

Hand-held Automatic Transport Ventilators - A simple solution for pre-hospital ventilation

Definition

A hand-held automatic ventilator is a device designed to provide physiologically normal positive pressure ventilation to the non-breathing patient. They are compact, with all controls located in the hand piece. This allows for the adjustment of ventilation parameters without the need for the rescuer to remove their hands from the facemask, thereby maintaining a secure mask to face seal.

Types

Hand-held automatic ventilators come in two operating types:

Time/volume cycled ventilation:

Where the ventilation volume and rate is controlled by the device. They may also be designed with the ability to respond to the patient's inspiratory effort and provide the patient actuated, device controlled breath (Assist Control Ventilation - ACV) or can enable the patient to demand breathe at their own rate and volume while providing a mandatory minute ventilation (Synchronous Intermittent Mandatory Ventilation -SIMV).

Pressure cycled ventilation:

Where the rate and volume of ventilation is dictated by airway pressure. These devices are not recommended for use during CPR as chest compressions may trigger early cessation of the delivered breath with a subsequent reduction in oxygenation. These devices also provide inadvertent PEEP which may impede venous return to the heart and reduced cardiac output and coronary perfusion pressure. These devices also tend to provide reduced levels of oxygenation in patients with underlying respiratory conditions where the airway may be restricted.

Functionality

Depending on the product selected, these devices may provide automatic positive pressure ventilation, manual ventilation (for mask ventilated CPR) and demand breathing for the spontaneously breathing patient. These comprehensive devices can be considered to be the equivalent of a manual resuscitator, demand valve, and transport ventilator in one.

Their simplicity of parameter selection, size and weight make them ideal for emergency pre-hospital use. They free up the rescuer to perform other task by taking over the ventilation function once the airway is secured.

Equipped with safety features such as a pressure relief system, these devices ensure that the patient is monitored for changes in airway pressure. These changes may be due to over-ventilation or compliance or airway resistance changes.

Efficacy

Modern, time/volume cycled ventilators provide excellent breathing parameters to meet the needs of most respiratorily compromised patients. Their main attraction for the pre-hospital environment is in freeing up the hands of the rescuer to perform other tasks in the knowledge that the resuscitator is ventilating to the patient.

Because of their consistency they remove the risks of Inadvertent Hyperventilation associated with manual resuscitators. By providing controlled and consistent ventilations at physiologically normal rates, volumes and I:E (inspiratory : expiratory) ratios, these device are a valuable tool for pre-hospital and in-hospital staff.

O-Two Medical Technologies manufacture two types of handheld, time cycled, automatic transport ventilators:

The CAREvent® ALS - designed for use by professional emergency medical personnel

The CAREvent® CA - Chemical Agent Resuscitation Environment Ventilator designed for use by minimally trained or professional rescuers specifically for use in toxic environments.

You can find information on both these products on our website.