

FREQUENTLY ASKED QUESTIONS ABOUT THE UAM

Q CAN THE UAM BE USED WHEN ELECTRICAL POWER IS LOST?

A Yes. The UAM has been especially designed for places where electrical power loss is common. The UAM's oxygen monitor can run up to 8 hours without power because of its internal battery. Although the UAM's oxygen concentrator does not run on battery power, in the event of a power loss, oxygen can be obtained from a pin index cylinder or from a pipeline source. In the case that these sources are not available, the UAM draws in room air (21% oxygen) to deliver the anesthetic agent to the patient. The optional patient monitor provided with the UAM has an internal battery, which provides up to 4 hours of use.

Q WHAT MEDICAL GASES CAN BE USED WITH THE UAM?

A The UAM can use oxygen with or without nitrous oxide, in addition to room air. The oxygen can be obtained from the UAM's built in oxygen concentrator, from an e-size pin index cylinder, or from an oxygen pipeline source. Alternatively, if the hospital does not have a pipeline but has access to large oxygen cylinders, the UAM's pipeline input can be connected to a large oxygen cylinder fitted with a regulator to regulate the pressure to 3.5 Bar (50 PSI). The oxygen and nitrous oxide rotameters permit adjusting the flow of each gas from 0 to 10 liters per minute (LPM) and 0 to 12 LPM respectively. If the total gas flow is less than the patient's minute ventilation (either with spontaneous or manual ventilation), air is entrained via the negative pressure valve upstream of the vaporizer.

The UAM accepts nitrous oxide as a carrier gas since it is requested and used by many anesthesia practitioners around the world because of its many desired effects: it is not a strong analgesic, allows rapid induction and recovery, reduces awareness, and permits the use of less halothane, which can be important if there are cardiac rhythm problems. As an anti-hypoxic safety feature, the UAM continuously monitors the oxygen concentration of the gas delivered to the patient and when it falls below 25% a solenoid automatically stops the flow of nitrous oxide.

Q WHAT TYPES OF VAPORIZERS CAN BE USED WITH THE UAM?

A The UAM can be fitted with either an isoflurane or a halothane draw-over type vaporizer. To ensure safety each vaporizer is designed and calibrated to be used exclusively with the intended anesthetic agent. Both types of vaporizer can be purchased and used with the UAM, however, due to the UAM's compact size, only one can be attached at a time.

The UAM vaporizers should not require periodic service or calibration as long as they are properly used and not damaged. Periodically draining the halothane vaporizer as part of standard maintenance will also ensure a longer life. In the event that a vaporizer needs service, Gradian will immediately exchange it for a new one.

At this time a sevoflurane vaporizer is not available for the UAM, but Gradian plans to develop one in the future.

Q HOW DOES THE OXYGEN CONCENTRATOR WORK AND DOES IT NEED TO BE REPLACED AFTER A CERTAIN AMOUNT OF TIME?

A The UAM produces its own oxygen using an integrated concentrator that converts room air to a mixture as high as 95% oxygen depending on room temperature and humidity. Air is drawn into the UAM and is purified by 2 different filters. Ambient air is made up of 78% nitrogen, 21% oxygen and 1% other gases. The electrically powered oxygen concentrator in the UAM removes nitrogen from room air, creating a mixture that is 95% oxygen and 5% other gases. The compressed air passes into a canister filled with a powdered material called Zeolite. Nitrogen sticks to the Zeolite, while oxygen and other gases flow through it to a reservoir tank. The UAM produces up to 10 liters per minute of 95% oxygen.

The concentrator will work best when the ambient air humidity is less than 85% and the ambient temperature is between 10 and 40 °C. If the concentrator is used within suitable conditions and if the air filter is cleaned and replaced periodically, the Zeolite material should not need to be replaced.

In order to conserve the hospital's oxygen reserves, we recommend that the concentrator be used by default. If power is lost or if the concentrator were to fail, then one should switch to cylinder or pipeline oxygen sources. If these sources are not available then room air is automatically drawn in to continue the provision of anesthesia. When using the concentrator, one should ensure that the cylinder and other sources are shut off in order to not inadvertently deplete them.

Q DOES THE UAM USE A CIRCLE BREATHING SYSTEM?

A The UAM was designed to not require a circle breathing system. In many settings acquiring soda-lime, which is needed for the circle system's CO₂ absorber, can be difficult to obtain as well as costly. Because of this, many practitioners use a circle system without replacing exhausted soda-lime and this poses an unsafe situation for the patient, especially in the absence of an end-tidal CO₂ monitor. With the UAM there is no need to worry about CO₂ accumulating in the system because there is no rebreathing taking place. To get the humidification benefits that a CO₂ absorber provides, a single-use bacteria filter with heat and moisture-exchanging properties can be placed on the patient Y-piece

Q CAN THE UAM BE USED WITH PEDIATRIC PATIENTS?

A Yes. The UAM's bellows with a Y-piece is permissible for children with at least 4 Kg body weight. The included Ayres T-piece breathing circuit should be attached for patients under 4 Kg, and is preferable for children up to 10 Kg. When using the T-Piece the UAM operates as a continuous flow machine with the backbar and bellows filled to capacity. This allows the operator to control flow of anesthetic gas using the open-ended bag.

Q WHAT ANESTHESIA PARAMETERS DOES THE UAM MONITOR?

A The UAM constantly monitors the oxygen concentration of the breathing gases provided to the patient and also monitors the pressure in the backbar to ensure that there is breathing activity. The breathing circuit airway pressure gauge displays the breathing pressure in cm H₂O. The optional patient monitor provided with the UAM monitors ECG, non-invasive blood pressure, oxygen saturation, pulse, and temperature. For capnography or end-tidal CO₂ (etCO₂) measurements, a separate multi-parameter patient monitor with etCO₂ capabilities or a dedicated standalone etCO₂ monitor is required.

Q DOES THE UAM HAVE A SCAVENGING SYSTEM?

A The UAM can be connected to a central or standalone anesthetic waste gas scavenging system, whether of the active or passive type, by using the provided hose to connect between the UAM's 30mm taper connection and the scavenging system's inlet port. Please refer to the specific instructions for your scavenging system for set it up and proper use.

Q DOES THE UAM HAVE AN AUTOMATIC/MECHANICAL VENTILATOR?

A Not at this time, but Gradian expects to release its full-feature UAM Ventilator during the first quarter of 2015. The ventilator will be compatible with all existing UAMs through an upgrade program.

Q WHY DOESN'T THE UAM HAVE AN APL VALVE?

A An adjustable pressure limiting (APL) valve is used in conventional anesthesia machines to regulate the amount of gas in the system when you need to fill the breathing bag to ventilate the patient. With the UAM, its bellows is filled manually and the breathing pressure is controlled by the provider, and therefore, an APL valve is not necessary. The breathing pressure, however, is limited to 55 cmH₂O by the UAM's built in positive pressure relief valve.

Q DOES THE UAM HAVE AN OXYGEN FLUSH FUNCTION?

A Because of the UAM's low volume characteristics it only takes a few vigorous activations of the bellows to quickly flush out anesthetic agent and/or nitrous oxide out the UAM's breathing circuit. A typical button-actuated high-pressure high-flow oxygen flush function is not needed and can be dangerous in a demand flow system.

Q HOW IS MAINTENANCE PROVIDED TO THE UAM?

A The UAM has been designed so that most maintenance activities are simple to perform. When the UAM is installed, a full day of maintenance training is provided to the hospital's biomedical engineers and biomedical equipment technicians. This training teaches the common maintenance procedures and tests. Full technical support is available by telephone or email (service@gradianhealth.org) and during the warranty period or service contracts, repair parts are shipped free of charge if the problem is not due to neglect. If the hospital personnel cannot fix a problem then a certified service representative will visit the hospital to perform or complete the work.

A warranty extension (service contract) can be purchased with the UAM, at an additional cost. Also, a warranty extension may be purchased no later than 3 months prior to the expiration of the original warranty period. The extended warranty will only be sold if the original warranty terms have not been violated.

Q WHAT QUALITY STANDARDS DOES THE UAM COMPLY WITH?

A The UAM is manufactured with the highest quality materials and components, under the highest standards. It carries the CE Mark, having passed EU regulatory inspection and is manufactured in an ISO-certified factory in England.