SomnoFlo®

Low-Flow Electronic Anesthesia System

User's Guide

Kent Scientific
CORPORATION

SomnoFlo®

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User's Guide

TABLE OF CONTENTS

Introduction

SomnoFlo®

Small Animal Anesthesia

General Information

Introduction

The SomnoFlo is not designed, intended or authorized for use in human applications.
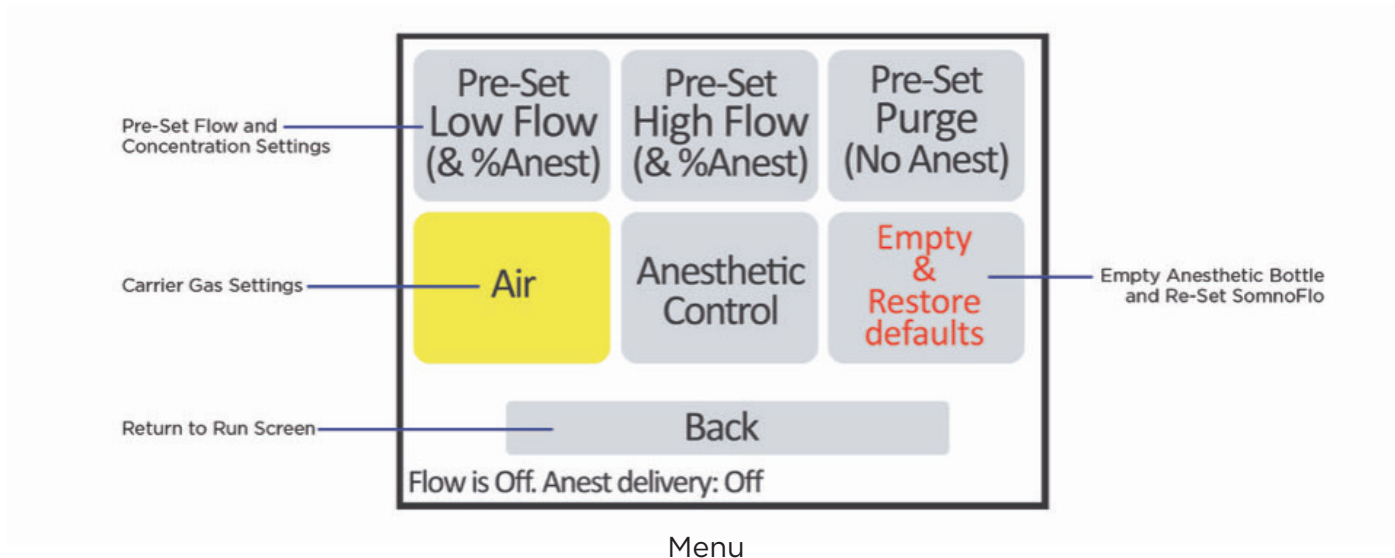
System Components

- Compressed Gas Port
- Ambient Air Port
- Anesthetic Tubing Port
- Integrated Bottle Holder
- Touch Screen
- Anesthetic Concentration Dial
- Air/O2 Flow Rate Dial
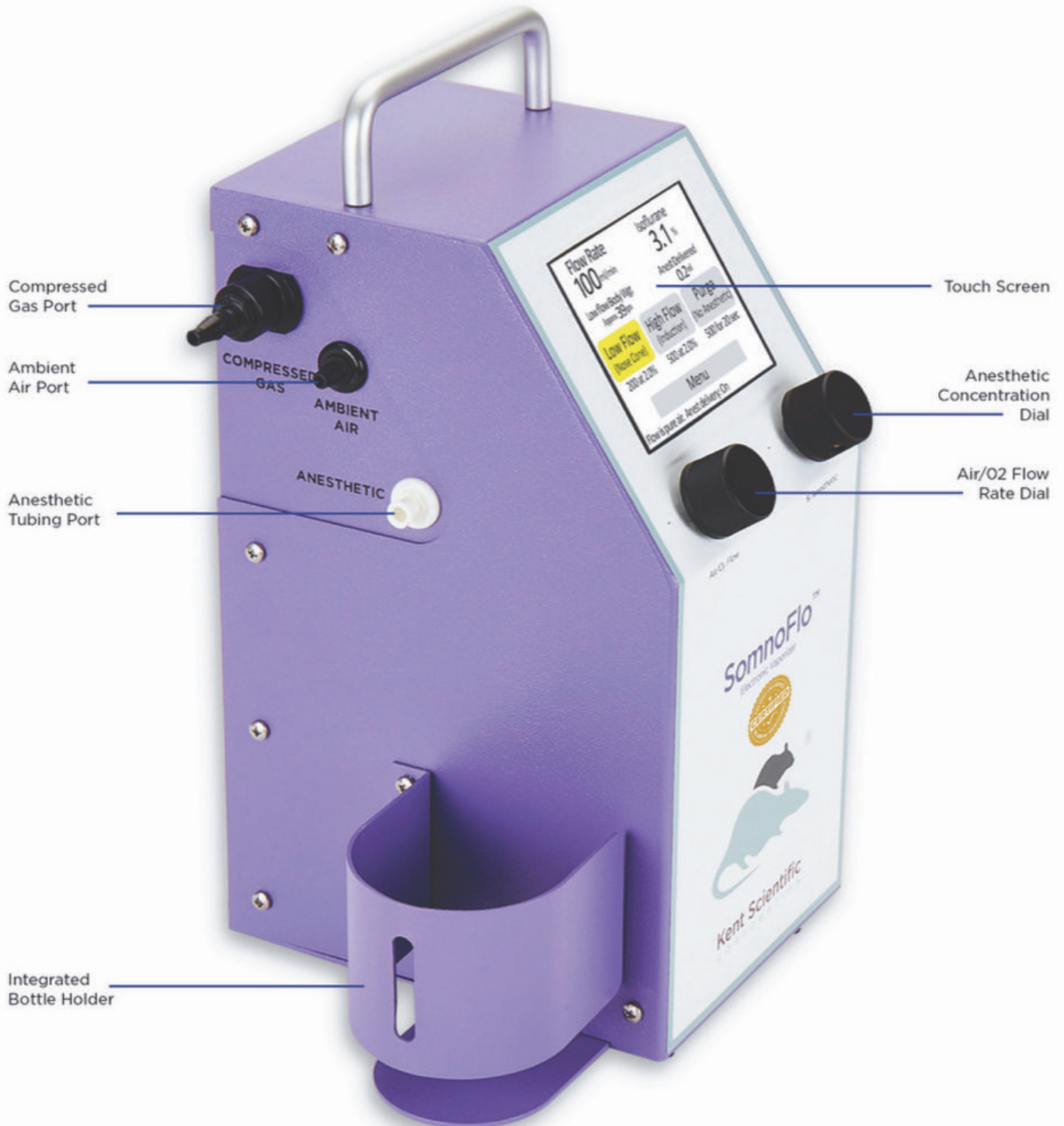
Navigating SomnoFlo®

SomnoFlo Touch Screens offer quick access to menus and settings.

Running Flow Rate —

Corresponding Animal Weight —

Flow Selections —

Pre-Set Settings —

Carrier Gas Settings and Indicator Banner —

Flow Rate	Isoflurane
100 ml/min	**3.1** %
	Anest Delivered
Low flow Body Wgt Approx **39** gm	0.2 ml

Anesthetic Setting

Volume of Anesthetic Delivered

Low Flow (Nose Cone)	High Flow (Induction)	Purge (No Anesthetic)
200 at 2.0%	500 at 2.0%	500 for 20 sec

Menu — Access Menu Screen

Flow is pure air. Anest delivery: On

Run Screen

Touch the Menu button for anesthetic delivery settings.

Pre-Set Flow and Concentration Settings —

Carrier Gas Settings —

Return to Run Screen —

Pre-Set Low Flow (& %Anest)	Pre-Set High Flow (& %Anest)	Pre-Set Purge (No Anest)
Air	Anesthetic Control	Empty & Restore defaults

Empty Anesthetic Bottle and Re-Set SomnoFlo

Back

Flow is Off. Anest delivery: Off

Menu

There are two Dials, Air/O2 Flow and %Anesthetic, which can be used on the Run Screen and in the Menu options to control their respective parameters.

SomnoFlo® Small Animal Anesthesia

Set Up Hardware

1) Connect the INSP portion of the 2-Accessory Connector to the port labeled "Out."

2) Connect the INSP nose cone tubing to one branch, and the INSP chamber tubing to the other branch.

> **Note:** The nose cone adapter has a specific inlet with tubing labeled INSP.

3) Connect the EXP portion of the 2-Accessory Connector to the EXP tubing on the chamber and nose cone.

4) Attach the Charcoal Canister with the Canister Tubing Assembly.

5) If using Room Air as a carrier gas, leave the Ambient Air port open to atmosphere. If using Compressed Gas, use the Compressed Gas Assembly to connect a pressure-regulated gas source to the SomnoFlo's Compressed Gas port.

> **Note:** The SomnoFlo requires an input pressure of 10-15 PSI. Higher pressures can damage your SomnoFlo. If your gas source has a higher output, use the pressure Reducer to automatically regulate gas sources of up to 100 PSI to the required 10-15 PSI range.

6) Connect the bottle top adapter to a bottle of anesthetic.

> **Note:** If using a 100mL bottle, the inner bottle top adapter tubing can be cut to a shorter length.

7) Connect the anesthetic delivery tubing directly to the bottle top adapter. Place the isoflurane bottle into the SomnoFlo's integrated holder, taking care not to kink the delivery tubing.

8) Turn on the SomnoFlo to begin automatic priming. If the SomnoFlo is on during a bottle change, touch Anesthetic Control > Prime.

The SomnoFlo will automatically prime when powered on. Priming only needs to be performed before the first use of the day and after changing the anesthetic bottle.

The Prime cycle requires approximately 70 seconds to complete. The SomnoFlo will automatically perform a Purge at the end of each Prime cycle.

9) **Important:** Run the system for several minutes prior to introducing any animals. This warm-up period is important to equilibrate to current settings after priming.

During warm up, set the gas/air flow rate to 200 ml/min and the anesthetic to 2%. Allow the SomnoFlo to run at these settings for about 5 minutes to reach a stable anesthetic gas flow. This will deliver the proper amount of anesthetic into the vaporizer block at a median gas flow and allow the vaporizer block time to warm up.

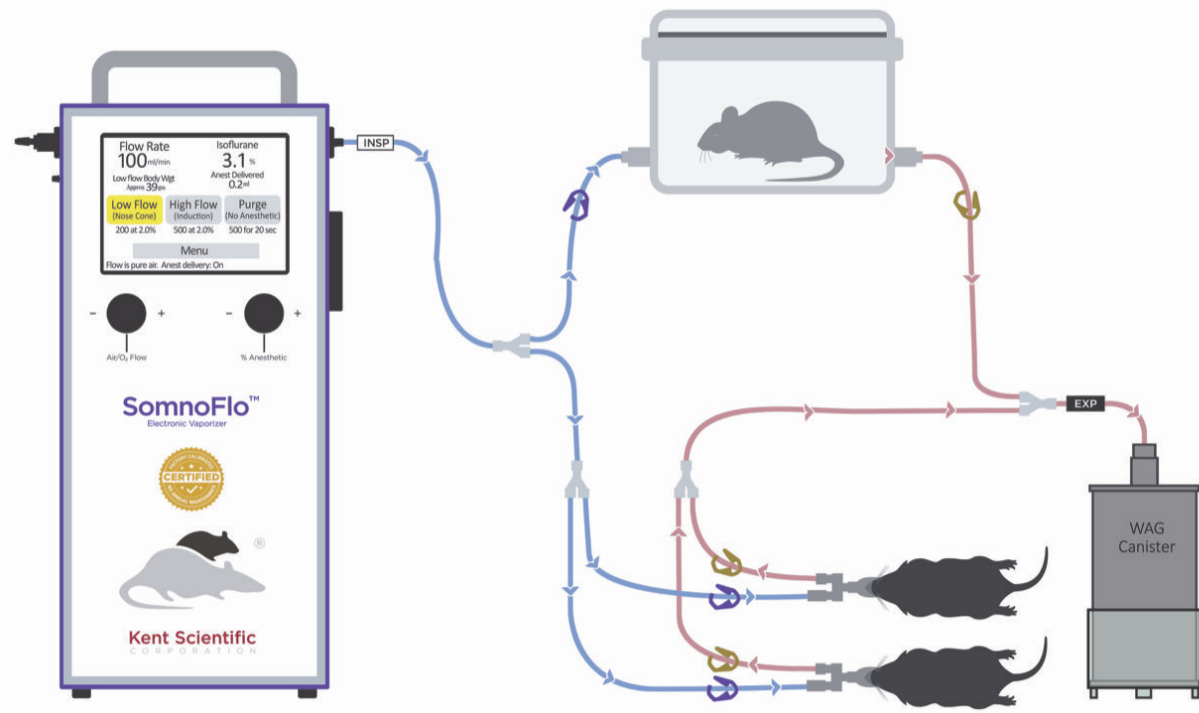> **Note:** While warming up, the SomnoFlo should be connected to a charcoal canister for scavenging.

10) Once the warm up is complete, perform a Purge to clear the induction chamber of any excess anesthetic. The SomnoFlo is now ready to use.
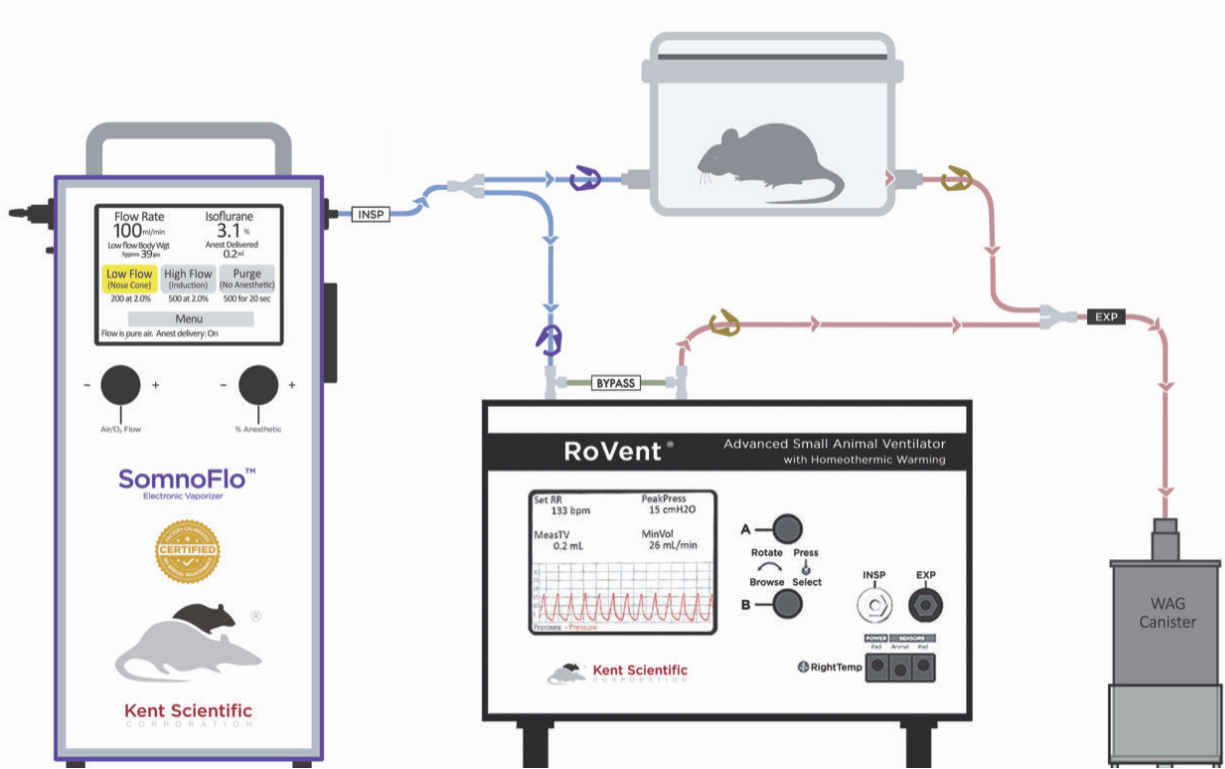
Setup Examples
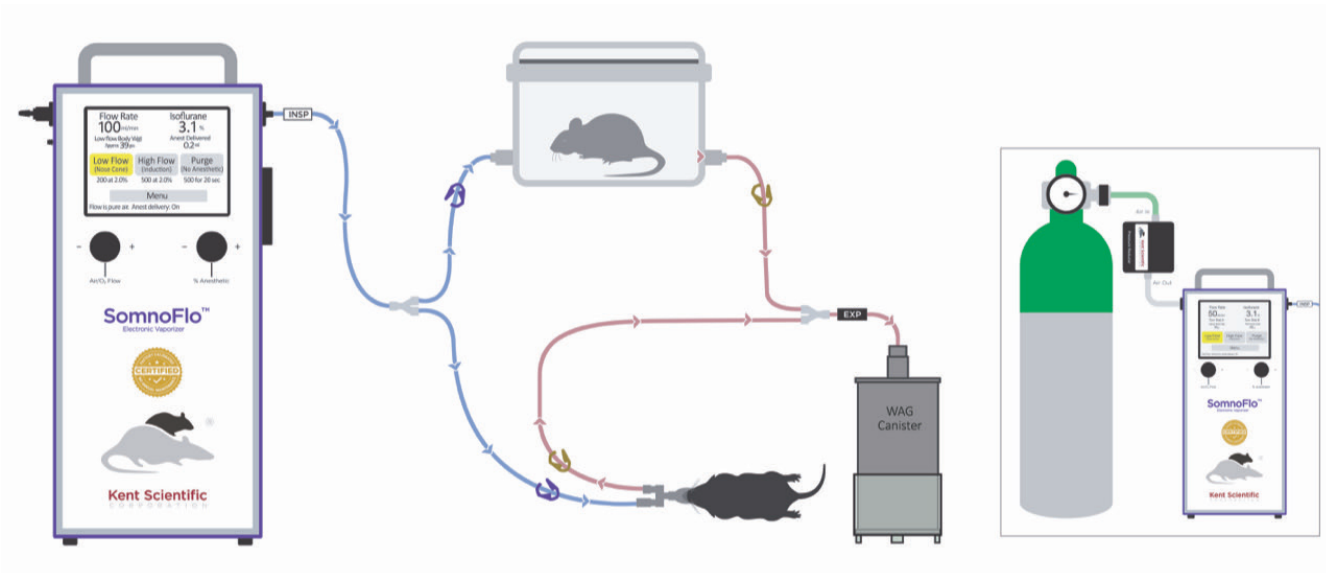
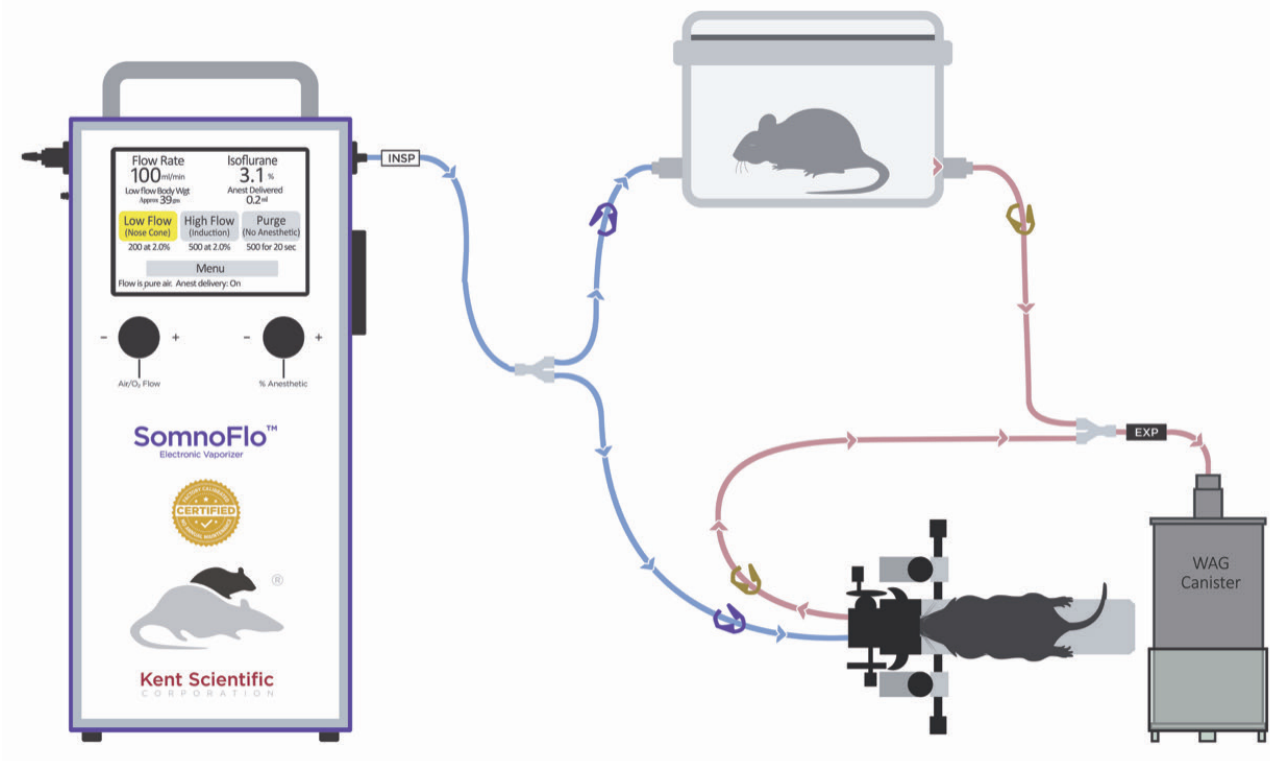SomnoFlo with 2-Accessory Connector for Chamber and Nose Cone

SomnoFlo with Optional 3-Accessory Connector for Chamber and 2 Nose Cones

SomnoFlo with 2-Accessory Connector for Chamber and Ventilator

SomnoFlo with 2-Accessory Connector for Chamber and Stereotaxic Gas Anesthesia Mask

Configure Settings

Touch Menu to enter settings:

1) PreSet options
   - o Low Flow can be used for nose cone settings. Enter desired flow rate and anesthetic concentration for maintenance. These values will be stored for quick access by pressing the Low Flow button on the main screen.

   - o High Flow can be used for induction settings. Enter desired flow rate and anesthetic concentration for induction. These values will be stored for quick access by pressing the High Flow button on the main screen.

   - o Purge can be used to reduce residual anesthetic in the chamber prior to opening. These values will be stored for quick access by pressing the Purge button on the main screen.

   > **Note:** "Purge" pushes air/O2 through the vaporizer without the addition of anesthetic. This is an effort to reduce the levels of residual anesthetic in the vaporizer, induction chamber and other attachments connected to the outlet of the SomnoFlo. Note that because of the complexity of the attachments, and their dead space volume and flow paths, anesthetic levels may not be lowered to acceptable levels or even reduced using Purge.
   >
   > To more completely reduce anesthetic levels in the attachments, an external source of compressed gas or air should be connected to the system with external controls.

2) Carrier Gas Source Air/Compressed gas (O2)

   a. Touch the Air/Oxygen button to select a carrier gas. Select "Air" to utilize the SomnoFlo's internal air pump, or select "Oxygen" to use a compressed gas source.

3) Anesthetic Control

   a. Prime: Fills the SomnoFlo tubing with liquid anesthetic from the bottle. See "Filling the SomnoFlo", above.

   b. Empty: Removes liquid anesthetic from the internal components of the SomnoFlo and empty liquid back into the bottle.

   > **Note:** After emptying the SomnoFlo, use Prime to re-enable anesthetic delivery.

c. Select Anesthetic Type: Choose Isoflurane or Sevoflurane. *

d. Set Used Anest to Zero: Reset how much anesthetic has been used. Select when replacing the isoflurane bottle.

e. Total Delivered Alarm: Sound an alarm when a certain volume of anesthetic has been used. Set as a reminder to replace the isoflurane bottle.

f. Monitor Delivery Beep: Sound a beep at volume delivered intervals while the SomnoFlo is in use.

Delivering Anesthesia

1. When powered on, the SomnoFlo will automatically begin a prime cycle. Once completed, allow the system to warm up for 5 minutes at 200mL/min and 2% isoflurane before moving to step 2.

2. Enter any required settings, include the Air/Oxygen, Anesthetic Type, Preset Flow Rates, and Alarms.

3. Adjust clips to send airflow to the induction chamber.

4. Place animal in induction chamber and touch "High Flow".

    a. The SomnoFlo will automatically deliver the flow and anesthetic concentration set in the Presets menu. If you need to make adjustments, use the dials to change the flow and anesthetic concentration.

5. When the animal is fully anesthetized, touch "High Flow" again to stop delivery.

6. If desired, purge the chamber using "Purge".

7. Remove the animal from the chamber and position on the nose cone.

8. Adjust clips to direct airflow to the mask.

9. Touch "Low Flow" to resume anesthetic delivery at preset flow and anesthetic concentration.

    a. The SomnoFlo will automatically deliver the flow and anesthetic concentration set in the Presets menu. If you need to make adjustments, use the dials to change the flow and anesthetic concentration.

Your SomnoFlo can be used with isoflurane to great advantage in your lab. Our internal quality control team regularly monitors and evaluates SomnoFlo's accuracy with both isoflurane and sevoflurane to ensure that it performs to the highest accuracy. Although we do not yet recommend sevoflurane at this time, we will update our results.

10. When finished with the procedure, touch "Low Flow" again to stop delivery and recover the animal.

11. Touch Menu > Anesthetic Control > Empty to empty the SomnoFlo of anesthetic, then remove the anesthetic bottle from the system.

> **Caution:** Be sure to perform the Empty cycle before powering off the system or disconnecting the anesthetic bottle.

> When the system is not in use, remove the bottle top adapter and replace the manufacturers cap onto the anesthetic bottle.

Recommended Flow Rates

Body Weight	Low-Profile Nose Cone (mL/min)	Standard Face Mask (mL/min)	Stereotaxic Mask (mL/min)
<60g	100	100-120	120-140
60-80g	100	100-150	140-180
80g-100g	100	120-180	180-210
100-120g	100-120	140-200	200-240
120-140g	120-130	150-220	240-270
140-160g	130-150	180-250	270-300
160-180g	150-160	200-270	300-330
180g-200g	160-180	220-300	330-350
200-300g	180-250	230-400	350-480
300g-400g	250-300	320-500	480-580
400-500g	300-360	400-600	600-720
500-600g	360-420	480-680	720-830
600-700g	420-460	550-770	830-920
700-800g	460-520	620-850	920-1000
800-900g	520-560	680-740	1000, with caution
900-1000g	560-610	740-1000, with caution	1000, with caution
1000-1100g	610-660	820-1000, with caution	Not Recommended
1100-1250g	660-730	880-1000, with caution	Not Recommended

SomnoFlo® Troubleshooting

Problem	Possible Cause	Solutions
Anesthetic depth too light, or the animal wakes up	• Flow rate is too low • Incorrect tubing setup	• Increase the flow rate by turning the Air/O2 Dial. • Verify that tubing is connected properly, unobstructed, and correct clips are open.
Anesthetic depth too deep	• Flow rate is too low	• Increase the flow rate by turning the Air/O2 Dial.
Minute volume displays 0mL/min.	• Incorrect Air Source setting • Blockage at air inlet or exhaust • Compressed gas source not turned on or turned on at incorrect pressure • Airflow not turned on	• Check that Air Source is set properly by touching Menu and Air/Oxygen. • Check all connections and ports for blockages. • If using compressed gas, be sure the gas source is turned on and flowing properly. • Pressure should be between 10 and 15 PSI. • Check that airflow is turned on, indicated by the shading of the Low Flow, High Flow, or Purge buttons on the Run screen.

General Information

Thank you for purchasing a SomnoFlo. We truly appreciate your business. We strongly advise that you read and study this User's Guide to fully appreciate all the features, benefits, and capabilities of the SomnoFlo.

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This product is not designed, intended or authorized for use in human applications.

Product Warranty

The SomnoFlo has a one (1) year warranty including all parts and labor charges. This warranty does not cover damage by any cause including, but not limited to, any malfunction, defect or failure caused by or resulting from unauthorized service or parts, improper maintenance, operation contrary to furnished instructions, shipping or transit accidents, modifications or repair by the user, harsh environments, misuse, neglect, abuse, accident, incorrect line voltage, fire, flood, other natural disasters, or normal wear and tear. Changes or modifications not approved by Kent Scientific Corporation could void the warranty. The foregoing is in lieu of all other expressed warranties. Kent Scientific Corporation does not assume or authorize any party to assume for it any other obligation or liability.

Satisfaction Guarantee

Should you experience difficulty with the SomnoFlo, our Technical Support Group will assist you in trouble-shooting and determining if the product needs to be returned to our facility. We will issue you a Return Manufacturer Authorization (RMA) number before the product is shipped back for repair. It is at the discretion of the manufacturer to replace or repair a defective part or product. Please call Customer Service at 888-572-8887 to obtain a Return Manufacturer Authorization number. Shipments without a RMA number will not be accepted. Please note that after our 30-day return policy period ends, we will be happy to assist you with your application, but cannot issue any credit or refund for a returned SomnoFlo.

Prior to shipment, please clean and decontaminate the product of any chemical, biological, or isotopic contamination. Please include a completed Product Return Form with the shipment. This form can be obtained by contacting Kent Scientific Customer Service at 888-572-8887 or 860-626-1172.

Specifications

Voltage	12V, 2.5A
Dimensions	5.6 x 7.7 x 10.6 inches
Weight	5.11 lbs

Input	100 to 240 V, 50 to 60 Hz, 1.0 A
Output	12V, 2.5A

Environmental	Intended for Indoor Use
Recommended Operating Temperature	Optimal Range = 18°C – 26°C (26°C Max)
Relative Humidity	Not exceeding 90%
Altitude	0 to 2,000 meters
Overvoltage Category	II

Index