

Quantum Perfusion Systems



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Spectrum Medical proudly presents an exciting new generation of Extracorporeal Technologies and Integrated Patient Safety Systems designed specifically for cardiopulmonary bypass and ECMO therapies.

- The robust and compact Stainless Steel Space Frame construction improves usability by significantly reducing both footprint and weight. The independent placement of system modules allows fine-tuning of overall ergonomics, which leads to improved patient focus and safety.
- The compact modular design and customization opportunities offers an unprecedented degree of flexibility in the optimization of perfusion circuits focused on lowering hemodilution for improved patient outcomes.
- Integrated into the Stainless Steel Space Frame is the Quantum Power Management Module which contains a four-hour battery pack and can integrate up to thirteen Quantum modules to support changing clinical practice.
- This system can also drive two centrifugal pumps with no change in overall footprint. The Quantum Pump Console can be upgraded at any time, with the addition of an external drive motor, to support the integration of centrifugal pumps into your clinical practice.
- All power management cabling is contained within the stainless steel frame to improve both ergonomics and system durability.



The Cheltenham HLM Frame



The Vienna ECMO Cart



The Blackpool HLM Frame

The 15" Quantum Workstation

The 15" Quantum Workstation is the gateway into the management of the World's most advanced Perfusion Management System.

Integrated software applications (Apps) supported by a unique range of advanced Quantum System Modules extend both Perfusion management and Perfusion functionality well beyond today's conventional technologies.

With a commitment to both patient and physician safety the Quantum Workstation with its high resolution 15" LCD has been designed to allow the centralization of critical patient data and perfusion management functions into a single user interface.

The Quantum software system is totally configurable to the needs of individual customers. Apps can be selected from the Quantum App Store and integrated into the practice work flow to provide the following functionalities:

- Blood Flow Management, the Delivery of Cardioplegia and Patient Weaning
- Patient Ventilation, Gas Blending and Vacuum Management
- Vitals Management and Diagnostic Alarm Settings
- Quantum EMR and Quantum System Settings



15" Quantum Workstation with optional Pump Control Module

The Quantum Ventilation and Diagnostic Systems

Spectrum Medical's advanced technologies - a breakthrough in the safe delivery of patient ventilation and non-invasive diagnostics.

Quantum Ventilation System

The Quantum Ventilation System is a world first solution designed to manage extracorporeal patient ventilation, including the blending of gases, the management of vacuum, integrated patient safety systems and perfusion diagnostics.

The ultra-compact Quantum Ventilation System employs the very latest gas blending technologies to ensure the precision delivery of FiO_2 , CO_2 and sweep flow rates. The System provides a sweep flow range from 0.025 to 10 L/m when flowing a single gas e.g. O_2 and up to a maximum flow rate of 20 L/m when modulating the delivery of at least two gases e.g. 60% FiO_2 .

To ensure system performance and safety the

ventilation system has a fully integrated secondary monitoring system that continuously compares actual measured values with user defined requirements and activates an alarm when the discrepancy between the two systems is greater than 10%.

In 'Patient Ventilation Mode' the Quantum Ventilation System, combined with its patented PaO_2 and PaCO_2 measurement technologies, provides a decision support capability that will assist the clinician in the setting of gas flows and gas concentrations when setting PaO_2 and PaCO_2 target values.

The Quantum Ventilation System provides precision modulation and monitoring of two independent vacuum channels.





To further improve patient safety the Quantum Ventilation System provides real-time monitoring of the following gas-ventilation parameters.

Incoming Gas Concentrations and System Pressures:

- Air, O₂, CO₂, Vacuum Incoming Supply Pressures
- O₂ and CO₂ Gas Concentrations to the Oxygenator
- Overall Gas Flow to the oxygenator (SWEEP)
- CO₂ concentrations measured at the primary exhaust port

Integrated within the Quantum Ventilation System is Spectrum Medical's full range of Non-Invasive Diagnostic and Calculated Physiologic Measurements. To further improve usability the system includes the measurement of Flow & Bubble Detection, Pressure, Temperature and Reservoir Level Management. Refer to the Spectrum Medical website for further information.

Quantum Diagnostic System

The 'entry level' Quantum Diagnostics sensor-module is designed to provide the complete range of perfusion circuit parameters required for the safe management of extracorporeal circulation. The sensor module includes three measurement channels of pressure and flow (including emboli & bubble detection), two temperature channels and a reservoir level detection system.

The Quantum Diagnostics module integrates the entry level sensor module capabilities with Spectrum Medical's proven System M non-invasive Diagnostic technology as well as its complete range of Calculated Physiologic indices. New to Spectrum Medical is the capability for a single configuration to measure with high accuracy a gas flow range from 0.025 to 10.00 L/m.

Offering complete flexibility, the Quantum Diagnostics module can be connected directly to the Quantum Workstation and to multiple locations within a Quantum Perfusion Console.

Perfusion Roller Pump

A Quantum leap in patient safety and perfusion systems' functionality.



- The compact range of Quantum direct drive peristaltic roller pumps are provided with 4", 6" and 8" raceway diameters which maximizes both flexibility and compactness when optimizing **HLM** design. In particular the introduction of the mid-range 6" option eliminates the current compromise that compels users to use 8" pumps in medium flow applications.
- The Quantum Universal Clamping System supports the mounting of pumps into multiple locations and pump change times of less than 60 seconds. Importantly, Quantum's pump detection software eliminates user intervention when adding or exchanging pumps.
- Smart LEDs enable visual identification of pump function and color coordination with both the Quantum Workstation and the Quantum Pump Control Module
- Spectrum Medical's universal tube clamping system is designed to eliminate the frustration of using current tube clamping solutions and colour coded plastic inserts. A single 'bobbin' solution allows for the clamping of all tubing diameters associated within the selected size of race-way.

Intelligent Tube Occlusion



The Quantum Smart Occluder is a revolutionary new approach to the management of perfusion-tube occlusion during bypass surgery. The Quantum Smart Occluder replaces the guess-work associated with conventional technologies with precise user inputs for the setting of flow – a critical requirement during certain phases of care e.g. perfusion initiation and patient weaning.

The introduction of closed loop flow control ensures flow control within +/- 2% of the requested set point and system wide communication allows the user to combine Smart Occluder with other Quantum

Modules to deliver levels of functionality new to the world of Perfusion.

Continuing the Quantum philosophy of seeking to improve wherever possible system ergonomics the Smart Occluder module includes two channels of flow measurement and bubble detection, two channels of pressure measurement and a two channel reservoir level detection system. An interlocking Lid, Color-coded LEDs and a mechanical override system maximizes system safety.

Total Customer Support

With an absolute dedication to customer support and a total solutions approach to maximizing equipment availability within the hospital, Spectrum Medical has designed a two-tier customer support program called Sentinel Total Care and Vigilance Total Care.

Sentinel Total Care:

Extended Warranty Full warranty on your Quantum Perfusion System including Associated Accessories (sensors, cable assemblies) for its 10-year life at no cost to the customer. Quantum products beyond economic repair will be replaced with latest 'new build' technologies.

Annual Servicing Includes all required servicing visits performed by dedicated Spectrum Medical's service personnel and the cost of all servicing items.

Accidental Damage Accidental damage including accessories (sensor, cable assemblies) for the 10-year life of your Quantum Product at no cost to the customer. (Available with Vigilance in US Markets).

Emergency Loan Equipment Loan equipment provided at no cost if the defective equipment cannot be rectified within 24 hours of being returned to Spectrum Medical.

Annual Software Updates During the service visit the Quantum Software will be maintained to latest standards including changes to user functionality, updates to enhance maintainability, reliability and protocol changes to third party device driver software at no cost to the customer. Software deployment is subject to prior customer approval, and training via webinar or in-house at Spectrum Medical is included free of charge.

Telephone Support Within standard working hours.

Vigilance Total Care: additional support when using Spectrum Medical's Quantum Informatics and VISION Data Management System.

Vigilance Server Vigilance Server is a revolution in customer support and uses current technology developed for Spectrum Medical's Perfusion Management System. Integrated within the VISION Server System the Vigilance maintenance application provides for the pro-active, real-time monitoring and reporting of electronic and functional sub-systems, real-time fault diagnosis, deployment of system wide software updates, and on-line system support. With access to a private VPN, this diagnostic information is communicated in real-time to Spectrum Medical.

Quantum Instant Access To maximize operational uptime of the Quantum Perfusion System Spectrum Medical will, at its discretion, deploy a 'bonded inventory' of critical Quantum modules within a secure hospital location. Customers will have immediate 24-hour access to this bonded stock and more importantly prior approval from Spectrum Medical will not be required.

Spectrum Medical must be notified as soon as practically possible that the bonded stock has been used.

IT Solutions for Perfusion, ECMO and the ICU



Quantum Informatics, I.T. Solutions for Perfusion, ECMO and the ICU

Quantum Informatics is a revolutionary new methodology for the provision of specialized health informatics solutions for the critical care space including the ICU and the O.R. The real-time integration of physiologic data facilitates the real-time implementation of Best Practice and Evidence Based Protocols that can support the identification of adverse events before they become adverse outcomes. Quantum Informatics is highly configurable and can easily integrate within existing Hospital Information Systems, clinical workflows and diverse care locations. The overall system consists of the following three modules:

VIPER EMR – VIPER EMR is the clinical interfacing software that uses an App based architecture for easy integration into the individual work-flow needs of a hospital. VIPER EMR can run on either the 12"

or 15" Quantum Workstation or a Quantum Tablet.

VISION – Spectrum Medical's VISION server application provides system-wide maintenance of software, system-wide communication, the creation and transfer of patient records (end of case and real-time) and bi-directional HL7 communication to the H.I.S. using a Mirth Interface Engine. VISION's SQL database is used for the storage of critical patient information and is supported by a comprehensive analytics package to support improved quality outcomes.

LIVE VUE – LIVE VUE is Spectrum Medical's web-based near real-time remote monitoring solution. Highly configurable graphical presentation systems and integrated best practice alert systems provide clinicians with instant access to live patient data from a variety of care locations to enhance patient safety and rapid decision support.

Accessories



- Trays – three sizes
- Clamps – three options

- Drip Stand
- Hand cranks – three sizes

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