Pressure controlled ventilators

Small Animal Pressure Controlled Ventilator KTR-5

- Different Versions available
- From mouse to rabbit
- Avoids the danger of excessively extending and damaging the lung
- Variable Ins/Exp ratio
- “Plateau” function to maintain the end-inspiratory pressure
- Sigh function

The KTR-5 is available in different version. It is used for ventilating the most frequently used animals in the laboratory, from mouse to rabbit. It employs Microprocessor control. This permits flexible adaptation of the ventilation parameters to the most diverse experimental conditions. The functional sequence is signaled by suitably marked signal LEDs. The ventilation sequence can also be influenced by external signals.

Unlike a STARLING piston pump, use of the KTR-5 avoids the danger of excessively extending and damaging the lung of the ventilated animal through

incorrect setting of the stroke volume. The electronic control of the KTR-5 also permits free selection of the ventilation timing over a wide range in order to adapt it to the

requirements of your experiment.

The KTR-5 operates on the principle of intermittent positive pressure ventilation. A continuously adjustable air (gas) stream is passed by solenoid valves either to the animal or to an overflow outlet. The effective pressure in the ventilation cannula is measured and indicated. By suitable settings on the unit it is possible to utilize the measuring circuit to terminate the inspiration process when a given adjustable ventilation pressure has been reached (EIP LIMIT: 0–29 cmH20). This effectively protects the animal against excessive pressure rise in the lung.

Through the “Plateau” function, the end-inspiratory pressure can be maintained constant over an adjustable period of time (% of cycle). This function permits direct control of the inspired air retention. Measurements can also be performed in the inspired condition.

The air flow to the ventilated animal is adjusted by means of a built-in needle valve. The set air flow is indicated on a float flowmeter (rotameter). A sigh (or a number of sighs) can be induced at any time by key stroke.

The connection to the tracheal cannula is made through a specially formed Y-shaped ventilation cannula. It carries the following tubing on its ends: inspiration

(4 mm dia.) and expiration (6 mm dia.).

The ventilation air required is normally supplied by a built-in pump. There is also a provision for introducing ventilation gas from outside (max. pressure: 0.5 bar, 7.5 psi). A special version has the internal pump replaced by a precision pressure regulator; in this case the supply has to be provided by an external pressure source (pressure range: 2 - 8 bar , 29 - 116 psi).

Dual Version Rat and Mouse

Rear view

The ventilation cannula is a linked to the KTR5 ventilator by a Y-shaped connector and suitable tubing. Different type of cannulae and Y-connections are available depending on the application and on the species.

Cannulae (for tracheotomy or intubation) with an outher diameter up to 3.5mm exist as cannulae with luer connection or as Y-cannulae. Cannulae with an outher diameter greather than 3.5mm exist only as Y-cannulae

Tracheal cannula with luer connector

Intubating cannula with luer connector

tip

Y-connector for cannulae with luer connection

tip

Tracheal cannula with Y-Connetion

Intubating cannula with

Y-connection

TECHNICAL DATA

Adjustable ventilation parameters:

respiration rate:	1 - 200 bpm (breaths per minute)
inspiration duration:	10 - 79% of ventilation cycle
duration of plateau:	1 - 50% (of total cycle time)

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EIP limit:	0.1 - 50 cm H2O
leak alarm:	0 - 10 cmH2O
Maximum sigh pressure:	0.1 - 50 cmH2O
sigh number:	1 - 10
adjustable continuous air flow:	5000 ml/min max. (with internal compressor) 1)
minute volume range:	up to 2500 ml/min (50% INSPIR, depending on compliance) 1)

1) Rotameter can easily be exchanged for better adaptation to the species (flowmeter in the range for 1 l/min to 20 l/min are available). As a special version the ventilator can be equiped with two different flowmeter to match a large range of species.

Mouse version:

same as above except:

- EIP limit: 0.1 - 20 cm H2O
- Max sigh pressure: 0.1 - 20 cmH2O

Displays:

- LC-display, 3 lines of 12 characters
- 7 LED's for function control

Electrical outputs:

- recorder output for measured ventilation pressure: 0.1 V/cm H_2O
- trigger output (TTL) for synchronising external equipment

Other functions:

- alarm function, visual and audible, on pressure fall, alarm limit adjustable on “LEAK ALARM” control.
- indication of functional sequence by signal LEDs.
- remote control

Air/gas connections:

- outlet for expiration air/gas (EXHAUST EXPIR), immersion tube for PEEP adjustment is connected to this outlet, also used for gas sampling to analyze the expired gas.
- outlet for excess air or gas (EXHAUST OVERFLOW)
- connection for Halothane Vaporizer (FROM, TO HALOTHANE VAPORIZER)
- inlet for external supply (2 bar max.)

Air/gas supply:

- internal compressor 5 l/min max
- external supply from tank or central supply using pressure reducer and particle filter. Maximum pressure 2 bar.

Ambient conditions:

- Operating temperature: 15 to 35°C
- Storage temperature: -10 to 50°C
- Humidity: 20 - 80%, no condensation

Supply: 115/230 V, 50 - 60 Hz, 75 VA

Dimensions (W x H x D): 37 cm x 15 cm x 26 cm.

Weight: 6.5 kg

Versions	With Built-In Pump for Internal Air Supply		Wwithout Pump, with Built-In Precision Pressure Regulator for External Air Supply	
	230 VAC	115 VAC	230 VAC	115 VAC

Rodent up to Rabbit version with 1 Flowmeter	73-3597	73-3645	73-3641	73-3646
Option for second Flowmeter	73-3691	73-3691	73-3691	73-3691
Mouse Version with 1 Flowmeter	73-3640	73-3647	73-3642	73-3648
Mouse up to Rabbit Version with 2 Flowmeters	73-3629	73-3649	73-3643	73-3650
Remote control	73-3709	73-3709	73-3709	73-3709

Please contact with our local distributor NatureGene Corp.