

ENMET Corporation
PO Box 979
Ann Arbor, MI 48106-0979

RECON/4

Manual

Manual Part Number
80006-004
MCN-417, 06/22/09

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1.0 Introduction

The **RECON/4** is a portable multi-gas detector, monitoring continuously and simultaneously. It is widely used in areas where explosion-proof instruments are required or possible toxic gas leaks. Examples: underground tunnels or mining industry. For the protection of the life, health and avoid damage of equipment.

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

1.1 Unpack

Unpack the **RECON/4** 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

<p>Items included with the RECON/4</p> <ul style="list-style-type: none"><input type="checkbox"/> Instrument<input type="checkbox"/> Charger<input type="checkbox"/> Calibration Cover<input type="checkbox"/> Screwdriver<input type="checkbox"/> Alligator Clip<input type="checkbox"/> Manual	<p>If there are any shortages or questions regarding this shipment, please notify ENMET Customer Service within 5 days of receipt at the following address:</p> <p style="text-align: center;">ENMET Corporation 680 Fairfield Court Ann Arbor, MI 48108 734-761-1270 734-761-3220 Fax</p>
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1.2 Check Order

Check, the contents of the shipment against the purchase order. Verify that the **RECON/4** 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 Serial Numbers

Each **RECON/4** is serialized. These numbers are on tags on the equipment and are on record in an **ENMET** database.

2.0 Features

2.1 RECON/4 elements

See Figure 1 for location of features:

ITEM	FEATURE	DESCRIPTION
1	Visual Alarm	Red indicators clearly visible on 3 sides and located at the tip of the RECON/4. LED's activate when alarm thresholds are exceeded.
2	Display	The color Liquid Crystal Display (LCD) allows messages to be read clearly Time and Battery status indications, <i>See Section 2.2 for features.</i> Quadrant Color coded for displaying data for each gas
3	Audio Alarm	Loud buzzer located on the front of the RECON/4 The audio alarm (buzzer) is on when the unit is in alarm.
4	Pushbutton	To turn the RECON/4 Power On/Off, <i>See Section 2.3 for functions.</i>
5	Input Port	Calibration gas input port.
6	Sensors	Detection area
7	D-Ring	Attached to alligator clip
8	Alligator-Type Clip	To clip to outside of clothing for hands-free operation
9	Belt Clip	To clip to belt or pocket for hands-free operation
10	Label	Instrument serial number and gases
11	Port	Socket connection for battery charger or computer connection

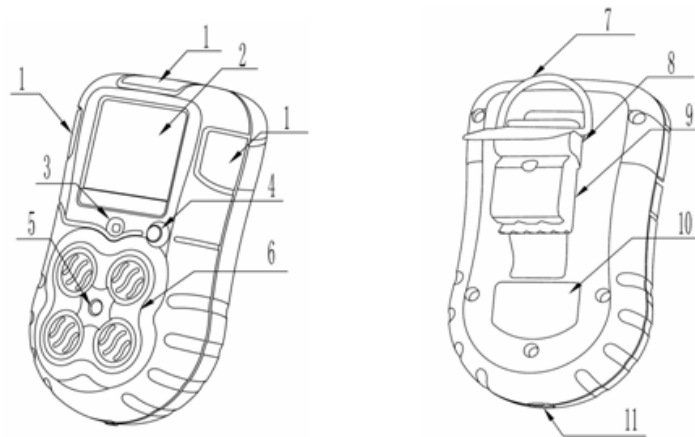


Figure 1

Figure 1: RECON/4 Features

2.2 RECON/4 Display Features

See Figure 2 for location of display features.

Color LCD, Display	Item	Function
<p>The diagram shows a color LCD display with the following layout: - Top left: Time '16:08:25' (Item 1) - Top right: Battery status icon (Item 3) - Middle left: Gas type 'O₂' (Item 4) and measurement '18.5' (Item 6) with unit '%vol' (Item 7) and a 'LOW' alarm indicator (Item 8). - Middle right: Gas type 'H₂S' (Item 4) and measurement '0' (Item 6) with unit 'ppm' (Item 7) and a 'TWA' alert indicator (Item 5). - Bottom left: Gas type 'CO STEL' (Item 4) and measurement '518' (Item 6) with unit 'ppm' (Item 7) and a 'HIGH' alarm indicator (Item 8). - Bottom right: Gas type 'CH₄' (Item 4) and measurement '30' (Item 6) with unit '%LEL' (Item 7) and a 'HIGH' alarm indicator (Item 8).</p>	①	Time
	②	Quadrant Gas Data, color coded
	③	Battery status
	④	Gas Type, each quadrant
	⑤	TWA or STEL alert
	⑥	Gas Measurement, each quadrant
	⑦	Unit of Measure, each quadrant
	⑧	High or Low Alarm Indication

Figure 2: RECON/4 Display

2.3 RECON/4 Pushbutton Function

Pushbutton	Function
	<ul style="list-style-type: none"> ● Turn on: Press and hold for 1second, the RECON/4 is power on. ● Turn off: Press and hold for more than 3 seconds, the RECON/4 is power off. ● Audio: When in alarm, press it once and the audio will silence. ● Vibration: When in alarm, after audio alarm is silenced, press it once and vibratory alarm will stop. ● RECON/4 status: When the RECON/4 is on, press it to check max gas level, min gas level, STEL, TWA, current time, serial number and version number. ● Calibration: <i>See Section 4.0.</i>

3.0 Operation RECON/4

CAUTION: RECON/4 is set to auto zero calibrate after turning on. Turn on the RECON/4 in clean air. Incorrect readings will occur if the RECON/4 is turned on in contaminated air.

3.1 Activate RECON/4

Press and hold the button for 1second and then release it. After the buzzer gives a short sound once, the RECON/4 is on.

The RECON/4 will display **ENMET** information and run a self test.

The display will indicate “Starting Warming up” with each test listed below

Example: Alarm, Vibrator, “High alarm”, “Low alarm”, “STEL” and “TWA”.

After that, it enters detecting status. At this time, it displays the concentration of O2, H2S, CO and Combustible gas in the environment.

3.1.1 Display Conservation

Following the warm up, to conserve battery life, the display will fade to black in about 30 seconds. An audio confidence “chirp” will activate every 3 minutes to indicate the RECON/4 is active.

NOTE: Pressing the button or any gas detected event will recall the display.

3.2 Deactivate RECON/4

To turn the RECON/4 off, press and hold the button for 3 seconds, the buzzer gives a short sound twice and long sound once. The RECON/4 is now off.

3.3 RECON/4 Alarm

(1) When the gas concentration reaches the preset alarm levels, the RECON/4 will activate relative alarms:

The LED lights flash, audio alarm sounds and vibratory alarm activates.

The user can cancel audio and vibratory alarm by pressing and releasing the button: The first press will cancel audio alarm, and the second to cancel vibration.

(2) When the RECON/4 is kept in an environment with the target toxic gas, if the gas concentration is more than the maximum average level of TWA or STEL, the RECON/4 will give TWA or STEL alert. At this time, the user can also cancel the audio and vibratory alarming by pressing the button as described in above Section (1).

Alarms sound when its sensor faults or at low battery status. Please refer to the LCD display for details.

3.4 RECON/4 Status Check

When the RECON/4 is on and in non-alarm status, press and release the button, the LCD screen will display max. gas level and min. level*, STEL**, TWA**, current time, serial number(SN) and version number(VER) in turn.

NOTE: *Only O2 sensor has such indication.

**Only toxic gas sensors have STEL and TWA alert.

3.5 RECON/4 Battery Charging

When the battery voltage is low, the RECON/4 will not function properly. To recharge the batteries of the RECON/4: The RECON/4 must be *Off*, connect the AC connector plugs of the charger to a 110VAC or 220VAC outlet and plug the charging cable into the RECON/4. The detector will activate automatically and indicates that it is being charged. When the charging cycle is completed, the display will indicate full charge.

WARNING: DO NOT start the battery charge process with the RECON/4 power on; otherwise the charge speed will be adversely affected. Always charge the battery in normal ambient air. Do not charge the RECON/4 in a hazardous area to be monitored, to avoid fire or explosion. Disconnect the charger after 24 hours, failure to do so will damage the battery.

4.0 Calibration

CAUTION: This operation is to be performed in clean air.

The **RECON/4** is capable of calibrating all active channels at the same time, however, **ENMET** Corp recommends you calibrate individual gas sensors.

With the **RECON/4** on, Press and hold the button, the **RECON/4** will turn off, continue to press the button.

- After about 10 seconds, the LCD screen will display again and enters calibration mode, then release the button.
- After warming up, the **RECON/4** begins zero calibration. Please put the **RECON/4** into the clean air environment.
- When the screen displays the calibration level,
- Inject the standard gas into the **RECON/4** as indicated in **Figure 3**.
- The **RECON/4** will automatically analyze the gas and process the calibration.
- After calibration, the screen will display the calibrated gas name and relative data.
- For each sensor being calibrated, repeat the above process.

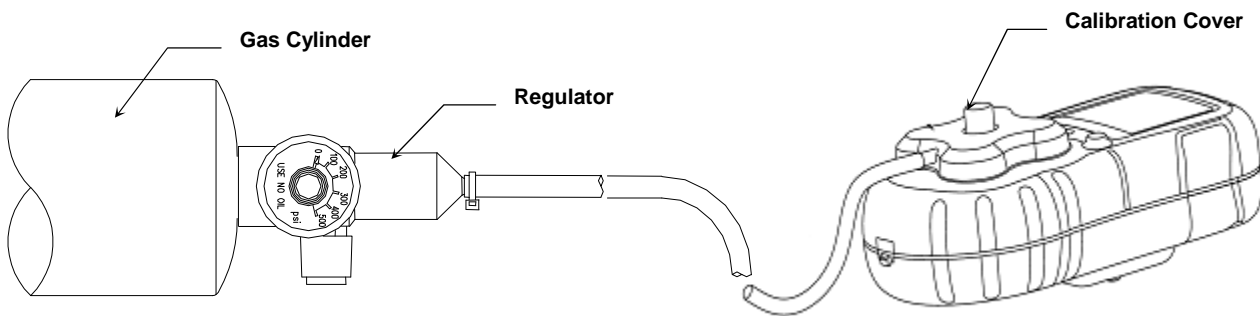


Figure 3: Calibration of RECON/4

4.1 Calibration Equipment

ENMET part numbers

Description of Part	Part Number
Regulator Assembly for 34 liter cylinder	02506-002
Regulator Assembly for 17 liter cylinder	02506-004
Gas Cylinder, 40ppm H2S, 34 liter	03314-040
Gas Cylinder, 500ppm CO, 17 liter	03219-500
Gas Cylinder, 50%LEL Methane, 17 liter	03220-050
Gas Cylinder, 20.9% O2, 17 liter	03296-209
Gas Cylinder, Mixed Gas, 34 liter 500ppm CO, 40ppm H2S, 50%LEL CH4, 20.9%O2, balance N2	03388-001

5.0 Technical Data and Specifications

Electrical Power	Working Voltage	3.6VDC, Lithium battery, rechargeable
	Operation Time	Approximate 8 hours, continuous, non-alarm condition
	Charge Time	Approximately 6 hours
Operation	Temperature Range	-20°C to +50°C
	Relative Humidity	5 to 95% RH, non-condensing
Mechanical	Dimensions	2.6 x 4.6 x 1.2 inches (66 x 116 x 31 mm)
	Weight	7 ounce (200g)
	Ingress Protection	IP 65
	Approval	Designed to be Intrinsically Safe

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

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 are 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

80006-004

April 2008

MCN-411, 12/10/08

MCN-417, 06/22/09



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 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 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 Card Code
 American Express _____
Card number Expiration Card Code

Name as it appears on the credit card _____

Return Shipping Method:

- UPS: Ground 3 Day Select Next Day Air ND Air Saver 2-Day Air
- UPS Account number: _____
- 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:** \$ _____