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SPECTRUM CO RAL
Compressed Air Line
Carbon Monoxide Monitor
Instrument Manual

Manual Part Number
80002-041
May 2002

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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.]

1.0 Introduction

The **SPECTRUM CO RAL** carbon monoxide monitor is a small battery operated instrument for the detection of carbon monoxide(CO) gas in compressed air lines. An electrochemical cell detects the gas, and the gas concentration is displayed on an LCD. Audio and visual alarms occur when the gas concentration exceeds a preset alarm point. At relatively low concentrations of CO, an alarm can be acknowledged, which results in the temporary cessation of the audio alarm. Operation and maintenance procedures are managed with three pushbutton switches.

A description of the characteristics and toxic effects of carbon monoxide is given in Appendix A, and should be reviewed by the user.

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

1.1 Unpack

Unpack the **SPECTRUM CO RAL** 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 our company 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. 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 Corporation
680 Fairfield Court
Ann Arbor, MI 48108
734-761-1270 734-761-3220 Fax

1.1.1 Check Order

Check the contents of the shipment against the purchase order. Verify that the **SPECTRUM CO RAL** is received as ordered. 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.

1.1.2 Serial Numbers

Each **SPECTRUM CO RAL** is serialized. These numbers are on tags on the equipment and are on record in an **ENMET** database.

1.2 Turn Instrument ON

Turn the instrument ON, by pressing and holding the POWER / BACKLIGHT pushbutton for two seconds. In *uncontaminated* air, for most instruments the display should read 0000 within ten seconds of turn-on.

1.2.1 Verify Operation

The **SPECTRUM CO RAL** is calibrated prior to shipment. However, if there is access to a source of CO gas, such as a calibration kit, expose the sensor to the gas, and observe that the instrument is responsive.

1.2.2 Acknowledge Alarm

If the concentration of CO is greater than 10 ppm, the instrument indicates an alarm condition. Acknowledge the alarm by pressing and releasing the right hand pushbutton, **SELECT**; this silences the audio alarm for four minutes unless the concentration of the CO is greater than the upper alarm limit.

1.2.3 Remove Gas

Remove the source of the CO. Attach to compressed air line, after the display reads zero or close to it, turn the instrument OFF, by pressing and holding the POWER / BACKLIGHT pushbutton for approximately three seconds. The display flashes "OFF" and then goes blank after the pushbutton is released.

1.2.4 Contact **ENMET**

If the instrument doesn't operate as described, contact **ENMET** customer service personnel immediately.

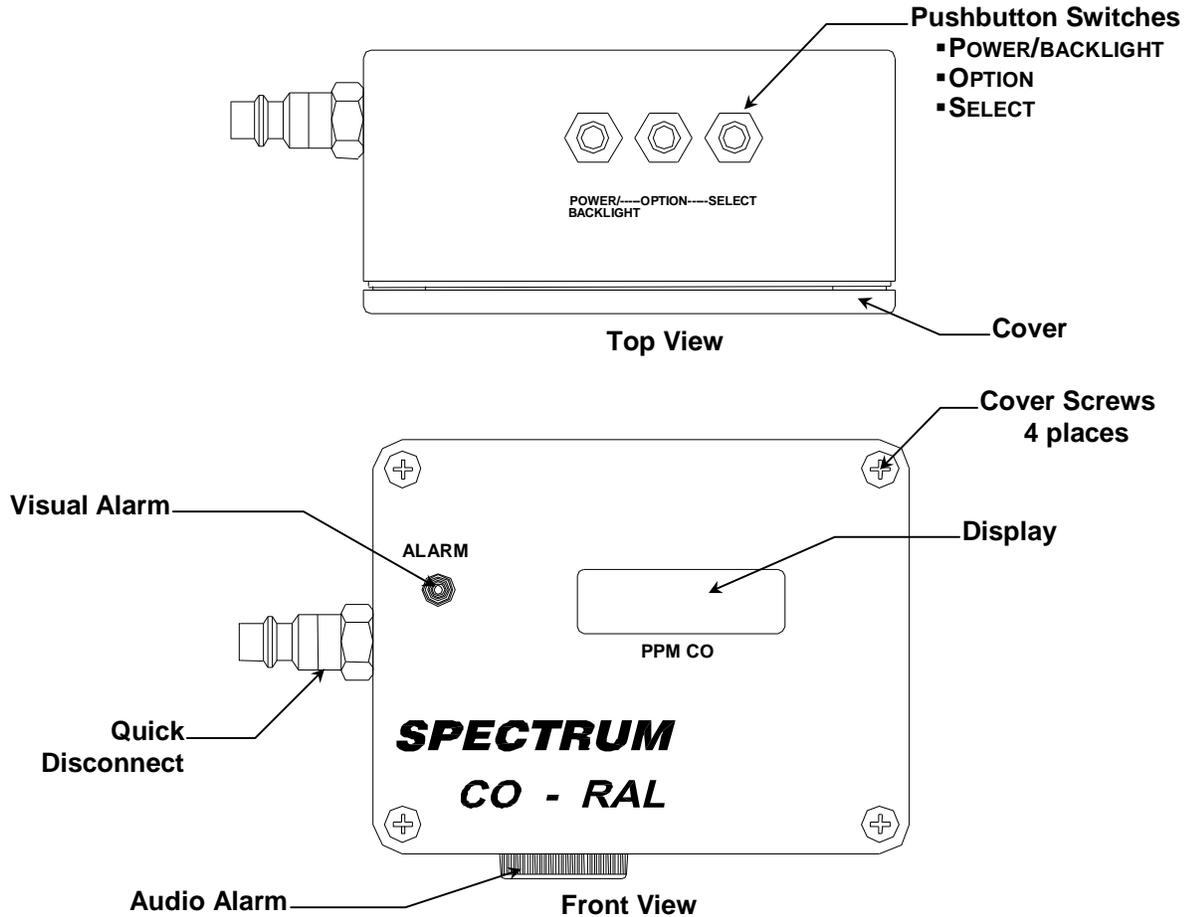


Figure 1: SPECTRUM CO RAL Features

2.0 SPECTRUM CO RAL Features

The features of the **SPECTRUM CO RAL** are shown in Figure 1. These are:

- DISPLAY** An LCD upon which either the gas concentration, or prompts for the operational and maintenance menus, are given.
- PUSHBUTTON SWITCHES** There are three of these, as follows:
- **POWER / BACKLIGHT** The left hand switch when the instrument is held upright with the display facing the user.
 - **OPTION** The middle switch.
 - **SELECT** The right hand switch.
- These switches are used to access and utilize the operational and maintenance menus.

ORIFICE Allows a small amount of gas to reach sensor

QUICK DISCONNECT PNEUMATIC FITTING For quick connect/disconnect; fits into the port of an air line filter unit and **ENMET** calibration adapter (03406-001).
Air inlet fitting is a Milton 727, compatible with Hansen 1000 series. If you substitute other fittings, the calibration fixture must also be changed.

VISUAL ALARM A red LED which is ON whenever the CO concentration is above the alarm point, and also blinks periodically with the confidence beep.

AUDIO ALARM A small horn which is ON whenever the CO concentration is above the alarm point, until the alarm is acknowledged. This horn also furnishes a confidence beep

COVER Retained with four screws, and removed to change the battery and sensor.

BATTERY The power source of the instrument, which is removed and replaced when depleted.

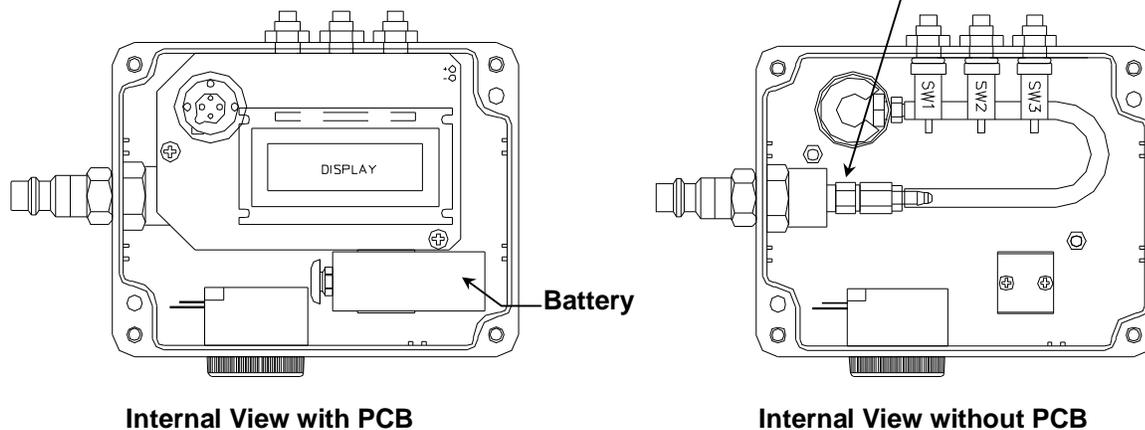
2.2 Installation

The location should be far enough upstream from the user that the sample air reaches the monitor before the air reaches the user. **SPECTRUM CO RAL** is a portable device the male quick disconnect pneumatic fitting is a Milton 727, compatible with Hansen 1000 series. If you substitute other fittings, the calibration fixture must also be changed.

2.3 Air Supply

50 to 100 PSIG will result in an adequate air supply to the sensor.

CAUTION: Do Not exceed 100 PSIG



3.0 Operation

3.1 Operational Menu

The **SPECTRUM CO RAL** operation menu flow diagram is shown in Figure 2. This menu is accessed with the OPTION pushbutton switch, the middle switch of the three. Successive displays are achieved by repeatedly pushing the switch, as indicated by "O" in the menu flow diagram.

The alarm acknowledgement function, and displays and function in the "see DATA" area, are accessed with the SELECT pushbutton, indicated by "S" in the operation menu flow diagram.

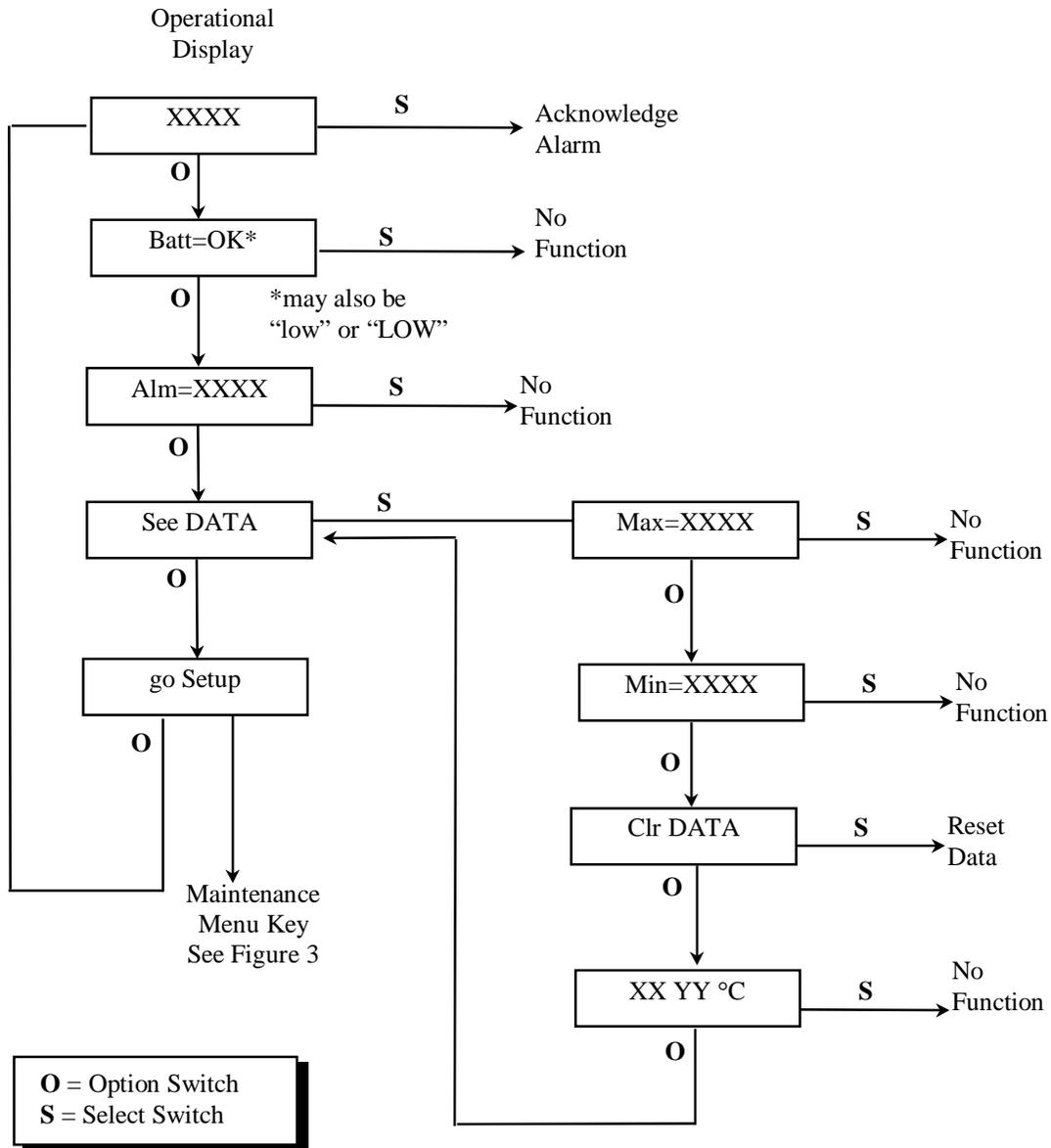


Figure 2: Operation Menu Diagram

3.1.1 Turn ON and OFF

Turn the instrument ON by pressing the POWER / BACKLIGHT pushbutton. the display should read "0000" within ten seconds when the monitor is supplied with *uncontaminated* air.

Turn the instrument OFF by pressing and *holding* the POWER / BACKLIGHT pushbutton for three seconds. The display flashes "OFF" and then fades out after the pushbutton is released. The instrument can be turned OFF from any location in the operational or maintenance menus.

3.1.2 Gas Concentration Display and Alarms

The LCD furnishes a numerical display of CO concentration from 0000 to 100 ppm; this is the operational display. If the CO concentration exceeds 100 ppm, the display reads "100+." When the concentration of CO exceeds the preset alarm point, the audio and visual alarms are activated. The gas concentration continues to be displayed during alarm. The alarm point is adjustable between 5 and 100 ppm CO by accessing the maintenance menu; the factory setting of the alarm point is 10 ppm CO, the value recognized by OSHA as the acceptable exposure limit for compressed air lines. A user should have a justifiable application-based reason for setting the alarm point higher than 10 ppm. When the CO concentration drops below the alarm point, the audio and visual alarms cease operation. The alarm point setting can be observed on the display by pushing the OPTION switch twice.

If an alarm concentration is encountered when the display is at a location in the operational menu other than the operational display, the audio and visual alarms are activated and the alarm cannot be acknowledged.

If the display is left idle at a location other than the operational display for 45 seconds it automatically transfers to the operational display.

3.1.3 Alarm Acknowledge

When the instrument is in alarm, and the CO concentration is below 50 ppm, the alarm can be acknowledged by pressing and releasing the SELECT pushbutton, but only when the instrument is in the operational display location of the operational menu. The acknowledgement causes the temporary cessation of the audio alarm; the red LED continues to be ON. The audio alarm is OFF for a period of four minutes, after which it is reactivated, if the gas concentration is still above the alarm point. The alarm can again be acknowledged. However, acknowledgement of the alarm at gas concentrations above 50 ppm does not result in audio alarm cessation, and if the gas concentration rises above 50 ppm during an alarm condition which has been acknowledged, the audio alarm resumes operation.

3.1.4 Data

The **SPECTRUM CO RAL** monitor retains the maximum and minimum gas concentration values encountered since turn-on, or since the data was cleared and reset. There is a one minute delay from the time the instrument is turned on until when it starts storing the information. To access this press the OPTION switch three times; "see DATA" is displayed. Press the SELECT switch; the maximum concentration since turn-on or last reset is displayed. Press the OPTION switch again; the minimum concentration since turn-on or last reset is displayed. Press the OPTION switch again; "clr DATA" is displayed. Pushing the SELECT switch clears the data and resets it to the current concentration.

Pushing the OPTION switch once more results in a display of both the countdown to the confidence beep and the internal temperature of the instrument in degrees centigrade. Push the OPTION switch three more times to return to the operational display.

3.1.5 Backlight

To backlight the display for observation in a dark area, press and quickly release the POWER / BACKLIGHT pushbutton. The LCD backlight comes ON for a period of 45 seconds and then turns OFF automatically. The backlight can be turned off sooner than 45 seconds by pressing the POWER / BACKLIGHT pushbutton a second time. Use the backlight feature sparingly; it is a relatively high energy user, and extensive use rapidly depletes the battery.

3.1.6 Low Battery Alarm

The battery status display is accessed by pressing the OPTION pushbutton once. When this display is "Batt=OK", the battery energy level is sufficient for operation of the instrument. In this condition, the confidence beep occurs every thirty seconds when the instrument is not in alarm.

When the battery energy level drops below the critically low point, the instrument automatically shuts off, and cannot be used until the battery is replaced. See Section 4.2.2 for battery removal and replacement.

3.2 Interference Gases

Some gases other than CO cause a sensor response, and thus are termed "interference gases". Known interference gases are as follows:

Gas	Concentration in ppm	Reading in ppm
Hydrogen	1000	450
Nitric oxide	100	25

The following levels of gases are known to cause no sensor response:

Gas	Concentration
Ammonia	100 ppm
Carbon dioxide	5,000 ppm
Chlorine	5 ppm
Ethylene*	2 %
Gasoline vapor*	saturated
Hydrogen cyanide	10 ppm
Hydrogen sulfide*	10 ppm
Isopropanol*	1,025 ppm
Methane	10,000 ppm
Nitrogen dioxide*	10 ppm
Sulfur dioxide*	10 ppm

* For indicated gases or vapors, prolonged exposure may reduce the efficiency of the sensor filter.

4.0 Maintenance

4.1 Maintenance Menu

From the operational display, press the OPTION pushbutton four times; "go SETUP" is displayed. This is the entrance to the maintenance menu. The **SPECTRUM CO RAL** maintenance menu flow diagram is shown in Figure 3.

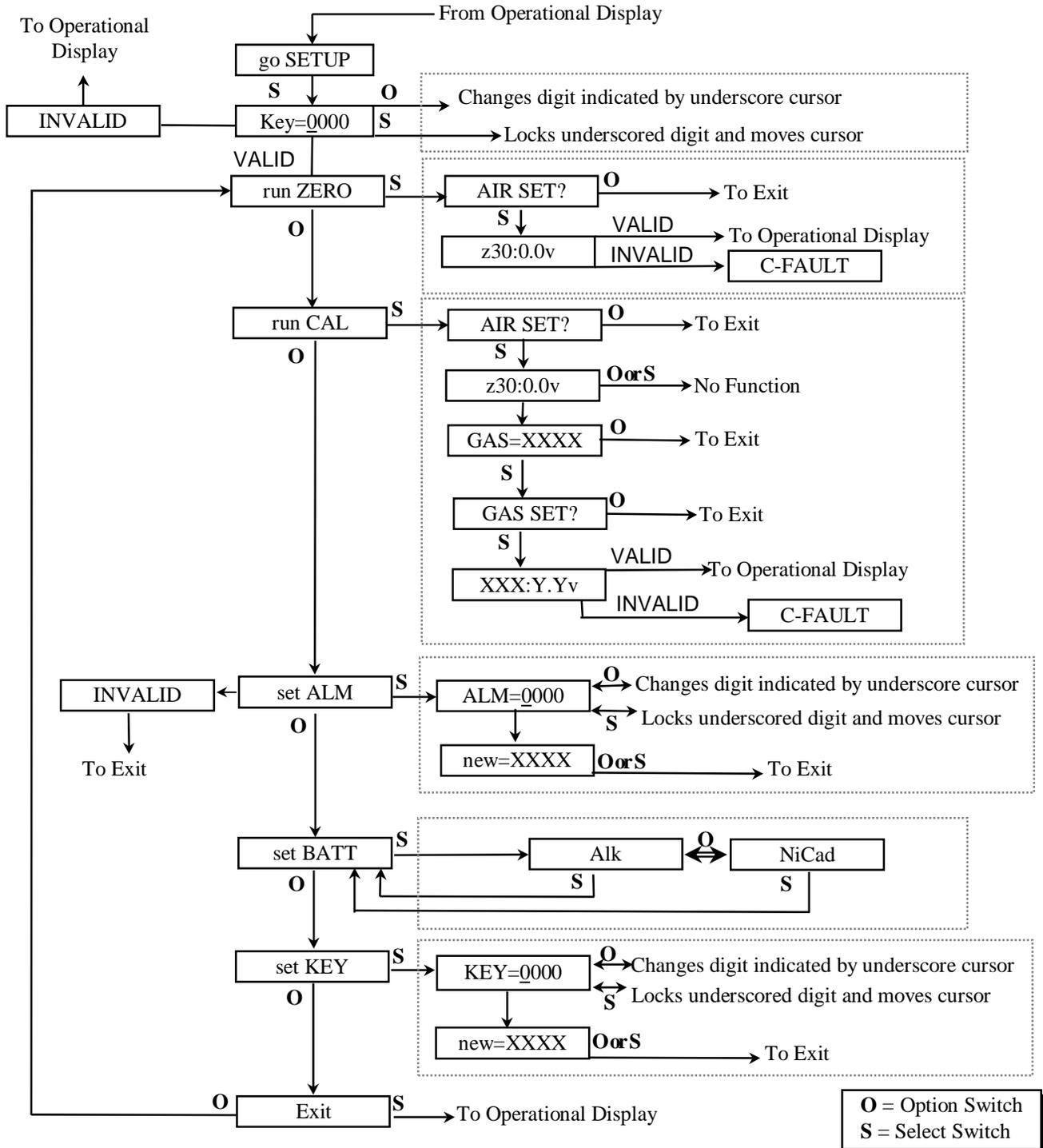


Figure 3: Maintenance Menu Flow Diagram

4.1.1 Entering Key

Entrance to the maintenance menu is guarded with a four digit numerical key. The factory default setting of the key is 1270*. When the valid numerical key is inserted, the user is allowed to enter the maintenance menu

When in the "go SETUP" location, press the **SELECT** pushbutton; "Key=0000" is displayed. The underscore cursor is under the left hand digit. To insert the key, press the **OPTION** pushbutton to change the left hand digit, and choose the correct digit; then press the **SELECT** pushbutton, which locks in the chosen left hand digit and moves the underscore cursor one space to the right. Continue this process until the four digit key is complete. When the valid key is inserted in this manner, the display is transferred to the "run ZERO" portion of the maintenance menu. When an invalid key is inserted, "INVALID" is briefly displayed, and the instrument returns to the operational display.

*The process by which a different key is set is given in Section 4.1.6.

4.1.2 Setting Zero Point

A valid key entry sets the instrument at the "run ZERO" location, of the maintenance menu, which enables the setting of the zero gas concentration point. This is desirable if the zero reference of the gas sensor has drifted over a period of time, indicated by a persistent gas concentration reading in a clean environment. Note that the calibration sequence given below also includes setting the zero point. If a full calibration is required, instead of setting just the zero point, push the **OPTION** button once; "run CAL" is displayed. See Section 4.1.3.

To set the zero point without performing full calibration, from the "run ZERO" location press the **SELECT** pushbutton; "AIR SET?" is displayed. Be certain that the instrument is in clean air, uncontaminated by the target gas. If uncertain of the environment, use clean 20.9% by volume oxygen compressed air from a pressurized cylinder. See Section 5.0 for **ENMET** part number.

With the instrument in "AIR SET?", press the **SELECT** pushbutton again. "z30:0.0v" is displayed; this is a counter that counts down in seconds from 30 to 0. The validity of the new zero setting is then examined; if it is within preset parameters, the display is transferred to the operational display in the operation menu.

If the new zero setting is not between preset parameters, "C-FAULT" is displayed. Turn the instrument OFF, then ON again. This re-boots the system with the most recent valid zero setting.

4.1.3 SPECTRUM CO RAL Calibration

NOTE: Calibration must be performed at normal room temperature (20-25°C) for optimal performance. If the instrument is exposed to temperature extremes just prior to calibration, allow it to stabilize to room temperature. The internal temperature of the instrument is verified by cycling through the "see DATA" menu.

In order to calibrate the instrument, it is first zeroed as previously described in Section 4.1.2. Then the sensor is presented with a known concentration of the target gas, in air or an inert gas such as nitrogen, called the "span gas". After an appropriate interval, which is timed, the new span setting is examined for validity.

A valid key entry sets the instrument at the "run ZERO" location of the maintenance menu. Press the OPTION pushbutton once to access the "run CAL" display, then press the SELECT pushbutton; "AIR SET" is displayed. Zero the instrument as described in Section 4.1.2. When the zero timer is complete, the display indicates "SPAN=XXX", where the numbers indicate the correct span gas concentration for the instrument. The span gas value for this instrument is 20 ppm CO.

Assure that the correct span gas is available. Connect the calibration adapter to the cylinder, shown in Figure 4. Then press the SELECT button; "GAS SET" is displayed. Unplug the regulator-flowmeter assembly from the airline, connect it to the calibration adapter. Then press the SELECT button; "XXX:0.Yv" is displayed. The XXX is a counter which counts down in seconds to zero from 120 to provide the proper time interval for calibration. The 0.Yv indicates a sensor signal which is used during the sensor replacement procedure. When the timer reaches zero, the new calibration and zero gas settings are examined for validity. If the values are reasonable, the display is transferred to the gas concentration numerical display in the operations menu. Return the regulator-flowmeter assembly to the airline.

If the new zero and calibration settings are not reasonable, "C-FAULT" is displayed. Turn the instrument OFF, then ON again. This re-boots the system with the most recent valid zero and calibration settings.

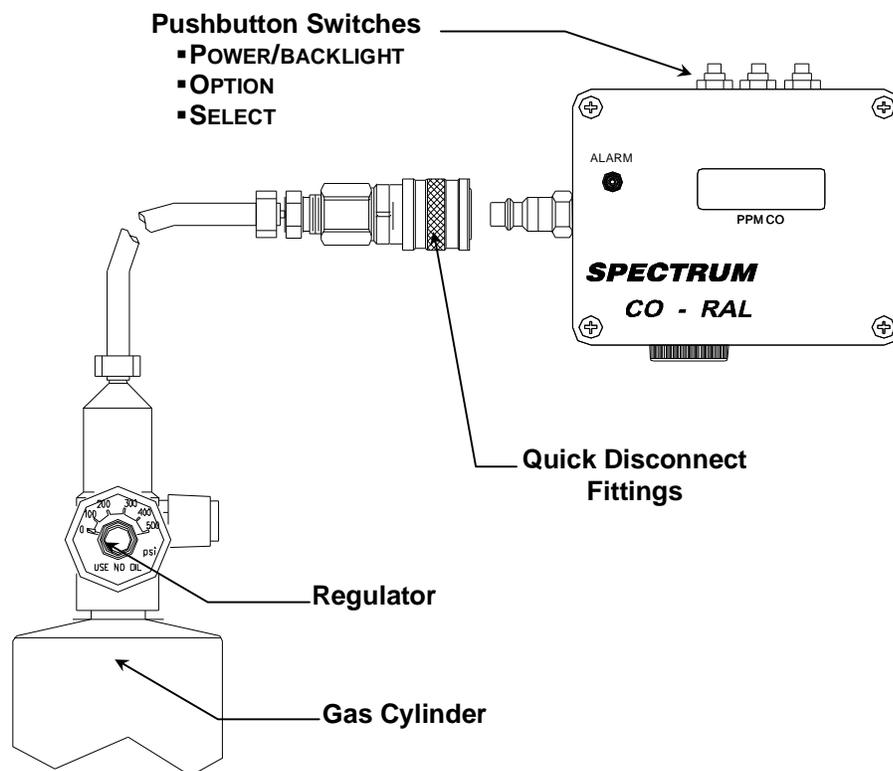


Figure 4: cal of SPECTRUM CO RAL

4.1.4 Changing the Alarm Level

A valid key entry sets the instrument at the "run ZERO" location of the maintenance menu. Press the OPTION push button twice to access the "set ALM" display, then press the SELECT button; ALM=0000" is displayed. This is called the alarm update window, and the value displayed is the present alarm setpoint. The underscore cursor is under the far left digit. Press the OPTION button to index the underscored digit; press the SELECT button to index the underscore cursor one position to the right. When the desired new alarm point is set, press either the OPTION or SELECT button to return to the alarm update window. If the new alarm setting is valid, "set ALM" is again displayed. Press the OPTION button four times to return to the operations menu.

For the safety of the user, there is an upper limit past which the alarm setting is invalid, and the instrument does not accept it. If an invalid alarm setting is attempted, after the numerical value is inserted in the "ALM=0000" window, pressing the OPTION or SELECT button results in a momentary display of "INVALID" after which the display returns to the alarm update window. Exiting the alarm update window at this point results in an alarm point setting unchanged from the value present when the procedure was begun.

For the **SPECTRUM CO RAL**, the factory default alarm setpoint is 10 ppm, and the upper alarm limit is 50 ppm.

4.1.5 Setting the Battery Type

CAUTION: The **SPECTRUM CO RAL** should never be used with Lithium type batteries. Although they physically fit in the enclosure, erroneous gas display reading may occur.

A valid key entry sets the instrument at the "run ZERO" location of the maintenance menu. Press the OPTION pushbutton three times to access the "set BATT" display, then press the SELECT pushbutton; "Alk " is displayed. Press the OPTION pushbutton to cycle the display among the two types of batteries which are valid, "Alk " and "NiCad". Choose the battery type that is being used to power the instrument by pressing the SELECT pushbutton; doing so returns the display to "set BATT" location. Push the OPTION pushbutton three times to return to the maintenance menu.

CAUTION: If the "set batt" selection is not identical with the battery being used, incorrect low battery indications are furnished.

4.1.6 Setting a New Key

A valid key entry sets the instrument at the "run ZERO" location of the maintenance menu. Press the OPTION pushbutton four times to access the "set KEY" display. Press the SELECT pushbutton once; "KEY=0000 is displayed. A new key can be set by changing the underscored number with the OPTION pushbutton and moving the underscore cursor with the SELECT pushbutton. After the new key is entered "new-XXXX" is displayed, press the OPTION or SELECT pushbutton to display to "exit", then press the OPTION pushbutton to return to "run ZERO".

NOTE: Four digit key numbers should be selected carefully and recorded. Without the correct key, the maintenance menu cannot be accessed. If a four digit key number is lost, call **ENMET** customer service personnel.

4.2 Changing Components

Changing the sensor requires that the front of the instrument be removed; remove the four phillips head cover retaining screws, and then the cover. See figure 5.

NOTE: The cover screws are unique to the enclosure care must be taken not to lose them.

4.2.1 Sensor Removal and Replacement

A sensor must be replaced when it no longer responds adequately to the target gas. This is indicated by a low gas concentration reading when exposed to a known concentration of the target gas, and the inability to calibrate the instrument, with a "C-FAULT" display after calibration. The expected sensor lifetime in normal environments is one to two years.

Remove the front cover of the instrument enclosure. Remove 2 screws that hold circuit board. Remove board. Unplug the sensor from the circuit board,

Remove shorting spring/clip from the new sensor if needed.

Plug the new sensor in its place. Allow the sensor to stabilize in the instrument with the power on for one hour before recalibrating.

The initial calibration of a new sensor must be performed with the front cover of the enclosure removed. Follow the procedure for calibrating the instrument as outlined in Section 4.1.3 of this manual with the following modification.

During the application of the span gas, the counter counts down from 120. When the counter gets down to 30, adjust the potentiometer next to the display module on the instrument PC board, so that the display to the right of the counter reads 0.65v. This is a one-time adjustment to align the sensor output with the instrument electronics. It should only be performed upon sensor replacement. All future calibrations should follow the procedure in Section 4.1.3.

Replace the front cover on the instrument enclosure. Calibrate the instrument according to the procedure in Section 4.1.3.

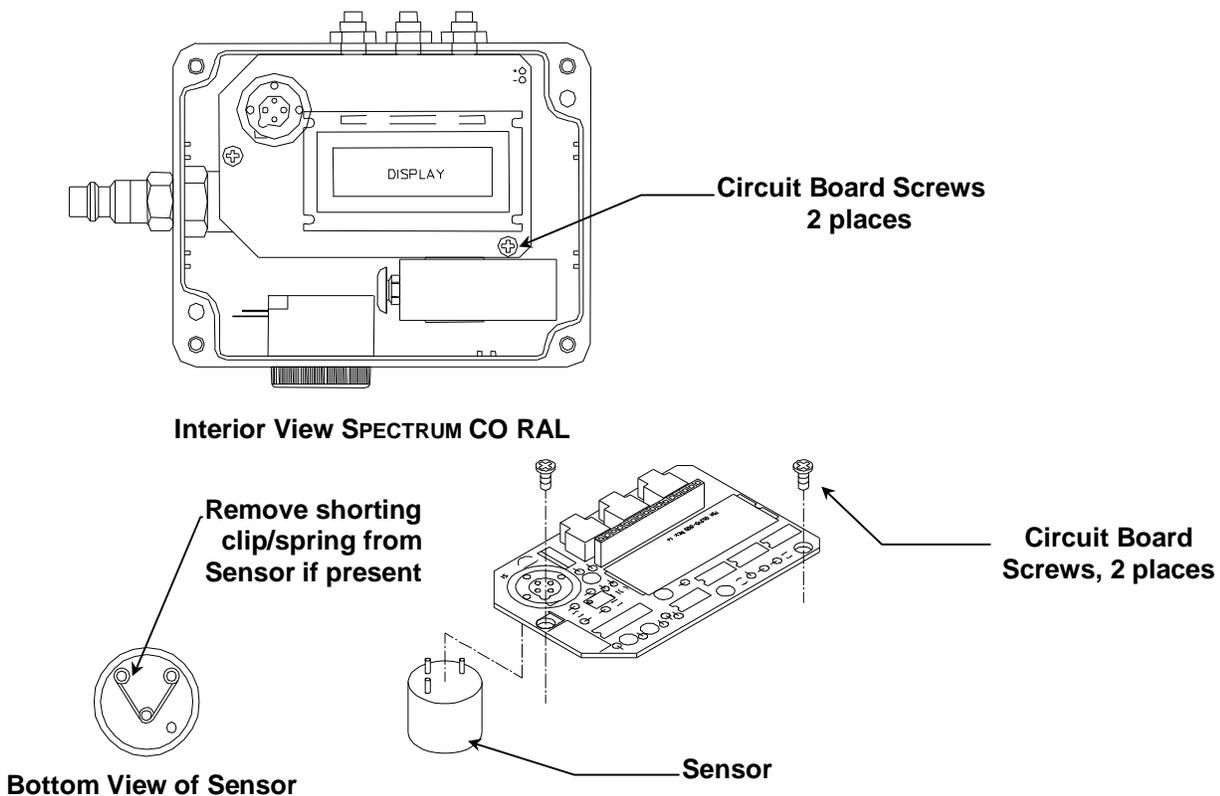


Figure 5: SPECTRUM CO RAL Sensor Location

4.2.2 Battery Removal and Replacement

Remove the front of the instrument. The battery is in a clip in the lower right of the enclosure. Remove it, unclip the battery connector, replace with a 9 volt alkaline battery. Push the new battery into the clip and replace the cover.

Two types of batteries are available for use with the **SPECTRUM CO RAL**: alkaline and rechargeable Ni/MH. They have different end-of-life discharge characteristics. Either replace a battery with the same type, or go to the "set BATT" portion of the maintenance menu, and select the new type being used. See Section 4.1.5 to set battery type.

If the "set batt" selection is not identical with the battery being used, incorrect low battery indications are furnished.

The rechargeable Ni/MH battery is of a common type that can be charged by a charger available at any electronic store.

CAUTION: The **SPECTRUM CO RAL** should never be used with Lithium type batteries. Although they physically fit in the enclosure, erroneous gas display reading may occur.

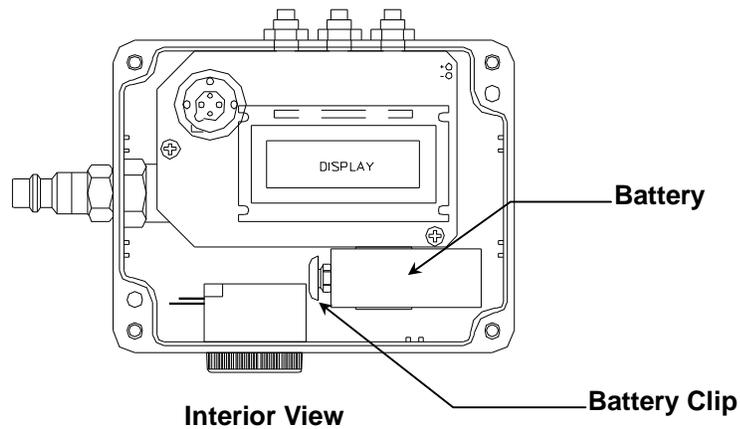


Figure 6: SPECTRUM CO RAL Battery Location

5.0 Replacement Parts and Accessories

ENMET part numbers for replacement parts and accessories:

Description	Part Number
Calibration adapter	03605-002
Calibration Gas, 20 ppm CO	03219-020
Zero Gas, 20.9% by Vol. Oxygen	03296-209
Replacement CO Sensor	67016-1204
Orifice	73070-012
Display Assembly	62022-007
PC Board Assembly	05215-002
Batteries:	
Alkaline	67012-001
NiCad	67011-003

6.0 WARRANTY

ENMET 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 from ENMET. The warranty covers both parts and labor excluding instrument calibration and expendable parts such as calibration gas, filters, batteries, etc... Equipment believed to be defective should be returned to ENMET within the warranty period (transportation prepaid) for inspection. If the evaluation by ENMET 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 by the most economical means, e.g. Surface UPS/FedEx Ground. If an expedient means of transportation is requested during the warranty period, the customer is responsible for the difference between the most economical means and the expedient mode. ENMET shall not be liable for any loss or damage caused by the improper use of the product. The purchaser indemnifies and saves harmless the company with respect to any loss or damages that may arise through the use by the purchaser or others of this equipment.

This warranty is expressly given in lieu of all other warranties, either expressed or implied, including that of merchantability, and all other obligations or liabilities of ENMET which may arise in connection with this equipment. ENMET neither assumes nor authorizes any representative or other person to assume for it any obligation or liability other than that which is set forth herein.

NOTE: When returning an instrument to the factory for service:

- Be sure to include paperwork.
- A purchase order, return address and telephone number will assist in the expedient repair and return of your unit.
- Include any specific instructions.
- For warranty service, include date of purchase
- If you require an estimate, please contact ENMET Corporation.

There is Return for Repair Instructions and Form on the last pages of this manual. This form can be copied or used as needed.

Manual Part Number

80002-041

May 2002

Appendix A: Characteristics and Effects of Carbon Monoxide

Carbon monoxide is a colorless odorless toxic gas generated by incomplete combustion of a hydrocarbon fuel in air. It may be present where internal combustion engines, furnaces, boilers, and other combustion devices are present. It is toxic when inhaled because of its great affinity to hemoglobin, the oxygen carriers in the red cells of the blood. CO replaces the oxygen normally carried by the hemoglobin, and thus inhibits the delivery of oxygen throughout the body; the victim suffers from oxygen deficiency, and may die from asphyxiation. The symptoms and degree of danger resulting from exposure to CO depend upon the concentration of the gas and the length of exposure; this is shown in Figure 5. The **SPECTRUM CO RAL** instrument is employed to warn the user of the presence of CO, and to facilitate the assessment of the degree of danger that he or she is exposed to

Based upon knowledge of the effects of CO, the Occupational Safety and Health Authority (OSHA) has set limits on exposure to CO in the workplace. These are 35 ppm (parts CO per million parts air) as an time weighted average for an eight hour day, and a maximum exposure of 200 ppm. The **SPECTRUM CO RAL** is shipped with the adjustable alarm set at 35 ppm; this alarm cannot be adjusted above 200 ppm.

The curves in Figure 7 below are for percent carboxalhemoglobin with 50% being the top curve, 5% the bottom. %COHb is a measure of the amount of hemoglobin occupied by CO rather than oxygen. CO effects upon children, adults engaging in physical activity and smokers are more pronounced.

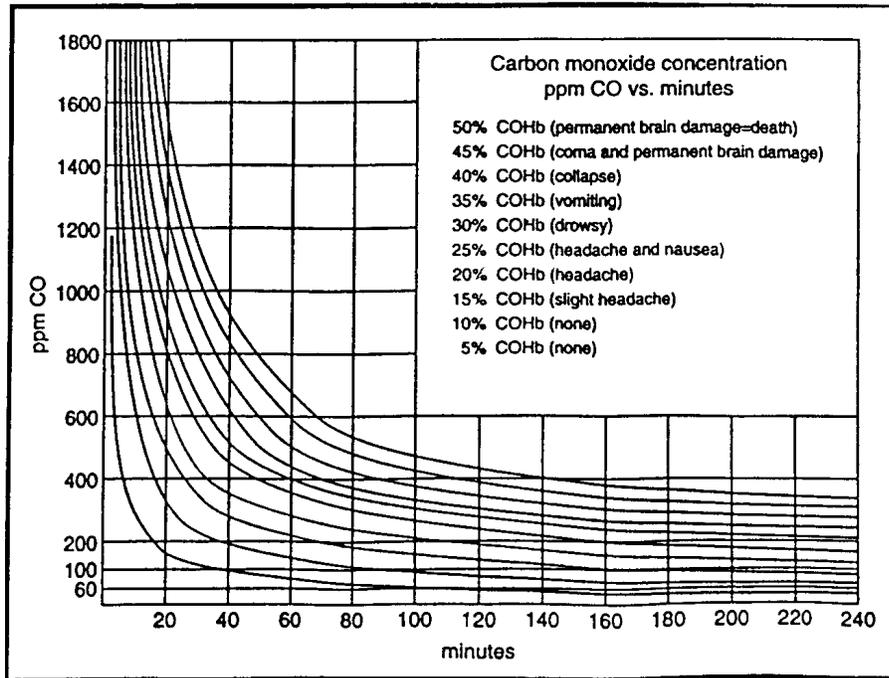


Figure 7: CO Exposure over Time



PO Box 979
680 Fairfield Court
Ann Arbor, Michigan 48106-0979
734.761.1270 Fax 734.761.3220

Returning an Instrument for Repair

ENMET instruments may be returned to the factory or any one of our Field Service Centers for regular repair service or calibration. The **ENMET** Repair Department and Field Service Centers also perform warranty service work.

When returning an instrument to the factory or service center for service, paperwork must be included which contains the following information:

- A purchase order number or reference number.
- A contact name with return address, telephone and fax numbers
- Specific instructions regarding desired service or description of the problems being encountered.
- Date of original purchase and copy of packing slip or invoice for warranty consideration.
- If a price estimate is required, please note it accordingly *and be sure to include a fax number.*

Providing the above information assists in the expedient repair and return of your unit.

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 \$30 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 with the evaluation fee.

Service centers may have different rates or terms. Be sure to contact them for this information.

Repaired 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.

If a component is purchased and installed in the field, and fails within the warranty term, it can be returned to **ENMET** and will be replaced, free of charge, per **ENMET**'s returned goods procedure.

If the entire instrument is returned to **ENMET** Corporation with the defective item installed, the item will be replaced at no cost, but the instrument will be subject to labor charges at half of the standard rate.



Repair Return Form

Mailing Address:
ENMET Corporation
PO Box 979
Ann Arbor, Michigan 48106

Shipping Address:
ENMET Corporation
Attn: Repair Department
680 Fairfield Court
Ann Arbor, Michigan 48108

Phone Number: 734.761.1270
FAX Number: 734.761.3220

Your Mailing Address:

Your Shipping Address:

Contact Name: _____ **Your Phone:** _____

Your PO/Reference Number: _____ **Your FAX:** _____

Payment Terms: **COD**
(Check one) **VISA / MasterCard** _____
Card number Expiration

Return Shipping Method:

- UPS: Ground 3 Day Select Next Day Air ND Air Saver 2-Day Air
 Federal Express: Ground Express Saver P-1 Standard 2-Day Air
 FedEx Account number: _____

Would you like ENMET to insure the return shipment?

No Yes **Insurance Amount:** \$ _____