

LFS-113 LOW FLOW AIR SAMPLING PUMP

OPERATION MANUAL



SENSIDYNE®

1000 112th Circle N, Suite 100 • St. Petersburg, Florida 33716 USA
(800) 451-9444 • (727) 530-3602 • (727) 539-0550 [FAX] • www.sensidyne.com

REF 360-0041-01 (G)

PROPRIETARY NOTICE

This manual was prepared exclusively for the owner of the Sensidyne LFS-113 Low Flow Air Sampling Pump. The material within this manual is proprietary information and is to be used only to understand, operate, and service the instrument. By receiving this document, the recipient agrees that neither this document nor the information disclosed within nor any part thereof shall be reproduced or transferred, physically, electronically or in any other form, or used or disclosed to others for manufacturing or for any other purpose except as specifically authorized in writing by Sensidyne, LP.

COPYRIGHT NOTICE

© 2005, 2008, Sensidyne, LP All Rights Reserved. No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form by any means without the prior written permission of Sensidyne, LP.

TRADEMARK NOTICE

Sensidyne, the Sensidyne logo, Gilian, and the Gilian logo are registered trademarks. These trademarks are protected through use and registration in the United States. The trademarks and servicemarks used in this document are the property of their respective companies and are used only for informational and explanatory purposes.

DISCLAIMER

THE SELLER ASSUMES NO RESPONSIBILITY WHATSOEVER, TO ANY PARTY WHOSOEVER, FOR ANY PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH RECEIVED BY OR RESULTING FROM, IN WHOLE, OR IN PART, THE IMPROPER USE, INSTALLATION, OR STORAGE OF THIS PRODUCT BY THE USER, PERSON, FIRM, ENTITY, CORPORATION OR PARTY NOT ADHERING TO THE INSTRUCTIONS AND WARNINGS IN THIS MANUAL, OR OTHERWISE PROVIDED BY THE SELLER OR FROM NOT ADHERING TO ALL FEDERAL, STATE, AND LOCAL ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY LAWS AND REGULATIONS.

THE SELLER SHALL NOT BE LIABLE FOR DIRECT, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR OTHER DAMAGES RESULTING FROM THE SALE AND USE OF ANY GOODS AND SELLERS' LIABILITY HEREUNDER SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF ANY GOODS FOUND DEFECTIVE. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE OR FOR A PARTICULAR PURPOSE WHICH ARE EXPRESSLY DISCLAIMED.

TABLE OF CONTENTS

- **PREFACE**
 - Notices 2
 - WARNINGS 4
 - Certifications 5
- SECTION ONE: INTRODUCTION**
 - Components 6
- SECTION TWO: PUMP OPERATION**
 - 2.1 Equipment Set-Up 9
 - 2.2 Field Calibration/Flow Verification 10
 - 2.3 Taking A Sample 13
- SECTION THREE: MAINTENANCE**
 - 3.1 Battery Maintenance 14
 - 3.2 Filter Maintenance 14
- SECTION FOUR: APPENDICES**
 - Appendix A: Parts List 15
 - Appendix B: Specifications 16
 - Appendix F: Service 17
- LIST OF FIGURES**
 - 1.1 LFS-113 Air Sampling Pump: Front View 7
 - 1.2 LFS-113 Air Sampling Pump: Rear View 8

 - 2.1 Field Calibration Equipment Set-Up 9
 - 2.2 Field Calibration: Constant Flow 11
 - 2.3 Field Calibration: Multi-Flow 12
 - 2.4 Sampling 13



WARNINGS

READ AND UNDERSTAND ALL WARNINGS AND INSTRUCTIONS BEFORE USE

Failure to read, understand, and comply with ALL accompanying literature, product labels, and warnings could result in property damage, severe personal injury, or death.

Read and understand ALL applicable environmental health and safety laws and regulations. Ensure complete compliance with ALL applicable laws and regulations before and during use of this product.

DO NOT remove, cover, or alter any label or tag on this product, its accessories, or related products.

UNDER NO CIRCUMSTANCES should this product be used except by qualified, trained, technically competent personnel.

DO NOT operate this product should it malfunction, require repair, or have a cracked or broken case. DO NOT repair or modify, except as specified in Operation Manual. No user serviceable parts located within case. Service to be performed by Sensidyne Authorized Service Departments only.

Use ONLY specified Sensidyne parts when performing maintenance procedures described in this manual. Intrinsic safety certifications become void by substitution of components, unauthorized repair or alteration.

This product is intended for both indoor and outdoor use when protected from splashed or wind blown liquids. The unit is not waterproof so NEVER submerge the unit in water. Pump failure or faulting may result.

Possible static hazard. Do not rub with dry cloth.

DO NOT charge battery in an explosive atmosphere.

This product uses rechargeable Nickel-Metal-Hydrate batteries. ALWAYS fully charge before use. Use only battery pack and chargers specified in Operation Manual. DO NOT insert any foreign objects into contact slot. Shorting contacts will blow protective fuse.

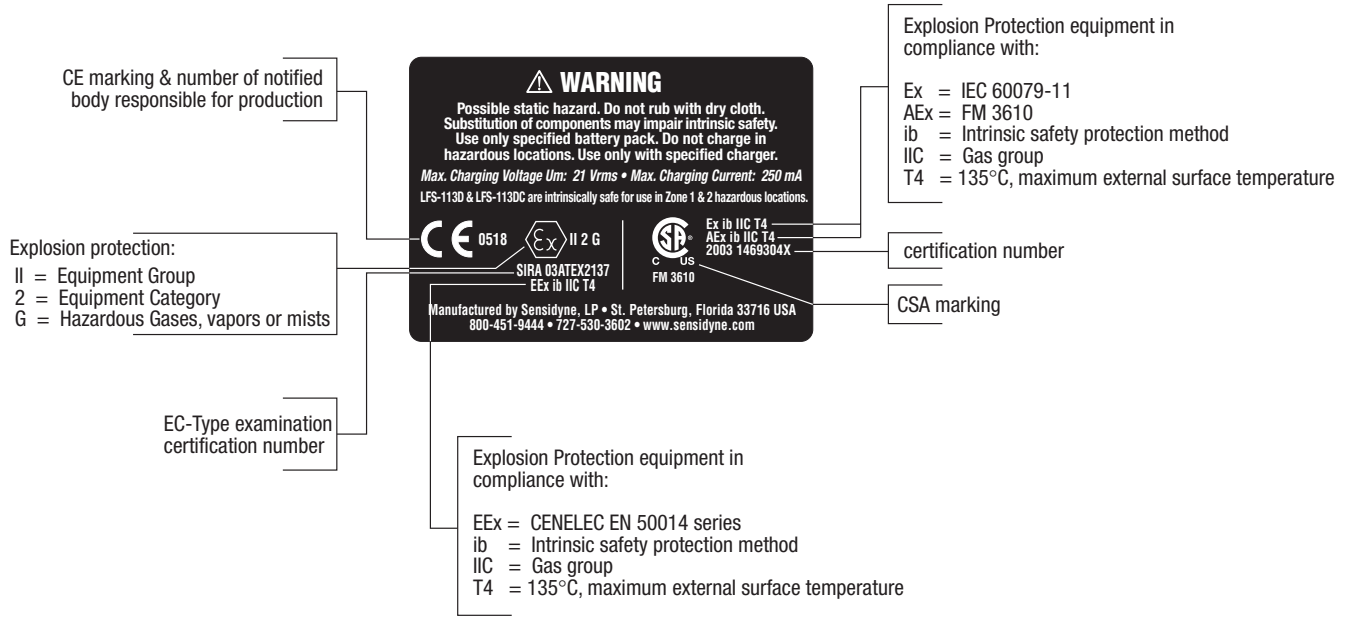
If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised. Examples of aggressive substances are acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials. Examples of suitable precautions are regular checks as part of routine inspections or establishing from material data sheets that it is resistant to specific chemicals.

DO NOT operate with a dirty or blocked inlet filter or kinked tubing. Pump failure or faulting may result.

Caution: Both charger and battery become warm during charging.

If further translation is required, please contact Schauenburg Electronic Technologies GmbH, the Sensidyne EU Authorized Representative.

CERTIFICATIONS



SECTION ONE

INTRODUCTION

- **COMPONENTS**

- **See Figures 1.1 and 1.2**

- (1) Inlet Boss
The Inlet Boss is located on the filter housing and provides a built-in means of attaching tubing for suction sampling.
- (2) Air Inlet Pump Filter
A 10 Micron Nylon Air Inlet Pump Filter protects the pump assembly from dirt.
- (3) Flow Adjustment (requires slotted screwdriver).
- (4) Battery Check
This green LED (B) indicates that sufficient battery power is available to run the pump for an 8 hour period under normal load conditions.
- (5) On/Off Switch
- (6) Fault Indicator
This red LED (F) indicates a flow fault due to excessive pressure or insufficient battery voltage to maintain flow.
- (7) Clock Display (DC Model only)
The Clock Display shows the continuous run-time (in minutes, to two decimal places), and will lock-in the sample time upon fault indication. The time will reset to zero when the power switch is turned OFF and then back ON again.
- (8) Outlet Port
The Outlet Port provides a receptacle for the discharge (bag sampling) boss accessory. The cap screw prevents dirt from entering the Outlet Port when not in use.
- (9) Discharge (Bag Sampling) Boss
This is an accessory which, when installed into the Outlet Port, provides a means for filling air sampling bags.
- (11) Charging Jack
The Charging Jack receptacle is used to connect a charger for recharging the internal battery pack.
- (12) Belt Clip
- (13) Rechargeable Battery Pack
- (14) Tube Breaker Assembly.
- (15) Mode Indicator
The Mode Indicator visually confirms the sampling mode selected (via a Black/White indicator)
- (16) Mode Selector
The Mode Selector is used to change the sampling mode. The selector is used for unlocking, indexing, and re-locking the mode selector valve while changing from Constant Flow Mode to Constant Pressure (Multi-Flow) Mode.
- (17) Hex Key

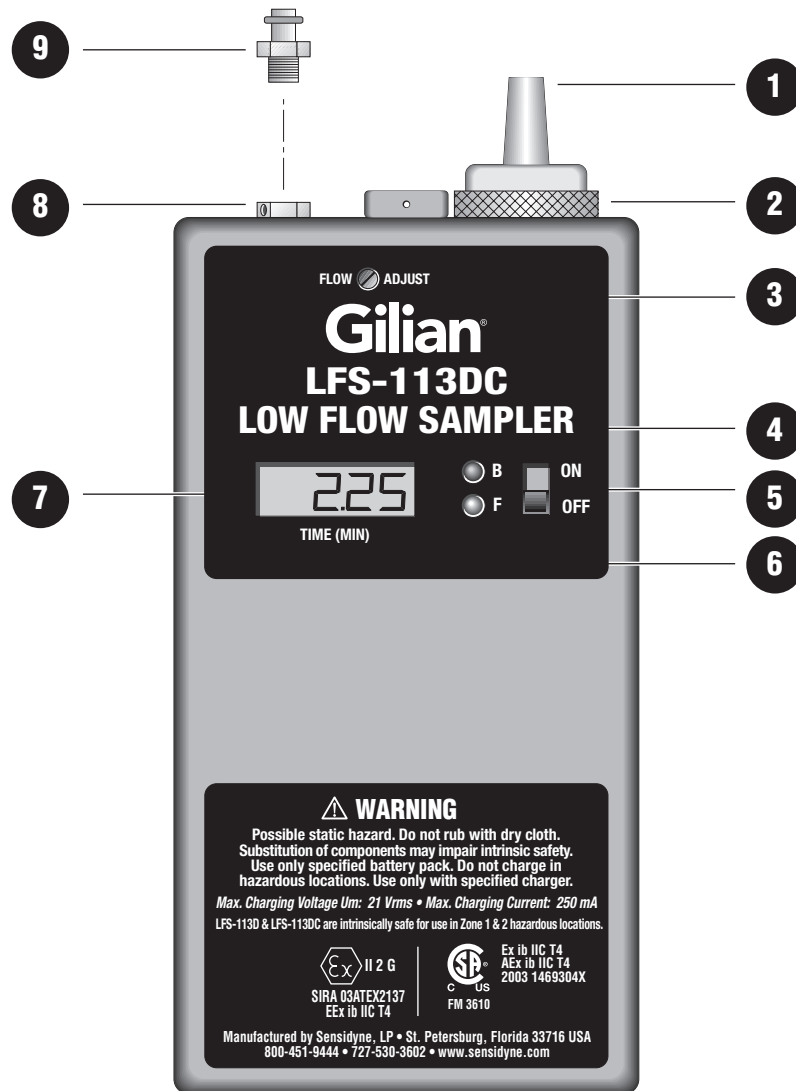


Figure 1.1
LFS-113 Air Sampling Pump: Front View

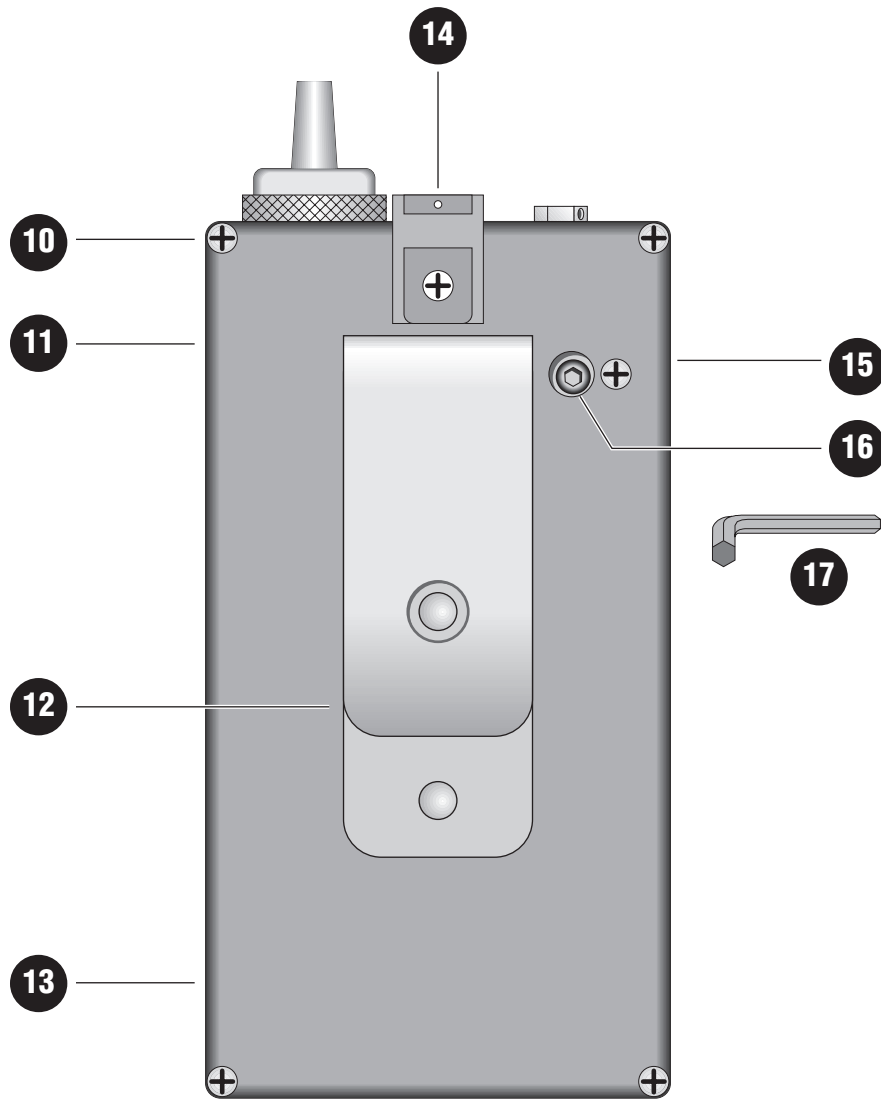


Figure 1.2
LFS-113 Air Sampling Pump: Rear View

2.2 Field Calibration/Flow Verification

Field calibration (flow rate verification) must be performed before sampling and when setting the flow rate.

- See Figure 2.2 for Constant Flow

- See Figure 2.3 for Multi-Flow

- 1) Insert the hex key [1] into the hex head screw on the pump.
- 2) Turn the key counterclockwise [2] to change the mode.
- 3) Continue turn the key until the mode indicator shows black for constant flow [Fig. 2.2, #3] or white for multi-flow [Fig. 2.3, #3].
- 4) Turn the key clockwise [4] to lock your selection into place.

- 5) Turn on the pump using a pointed instrument such as ball point pen [5].

- 6) Make sure the Gilibrator 2 is on and working.

- 7) Set the pump flow rate as follows:

Constant Flow: Use a slotted screwdriver to make flow adjustments on the pump itself [Fig. 2.2, #6].

Multi-Flow: Use a slotted screwdriver to make individual flow adjustments on the sampling device [Fig. 2.3, #6].

- 8) When desired flow rate has been reached, turn off pump and Gilibrator 2. The pump is now ready for sampling.

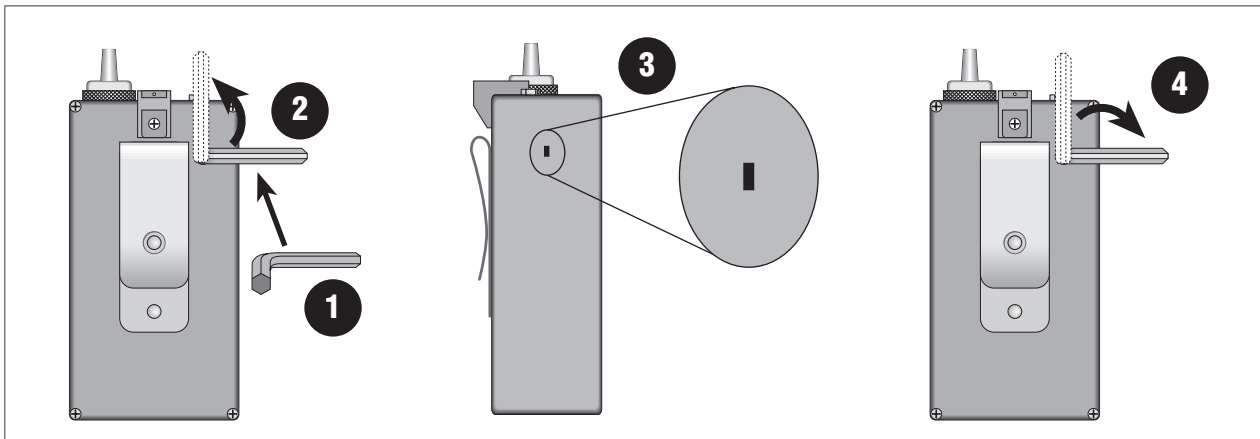
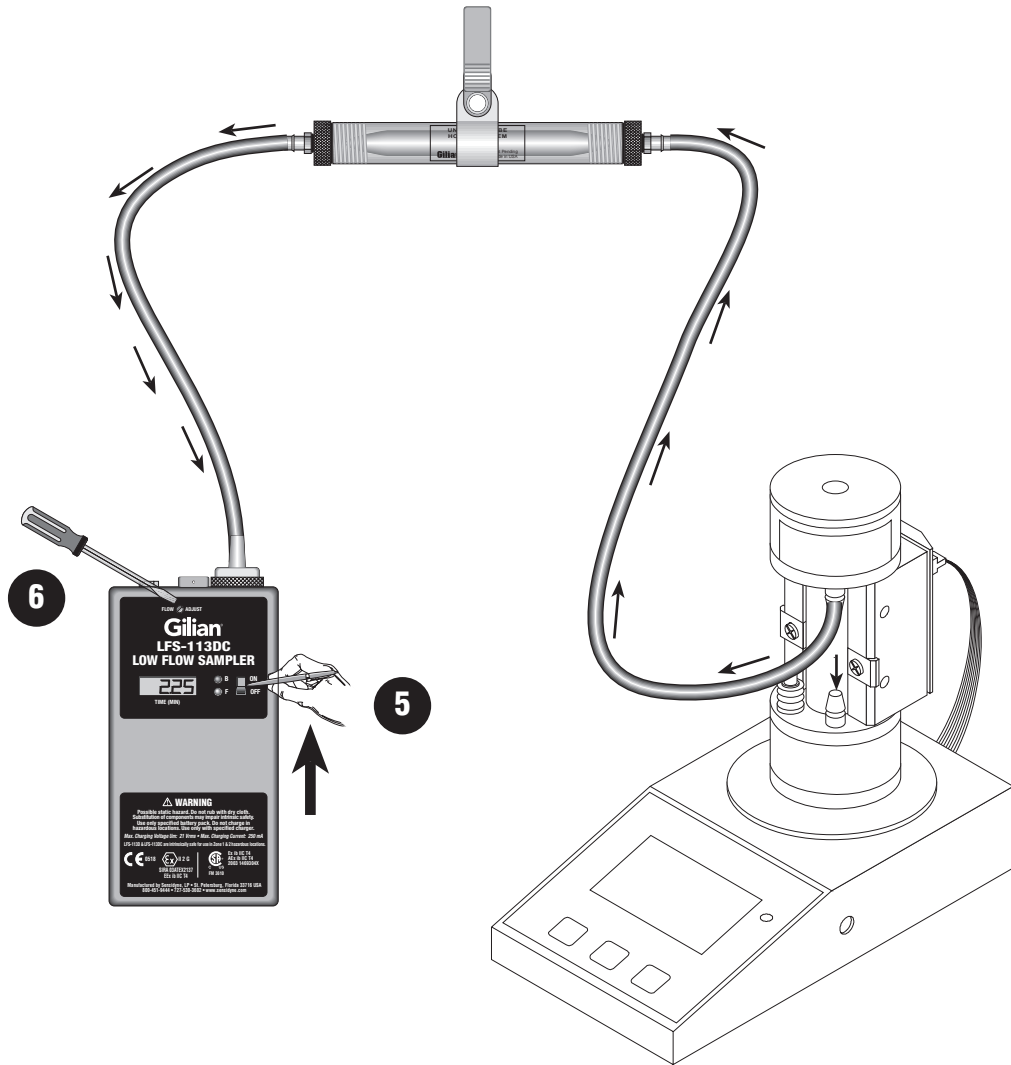


Figure 2.2
Field Calibration: Constant Flow

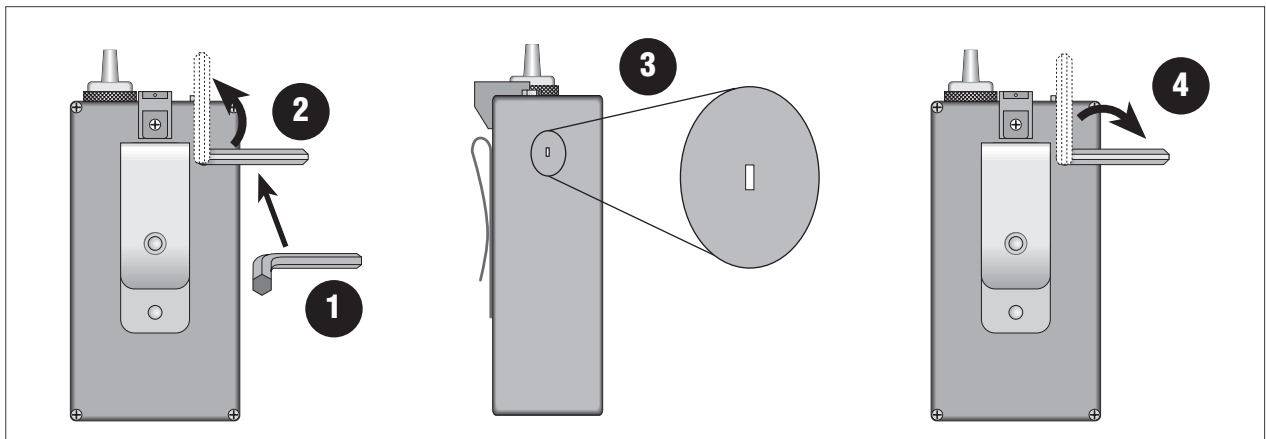
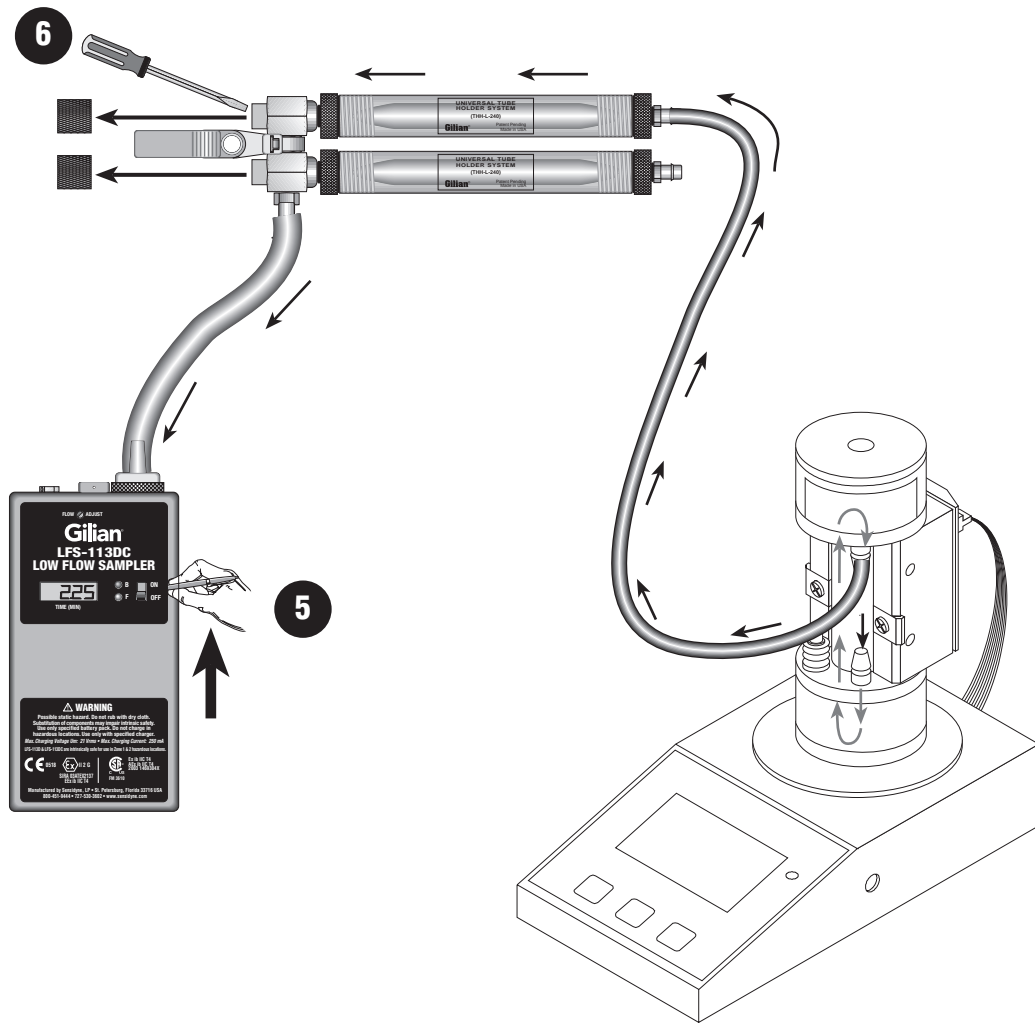


Figure 2.3
Field Calibration: Multi-Flow

2.3 Taking A Sample

- 1) Use a pointed instrument such as a ball point pen to turn on the pump.
- 2) Place the pump, tubing and sampling device on the worker as shown in Figure 2.4.
- 3) When sampling is completed use a pointed instrument such as a ball point pen to turn off the pump. Record the sample data.

Note for Clock Models

When the pump is shut off after a sample run, the accumulated run time minutes (to the nearest 0.01 minute) are displayed. To calculate totaled air volume sampled, use the following formula:

$$\text{Total Air Volume (Liters)} = \text{Air Flow Rate (cc/min)} \times \text{Sample Time (minutes)} \div 1000 \text{ cc/Liter}$$



Figure 2.4
Sampling

SECTION THREE MAINTENANCE

3.1 Battery Maintenance

NOTE

Do not charge battery pack while in an explosive atmosphere.

The LFS-113 pump uses rechargeable Nickel-Metal-Hydrate batteries that must be fully charged and properly maintained for maximum run time. The battery pack is rated at 4.8 Volts (720 mAh).

Make certain charger plug is fully inserted into jack on battery pack (see Figure 1.2, #11 for charger jack location).

CAUTIONS & NOTES

Both charger and battery pack become warm during charging.

Do not short battery terminals. Shorting will blow internal fuse.

All NiMH batteries lose charge when not in use. If battery pack has not been charged for 3-4 days, recharge battery before use. This ensures that batteries are fully charged just prior to sampling. NiMH batteries stored for extended time periods should be recharged every 1-2 months to avoid complete discharge.

Battery pack has an estimated life of 300-500 charge/discharge cycles, depending on use. Table below shows estimated battery life based on usage level.

Pump Usage	Weekly Use	Est. Battery Life
High	40-60 hrs	1.0-1.5 yrs
Medium	20-39 hrs	1.5-2.5 yrs
Low	< 20 hrs	2.5 yrs

• Chargers

Single Station Charger

A dual rate charger that can be switched from constant-rate charge to trickle charge.

LFATR Multi-Station Charger

A dual rate charger offering five-station timed constant-rate charging that automatically defaults to trickle charge.

NOTE

Both chargers can be damaged by line transients and overvoltage. While not a common problem, long term reliability can be improved by use of a surge/overvoltage protector.

3.2 Filter Maintenance

Under normal operating conditions, the pump filter should be changed after approximately six months or 250 hours of operation, or when needed. Failure to change the filter as it becomes dirty will decrease the pump's back pressure capability and performance envelope.

• See Figure 1.1, #1

Blow all dust and debris from around the Filter Housing. Grasp the knurled edge of the filter housing assembly and rotate counterclockwise. Check the new filter housing assembly to make sure that the sealing O-ring is present on the internal boss. Install the new Filter Housing Assembly onto the pump rotating the knurled edge clockwise. *Do Not Overtighten!*

APPENDIX A

PARTS LIST

Accessories

<i>Part Number</i>	<i>Description</i>
200504	Tubing, 1/8" ID x 1/16" W (10 ft)
200505	Tubing, 1/8" ID x 1/16" W (3 ft)
800565-4	Diagnostic Panel with Carrying Case (2–50cc, 20–200cc, 50–800cc)
800400	Carrying Case (18" x 13" x 7")
800093	Filter Assembly
800093-3	Filter Assembly (pkg of 3)

Spare Parts

<i>Part Number</i>	<i>Description</i>
400324	5-Unit Charger, 120V
298-0005-01	Single Unit Charger, 120V
400373	5-Unit Charger, 230V [CE]
400198-1	Single Unit Charger, 230V, Euro Plug [CE]
800222	Tool Kit
800685	Air Boss Kit (required for bag sampling)
360-0041-01	LFS-113 Manual

APPENDIX B

SPECIFICATIONS

Additional Features	Flow Fault indication LED Batt check LED Belt clip Dual filtration system Sorbent tube end breaker External flow adjust
Options	Elapsed timer clock module (DC models only): LCD display automatic instant-fault shutdown function RFI shielding
Dimensions	2.50" (W) x 1.38" (H) x 4.63" (L) 63.5 mm (W) x 34.9 mm (H) x 117.5 mm (L)
Weight	Main Unit: 12 oz (340 g)
Operating Range (Constant Flow Mode)	20–200 cc/min, back pressures to 25" H ₂ O
Operating Range (Constant Pressure Mode)	1–350 cc/min, flows adjustable through a single or multiple tube flow controller.
Pressure Range	Backpressure up to 25" H ₂ O.
Flow Control	± 5% of set point
Battery Type	Rechargeable Nickel-Metal-Hydride battery pack
Battery Output	4.8 v, 720 mAh
Charging	Internal (external with adapter).
Operating Temperature	-20° to 45°C (-4°F to 113°F)
Storage Temperature	-40° to 45°C (-40°F to 113°F)
Charging Temperature	0° to 45°C (32°F to 113°F)

APPENDIX C

SERVICE

Domestic Service

Sensidyne, LP.
1000 112th Circle N, Suite 100
St. Petersburg, Florida 33716 USA

800-451-9444
727-530-3602

727-539-0550 [Main fax]
727-538-0671 [Service fax]

e-mail: info@sensidyne.com
web: www.sensidyne.com

European Service

Goffin Meyvis
Analytical and Medical Systems B.V.

Deliveries:

Ecustraart II
4879 NP Etten Leur
the Netherlands

Mail:

P. O. Box 251
4870 AG Letten Leur
the Netherlands

+31 (0)76 5086000

+31 (0)76 5086086 [fax]

e-mail: info@goffinmeyvis.com
web: www.goffinmeyvis.com

Manufactured by:

**Sensidyne, LP
1000 112th Circle N, Suite 100
St. Petersburg, Florida 33716
USA**



**800-451-9444 • 727-530-3602 • 727-539-0550 [fax]
www.sensidyne.com • info@sensidyne.com**

Authorized EU Representative

**Schauenburg, Electronic Technologies GmbH
Weseler Str. 35 • 45478
Mulheim-Ruhr Germany**

**Tel. +49 (0) 208 9 99 10 • Fax. +49 (0) 208 5 41 10
www.schauenburg.com • international@schauenburg.com**