CALSCAN
reliable
temperature pressure
& flow measurement

Hawk Low Flow Vent Gas Meter

Solutions for Low Flow Vent Gas Measurement

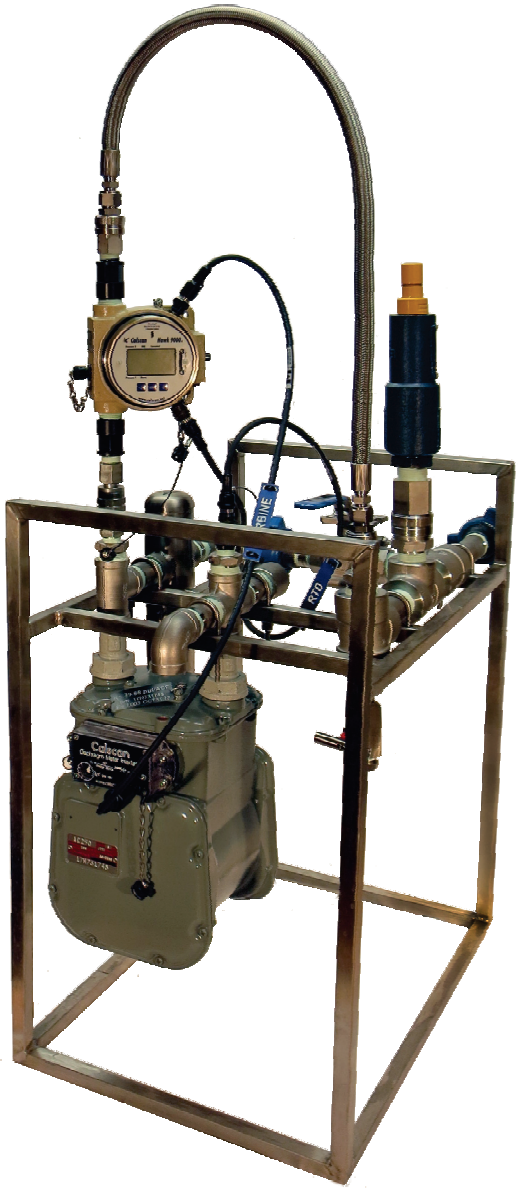
The Hawk Vent Gas Meter is designed to measure and digitally log low flow vent gas, such as methane, with high accuracy. Typical applications are compressor seals, surface casing vent, pneumatic control gas usage, and any vent gas where either high accuracy and audit trails are required.

The Hawk uses a digitized positive displacement diaphragm meter with precision pressure sensor, a flowing temperature probe and industry standard gas flow measurement algorithms to accurately measure the gas rates. As a result, flow rates down to 1 acf/day can be measured with accuracies less than +/-2% depending on the length of test.

Reporting is the next step once your test is done. Calwin the Hawk's Windows interface software uses the Hawks digitally logged values and generates a report showing the gas flow trends and the total flow measured in a PDF format. An example is shown on the back of this datasheet.

Surface Casing Buildups can be accommodated by configuring the Hawk Vent Meter with a shut-in valve and a pressure safety valve.

Safety is ensured since the Hawk is Class 1 Div I rated. This allows the Hawk to be run right beside the wellhead or in a enclosed building.



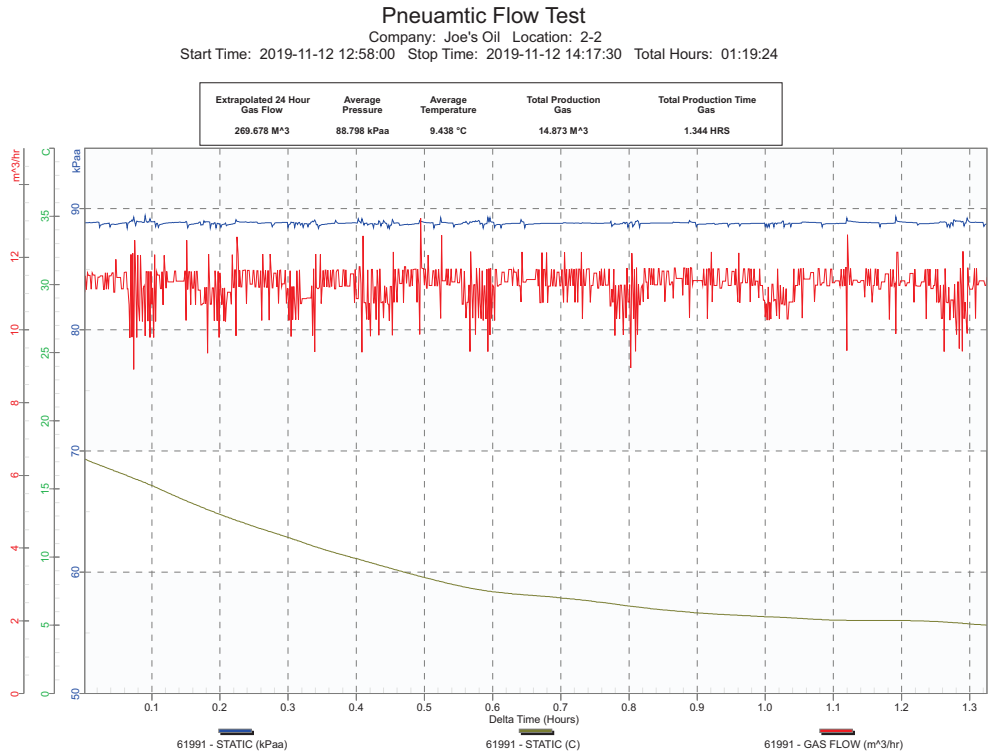
Feature Summary

- All data and settings logged for **Audit Trail**
- PDF reporting of data
- Fuel gas rate accuracy less than +/- 2%
- Sample rates as fast as once per second
- Calibrated from -40°C to +60°C
- Gas Equations AGA8 and AGA7
- Certified for Hazardous Location Class I Div1
- Able to measure methane gas on compressor seals, pneumatics, surface casing vent and most any gas venting
- Stainless Steel Frame and Piping for Low Maintenance
- Available for rent or purchase

Reporting

One of the hardest things after collecting data is generating a report summarizing the results.

Calwin, the Hawk's windows interface software, can generate a simple one page PDF report and export the data. No more struggling with Excel to generate a simple report.



Total Flow Accuracy

All diaphragm meters have inherent non-linear errors when measuring small volumes due to the uncertainty of the bellow's position when the test starts. This is in addition to the stated flow accuracy specification.

The "Total Flow Accuracy" chart on the right combines the AC-250 total diaphragm meter errors, the flowing temperature, and the static pressure sensor errors of the Hawk. For example, to get a ±2% measurement error at 0.5 acf/day flow rate, you would need at least a 19 hour long test.

Flow Rates acf/day (m^3/day)

Total Flow Accuracy ±%	0.5 (0.014)	1 (0.028)	2 (0.057)	5 (0.14)	10 (0.28)	50 (1.4)
10	2.9 hrs	1.4 hrs	44 min	18 min	8.6 min	1.7 min
9	3.3 hrs	1.6 hrs	49 min	20 min	9.8 min	2.0 min
8	3.5 hrs	1.7 hrs	52 min	21 min	11 min	2.1 min
7	3.8 hrs	1.9 hrs	58 min	23 min	12 min	2.3 min
6	4.4 hrs	2.2 hrs	1.1 hrs	26 min	14 min	2.6 min
5	4.6 hrs	2.3 hrs	1.2 hrs	28 min	15min	2.8 min
4	8.3 hrs	4.1 hrs	2.1 hrs	50 min	25 min	5.0 min
3	9.6 hrs	4.8 hrs	2.4 hrs	58 min	29 min	5.8 min
2.5	14 hrs	6.5 hrs	3.3 hrs	1.3 hrs	40 min	7.8 min
2	19 hrs	9.5 hrs	4.8 hrs	1.9 hrs	57 min	12 min
1.5	29 hrs	15 hrs	7.4 hrs	3.0 hrs	1.5 hrs	18 min
1.25	51 hrs	27 hrs	13 hrs	5.1 hrs	2.5 hrs	31 min

Minimum Length of Test for Desired Accuracy

Specifications

Silicon Pressure Sensors
BuildUp Pressure Ranges: 1500, 3500 psig
Pressure Accuracy: 0.024 % full scale
Pressure Resolution: 0.0003 % full scale
Pressure Drift: < 0.01 % full scale/year

Flowing Pressure Range: 270 psia
Pressure Accuracy: 0.040 % full scale or ±0.11 psi (0.744 kPa)

Flowing Temperature Probe (RTD)
Temperature Accuracy: ±0.4°C (±0.20°C typical)
Temperature Resolution: < 0.05°C

AC-250 Diaphragm Meter
Flow Accuracy: ±1%
Flow Resolution: 0.025 cubic feet (0.000708 m^3)
Max Flow at 0.125 kPa Differential: 6000 acf/day (170 am^3/day)
Max Flow at 0.500 kPa Differential: 12000 acf/day (340 am^3/day)
Minimum Constant Flow rate: 0.5 acf/day (0.028 am^3/day)
Max Allowable Working Pressure: 34 kPag (5 psig)

The **"a"** in the units means the gas is referenced to the *actual* flowing pressure and temperature, not to standard conditions

Back Pressure when Measuring Pneumatic Instruments
< 0.5 kPa total at 250 scf/hour using Pneumatic Accessory Kit
Atmospheric pressure normally varies by ±3.5 kPa

Gas Equations
AGA7 and AGA8-92 Detailed or Gross

Certified Safety Compliance
C22.2 No O-M 1991 : Canadian Electrical Code Part II

C22.2 No 157-M 1992 : Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations

UL 913, Sixth Edition : Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II, Ill, Division I, Hazardous (Classified)

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All specifications are subject to change without notice rev 2v70