



## Flexible Support Solutions for Extracorporeal Perfusion



*The story of Spectrum Medical is now 20 years old and our total commitment to the care of our critically ill patients can be seen in every single one of our revolutionary technologies described within this brochure. Nothing is compromised, no technology is ever considered complete, and minor details matter in the pursuit of perfection.*

*At Spectrum Medical we have one goal and that is to be your “trusted partner” both clinically and commercially. We understand that our new technologies do push the envelope, they do question current clinical practice and therefore they drive new learning opportunities. Additionally, it is self-evident that for this process to work successfully a traditional vendor mentality by both parties is simply not fit for purpose.*

*In this brochure we present to you three critical technologies as a unified solution. We begin the journey as a trusted partner and together we can change the current status quo and take patient safety, patient outcomes and healthcare efficiency to the next level.*

*At Spectrum Medical we are proud of where we started all those years ago with the development of non-invasive SO<sub>2</sub> technology to being a full solutions provider today. We have proven that Cardiopulmonary Support is an exciting place to integrate ground-breaking technology and Spectrum Medical is dedicated to its future.*

*Yours Sincerely,  
Steve Turner  
C.E.O & Founder*

# Quantum Perfusion Technologies

The ultimate representation of Performance,  
Functionality and Ease of use.



# Quantum Perfusion Systems

Spectrum Medical proudly presents a modular range of Quantum Perfusion Modules and Patient Safety Systems.

## The Toronto Perfusion System





## The Charlotte Perfusion System



# The Quantum Perfusion System

Combining future technologies with proven Quantum performance to maximize safety and simplify patient care.

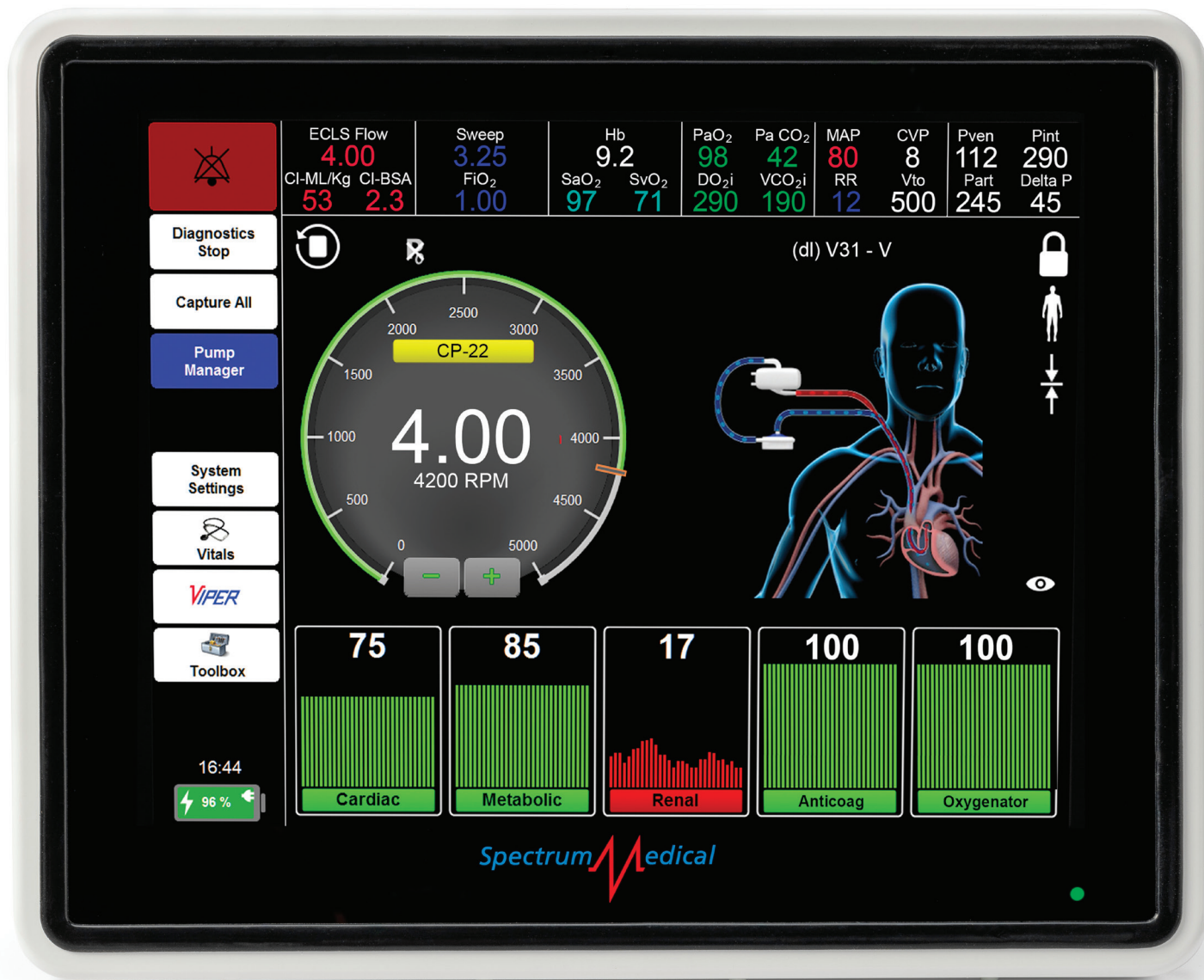
## The Melbourne System





# The Quantum Workstation Elite

Your gateway into the management of the World's most advanced Perfusion Patient Safety System supporting complex procedures.



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 procedures.

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

As a standalone technology the Quantum Workstation Elite can modulate two CP22 Quantum Centrifuge Pumps or two Quantum 4" Roller Pumps (or any combination). When connected to

a perfusion system with a Quantum Power Pack the Quantum Workstation can modulate both 6" and 8" roller pumps. 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 third-party device connectivity solution that enables the central display and transfer of critical real-time continuous clinical information.



# The Quantum Ventilation Lite

Finally, a fully integrated “single solution” Ventilator technology designed to provide the safe delivery of patient ventilation for the Membrane Oxygenator.



## Quantum Ventilation Lite

The Quantum Ventilation Lite is a world first solution designed to manage 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 a variety of features.

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%  $\text{FiO}_2$ .

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 CP-22 Drive Units



# The Quantum Centrifugal Pump Drive System

The CP22 Quantum Centrifugal Drive System is both compact and powerful and can be used to support circuits utilizing either the Quantum CP22 or CP20 Centrifugal Pump. Central to the Quantum philosophy is system flexibility and equipment utilization. The CP22 Motor Drive

System can be integrated with either the Charlotte and Toronto Perfusion Systems or directly connected to the new Quantum Workstation Elite. The availability of a hand-crank further improves patient safety.



Quantum CP22 Hand-Crank



Quantum CP22 Motor Drive

# 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 Perfusion System 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.



# Sterile Technologies



# The Quantum Dual Chamber Oxygenator

## Total Surface Area (Ventilation Efficiency)

Spectrum Medical's revolutionary laminated membrane construction significantly increases gas exchange efficiency, minimises pressure drop and priming volume. The unique construction eliminates the current compromise between fibre bundle compression and low priming volume.

Individually all fibre layers within the fibre bundle are separated by ten microns, leading to a significant advantage in that the individual fibres within the laminated bundle construction, are in contact with flowing patient blood and providing gas exchange. This significant increase in gas transfer efficiency leads to a reduction in blood contact surface area and by default a lower priming volume and pressure drop.

## Superior Air Handling

Spectrum Medical continues its commitment to patient safety with the integration of its patented Quantum Vortex Flow technology. This innovation in fluid dynamics ensures that blood flow passing through the laminated bundle construction is centrifugal in nature which generates a fluid vortex to support the separation of gross air from flowing patient blood. This separation of gross air from patient blood ensures almost instantaneous priming in addition to minimising or eliminating venous air being passed through to the arterial circuit.

## Maximum Fluid Dynamic Performance

The elimination of low velocity sections and dead space within the fluid path has been at the forefront of Spectrum Medical's "anti-thrombotic" strategy. This unique design concept in conjunction with the Quantum Vortex Flow and Fibre Separation technologies guarantees that the total surface area of the laminated bundle construction is subjected to a circulating blood flow with a guaranteed full volume wash out of approximately 4 seconds when flowing blood at 5 lpm.

## Biocompatible

Resulting from significant process research, a world first in the application of PC1036 cross-linked biocompatible coating to a fibre membrane construction. Superior adhesion qualities, elasticity and surface smoothness maximises antithrombotic performance throughout the life of the product.

# The Quantum Oxygenator

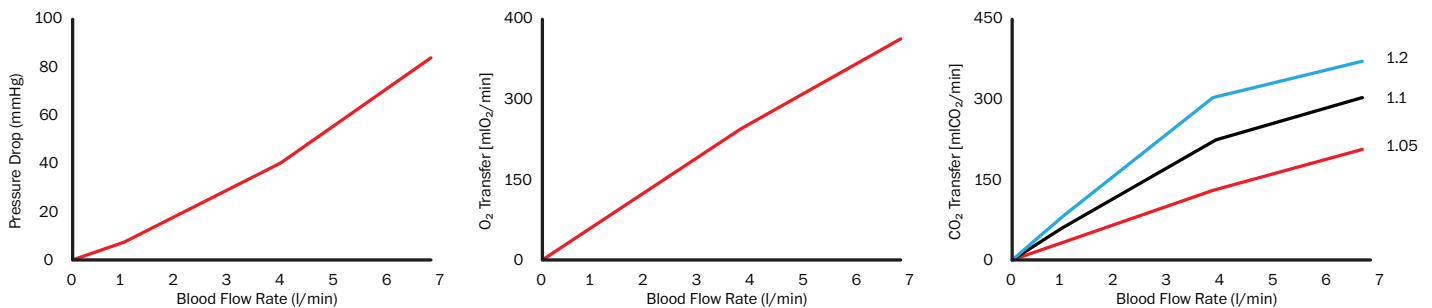
Spectrum Medical's Extracorporeal Membrane Ventilation Technology is another world first technology combining a revolutionary fluid path design with a dual chamber gas transfer technology.

## Sizes available:

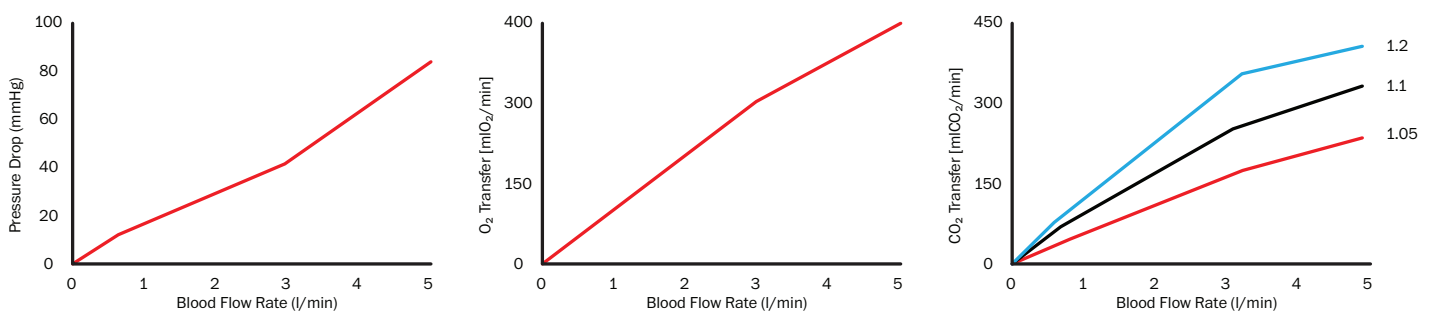
Large Adult VT-200  
Small Adult VT-160



## Quantum Perfusion Blood Oxygenator ECC VT200



## Quantum Perfusion Blood Oxygenator ECC VT160



Paediatric and Neonate Oxygenators coming soon. Keep Checking our website for updates.

Performance of the device were obtained in agreement with ISO 7199 Standard (37 °C)

# The Quantum Centrifugal Pump

CP-20 (1/4) and CP-22 (3/8).

Spectrum Medical's next generation range of Quantum Centrifugal Pumps provide exceptional levels of performance along with significant reductions in prime volume. 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.

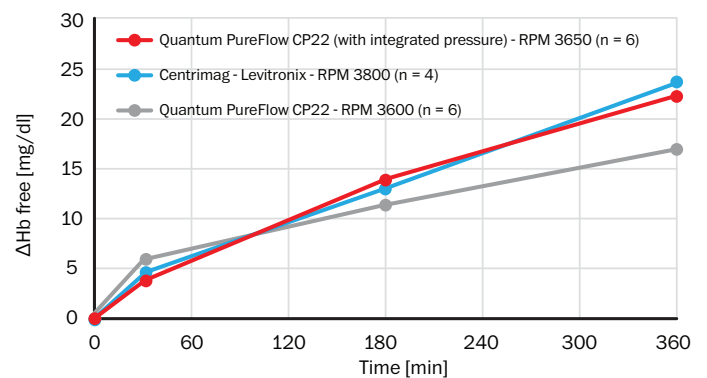
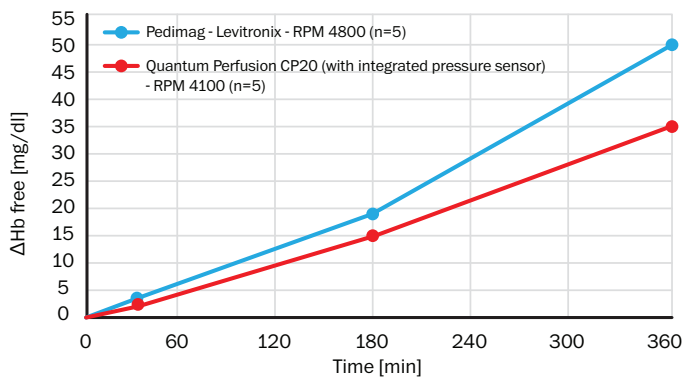
In-line pressure and temperature measurement of both the arterial and venous lines can now be accomplished without compromising the safety of the circuit.



CP20



CP22



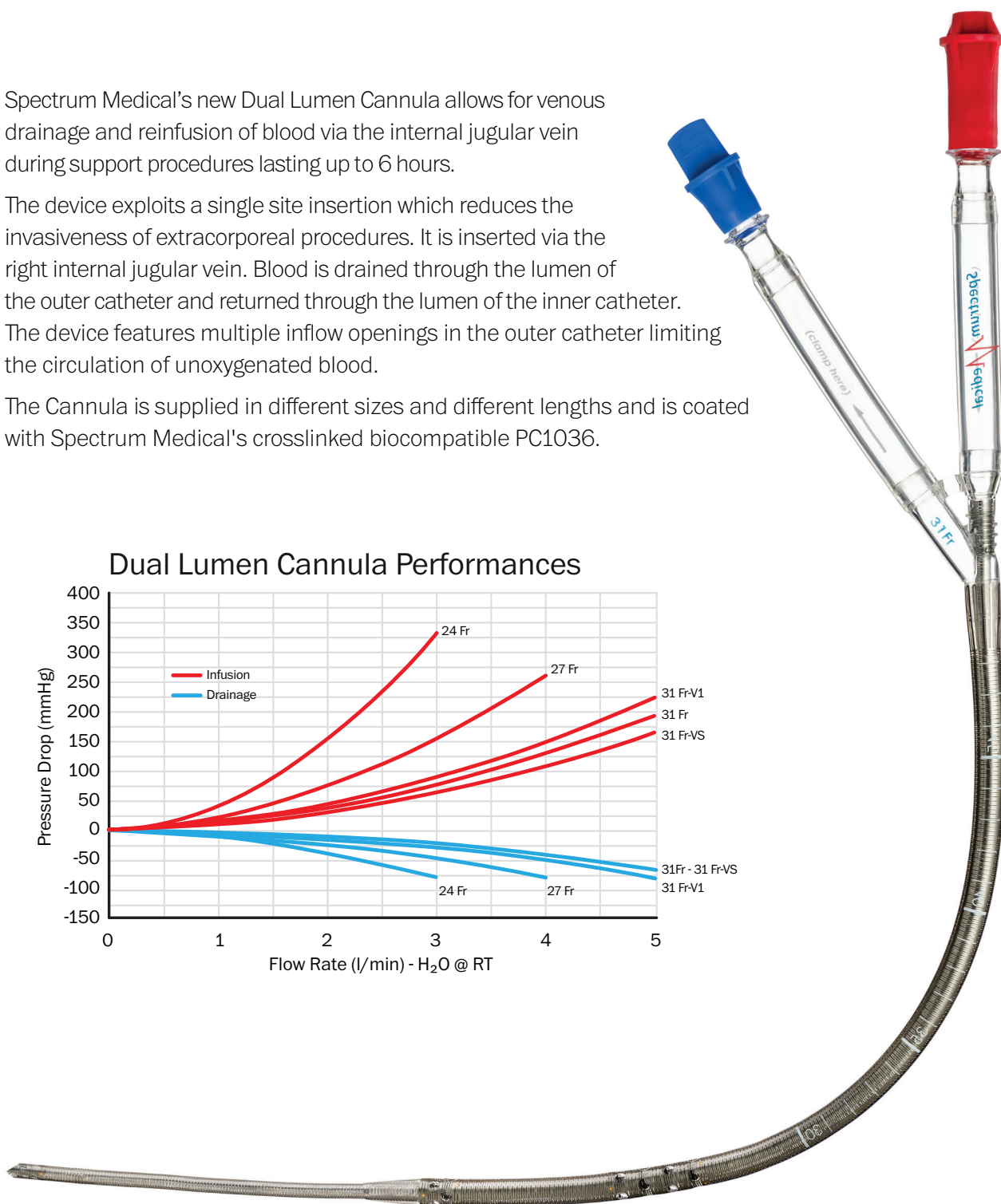
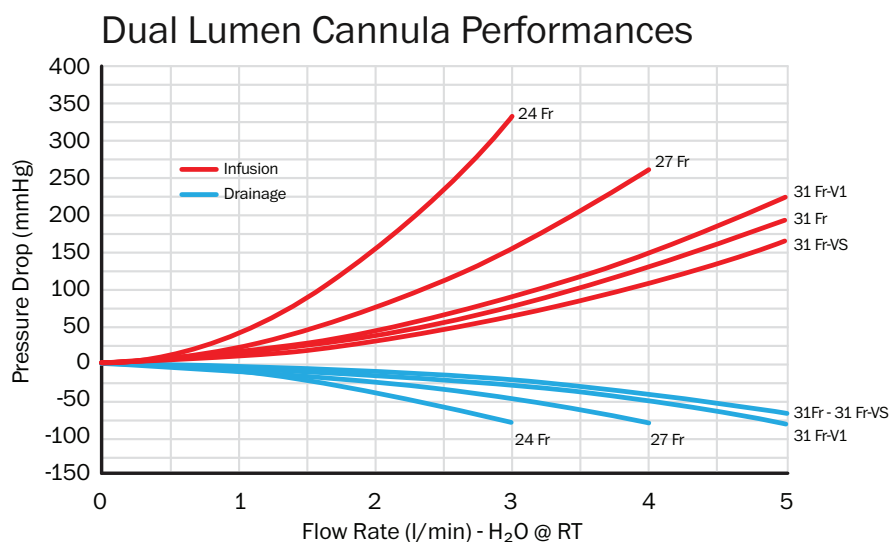
# The Quantum Dual Lumen Technology

Spectrum Medicals revolutionary range of Dual Lumen Cannulas minimizes venous/arterial recirculation during Cardiopulmonary Support.

Spectrum Medical's new Dual Lumen Cannula allows for venous drainage and reinfusion of blood via the internal jugular vein during support procedures lasting up to 6 hours.

The device exploits a single site insertion which reduces the invasiveness of extracorporeal procedures. It is inserted via the right internal jugular vein. Blood is drained through the lumen of the outer catheter and returned through the lumen of the inner catheter. The device features multiple inflow openings in the outer catheter limiting the circulation of unoxygenated blood.

The Cannula is supplied in different sizes and different lengths and is coated with Spectrum Medical's crosslinked biocompatible PC1036.





# Sentinel Total Care

Absolute dedication to customer support  
and a total solutions approach to a “trusted  
partner status”



# In-service Customer Support

Sentinel Total Care defines Spectrum Medical's approach to a total solutions support program that maximises equipment availability with the very latest systems functionality.

## Software Updates:

Spectrum Medical is committed to the continuous improvement of both systems functionality and the enhancement of capital value. We continually review, enhance, and add software functionality driven by evidence-based clinical usage and trends. Our 3rd party device driver software is regularly updated to ensure compatibility with both established and new systems. All software updates are included at no additional cost to the customer. Any software deployment is subject to prior customer approval and training via Spectrum Medical's web-based electronic Learning Management System (Quantum eLearning).

## On Site Customer Support:

A Spectrum Medical Product Specialist will perform all required routine servicing to ensure optimum performance of your Quantum Perfusion System. Visiting Product Specialists will also provide additional user training and support changes to systems configuration to enhance clinical practice. Using dedicated Product Specialists as opposed to traditional service personnel is

a unique strategy within the Cardiopulmonary Support space, with Sentinel Total Care covering all associated service visit costs (travel, labour, and spare parts).

## Extended Warranty:

Sentinel Total Care includes comprehensive protection in the event of any breakdown of your Quantum System. Coverage includes modules, sub-assemblies, and any associated accessories (sensors, cables, clamp assemblies, batteries, etc.). Quantum products beyond economical repair will be replaced with the latest 'new build' technologies at no additional cost.

## Accidental Damage:

No questions asked, unintentional damage protection, including all Quantum accessories. Quantum products beyond economical repair will be replaced with the latest 'new build' technologies at no additional cost. Sentinel Total Care allows you to effectively manage your budget with no sudden large Purchase Order requirements.

# In-service Customer Support

Real Time Customer support 24 hours, seven days a week.

## Remote Real-Time Support (QuantumChat):

Integrated, as part of Sentinel Total Care, users have access to Spectrum Medical's comprehensive 24/7 remote real-time support application, QuantumChat.

QuantumChat puts customers in direct contact with our product, clinical and technical specialists located globally. Ask a question anytime, anywhere and get an immediate response back straight away. Share pictures, videos or even start a live video chat with a product expert using your mobile device. Each user is given a dedicated login and grouped within your clinical team. Follow or respond to questions asked by fellow team members. Get device information about your Quantum System by simply scanning the QR barcode found on any Quantum module/sensor. Accessed via the app, our knowledge-based libraries such as documents, manuals, software release notes and various troubleshooting help tips. QuantumChat makes troubleshooting and resolving issues easy and fast. QuantumChat supports multiple languages and is compatible with either Apple or Android mobile devices.

Additionally, with the inclusion of our VISION Server System and with VPN access, Spectrum Medical can provide remote monitoring and fault diagnosis of all Quantum system networks connected to the local VISION server intraoperatively.



## QuantumChat



## Emergency Loan Equipment:

Spectrum Medical will dispatch complimentary loan equipment if your defective equipment cannot be rectified within 24 hours of being returned to a Spectrum Medical Service Centre. To maximise equipment uptime our loan equipment stays with you until you receive a repaired or new replacement module from Spectrum Medical.

## Quantum Sterile Products Support:

Partnering with hospitals in the provisioning of care is at the core of the Sentinel relationship and providing dedicated customer support for sterile disposable technologies is another exciting world first for Spectrum Medical.

Spectrum Medical can now offer its exclusive users of the Quantum SuperPAC technology an optional fixed cost per patient pricing model. To minimise disruption and associated administration costs this option is only available to hospitals using Quantum Informatics.

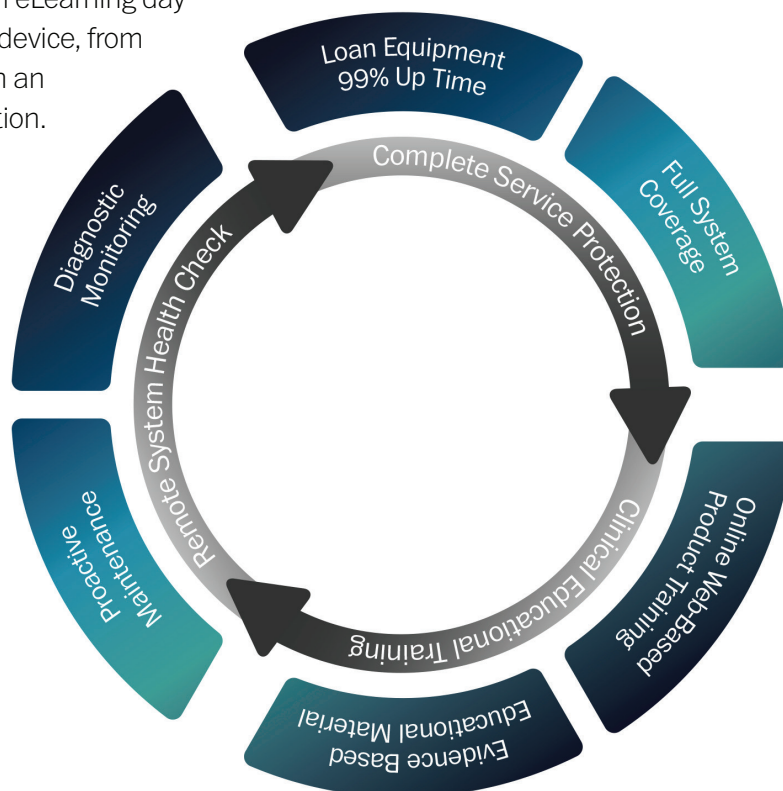
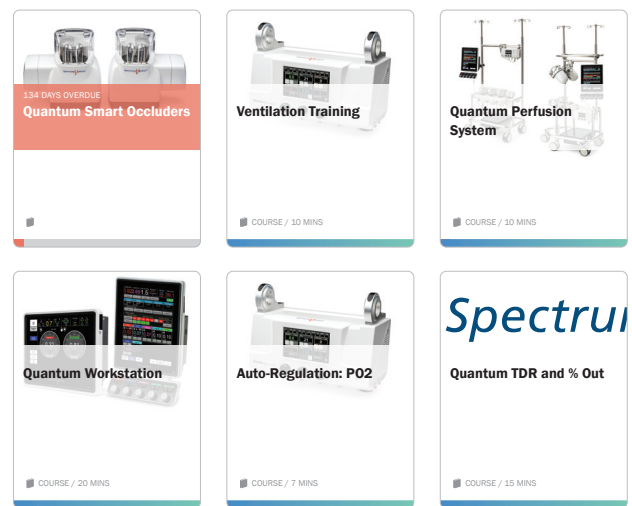
Quantum sterile products supplied by Spectrum Medical that have exceeded their expiration date can be returned to Spectrum Medical for full credit against future purchases.

Sentinel provides access to a wide range of structured Training, Educational and Re-Certification resources.

## On-Line Learning Support (Quantum eLearning):

All users have access to Spectrum Medical's web-based eLearning management platform, Quantum eLearning. Quantum eLearning will complement any existing training or re-certification program. Each Spectrum Medical module, product or technology, has its own dedicated course. Each course content is available in multiple languages and designed to ensure that the user's product and clinical knowledge is both relevant and up-to-date. Topics covered include clinical benefits of hypobaric oxygenation, safety features for Mini-Bypass mode, and auto-regulation of PO<sub>2</sub> and PCO<sub>2</sub>. Quantum eLearning is an easily accessible resource library.

Access Quantum eLearning day or night, on any device, from any location with an internet connection.





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