



LFE GAS FLOW CALIBRATOR

Available Model PSI-LGFC-1

Calibration is the process of comparing a measurement device against an equal or a better standard to verify the closeness of the measurement device to the standard. The standard instrument, commonly called a calibrator, is generally required to be more accurate than the instrument under calibration. Calibrators are characterized by high accuracy, reproducibility, high reliability and stability. A calibrator's accuracy itself needs to be verified against a known primary or secondary standard and is called traceability of calibration

In most commonly used flow meters, the accuracy of measurement of flow at low flow rates becomes poor. Polltech's LFE gas flow calibrator is a special instrument which utilizes a Laminar Flow Element (LFE) which affords measurement accuracy of better than +/- 1% even at low flow rates. The calibrator can be fine tuned on specific request to further enhance the accuracy to +/-0.5 % of reading.

Salient Features

- ☞ Laminar Flow Element (LFE) sensor
- ☞ Built-in sensors for measuring temperature differential and absolute pressure
- ☞ Flow Accuracy $\pm 1\%$ of reading
- ☞ Customizable to 0.5% of reading
- ☞ OLED display of 4 line x 20 character
- ☞ Touch sensitive key pad
- ☞ Multiple Units Option
- ☞ Various Flow mode options
- ☞ Wide Measuring Range
- ☞ Measures Flow from Pressure or Vacuum Source
- ☞ Gas Selection Mode: User can select flow meter gas from a large number of gases.
- ☞ USB port for Data Transfer to PC. Windows based application software utility
- ☞ Fully Portable
- ☞ Elegant Cabinet



Principle of Operation

Differential pressure (Δp) flow meters are one of the most common types of flow meters. The principle of operation of Δp flow meters is based on Bernoulli's equation which relates flow to differential pressure across a restriction. Accordingly, in these Δp flow meters, a constriction (normally a orifice or venturi) is introduced in the flow path. When the fluid flows through this constriction, a pressure drop develops across it; the greater the flow, the more is the pressure drop. Mathematically, the pressure drop across the constriction is proportional to the square of the flow rate. Because of this, the accuracy of measurement at lower flow rates becomes poor. This problem is mitigated by the using a Laminar Flow Element (LFE).

LFE is a special kind of constriction, through which the fluid flow is in laminar regime (low Reynolds number). The pressure drop across this element is linear in relation to the flow rate. This enhances accuracy of reading at lower flow rates and increases the "turn down ratio" from the usual 10:1 to 100:1.

The flow is computed by measuring differential pressure and making corrections with data from temperature and absolute pressure sensors

Design & Construction

PSI -LGFC is a microprocessor based hand held instrument. It utilizes a Linear Flow Element suitable coupled with a differential pressure sensor. It also includes sensors for measuring temperature and absolute pressure. The user interface comprises a 4 lines by 20 characters OLED Display and a 9-key touch sensitive key pad. It is also provided with a USB port for data transfer to a PC. All the electronics and the sensors housed in a hand held elegant and sturdy imported cabinet.

Data Transfer and Management

Windows based software app for data capture on PC and subsequent management of capture data is provided.

Detailed Technical Specifications:

The various models are designed to cover wide flow ranges starting from 1.00 lpm full scale to 100.00 full scale.

Flow Measuring Range	From 1.00 cc/minute to 300.00 LPM in 4 models 1.00cc/minute to 100.00 cc/minute 50.0 cc/minute to 5000.0 cc/minute 1.00 LPM to 100.00 LPM 30.00 to 300.00 LPM Other ranges on request
Flow Sensor	Laminar Flow Element (LFE)
Flow Inference Methodology	Flow is inferred from the differential pressure (Δp) developed across LFE
Flow Vs Δp Relation	Linear
Accuracy	Better than $\pm 1\%$ of Reading Customizable to $\pm 0.5\%$ of Reading
Gas measured	User selectable from dry air, wet air, Nitrogen, Argon, Oxygen Helium, Hydrogen Carbon dioxide etc.
Unit of measurement	User selectable from cm ³ /sec (ccs), cm ³ /min (ccm), Liters/sec (LPS), Liters/min (LPM), Liters/hr (LPH), Std cm ³ /sec (sccs), Std cm ³ /min (sccm), cu ft/sec(CFS), cu ft/min(CFM), Std cu ft/hr(SCFH), Std cu ft/sec(SCFS), Std cu ft/min(SCFM), Std cu ft/hr(SCFH), milligram/sec (mgs), milligram/min (mgm), milligram/hr(mgh)
Flow Mode	Use selectable from Flow at Operating Conditions, Flow at STP, Mass Flow at operating condition and at STP
Other User Settings	Averaging Period, Data Transfer Rate, Data Storage Frequency
Parameters Displayed	Gas, Temperature, Pressure, Flow Rate, Battery Status
Display	4 lines x 20character alphanumeric OLED Module
Operating Keys	9 Nos.
Key Functions	Select gas, Select Flow mode, Auto zero Inc/ Scroll up, Dec/ Scroll Down, Escape, Fn, Return
Operating Supply	Built-in Li-ion battery with USB charger
Dimensions	260 x 130 x 45 mm

Related Products

Air Flow Calibrator Models PSI-AFC-1L, PSI-AFC-1M, PSI-AFC-1H

Digital Air Flow Calibration System Model PSI-DFCS-1L, PSI-DFCS-1M, PSI-DFCS-1H

Low Flow Digital Calibrator Model PSI-DFC-1L

Digital Orifice Flow Calibrator Model PSI-OFC1, Model PSI-OFC2, Model PSI-OFC3

Digital Flow Meter Model PSI-DFM-1L, Model PSI-DFM-1M, Model PSI-DFM-1H

Top Loading Orifice Calibrator Model PSI-TLOC1 & PSI-TLOC2.

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