

# High Accuracy All-in-One Primary Standard Gas Flow Calibrator Corrosive Gases

## FEATURES

- Primary standard, dimensionally based piston prover system
- Accuracy: +/- 0.15% of reading mass flow plus +/- 0.01 sccm
- For all inert gases, semiconductor gases, and corrosive gases compatible with wetted materials
- For mass or volumetric flow rate
- Range: 5 sccm up to 50 slpm
- Manufactured to ISO 17025 standard at NIST-accredited lab (NVLAP)
- 304-316 stainless steel construction with Teflon and AFLAS® o-ring seals, borosilicate glass
- Ideal gas correction for compression factors
- Flexible: all-in-one multiple cells eliminate switching tubes
- Fast: horizontal tube design – no 'dead piston time' for faster readings
- Easy to use: touch-pad controls provides simple, fast and intuitive device operation
- CalSoft™ Software
- Field portable: battery powered
- Hands-free auto mode
- CE approved and RoHS compliant

850  
CalTrak  
850



## DESCRIPTION

**B**ring world class accuracy to your facility. Sierra's CalTrak® 850 is an all-in-one measurement instrument for use in a laboratory or transported to the factory floor measurements. Designed to calibrate or verify the mass flow meters and mass flow controllers commonly used in the semiconductor industry, the CalTrak 850 can measure corrosive gases compatible with these wetted path materials: 304-316 stainless steel, borosilicate glass, Teflon®, and AFLAS® elastomeric.

Flow measurements can be taken manually (one reading at a time), or automatically in continuous mode, with up to 100 measurements in an average sequence. CalTrak 850 calibrators offer digital communications via RS-232 and USB plus a complete data collection software suite.

The design of the CalTrak 850 allows for increased flexibility and speed of reading. Three tubes sit horizontally in the instrument and are fitted with low mass borosilicate glass pistons with a low friction coating that oscillate between two detectors to quickly and accurately measure gas flow rates.

Make CalTrak a workhorse in your facility, and save money by doing your own flow calibration.



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



## WHY PRIMARY STANDARD?

CalTrak 850 is a true primary standard in every sense of the word, because its accuracy is based upon primary SI units: The interior diameter of the glass measuring cylinder; the length of piston travel within the cylinder; and the time it takes the piston to travel this distance, implying a known volume. Our patented technology, therefore, offers accuracies at the level of national laboratories in one portable device.

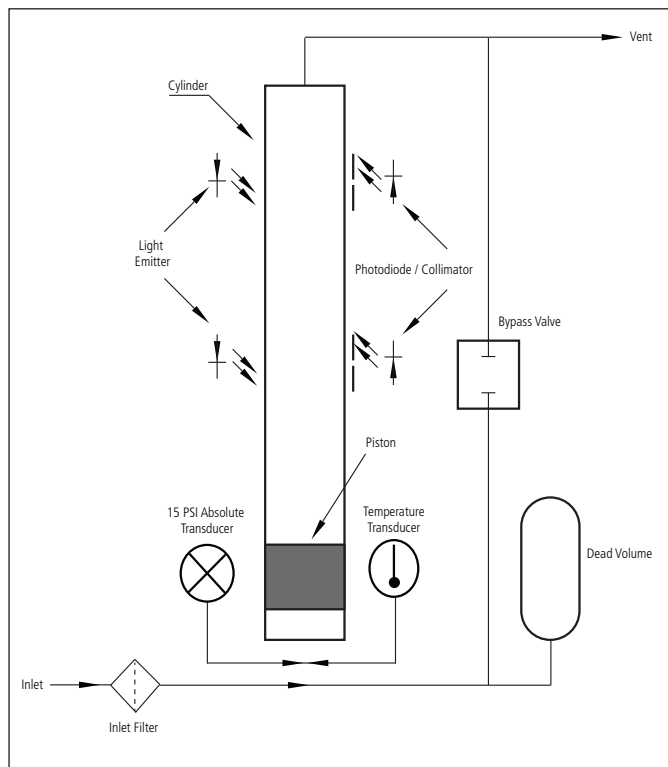
## OPERATING PRINCIPLE

Sierra's CalTrak 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 (see Figure 1).

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.

Figure 1: CalTrak 850 Operating Principle



## PERFORMANCE SPECIFICATIONS

### Standardized Accuracy\*

+/- 0.15% of reading (primary standard) and +/- 0.01 sccm across a flow range of 5 sccm to 50,000 sccm (50 slpm)

### Volumetric Accuracy

+/- 0.15% of reading and +/- 0.01 sccm across a flow range of 5 to 50,000 ccm (50 L/min)

### Time Per Measurement

Flow dependent (.5 to 60 seconds); typical 2 seconds

\*Note: Volumetric accuracy (ccm or L/min) is same.

## OPERATION SPECIFICATIONS

### Flow Ranges

5 sccm to 50,000 sccm (50 slpm)\*

Low Tube: 5 sccm to 500 sccm\*

Medium Tube: 350 sccm to 5,000 sccm\*

High Tube: 3,500 sccm to 50,000 sccm\*

\*Note: At gas pressure of 760 mmHg, (1 atm) and a gas temperature of 25°C (77°F) with standardization temperature set to 21.1°C (69.98°F)

### Operating Pressure

+/- .5 psia (0.03 barA)

### Temperature Range

15°C to 30°C (59°F to 86°F)

### Temperature Range Storage

0°C to 70°C (32°F to 158°F)

### Inlet and Outlet Fitting

1/2-inch VCR® fitting

### Gas Compatibility

Gases compatible with (316/304 SS, borosilicate glass, Teflon®, AFLAS® elastomeric)

### Compressibility Factor Correction

User selection of gases to apply NIST REFPROP compressibility factor correction for non-ideal gas behavior

### Approvals

RoHS and CE Compliant

### Digital Communication

RS-232 and USB

### Warranty

1 year; battery 6 months

**PHYSICAL SPECIFICATIONS**

**Dimensions**

Height: 15 inches (56 cm)  
 Width: 22 inches (38 cm)  
 Depth: 13 inches (33 cm)

**Weight**

62 lbs (28 kilograms)

**Configuration**

Multiple cells eliminate switching tubes

**User Interface**

Touch screen or via commands through data port

**POWER REQUIREMENTS**

**Wall-mounted power supply**

Input: 100-240 VAC, 1.5 A (max), 50-60 Hz  
 Output: 24VDC, 3.0A

**USER INTERFACE & SOFTWARE**

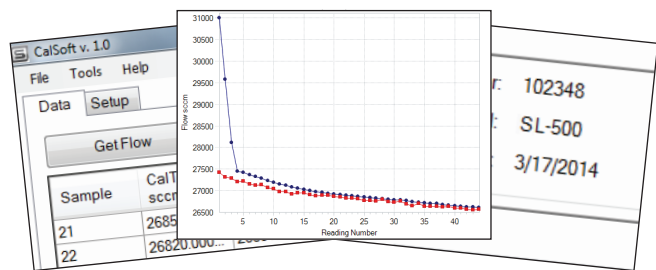
**Local Interface**

Backlit LCD graphical display; Four directional arrow buttons on the control panel allow you to navigate through the menu; user selectable flow units plus time intervals

**CalSoft™ Software**

Software System Requirements  
 Windows® XP, Windows® 7  
 Microsoft Excel® 2003 and up

- Captures flow data from your CalTrak instrument for easy export into common software packages, a PC, or Microsoft environment.
- Real-time data monitoring
- Upload the latest version of the firmware to your CalTrak
- Enter flow rates from pumps or other flow source or flow meters and calibrate the flow source.
- Compare the flow measurements from your CalTrak precision calibrator.



**GAS FLOW SOURCE CONTROL**

**Mass Flow Controllers**

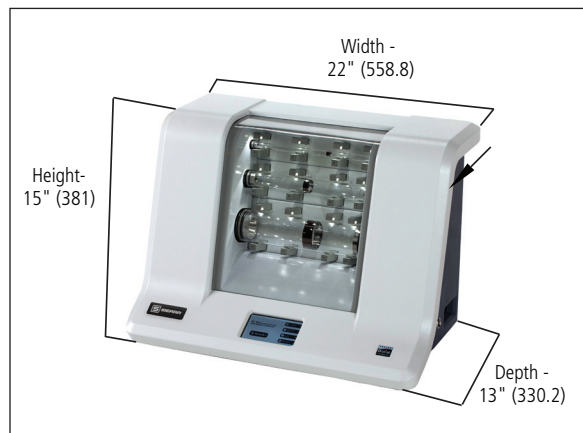
Sierra's popular SmartTrak® 100 Series Mass Flow Controllers are ideal for generating and maintaining a constant flow of gas so that any type of flow meter can easily be calibrated. Special versions of the SmartTrak are available to cover the range of each CalTrak flow cell. With the built-in display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

SmartTrak 100 Mass Flow Controller

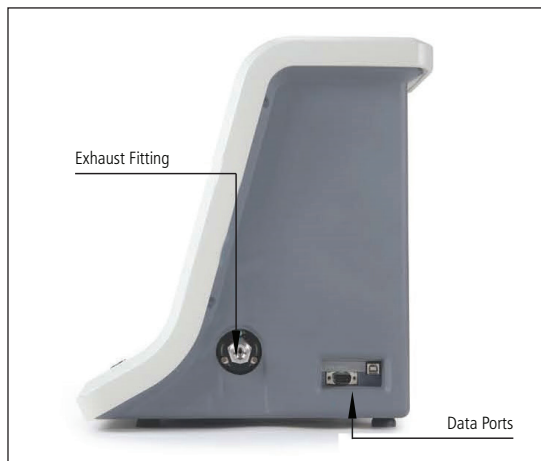


**850 PRODUCT VIEWS**

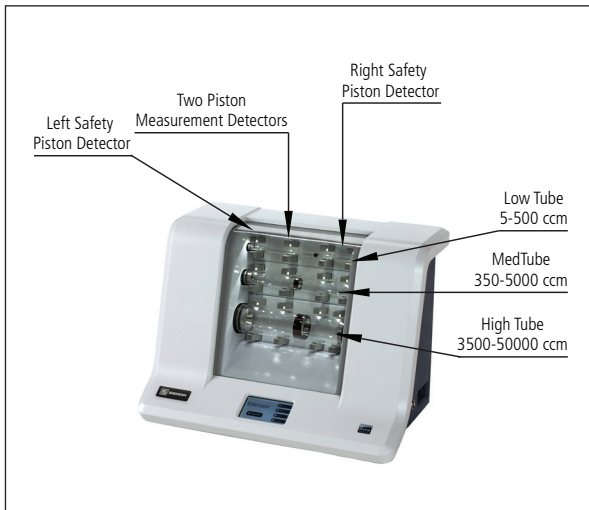
CalTrak 850 Dimensional Drawing



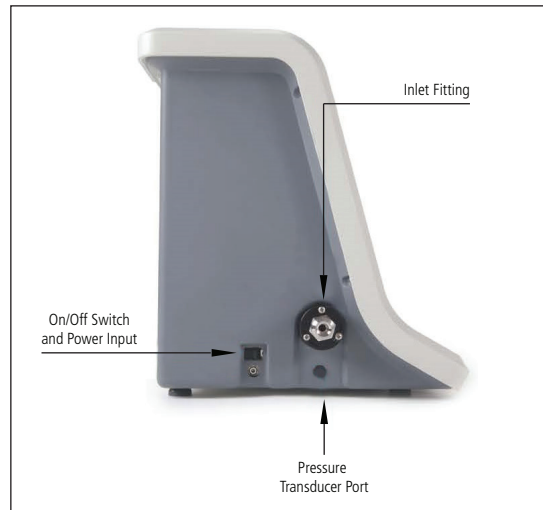
CalTrak 850 Side View



CalTrak 850 Front View



CalTrak 850 Side View



ORDERING THE CALTRAK® 850

850

Instructions: To order a CalTrak 850, please fill in each feature number block by selecting the codes from the corresponding features below.

Primary Flow Standard; CalTrak® 850	
<b>CalTrak 850</b>	CalTrak 850 is a positive displacement primary piston prover for gas flow measurements with three measurement tubes for measuring gas flow. CalTrak 850 measures flow from 5 sccm to 50,000 sccm (50 slpm) within an accuracy of +/-0.15% of reading and +/- 0.01 sccm across flow range 5 to 50,000 sccm (50 slpm). The 850 also has a volumetric accuracy of +/-0.15% of reading and +/- 0.01 ccm across flow range 5 ccm to 50,000 ccm (50 L/min). Designed for the common gases used in the semiconductor industry, the CalTrak 850 comes complete with universal 100-240V AC power adapter/charger, NIST-traceable calibration certificate, manual, Swagelok® fittings and case.