RoVent® Jr.
Automatic Ventilator
Volume & Pressure Controlled

User's Guide

Kent Scientific
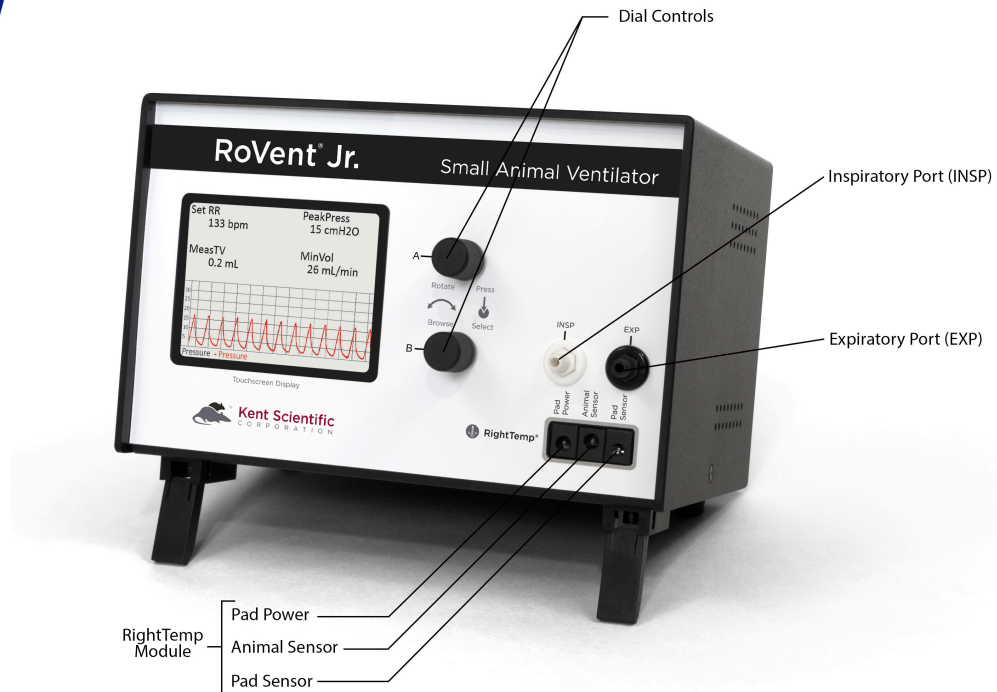CORPORATION
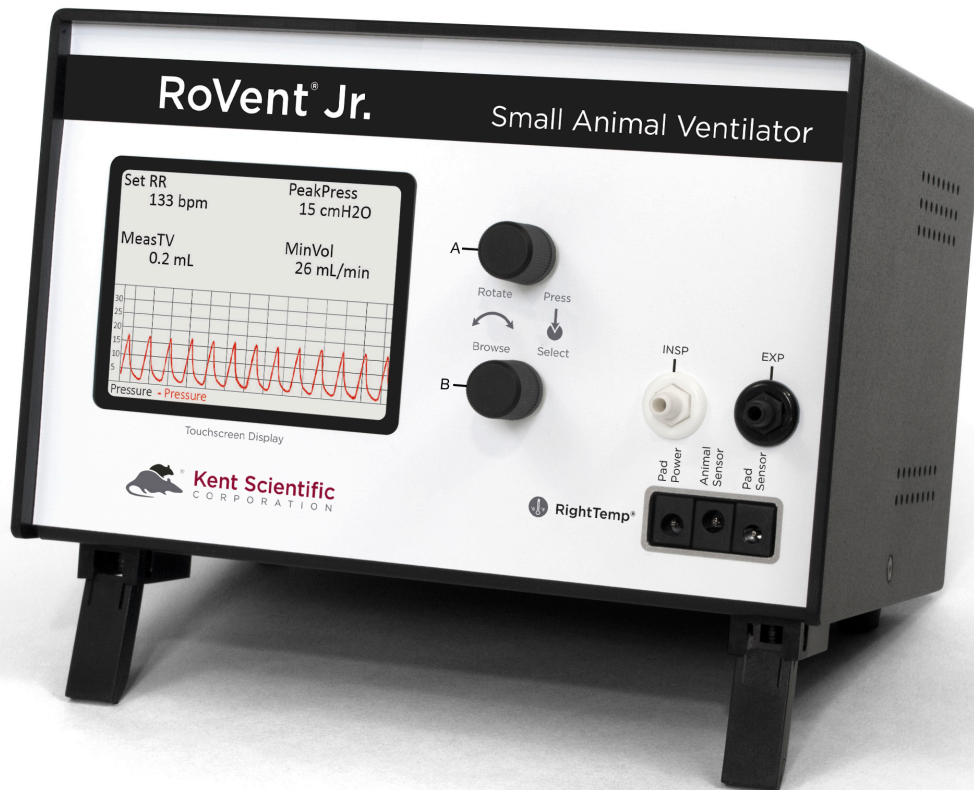
TABLE OF CONTENTS

Introduction

The RoVent® Jr. is not designed, intended or authorized for use in human applications.

System Components

Front Panel

- Dial Controls
- Inspiratory Port (INSP)
- Expiratory Port (EXP)
- RightTemp Module
  - Pad Power
  - Animal Sensor
  - Pad Sensor

RoVent® Jr.
Small Animal Ventilator

Set RR
133 bpm

PeakPress
15 cmH2O

MeasTV
0.2 mL

MinVol
26 mL/min

Pressure

Touchscreen Display

Rotate   Press
Browse   Select

A
B

INSP   EXP

Pad Power   Animal Sensor   Pad Sensor

RightTemp®

Kent Scientific
CORPORATION

Back Panel

- Air Inlet
- Exhaust

SERIAL #:
MADE IN U.S.A.
CE

Kent Scientific
CORPORATION
1116 Litchfield Street   Tel: 860-626-1172
Torrington, CT 06790   Toll-Free: 888-572-8887

Side Panel

USB

Power

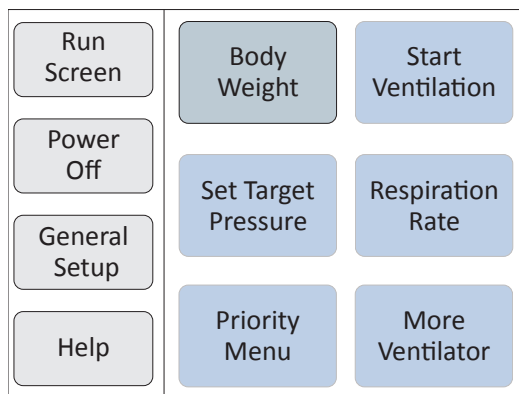VOLTAGE: 12VDC
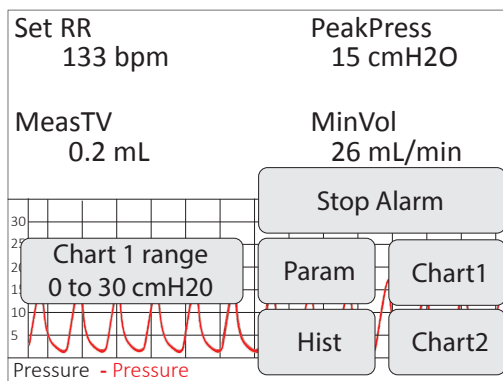AMPS: 2.5A

Navigating RoVent® Jr.

Touch Screen

RoVent® Jr. Touch Screens offer quick access to most features and settings. Touch the upper half of the Run Screen to reach the first Touch Screen.

Run Screen	Body Weight	Start Ventilation
Power Off	Set Target Pressure	Respiration Rate
General Setup		
Help	Priority Menu	More Ventilator

First Touch Screen
(Screen buttons may vary based on the modules installed.)

Touch the bottom half of the Run Screen to open the pop-up Display Menu and quickly scroll through charts, view other data or to silence Alarms.

Set RR	PeakPress
133 bpm	15 cmH2O
MeasTV	MinVol
0.2 mL	26 mL/min

Stop Alarm

Chart 1 range 0 to 30 cmH20 | Param | Chart1

Hist | Chart2

Pressure - Pressure

Pop-Up Display Menu
(Screen buttons may vary based on the modules installed.)

Dial Control

There are two Dials, A and B. The function of a Dial varies based on:

- where you use it – from the Touch Buttons Screens, Run Screen, Menu Screens or Main Menu.

- how you use it – turn, press or hold down.

Dials can have specialized uses in a few specific locations. The unit displays on-screen instructions in those locations.

ACTION	DIAL	RESULT
Press	A	Back one level from Main Menu Screens To Run Screen from Main Menu To Run Screen from Touch Button Screens
	B	Select a highlighted Menu item To Main Menu from Home Screen Clear Alarms if they are enabled
Turn	A	Move through Menu choices
	B	Change setting values at Menus
Hold down	A	To Main Menu from Run Screen To Help at any Menu screen
	B	–

See Main Menu on page 4.

Display Options

Customizing the Run Screen Display:

To configure Parameters:
1. Touch:
    1) the upper half of the Run Screen for the Touch Screen Menu.
    2) "General setup".
    3) "Config".
    4) "Param Locations".

2. Turn Dial A to choose a Parameter and Dial B to assign the Parameter to a Run Screen location.

To configure Charts:
1. Touch:
    1) the upper half of the Run Screen for the Touch Screen Menu.
    2) "General setup".
    3) "Config".
    4) "Chart 1 setup" or "Chart 2 setup" to choose the type and timing for a chart.

2. Press Dial A to return to the General setup page of the Touch Screen Menu.

3. Touch "Set ranges" to choose the best-fitting axis range for the Parameters on your charts.

Menus

The Main Menu is the non-touch gateway to all features and setting choices for configuring RoVent® Jr., useful when a touch screen is not a feasible option, such as for an operator with damp hands. Access the Main Menu through the Touch Screen Menu or from the Run Screen by holding Dial A.

Main Menu	
Body wgt	Set body weight
Vent	
Modules	30g
Config	Nominal RR: 133bpm
Power off	Nominal Tidal Vol: 0.200mL
Help	Nominal Minute Vol: 26mL/min
	Turn Dial B to choose the weight of your animal
	Hold Dial A for Help.

Main Menu
(Screen buttons may vary based on the modules installed.)

Alarms

RoVent® Jr. system alarms alert you to certain conditions that might require attention while RoVent® Jr. is running.

There are two levels of alarms:

Level	Based On	Banner	Sound (If On)	Configurable
Warning	Parameters or other operating conditions	Yellow	1-beep pattern	Yes
Serious	Parameters or other operating conditions	Red	3-beep pattern	Yes except for system alarms

To clear a sounding alarm:

A triggered alarm produces a colored banner at the bottom of the screen describing the cause of the alarm. The banner color corresponds to the severity of the alarm.

> To silence the alarm:
> Touch:
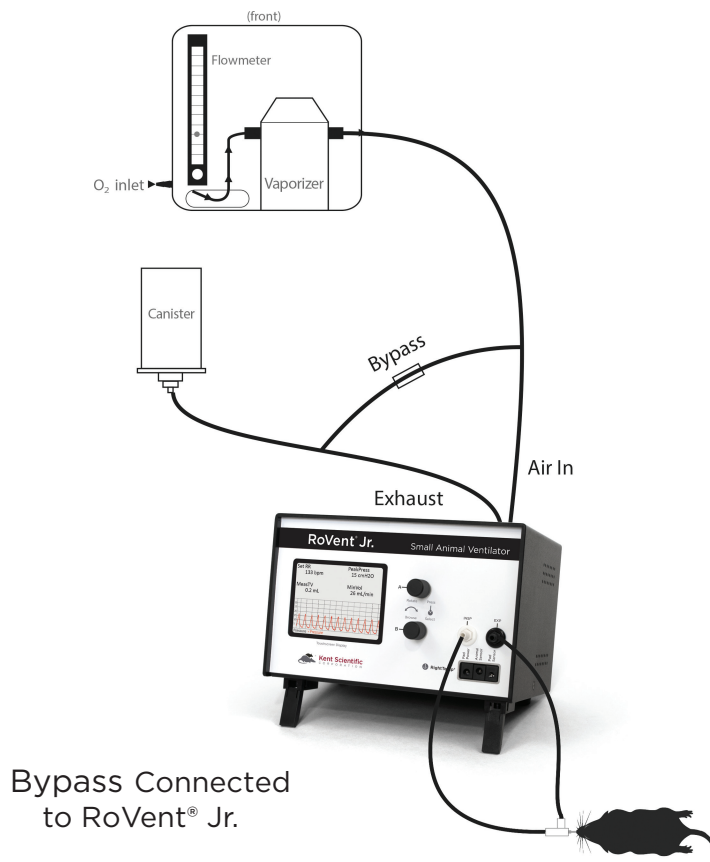> 1) the bottom half of the Run Screen.
> 2) "Stop Alarm".

Set Up Hardware

Air Source:

If you are using a Compressed Gas Source or an Anesthetic Vaporizer:

1. Connect the Vaporizer Connection Assembly with Bypass to the back of the RoVent® Jr.

2. Connect the compressed gas or vaporizer to the inlet side of the bypass assembly.

(front)

Flowmeter

O_2 inlet ▶

Vaporizer

Canister

Bypass

Air In

Exhaust

RoVent® Jr.   Small Animal Ventilator

Kent Scientific

Bypass Connected
to RoVent® Jr.

If you are using air:

No additional hardware setup is necessary.

Scavenging:

If you are using a Compressed Gas Source or an Anesthetic Vaporizer:

Connect a charcoal canister to the exhaust side of the bypass assembly.

Tubing Configurations:

Connecting Ventilator Tubing to an Endotracheal Tube:

Connect the intubation connector tubing directly to the INSP and EXP ports on the front of the RoVent® Jr.

RoVent® Jr. with Intubation Connector on Front
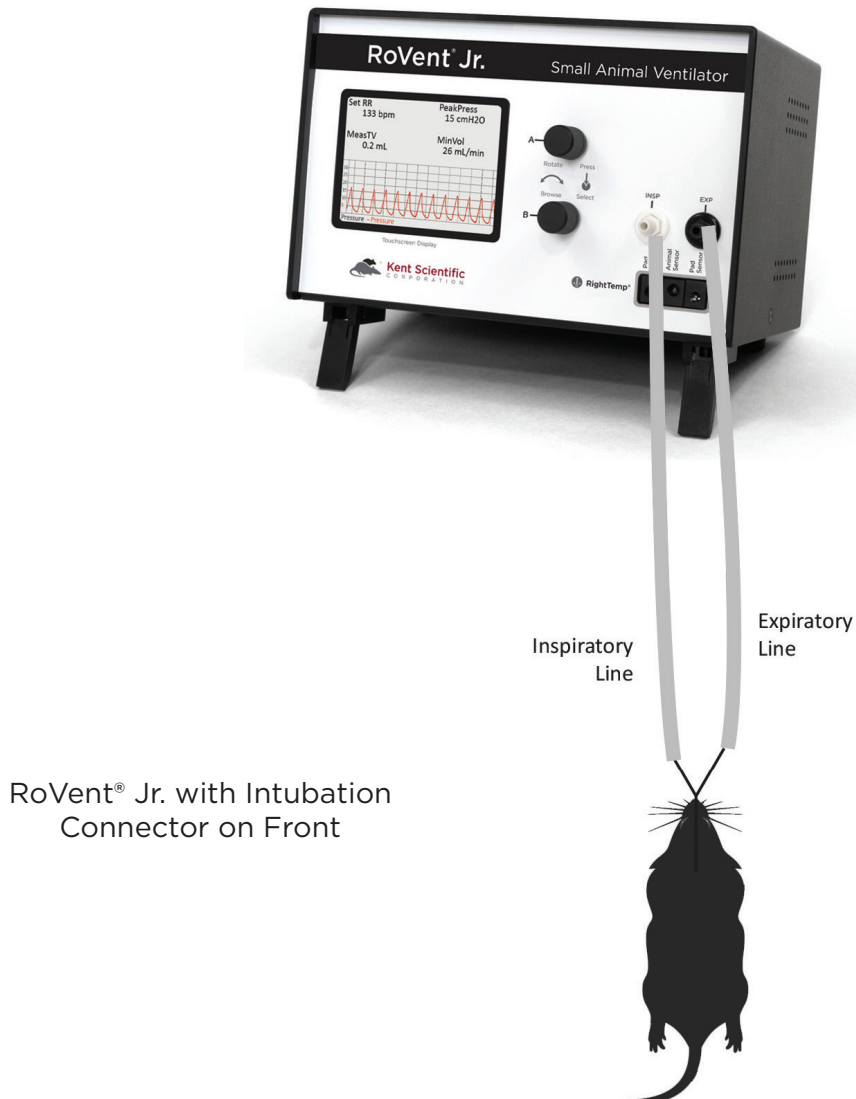
Ventilating an Animal

1. Anesthetize and intubate the animal. Connect the endotracheal tube to the intubation connector.

2. Touch "Start ventilator" to begin ventilation.

> **RoVent® Jr. calculates the respiration rate and tidal volume using the animal's body weight. To change these settings, touch "More ventilator", then "Respiration rate" or "Set target pressure/volume". This will override the calculated settings.**

3. At the end of the procedure touch "Stop ventilator" to stop ventilation. Allow the animal to recover.

Configure Settings

Ventilator Calibrations

Note: Never perform these functions when an animal is connected to the ventilator.

1. **Measure Deadspace**
   1) Set up tubing.
   2) Touch "Calib & tests", then "Measure deadspace".
   3) Firmly seal the end of the endotracheal tube with your finger or a cap, ensuring that there is no air leakage.
   4) Press Dial B. When asked to confirm measurement, press Dial B again.

2. **Zero Sensors**
   1) Set up tubing.
   2) Touch "Calib & tests", then "Zero sensors".
   3) Press Dial B. When asked to confirm measurement, press Dial B again.

3. **Make Ventilator Settings**
   Configure all anesthesia settings and air supply settings first (see page 7).

   1. Touch:
      1) "Select Ventilator" for access to all RoVent® touch menus.
      2) "Body Weight" to choose the body weight that determines the automatic settings for respiration rate and tidal volume. To change these Parameters manually, Touch "Respiration rate" or "Set target volume".

   2. Choose a ventilator priority by touching "More ventilator", then "Priority Menu".

      Pressure Priority: RoVent® ventilates to a specified inspiratory pressure. The default target pressure is 15cmH2O independent of body weight setting. To change the target pressure, touch "Set target pressure".

      Volume Priority: RoVent® delivers an initial target pressure for the first breath, then delivers a target tidal volume. The default target tidal volume is calculated based on body weight. To change the target tidal volume, touch "Set target volume".

> **Note: You can change the initial target pressure for the first breath, as well as the minimum and maximum allowed pressures to customize the ventilator's operating range as the ventilator delivers the set tidal volume.**

RoVent® Troubleshooting

Alarm Messages

Problem	Possible Cause
Tube open to atmosphere The highest measured pressure in a breath cycle is under 25% of the target and the tidal volume is over target.	• Part of the tubing between the INS and EXP ports is open, disconnected or leaking. • There is a large mismatch between the set or calculated tidal volume and the required tidal volume, or between the set and actual body weights.
Tube blocked The highest measured pressure in a breath cycle is under 25% of the target and tidal volume is under target.	• The endotracheal tube is not seated correctly. • There is a kink, blockage or foreign matter in the inspiratory or expiratory lines.
Exhaust blocked The breath pressure fails to drop during the expiratory phase of a breath.	• The cap is on the EXP port. • The expiratory valve has failed.
Out of regulation Over five consecutive breaths, peak pressure was more than 25% or less than 75% of your target.	• Requested Tidal Volume is too high for Pressure and RR .
Large rise in TV Over the last four breaths, there was an increase of more than 25% in average tidal volume compared to that of the previous 16 breaths.	• Part of the tubing between the INS and EXP ports is open, disconnected or leaking.
Large drop in TV Over the last four breaths, there was a decrease of more than 25% in average tidal volume compared to that of the previous 16 breaths.	• There is a kink in the tubing. • There is foreign matter in the tubing or in the exhaust valve. • The exhaust outlet is blocked. • The endotracheal tube is not seated correctly.
Deadspace calib Dead space calibration produced a negative tidal volume.	• Deadspace calibration is incorrect for current tubing setup.

Diagnostic Procedures

To access these diagnostic procedures, touch "Calib & tests".

Purge

Resulting Message	Meaning	Possible Action
Success	No leaks found.	None is needed.
Low baffle pressure	There is an internal RoVent problem.	Contact Kent Scientific.
Clears any accumulations from the valves using high pressure air flow.		

Leak Test

Checks for internal leaks as well as leaks in tubing circuits.

Resulting Message	Meaning	Possible Action
Test OK	No leaks found.	None is needed.
Tubing leaks	The tubing is open to the atmosphere through a loose connection or a crack or hole in the tubing.	Tighten all connections and ensure that the circuit is air tight. Run Leak test again. If the error recurs, contact Kent Scientific.
Low baffle pressure or **Baffle leaks**	There is an internal RoVent problem.	Retest making sure that the tubing is not flexed or moved. If the error recurs, contact Kent Scientific.

RightTemp Temperature Monitor and Homeothermic Warming

Set Up Hardware

1. Connect the warming pad to the "Pad Power" port on the front of the RoVent® Jr.

2. Choose one of the two probes as the body temperature sensor.
   - For mice, select the smaller probe.
   - For rats, select the larger probe.

3. Connect the body temperature sensor to the "Animal Sensor" port.

4. Use the other probe as the pad sensor.

5. Connect the sensor to the "Pad Sensor" port.

Pad and Body Temperature Sensors Connected to RoVent® Jr.

Pad Pensor (taped under animal)

Rectal Sensor/Probe

Pad Power
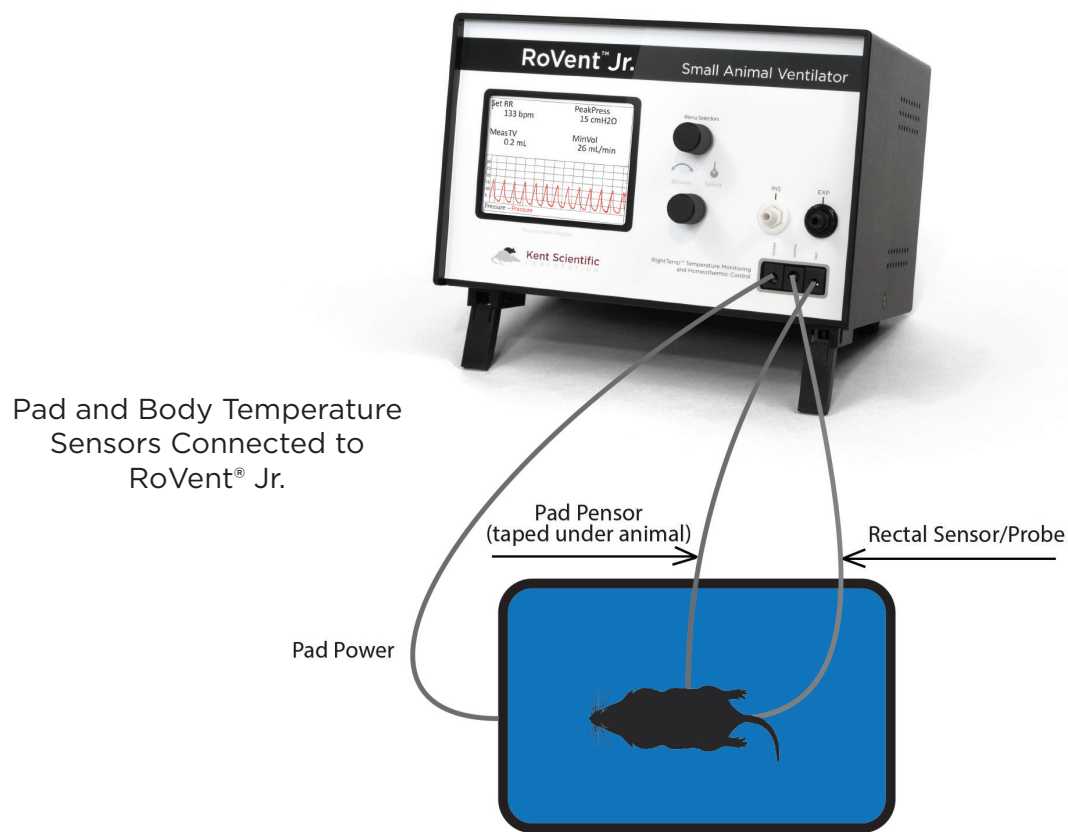
We recommend that you secure the pad probe to the warming pad using tape, etc.

Configure Settings

RightTemp Sensor Calibration

1. Place both sensors in a beaker of water and measure the water temperature with an accurate digital thermometer.

2. Wait for the screen display for the sensors to stabilize.

3. Touch:
   1) "General setup".
   2) "RightTemp setup".
   3) "Calibrate temp".

4. Turn Dial B to enter the temperature as measured by the digital thermometer.

5. Press Dial B to save the calibration.

RightTemp Settings

1. Touch:
   1) "General setup".
   2) "RightTemp setup".
   3) "Control warming" to choose the type of warming:
      - "Off": temperature monitoring, no warming
      - "Unregulated": temperature monitoring, warming with no sensor control
      - "Pad temp regulated": temperature monitoring with Pad sensor control
      - "Body temp regulated": temperature monitoring with Animal sensor control

2. Set the target temperature, limit the maximum pad temperature, or set the power level depending on the type of warming you have selected. Appropriate buttons will appear on the screen to allow you to make settings.

Monitoring an Animal

1. Place the anesthetized animal on the warming pad.

2. Insert the animal temperature probe into the rectum of the animal. Secure the probe if necessary.

> **Always secure the pad temperature probe beneath the animal.**

RightTemp Troubleshooting

Problem	Possible Cause	Solutions
Pad is not heating.	Incorrect settings	• Ensure that all settings are properly enabled for warming and target temperatures are selected.
	Incorrect or loose connections	• Ensure that the connection at the back of the RoVent Jr is tight.
Pad is overheating.	Incorrect settings	• Ensure that all settings are properly enabled for warming and target temperatures are correctly selected. • Enable a "Maximum Pad Temp" when type of warming is "Body temp regulated" to prevent overheating.
	Incorrect sensor placement	• Place pad sensors directly beneath the animal. • Place animal sensor rectally only.
Sensors are reading incorrect temperatures.	Sensors calibration required	• Recalibrate the temperature sensors.
	Sensor function reassignment	• Recalibrate the temperature sensors. Do this any time you reassign sensor function.

RightTemp Pad and Sensor Maintenance

• Use the disposable warming pad covers to prevent soiling the warming pad.
• Wipe the warming pad clean with a damp cloth if needed. Never saturate the warming pad.
• Gently wipe the sensors clean between uses.

General Information

Thank you for purchasing a RoVent® Jr. We truly appreciate your business. We strongly advise that you read and study this Owner's Manual to appreciate fully all the features, benefits, and capabilities of the RoVent® Jr.

Contact Information

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

Product Warranty

The RoVent® Jr 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 RoVent® Jr, 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 RoVent Jr.

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. The form can be found on page 68 of this Owner's Manual. This form can be obtained by contacting Kent Scientific Customer Service at 888-572-8887 or 860-626-1172.

Specifications

Controller

Voltage	12 V, 2.5A
Dimensions	13.3cm (5.25in) x 19.1cm (7.50in) x 13.9cm (5.50in)
Weight	1.0kg

Power Supply

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

RoVent

Control Modes	Volume controlled, pressure controlled
Respiratory Rate Range	20bpm to 400bpm
Tidal Volume Range	0.01 – 12.0mL
Weight Range	3g to 1,250g

RightTemp Sensors

Resistance	2,252 Ohm
Operating temperature	-60°C to 150°C (-76°F to 302°F)
Sensor tip diameters	Mouse 0.080" and Rat 0.140"
Time constant in air	15.0sec
Dissipation constant	0.75 m/W (°C)
Conditions	Operating: 0°C to 45°C, 10% to 90% RH, non-condensing Storage: -40°C to 70°C, <90% RH, non-condensing

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Index