



Agilent Flowmeter ADM1000

Operating Instructions



Agilent Technologies

Notices

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Agilent Flowmeter ADM1000 Operating Instructions

Agilent Flowmeter ADM1000

Packing List

Thank you for choosing Agilent's ADM1000 Flowmeter. When unpacking the box, please make sure it contains the following:

- | | |
|---|---|
| 1 | ADM1000 Flowmeter
(battery included) |
| 1 | Instruction Manual |

Principle of Operation

The ADM1000 provides continuous, real time measurements of all **NON-CORROSIVE AND NONFLAMMABLE GAS FLOWS**. Unlike bubble flowmeters, the ADM1000 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 ADM1000 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 test 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 ADM1000, measurements taken with bubble-type flowmeters may show a difference. This is not a problem with your new ADM1000.

As a consequence of the ideal gas law, measurements made with both soap bubble meters and the ADM1000 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 ADM1000. 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 readings can be much higher than the true flow rate. Figure 1 shows the effect of water vapor on volumetric flow measurements. Since the ADM1000 is **bubble-free**, this error is not introduced into the flow rate measurement.

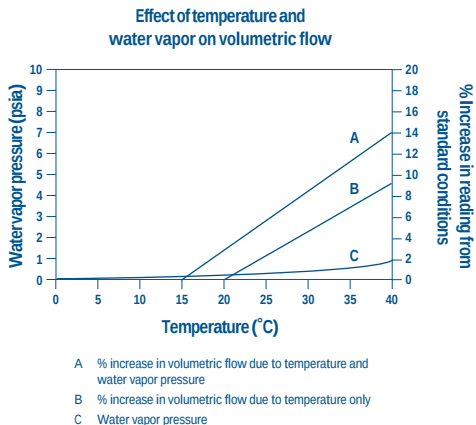


Figure 1 Effect of temperature and water vapor on volumetric flow.

Autoranging Display

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

Flow (mL / min)	Display resolution (mL / min)
0.50 - 9.99	0.01
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 and Setting a Split Ratio

Turn the unit on by briefly pressing the on/split button. Connect the flexible tubing from the ADM1000 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.)

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.

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

Recalibration and Repair Service

To have your ADM1000 recalibrated or repaired, consult the Agilent website for more information. Go to www.chem.agilent.com and do a quick search for ADM Flowmeters. Once there, look in the Technical Support section for the recalibration/repair details.

Replacing Flexible Tubing

When replacing the flexible tubing please order P/N 701-0016. This tubing is available by the foot; a minimum of 2 feet is necessary. If tubing other than this is used, please cut to 18 inches (± 2 inches) in length. **Important:** If flows to be measured are less than 200 mL/min and a greater length of tubing is desired (greater than 18 inches) please order tubing extension kit P/N 220-1179.

If tubing greater in length than 18 inches is used without this kit, 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 $\pm 3\%$ of reading, or ± 0.2 mL/min, whichever 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.

Technical Support

Agilent's Technical Support Specialists are chemists with years of laboratory experience. They can provide you with in-depth knowledge and experience. Contact Agilent technical support; call 1-800-227-9770 in the US and Canada or call your local Agilent sales office or to contact Technical Support on the Internet, go to (www.agilent.com/chem).