

ENMET

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ENMET
Creative Gas Detection Solutions



Recon IS
Operation and 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.]*



Attention / Warning



Earth Ground

1.0 Introduction

The **RECON-IS** Series instruments are designed to detect toxic gases and oxygen concentrations in ambient air and has been approved to be used in hazardous locations. Their one button operation, low power consumption and small size makes them ideal for use in many situations like, oil field, chemical plant and the mining industry as well as confined space entry, general construction and environmental industries.

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

1.1 Unpack

Unpack the **Recon IS** 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 **Recon IS** 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

1.3 Safety Settings

Please read the following information carefully before using the detector.

- Do not use a damaged gas detector.
- Do not open the RECON-IS in a possible explosive working environment.
- Caution should be used if the background oxygen concentration is greater than 20.9% by volume since there is a greater risk of ignition of a combustible gas if present. Oxygen concentration in the air exceeding 20.9% vol could reduce the anti-explosion feature of the detector. **ENMET** Cooperation recommends that a "Bump Test" be performed to confirm sensor responds and to ensure that the audio, visual and vibration alarms are working properly.

2.0 RECON-IS Features

- Advanced 16-digit MCU for low consumption;
- 3V Lithium battery life approximate 2 year;
- High contrast LCD displays the gas level and device status;
- Back light based on instruction or alarm status;
- Audio, Visual and Vibratory Indicators;
- Single button operation
- Alarm of: Low-alarm, High-alarm, TWA alert, STEL alert, Over range alert, low voltage alert etc.;
- Confidence beep;
- With instruction, it will display STEL value, TWA value, Max. or Min. gas level, confidence beep information;
- Self-test on the gas sensor, electric circuit, battery, audio alarm, visual alarm and vibration alarm;

2.1 RECON-IS Configuration and Function

See Figure 1 for location of features:

	Feature	Description
1	Visual Alarms	LEDs
2	LCD Display	Multi-function, See Section 2.2 for details
3	Audio Alarm(Horn)	Low Alarm – Slow Pulse High Alarm – Fast Pulse
4	Button	Multi-function, See Section 2.3 for details
5	Sensor	See back of unit for Type: CO, H2S, O2
6	Label	(number) of Unit
7	Belt Clip	

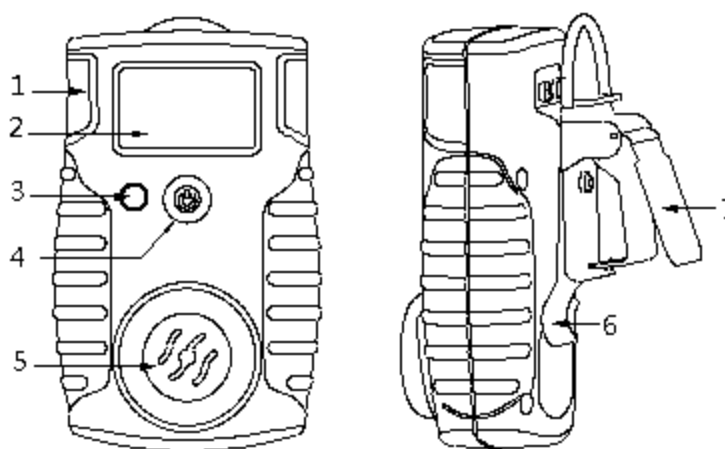
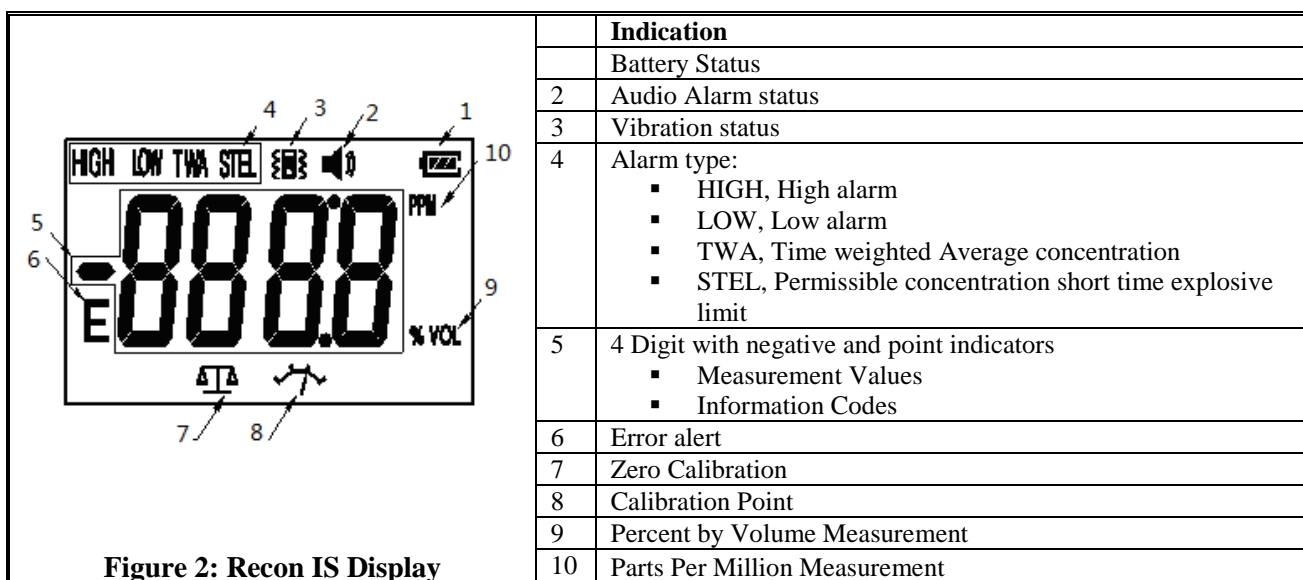


Figure 1: Recon IS Features

2.2 RECON-IS Display

See Figure 2 for location of indications.



2.3 RECON-IS Button Function

Easy operation through the single button: turn on or off the detector, mute, cancel vibration alarm, information checking, activate/deactivate confidence beep, calibration etc. In different status, the function of the button is different as follows:

Function	Action
Turn on	Press it for 3 seconds when it is power off.
Turn off	Press it for 3 seconds when it is power on.
Cancelling sound or vibration alarm	When alarming, press it once.
Information checking	In normal monitoring status, press it for 1 second, the backlit is on, and the screen displays in turns STEL, TWA, peak level, minimum level, confidence beep information etc.
Activate/Deactivate Confidence Beep	When the detector is being turned on, keep pressing it till the screen displays, "H OP" or "H CL".
Calibration	Keep pressing it till the detector is power off and is again turned on, the screen displays "CAL", then release the button, and the detector enters calibration status.

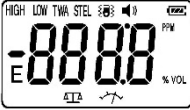


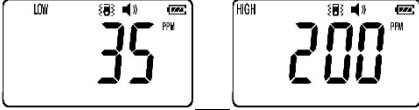
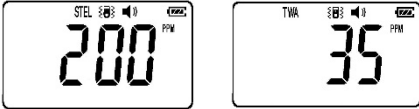
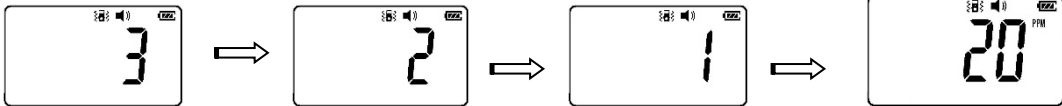
See Section 3 for more details of Button Functions.

3.0 RECON-IS Operation

3.1 Turn On RECON-IS

Press and hold the button for 3 seconds, the detector will turn on. After this, the detector will start a following self-test:

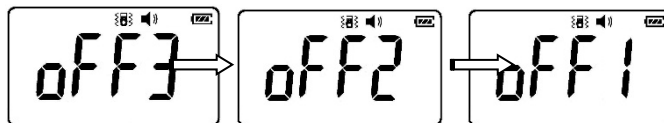
Example: RECON-IS CO

<p>A. Display all the fields and graphs and light the backlight.</p> 
<p>B. The buzzer gives sound. </p>
<p>C. The vibration and alarm indication pulse.</p>
<p>D. Display the version number:</p> 
<p>E. Display the preset low alarming value and the high alarming value:</p> 
<p>F. Display STEL and TWA levels:</p> 
<p>G. Warm-up Completion: After passing the self-test, the detector starts warm-up, display shows 3, 2, 1. The unit is now operational and mentoring for the target gas concentration in the area:</p> 

If the self-test fails, the **RECON-IS** will turn off automatically. Please contact the *ENMET* for information.

3.2 Turn Off RECON-IS








In the normal monitoring status, hold the button till the buzzer gives sound 3 times and the screen displays “OFF”, “OFF3”, “OFF2” and “OFF1” as shown in the following pictures:



After that, the screen is off. Release the button and the detector will be power off.

3.3 Information Checking

In the normal monitoring status, press and release the button twice to activate the backlight. Press the button for about 1 second and the screen will display: STEL level, TWA level, Max. gas level (for toxic gas) or Min. gas level (for O₂ only), confidence beep status (on or off), zero calibration information, and data reset information.

STEL Level	
TWA Level	 Max or Min Level that has been detected 
Confidence Beep – ON	 Confidence Beep – OFF 
Zero Calibration	 Data Reset 

3.4 Confidence Beep

Only when the user is turning on the **RECON-IS**, can the confidence beep setting be changed. Follow these steps to change the setting:

1. With the **RECON-IS** off.
2. Press and Hold the button during the turn on period continue to press the button until the unit counts down 3, 2, 1 continue to hold the button until the screen displays “H oP”(ON) or “H CL”(OFF) release the button. The status of the confidence beep is now changed.

NOTE: With the confidence beep turned on, the buzzer sounds once every 2 minutes, which indicates the detector is working normally. If the confidence beep is turned off, there is no such indication when the detector is working normally.

3.5 Zero Calibration

In the clean air, if the test result is not accurate, please proceed to the zero calibration in the clean air.

The procedures are as follows:

During the information checking, when the screen displays “ZoF”, press and release the button quickly.

If the operation is successful, the buzzer gives sound once.

The zero-calibration range is $\pm 5\%$ F. S.

3.6 Data Reset: Clear recorded STEL, TWA and Max/Min Levels

During the information checking, when the screen displays “rES”, press and release the button quickly.

If the operation is successful, the buzzer gives sound once. And the STEL value, TWA value, Max. Gas level (for toxic gas) or Min. gas level (for O₂) will be reset.

3.7 Alarm Information




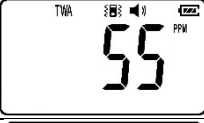











Alarm type	Information displayed
Low alarm: <ul style="list-style-type: none"> ▪ Slow Pulsed tone alarm sound ▪ Alarm LED Flashing ▪ Vibration 	
High alarm: <ul style="list-style-type: none"> ▪ Quick Pulsed tone alarm sound ▪ Alarm LED Flashing ▪ Vibration 	
STEL alert: <ul style="list-style-type: none"> ▪ Quick Pulsed tone alarm sound ▪ Alarm LED Flashing ▪ Vibration 	
TWA alert: <ul style="list-style-type: none"> ▪ Quick Pulsed tone alarm sound ▪ Alarm LED Flashing ▪ Vibration 	
Over range alert: <ul style="list-style-type: none"> ▪ Quick Pulsed tone alarm sound ▪ Alarm LED Flashing 	
Battery low voltage alert: <ul style="list-style-type: none"> ▪  log appears. ▪ At this time, the detector can still work for 30 days at least. When the battery is used up, the detector will turn off automatically. 	
Sensor end-of-life indication: <ul style="list-style-type: none"> ▪ Within 0-9 days before the sensor is used up, screen will display as the right picture shows when the detector is self-testing after turning on. The figure means the number of the days remaining. 	

Table 1: Recon IS Range and Alarm Levels

Target gas	Detecting Range	Low alarm level	High alarm level	TWA level	STEL level
H ₂ S	0-100ppm	10ppm	15ppm	10ppm	15ppm
CO	0-1000ppm	35ppm	100ppm	25ppm	200ppm
O ₂	0-30% vol	19.5% vol	23.5% vol	--	--

3.8 Calibration

In order to assure the testing accuracy, *ENMET* Corporation suggests that the **RECON-IS** be calibrated at a minimum of every 180 days. The calibration procedures are as follows:

<p>1. In clean air, press the button till the detector is turned off, keep pressing the button, the detector will turn on again, the screen displays time count-down of 3 second.</p>	
<p>2. When the screen displays "CAL", release the button and the detector enters calibration status.</p>	
<p>3. The detector will first calibrate the zero point. Please connect the detector to the gas bottle and input high-pure N2 into the detector at the speed of 120ml/min. Or put the detector in the clean air and it will calibrate zero.</p>	<p>Example:</p> 
<p>4. When the screen displays flashing calibration points, connect the cylinder regulator, calibration gas and sensor cover to the instrument. In 30 seconds' display will indicate numbers Example 1476 and continue to change until the sensor response stabilizes If no gas input within 30s, the system treats the calibration as failed.</p>	<p>Example CO, See Table 1</p>  <p>Calibration Gas Sensor Responding to Calibration Gas</p>
<p>5. If the standard gas is input normally, the detector will adjust once every 3 seconds till the system is steady and the calibration is finished. If calibration succeeded, the screen displays "S" and the detector turns off.</p>	
<p>6. If calibration failed, the screen displays "F C" for 30 second. During this period, the user can press the button to repeat the calibration.</p>	
<p>7. During the 30 seconds of "F C" flashing, if no operation, the calibration failed. The screen will display "F" and the detector turns off automatically.</p>	

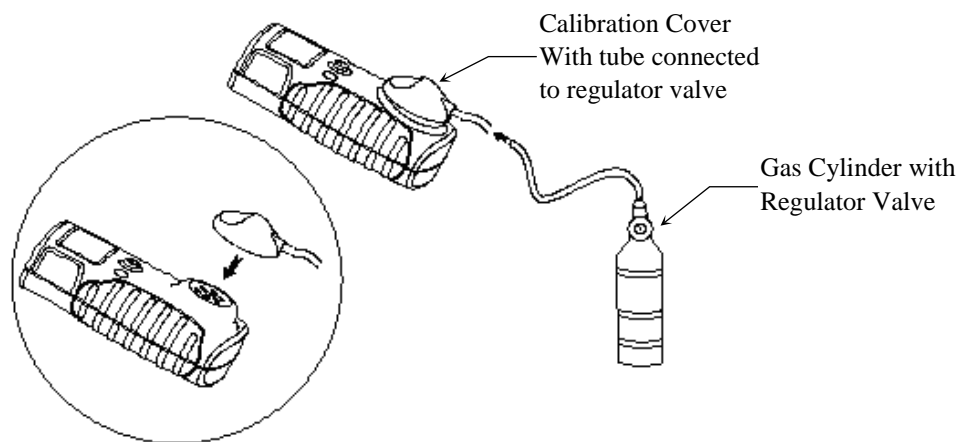


Figure 3: Recon IS with Calibration Adapter

4.0 Troubleshooting RECON-IS

Problem	Possible reason	Solution
The detector cannot be turned on	Battery used up	Please contact <i>ENMET</i> Corporation.
	Circuit fault	Contact the distributor or <i>ENMET</i> Corporation.
No response to the gas	Warm-up not finished	Wait till warm-up is finished
	Circuit fault	Contact the distributor or <i>ENMET</i> Corporation.
Testing not accurate	Sensor is end-of-life	Contact the distributor or <i>ENMET</i> Corporation.
	Not calibrated for long time	Calibrate it in time.
Gas level is negative	Sensor drift	Calibrate zero point
Zero calibration unavailable	Too much sensor drift	Calibrate or replace the sensor

5.0 Sensor Replacement

WARNING: *the replacement sensor must be the same type as the sensor to be replaced.*

Remove retaining screw, open the **RECON-IS**, pull out the present gas sensor (If the sensor is too tight, please shake it slightly and then pull out it). And then put new gas sensor into the sensor socket. Make sure the sensor plug and socket is corresponding. After replacement, screw on the retaining screw.

CAUTION: *When plugging in the gas sensor, please don't use too much pressure. Otherwise, the sensor may be damaged. After replacement, please calibrate the sensor after the detector works for 30 minutes.*

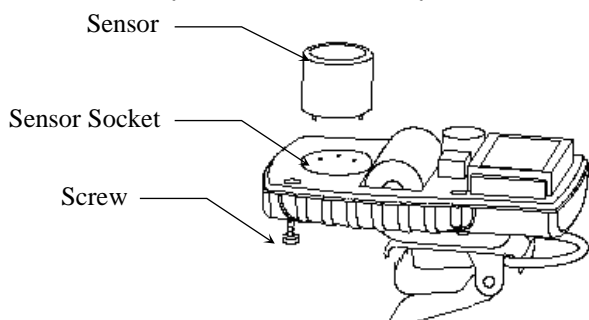


Figure 4: Replacing Recon IS Sensor

5.1 Replacement Sensors

ENMET replacement sensor part numbers:

Table 2: Sensor Part Numbers

Description of Part	Part Number
Sensor H ₂ S	02542-0200
Sensor O ₂	02542-1100
Sensor CO	02542-1200

NOTE: *Contact ENMET Corporation or local distributor for additional sensor information.*

6.0 Maintenance

In order for the **RECON-IS** to operate normally, please follow these maintenance procedures:

Inspect, test and calibrate the **RECON-IS** periodically. *ENMET* Corporation suggests that the **RECON-IS** be calibrated at a minimum of every 180 days.

Keep a record of all the maintenance, calibration and alarms. After extended use, if there is dust on the cover of the detector, clean it by using a clean soft cloth. Do not use an impregnated, soap and polishing reagent for cleaning. When clearing the gas sensing hole, please use dry downy cloth or soft brush.

Please do not put the detector in any type liquid.

- Changing the parts may be harmful to the inner safety of detector.
- Do not use another sensor for your **RECON-IS**. Only use *ENMET* 02542- Series Sensor. See Section 5.1.
- Only assigned model lithium battery 3V DC, 1300 mAh Panasonic CR123A allowed.
- The **RECON-IS** is powered with a lithium battery do not discard with general waste. Dispose of battery per local codes only
- Unauthorized removal, adjustment or repair of the **RECON-IS** will influence the performance of the device and the explosion-proof.

6.1 Maintenance Equipment

ENMET calibration equipment part numbers

Table 3: Calibration Gas and Maintenance Equipment

Description of Part	Part Number
Cylinder, 40 ppm H ₂ S	03314-040
Cylinder, 500 ppm CO	03219-500
Cylinder, 17% Oxygen by Vol. for alarm check only Not calibration	03296-170
Cylinder 20.9% Oxygen by Vol.	03296-209
Regulator, Cylinder: CO, O ₂ , Methane	02506-004
Regulator, Cylinder: H ₂ S	02506-002
Sensor Cover	02543-027
Battery Lithium, 3VDC, 1300mAh or CR123A	*Obtain form local source

***NOTE:** Due to issues with shipping individual lithium batteries, users should purchase the battery from a local source. Panasonic 3VDC, # CR123A, no substitution allowed for approval purposes.

Contact *ENMET* Corporation or local distributor for additional information.

7.0 Technical Data and Specifications

Detection Method	Natural Diffusion
Sensor	Electrochemical Sensor
Detection Range & Alarm Levels	See Table 1
Operation Condition	Temperature: -20°C – 55°C Humidity: 5 – 95%RH non-condensing
Electrical Power	Lithium Battery, DC3.6v CR123A, Rechargeable
Operating Time	Continuous, Non-Alarm Conditions Approximately: 8 Hours for Combustible (LEL) unit 300 Hours for CO, H2S & O2 units
Charge Time	4 – 6 Hours
Expected Sensor Life	2 years
Ingress Protection	IP 65
Approval Rating	CE 0470 Ex II 1G Ex ia IIC T4 Ga
Dimensions	2.4 x 3.9 x 1.3 inches(60x100x33mm)
Weight	5 ounces (140g)

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 Shipping Terms

All shipments are F.O.B. ENMET's facility in Ann Arbor, MI, USA or Bowling Green, KY, USA. Shipping and handling charges are prepaid and added, and must be paid by the customer. Shipping and handling charges may be billed to VISA, MasterCard, American Express, or to the customer's preferred carrier account number. Delivery to the carrier constitutes delivery to the customer, and risk of loss passes to the customer at that time, however, title shall remain with ENMET until payment is received in full. Claims for shortages and damage must be made by the customer to the carrier within 5 days of receipt. **Refer to section "1.1 Unpack" for more information on this matter.**

A special service of \$50.00, or more, may be assessed on expedited shipments.

NOTE: Calibration gases are classified as Dangerous Goods for transportation purposes, and shipping companies charge a hazardous material fee for processing the documentation required for handling such items. Also, other restrictions apply to shipment of Danger Goods by air. Check with **ENMET** for clarification and additional information.

8.3 Payment

Open accounts must be established in advance with ENMET's Accounting department.

Address Payments to:

ENMET
680 Fairfield Court
Ann Arbor, MI 48108

Phone: 734-761-1270

We accept payments by VISA, MasterCard, and American Express. Payment by credit card must be specified at time of order placement. Your credit card will be charged on the date of shipment.

ENMET invoices for products that are shipped on open account are due and payable 30 days from the date of shipment from the **ENMET** site. **ENMET** may institute collection services should any bona fide invoice remain unpaid with no payment schedule negotiated by the customer with the **ENMET** Accounting Department. Any cost incurred by **ENMET** for professional collection services or legal fees to collect on a customer invoice will be added to any future business conducted between **ENMET** and that customer.

8.4 Warranty Information and Guidelines

Equipment must be returned prepaid to the point of origin, and ENMET will prepay the return transportation charges. Transportation prepaid by ENMET will be by most economical means (e.g. FedEx Ground). If an expedient means of transportation is requested during the warranty period, the customer must pay the difference between the most economical means and the expedient mode. ENMET warrants new instruments to be free from defects in workmanship and material under normal use for a calibration and expendable parts such as filters, detector tubes, batteries, etc. In addition, some oxygen cells and other sensors are limited to a warranty period of six months from date of shipment. Refer to the instrument manual for specific warranty details. If the inspection by ENMET confirms that the product is defective, it will be repaired or replaced at no charge, within the stated limitations, and returned prepaid by FedEx Ground to any location in the United States. ENMET shall not be liable for any loss or damage caused by the improper use or installation of the product. The purchaser indemnifies and holds 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 representatives or other persons to assume for it any obligation or liability other than that which is set forth herein.

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

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

- o Be sure to include all paperwork (the “Request for Service” form).
- o Include any specific instructions.
- o For warranty service, include the date of purchase.
- o If you require an Estimate, please contact ENMET.

The “Request for Service” form is on the final page of this manual. This form can be copied or used as needed. For service requests, outside of the warranty period, please refer to the “Returning an Instrument for Service Instruction” found later in this section.

8.5 Return Policy

All returns for credit must be approved by ENMET and identified with a “Return Material Goods” number. Such returns are subject to a minimum of a \$50.00 or 20% restocking fee, whichever is greater. **Approval of equipment for return is fully at the discretion of ENMET.** All requests for return/exchange must be made no later than 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 due to the Department of Transportation refill restrictions. Air Filtration Systems (AFS series & parts) cannot be returned or restocked because their internal surfaces and filters are not amenable to re-inspection.

Certain products, such as stationary systems, or instruments with custom sensor configuration (non-standard) are built to order, and cannot be returned. Cancellation of orders for custom-built products, prior to shipment, will result in the assessment of a cancellation fee. The amount of the cancellation fee will be based upon the size and complexity of the order, and the percentage of total cost expended prior to cancellation.

8.6 Returning an Instrument for Service Instructions

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 unrepared. 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 unrepared 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).

Mailing/Shipping Address:

ENMET
680 Fairfield Court
Ann Arbor, MI 48108
repair@enmet.com



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: _____