

Rodent Ventilator Q&A

Rodent ventilation is an invasive procedure requiring specialized equipment and training. This document is intended to answer common questions involving setup and use. All research applications are unique, so we encourage you to contact one of our technical experts to discuss your application.

Do I need a bypass?

A bypass assembly reduces backpressure by allowing excess inlet flow to enter the exhaust line directly, maintaining neutral pressure at the gas inlet. The RoVent® requires neutral pressure at the inlet port, achieved by using a bypass setup. The RoVent will sample as needed from the inlet line.

Does backpressure affect ventilation?

Backpressure in a ventilator inlet strains the ventilator's inspiratory valve, which can cause issues with ventilation.

To address these issues, ensure that the bypass assembly is connected at the back of the system. Be sure that the charcoal canister is not blocked to ensure proper exhaust flow.

Even with a bypass connected, high flows from an anesthesia system or pressure regulator can create backpressure in the Exhaust line. This may cause a decrease in delivered tidal volume. You may also observe gasping, hiccupping, or rebreathing. To resolve these issues, decrease the input flow.

Why is calibrating dead space important?

The dead space measurement calibrates the tidal volume delivery. An incorrect dead space calibration can cause the system to report a higher or lower tidal volume than what is actually delivered to the animal. If you are using a volume-controlled ventilator, this can over- or under-ventilate the animal.

Always be sure to calibrate the dead space whenever the tubing circuit is changed.

What is the difference between volume and pressure mode?

Kent Scientific ventilators can be used in either Pressure Mode or Volume Mode. Pressure Mode will maintain a target inspiratory pressure by varying the delivered tidal volume accordingly. Volume Mode functions similarly to a standard pressure-regulated-volume-control ventilator, maintaining a set tidal volume within an upper and lower inspiratory pressure constraint.

When do I begin ventilation?

Some ventilators do not have safety features often needed when ventilating rodents. Without safety features, the animal could experience sudden and high changes in tidal volume.

All Kent Scientific ventilators include a safety feature that prevents over-pressurizing the lungs. For this reason, it is important that the animal is connected prior to starting ventilation. If the animal is not connected prior to starting ventilation, the animal may receive a sudden and very high tidal volume.

Are you performing open-chest procedures?

Peak end-expiratory pressure (PEEP) will prevent lung collapse upon opening the chest cavity. Historically, PEEP was achieved by connected an external water column on the ventilator's exhaust line. Some Kent Scientific ventilators offer integrated PEEP. For safety reasons, this is not an automated setting. It can be enabled mid-procedure and adjusted as needed.

Are you working with lung injury models?

Some Kent Scientific ventilators offer the ability to override standard ventilation parameters. Some lung injury models require high inspiratory pressure with tidal volumes outside the limits of safety ventilators.

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