



# 1022M

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## AMC-1022M SERIES HAZARDOUS GAS MONITORING SYSTEM INSTRUCTION MANUAL

**IMPORTANT:**  
**PLEASE READ THESE INSTRUCTIONS  
CAREFULLY BEFORE BEGINNING  
INSTALLATION AND/OR OPERATION OF  
THIS EQUIPMENT.**

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## WARRANTY

The AMC-1022M series monitor is warranted against defects in material and workmanship for a period of two years from date of delivery. During the warranty period, we will repair or replace components that prove to be defective in the opinion of the Armstrong Monitoring Corporation. We are not liable for auxiliary interfaced equipment, nor consequential damage.

### NOTE

**ANY SUBSTITUTION OR TAMPERING WITH COMPONENTS WITHOUT THE EXPRESS PERMISSION OF THE ARMSTRONG MONITORING CORPORATION MAY RESULT IN DAMAGE THAT MAY CANCEL THE EFFECTIVENESS OF THE WARRANTY.**

## LIABILITY

All Armstrong Monitoring Systems must be installed and maintained according to instructions. Only qualified technicians should install and maintain the equipment.

The Armstrong Monitoring Corporation shall not be responsible for any liability arising from auxiliary interfaced equipment, consequential damage, or the installation and operation of this equipment. Armstrong's total liability is contained in the warranty conditions stipulated above. No other acceptance of liability is expressed or implied by the Armstrong Monitoring Corporation.

Read this manual carefully, as the purchaser is entirely responsible for installation and operation.

## MODIFICATIONS AND SUBSTITUTIONS

Due to an ongoing development program, Armstrong reserves the right to modify the design and substitute components in any of its products without prior notice. All changes are at the sole discretion of Armstrong, and Armstrong shall not be liable for any costs arising out of such modifications or substitutions, which may be incurred by the user.

## PRODUCT RETURN UNDER WARRANTY

All products that must be returned for warranty service will be by prepaid freight and they will only be accepted with an R.M.A. number issued by The ARMSTRONG MONITORING CORPORATION. Goods returned to the client will be freight collect.



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## SPECIFICATIONS

Monitor Serial Number.....

Power Supply Requirement..... 120 VAC, 60 Hz

Fuse Type and Rating..... 3AG, \_\_\_ Amp

Operating Temperature Range..... 0°C to 40°C

Chan. No.	Sensors/Transmitters		Type of Gas	Alarm Trip Points	
	Part No.	Serial No.		Low	High
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

### NOTE

<p><b>ALL ARMSTRONG MONITORING SYSTEMS MUST BE INSTALLED AND MAINTAINED ACCORDING TO INSTRUCTIONS, TO ASSURE PROPER OPERATION. ONLY QUALIFIED TECHNICIANS SHOULD INSTALL AND MAINTAIN THE EQUIPMENT.</b></p>
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# AMC-1022M

## 1 INTRODUCTION

### 1.1 GENERAL DESCRIPTION

#### NOTE

**ITEMS 6 THROUGH 17 DESCRIBE FEATURES OF ONE CHANNEL ONLY. THESE FEATURES ARE NORMALLY IDENTICAL FOR ALL CHANNELS.**

The AMC-1022M is a multi-sensor gas monitoring system designed to continuously monitor for traces of hazardous gases (listed in Specifications, page v). It can be calibrated to detect a wide variety of gases, and each channel can monitor a different gas. The monitor comes with the following features as shown in Figures 1-2, 1-3 and 1-4:

- |                          |   |
|--------------------------|---|
| 1. POWER SWITCH          | -Main AC power switch for all channels.   |
| 2. FUSE HOLDER           | -Front panel mounted for easy access to the fuse.   |
| 3. AUDIO ALARM INDICATOR | -When operational (see item 14), the buzzer will activate when a high alarm condition occurs.   |
| 4. CLAMPS                | -To secure the front panel, restricting access to internal controls.  |
| 5. POWER TERMINAL BLOCK  | -For line voltage connections (120 VAC, 60 Hz.).  |
| 6. POWER ON INDICATOR    | -Power is indicated by a green LED.   |
| 7. FAIL INDICATOR        | -Sensor/transmitter signal fail is indicated by an amber LED. (Only when this option is installed).   |
| 8. HIGH ALARM INDICATOR  | -High levels of gas is indicated by a red LED.  |
| 9. LOW ALARM INDICATOR   | -Low levels of gas is indicated by a yellow LED.  |
| 10. TEST SWITCH          | -The test switch is provided to electronically simulate alarms in order to test the low and high alarm indicators, relays, and the audio alarm indicator. |
| 11. HIGH ALARM ADJUST    | -Sets the High alarm trip point.  |
| 12. LOW ALARM ADJUST     | -Sets the Low alarm trip point.   |
| 13. SIGNAL ADJUST        | -Sets the sensitivity of the sensor. (Not required for transmitter).  |



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14. THREE CIRCUIT MINIATURE SWITCH -Each actuator on the miniature switch controls a different circuit as shown in Figure 1-1. If the actuator is set in the UP position, its corresponding circuit is ON. If the actuator is set in the DOWN position, the circuit is OFF.

LEFT ACTUATOR: Provides a TEN minute time delay, when switch is ON, to eliminate unnecessary alarms caused by momentary exposure to high levels of gas.

MIDDLE ACTUATOR: Provides a FIVE minute time delay, when switch is ON, to eliminate unnecessary alarms caused by momentary exposure to low levels of gas.

RIGHT ACTUATOR: Controls the audio alarm indicator. When ON, the buzzer will activate when a high alarm condition occurs.

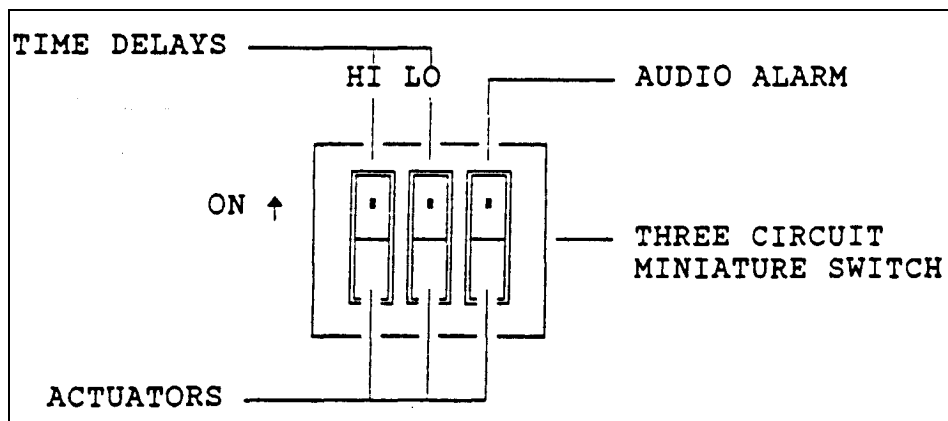


FIGURE 1.1 THREE CIRCUIT MINIATURE SWITCH

15. RELAYS -There are two DPDT relays per channel which work with high alarm and low alarm respectively.

16. TRANSFORMER -Class II, step down transformers run the internal circuitry at low voltages.

17. SENSOR TERMINAL BLOCK -For remote sensor or transmitter connections.



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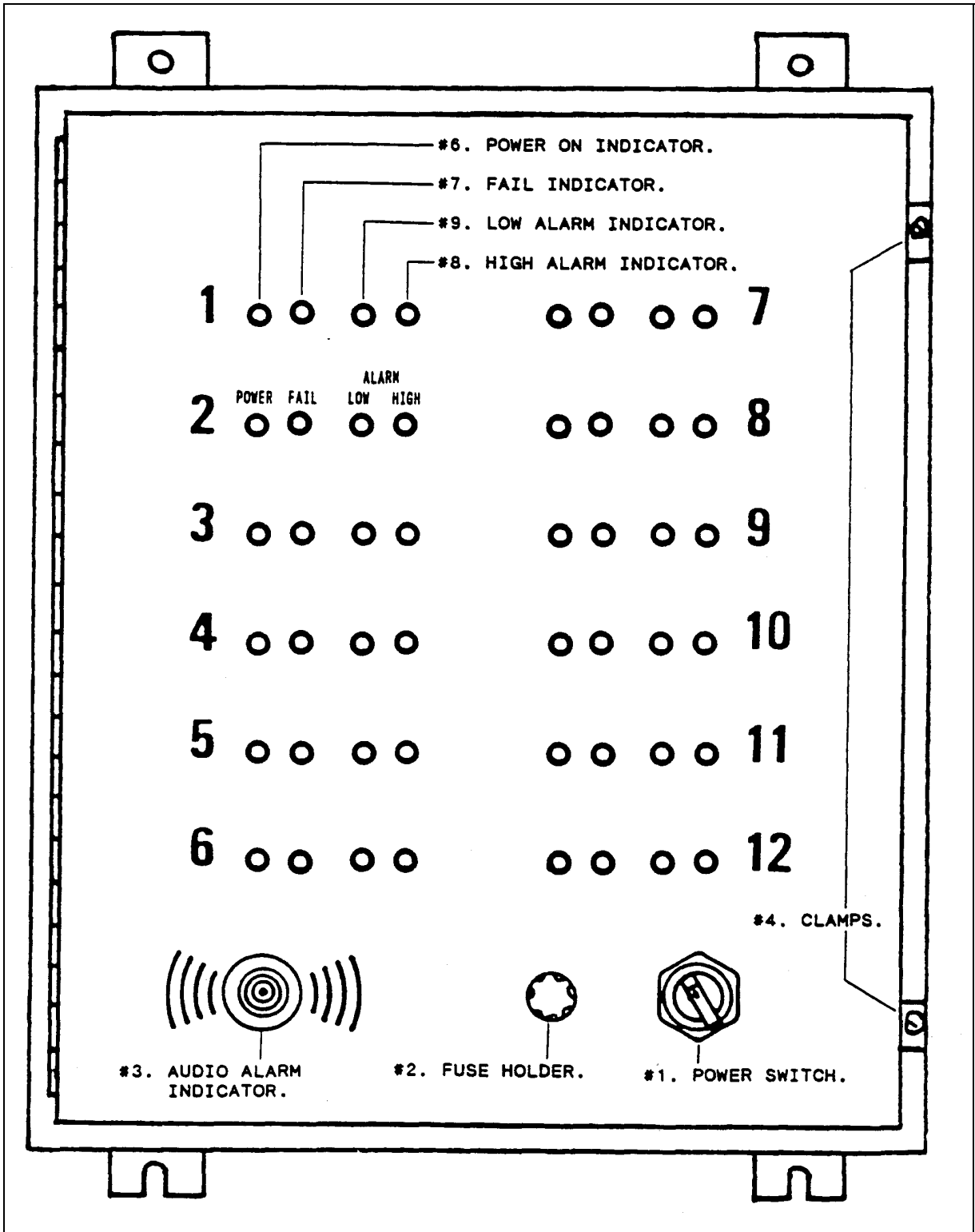


FIGURE 1.2 AMC-1022M SERIES MONITOR, FRONT PANEL.





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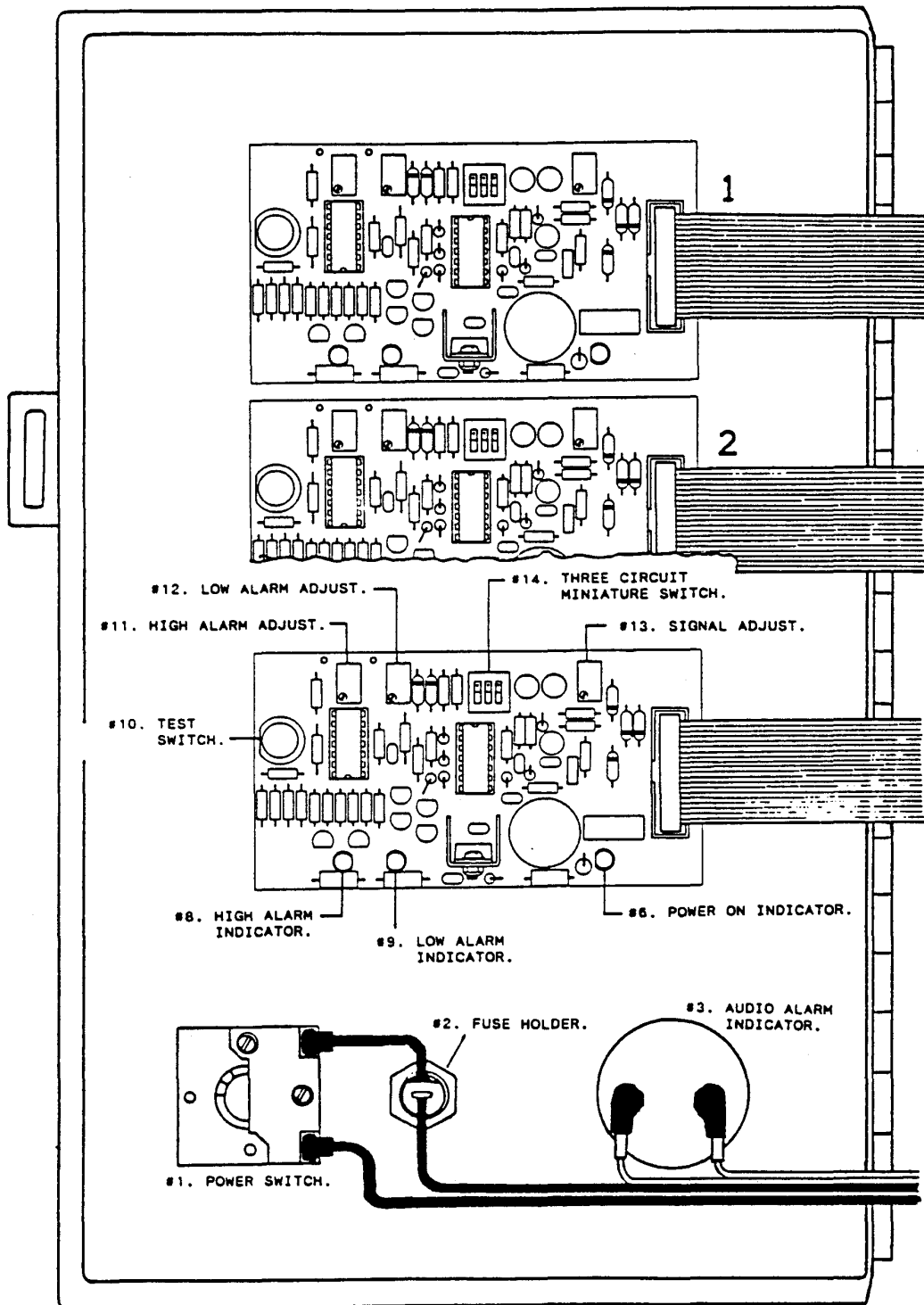


FIGURE 1.3 AMC-1022M SERIES MONITOR, INSIDE FRONT PANEL.



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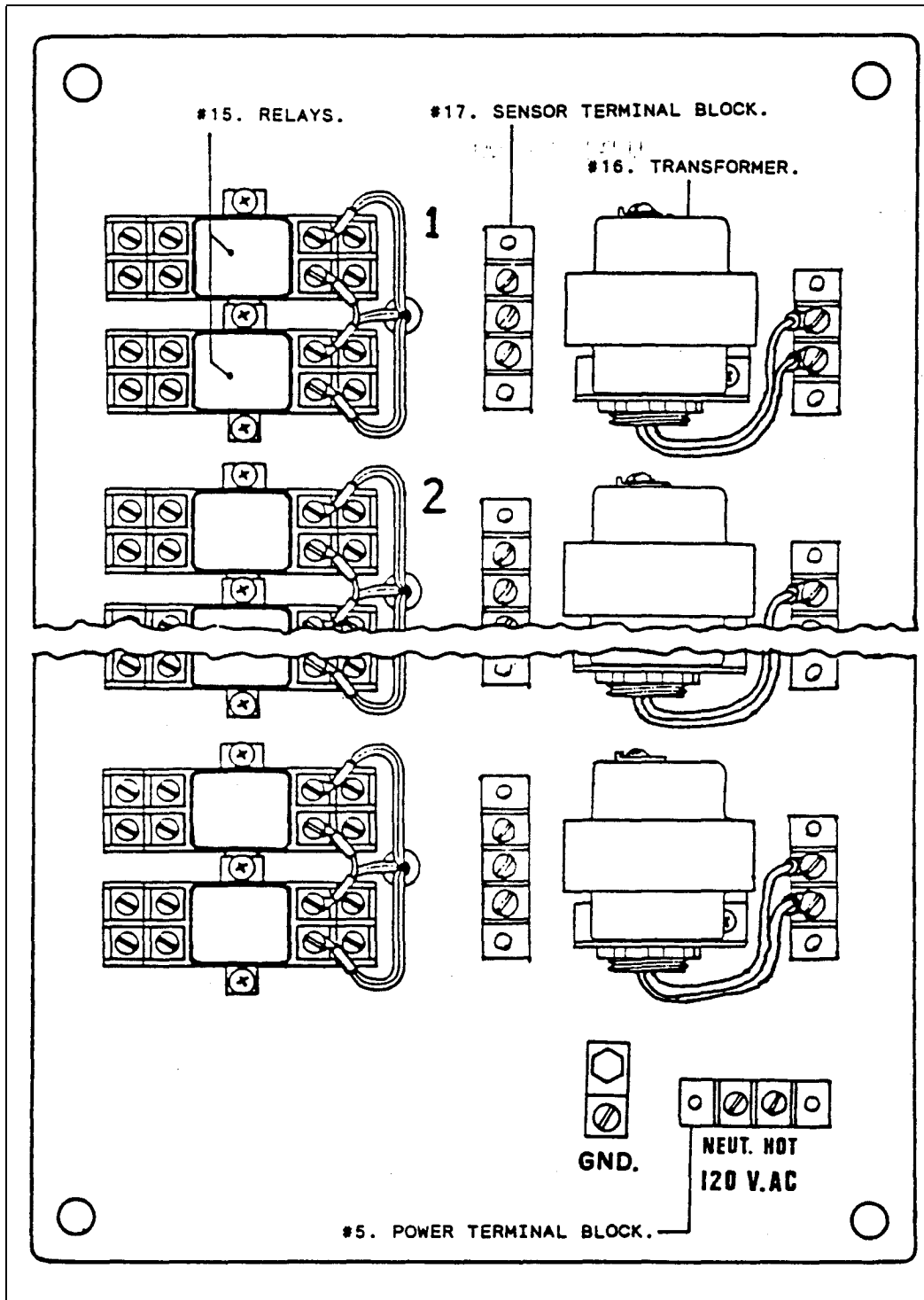


FIGURE 1.4 AMC-1022M SERIES MONITOR, INSIDE POWER/RELAY PANEL.



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## 2 INSTALLATION

### 2.1 LOCATION AND MOUNTING

Care should be taken to securely fasten the monitor (via four mounting holes provided) to a solid, vertical, nonvibrating surface or structure. See Figure 2-2 for mounting dimensions.

#### NOTE

**ALL CABLE ENTRY MUST BE THROUGH BOTTOM OF MONITOR ENCLOSURE ONLY. OTHER ENTRY LOCATIONS WILL ALLOW FOREIGN MATERIALS TO ENTER THE ENCLOSURE, CAUSING POSSIBLE DAMAGE TO THE INTERNAL COMPONENTS.**

Mount the monitor in a NON-HAZARDOUS area (e.g. control room, manager's office) where the unit can be observed periodically.

Mount the sensor and/or transmitter units in areas where the local concentrations of gases are unaffected by the presence of ventilation systems.

### 2.2 WIRING OF THE MONITOR & SENSORS AND/OR TRANSMITTERS

- |                          |  |
|--------------------------|--|
| Power Supply             | -The monitor operates on 120 VAC, 60 HZ. For each channel, a class II step down transformer runs the internal circuitry at low voltages. The power supply connections are made at the power terminal block located inside the monitor (see Figure 2-1).  |
| Relays                   | -There are two DPDT relays per channel that activate with high alarm and low alarm respectively (see Figure 2-3) causing contact transfer. The contacts are available for activating a remote alarm or, in some applications, an exhaust fan. Relays are rated 1/3 HP. @ 120 VAC/240 VAC; 10 Amp. @ 28 VDC/120 VAC/ 240 VAC, resistive. For relay contact arrangement, see Figure 2-4. |
| Sensors and Transmitters | -Each remote sensor or transmitter connects to a sensor (-,sig,+) terminal block located on the inner panel of the monitor (see Figure 2-3). All Connections should be made using shielded 2 or 3-conductor cable, depending on which sensor or transmitter is used. See schedule of cable sizes (Section 2.3) to select appropriate cable.  |



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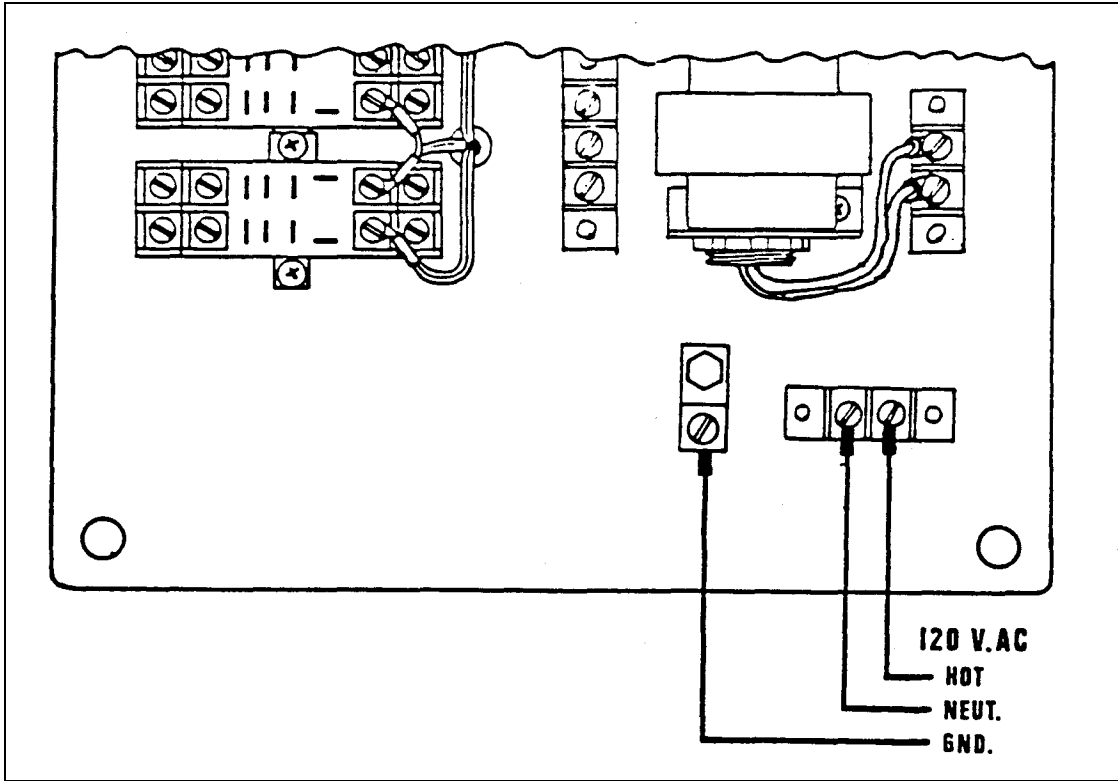


FIGURE 2.1 MONITOR POWER SUPPLY CONNECTIONS.

## 2.3 SCHEDULE OF CABLE SIZES

For maximum noise rejection, each cable shield and metal conduit should be grounded at the monitor. The following is a listing of maximum distances the sensors or transmitters may be located from the monitor for various cable sizes.

WIRE GAUGE AWG	CABLE LENGTH in FEET (metres)	
	Remote Sensor or 3-Wire Transmitter	2-Wire Transmitter
22	185 (56)	1000 (305)
20	290 (88)	1500 (457)
18	460 (141)	2500 (762)
16	700 (214)	3800 (1158)
14	1110 (338)	5600 (1706)

### NOTE

THE ABOVE CHART IS BASED ON A 6 OHM CABLE LOOP RESISTANCE. REFER TO LOCAL ELECTRICAL CODES FOR WIRING REGULATIONS.



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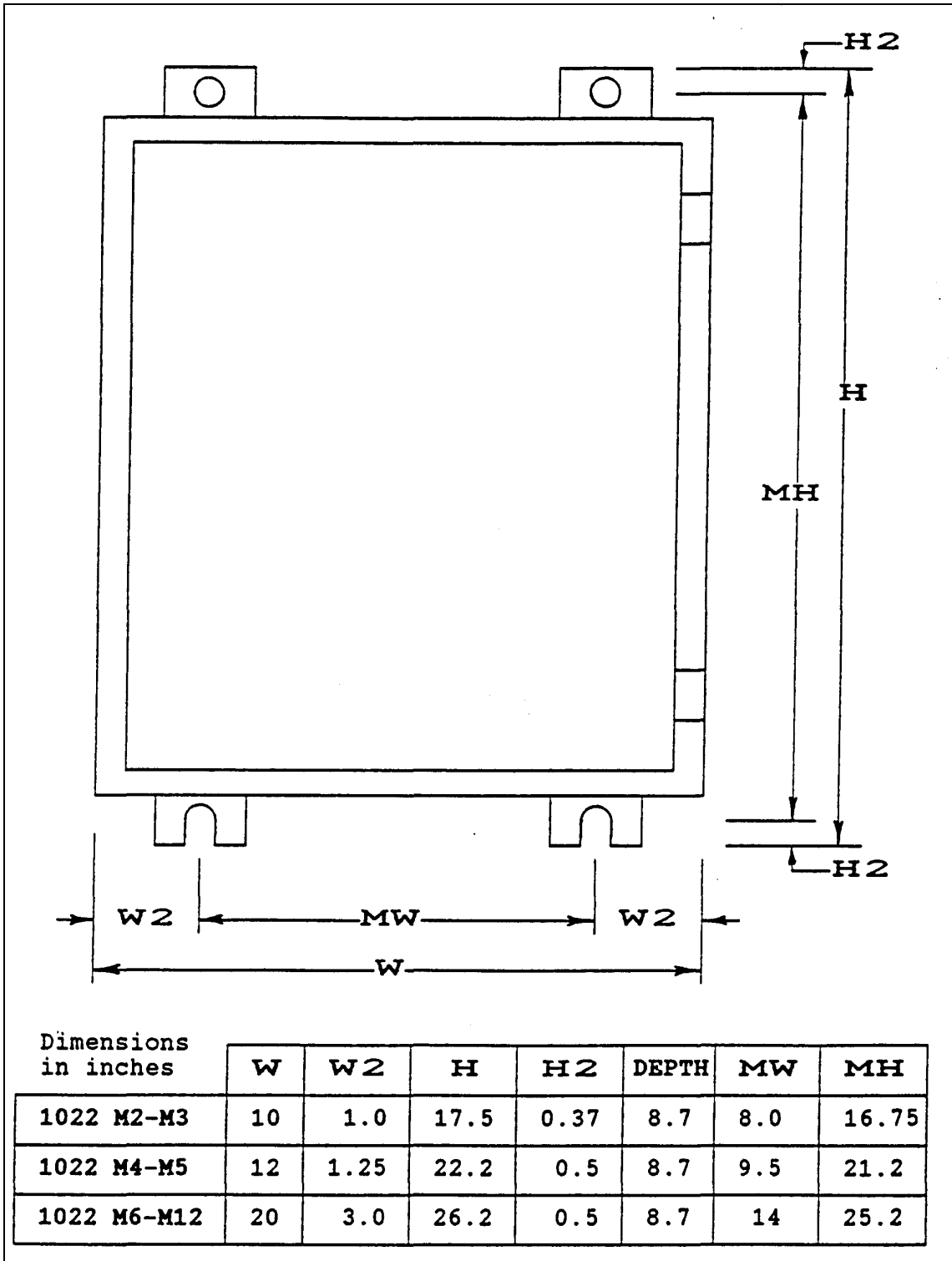


FIGURE 2.2 MONITOR MOUNTING DIMENSIONS.



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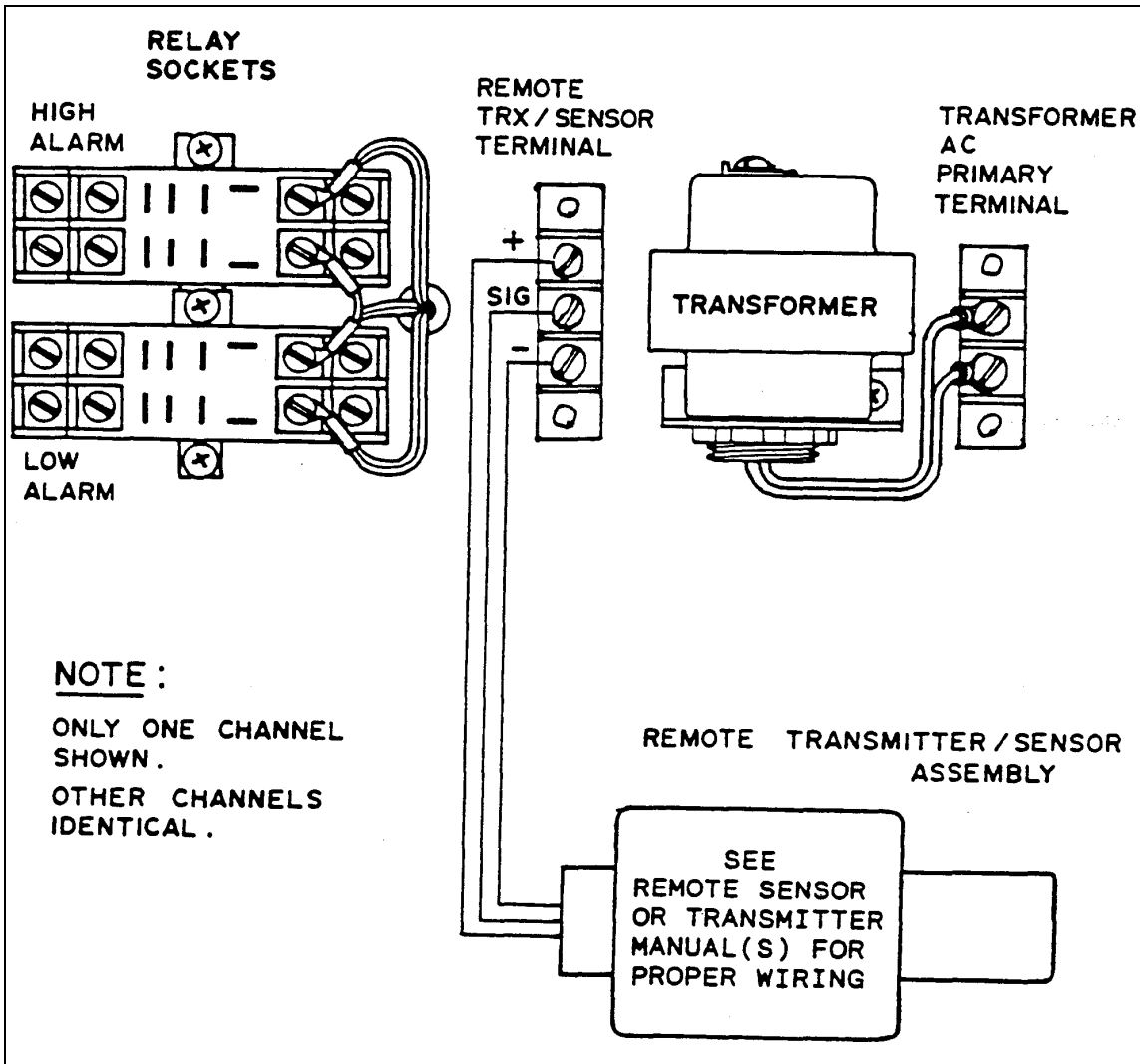


FIGURE 2.3 REMOTE SENSOR/TRANSMITTER WIRING LAYOUT (ONE CHANNEL)



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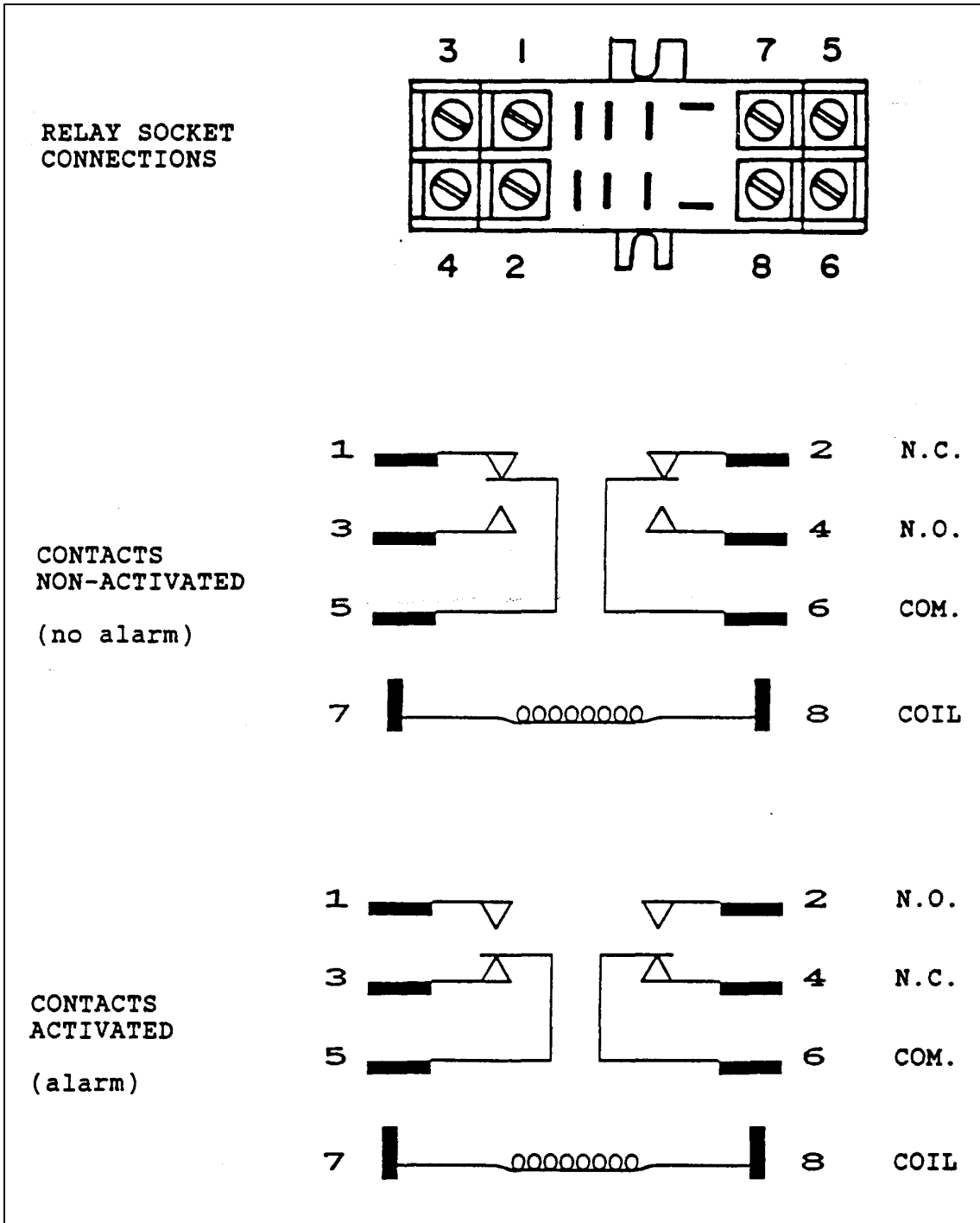


FIGURE 2.4 RELAY CONTACT ARRANGEMENT



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## 3 OPERATION AND CALIBRATION

### 3.1 OPERATION

#### NOTE

**BEFORE TUNING ON THE MAIN POWER TO THE MONITOR, MAKE SURE ALL CONNECTIONS ARE PROPERLY MADE.**

When power is applied, the green power LED will light. A one-minute time delay eliminates false alarms from occurring during the sensor's warm-up period. After this delay, the unit becomes fully operational. If time delays are required or the audio alarm indicator is not needed, the three-circuit miniature switch can be set accordingly (refer to Section 1.1, item 14 and Figure 1-1).

If any gas surrounding a sensor exceeds the low alarm trip point setting, the yellow LED and low alarm relay for that channel will be activated. Likewise, if any gas exceeds the high alarm trip point setting, the red LED, high alarm relay and buzzer will be activated.

### 3.2 CALIBRATION

The monitor can operate with remote sensor and/or transmitter assemblies, on-site adjustments for remote sensors are made at the monitor, and adjustments for transmitters are made at the transmitter locations.

The AMC-1022M series monitor is factory calibrated at levels based on set standards. Calibration of the monitor should be performed every 6 months, unless the alarm trip point settings need to be changed. Recalibration only necessary when either replacing a sensor or changing the alarm trip point settings.

#### NOTE

**BEFORE MAKING ANY CHANGES TO ALARM LEVEL SETTINGS WE RECOMMEND CONSULTING THE ARMSTRONG MONITORING CORPORATION FOR ADVICE ON SETTING THE PROPER TRIP POINT VOLTAGE FOR A SPECIFIC ALARM CHANGE.**

#### 3.2.1 APPLYING CALIBRATION GAS SAMPLE(S)

#### NOTE

**FOR THIS PROCEDURE, REFER TO CALIBRATION SECTION 3.2 IN THE REMOTE SENSOR AND/OR TRANSMITTER MANUAL(S)**

#### 3.2.2 ADJUSTMENTS

To observe immediate reaction during calibration, the low and high alarm time delays should be disabled. All calibration is made using the three trimmers along the top edge of each circuit board as shown in Figure 3-1.





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## NOTE

**THE FOLLOWING PROCEDURE IS FOR REMOTE SENSOR ONLY. IF A TRANSMITTER IS USED, REFER TO ADJUSTMENTS IN CALIBRATION SECTION 3.2 IN THE APPROPRIATE TRANSMITTER MANUAL.**

The low alarm adjust is used to establish the low alarm trip point. This is done by exposing the sensor being calibrated to the low alarm gas concentration and adjusting the LO trimmer clockwise until the yellow LED just lights.

The high alarm adjust is used to establish the high alarm trip point. This is done by exposing the sensor being calibrated to the high alarm gas concentration and adjusting the HI trimmer clockwise until the red LED just lights.

## NOTE

**IF A SENSOR HAS BEEN REPLACED, ADJUST THE SIGNAL FIRST AND THEN PROCEED WITH LOW ALARM AND HIGH ALARM ADJUST. SIGNAL CALIBRATION IS PERFORMED USING A DIGITAL MULTIMETER SET TO MEASURE DC VOLTAGES TO TWO (2) DECIMAL PLACES (E.G. 0.00 V).**

The signal adjust is used to set the sensitivity of a sensor. This is done by exposing the sensor to the low alarm concentration of gas. The voltage associated with signal can be measured at the test point immediately above and to the left of the SIG trimmer as shown in Figure 3-1. The voltage measured at the signal test point should be approximately 3.0 volts.



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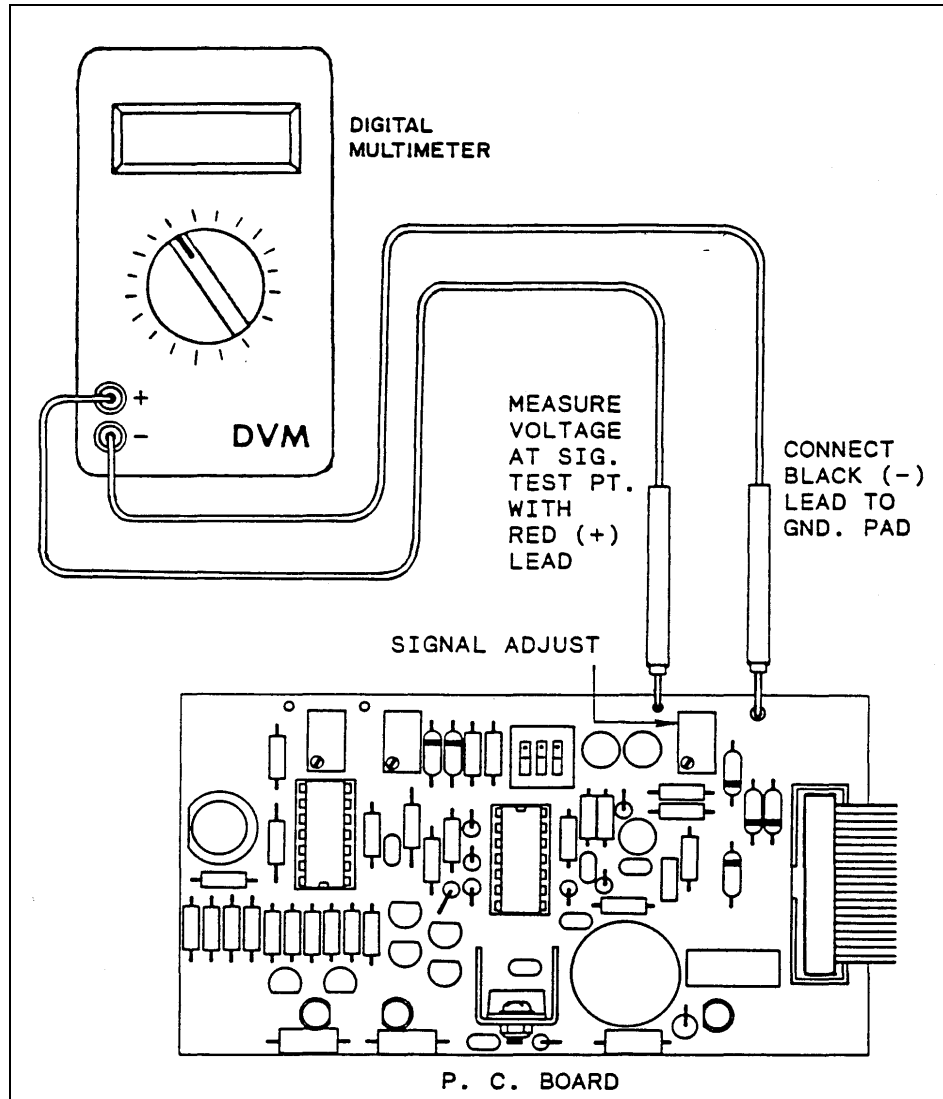


FIGURE 3.1 TRIMMER ADJUSTMENTS AND TEST POINT LOCATIONS.



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## 4 MAINTENANCE

### 4.1 GENERAL

The monitor should be wiped clean with a damp cloth following a regular maintenance program. Avoid spraying, submersion and other conditions that could cause a liquid to enter the monitor and cause possible intrinsic damage to internal components.

### 4.2 VERIFICATION OF OPERATION

To verify the operation of the monitor and sensor/transmitter units, make sure that they are responding to gas. This test should be performed regularly, every 3 months, but for more demanding applications, verification should be performed on a weekly basis.

### 4.3 SENSOR REPLACEMENT

#### CAUTION

**TURN OFF POWER SUPPLY BEFORE ATTEMPTING THE FOLLOWING.**

Refer to the remote sensor or transmitter manual (Section 4.3 and Figure 4-1) for information on sensor replacement procedure.

#### NOTE

**-FOR REMOTE SENSOR, ALLOW 24 HOURS FOR NEW SENSOR ELEMENT TO STABILIZE (BURN-IN) BEFORE RECALIBRATION, APPLY CALIBRATION GAS SAMPLE, THEN FOLLOW THE INSTRUCTIONS IN ADJUSTMENTS SECTION (3.2.2) OF THIS MANUAL.  
-FOR TRANSMITTER, REFER TO CALIBRATION SECTION (3.2) OF THE APPROPRIATE TRANSMITTER MANUAL.**