



# MFTA-205

MAINFRAME  
OVER / UNDER TEMPERATURE  
ALARM ACCESSORY  
AND COMMUNICATIONS BUS

INSTRUCTION & INSTALLATION MANUAL

## **SAFETY WARNING**



**WARNING!**

### ***READ THIS MANUAL BEFORE OPERATING EQUIPMENT!***

The high voltage required to operate this mainframe temperature control system and the high temperatures created by its operation can cause serious injury or death, and presents a potential fire hazard.

Installation and operation of this equipment should only be performed by qualified individuals and all directions should be carefully followed. Caution should be taken to guarantee that only the rated voltage is applied to this unit and appropriate limiting control devices should be used for safe operation.

### ***DISCONNECT THE MAIN POWER FROM THE CONTROL SYSTEM BEFORE SERVICING!***

Hazardous voltage is present on the inside of the mainframe system.

Standard safety procedures should be followed. Additionally, the following guidelines will help prevent personal injury and product damage:

- Do not apply a voltage greater than that specified on the product nameplates.
- Do not operate controllers or mainframe systems without appropriate supply ground connections.
- Do not insert or remove controllers into mainframe systems with power applied.
- Do not operate any controller or mainframe system without all covers in place and properly secured.
- Do not operate this product when wet or in a damp environment.
- Do not operate this product in an explosive atmosphere.

## **CE COMPLIANCE**



This control system, when properly installed as described, complies with the following European Standards:

- **EN-61010-1**  
“Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use – Part 1. General Requirements (1995)”
- **EN-61326-1**  
“Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements (1998)”

### **Note on EMC compliance:**

Due to the processing of small analog voltages (thermocouple input) the controllers used in this mainframe are susceptible to interference caused by radiated electromagnetic fields.

Although steps have been taken to reduce upsets caused by EMI, strong signals may cause degradation of system accuracy. User intervention is not required to reset the system under these circumstances. The system will automatically recover following the removal of the interfering signal.

If continuous upsets are recognized remove the interfering signal from the process. If this is not possible consult the manufacturer for assistance with solving specific EMI interference problems.

## **INTRODUCTION**

The MFTA-205 Over / Under Temperature Alarm Accessory has been introduced to complete the PCS Company family of G-Series† style mainframe control systems. This control system was designed to provide affordable and compatible solutions for hot runner control requirements. The mainframes, when combined with the VC-M digital temperature control module, provide the user with a temperature control system that is user friendly, highly accurate and prepared to handle even the most difficult control applications. The MFTA completes the package by providing an audible alarm, as well as auxiliary contact closures, in the event that an uncontrolled event occurs.

Unlike many competitive alarm accessories the MFTA does not require the use of a valuable control zone slot. Instead, it has been designed to be conveniently positioned behind the main breaker disconnect panel, which keeps all mainframe controller positions available.

This manual combines graphical representation of components and wiring information with explanatory dialogue to help the users acquaint themselves with the MFTA alarm accessory features, as well as retrofit installation.

**NOTE: THE MAINFRAME IN WHICH THE ALARM ACCESSORY IS INSTALLED MUST ALSO BE EQUIPPED WITH THE APPROPRIATE SIZE COMMUNICATION BUS P.C. BOARD ASSEMBLY. (For example, PCS P/N: CIK-12.)**

**WITHOUT THE COMMUNICATIONS BOARD INSTALLED THE TEMPERATURE CONTROLLERS WILL NOT BE ABLE TO "COMMUNICATE" WITH THE MFTA TO TRIGGER THE ALARM IN THE EVENT OF A FAULT CONDITION.**

Should further clarification be required do not hesitate to contact your nearest sales representative or distributor for assistance.

## **SPECIFICATIONS**

### **GENERAL**

Dimensions ..... 4.0" Wd X 7.0" Hg X 4.0" Lg  
(102mm X 178mm X 102mm)  
Weight ..... 1.25lb (0.57Kg)  
Operating Temperature ..... 32 to 120°F (0 to 50°C)

### **INPUT POWER**

Operating Voltage ..... 230VAC (+10/-20%) 50/60Hz  
Selectable 115VAC (+10/-20%) 50/60Hz  
Power Consumption ..... < 4 Watts  
Circuit Protection .... Dual ¼ Amp Fast-Acting Fuse  
Ceramic Type ABC¼ (or less) **\*\*No Substitutes\*\***  
Circuit Isolation ..... Transformer; > 2500 Volts  
Alarm Input Signal ..... +5 VDC  
(Must be supplied by temperature controller  
VC-M optically couples signal to digital circuit)

## **OUTPUT**

Visual Alarm Indication ..... Red LED  
Audible Alarm ..... Piezoelectric Buzzer  
Intermittent Beep 0.8-1.2 Seconds  
90 dB at 12" (30cm)  
Auxiliary Output ..... Contact (Relay) Closure  
(1) Normally Open / (1) Normally Closed  
**5 A @ 30 VDC MAXIMUM**  
**or 5 A @ 250 VAC MAXIMUM**  
**\*\*USER IS RESPONSIBLE FOR PROTECTION\*\***

## **INSPECTION**

After removing the MFTA alarm accessory from the shipping container immediately inspect the unit for damage resulting from mishandling in shipping. Inspect for loose components and mechanical damage such as bent sheet metal, marred front panel screen, etc. Remove the spare ABC¼ fuses and auxiliary connector mating connector kit and save them for later use.

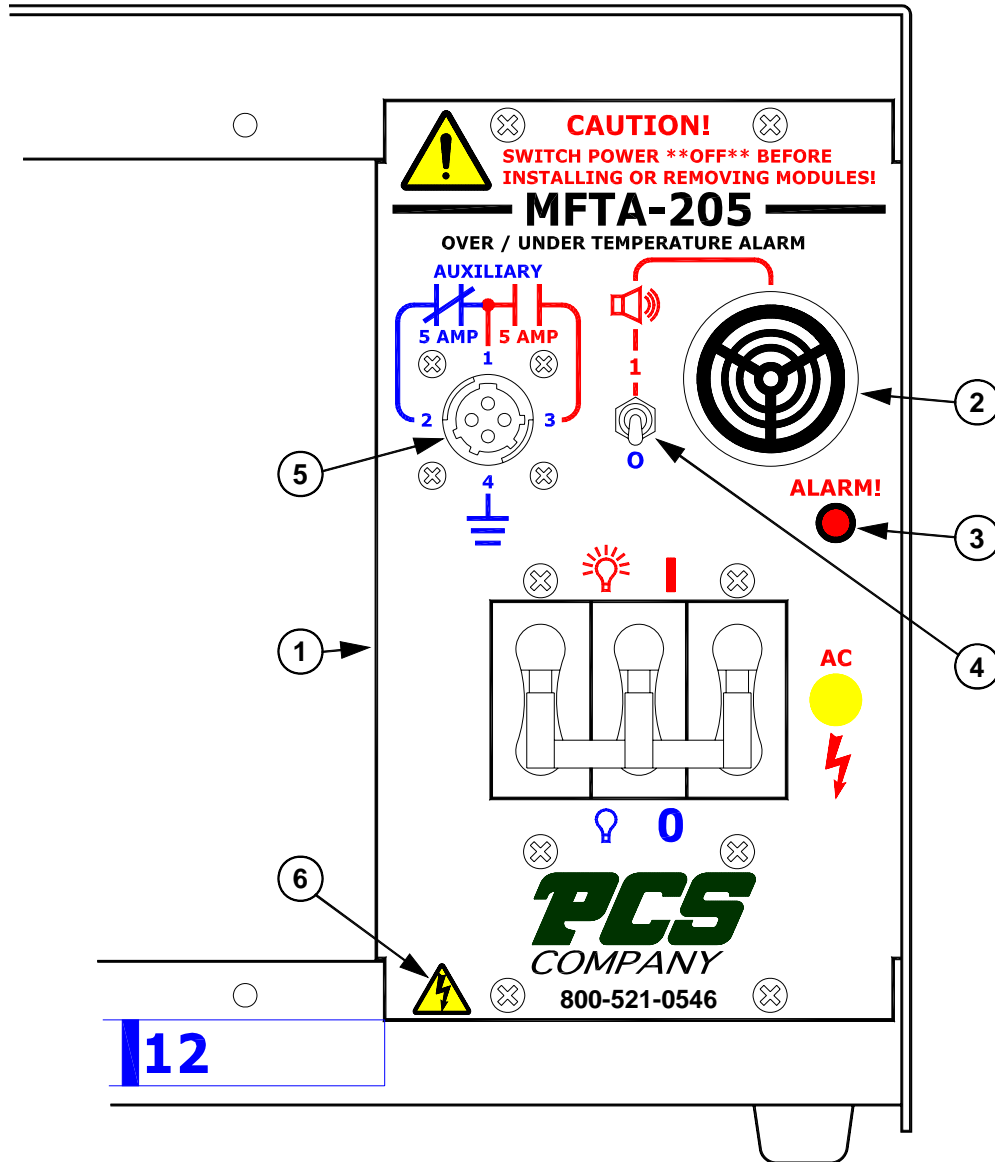
**Note: If the unit appears damaged or the container is missing components, contact your sales representative immediately! Use or modification of the MFTA or its packaging will decrease the likelihood of freight claim reimbursement.**

## **OPERATION**

**Refer to Figure 1 to become oriented with the MFTA alarm accessory indicators and user controls.**

The MFTA is easy to use and requires no special training. The fused input power to the MFTA is connected to the mainframe power bus. Power is automatically applied to the MFTA alarm unit when the mainframe main circuit breaker disconnect is turned on. The amber AC power light located on the disconnect panel will become illuminated when power is turned on.

Under normal control system operating conditions the MFTA will be inactive. In the event of a fault condition the temperature controller will apply a +5 VDC signal to the mainframe communication bus printed circuit board assembly. This electrical signal is transferred to the MFTA via a ribbon cable connection. When the MFTA realizes an alarm signal it will visually and audibly (if enabled) alert the operator of a fault condition.



## **CONTROLS AND INDICATORS**

1. Faceplate - Interchangeable with Mainframe  
Circuit Breaker Mounting Plate. (Circuit Breaker Not Included)
2. Audible Alarm Beeper
3. Red Alarm LED
4. Alarm Beeper Enable / Disable Switch
5. Auxiliary Connector (Mate Included)  
Provides One Set Each of 5 Amp Normally Open & Normally  
Closed Switch Contacts
6. Caution, Risk of Electrical Shock Symbol (Required per CE LVD)

**Figure 1**  
**Controls & Indicator Placement**

The PCS Company VC-M temperature controller generates an alarm signal under any one of the following fault events:

- Ground Fault (Current Leakage)
- Shorted Triac (Output Control Device)
- Open Triac (Output Control Device)
- Open Thermocouple (Temp Sensor)
- Shorted Thermocouple
- Reversed Thermocouple
- 30°F (17°C) Over Setpoint Temperature
- 30°F (17°C) Under Setpoint Temperature

## **ALARM INDICATION**

The MFTA signals an alarm condition several ways simultaneously:

1. The red LED on the front panel will be illuminated.
2. The audible beeper, if enabled, will begin to pulsate.

**NOTE: The beeper can be disabled by placing the toggle switch in the “OFF” (0) position.** (Item #4, Figure 1.)

Once the operator is aware of the fault condition it may be more comfortable to evaluate the system without the interruption of the beeper.

3. The auxiliary connector normally open and normally closed contacts will close and open respectively. (Item #5, Figure 1.)

Once the fault condition has been corrected, the VC-M temperature controller will automatically remove the alarm signal from the communication bus, turning the MFTA alarm accessory off.

## **AUXILIARY CONNECTOR**

The auxiliary connector (Item #5, Figure 1) provides access to relay contacts which open and close with the alarm signal. The mating cable connector is supplied with the MFTA.

The relay contacts can be used to open or close user designed ancillary circuits to compliment the MFTA method of alert. Refer to Figure 4 for an example of such use.

**THE MFTA AUXILIARY CONNECTOR CIRCUIT DOES NOT SUPPLY ANY VOLTAGE! It is dry contact closure only.**

**NOTE: THE MFTA AUXILIARY CIRCUITRY DOES NOT CONTAIN FUSE PROTECTION! The user is responsible to properly protect these components at less than or equal to 5 amps maximum!**

**DO NOT EXCEED THE RELAY AND CONNECTOR MAXIMUM VOLTAGE! The maximum circuit voltage is 250 VAC or 30 VDC!**

## **INSTALLATION**

If the MFTA was purchased as a kit for mainframe retrofit installation the following instructions will assist the user to accomplish successful installation.

The retrofit procedure is not difficult, however, time and care must be taken to prevent personal injury and/or damage to control system components. Installation of this equipment should only be performed by qualified individuals and all directions should be carefully followed.

The instructions and photographs that follow are specific to the PCS Company VC-F mainframes. Contact your sales representative for clarification if installing the MFTA into other manufacturer's G-Series®† style mainframes.



**WARNING!**

**THE CONTROL SYSTEM MAINFRAME MAIN POWER DISCONNECT MUST BE IN THE “OFF” POSITION BEFORE COMMENCING THE RETORFIT INSTALLATION.**

**THE MAINFRAME POWER CORD SHOULD BE DISCONNECTED FROM THE ELECTRICAL SERVICE, OR THE DISCONNECT DEVICE SHOULD BE SWITCHED AND LOCKED IN THE “OFF” POSITION.**

**PHOTOGRAPHIC AIDS FOLLOW THE INSTRUCTION.**

**Step 1:** Remove the mainframe rear cover panel. (The large green with yellow stripe ground wire may or may not have to be disconnected from the rear cover panel.)



**Step 2:** Locate the cooling fan and neon power light wire bundle and remove the wire ties, exposing the individual wires. (Take care to not cut any of the wires.)



**Step 3:** Disconnect the neon light wires from the fuse holder connections. (The light wires are larger diameter than the fan wires.)



**Step 4:** Remove the breaker disconnect mounting screws and the disconnect panel mounting screws.



**NOTE: THE BREAKER DISCONNECT IS MOUNTED WITH #6-32 X 1/4" SCREWS. THEY MUST BE REUSED IN THE SAME LOCATION!** Remounting the breaker disconnect with longer screws, such as the #6-32 x 3/8" screws used for the mounting panel, will damage the breaker disconnect.

**ASSEMBLY AID:** Removing the disconnect mounting panel in this manner will leave the breaker disconnect in its original location allowing for easier reassembly and avoiding troublesome wire re-routing.

**Step 5:** Remove the disconnect mounting panel with the neon power light installed. Discard the assembly or save for future maintenance.



**Step 6:** Install the MFTA mounting plate assembly over the breaker disconnect in place of the original disconnect panel.

**BE CAREFUL NOT TO PINCH OR DAMAGE ANY COMPONENTS OR WIRING.** Care must be taken to properly position the MFTA assembly over the breaker disconnect.

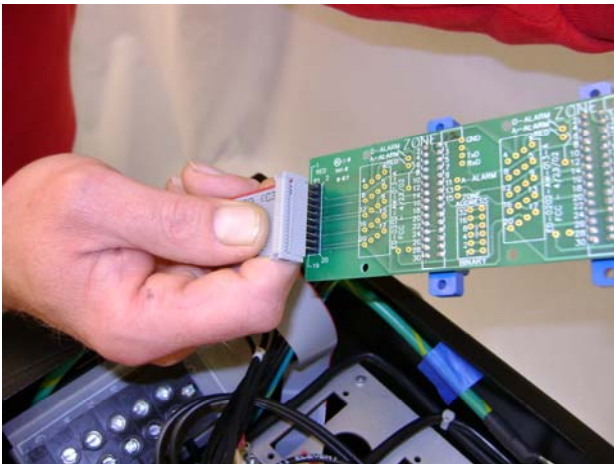


**Step 7:** Route the MFTA power wires, ground wire, communications ribbon cable and new neon power light wires through to the back plane of the mainframe.



**Step 8:** With the MFTA mounting panel in location reinstall the breaker disconnect #6-32 x 1/4" mounting screws.

**Step 9:** Secure the MFTA panel into the mainframe reusing the #6-32 x 3/8" screws.



**Step 10:** Working from the rear of the mainframe, connect the MFTA ribbon cable to the communications bus printed circuit board. The communications cable is polarized by a red stripe indicating the #1 conductor. The red stripe must be connected to pin #1 of the communication board ribbon cable crimp connector (notch in connector body) or header connector (Pin #1 identified by print), depending on the version of communications board. (Refer to Figure 3 for clarification)

## OLD STYLE COMMUNICATIONS WITH GRAY RIBBON CABLE CONNECTOR:

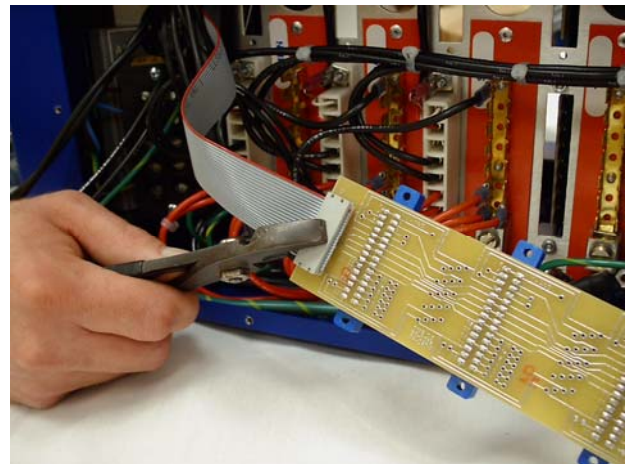
Step 10a: If the communications printed circuit board has the 2 x 10 header installed, the connection with the communications board can be easily made with the board installed in the mainframe. Simply push the ribbon cable header connector onto the header. **Continue to Step 11.**

Step 10b: If the communications printed circuit board has the flat crimp style connector, the communication board should not be installed in the mainframe at this time. It will be much easier to make the connection, and the connection will be much more reliable, if the board is loose and can be handled to accommodate the ribbon cable crimping.

Step 10c: To crimp the ribbon cable to the ribbon cable connector, begin by removing the adhesive cover strip from the connector cover. Carefully place the cover over the ribbon cable, allowing the ridges of the conductors to fit into the mating detents in the connector cover.

Once this is accomplished place the cover, with the cable, over the communications board connector. The (4) plastic pins on the corners of the connector line up with the notches in the cover. This pin-notch mechanism properly aligns the cable and cover to the connector.

Using a pair of pliers gently and carefully begin to squeeze the cover onto the connector, working from one side of the connector to the other. As this is done the sharp contact pins of the connector pierce the ribbon cable insulation, making the connection.

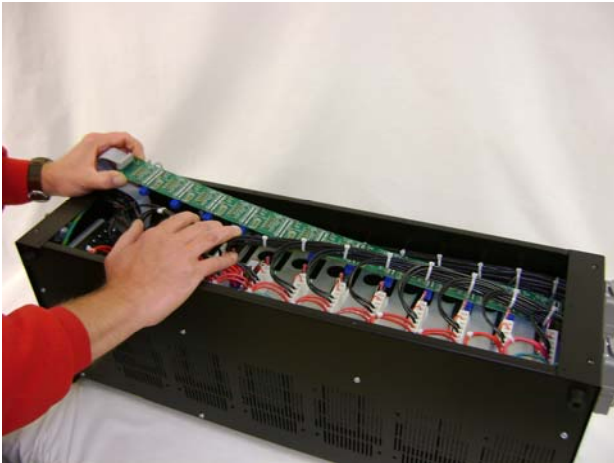




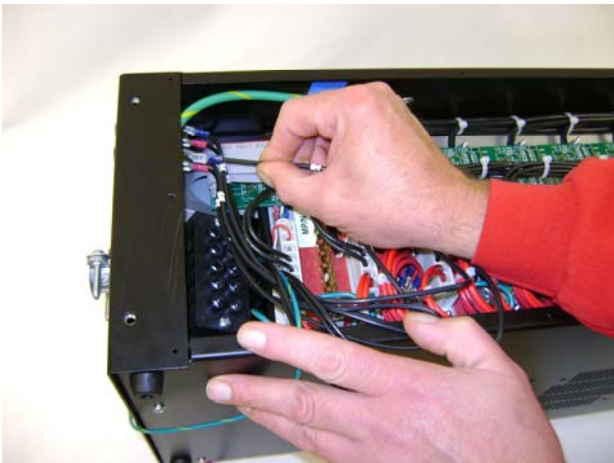
## COMMUNICATIONS ADDRESSING:

Figure 3 contains instructions as well as an address table that detail how to address the communications bus printed circuit board. **THE MFTA ALARM ACCESSORY DOES NOT REQUIRE ADDRESSED COMMUNICATIONS!** This information has been provided for use in the event that intelligent communication products (such as personal computer interface modules) are to be used with the control system.

**Step 11:** Position and install the communications printed circuit board into the mainframe. (Being careful not to pinch the T/C wires.)



**Step 12:** Connect the neon power light wires to the fuse holder positions (as were removed in step #3).



**Step 13:** Plug the MFTA power wires into the mainframe brass power distribution strips.

### 240 VAC IS REQUIRED!

For North American mainframe wiring configurations the terminations should be at R/L1 and S/L2.

For European (export) mainframe wiring configurations the terminations should be MP/N and R/L1.

**Refer to the mainframe operating voltage and wiring scheme on the mainframe serial number label to insure the correct input voltage connections are made.**



**Step 14:** Connect the MFTA chassis ground wire (green/yellow) to one of the unused ground tabs at the bottom of the connector panel.

**Step 15:** Gently take up the slack of the MFTA power and ground wires, the neon power light wires and ribbon cable by pulling them to the back of the mainframe.

**Step 16:** Neatly bundle these wires with the fan wires using the supplied wire ties.



**Step 17:** Inspect all wiring for cuts or knicks and remove any debris from inside the mainframe.



**Step 18:** Reinstall the mainframe rear cover panel per the instruction manual. ***If the large green with yellow stripe ground wire was disconnected in step 1, be sure to reconnect it to the rear cover panel. Failure to do so will not properly ground the enclosure rear cover panel!***

**Step 19:** Inspect the last zone in the mainframe, adjacent to the MFTA. Be sure that all wires are tucked inside the line of the mounting plate.

**The backside of the temperature controller printed circuit board has sharp component leads that will cut interfering wires and create a dangerous situation! Be sure that all wires are clear!**

**Step 20:** Reach behind the MFTA panel and spin the mainframe cooling fan. Listen for the fan blades hitting interfering wires. Remove as necessary.

Installation is complete. Install the temperature controllers and resume normal operation of the system.

## **MAINTENANCE**

The MFTA alarm accessory requires very little maintenance for continuous and reliable operation. As with any electronic equipment it may be appropriate to periodically clean the main printed circuit board assembly depending on the atmosphere of the facility. This should only require blowing off dust and debris using clean and dry compressed air.

If the printed circuit board has been soiled and the air is not sufficient it is acceptable to clean the board, components and component leads using **ISOPROPYL ALCOHOL** only. Be sure that the board and components are completely dry before reapplying power to prevent unsafe and damaging short circuits.

If the faceplate assembly needs to be cleaned use only a **DAMP RAG AND MILD DETERGENT**. Gently rub the panel to remove any oil and debris. Be sure that all components are completely dry before reapplying power to prevent unsafe and damaging short circuits.

## **REPLACEMENT PARTS**

It is recommended that all PCS Company control equipment, including the MFTA alarm accessory, be returned to an authorized representative for repair and calibration service.

**Warning: MFTA, VC-M and VC-F mainframe service by unauthorized personnel may void warranty coverage!**

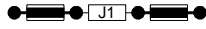
Some component failures are easily recognized and can be quickly repaired in the field by qualified maintenance personnel. The following list of replacement parts identifies these components that are readily available through local sales representatives and distributors.

<b>DESIG.</b>	<b>DESCRIPTION</b>	<b>PART NO.</b>
F1, F2	FUSE - ¼ AMP 250VAC **Type ABC¼only**	R143-006
T1	TRANSFORMER 240/120VAC PRIMARY	R154-001
U1	IC - +5VDC REGULATOR	R163-007
RLY1	RELAY - MECHANICAL	R159-005
RLY2	RELAY - REED	R159-007
SA1	ALARM BEEPER	R159-025
CONN1	4 POS. MALE OUTLET Flange Mount	R119-025
----	#16-18 AWG PIN For CONN1 Outlet	R119-028
CONN2	4 POS. FEMALE INSERT For Cable Hood	R119-026
----	#16-18 AWG SOCKET For CONN2 Insert	R119-029
CONN3	4 POS. CABLE HOOD	R119-027

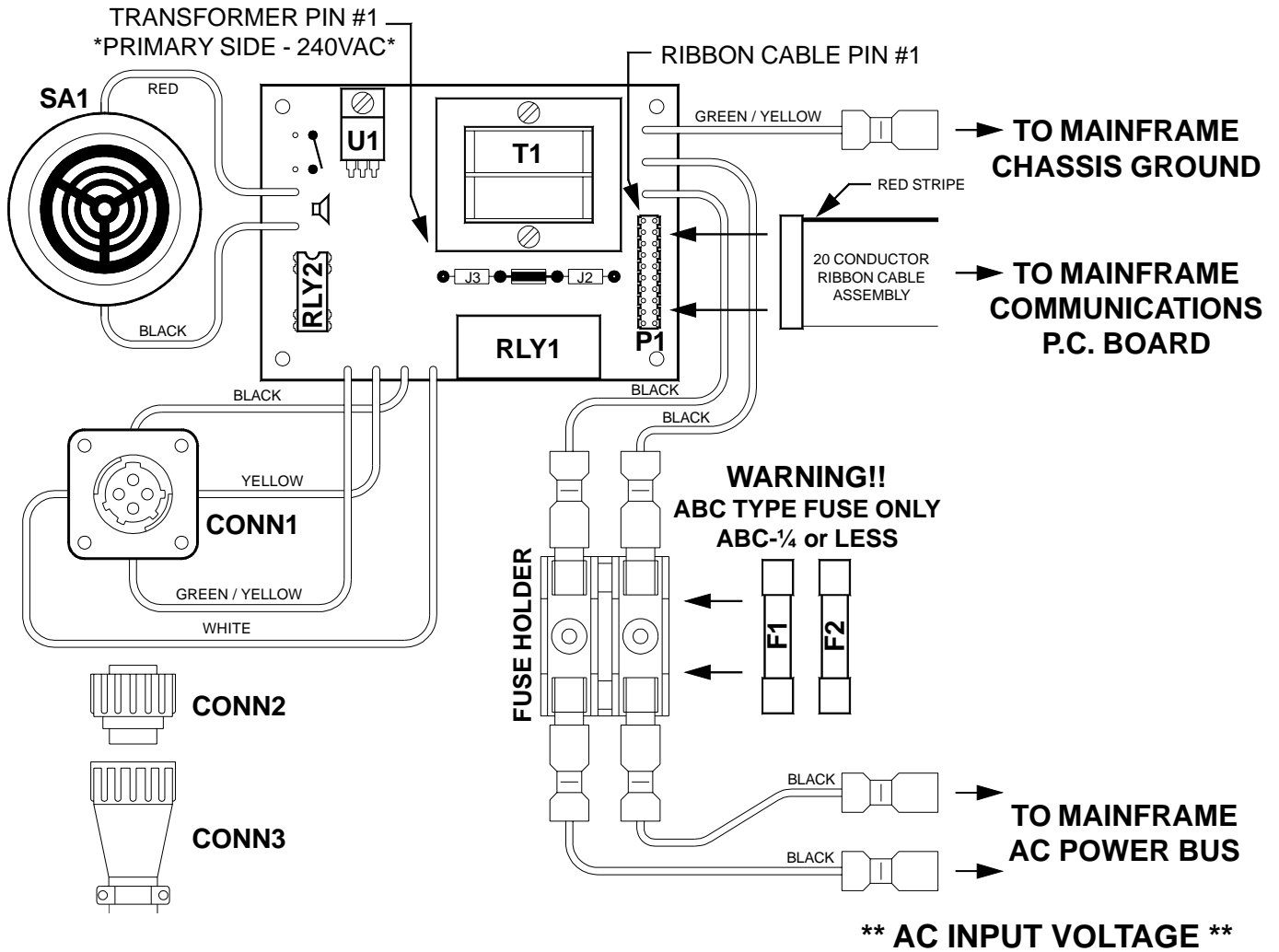
Refer to the Component Layout (Fig. 2)

## INPUT VOLTAGE JUMPERS

ALTERNATE SETTING "J2" & "J3"  
120 VAC



**FACTORY INSTALLED "J1" SHOWN BELOW**  
**\*\*\* 240 VAC \*\*\***

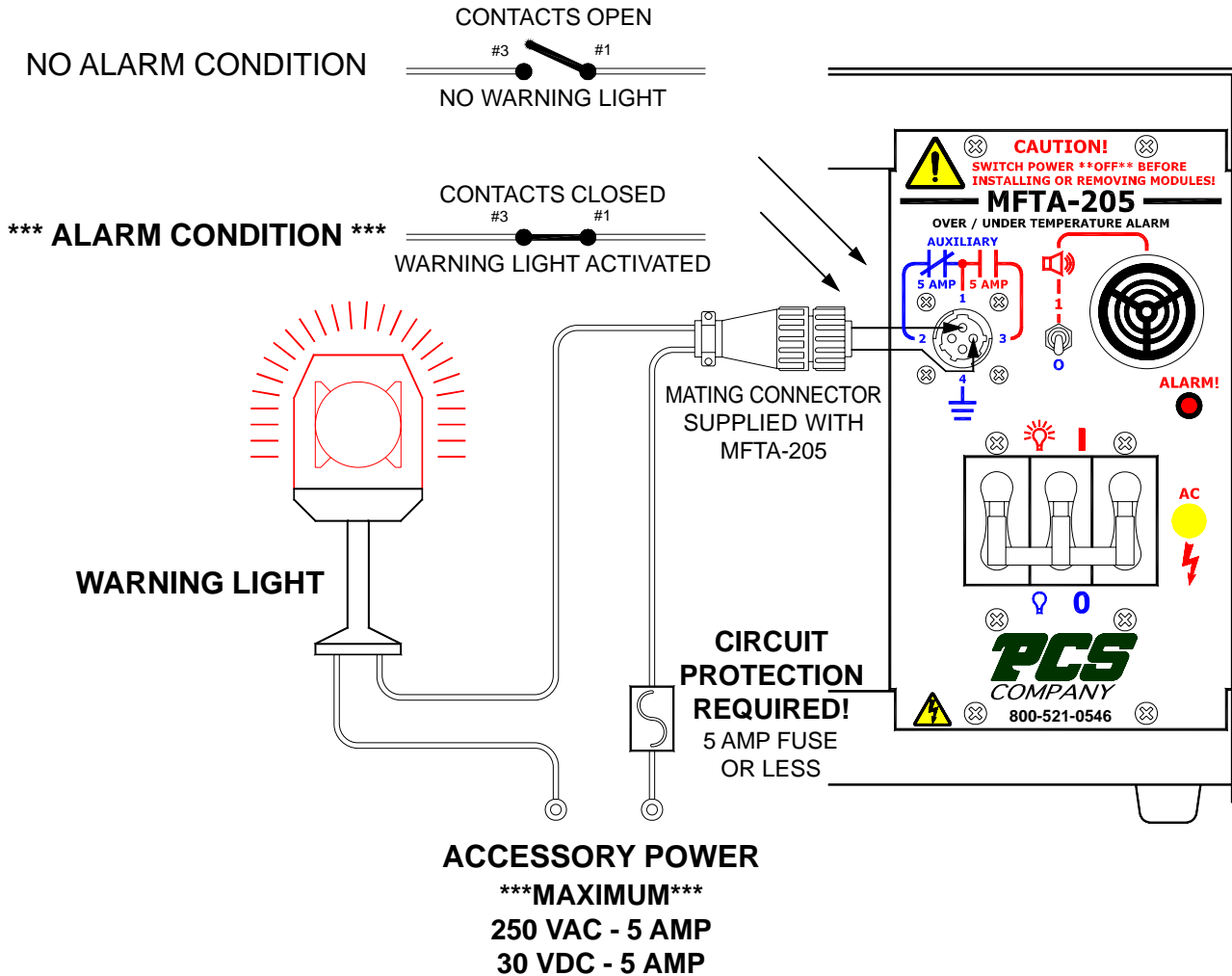


**Figure 2**  
**Component Layout**



# AUXILIARY CONTACT ACTION

(NORMALLY OPEN CONTACTS SHOWN)



**Figure 4**  
**Auxiliary Output Connector - Example Use Schematic**



## **DISCLAIMER**

The information contained in this manual is proprietary and supplied for customer use only.

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All information contained in this document is deemed accurate at the time of its publication. Every effort will be made to insure that its contents match the hardware supplied. Specifications, hardware and software are subject to change without notice and the manufacturer assumes no obligation of informing the holder of this document of such changes.

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## **LIMITED WARRANTY**

The manufacturer warrants that this product will be free from defects in materials and workmanship for a period of **two tears** from the date of shipment.

The manufacturer, at its discretion, may or may not grant warranty service if it is determined that this product has been abused, used in a system or application which it was not designed for, altered or tampered with by unauthorized personnel.

If warranty service is applicable the manufacturer, at its option, may either repair the damaged product without charge for parts and labor or provide a replacement product in exchange for the defective unit.

This warranty excludes fuses. Appropriate arrangements must be made with a sales agent prior to the return of any material.

## **DISTRUBUTED BY:**



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