

Conventional flowmeter to Electronic flowmeters transition: AML

THE CLOSED-CIRCUIT anaesthesia machine has become the main stay for providing oxygenation, ventilation, and administration of volatile anaesthetics to patients to allow for otherwise intolerably painful procedures to be performed in modern-day medicine. Anaesthesia machines and the providers utilizing them have become such an essential component of the operating room that they have evolved to incorporate various electronic equipment and complex ventilators to become what is known as the “anaesthesia workstation.” The modern anaesthesia machine is a complex operating room instrument that incorporates a ventilator to optimize the delivery of inhaled anaesthetics. The anaesthesia machine has gradually evolved from simply a means to anesthetize and oxygenate a patient to an anaesthesia workstation incorporating increasingly complex ventilator modes, end-tidal CO₂ monitors, end-tidal anaesthetic concentrations, minimal alveolar concentration estimators, and a means of monitoring vital signs. Despite all these innovations and new instruments added to the anaesthesia machine, an understanding of the anaesthesia machine is still a core component of the practice of anaesthesiology.

Important components of anaesthesia machine include Vaporiser, Adjustable pressure limiting Valve (APL), O₂ flush button, Breathing module/ Carbon dioxide absorbent, Flowmeter and Ventilator. Vaporiser being the heart of any anaesthesia machine provides the function of converting liquid form of drug to vapour form, the gas that enters the vapor chamber becomes saturated with anaesthetic and then reunites with the fresh gas flow to deliver a carefully calculated dose of volatile anaesthetic. The vaporizer automatically compensates for a wide range of temperatures in the operating room to ensure a steady output of anaesthetic at a given atmospheric pressure. Each vaporizer is specific for a certain volatile anaesthetic such as halothane, isoflurane, desflurane, and sevoflurane.

Carefully calibrated drugs, ventilators and flowmeters keep patients breathing and comfortable during their most vulnerable moments — and gratefully unable to recall what transpired on the surgical table. From their perspective, it's simple: Breathe in, breathe out, wake up in a recovery bed. But for the healthcare providers, it's a delicate art as well as science. R&D team at AML has developed a new advanced anaesthesia machine that help doctors deliver high-quality patient care while also gathering oodles of detailed data about what's happening with the device and the patient during surgery. *Neptune Plus* has now become a fully digital anaesthesia machine with Neptune legacy Insights along with advance feature like electronic gas mixing with digital

hypoxia guard. Combined, these tools help clinicians deliver the right levels of anaesthetic gas for their patients, more safely and efficiently.

Electronic Flowmeters developed by AML are scrupulous and do not have the disadvantages of having multiple mechanical parts which are prone to leaks and breakages. Neptune Plus is equipped with electronic gas mixing that facilitates digital setting of the fresh gas flow with measurement of delivered gases both in digital and virtual form. Built in digital Hypoxia guard controls the oxygen to nitrous oxide setting in such a that the patient does not get gas flow of nitrous oxide concentration beyond permissible range. These allow easy identification of gas flows in a darkened theatre and the export of electronic data to an information system. AML has not only developed the Electronic Flowmeter but also incorporated a Modern Breathing module in Neptune Plus anaesthesia Workstation. Circle Absorber is primarily designed to use with features for low flow anaesthesia. Connections are internalized to reduce the likelihood of misconnections, or disconnections. The internal pathways for gas movements are made compact to reduce circuit volumes to enable rapid changes in gas composition at low flows. ■



Electronic flowmeter