



# IM331

## Display & Relay Module

### INSTRUCTIONS

Installation, Operation & Maintenance  
of the AMC-IM331 Display & Relay Module

#### IMPORTANT:

**Please read these installation and operating instructions completely and carefully before starting.**

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## TABLE OF CONTENTS

Section Title	Page
<b>1 WARRANTY.....</b>	<b>3</b>
1.1 LIABILITY.....	3
1.2 MODIFICATIONS AND SUBSTITUTIONS.....	3
1.3 PRODUCT RETURN .....	3
<b>2 PRODUCT INFORMATION.....</b>	<b>4</b>
2.1 DISPLAY AND RELAY MODULE .....	4
2.2 FACTORY SETTINGS .....	4
<b>3 PRODUCT DESCRIPTION .....</b>	<b>5</b>
3.1 GENERAL DESCRIPTION.....	5
<b>4 INSTALLATION .....</b>	<b>6</b>
4.1 LOCATION AND MOUNTING.....	6
4.2 WIRING OF THE SYSTEM.....	7
<b>5 OPERATION AND CALIBRATION .....</b>	<b>9</b>
5.1 OPERATION .....	9
5.2 CALIBRATION .....	9
<b>6 PREVENTIVE MAINTENANCE.....</b>	<b>10</b>
6.1 GENERAL.....	10
6.2 VERIFICATION OF OPERATION .....	10



**NOTE**

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## 1 WARRANTY

The AMC-IM331 Display and Relay Module is warranted against defects in material and workmanship for a period of two (2) years from date of shipment. During the warranty period, The Armstrong Monitoring Corporation will repair or replace components that prove to be defective in the opinion of AMC. We are not liable for auxiliary interfaced equipment, or consequential damage. This warranty shall not apply to any product, which has been modified in any way, which has been repaired by any other party other than a qualified technician or authorized AMC representative, or when such failure is due to misuse or conditions of use.

### 1.1 LIABILITY

All AMC products must be installed and maintained according to instructions. Only qualified technicians should install and maintain the equipment. AMC shall have no liability arising from auxiliary interfaced equipment, for consequential damage, or the installation and operation of this equipment. AMC shall have no liability for labour or freight costs, or any other costs or charges in excess of the amount of the invoice for the products.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND SPECIFICALLY THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE THEREOF.

### 1.2 MODIFICATIONS AND SUBSTITUTIONS

Due to an ongoing development program, AMC reserves the right to substitute components and change specifications at any time without incurring any obligations.

### 1.3 PRODUCT RETURN

All products returned for warranty service will be by prepaid freight and they will only be accepted with a repair number issued by AMC. All products returned to the client will be freight collect.

## WARNING

<p><b>USING ELECTRICALLY OPERATED EQUIPMENT NEAR GASOLINE OR OTHER COMBUSTIBLE VAPOURS MAY RESULT IN FIRE OR EXPLOSION, CAUSING PERSONAL INJURY AND PROPERTY DAMAGE. CHECK TO ASSURE THE WORKING AREA IS FREE FROM SUCH HAZARDS DURING INSTALLATION OR WHEN PERFORMING MAINTENANCE, AND USE PROPER PRECAUTIONS.</b></p>
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## 2 PRODUCT INFORMATION

### 2.1 DISPLAY AND RELAY MODULE

Module Serial Number .....	_____
Power Supply Requirement .....	12 to 24 VDC
Power Supply Current (minimum) .....	For AMC-300 series transmitters: 600mA For AMC-200 series transmitters: 200mA
Operating Temperature .....	0 to +60 °C (+32 to +140 °F)
Relative Humidity .....	0 to 95 %, non-condensing
Display Type .....	3,1/2 digit LED display, 0.37" high
Alarm Indicators .....	LED's for Fail, Low alarm & High alarm
Input .....	4 to 20 mA DC
Output .....	4 to 20 mA DC into 250 Ohms
Relay Ratings (Fail, Low, High) .....	1.0A @ 30VDC

### 2.2 FACTORY SETTINGS

#### DISPLAY:

4 mA .....	_____
20 mA .....	_____
Low Alarm Trip Point (optional) .....	_____
High Alarm Trip Point (optional) .....	_____

#### RELAYS (optional):

#### Relay Coils

Low Alarm .....	<input type="checkbox"/> Normally Energized	<input type="checkbox"/> Normally Non-Energized	_____
High Alarm .....	<input type="checkbox"/> Normally Energized	<input type="checkbox"/> Normally Non-Energized	_____

#### Note:

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

### 3 PRODUCT DESCRIPTION

#### 3.1 GENERAL DESCRIPTION

The AMC-IM331 display and relay module is designed to accept 4-20 mA outputs from a variety of gas sensor/transmitters and offers local or remote concentration readout, alarm indication and contacts. It features a 3 -1/2 digit LED display for indicating gas concentrations and has relay outputs for fail, low and high alarms. There is also a non-isolated 4-20 mA repeater output, which matches the input signal. For 1 – 5 volts output, add a load resistor (250 ohms) as shown in Figure 1 (A load resistor is not required for AMC monitors). As a DIN rail mounted unit, this module can be combined with a wide assortment of monitoring instruments for local indication and alarm functions.

- 1) RELAY TERMINAL BLOCK: For connecting auxiliary equipment to the relay contacts.
- 2) DISPLAY: 3-1/2-digit display for gas concentration indication.
- 3) LED INDICATORS: LED indicators for power, fail, low and high alarm.
- 4) TRANSMITTER CONNECTION: For transmitter connection to module.
- 5) MONITOR CONNECTION: For connection to host monitor or power supply.

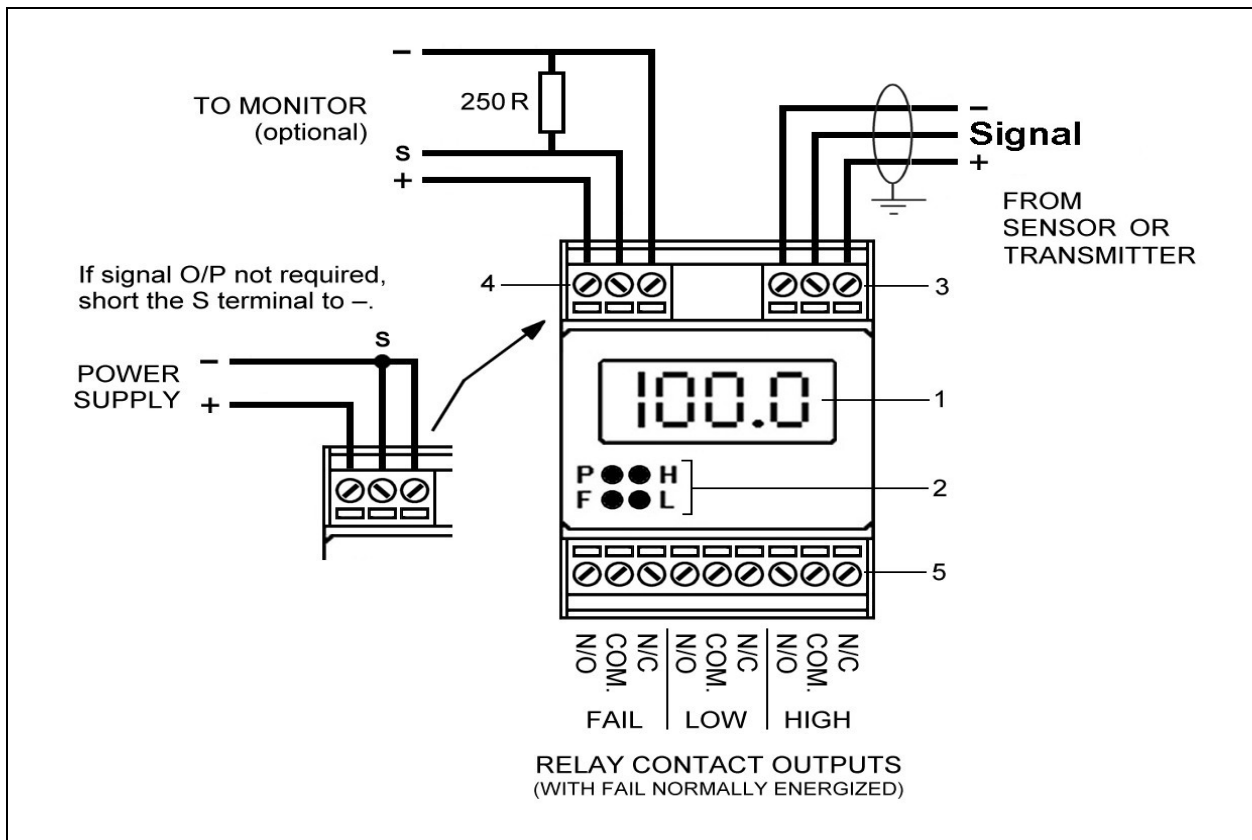


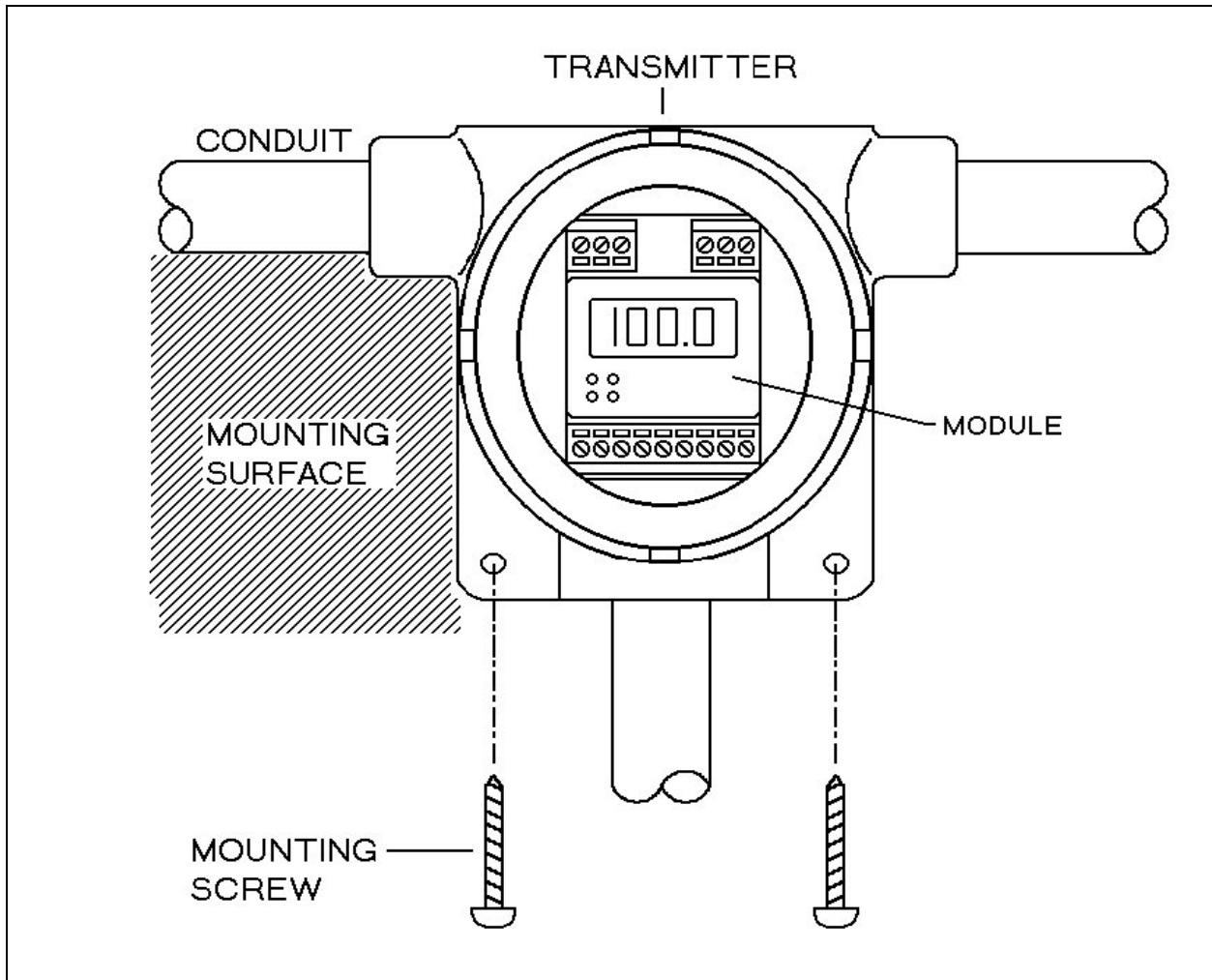
FIGURE 1: AMC-IM331 display and relay module (front view).

## 4 INSTALLATION

### 4.1 LOCATION AND MOUNTING

Care should be taken to securely fasten the AMC-IM331 display and relay module on a solid, non-vibrating surface or structure at eye level. Mount the module in an area where it can be observed periodically.

The module can be supplied in a NEMA-4X enclosure with transparent or windowed cover, in an explosion-proof housing rated for Class 1, Groups B, C, D (as shown in FIGURE 2), or can be simply snapped onto a DIN rail in an existing enclosure. To remove the module, a small flat screwdriver is required. Insert the tip of the screwdriver into the slot of the release tab, below the relay terminal blocks. Then, push the handle of the screwdriver towards the display and tilt the module in the same direction. This will pop the module off of the DIN rail.



**FIGURE 2: Mounting the explosion-proof housing with display/relay module.**



## 4.2 WIRING OF THE SYSTEM

Monitor/Power Supply Module: Connection to the host monitor/power supply is made at the MONITOR CONNECTION block (See FIGURES 1 & 3). All connections should be made using shielded two or three-conductor cable, depending if return signal wire is required. If an analog output is not required, connect the “S” terminal to the “-” terminal.

**NOTE: See FIGURE 4 for wire length and gauge depending on voltage of power supply used.**

Transmitter:  
2-Wire The two wire transmitter connects to the Transmitter Connector “Signal (S), +” (see FIGURES 1 & 3). All connections should be made with shielded 2-conductor cable. The shield is to be grounded at the module. (See FIGURE 4 to select appropriate cable gauge).

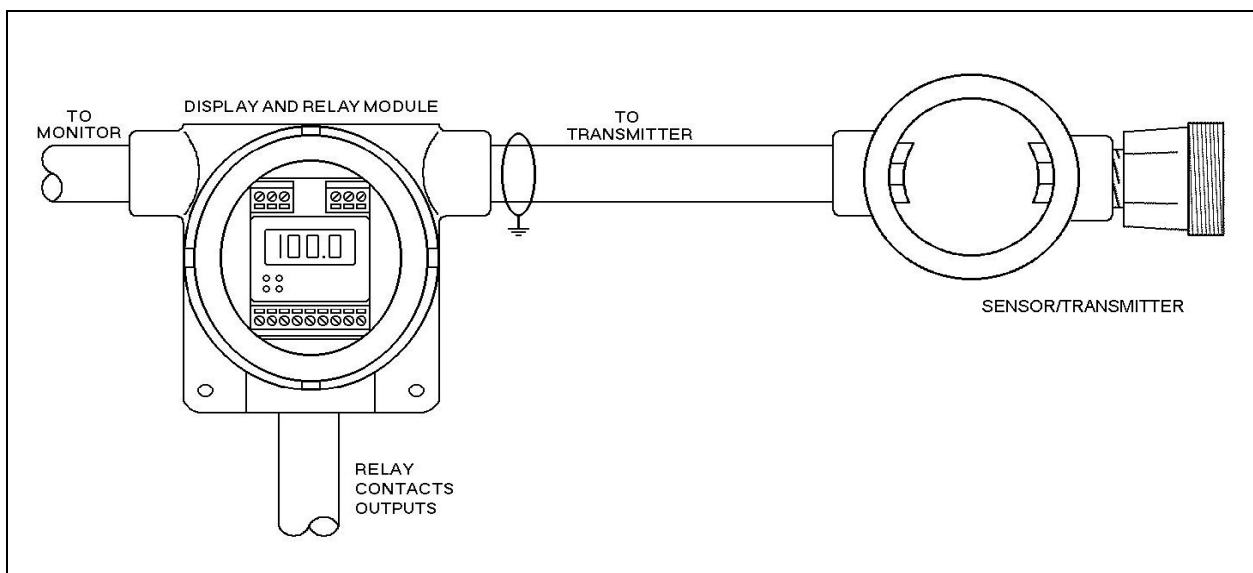
3-Wire The three wire transmitter connects to the Transmitter Connector “-, Signal (S), +” (see FIGURES 1 & 3). All connections should be made with shielded 3-conductor cable. The shield is to be grounded at the module. (See FIGURE 4 to select appropriate cable gauge).

Relays (optional): Three SPDT relays within the module are optionally available, which activate with fail, low and high alarm causing contact transfer. Auxiliary control devices may be connected to these contacts providing they do not exceed relay ratings.

Relays are rated: 0.5A @ 30 VDC

The relay set-up is located in section 2.2 for FACTORY SETTINGS on page 4. For relay contact arrangement (see FIGURE 1).

**NOTE: For Class I locations use appropriate conduit sealing fittings.**



**FIGURE 3: Transmitter to interface module-wiring layout.**

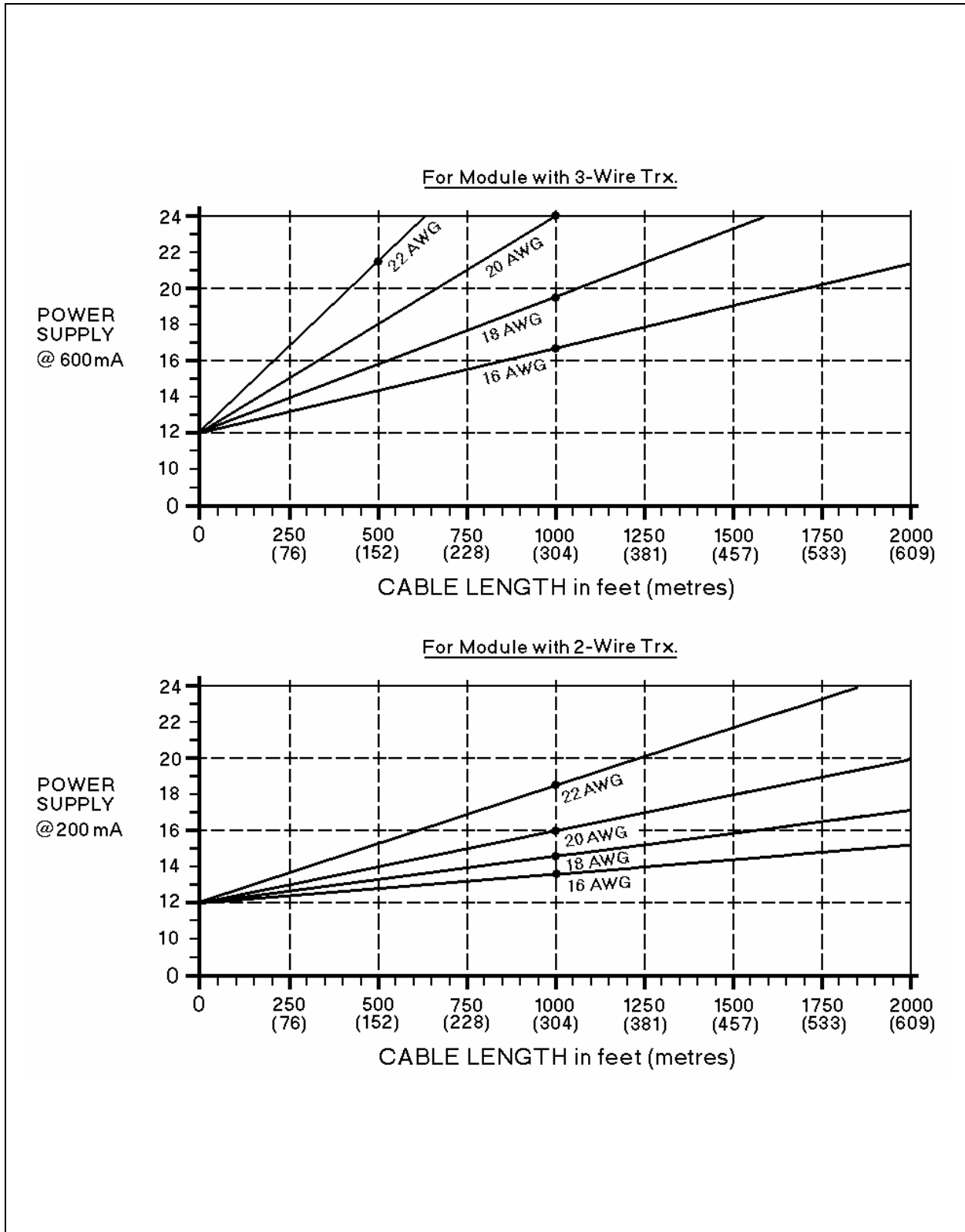


FIGURE 4: Cable selection graphs for power supply requirements.



## 5 OPERATION AND CALIBRATION

### 5.1 OPERATION

When power is applied, the green power LED will light and the display will register a value representing the gas concentration.

If a fail condition occurs on the connected transmitter the amber fail LED will activate and the display will read negative. The fail relay will change state.

If any gas surrounding the transmitter exceeds the low alarm trip point setting the yellow LED will activate and the low alarm relay will change state.

If any gas surrounding the transmitter exceeds the high alarm trip point setting the red LED and high alarm relay will activate or de-activate depending on specified set-up.

The display on the module reflects the gas concentration seen by the connected transmitter.

The signal current input from the transmitter is repeated and fed to the module's output terminals. A monitoring device with a maximum impedance of 250 ohms may be connected to this output circuit. If an analog output is not required, connect the "S" terminal to the "-" terminal.

### 5.2 CALIBRATION

The AMC-IM331 display and relay module is factory calibrated based on customer requests and/or standards. Calibration should last for the life of the module. Recalibration is only necessary when changing the trip points. See section 2.2 for FACTORY SETTINGS. To change the trip points, refer to the following figure for the location of the trim pots.

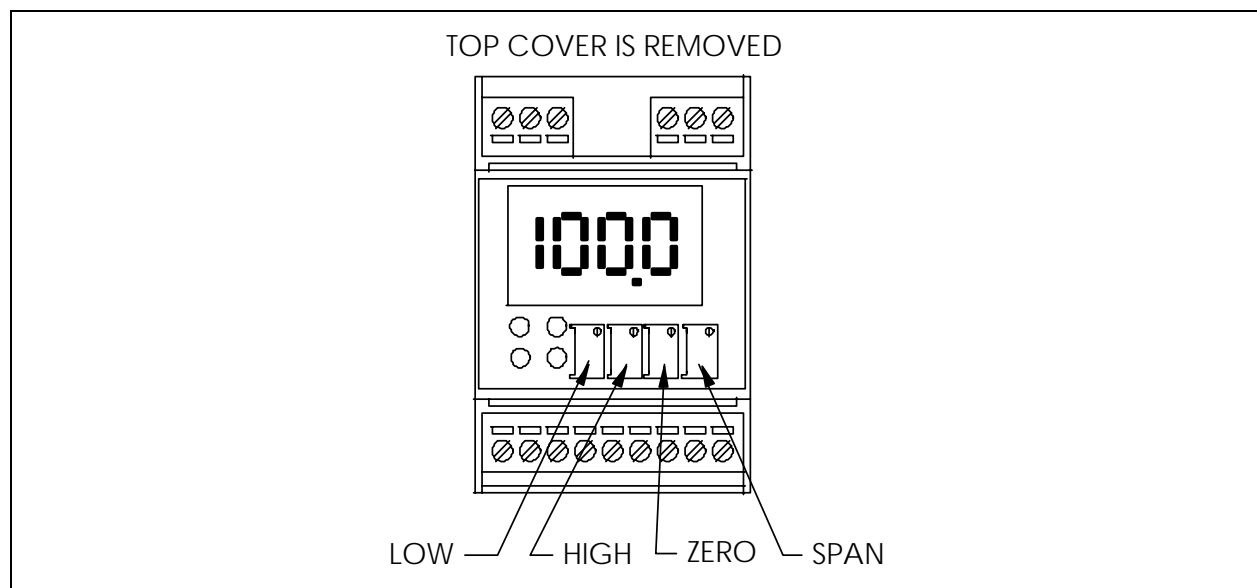


FIGURE 5: Trim pots locations.



## 6 PREVENTIVE MAINTENANCE

### 6.1 GENERAL

The module enclosure should be brushed or wiped clean once a year or more, of any dust or dirt which settles on it, depending on the accumulation.

The unit SHOULD NOT be submerged in water or other liquids. Also, hosing and other conditions that could cause a liquid to enter the enclosure should be avoided.

### 6.2 VERIFICATION OF OPERATION

To verify the operation of the system, make sure that each sensor and/or transmitter is still responding to gas and that the correct condition is shown on the display. This test should be performed every 2 months, but for more demanding applications, verification should be performed on a weekly basis.