

# Primary Standard Gas Flow Calibrators For Mass and Volume

## Features

- Superior Accuracy:  
**SL-800:** 0.15% of reading mass flow  
**SL-500:** 0.35% of reading mass flow
- Primary standard: Dimensionally based
- Attractive Price: Less expensive than most popular secondary standards
- Safe: No mercury or other hazardous materials
- Quality: Manufactured to ISO 17025 Standards
- Field portable: Battery powered
- Fast: Readings in 1-60 seconds (flow dependent)
- Easy: Push one button!
- Range: 5 sccm up to 50 slpm
- Versatile: Ideal for calibration of all Mass Flow Meters/Controllers
- Hands-Free Auto Mode
- Fully traceable to NIST
- CE approved



SL-500

SL-800

## Description

**S**ierra Instruments, Inc. presents a new line of portable, low-maintenance, primary standard gas flow calibrators—the Cal=Trak SL-500 and Cal=Trak SL-800. The Cal=Trak SL-500 offers an excellent accuracy of  $\pm 0.35\%$  of reading while the Cal=Trak SL-800 offers the best accuracy of any commercially available standard:  $\pm 0.15\%$  of reading! The accuracy of the highest level metrology laboratories worldwide can now be a part of your lab, workshop or production floor when you do-it-yourself with Cal=Trak.

The information contained herein is subject to change without notice.



## Why a Primary Standard?

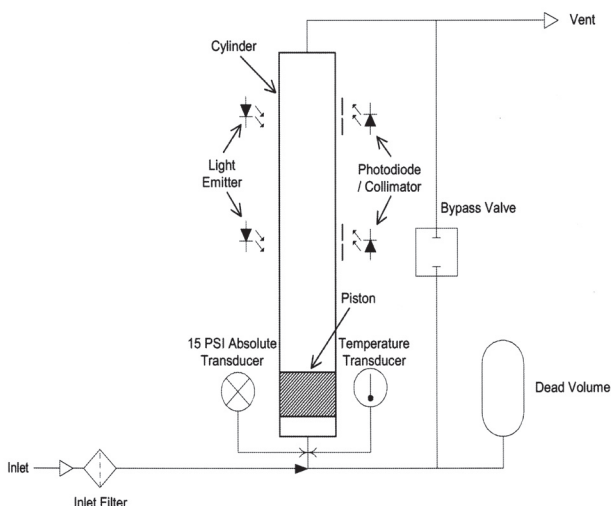
Primary standards are characterized by the most basic of quantities (i.e. time and distance) unlike transfer or secondary standards, such as laminar flow elements. Primary standards can be verified by every national laboratory by checking these basic quantities. This guarantees that the main objective of any calibration is met: reliable, accurate measurements.

## Operating principle

Sierra's Cal=Trak models contain a nearly frictionless graphite piston that moves freely inside a borosilicate glass tube. When the parallel bypass valve is closed, the gas flow is directed into the tube to push the piston up.

Two photo-optic sensors detect the piston as it travels past. The distance the piston travels between the two sensors is precisely defined and represents a known volume. Accurate crystal-based timers drive a micro-processor which calculates the rate of rise. This defines the volumetric flow rate.

At the same time, extremely accurate temperature and absolute pressure sensors collect data used to calculate the mass flow rate



## Want to know more?

If you want to know more about how the accuracy is guaranteed, you can contact Sierra Instruments. There are a number of in-depth articles available including a complete and comprehensive uncertainty analysis. Go to [www.sierrainstruments.com](http://www.sierrainstruments.com) to learn more.

## Specifications

The Cal=Trak Models consist of a base with interchangeable flow cells. Each cell has a specific range. Cells can be easily changed (No tools needed) within seconds and can be purchased separately. Cells for the model SL-800 may be used only with the SL-800 base. Cells for the model SL-500 may be used only with the SL-500 base.

### Flow Ranges and Single-Reading Accuracy<sup>(1)</sup>

SL- 800 Series	Range	Accuracy <sup>(1)</sup> (% Reading)	
		Mass <sup>(3)</sup>	Volumetric <sup>(2)</sup>
SL-800-10	5 - 500 sccm	0.15	< 0.15
SL-800-24	50 - 5000 sccm	0.15	< 0.15
SL-800-44	0.5 - 50 slpm	0.15	< 0.15

SL- 500 Series	Range	Accuracy <sup>(1)</sup> (% Reading)	
		Mass <sup>(3)</sup>	Volumetric <sup>(2)</sup>
SL-500-10	5 - 500 sccm	0.40	0.25
SL-500-24	50 - 5000 sccm	0.35	0.20
SL-500-44	0.5 - 50 slpm	0.40 <sup>(4)</sup>	0.25 <sup>(4)</sup>

(1) Using the averaging mode will increase accuracy

(2) Temperature range 5-40 C

(3) Temperature range 15-30 C

(4) From 30-50 slpm: 0.45% standardized, 0.3% volumetric

Suitable gases: Non corrosive, humidity less than 70%, non-condensing

Time per reading: Approximately 1-60 Sec (Flow dependent)

Operating modes: Single cycle, continuous cycling (averaging) or 1 to 255 second intervals

Battery system: Internal continuously chargeable sealed lead-acid battery

AC Charger/Adapter: 100-240 VAC, 50-60 Hz

Self test: Leakage & dynamic functional verification

Outputs: Back-lit LCD display, RS232 serial port with software, parallel printer port (for dedicated printer)

### Dimensions:

Model	Width mm (in.)	Depth mm (in.)	Height mm (in.)
SL-800	152 (6)	267 (10.5)	436 (17)
SL-500	133 (5.2)	273 (10.6)	343 (13.4)

**Weight:** SL-800: 4.5 Kg (10 lb.s)

SL-500: 3.5 Kg (7.8 lb.s)

**Warranty:** Product, 1 year

## Operation

Not only is Cal=Trak™ accurate and reliable, you will be pleasantly surprised by its simple operation. The Calibrator provides the user accurate flow readings with the push of a button. The LCD display indicates the volumetric rate, average flow rate, standardized flow rate, atmospheric pressure and battery status. Using the keyboard and back-lit LCD display, you can set variables like: reference conditions, K-factors for different gases, operating mode, self-check features and many more to meet changing requirements. With the RS232 output, a Calibration Certificate can be created by exporting data to a computer template or by using the optional printer.

## Safe, Portable and Reliable

Cal=Trak is safe. It does not contain any hazardous materials like mercury, commonly found in previous generations of primary gas flow calibrators. In addition, there is no mess common with soap-bubble devices.

Cal=Trak is portable. You can set Cal=Trak up in minutes almost anywhere due to its compact size, light weight and battery power. A custom, impact-resistant case is available as an accessory to store and protect the calibrator during transport or periods of non-use.

Cal=Trak is reliable. Sierra's Cal=Trak line provides primary NIST traceability, is manufactured under strict ISO 17025 certification (NVLAP accreditation), and is CE approved. Due to the simplicity of Cal=Trak, you can depend on this calibrator to do exactly what you need—measure gas flow accurately, quickly and reliably.

## Accessories

### Cases

PEL-1550: Case with foam insert. Fits one SL-500 base, one cell and accessories.

PEL-1620: Case with foam insert. Fits one SL-500 base, up to 3 cells and accessories.

PEL-1600: Case with foam insert. Fits one SL-800 base, one cell and accessories.

PEL-1650: Case with foam insert. Fits one SL-800 base, up to 3 cells and accessories.

### Mass Flow Controllers

Sierra's popular Smart-Trak® 100 Series Mass Flow Controllers are ideal for generating and maintaining a constant flow of gas so that any type of flow meter can easily be calibrated. Special versions of the Smart-Trak are available to cover the range of each Cal=Trak flow cell. With the built-in display and controls, Smart-Trak is a complete gas flow generation system.

### Printer BP-1

A re-chargeable battery operated Thermal 4" printer can be connected to the printer port of the SL-500 or SL-800. Includes: printer cable, battery charger and printer paper. (Additional paper: 6 rolls part No TP-2-6)

### Software

Software to download calibration data from the Cal=Trak into familiar spread sheet programs is included free with each calibrator. Additional software to simplify calibration will become available soon. Please inquire.

For more information see [www.sierrasmartrak.com](http://www.sierrasmartrak.com).





5 Harris Court, Building L  
Monterey CA 93940  
800-866-0200  
831-373-0200  
fax: 831-373-4402

Sierra Instruments b.v.  
Bijlmansweid 2  
1934RE Egmond a/d Hoef  
The Netherlands  
+ 31 72 507 1400  
fax: + 31 72 507 1401

Sierra Asia  
100 Jiangnan Dadao  
Zhong Guang Building, Suite 2303  
Guangzhou, China  
+86 203435 4870  
fax: +86 203435 4872

Website:  
[www.sierrainstruments.com](http://www.sierrainstruments.com)