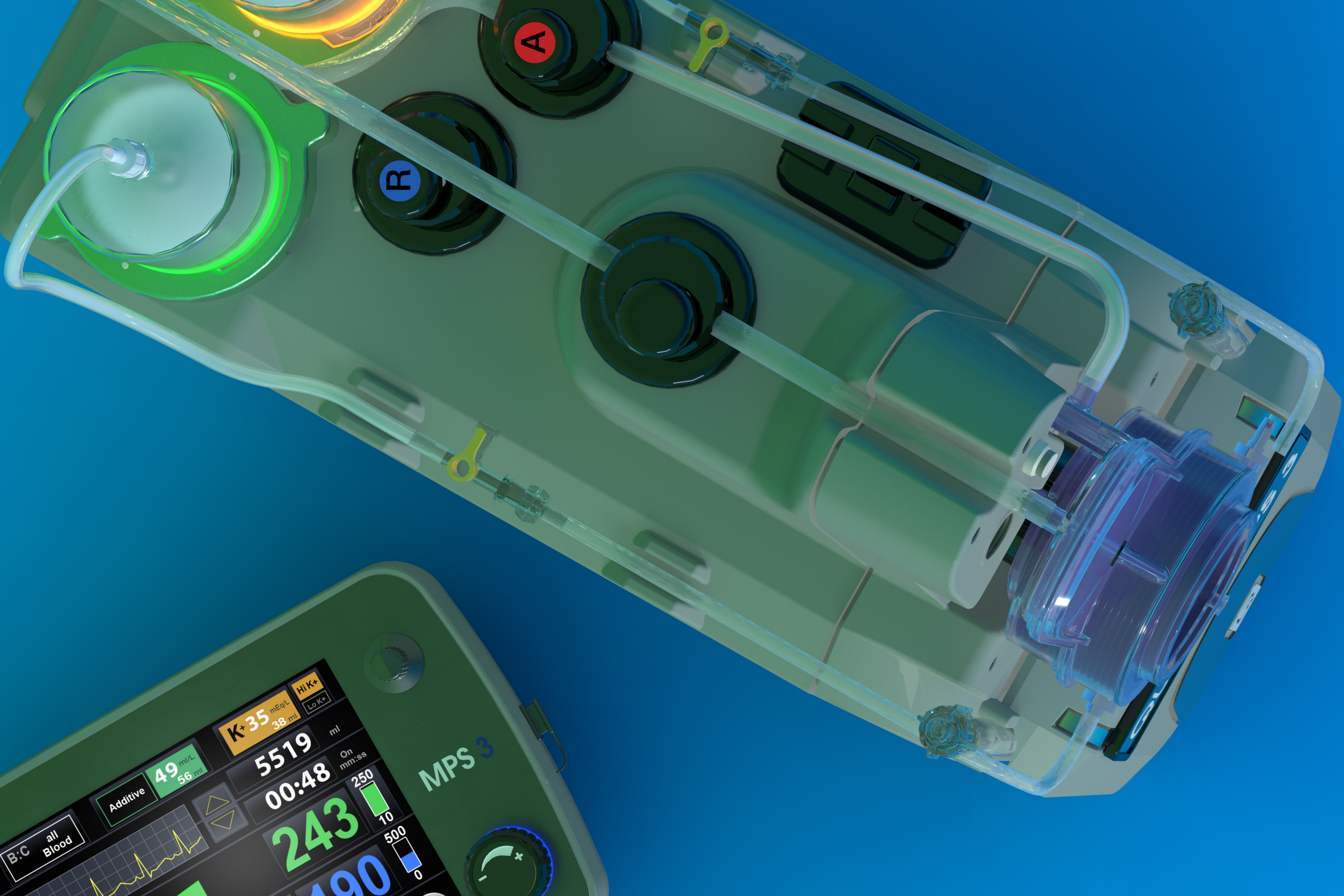


Nordson
MEDICAL

MPS[®] 3 System

SMARTER MYOCARDIAL
PROTECTION™





MPS[®] 3

SMARTER MYOCARDIAL PROTECTION[™]

Introducing the MPS[®] 3 Myocardial Protection System, the latest innovation from Quest Medical, Inc., a Nordson MEDICAL company.

The MPS[®] 3 System's coordinated drug delivery technology is well known for eliminating patient hemodilution and the associated sequela caused by cardioplegia delivery. This technology has been proven beneficial for improved patient outcomes, as well as a sound investment for hospitals.^{1,2}

Experience cardioplegia confidence with the MPS[®] 3.

SAFETY | VERSATILITY | PRECISION

Confidence In Safety

MICROPLEGIA™—OUR STRATEGY FOR CONFIDENT MYOCARDIAL PROTECTION

Microplegia™ is the pure blood initiative, a whole blood alternative to traditional blood-crystalloid cardioplegia. It provides superior myocardial protection without hemodilution, using the patient's own blood as the most physiologic buffer, lowering transfusion rates.

Pure blood is infused with specific drugs to arrest and optimally protect the heart tissue throughout the procedure.



Auto-Start

Evolved technology for effective myocardial protection. A one-touch button that allows for fast aortic valve closure and a quick arrest, while in control of flow, pressures, and displays ECG output.

Internal Battery

With the MPS® 3 System, you no longer need to worry about a possible power surge or outage. With an all new internal battery, you will experience seamless power regardless of external conditions.

Power through Precision

Know the precise drug concentrations, in real time. Accurately adjust the controls during the case.

Enhanced Drug Cartridges

New safety features and increased capacity, ensuring patient safety and reducing the need to refill on longer procedures using all-blood, single-dose strategies.

Real-Time Data Collection

The ability to collect and review data and analytics anytime throughout, or after, a procedure.

Active Monitoring Controller (AMC)

The command center for the perfusionist. Control flow rate, monitor doses, and more— all at your fingertips. The MPS® System allows for more precise and responsive control.

Active Monitoring Controller (AMC)

EVIDENCE-BASED MEDICINE

Cardioplegia delivery and cardiac activity are now visually connected with our new Active Monitoring Controller (AMC). Observe patient activity and stay ahead of critical moments.

The all-new AMC allows perfusionists to observe:

- Real-time ECG monitoring
- Critical delivery parameters
- Drug names, volumes, concentrations, and summaries
- Temperature control and displays
- Alarms and alerts for safety
- Time recordings throughout the case



Utilize the Data

Download core data and easily utilize by converting into spreadsheet format for analysis.

Ease of Use

- Create up to 64 custom protocols
- Streamline case setup: all saved protocols are available at the touch of a button
- A master file is created and can be transferred to all other MPS® 3 System controllers: protocols can easily be updated, keeping the whole fleet current.

Knowledge is Power

Imagine the possibilities of training and education from the data analytics provided from our MPS® 3 System.

Review individual case logs for drug distribution and usage, and digital case files to assist with budget management.

Better Patient Care and Outcomes

The MPS® 3 System is a powerful tool for the cardiovascular team, promoting better patient care with detailed data analytics.

New Safety Features

MPS® SYSTEM-SPECIFIC DRUG CARTRIDGES

The MPS® 3 System disposables make setup quick and easy. The new smart drug cartridges can be pre-filled and offer a refilling port if necessary during a case.

- Designed for safety and ease of use
- Reduce the need to refill during longer cases using all-blood, single-dose strategies with new, larger drug cartridges - 75 mL capacity
- Visually manage independent drug delivery through translucent cartridges with mL markers, automatic volume detection, and color-coded LED lighting.
- Volume accuracy and delivery precision are now at your fingertips- drug cartridge sensors interface with the Active Monitoring Controller (AMC)
- Cartridge securement ensures proper placement onto arrest and additive pumps

Safeguard patient safety and prevent accidental connections with a new, non-standard luer on the arrest cartridge.



QUEST MPS 3



Mobile & Adaptable

NOW 30% SMALLER & 44% LIGHTER

The MPS® 3 console's flexibility and versatility adapts to any setup. Now with a streamlined footprint weighing only 37 pounds, it seamlessly integrates with your heart-lung machine.

Control and ease of use is provided by the adaptable positioning for the AMC- putting power in the hands of the perfusionists.



Confidence in Versatility

COMPLIANCE WITH ANY PROTOCOL

Any ratio, any strategy, any methodology, **any time.**

Protocols for perfusionists are always changing. Regardless of what tomorrow holds, the MPS® 3 System has you covered. The future is now.

All parameters are easily and quickly adjustable during the case, providing accurate and agile control for better myocardial protection.

The AMC provides a snapshot of critical information to the perfusionist, giving them a command center for control.



- A: Temperature
- B: Real-time ECG display
- C: Visual display of pressure and flow
- D: Intuitive Icons
- E: Cardioplegia ratio
- F: Additive
- G: Potassium
- H: Digital time stamps are saved in the case file in addition to all aspects of the case
- I: Pressure
- J: Flow

PRECISE DRUG CONCENTRATIONS & VOLUMES ARE AVAILABLE & EASILY MANAGED ON THE NEW ACTIVE MONITORING CONTROLLER (AMC).

Input custom drug lists including concentration values.

Throughout the case, the MPS® 3 System actively monitors drug amount delivered and saves the data in the case file for future reference.



Instructional safety alerts/alarms display on the AMC which guide the perfusionist to a quick resolution.

Train in safety with **Trainer Mode:** Each AMC has a Trainer Mode for ease of learning and case scenario simulation prior to patient use.



Confidence in Precision

EXPERIENCE THE EVOLUTION OF CONTROL & ACCURACY

Auto-Start and the Induction Dose:

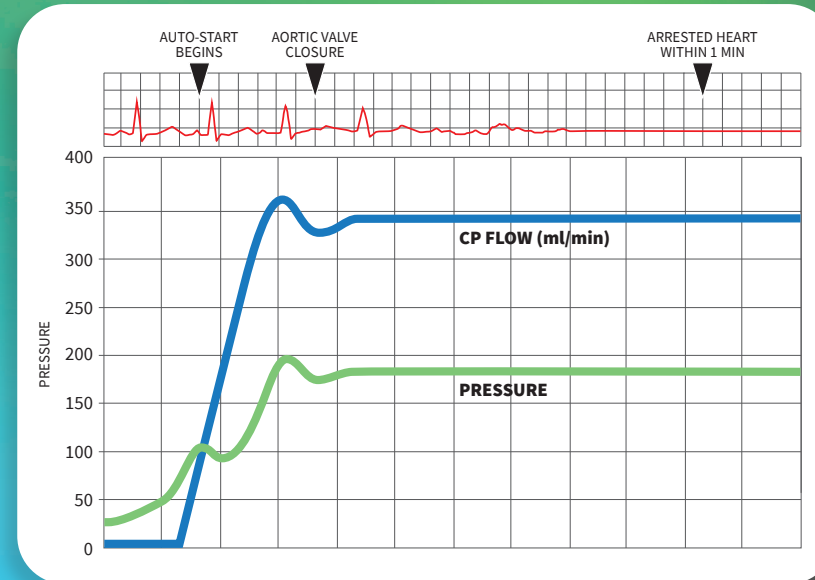
The MPS® 3 System has redefined the induction dose with its Auto-Start feature. Innovative technology for myocardial protection allows for fast aortic valve closure. Targeted parameters of flow and pressure are set within the Active Monitoring Controller (AMC). The MPS® 3 System quickly initiates and auto-regulates ramp-up, reaching targeted values for a fast and safe arrest. Achieve the most effective induction dose possible, all with the touch of a button.

Real-Time Data Collection:

The MPS® 3 System captures and records all drug volumes and concentrations in real time. The agility of the system allows for changes any time during the procedure. The console and freestanding controller work in unison to provide accurate and safe delivery of arrest and additive agents, no matter which cardioplegia protocol you prefer.

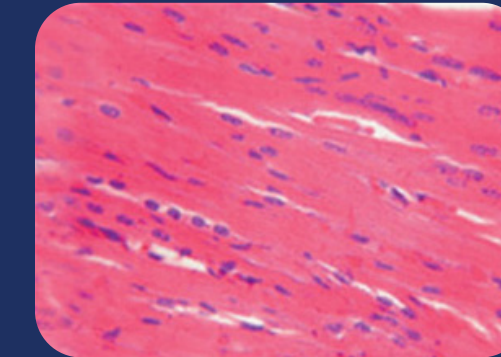
Power Through Precision:

- Avoid medication errors with organized drug records
- Know the precise drug concentrations given to your patient in real time
- Increase patient safety with evidence-based medicine



Microplegia is superior myocardial protection without hemodilution. Only MPS® technology delivers precision microplegia by independent control of additive and arrest agents.

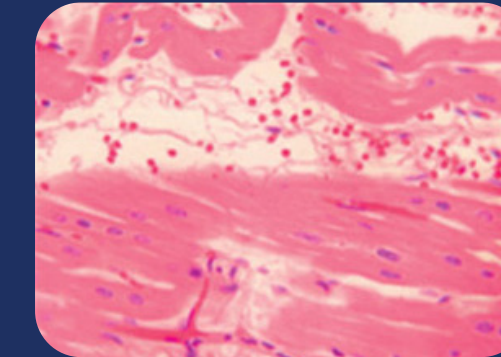
Precision Drug Delivery Without Hemodilution¹



THE BENEFITS OF MICROPLEGIA

- Provides superior myocardial protection with natural distribution
- Maximizes aerobic environment for the myocardium
- Reduction of hemodilution
- Lowers transfusion rates
- Minimizes use of hemoconcentrator
- Reduces inotropes/blood products

Diluted Cardioplegia¹ (Traditional 4:1 (Blood:Crystalloid))



NEGATIVE EFFECTS OF USING CRYSTALLOID

Excessive dilution may lead to:

- Tissue edema
- Increased use of blood transfusions
- A low HCT
- Elevated glucose levels
- Low cardiac output syndrome⁴
- Increased potassium levels

Facilitating Continuous Improvement

NEW & ENHANCED FEATURES

We are always striving to provide state-of-the-art technology with proven safety and benefits for cardiovascular teams. Our engineers and R&D department have expanded the capabilities of the MPS® 2 through continued research and development.

See our comparison of enhanced pre-existing features and new features, only offered on the MPS® 3.



MPS® 2	MPS® 3
Dimensions: 24.5”L x 7” w x 18.5”h Weight: 62 lbs.	Dimensions: 16.5”L x 7” w x 18.5”h Weight: 37.25 lbs.
Controls on unit face, mechanical buttons	Freestanding touch screen controller; more mounting options
Flexible drug pouches mount inside	Rigid plunger-style drug cartridges mount on top, coupled with LEDs, allowing better visibility of drugs during delivery and refill
Drug capacity: 50 mL	Drug capacity: 75 mL
Flow range: 10 to 1000 mL/min	Flow range: 5 to 1000 mL/min with real-time visual charting
Pressure range: 0-500 mmHg	Pressure range: 0-750 mmHG with real-time visual charting
External battery backup system	Internal battery backup
X	Auto-Start
X	Graft mode of operation - graft labeling options
X	Case report that records over 20 pre-op and intra-op parameters
X	Volume summary provides individual drug details if properly configured
X	Protocol management: master copy to ensure protocols and settings are identical across units in the account
X	Flow and pressure data records for record keeping and/or research
X	Extensive self diagnostics
X	Built-in trainer
X	Data analytics

MPS® 3 For Surgeons

ENHANCING MYOCARDIAL PROTECTION

The new MPS® 3 allows surgeons to take myocardial protection to the next level. The advanced technology brings unmatched control and flexibility through precise drug delivery, auto-pressure regulating, and enhanced flow distributions. Embrace more control, accuracy, and flexibility with the MPS® 3.

Precise Drug Delivery

A new feature for MPS® 3 is Auto-Start. This innovative technology auto-regulates the ramp-up flow to target a desired pressure level for an induction dose. With a touch of a button, the aortic valve closes quickly which preserves more cardioplegia to target desired areas.

Navigate through Complex Procedures

The responsive design of the MPS® 3 allows a surgeon to quickly change any strategy/protocol without interruption.

- Adjust drug delivery settings quickly during a case
- Independent control of potassium and cardioprotective drugs through a dual delivery line set
- Track and record individual components
- Antegrade, retrograde, simulgrade

Flexibility With Your Choice of Cardioplegia

THE MPS® 3 CAN DELIVER ANY CARDIOPLEGIA STRATEGY:

- Intermittent microplegia
- Ratio cardioplegia
- Extended arrest protocols (single-dose strategy)

Reap the benefits of Auto-Start with the auto-ramp up feature that allows for quick aorta closure, preserving the cardioplegia for targeted distribution—no matter which strategy is utilized.

Microplegia is a whole-blood alternative to the traditional blood-crystalloid cardioplegia. It provides superior myocardial protection without dilution, using the patient's own blood as the most physiologic buffer, lowering transfusion rates. Precision microplegia is only possible through the use of MPS® technology.

Faster Patient Recovery²

With MPS® technology and the talent of surgeons and perfusionists, the heart can emerge stronger from surgery, requiring less time in ICU.

Safety

- **Case management:** protocols and strategies can be saved for quick reference, then customized per individual cases
- **Air bubble detection:** warnings provide alerts to enhance patient safety during the procedure
- **Internal battery backup:** provides peace of mind

Be on the cutting edge of myocardial protection with the MPS®3 System.

Contact our team today to set up a free demonstration:

+1.800.627.0226

mps3@nordsonmedical.com



A Powerful Tool for Perfusionists

CONTROL, ACCURACY & FLEXIBILITY

The MPS® 3 brings myocardial protection to the next level. The fully redesigned MPS® 3 is engineered to bring unmatched control and flexibility through customizable protocols and strategies, precise accuracy on dosages, quick aortic valve closure, and adaptable settings during a case.

Induction Dose Sets the Stage

The induction dose is vital for a safe and successful surgery. Myocardial protection gains its momentum from the initial dose of cardioplegia and ideal distribution to specified areas. The MPS® 3 is the tool that can provide accurate control for a strong start by:

- Closing the aortic valve quickly for better distribution
- Purposeful pressure and flow to reach ventricles
- Fast and efficient arrest
- Using less cardioplegia to arrest allows focused distribution

Auto-Start is a new feature that allows the perfusionist control and accuracy to accomplish a strong start. This innovative technology auto-regulates the ramp-up flow to target a desired pressure level for an induction dose. With the touch of a button, the aorta closes quickly, preserving more cardioplegia to target desired areas.

User-Friendly

- Intuitive freestanding touchscreen controller
- Quick setup with disposables and priming
- Protocols and strategies easily saved for quick reference
- Training mode with easy navigation
- The new freestanding controller is equipped with a thorough and realistic training mode to allow users to discover and learn the powerful features of the MPS® 3.

Safety

- **Case management:** protocols and strategies can be saved for quick reference, then customized per individual cases
- **Air bubble detection:** warnings provide alerts to enhance patient safety during the procedure
- **Internal battery backup:** provides peace of mind

State-of-the-Art Touchscreen Controller

The freestanding controller allows for a flexible set up in the OR. The touchscreen monitor puts detailed displays at your fingertips.

ECG DISPLAY

- Display of rhythms, trends, and time to arrest on a case-by-case basis
- Record time to arrest, total arrest time, ischemic time
- Label and see reanimation statistics

DRUG DELIVERY

- Precise delivery of each additive and arrest component, including drug volume and concentration
- Drug delivery tracking with individual component recording
- Ability to quickly adjust settings during a case
- Antegrade, retrograde, simulgrade

PROGRAMMABLE PROTOCOLS/DOSE HISTORY

- Load as many as 64 saved protocols in the controller for consistency, ease, and uniformity when needed
- Ability to switch protocols on the fly during a case to best adapt to case dynamics
- Customizable additives and components with precise drug delivery tracking
- Dose summaries with graphic charts

Be on the cutting edge of myocardial protection with the MPS®3 System.

Contact our team today to set up a free demonstration:

📞 **+1.800.627.0226**

✉️ **mps3@nordsonmedical.com**



MPS® 3 For RX & Admin

VALUE-ADDED BENEFITS FOR HOSPITALS

The new MPS® 3 technology can benefit hospitals at multiple levels through the next generation of myocardial protection. The advanced technology can reduce hospital costs and simplify pharmacy management.

Reduce Costs

Investing in the MPS® 3 benefits hospitals by:

- Eliminating the purchasing of compound cardioplegia
- Reducing waste
- Improving patient outcomes

The innovative design of the MPS® 3 allows drawing drugs directly from the vial, which eliminates the need for compounding multi-ingredient cardioplegia solutions and can reduce waste.

With the superior myocardial protection that MPS® technology offers during surgery, the heart emerges stronger from surgery, allowing for a quicker recovery and less time in ICU².

Microplegia with MPS® vs. traditional cardioplegia²



Experience a reduction in adverse events



Patients experience 1 day less in the ICU



Patients recover faster and are discharged 1 day earlier



Reduction in medication costs



Reduction in hospital costs



Better patient outcomes

Pharmacy Management and Data

In addition to eliminating the need for compounding cardioplegia drugs, the MPS® 3 can assist with drug accuracy and tracking. Each individual case saves the protocols used during the procedure, including drug lists and dosage amounts. The MPS® can interface directly with hospital files to assist with tracking and usage of drugs. The data from cases is downloadable via a removable flash drive that can be imported into a spreadsheet software.



Be on the cutting edge of myocardial protection with the MPS®3 System.

Contact our team today to set up a free demonstration:

 **+1.800.627.0226**

 **mps3@nordsonmedical.com**



Be a Part of the Evolution

CONFIDENT MYOCARDIAL PROTECTION WITH THE MPS® 3 SYSTEM

Set up a free demonstration of the MPS® 3 System by calling customer service team at +1.800.627.0226 or visiting our website.



IMPORTANT SAFETY INFORMATION: For complete indications, contraindications, warnings, precautions, and potential adverse events, refer to the product's Instructions for Use (IFU).

Manufactured by Quest Medical, Inc.

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