

Go-CAL™

Air Flow Calibrator



User Manual

SENSIDYNE®
Industrial Health & Safety Instrumentation

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REF 360-0162-01 Rev. D

Quality Policy Statement

At Sensidyne, we are committed to providing products and services that consistently meet customer needs and comply with all applicable statutory and regulatory requirements.

Our products are designed and manufactured in accordance with ISO 9001:2008, EN 13980:2002, ATEX Directive 94/9/EEC, and IECEx.

Through ongoing review of our designs, supplier performance, and customer feedback we strive to ensure continuous improvement.

All employees at Sensidyne share the responsibility to provide products that are produced efficiently and economically representing the best value to our customers.

We are committed to meeting or exceeding customer expectations in everything we do.

Sensidyne, LP

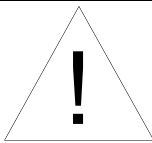
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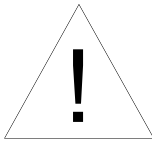
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	WARNING
	<p>This calibrator employs a heated platinum sensor. It should not be used in the presence of flammable or explosive gases or mixtures.</p>

	Caution
	<p>This calibrator is not a medical device under FDA 510k and in no situation should it be utilized for human respiration measurements.</p>

LIMITATION OF WARRANTY AND LIABILITY. Seller warrants that this product, under normal use and service as described in the operator's manual, shall be free from defects in workmanship and material for a period of twenty-four (24) months, or the length of time specified in operator's manual, from the date of shipment to the customer. This limited warranty is subject to the following exclusions:

- a. Batteries and certain other components when indicated in specifications are warranted for a period of 90 days from the date of shipment to the customer.
- b. With respect to any repair services rendered, Seller warrants that the parts repaired or replaced will be free from defects in workmanship and material, under normal use, for a period of 90 days from the date of shipment to the customer.
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SECTION ONE: Unpacking and Parts Identification

Carefully unpack the instrument and accessories from the shipping container. Check the individual parts against the list of components in Table 1. If any parts are missing or damaged, notify Sensidyne immediately.

Table 1. List of Components (see figures 1-1 and 1-2)

Qty	Item Description	Part/Model
1	Calibrator	811-9916-01
1	Filter 63 mm HEPA filter with 0.375 inch barbed fittings	811-9917-01
1	Tubing Kit with connectors and battery pack mounting lugs	811-9917-02
1	Battery Pack	811-9917-03
1	Soft Carrying Case	811-9917-04
1	User's Guide	360-0162-01
1	Dampening Module	811-9917-05

Table 2. Optional Accessories

Qty	Item Description	Part/Model
1	AC Adapter 115 V, North America, ungrounded 100–240 V, NEMA 5-15 plug, grounded 100–240 V, Europlug, CEE 7/16, grounded 100–240 V, Great Britain, grounded, fused 100–240 V, Australia/NZ	811-9918-01 811-9918-02 811-9918-03 811-9918-04 811-9918-05



Figure 1 Kit Components

1. Soft-Sided Carrying Case
2. Latex Tubing
3. Dampening Module
4. Calibrator
5. Adapters
6. High-Efficiency Inlet Filter
7. Spare Mounting Lugs
8. 6 AA-size Batteries

SECTION TWO: Setting-Up

2.1 Assembly Instructions for the Calibrators

The calibrator can be quickly attached to the battery pack by screwing the mounting lugs into the threaded holes in the base of the calibrator. The lugs should then be placed over the receiving holes in the top of the battery pack and snapped gently into place. Insert the connector from the battery pack to the receptacle in the back of the calibrator.

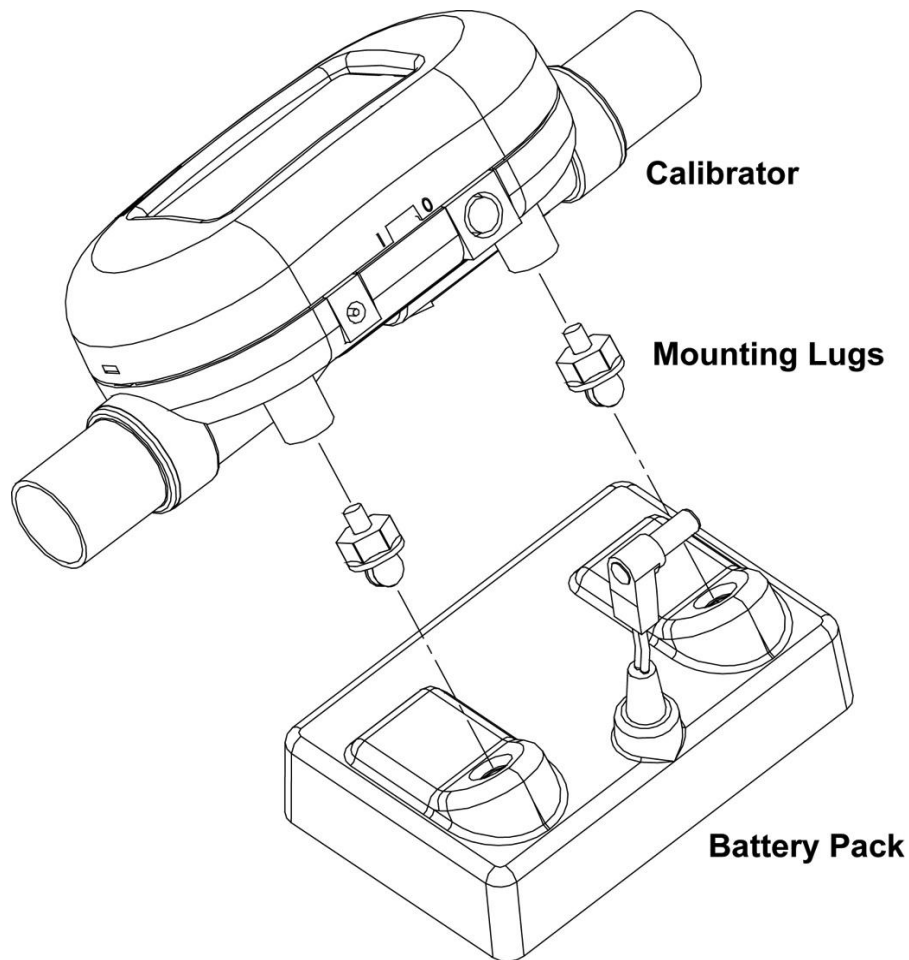


Figure 2-1 Calibrator Assembly

2.2 Supplying Power


The calibrator can be powered in one of two ways: through the power jack using the supplied 811-9917-03 battery pack or using an optional AC adapter. The DC power input connector is shown below along with the power requirements.

Power Supply: 7.5 VDC \pm 1.5 V, 300 mA maximum



2.3 Connecting Filter and Flow Tubes

The calibrator has a thermal sensor exposed to the air flow that must be protected from foreign matter and particles. Sensidyne supplies a filter that should be connected to the inlet of the calibrator; however, any filter will work as long as it has a minimum efficiency of 99.9%.

	Caution
	Always use a filter on the inlet of the calibrator. Failure to filter the air flow may change the calibration and/or permanently damage the sensor.

Note: Flow direction is identified by the large arrow printed on the bottom side of the calibrator and on the bottom of the battery pack.

Attach the filter to the inlet of the calibrator using supplied tubing and/or adapters. Connecting a tube to the outlet of the calibrator will create back pressure. See Appendix A for calibrator accuracy specifications when operating at various pressures. In general, minimize back pressure on the calibrator by using shorter lengths of tubing to maintain highest level of accuracy.

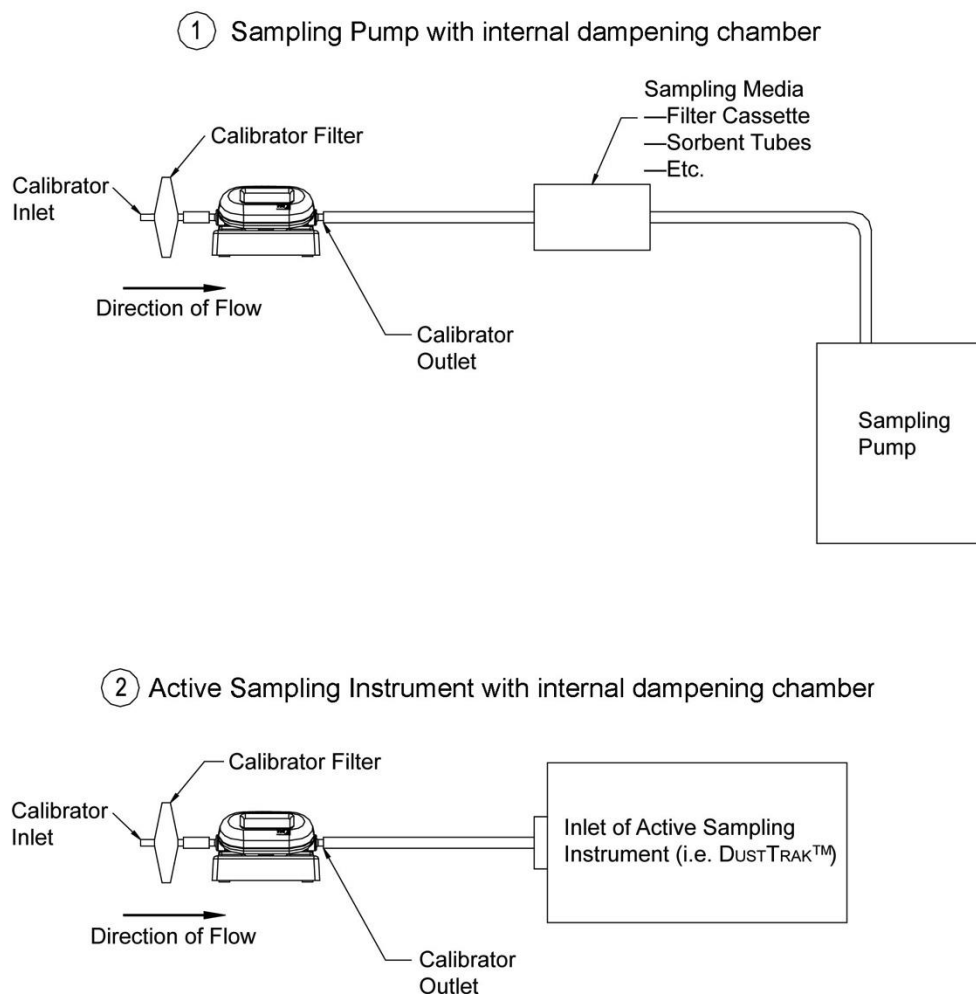


Figure 2-2 Typical Setup Configurations

A dampening module is available for calibrating sampling pumps that do not incorporate an internal pulsation dampener. Use the 6 in. (15 cm) tubing to connect the dampening chamber in line between the Go-Cal Calibrator and the instrument. For best results, position Dampening Module with openings to the side, off the work surface.

SECTION THREE: Operation

3.1 Overview

The calibrator measures volumetric flow rate inside the flow tube. All measurements are NIST traceable.

3.2 ON/OFF Switch

Slide the switch to the ON position. The LCD displays volumetric flow in units of liters per minute (L/min).

3.3 Flow Rate Measurement

Flow rate data will be displayed through the LCD.

Volumetric flow is displayed in units of liters per minute (L/min).

3.4 Setting Flow Rates and Calibrating Instruments

The calibrator may be used to set flow rates and calibrate sampling pumps or other instruments which draw an active flow sample. Be sure to follow all instrument manufacturer's flow setting and calibration procedures.

1. Start up the calibrator and let it warm up for 1 minute prior to setting any flow rates or conducting any calibrations.
2. Configure your sampling with the desired sampling media and sampling train to be used.
3. Connect the outlet of the calibrator to the inlet of the sample media (used with sampling pumps) or to the inlet of the active sampling instrument using the tubing supplied.
4. Follow the instrument manufacturer's flow setting and/or calibration procedures. The volumetric flow in units of liters per minute (L/min) will be continuously displayed on the LCD of the calibrator.

3.5 Dampening Module

The Dampening Module is included for use with systems that do *not* have internal dampening chambers. The Dampening Module (P/N 811-9917-05) can be added in line between the end of the sampling train and the calibrator. The Dampening Module reduces flow pulsation with insignificant affect on flow rate or back pressure.

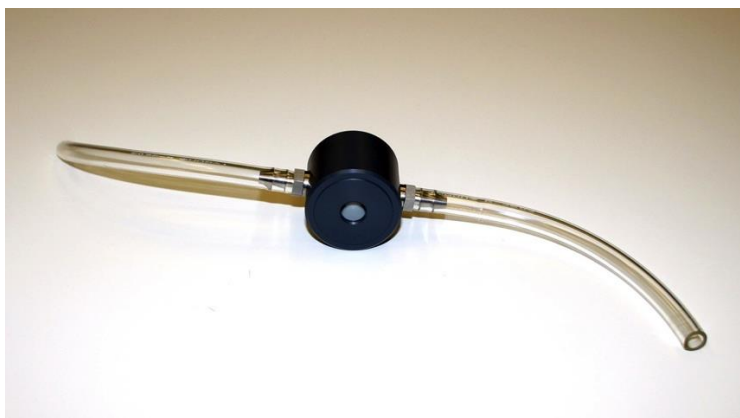


Figure 3-1 Dampening Module with Tubing Attached

All diaphragm pumps produce flow pulsations during operation. Most commercially available 3 L/min and 5 L/min sampling pumps are designed with internal dampening chambers to minimize flow pulsations.

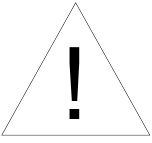
Some common air sampling instruments that may not have internal flow pulsation dampening chambers are listed below. Contact your instrument manufacturer if you have questions. This list is just an example and is not intended to be all inclusive.

- Low flow personal sampling pumps
- Confined space meters
- Photometers
- Optical Particle Counters (OPCs)
- Condensation Particle Counters (CPCs)
- Photo Ionization Detectors (PIDs)
- Flame Ionization Detectors (FIDs)

SECTION FOUR: Maintenance

4.1 Flow Sensor

Periodically inspect the flow sensor by looking into the outlet of the calibrator. Remove dust, particles and fibers from the sensor with clean, dry, **low pressure** compressed air. The flow sensor may break if touched. ***Never run liquids through the calibrator and never touch the sensor with a brush.*** Dust or other deposits on the flow sensor will degrade the flow accuracy.

	Caution
	The calibrator must be switched off for cleaning. Only use clean, dry, low pressure compressed air when attempting to remove contamination from the sensor.

4.2 Re-certification

To maintain a high degree of confidence in the measurements made by the calibrator, Sensidyne recommends that the instrument be returned to Sensidyne every 12 months for re-certification. The calibrator will be recalibrated and returned with a certificate of calibration to US National Institute of Standards Technology (NIST) traceable standards.

4.3 Cases

If the instrument case or storage case needs cleaning, wipe it off with a soft cloth dipped in isopropyl alcohol or mild detergent. Never submerge the calibrator or allow liquids to enter the flow tube.

4.4 Storage

When storing the calibrator, always cover the ends of flow tubes with the caps provided to prevent dust or other foreign matter from entering the tube.

SECTION FIVE: Troubleshooting

Table 3 lists the symptoms, possible causes, and recommended solutions for common problems encountered with calibrator. If the symptom is not listed, or if none of the solutions solves the problem, please contact **Sensidyne at 1-800-451-9444, extension 781 or 727-530-3602, extension 781 or service@sensidyne.com**.

Table 3. Troubleshooting

Symptom	Possible Causes	Corrective Action
No display	Unit not switched on	Switch on the unit
	No power to instrument	Check power connection
Temperature reads high at low or zero flows	Temperature sensor is being heated from the flow sensor	The temperature value will track the actual air temperature once the flow rate through the calibrator exceeds 1 Std L/min
Flow readings fluctuate greatly	The flow is fluctuating	Improve inlet conditions or increase display averaging time
Display shows flows over-range with no flow passing through flow tube	The sensor may be damaged or broken	Return calibrator to Sensidyne for service

APPENDIX A: Specifications

	Specifications*
Flow Measurement	
Measurement Range	0.01 to 20 L/min
Accuracy	±2% of reading or 0.005 std. L/min, whichever is greater at standard conditions (21.1°C and 101.3 kPa) See notes 1 through 5 below.
Instrument Temp. Range	
Operation, Ambient	0 to 50°C
Storage, Ambient	-20 to 60°C
Physical Dimensions	
External Dimensions	5 in. x 2 in. x 1.25 in. (12.7 cm x 5 cm x 3.2 cm)
Tube Adapters (Inlet & Outlet)	0.375 inch O.D. straight
Weight	1.7 lbs (0.8 kg)
Flow Body Material	Polycarbonate
Warm-up Time	1 min
Power	Battery pack 7.5 VDC ± 1.5 V, 300 mA maximum

Notes:

- 1 Accuracy stated at standard conditions of 21.1°C and 101.3 kPa.
- 2 Accuracy stated with air temperature and flow body temperature within ±10°C of one another.
- 3 Accuracy stated measuring dry air (less than 10% R.H.).
- 4 Includes ±0.5% of reading repeatability.
- 5 Volumetric flow rate is calculated from the mass flow measurement. Add an additional 0.25% of reading to the flow accuracy to account for the uncertainty in measuring air temperature and pressure.

*Specifications subject to change without notice.

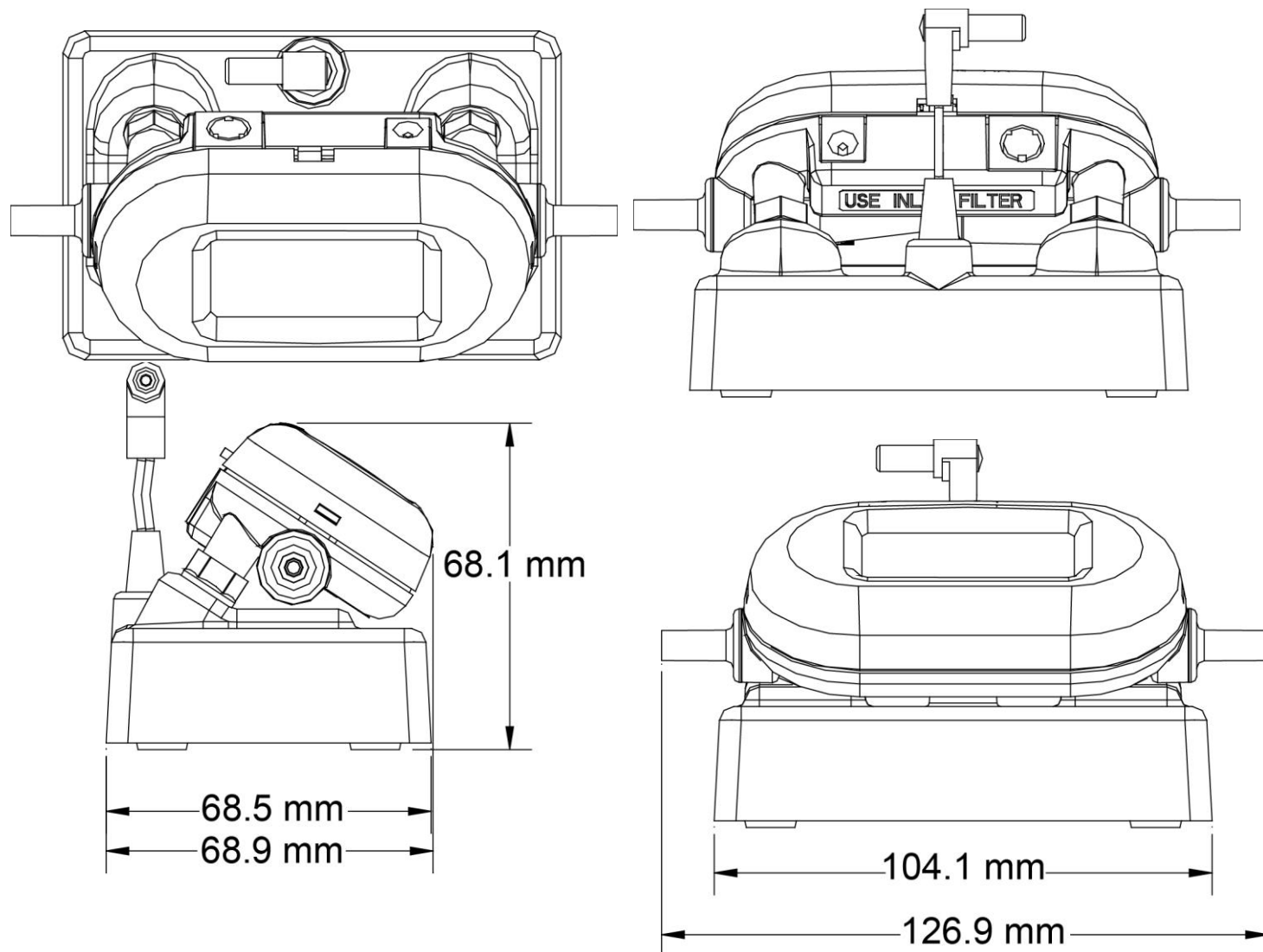


Figure A Unit Dimensions

APPENDIX B: Factory Calibration and Service

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