

## Fumiscope

Model D, 4.0, 4.2

### Operating instructions

#### Purpose and principles of operation

The Fumiscope is a portable instrument which will measure the concentration of gases in the air. The instrument is calibrated for the measurement of Methyl Bromide and Vikane gases in the range of concentrations used in fumigations for insect pest. The display indicates the concentration of these fumigant gases in dry air to an accuracy of 2 percent of the full scale reading, in the range from 0 - 2999 oz. per 1000 cu. ft. of Methyl Bromide or Vikane.

(oz. per 1000 cu. ft. is the same as metric readings ).

The Fumiscope employs a thermal conductivity cell to compare the thermal conductivity of a mixture of gas and dry air to that of ambient air. This difference is converted into an electric current which represents the concentration of the fumigant and is shown on the digital LED display. The Fumiscope contains a power supply for operation from a 115 volt or 220 volt A. C. line. ( user selectable ) The Fumiscope also contains an electric air pump and gas flow meter so the gas sample can be drawn through the T/C cell at a controlled rate.

The Flow rate of the sample stream may be adjusted to a constant value, regardless of the length of the sample tubing by the flow adjustment knob. A line filter is placed in the gas sample line to prevent water and dirt from entering the instrument. The Fumiscope , being a portable instrument, requires no more than a level place to set the instrument, and a grounded power source. The power requirement of the Fumiscope is only 200 watts, so a small 12 volt inverter can be used to increase instrument portability. The Fumiscope is complete in one case and requires no other auxiliary equipment.

**Inlet** - This hose connection is the connection for the sample line to connect to the instrument through the line filter. A 1/4 " I.D. vinyl sample line should be used and NO adapters or couplings should be used.

**Digital Display** - The digital LED display registers the concentration in oz. per 1000 cu. ft. There is no need to convert readings, however, 1 oz. = approximately 250 ppm.

**Fumigant selector switch** - As marked by MeBr and Vikane this switch changes the display to register the concentration of the selected gas.

**Zero adjust knob** - This adjustment is used to bring the display to read Zero after the instrument has warmed up and settled. The instrument should be set to zero before taking reading and reset after each reading.

**Line switch** - The line switch is used to turn the instrument on and off. The switch panel contains the fuses and can be changed to accommodate 120 volt or 220 volt. The instrument can be left on for long periods of time without harm, in fact, it is beneficial to do so.

**Exhaust** - An outlet fitting is provided to return exhausted gases back to the fumigation chamber. This is recommended when the instrument is used in confined spaces. When used outdoors this may not be necessary, however, it is recommended the exhaust be directed away from the operator.

**Flow Meter** - The flow meter indicates the amount of gas sample being drawn through the unit. The flow meter should always be set to the # 1. This is the flow rate that is used to calibrate all Fumiscopes. The

meter may need to be adjusted after sample lines are attached and disconnected. The Flow meter should always read 1.0. Occasionally the flow meter ball may stick. A gentle tap may be necessary to dislodge the ball.

Flow rate adjustment - This knob adjust the flow rate of the flow meter. The flow rate should ALWAYS read 1.0.

Operation - When using the Fumiscope to monitor the gas concentration during a fumigation it is set up in a location outside the area to be fumigated, but easily accessible to the operator and the line source of power and light.

The sample tubing used is 1/4" I.D. polyvinyl tubing. Clear tubing is used so that it may be inspected for dirt and water. If either is present do NOT use the tubing. The tubing should be clean and dry. Water will damage the Fumiscope. The sample tubing should be placed at some point in the fumigation area that the fumigator feels will best represent the whole fumigation area. Frequently several tubes are used to monitor the gas concentration various locations within the fumigation area to check the distribution of the gas.

When all is setup, the Fumiscope should be turned on and allowed to warm up. This should take about 5 - 10 minutes. It is recommended the Fumiscope be kept at the same temperature as the fumigated sight. It may take up to 2 hours for the Fumiscope to acclimate if moved from and extreme temperature. After the display settles the flow meter should be set to the # 1 and the display should be set to zero. The Fumiscope is now ready to take readings.

After the gas has been introduced and allowed to reach equilibrium, connect the sample tube to the filter and allow the pump to draw a sample into the Fumiscope. This may take a few minutes depending on the length of the sample tubing. Wait until the instrument reaches it's maximum reading and does not move for 30 seconds. This is the gas reading. Make sure the flow meter is still on 1.0 with the tube connected. When the sample tube is disconnected the instrument should return to zero. Again check the flow meter (1.0). If necessary re-zero the instrument before taking additional readings.

Measuring other gases - The Fumiscope can be calibrated to measure other gases. Carboxide can be read on the Vikane scale without having the instrument re - calibrated.

Maintenance - The line filter should be clean and dry. Replace the filter if the flow rate of 1.0 can not be obtained or moisture is present. This will extend the life and calibration of the Fumiscope.

Avoid letting any water or dirt to enter the unit. Check the sample tubing to be sure there is no moisture in the lines. It is advisable to run the Fumiscope before going to the fumigation job. Let the instrument run for several hours especially if the unit has not been operated for long periods of time.