

SYSTEM OBJECTIVE

The System Offer 4 Discrete Modes Of Ventilation:

- In **Pressure Control Ventilation (PCV)** mode, the system provides fixed inspiratory pressure and constant respiratory rate and duration, with tidal volume which is a function of physical characteristics, such as patient lung compliance and airway resistance.
- In **Pressure Regulated Volume Control (PRVC)** mode, the system provides constant tidal volume, rate and duration, with variable pressure.
- In **Pressure Support (PS)** mode, the system delivers fixed inspiratory pressure and respiratory duration, with respiratory rate determined by the patient's autonomous respiration. A backup respiratory rate can also be set, which provides mandatory breaths if the patient fails to breath autonomously within a time limit.
A pressure-based trigger can be set for autonomous breathing, with negative or positive pressure values.
- In **Continuous Positive Airway Pressure (CPAP)** mode the system required the use of a CPAP mask with a single-limb breathing circuit.

In each of the ventilation modes, PEEP pressure will be maintained in the lungs after each breath, and the oxygen content of the mixture will be set by the attendant.

SYSTEM COMPONENTS

The System Is Comprised Of 4 Main Units:

- **Central control unit** - Contains a programmable-logic controller, touch-screen human-machine interface, two inlet valves (oxygen and air), and sensors which enable measurement of pressure, air flow and oxygen content. This unit acts as both a main control hub and a user interface for the system.
- **Mixing bag** - Serves as pressure reservoir and mixing tank. It stores the mixture with the required oxygen content and pressure before delivery to the patient, dampening positive and negative pressure shocks (functioning as a pneumatic capacitor of sorts).
- **Patient unit** - Contains the inspiratory and expiratory valves, an intrapulmonary pressure sensor and 22 mm connectors, for connecting a dual limb breathing circuit to the endotracheal tube. To be placed on the patient's bed, by the head.
- **Flexible tubing** - Connects the main control unit to the chest unit, and the main control unit to the mixing bag.



SYSTEM OPERATION SCHEME

Mixture Control

The system maintains a reservoir of pressurized mixture within the mixing bag, at the selected inspiratory pressure and oxygen content, by periodically opening the inlet valves and allowing high pressure air and oxygen to enter the mixing bag. This ensures a homogeneous mixture, and prevents pressure spikes and drops.

Breathing Cycle

At the start of each breathing cycle - the inspiratory valve is opened, allowing the pressurized mixture to flow from the mixing bag into the patient's lungs. At the end of the inspiratory portion of the cycle, the inspiratory valve is closed, and the expiratory valve is opened to allow gas to leave the patient's lungs, until they reach the set PEEP value.

If, for any reason, the intrapulmonary pressure rises above PEEP (for instance, during patient coughing), the expiratory valve momentarily re-opens.

Ventilation Modes And Variables

The system can be operated in one of three ventilation modes:

- Pressure control
- Pressure support
- Volume control

The system can also be operated as a CPAP machine, using a single limb breathing circuit and adequate CPAP mask.

The user can change any of the following variables in order to achieve an optimal breathing scheme for the specific patient:

- Ventilation mode
- Inspiratory pressure/tidal wave (mode-dependent)
- Respiratory rate
- Inspiration:expiration ratio
- PEEP
- Oxygen concentration (FiO₂)

The Control Unit presents a graphic representation of inspiratory tidal volume, inspiratory flow and intrapulmonary pressure. It also includes a numeric display of the tidal volume of the last breathing cycle, current oxygen concentration, inspiratory pressure and current PEEP.



VENTILATION MODES

- Pressure control
- Pressure support
- Volume control

MEASURED VALUES DISPLAYED

- Inspiratory tidal volume (VTi)
- Inspiratory oxygen concentration (FiO2)
- Inspiratory pressure
- Current lung pressure

MONITORS

- Respiratory rate
- PEEP
- I:E
- Peak pressure
- Oxygen % (FiO2)

ALARMS

- Inspiratory pressure: High/low/failure
- PEEP: High/low/failure
- Inspiratory tidal volume: Low
- Oxygen: hypoxia
- AC power supply: failure

PARAMETER SETTINGS

- Respiratory rate (Ventilation frequency): 5-25 breath/min
- Inspiratory expiratory ratio: 1:1, 1:2, 1:3
- Tidal volume: 50-2000 ml
- Inspiratory pressure: 5-60 cmH2o
- PEEP: 0-35 cmH2o
- Oxygen concentration (FiO2): 21-100%
- Pressure trigger: <0 cmH2O

PHYSICAL CHARACTERISTICS

MAIN CONTROL UNIT

Width: 345 mm
Height: 280mm
Depth: 190 mm
Weight: 3.5 kg

CHEST PIECE

Width: 150 mm
Height: 100mm
Depth: 100 mm
Weight: <1kg

Screen size: 7" Highly quality touch screen

Communication Port: RJ 45 Ethernet connectors

Backup battery: Up to 3 hours

MEDICAVENT™

INTUITIVE AND HIGHLY CONFIGURABLE TOUCH SCREEN

