

MGB1000 Micro Gas Blender

The best way to calibrate gas analyzers at sub-ppm concentrations.

FEATURES & BENEFITS

- ▶ Blended gas flow rates up to 25 L/min or 1.5 L/min.
- ▶ Single step dilution up to 4545:1
- ▶ Compact design
- ▶ Micro volume flow path for fast equilibration time
- ▶ Low cost operation
- ▶ Low zero gas consumption
- ▶ Reduces cylinder gas stocking requirements
- ▶ Extremely low internal volume
- ▶ Total shut-off of CAL-gas for blank runs
- ▶ Bench-top or 19" rack-mountable

The Trace Analytical™ MGB1000 Micro Gas Blender, from AMETEK Process Instruments, generates consistent and reliable fixed-point gas concentrations at blend ratios up to 4545 to 1. Applications include calibration and/or certification of gas analysis instrumentation.

The MGB1000 is ideal for calibrating gas analyzers, such as the ta3000 and ta5000, with ppm or ppb mixes of a single component or mixed component gas standard. The micro volume flow path enables single step blends quickly and reliably, without consuming large quantities of zero gas.

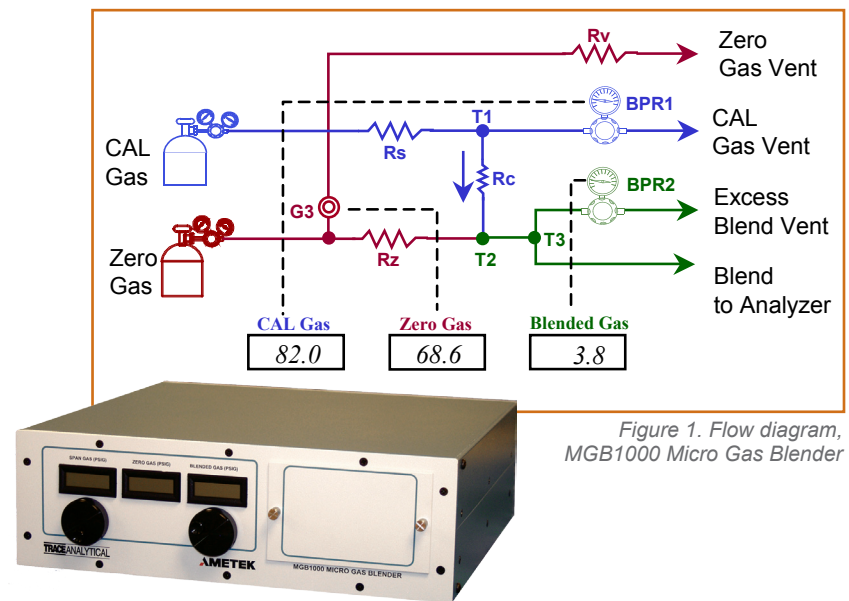


Figure 1. Flow diagram, MGB1000 Micro Gas Blender

OPERATION

The MGB1000 meters gas flow by accurately controlling the pressure across stainless steel capillary restrictor tubes. Every restrictor is factory calibrated for flow rate versus pressure. By adjusting the pressure on the upstream side of the flow restrictor, a predetermined fixed flow rate through the restrictor can be set easily and precisely.

In Figure 1, calibration gas (CAL-gas) is blended with zero gas at T2. The CAL-gas flow through restrictor Rc is controlled at T1 by back-pressure regulator BPR1, while resistor Rs limits the total amount of CAL-gas that is allowed to flow through the instrument.

The flow rate of zero gas through restrictor Rz is determined by the inlet pressure, as indicated by gauge G3.

Zero gas flow can be adjusted to a rate up to .25 L/min or 1.5 L/min, depending on the configuration. Vent restrictor Rv maintains a constant flow rate (~30mL/min) through gauge G3 to prevent back-flow of any contaminants into the zero gas.

Blended gas delivery pressure is maintained at a constant setting at T3 by back pressure regulator BPR2. Depending on analyzer requirements, the blended delivery pressure to the analyzer can be set from 0.5 to 15 psig.

Note that regulators and gauges are located downstream of the primary flow path for both CAL and ZERO gases. This is a significant feature of the MGB1000, because it prevents any contamination of the blended stream due to minor leakage or outgassing at joints, gaskets, or welds.

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LONG TERM STABILITY

All tubing and interconnecting fittings in the primary flow path of the MGB1000 are constructed from 316 stainless steel. Electronic pressure gauges are stable to within 0.1% of full-scale reading per year. As an extra precaution, each gas inlet line is protected from particulate matter by a 2 micrometer particle filter.

The pressure to flow relationship of the capillary restrictors does not change with time, providing stability virtually over the lifetime of the product.

SPECIFICATIONS

Front Panel

CAL-gas pressure adjustments and display
Blended gas pressure adjustment and display
Zero gas pressure display
Calibration gas restrictor compartment

CAL-GAS Restrictor Flow (mL/min), Typical

@ Inlet Pressure	Low	Med	High
20 psig (1.4 bar)	0.05	.025	2.0
100 psig (6.9 bar)	0.5	2.5	20

ZERO Gas Restrictor Flow (mL/min), Typical

@ Inlet Pressure	Low	or	High
20 psig (1.4 bar)	40		250
100 psig (6.9 bar)	250		1500

Back-Pressure Regulators

CAL-gas pressure 100 psig (6.9 bar) max.
Blend gas pressure 15 psig (1 bar) max.

Pressure Gauges

Maximum Operating Pressure 100 psig (6.9 bar)
Linearity $\pm .025$ psig (0.0017 bar)
Temperature Effect (22-28°C) $\pm 0.5\%$ of reading
Repeatability ± 0.05 psig (0.0035 bar)
1 year stability ± 0.1 psig (0.0069 bar)
Readout ± 0.1 psig (0.0069 bar)
Construction, diaphragm and Housing 316 SS

OPTIONS

- ▶ 19" rack-mount
- ▶ 1/4-inch face seal fitting adaptor kit
- ▶ Zero gas regulator
- ▶ Calibration for Ar, He, H₂ or other gases (N₂ included)

Flow Rate Reproducibility Over 1 Year

Flow Rate < 0.1 mL/min $\pm 2\%$ of reading
Flow Rate > 0.1 mL/min $\pm 1\%$ of reading

Electrical

Standard 110 VAC, 50-60 Hz
Optional 230 VAC, 50-60 Hz

Mechanical

Internal piping, primary flow path 316 stainless steel
Internal volume, primary flow path < 0.5 mL
Rear Panel gas ports 1/16" compression

Dimensions

5.3" H x 16.8" W x 14.0" D
(133 mm x 427 mm x 356 mm)

Weight

Net 15.5 lb (6.8 kg)
Shipping 18.0 lb (8.2 kg)

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