






Gradian Health Systems & the Universal Anaesthesia Machine

Gradian Health Systems

Gradian Health Systems is a nonprofit medical device company that equips low-resource hospitals to perform safe surgery. We provide appropriate equipment, clinical and technical training, and ongoing customer service to ensure that hospitals in developing countries can deliver high-quality surgical and anesthesia care. Our core technology - the Universal Anaesthesia Machine (UAM) - is a CE-certified anesthesia workstation designed to function without electricity and oxygen, helping its users operate with confidence regardless of their environment.

Our Approach

Gradian's model blends a nonprofit mission with an industry approach to providing and sustaining reliable medical equipment in low-income markets. Our model hinges on three major components:

 TECHNOLOGY	 TRAINING	 SERVICE
We design products for some of the most challenging surgical settings in the world - particularly those with unreliable power and oxygen. Our technology is versatile enough for any operating room - from a district-level hospital in sub-Saharan Africa to a world-class medical center in Europe.	For every installation, we provide on-site product training for hospital staff, led by a team of locally-based anesthesiologists and biomedical technicians. We also offer our customers refresher trainings and instructional resources in a variety of formats and languages.	Our complimentary service warranty covers biannual preventive maintenance, repairs and spare parts for two years. All technical support is carried out by Gradian-certified technicians based in each of our markets, and our service team is available by phone, email or WhatsApp.

Our Progress

To date, Gradian has:

 <p>Equipped 200+ ORs with the UAM</p>	 <p>Installed UAMs in 25 countries</p>	 <p>Trained 600+ clinicians & technicians</p>
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The Universal Anaesthesia Machine

The Universal Anaesthesia Machine (UAM) is a CE-certified general anesthesia workstation that uses both continuous-flow and draw-over technologies to function indefinitely without power or compressed oxygen. It features an integrated oxygen concentrator to generate its own oxygen and provides standard connectors for cylinder, pipeline and portable oxygen. If no electricity or external source of oxygen is available, the machine automatically draws in room air as the carrier gas. Its optional ventilator provides electrically-driven automatic ventilation in volume- and pressure-control modes, will operate without mains power for up to six hours on rechargeable battery and comes with a manual ventilation option as a final safety measure.

"The UAM was well received for its simplicity and good design, safety, reliability, and functionality. It was easy to learn to use and demonstrate to others, anesthetists and other health professionals alike. Its service requirement should be minimal. These features along with its low cost are likely to propagate its popularity. As the only CE-marked anesthetic designed for use in low-resource settings, potentially the UAM has an important universal role to play."

—Journal of Anaesthesia Practice



- **Ventilator**
Fully automatic, electrically-driven ventilator with six-hour rechargeable battery backup; no oxygen needed
- **Patient Vital Signs Monitor**
Real-time monitoring of pulse-oximetry, ECG, non-invasive blood pressure and temperature, with up to six hours of operation on battery backup
- **Oxygen Monitor**
Touch-screen oxygen monitor that displays inspired oxygen content and lasts up to 10 hours on battery backup
- **Low-Resistance Vaporizer**
Low-resistance vaporizer that accurately delivers a calibrated flow of halothane or isoflurane with or without compressed gas
- **Bellows**
Manual bellows that ensures safe, assisted respiration for adults and children without requiring a high-pressure gas source; provides backup means of IPPV to the ventilator
- **Balloon Valve**
Silicone-inflating balloon valve at the expiratory port that opens and closes with the bellows and ensures that the patient breathes safely
- **Integrated Oxygen Concentrator**
Built-in oxygen concentrator that produces up to 10 liters per minute of up to 95% oxygen; room air cleaned with a dual filtration system



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