

# CAREvent<sup>®</sup> (DRA) Rescue Resuscitator

## The Most Commonly Asked Questions



Rescue Personnel would agree that resuscitation during the rescue of a trapped miner underground is difficult and often inadequate when there is only one initial rescuer or the injured Miner has to be moved over rough terrain. "Every second puts the lives of patients more at risk". Long rescue and transport times to the hospital with an injured Miner can tax the resources of the Rescue Provider.

Most resuscitation situations require more hands than the Rescue Provider could possibly provide. It is difficult to maintain an airway, prepare equipment, provide advanced airway management, trauma care, extricate and transport the injured minor during this stress filled period. Many of the resuscitation attempts were futile resulting in frustration for the rescuer and an undesirable outcome for the injured Miner.

Version "E" August 2007



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# **CAREvent<sup>®</sup> (DRA)**

## **Handheld Automatic Rescue Resuscitator**

### **What are the advantages of using automatic resuscitation?**

The European Resuscitation Council (ERC) and the American Heart Association (AHA) Guidelines 2005 for CPR and ECC, clearly indicates that automatic ventilators are superior at maintaining constant minute ventilation and adequate arterial blood gases.

Automatic time/volume ventilation frees both hands to ensure airway maintenance and allows the Rescuer to concentrate on patient management, rescue and transport.

Automatic time/volume ventilation provides improved lung inflation with minimal risk of gastric distension due to its ability to reduce airway pressures and provide a specific tidal volume, respiratory rate, and minute volume.

### **What is the CAREvent<sup>®</sup> (DRA) Handheld Rescue Resuscitator?**

The CAREvent<sup>®</sup> (DRA) Handheld Rescue Resuscitator is the smallest and most versatile automatic time/volume cycled Rescue Resuscitator on the market today. The CAREvent<sup>®</sup> (DRA) Handheld Rescue Resuscitator is a state-of-the-art pneumatically powered; time/volume cycled ventilatory resuscitator with the added feature of Demand Breathing.

The CAREvent<sup>®</sup> (DRA) Handheld Rescue Resuscitator unique features combined with the Drager Panoramic Full Face mask allows both hands of the Rescuer to be free during the rescue and transport of the injured miner.

The CAREvent<sup>®</sup> (DRA) Handheld Rescue Resuscitator is designed to complement and enhance patient care during CPR and Respiratory Arrest in the confined space and potentially toxic environment rescue situation. The CAREvent<sup>®</sup> (DRA) Handheld Rescue Resuscitator has a preset automatic frequency/flow rate to meet the physiological needs of the individual patient based upon 5 – 7 ml/Kg of body weight. In other words, the CAREvent<sup>®</sup> (DRA) Handheld Resuscitator is designed to provide the correct breaths per minute, along with the correct tidal volume for the average adult patient in accordance with the American Heart Association (AHA) and European Resuscitation Council (ERC) Guidelines 2005 Recommendations.

During CPR, the CAREvent<sup>®</sup> (DRA) Handheld Rescue Resuscitator provides a concise ventilation volume and rate allowing the Rescuer to perform accurate timing of chest compressions between ventilations, which is often difficult with manual ventilation methods such as a Bag-Valve-Mask or Oxygen Powered Manually Triggered Demand Valve Resuscitators, especially during patient rescue, loading and transport.

## **How do I operate the CAREvent® (DRA) Handheld Rescue Resuscitator?**

The CAREvent® (DRA) Handheld Rescue Resuscitator has been designed to allow the Rescuer to concentrate on the injured or trapped Miner. It is provided with an instant “ON” feature that delivers oxygen to the patient as soon as the oxygen source is turned on. This frees the Rescuer to concentrate on placing the Rescue Resuscitator Universal Face Mask on the patient’s face with both hands and maintaining an open airway.

In the event that additional breaths are required, the Rescuer can depress the Manual Override Button located on the front of the Rescue Resuscitator.

## **What if the injured miner is wearing a Drager BG4 with a Panoramic Full Face Mask?**

An optional BG4 Adapter is available that allows the CAREvent® (DRA) Handheld Rescue Resuscitator to be directly attached to the Panoramic Full Face Mask. You simply press the release button on the Mask to allow the removal of the Drager BG4 Connector and attach the CAREvent® (DRA) Handheld Rescue Resuscitator with BG4 Adapter into the Panoramic Mask.

This ensures a positive mask-to-face seal and securely attaches the CAREvent® (DRA) Handheld Rescue Resuscitator onto the Panoramic Mask during the rescue and transportation of the injured Miner.

## **How do I secure the CAREvent® (DRA) Handheld Rescue Resuscitator on an injured Miner that is not wearing a BG4 Apparatus?**

The use of an optional CAREvent® (DRA) Head Harness System allows the Universal Resuscitation Mask to be securely attached to the injured Miners Head allowing hands free operation of the CAREvent® (DRA) Handheld Rescue Resuscitator during the rescue.

## **Will chest compressions effect the functioning of the CAREvent® (DRA) Handheld Rescue Resuscitator?**

The CAREvent® (DRA) Handheld Rescue Resuscitator is designed to be used in conjunction with chest compressions. Consistent Accurate Ventilation helps the Rescuer to time their compressions with the ventilation. This ensures that the compression to ventilation ratio is kept consistent helping the distribution of oxygenated blood throughout the body.

The CAREvent® (DRA) Handheld Rescue Resuscitator is manufactured to meet the 2005 Guidelines for CPR and Resuscitation as established by the AHA and ERC, allowing for the delivery of two breaths followed by a 20 second delay in order to provide 30 chest compressions before the delivery of the next automatic breath.

## **Why is the I:E (Inspiration to Expiration) ratio set at 1:2?**

The timing process involved with the squeeze and release of a Bag-Valve-Mask Resuscitator will vary from breath-to-breath and person-to-person. The variations in timing and volume can increase from the adrenaline rush or decrease due to the rescue environment, fatigue, and a compromised airway.

The CAREvent<sup>®</sup> (DRA) Handheld Rescue Resuscitator has an I:E ratio that is set at 1:2 in order to prevent stacking of ventilations or trapping gas within the lungs. This prevents gas diffusion from being compromised, and allows for better oxygen/carbon dioxide exchange.

Too long of an inspiratory time may impede complete lung deflation (exhalation). If the patient cannot exhale the residual gas due to long inspiratory times, the residual gas stays in the lungs and becomes oxygen depleted and carbon dioxide rich.

This timing is constant with each and every breath throughout the course of the patient emergency regardless of other patient management intervention or rescue techniques being provided by the Rescuer.

## **Can I blow up somebody's lungs and cause damage!**

No. Over inflation is prevented and indicated by the operation of the audible pressure relief system to alert the rescuer that low compliance or high airway resistance is resulting in a diminished tidal volume delivery. The excess volume is vented through the pressure relief system if the airway pressure exceeds 60 cm H<sub>2</sub>O.

In fact, there is less chance of gastric distension while using the CAREvent<sup>®</sup> (DRA) Handheld Resuscitator than there is with a Bag-Valve-Mask Resuscitator or Mouth-to-Mouth Rescue Breathing. Most Adult Bag-Valve-Mask Resuscitators do not come with a pressure relief system. Therefore the Rescuer squeezing the bag aggressively can deliver excessive volumes to the patient increasing the risk of gastric distension and aspiration of stomach contents.

Also, there is no audible indicator with most manual forms of ventilation that the airway pressure is high due to narrowing of the airway or an obstruction.

## **What happens if the patient begins to breathe on their own?**

The CAREvent<sup>®</sup> (DRA) Handheld Rescue Resuscitator is equipped with an integrated "Demand Valve" which allows spontaneous respiration by the breathing patient. When a patient begins to spontaneously breathe the demand valve will deliver oxygen or air (depending on the gas source being used) to the patient at a flow rate exactly equivalent to the patient's demand.

In the event the patient's demand flow rate exceeds 30 L/min and is continued for greater than one second, the "Automatic Shut-Off Circuit" will stop the automatic cycling and will allow the patient to breathe on demand at his/her own rate and volume (providing that the patient's respirations are adequate).

### **What happens if the patient stops breathing again?**

The automatic cycling will restart if the patient either stops breathing completely, or the flow rate demanded drops below 30 L/min for greater than 4 seconds. This occurs automatically, without any intervention from the rescuer.

This greatly enhances patient care resuscitation management and in effect provides an invisible second set of hands dedicated to monitoring the airway while Rescue Personnel transport the patient to the surface.

### **How long will a 3,000 Psi 420 Litre Oxygen Cylinder last during use During Rescue of the Non-breathing Patient?**

The CAREvent® (DRA) Handheld Rescue Resuscitator conforms to the 2005 Guidelines for resuscitation. It will deliver 10 Breaths per Minute with a Tidal volume of 500 ml per Breath. This will result in approximately 80 Minutes of resuscitation time during the rescue and transport of the injured Minor.

### **Can the CAREvent® (DRA) Handheld Rescue Resuscitator be used on the Rescuer if they experienced a problem with their own oxygen supply?**

If the CAREvent® (DRA) Handheld Rescue Resuscitator is equipped with the optional BG4 Adapter, you simply press the release button on the Mask to allow the removal of the Drager BG4 Connector and attach the CAREvent® (DRA) Handheld Rescue Resuscitator with BG4 Adapter into the Panoramic Mask.

This will allow the Rescuer to breath at their own rate and volume as needed during their exit from the area.

### **How long will a 3,000 Psi 420 Litre Oxygen Cylinder last during use During Escape?**

Based upon the requirements for emergency escape, the CAREvent® (DRA) Handheld Rescue Resuscitator will operate for a minimum of 10 Minutes.