DO NOT apply power to this monitor without thoroughly reading this manual and checking all connections. **DO NOT** connect a power source other than what's marked on the label to this monitor, as this may permanently damage it.

5.1 Checkout Procedure

- Step 1** Before applying AC line power to the 8030 Series Rack Monitor, perform a visual inspection of the power and control wiring according to Figure 2.
- Step 2** Apply the proper AC line power to the 8030 Series Rack Monitor. Ensure the Ground Verification plug is not connected to anything. The RED indicator on the Rack Monitor should light.
- Check the rack automation equipment for a NON PERMISSIVE signal.
- NOTE:** Bypass should NOT be connected.
- Step 3** Connect a Ground Verification signal to the IS connector (pins 6 and 7). The RED lamp will change from OFF to ON.
- Step 4** Testing Bypass (is applicable). If you have purchased the BCU-2 Bypass Control Unit, make sure to disconnect the Ground Verification equipment in step 3. Connect the BCU-2 to its connector on the junction box. The GREEN and RED lights will come on and the relay will activate.
- Check the rack automation equipment for a "PERMISSIVE" signal.
- Step 5** Troubleshoot any problems if the monitor's operation is not as stated above. The J3 Intrinsic Safety terminals may be measured for voltage presence. Using a voltmeter set on a 20 volt DC scale. With the ground (negative) lead of the meter on terminal 2, measure the DC voltage at pin 3 and it should read between 12 and 14 V with no wiring connected.

CAUTION:

Hazardous conditions exist on the printed circuit board. Only a qualified technician should be probing around on the circuitry contained within. Please consult the factory with any questions.

5.2 Replacement Parts

The printed circuit board (PCB) can be replaced in the field.

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Open the cover to the enclosure; and then remove the two (2) screws holding the safety panel and remove the safety panel. Remove the four (4) mounting screws that hold the board to the bottom of the chassis. Separate the two halves of the black connector to disconnect the board from the pilot lamps. The board can now be removed for replacement.

The following is a list of repair PCBs for the monitors. Replace with the correct version.

C52319-120 Basic Ground Verify Monitor PCB; 120VAC

C52319-240 Basic Ground Verify Monitor PCB; 240VAC;

CAUTION:

The monitor chassis contains NO components that are field replaceable except for three (3) AC fuses. Any substitution of components may impair the intrinsic safety and approvals of the system.

The three (3) fuses that are field replaceable are F1, F2 & F5. The following list of specifications should be followed.

Description	Civacon Part Number
F1 & F2 = 3AG Type, 250V, 1/2 AMP. For AC line input, Li and L2 Inputs.	H50784M
F5 = 3AG Type, 250V, 5 AMP. For Relay Contacts	H52517M

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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

6. Warranty

All parts and products are thoroughly inspected and tested from the time raw material is received at our plant, until the product is completed. We guarantee that all products are free from defects in materials and workmanship for a period of one year from the date of shipment. Any product that may prove defective within said one year period will, at our option, be promptly repaired, or replaced, or credit given for future orders.

This warranty shall not apply to any product that has been altered in any way, which has been repaired by any party other than an authorized service representative, or when such a failure is due to misuse or conditions of use. We shall have no liability for labor costs, freight costs, or any other cost or charges in excess of the amount of invoice for the products.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

WARNING:

OPW Engineered Systems' products should be used in compliance with applicable federal, state, and local laws and regulations. Product selection should be based on physical specifications and limitations, compatibility with the environment, and the material to be handled. OPW Engineered Systems makes no warranty of fitness for a particular use.

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