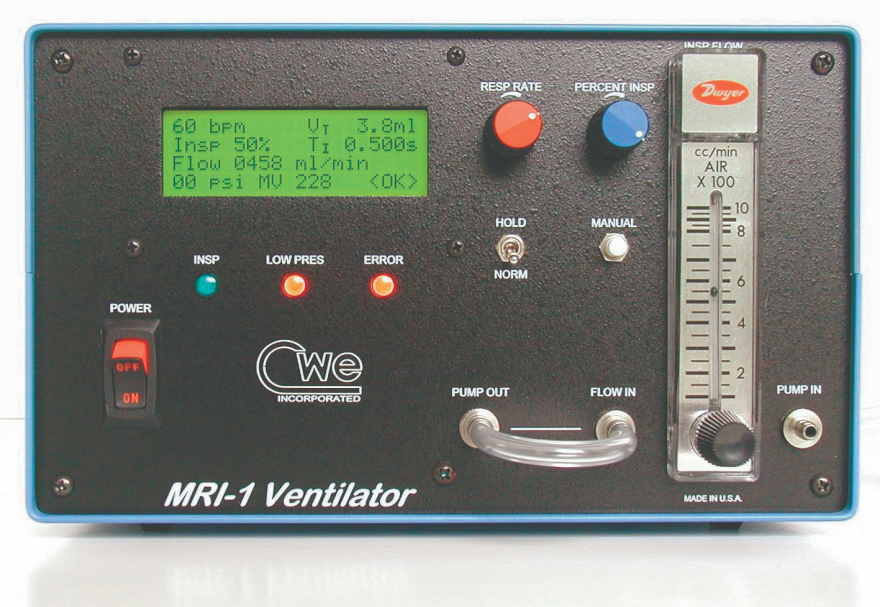
CWE-MRI-1

MRI-Compatible Volume-Cycled Small Animal Ventilator



Standard Features

- Non-magnetic pneumatic valves
- Wide tidal volume and rate range
- Safe with oxygen and anesthesia
- Well-suited to sensitive electrophysiology recording situations, because of the non-electrical nature of the ventilation valves
- Accepts standard miniature pneumatic valves
- Mice to guinea pig size
- Expandable for larger animals
- Internal air pump
- Dependable all-electronic ventilator
- Direct readout of volume and rate

The CWE-MRI-1 Ventilator is a small animal ventilator designed for use in MRI and other high magnetic field environments, though its use is not limited to those environments. Operated alone or controlled/monitored by a computer, the CWE-MRI-1 system consists of a microprocessor-based control unit and a set of remote, pneumatically operated, non-metallic valves. The CWE-MRI-1 operates on the flow-time principle, dispensing a known airflow into the lungs for a set inspiratory time to generate the desired tidal volumes. The three controls – respiratory rate, inspiratory time and flow rate – allow for accuracy and extraordinary flexibility over a wide range of volumes, breaths-per-minute and inspiration/expiration time (I/E) ratios.

An internal air pump generates the respiratory airflow, but CWE-MRI-1can also connect to an external pressurized air or gas source (oxygen or anesthetic gasses). The remote high-speed, miniature pneumatic valves control the airflow switching. To minimize dead-space and tubing compliance, locate the valves close to the animal (including inside the magnet bore, if necessary).

This unit may be expanded to ventilate larger animals or multiple small animals simultaneously by adding external valve assemblies. External valves operate synchronously, but tidal volumes are independently set by varying the flow rate to each valve assembly. A source of compressed air or helium is required for operating the pneumatic valves. Helium is often used as the actuating gas, because its lower density and viscosity permit faster valve switching.

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SPECIFICATIONS

Respiratory Rate Range	5-150 breaths/min
Inspiratory Flow Range	50-1000 mL/min
Inspiration/Expiration (I/E ratio) Range	20-80%
Tidal Volume Range*	0.1-30 mL
Manual Control Functions	HOLD (suspends inspiration), MAN (manual inflation)
LCD Panel	4 lines x 20 characters, backlit
Indicator Lights	INSPIRATION, LOW PRES WARNING, and ERROR
Internal Airpump Capacity	4 lpm
Pneumatic Valve Switching Speed (Air Actuation)	75 mS
Pneumatic Valve Switching Speed (Helium Actuation)	< 55 mS
Pneumatic Valve Actuation Pressure	3-5 bar
Pneumatic Valve Flow Orifices	0.080 in. (2.0mm)
Pneumatic Valve Materials	PTFE body, non-metallic fasteners, one non-ferrous coil spring
Dimensions, Main Unit	9x5.5x9 in. (23x14x23 cm)
Dimensions, Pneumatic Valve (each, of two)	1.0 in. diam x 1.8 in. long, (47x25 mm)
Port Connections, Respiratory and Pressure Functions	0.125 in. (3 mm) ID Tygon tubing
SYNC OUT Connector	BNC
Data Port Connector	DB-25S
Power Requirements	120/240V (switchable), 100VA

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