

## Flexible ECLS Solutions for the I.C.U. and Patient Transport



# Quantum Perfusion Systems

Spectrum Medical proudly presents a modular range of Quantum Perfusion Modules and Patient Safety Systems for a wide range of ECLS procedures used in the I.C.U. and Patient Transport.

## The Toronto Perfusion System

The Toronto Perfusion System has been designed to provide an integrated platform for the Quantum Transportation technology, allowing quick release for when you are on the move. The Toronto Perfusion System also allows total Quantum flexibility in supporting ECLS therapies in the I.C.U., the O.R. and the Cath Lab.

Integrated cabling and a standard sized Quantum Power Pack optimizes patient safety, extends battery life and supports potential configurations of up to 13 different Quantum Modules.



The Toronto Perfusion System

## The Charlotte Perfusion System

Within Spectrum Medical's range of ECLS Perfusion Systems the "Charlotte" is its smallest footprint. Highly flexible, simple to use and yet offering the ultimate in-patient safety technology for all ECLS therapies within the I.C.U. The Charlotte Perfusion System comprises of the Quantum Workstation Elite, Quantum Ventilation Lite, it can also integrate both centrifugal and roller pumps. Integrated cabling and a secondary Power Pack optimizes patient safety and extends battery life.



The Charlotte Perfusion System

# The Quantum Transport System

Combining future technologies with proven Quantum performance to maximise safety and simplify patient care during patient transport.

Modular, flexible and extremely light weight, Spectrum Medical's Quantum Carbon Fibre advanced systems technology defines the future of ECLS transport solutions. The Quantum Carbon Fibre transport solution is a completely integrated system within the Quantum range of technologies combining proven Quantum

flexibility with the Quantum Informatics Patient Safety system for the care of critically ill patients. The Quantum Carbon frame is supplied with Quantum Workstation Elite, the Quantum Mini Ventilation Module and one or two Quantum CP22 Centrifugal Pumps using therapy based disposable

mounting systems. All modules are detachable and can be used with alternative framing solutions such as the Toronto or the Charlotte to maximise equipment utilization.

The integrated Quantum Mini Ventilation module is a world first ventilation technology, designed by

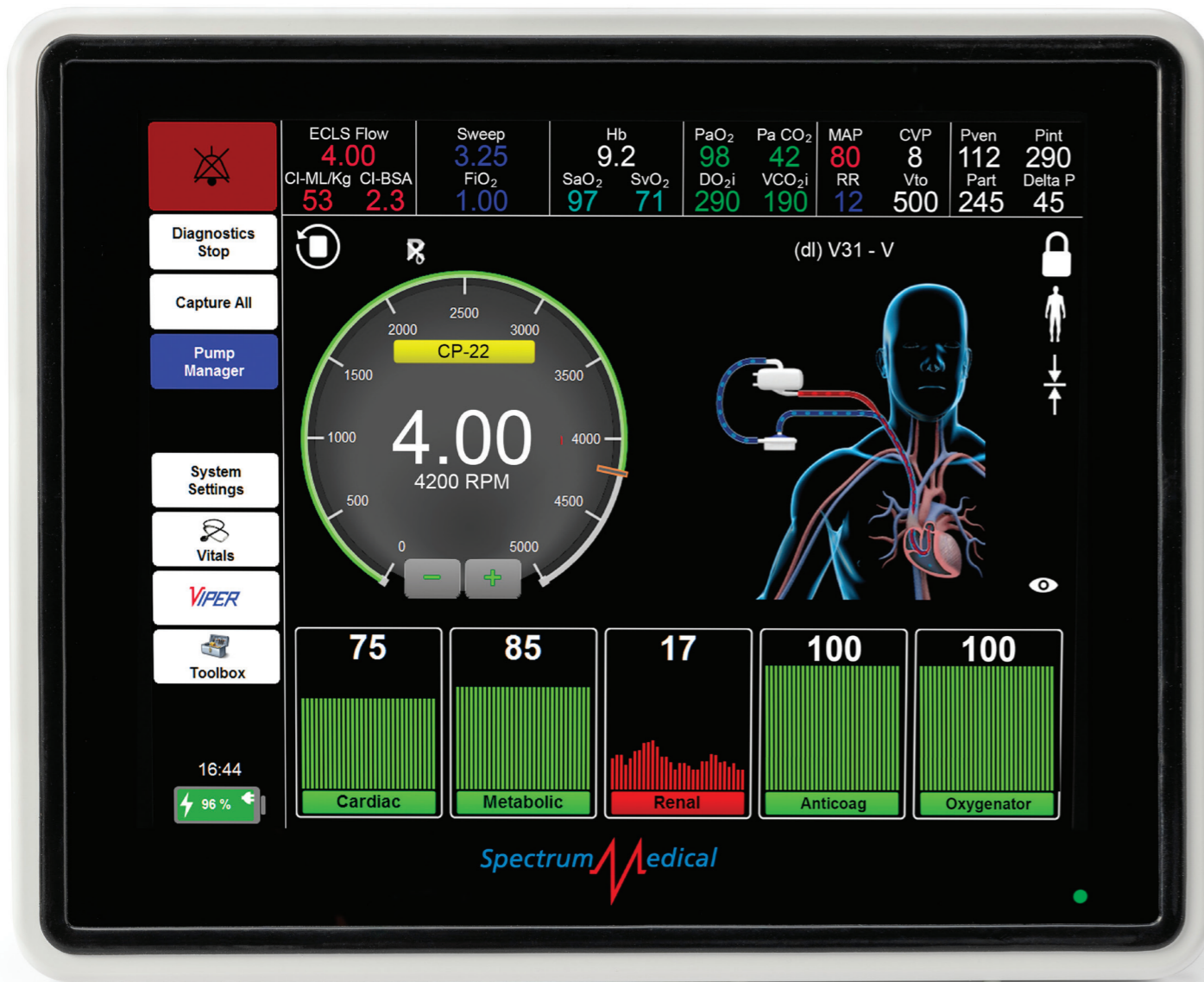
Spectrum Medical to be used for ECLS transport. The Quantum Mini Ventilation module provides a hypobaric ventilation strategy using dual oxygen sources allowing for a V/Q mismatch within Spectrum Medical's revolutionary ventilator technology, which is due late 2020.



The Quantum Transport System

# The Quantum Workstation Elite

Your gateway into the management of the World's most advanced Perfusion Patient Safety System supporting complex ECLS procedures in the I.C.U. and during patient Transport.



Quantum Workstation Elite

## The Quantum Workstation Elite

The new and revolutionary 12" Quantum Workstation Elite has been designed to offer the ultimate in clinical flexibility when supporting complex ECLS procedures in the I.C.U. and during patient transport. A single solution not only reduces training requirements it offers maximum investment utilization.

The Quantum Workstation integrates two channels of flow measurement, four channels of pressure and temperature measurement, and Spectrum Medical's proven non-invasive measurement of O<sub>2</sub> Saturations and Hb/Hct.

Additionally, the Quantum Workstation Elite can drive and modulate two CP22 Quantum Centrifuge Pumps or two Quantum 4" Roller Pumps (or any combination). Furthermore, The Quantum Workstation Elite supports connectivity to a wide range of Quantum modules including the Quantum Ventilation Lite.

Systems interoperability and patient safety are fundamental to Spectrum Medical and its commitment to partnering with customers to improve patient outcomes. The new Quantum Workstation Elite has an integrated 3<sup>rd</sup> party device connectivity solution that enables the central display and transfer of critical real-time continuous clinical information.

The system also includes a range of safety and best practice systems. Compliance is supported by the Best Practice App and patient safety through our Checklist and Complications Apps. Spectrum Medical's Live Vue technology and Critical Care Scoring systems functionality are available when the Quantum Workstation Elite is network connected to a Quantum Informatics server installation.

# The Quantum Ventilation Lite

Finally, a fully integrated “single solution” Ventilator technology designed to provide the safe delivery of patient ventilation for specialized ECLS applications in the I.C.U.



## Quantum Ventilation Lite

The Quantum Ventilation Lite is a world first solution designed to manage ECLS patient (Membrane) ventilation, including the blending of gases, integrated patient safety systems and perfusion diagnostics.

The ultra-compact Quantum Ventilation Lite employs the very latest gas blending technologies to provide the user with an Atmospheric or Hypobaric patient ventilation capability.

In Atmospheric mode the Quantum Ventilation Lite delivers precision regulated  $\text{FiO}_2$ ,  $\text{CO}_2$  with a sweep flow range from 0.025 to 10 L/m when flowing a single gas e.g.  $\text{O}_2$  and up to a maximum flow rate of 20 L/m when modulating the delivery of two gases e.g. 60%  $\text{FiO}_2$ .

In Hypobaric mode the Quantum Ventilation Lite regulates the delivery of two channels of  $\text{O}_2$  to Spectrum Medical's new Ventilator technology with a sweep flow range of 0.025 to 10L/m per channel.

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 set-points

and activates an alarm when the discrepancy between the two systems is greater than 10%.

In 'Patient Ventilation Mode' the Quantum Ventilation Lite, combined with its patented  $\text{PaO}_2$  and  $\text{PaCO}_2$  measurement technologies, provides a decision support capability and an auto regulation function for the modulation of gas flows and gas concentrations when setting  $\text{PaO}_2$  and  $\text{PaCO}_2$  target values.

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

- Incoming Supply Pressures of Air,  $\text{O}_2$  &  $\text{CO}_2$
- $\text{O}_2$  and  $\text{CO}_2$  Gas Concentrations & Pressures to the Oxygenator
- Overall Gas Flow to the oxygenator (SWEEP)
- $\text{FeCO}_2$  concentrations

Integrated within the Quantum Ventilation Lite 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 (including bubble detection), Pressure and Temperature.

# The Quantum Centrifugal Pump CP22

Dedicated centrifuge pump technology for ECLS application in the I.C.U. and during transport.

Leading the world with integrated patient safety technologies.

Spectrum Medical's next generation Quantum Centrifugal Pumps provide exceptional levels of performance along with significantly reduced prime volumes. The integration of a single sapphire bearing, and patented hydro-dynamic balancing technology ensures levitation at low RPMs leading to significantly reduced heat generation and haemolysis.

The CP22 can be connected to either a Quantum Perfusion System or the new Quantum Workstation Elite, integration with the Quantum Workstation Elite simplifies systems and circuits for ECLS procedures used in the I.C.U. or during transport.



Quantum CP22 Hand-Crank



Quantum CP22 Motor Drive



CP22 (Order Code: CP22V-VT)

To support the introduction of the Quantum Heater-Cooler Technology and to minimise circuit complexity Spectrum Medical has integrated its stainless-steel PureFlow Venous heat exchanger and the CP22 Centrifugal Pump into a single disposable assembly. Mounted directly to CP22 motor drive system, the CP22 with its integrated Venous heat exchanger can be used with the Quantum Heater-Cooler technology and its Glycol heat transfer fluid.



PH33 (Order Code: PH33V-VT)

Another world first is the integration of Spectrum Medical's advanced pressure and temperature measurement technology. In-line pressure and temperature measurements of both the arterial and venous lines can now be accomplished without compromising the safety of the ECLS circuit.

The CP22 is rated to 6 liters/min at 500 mmhg and has a class-leading prime volume of only 22cc.

PC1036 Bio-Compatibility coating and the availability of a hand-crank further improves patient safety.

## Perfusion Roller Pump

A Quantum leap in usability 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.

## Mounting Solutions

The range of Quantum Mounting Solutions maximises equipment utilization within the I.C.U. and the Cath Lab. Simply change the mounting solution and then select the required Quantum Software and your ECLS system is reconfigured and ready for use.



# Centralized & Remote Tele-Health and Integrated Alerting Systems

With the seamless integration of “multiple information feeds” and the intuitive input of A.D.T. data, Spectrum Medical is committed to maximizing patient safety with real-time responses to real-time adverse events.

With the integration of Spectrum Medical’s revolutionary Quantum Elite and its app based Patient Safety System with our next generation server based Quantum Informatics technology, you take clinical safety and real-time physician response to the next level.

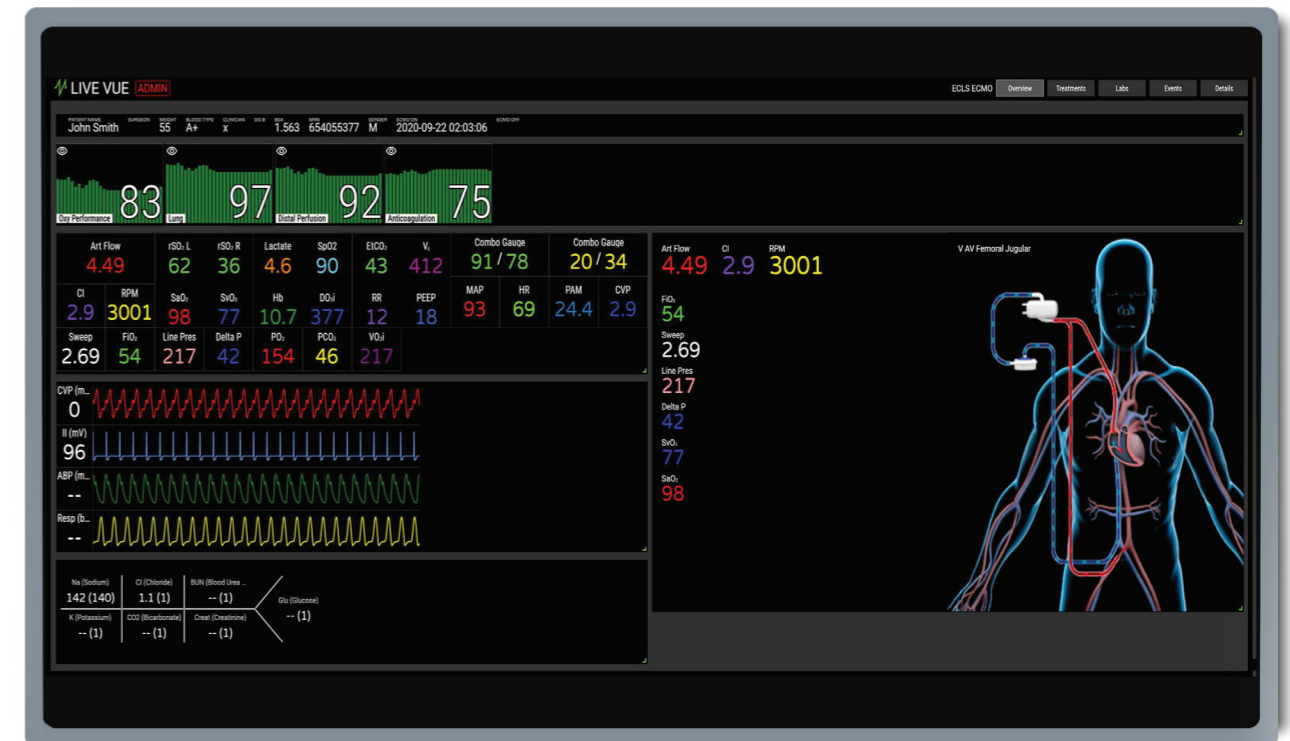
Quantum Informatics LIVE VUE is the name given to the software system designed to visualize real-time clinical information in both graphical and textual formats to clinicians within the clinical setting or from a remote location. LIVE VUE will provide the clinical team with a “wide area, real-time perspective” of all patients within the care setting. This presentation of data is further enhanced with the integration of system alerts associated with the deployed active Patient Safety System.

System alerts for Complications, Compliance, Critical Care Scoring and Checklist, if active, will

be communicated to the summary information screen and to the clinician personnel comms device in real-time.

Access to patient specific granular trending information is made possible by selecting a patient displayed in the LIVE VUE dashboard. This data can include wave forms, trending physiologic data, intermittent blood gas data etc. In fact, the presentation of discreet patient data can be further enhanced by extending the exchange of information to include relevant data within the Hospital Information System.

The LIVE VUE interface is also used for the selection and deployment of both surveillance profiles and check lists. The LIVE VUE interface is also used for the individual setting of alerts within an active patient surveillance profile.





# Total Customer Support

With an absolute dedication to customer support and a total solutions approach to a long-term partnership, Spectrum Medical is proud to present its annual support plan, Sentinel Total Care.

## Sentinel Total Care:

**Extended Warranty:** Total Warranty on your Quantum Perfusion System including Associated Accessories (sensors, cable assemblies etc.). 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.

**Time Expired Sterile Products:** Partnering with hospitals in the provisioning care is at the core of the Sentinel relationship. Quantum sterile products supplied by Spectrum Medical that have exceeded their expiration date can be returned to Spectrum Medical and exchanged for new replacement products free of charge.

**Accidental Damage:** Accidental damage on your Quantum Perfusion System including accessories (sensors, cables assemblies etc.). Quantum products beyond economic repair will be replaced with latest new build technologies.

**Quantum eLearning:** Includes access to Spectrum Medical web-based electronic Learning Management System (or LMS) to streamline product training and to complement your current training practice and recertification.

**Remote On-Line Support:** Integrated within the VISION Server

System and with VPN access, the Sentinel maintenance application provides a capability to support the remote monitoring and fault diagnosis of all Quantum systems network connected to the local VISION server.

**Emergency Loan Equipment:** For all products that cannot be repaired within 24 hours of being returned to Spectrum Medical Service Center.

**Software Updates:** During the service visit Quantum Software will be maintained to latest standards, including changes to user functionality, updates to enhance maintainability, reliability and protocol changes to 3<sup>rd</sup> 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.

**Comprehensive 24/7 Support:** Spectrum Medical's innovative 24-hour live messaging support platform enables users to have immediate access to an extensive knowledge-based product library, frequently asked questions and troubleshooting tips. Additionally the 24-hour support platform supports immediate communication with Spectrum Medical's global support team which comprise, service technicians, clinical consultants and system application experts via a dedicated phone number, email address or Spectrum Medical 24-hour live messaging service.



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SMM-010 v1