



The Digital Breathing Machine

Technical specification:

Maximum flow rate	750+ litres/min (12.5+ litres/sec)
Maximum respiratory frequency	120+ cycles per minute
Maximum minute volume	In excess of 200 litres
Maximum rate of change of flow	70 litres/sec ²
Maximum positive pressure	>150mBar (projected)
Maximum tidal volume	5 litres approximate
Operating temperature range	0°C to 60°C (32°F to 140°F)
Motor power requirement	250VA maximum
Overall dimensions	415x415x590mm (16"x16"x23")
Weight	60kg

Precise details are not shown as machines are built to the specification required for the application in question.

Technical Information

The Digital Breathing Machine consists of a pressure balanced piston moving within an ultra-smooth bore. Movement of the piston is created by an electric linear actuator controlled with extreme precision by a computer system. For pressure breathing a valve box can be supplied, allowing the rear of the piston to be properly vented.

The system uses the LabVIEW data acquisition and control software from National Instruments. The latest version of the machine uses a USB data acquisition unit mounted as part of the machine to interface to the computer.

Custom software is supplied to drive the Digital Breathing Machine. This is able to reproduce any breathing waveform the human lung can perform. Software is supplied to create waveform files as simple sinewaves or complex described waveforms, or even live subject tests (this needs a suitable flow measurement device). Once a waveform file is created it is stored on the computers hard disc and can be called up and reproduced as required. Switching from one waveform to another is as simple as selecting a different data file.

New for 2020 is the cough/sneeze option that provides the ability to reproduce accurate coughs and sneezes from the machine by the fitting of a solenoid valve to simulate the glottis, allowing the increase in lung pressure and rapid expiration of air seen in coughs and sneezes.

The system is also capable of recording and reproducing real life human breathing patterns, when used in conjunction with suitable breathing recording equipment (which can be supplied). Up to one hour of subjective flow measurement can be recorded and then reproduced as required. Again, these files are stored on the computer for reproduction as needed.

Software can also be supplied to utilise the other data acquisition functions of the LabVIEW hardware and software, adding continuous monitoring of other data devices such as pressure transducers, flow sensors etc. along with driving the breathing machine.

Contact us now for more Information on how we can build the breathing machine for you.

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