



GS-24-DF
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 **ENMET GS-24-DF** is designed to be used with most **ENMET** Corporation stationary sensor/transmitters.

Specifications:

Flow Range	0 – 1 /PM, 2 – 0 CFM, or 0 – 2000 CCM
Power	24 VDC
Alarm Relay	Positive safety, 2A 30VDC, 0.4A 115VAC
Digital Display	Backlit
Alarms	Audio and LED indicators

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

1.1 Unpack

Unpack the **GS-24-DF** 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 **GS-24-DF** 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 **GS-24-DF** is serialized. These numbers are on tags on the equipment and are on record in an **ENMET** database.

2.0 Specifications and Features

2.1 Specification of the GS-24-DF

Power Requirement	10 - 30 VDC
Suction Flow Rate	0.5 Liter/min. (adjustable after installation)
Sampling distance	100 ft. maximum
Suction Pump	Electromagnetic diaphragm pump
Piping Material	Polypropylene, Teflon lined vinyl tubing
External Piping Connections	Push Lock fitting for ¼ O.D. tubing
Installation Method	Wall mounting
Dimensions	11(w) X 6.5(H) X 5(D) inches
Weight	2 lbs.
Operating Temperature Range	+32°F (0°C) to +104°F (40°C)

Specifications subject change without notice.

2.2 Features of the GS-24-DF

For location of features See Figure 1 and 2

Feature	Description
Power Terminal	This terminal provides connections for: the DC power (24 VDC) supplied from external power source, Sensor/Transmitters and 4-20mA
Display	LCD, Allows the user to verify and monitor the flow rate of the air sample. Standard flow rate, approximately 05 ℓpm (liter per minute).
Indicator LED	Green/Red: When green indicates flow rate is sufficient. When red indicates flow rate is inadequate. Yellow: When on solid indicates GS-24-DF is in menu to change settings When flashing indicates GS-24-DF is in menu to calibrate (<i>factory use only</i>)
Sampling Pump	This electromagnetic diaphragm pump draws the air sample from the test area to the sensor chamber.
Pushbutton Switch	SW1: Menu Switch, this switch is for viewing/changing display settings. SW2: Select Switch, this switch is for temporary deactivating audio alarm and changing display settings.
Potentiometer	Flow Adjustment Potentiometer (POT)
Inlet Port	This port draws the air sample from the test area. For external piping, use ¼" O.D. tubing. See section 4 for type of tubing to be used.
Outlet Port	This port expels the air sample after it passes the sensor. For external piping, use ¼" O.D. tubing
Gas Sensing Chamber	This chamber directs the air sample to the gas sensor. Varies, depending on the type of sensor/transmitter.

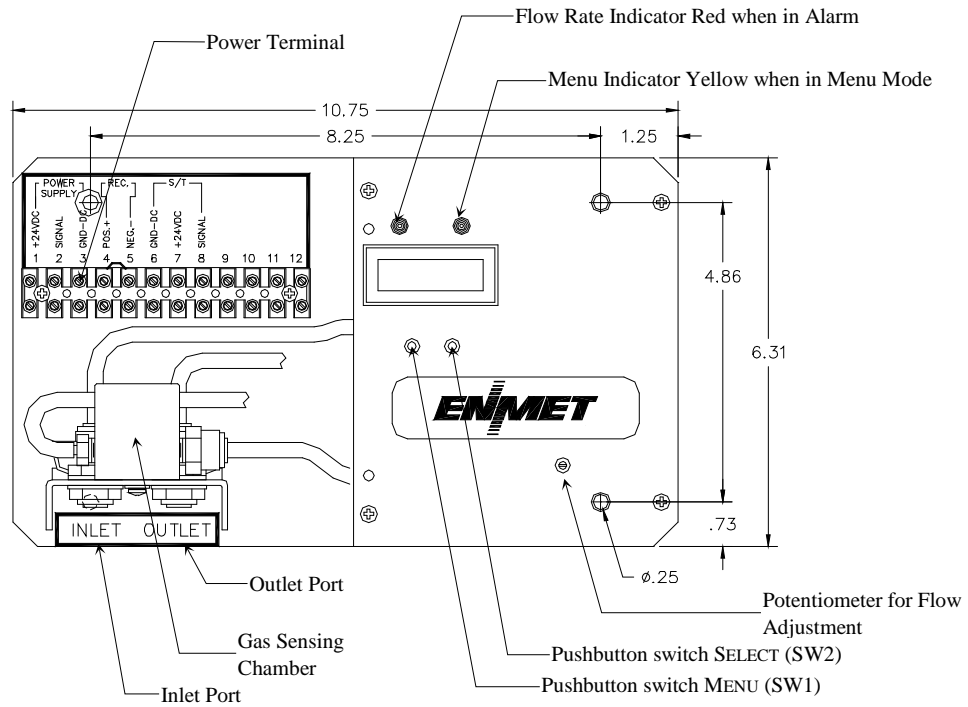


Figure 1: Front View

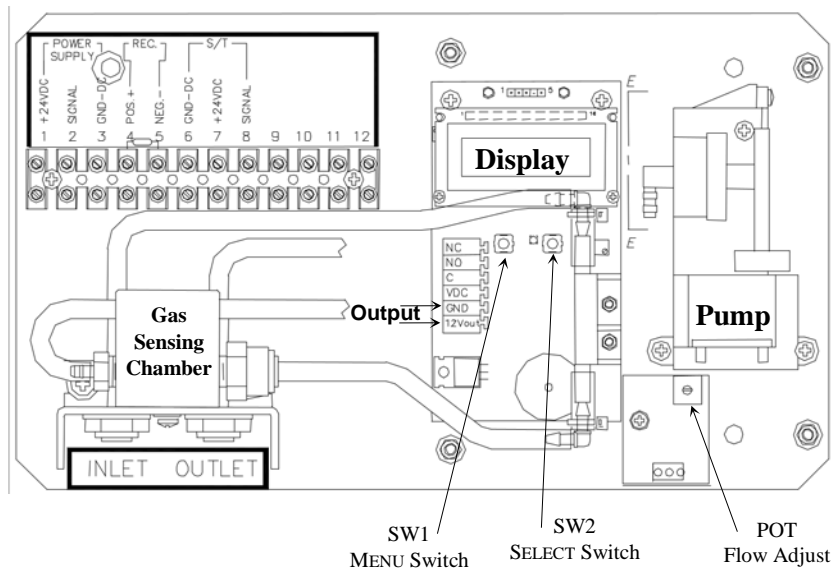


Figure 2: Interior View

3.0 Installation

The **GS-24-DF** needs to be level and as close to the area to be monitored as possible, to reduce transport time to the sensor/transmitter.

- Sensor/Transmitters can be located within the **GS-24-DF** or remotely.
- Inlet tubing must be compatible with the target gas.

Non-reactive gases Standard vinyl or tygon tubing, **ENMET** part number 73073-001

Reactive gases Teflon lined vinyl or tygon tubing, **ENMET** part number 73073-029

- Caution should be used to ensure that fluids do not enter the inlet tubing.
- Some types of gases require that the sample gas be removed from the area. This is accomplished with the outlet port.
- Power is supplied from an external source. Connect 24 VDC to terminal block positions 1 and 3.
- Note 12Vdc output is available on the pump module.
- After installing all the tubing and the sensor/transmitter, verify that there are no leaks in the system. Verification should be done by plugging the inlet tube. If the system is correct the flow meter reads zero and the flow alarm activates. If this does not happen, check all fittings and seals.

4.0 Display Settings

To display the current settings of the **GS-24-DF** use the push button switches. See figures 1 and 2 for location of switches. Access the MENU and SELECT switches through holes in front. See figures 1 and 2.

To cycle through the display settings press:

MENU switch once = Low Flow alarm setting.

MENU switch twice = High Flow alarm setting.

MENU switch three times = Audio alarm on or off.

MENU switch four times = Raw sensor signal in millivolts.

To disable audio alarm press:

SELECT switch once = Audio Alarm (horn) disabled for approximately 1 minute.

4.1 Changing Display Settings

To change the current setting of the **GS-24-DF** use the push button switches.

Press and hold MENU switch for *three seconds*, display will indicate Units

Press MENU switch again, once for each setting: SET LO, SET HI, Set audio or Display menu.

When Units is displayed: Press SELECT switch to change value.

Press MENU switch to step through the values: LPM, CCM, CFM

Press SELECT switch to exit, Display steps to SET LO

When SET LO is displayed: Press SELECT switch to display the value.

Press MENU switch to change the value.

Press SELECT switch to Exit

When SET HI is displayed: Press SELECT switch to display the value.

Press MENU switch to change the value.

Press SELECT switch to Exit

When SET AUD is displayed: Press SELECT switch to display On or Off.

Press MENU switch to change

Press SELECT switch to Exit

When DISPLAY is displayed: Press SELECT switch to display On or Off.

Press MENU switch for Flow Dsp or Go/NoGo.

Press SELECT switch to Exit

5.2 Check Valve Housing Replacement

If the check valve becomes damaged or to warn to operate correctly it can be replaced.
 Pump repair kit *ENMET* part number 04018-116.

WARNING: *The check valve housing and associated gasket must be installed in the proper position for the pump to operate correctly. If they are installed improperly the pump will flow in the wrong direction.*

- Remove the outlet fittings, pump arm with diaphragm and note the orientation of the check valve housing and gasket. See figures 5 and 6.
- Remove flat-head screw and check valve housing.

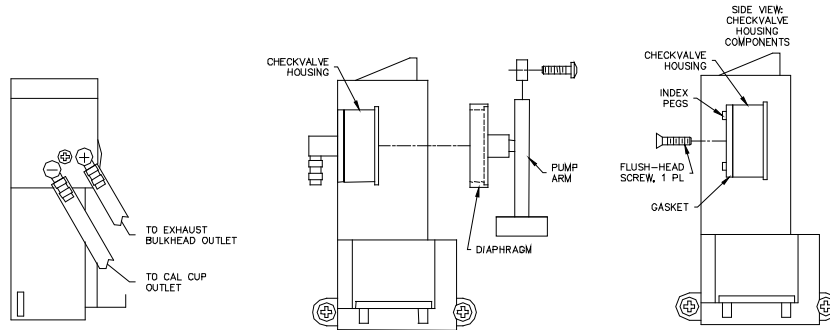
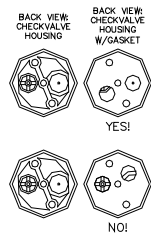
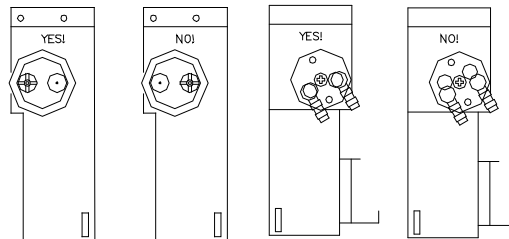


Figure 5: Check Valve Housing Replacement Details

- Verify that gasket and housing are in the proper position.



Verify Gasket



Verify Housing position – Inside and Outside

Figure 6: Proper Orientation of Check Valve Housing and Gasket

- Replace check valve housing with flat head screw.
- Verify proper position of check valve housing.
- Reattach pump arm and reseal diaphragm
- Reattach outlet fittings

6.0 Terms and Conditions

6.1 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.

6.2 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.

6.3 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.

6.4 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.

6.5 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.

6.6 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: _____