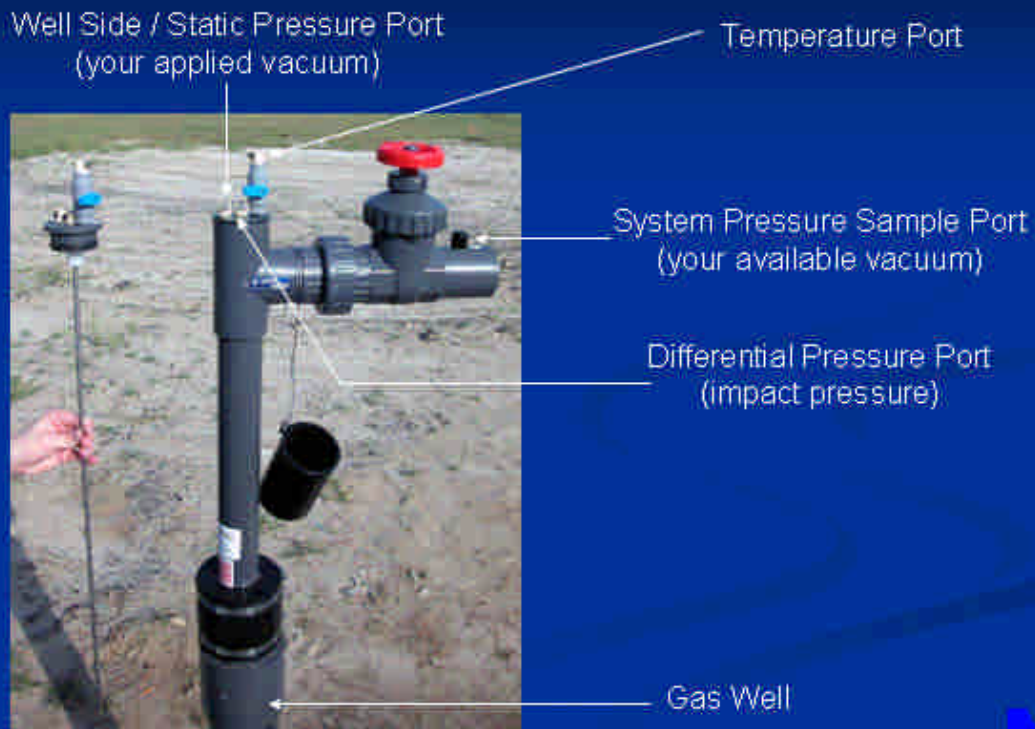


Sample Ports



AccuFlo™ Wellheads

AccuFlo™ wellheads are the most accurate method of flow determination. They are available in sizes from one and one half inch to three inch. The one and one half-inch and the two inch wellheads are available in either horizontal or vertical configurations. The AccuFlo™ wellhead has a calibrated Pitot tube installed along with access ports for static pressure and temperature probe. The access ports are located in one single area of the wellhead for ease of obtaining gas concentrations, static pressure differential pressure and gas temperature. SCFM and BTU information can be obtained in as little as sixty seconds, thus simplifying field monitoring. AccuFlo™ wellhead size and orientation are chosen from a menu located in the Instrument communications software.

Temperature will be stored if a temperature probe is used with the Gem if there is no probe it will need to be entered manually. Advancement to the flow screen will display calculated SCFM and BTU readings.

GEM 2000

DATA PORT

The top data port on the left side of the instrument is a multifunction connection. The data communications cable (RS-232 and USB), temperature probe or optional gas pod all use this port and the battery charger uses the bottom port. Extreme caution should be used whenever plugging into or out of this port to prevent damage to the internal connectors. The dust cap should always be in place when this port is not in use.

EXHAUST PORT

The exhaust port is used in conjunction with the gas pods to supply gas to the pod for detection. This port may also be used to fill a Tedlar bag when a sample needs to be sent to a lab for a more complete analysis.

2.1 Physical Characteristics of the GEM™ 2000

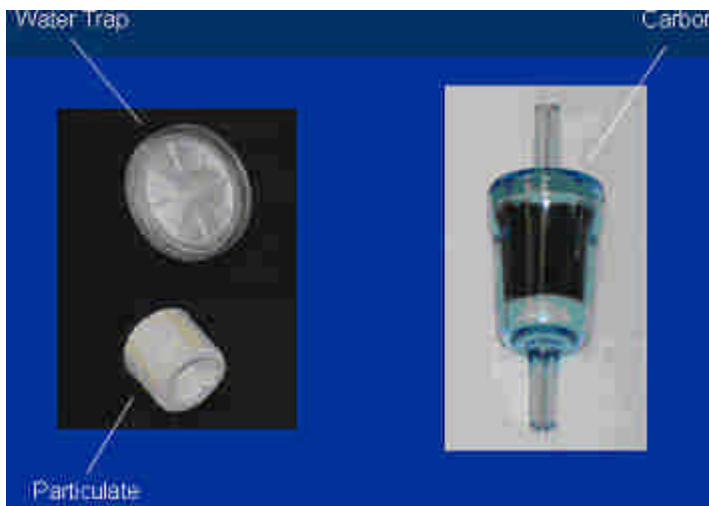


FILTERS

There are four filters used with the instruments, three, which are required and one optional external filter that may be purchased as a accessory. Two of the

required filters may be changed in the field, and the third is an internal filter that requires factory replacement. The two field changeable filters are the external water trap filter and the particulate filter that is located in the back of the Instrument. These filters should be replaced, in tandem, every hundred hours of use. The external water filter should be replaced more often if high levels of moisture are observed to be condensing in the clear tubing.

An external charcoal filter may also be used in series with the external water filter and should be installed on the instrument side of the external water trap filter. The charcoal filter is used when known or suspected levels of H₂S, hexane, pentane, or other non-methane hydrocarbons exceed one hundred ppm. Presence of these gases can effect the methane channel by indicating artificially high concentrations of methane. The charcoal filter needs to be condition with Calibration gas before use. You should have a separate clean hose for your calibration



GEM™2000 Specifications Accuracy

Concentration	%CH ₄ by volume	%CO ₂ by volume	%O ₂ by volume
5% (LEL, CH ₄)	±0.3%	±0.3%	±1.0%
Full Scale	±3.0% _(100%)	±3.0% _(60%)	±1.0% _(25%)

	Sensor Range	Resolution
Methane - CH ₄	0-100%	0.1%
Carbon Dioxide - CO ₂	0-60%	0.1%
Oxygen - O ₂	0-25%	0.1%
Pressure	(diff) 0-10" W.C.	0.001" W.C.
	(static) 0-100" W.C.	0.1" W.C.

Flow Accuracy (50% CH₄ measured in 2" Accu-Flo wellhead)

- ±3% - 5-150 SCFM

Pump Flow Rate - 500cc/min. nominal flow

Vacuum - Up to 80" W.C.

UL - Certified to Class 1, Zone 1, AEx Ib d Ila T4

The GEM-2000 should be field calibrated using the nearest concentration to the expected gas concentration in the field. In other words, if the expected field concentration is five percent methane and two percent carbon dioxide, than the calibration gas should be a concentration of fifteen percent methane and fifteen percent carbon dioxide with a balance of nitrogen. Conversely, if the expected concentrations are forty-five percent methane and thirty-seven percent carbon dioxide, than the calibration gas should be fifty percent methane and thirty-five percent carbon dioxide. In all cases it is good practice to have the concentration of the calibration gas be equal to or greater than the expected concentrations of the respective gases to be tested. A field calibration should be performed on a daily basis prior to field testing or when the ambient operating temperature of the instrument changes more than +/- 20 degrees Fahrenheit to insure maximum sensitivity of the instruments.

Field calibration for LANDTEC'S GEM-2000, requires two calibration gas mixtures. The Portable Gas Calibration Kit comes with two cylinders of calibration gas. The first mixture is 15% or 50% methane, 15% or 35% carbon dioxide, balance nitrogen. The second is 4% oxygen, balance nitrogen. The first mixture is used to calibrate methane and zero oxygen. The second mixture calibrates lower levels of oxygen. The closer the blend of gases to expected conditions, the greater the accuracy. LANDTEC has found these blends appropriate for most landfills.