



A.P. BUCK, INC.

Libra™

MODEL L-4

INSTRUCTION MANUAL



A.P. BUCK, INC.

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A.P. BUCK, INC.

MAN-LIBRA REV-A
5/28/2004

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SERVICE INFORMATION

For all work not covered under warranty, A.P. Buck, Inc. will repair any instrument for the cost of parts and labor as quoted. If major components must be replaced, A.P. Buck, Inc. will notify the customer before proceeding with repairs.

When returning any instrument for service, please include a Purchase Order marked: "Repair – Cost Not to exceed \$250.00 without customer authorization". Please provide the following information with your instrument:

Company Name:
Address:
Telephone:
Fax:
Contact Name:
Serial Number(s):
Date of Purchase:
Service Required or Description of Problem:

You must obtain an RMA number prior to returning any product. Obtain your RMA number by calling **A.P. Buck, Inc. Customer Service at 800-330-BUCK or 407-851-8602**. To expedite service and repairs, have your Customer ID handy.

Please ensure that all products returned to A.P. Buck, Inc. contain no hazardous materials. Any obviously contaminated product received will be returned to the customer. All products scheduled for service must be received within 30 days of the RMA number issuance date. Unauthorized products will be returned to the customer.

TECHNICAL SUPPORT SERVICES

Technical Assistance: (407) 851-8602
Fax: (407) 851-8910
Email: apbuck @apbuck.com
Web site: www.apbuck.com
Hours : Monday–Friday
8:00 AM to 4:30 PM (EST)

If you need additional information or help during installation or normal use of this product, contact A.P. BUCK, Inc. Technical Support. Our customer support staff will attempt to answer your installation questions by phone or issue a service authorization number for repair or replacement of your product. Unauthorized returns will not be accepted. When calling for support, please have your product serial number and product model available.

WARRANTY

The seller warrants to the Purchaser that any equipment manufactured by it and bearing its name plate to be free from defects in material or workmanship, under proper and normal use and service, as follows: if, at any time within 1 year from the date of sale, the Purchaser notifies the Seller that in his opinion, the equipment is defective, and returns the equipment to the Seller's originating factory prepaid, and the Seller's inspection finds the equipment to be defective in material or workmanship, the Seller will promptly correct it by either, at its option, repairing any defective part or material or replacing it free of charge and return shipped lowest cost transportation prepaid (if Purchaser requests premium transportation, Purchaser will be billed for transportation costs). If inspection by the Seller does not disclose any defect in material or workmanship, the Seller's regular charges will apply. This warranty shall be effective only if installation and maintenance is in accordance with our instructions and written notice of a defect is given to the Seller within such period. This warranty is exclusive and is in lieu of any other warranties, written, oral or implied; specifically without limitation, there is no warranty of merchantability or fitness for any purpose. The liability of the Seller shall be limited to the repair or the replacement of materials or parts as above set forth.

LIMITATION OF LIABILITY

The seller shall not be liable for any claim for consequential loss or damage arising or alleged to have risen from any delay in delivery malfunction or failure of the equipment. The Seller's liability for any other loss or damage arising out of or connected with the manufacture, sale or use of the equipment sold, including damage due to negligence, shall not in any event exceed the price of the equipment supplied by us.

A.P. Buck, Inc. reserves the right to make changes at any time, without notice, in prices, colors, materials, specifications, and models; and to discontinue models.

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A/C Power Supply (continuous sampling)

The Standard **Battery** Charger for BUCK pumps, will supply enough power to operate the Libra Pump continuously while sampling. Simply plug the charger into the battery pack and 120 VAC outlet and turn the pump on to sample.

Interchangeable Batteries

The BUCK-Libra Series incorporates a unique system of interchangeable batteries to provide additional flexibility in sampling. A triple pack is available for extended run times and has all of the required intrinsic safe approvals. All BUCK-Libra Series Pumps will recharge in approximately 1 (one) hour with either the BUCK **FastOne**™ or **FastFive**™ Charger for the standard (single) and 3 1/2 (three and ½) hours for the triple packs.

Section 4

BATTERY CHARGERS

Note: The BUCK FastOne™ and FastFive™ Battery Chargers are designed to charge only the battery packs for the BUCK-Libra Series Pumps.

BUCK FastOne™ and FastFive™ Battery Chargers Description

The BUCK FastOne™ and FastFive™ Chargers are microprocessor-controlled battery chargers providing an entirely automatic battery charging cycle in approximately one hour. The pump battery pack can be recharged with or without the pump connected. When inserting the charger lead into the battery pack socket, first lift up the protective rubber cover. The charger uses a voltage detection technique that provides a full recharge. When plugged in, the Yellow and Green LEDs light to indicate the microprocessor is functioning and the charging cycle is in progress (“Yellow”) and finished or ready (“Green”).

The FastOne™ and FastFive™ Chargers will charge a standard pump battery in approximately one (1) hour and 15 minutes; three (3) hours and 45 minutes for the optional Triple Pack with a fully discharged pack. After a full charge, a trickle charge cycle (“Green” LED) will begin. Batteries may be left in trickle charge indefinitely.

The charger is designed to operate from a 100-240 VAC. The charger begins operation automatically when plugged in to an AC source.

Operation

When plugged in, the “Charging” light will indicate Yellow (ON). When the green light turns ON and Yellow turns OFF, the batteries are fully charged. The fast charging of the FastOne™ and FastFive™ Chargers prevent any of the “Memory Problems” previously associated with Nickel Cadmium batteries. BUCK-Libra Series pump batteries take advantage of improved chemistries in the cells’ electrolyte and the high current charge rate. Any stagnation of the electrolyte or electrical corrosion is removed on charging.

Standard Charger

The Standard Charger is designed to charge the BUCK PUMP battery pack in 16 hours. The connection is made through the same charge port on the rear bottom of the battery pack. The RED LED light on the A/C charger will light. After 16 hours, the pump batteries will be fully recharged for portable operation. The battery pack can be charged either on or off the BUCK-Libra pump.

Section 1

Buck-Libra Series Quick Start Guide

Note: Connect a representative sampling filter cassette using 1/4 inch tubing to the pump prior to setting Flow Rate for optimal performance.

Operating Instructions



ON green LED

FAULT orange LED is lit when flow cannot be maintained.

BATTERY red LED is lit for low battery condition.

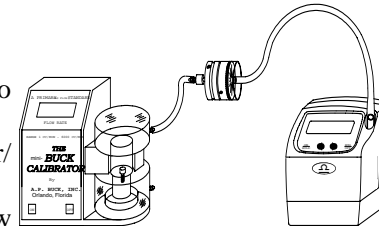
SET button is to be pressed when using the Arrow keys to adjust flow.

ON/OFF button

Press to turn ON, pump will begin running at previous set flow rate. Press and hold for 3 seconds to turn off.

Setting the flow rate

1. Connect sampling filter with hose to pump.
2. To measure flow rate have a rotometer/calibrator handy for use.
3. Turn on the pump and adjust the flow by holding the “SET” button and pressing the up (to increase flow) or the down arrow (to decrease flow) button.
4. Measure the flow with the rotometer or calibrator.
5. Continue to adjust until a satisfactory flow is obtained.
6. Releasing the “SET” button saves the flow rate to memory and the next time the pump is turned on it will resume this flow.



LED Indications

The green LED will blink for each pressing of the arrows in Step 3 above. The orange LED will light if the flow is higher than the pump is capable of maintaining.

If the red LED comes on, stop and recharge the batteries.

Section 2

Description

Design and Features

The main purpose of this battery-operated personal sampling pump is to draw contaminants from an air sample into, onto or through a sampling media such as 25 and 37mm filter cassettes, adsorbent sample tubes, impingers, long-duration color detector tubes to gauge personnel exposure to gases, vapors, particulates, aerosols, etc. Both the analytical method required for the contaminant and the type(s) of contaminants sampled determine the selection of sampling media. Many sampling methods specify the use of filters for collection. (ie. Asbestos and Lead). The pore size, filter diameter, and filter material affect the ability of the sample pump to draw air through the filter for contaminant collection.

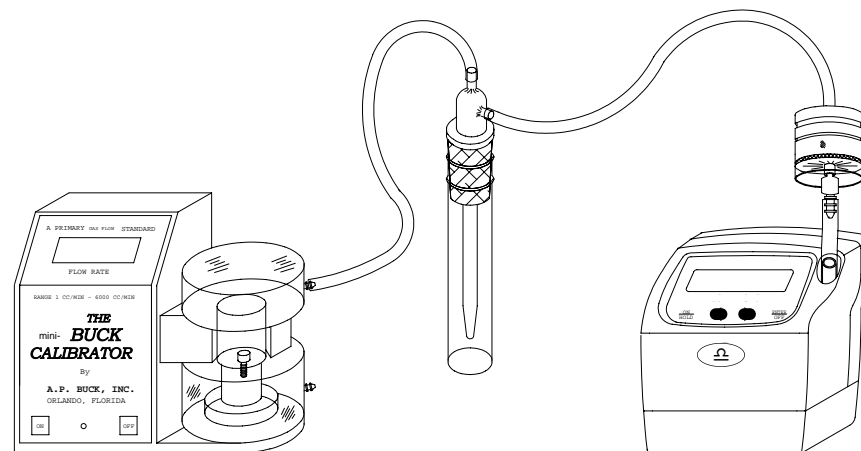
The BUCK-Libra™ Model L-4 Abatement Air Sampler consists of a pump contained in a Lexan case, electronic circuit board for flow control, a single diaphragm pump mechanism and a rechargeable nickel cadmium battery pack.

Features:

- Compact, Rugged and quiet
- No tools required to change flow rates.
- Battery pack rechargeable while attached or separately
- Stainless steel belt clip with built-in tripod connector
- One-hour rechargeable batteries and optional extended run triple packs
- High impact steel fiber filled Lexan case, antistatic and RFI shielded
- “Auto-restart” within one minute of a flow fault and automatic reset
- Flows up to 4 LPM for special cyclone requirements
- Dual flow range easily handles filters, impingers, cyclones, and tubes
- High backpressure capable for 25mm 0.45 micron asbestos filters
- Built in washable stainless steel 100 micron filter for economy of use
- One year warranty

Section 3 continued

Bubbler and Impingers Sampling

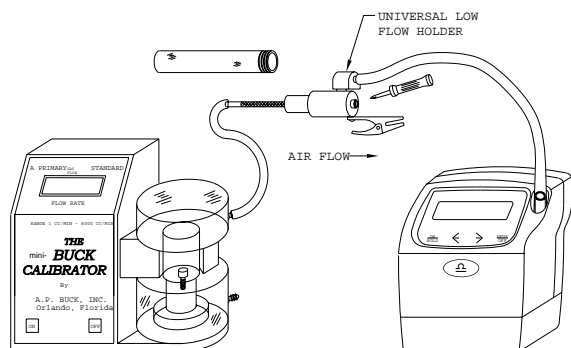


CAUTION: FIRST SET THE FLOW WITHOUT SOLUTION IN BUBBLER. The default flow rate at 2000cc/min. or previously selected flow may be too fast and draw bubbler solution into the pump. Generally, 1,000 cc/min. is the flow of choice.

1. Connect a standard 37mm three piece filter cassette (with a 0.8 micron filter in place) close to the inlet of the pump. This serves as a protective trap to prevent any fluids from being drawn into the pump.
2. Attach a bubbler using desired length of hose to the input of the cassette, so the order of the sampling train from right to left (traveling upstream of the flow) is pump, cassette and then bubbler as shown in drawing. Set flow at 1,000 cc/min.
3. Turn pump off, and next add solution to bubbler and reinstall flow tube to holder.
4. Press ON begin sampling. Even though different brands of bubblers/impingers have varying amounts of flow resistance, the BUCK-Libra Series Pumps will operate at the pre-selected flow.

Section 3 continued

LOW FLOW SAMPLING (5 to 800 cc/min.)



SETUP:

Using the setup as shown above, flows of 5 to 800 cc/min. may be collected in adsorbent tubes (charcoal, silica gel, etc.). Caution: first set up sorbent tube in Tube Holder with proper tubing before turning pump on.

Low Flow Sampling Procedure:

1. The pump must be turned on with a flow rate setting close to the same as when sampling at 2.0 LPM with a 37 mm 0.8u cassette.
2. Using the **mini-BUCK Calibrator M1 (0.1 to 300 cc/min.)** or **M5 (1 to 6000 cc/min.)**, measure the flow through the adsorbent tube as shown above.
3. Use a screw driver to adjust the flow to the desired rate. If the desired flow cannot be obtained by adjusting the needle valve in the low flow holder, on the pump use the "SET" button and the arrows to increase the flow through the tube. Lower pump flows give longer sample run times. Some new higher flow thermal desorption, higher backpressure tubes may be used with the non-adjustable tube holder (P.N. APB-109032) for flow above 800 cc/min.
4. Once the sample flow rate has been set: an accuracy of flow of $\pm 5\%$ can be maintained throughout the sampling day.

Pump Specifications

Model: L-4

Total Flow Range: 0.005-4 LPM (5-4000 cc/min)

Flows 5–800cc/m requires Universal Low Flow Holder APB-109030

LED's Operational Function

Green LED is ON and pump is running

Orange LED on indicates flow fault

Red LED indicates a low battery

Data Storage: Last flow rate setting is saved into the circuit board memory for next sampling

Power: Rechargeable NiCad Batteries: 4.8V, 1.5Ah

Operating Temperature Limits: 32°F to 104°F (0°C to 40°C)

Case: Polycarbonate steel fiber filled * RFI-shielded and antistatic

Size: 4.5"H x 4"W x 2"D

11.4 cm H x 10.2 cm W x 5 cm D

Weight: 16 oz (453g)

Battery Pack

The *BUCK-Libra Series* Standard Battery Pack consists of four nickel cadmium batteries. The batteries are rated at 1500mA hour capacity. The FastOne™ and FastFive™ Battery Chargers connect to the back of each battery case; by lifting the protective rubber cover, the charger lead can be easily inserted. A Triple Battery Pack may be substituted for the standard battery pack to provide three times as much battery capacity for the Libra. When a Battery Pack or pump with Battery Pack is connected to a **BUCK FastOne™** or **FastFive™** Charger, a yellow LED(**CHARGING**) will indicate the charging cycle has begun. The charge cycle takes approximately 75 minutes for the single packs and 4 hours for the triple packs. When the charging cycle is completed, a green LED will light (**READY**) indicating end of cycle. Individual battery packs may be charged independently of the pump if required. The pump may be left connected to the charger in "trickle charge" indefinitely. Battery pack cases are connected to the pump case bottom with four self-retaining screws.

Caution: Never charge batteries in hazardous areas.

Performance Profile

Accuracy: +/- 5% of the flow set point

Constant Flow Range: Minimum of 8 hours of operation

- 1.5 LPM up to 15 inches of water backpressure
- 2.0 LPM up to 35 inches of water backpressure
- 2.5 LPM up to 30 inches of water backpressure
- 3.0 LPM up to 20 inches of water backpressure
- 4.0 LPM up to 8 inches of water backpressure

Pump Run Time with Sampling Filters

Filter type and size	Flow Rate in LPM			
	2.0	2.5	3.0	4.0
37mm 0.8u PVC	15 hr	14 hr	12 hr	10 hr
37 mm 0.8u MCE	15 hr	13 hr	11 hr	9 hr
25 mm 0.8u MCE	10 hr	9 hr	8 hr	—
25 mm 0.45u MCE	7.5 hr	6.5 hr	—	—

Section 3

Setting the Flow Rate for Sampling from .8 to 4.0 LPM

Operating Instructions



ON green LED

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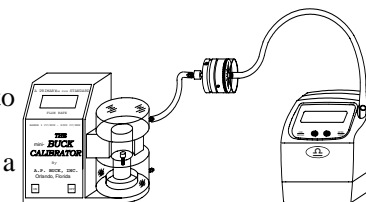
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5. Continue to adjust until a satisfactory flow is obtained.
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