USER GUIDE

LAB MONITOR FOR TRACE MOISTURE

LM-H_2O-A, Part Number 103572 (110 VAC)
LM-H_2O, Part Number 103571 (110 VAC)
LM-H_2O-A, Part Number 103603 (220 VAC)
LM-H_2O, Part Number 103602 (220 VAC)

VAC

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1 INTRODUCTION

1.1 GENERAL

The Vacuum Atmospheres Lab Monitor accurately measures and displays trace moisture levels in inert gas systems. Using an aluminum oxide, NIST traceable moisture probe coupled to the display unit with a 2 wire, 4-20 mA current loop, the analyzer will display moisture levels down to 0.5 ppm.

Two models are available:

LM-H_2O-A	Lab Monitor for Trace Moisture, with alarm, form C relay contacts and 0-1 VDC output setpoint
LM-H_2O	Lab Monitor for Trace Moisture, basic model

Both moisture analyzer models feature autoranging 3 1/2 digit LCD displays.

Housed in a compact enclosure, the analyzer is easy to set up and operate. The small footprint allows mounting in various convenient locations on or near the glove box. One port is required in the glove box for mounting the moisture probe. All installation hardware is provided. The analyzer requires 24 VDC power from a supplied power adapter.

Vacuum Atmospheres Company also manufactures a Lab Monitor for Trace Oxygen in the same form factor as the moisture analyzer. If both trace moisture and oxygen measurement are to be added to your system, the units may then be stacked, placed side by side, or kept in separate locations as the need dictates. See the separate *Lab Monitor for Trace Oxygen User Guide* for full information.

1.2 LAB MONITOR CONFIGURATION

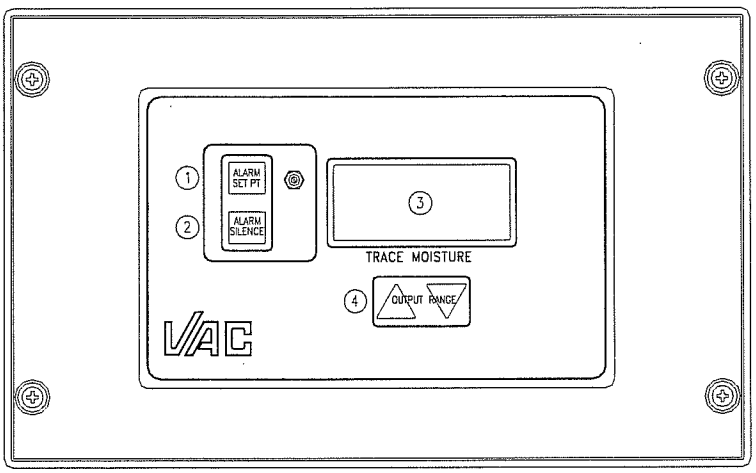


Figure 1-1
Front View, LM-H_2O-A

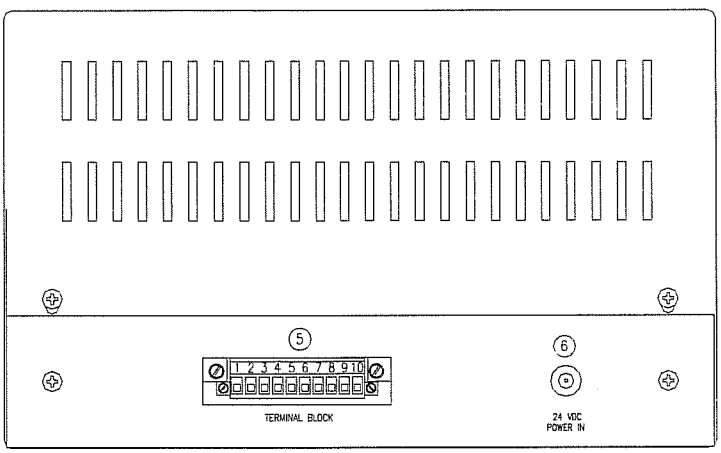


Figure 1-2
Rear View, LM-H_2O-A

1. Alarm Set Point Key and Adjustment Potentiometer
2. Alarm Silence Key
3. LCD Display
4. Output Range Selection Key
5. Moisture Probe Connections, Analog Output and Alarm Relay Contacts
6. 24 VDC Power In (from power adapter)

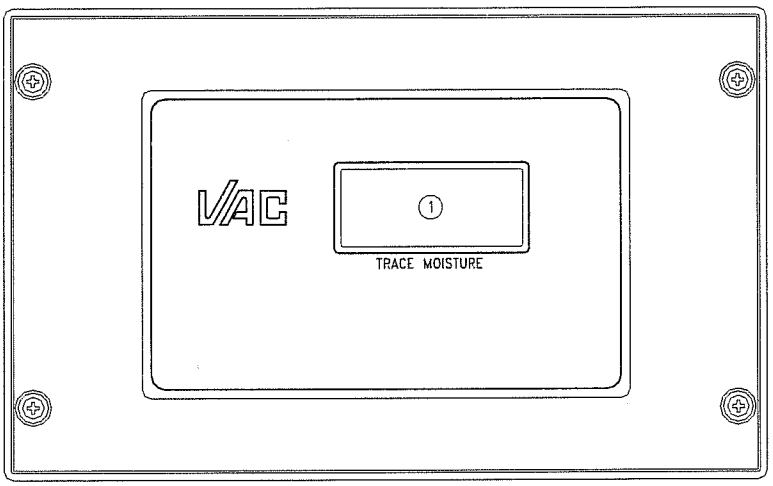


Figure 1-3
Front View, LM-H_2O

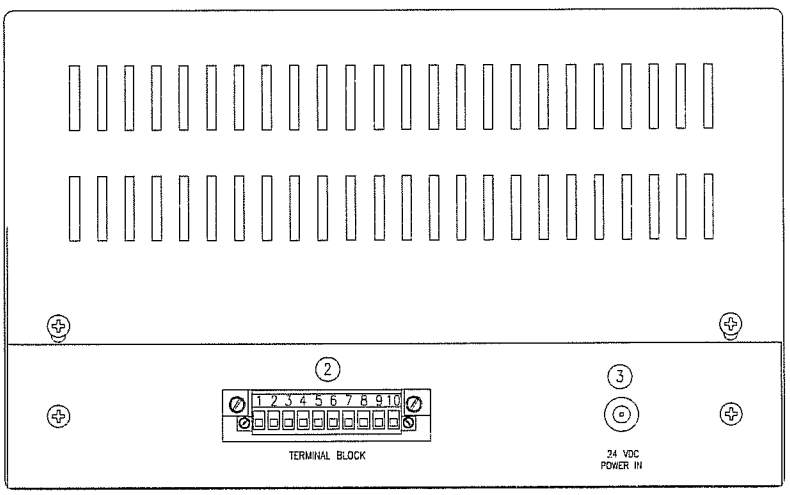


Figure 1-4
Rear View, LM-H_2O

1. LCD Display
2. Moisture Probe Connections
3. 24 VDC Power In (from power adapter)

2 INSTALLATION

2.1 UNPACKING AND INSPECTION

Remove all the plastic wrapping from the unit. Carefully inspect for any sign of shipping damage. Call VAC immediately if any damage is noted.

2.2 ELECTRICAL UTILITIES

The analyzer requires 24 VDC power, provided by the supplied power adapter. Depending on your model, the adapter plugs into 110 or 220 VAC, 50/60 Hz power.

2.3 ANALYZER PLACEMENT

Find a secure, level location for the analyzer, on or near the glove box. Do not plug in the wall mount adapter at this point.

2.4 INSTALLATION OF MOISTURE PROBE

The bulkhead fitting, O-ring and nut for installing the moisture probe are supplied with the kit. A 1-¾" diameter hole in the glove box is required. See Figures 2-1 and 2-2 for details.

Install the moisture probe into the coupling and tighten using the hex collar on the probe.

Warning: Do NOT use the moisture probe body to tighten the probe into the fitting. Use the hex collar ONLY.

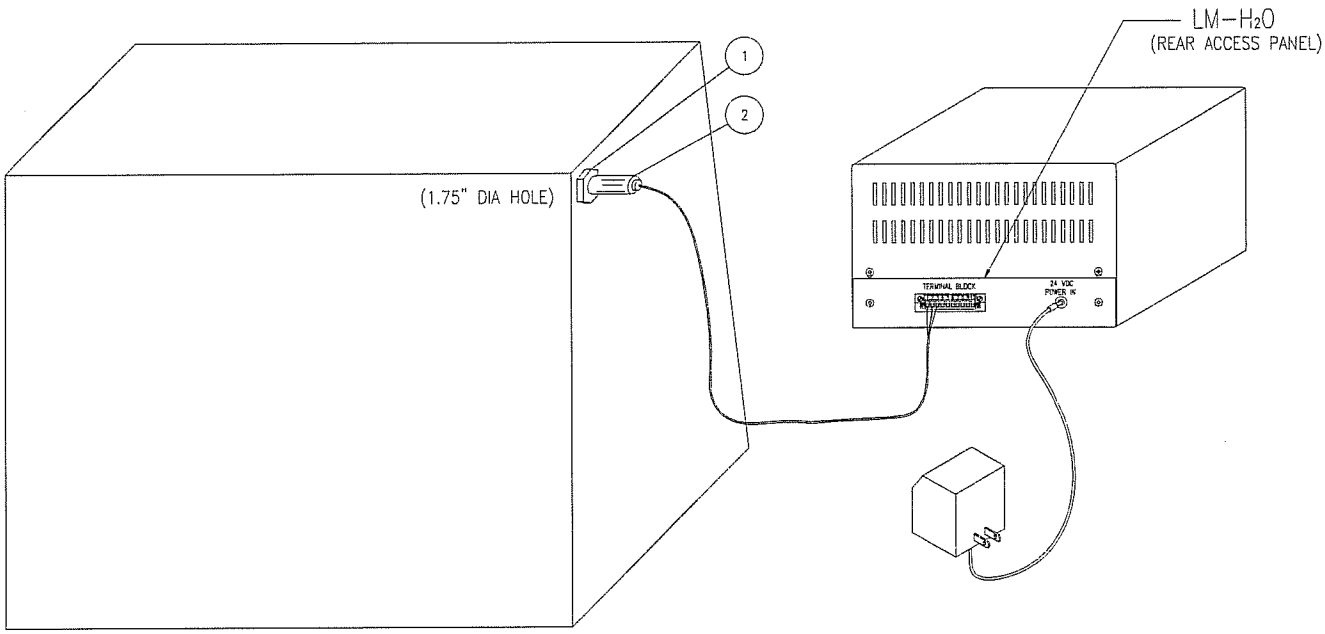
Connect the supplied cable assembly to the moisture probe.

Before proceeding, make sure the probe connection is tight and leak free. Any leaks in the system will contaminate the glove box atmosphere and reduce the quality of the inert atmosphere.

2.5 CONNECTIONS TO TERMINAL STRIP

Both LM-H_2O-A and LM-H_2O have terminal strip connectors on the rear panel. A mating connector is supplied with screw connections.

Pin	LM-H_2O-A Function		LM-H_2O Function
1	24 VDC to probe (blue wire)		24 VDC to probe (blue wire)
2	Signal from probe (brown wire)		Signal from probe (brown wire)
3	Shield		Shield
4	+ Out	0-1 VDC	Not Used
5	- Out		Not Used
6	Shield		Not Used
7	Not Used		Not Used
8	Com	Alarm Relay	Not Used
9	N.C.		Not Used
10	N.O.		Not Used



Item	Description
1	Feedthru Assy, VAC 900052
2	Probe and cable, VAC 2258

Figure 2-1
Glove Box Installation

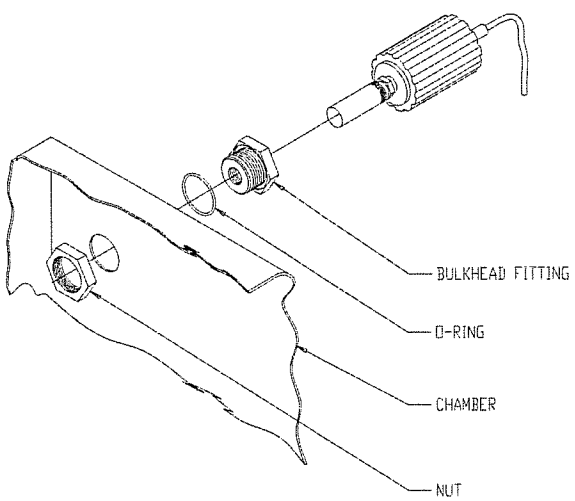


Figure 2-2
Installation Detail

3 START UP

3.1 START UP PROCEDURE

Plug in the power adapter to apply power to the analyzer. After a short initialization period, the display should indicate moisture level in ppm.

3.2 MOISTURE PROBE DRY-DOWN TIME

Because initially it is saturated with atmospheric moisture, the probe may take several days before it will accurately measure the level in a dry glove box.

4 LM-H_2O-A OPERATION (WITH ALARM)

4.1 ALARM CONFIGURATION

An internal audio alarm will sound when the oxygen level exceeds a user defined set point. The display also indicates ALARM in the lower left corner when this occurs. The normally open relay contact (on the rear terminal strip connector, see sect. 2.5) will close at this point also. The user can silence the alarm by pressing ALARM SILENCE, but the N.O. relay contact will remain closed and the ALARM display will remain until the moisture level is once again below the set point.

4.2 SETTING THE ALARM LEVEL

1. Press the UP and DOWN arrows simultaneously and hold them down until the range is displayed.
2. Release the UP and DOWN arrows, then quickly select the range using the UP or DOWN arrow. If the range is correct, go to the next step. Note that the range is the maximum value of the alarm setpoint, so for example, if the intended alarm setpoint is 5 ppm, choose the 10 ppm range, and if the intended alarm setpoint is 12 ppm, choose the 50 ppm range.
3. Immediately press ALARM SET PT. The display will indicate ALARM in the lower left corner, and the current alarm set point will be displayed. Hold ALARM SET PT down and adjust the adjacent potentiometer until the desired setpoint is reached.
4. Release ALARM SET PT and after 5 seconds the normal display returns.

If at any point during this procedure, more than 5 seconds elapses between the time a key is released and the time the next key is pressed, the display reverts to normal and you will need to start again. DO NOT adjust the potentiometer while the display is in the normal mode - it will have no effect on the alarm setpoint until you re-enter the alarm setpoint procedure.

4.3 CHECKING THE ALARM LEVEL

Press ALARM SET PT while the normal display is on.

4.4 0-1 VDC OUTPUT

This output may be used for a strip chart recorder or a similar device. See sect. 2.5 for terminal strip pin connections. The voltage range corresponds to the range selected in 4.2 step 2 above. For example, 500 mV represents 5 ppm when the selected range is 0-10 ppm.

5 CHANGING THE MOISTURE PROBE

All moisture probes have a calibrated output so that the probes are interchangeable. The moisture probe should be calibrated approximately once a year and must be sent back to the factory for calibration.

To remove the moisture probe:

1. Disconnect the electrical connector on the probe.
2. Maintain the glove box at positive pressure, between +4" and +5" water column, to prevent air from contaminating the glove box atmosphere while changing the probe.
3. Unscrew the probe from the coupling using the hex nut collar.
   Do NOT use the probe body to unscrew the probe!
4. Quickly plug the coupling with a 3/4-16 thread bolt (wrap teflon tape around the threads to prevent any leaking) while having the probe calibrated.
5. Return the glove box pressure to normal conditions.

To re-install the probe, reverse the procedure.

6 SPECIFICATIONS

Both Models:

Sensor Type: Thin film aluminum oxide moisture sensor probe

Dewpoint Range: -80°C to +20°C (display is in ppm, range is 0.5 ppm to 2.3%)

Accuracy: ±2°C from –65°C to 20°C, ±3°C from –80°C to -66°C

Repeatability: ±0.5°C from –65° to 20°C, ±1.0°C from –80° to -66°C

Response Time: <5 seconds for 63% of a step change of moisture content in either wet-up or dry down cycle.

Operating Temperature: -40°C to 60°C

Power requirements: 500mA @24VDC, adapter supplied for 110 VAC or 220 VAC, 50/60 Hz.

LM-H_2O-A (Moisture Analyzer with Alarm)

Analog Output: 0 - 1 VDC, output depends on range selection.

Moisture Alarm Contacts: Form C contacts rated at 1 A, 120 VAC/30 VDC.

Dimensions

10.5" W x 5.9" D x 6.5" H

Revision Record

Rev	Description	Date	Approved
A	E.O. 15396	04/13/04	WCM
B	E.O. 15443	05/10/04	WCM
C	E.O. 15727	05/17/05	WCM
D	E.O. 15910	11/20/06	WCM / SJ