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ENMET

Creative Gas Detection Solutions

AM-5175
Ambient Air Monitor
Operation & Maintenance Manual

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Reference Information:

NOTE: *[important information about use of instrument]*
CAUTION: *[affects equipment – if not followed may cause damage to instrument, sensor etc....]*
WARNING: *[affects personnel safety – if not followed may cause bodily injury or death.]*

Earth Ground

1.0 Introduction

The **AM-5175** is an ambient air monitoring instrument that measures and detects gases utilizing electrochemical sensor. The **AM-5175** is *NOT* in an enclosure rated for use in a Class I, Div. 1, Groups B, C, D classified area and ***cannot*** be installed in a hazardous location.

Features of the **AM-5175:**
- continuous monitoring of the ambient air
- continuous LCD display of gas and vapor concentrations
- menu driven operational and maintenance controls
- menu driven calibration procedure
- audio and visual alarms indicate unsafe conditions
- alarm relay contacts available on terminals
- a fault relay and visual fault alarm
- alarm acknowledgement capability including audio defeat
- mA outputs for target gas

NOTE: *All specifications stated in this manual may change without notice.*

1.1 Unpack

Unpack the **AM-5175** and examine it for shipping damage. If such damage is observed, notify both *ENMET* customer service personnel and the commercial carrier involved immediately.

Regarding Damaged Shipments

NOTE: *It is your responsibility to follow these instructions. If they are not followed, the carrier will not honor any claims for damage.*

- This shipment was carefully inspected, verified and properly packaged at *ENMET* and delivered to the carrier in good condition.
- When it was picked up by the carrier at *ENMET*, it legally became your company's property.
- If your shipment arrives damaged:
  - Keep the items, packing material, and carton "As Is." Within 5 days of receipt, notify the carrier's local office and request immediate inspection of the carton and the contents.
  - After the inspection and after you have received written acknowledgment of the damage from the carrier, contact *ENMET* Customer Service for return authorization and further instructions. Please have your Purchase Order and Sales Order numbers available.
- *ENMET* either repairs or replaces damaged equipment and invoices the carrier to the extent of the liability coverage, usually $100.00. Repair or replacement charges above that value are your company's responsibility.
- The shipping company may offer optional insurance coverage. *ENMET* only insures shipments with the shipping company when asked to do so in writing by our customer. If you need your shipments insured, please forward a written request to *ENMET* Customer Service.

Regarding Shortages

If there are any shortages or questions regarding this shipment, please notify *ENMET* Customer Service within 5 days of receipt at the following address:

ENMET
680 Fairfield Court
Ann Arbor, MI 48108
734-761-1270 Fax 734-761-3220
Toll Free: 800-521-2978

1.2 Check Order

Check, the contents of the shipment against the purchase order. Verify that the **AM-5175** is received as ordered. Each **AM-5175** is labeled with its target gas. If there are accessories on the order, ascertain that they are present. Check the contents of calibration kits. Notify *ENMET* customer service personnel of any discrepancy immediately.

1.3 Serial Numbers

Each **AM-5175** is serialized. These numbers are on tags on the equipment and are on record in an *ENMET* database.

2.0 Components of the AM-5175

2.1 AM-5175 elements
See Figure 1 for location of elements:

Feature	Description
Enclosure	A polycarbonate box, approximately 7 x 5 x 3, with a detachable front cover. 4 holes for mounting the enclosure to a vertical surface. Located at the corners of the bottom of the enclosure, directly beneath the 4-front cover retaining screws. See **Figure 3**
Front Cover	Detachable front cover of **AM-5175** with Display Panel. See **Section 2.2 and Figure 1** There are 4 Screws that hold the front cover in place.

2.2 AM-5175 Operational Features
The Display Panel is attached by a cable and is released by unscrewing the 4 screws located in the corners. After releasing the panel, it is swung upward, exposing the interior of the enclosure. See **Figure 1** for location of features.

Feature	Description
Display	A single line, 8-character LCD with backlight. Indicates the level of gas detected by sensor. The numerical value of gas concentration and other information is displayed.
Audio Alarm(Horn)	Audio alarm (105 dB at 30cm/12in). The audio alarm is activated when the unit is in alarm.

Visual:
Indicators and Alarms
	LED indicators:
	   Power / Fault Indicator LED, Green / Red
	   Alarm (3) Indicator LED, Red

Membrane Switches	2 Pushbutton Switches on front panel control the instrument maintenance functions. The pushbutton switch locations are indicated by: Advances the instrument display through operation information and maintenance menus **SELECT**☐ Disables audio alarm temporally and Selects the maintenance menu operations such as, Zero, Span, Exit menu or sets proper calibration values for Zero or Span See **Section 4.0 and 5.0** for operational and maintenance flow charts.

Three alarm points are preprogrammed into the **AM-5175**. At each alarm point, an LED on the front panel is activated. There are 4, 10 Amp relay contacts at each alarm point, plus a fault relay. See Section 3.2 for wiring information.
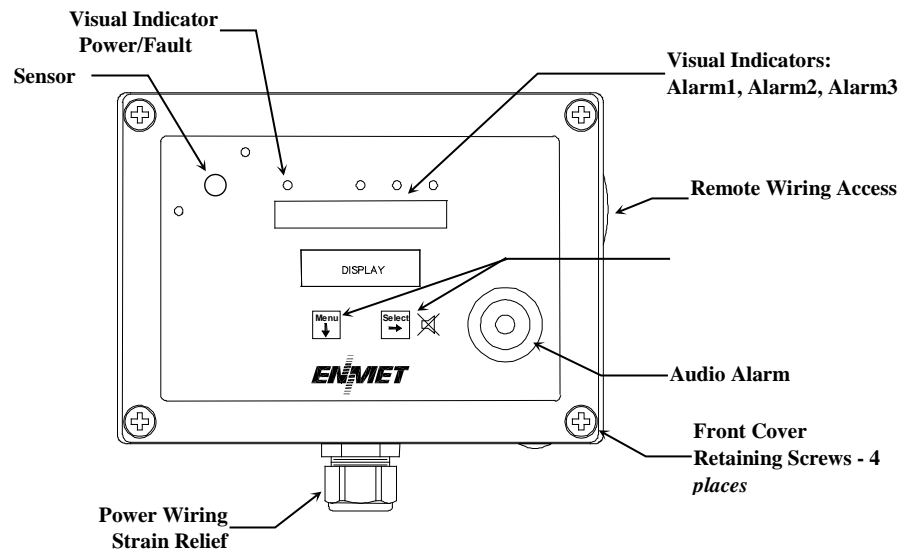
Figure 1: External AM-5175 Feature

2.3 Circuit Board Features

The Display Panel is attached by a cable and is released by unscrewing the 4 screws located in the corners. After releasing the panel, it is swung upward, exposing the interior of the enclosure. The Circuit Board is mounted at the back surface of the enclosure interior. Features are shown in **Figure 2**.

Feature	Description
Relay Terminals: **J14, J15, J16, J17**	This group of terminals is located on the Circuit Board. For the contacts for each of three alarm relays, and for the contacts of a fault relay. See **Section 3.3**
Terminal J12	For VDC back-up power in and the 4-20 mA output. See Section 3.1.2
Sensor Terminal J8	Sensor connection, See Section 3.2
Data Terminal J19	RS-485 input/output
Potentiometer 2, 3 & 4	Not used in **AM-5175** Do Not Adjust
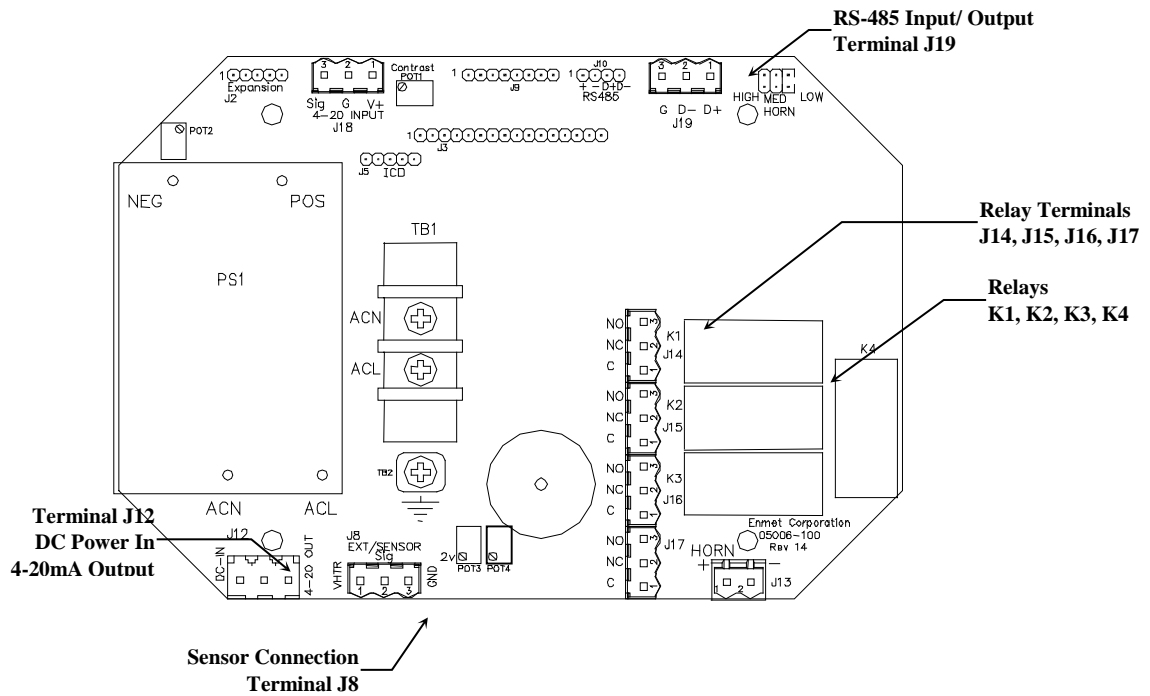
Figure 2: AM-5175 Circuit Board Features

3.0 Installation of the AM-5175

The **AM-5175** is supplied with a strain relief and a standard U.S. 3 prong power line cord.

NOTE: This control panel is *NOT* rated for hazardous locations. The control panel must be located in a *Non*-Hazardous area.

3.1 Mounting AM-5175

Mount the **AM-5175** instrument on an appropriate vertical surface, leaving room for lid to be opened, using the mounting holes provided. Avoid areas with excessive vibration or temperature extremes. The holes in the bottom of the enclosure are 0.18 inch in diameter and form a 6.44☐x 4.47☐rectangle. **See Figure 3**

It is recommended to use #8 drywall anchors and screws for mounting the **AM-5175** to a drywall/sheetrock surface.

Access for Sensor / Remote Sensor Wiring

Right Side
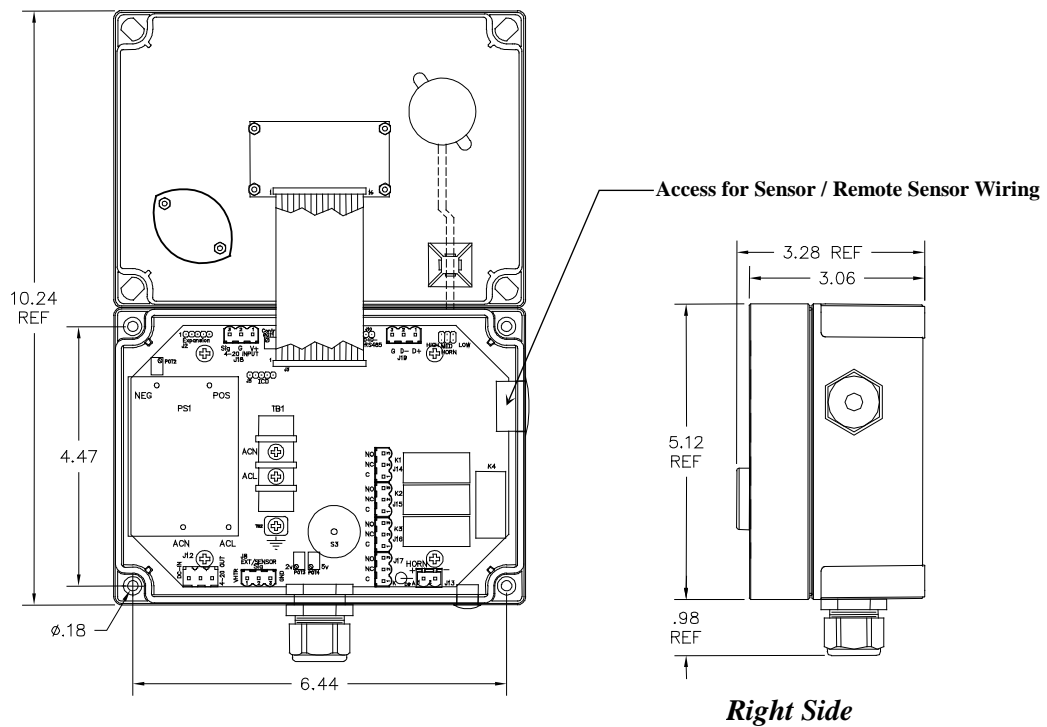
Dimensions are in inches.

Figure 3: Mounting AM-5175

3.1.1 Wiring the AM-5175
The electrical installation should conform to appropriate electrical codes, such as the National Electrical Code in the United States.

WARNING: *The compliance of the installation to appropriate codes is not ENMET's responsibility.*

The **AM-5175** should be powered through circuit breakers provided for this purpose.

3.1.2 Power Supply
The input power can vary from 100 to 240 VAC, 50/60 Hz. Power should be connected to the Power Input Terminal **TB1** and the *Ground screw*. See **Figure 4** for location. Instrument is supplied with a strain relief and a standard U.S. 3 prong power line cord.

For DC wiring 24VDC may be wired to J12, (J12-1) position 1 + with ground connected to (J12-2) position 2.
Upon supplying power to the **AM-5175**:
- The green power on LED is lit.
- The display backlight is lit, and instrument will step through a start-up sequence: unit serial number and software revision may be shown on the display.

The instrument may go into alarm briefly, but the sensors stabilize quickly. If the instrument persists in alarm, acknowledge the alarm by pressing the **SELECT** button. If alarm persists longer than 30 minutes, call *ENMET* customer service personnel.

WARNING: *Continuous gas detection and alarm systems (110VAC/220VAC / 24VDC/12VDC powered) become inoperative upon loss of primary power. Contact factory for specifications and pricing of backup battery systems.*

AC Power Supply Terminal: TB1

	Label on PCB	Function
110VAC	TB1 ACN	Neutral
	TB1 ACL	Line
Ground Screw	⏚	AC GND
220VAC	TB1 ACN	Neutral
Optional	TB1 ACL	Line
Ground Screw	⏚	AC GND

CAUTION: 110/220 VAC when applied

DC Power Supply/4-20mA Terminal: J12

Position	Function
1 +	24 VDC power
2	GND
3	4 - 20 mA out

Sensor Terminal: J8

Position	Function	Color
1 +	Sensor	Red
2	Sensor Signal	White
3	Sensor Ground	Black

Cover Inside View
Opened Upward

Caution: *110/220 Vac when applied*

Figure 4: Power Terminal Connections AM-5175

3.3 Relay Contacts

Relay contacts are available for each alarm; these are SPDT, rated at 10Amp at 110VAC, and may be latching or non-latching as required by the application.
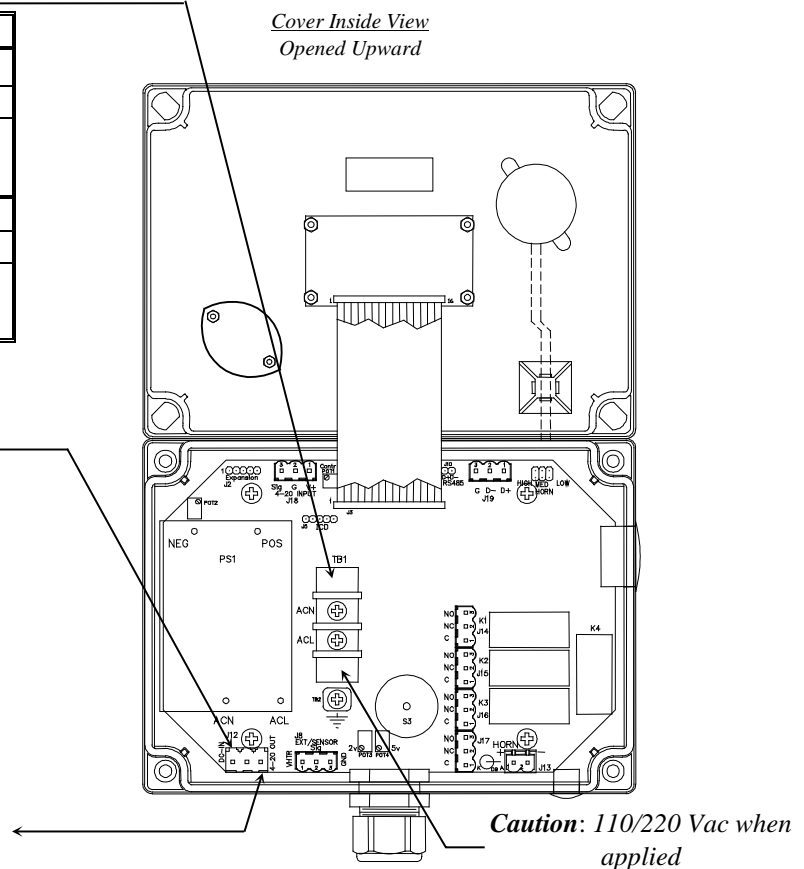
They are accessed on the terminals next to each relay see **Figure 5**. The contact positions are noted on the circuit board next to each terminal.

The following table is for the relays in their un-energized state. This is also the alarm condition state. Non-failsafe configured relays in the alarm state, are the reverse of the PC board labeling. Note that the Fault(FLT) relay cannot be set to operate in a Non-Failsafe mode. Please see **Table 1** below:

Table 1: Relay Failsafe Settings

Alarm	Position	
Alarm 1	J14 (K1) Relay 1 - NO	Normally Open
	J14 (K1) Relay 1 - NC	Normally Closed
	J14 (K1) Relay 1 - COM	Common
Alarm 2	J15 (K2) Relay 2 - NO	Normally Open
	J15 (K2) Relay 2 - NC	Normally Closed
	J15 (K2) Relay 2 - COM	Common
Alarm 3	J16 (K3) Relay 3 - NO	Normally Open
	J16 (K3) Relay 3 - NC	Normally Closed
	J16 (K3) Relay 3 - COM	Common
Fault Alarm	J17 (K4) Relay 4 - NO	Normally Open
	J17 (K4) Relay 4 - NC	Normally Closed
	J17 (K4) Relay 4 - COM	Common

These relay contacts can be used to operate auxiliary alarms or other functions. The relay contacts are DRY, power must be supplied. It is recommended that power for auxiliary equipment be supplied from an independent power source separate from the **AM-5175**. Use the existing hole in the enclosure for wire to enter and exit and use appropriate cable fittings. Wiring should be grouped together, VAC wires should be separated for VDC wires.
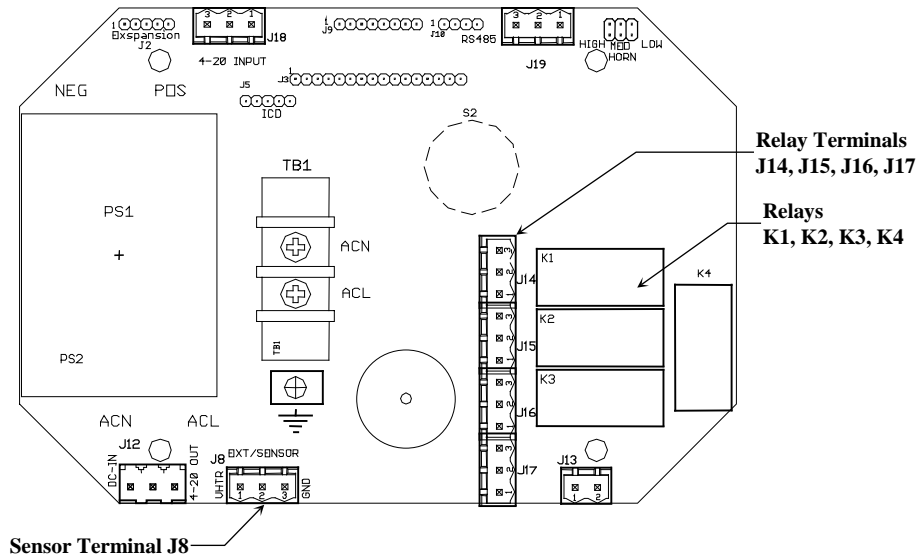

Figure 5: Relay Terminal Connections AM-5175

4.0 Operation

When the **AM-5175** is installed as described in **Section 3**, and in clean air, the POWER green LED is on, the display is lit and the information on the display is measurement of the target detected by the **AM-5175**. The red alarm and fault LEDs are not lit.

4.1 Start Up AM-5175

When the **AM-5175** is first powered up, it goes through a series of momentary screens, which identify the instrument model number, serial number and software revision. After all of the momentary screens have been displayed, the instrument arrives at the Main Gas Display showing the gas concentration and unit of measurement.

Depending on transmitter configuration and calibration condition, the furthest right character in the display may flash a letter indicating the instrument status. See the Section 4.1.1 below

4.1.1 Typical Start Up

When power is supplied to the **AM-5175,** the instrument will display the following sequence of information:
Typical start up sequence of information displayed.

Example of Typical Start Up Display	Function
AM-5175	The instrument: Model **AM-5175**
Example for reference only 312-1256	The instrument: Serial Number
Example for reference only S/W X.X	The instrument: Software Revision
IF the right most character is a flashing **W** 0ppW OR 20.9W	The instrument is in Warm-up mode This should last about 1 minute The Signal Output is held at 4mA during warm-up
IF the right most character is a flashing **C** 0ppC OR 20.9C	The instrument has failed Calibration The last good calibration values are retained, but the sensor may not be responsive to gas A new Calibration should be performed *As Soon As Possible*
0ppm OR 20.9%	The instrument: Normal Display Mode Measurement of the target gas

**NOTE:** *Software revision may cause variations of display output.*

4.2 Normal Display Mode

When the **AM-5175** is installed as described in section 3, and in clean air, the POWER green LED is on, the display is lit and the information on the display in measurement units of ppm detected by the **AM-5175**. The red alarm and fault LEDs are not lit.
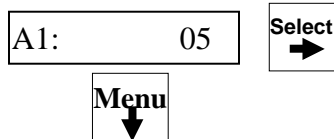To advance through displays of operational information press the **MENU** button.
NOTE: Software revision may cause variations of display output.

See sequence of operational information below:

Display Measurement of the target gas
Press **MENU** button

                        0ppm   Select ➡
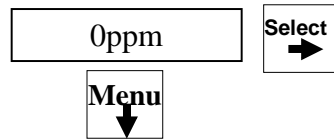
                        Menu ↓

Display indicates Alarm 1 Set point
Press **MENU** button

                        A1:   05   Select ➡

                        Menu ↓

Display indicates Alarm 2 Set point
Press **MENU** button

                        A2:   10   Select ➡
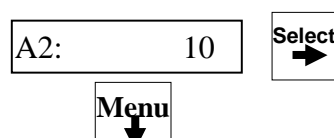
                        Menu ↓

Display indicates Alarm 3 Set point
Press **MENU** button

                        A3:   20   Select ➡
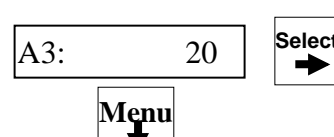
                        Menu ↓

Display indicates mA Span range
(Full Scale)
Press **MENU** button

                        mA: 50   Select ➡

                        Menu ↓
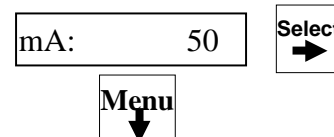
Display returns to gas measurent

Press **SELECT** button
To temporally disable
audio alarm, see
Section 4.2.1

Operational Display Flow Chart

4.2.1 Alarm Conditions AM-5175

There are three alarm set points available. These alarm points are normally set at established safety levels, such as the OSHA Permissible Exposure Limit (PEL) for toxic gases.

The alarm set points can be changed within limits; see the maintenance section of this manual for the procedure.
If the gas concentration increases above that of the alarm set point, the associated red LED is lit, the associated relay changes state, and the audio alarm is activated.

Pressing the **SELECT** button can temporally disable the Audio Alarm. The horn will be disabled for about five minutes. If a second alarm condition occurs during this time the horn will re-activate. If the alarm condition(s) have ended during this time the horn will not re-activate.

5.0 Maintenance

The **AM-5175** maintenance menus are accessed by pressing the **MENU** button and **SELECT** button as described in the maintenance menu section.

5.1 Maintenance Menus

CAUTION: Do Not Attempt a Span Procedure Without Calibration Gas Applied to The Sensor; if this is done, the instrument is forced into a calibration fault mode.
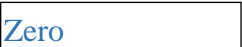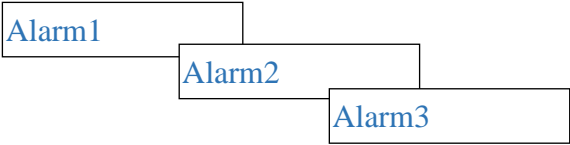
Pushbutton switches control the **MENU** and **SELECT** functions. The **MENU** and **SELECT** button locations are indicated on the display panel, see **Figure 1.** The **MENU** button is used to display the various menu options and make incremental changes to numbers such as alarm points, calibrations gas, etc. The **SELECT** button is used to select that option, set zero or span digit.

To enter the maintenance menu, press and *hold* the **MENU** button for 2 to 4 seconds
Table 2 indicates the maintenance menu sequence see **Figure 6** for a detailed maintenance menu flow chart.

NOTE: *Software revision may cause variations of display output.*

Table 2: AM-5175 Maintenance Menus Sequence

Example of Display	Function
5ppm Normal Display Mode	Measurement of CO
Press and *hold* the **MENU** button for 2 – 4 seconds to enter the Maintenance Menu	
The Power/Fault LED will flash Green – Red to indicate the **AM-5175** is in Maintenance Mode	
Exit	To exit the maintenance Menu and return to the Normal Display Mode: If intended function Press **SELECT** button
Press the **MENU** button to advance to the Zero procedure ***Not Present for Oxygen Units***	
Zero	For adjusting Zero: If intended function Press **SELECT** button
Press the **MENU** button to advance to the Span procedure	
Span	For adjusting the Span: If intended function Press **SELECT** button
Press the **MENU** button to advance to each Alarm set point procedures	
Alarm1 Alarm2 Alarm3	For adjusting the Alarm 1, 2 and 3 set points: If Intended Function, Press **SELECT** button.
Press the **MENU** button to advance the mA Span set point procedure	
mA Span	For adjusting the mA Span set point: If intended function Press **SELECT** button

Pressing the **MENU** button without pressing the **SELECT** button will allow you to cycle through the menu options.
You must Press the **SELECT** button to initiate the desired operation.

NOTE: *Software revision may cause variations of display output.*

5ppm	*Normal Gas Display*
Menu ↓	Press and **Hold** the **Menu** button for 2 – 4 seconds to enter the Maintenance Menus

Exit	**Select** →	Press the **Select** button to return to the Normal Gas Display. ***See Section 5.2.1***
Menu ↓		Press the **Menu** button to cycle through Maintenance Menus

Zero | **Select** → | PV: 0 | **Select** → | Press the **Select** button to initiate Zero adjustment

Not Present for Oxygen Units

Menu ↓   OR

Cal OK — **If** the Zero signal is within Preset Specs the AM-5175 will display Cal OK, ***See Section 5.2.2***

Bad ZERO — **If** the Zero signal is not within Preset Specs the AM-5175 will display Bad ZERO

Span | **Select** → | PV: 0 | **Select** → | You can Press and **Hold** the **Select** button to change the Calibration Gas Level ***See Section 5.2.3***

20

Menu ↓

Select →

Cal OK

OR

Same mV

OR

Bad Sens

Apply Cal Gas until signal value becomes stable (about 1 to 4 minutes) See Figure 6

Press **Select** to enter the cal signal:
   If cal is good display will indicate OK or Same
   If cal is not within preset "range" display will indicate Bad Sens

Alarm1 | **SELECT** | Λ 5

MENU | SetTDsec

0

Alarm2 | **SELECT** | Λ 10

MENU | SetTDsec

0

Alarm3 | **SELECT** | Λ 20

MENU | SetTDsec

0

To change Alarm set points:
Press Menu switch until Alarm to be changed is displayed
Press Select switch to display the set point
   The **MENU** switch: changes digit indicated by underscore cursor
   The **SELECT** switch: locks in the underscored digit and moves to next digit
If change is not within range display returns to first digit
If change is within range display moves to Set Time Delay

Use **MENU** and **SELECT** switches as above to change time delay. Between 0 and 5 seconds is allowed

If change is within range display moves to next menu
See Section 5.2.4
Λ - Indicates increasing alarm
V - Indicates decreasing alarm

mA Span | **Select** → | 50

Menu ↓

To change mA Span set point:
Press Menu button until mA Span is displayed
Press Select button to display the set point
   The **Menu** button changes digit indicated by underscore cursor
   The **Select** button locks underscored digit and moves to next digit
See Section 5.2.5

To return to Normal Gas Display:
Press **MENU** button until EXIT is displayed
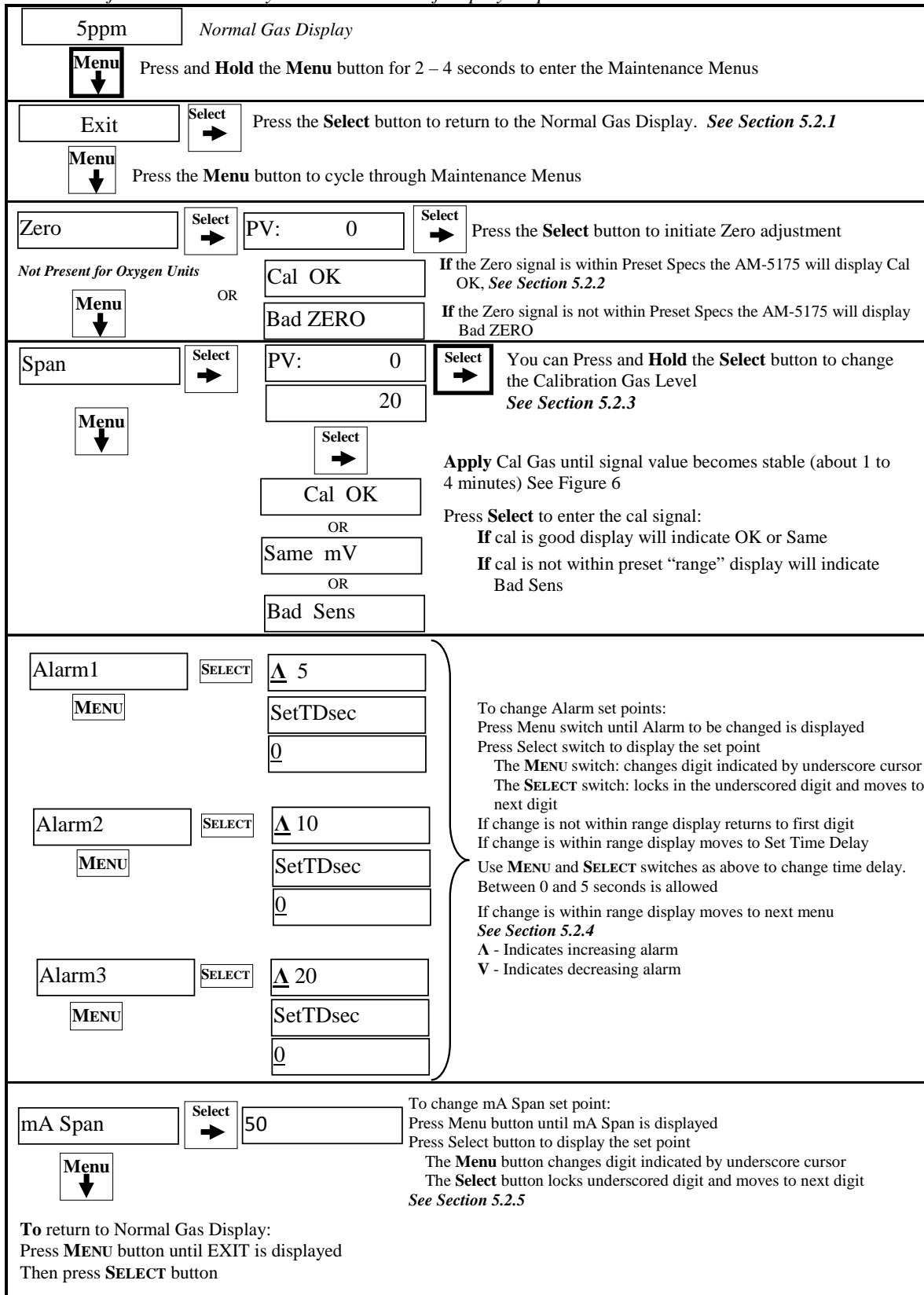Then press **SELECT** button

Figure 6: AM-5175 Maintenance Menu Flow Chart

5.2 Calibration of the AM-5175

Calibration is the process of setting the instrument up to read accurately when exposed to the target gas. The Zero function sets the clean air reference point and the Span function sets the sensitivity of the instrument.

Initial Calibration: Wait at least 3 – 4 hours after initially supplying power to the **AM-5175** instrument before initial calibration, overnight is preferred. The **AM-5175** has been pre-calibrated at the factory, and initial field calibration should result in only fine-tuning to circuit, as well to check that installation is successful. It is not necessary to open the enclosure to make adjustment. The calibration functions are operated with pushbuttons from outside the enclosure through the **MENU** and **SELECT** switches.

Calibration Zero and Span functions are two separate procedures. They operate independently of each other. It is recommended that the Zero procedure be done prior to the Span procedure.
*ENMET recommends at least quarterly calibration of the* **AM-5175** *instrument*.

Calibration equipment is available from *ENMET* to calibrate the **AM-5175** instrument.
- Calibration adapter, a length of tubing with a regulator for the gas cylinder on one end, and a calibration cup to connect to the sensor of the **AM-5175** on the other.
- Gas cylinder, zero gas 20.9% oxygen or Span gas, factory determined, varies by intent.
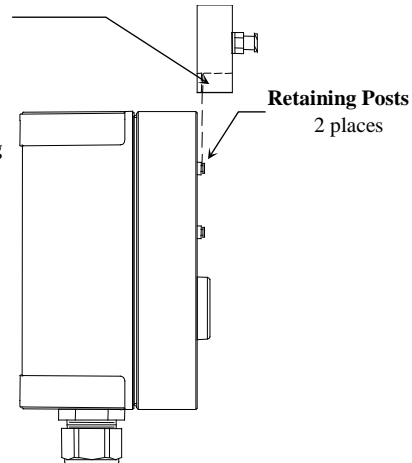
Generally, a cylinder of 20.9% Oxygen is used to provide a Zero point or fresh air reference for the calibration.

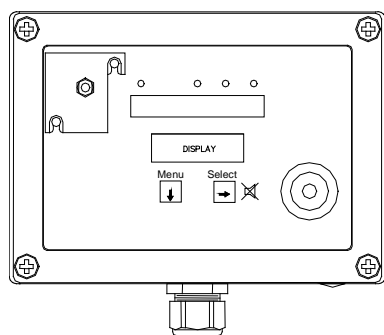NOTE: Software revision may cause variations of display output.
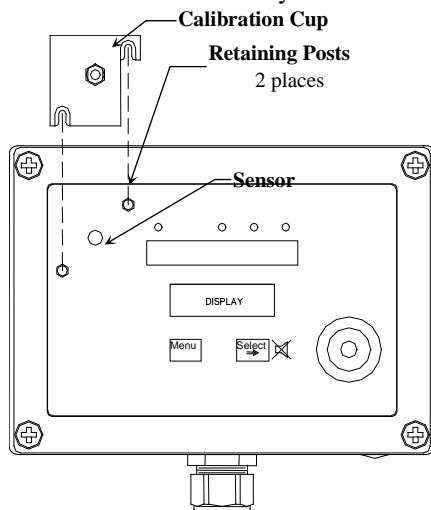
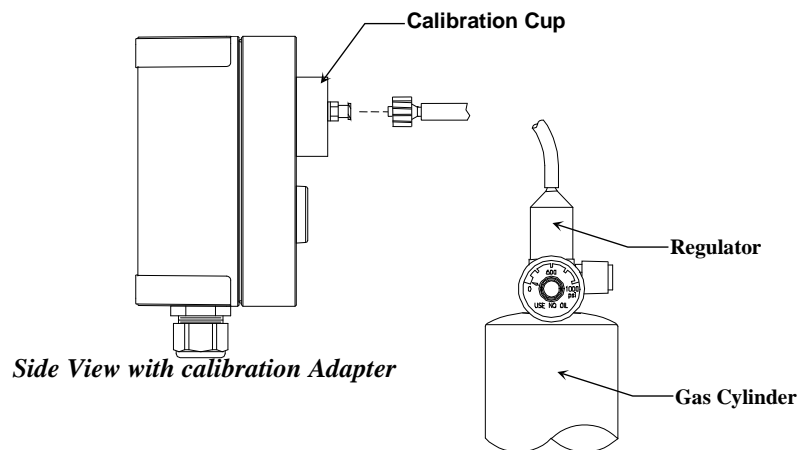*Front View, Attaching Calibration Cup*

Side View, Attaching Calibration Cup

*Front View with Cal Cup attached*

Side View with calibration Adapter

Figure 7: Calibration Adapter

5.2.1 Exit Maintenance Menu

Exit maintenance, by pressing the Exit appears on the display. Press the **SELECT** button to return to the instrument Normal Gas Display.

Example of Exit menu:

Exit   **Select** ➡   Press the **Select** button to return to the Normal Gas Display.

Menu ⬇   Press the **Menu** button to cycle through Maintenance Menus
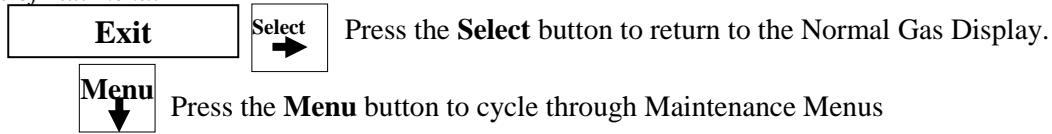
5.2.2 Zero Adjust   *Not Present for Oxygen Instruments*

The ZERO function must be performed by exposing the **AM-5175** instrument to clean fresh air. If the air at the sensor is in question, use a cylinder of 20.9% oxygen to provide a clean air reference.

Enter the maintenance menu by pressing and holding **MENU** button for 2 to 4 seconds. See **Figure 6, AM-5175** Maintenance Menu flow chart.

After entering the maintenance menu, Press the **MENU** button until the Zero menu is displayed.
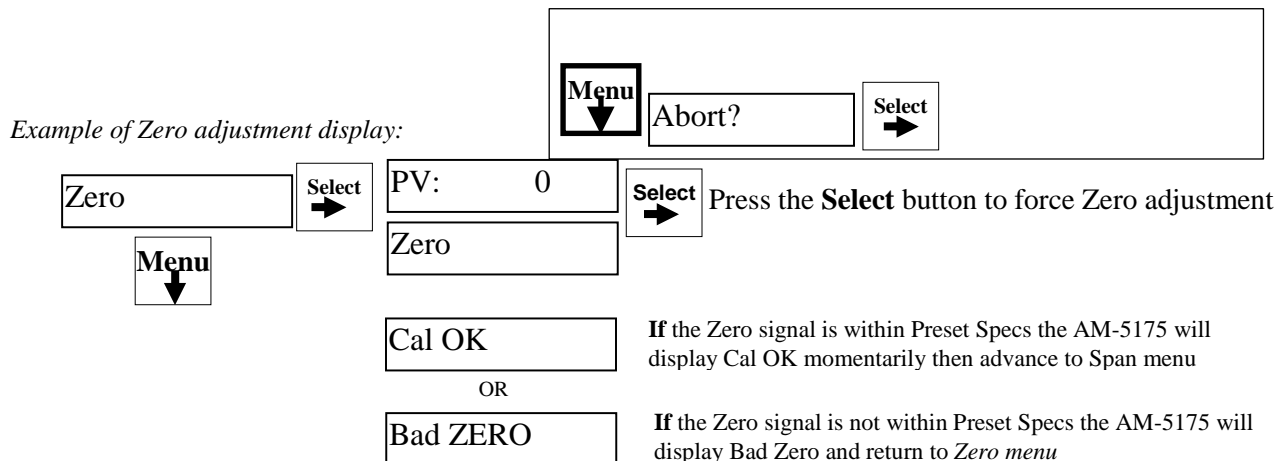Press the **SELECT** button to perform a Zero.

The display will alternate between Zero and PV: To abort Zero function press and hold **MENU** button for 3 – 4 seconds, Abort? will appear, press **SELECT** button to return to Zero.

Press the **SELECT** button to initiate a Zero adjustment.

An auto detect sequence is initiated. After 15 seconds, the **AM-5175** will monitor the zero reading for stability.
- ▪ *If the reading stabilizes*, within the pre-programmed perimeters, an automatic zero adjustment will be made.
  Cal OK appears on the display and in 1 – 2 seconds, display will change to Span.
  If you wish to Span the sensor press the **SELECT** button you are now ready to apply gas. **Proceed to gas span step 2**
  If you wish to Exit the maintenance menu, press **MENU** button until Exit is displayed, then press **SELECT** button to return to the instrument Normal Gas Display
- ▪ *If the reading does not stabilize,* within 255 seconds, the procedure will be aborted. Sensor is outside of safe parameters to be zeroed, the display will read Bad Zero. Repeat Section 5.2.2 Zero Adjust making sure to use a Zero gas of 20.9% Oxygen. *ENMET* part number 03296-209.

NOTE: *Zero adjust is Not Present for Oxygen Instruments*

Example of Zero adjustment display:

Menu ⬇ | Abort? | **Select** ➡

Zero | **Select** ➡ | PV: 0 | **Select** ➡ Press the **Select** button to force Zero adjustment

Menu ⬇ | Zero

Cal OK   **If** the Zero signal is within Preset Specs the AM-5175 will display Cal OK momentarily then advance to Span menu

OR

Bad ZERO   **If** the Zero signal is not within Preset Specs the AM-5175 will display Bad Zero and return to *Zero menu*

NOTE: *Software revision may cause variations of display output.*

5.2.3 Gas Span

It is recommended that the Zero Function be performed first.

Do not perform a calibration unless span gas is applied to sensor. Calibration can be aborted by pressing and holding the **MENU** button for 3 – 4 seconds.

Enter the maintenance menu. See **Figure 6, AM-5175** Maintenance Menu flow chart.

1. Press the **MENU** button until Span display.
2. Press the **SELECT** button to perform a Span procedure.
   The display will alternate between the calibration gas concentration (*Example*: Cal 20) and a signal level (PV).
   ▪ To Abort calibration press and Hold **MENU** button for 3 – 4 seconds, "Abort?" will appear, press **SELECT** button to return to Span.

Note: *To abort calibration. Press and Hold the Menu button to abort Calibration*
Menu ↓ *When "Abort?" appears, press Select button to advance to desired menu*

Abort? | **Select** →

   ▪ To change calibration gas level to be used, press and Hold **SELECT** button for 3 – 4 seconds, use menu button to

Note: *To change calibration gas level. Press and Hold the Select button to change the Calibration Gas Level*
Select →   *-Use the Menu button to change digits*
              -Use the Select button to move to next digit | 20

   change digit and select button to move to next digit.
3. Attach the associated calibration gas cylinder to the calibration adapter. See **Figure 7** calibration adapter.
4. Open the valve to apply the calibration gas to the sensor.
   An auto detect sequence is initiated after 30 seconds, the **AM-5175** will monitor the cal reading for stability.
5. Watch for the signal level to stabilize. This should take about 1 – 4 minutes.
6. Once the signal level has stabilized,
   ▪ If the Span is successful, Cal OK appears momentarily, then will advance to Alarm1 menu.
     To exit cal, press **MENU** button until Exit appears and press **SELECT** button
   ▪ If the sensor is outside of acceptable parameters, Bad Span is displayed.
   ▪ If the sensor did not respond, an incompatible span gas was applied and the sensor did not respond at all, Same mV is displayed then will return to Span.
   → If calibration is not successful, it is suggested that calibration be attempted again in 30-60 minutes.
     If the sensor will not calibrate *See Section 5.3* for sensor replacement.
7. Remove the calibration gas.
8. Press the **MENU** button to advance to Exit menu or desired menu.

NOTE: *Software revision may cause variations of display output.*
Example of Calibration Display:

Span | **Select** → | PV: 0 | **Select** →
Menu ↓

PV: 0
          20

Cal OK

Bad Sens
          OR
Same mV

Apply Cal Gas until signal value becomes stable (about 1 to 4 minutes)
          See **Figure 7** Calibration Adapter

When cal signal is stable **AM-5175** will automatically update:
     If cal is good display will indicate OK or Same and advance to Alarm1
     If cal is not within preset "range" display will indicate Bad Sens or Same mV the **AM-5175** will return to the Span Menu
To exit press **Menu** button until Exit appears and press **Select**

5.2.4 Alarm Set Points

The **AM-5175** has three alarm set points set at the factory. These alarm points are normally set at established safety levels. Alarm set points can be changed within limits.
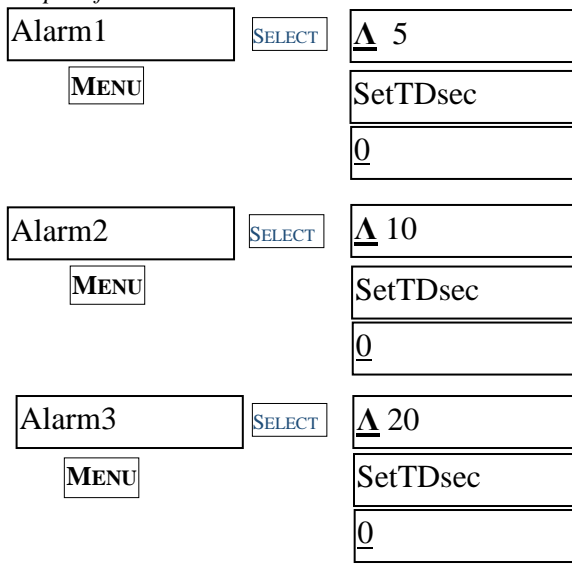
To change any of the three alarm points:

Enter the maintenance menu as shown in **Figure 6 AM-5175** Maintenance Menu flow chart.

1. Press the **MENU** button until to display Alarm1 is displayed.
2. Press the **SELECT** button to initiate alarm set point change
3. Press the **MENU** button to change the digit indicated by the underscore cursor
   Λ - Indicates increasing alarm
   V - Indicates decreasing alarm
4. Press the **SELECT** button to move the cursor to the next digit
   When last digit is entered the **AM-5175** will advance to the next menu
5. Use **MENU** and **SELECT** switches as above to change time delay.
   Between 0 and 5 seconds is allowed
6. Press the **MENU** button to advance to the next menu

NOTE: *Alarms 2 and 3 cannot be set below the Alarm 1 setting.*

Example of Alarm Set Point menus:

Alarm1	SELECT	Λ 5
	MENU	SetTDsec
		0
Alarm2	SELECT	Λ 10
	MENU	SetTDsec
		0
Alarm3	SELECT	Λ 20
	MENU	SetTDsec
		0

To change Alarm set points:
Press Menu switch until Alarm to be changed is displayed
Press Select switch to display the set point
   The **MENU** switch: changes digit indicated by underscore cursor
   The **SELECT** switch: locks in the underscored digit and moves to next digit
If change is not within range display returns to first digit
If change is within range display moves to Set Time Delay
Use **MENU** and **SELECT** switches as above to change time delay.
Between 0 and 5 seconds is allowed
If change is within range display moves to next menu

Λ - Indicates increasing alarm
V - Indicates decreasing alarm

NOTE: *Software revision may cause variations of display output.*
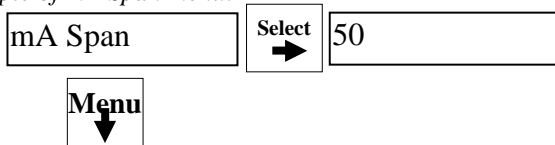
5.2.5 mA Span Set

The **AM-5175** 4-20mA span range is set at the factory, normally to the full scale of the measurement and can be changed within limits.

To change the span range:

Enter the maintenance menu as shown in **Figure 6 AM-5175** Maintenance Menu flow chart.

1. Press the **MENU** button until to display Span is displayed.
2. Press the **SELECT** button to initiate the mA Span menu
3. Press the **MENU** button to change the digit indicated by the underscore cursor
4. Press the **SELECT** button to move the cursor to the next digit
   When last digit is entered the **AM-5175** will advance to the next menu
5. Press the **MENU** button to advance to the next menu

Example of mA Span menu:

mA Span	**Select** →	50
	Menu ↓	

To change mA Span set points:
Press Menu button until mA Span is displayed
Press Select button to display the set point
   The **Menu** button changes digit indicated by underscore cursor
   The **Select** button locks underscored digit and moves to next digit

5.3 Sensor Replacement

WARNING: **Power must be removed from the AM-5175 before this or any internal procedure. Failure to do so may cause**
damage to equipment, bodily injury or death.

Sensors should be replaced when they can no longer be calibrated. Replacement sensor part numbers are listed in Section 6.0 of this manual. If you do not know the proper part number for your sensor, be sure to have the **AM-5175** serial number available when contacting your distributor or *ENMET* technical Support.

SENSOR REPLACEMENT PROCEDURE:

1. Obtain a new sensor. Make sure the sensor type is identical to your original sensor.
2. Disconnect the instrument for power.
3. Remove the 2 Sensor PC board retaining screws.
4. Unplug the sensor from the PC Board. **See Figure 8**
5. Plug the new sensor into the PC Board. **See Figure 8**

    NOTE: *If a shorting clip is present, remove the clip before plugging in the new sensor.*

6. Replace the Sensor PC board and 2 retaining screws.
7. Reconnect the instrument to power.
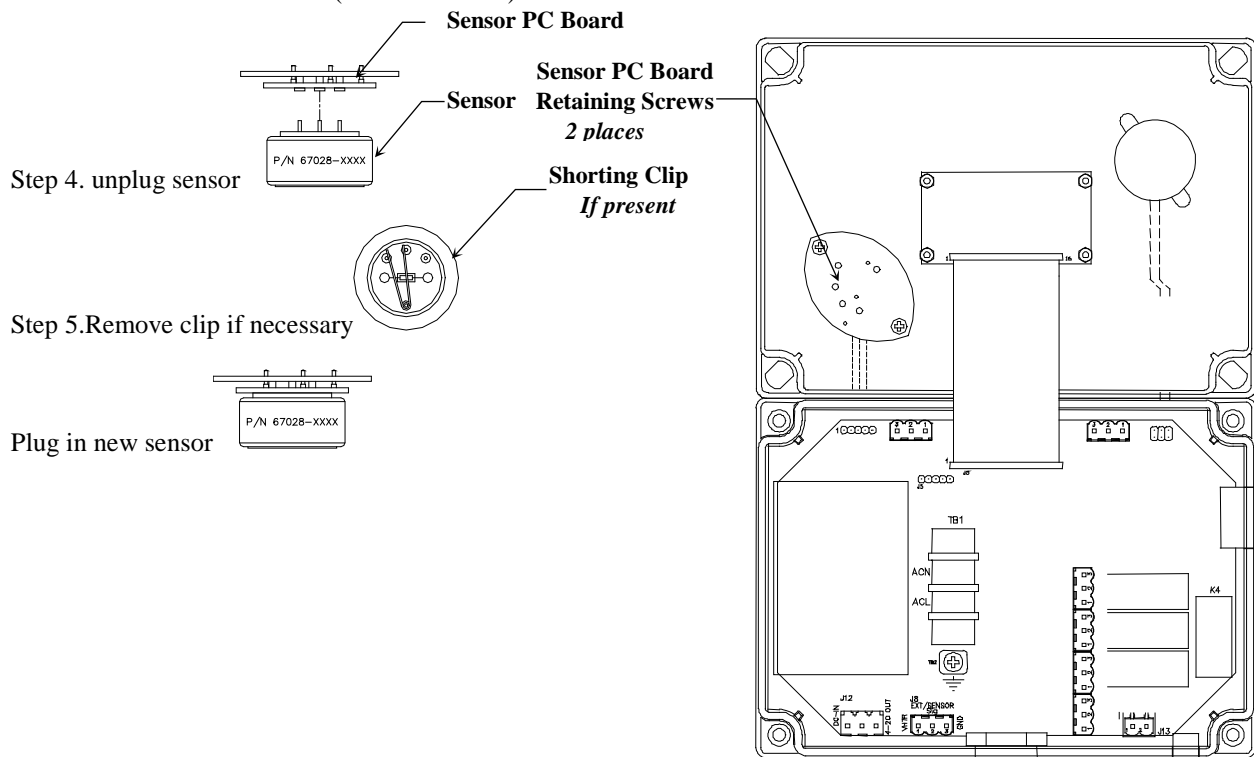8. Recalibrate the instrument (See Section 5.2).

Figure 8: AM-5175 Sensor Replacement

After the sensor has been installed, it is suggested to allow the sensor to stabilize for at least 3 – 4 hours, preferably overnight.

5.3.1 A Factory calibration must be performed.

After entering the Maintenance menu, press and hold the **MENU** button for 2-4 seconds while viewing the Zero menu.
After 2-4 seconds, an F will appear on the far-right hand side of the display. The F indicates that the instrument is in Factory mode.
Perform the calibration Zero and Span procedures as outlined in **Section 5.2**. Be sure that the F is present when selecting the Zero and Span functions.

The Factory calibration sets a calibration window for future standard instrument calibrations.

6.0 Accessory and Replacement Parts
ENMET accessory part numbers:

Part number	Description
03620-022	Calibration Cup
04834-004	Calibration Regulator Assembly for Steel Cylinder
03219-100	Gas Cylinder, 100 ppm CO in air, (34 Liter, Steel Cylinders)
03296-209	Gas Cylinder, Zero Gas, 20.9% oxygen in nitrogen, (34 Liter, Steel Cylinders)
04834-001	Calibration Regulator Assembly for Aluminum Cylinder
03314-020	Gas Cylinder, 20 ppm H_2S in N_2 , (34 Liter, Aluminum Cylinders)
67028-0200	Sensor H_2S
67028-1100	Sensor O_2
67028-1200	Sensor CO
73083-000	Carry Case

7.0 Technical Data and Specifications

Electrical Power	15 Amp fused branch circuit	
	100-240 V_{AC}	
	0.45A, 50/60 Hz	
	0.6A, 24V_{DC}	
Operation	Temperature:	-20☐ to +40☐C (-4☐ to +104☐F)
	Relative Humidity	10-99% RH, non-condensing
Mechanical	Dimensions:	7.1 x 5.1 x 3 in(180x130x75mm)
	Weight:	2 lbs (0.9 kg)
	Material:	Polycarbonate
	Strain relief:	3 - 6.5mm OD
Outputs	Relays:	SPDT Resistive Load Inductive Load 10A at 110 V_{AC} 7.5A at 110 V_{AC} 10A at 30 V_{DC} 5A at 30 V_{DC}
	Analog:	4-20mA
	Digital:	RS-485-modbus
	Audio:	105 dB at 30cm/12in

NOTE: *All specifications stated in this manual may change without notice.*

8.0 Terms and Conditions

8.1 Ordering Information

Address orders to:

ENMET
Attention: Customer Service Department
680 Fairfield Court
Ann Arbor, MI 48108

Email Orders: orderentry@enmet.com
Phone: 734-761-1270   Fax: 734-761-3220
You may also contact our customer service department by email info@enmet.com. MINIMUM ORDER IS $50.00.

8.2 Delivery

Unless Seller otherwise specifies, delivery will be made: FOB Ann Arbor, MI and/or FOB Bowling Green, KY. Title and risk of loss shall pass to Buyer at that point. Shipping and handling charges will be Prepaid and Added to Buyer's invoice. Buyer may request shipping be charged to their own account with a preferred carrier. Seller shall have the right to choose means of transportation and to route shipment when specific instructions are not included with Buyer's order. Seller agrees to deliver the goods and services, within the time, in accordance with specifications, at the prices specified on the face hereof. Buyer's orders to this quotation are not subject to cancellation or deferment of delivery without indemnification of loss to the Seller resulting there from. Seller shall not be liable to Buyer for any loss or damage sustained on account of this delay or nonperformance due to causes beyond Seller's control and without his fault or negligence. Where performance of the terms here is contingent upon timely delivery of goods or services by the Buyer and such delivery is in default, Seller shall be indemnified for any damage or loss resulting there from, and/or by extension of Seller's delivery commitment, as applicable.

8.3 Payment Terms

Payment Terms are Net 30 Days from the date of shipment from Seller unless otherwise noted. All shipping and handling costs will be charged to Buyer on a Prepaid and Add basis. Buyer has the option of paying for shipping by charging its own account with a carrier

8.4 Warranty Information and Guidelines

The Seller warrants new instruments to be free from defects in workmanship and material under normal use for a period of one year from date of shipment. The warrant covers both parts and labor excluding calibration and expendable parts such as filters, detector tubes, batteries, etc. If the inspection by the Seller confirms that the product is defective, it will be repaired or replaced at no charge, within the stated limitations, and returned prepaid to any location in the United States. The Seller shall not be liable for any loss or damage caused by the improper use or installation of the product. The Buyer indemnifies and saves harmless the Seller with respect to any loss or damages that may arise through the use by the Buyer or others of this equipment. This warranty is expressly given in lieu of all other warranties, either expressed, implied or statutory, including that of merchantability, and all other obligations, or liabilities of ENMET, LLC for damages arising out of or in connection with the use or repair or performance of the product. In no event shall ENMET, LLC, be liable for any indirect, incidental, special or consequential damages or for any delay in the performance by ENMET, LLC, which may arise in connection with this equipment. ENMET neither assumes nor authorizes any representatives or other persons to assume for it any obligation or liability other than that which is set forth herein. Buyer agrees to indemnify and save harmless Seller for any damage or loss from lawsuits against Seller by reason of manufacture of sale of materials, parts, or use of processes resulting from Buyer's design specifications. Any patent, design, pattern, tool, die, jig, fixture, drawing, test equipment, or process furnished by Seller; whether possessed by the Seller before the date of this quotation, or devised or acquired by Seller during performance of the terms of this quotation, shall remain the property of the Seller except by specific stipulation on the face hereof. Seller reserves the right, without liability, for damage or loss, to destroy Buyer's drawings, specifications, patterns and special tools supplied by Buyer for performance of the terms on the face hereof, unless Buyer gives notice of the disposition of such items.

8.5 Return Policy

All returns for credit must be approved in advance by ENMET, LLC. Such returns are subject to a minimum $50.00 or 20% restocking charge, whichever is greater. **Approval of equipment for return is totally at the discretion of ENMET, LLC.** All requests for return/exchange must be made no later 30 days of the original shipping date from ENMET. The actual amount of any resulting credit will not be determined prior to a complete inspection of the equipment by ENMET. Calibration gas cylinders cannot be returned or restocked.

9.0 Instructions for Returning an Instrument for Service
Contact the ENMET Service Department for all service requests.
Phone: 734-761-1270
Email: repair@enmet.com

Fill out the "Service Request Form" found at the end of this manual and return with your instrument for all needs. Please send your instrument for service to the site in which the product was purchased. A new "Service Request Form" may be requested if the one found in the manual is not available. All instruments should be shipped prepaid to ENMET.
Address for Service:

     Michigan Location:

ENMET
Attention: Service Department
680 Fairfield Court
Ann Arbor, MI 48108

     Kentucky Location:

ENMET
62 Corporate Court
Bowling Green, KY 42103

Providing the "Service Request Form" assists in the expedient service and return of your unit and failure
to provide this information can result in processing delays. *ENMET* charges a one hour minimum billing for all approved repairs with additional time billed to the closest tenth of an hour. All instruments sent to *ENMET* are subject to a minimum evaluation fee, even if returned unrepaired. Unclaimed instruments that *ENMET* has received without appropriate paperwork or attempts to advise repair costs that have been unanswered after a period of 60 days may, be disposed of or returned unrepaired COD and the customer will be expected to pay the evaluation fee. Serviced instruments are returned by UPS/FedEx Ground and are not insured unless otherwise specified. If expedited shipping methods or insurance is required, it must be stated in your paperwork.

NOTE: *Warranty of customer installed components.*

For Warranty Repairs, please reference *ENMET's* "Warranty Information and Guidelines" (found earlier in this section).

ENMET

Phone: 734.761.1270
Fax: 734.761.3220

Service Request Form

Product Name or Number:
Product Serial Number:

Describe Problem or Needed Service:

Warranty Claim? ☐ Yes ☐ No

CUSTOMER INFORMATION

Billing Address: **Shipping Address:**

Contact Name: **Phone #:**
Email: **Fax #:**
PO/Reference #:

PAYMENT METHOD

☐ COD ☐ VISA/MasterCard ☐ American Express

Card Number Exp. Date Security Code:

Name as it Appears on Card:

RETURN SHIPPING METHOD

☐ UPS Ground	☐ UPS 3 Day Select	☐ UPS Next Day Air	☐ UPS ND Air Saver	☐ UPS 2 Day Air

UPS Account #:

☐ FedEx Ground	☐ FedEx Air Express Saver	☐ FedEx Air Overnight Std.	☐ FedEx Air 2 Day	☐ FedEx Air Overnight P-1

FedEx Account #:
Insure Shipment: ☐ Yes ☐ No

Insurance Amount: $