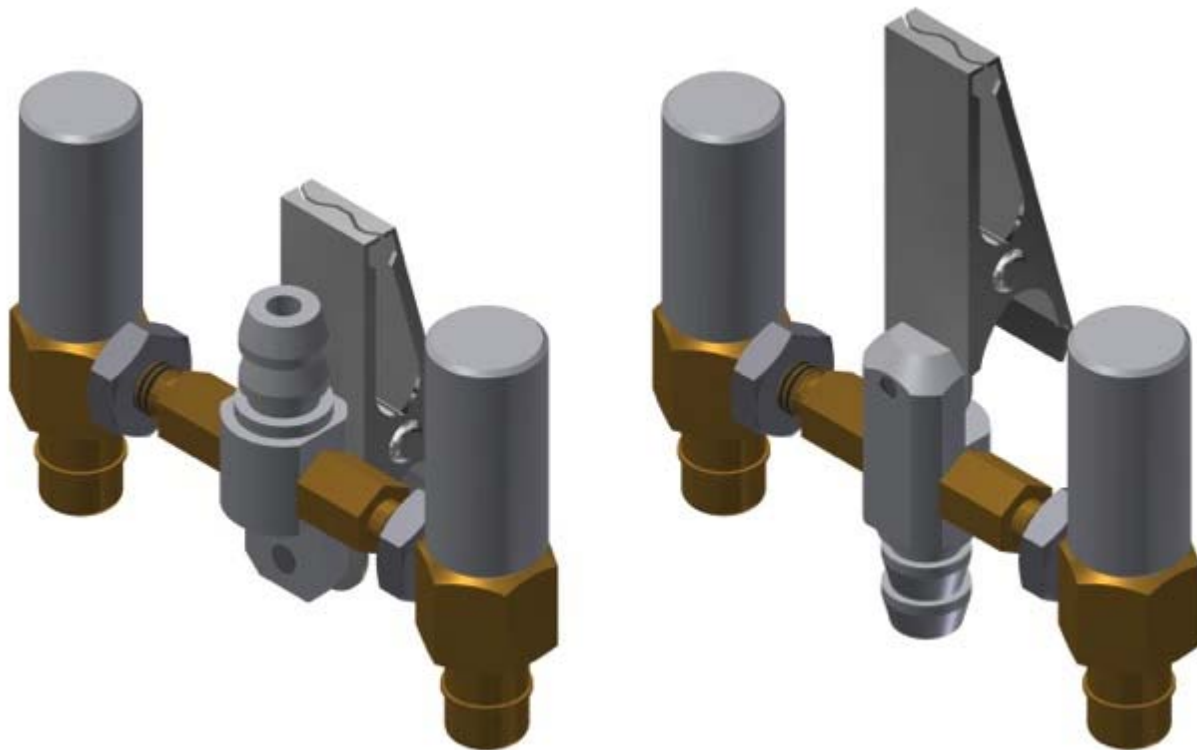


Gilian[®]



Dual Port High/Low Flow Manifold

for use with GilAir Plus Air Sampling Pumps

User Manual

SENSIDYNE[®]
Industrial Health & Safety Instrumentation

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REF 360-0154-01 Rev C

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

Warranty

Sensidyne warrants that, at the time of delivery, the Gilian Dual Port High/Low Manifold shall be free of all defects in workmanship and material. Sensidyne will repair or replace, at its sole option, any Dual Port High/Low Manifold found to be defective by Sensidyne, if notified by Purchaser within the Warranty time period.

The warranty time period shall be for one (1) years from the date of original shipment by Sensidyne.

- A. This warranty shall be null and void on any product which:
1. Is operated or used in excess of the product's operating specifications; or
 2. is not properly maintained in accordance with its maintenance manual or specifications; or
 3. has been repaired or modified by persons other than authorized Sensidyne personnel or Factory Trained Service Centers, unless such work is authorized in advance in writing by Sensidyne; or
 4. has been damaged, abused, or misused.
- B. Warranty on Service and Repairs:
1. Goods, which have been repaired or replaced during the warranty period, are warranted only for the remainder of the unexpired portion of the original warranty period.
 2. Repairs or service provided not pursuant to warranty: 180 days from date of shipment by Sensidyne.

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WARNINGS

READ AND UNDERSTAND ALL WARNINGS AND INSTRUCTIONS BEFORE USE.

Read and understand ALL warnings before using this product. Failure to read, understand, and comply with ALL warnings could result in property damage, severe personal injury, or death.

Read and understand ALL applicable Federal, State, and Local environmental health and safety laws and regulations, including OSHA. Ensure complete compliance with ALL applicable laws and regulations before and during use of this product.

UNDER NO CIRCUMSTANCES should this product be used except by qualified, trained, technically competent personnel and not until the warnings, Operation and Service Manual, labels, and other literature accompanying this product have been read and understood.

This manual must be read and understood by each user before operating this product or using its accessories, in order to ensure proper and safe use and installation of this product and to ensure familiarity with the proper treatment and safety procedures in the event of an accident.

Make certain you read and understand ALL manuals and literature for products used in conjunction with this product.

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

DO NOT operate this product should it malfunction or require repair. Operation of a malfunctioning product, or a product requiring repair may result in serious personal injury or death. DO NOT attempt to repair or modify the instrument, except as specified in the Instruction Manual. Contact the Gilian Service Department to arrange for a Returned Material Authorization (RMA).

Use ONLY genuine Gilian replacement parts when performing any maintenance procedures described in this manual. Failure to do so may seriously impair instrument performance. Repair or alteration of the product beyond the scope of these maintenance instructions, or by anyone other than a certified Gilian service technician, could cause the product to fail to perform as designed and persons who rely on this product for their safety could sustain severe personal injury or death.

The Gilian Dual Port High/Low Flow Manifold is intended for use with the GilAir Plus series of pumps in the constant pressure mode only. Use with other pumps and in other control modes will result in improper sample acquisition.

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SECTION ONE: Introduction

1.1. Introduction

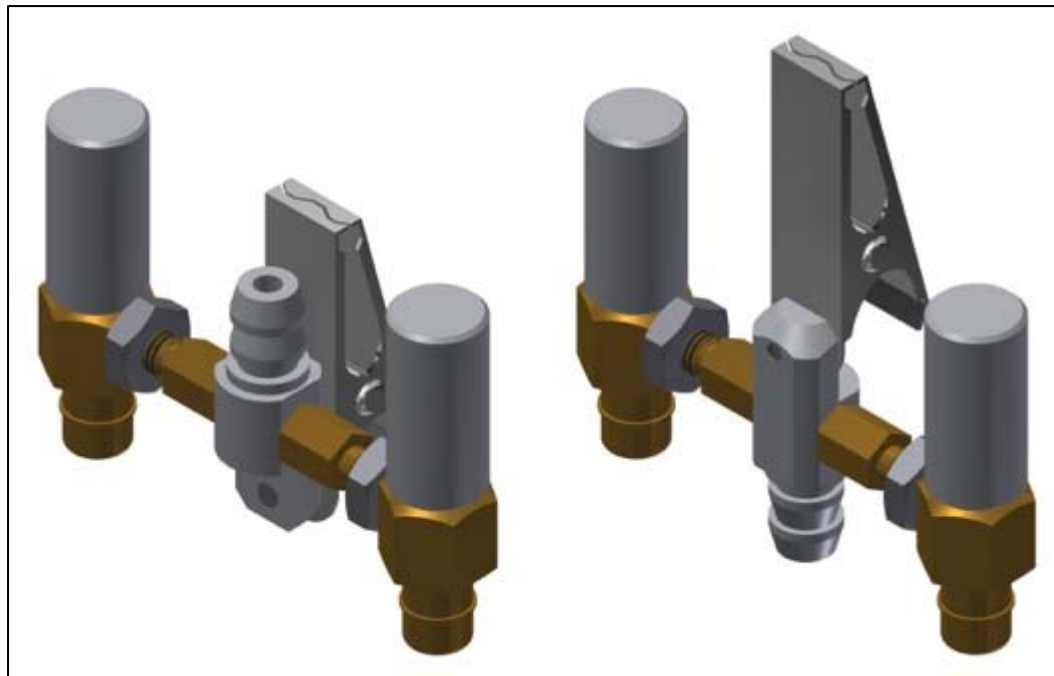


Figure 1: Dual Port High/Low Flow Manifold shown in the top and bottom access orientation.

The Gilian Dual Port High/Low Flow Manifold is an active sampling media system using particulate filter cassettes and/or sorbent tubes to capture particulates, gases, and vapors. The system can use two filter cassettes, two sorbent tubes, or a combination of one filter cassette and one sorbent tube.

Filter cassette holders hold filter media during active sampling. The filter media is available in a variety of materials suitable for sampling various types of particulates.

Sorbent tubes are sealed glass tubes packed with charcoal, silica gel, Tenax, or other sorbent material for absorption or adsorption of gases and vapors. In preparation for a sample, the glass ends are broken off to allow air to pass through the tube. The tubes are held in place using a clear tube holder. Holders eliminate contamination within the tube, prevent tube breakage, and allow “in-line” flow calibration. Tube holders come in a variety of sizes, from standard to sizes for Kitagawa and Drager tubes (see tube holder manual F-PRO-1218).

The Gilian Dual Port High/Low Flow Manifold consists of a dual needle valve assembly that supports the use of filter cassettes and/or sorbent tube holders. The system provides multiple configurations for single or dual sample use at flow rates from 1cc/min to 4000 cc/min. Simultaneous sampling (Constant Pressure, Multi-Flow), is the primary application for this accessory though the system can also be used for constant flow single sample collection by closing the valve on the unused port.

All fittings in the Gilian Dual Port High/Low Flow Manifold System contain O-rings to maintain an air seal and permit easy assembly. The see-through housings are ideal for colorimetric tubes. A cross-section of a typical tube holder with tube is shown in Figure 2.

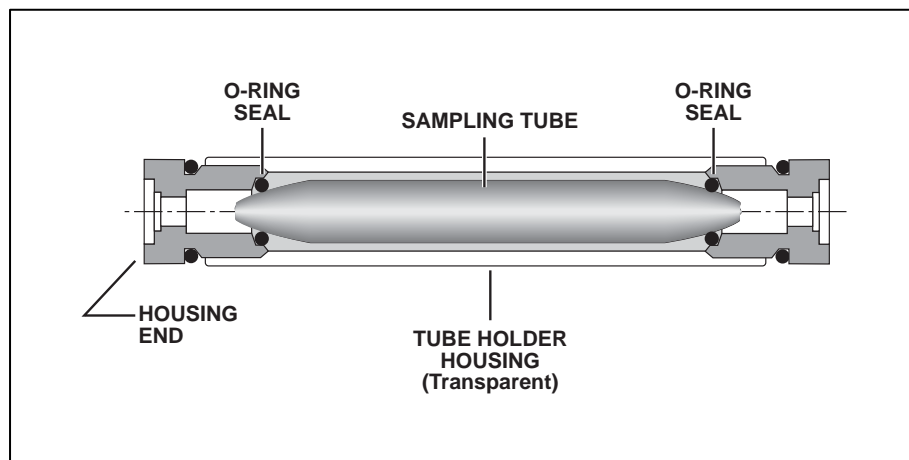


Figure 2: Cross-section of a typical tube holder with tube.

1.2. Theory of Operation

The Gilian Dual Port High/Low Flow Manifold consists of adjustable valves arranged in parallel to allow setting flow in sample media that have no significant variation in back pressure during sampling. The barb fitting, located between the valve bodies, is connected to a length of flexible tubing and attached to the suction side of the air sampling pump.

In operation, the GilAir Plus is set to run in constant pressure mode and the needle valves are set for the desired flow through each sample media. An air flow calibrator like the Gilian Gilibrator must be used to measure the flow at the inlet of each port.

The Flow Adjust Valve in the manifold is used to set the flow rate for that individual sample cassette or tube. If multiple sampling is being done, each cassette or tube is adjusted individually. The flow rate within each sample is maintained independently.

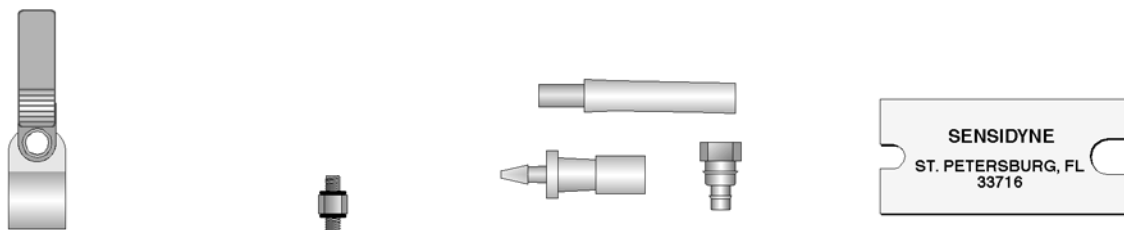


Figure 3: Protective caps remove to reveal the Flow Adjustment Valves

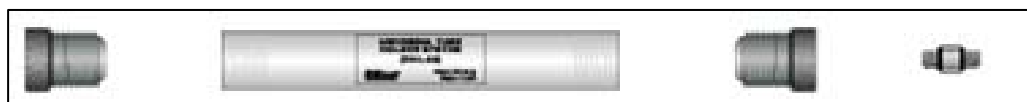
Note: The total amount of flow passing through the manifold cannot exceed the maximum pump flow capacity.

1.3. Tube Holder Assembly and Accessories

The tube holder comes with the following accessories (shown below left to right): a coupling for connecting the tube holder to the manifold inlet, tube holder adapters, and a fittings wrench.

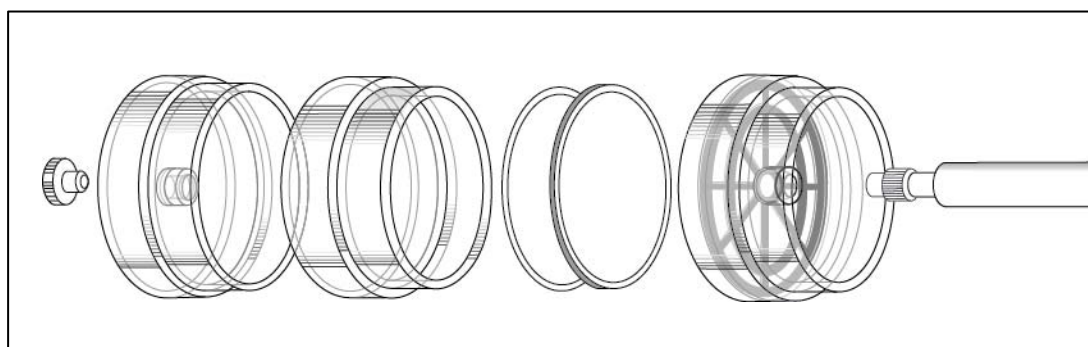


To assemble the tube holder, screw the housing ends into the tube holder housing. The coupling screws into the outlet end of the tube holder and into the inlet of the Dual Port High/Low Flow Manifold.



1.4. Filter cassette Holder Assembly

The filter cassette holder assembles in the following order (shown below left to right): seal plug (removed to begin sampling), cassette inlet cap (used in closed face sampling and removed in open face sampling), center spacer ring, filter membrane, support pad, gridded filter base, luer fitting, and tubing to the manifold.



SECTION TWO: Installation & Setup

2.1. Tube Installation & Set-Up

- 1) Before you install the Tube Holder, refer to Figure 2 and make certain the Tube Holder Housing and Housing Ends are correctly matched.
- 2) Install a Housing End on the Tube Manifold. Make certain there is an O-ring between the Housing End and the Manifold.
- 3) Select the appropriate Tube Holder Housing to be used and screw it onto the Housing End about half way down the threads.
- 4) Prepare the sorbent tube ends and install into the Tube Holder Housing. Make certain the arrow on the sorbent tube faces toward the Manifold.
- 5) Install the other Housing End and tighten gently. The sorbent tube will be contained and sealed with the O-rings (refer to Figure 2).

IMPORTANT: It is not necessary to thread the Housing Ends all the way down to meet the housing. You risk breaking the sorbent tube if you do this. However, this may not apply when using shorter sorbent tubes.

- 6) Before connecting the Tube Holder configuration to the pump, set the pump to constant pressure at the desired pressure setpoint. The GilAir Plus pumps are delivered from the factory pre-set at 18 inches and can be adjusted from 5 to 35 inches of water.
- 7) Attach the sorbent tube holder to the dual port manifold using the nipple provided.

2.2. Cassette and Tube Holder Installation

Assemble the cassette as illustrated in the drawing in section 1.4 and connect it to the sample inlet on the Dual Port High/Low Flow Manifold.

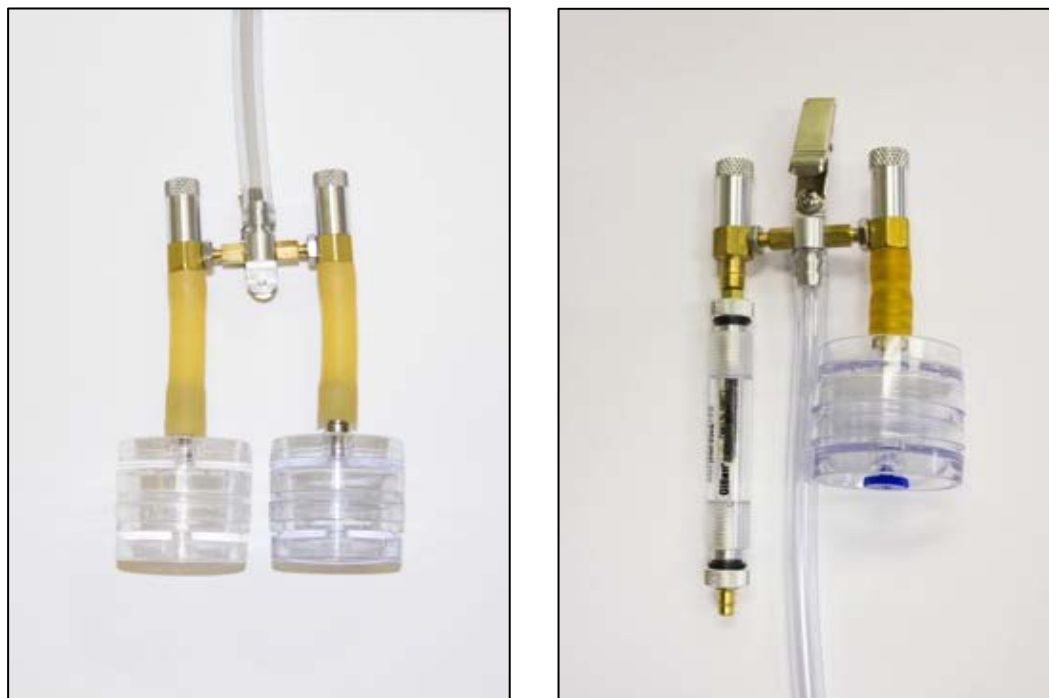


Figure 4: Assembled Dual Port High/Low Flow Manifold with sampling media

2.3. Flow Controller Calibration

The Variable Flow manifold should be calibrated with the filter cassette in place and sorbent tubes installed inside the tube holders to assure greater calibration accuracy.

Refer to Figure 4 and follow the steps below to complete calibration:

- 1) Make certain the dual port manifold configuration and tubing are attached to the suction side of the sampling pump.
- 2) Unscrew and remove the Anti-Tamper Cap on the Control valve you wish to adjust
- 3) Adjust valve to the desired flow rate. Turning the valve clockwise decreases the flow rate. Turning the valve counter-clockwise increases the flow rate.
- 4) After the desired flow rate has been set, replace the Anti-Tamper Cap.
- 5) Repeat Steps 2, 3 & 4 for the other valve.
- 6) When both Flow Controllers have been adjusted, check the flow accuracy with a rotameter, or Gilibrator-2 Calibrator.

IMPORTANT: The total combined flow rate through the manifold should not exceed the flow capability of the sample pump.

APPENDIX A: Dual Port High Flow Manifold Datasheet & Specs.

- Dual air sampling with one personal pump
- Sample with two filter cassettes, or one filter and one sorbent tube simultaneously
- Sample for heavy metals, asbestos, and organic solvents in tandem in any combination
- Saves time and money

Sensidyne's Dual Port High Flow Manifold is used in conjunction with the GilAir Plus pump's high flow constant pressure capability, a part of the Quad Flow feature. Only the GilAir Plus pump can accommodate constant pressure control in the high flow mode (up to 5000 cc/min.), allowing dual simultaneous samples of such airborne contaminants as heavy metals (e.g., lead) or asbestos fibers. With the Dual Port High Flow Manifold, the GilAir Plus can also accommodate one high flow and one low flow sample simultaneously (e.g., lead and benzene) using a filter cassette and a charcoal tube in tandem.

The Dual Port High Flow Manifold allows separate flow settings on a split sample making dual sampling possible. The constant pressure control maintains a constant negative pressure in the sample train between the pump and the manifold, so that the force driving the samples does not change. Adjusting the flow on one side does not affect the other. Similarly, sample media loading on one side does not affect the other. Any sampling method that does not undergo a large backpressure change from start to finish may be accomplished using this system. (Sampling for dust in this mode requires careful consideration of pressure capabilities and possible changes in resistance and is not recommended).

To operate the Dual Port High Flow Manifold with the GilAir Plus pump series, follow the steps below.

Set the GilAir Plus pump to operate in the constant-pressure high-flow (CPH) mode. Attach the Dual Port High Flow Manifold using the ¼ inch tubing provided. The manifold should be mounted at the worker's lapel so as to represent the breathing zone. Note that the manifold is available in two configurations, allowing the choice of running the tubing over the shoulder (top access) or under the shoulder (bottom access). Using the Gilibrator-2 or equivalent air flow calibrator with very low pressure drop, measure the flow rate at the sample inlet, and adjust the flow rates individually using the splitter's needle valves. Two simultaneous filter samples may be run at up to 2 LPM each.

For further information, see the GilAir Plus operations manual and the technical paper, *GilAir Plus Quad Mode – Split Sampling in the High Flow Mode*.

Specifications

Size dimensions, top access model.....	58 x 42 x 23 mm
Size dimensions, bottom access model.....	58 x 63 x 16 mm
Weight.....	53 grams
Number of simultaneous samples.....	2
Flow control range, each channel.....	1 to 4000 cc/min

APPENDIX B: Parts & Accessories

Description	P/N
Dual Port High Flow Manifold Kit, Top Access	911-0902-01-R
1 ea. Dual Manifold High Flow Splitter only, Top Access	
2 ea. Sorbent tube adapter nipple for Dual Port High Flow Manifold	
1 ea. Sorbent Tube Holder, 6 x 70 mm, for Standard Charcoal Tube	
1 ea. Luer Fittings (Pk of 6)	
2 ea. 1/4 inch ID Flexible Vinyl Tubing, 1.5 inch length	
1/4 inch ID Flexible Vinyl Tubing, 3 feet	
Dual Port High Flow Manifold Kit, Bottom Access	911-0901-01-R
1 ea. Dual Manifold High Flow Splitter only, Bottom Access	
2 ea. Sorbent tube adapter nipple for Dual Port High Flow Manifold	
1 ea. Sorbent Tube Holder, 6 x 70 mm, for Standard Charcoal Tube	
1 ea. Luer Fittings (Pk of 6)	
2 ea. 1/4 inch ID Flexible Vinyl Tubing, 1.5 inch length	
1/4 inch ID Flexible Vinyl Tubing, 3 feet	
Spares for Dual Port High Flow Manifold	
Dual Port High Flow Manifold Kit only, Top Access with Tubing	811-0919-01-R
Dual Port High Flow Manifold Kit only, Bottom Access with Tubing	811-0918-01-R
Sorbent tube adapter nipple for Dual Port High Flow Manifold, ea	800165
Dual Manifold High Flow Splitter only, Top Access	611-0902-01-R
Dual Manifold High Flow Splitter only, Bottom Access	611-0901-01-R
Sorbent tube adapter nipple for Dual Port High Flow Manifold, (10/pk)	800165-10
Sorbent Tube Holder, 6 x 70 mm, for Standard Charcoal Tube	800149
1/4 inch ID Flexible Vinyl Tubing, 3 feet	200484
1/4 inch ID Flexible Vinyl Tubing, 1.5 inch length	6667-6206
Replacement Valve Caps (Pack of 2)	811-0920-01
Luer Fittings (Pk of 6)	200156-6

APPENDIX C: Factory Calibration and Service

Sensidyne maintains an instrument service facility at the factory to provide its customers with both warranty and non-warranty repair service. Sensidyne assumes no liability for service performed by personnel other than Sensidyne personnel. To facilitate the repair process, please contact the Sensidyne Service Department in advance for assistance with a problem which cannot be remedied and/or requires the return of the product to the factory. All returned products require a Returned Material Authorization (RMA) number. Sensidyne Service Department personnel may be reached at:

1000 112th Circle North, Suite 100; St. Petersburg, FL 33716 U.S.A.

727-530-3602

727-539-0550 [FAX]

All non-warranty repair orders will have a minimum fee whether the repair is authorized or not. This fee includes handling, administration and technical expenses for inspecting the instrument and providing an estimate. However, the estimate fee is waived if the repair is authorized.

If you wish to set a limit to the authorized repair cost, state a “not to exceed” figure on your purchase order. Please indicate if a price quotation is required before authorization of the repair cost, understanding that this invokes extra cost and handling delay. Sensidyne’s repair policy is to perform all needed repairs to restore the instrument to its full operating condition.

Repairs are handled on a “first in - first out” basis. Your order may be expedited if you authorize an expediting fee. This will place your order next in line behind orders currently in process.

Pack the instrument and its accessories (preferably in their original packing) and enclose your return address, purchase order, shipping and billing information, RMA number, a description of the problem encountered with your instrument and any special instructions. All prices are subject to change without notice.

If this is the first time you are dealing directly with the factory, you will be asked to prepay or to authorize a COD shipment.

Send the instrument, prepaid, to:

1000 112th Circle North, Suite 100; St. Petersburg, FL 33716 U.S.A.

ATTENTION: Service Department

RMA #: _____

U.S.A.

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