

INTELLIGENT Flow METERS

Varian's Intelligent Digital Flowmeter

Operating Instructions

varian 
analytical instruments

Varian's Intelligent Digital Flowmeter

Packing List

Thank you for choosing Varian's Intelligent Digital Flowmeter. When unpacking the box, please make sure it contains the following:

- 1 Varian's Intelligent Flowmeter
(battery included)
- 1 Instruction Manual

Principle of Operation

The Intelligent Flowmeter provides continuous, real time measurements of all **NON-CORROSIVE AND NON-FLAMMABLE GAS FLOWS**. Unlike bubble flowmeters, the Intelligent Flowmeter operates without liquids, bubbles or glass parts.

When activated, a solenoid actuated valve interrupts the gas flow momentarily. The gas flow moves a diaphragm in proportion to the flow rate. This movement is transformed by the microprocessor into a digital value which is displayed instantly.

Adjusting the Viewing Angle

The flip down wire stand will give you a better viewing angle when the Intelligent Flowmeter is placed above bench level. Simply pull the stand down until it is in the locked position.

Taking a Flow Measurement

Make sure that the flow to be measured is within the range of the flowmeter. Over ranging the flowmeter can damage the transducer. Briefly press the on/split button. The display will flash the message **WARMUP**. During this time, the microprocessor will run a self-diagnostic to ensure the system is functioning correctly. **Always turn the flowmeter on before connecting to a flow source.**

Connect the flexible tubing to the gas source to be measured, wait for the reading to stabilize (1 - 2 seconds) and record the reading.

Note: Low flows (less than 1 mL/min) may take up to 5 seconds for the reading to stabilize.

Important

When compared with readings from the Intelligent Flowmeter, measurements taken with bubble-type flowmeters may show a difference. This is not a problem with your new Intelligent Flowmeter.

As a consequence of the ideal gas law, measurements made with both soap bubble meters and the Intelligent Flowmeter are temperature sensitive. However, bubble-type flowmeters add water vapor to the gas being measured which introduces error into the flow rate measurement.

Even when accurately calibrated, soap bubble meters typically read slightly higher than the Intelligent Flowmeter. The higher readings arise from relatively high concentrations of water vapor present in the soap bubble apparatus. At room temperature, water vapor can raise readings by nearly 4%. This unfortunate property is amplified by the effect of temperature. As the measured gas or the flowmeter itself is warmed, the amount of water vapor increases, and the reading can be much higher than the true flow rate. Figure 1 shows the effect of water vapor on volumetric flow measurements. Since the Intelligent Flowmeter is BUBBLE-FREE, this error is not introduced into the flow rate measurement.

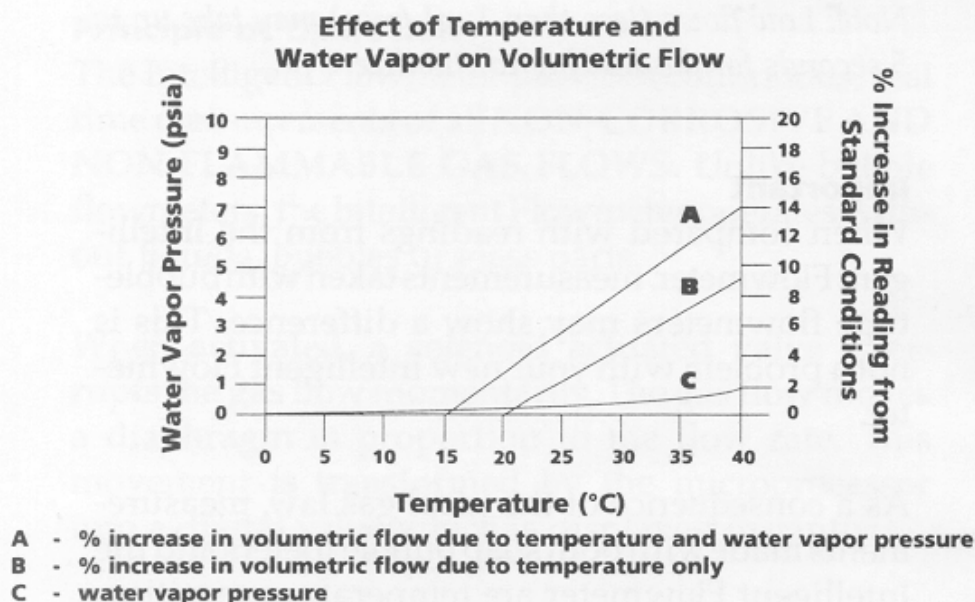


Figure 1. Effect of temperature and water vapor on volumetric flow.

Autoranging Display

The microprocessor automatically adjusts the resolution of the display in response to various gas flow ranges as follows:

<u>Flow (mL/min)</u>	<u>Resolution (mL/min)</u>
0.5 – 9.99	.01
10.0 – 99.9	0.1
100 – 1000	1.0

Auto/Manual Power Off

Every time the unit is activated, a “power-off” cycle begins, lasting 10 minutes. If the flowmeter is not used during this time, the unit will turn off. To conserve battery power, turn off the instrument manually by pressing and holding the on/split button until the sign off message appears.

Low Battery Indicator

When the **LOWBAT** symbol is displayed, replace the battery. (We recommend a standard 9V alkaline battery.) Install it by removing the battery cover on the back of the case. Change the battery and replace the cover.

Reading & Setting a Split Ratio

Turn the unit on by briefly pressing the on/split button. Connect the flexible tubing from the Intelligent Flowmeter to the GC column gas flow*. When the reading stabilizes (1-2 seconds), briefly press the on/split button. (*Note: The display will show an error message if the flow being measured is less than 0.5 mL/min.*)

** Accurate column flow rates can only be determined when detector gases have been turned off.*

The reading is now stored in memory, and the display will read **1:1**. Disconnect the flexible tubing from the GC column flow and connect it to the split vent. The display will now read the ratio directly. The exact ratio can be dialed in by simply adjusting the flow of the split vent until the required ratio is displayed.

2.00 mL

1.00:1

50.0:1

Typical display sequence for setting a 50.0:1 split ratio with a 2 mL/min column flow.

Returning to Single Flow

To return to single flow operation, briefly press the on/split button.

Recalibration Service

To have your Intelligent Flowmeter recalibrated, order part number 01-900115-01.

Replacing Flexible Tubing

When replacing the flexible tubing, please cut to 18" (+/- 2") in length.

If tubing greater in length than 18" is used, errors in the displayed flow value may occur with flows under 200 mL/min.

Product Specifications

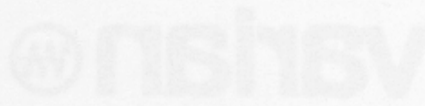
- Flow range: 0.5 to 1000 ml/min. autoranging
- Accuracy +/- 0.2 ml/min or 3% which ever is greater
- Tubing temperature range: -62°C to 110°C
- Operating temperature range: 0°C to 45°C
- Power: 9V battery (alkaline)
- Display: 16 character alphanumeric
- Automatic power off
- Split ratio mode with continuous split flow rate reading
- NIST traceability
- Compatible with non-corrosive and non-flammable gases
- Self-checking power on sequence
- Each flowmeter individually computer calibrated

For Ordering and Technical Support

Call (800) 926-3000 (USA Only)

Fax (925) 945-2360 (USA Only)

For International locations, contact your local Varian sales office.


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